

Better Homes and Gardens®

WOOD

THE WORLD'S LEADING WOODWORKING MAGAZINE

FEBRUARY 1997 ISSUE NO. 95

RIP FENCE ROUNDUP

WE TEST 21 MODELS
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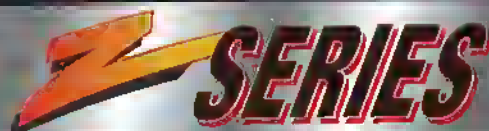
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- We've added several new shareware programs for your computer to help solve shop problems. You can now download all of the programs for free from our Woodworker's Software Library.
- Use our searchable index to find articles and projects from issue no. 1 to the present.

THE EDITOR'S ANGLE

A creative use for Tired-Out Trees

I don't know about you, but I've always been fascinated by chainsaw carvings. Whenever I watch one quickly taking shape under the skillful hands of the carver, I feel like I'm witnessing a miracle.

Lately, it seems like I've been seeing more of these carvings than ever, mainly used as outdoor sculpture. Recently, on the way home from work, I spotted one in the shape of a turkey in someone's front yard.

Then, at the Iowa State Fair last summer, I was in a large crowd that watched as carver Brian Ruth, of Hartsville, Pennsylvania, transformed a red maple log into a 24" tall roadrunner with his chainsaws.

The most interesting use of chainsaw sculpture I've seen, though, is in the yard of Bill Mays, a retired executive, in suburban Des Moines, Iowa. Bill's odyssey began after the city decided to widen the street adjacent to his lot. According to Bill, as a result of the city installing a retaining wall along his property, several 65- to 80-foot pine trees next to the wall died.

Faced with the prospect of having to saw the trees into firewood, Bill opted for what has turned out to be a traffic-stopping solution. He hired A.J. Lutter, a talented California chainsaw carver, to create five humorous bear sculptures (one is shown in the photo above). Bill tells me that the bears, which A.J. created without drawing pattern lines, have become such a popular tourist attraction that city officials and the police now offer interested parties directions to Bill's lot.



California chainsaw carver A.J. Lutter (left) and Bill Mays standing beside one of the five 10'-tall bear sculptures that grace Bill's property.

Thanks to this conservation-minded property owner's quick thinking, and to one terrific carver, the world is now a more lighthearted, more beautiful place. Thanks guys!

If any of you have a tree on your property that you're thinking about getting rid of, give Bill's solution some thought. To locate chainsaw carvers in your area, first call local chainsaw dealers. If that doesn't produce results, check with the local artists' association. No luck, there? Then write to me, and I will try to help you locate someone who can work on your project. (Note: A.J. charges anywhere from \$100 to \$300 per foot for his carvings.)

Larry Clayton

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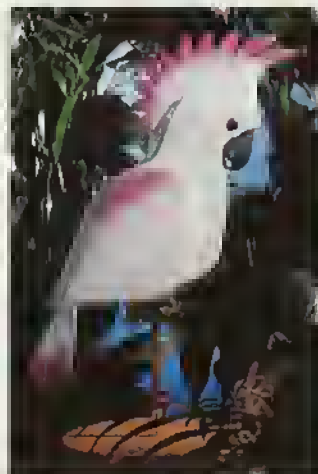
THE WORLD'S LEADING WOODWORKING MAGAZINE

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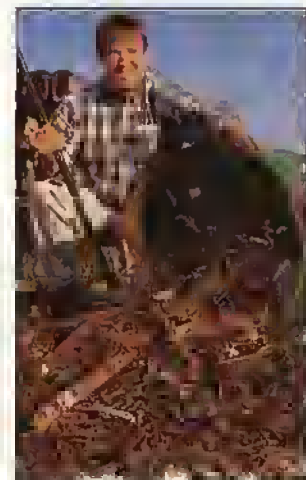
Let kids walk tall with this design.



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TALKING BACK

Converting decimals to fractions

A part of the course in cabinet-making that I took about 50 years ago included a way of changing decimal measurements into fractions. This technique came to mind when I read "What woodworkers need to know: Calipers" in the September 1996 issue. Here's how it works:

1 Take the decimal measurement reading from your dial caliper (I'll use the .768 from the article) and multiply it by the fractional denominator you're most likely to use (32 for working in 1/2" measurements):

$$\begin{array}{r} .768 \\ \times 32 \\ \hline 1536 \\ \hline 2304 \\ \hline 24.576 \end{array}$$

How to reach us

We welcome comments, criticisms, suggestions, and even compliments. And you're sure to hear back from us, perhaps on this page! You can "talk back" by one of several ways:

• **Via mail.** Send your letter to Talking Back, *WOOD* magazine, 1912 Grand Ave., Des Moines, IA 50309-3379.

• **Via computer.** Send your e-mail to one of these addresses: CompuServe: 74404,3516 Internet: 74404.3516@compuserve.com

2 Round the answer to the closest whole number, in this case, 25. This becomes the numerator of your fraction. So, .768 roughly equals 25/32".

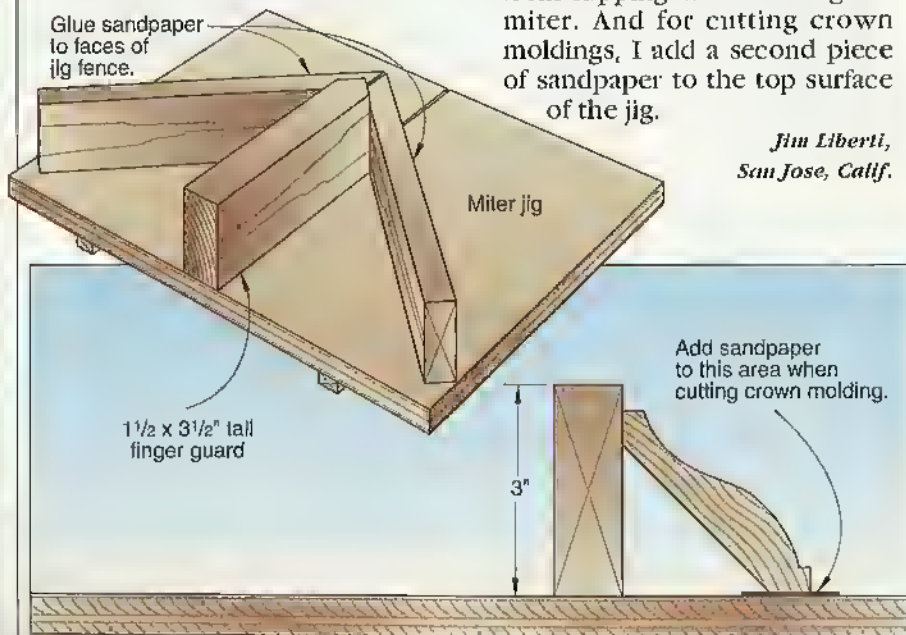
—Donald Burrows, Euclid, Ohio

An addition to miter jig

I made Tim Hanson's miter jig as shown in the September 1996 Talking Back letter "Improvements on the miter jig." It was quick and easy to make, and the blade guard is an excellent safety feature.

However, I did make one addition to my version. I applied sandpaper to the entire face of each fence, using a spray adhesive applied to the paper. This helps prevent the workpiece from slipping while cutting the miter. And for cutting crown moldings, I add a second piece of sandpaper to the top surface of the jig.

Jim Liberti,
San Jose, Calif.



Continued on page 6

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To make it even better, we added something no other dado manufacturer has... a sixth chipper that is 3/32" thick. That doubles the number of possible slot widths (from 1/4" up to 23/32" wide), and allows you to set the dado to fit today's undersized plywoods. To make it even more flexible, we've included a set of precision steel shims for fine adjustments. Here is a dado that matches the slot width flexibility of an adjustable dado while maintaining the safety and finish of a stacked dado system.

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Exclusive 3/32" Chipper lets you perfectly adjust the width of the cut for today's undersized plywood.

TALKING BACK

Continued from page 4

Tips for buying router bits

I enjoyed the new column "Router Bit Review: Lock Miter Bit" in the February 1996 issue. I started checking the cost of these bits and found that the prices range all over the place. Locally, a home improvement store had this style bit for \$129. A mail-order company listed the bit at \$45 (standard) and \$90 for the anti-kickback design shown in the article. Does the anti-kickback feature justify the additional cost, and which bits would you recommend?

—Andy Grintbal, Green Township, N.J.

Andy, for an answer to your question, we contacted Jim Brewer at Freud. Jim stated, "We often find ourselves dealing with the erroneous perception that the anti-kickback feature adds to the cost of a router bit. However, when Freud introduced the anti-kickback technology about 6 years ago, we did not increase the price of our bits.

"The price difference that you see between router bits with the anti-kickback technology and those without generally reflects the difference in the quality of the bit rather than the addition of the anti-kickback feature. The additional cost lies in the use of better-quality and thicker carbide,

together with the better technologies involved in producing the advanced cutting geometry."

When we select a bit for our shop here at WOOD® magazine, we first look at the quality of the cutter in relation to the amount of use we expect the bit to receive. In our December 1994 review of router bits, the two top-rated manufacturers were Freud and CMT. We'd most likely consider buying one of these router bits for situations where we know the bit will receive heavy use. For a bit that we may use on only a few projects, we'd be more likely to consider the less-costly Taiwanese-made bits.

The second area we consider when buying a router bit is the shank size. We recommend you select router bits with a 1/2" shank for cutter profiles that remove a lot of wood (such as a 1/2" cove, 1/2" roundover, or panel-raising bits as shown above.)



The sliver of gray on the Freud bit is all the carbide that can grab the wood should a kickback occur. The larger exposed area of carbide on the bit in front can cause a much harder kickback.

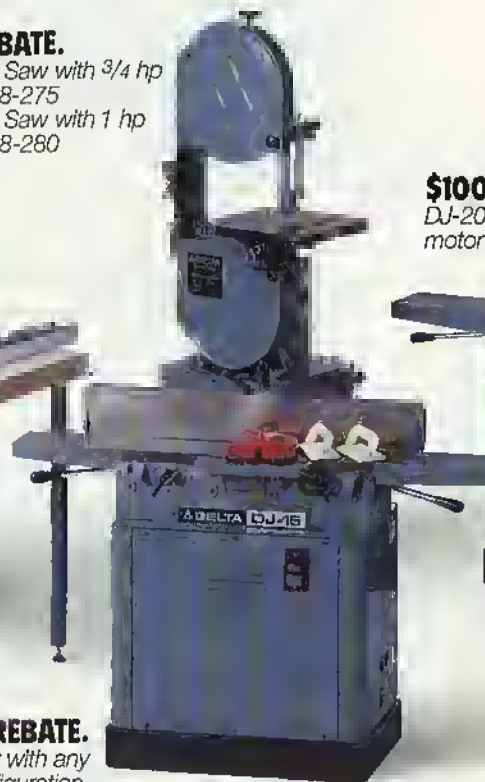
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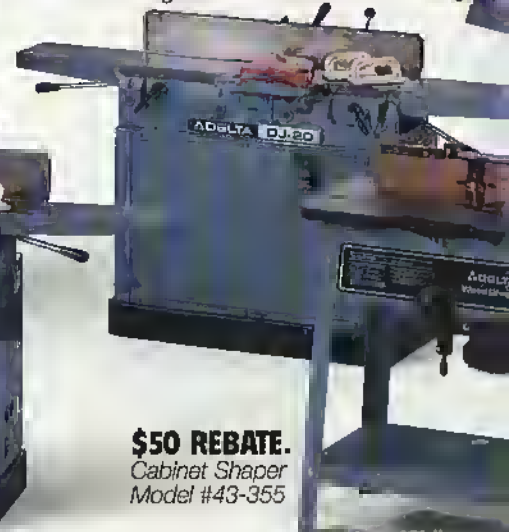


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Personalizing the mailbox

My husband Carl decided to build the "First-Class Mailbox" featured in your February 1996 issue, as he thought it would look great on our house. However, to add just the right personal touch, he replaced the word MAIL with our last name—GRICE. And boy, did it ever turn out great! We've received many compliments on it. Thanks for getting us started.

—Allison Grice, Millington, Tenn.

For those of you with names too long to fit on the mailbox, you may want to include your house numbers.



Knobs help protect precious fingers

I just finished building the "Kid's Country Cottage" from the April 1996 issue. And I am astounded at how much fun my 4-year-old daughter Ashley is having with it, even though it's still sitting in the basement waiting for warm weather to arrive.

However, I noticed a couple of things as I watched her play with the cottage. After she would walk through the door, she would try to close it. This resulted in her getting her fingers pinched. To solve this problem, I added a knob on the inside of the door, similar to the knob on the outside. I also added interior knobs on all the windows for the same reason.

I replaced the acrylic in the door and windows with screen material to allow for air circulation. This also lets Ashley and her friends play in the house and keep the insects on the outside. ♣

—Ken Kaplan, Oakridge, N.J.



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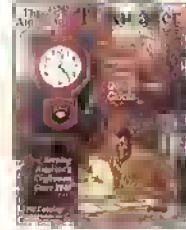
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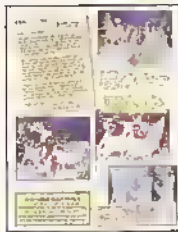
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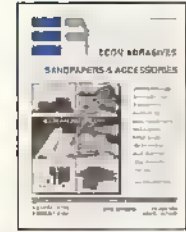
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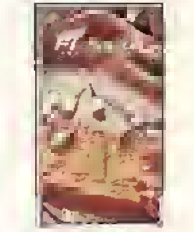
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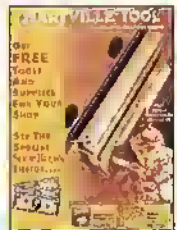
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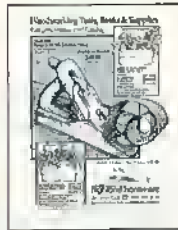
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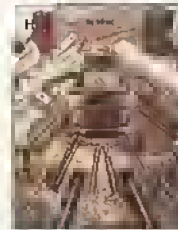
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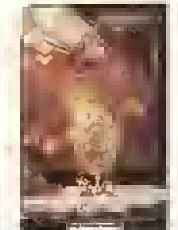
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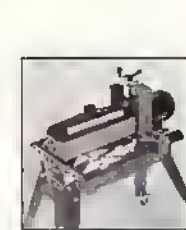
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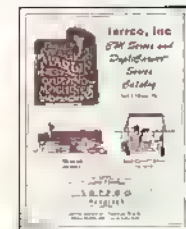
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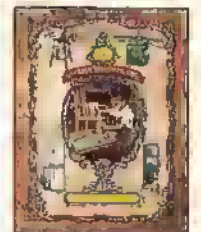
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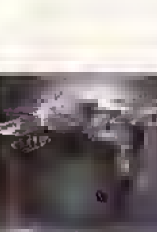
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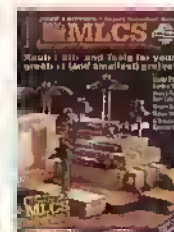
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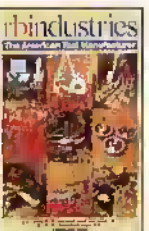
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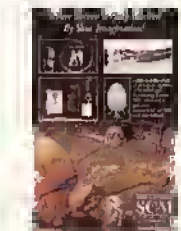
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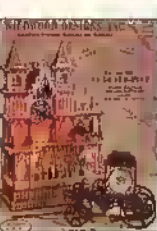
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Glen Kraig spends a lot of free time relaxing in his workshop.

Chickens once roosted in Top Shop Tip winner Glen Kraig's workshop. But they've long since flown the coop, and the San Bernardino, California educator has converted his hen house into a spacious workshop that gives him plenty of room to spread his wings.

Glen calls himself an "eclectic" woodworker, producing projects ranging from an inlaid backgammon board to an oak corner cupboard. He developed the tip *right* while building a sofa table. We think it will be a real time saver for anyone who has to cut tapered legs.

To become a prizewinner like Glen, tell us how you solved a particular woodworking problem. We pay \$40 for all tips published. If yours is selected as the Top Shop Tip, you'll win a tool prize valued at \$250 or more and be featured in this column. Send a letter, including your daytime phone number, with a photo or drawing of your idea, to:

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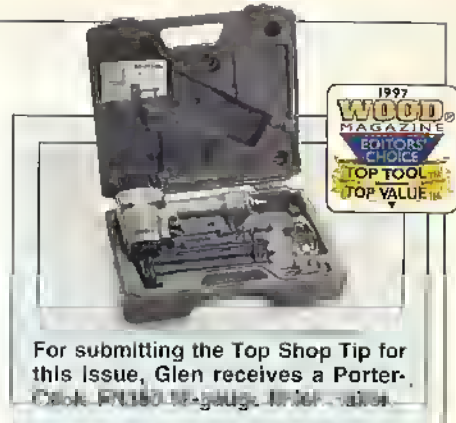
Kerry Gibson

GENERAL-INTEREST EDITOR

Use extension blocks to cut tapered legs

After trying to cut tapered table legs by shimming them in my taper jig, I decided there had to be an easier, more accurate way. My solution requires a little more stock, but the results are well worth it.

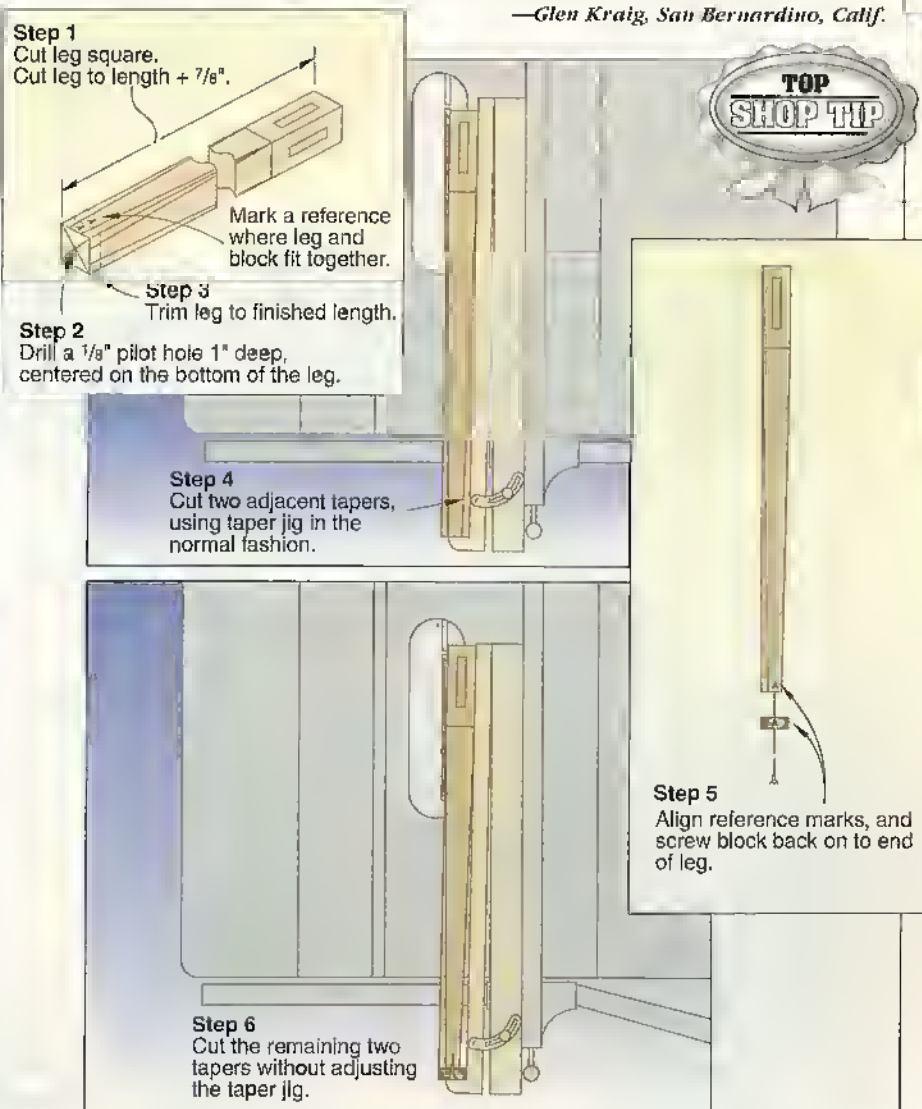
I start by ripping the legs $\frac{7}{8}$ " longer than finished length (Step 1 of the drawing *below*). Next, I drill a $\frac{1}{8}$ " pilot hole 1" deep centered on the bottom end of each leg (Step 2). After making reference marks on each leg, I trim the legs to finished length (Step 3) and set the waste extension blocks aside.



For submitting the Top Shop Tip for this issue, Glen receives a Porter-Cable FN150 W-gauge taper jig.

Using my tablesaw taper jig, I cut the tapers on two adjacent sides (Step 4). Then, using the reference marks I made earlier, I reattach the extension blocks to the legs with 1" screws (Step 5). The blocks keep the legs properly positioned when making the final two taper cuts (Step 6).

—Glen Kraig, San Bernardino, Calif.



Continued on page 12

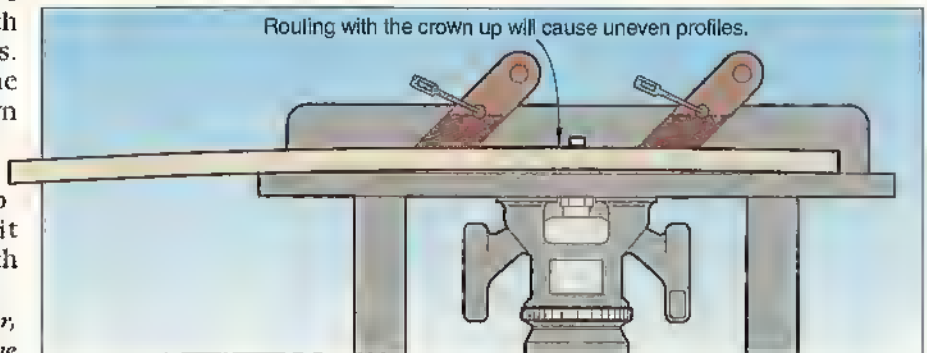
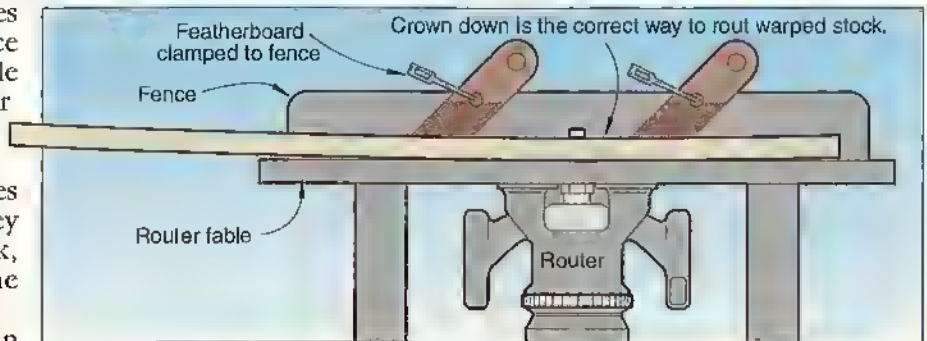
Continued from page 11

It's "crown down" when table-routing long workpieces

When molding long workpieces on a router table, the workpiece must be held flat against the table and fence in order for the router bit to cut a consistent, smooth profile. Even with the help of featherboards, bowed workpieces used to cause me fits because they wouldn't lie flat. Narrow stock, which nearly always has some bow in it, was always the worst.

To cut consistent profiles on bowed stock, I examine these workpieces and place them with the bow down for best results. This takes the spring out of the board that occurs with the crown of the bow up. I still use featherboards, but holding the workpiece firmly against the tabletop and fence at the router bit requires much less pressure with the crown facing down.

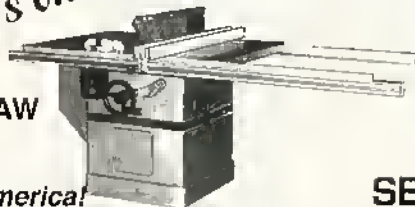
—Jim Downing, Design Editor,
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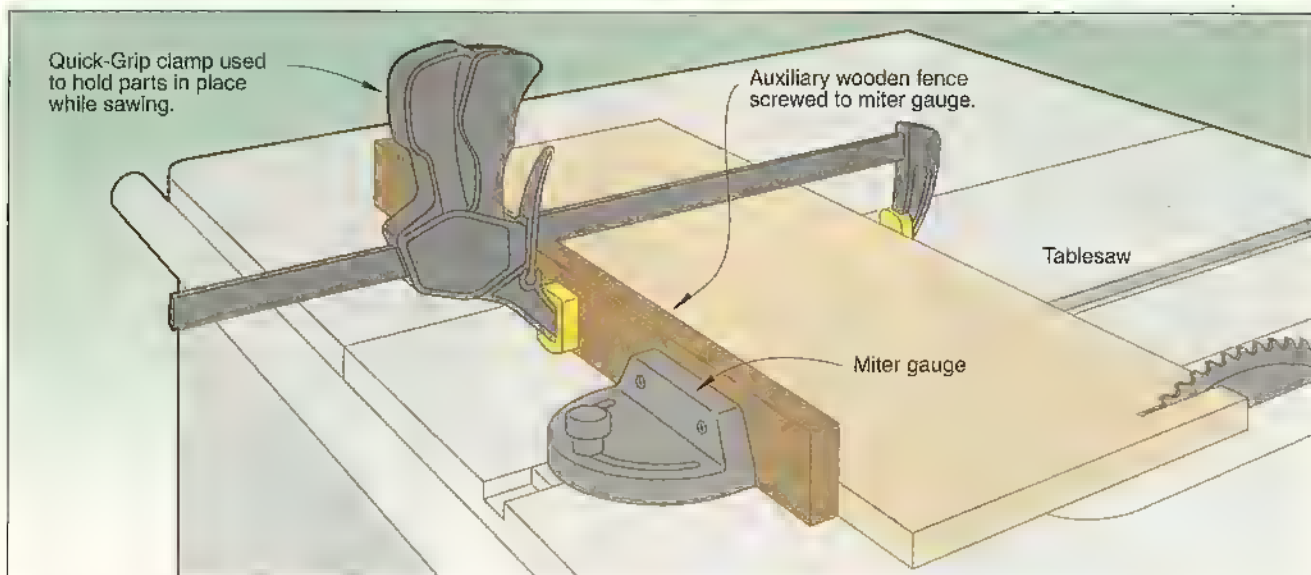
Quick-Grip clamp helps keep crosscuts square

When an elbow injury made it difficult for me to squarely crosscut long workpieces, I had to find another way to get the job done. My solution was to mount an aux-

iliary fence to my miter gauge, then clamp the workpiece to the fence with a Quick-Grip clamp as shown *below*. The clamp holds the workpiece tightly against the

auxiliary fence, ensuring a square cut. It also provides me with a convenient handle to help push the piece through the saw.

—Dave Rickett, Sylvan Lake, Alberta



Continued on page 14

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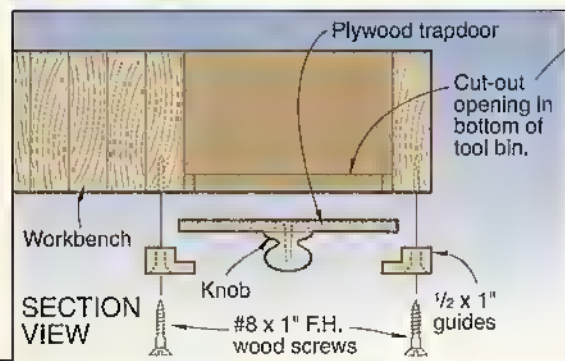
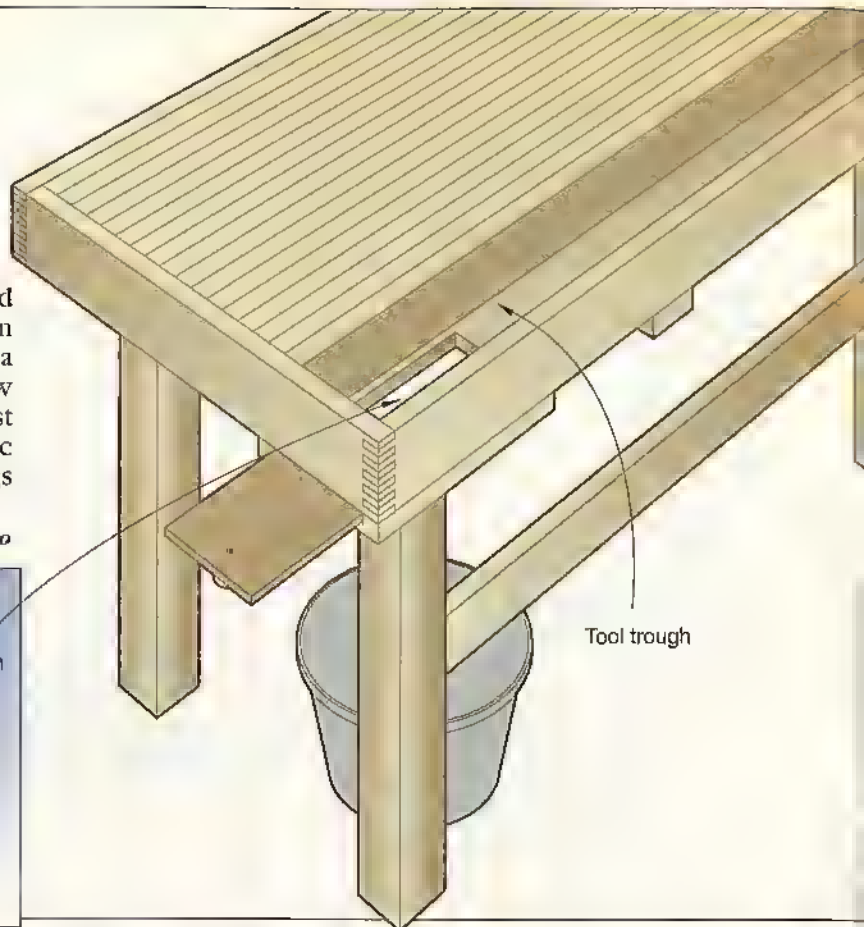
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Continued from page 13

Trapdoor lets workbench dust and chips fall free

The trough on my carver's style bench is great for keeping tools close at hand, but it also collects a lot of dust and chips. Instead of building a ramp to sweep waste up and out of the trough, I cut away a short section of the trough's bottom panel and installed a sliding trapdoor, where shown *below*. Now when I want to clean out the trough, I just place a trash can under the bench, open the trapdoor, and push the dust and shavings through the hole. Gravity handles the rest!

—R.B. Himes, Vienna, Ohio



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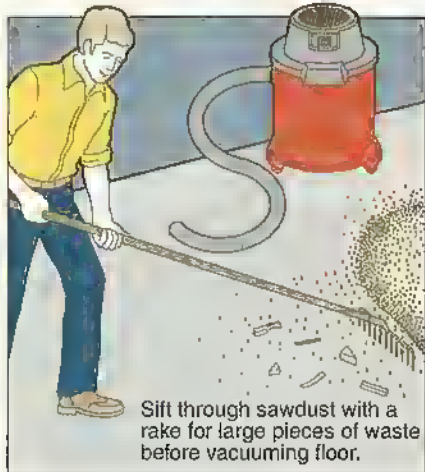
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Rake out the big pieces

A garden rake isn't standard shop equipment, but it sure comes in handy for separating hose-clogging chunks from a pile of shop debris. I rake through the pile before I vacuum.

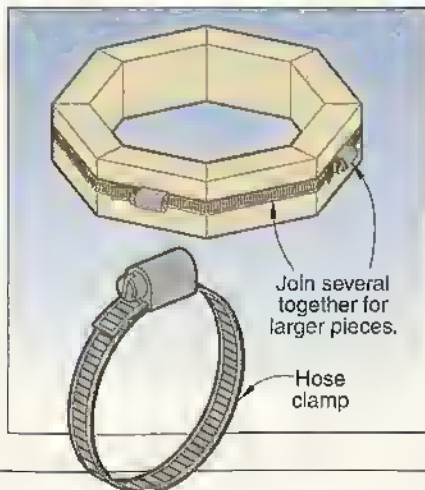
—C. J. Jones, Fieldale, Va.



Link clamps to fit work

Band clamps work well on large, or irregular-shaped objects, but as a turner, I often need multiple clamps spread out along the length of a cylinder blank. I found that stainless steel hose clamps are an inexpensive alternative. Available in a variety of sizes, several clamps can be linked end-to-end when I need to encircle larger pieces. Added bonuses are that glue squeeze-out is easily scraped off the clamps and they don't rust.

—Wayne Gaul, Shamon, Ill.

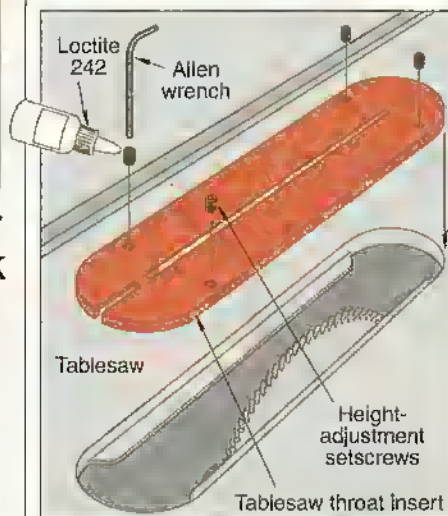


Glue setscrews to keep tablesaw insert level

My tablesaw's throat insert used to cause me grief. Vibration from the motor loosened the setscrews a bit over time, and the insert dropped down below the table-top. When I tried to rip a board, the bottom edge of the forward end would catch, resulting in an endgrain tearout.

To keep the setscrews firmly in place, I put a dab of Loctite 242 glue on the threads. The glue prevents the setscrews from moving, but a hearty twist with an allen wrench breaks the glue bond.

—R. J. Lemerise, Utica, Mich.



A FEW MORE TIPS FROM OUR WOODWORKING PROS

- When gluing a face-to-face lamination, the layers almost always slip out of alignment as you tighten the clamps. A crosswise clamp, as shown in the photo on page 68, can prevent the problem.
- Need to make a pivoting joint? Install a panhead screw with a washer into one end of a short dowel, as shown in the Pivot Pin Detail drawing on page 45.
- How does the electrical service in your shop rate? Find out how to bring it up to par on page 66. ♣

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Vertical raised-panel bits



These cutters have grown increasingly popular in recent years because they don't require a big, variable-speed router (as horizontal raised-panel bits do). But, there are trade-offs that you need to consider.

The pros and cons of vertical raised-panel bits

Because vertical bits don't exceed 1½" in diameter, you can run them at full speed (about 24,000 rpm). So, most single-speed routers with at least 1½ hp will handle them.

You can buy these bits for \$45 to \$60 each—about the same price as or slightly less than horizontal bits. Vertical bits have ½" shanks, and cut the same profiles (ogee, cove, or straight bevel) and the same reveal (about 1½") as full-sized horizontal bits.

As you will see in the next section, vertical bits will cut almost as smoothly as horizontal bits, but only if you take your time and work slowly. You won't find their slow pace a big problem if you're not in a hurry and are making just a few panels.

Finally, vertical bits can only make cuts along straight edges. So, they won't help you make arch-topped panels.

How to get smooth results

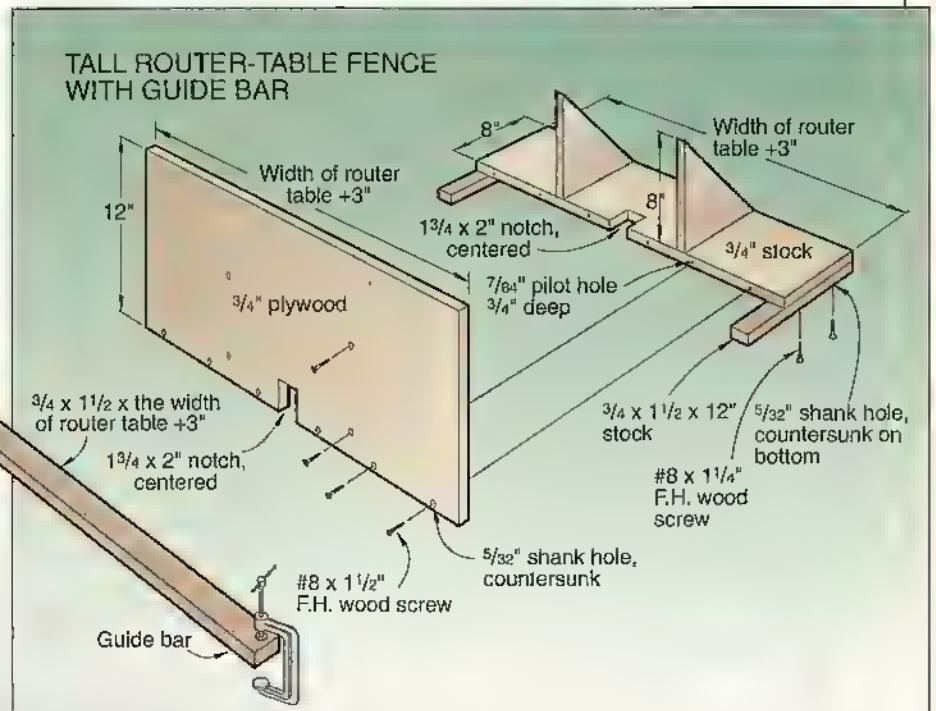
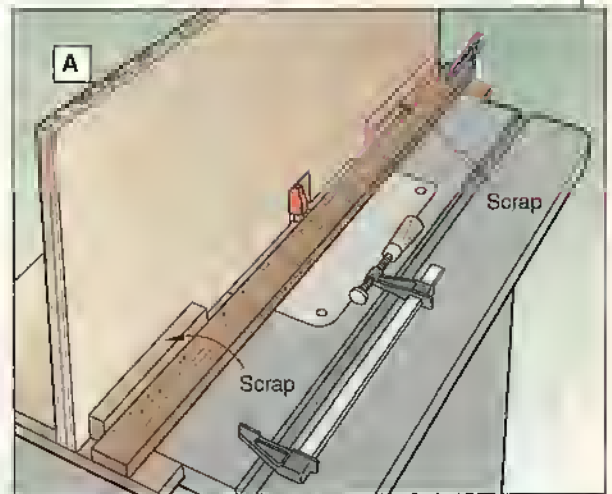
Note: Build the frame that the panel will fit into before you start the following procedures. Then, you can test-fit your first panel and be confident that all of your panels will fit in their frame grooves. These bits are designed to be used with ¾"-thick stock.

With vertical panel-raising bits, you stand workpieces on edge as you feed them, so you need a tall router-table fence for support. We've had our best success with the fence shown at right. It has a guide bar that holds the bottom of the panel in firm contact with the

router bit for a consistent cut. It also helps to keep your hands away from the bit.

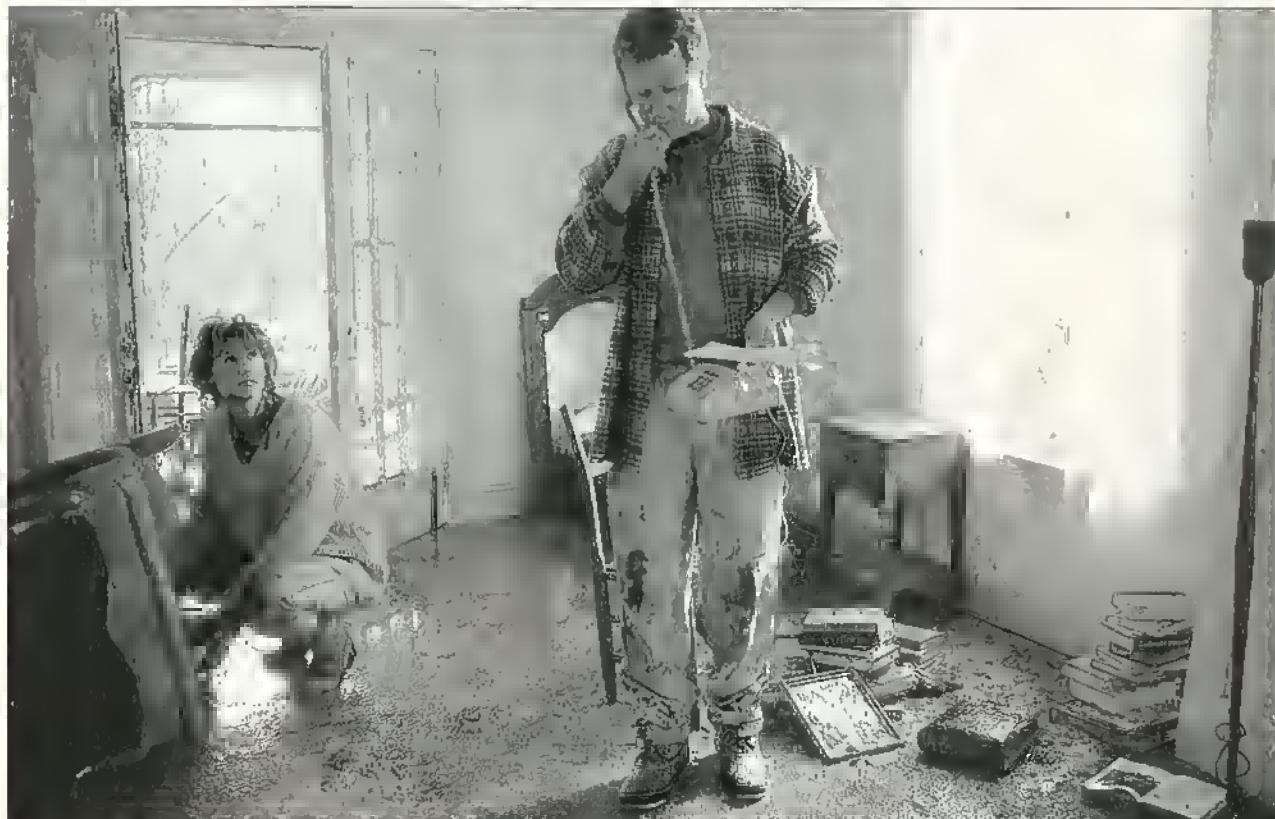
After building the fence, clamp the guide bar in place, adjusting it so a panel snugly fits between the bar and fence. The panel should slide smoothly, but without any slop. We positioned the bar by placing two pieces of scrap panel stock between the fence and bar as shown in *Illustration A*.

Now, install the bit and adjust its height so that all but ⅛" of its carbide cutting edge is above the table surface. Clamp the fence to the router table so the bit makes a cut about ⅛" deep.



Continued on page 18

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Continued from page 16

Vertical raised-panel bits

Hold your panel as shown in *illustration B*, and make a cut along the end grain. Hold the top of the panel in solid contact with the fence, being careful not to tip the bottom of the panel into the bit. Feed the workpieces slowly to prevent scalloped cuts and grain tearout (the ends are especially susceptible to tearout). Don't pause as you feed, or the bits will burn. Make the same cut along the opposite end, and then cut the edge-grain sides.

With a pencil, mark the position of the fence on both ends of the table as shown in *illustration C*. These marks will help you reposition the fence for subsequent panels. Then, readjust the fence for another $\frac{1}{16}$ "-deep cut. Make the cuts, remembering to cut the ends first, and again mark the position of the fence. Repeat this procedure until you cut the profile to its final depth.

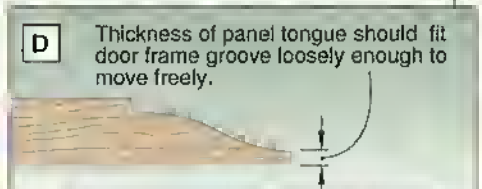
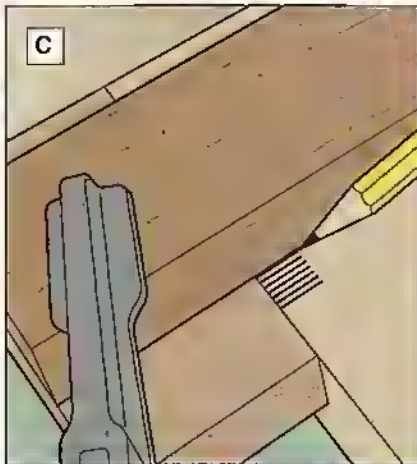
Depending on the wood, you may be able to take deeper cuts without any problem. But, it's best to err on the side of shallow cuts—even when you get smooth results with deeper cuts. Why? Large chunks of wood can unexpectedly break free from hard, open-grained woods such as red oak, seriously marring the panel.

As you approach the final depth (the panel edges should be about $\frac{1}{8}$ " thick), check the panel for fit into the frame groove according to the guideline in *illustration D*. If you're making multiple panels, clamp some stops onto the table in back of the fence as shown in *illustration E*. These will guarantee cuts of uniform depth on all of your pieces.

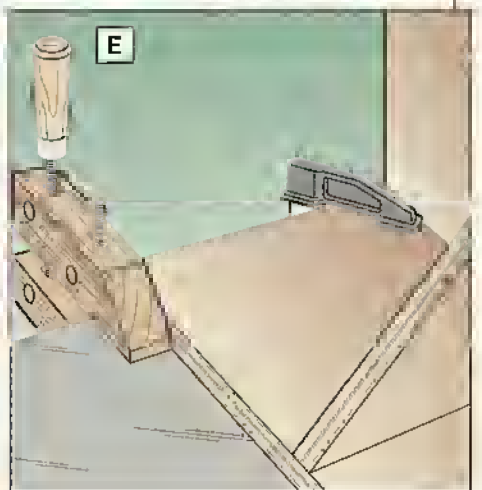
The final verdict

If you already own a 3-hp, variable-speed router, or can afford to buy one, go with horizontal bits for panel raising. They don't require any special jigs, but you may need an auxiliary tabletop if your router-table plate doesn't have insert rings for bits of various diameters. And, you'll get better results in much less time.

Vertical raised-panel bits make sense if you need to make a few panels and don't want to spend \$210 or more for a big router. Just remember to be patient and take your time. 🛠️



ADJUSTING DEPTH OF CUT

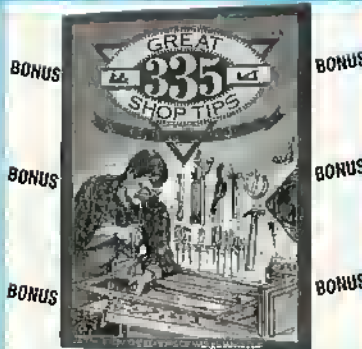


Written by Bill Krier with Jim Downing Illustrations: Kim Downing

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For TABLE and RADIAL SAW — 10% to 20%

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8-1/4"x60T	\$150	\$109
8"x60T	\$150	\$109
7-1/4"x60T	\$150	\$109

OTHER SIZES AVAILABLE — 7 1/4" — 14"



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New specs, 5° Neg. Pls. & flat, runs
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Oella Sidekick 6-1/2"x40Tx5/8"	\$149	\$89
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Hitachi 8-1/2"x80Tx5/8"	\$179	\$109
OeWall 8-1/2" & Ryobi 8-1/2"x60Tx5/8"	\$179	\$109
Oella 9"x80Tx5/8"	\$204	\$119
Ryobi-Makita & all 10"x80Tx5/8"	\$207	\$129
OeWall, Makita, B&D, Hitachi 12"x80Tx1"	\$229	\$139
Ryobi-Makita 14"x100Tx1"	\$266	\$179
Hitachi 15"x100Tx1"	\$277	\$189

For good general purpose cuts use Woodworker II 30T & 40T or Woodworker I. Use small stiffener where possible.

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5/8" HOLES Boring up to 1-1/4" \$7.50 extra.
 Larger holes—flute basis, Shipping \$4.50.

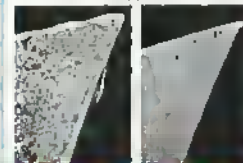
	SIZES AVAILABLE	LIST	SALE
Faster feed rates & absolute splinter control.	7-1/4"x60Tx3/32" K	\$149	\$129
Stops splintering on OAK, BIRCH PLY VENEERS & MELAMINE.	8"x80Tx1/8" & 3/32" K	\$202	\$169
	9"x80Tx1/8" & 3/32" K	\$207	\$179
	10"x80Tx1/8" & 3/32" K	\$207	\$169
Other sizes available	12"x80Tx1-1/8"K	\$212	\$181



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Above 1" bore standard.
**CARBIDE IS THE HARDEST OF THE
 C-4 GRADES AND 40% STRONGER, NOT WEAKER!**
 FOR 50% TO 300% LONGER LIFE.

Standard C-2 Carbide (below, left) and FORREST still sharp Oxidation and Corrosion Resistant Sub-Arcion C-4 Carbide (below, right). Each shown after cutting 8,500 feet of MDF. Similar results obtained cutting particle board, melamine, and plywood.



STILL SHARP
 AFTER 8,500 FEET
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Call the factory for
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I just purchased your WOODWORKER II 3/32 blade, and I AM TICKLED PINK with it. My RYOBI BT 3000 saw acts like it had a 3 H.P. motor in it. Cuts so much easier and quieter and smoother. Don't need my jointer or sander now.

P. Rose, PA

After installing your blade and 5 in. stiffener the vibration in my saw went down another 20%. I ran several pieces of hardwood through the saw, both crosscut and ripping, and was amazed at the smoothness. It was like cutting butter, maybe smoother. I have never had a saw blade that cut this smooth.

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C-4 Carbide Tips — 4 on each chipper with special negative face hoods.

	LIST	SALE	10%	15%
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10" D. 5/8" & 1" Bore	\$369	\$349	\$314	\$297
12" D. 1" Bore	\$499	\$449	\$404	\$382

(Bore up to 1-1/4" Add \$25 — Plus \$5.50 S&H)

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FOR BETTER CUTS on all brands of blades, use our large 1/8" DAMPENERS-STIFFENERS against one side.

4"	\$21
5"	\$24
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I want it measured in board feet

Do you have an easy formula for converting lineal feet to board feet?

—Jack Jolley, Bellville, Texas

Here's how to do it, Jack:

1 Multiply the length of the board (in inches) by its average width.

2 Multiply this figure by the thickness of the rough-cut board (4/4=1" rough, or about 3/4" when planed. 5/4 lumber =1.25", or 3/4" after planing, etc.).

3 Divide your answer by 144 to obtain the final measurement in board feet.

Here's an example, using a 5/4 thick board 60" long and 4" wide:

$$4" \times 60" = 240 \text{ square inches}$$

$$240 \times 5/4 \text{ (or 1.25)} = 300$$

$$300 \div 144 = 2.08 \text{ board feet}$$

Have a question for our woodworking experts? Here's how to reach us.

No matter how simple or perplexing a woodworking problem you're faced with, we would love to hear from you. We'll do our level best to solve your mystery, and you might even find your question and our reply on this page.

You can reach us by one of several ways:

• **Mail.** Send your letter to Ask WOOD®, 1912 Grand Ave., Des Moines, IA 50309-3379.

• **Via Computer.** Send your e-mail to these addresses:

CompuServe: 74404,3516

Internet: 74404.3516@compuservc.com

A 4/4 board (1" thick rough, about 3/4" thick planed) of the same width and length would be calculated this way:

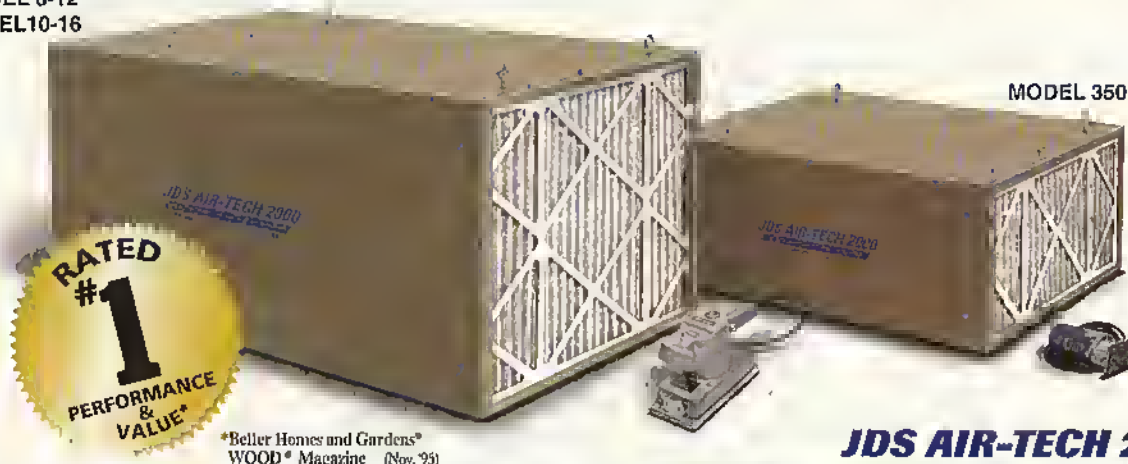
$$4" \times 60" = 240 \text{ square inches}$$

$$240 \times 4/4 \text{ (or 1.00)} = 240$$

$$240 \div 144 = 1.67 \text{ board feet}$$

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The JDS AIR-TECH 2000 systems will remove 99% of dust particles as small as five micron and 80% of the particles as small as one micron.

Our unique design makes both ceiling installation and filter changing quick and easy.

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Manufactured in the U.S.A.

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These tiger stripes aren't in the zoo

I've seen some projects that were built from "Tiger-stripe oak." Can you give me some information on this wood?

—John Evans, Kansas City, Mo.

John, we've seen the term "tiger stripe" used in two different ways when referring to oak. However, both uses refer to a grain pattern in the wood rather than a separate species of oak.

In the first usage, "tiger stripe" becomes interchangeable with the terms "fiddleback" or "curly." In this grain pattern, the annual rings move up and down in relation to the face of the board as the grain runs the length of the board. This results in the grain at the surface of the board alternating between light-reflecting side grain and light-absorbing end grain, creating a striped pattern (see the photo below left).

Some woodworkers also use "tiger stripe" to describe medullary rays that appear on the surface of rift cut oak boards. These rays appear as lighter stripes running across the longitudinal grain of the wood. This type of wood was commonly used in better pieces of Mission-style furniture, and in trimming Craftsman-style houses. See the photo below right for an example of this grain pattern. ♣

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16" SCROLL SAW

- Precision milled 14-1/2" x 8" table lifts 0° to 45°
- Uses pin end blades, 5-1/2" long
- Heavy duty cast iron frame and base reduces vibration
- 7/8" blade stroke
- 1/8 HP, 110V, .83 amps
- 1750 SPM blade speed



ITEM 34618-05XA

\$59⁹⁹

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ITEM 00495-65XA

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- Maximum depth of cut: 3/8"

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\$199⁹⁹

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ITEM 33271-15XA

\$9⁹⁹

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TRIM ROUTER

Now you can tackle those jobs that were too fine or exciting for a standard router. This compact router weighs only 4 lbs. for easy operation. Includes a straight and adjusting conductor to assist in trimming and engraving in both straight and circular patterns.

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- 30,000 RPM no load speed
- 110V, 3-1/4 maximum amp draw
- 8-1/2" overall length
- 4 lbs. tool weight

ITEM 33833-35XA

\$39⁹⁹

CENTRAL MACHINERY

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 scales for precise cutting

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

ITEM 35715-25XA

\$79⁹⁹

10" 40 TDDTH CARBIDE TIP SAW BLADE

ITEM 00529-45XA

\$9⁹⁹

DELTA Delta 36-510

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10" BENCH SAW

Big saw capacity in a portable unit. Easy and safe to use with up-front controls and removable on/off switch. Front and rear locking rip fence and miter gauge maintain full sized accuracy.

- Motor: 13 amps, 115V, 4700 RPM
- 5/8" arbor • Table: 16" x 26"
- Capacity: 3" max. depth, 2-1/2" max. depth at 45°
- Dimensions: 15" x 26" x 19"
- 40 lbs. tool weight

ITEM 35734-45XA

\$109⁹⁹

HITACHI

7-1/4" CIRCULAR SAW

- 115V, 10 amps, 60 Hz, single phase
- 5500 RPM • Tool weight: 8-3/4 lbs.
- Maximum cutting depth: 2-1/4"

ITEM 35120-85XA

\$64⁹⁹

8-1/2" SLIDE CDMPDND MITER SAW

ITEM 31876-85XA

\$429⁹⁹

3/8" 9.6V DRIVER DRILL WITH KEYLESS CHUCK

ITEM 34641-75XA

\$99⁹⁹

4" DISC GRINDER

ITEM 34644-75XA

\$54⁹⁹

3/8" 9.6V CDRDLESS DRILL WITH KEYLESS CHUCK

ITEM 34998-65XA

\$99⁹⁹

4-1/2" ANGLE GRINDER

ITEM 35015-45XA

\$59⁹⁹

9.6 VOLT CDRDLESS 1/4" IMPACT DRIVER

ITEM 35254-25XA

\$139⁹⁹

MCCULLOCH McCulloch 3214

14" GAS POWERED CHAIN SAW

- 32cc engine handles tough jobs
- Hard chrome cylinder bore for longer engine life
- Gear driven automatic chain oiler
- 3 position choke for easier starting
- Safety trigger prevents accidental acceleration
- 15 lbs. ship. wt.
- Spark arrestor screen reduces fire hazard
- Features: chain brake/hand guard, chain catcher, throttle latch, muffler shield, and low kickback chain
- 10-1/2 oz. fuel tank capacity
- Factory reconditioned, factory perfect

ITEM 51502-15XA

\$79⁹⁹

DEWALT DeWalt DW705

12" HEAVY DUTY CDMPDND MITER SAW

- 13 amps; 4000 RPM no load speed
- Spindle lock • Electric brake
- Stainless steel miter scale with 9 positive stops • 40 lbs. ship. wt.
- Includes 32 tooth blade
- 0-48° bevel capacity • 1" round arbor
- 0-48° miter left and right
- Capabilities 5-1/4" crown mauling; 2 x 8 at 45° bevel; 4 x 4 & 2 x 6 at 45° miter
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- Factory reconditioned, factory perfect

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ITEM 35838-15XA

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5 PC. TRIANGLE SANDING PAD ASSORTMENT

ITEM 36082-05XA

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2 HP, 1200 PSI, 1.6 GPM PRESSURE WASHER



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ITEM 01611-15XA

\$49⁹⁹

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ITEM 00528-15XA

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8-1/4" COMPOUND MITER SAW

- Electric brake stops blade in seconds
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- 20 lbs. shipping weight
- Includes free 8-1/4" multi-purpose blade

ITEM 01078-25XA

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1/3 HP

5 SPEED BENCH DRILL PRESS

- 620 to 3100 RPM
- 8-1/4" maximum distance, spindle to table • 1/2" chuck
- 2" stroke, 8-1/4" swing
- 22-1/2" high, 49 lbs shipping weight
- 1/3 HP motor

ITEM 05901-05XA

\$48⁹⁹

DRILL PRESS WITH KEYLESS CHUCK

ITEM 34231-35XA

~~\$69⁹⁹~~ **\$54⁹⁹**

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FREE ACCESSORIES:
Stand, 6" belt, 9" disc, open-end wrench, and hex key wrench

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COMBINATION 6" BELT AND 9" DISC SANDER

1HP, 110V, 8 amps, 3450 RPM, all ball bearing motor; Overall height: 40"; Table tilt 0° to 50°; Table surface: 6-1/2" x 12-3/4"; Two position work table for disc or belt use; Disc speed: 1720 RPM; Belt: 6" W x 48" L; Belt speed: 1280 FPM; Weight: 121 lbs.

ITEM 06852-65XA

\$169⁹⁵

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TiN COATED FORSTNER BIT SETS

SAVE UP TO 25% FROM OUR FALL '96 BOOK

Titanium nitride runs cooler, cuts easier, and lasts longer than standard steel. Includes 3/8" shanks and individually organized wooden case. Rockwell hardness range from 55-65 HRC.

20 PC. SET

• 20 sizes from 1/4" to 3/4" by 16ths, 7/8", 15/16", 1" to 2" by 8ths

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\$34⁹⁹

16 PC. SET

• 16 sizes from 1/4" to 2-1/8" by 8ths

ITEM 32404-85XA

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Power Tools

3-1/4" PLANER

- Front base has a V-groove to help guide in chamfering • 2 blade cutter
- Depth adjustment knob
- Includes tabbing guide plate/lence, sharpening holder, blade setting jig, replacement bushes, replacement belt
- D-handle with lock-on button
- 1/10" maximum depth of cut; 3-1/4" planing width
- 110V, 5 amps, 17,000 RPM
- 34,000 cuts per minute
- Tool wt.: 6-1/4 lbs.

ITEM 32222-95XA

\$39⁹⁵

2 PC. REPLACEMENT BLADES

ITEM 33262-25XA

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SAVE UP TO 33%

CONTROLLED PRESSURE, NON-MARRING HARDWOOD CLAMPS

These hand screws will clamp without scratching or marring your workpiece. Hardwood jaws distribute pressure evenly, and can easily be adjusted for non-parallel surfaces and odd shapes.

JAW LENGTH	CAPACITY	ITEM	REGULAR PRICE	PRICE
8"	4-3/4"	04852-35XA	\$5.99	\$3⁹⁹
10"	6"	04853-45XA		\$4⁹⁹
12"	8-1/2"	04854-75XA		\$5⁹⁹

CENTRAL MACHINERY
CONTRACTOR SERIES

18 GAUGE AIR BRAO NAILER

This unit has the features you need: safety trigger, adjustable nailing depth, durable aluminum magazine, and easy jam clearance.

- 55-95 operating PSI • 1/4" NPT Inlet
- 3/8" to 1-1/4" broad length capacity
- 100 broad maximum capacity
- 18 gauge blades • Tool wt.: 2-3/4 lbs.
- Stainless steel driver & cylinder

ITEM 31308-35XA

~~\$49⁹⁹~~ **\$39⁹⁹**

18 GAUGE BRAOS PACKS OF 5000

SIZE	ITEM	PRICE
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model 5008 Dovetail Templet, but you can adapt the fence to fit your particular jig.

To make the fence, cut the body pieces (A, B, C, D, and E) to size. Using your tablesaw, rip a $\frac{1}{8}$ " groove $\frac{1}{4}$ " deep in the top plate (A) where shown on the Exploded View drawing. Reset the blade depth to $\frac{1}{2}$ ", then cut the rabbet in the front plate (B) where shown.

Fasten the top and front plates (A and B) to the clamping and support blocks (C and D) with glue and screws as shown. Then

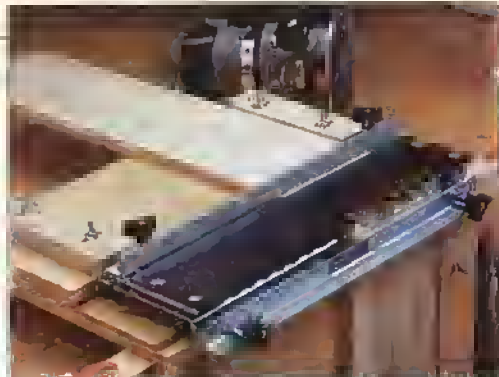
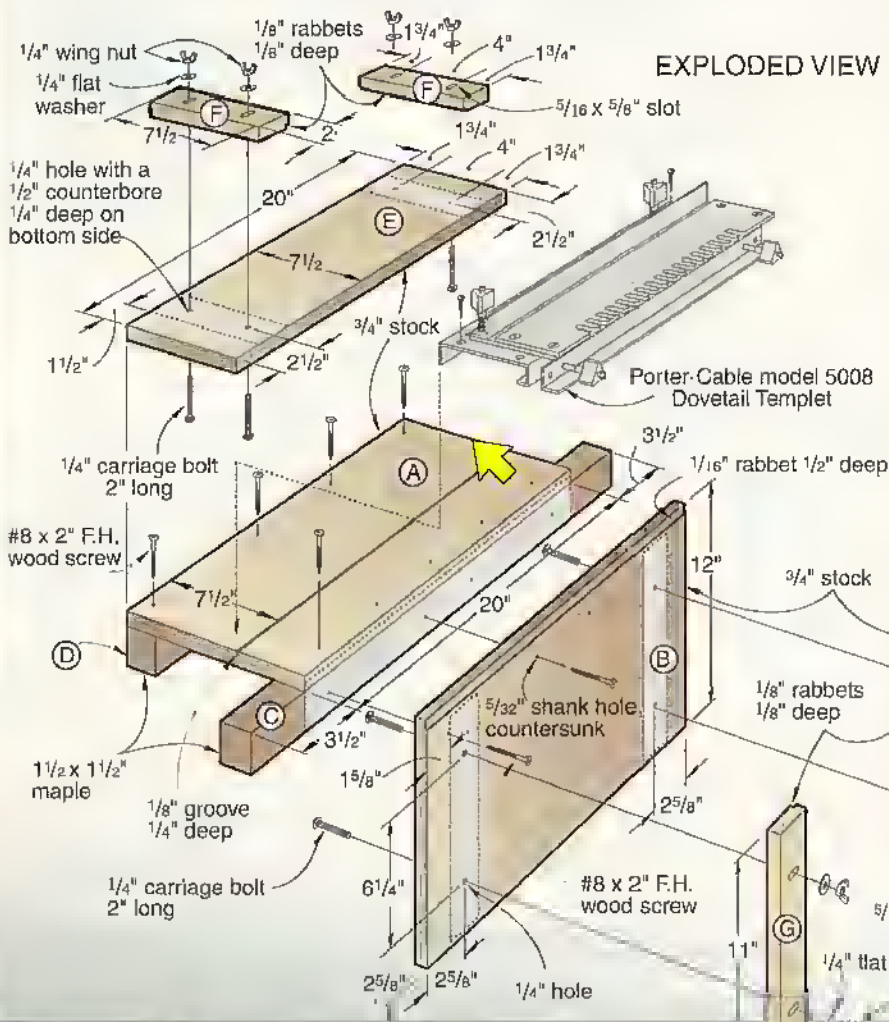
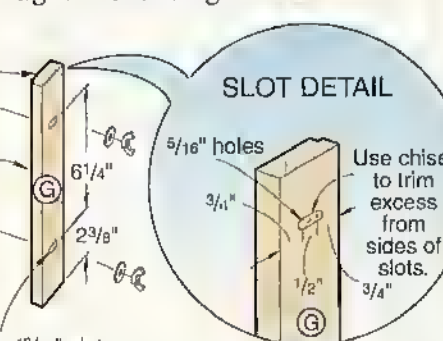
position the dovetail jig in the groove and mount it with screws.

Drill $\frac{1}{4}$ " counterbored holes where shown in the front plate (B) and fence plate (E), and insert $\frac{1}{4}$ "x2" carriage bolts in the holes. Clamp the fence plate (F) in position, making sure the top of the plate is flush with the face of the jig. Then, attach the fence plate with screws as shown.

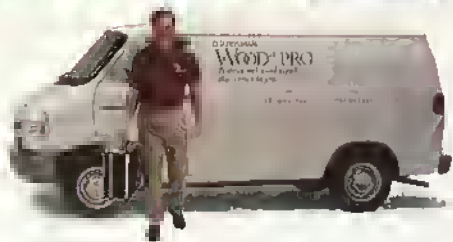
Cut the fence bars (F and G) to size and cut a $\frac{1}{8}$ "x $\frac{1}{8}$ " rabbet on one edge. Using a $\frac{3}{16}$ " bit, drill holes as shown in the Slot Detail drawing to create the $\frac{3}{16}$ " slots. Install the fence bars with washers and wing nuts as shown.

To adjust the fence, set the jig for a particular type of dovetail joint, then clamp a scrap board vertically in the jig. Insert a board horizontally in the jig and align its squarely cut end firmly against the vertical scrap. Then, position the top fence bar against the edge of the horizontal board and tighten the wing nuts down.

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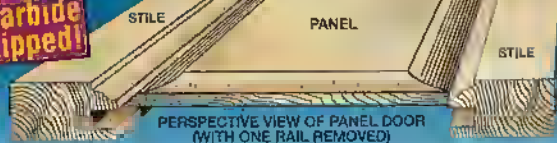
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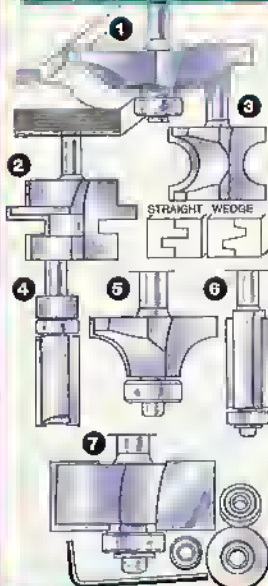
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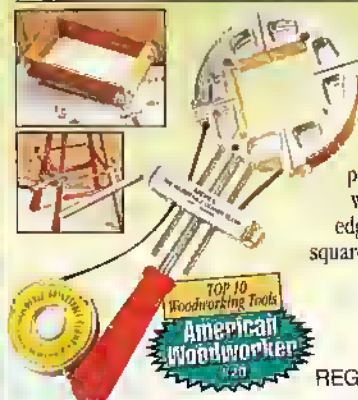
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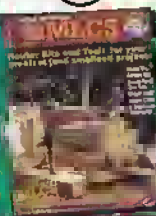
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His sticks are made for **WALKIN'!**

Kentuckian Tom Smith supports his fishing with a unique brand of woodworking, and he couldn't be happier.



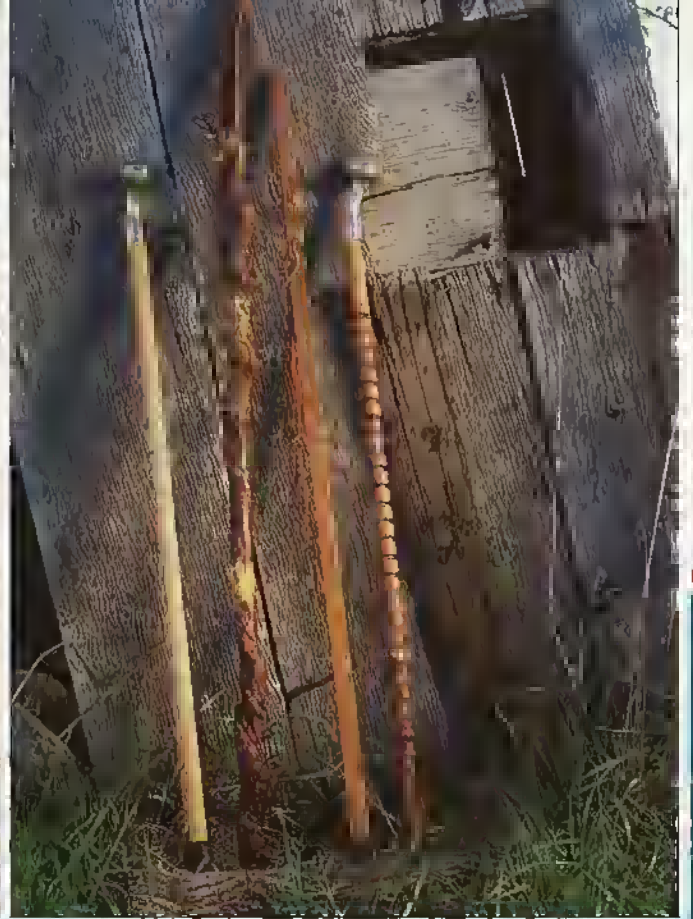
Daniel Boone wasn't much for spelling, and Tom Smith thanks him for that. "In one of his early letters from what was then the frontier, ol' Daniel spelled Kentucky 'Kantucke.' I just continued his style," explains Tom Smith about how he came to name the "Kantucke Wolken Sticks" he makes and sells. "If one misspelled word could catch someone's attention, why not misspell them all?"

"People throughout history liked to carry walking sticks. Even Moses had one," says Kentucky stickmaker Tom Smith, resting on a log near his farm.

Continued



"My best-selling stick is the spiral in walnut, the diamond is next, then the plain," notes the stickmaker. The 52" stick left of center, with its brass tip, retails for about \$200. Tom also does custom sticks, such as the wading staff for fishing, at left.



The twisted sassarras for the tall hiking stick comes from Tennessee. Tom taps his supply of old tobacco-drying sticks to offer the simple, rectangular model. The design far right he calls the Tootsie Roll.

That christening four years ago has resulted in a retirement enterprise that has grown beyond the 65-year-old's greatest imagination. A member of the Guild of Kentucky Craftsmen, Tom now tallies nearly three dozen retail outlets for his sticks across the nation. Those accounts, plus the five or so craft fairs he does each year, keep his stick production at around 450 annually. That leaves plenty of time for fishing.

"All I wanted to do in retirement was keep active—find something to do to help support my fishing," Tom laughingly admits. "But golly, in my wildest dreams I never thought I could make anything that someone would pay so much money for," he says in wonderment. In his hands he displays a satin-finished walnut walking stick, its shaft decorated in a carved diamond pattern. Topped with a

bright brass hame knob from a horse collar and adorned with a woven leather lanyard, the 52" stick has a price tag of \$200.

Moses carried one, too

A few years before he retired from his job as a steel inspector with the Kentucky department of highways, Tom was giving serious thought to how he would spend his future days. "Then one day Sissy [his wife Elizabeth] and I were visiting a craft fair and saw this old gentleman," he recalls. "There he was, walkin' down the street in bib overalls and gum boots like you wear around the cattle barn. He was carrying this long stick with a bandanna wrapped around the holdin' end. Well, that sight started me thinking about walking sticks. Seems that people have always wanted something to aid their walking, kind of

like a companion. Why, even Moses carried a stick."

Back on their 63-acre farm outside of Frankfort, Tom began some experiments in stickmaking. "I went directly from working with steel to wood," he says. "I never had much to do with wood, but my dad once operated a sawmill right when I was born, so maybe there was sawdust in my blood and it finally came out."

The sawdust took a while to emerge, as Tom tells it. "I got to playing with the idea of making sticks and made two or three prototype models. Just whittled on 'em with a knife. Finally, Sissy said, 'Why don't you make some kind of design on them?' So I carved some spirals and some diamonds. But it was really tough."

Tom, a problem solver, figured there had to be a better way. And there was, right at his fingertips.

“Seems that people have always wanted something to aid their walking, kind of like a companion.”



Notice the metal “saddle” to the left of the bit. It was added to prevent bowed wood from getting a deeper bite from the router.

The Craftsman Router Crafter gives Tom a design versatility and the speed to keep up with orders. He routs spirals with a 1½-hp router and an ogee bit.

Router to the rescue

“I got to lookin’ through the Sears Roebuck catalog and saw this Router Crafter,” Tom remembers. “It was like a lathe, with a router riding on top. Fitted with a bit, I could index it to cut designs on the sticks as they turned. But I needed a lathe, too. Eventually, I ordered a Router Crafter and a lathe, then wasted a lot of wood until I got the technique, and the right wood, down pat. You see, I was using green wood at first—I’d just go back on the property and cut down a wild cherry tree or a yellow poplar, split it out, then put the splits on the lathe to round them down to the diameter I wanted. With the Router Crafter, I’d add the designs.

“But the green wood fuzzed up,” he continues. “Then, the sticks cracked as they dried. But I was starting to sell them anyway, and

knew I had to do something to get better speed and quality. Finally, I bought kiln-dried wood.”

Tom now uses nothing but. And he buys the hickory and walnut stock already round in the form of 1”- and 1¼”-diameter dowels cut to 36” and 48” lengths.

Horsing around for the perfect stick

Tom was busy perfecting his turning and cutting techniques while still making sales at craft fairs. He was purchasing pretuned finials and attaching them to the top of his walking sticks. He also had found a source for a different style of stick.

“I met a guy from Tennessee who had a supply of sassafras sticks,” Tom explains. “Where he lives, young sassafras saplings get entwined with wild grape vines. The result is a naturally twisted

stick. I clean them up and leave some bark on, varnish them, and add a leather thong. They look more like a hiking stick, and the outdoor types buy them.”

Yet it was horses more than anything else that ended up offering Tom the most unusual adornment that now makes his sticks stand out. “Sissy and I took a day to tour Shaker Village of Pleasant Hill. There, they have a beautiful team of draft horses that pull a wagon around the village,” he says. “They really looked good, with oiled harnesses and polished brass fittings. Well, I got to looking at the brass hame knobs that guide the reins. Why couldn’t I put those knobs on my sticks?”

Why not, indeed. But Tom had to find them first.

Some turned up at flea markets. More were found at farm sales, especially in Amish areas. Garage

Continued

“A while back, I was thinking that maybe I was

sales turned up a few. To this day, the search goes on for horse collars with the valued hame knobs. “Friends and neighbors keep on the lookout for them,” says Tom, “but as yet I haven’t found a reliable supplier for new hame knobs.”

So far, Tom and Elizabeth have discovered five different shapes of knobs. “I started out by putting little round ones on my sticks, but everyone called them doorknobs,” notes Tom. “Now, I try to use only the longer type, which weigh three to four pounds.”

It’s a logical thought: With a heavy brass head and downright tough wood like hickory, Tom’s sticks might play a role other than that of a walking companion. The craftsman downplays the idea of his sticks as a means of self-defense, though. “That’s not part of my sales pitch,” he says. “Although I did have a fella come by at a show and ask for a plain hickory stick—no carving—with a heavy hame knob. Turns out there was a bad neighborhood between

his house and his favorite tavern, and he wanted something strong to carry walking through it.”

Tom fulfills more personalized requests, too. Such as a special type of wood, or a brass plate engraved with names and dates. He even provided a shovel fitted with a hame knob to the governor of Kentucky for an official groundbreaking. Usually, however, the requests are minor, and he handles them on the spot.

“One time we had a short man from California come up to our booth. He wanted a walking stick, but a littler one. I told him I could cut a 36” one down, and proceeded to saw off an inch, then another inch, and he kept nodding to keep going. Finally, it was down to about two feet long before he said that would do. ‘You had better buy it now,’ I said, ‘because no one else will.’ And he did.”

And when a new opportunity arises, Tom doesn’t hesitate to add to his lineup of sticks. “A while back, I was thinking that maybe I

was missing a whole end of the market—the low end,” he says, reaching to snare yet another stick from his stock. “These are tobacco sticks, used to hang tobacco leaves up in the barn to dry. In this part of the country they’re mainly white oak. I cut them off to 45”, sand the heck out of them and varnish them, and brand on ‘Kentucky Tobacco Stick.’ Then, I wholesale them with a leather thong for seven bucks apiece. My other sticks start at \$35 wholesale. And I’ve got about 5,000 tobacco sticks out in the barn left from the time when I raised tobacco.”

Round and round, he makes his mark

Key to getting an impeccably cut design on a walking stick is centering and indexing, advises the stickmaker about his main tool, the Router Crafter. “Of course, I start with a round stick blank that’s usually 36×1”. To find the exact center of each end for mounting, I use a center finder,



missing a whole end of the market—the low end.”

then make a hole at each point with an ice pick.”

Tom mounts the stick to be routed onto the machine, lining it up with the index points for the number of cuts per inch of stick circumference he's selected.

Next, Tom turns the crank on the Router Crafter to check the straightness of the wood. "If the stick has a little bow in it, I'll go to a less demanding design, such as fewer spirals," he says. "For the spirals, you see, I can cut four to six for every inch. No closer than six, though. To get the diamonds, I set the index, say to four, then go down the stick. When finished, I reverse the stick end to end and go down it again. I do it all with a Vermont American ogee bit chucked in my 1½-hp router."

To counter any bow in the stick, Tom devised a half-round metal saddle mounted on the router base ahead of the bit (see close-up, page 29). "It acts like a bumper to keep the bit the same distance from the turning stick so that it won't tear out if the wood has a bow in it," he notes.

For 4' sticks, Tom uses his second Router Crafter. He extended its original 36" rails to

48". "I also added a support under the rails because the longer sticks want to whip," he notes. "The compression of the stick between the drive center and the tailstock also exaggerates any bow. Without that support, I couldn't use 40 percent of the wood I buy!"

After routing the design in a stick, Tom removes it from the machine and clamps it in his shaving horse. There, he hand-sands the cuts smooth with a teardrop-shaped sander made of foam rubber covered with 120-grit paper. The handwork takes about 20 minutes, except for hickory sticks.

"Hickory is so hard that I have to make two or three passes on the Router Crafter to just one for walnut. It often burns in the routing, too, so I have to take a flexible-shaft carving tool with a sanding wheel and clean it out," says Tom.

While Tom has the stick clamped in the shaving horse, he takes the opportunity to shave one end of the shaft with a drawknife to accommodate the hame knob. For final sanding, Tom mounts the cleaned-up and shaved stick in his lathe and sands it with 80-grit.

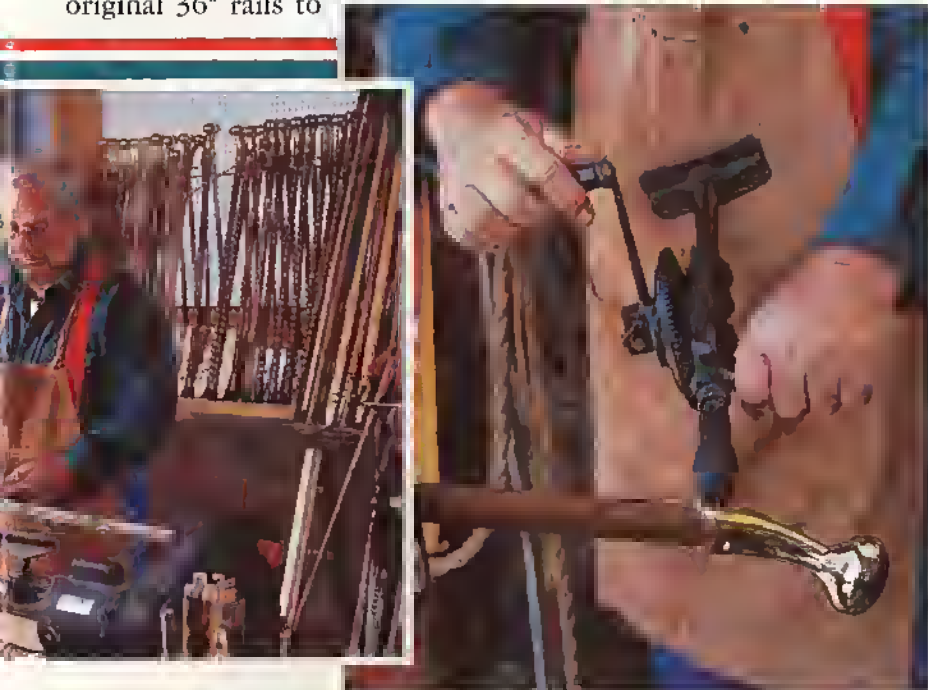
For a finish, he coats the stick

once with polyurethane varnish and lets it dry. A light sanding with 60-grit cuts the raised grain. "The last coat of polyurethane, followed by a sanding with 120-grit, gives me a durable finish that looks just like I want it to," says Tom. "I don't want my sticks real slick and shiny, but I like the yellowish cast of the varnish. It brings out the color of the wood."

For the finishing touch, Tom fits the stick with a shiny hame knob of solid brass and predrills the screwholes with a hand brace. A few twists with a screwdriver and another Kantucke wolken stik is ready for market. Tom admires his work, then says: "I've gotten so now that I have a piece of power equipment for every major step that I need to do on my walking sticks. But it always makes me feel good to end it up with a good old hand tool." ♣

For a bit of Olde Kantucke

To receive a catalog sheet describing Tom's line of walking sticks, send your request with a SASE to Olde Kantucke Wolken Stiks, Inc., 1280 Old U.S. 60, Frankfort, KY 40601.



Far left: Tom built the solid cherry shaving horse to grasp sticks for detail sanding. Here he shaves the end of a stick with a drawknife in order to add the hame knob. Note the harnesses hanging about.

Middle: Today, the lathe gets little use for turning. Tom mounts sticks there for sanding. "But I did waste and use up an awful lot of wood at it," says the craftsman.

Near left: Tom predrills screwholes with a hand brace to attach the brass hame knob, just part of the handwork that goes into his line of walking sticks.

Written by Peter J. Stephano Photographs: John F. Schultz

One cool Catchall

A beautiful box that's a breeze to build



Desktops and dressers act like clutter magnets—stuff always seems to be drawn to them. This clever little box can help contain it all. And building this bandsawn beauty is so simple, you'll want to make several for family and friends.

Bandsaw the lid and bottom

1 Cut two pieces of stock $1\frac{1}{16} \times 4 \times 5\frac{3}{4}$ " for the lid (A) and bottom (B). (We used walnut.) Stack them, then look at the edges. The grain should run in the same direction, giving roughly the appearance of one thick piece of stock. If not, turn one piece around or flip it over to achieve the most seamless look. Mark the mating faces for orientation.

2 Chuck a $\frac{3}{8}$ " round-over bit in your table-mounted router. Rout the upper edges of the lid and the lower edges of the bottom where shown by the Lid and Bottom Side View drawing.

3 Transfer the inside cutting lines from that drawing to the lid (A) and bottom (B). You can photocopy the drawing, cut it into the two parts, and adhere them to the stock. Or, you can lay out the cutting lines directly on the stock, measuring from the drawing.

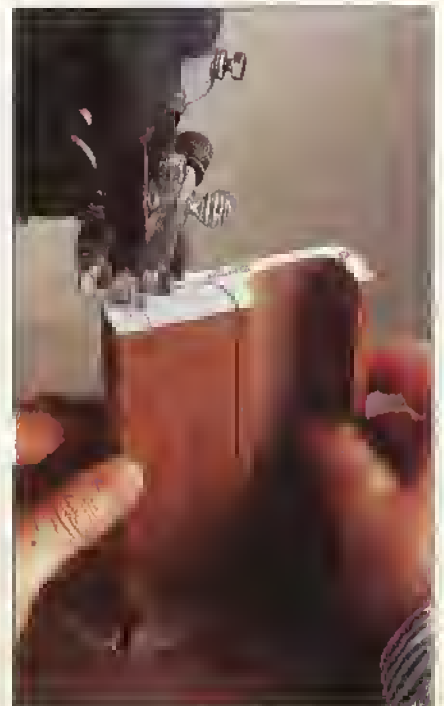
4 Adjust your bandsaw for a 6" cutting depth. Then, standing the lid (A) on its unpatterned end, saw along the inside line. Then, saw the bottom, as shown *right*.

5 Sand the lid and bottom inside and out with 100-, 150-, and 220-grit sandpaper. Wrap your sandpaper around a length of dowel rod to sand the inside corners, as shown *opposite page*. Using a disc sander, sand about $\frac{1}{16}$ " from one end of the lid, making it shorter than the body. This will allow the lid to open freely after assembly.

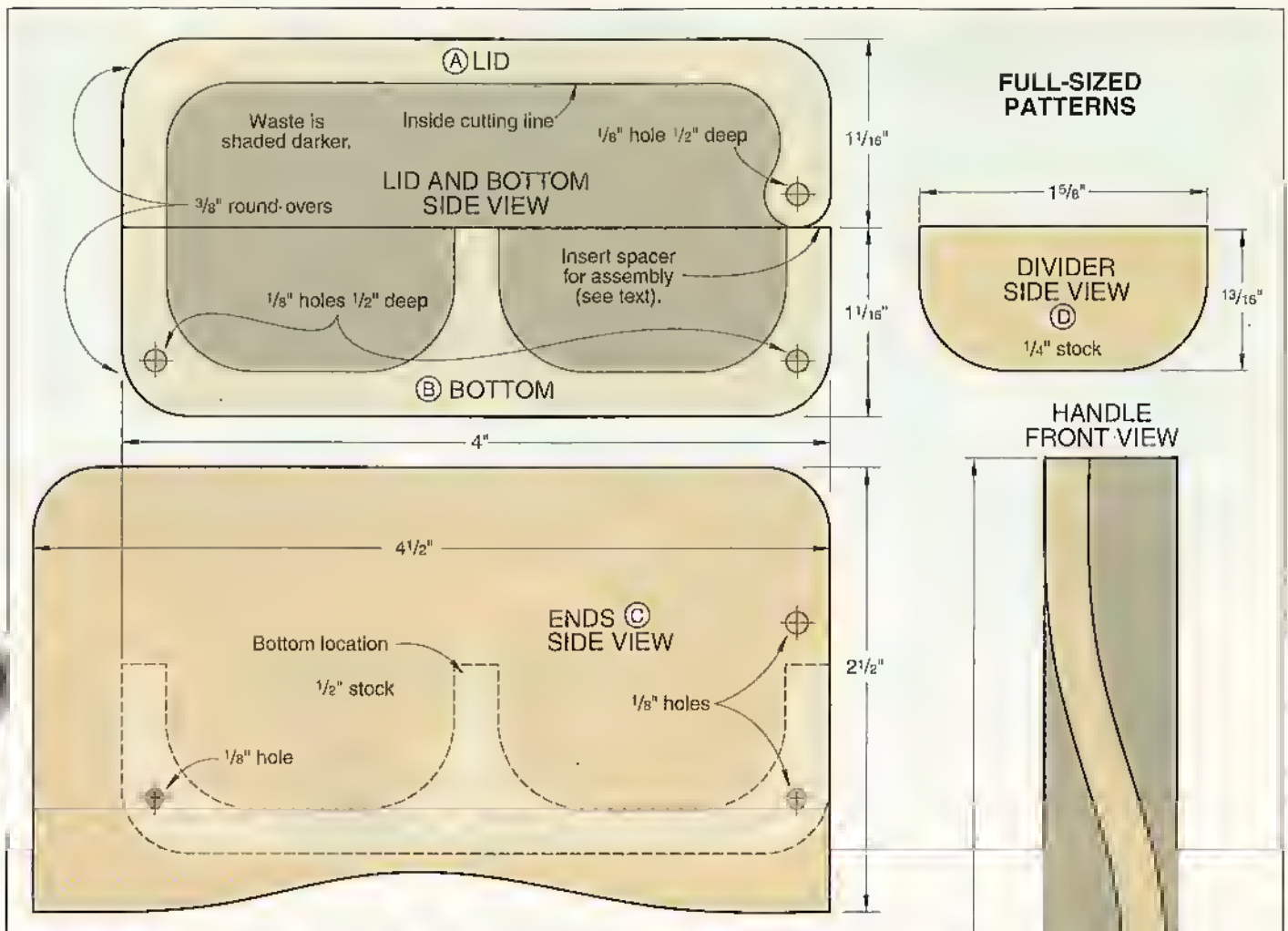
The ends come next

1 With double-faced tape, laminate two $\frac{1}{2} \times 3 \times 5$ " pieces of stock, good faces together, for the ends. Choose a wood that contrasts with the body. (We used maple.)

2 Photocopy the Ends pattern. Adhere the copy to the laminated stock with rubber cement or spray adhesive.

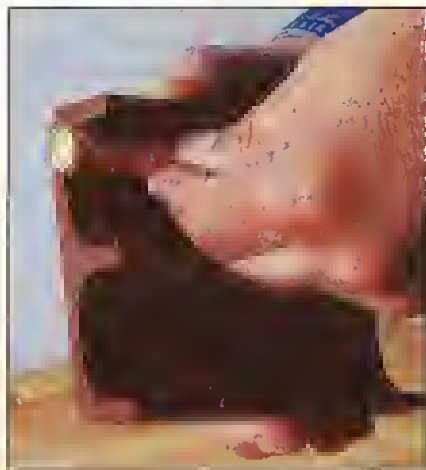


Stand the lid and bottom on end to saw the inside contours.



3. Drill the three $\frac{1}{8}$ " holes through both ends where shown. For accuracy, employ a drill press. Back the workpiece with scrap-wood to prevent tearout.

4 Bandsaw around the outer pattern line. For a smooth edge, saw slightly outside the pattern line,



Sand the inside curves with sandpaper wrapped around a dowel.

then sand down to it. Remove the paper pattern, and separate the two pieces. Remove traces of adhesive with lacquer thinner.

5 Rout a $\frac{3}{8}$ " round-over along the front, back, and top edges of the outer face on each endpiece. Rout the parts facedown on a router table, making multiple shallow cuts.

Glue on the ends

1 Sandwich a spacer about $\frac{1}{16}$ " thick between the top and bottom. (We used the cardboard back from a memo pad.) Bind the pieces together with masking tape as shown *next page*, keeping the ends and edges flush.

2 Clamp the ends to the bottom/lid assembly. Position the ends flush with the top of the lid and the back (hinge side).

3 With a drill press, drill two $\frac{1}{8}$ " holes in each end of the body and one in each end of the lid, using

Continued

Catchall

the holes in the ends as guides. Drill $\frac{1}{2}$ " deep. (The total depth of the holes from the face of the end should be 1".)

4 Remove the ends. Sand both sides of the two ends with 100-, 150-, and 220-grit abrasives.

5 Cut six $1\frac{1}{8}$ " lengths of $\frac{1}{8}$ " dowel rod. Apply glue to one end of the bottom (B), and attach the appropriate end (C) to the bottom. Push

a dowel pin into the two lower holes on the end. Repeat for the other end. Clamp until dry.

6 Adhere a photocopy of the Divider pattern (D) to a $\frac{1}{2}$ "x1x2" piece of stock. (We used maple to match the ends.) Cut out the divider, place it in position, and sand it to fit. Then, finish-sand the divider, and glue it into the middle of the front tray.

Dress up the lid

1 Photocopy the Handle pattern (E). Adhere the copy to the best face of a piece of stock $\frac{3}{8}$ "x $\frac{3}{4}$ "x $5\frac{3}{4}$ ". (We cut the handle from maple to match the box ends.)

2 Bandsaw or scrollsaw the handle. Remove the paper pattern, and sand $\frac{1}{8}$ " round-overs along both edges of that face. Finish-sand the handle.

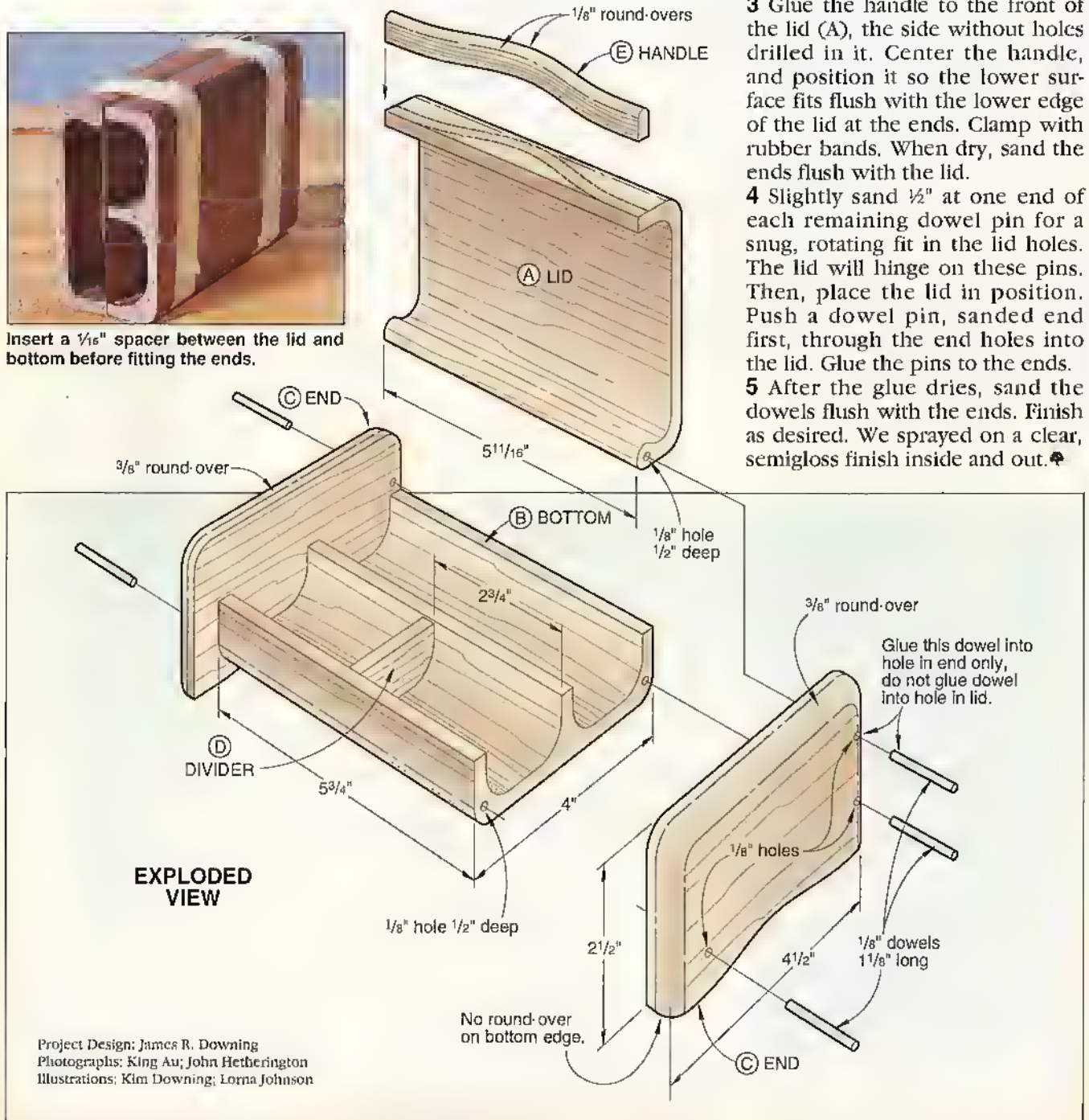
3 Glue the handle to the front of the lid (A), the side without holes drilled in it. Center the handle, and position it so the lower surface fits flush with the lower edge of the lid at the ends. Clamp with rubber bands. When dry, sand the ends flush with the lid.

4 Slightly sand $\frac{1}{2}$ " at one end of each remaining dowel pin for a snug, rotating fit in the lid holes. The lid will hinge on these pins. Then, place the lid in position. Push a dowel pin, sanded end first, through the end holes into the lid. Glue the pins to the ends.

5 After the glue dries, sand the dowels flush with the ends. Finish as desired. We sprayed on a clear, semigloss finish inside and out. ♣



Insert a $\frac{1}{16}$ " spacer between the lid and bottom before fitting the ends.



Project Design: James R. Downing
 Photographs: King Au; John Hetherington
 Illustrations: Kim Downing; Lorna Johnson



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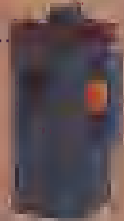
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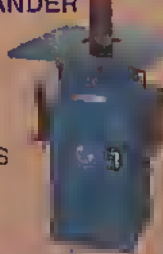
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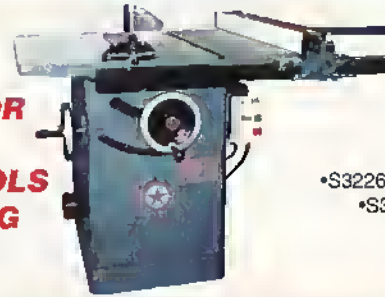
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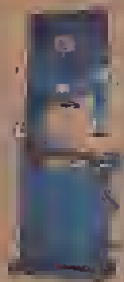
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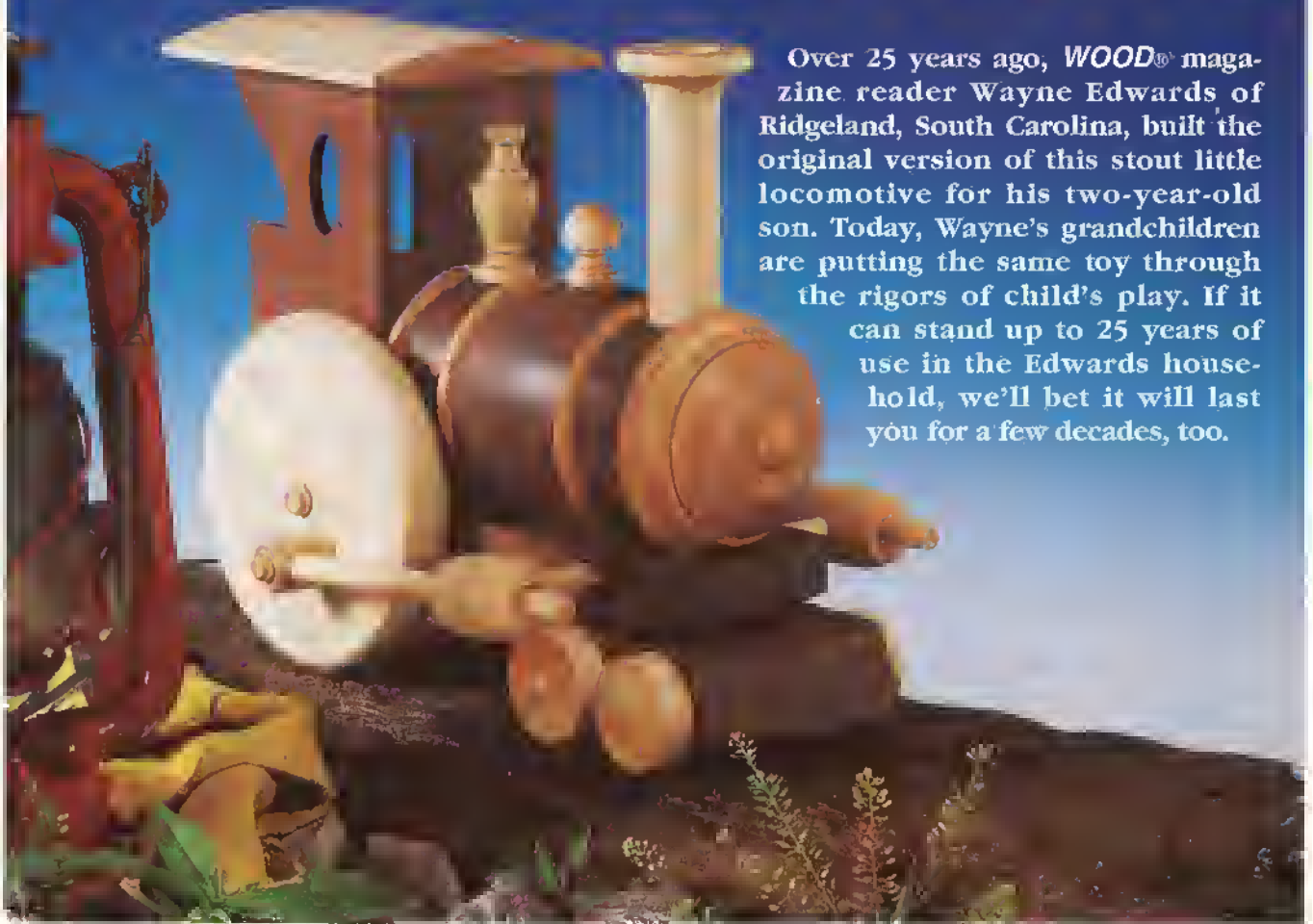
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CHUBBY CHOO-CHOO



Over 25 years ago, *WOOD*® magazine reader Wayne Edwards of Ridgeland, South Carolina, built the original version of this stout little locomotive for his two-year-old son. Today, Wayne's grandchildren are putting the same toy through the rigors of child's play. If it can stand up to 25 years of use in the Edwards household, we'll bet it will last you for a few decades, too.

Let's get things rolling with the walnut chassis assembly

1 From $\frac{3}{4}$ " walnut, cut the chassis (A) to the size listed in the Bill of Materials. Mark a 3° radius on each end of the chassis where shown on the chassis (A) pattern on the *WOOD PATTERNS*® insert in the center of the magazine. Bandsaw the ends of the chassis to shape. Then, sand the ends smooth to remove the saw marks.
2 Cut the spacer (B) to size from $\frac{1}{4}$ " stock (we resawed this piece from $\frac{1}{2}$ " material), and glue it to the bottom of the chassis where shown on the full-sized chassis pattern on the pattern insert.

3 Cut the cowcatcher (C) to size, but to 12" in length. The extra length is necessary when cutting the beveled front end to shape.

4 Cut the front end of the $1\frac{1}{16}$ "-thick cowcatcher (C) to shape as illustrated on the Cutting the Cowcatcher drawing on the following page. Also, see the full-sized cowcatcher pattern on the pattern insert for reference.

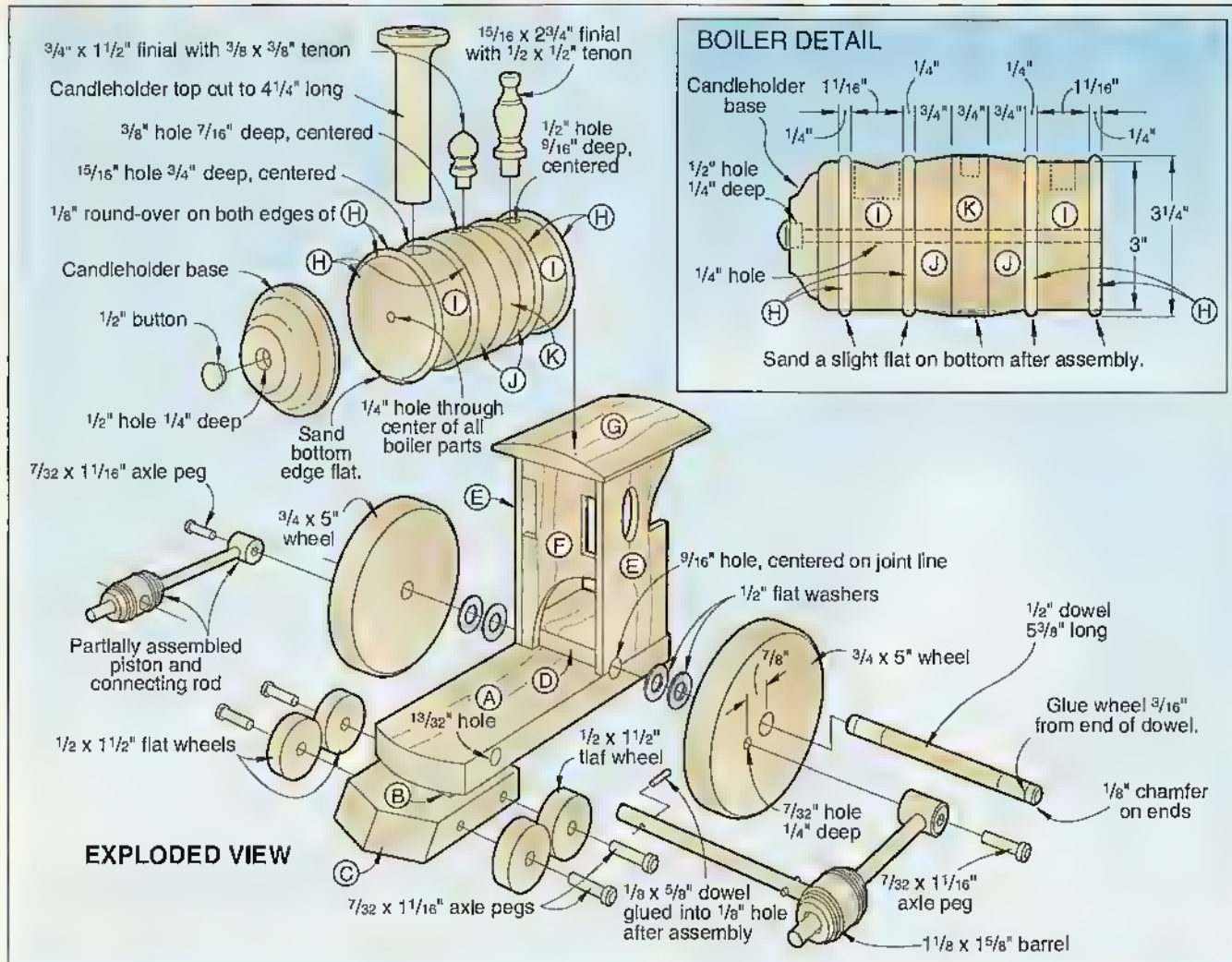
5 Crosscut the cowcatcher to final length ($4\frac{1}{8}$ "), and glue it to the bottom of the spacer (B) where shown on the full-sized cowcatcher pattern. Keep the back end of the cowcatcher flush with the back end of the spacer.

Add a cab to house the conductor

1 Cut the cab floor (D) to size. Glue and clamp it to the top of the chassis (A) where located on the full-sized chassis pattern.

2 Cut the cab sides (E) to size from $\frac{1}{4}$ " stock. Use double-faced tape to adhere the pieces face-to-face, with the edges and ends flush. Transfer the full-sized side pattern from the pattern insert to the taped-together pieces. Drill a $\frac{1}{4}$ " blade start hole, and cut the window to shape. Then, cut and sand the back edge of the cab sides to shape. Separate the pieces and remove the tape.

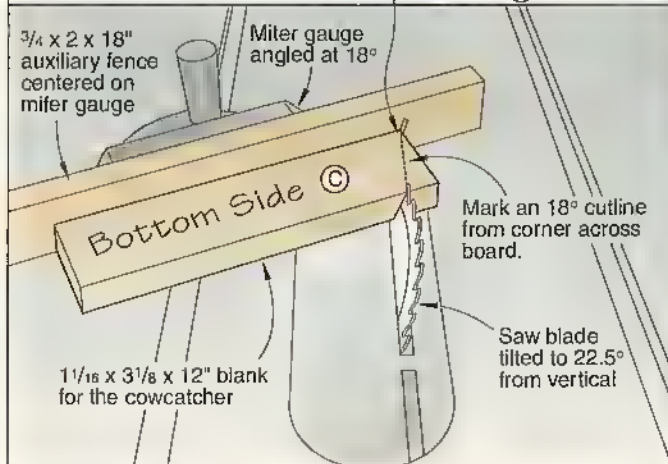
CHUBBY CHOO-CHOO



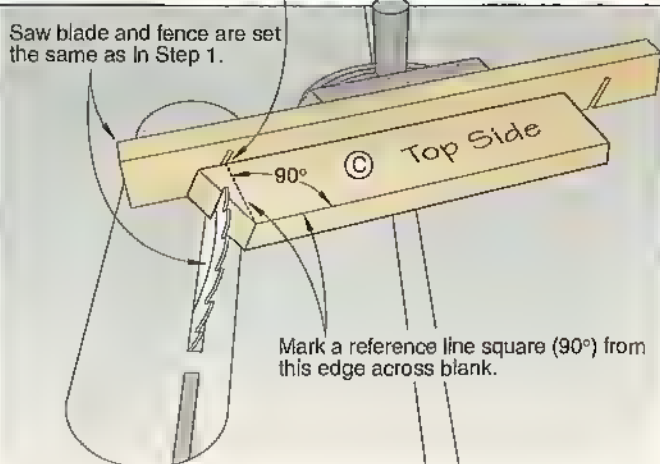
CUTTING THE COWCATCHER

STEP 1 Angle miter gauge and saw blade, and then cut through the auxiliary fence.

STEP 2 Mark a cutline on the bottom side of (C). Align marked cutline with kerf cut in fence, and make the first cut across (C).

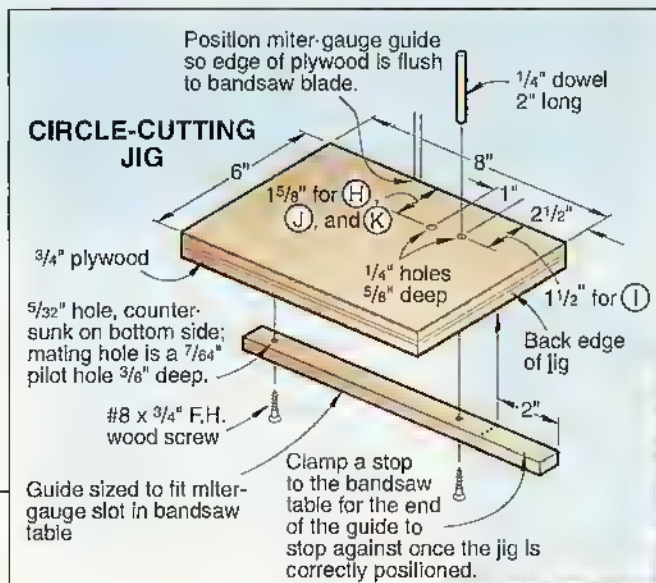
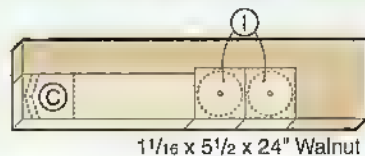
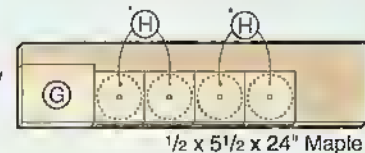
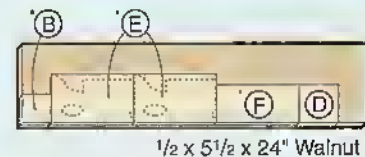
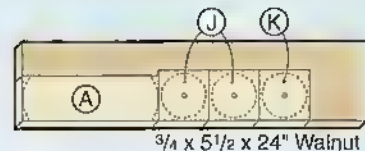


STEP 3 Switch miter gauge to the slot on the left-hand side of the blade, and cut through the fence. Mark a reference line square to one edge, align reference line with kerf, and make the second cut.



Bill of Materials											
Part	Finished Size			Matl.	Qty.	Part	Finished Size			Matl.	Qty.
	T	W	L				T	W	L		
CHASSIS ASSEMBLY						BOILER					
A chassis	3/4"	3 1/2"	9 1/2"	W	1	H* bands	1/4"	3 1/4" dia.	M	4	
B spacer	1/4"	2"	2"	W	1	I* discs	1 1/16"	3" dia.	W	2	
C* cow-catcher	1 1/16"	3 1/8"	4 1/8"	W	1	J* discs	3/4"	3 1/4" dia.	W	2	
CAB						K* disc	3/4"	3 1/4" dia.	W	1	
D floor	1/2"	2 5/8"	2 3/4"	W	1	*Initially cut parts marked with an * oversized. Trim to finished size according to the instructions.					
E sides	1/4"	3 1/4"	5 3/4"	W	2	Materials Key: W-walnut, M-maple					
F front	3/8"	2 5/8"	5 3/4"	W	1	Supplies: 1/8", 3/8", 1/2", and 3/4" dowel stock, 4-1/2" flat washers, clear finish.					
G roof	1/2"	4"	5"	M	1						

CUTTING DIAGRAM



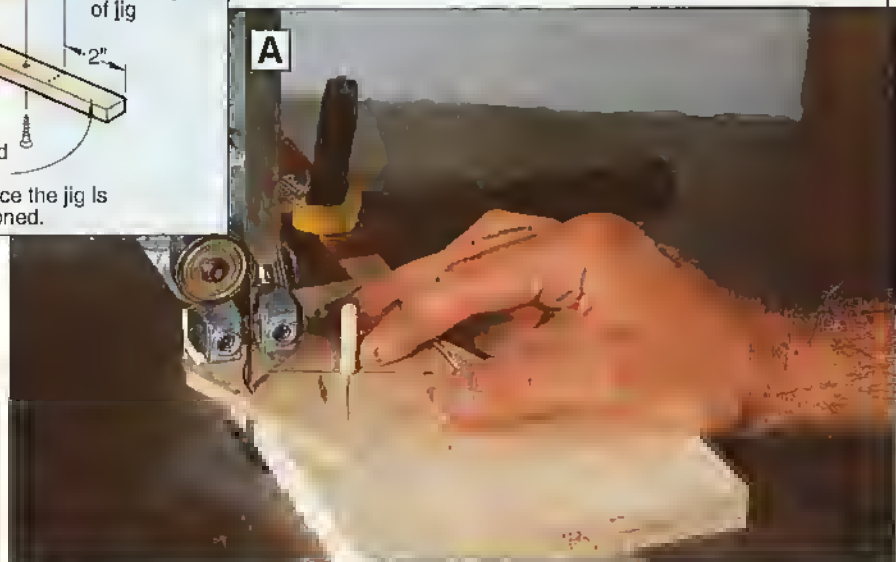
*Plane or resaw to the thicknesses listed in the Bill of Materials.

With the square boiler-band blank mounted on the dowel in the jig, slide the jig until it hits the stop, and bandsaw the disc to shape.

3 Cut the cab front (F) to shape. Lay out the notch locations along the edges, and cut them to shape.

4 Glue and clamp the cab sides (E) and front (F) to the floor (D).

5 Carefully lay out the hole centerpoints on the chassis sides (A, C) where dimensioned on the Chassis/Cab drawing on the following page and on the full-sized pattern. Drill the holes where marked. (For support and consistent placement, we used a fence on our drill-press table when drilling the holes. A vernier caliper came in handy when checking the depth of the 5/32" holes in C.)



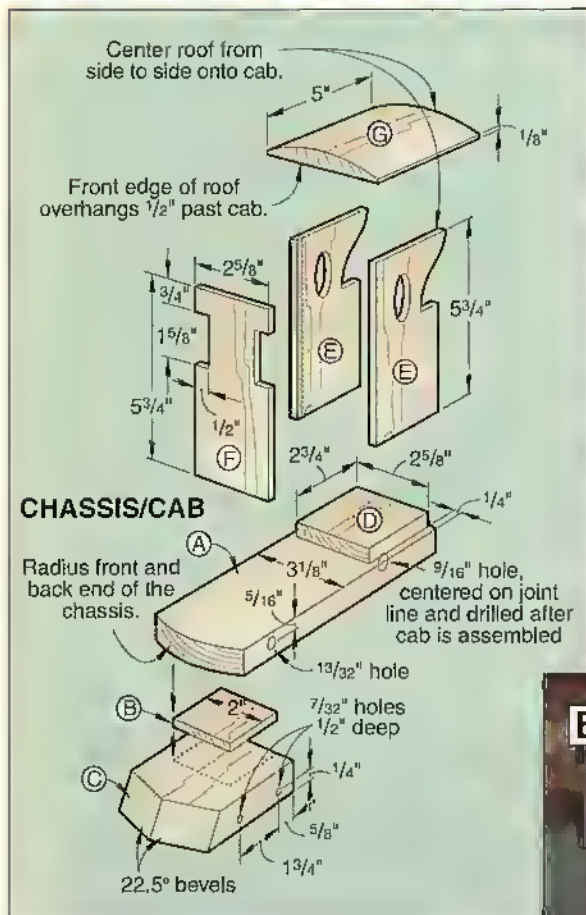
6 Cut the cab roof (G) to size. Sand the top to the shape shown on the pattern insert, being careful to keep a 1/8" flat area along the edges. (We used double-faced tape to adhere the roof to a 2x4 to act as a handle when sanding.)
7 Center the cab roof side-to-side on the cab assembly, with a 1/2" overhang over the front edge. Glue and clamp (or tape) the cab roof in place until the glue dries.

A boiler gives this engine power to spare

1 To form the boiler bands (H) and discs (I, J, K), you can cut the discs frechand or build a circle-cutting bandsaw jig like the one shown on the Circle-Cutting Jig drawing. Cut four pieces of 1/4"-thick maple to 3 1/2" square for the boiler bands (H). Draw diagonals to find center. Drill a 1/4" hole at the marked center of each piece.

Continued

CHUBBY CHOO-CHOO



C Use a disc sander to sand a flat area on the bottom of the boiler for mounting the boiler to the chassis later.



B Chuck the threaded end of the carriage bolt into your drill press, and sand the center boiler section smooth.

2 To use our handy jig to cut the discs to near-perfect shape, position the jig on your bandsaw table so the center of the hole being used in the jig is directly across from the center of the blade (we recommend a 1/4" bandsaw blade). Without moving the jig, clamp a stop in the miter-gauge groove directly behind the jig. Mount one of the square boiler-band blanks on the 1/4" dowel in the jig. Start the saw, and push the jig until it comes in contact with the stop. When doing this, you'll have cut into the square blank. Now, rotate the blank to finish cutting the disc as shown in Photo A. Turn the saw off, and remove the disc from the jig. Repeat to form the other three boiler bands.

3 Using 3/4" stock and the jig's 3 1/4" diameter setting, bandsaw the boiler discs (J, K) to shape. Then,

move the 1/4" dowel to the other hole in the jig, and cut the I parts to 3" in diameter. Note that the I parts are cut from 1 1/16" material.

4 Fit your table-mounted router with a 1/8" round-over bit and a V-notched fence, and rout the edges of the boiler bands (E).

5 Using a 1/4" carriage bolt 4" long with a washer and wing nut, glue and clamp the three inner discs (J, K) together. The carriage bolt allows you to clamp and align the three pieces at the same time. Later, remove the bolt, and use a disc sander, with the table tilted to 12° from horizontal, to sand the edges of each J.

6 To finish-sand the edges of the center section (J, K), remount it to the carriage bolt, and chuck the threaded end of the carriage bolt into your drill-press chuck. Start the drill, and sand the edges smooth, as shown in Photo B. Repeat the process on your drill press to sand the edges of the front and rear discs (I) smooth.

7 Drill a 1/2" hole 1/4" deep centered in the front end of the candleholder base piece used to form the front of the boiler. See the Boiler detail for reference. Then, drill a 1/4" hole through the center of the 1/2" hole.

8 Using a 12"-long piece of 1/4" all-thread rod, glue and clamp the remaining boiler pieces H, I, and the candleholder base to the center boiler section (J, K).

9 steps to great-looking **Half-Blind Dovetails**

Simple dovetail jigs such as the one here help you make tight-fitting half-blind dovetails quickly and easily. Follow these key steps and tricks for using your dovetail jig, and you're sure to enjoy success.

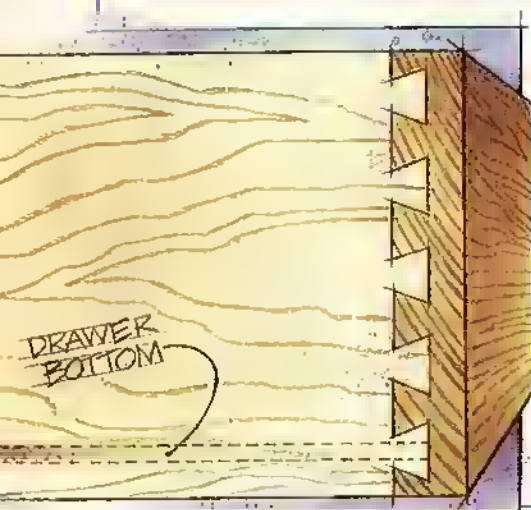
Note: To make your dovetail jig faster and easier to use, build the dovetail jig fence on page 24. If you make a lot of dovetail joints, you'll find that this handy accessory more than pays you back for the small investment in materials and time required to make it.

1 Dovetail jigs come with a template or "comb," with a series of "fingers" that you guide a router along to cut the dovetails. A standard $\frac{1}{2}$ " template works in conjunction with a $\frac{1}{2}$ " dovetail bit, and typically has fingers spaced $\frac{7}{8}$ " apart as shown *right*. However, we've seen some templates with 1" spacing. And, manufacturers offer optional templates with smaller finger spacing. For example, with our Porter-Cable jig we occasionally use a $\frac{1}{4}$ " template that has fingers spaced $\frac{7}{16}$ " apart. Measure the spacing and make note of it.

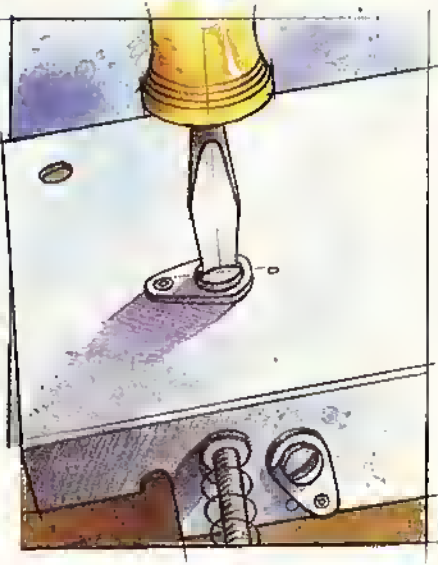


2 Make the width of your workpieces an increment of the finger spacing. For example, a template with $\frac{7}{8}$ " spacing will work nicely with $3\frac{1}{2}$ ", $4\frac{3}{8}$ ", or $5\frac{1}{4}$ "-wide pieces. That way, your workpiece will have equal half dovetails at the top and bottom of the joint as shown *left*.

This also leaves a full tail correctly positioned for a drawer bottom. Plan to center a $\frac{1}{4}$ "-wide, $\frac{1}{4}$ "-deep bottom-holding groove on this tail *after* you machine the dovetails.

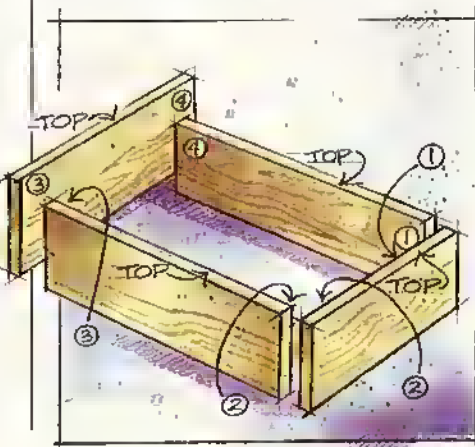


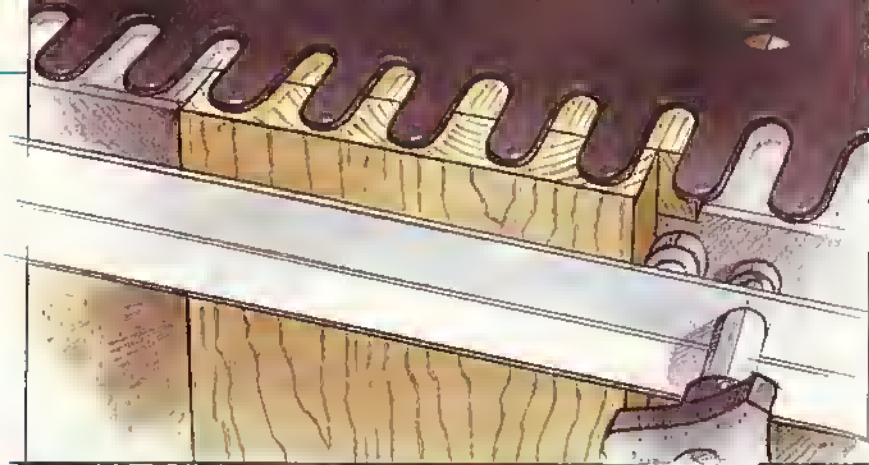
3 Most likely, your dovetail jig will have a set of stops on both ends that the edges of the workpieces butt against. Set these according to which template you are using.



4 Now, select your stock and plane or resaw it if necessary. Drawers typically have $\frac{3}{4}$ "-thick fronts and $\frac{1}{2}$ "-thick sides and backs. With our Porter-Cable jig, the $\frac{1}{2}$ " template requires workpieces at least $\frac{1}{2}$ " thick. The $\frac{1}{4}$ " template works with drawer fronts at least $\frac{3}{8}$ " thick, and sides at least $\frac{5}{16}$ " thick.

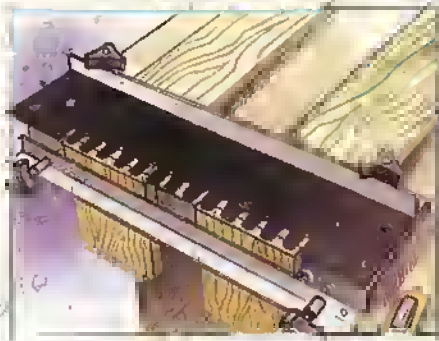
Cut your workpieces to size, making sure they are square, and arrange them as shown *below*. Mark the top edges and number all of the matching inside corners.





5 Grab two workpieces with same-numbered corners. Place them into the jig with the numbered ends together, the drawer side positioned vertically, and the front or back sitting horizontally as shown *above*.

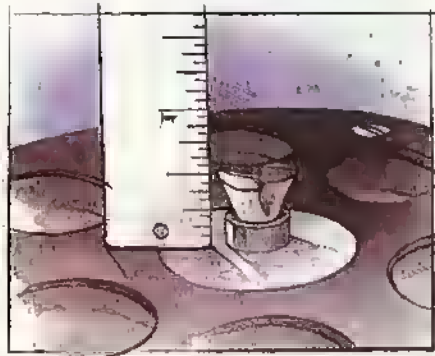
The inside (numbered) surface of the drawer parts should be facing away from the jig, visible to you. The workpieces should be in contact with the stops, and tight against each other, with the face grain of the horizontal workpiece



flush with the end grain of the vertical piece.

To speed things up, place workpieces on both ends of the jig as shown *above*. This only works if the width of your pieces is less than half of the jig's capacity.

6 Mount the correct guide bushing into your router's base. Our jig requires a bushing with a $\frac{7}{16}$ " outside diameter (O.D.) when using a $\frac{1}{2}$ " template, and $\frac{5}{16}$ " O.D. bushing for its $\frac{3}{4}$ " template. Secure the necessary dovetail bit, and use a metal rule to adjust its height according to the instruction manual.



Note: Perform the following steps in scrap stock that's of the same dimensions as your workpieces. After you're satisfied with the results, cut your actual workpieces as described in Step 7.

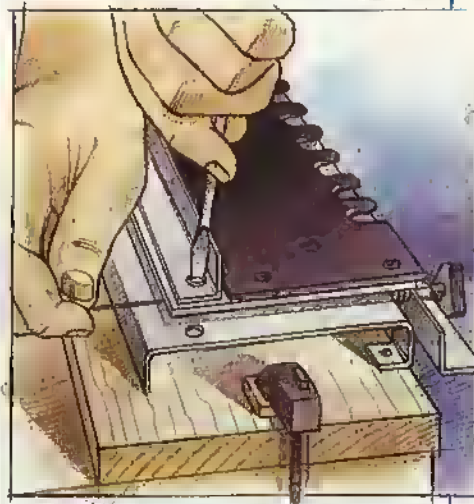
7 Working from left to right, move the router in and out of each of the template fingers. Go slowly, especially near the ends of the cut, to ensure clean results.

Remove the two workpieces and check their fit with one another. The dovetailed ends should slide together with firm hand pressure or light tapping with a rubber mallet. If the joint requires more force than that, or won't go together at all, decrease the height of the bit and repeat your test cuts. If the dovetails fit together too sloppily, increase the bit height.

8 If you run into grain splintering near the end of the cut, add a scrap piece as shown *below*. The scrap may splinter, but it will help keep the workpiece clean if the two are tightly butted together.



9 Now, check if the dovetails go together so that the face grain of the drawer sides aligns flush with the end grain of the front or back. If they won't align flush, you need to increase the length of the dovetail cuts by adjusting the templates in, away from the router. If the dovetail cuts are too long and the workpieces go more than a hair past flush, adjust the templates out, toward the router. With our Porter-Cable jig, we do this by loosening a holding screw and micro-adjusting a setscrew in or out with a hex key as shown.



Written by Bill Krier with Chuck Hedlund
Illustrations: Brian Jensen

Cockatoo

A bird with lots of cents Cache

Kids love to stash their cash away. That's why we're sure any youngster will welcome this colorful cockatoo as a roommate. This bird conceals a bank under one wing, as shown in the *inset photo*.

Begin with the body

1 Photocopy the Full-Sized Body Pattern (A), in the *WOOD PATTERNS*® insert in the middle of the magazine. Using rubber cement or spray adhesive, adhere it to a 1½×6×10" piece of stock (basswood, poplar, or pine would be good choices for the painted bank). Bandsaw the body.

2 Chuck a ¼" bit in your drill press, and drill through the body at the center mark for the 3½"-dia. hole. Piloting on that hole, bore about halfway through the body with a 3½" hole cutter. Flip the body over, and bore in from the other side to complete the cavity.

3 With a ¼" rabbeting bit, rout a ⅛"-deep rabbet around the hole on the patterned side of the body.

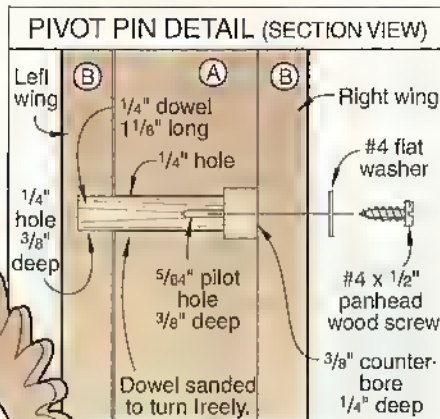
4 Drill a ⅛" pilot hole through the body at the eye location. Guiding on the pilot hole, drill a ½" eye hole about ⅛" deep on each side of the body. Drill a ⅛" hole ¼" deep and a ¼" hole through the body where shown. On the right side of the body, counterbore the ¼" hole ¼" deep with a ⅜" bit.

5 Install a ¼" round-over bit in your table-mounted router. Rout the body on both sides, starting in front of the line marking the front of the notch for the feet. Continue around the body to the tail notch at the back.

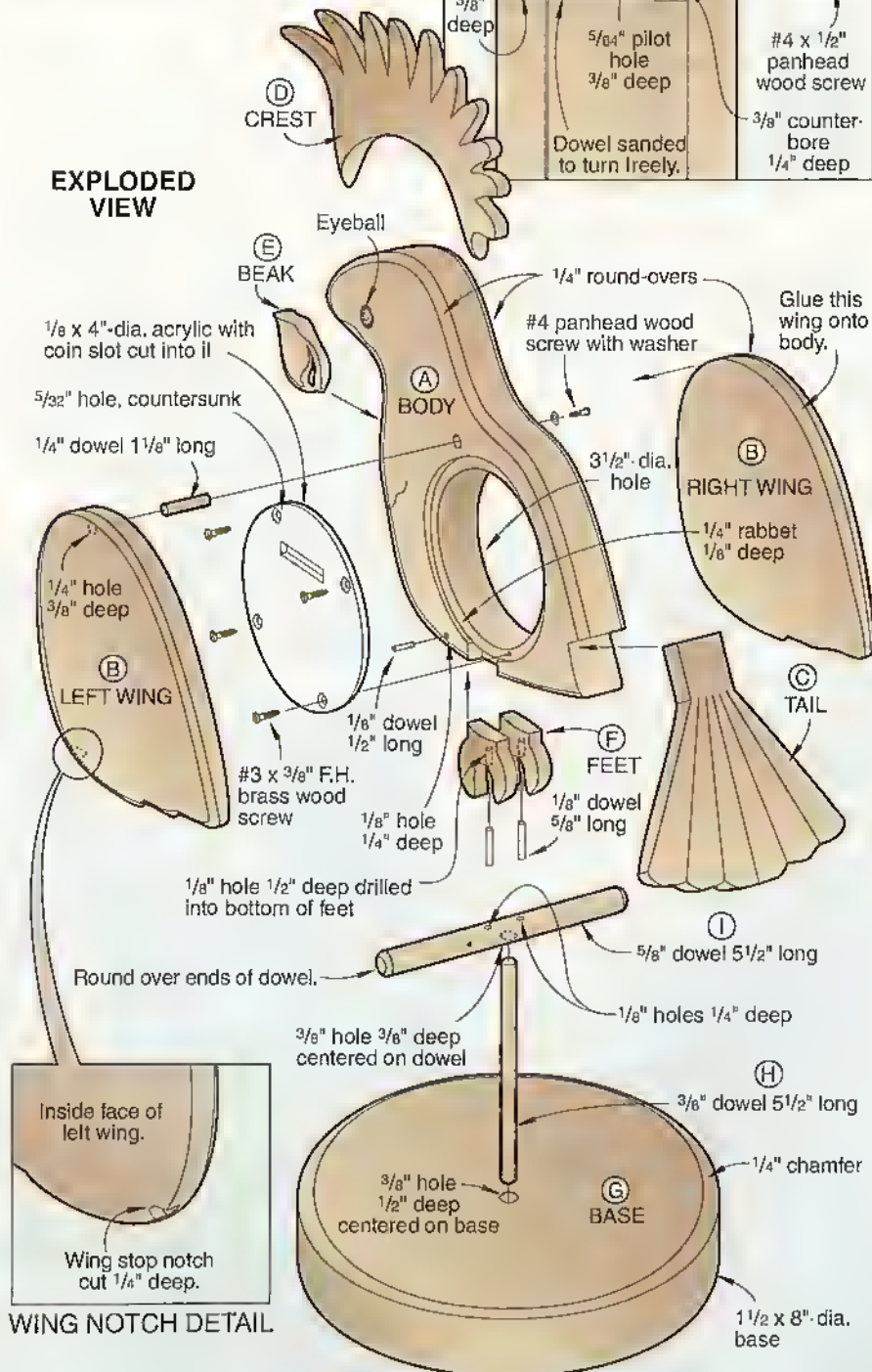


Swing up the colorful cockatoo's left wing, and you'll find a coin bank.

SEE THE
WOOD PATTERNS® INSERT
FOR FULL-SIZED PATTERNS



EXPLODED VIEW



WING NOTCH DETAIL

6 Glue a $\frac{1}{2}$ " length of $\frac{1}{8}$ " dowel rod into the $\frac{1}{8}$ " hole on the left side of the body. Sand down the protruding end so it extends about $\frac{1}{8}$ " from the body.

7 Carve a $\frac{1}{16}$ " V-cut along the dotted line at the front of the body to indicate breast feathers. A $\frac{1}{16}$ " V-tool or the corner of a rotary carving burr will make the cut.

8 To make the cover for the rabbeted side of the coin opening, cut a 4"-diameter disc of $\frac{1}{8}$ "-thick clear acrylic. (You could use tempered hardboard or Baltic birch plywood instead, if you wish.)

9 Drill a $\frac{1}{8}$ " blade start hole where shown in the cover's coin slot. Scrollsaw the slot, or drill overlapping holes and file it out. Drill and countersink four $\frac{5}{32}$ " screw holes in the cover where shown.

Shape the wings

1 Stack two $\frac{1}{2} \times 5\frac{1}{2} \times 6\frac{1}{2}$ " pieces of stock together with double-faced tape. Adhere the Wing pattern (B) on page 47 to the top of the stack, and cut out the wings.

2 Separate the cutouts, and designate one the left wing and one the right. On back of the left one, drill a $\frac{1}{4}$ " hole $\frac{3}{8}$ " deep where shown.

3 On the face of each wing that will lie against the body, mark the area shown at the lower back corner of the pattern. Relieve the area by sanding, bringing the wing's thickness at the bottom rear tip to about $\frac{1}{4}$ ". This will allow the wings to clear the tail when installed, as shown by the photo next page. Then, sand the outer face of each wing to shape. Round over the front edge and taper the back, as indicated by the pattern's Cross-section view.

4 Carve a shallow V-groove on the outer face of each wing, where shown by the broken line. Carve $\frac{1}{16}$ " deep with a $\frac{1}{16}$ " V-tool.

Continued

Cockatoo Cache



Turn to the tail

1 Adhere the Tail pattern (C) below to 1/2" stock. Cut out the tail.

2 Taper the top surface to about 1/8" thick at the wide end, carving the tops of the feathers as you go. To

do so, carve a V-groove between the two feathers numbered 1. Then knife-cut each remaining feather line.

3 Employing a shallow carving gouge or a narrow chisel, carve from the center of feather 2 toward feather 1 on each side, going slightly deeper as you approach the knife-cut line. Similarly, carve from feather 3 to feather 2 on each side. This will create a layered appearance, as shown in the detail photo. Carve V-grooves for the feather lines on the bottom of the tail.

4 Glue the tail to the body. After the glue dries, sand the tail and body contours to match. Fill the joint, if necessary, and sand.

Details make the bird

1 Cut the crest (D) from 1/2" stock. Taper it to about 1/8" thick at the feather tips, sanding each side to a gentle curve rather than a straight slope. Glue the crest to the head, straight along the centerline.

2 Cut the beak (E)—or is it a treasury bill?—from 1/2" stock. Sand the front round, starting from the broken line. Glue the beak into place.

3 Cut two feet (F) from 3/8" stock. Sand the front and back round where shown by the broken lines.

4 Chisel out the 3/8"-deep notch for the foot on each side of the body, then glue the feet into place. Position the outside face of each foot flush with the body.

5 Drill a 1/8" hole 1/2" deep where shown in the middle of each foot. (We held the body upside down in a vise and drilled with a cordless drill.) Glue a 3/8" length of 1/8" dowel rod into each hole.

Complete the bird bank

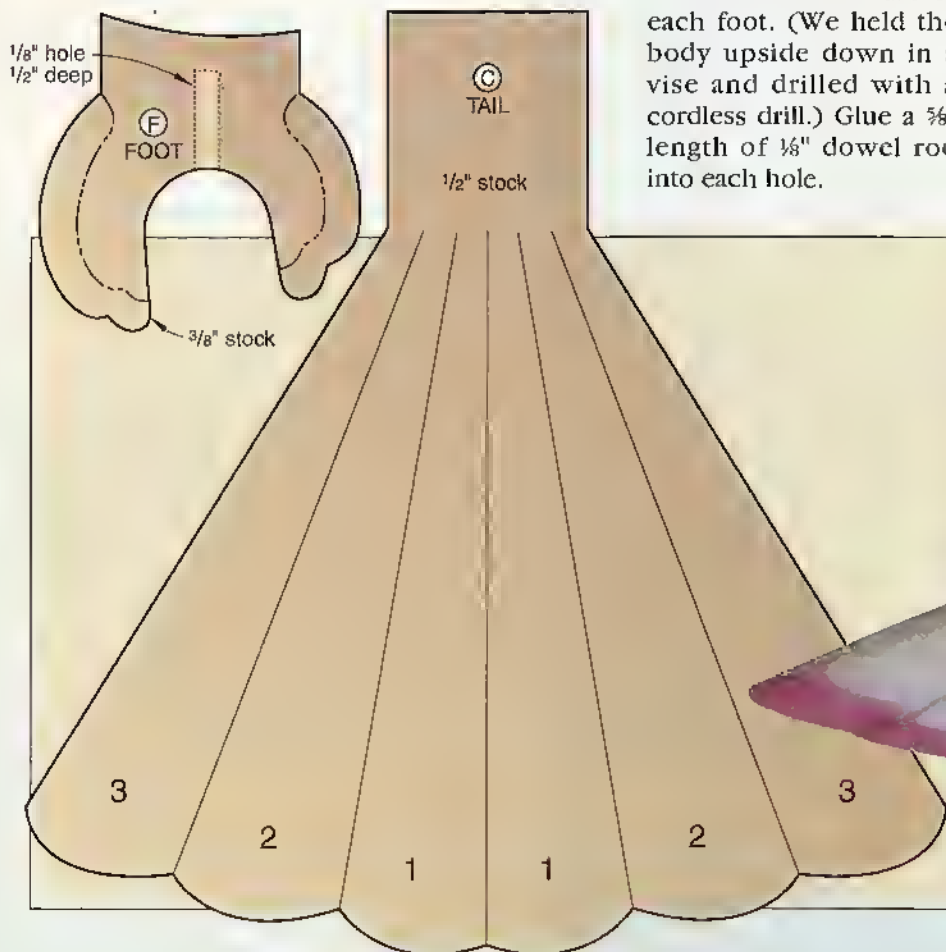
1 Sand the body and wings. Paint white, and apply bright color highlights where shown. Airbrush or aerosol-can application gives the best effect. Apply a clear coating.

2 Now, attach the wings, starting with the pivoting left wing. First, cut a piece of 1/4" dowel rod 1 1/8" long for the pivot pin. Insert one end into the hole on the back of the left wing (do not glue it). Sand the other end to turn freely but without play in the 1/4" hole through the body.

3 Press the left wing against the body side with the pivot pin through the hole. Mark the pivot pin at the bottom of the counter-bore, and cut it to that length.

4 Drill a 5/16" pilot hole in the sanded end of the pivot pin. Drive in a #4x1/2" panhead screw with a washer, as shown in the Pivot Pin Detail drawing. Be careful not to split the pivot pin, and make sure it turns easily with the screw in.

5 Remove the screw and washer, and glue the pivot pin into the wing hole. After the glue dries, install the left wing with the screw and washer. Then, scrape the



Shape the inside of the wings to clear the tail. Fan the tail feathers out from the middle.

paint from a few mating spots on the back of the right wing and the right side of the body, and glue the right wing into place.

6 Swing the left wing down until it contacts the stop dowel. Mark the contact point, then carve the stop notch into the underside of the wing, shown in the Wing Notch Detail drawing.

7 Glue in the eyes. (We used black plastic eyes from a craft shop; black-painted buttons would work, too.) Position the plastic cover in the rabbeted opening. Drill $\frac{1}{16}$ " pilot holes, and secure the cover with four #3 $\times\frac{3}{8}$ " flathead brass wood screws.

Build the perch

1 Scribe an 8"-diameter circle on $1\frac{1}{2}$ "-thick stock for the base (G).

Bandsaw the base. Saw outside the cutting line, then sand down to it.

2 Rout a $\frac{1}{4}$ " chamfer around the top edge. Drill a $\frac{3}{8}$ " hole $\frac{1}{2}$ " deep at the center. Sand the base.

3 Cut a $5\frac{1}{2}$ " length of $\frac{3}{8}$ " dowel rod for the upright (H) and a $5\frac{1}{2}$ " length of $\frac{5}{8}$ " dowel rod for the crossbar (I). Drill a $\frac{3}{8}$ " hole $\frac{3}{8}$ " deep at the center of part I.

4 Glue the crossbar (I) to the upright (H). Then, glue the assembly into the base hole.

5 Lay a piece of carbon paper across the stand's crossbar. Then, slide the cockatoo's feet down onto the crossbar—making sure the bird is centered—and press down so the dowels in

the feet make carbon-paper marks on the crossbar. Drill a $\frac{1}{8}$ " hole $\frac{1}{4}$ " deep at each mark.

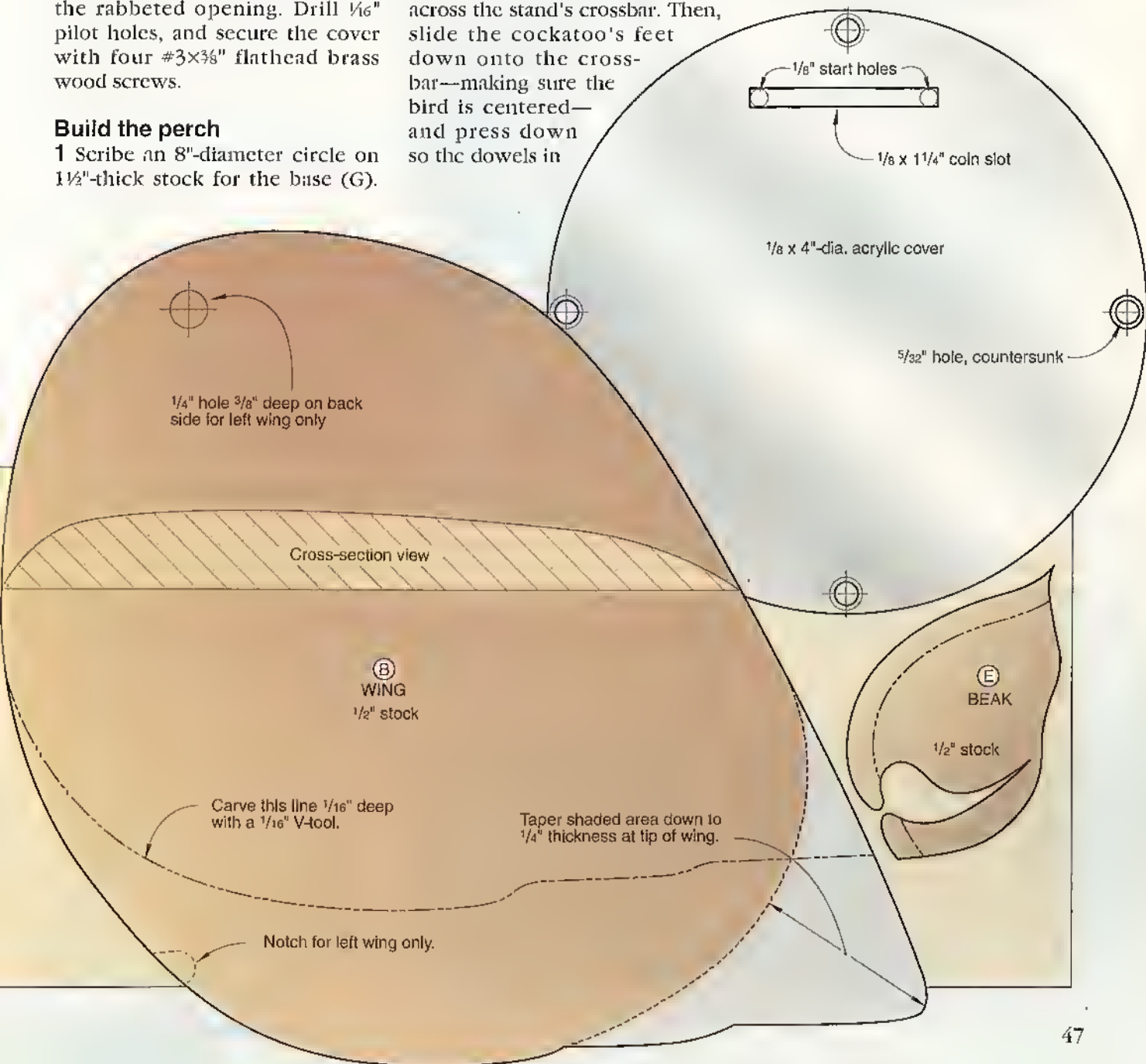
6 Sand and finish the stand. You could paint it or, as shown, stain it and apply a clear finish. After the finish dries, position the cockatoo on its perch, engaging the dowels in the feet into the holes in the crossbar. For greater stability, glue the feet to the crossbar. ♣

Project Design: Raccoon River Scrollworks, P.O.

Box 41308, Des Moines, Iowa 50311-0506

Photographs: John Hetherington

Illustrations: Kim Downing, Lorna Johnson





A PRO'S POINTERS

Chuck Hedlund, *WOOD*® magazine's project builder, gives you his tips for getting a great finish.



periodically you do have to give the piece another coat to keep up the protection."

What about water-based finishes? "Water-base has more of a natural look on the wood. It doesn't give it a yellow cast, which takes some people a while to get used to," says Chuck. "The trouble with water-base is that it raises the wood grain, making more work for you in the application. Sometimes what helps, though, is to first sand the wood, then wipe it with a damp cloth, and then sand it again. But don't saturate the wood. There's only so much grain to raise."

Choosing the right finish is really the easy part. The biggest—and hardest—aspect of getting a great finish is the preparation, Chuck believes. "It's like painting a car—the spraying is the easiest and quickest thing. But if the surface isn't prepared correctly, the paint job won't look good. No matter how well you can spray or brush, if you don't prep the wood right, you won't get a great finish."

Proper preparation begins with gluing

To Chuck, about the worst contributor to a bad finish is glue squeeze-out. "You have to get it all off the wood because even with sanding, sometimes the glue only shows up after you stain the wood or apply the final finish," he notes. "Then, it's a real problem to repair. You have to go back through all the sanding steps."

So, what can you do about glue squeeze-out? After all, there has to be some.

"If you don't have any squeeze-out, you'll have a starved joint that could eventually separate," says Chuck. "If you have too much, you end up with a chore in removing it. I've found that

According to Chuck Hedlund, there isn't a "perfect" finish. Why? He explains: "It depends on the application. As a woodworker, you have to look at the project and its use, the design, and the wood before you select the finish to put on it."

Selecting the right finish

"Basically, if you have a piece of furniture that will take a lot of touching, like the wooden arms of a dining chair or a table top, that's where polyurethane is appropriate," Chuck explains. "You could use lacquer, but then you have to be more careful and aware of the finish because you can't treat it roughly. I have an oak rolltop desk at home that I sprayed with lacquer, but I protect the writing surface with a desk pad and use a coaster to rest cold drinks on. I also paste-wax it twice a year.

"And that desk top has at least six coats of lacquer on it," he con-

tinues. "I put more coats of finish, usually double, on flat surfaces like table and desk tops. Edges should get multiple coats, too. And it's important to seal the bottom side with the same number of coats. You don't have to rub out the finish on the bottom, but you should put on the same number of coats."

Chuck admits that part of lacquer's widespread appeal is its sprayability and fast-drying nature. But he believes there's a place for oil finishes, too.

"Oil [tung, Danish, etc.] is appropriate on anything made of what I call 'elegant' wood, such as cherry, black walnut, and figured maple," says the project builder. "Sure, you can put polyurethane or lacquer on all of them, but it won't bring out the richness of the color and grain. Oil soaks into the wood, and one of the easiest is Minwax Antique Oil because it builds up quickly. But with oil,

FOR PREPARATION



Here's what the squeeze-out of a good glue line should look like. Chuck removes it with a chisel before it's dry.

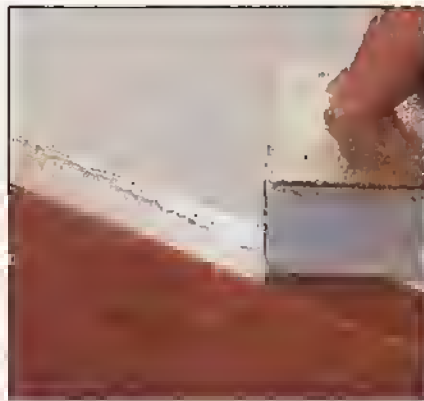
squeeze-out the size of a pencil lead is just about right. [See photo above.] I wait until the squeeze-out thickens, then I lift off the glue with a chisel, putty knife, or scraper. If you wait and let it set up overnight, you risk pulling off some of the wood when you remove it because the glue bonds. Unless you plan to resand the surface, you don't want to let it dry."

You can sand too much

Don't skip a grit is a woodworking commandment. Yet, that doesn't necessarily mean sanding progressively through all the abrasive grits.

"The number of grits I go through depends on the circumstances," Chuck comments. "For example, with penetrating oil where you'll actually feel the wood through the finish, you'll normally want to go from 80 to 320. But if you use a lacquer or poly, which are surface finishes that build up, you can stop at 150 grit. Of course, if you have a thickness planer that puts out a nice smooth surface on the wood, you might be able to start with 120- or 150-grit. If you don't need 80, stay away from it and any coarser grits. That's because any time you use a coarser grit you're visibly scratching the surface.

"However, no matter with what grit you start, don't skip a grit because it will just take longer to remove the scratches from the previous one," Chuck cautions. "And if you plan to stain the wood, remember this: The coarser the sandpaper you end up with, the darker the surface will stain; the finer the grit, the lighter the stain will be. That's because pigment collects in open pores."



To remove a messy run of finish requires scraping the excess with a chisel, light sanding, and then buffing the area with a polishing compound.

One good way to brush

Many, if not most, home woodworkers rely on their hands rather than a spray gun to apply finishes. And Chuck has some advice regarding that. "Buy a quality, natural bristle brush for lacquer because the better the brush, the better the result. There's nothing more irritating than a bristle coming out on the final stroke. To

brush poly or a water-based finish, you can use a disposable foam brush [lacquer eats foam]."

So, how do you start? "I usually start in the left corner away from me and bring the finish to my right, working from back to front," says Chuck. (See below.) "That's so I don't drop anything onto the fresh finish by reaching across the full width."

After applying the finish, Chuck inspects the piece for areas he



How Chuck Hedlund brushes on a finish

might have missed or didn't apply enough to. After the finish dries, if he finds any runs, he scrapes and sands them down. "About the only way to correct imperfections is with scraping, light sanding, and buffing," he says, then adds some final words of advice. "Don't get in a hurry. Finishing takes time. You put a lot into making the project, so spend the time necessary to finish it correctly, even if it takes as long as the building." ♣

More great finishing tips from Chuck

- Use cotton swabs to spread finish into corners and crevices, and to unclog dowel holes.
- Remove the back of a cabinet before spraying. Take off handles and anything else that you can remove.
- Stuff cotton balls in any dowel holes yet to be filled.
- Keep stains stirred throughout application.
- Don't let stain dry before wiping it off. Always keep a wet edge. On a large surface, first stain two-thirds and then wipe it down.

ARCHED-TOP Wall Shelf



Want to add a little sparkle to a ho-hum entry or brighten up a dreary hall? If so, you're going to love this simply elegant shelf. All it takes is a tablesaw, jigsaw, sander, and an evening or two of your time. It's that simple.

Start with the plywood back and side pieces

1 Cut a piece of $\frac{1}{2}$ " plywood to $12\frac{1}{2}$ " wide by 34" long for the back (A) and two pieces to $5\frac{1}{8}$ " wide by $22\frac{1}{2}$ " long for the sides (B). (Because it has more plies and is void free, we selected Baltic birch plywood for this project. Select your own stock, or see the Buying Guide for our source of this quality plywood.)

2 Cut the pattern pieces for the full-sized mirror and back (A) from the *WOOD PATTERNS*® insert in the center of the magazine. Note that the pattern comes in two pieces, and that you'll have to tape a $16\frac{5}{8}$ " piece of paper between the patterns. Then draw lines to connect the patterns and add the middle horizontal piece. Trace the full-sized mirror pattern from this paper pattern. The paper pattern gets destroyed when cutting the back to shape.

3 Transfer the full-sized back (A) and side (B) patterns to the respective stock. Drill a blade start hole inside each marked opening.

4 To cut the openings in the back (A) and sides (B), use a scrollsaw if you have one with a large enough throat. If not, use a jigsaw to cut the pieces to shape as shown in the photo *at right*. (We used a jigsaw fitted with a Dewalt trim/coping blade, #3715 for the curved cuts and a Dewalt fine cut/smooth finish #3710 blade for the straight cuts. If you have a

A delightfully different showcase for prized collectibles

jigsaw requiring a bayonet-style blade, we recommend the AEG 254061 jigsaw blade. (A quality blade is important to minimize chipping when making the cuts.) See the box at the end of the article for three tips on making smooth cuts with a jigsaw.

5 Using the one side piece cut to shape as a template, transfer the pattern to the second piece of plywood, and cut it to shape.

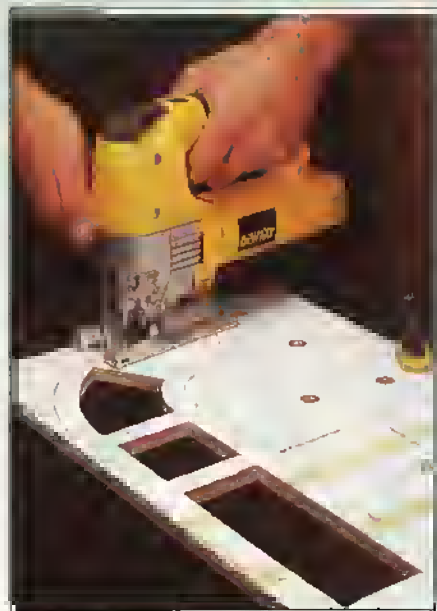
6 After the cuts are made in the back and sides, remove the patterns, and fill any voids (we recommend Durham's Rock Hard Putty). Sand each opening.

It's time to cut the dados and grooves

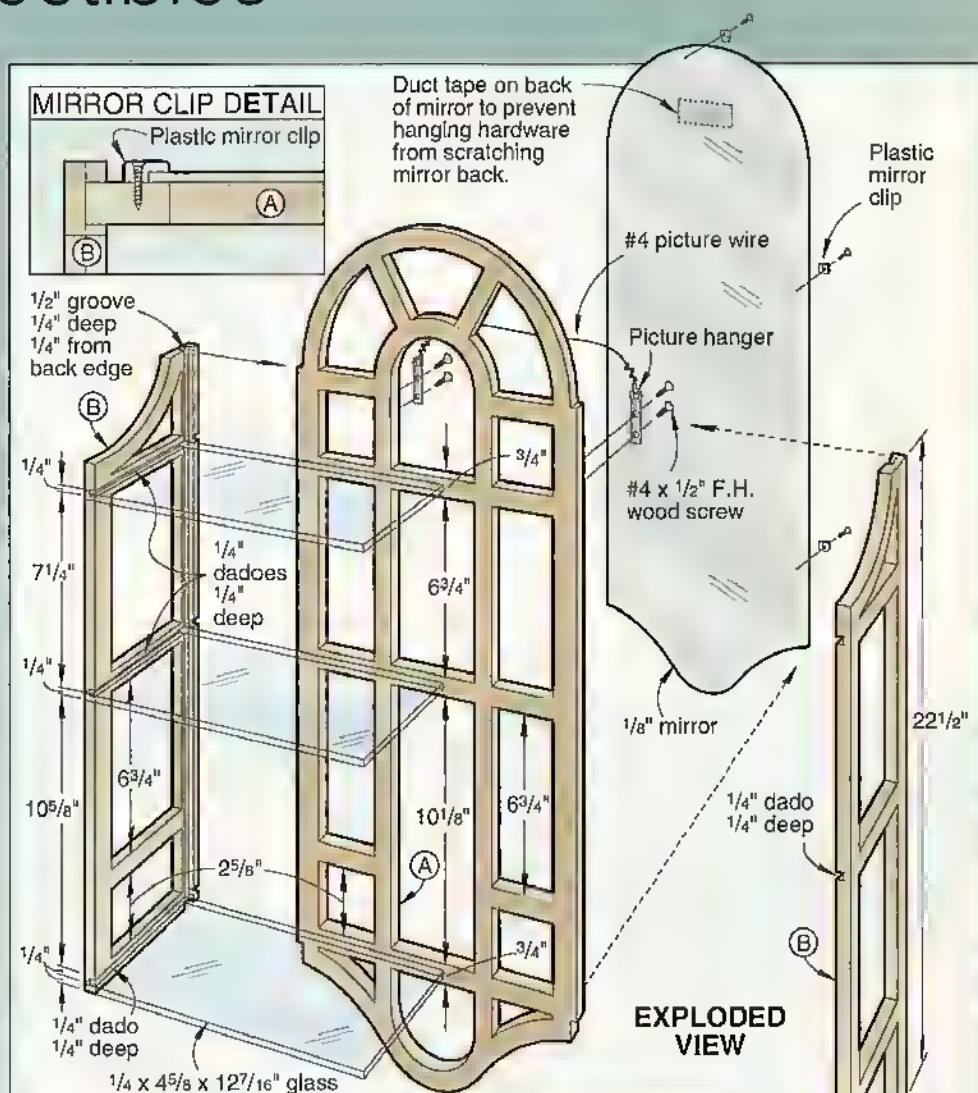
1 Fit your tablesaw with a $\frac{1}{8}$ " dado blade, and cut $\frac{1}{4}$ " dados $\frac{1}{4}$ " deep in the sides (B) where dimensioned on the full-sized pattern and Exploded View drawing.

2 Switch blades and cut a $\frac{1}{2}$ " groove $\frac{1}{4}$ " deep along the back inside edge of each side (B) where

Continued



Drill blade start holes, and then cut the marked openings on the plywood back to shape.



Bill of Materials					
Part	Finished Size			Matl.	Qty.
	T	W	L		
A* back	$\frac{1}{2}$ "	$12\frac{1}{2}$ "	$32\frac{3}{4}$ "	BP	1
B sides	$\frac{1}{2}$ "	$5\frac{1}{8}$ "	$22\frac{1}{2}$ "	BP	2

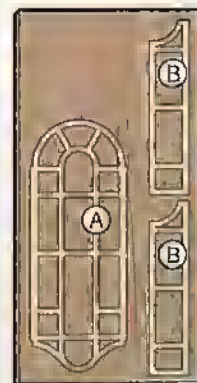
*Initially cut parts marked with an * oversized. Then, trim each to finished size according to the how-to instructions.

Material Key: BP—Baltic birch plywood.

Supplies: 3— $\frac{1}{4}$ x $4\frac{5}{8}$ x $12\frac{7}{16}$ " glass for shelves, $\frac{1}{8}$ x 11 x $31\frac{1}{2}$ " mirror, 2 picture hangers with screws and #4 picture wire, 6 plastic mirror clips with screws, primer, paint.

Buying Guide

Hardwood kit. All of the pieces shown on the Cutting Diagram cut slightly oversized from $\frac{1}{2}$ "-thick Baltic birch plywood. W951, \$24.95 ppd. Heritage Building Specialties, 205 North Cascade, Fergus Falls, MN 56537. Or call 800/524-4184 to order.



$\frac{1}{2}$ x 24 x 48" Birch plywood

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Wall Shelf

shown on the Exploded View drawing. (We cut scrap stock first to ensure the width of cut was equal to the thickness of the plywood used.) Adjust your blade until the mating back piece (A) fits snugly inside the groove in each side (B).

Assemble the pieces, and check for square

1 Slide the back (A) into the $\frac{1}{2}$ " grooves in the mating sides (B). Temporarily clamp the assembly together, and check for square.

2 Carefully measure the distance between dados in the side pieces, and cut two pieces of scrap to fit between the sides to

hold them parallel to each other and square to the back (A).

3 Glue and clamp the sides to the back as shown in the photo *below*. Use the spacers to hold the assembly square until the glue dries. Remove the clamps and spacers. Finish-sand the assembly.

Add the shelves, mirror, and finish

1 Use a piece of hardboard or cardboard to form a template for the $\frac{1}{8}$ " mirror. Measure the size of the glass and mirror cut to shape. (We had our glass shelves cut $\frac{1}{16}$ " less in length than the opening so the shelves would slide in place

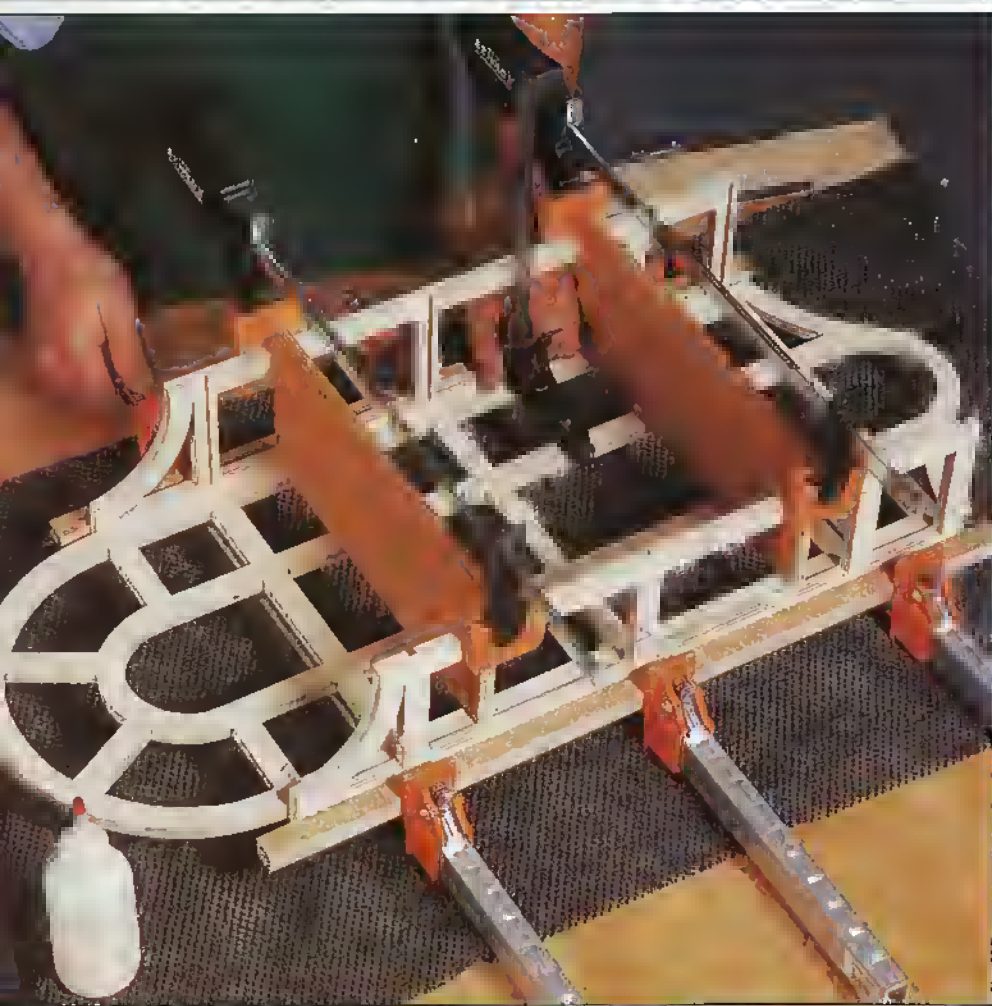
easily. We also had the shelves cut $\frac{1}{8}$ " wider, front-to-back than the opening, so the shelves protruded slightly from the front of the wall-shelf sides.)

2 Before painting, check to see that you have filled all the voids and that you have sanded all the surfaces. Prime the project, and then paint it to the desired color.

3 Using the Mirror Clip detail, secure the mirror to the back side of the plywood back (A).

4 Add a pair of picture frame hangers and wire to the back of the assembly. Add a piece of duct tape to the back of the mirror so the hanger doesn't scratch the silvering. Hang the project, add the glass shelves, level the shelf, and add your collectibles. ♣

Use two spacers to hold the sides square to the back until the glue dries. Clamping blocks prevent the project from being marred when clamping.



3 tips to ensure smooth jigsaw cuts

1 After selecting a jigsaw blade, cut a piece of scrap stock from the same material as the back and sides, and check for smoothness. We noticed that one side of the blade cut smoother with less chip-out than the other. With this in mind, we used the good side of the blade to cut next to the marked pattern line and the poorer side of the blade on the waste side of the stock.

2 Also, if you have an adjustable jigsaw, set it so the blade cuts straight up and down and not in the orbital motion. This is a less aggressive cut and results in less chipping.

3 Finally, we primed the surface of the plywood before applying the pattern. The primer seemed to bond the wood fibers slightly, making for a smoother cut.

Written by Marlen Kenmet
Project Design: James R. Downing
Illustrations: Roxanne LeMoine; Lorna Johnson
Photographs: Hopkins Associates

Rip Fences

What you need to know before upgrading

You say you're not getting the results you hoped for from your tablesaw? The problem may be its fence. Fortunately, there's a whole fleet of high-quality rip fences capable of transforming any tablesaw into a precision cutting machine. Read on to find out what we discovered about the 21 models we tested.

Fast Facts

- All of today's high-quality fences will improve greatly the performance of a tablesaw outfitted with a standard, low-cost fence. If your tablesaw has a cast-iron top and an induction motor, it probably makes sense to upgrade your saw with one of the fences reviewed here.
- Most high-end tablesaws already come with one of the fences reviewed here, or offer you the option of choosing among several of these fences when buying the saw.
- You can save up to \$75 by buying one of the down-scaled versions that we found plenty accurate and suitably durable for most part-time woodworkers.

Rip Fences

First things first—do you need a new fence?

Rip fences of the quality reviewed in this article have become standard equipment on most tablesaws priced over \$1,000—with good reason. High-quality fences help bring out the full potential of any table-saw—high *or* low-priced—by making it more accurate and convenient to use. Here's what to consider before taking the plunge:

- As our hands-on tests show, a high-quality fence will remain parallel to the blade cut after cut. The same cannot be said for most standard, lesser-quality fences. A fence that doesn't reset itself parallel to the blade contributes mightily to poor-quality cuts, and the possibility of workpiece kickback.

- High-quality fences cost \$210 to \$420 as an aftermarket item, and will add nearly that much to the cost of a new table-saw.

- If you work with wood for several hours or more every week, you'll appreciate the speed and convenience of a built-in tape measure. All of the tested units have hairline cursors on the fence that you align with a tape measure mounted on the front rail. Doing this is much faster than pulling out a tape measure and checking the blade-to-fence distance for every cut.

Do you need a rear-locking fence?

All of the tested fences lock in front, and several also lock to a rear rail. In the *WOOD* magazine shop we use fences that lock only in the front. We've never had a problem with the back end of the fence lifting or deflecting. But, we don't use a power feeder, stock hold-downs, or a scoring blade. If you do, you should consider a model with a rear lock. Or, you can simply clamp the rear of any of the tested fences if the need arises. All in all, we don't find a rear-locking device to be an essential feature.

Your product choices close-up

Biesemeyer and its clones

- Biesemeyer.** The Biesemeyer T-square is the original aftermarket rip fence, and it has the greatest name recognition in this category. As shown *below*, a Biesemeyer fence has two heavy angle irons that bolt to the front and back edges of a table-saw. These help support an extension table on the side of the table-saw, and the front rail provides a rigid mounting surface for the front tube. The fence pinches against the front tube when you lock it in place by lowering its lever.

Biesemeyer, like several other brands, offers a down-sized version of the "commercial" model shown here. These "home shop" fences have slightly less beefy components and shorter fences, but are accurate, and built plenty well for the dedicated wood-working hobbyist.

Biesemeyer's no-nonsense, all-steel construction and years of proven service have made it a top-selling aftermarket fence. It's no wonder, then, that it has recently been imitated with varying results by General, Jet, Powermatic, and Modulus. Let's look at those models.

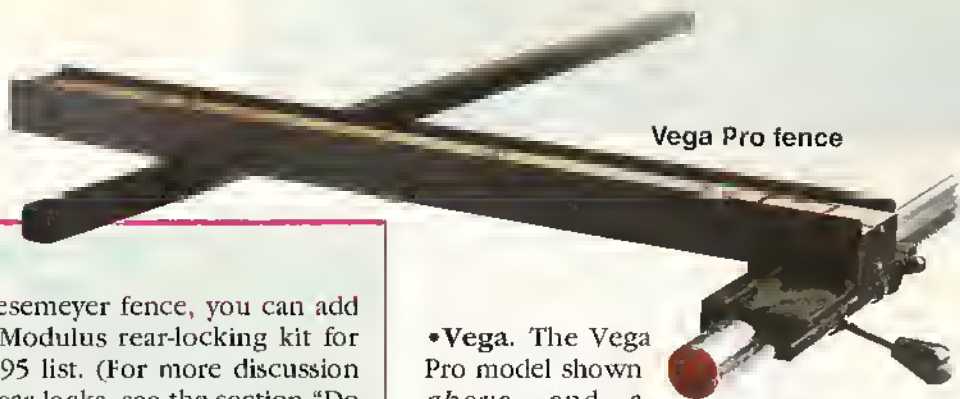
- General.** We could find no major differences between the fences offered by General and Biesemeyer.

- Jet.** The Xacta commercial and home shop fences closely mimic the Biesemeyer fences, with a couple of modifications. In place of the plastic-laminated plywood faces on a Biesemeyer fence, the Jet fences have slick plastic faces made of high-density polyethylene. The Jet faces are easier to replace because they have accessible screwheads. With Biesemeyer faces you have to remove the laminate to access the screws. Despite this advantage, we prefer the Biesemeyer faces because we found that they wear longer and mar less easily than the Jet faces. The Jet rails and tube are made from slightly thinner steel than the corresponding parts on the Biesemeyer fences we tested.

- Powermatic.** Although the Accu-Fence Commercial model appears to be a copy of the Biesemeyer Commercial model, it features two improvements. First, as shown on the *right* side of the photo *right*, it has T-slots milled into the back sides of the fence faces, and nut-access holes in the underside of the fence body. These allow you to easily change faces without tearing off the plastic laminate.

Like the Biesemeyer locking handle, the Powermatic handle releases the fence completely





Vega Pro fence

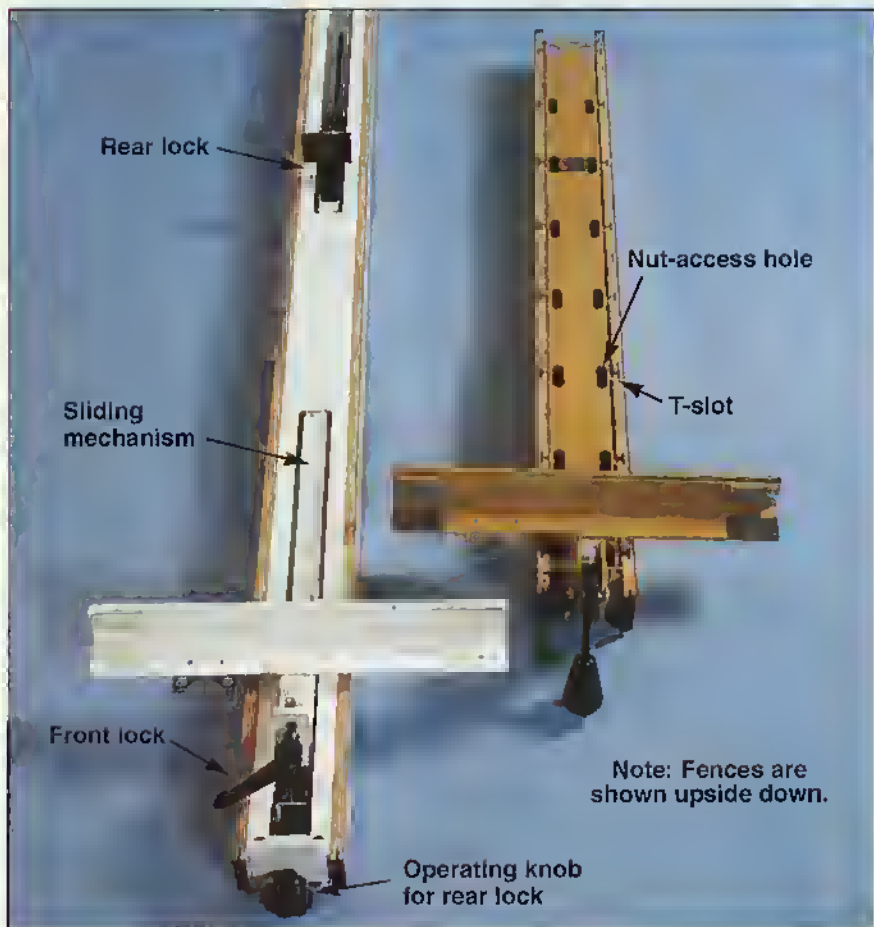
when you pull it up, and locks the fence when you push it down. But, the Powermatic fence has an intermediate position that holds the fence parallel to the blade as you fine-tune its position by tapping it to the right or left slightly before locking.

•**Modulus.** You can purchase three similar fences from this company. They come with rails and front tube, or without them (in case you already have Biesemeyer rails and tube). All three models have a mechanism that locks the rear of the fence to the back rail. If you already own

a Biesemeyer fence, you can add the Modulus rear-locking kit for \$79.95 list. (For more discussion on rear locks, see the section "Do you need a rear-locking fence?")

If you frequently work with sheet goods, and have had times when you wish you could position the fence farther to the front or back of the sawblade, you should take a look at the largest Modulus model, the SSF-100. It has a 60"-long fence that slides forward and back. As shown *below*, a mechanism within the fence body controls the sliding motion, and front knobs lock the fence in place.

•**Vega.** The Vega Pro model shown *above*, and a down-scaled version called the Utility model, have proven to be reliable performers for a number of years. Both of these fences, and the new Vega Commercial model shown *below*, have a micro-adjust mechanism. With this feature you can lock the fence approximately where it belongs, then dial it to an exact position with a threaded knob. This feature also comes in handy when you need to "tweak" a precise cut.



Micro-adjustment mechanisms, like this one on the underside of the Vega Commercial model, have threaded knobs that help you conveniently move the fence in controllable increments.

•**Sears Exact-I-Rip.** This unit is made almost entirely of beefy extruded aluminum components. The rails are light in weight, but stiff and straight. It has a micro-adjuster with the same benefits described for the Vega models.

The hardware and instructions packed with the Exact-I-Rip make it easy to mount to a Sears saw, but mounting it to another brand can be a challenge. This fence performs well, and we see it as a good upgrade for higher-end Craftsman tablesaws.

The Modulus SSF-100 (left) and Powermatic Accu-Fence look like Biesemeyer fences, but they feature significant modifications.

Continued

Rip Fences

Product choices *Continued*

• **Excalibur by Sommerville Design.** Unlike the other fences discussed so far, this fence “floats” along its rails because it rides on wheels both front and back. Finger pressure alone propels the fence left or right. Like the Modulus, the fence grips solidly in the rear as well as the front.

In our tests we found this system somewhat finicky. The rails flex more than any others in our test, so mounting them straight and parallel with each other proved to be a challenge (but it can be done if you have some patience). And, uneven spring pressure on the front wheels prevented the fence from repeatedly setting itself precisely parallel to the blade. We tried a second fence, but ran into the same problem.

• **Shop Fox.** This relatively new entry most resembles the Sommerville Design unit because it locks front and rear and moves on wheels. It rolls along a pair of angle irons as shown. These are considerably more rigid than the

Sommerville Design rails, but they still proved finicky during installation. We found the fit of some of the internal components, as well as the finish of the rails, as well as the finish of the rails, needing some improvement.

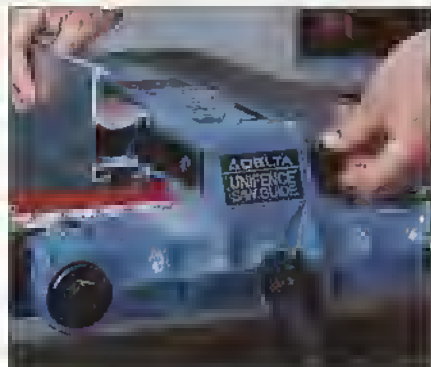
• **Delta.** Like the Sears Exact-I-Rip, the Delta Unifence has a beefy extruded aluminum front rail and fence. And, similar to the Modulus SSF-100, the Delta fence slides forward and back as shown *below right*. But, unlike any of the other tested units, the Unifence can be repositioned for ripping thin stock as shown in the photos.

To complement the time-tested Unifence, Delta recently has come out with a down-scaled version called the Precision Saw Guide. Although it has a less-substantial extruded-aluminum front rail than the Unifence, it performed well in our battery of tests.

• **Paralok.** If you’ve ever used a drafting table with pulleys and cable for controlling the position of its horizontal straightedge, then

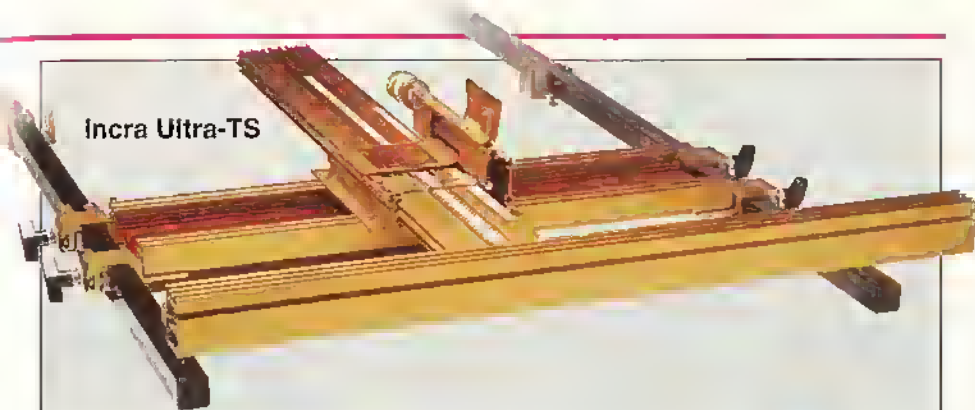
you already have a good idea of how the Paralok works. Although some woodworkers fear the complexity and doubt the durability of the cable system, our tests revealed otherwise. Installation was straightforward and took only about 45 minutes. The Paralok easily outperformed the other fences in our tests of repeatability of parallelism, parallelism over ripping range, and deflection.

• **Voss Technologies.** The Evolution I and its little brother, the Pro Rip, struck us as a cross between the Delta and Vega fences. Like the Deltas, both Voss models have U-channel front rails that capture the fence-locking mechanism on the inside of the channel. But, unlike the rigid aluminum Delta rail, the thinner steel rails of the Voss models had a tendency to flex. Like the Vegas, the Evolution I and Pro Rip have micro-adjust mechanisms.

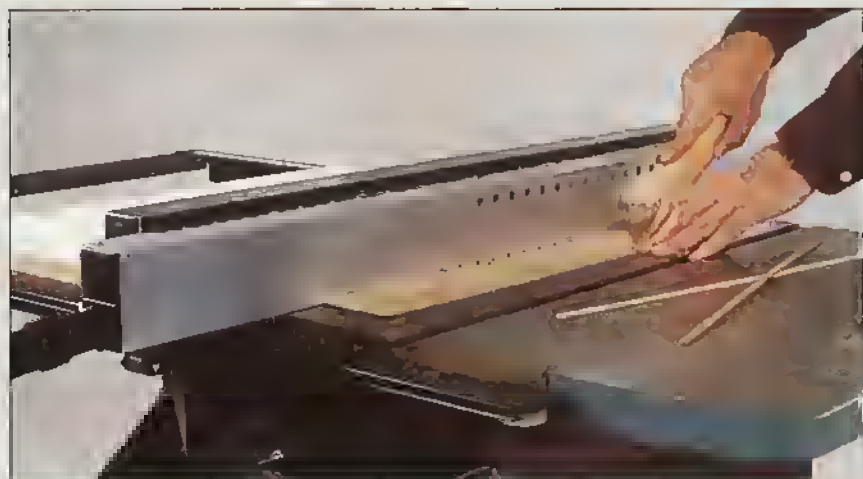


The face on the Delta Unifence slides forward and back as shown above to meet various cutting tasks. And, it can be mounted in a high position (above) or low for cutting thin material (below).





Incra Ultra-TS



The Vac-U-Fence excels at helping you rip thin strips, among other things.

Two products that are completely different

Most of us can get by just fine with one of the fences already mentioned. But if you have specialized needs, the Incra Ultra TS fence or Vac-U-Fence Saw Guide may be what you're looking for.

Like its famous cousin, the Incra Jig, the Ultra TS shown *top* uses plastic saw-tooth racks that automatically locate the fence at exact and repeatable positions (to within .004"). We found the fence ideal for small-scale work that demands incredible precision. But, it isn't rugged enough for ripping large boards or sheet goods. And, in our tests large workpieces caused it to deflect.

The Vac-U-Fence is actually an *attachment* for your existing fence. It uses suction provided by your shop vacuum to hold

workpieces of various thicknesses in contact with its face.

The accessory consists of a section of extruded aluminum with two chambers. Each chamber has different-sized holes so that you can flip the fence depending on the thickness of your workpieces.

It worked well in our tests by holding stock against its face without significant resistance to our feeding pressure. As shown *above*, we found it especially helpful for ripping thin strips. The suction ensured consistently thick strips during the cut, and prevented the strips from flying back at us at the completion of the cut. Its price: \$179 for clear anodized aluminum, or \$195 for colored. Not cheap.

Let's review the charted test results

We performed three key tests that measure *repeatability of parallelism, parallelism over ripping range, and deflection* for each of the tested fences. From these results we assigned performance ratings for the main chart.

•Repeatability of parallelism.

For this test, we set the fences for a 12" rip and adjusted them exactly parallel with the miter gauge slot (which was exactly parallel with the blade). Then, we subjected the fences to some typical shop use, reset them for a 12" rip, and with a dial indicator measured how well they maintained parallelism with the miter gauge slot. We did this several times, ripping various boards and sheet goods.

The Paralok was the champ. It consistently reset itself exactly parallel. The Delta Unifence was nearly as good, consistently resetting itself to within .001" of parallel. For complete results, see the chart on the *next page*.

•Parallelism over ripping range.

Here, again, we adjusted the fence parallel to the blade at a 12" ripping capacity. Then, we moved the fence away from the blade in 12" increments and measured the change in parallelism from the front to the rear of the fence. If the rear of the fence cocked itself toward the blade, this registered as a plus (+) reading on our dial indicator. Fences cocked away from the blade gave us a minus (-) reading.

In our tests, workpieces tended to lift off the tablesaw top anytime the fence was more than .005" out of parallel in the plus direction. At +.015 the stock burned badly and kickback became imminent. Dado-cut quality dropped when the fence was more than .005" out of parallel in either direction.

Rip Fences

• **Deflection.** As you feed a workpiece through a tablesaw blade, the workpiece exerts enough pressure on the fence to make the rear of the fence deflect away from the blade. To test this deflection under actual working conditions, we ripped a sheet of 3/4" plywood and measured the degree of deflection during the cut with a dial indicator. See the chart below right for complete results.

The Excalibur, Paralok, Sears Craftsman, two Modulus fences, and Woodstock International fences—all rear-locking units—earned "excellent" ratings in our main chart right.

The problem with excessive deflection is that when you let up on feed pressure, as inevitably happens unless you use a stock feeder, the fence tends to "spring" back toward the blade. Then, the position of the work-

piece shifts in relation to the blade, and telltale sawmarks (shallow arched notches) appear on the edge when you slow or stop the feed pressure. These marks, as well as chipping on dado cuts, showed up with any of the fences that deflected .005" or more.

Still "on the fence?" Here are our choices

The Paralok fence system stood clearly above the field for its dead-on precision. We were also impressed by the Powermatic Accu-Fence and Delta Unifence.

If you're looking for something a little less expensive, buy a home shop fence. Here, the Delta Precision Saw Guide was tops in our opinion, with the Biesemeyer home shop fence a close second.

PARALLELISM OVER RIPPING RANGE

BRAND	READING IN THOUSANDS OF AN INCH AT 12" RIPPING CAPACITY INCREMENTS		
	24"	36"	48"
Biesemeyer Commercial	-.004	-.008	+.010
Biesemeyer Home Shop	+.006	+.006	
Delta Unifence	-.001	-.002	-.005
Delta Precision Saw Guide	.000	.000	+.003
Excalibur by Somerville Design	+.008	-.011	+.014
General T50 F42	-.004	-.013	-.017
General Home Shop	Not available for testing		
Incra Ultra-TS	-.003		
Jet Xacta Commercial	+.002	+.004	+.013
Jet Xacta Home Shop	+.006	+.008	
Modulus SSF-100	All Modulus fences tested on both Biesemeyer and General rails with results comparable to Biesemeyer and General.		
Modulus SF-100			
Modulus SF-10			
Paralok 27x6'	.000	.000	-.001
Powermatic Accu-Fence	-.003	-.006	-.010
Sears Craftsman Exact-I-Rip	-.005	-.008	
Vega Pro	-.011	-.008	+.005
Vega Utility	+.001		
Vega Commercial	-.001	-.008	-.005
Voss Technology Evolution 1	+.001	-.008	+.005
Voss Technology Pro Rip	-.001	-.008	-.004
Woodstock Int'l Shop Fox	+.002	+.006	

* Reading taken at 30" rip capacity.

DEFLECTION

BRAND	DEFLECTION (IN INCHES)
Biesemeyer Commercial	.006 (6/1000)
Biesemeyer Home Shop	.006
Delta Unifence	.004 (low) / .008 (high)*
Delta Precision Saw Guide	.006 (low) / .010 (high)*
Excalibur by Somerville Design	.0003
General T50 F42	.006
General Home Shop	.006
Incra Ultra-TS	.015
Jet Xacta Commercial	.014
Jet Xacta Home Shop	.009
Modulus SSF-100	.005
Modulus SF-100	.001
Modulus SF-10	.001
Paralok 27x6'	.0005
Powermatic Accu-Fence	.005
Sears Craftsman Exact-I-Rip	.001
Vega Pro	.005
Vega Utility	.008
Vega Commercial	.008
Voss Technology Evolution 1	.010
Voss Technology Pro Rip	.006
Woodstock Int'l Shop Fox	.005

* Readings taken with fence face in high and low positions.

Written by Bill Krier
Product testing: Dave Henderson
Photographs: Wm. Hopkins, John Hetherington

BRAND	MODEL	RIP CAPACITY (INCHES OF RIP CAPACITY)	
		LEFT	RIGHT
BIESEMEYER	COMMERCIAL	12	50
	HOME SHOP	12	40
DELTA	UNIFENCE	8 1/4	52
	PRECISION SAW GUIDE	11	29
EXCALIBUR BY SOMMERVILLE DESIGN	INDUSTRIAL T-SLOT SAW FENCE	12	50
GENERAL	T50 F42	12	52
	HOME SHOP	12	40
INCRA	ULTRA-TS	16	26
JET	XACTA COMMERCIAL	12	50
	XACTA HOME SHOP	12	30
MODULUS	SSF-100 SLIDING SUPER FENCE-COMMERCIAL	12	50
	SF-100 STANDARD SUPER FENCE-COMMERCIAL	12	50
	SF-10 STANDARD SUPER FENCE-HOME SHOP	12	52
PARALOK	27x6'	16	50
POWERMATIC	ACCU-FENCE COMMERCIAL	12	50
	ACCU-FENCE HOME SHOP	12	50
SEARS CRAFTSMAN	EXACT-I-RIP	24	30
VEGA	PRO	10	50
	UTILITY	8	26
	COMMERCIAL	12	30
VOSS TECHNOLOGIES	EVOLUTION I	10	50
	PRO-RIP	10	50
WOODSTOCK INTERNATIONAL	SHOP FOX	8 1/2	25

NOTES:

1. Most models are available in smaller capacities. Also, capacity can be shifted left or right for most models.

2. (AE) Aluminum extrusion
(RS) Round steel
(SA) Steel angle
(SE) Steel edge
(SU) Steel U-channel
(TS) Tubular steel

3. Excellent
Good
Fair
Poor

RIDING THE RAILS WITH TODAY'S RIP FENCES

MAXIMUM RIP CAPACITY (INCHES) AVAILABLE WITH OTHER VERSIONS (1)		FENCE (INCHES)		MATERIALS (2)		REAR LOCK (YES, NO)		MICRO-ADJUSTMENT (YES, NO)		PERFORMANCE (3)								T-SLOTS ON TOP OF FENCE (YES, NO)		STANDARD ACCESSORIES (5)		AVAILABLE ACCESSORIES (5)		COUNTRY OF ASSEMBLY (5)		SELLING PRICE OF TESTED VERSION (6)		COMMENTS
LEFT	RIGHT	LENGTH	HEIGHT	RAIL	FENCE	REAR LOCK (YES, NO)	MICRO-ADJUSTMENT (YES, NO)	INSTRUCTION MANUAL	INSTALLATION EASE	ALIGNMENT EASE	EASE OF SLIDING FENCE LEFT OR RIGHT	EASE OF REMOVING FENCE	REPEATABILITY OF PARALLELISM (4)	PARALLELISM OVER RIPPING RANGE (4)	DEFLECTION (4)	T-SLOTS ON TOP OF FENCE (YES, NO)	STANDARD ACCESSORIES (5)	AVAILABLE ACCESSORIES (5)	COUNTRY OF ASSEMBLY (5)	SELLING PRICE OF TESTED VERSION (6)	COMMENTS							
48	122	42	2 1/2	TS	TS	N	N	E	E	E	G	E	E	F	G	N	AF, LF, OF, SL, XT	U	U	\$350	The original T-square style rip fence. It's still a rugged, precision tool with no major weak points.							
24	52	36	2	TS	TS	N	N	E	E	E	G	E	E	G	G	N	AF, SL, XT	U	U	260	Similar to Biesemeyer Commercial model, but with less-beeey components. Plainly stout for part-time woodworkers.							
8 3/4	96	43	1/2 or 3/4	AE	AE	N	N	E	G	E	G	G	E	E	G	N	SL	CO, ME, XT	U	360	A solid performer with a unique fence that changes from low to high in height, and slides forward and back.							
11	50	32	1/2 or 2 3/4	AE	AE	N	N	E	G	E	G	G	E	E	G	N	SL	XT	U	210	Lighter-duty version of the Unilence with similar advantages.							
LONGER RAILS MADE TO ORDER		45	2 1/2	AE/SF	AE	Y	N	G	F	F	E	E	F	F	E	Y	AF, FS, LF, SL, SP	C	C	325	Although fence glides along rails with ease, and locks solidly, we found installation and repeatability to be a problem.							
48	144	42	2 1/2	TS	TS	N	N	E	E	E	G	E	E	F	G	N	SL, XT	C	C	330	Nearly identical to Biesemeyer home shop model except for tape measure that includes a metric scale.							
24	52	36	2	TS	TS	N	N	NOT AVAILABLE FOR TESTING								N	SL, XT	C	C	295	Nearly identical to Biesemeyer home shop model except for tape measure that includes a metric scale.							
OTHER VERSIONS NOT AVAILABLE		36	2 1/2	TS	AE	N	Y	E	F	G	E	G	E	E	F	Y		U	U	360	Extremely accurate fence for small-scale work, but not rugged or versatile enough for everyday use in a typical shop.							
48	122	42	2 1/2	TS	TS	N	N	G	E	E	G	E	E	F	F	N	AF, LF, SL, XT	U	U	330	Modeled after the Biesemeyer Commercial, but it has thinner-gauge components and fence sides that wear more quickly.							
12	52	36	2	TS	TS	N	N	G	E	E	G	E	E	F	G	N	AF, SL, XT	U	U	260	Similar to Jet Xacta Commercial, but down-sized for the part-time woodworker.							
LONGER RAILS MADE TO ORDER		60	2 1/2	TS	TS/AE	Y	N	G	E	E	G	G	G	G*	G	Y		C	C	420/315	A long fence that slides forward and back, along with rear-lock mechanism, make it ideal for use with sheet goods.							
		41	2 1/2	TS	AE	Y	N	G	E	E	G	G	G	G*	E	Y		C	C	360/240	Similar to SSF-100 above, but has an average-length fence that does not slide forward and back.							
		41	2	TS	AE	Y	N	G	E	E	G	G	G	G*	E	Y		C	C	300/205	Less-beeey version of the SF-100.							
16	78	36 1/2	3 1/2	SA	AE	Y	N	G	E	E	G	G	E	E	N		U	U	350	Our favorite fence because it never went more than .001" out of parallel at any position. Cable system wasn't problematic during installation or operation.								
48	122	42	2 1/2	TS	TS	N	N	G	E	E	G	E	E	G	G	N	SL, XT	U	U	340	Identical to the Biesemeyer Commercial model but has easily replaceable fence sides and three-position front lock.							
12	28	36 1/2	2	TS	TS	N	N	NOT AVAILABLE FOR TESTING								N	SL, XT	U	U	300	Down-sized version of Accu-Fence Commercial.							
OTHER VERSIONS NOT AVAILABLE		36 1/2	3	AE	AE	Y	Y	G	F	F	E	E	E	G	E	Y		C	C	270	Extruded aluminum components are light in weight, but stout, making this a good choice for Sears contractor-style saws.							
10	50	42 1/2	2 1/2	RS	AE	N	Y	G	E	F	G	E	E	G	G	Y	LG, SF, SL, SP	U	U	320	Vega's original fence is still one of the easiest to install. Its performance was about middle-of-the-pack.							
8	50	36 1/2	2 1/2	RS	AE	N	Y	G	E	F	G	E	E	G	G	Y	LG, SF, SL, SP	U	U	220	A smaller version of the Vega Pro intended for the occasional woodworker.							
12	50	41	2 1/2	TS	TS	N	Y	G	E	E	G	E	E	G	G	N	LG, SL	U	U	295	A new, all-steel model for heavy-duty use. Like other Vega models it has a micro-adjustment feature.							
0	60	42	2 3/4	SU	TS	N	Y	F	E	G	G	G	E	F	G	N	AK, CO, LF, OF, SL, TS, XT	U	U	289	A much-improved version of previous models. Easy to install. Has micro-adjustment mechanism and three-position front-locking handle.							
10	50	38	2	SU	TS	N	Y	F	E	G	G	G	G	F	G	N		U	U	259	Down-sized version of the above model.							
8 1/2	50	40	3 1/2	SA	AE	Y	Y	E	G	G	E	F	G	G	E	Y	SL	AK, TJ	T	275	Has locking mechanism similar to Paralok's, and roller system similar to Excalibur's, but rails were too rough for top performance.							

4. See article text for more explanation.

(*) Modulus fences tested on Biesemeyer commercial rails.

5. (AF) Auxiliary fence (AK) Anti-kickback device (CO) Cut-off fence (FS) Flip-up work stops (LG) Laminated cutting guide (LF) Longer fence (ME) Miller-gauge extension (DF) Dilsel fence (SF) Stock lead system (SL) Extension table support legs (SP) Stock pusher (TJ) Tenoning jig (TS) T-slots (XT) Extension table

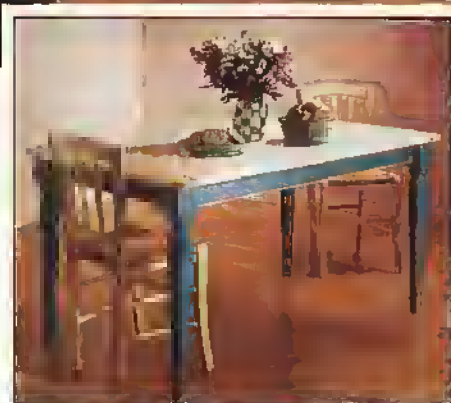
6. (C) Canada (T) Taiwan (U) United States

7. (*) Modulus prices given with/without Biesemeyer-type rails.

WHERE TO CALL FOR MORE INFORMATION:

Biesemeyer 800/782-1831 602/835-9300	Jet 800/274-6842 206/351-6000	Powermatic 800/248-0144 615/473-5551	Vega 217/963-2232
Delta 800/438-2486 412/963-2400	Modulus 800/833-8587 802/865-0569 (US only)	Saars Craftsman Call or visit your local store	Voss Technologies 719/635-2657
General 819/472-1161	Paralok 800/423-9611 503/281-8086	Excalibur by Somerville Design 800/357-4118 906/831-4755	Woodstock International 360/734-3482
Inca 972/243-7943			

COUNTRY BUFFET



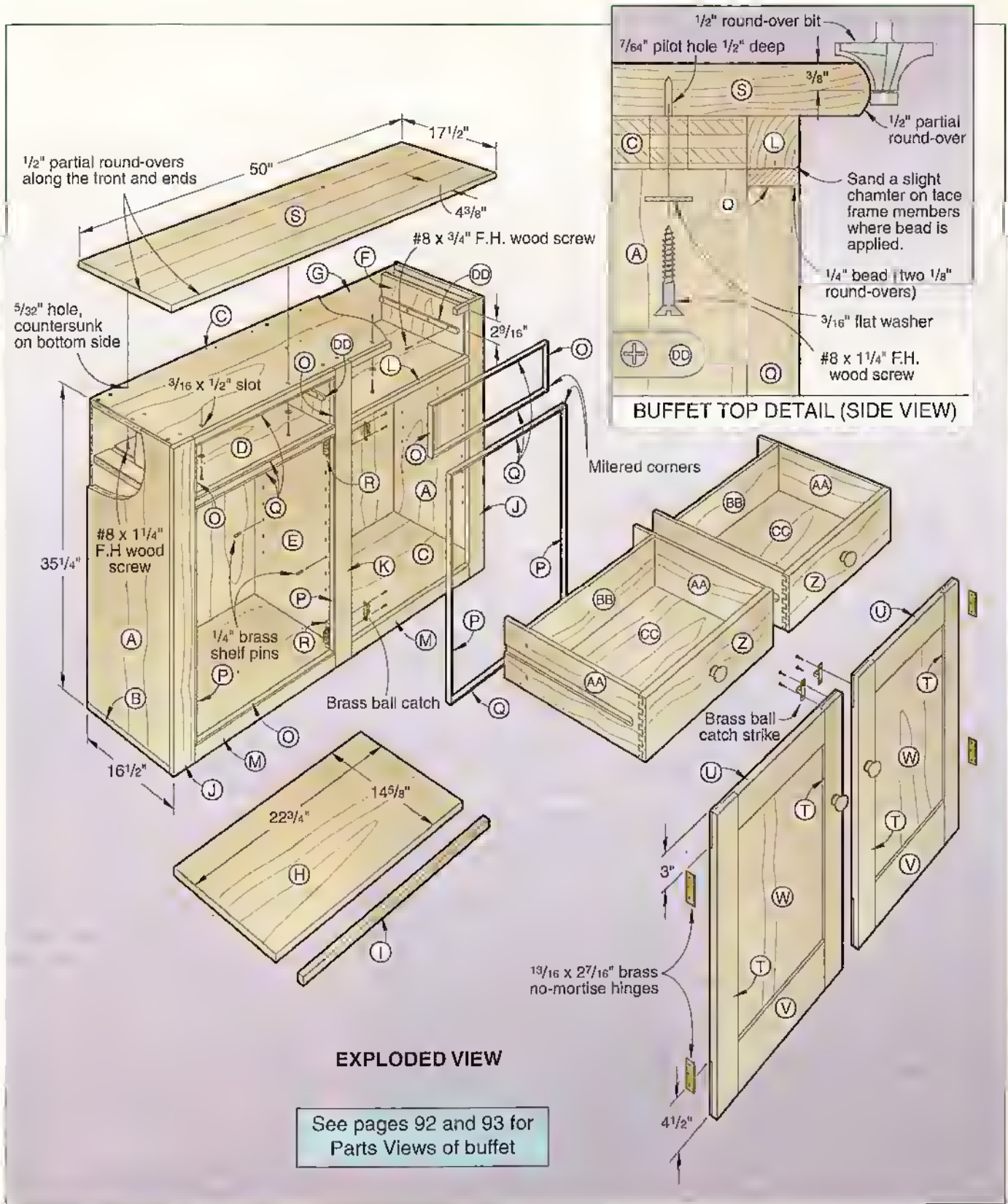
Featured in the August 1996 issue of *WOOD*® magazine, our country-style table features a rock-solid top, turned (or mail-order available) legs, and a terrific paint job for a fine dining experience.



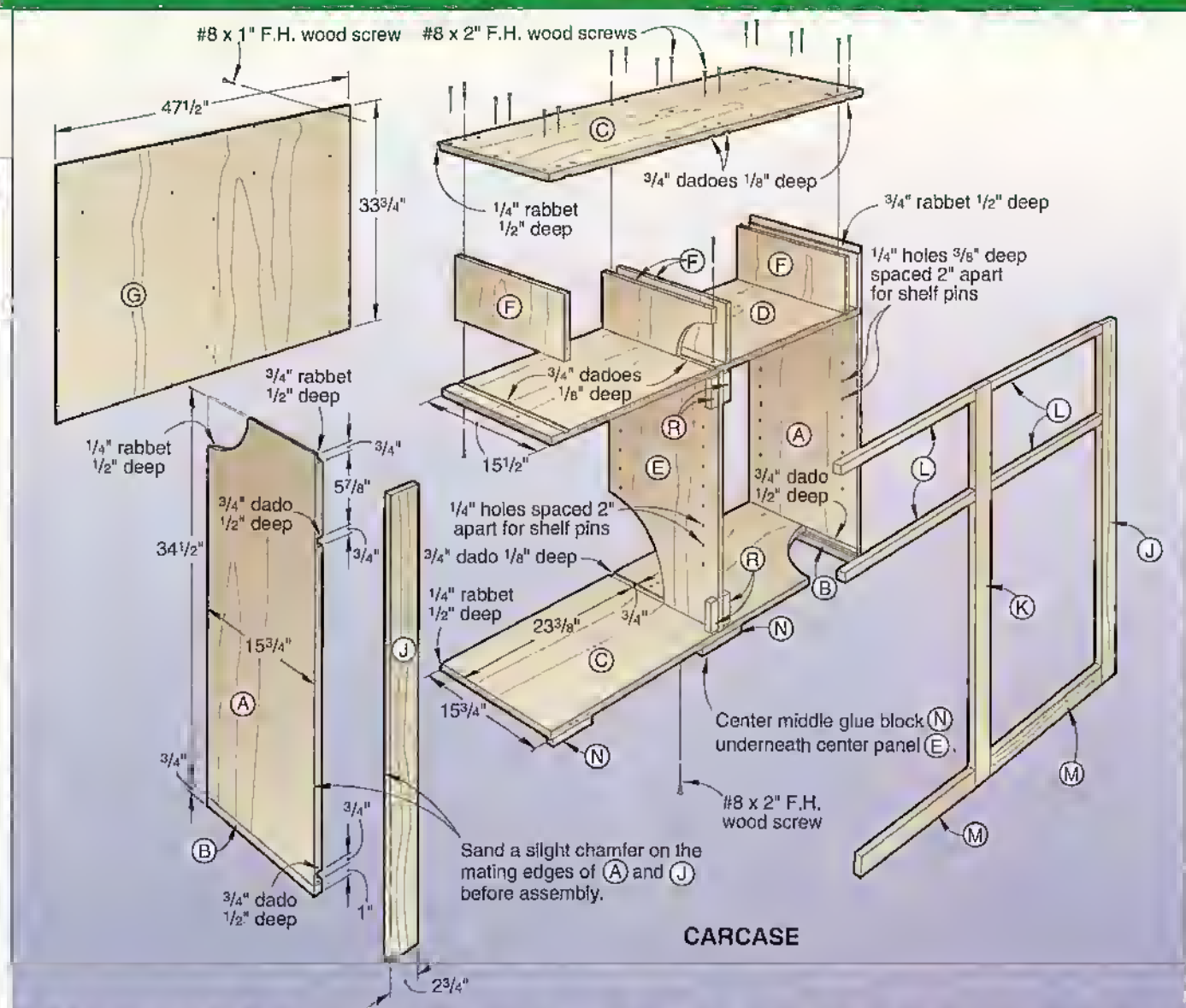
To match our popular country-style kitchen table at far left, we designed this handsome buffet and accompanying cupboard. Here we'll show you how to build the buffet. In the next issue, we'll present the matching cupboard. Keep in mind that these are terrific-looking stand-alone pieces that work equally well as a matching set.

Continued

& CUPBOARD-Part 1



COUNTRY BUFFET & CUPBOARD



Build a carcass to form the basic substructure

1 Cut the carcass sides (A) and bottom banding strips (B) to the sizes listed in the Bill of Materials. Glue and clamp the maple bottom banding to the bottom edge of each plywood side panel where shown on the Carcase drawing. Later, sand the banding flush. (Since the bottom dado is so close to the bottom edge of each side panel, we found it helpful to add the bottom banding now, before cutting the bottom dado.)

2 Install a dado head in your table-saw. Test-cut scrap stock to verify that the width of cut is the exact

thickness of your plywood. Shim the blades if necessary. Then, cut $\frac{1}{2}$ "-deep dados and rabbets in the side panels (A) where dimensioned on the Carcase drawing.

3 Cut the top and bottom panels (C), drawer shelf (D), center panel (E), and kickers (F) to sizes.

4 Mark the dado locations on the upper and lower panels (C) and drawer shelf (D). Note that the upper panel (C) and shelf (D) have four dados where located on the Parts View drawing of the buffet on *pages 92 and 93*, while the lower panel (C) has just one dado where dimensioned on the Carcase drawing. Use the same

dado blade as used in Step 2. Now, lower it $\frac{1}{8}$ " and cut the dados in the panels and shelf.

5 Cut a $\frac{1}{4}$ " rabbet $\frac{1}{2}$ " deep along the back inside edge of the side panels (A) and upper and lower panels (C) where shown on the Carcase drawing.

6 For adding the solid maple top (S) to the carcass later, mark the centerpoint and slot locations on the bottom side of the upper panel (C) where shown on the pattern insert. Drill the holes and form the slots.

7 Glue and clamp the bottom panel (C) and drawer shelf (D) into their respective dados in the

Bill of Materials															
Part	Finished Size			Matl.	Qty.	Part	Finished Size			Matl.	Qty.				
	T	W	L				T	W	L						
CARCASE					DOORS										
A sides	¾"	15¾"	34½"	BP	2	T stiles	¾"	3"	25½"	M	4	3/4 x 48 x 48" Birch plywood			
B bottom banding	¾"	¾"	15¾"	M	2	U upper rails	¾"	3"	19¾"	M	2	3/4 x 48 x 96" Birch plywood			
C panels	¾"	15¾"	47½"	BP	2	V lower rails	¾"	4½"	19¾"	M	2	3/4 x 48 x 96" Birch plywood			
D drawer shelf	¾"	15½"	47½"	BP	1	W panels	¼"	14¼"	18¾"	BP	2	3/4 x 48 x 96" Birch plywood			
E center panel	¾"	15½"	26¾"	BP	1	X vert. stops	¼"	½"	18¾"	M	4	3/4 x 48 x 96" Birch plywood			
F drawer kickers	¾"	15½"	6½"	BP	4	Y horz. stops	¼"	½"	13¾"	M	4	3/4 x 48 x 96" Birch plywood			
G back	¼"	47½"	33¾"	BP	1	DRAWERS					3/4 x 48 x 96" Birch plywood				
H shelves	¾"	14¾"	22¾"	BP	2	Z Irons	¾"	5½"	19¾"	M	2	3/4 x 48 x 96" Birch plywood			
I shelf banding	¾"	¾"	22¾"	M	2	AA sides	½"	5¼"	15¾"	M	4	3/4 x 48 x 96" Birch plywood			
FACE FRAME AND TOP										3/4 x 48 x 96" Birch plywood					
J side stiles	¾"	2¾"	35¼"	M	2	BB backs	½"	4¾"	18¾"	M	2	3/4 x 48 x 96" Birch plywood			
K center stile	¾"	2½"	35¼"	M	1	CC bottoms	¼"	13½"	18¾"	BP	2	3/4 x 48 x 96" Birch plywood			
L upper rails	¾"	¾"	20"	M	4	DD guides	¾"	1½"	14¾"	M	4	3/4 x 48 x 96" Birch plywood			
M bottom rails	¾"	1¾"	20"	M	2	Initially cut parts marked with an " oversized. Trim to finished size according to the instructions.					3/4 x 48 x 96" Birch plywood				
N glue blocks	¾"	¾"	6"	M	3	Materials Key: BP—birch plywood, M—maple, EM—edge-joined maple.					3/4 x 48 x 96" Birch plywood				
BEADING										3/4 x 48 x 96" Birch plywood					
O* upper vert. bead	¼"	¾"	5½"	M	4	Supplies: #8x¾", #8x1", #8x1½", #8x2" flathead wood screws; #17x1" wire brads; 1½x2½" no-mortise brass hinges; 1½x5½" adjustable brass ball catches; 4-1¾"-diameter Shaker knobs; ¼" brass shell pins; paint, clear finish, Minwax Fast-drying polyurethane—gloss and satin finish, Krylon Sandable Primer—#1315 All-Purpose Primer White, Rust-Oleum American Accents Heritage Satin Finish Teal 7929.					3/4 x 9 1/4 x 96" Maple				
P* lower vert. bead	¼"	¾"	26¾"	M	4						3/4 x 9 1/4 x 96" Maple				
Q* horz. bead	¼"	¾"	20"	M	8						3/4 x 9 1/4 x 96" Maple				
R catch blocks	¾"	1½"	3"	M	4						3/4 x 9 1/4 x 96" Maple				
S* top	¾"	17½"	50"	EM	1						3/4 x 5 1/2 x 48" Maple				

sides (A). Take diagonal measurements to check for square, and make sure the front edges are flush. Slide the center panel (E) in place. Drill countersunk holes, and screw the panel in place.

8 Glue and screw the upper panel (C) to the top of the assembly with the drawer kickers (F) in place. Drill mounting holes through the upper panel and through the drawer shelf (D) to secure the mating pieces where shown on the Carcase drawing on the *opposite page* and the Front Section View on page 93.

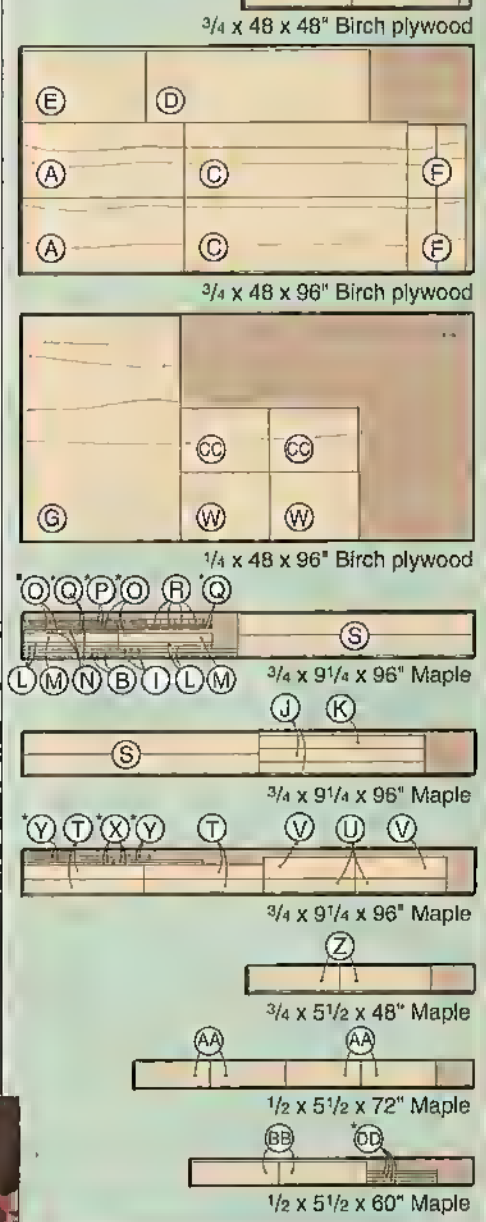
9 Measure the rabbeted opening, and cut the back (G) to size from



Glue and clamp the stiles to the carcase first. Then, measure the distance between the stiles and add the rails.

CUTTING DIAGRAM

*Plane or resaw to thickness listed in the Bill of Materials.



¼" plywood. Set it aside for now, you'll screw it in place later.

10 Cut a pair of shelves (H) to size, and add the banding (I).

The face frame comes next

1 Cut the side stiles (J) and center stile (K) to the sizes listed in the Bill of Materials. Sand a chamfer on the mating edges of the sides (A) and side stiles (J) where shown on the Carcase drawing.

Continued

COUNTRY BUFFET & CUPBOARD

2 Dry-clamp (no glue) the side stiles (J) and center stile (K) to the cabinet, keeping the outside edges of the side stiles flush with the outside surfaces of the sides (A). You'll notice a $\frac{1}{4}$ " reveal along the front edges of the drawer kickers (F). This will cover up when installing the $\frac{1}{4}$ " decorative beading. Trim the stiles if necessary. Now, as shown in the photo on the previous page, glue and clamp the stiles to the carcass.

3 Cut the upper rails (L) and the bottom rails (M) to size. Check their fit between the stiles, and then glue and clamp them to the carcass. The top edges of the bottom rails should be flush with the bottom panel (C).
4 Cut the glue blocks (N), and glue them in place.

Add the decorative beading

1 From the edge of $\frac{3}{4}$ "-thick maple, rip $\frac{1}{4}$ "-wide strips for the beading (O, P, Q) to size plus 2" in length.
2 Install a $\frac{1}{8}$ " round-over bit into your table-mounted router, and position the router-table fence flush with the edge of the pilot bearing. Then, rout the front edges of each strip, using a feather board for safety and to ensure consistent round-overs.
3 Sand a slight chamfer along the front edges of the face frame members that will receive the beading (O, P, Q). Miter-cut the beading strips to length, and glue and clamp them to the face frame where

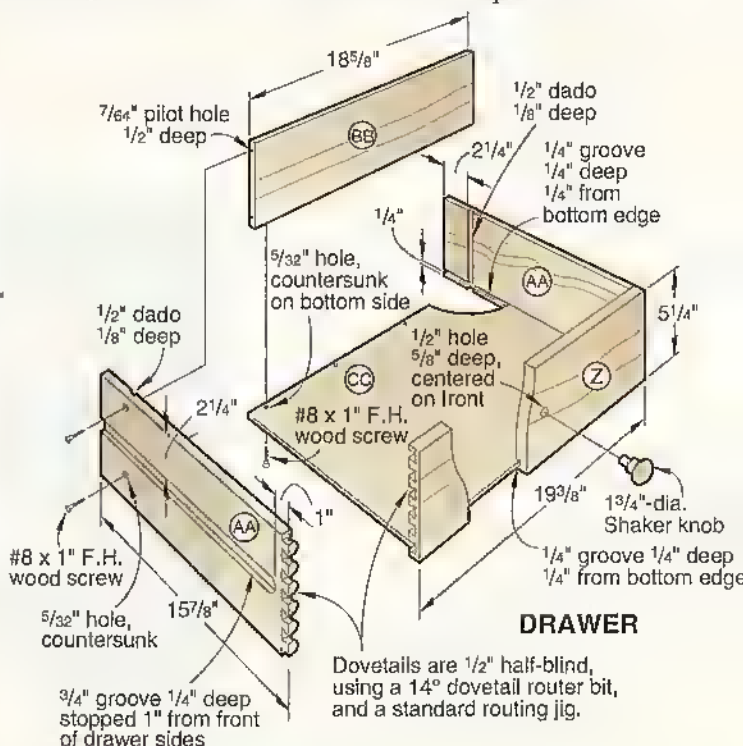
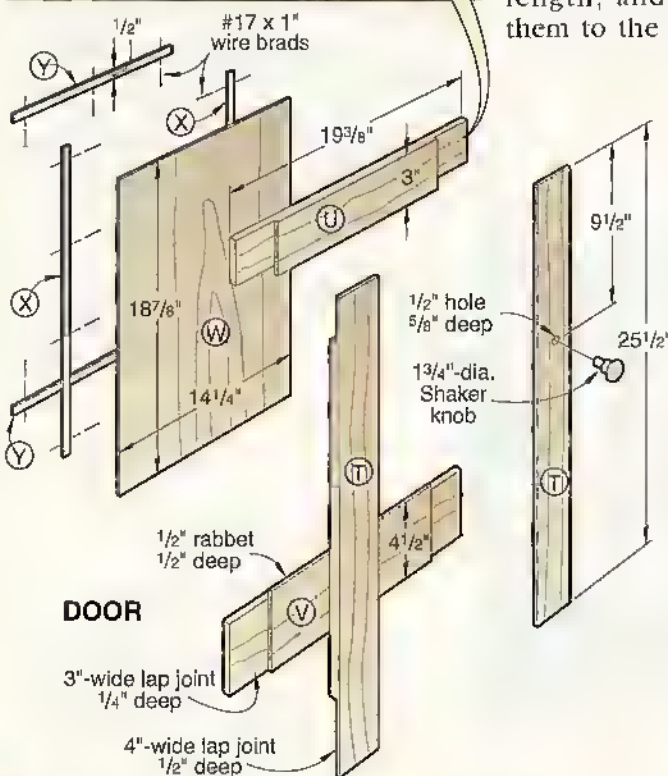
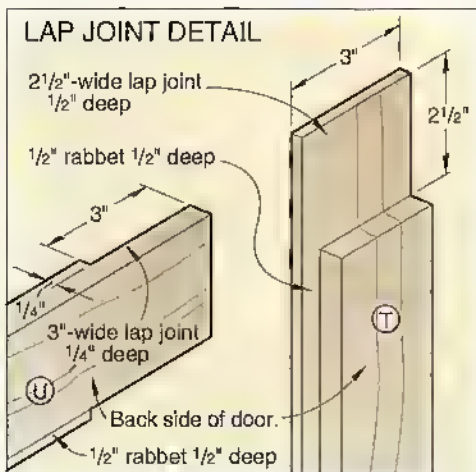
shown on the Exploded View drawing. The inside faces of the upper vertical beading (O) should be flush with the inside surfaces of the drawer kickers (F).

4 Cut the ball-catch blocks (R) to size, and glue them in place on the back side of the center stile (K) and surface of (E) where shown on the Carcase drawing.

5 Glue and clamp-up enough stock to form an oversized blank for the solid-maple top (S). Later, trim the top to finished size, and joint the front edge.

6 Rout partial round-overs along the front and ends (not the back) of the top (S), using the Buffet Top detail for reference.

7 Position the top (S) on the carcass, centered side-to-side and with the back edges flush. Clamp it in place. Using the holes and slots in the upper panel (C) as guides, mark the locations, and drill pilot holes into the bottom surface of the top. Secure the top to the carcass with flathead wood screws and flat washers. The slots allow for wood expansion.



Machine a pair of frame and panel doors

1 Cut the door stiles (T), upper rails (U), and lower rails (V) to size, and lay out the parts to form the two doors.

2 Mark the front face and inside edge of each stile and rail. Then, cut $\frac{1}{2}$ " rabbets $\frac{1}{2}$ " deep along the inside back edge of each piece.

3 Cut mating lap joints across the ends of the stiles and rails to the sizes noted on the Door drawing and accompanying detail.

4 Glue and clamp the stiles and rails together for each door.

5 Mark the knob-hole centerpoint on each door. Measure the diameter of the tenon on your Shaker knob (they can vary in size), and drill the mounting hole.

6 Measure the rabbeted opening, and cut the $\frac{1}{4}$ " birch plywood panels (W) to size minus $\frac{1}{8}$ " in each direction.

7 Cut the stops (X, Y) to size. Drill pilot holes through the stops and temporarily install the stops and panels to check the fit. Remove them; you'll finish the panels before nailing them in place.

8 Install the doors using the no-mortise hinges. See the Exploded View drawing for hinge locations. Install the catches.

Construct a pair of drawers for handy storage

1 Cut the drawer fronts (Z) to size. Set aside a piece of stock the same thickness and width as the drawer fronts to use when setting up the router dovetail jig later.

2 Cut the drawer sides (AA), backs (BB), and bottoms (CC) to size. Set aside a piece of stock the same thickness and width as the sides and front for cutting and testing the dovetail joints.

3 Rout dovetails on the extra pieces cut in the previous steps. Verify the dovetail jig settings, and rout dovetails on the mating ends of the fronts (Z) and sides (AA).

See our dovetail jig article on *page 24* for more information on using these handy jigs.

4 Cut the dadoes and grooves in the drawer parts where dimensioned on the Drawer drawing. Then, drill a mounting hole in each drawer front for attaching the Shaker knobs later.

5 Rout a $\frac{3}{8}$ " stopped groove in the outside face of each drawer side for mating with the drawer guides (DD) later.

6 Glue and clamp each drawer together, measuring diagonally to check for square. Drill counter-sunk mounting holes through the drawer sides (AA) and into the ends of the back (BB) where shown on the Drawer drawing. Screw the back in place. Drill holes through the bottom (CC) and into the bottom edge of the back (BB), and secure it in place.

7 Cut the drawer guides (DD) to size, forming a $\frac{3}{8}$ " radius on the front end of each. Mark the centerpoints, and drill four counter-sunk holes through each.

8 To accurately locate the drawer guides (DD), cut the two 2"-wide spacers to the size shown on the Drawer Guide Template drawing on *page 93*. Now, using the photo below for reference, use the spacers to hold the guides in place



Use a pair of spacers to accurately position the guides. Then, drill mating holes in the kickers for attaching the guides.

while you drill the holes and drive the screws. Repeat for each drawer guide.

Finishing and final assembly

1 Cut the Shelf-Hole Template shown on the *WOOD PATTERNS*® insert in the center of the magazine. Drill the $\frac{1}{4}$ " holes where dimensioned. Then, use the template to drill the shelf-pin holes in the carcass.

2 Remove the top, doors, hinges, and catches. If not already removed, remove the panels from the doors. Sand everything to 220-grit. (We sanded the knobs by chucking them into a drill press.)

3 Apply a clear finish to the inside of the carcass and face frame (just to the sanded chamfer at the joint between the stile and side panel). Add finish to the top (both surfaces), the back, the door frames and stops, the drawers, and all the knobs. (We used Minwax Fast-Drying Gloss Polyurethane for the first coat, and sanded it with 220-grit sandpaper after it had dried. Over this, we applied two coats of satin polyurethane.) Do not get the finish into the knob holes or on the knob tenons.

4 Mask off the face frame stiles, and prime the carcass sides and the door panels (we used Krylon Sandable Primer, #1315 Primer White). Sand lightly with 320-grit sandpaper after the primer has dried. Paint the primed areas (we used Rust-Oleum American Accents Heritage Satin Finish Teal 7929). Let the paint dry, and remove the masking.

5 Glue the knobs into the doors and drawers. Screw the top and back in place. Install the panels in the doors and fasten the stop in place with #17x1" wire brads. Mount the hinges on the doors and reinstall the doors in the carcass. Reinstall the catches. Wax the drawer guides, and slide the drawers in place. ♣

WIRING YOUR

For a safe, smooth-running home woodworking shop, start by providing a suitable electrical supply.

Whether your woodworking shop is a corner of the garage, the basement, an old storage room, or a separate building out back, adequate and safe wiring is a necessity. So if you are considering a new shop or reworking the old, here are some helpful guidelines.

Note: Reference for this article was the current National Electrical Code. Before beginning any job, consult local codes at your city building inspector's office. And unless you have wiring experience, get the advice and services of a qualified electrician.

Is your present electrical service adequate?

The electricity your local energy company supplies is distributed throughout your residence from a service panel located in your basement or other utility area. If you live in a house 30 or more years old with the original wiring, you may have only a 60-amp service panel. With such little capacity, you probably won't be able to run more wires to power your shop.

Newer homes—and electrically updated remodeled ones—have 100- or even 200-amp service. With such large capacity service panels, there may be unused circuits available for your shop. Or, if all circuits appear to be in use, it's often possible to split an existing circuit or two to satisfy minimum requirements.

Depending on your needs (the number of large stationary power tools in your shop and the shop's distance from the main service

panel), you may want to add a subpanel to handle the load. For this kind of job, you should seek an electrician's advice.

How much electricity will it take to power your shop?

Although most portable power tools operate well with 15-amp circuits, you may want to build in some overload insurance with 20-amp circuits. The cost difference is negligible, and the higher capacity lowers your chances of popping a circuit breaker. Two such circuits (plus one for lighting) are adequate for most home shops, since all the tools won't be running at the same time.

If you suspect you'll need more than that, read the owner's manuals that came with your tools, or check the tools' labels to see what amperage they draw. You'll need this information, called load, to plan the size and number of circuits in your shop. For example, if one of your tools requires 20 amps, a 15-amp circuit won't do. (The chart below lists approxi-

mate amperage ratings for tools of different horsepower.) Also, if two large tools normally run at the same time, such as a tablesaw and jointer, they shouldn't be on the same branch circuit. And, if one of your tools requires 220 volts, it needs a separate circuit.

Always put lighting on a separate circuit

To avoid blackouts, don't combine circuits that serve power tools with those that provide electricity for lighting. One 15-amp circuit probably will handle the entire lighting job.

But just in case, here's how to calculate your lighting needs. Each square foot of shop space should get three watts of light. So if your shop measures 20x20', you have 400 square feet times three, or 1,200 watts. Divide 1,200 watts by 115 volts (actual performance) and you get 10.43 amps.

If you feel that you need more light, add up all the wattages (bulbs and fluorescents) you need or want. Then, divide that number by 115 volts to arrive at the number of amps drawn if all fixtures were on. Don't plan on exceeding 80 percent capacity of the circuit's rating, though. That is, for a 15-amp circuit you wouldn't want to exceed a 12-amp demand for your lighting.

Use wire large enough to do the job

Always use grounded wire, with one black insulated wire (the "hot" wire), one white insulated wire (the "neutral" wire), and a bare wire (the "ground"). For dry areas, run type NM wire. In damp locations, use type NMC.

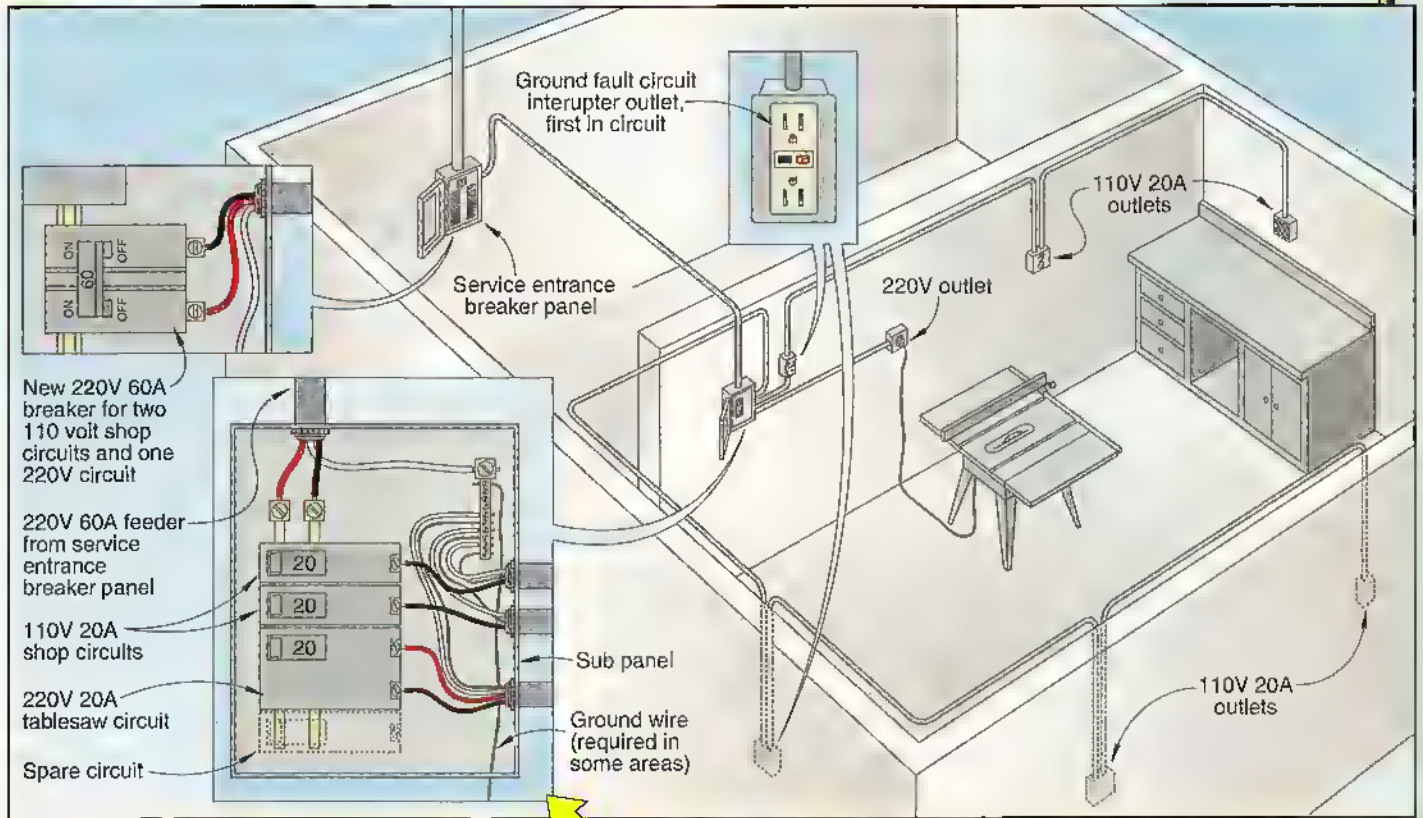
The wire gauge (diameter—the smaller the number, the larger the

POWER TOOL AMPERAGE		
HP	VOLTS	AMPS
¼	110	4.4-6.3
⅓	110	5-7.2
½	110	7-9.8
¾	110	11.5
1	110	13-15
1.5	110	16-19
2	110	19-23

For 220-volt motors, figure half the 110-volt amperage rating.)

SHOP

What you need to know to power up properly



Typical wiring for the home woodworking shop

The 60-amp home workshop above features a lockable subpanel, two 20-amp circuits for portable power tools with a ground fault circuit interrupter (GFCI), and a separate 20-amp, 220V saw circuit. All wires are enclosed in conduit.

wire) you use will be determined by the distance from the service panel to the outlet as well as the circuit amperage. For example, a 15-amp circuit utilizing 14-gauge wire can safely reach 30 feet. By using 12-gauge wire, you could go to an outlet 47 feet away from the panel.

In many cities, all wiring must be enclosed in metal, thin-wall conduit. Check what your local building code requires. Usually, though, the rule of thumb is if your wiring isn't enclosed in a wall, it must run in conduit. Generally, you should install conduit anywhere wiring can be seen, felt, touched, inadvertently

reached, or could come in contact with moisture.

The conduit itself must be grounded. Metal outlet boxes and connectors make the grounding simpler. Don't use plastic boxes because they don't conduct electricity. Also, you'll need to reevaluate wire size with conduit, since it reduces amperage capacity as much as 20 percent.

Grounded outlets protect you and your tools

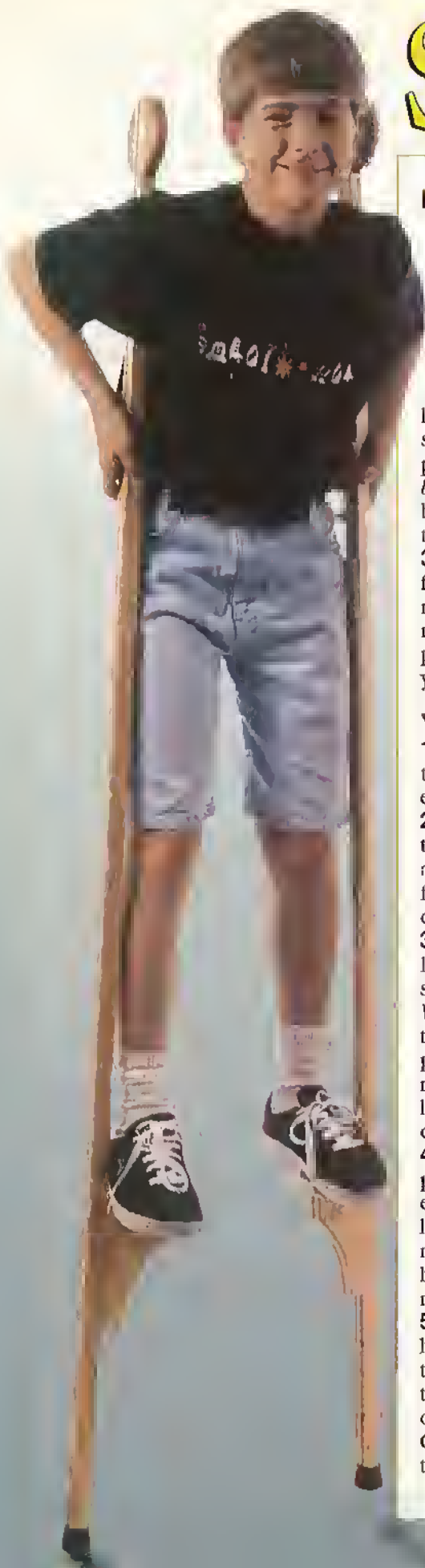
A GFCI, short for Ground Fault Circuit Interrupter, is a device installed either as a breaker in the service panel or as a receptacle in the outlet box that senses electri-

cal leakage in the ground circuit. If there's a leak, GFCIs shut off voltage instantly. They prevent electrocutions that happen when a person working with a portable power tool becomes the electricity's path to the ground. GFCIs also protect electrical motors from power surges.

Numerous building code sections specify the use of GFCIs—those pertaining to bathrooms, basements, kitchens, outdoor outlets, and more. Basically, if your shop is in a garage or unfinished basement, you must use GFCI protection. If you're not sure you should, use a GFCI anyway. It only costs a few dollars extra. ♣

Written by Peter J. Stephano with Mike Gilliland, PE, CSP Illustration: Kim Dowling

Stupendous



Laminate the blanks

1 Cut two $\frac{3}{8} \times 2\frac{1}{2} \times 73$ " ash strips and one piece of mahogany $\frac{1}{4} \times 2\frac{1}{2} \times 73$ ". These three strips will be laminated into the blank for the two stilt legs (A).

2 Glue the strips together for the lamination, sandwiching the mahogany between the two ash layers. Clamp, using plywood strips to spread the pressure and protect the ash faces, as shown *below right*. Place waxed paper between the bottom plywood and the lamination to prevent sticking.

3 Construct another blank for the foot pegs (B). For this one, laminate a $\frac{1}{4} \times 4 \times 14$ " piece of mahogany between two $\frac{3}{8} \times 4 \times 14$ " pieces of ash. Glue and clamp as you did the leg blank.

You need legs to stand on

1 After the glue dries, unclamp the two blanks. Joint one edge of each lamination.

2 Rip the leg blank (the long one) to the maximum possible width, and trim the ends to 72". Rip the foot peg blank to $3\frac{1}{2}$ " wide, and cut two 6" lengths from it.

3 On one edge of the leg blank, lay out the foot peg holes where shown on the Leg drawing in the *WOOD PATTERNS*® insert. Center the holes on the edge, which places them in the middle of the mahogany strip. Draw another line across the edge 1" above the center of the uppermost hole.

4 Chuck a $\frac{1}{4}$ " drill bit in your drill press, and center the bit on the edge of the blank. Drill the five holes through the blank where marked. Countersink the holes on both edges for $\frac{1}{4}$ " flathead machine screws.

5 Place the edge of a foot peg blank against the marked edge of the leg blank. Align the top end of the foot peg blank with the line on the leg blank above the holes. Clamp it in place, and mark the top. Then using a hand drill with a $\frac{1}{4}$ " bit, mark the hole loca-

tions on the foot peg blank as shown *opposite page top*. Repeat for the other foot peg.

6 Set your tablesaw's rip fence 1" from the blade. Rip two legs from the blank, sawing so that an edge with countersunk holes rides against the fence each time.

7 Set up your table-mounted router with a $\frac{3}{8}$ " round-over bit, and position the table fence flush with the bit's pilot bearing. Clamp a stopblock to the fence, then rout a $2\frac{1}{2}$ "-long round-over along each corner on the lower end of each leg.

The footsteps follow

1 Determine the hole size required for the $\frac{1}{4}$ " threaded inserts you're using. (Ours called for $\frac{3}{8}$ " holes.) Chuck a bit of the proper size in your drill press, and drill the holes in each foot peg blank where marked. Drill the holes $\frac{3}{8}$ " deep to keep the foot peg screws from bottoming in the holes before they're tight.

2 Stick the two blanks together with double-faced tape, aligning the edges and ensuring that both tops point the same way. Lay out the foot peg profile on the top piece, referring to the Foot Peg drawing. Bandsaw the curve slightly outside the line, then sand down to it with a drum sander. Separate the parts.



Strips of plywood help spread clamp pressure along the lamination and protect the surface from clamp marks. Put on crosswise clamps (the orange ones) first to keep the edges of the lamination aligned while tightening the clamps.

Stilts

Walking tall made easy

3 Open your compass to a 2" radius, and draw two 4"-diameter circles on 3/4" ash for the footsteps (C). Draw a line across the center of each circle perpendicular to the grain direction. Cut out the footsteps, and sand.

4 Using one of the footsteps as a pattern, draw two circles on 3/4" mahogany. From these, bandsaw four 1 1/2"-wide arcs for the disc segments (D) at the leg tops. To lay out the segments' straight sides, draw a line across the center of the circle, then draw parallel lines 1/2" on each side of it.

5 Fit your table-mounted router with a 45° chamfer bit, and adjust it to cut a 1/8" chamfer. Chamfer the legs, foot pegs, footsteps, and disc segments where indicated on the Exploded View and Parts View drawings. Stop the chamfers 2" above the uppermost hole on the inside face of each leg. When routing the small parts, push them over the bit with a foam-faced jointer pushblock.

6 Sand a flat 1/8" deep (the depth of the chamfer) on the inside edge of each footstep (C), perpendicular to the line. Drill counterbores and screw holes where shown.

Put the parts together

1 Install threaded inserts in the foot pegs (B). Coat the holes with five-minute epoxy before driving in the inserts. To drive in an insert, put two nuts on a 1/4" bolt about 2" long, then screw the insert onto the bolt. Jam the first nut against the insert and the other against the first nut. Then, screw in the insert, using a ratchet and socket. Hold the foot peg in a vise to prevent splitting.

2 Assemble the stilt steps by attaching the footsteps (C) to the foot pegs (B). To do so, place the foot peg on your bench, back edge down. Center the footstep, flat side down, at the peg top. Guiding through the holes in the footstep, drill pilot holes in the



Mark the hole locations on the foot peg blanks by drilling through the holes in the leg blank.

foot peg. Fasten the footstep to the foot peg with #8x1 1/2" flathead wood screws and glue. Plug the counterbores, and sand flush.

3 Glue the disc segments (D) flush with the leg tops where shown. They glue to the solid ash faces, not the laminated edges.

4 Finish-sand all parts with sandpaper from 100- to 220-grit. Apply two coats of satin exterior polyurethane, sanding with fine abrasive between coats.

5 Install a 1" rubber tip on the bottom of each leg. Cut two 3 3/4" circles from 4"-wide 3M nonskid tape, and apply one to each footstep. (We bought the tips and tape at a hardware store.)

6 Fasten the steps to the legs with 1/4-20x1 1/2" flathead brass machine screws. Start at the lowest setting, then move the steps up as your stilt-walker gains competence.

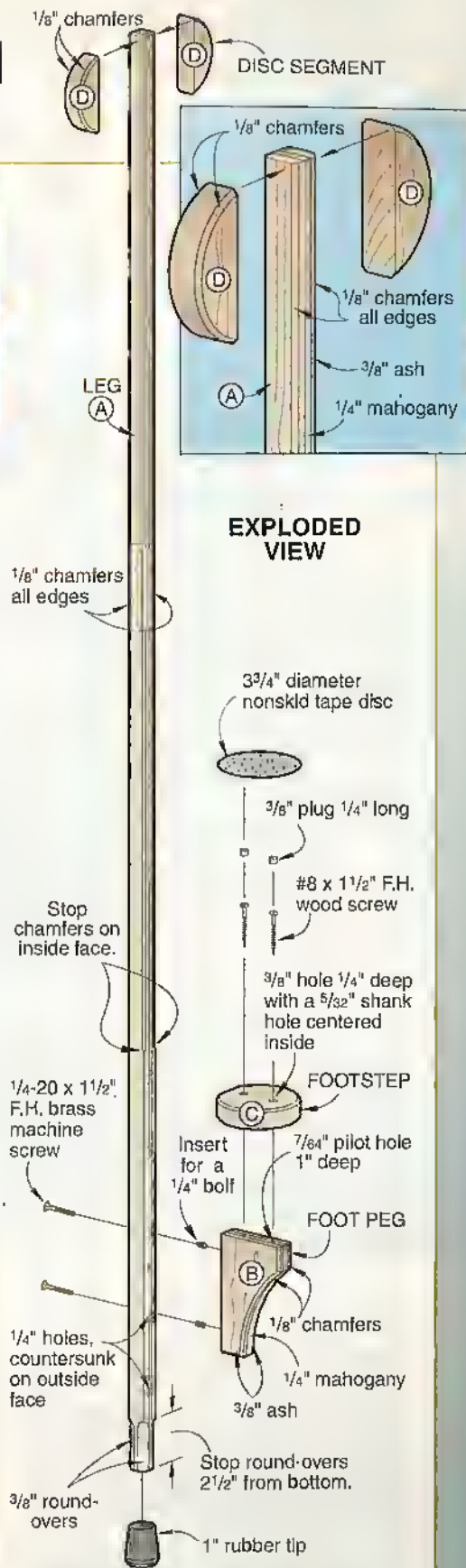
Project Design: Jan Hale Svec
Photographs: King Au
Illustrations: Roxanne LeMolne; Lorna Johnson

Bill of Materials					
Part	Finished Size			Matl.	Qty.
	T	W	L		
A' legs	1"	1"	72"	LAM	2
B' foot pegs	1"	3 1/2"	6"	LAM	2
C footsteps	3/4"	4" dia.		A	2
D disc segments	3/4"	1 1/2"	3 3/4"	M	4

*Make these parts oversized initially, then cut to finished size following the how-to instructions.

Materials Key: LAM-laminated ash and mahogany; A-ash; M-mahogany

Supplies: 1/4-20x1 1/2" flathead brass machine screws, 1/4-20 brass threaded inserts, #8x1 1/2" flathead wood screws, 3/8" wooden plugs, 1" rubber tips, 4"-wide nonskid tape, woodworker's glue, five-minute epoxy, satin polyurethane finish.



SEE THE WOOD PATTERNS®
INSERT FOR PARTS VIEW

SALVAGE



Removing metal is a time-consuming aspect of wood salvage. Jon Hoffman displays a sampling of what he has found on and in old timbers. *Inset.* Remarkably, this horseshoe imbedded in a beam was bypassed in its original sawing 100 years ago.

Reclaiming lumber from century-old buildings and the bottoms of waterways is backbreaking work. But it has its rewards in premium longleaf pine, Douglas fir, white pine, and fine-grained, old-growth hardwoods as well.

Jon Hoffman gets easily excited when he talks about reclaimed lumber. "That's the neat thing about this work. You can dig out

the nastiest-looking old beams, but once you saw into them, it's 'WOW! Look at that wood!' That's some satisfaction. And to think, for years most of these great old timbers went into local landfills."

With just three years' experience in the wood-reclamation business, Jon, 38, calls his Joliet, Illinois, company "the new kid on the block." Nevertheless, the J.M. Hoffman Lumber Company, "Purveyors of Premium Reclaimed Lumber," has earned a first-class

reputation in the Midwest as a source for old-growth longleaf (called "heart") pine, Douglas fir, and white pine, as well as hardwoods such as white and red oak, walnut, and chestnut.

Jon reclaims these and other species from 19th-century buildings slated for demolition: warehouses, stores, factories, granaries, barns, and even water storage tanks. His secondary source is sunken wood—whole logs of yellow ("red") birch, hemlock,

The New Way to Log Old-Growth Timber

cypress, heart pine, and white pine—recovered from the bottoms of lakes and inland waterways that before the turn of the century were the principal “highways” for travel to the sawmills.

Wood that you can hardly find anymore

The hard, yet attractive boards from the heartwood of longleaf pine that were used extensively for floors, staircases, and millwork in the most elegant Southern mansions have long been history. The Southern pine you see today comes from second- and third-growth plantation trees that rarely grow to 18" diameter before they're harvested.

The same is true for clear, straight-grained white pine that came from big trees in the vast stands that once covered the Upper Midwest. Now we make do with smaller, knottier stock.

And restricted logging in the old-growth Douglas fir forests of the Pacific Northwest has meant limited availability of this slow-grown wood that's as strong as it is goodlooking. These are the reasons Jon is in the wood-reclamation business.

“What I sell costs more than the lumber normally available,” says Jon. “First, there's time-consuming preparation work, such as cleaning and metal detection. Then there's the waste factor—at least 50 percent in remilling salvaged wood, with the cracks and everything. So right there the price of the raw material doubles. But there's nowhere else to buy it. It's the only available stock of that quality, and when it's gone, it's gone.”

How much would Jon's stock, made from salvaged timbers, cost

you? “In this business, there isn't a standard grading system,” he says. “We basically offer three grades in flooring: rustic, select plain-sawn, and quarter-sawn, all sold by the square foot, surface measure. They're appearance grades, and the boards are mostly 4/4 (1") thickness. Heart pine, for instance, our most popular wood,



Before salvaged wood is sawn, workers must go over it thoroughly with a metal detector to find nails, bolts, and other objects that would damage an expensive blade during remilling.

sells for \$5.60 a square foot in random widths of plain-sawn, the middle grade. Quarter-sawn stock would be in the \$7 range.”

But depending on the wood species—and where the building was located—Jon's prices can

Flooring products made from reclaimed timbers and beams of heart pine include, from left, rustic tongue-and-groove, select plainsawn, and select quartersawn.

vary. “I can't beat West Coast reclamation prices for Douglas fir because there is lots of it out there. On heart pine and white pine, I can be more competitive,” Jon notes.

Jon's company, although it does sell boards—and dressed timbers for beams—primarily markets heart pine remilled and profiled as tongue-and-groove flooring to high-end commercial and residential construction. Historic restorations have their place, too. “Last summer, we supplied Douglas fir flooring for a restoration project in St. Louis,” says Jon. “They specified that the new porch wood match the original, which was all clear, vertical-grain Douglas fir. We ran that job and also supplied them with antique white oak beams.”

Salvaging stock from the demolition forest

Most of Jon's timber comes from the demolition of buildings throughout the Midwest. For sunken river and lake logs, he contracts with divers from Wisconsin and Michigan to Alabama and Mississippi.

“At first, I geared up to do the demolition. I had a front-end loader, a truck with a flatbed trailer—the whole works,” recalls Jon. “My first demo job was a 40-60' radius water tank on the ground in Bettendorf, Iowa. It was all

Continued

SALVAGE

clear-heart, vertical grain redwood. I moved a lot of that stock to sign makers. But I soon learned that I couldn't do it all. So now I buy from demolition people or subcontract the work."

Jon's involvement with reclaiming wood normally begins with assessing a building to be razed. "I never buy a building sight unseen," he says. "I go to the job site and look it over. With a chainsaw, I'll cut out some wood from beams at different places—a random sampling. In barns, I look for signs of powder post beetles. In industrial buildings, it'll be water damage, or deep stains from chemicals or oil. Next, I check for tight-grained lumber, which indicates old-growth. Wood with wider growth rings is okay for resale as timbers, but not resawing and milling."

After he has given the building a good onceover, Jon can offer the owner or the demolition contractor a "ball park" price for what salvable wood might be in it. "But only when the wood is on the ground can I give them a final price because they lose a lot in the removal," he says. "Our people have to come in and sort it, band it, stack it, and have it ready to go on the truck. Demo contractors won't assume that cost. Five or so years ago, they were paying to have this stuff hauled to the landfill. Now, they think they're sitting on gold."

What type of wood does a typical industrial building yield? "Around here, first would be heart pine, then Douglas fir, although I just bid on a big six-story structure in Milwaukee that is all white pine. That's pretty unusual. And the wood in industrial buildings is good sized: 8x10", 8x12", 9x13", 10x12", 10x15", 15x20".

Barns and other farm buildings often hold surprises. "Recently, I talked with a guy out in western Illinois who has a 100-year-old



Above. Not many years ago, beams such as this 10x15" of old-growth heart pine from a razed building were wasted in local landfills.

Right. Jon mills heart pine and Douglas fir into heavy-duty, high-end flooring.



barn made from walnut," says Jon. "But back then they built from what was on hand. That's where you get buildings with walnut, chestnut, white pine, locust, and other unique hardwoods."

At this writing, Jon was preparing a bid to salvage the now closed Joliet Army Ammunition Depot. "The buildings I'm interested in are all Douglas fir," he says. "And there are between 2,000 and 3,000 white cedar telephone poles. Boat builders would be interested in that wood." ♣

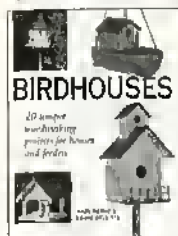
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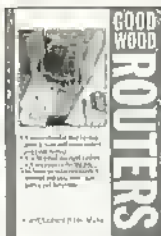
Written by Peter J. Stephano
Photographs: John L. Schultz

Editor's note: As landfill fees go up and environmental awareness increases, wood salvage and reclamation businesses are springing up around the nation, offering unique and usually hard-to-find old-growth wood species, sometimes "as is." For a business near you, check the Yellow Pages under "demolition contractors" or "salvage." Your state's environmental quality agency or department of natural resources also should be able to steer you to a source.

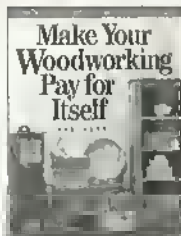
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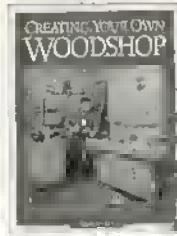


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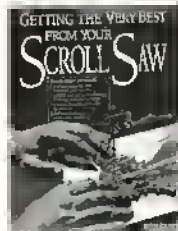


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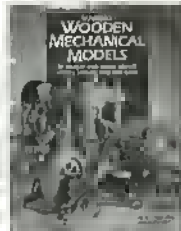
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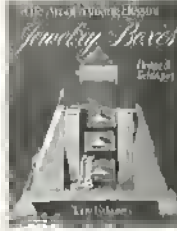
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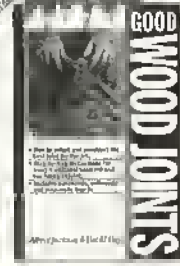
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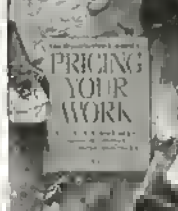
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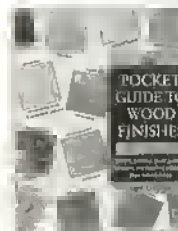
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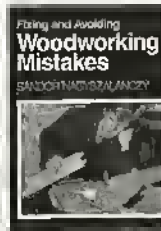
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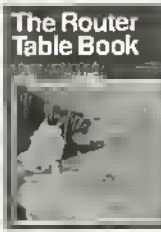
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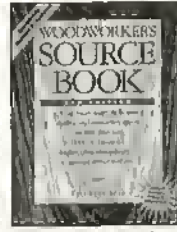
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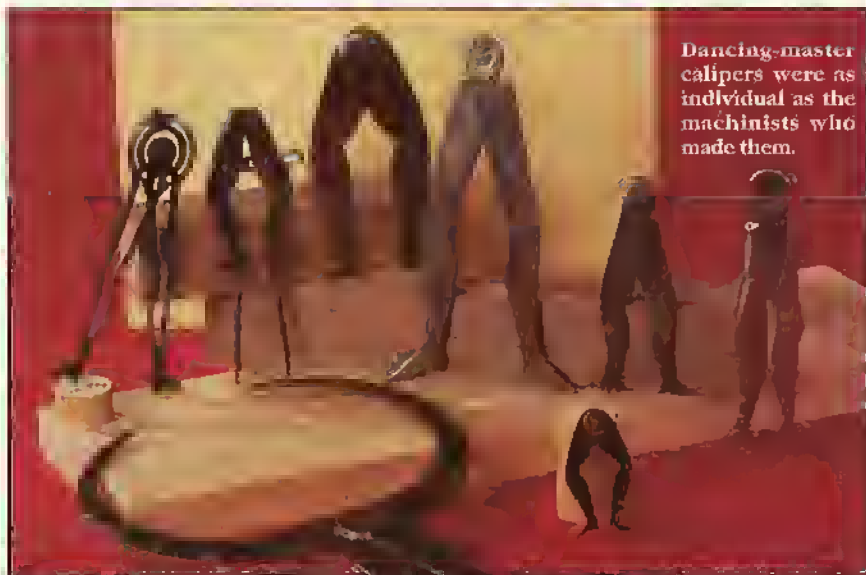
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We may never know why machinists began making these unique calipers either, but tool collector John Gillis of Yucaipa, California, has some ideas. "Maybe machinists were just trying to express their artistic side," he suggests. "During the Victorian period [1837-1901], many wood-working machines and tools were elaborate in design—almost works of art. The [dancing-master] calipers of that period tend to be voluptuous," he says.

Yet many of these calipers predate the Victorian era and its emphasis on the beauty of tools

and machines. That makes John suspect that the craftsmen's motives may have been slightly raffish, that the calipers were an early-days equivalent of later pin-up posters and calendars.

You probably won't find any two calipers alike; they were all handmade. "Some are masterpieces of technical workmanship, with elaborate hinges," John says, "while others are masterpieces of art, with lovely forms." The best of the calipers combine technical and artistic merit. "They are as varied as the machinists who made them," John says.

Nobody knows how many dancing-master calipers machinists turned out before the practice died out in the 1940s. Flea markets and tool auctions are the best places to find them today. You'll run across many selling for \$30-\$50. But, the price can soar for a great pair of legs. 🦵

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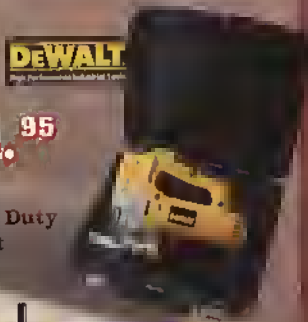
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Ryobi shrinks biscuit joiner to focus on detail work

Biscuit joinery used to be reserved for large scale projects, but that's no longer the case. With Ryobi's new DBJ 50 Detail Biscuit Joiner, you can use biscuits on projects such as face frames, picture frames, small boxes, and moldings. You also can edge-join pieces as thin as 1/4" and as narrow as 7/8" with the DBJ 50 and Ryobi's own miniature biscuits.

Ryobi offers its "Accu-Biscuits," in three sizes—R1 (7/32x3/8"), R2 (3/32x3/4"), and R3 (1/2x1"). These compare with the three standard-sized biscuits—#0 (9/16x17/8"), #10 (3/4x2 1/8"), and #20 (1 1/4x2 1/4").

Power comes from a 3.5-amp, direct-drive, 10,000 rpm motor mounted vertically over the blade. Ryobi uses this same basic design in its popular JM80K standard-sized biscuit joiner.

The DBJ 50 comes with a 1 1/2"-diameter, high-speed steel blade that cuts slots easily in both hard and softwoods. I found the length and depth of the slots was fine, but because of the aggressive set in the blade's teeth, which left a .120" kerf, the .100"-thick biscuits

fit loosely. Surprisingly, though, joint alignment and strength didn't appear to be compromised.

Ryobi made the DBJ 50's see-through fence both simple to use and accurate. Built from high-impact, tinted plastic, the 90° edge of the fence has a printed biscuit scale extending from both sides of the centerline. This makes aligning the joiner on your workpiece a snap.

A rib on the fence fits into a series of parallel grooves on the stationary base frame. Because of this, the fence adjusts in 1/16" increments, and it stays aligned perfectly parallel to the blade throughout the adjustment range.

Height-adjustment scales printed on both sides of the frame help you quickly reset the fence for different material thicknesses. To make 45° cuts, you remove the two knurled hold-down knobs, rotate the fence 180°, and then reinstall the knobs.

As an added feature, Ryobi offers biscuit-shaped hinges—chrome or brass in R3 size—for use on small boxes. By setting the fence to



zero on the scale, the DBJ 50 will cut a perfectly sized hinge mortise in the edge of the stock.

The DBJ 50 comes with a convenient, 10'-long cord and carries a two-year warranty. Priced at \$69, it's a handy tool that will find a place in many workshops.

—Tested by Bob McFarlin

PRODUCT SCORECARD

Ryobi DBJ 50 Detail Biscuit Joiner

Performance	★ ★ ★ ★ ☆
Price	About \$69
Value	★ ★ ★ ★ ★

Ryobi America Corp., 5201 Pearman Dairy Road, Suite 1, Anderson, SC 29625-8950. Call 800/525-2579.

ScrollSander ends tedious hand sanding

Hand sanding intricate scrollsawn projects requires more patience than many woodworkers possess. However, a new product called the ScrollSander turns your scrollsaw into a power sander.

The ScrollSander consists of a strip of cloth-backed abrasive with polycarbonate plastic tips molded onto each end. The plastic ends come in versions for most pin-type and pinless blade holders, except those on RBI and Reliant scrollsaws.

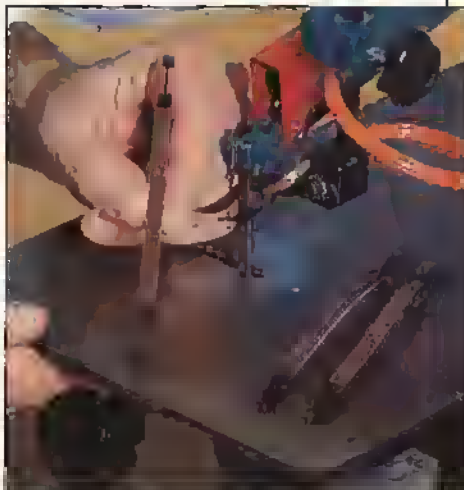
ScrollSander strips currently come in 1/4" and 1/2" widths. The

1/2" strips were too wide to fit the throat opening on my Excaliber saw, but the 1/4" version worked fine. The manufacturer, Crawford-Adams Enterprises, plans to introduce another model that uses .055"-diameter abrasive cord. The cord should accommodate saws with narrow throat openings and permit sanding in any direction.

Each package contains one each of 120-, 180-, 220-, and 320-grit strips and they did an excellent job, even on brittle material and fine edges. With light pressure, they maintained a square edge and didn't break until I intentionally overloaded one. When one half became worn after roughly 30 minutes of continuous use, I flipped the strip end-for-end and used the other half.

For beginners who leave a lot of saw marks, the ScrollSander takes the tedium out of sanding. More advanced scrollsawyers may also find it handy to have on hand.

—Tested by Dave Henderson



Continued on page 80

PRODUCT SCORECARD

ScrollSander

Performance	★ ★ ★ ★ ☆
Price	\$6.95 (package of 4)
Value	★ ★ ★ ★ ★

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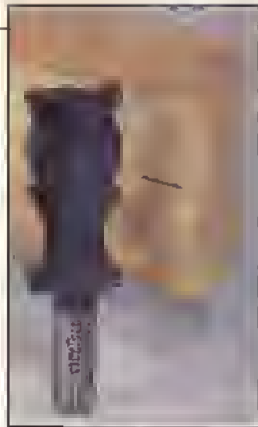
Continued from page 78

Create moldings with these profile bits

Most homecenters carry just a few sizes and profiles of molding. These cost a lot, and rarely do the stores stock anything other than pine or oak. But with Eagle America's carbide-tipped Large Crown Molding Bits, you can rout your own molding from any wood you choose.

The cutting lengths of these bits measure 2 1/4", except for the cove molding bit, which measures 2 1/2". All come with 1/2" shanks. I found the bits well-balanced and properly sharpened—important considerations when you're spinning this much steel in a router.

To use these bits, you need a router table, a fence tall enough to support the workpiece, and a featherboard. And you should chuck them into nothing less than a 2 1/2-hp router running at



about 10,000–12,000 rpm. For additional safety, I ripped my workpieces 3/4" wider than the height of the cutter. This left a small strip at the top and bottom of the workpiece to follow the fence on the exit side of the router table.

Even with these precautions, you still need to remove wood in small increments, taking four to six passes to complete the cut. But if you're willing to take your time, these bits will help you make moldings to match the

wood in your projects at a reasonable cost. And you won't be forced to use moldings carried at retail outlets.

—Tested by Dave Henderson

PRODUCT SCORECARD

Large Crown Molding Bits

Performance	★ ★ ★ ★ ☆
Price	\$65.95 each ppd.
Value	★ ★ ★ ★ ☆

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Water-based wood filler low on fumes, high on convenience

To meet stricter air quality standards, manufacturers have worked hard to develop solvent-free finishing products. The Darworth Company not only developed a water-based wood filler, but also came up with unique and handy packaging.

FI:X Wood Patch comes in a wide-mouthed tube that allows you to easily squeeze out just the right amount of filler where you need it. The large, screw-on cap seals tightly and serves as a base to stand the tube upright for storage—both features which help extend the filler's shelf life.

The rounded shape of the tube's other end works great for shaping and smoothing the filler. Unlike a putty knife, the pliable plastic allowed me to easily overfill the holes in the wood. By overfilling,

you avoid depressions caused when the filler dries and shrinks below the wood's surface.

FI:X worked well, even on vertical surfaces, adhering tightly to the edges of holes without sagging. It is odorless and dries slightly slower than most solvent-based fillers, but I found I still needed to work fairly quickly.

Sanding was a snap. It easily sanded flush and smooth without scratches and didn't load up the sandpaper, traits not found in some fillers. I drilled clean pilot holes in it and found it held screw threads well. It cleans up with water, but you need to catch it before it dries.

The lone drawback I found was in staining. Like most fillers, it failed to accept stain as readily as the surrounding wood. However,



I did achieve better results if I applied stain immediately after I sanded it.

FI:X's ease of application, odor-free formula, and handy packaging make it well worth trying.

—Tested by Dave Henderson

PRODUCT SCORECARD

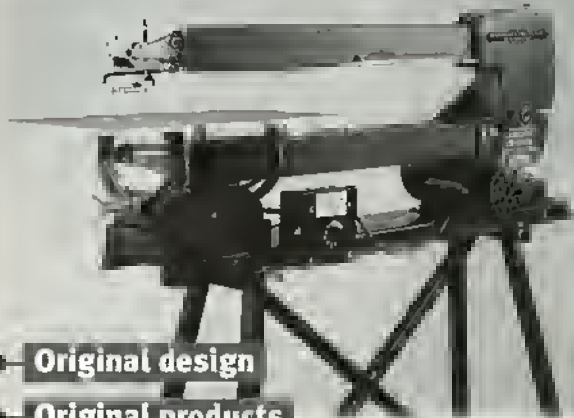
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Performance	★ ★ ★ ★ ☆
Price	\$3.49
Value	★ ★ ★ ★ ★

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Continued on page 82

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PRODUCTS THAT PERFORM



Continued from page 81

Save money on broken bandsaw blades

It's a fact of shop life—bandsaw blades often break before they dull. Rather than throw away a good blade, you may want to try repairing it at home with the Deluxe Blade Brazer. This kit includes a blade-holding jig, flux, flux brush, and silver solder.

To begin repairs, you place the broken blade ends under a flat bar on the jig. Tighten the two thumb screws to secure the blade ends. Then, bevel-grind the broken blade ends to approximately 45°.

Next, butt the blade ends tightly together on top of the jig and spread flux around the joint. Heat the blade with a propane torch, as shown below, and apply the silver solder. After the weld cools, clean it up on the grinder.

I found it easy to make strong welded joints with the Blade Brazer. The kit's instructions were clear and helpful.

According to the manufacturer, the flux and silver solder should last for 80 welds on 1/4" blades. So, this jig will pay for itself after just a few repairs.

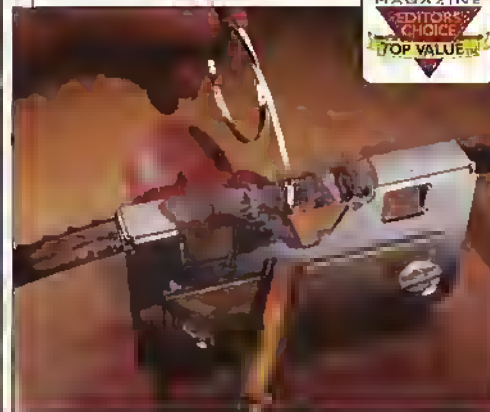
—Tested by Dave Henderson

PRODUCT SCORECARD

Deluxe Blade Brazer

Performance	★ ★ ★ ★ ★
Price	\$41.95 ppd.
Value	★ ★ ★ ★ ★

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Continued on page 90

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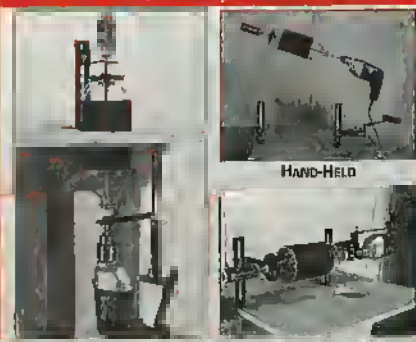


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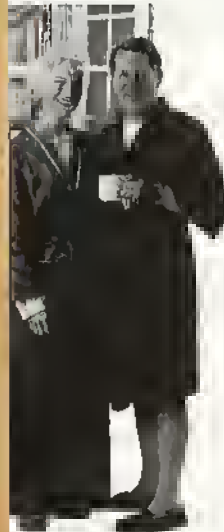
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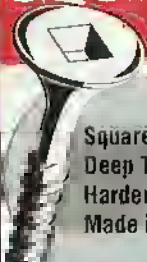
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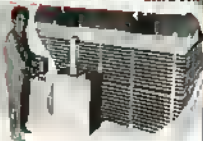
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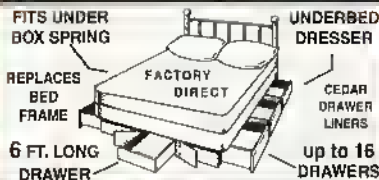
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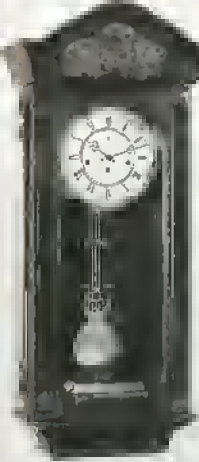
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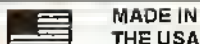
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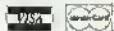
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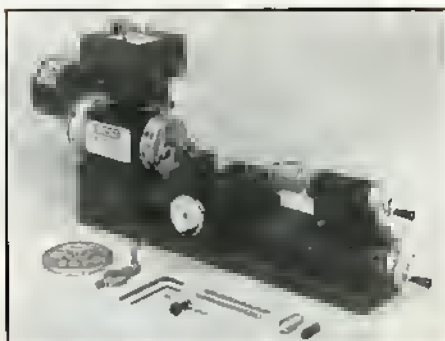
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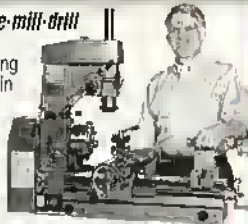
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PRODUCTS THAT PERFORM



Continued from page 82

Tame sheet goods with Delta's sliding table

Are you tired of wrestling with large panels as you crosscut them on your tablesaw? The Sliding Table Attachment from Delta turns that tricky operation into a safe and easy procedure.

This aftermarket accessory comes predrilled to fit Delta Unisaws, Contractor's Saws, and Heavy-Duty Wood Shapers. It also can be adapted to similar machines from other manufacturers. The laminated $\frac{3}{4} \times 15\frac{3}{4} \times 24$ " table rides on seven ball-bearing guides that track back and forth on two precision-ground steel tubes. When you set the 42" extruded-aluminum fence at the front of the table, you can cut panels up to 25½" wide. But you also can set the fence at the rear of the table and clear workpieces up to 36" wide.

It took us a couple of hours to assemble and adjust the model 34-555 attachment. Once we had it set, we used it to trim the ends of a 2½×24×60" laminated maple

benchtop. The sliding table handled this workpiece easily and gave us perfect 90° cuts on both ends. Since then, we've found ourselves using this handy attachment far more than we initially thought we would.

The other heavy-duty sliding miter tables on the market give you about 12" more crosscut capacity than Delta's 36". But you'll pay extra for this added capacity, typically \$60 or more to crosscut full-width (4×8') sheet goods. But if the Delta table fits your needs, it represents a good value for the money.

—Tested by Chuck Hedlund and Jan Svec

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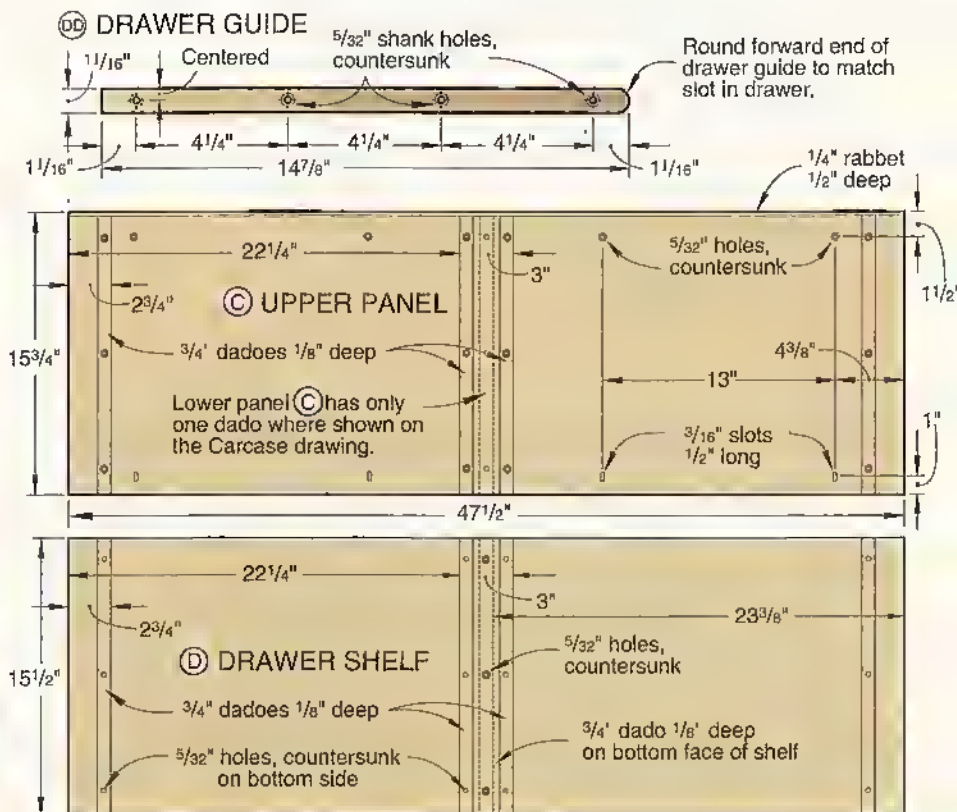
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See article on page 60



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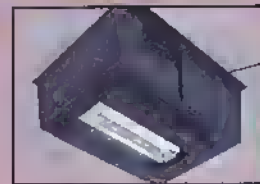
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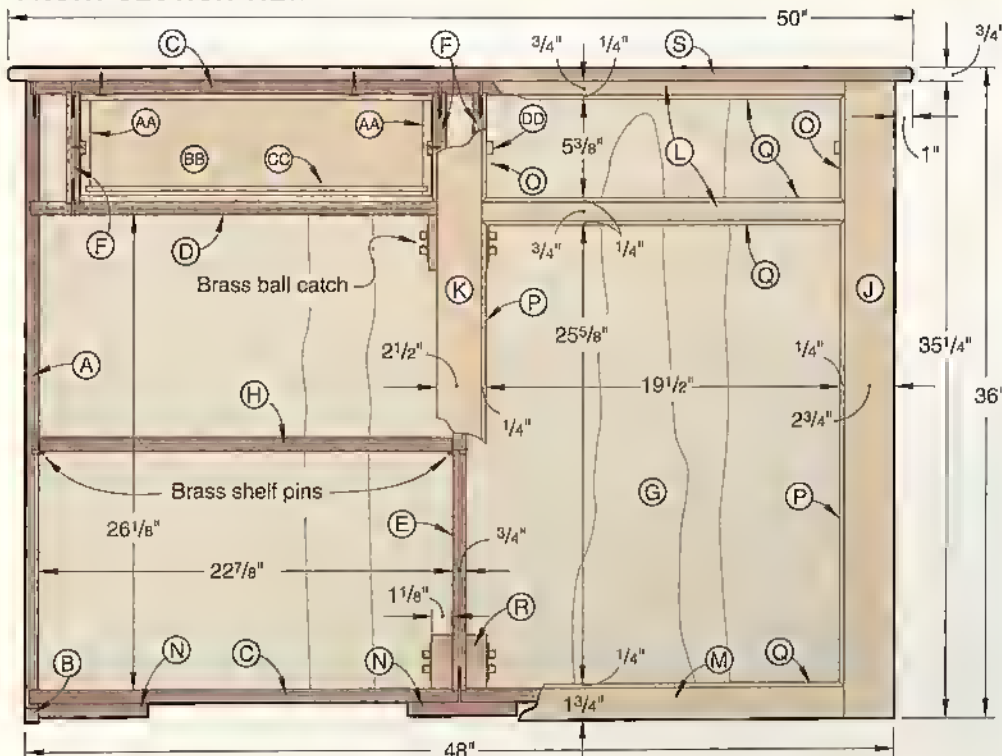
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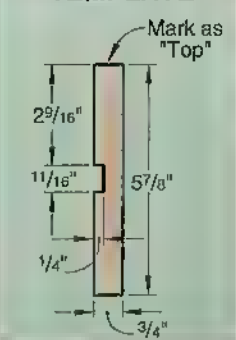
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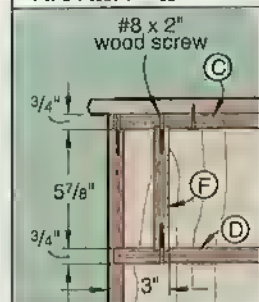
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- **Protect yourself against sawdust.** Arrange the sawdust-blower tube to direct the airflow away from you, off to the side, or better yet, toward the back of the saw. Wear a dust mask.

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- **Keep your workplace tidy.** Don't let sawdust and cut-off pieces pile up in front of the saw. Provide plenty of task lighting. Special magnifier lights work best of all.

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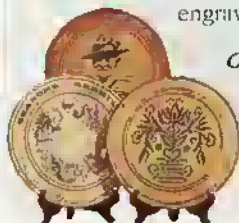
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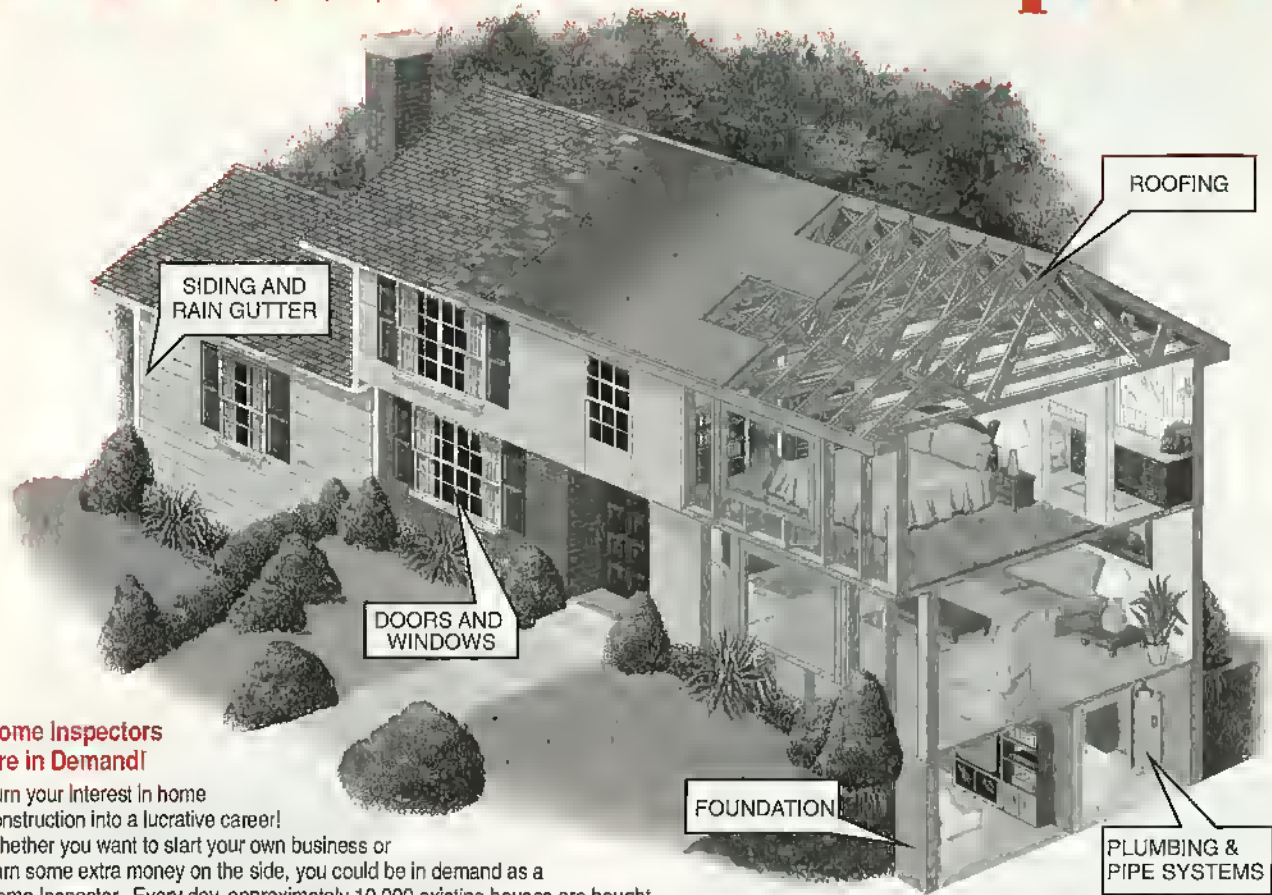
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Project Prep

Stock

3/4"-thick domestic or exotic hardwood, large enough to yield a round blank about 3" in diameter.

Turning tools

3/16" (or other small size) gouge
1/2" gouge
1/2" roundnose scraper
1/8" parting tool

Lathe equipment

3" faceplate

Turn the front first

1 Trace around your 3"-diameter metal faceplate onto one side of a 1"-thick piece of scrapwood. Glue a piece of 3/4"-thick stock for the watch body to the other side of this wasteblock. (The side glued to the wasteblock will be the back of the watch body.)

2 Bandsaw the lamination around the faceplate outline. Drill pilot holes in the wasteblock, and screw it to your metal faceplate.

3 Mount the faceplate on the lathe. With the lathe running at about 1,500 rpm, turn the blank to 2 1/2" diameter and flatten its face. The 1/2" gouge works fine for this.

4 With the lathe still running, mark a 1 3/8"-diameter circle on the face of the blank. To do this, lay a pencil on the toolrest, then bring

the point up to the blank to draw the circle accurately and on center.

5 Using the pencil mark as a guideline, turn a 1 3/8"-diameter recess 1/4" deep with a flat bottom to hold the clock insert. To begin, come straight into the face of the blank with the parting tool, just inside the pencil line. Cut in about 1/8" deep. Shut off the lathe, and check the diameter of the circle. If it's 1 3/8", finish cutting straight in to a depth of 1/4", and clean out the recess with a small gouge. Check the fit of the clock insert in the recess.

6 Turn the edge and front profile, following one of the Full-Sized Section Views or your own design. Sand the front and apply a finish, then part off the turning.

A jam chuck completes it

1 Hold the blank with a jam chuck while turning the back of the case. To make the chuck, form a 1 3/8"-diameter tenon on the wasteblock. The recess in the turning must fit snugly over this tenon to complete the turning, so test the fit frequently as you turn it.

2 Turn the back of the watchcase to one of the profiles shown. Or, create your own design. Sand and finish, then remove the completed case from the jam chuck.

3 Drill a 3/16" hole 1/16" deep centered on the top edge of the case. In the bottom of the hole, drill a 5/64" hole 3/16" deep. Dab epoxy glue

onto the threads, then screw the post for the watch chain into the hole. Press the clock insert into the case recess.

4 Drill out the post's eye hole to 7/64". Support the post with scrapwood, and drill the hole with a drill press, as shown below. Snap the chain hook into the hole.

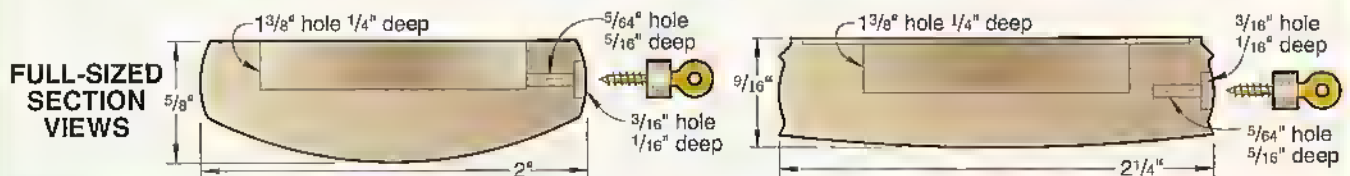


Support the post with scrapwood while you drill it to accept the chain hook.

Buying Guide

Clock insert, watch chain. Quartz insert, Roman or Arabic numerals (specify choice), and watch chain with post and belt clip, 15" long overall, item PW-KIT \$23.95 ppd. in U.S. Schlabaugh and Sons Woodworking, 720 14th St., Kalona, IA 52247, or call 800/346-9663 to order.

Photographs: King Au; John Hetherington
Illustrations: Roxanne LeMoine



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31-200	Sanding Center w/stand	1250	798
31-695	6" Belt/Disc Sander	441	349
23-700	Wet/Dry Grinder	200	149
23-710	New Sharpening Center	217	169
23-860	6" Bench Grinder 1/4 HP	80	69
11-950	8" Drill Press	178	128
31-485	4" Belt/Disc Sander	198	138
40-500	16" 2 speed Scroll Saw	230	165
40-540	NEW 16" variable Scroll Saw	249	184
11-950	12" Bench Drill Press	255	184
11-980	32" Radial Bench Drill Press	405	305
43-580	1/2" Bench Router/Shaper	399	299
43-580	1/2" Bench Top Planer	399	299
26-220	10" Compound Miter Saw	254	199
28-185	Bench Band Saw	213	168
37-070	NEW 6" v/spd Bench Joiner	351	259
14-650	Hollow Chisel Mortiser	390	239
33-990	10" Radial Arm Saw	381	273
33-995	8-1/4" Sawback comp w/legs	646	655
33-005	30" Unifence	348	245
36-905	50" Delta Unifence	444	319
36-755	10" Tilling Arbor Saw	1019	1019
17-800	16-1/2" Floor Drill Press	490	390
37-180	6" Deluxe Joiner	603	469
36-275	8-1/4" Builders Saw	355	268
36-240	10" Compound Miter Saw	344	225
36-040	8-1/4" Compound Miter Saw	190	135
36-070	10" Miter Saw	217	165
34-555	Sliding Table	487	323
34-444	10" Contractors Table Saw	589	425
36-250	10" Sliding Compound Saw	825	489
36-230	12" Compound Miter Saw	480	345
31-780	Oscillating Spindle Sander	253	195

DELTA REBATES			
Prices shown are before rebate			
Rebates valid thru 3/31/97			
525.00 rebate			
46-700	12" Wood Lathe	975	465
28-275	14" Band Saw 3/4 HP	635	335
28-280V14	Band Saw 1 HP motor	798	498
34-445	10" Table Saw w/30" fence	838	538
22-675	NEW DC380 15" Planer	1175	875
43-355	3/4" Shaper 1-1/2 HP	575.00	275.00
37-354	6" Joiner DJ-18	1289	989

MILWAUKEE TOOLS			
5527	NEW Sawzall with case	343	169
5528	new Sawzall w/blade cord	330	185
5537-2	5527 w/quick lok blade	424	175
4048-5	12V Drill w/keys chuck&2 batt	380	172
0224-1	3/8" Drill 4.5 amp magnum	236	132
0234-1	1/2" Drill 4.5 amp mag 0-850 rpm	255	129
0235-1	1/2" Drill w/keyless chuck	255	129
0244-1	1/2" Drill 4.5 amp 0-600 rpm	255	129
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	213	119
0228-1	3/8" Drill 3.5 amp 0-1000 rpm	207	111
0375-1	3/8" close quarter Drill	255	148
0379-1	1/2" close quarter Drill	288	165
6546-1	odis Screwdr 200 & 400 rpm	150	89
6547-1	6546-1 w/blades, 1/4" chuck, & case	165	100
5399	1/2" D-handle Hammer Drill	359	194
6537	Original SawZall with case	278	142
5397-1	3.8" w/spd Hammer Drill Kit	275	145
5371-1	1/2" w/spd Hammer Drill Kit	360	194
3107-1	1/2" w/spd right angle Drill Kit	234	124
3306-1	1/2" w/spd right angle Drill	378	199
5680	Router 2 HP w/collets	367	165
9142	4-1/2" Grinder w/blade & acc.	224	128
6368	7-1/4" Circular Saw 13 amp	229	129
8206	6365 w/fence, blade, & case	259	142
5256	Top Handle Jig Saw	278	149
6480	10" Miter Saw	486	265
6491	6480 w/carbide blade & bag	594	328
6494	10" Compound Miter Saw	565	315
0431-1	12V Drill w/2 batteries	441	239
6269-9	NEW Top Handle Jig Saw	315	165
6495	10" Slide Compound Saw	1050	869

FREUD CARBIDE TIPPED SAW BLADES				
5/8" Bore - Industrial Grade				
Item	Description	Teeth	List	Sale
LU22M010	Gen Pur. A.T.B 10"	40	69	42
LU24M010	Cut-off 10"	60	93	44
LU84M011	Comb 10"	50	78	42
LU85M010	Super Cut-off 10"	60	115	59
LM72M010	Ripping 10"	24	69	38
LU73M010	Cut-off 10"	60	84	45
LU67M010	Thin Kerf 10"	24	72	44
LU86M010	Thin Kerf 10"	60	84	49
LU98M010	Ultimate 10"	60	129	68
LU91M010	Compound Miter 10"	60	98	54
F410	Quiet Blade 10"	40	95	48
F010	Quiet Blade 10"	60	135	74
TK900	7-1/2" Finishing	40	38	25
TK900	10" Combo	50	53	32
SD380	8" Dado - Carbide	230	119	
SD506	6" carbide w/case & shims	292	145	
SD508	8" carbide w/case & shims	344	188	
FB100	16 piece Forstner Bit Set	238	194	
04-100	5 pc. Router Bit Dept System	380	169	
BF3	NEW Router Table	459	299	
FJ85	NEW Top Handle Jig Saw	229	125	

The following tools have a \$30.00 rebate. Price shown is before rebate.

FT2000E 3-1/4 HP variable speed Plunge Router 410 205

JS102 Biscuit Joiner w/fence & cs 355 179

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SD585 6" dial-a-width dado 389 199

SD586 6" dial-a-width dado 389 199

SD208 6" economy dado 155 85

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7680F	10 gallon turbo vacuum	645	465
7680F-D	"Drywall" 10 gal turbo vacuum		
		915	549
7680F-DAS	above vac w/ auto start	950	589

MAKITA TOOLS			
6172DWE	3/8" w/spd Drill Kit w/ 2 batt	222	100
6000DW	0-3/8" Saw Kit 9.6 volt	280	148
DA391D	3/8" angle Drill 9.6V	166	100
DA391DW	3/8" angle Drill Kit 9.6V	341	179
ML900	Incandescent Flashlight 9.6V		37

NEW CORDLESS BATTERIES			
Model	Description	List	Sale
6070DW	7.2V cdc Drill Kit. Variable speed & clutch. Complete with battery, charger, & case	285	185
6213DWA	12V 3/8" Drill Kit	285	185
6253DWA	14V 3/8" Drill Kit	358	198

SUPER CORDLESS SPECIALS			
6070DW	7.2V cdc Drill Kit. Variable speed & clutch. Complete with battery, charger, & case	285	185
T220DW	9.6 volt Stapler Kit. Complete with battery, charger, & case	99	99

9900B	3"x21" Belt Sander w/bag	347	179
9242BD	3"x24" Belt Sander w/bag	360	169
4301BV	Orb. var. spd Jig Saw 3.5A	292	155
JR3000V	1/2" w/spd Recip Saw w/case	264	135
9820-2	Blade Sharpener	433	215
N1900B	3-1/4" Planer with case	263	129
1912B	4-3/8" Planer	352	189
NE514B	4" Disc Grinder 4.5 amp	116	65
DA3000R3/8"	Angle Drill	355	175
2708W	8-1/4" Table Saw	637	309
6409	3/8" Drill Rev. 0-2100 rpm	115	65
6516LVR	3/8" Drill Rev. 0-1050 rpm	188	98
6013BR	1/2" Drill Rev. 5 amp	270	145
9401	4" x 24" Belt Sander w/bag	458	219
5007NEK7-1/4"	Circ Saw w/case	250	125
5037NB	NEW 7-1/4" Circular Saw	268	148
LS1011	10" Slide Compound Saw	995	429
LS1211	12" Slide Compound Saw	1620	779
3801	Plate Joiner Kit	376	109
3812C	NEW 3 HP Plunge Router	492	259
LS1940	NEW 10" Compound Miter Saw	5460	259

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SN325	Nailer 1-7/8" - 3-1/4"	665	419
SLK20	Finisher w/cs 5/8" - 1-1/2"	422	275
SN35	Stapler 5/8" - 1-1/2"	390	275
SN70	Framing - Clip Hd 2" 3-1/2"	725	449
SN60	Framing - Full Hd 2" 3-1/2"	708	449
SN65	15% more power than SN6070's	459	
SN450	Finish Nailer 1-1/4" - 2-1/2"	589	309

BOSTITCH AIR NAILERS			
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NB0C-1	Coil Nailer	Super Sale	339
RN45	Coil Roof Nailer 3/4" - 1-3/4"	549	299
NB0FN-2K	Finishing Nailer w/case	559	299
BT35-2	Brad Tacker 5/8" - 1-3/8"	254	155
BT35-2K	BT35-2 w/ case, oil, & brads	279	159
CMC100	1 HP Pancake Compressor	440	299
WI95	Flooring Stapler 15 gauge	902	520
S325X-1	Finish Stapler 1-1/2" - 1-3/8"	245	155
S325X-1K	S325X-1 with case & oil	269	165

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77	7-1/4" Worm Drive Saw	Sale	144
77M	NEW 77 Mag Worm Saw	Sale	165

PASLDOE IMPULSE GUNS			
IM250	Trimpulse Finish Nailer Kit	1130	549
IM325	Impulse Framing Nailer Kit	1130	549
IC2355S	Odts Framing Nailer Kit	1120	495

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DW321K	NEW Jigsaw Kit	300	164
DW264	7-1/4" Circ. Saw w/bags	294	158
DW610	1-1/2 HP 2 handle Router	266	152
DW411	1/4 sheet Palm Sander	68	58
DW100	3/8" Drill, 4 amp, 0-2500 rpm	18	18
DW628KB	Biscuit Joiner with case	448	199
DW705	12" Compound Miter Saw	734	399
DW625	3 HP w/spd Plunge Router, Sale	279	

DW623	router comes with DW6960	114	69
DW621	NEW 2 HP Plunge Router	400	216
DW675K	3-1/8" Planer with case	292	164
DW431	3 x 21 w/spd Belt Sander	330	184
DW421	5" Palm Ran. Orb Sander	144	74
DW444	6" Ran Orb Sander	260	139
DW443	DW444 w/hook & loop pad	266	139
DW473	NEW Laminate Trimmer Kit	354	190
DW935K	14.4V 5-3/8" Trim Saw Kit with 2 batteries	444	237

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DW932K	3/8" variable speed w/ two 9.6V XR batteries	264	139
DW936K	2-3/8" variable speed w/ two 9.6V XR batteries	330	179
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DW996K	1/2" w/spd/w/ two 14.4V XR batt	245	
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DW996K	1/2" w/spd/w/ two 14.4V XR batt	245	
DW901K	2-3/8" variable speed w/ two 14.4V XR batteries	415	225
DW940K	1/2" variable speed w/ one 14.4V XR battery	458	235
DW994K-2	above drill w		

West Virginia showcases the handmade

Several states actively promote and market the work of their crafts people. Some even have retail outlets for their "Made in (state name)" products.

No state, though, has gone the length that West Virginia has with the opening of its 59,000-square-foot retail crafts and cultural center, called Tamarack. Resulting

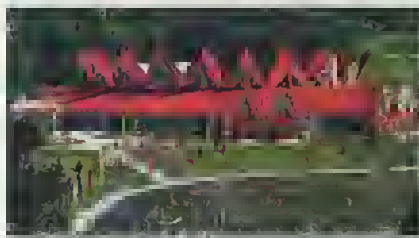
Furnituremaker John Wesley Williams designed and built the bird's-eye maple desk and chair to sell at Tamarack, The Best of West Virginia. He is one of the 1,200 juried West Virginia crafts people showing their work.



from a multi-level partnership of state agencies, industries, community leaders, business executives, artisans, and agricultural producers, the center showcases the work of 1,200 juried crafts people of the state. In addition to the retail complex with its 10,000 handmade products, there's a theater, a restaurant, craft studios, sculpture and herb gardens, a gourmet food store, and a festival park. Tamarack will also offer programs and apprenticeships in the crafts.

Planned as a travel destination, Tamarack is adjacent to I-77 in Beckley, a day's drive from major East Coast cities. Call 1-88TAMARACK (304/256-6843 in West Virginia) or Fax 304/256-6877.

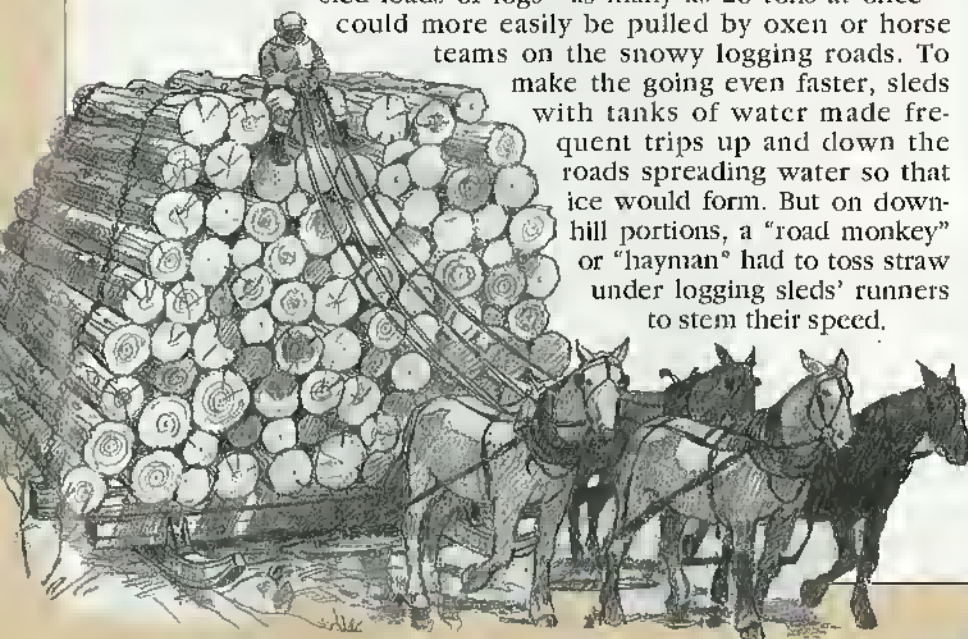
The architecture of West Virginia's Tamarack crafts center appears as impressive as the thousands of handmade items for sale inside.



Loggers liked icy roads

In the late 1800s when loggers were clearing northern Wisconsin's pine forests, winter was the time of greatest activity. That's because sled loads of logs—as many as 20 tons at once—could more easily be pulled by oxen or horse teams on the snowy logging roads. To

make the going even faster, sleds with tanks of water made frequent trips up and down the roads spreading water so that ice would form. But on downhill portions, a "road monkey" or "hayman" had to toss straw under logging sleds' runners to stem their speed.



How about hand-friendly hand tools?



Included in Stanley's new line of ergonomically designed hand tools are a measuring tape, handsaw, utility knife, and a hammer.

Ergonomics, the science of fitting the job task to the person doing the work instead of the other way around, is a buzz word in industry today. One possible reason: In 1994 the U.S. Bureau of Labor Statistics tracked 332,100 cases associated with cumulative trauma disorders (CTDs), the injuries that can result from repetitive work tasks. The National Council on Compensation Insurance calculates that the average claim for those injuries was \$12,617.

Stanley Tools jumped aboard the ergonomic bandwagon by introducing a user-friendly Contractor Grade line of hand tools at the National Hardware Show in Chicago last August. They offer more comfortable grips, better control, and in the case of the handsaw, teeth that cut 50 percent faster. You can identify the new ergonomically designed tools by their yellow and gray colors and distinctive packaging, as shown above.

In addition, Stanley has co-published with the National Safety Council a 12-page booklet that explains common cumulative trauma disorders and hand-tool ergonomics. A copy of the publication will cost you \$1 (U.S.). Write to: Introductory Hand Tool Ergonomics, Heggen & Associates, Inc., P.O. Box 5025, Evanston, IL 60204-5025. ☛

Illustration: Jim Stevenson
Photographs: J.W. Farrell; Stanley Tools

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¹We calculated resale using avg. trade-in values for '94-'95 full-size models vs. MSRPs, published in Jan. '95-Sept. '96 N.A.D.A. Official Used Car Guide® monthly editions. Use of these values does not constitute NADA's endorsement. ²Won Strategic Vision's 1995 and 1996 Total Quality Award™ in its class. Based on Strategic Vision's 1995 and 1996 Vehicle Experience Studies™ of 31,440 ('95) and 35,652 ('96) Oct. Nov. new vehicle buyers of 170+ ('95) and 200+ ('96) models after the first 90 days of ownership. ³J.D. Power and Associates 1995 & 1996 Automotive Performance, Execution, and Layout Studies™, based on 27,859 ('95) and 25,492 ('96) consumer responses.

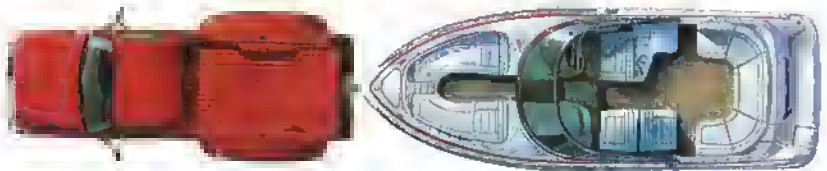


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Chevy or GMC.¹ That's not surprising, either. It's won the Total Quality Award™ in its class from Strategic Vision two years in a row.² And it's been ranked the "Most Appealing Full-Size Pickup," by J.D. Power and Associates as well—for the second straight year.³

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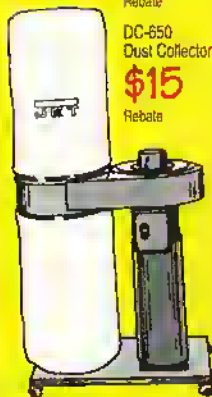
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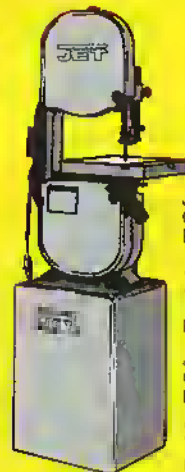
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Bandsaw

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JPM-13
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Rebate



JJ-6CSX
Jointer

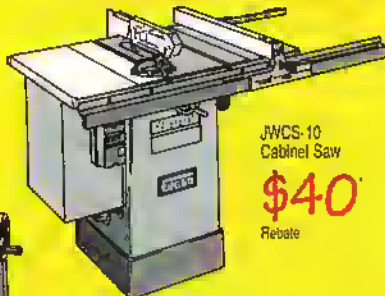
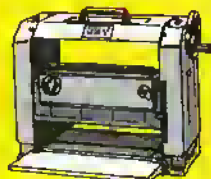
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JWP-12
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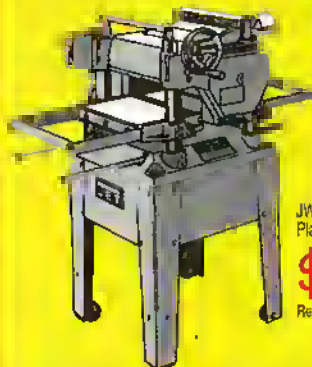
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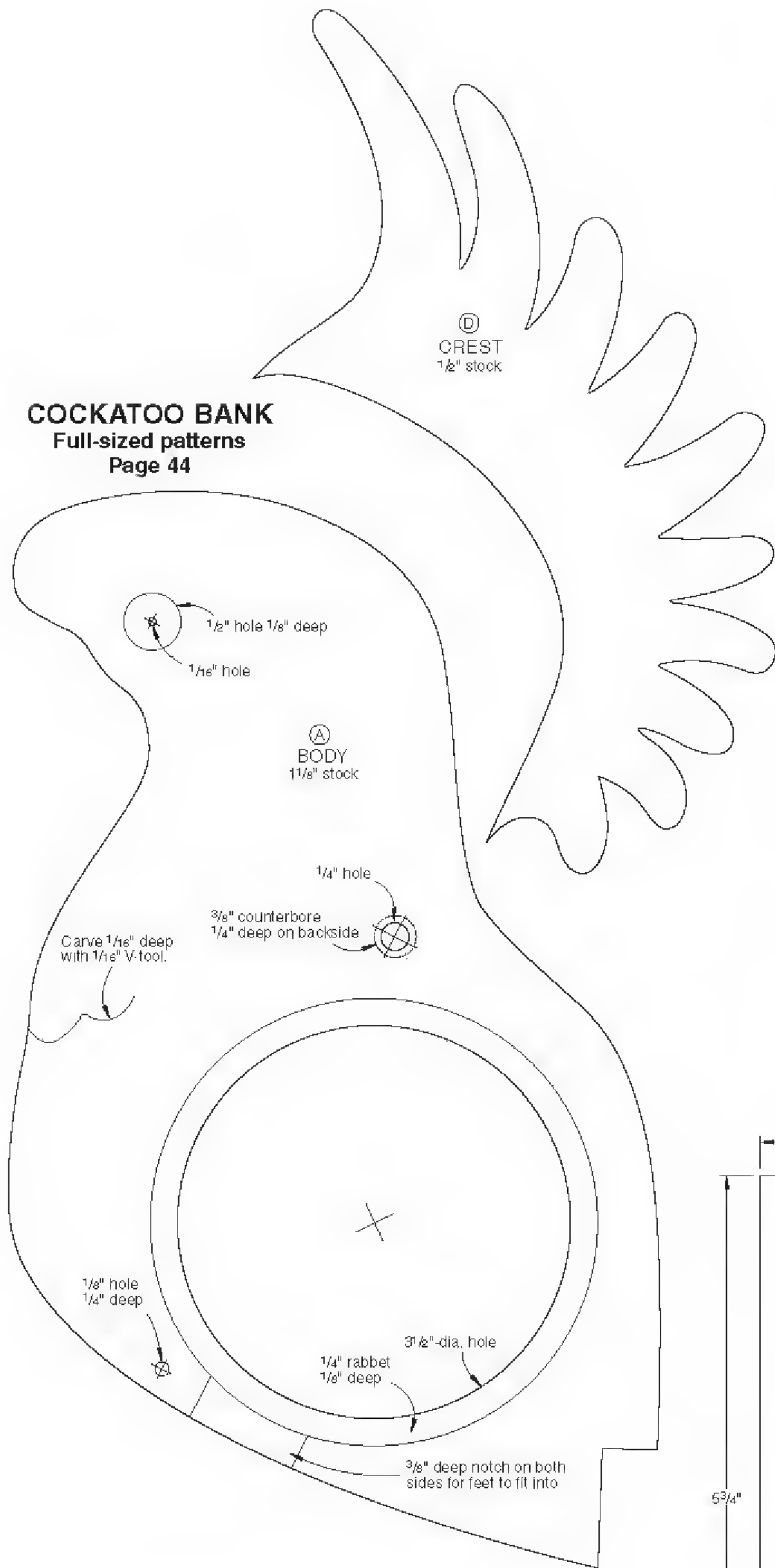
WOOD PATTERNS

FEBRUARY 1997

ISSUE 95

Dear Reader: As a service to you, we've included full-sized patterns on this insert for irregular-shaped and intricate project parts. You can machine all other project parts using the Bill of Materials and the drawings accompanying the project you're building.

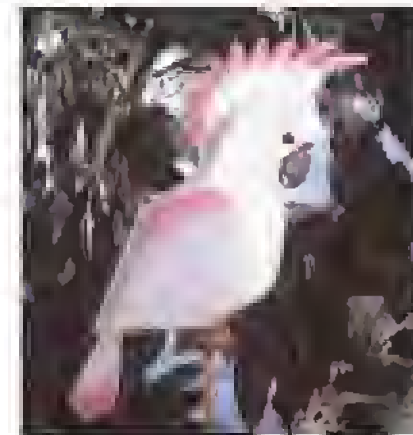
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Chubby Choo Choo Page 37



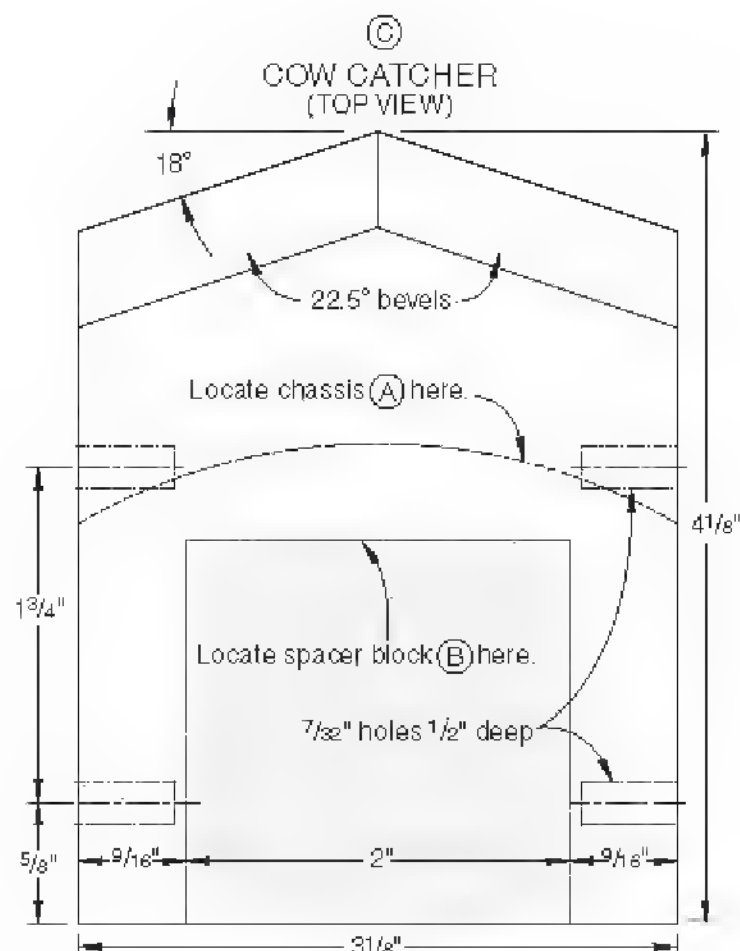
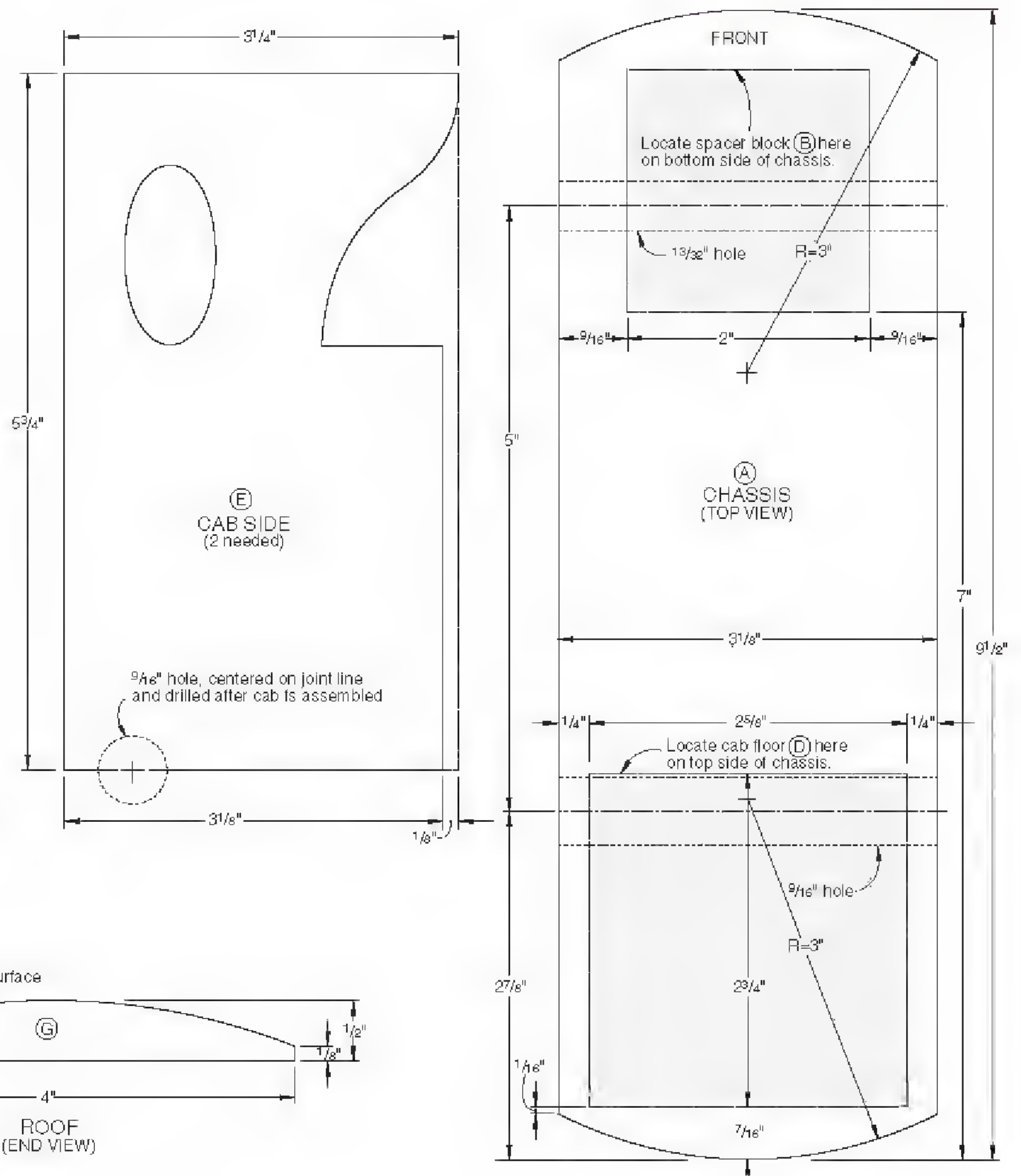
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