

10
BEST
CLAMP
TIPS

6 ROUTER TABLE FENCES—From Ba

WORKBENCH

WOODWORKING TO IMPROVE YOU

Fe

Innovative TOOL AWARDS FOR 2004

WORKBENCH
TOP
10
INNOVATIVE
TOOLS
2004

Learn How To

- CUT PERFECT-FITTING
COPED JOINTS
- SAND SOLID-WOOD
PANELS DEAD FLAT
- BUILD A BOX
BEAM CEILING

PLUS!
**SMALL SHOP
SPRAY BOOTH**

President & Publisher
Donald B. Peschke

Editor Tim Robertson
Senior Design Editor James R. Downing
Senior Editor Bill Link
Associate Editor Joe Hawkins
Assistant Editor Wyatt Myers
Project Builder Mike Donovan

Associate Art Director Kim Downing
Sr. Graphic Designer Kurt Schultz
Senior Illustrators Erich Lage
Matt Scott

Creative Director
Ted Kralicek

Senior Project Designers
Ken Munkel, Kent Welsh,
Chris Fitch, Ryan Mimick
Shop Craftsmen

Steve Curtis, Steve Johnson
Senior Photographer
Crayola England

Associate Style Director
Rebecca Cunningham

Electronic Publishing Director
Douglas M. Lidster

Pre-Press Image Specialists
Troy Clark, Minnie Johnson

Group Director - Marketing and Sales
J. Fritz Craiger

Advertising Sales Managers
George A. Clark 800-563-5472
Mary K. Day 877-835-1955

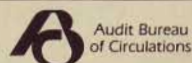
Marketing Associate
Nicolle Carter 515-875-7135

Subscriptions

Workbench Customer Service
P.O. Box 842
Des Moines, IA 50304-9961
Online:
www.WorkbenchMagazine.com
Phone: 800-311-3991

Editorial

Workbench Magazine
2200 Grand Ave.
Des Moines, IA 50312
email:
Editor@Workbenchmag.com



WORKBENCH (ISSN 0043-8057) is published bimonthly (Feb., April, June, Aug., Oct., Dec.) by August Home Publishing Company, 2200 Grand Ave., Des Moines, IA 50312. Workbench is a trademark of August Home Publishing. Copyright ©2004 August Home Publishing Company. All rights reserved.

Subscription rates: Single copy, \$4.99. One-year subscription (6 issues), \$22; two-year sub., \$33; three-year sub., \$44. Canadian/Int'l., add \$10 per year. Periodicals postage paid at Des Moines, Iowa, and at additional offices.

"USPS/Perry-Judd's Heartland Division automatable poly." Postmaster: Send address changes to Workbench, PO Box 37272, Boone, IA 50037-0272. Printed in U.S.A.



Corporate Services: Corporate Vice President: Douglas L. Hicks, Mary R. Scheve, Controller; Robin K. Hutchinson, Senior Accountant; Laura J. Thomas, Assistant Payable; Mary J. Schultz, Assistant Receivable; Margo Petrus, Production Director; George Chmielez, System Administrator; Chris Schwanebeck, PC Maintenance Technician; Robert D. Cook, New Media Manager; Gordon G. Gaippe, Web Site Art Director; Eugene Pedersen, Web Designer; Kara Blessing, Web Server Administrator; Carol Schoepfer, Web Site Content Manager; David Bretzger, Research Coordinator; Nicholas A. Jagers, Professional Development Director; Michael Sigel, Human Resources Assistant; Kirsten Koole, Office Manager; Natalie Lonsdale, Admin. Asst./Receptionist; Jeanne Johnson, Mail/Delivery Clerk; Lou Webber, Facilities Mgr.; Kurt Johnson • Circulation; Subscriber Services Director: Sandy Baum, New Business Director: Wayne J. Klingbeil, Renewal Manager; Paige Rogers, Circulation Marketing Analyst; Kris Schlemmer, Paula M. DeMates, Promotions Analyst; Patrick A. Walsh • Creative Resources; Sr. Editor: Craig Ruesspogger, Assistant Editor: Joel Hess, Art Director: Douglas A. Flint, Senior Graphic Designer: Chris Glowacki, Mark A. Hayes, Jr., Robin Friend, Graphic Designer: Jonathan A. Eike • Products Group: Operations Director: Bob Baker, Customer Service Manager: Jennie Enos, Warehouse Supervisor: Nancy Johnson, Buyer: Linda Jones, Administrative Assistant: Nancy Downey, Sr. Customer Service Representatives: Tammy Truckenbrod, Anna Cox, April Revell, Deborah Rich, Valerie Jo Riley, Customer Service Representatives: Kim Harlan, Cheryl Jordan, Warehouse Staff: Sylvia Carey • Woodsmith Store: Manager: Dave Larson, Assistant Manager: Tim Theles, Merchandise Marketing Mgr.: John Sberell, Plant Dept. Mgr.: James Hockins, Sales Staff: Wendell Stone, Larry Morrison, Mark Johnson, Gregory Kautzlarich, Brian McCallum, John Warren, Steve Anderson, Dave Fremming, Stephen Duncan, Brian Simmons, Office Manager: Vicki Edwards

EDITOR'S NOTES

Most woodworkers I know have one thing in common. They're ready, willing, and able to lend a hand. Whether it's sharing advice, loaning a tool, or strapping on a tool belt to help build a project, they *always* manage to come through. That was the case as the *Workbench* staff helped celebrate the grand opening of our parent company's most recent project — the Woodsmith Store, a retail operation with over 20,000 square feet of tools and lumber.

Our part in the festivities was to build the child's playhouse shown below, from start to finish, during the three-day opening. Upon completion, we auctioned the playhouse and donated the proceeds to Des Moines Habitat for Humanity.

Now building this project was no small task, but we had lots of support. All our tools were provided by Bosch Power Tools, which parked its "Big Blue" truck loaded with tools right next to our job site (see Photo above). The Southern Pine Council, Benjamin Moore, and the Woodsmith Store furnished building materials and paint. And the Gilcrest-Jewett Company, a local lumber company, moved the playhouse to its final destination.

All in all, it was a tremendously gratifying experience to see, once again, so many people from the woodworking community come together to share their time, talent, and resources for a worthy cause.

Tim

▲ A SIGN OF THE TIMES — Sharing time, talent, and resources was the theme as woodworkers came together to build this playhouse for charity.



FEATURES

Top 10 Tool Innovations

40 *Workbench editors select 10 breakthrough tools for 2004 guaranteed to improve your woodworking. And the winners are . . .*

Six-Drawer Cherry Dresser

50 *Back by popular demand! The plans for this heirloom dresser complete our elegant three-piece set of cherry bedroom furniture.*

Online Extra: Routing Half-Blind Dovetails

Build a Box-Beam Ceiling

68 *These ceiling beams are easy to build — just hollow “boxes” built up one board at a time.*

Small Shop Spray Booth

78 *Convert your shop into a temporary spray booth with a painter’s dropcloth and a fan.*

Online Extra: Workbench Ultimate Home Woodshop

Revolving Finishing Station

82 *Give the turntable on this finishing station a spin to ensure a smooth, even spray finish.*

Contents

WORKBENCH® February 2004

WORKBENCH

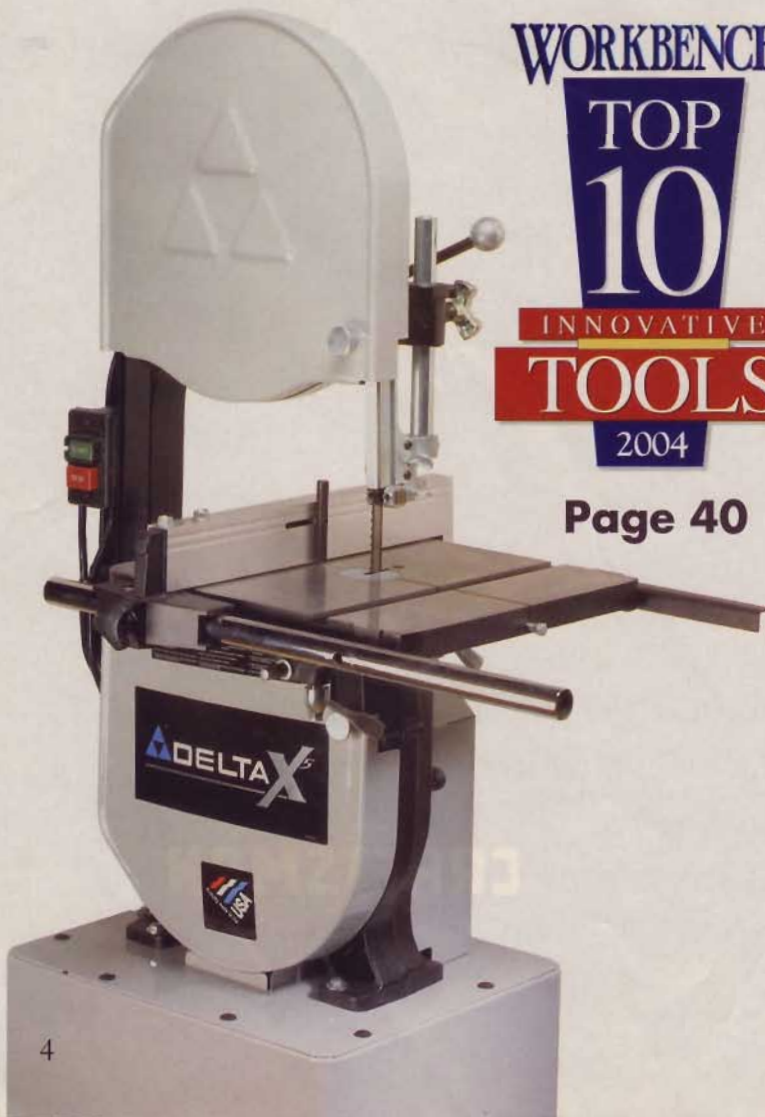
TOP
10

INNOVATIVE

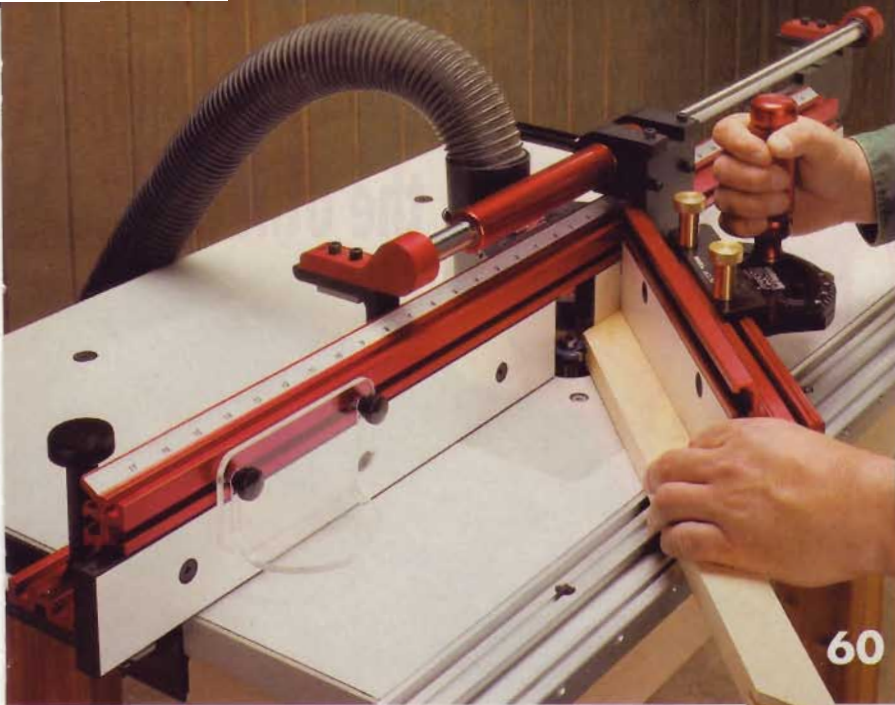
TOOLS

2004

Page 40



68



60

READER'S WORKSHOP

24 Table Saw Work Support

Crosscutting long pieces is a cinch with this height-adjustable work support. Plus, it doubles as a side support for the drill press.

TIPS FROM THE WORKBENCH SHOP


34 Handscrews Revisited: 10 Best Tips

Haven't used your wood handscrew clamps in a while? These 10 tips from our shop will make you blow the dust off and rediscover what makes a handscrew the most versatile clamp around.

TOOL REVIEW

60 6 Router Table Fences


These fences range from a no-frills guide to a complete joint-making system. Which one is right for you? We show you the best "rout" to take.

 [Online Video: Routing Dovetails Using Incra Fence](#)

SKILL BUILDER

76 The Case for Coped Joints

Learn the secrets to cutting, or coping, tight-fitting inside corner joints when working with cove molding or baseboard.

 [Online Video: Cutting Coped Joints](#)

TOOL CLOSE-UP

86 Fein's MultiMaster Detail Sander

It's not your ordinary detail sander. The Fein MultiMaster is also a power scraper, rasp, grout remover, and flush-cut saw. In short, it does it all.

W

IN EVERY ISSUE

CONTENTS



76



34

Departments

- 8 Questions & Answers
- 16 Tips & Techniques
- 28 Cutting Edge
- 88 Tools & Products
- 94 Craftsmanship

repairing a HARDWOOD FLOOR

Q I have a damaged section of hardwood floor in my dining room. I've tried everything from cleaners to sanding, but I just can't seem to get rid of it. Is there any way to repair it without it sticking out like a sore thumb?

Joe McMahon
Carlisle, PA

A If you have a section of hardwood floor that sanding won't fix, the best bet is to patch the floor with matching floorboards. Before you get started, find flooring the same width and thickness as your existing floor. I was able to purchase oak flooring that matched the original strips at a local flooring store. It was a bit thicker, but planing it flush is easy to do after the new strips are installed (page 12). Another option is to "borrow" floorboards from under a cabinet or in a closet.

The first step is simply to lay out the new flooring over the damaged area (Step 1). Then, it's just a matter of removing the old boards (Steps 2 - 4) and installing the new flooring (see page 12).



▲ STEP 1: Lay out New Flooring —

The first step is to arrange the new flooring directly over the spot to be patched. Cut boards to different lengths and stagger the end joints, so it won't look like a patch. Also do your best to match the existing grain of the floor. When you have the boards where you want them, mark the new end joints for each board with a pencil.



◀ STEP 2: Drill Holes —

When removing the old flooring, the trick is to avoid damaging the adjacent pieces. To accomplish this, start by drilling a series of holes just shy of the layout lines. These holes help you carry out the next step — removing existing floorboards.



◀ STEP 3: Chiseling —

To remove the old flooring, start by using a chisel to cut out a section of waste around the drill holes. Stay on the waste side of the layout lines. This chiseling technique is actually a three-step process, which is covered in detail on page 10.



◀ STEP 4: Pull Nails —

After removing the old flooring, take some time to clean up the opening so that new boards will slide in place easily. First, pull out any nails you run across (Photo). Then, use your chisel to clean the tongues and grooves on the undamaged flooring. Make a final pass with a vacuum to clean debris.

Remove Flooring

To remove the old flooring without damaging the adjacent pieces, you'll need to first remove a waste section at the end of each piece (*Sidebar*). Then, after squaring up the ends of the joints, use a chisel to split the center of the old flooring down its length (*Inset*), which makes it easy to remove the center (*Main Photo*). With the center removed, the two sides pull out of their respective tongue-and-groove joints easily.



ESTABLISHING THE NEW END JOINTS

STEP 1

First, begin at the joint line marked with a pencil, and angle the chisel in toward the drill holes. Cut across the floorboard to enlarge the holes.



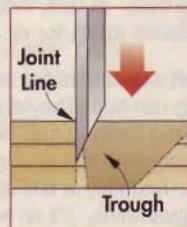
STEP 2

Now chisel in from the other side and cut toward the drill holes again. This forms a trough that makes it easier to remove the flooring pieces.



STEP 3

The last step is to square up the end joint so new boards fit. To do this, hold the chisel at 90° and cut straight down on the joint line.



SHIM-FREE & ADJUSTABLE

If you can turn the knob on a radio, you can adjust Amana Tool's® new:

eZ DIAL™ SLOT CUTTER

- ✓ Finally, a slot cutter with nothing to lose. No shims, no spacers.
- ✓ Nothing to take apart, just dial it, lock it, cut it.
- ✓ Easily makes perfect grooves for today's undersized plywood.
- ✓ Perfect for edge ("T") molding installation.
- ✓ Available in two sizes:
 - #55500 - For 1/8"-1/4" wide slots, 1/2" deep
 - #55510 - For 1/4"-1/2" wide slots, 1/2" deep
- ✓ Carbide tipped for long life.

Special Introductory price

\$99⁹⁵
ea.

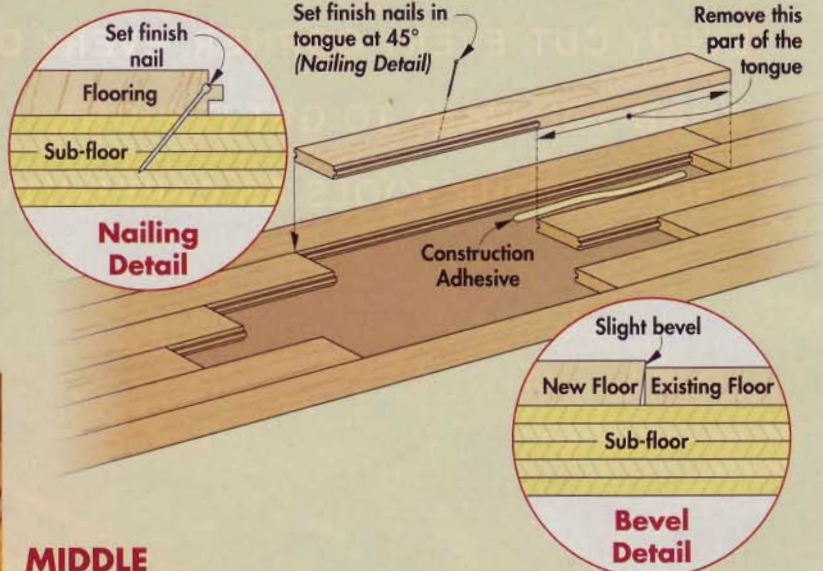
List Price \$149⁹⁵ ea.



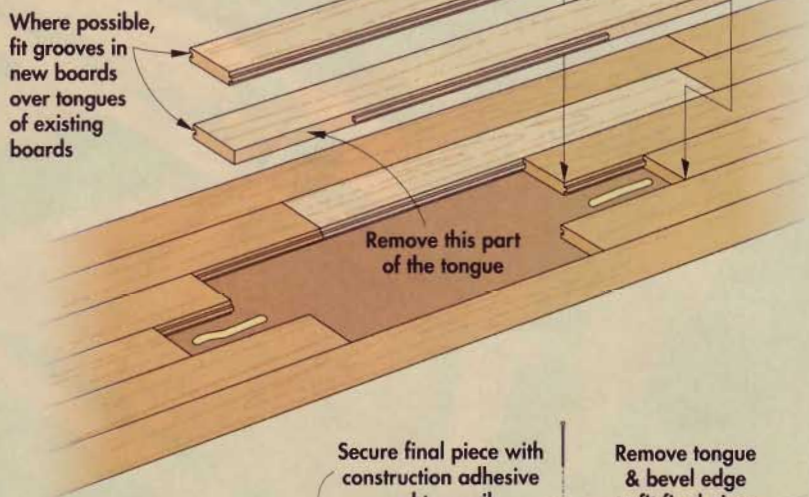
Amana Tool®
High Performance Cutting Tools

For Our New Catalog or a Dealer Nearest You
CALL 1-800-445-0077
Visit our website at
www.amanatool.com

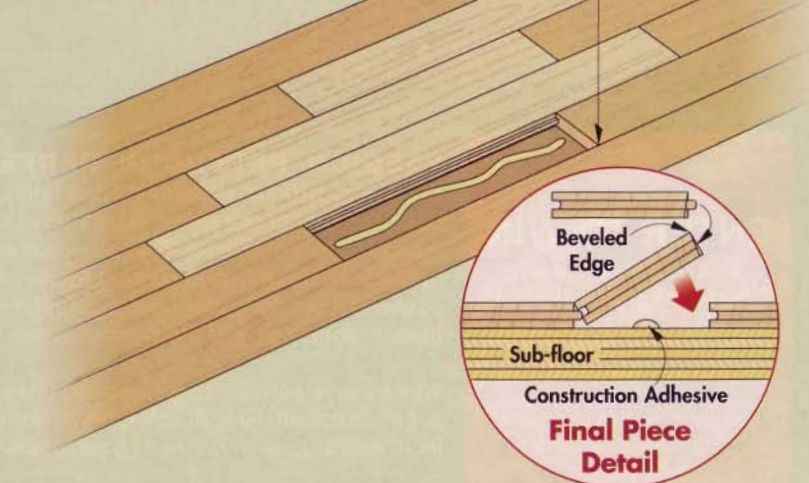
FIRST FLOORBOARD



MIDDLE FLOORBOARDS



FINAL FLOORBOARD



making a PERFECT PATCH

The hole you made in your floor may be different than this one. But regardless of size or shape, there are two basic things to keep in mind when installing new floorboards.

Tongues & Bevels—First off, there likely will be some instances where a new board will have to fit between two existing boards. In order to fit the board in place, you'll have to remove the tongue and bevel the edge where the tongue was removed (*Inset Photo and Bevel Detail*). Then, use construction adhesive to hold this part of the board firmly in place (*First Floorboard*).

Nailing Boards—If the board is facing out into the open floor, then installation is pretty straightforward. Simply hammer a few finish nails through the tongue of the new board and into the sub-floor at a 45° angle (*Nailing Detail*). Then use a nail set to set the nails.

Installing the Patch—Once you have these concepts down, you should be ready to lay new flooring. If possible, fit the groove in a new piece onto the tongue of the piece next to it and nail or glue it down (*Middle Floorboards*). Work your way across the opening in this fashion.

Final Floorboard—To make the last piece of flooring fit, remove the tongue and bevel the long edge. Then, slide the piece into place, using construction adhesive and top nails to secure it (*Final Floorboard*).

The Finishing Touches—If the patch stands a little proud, a few passes with a hand plane should take care of that. Surround the patch with tape while planing so you won't damage the existing floor (*see Photo*).

If you used new floorboards like I did, your local paint store can help match the existing finish.

The New
WD-40®
Big Blast Can.

The next
big thing
for big
things.



It's the same great WD-40, with a new way to spray large areas fast. Use Big Blast to clean, protect, lubricate, and keep dirt and debris from sticking to: lawn mowers, engines, tractors and large equipment, wheel barrows and shovels, boats, and recreational vehicles.

If it's big, blast it.

wd40.com

Product Information Number 345

clean jig saw cuts DON'T FORCE IT

Questions &
ANSWERS

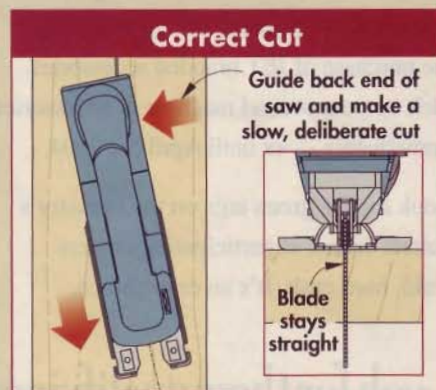
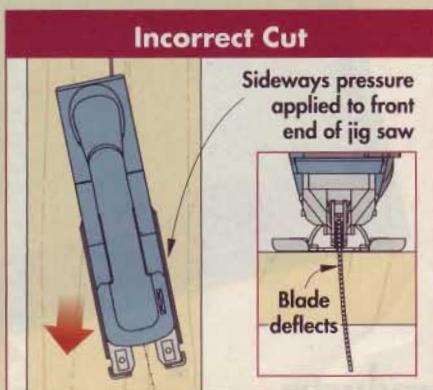
Q When I try to make tight curves with my jig saw, the cut is never perpendicular to the face of the board. What am I doing wrong?

Wayne Johnson
Grand Ledge, MI

A The first impulse when making a cut like this is to force the jig saw around the curve by applying too much forward and sideways pressure. But forcing the saw in this manner works

against the up-and-down motion of the blade. A lot of friction and heat build up, which bends the blade and causes a cut that's not perpendicular to the face of the workpiece (see *Incorrect Cut*).

To avoid this, let the saw do the work for you. Rather than forcing the saw around the curve, gently turn the back of the saw in the right direction and push it along the workpiece at the speed it wants to go, taking care not to apply sideways pressure (see *Correct Cut*).



A Tale of Two Outdoor Glues

Q In your June 2003 issue, you use Gorilla Glue, a polyurethane glue, to assemble the cedar bench. Would a moisture-resistant wood glue, like Titebond II, be a suitable substitute?

Wayne Shellock
Jackson, NJ

A Polyurethane glue is stronger and more durable than moisture-resistant wood glue. Even so, moisture-resistant glue will work fine for most outdoor projects.

If you're accustomed to working with yellow wood glue, then you might actually prefer moisture-resistant glue, as its application and drying time is the same as standard yellow wood glue.

Before using moisture-resistant glue, however, you'll want to make a couple considerations. First, most woods used for outdoor projects (cedar, redwood, and teak) are high in oil content. Moisture and oil prevent the curing of Titebond II, a water-based wood glue.

To get the best possible joint in woods high in oil or moisture, wipe the surfaces to be joined together with acetone (available at most home centers) 15 minutes before glue-up. Then apply the moisture-resistant glue and assemble the joint. Acetone is flammable, so have adequate ventilation for a large glue-up.





▲ The cast ribs underneath many band saw tables make clamping difficult. To create a flat clamping surface underneath the table (*Inset Photo*), use construction adhesive to glue wood blocks in the recesses formed by the ribs.

band saw blocks AID CLAMPING

When resawing thick stock into thin boards, I often clamp a fence to my band saw table. However, the “ribs” underneath the cast-iron table make it difficult to find a flat clamping surface. To solve that problem, I installed hardwood blocks in the recesses formed by the ribs (*see Photo at left*). The blocks create a flat, solid surface for easy clamping (*Inset Photo*).

The blocks will have to be customized to fit your table. An easy way to do that is to first remove the table. Then cut the blocks to shape to fit into the recesses.

Before installing the blocks, make sure they won't interfere with the operation of the saw. To find out, temporarily attach the blocks with double-sided tape, reinstall the table, and make a variety of cuts, changing blades and tilting the table during this process.

If everything checks out, glue in the blocks with construction adhesive. Just be sure the metal is clean and grease-free for proper adhesion.

*Richard R. Wegner
Joliet, IL*

WIN TOOLS for Shop Tips!



Richard Wegner wins this Drill Doctor 750 prize package for sending us his tip!

Mail your Shop Tips to:
Workbench Tips & Techniques
2200 Grand Avenue
Des Moines, IA 50312

Email: editor@workbenchmag.com

Speed Square ensures GREAT GLUE-UPS

When gluing and clamping a cabinet, it's all too easy to rack the corners out of square. To prevent that, clamp a *Speed Square* in one corner to keep the cabinet square while you clamp it together.

The square is held in place with C-clamps that fit through openings in the square. If necessary, enlarge the openings with a file.

*George Mason
Costa Mesa, CA*



table saw CROSSCUTTING TIP

Using a table saw to crosscut a wide, solid-wood panel to length is a challenge. The miter gauge isn't an option because you have to pull it so far back in front of the saw that it's no longer fully engaged in the miter gauge slot. So to get around that, I came up with a simple solution that guarantees accurate crosscuts.

This technique involves two things: clamping a metal guide underneath the panel and attaching a hardwood strip to the table saw. When you push the panel through the saw blade, the guide rides against the wood strip, ensuring a straight, accurate cut (see Photo).

For the guide, I use a manufactured product called a Clamp-N-Tool Guide (Inset Photo), but a straight scrap piece of wood clamped to the panel would also work. Note: Clamp-N-Tool Guides are available at many home centers and woodworking stores.

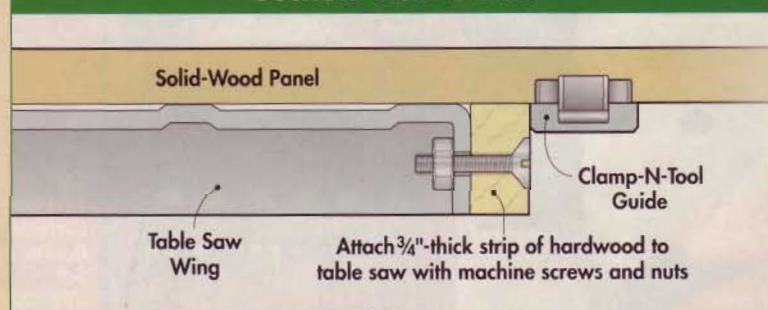
To set up a cut, you'll need to lay out two lines on the panel, both of which must be square to the edge of the panel. One of them indicates the cut line. The second line is used to position the guide. It's easy to determine the location of this second line. Just measure the distance between the blade and the outer edge of the wood strip attached to the saw.

Bruce Jackson
Phoenix, AZ



▲ To ensure accurate crosscuts, a Clamp-N-Tool Guide (shown at right) is secured to the bottom of the panel. It rides against a wood strip clamped to the table saw.

Section View Detail



pre-set roller heights

Save Tool Set-up Time

Like a lot of woodworkers, I use a roller stand to provide support for long workpieces. To make it as versatile as possible, I move the stand from tool to tool. But adjusting the height of the roller for each tool can get to be a nuisance.

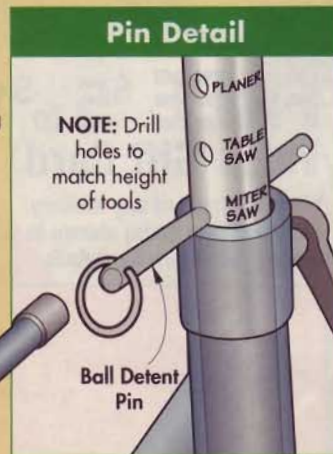
So to save time, I use a metal pin to hold the roller support at one of several pre-determined heights, each one corresponding to a different tool (see Illustrations at right). The pin is inserted into one of a number of holes that's drilled in the support post for the roller. If you label each hole for a specific tool, adjusting the height of the roller is automatic.

To prevent the pin from working loose, I used a ball-detent pin (available at most hardware stores). It has a spring-loaded ball that must be pressed in before you remove the pin.

Steve Tee
Covington, TN



Pin Detail



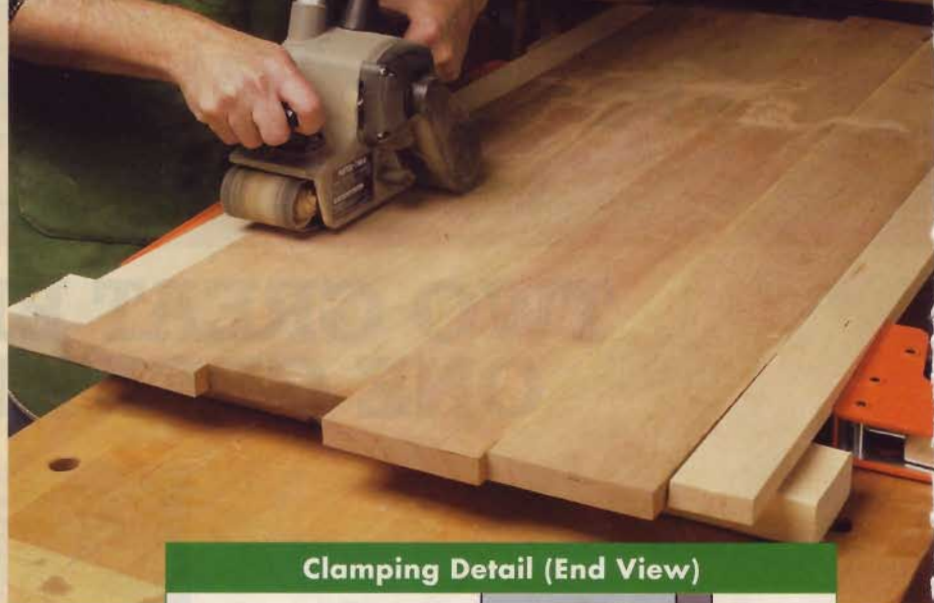
simple tip tames BELT SANDER

A belt sander is a great tool for sanding a solid-wood panel flat. But it only takes a momentary loss of concentration to accidentally tip the sander and round over the edges of the panel.

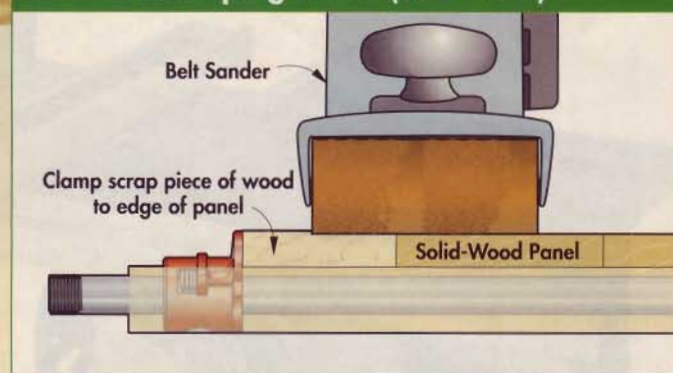
To stabilize the belt sander, I clamp scrap pieces of wood to the edges of the panel before I start sanding (see Photo and Illustration at right). That way, I can sand right up to — and even across — the edge of the panel, without worrying about rounding the edges.

Scott Sailor
Battle Creek, MI

Editor's Note: For more tips on sanding a panel flat, turn to page 57.



Clamping Detail (End View)



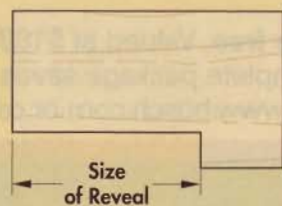
align shingles perfectly with 2x4 Gauge

When installing roof shingles, I use a wood block as a gauge to establish the proper reveal from one course of shingles to the next (Illustration, left).

The gauge is just a scrap 2x4 with a shallow notch that's the same length as the desired reveal, 5" in my case (see Illustration below).

To use the gauge, set the notch in the block against the bottom edge of the previous course of shingles. Then, align the next course with the top of the gauge.

Helen Melnick
Philadelphia, PA



locating electrical boxes INK MARKS THE SPOT

I've never had much luck when cutting the openings in drywall for electrical boxes. No matter how carefully I measure and then lay out the opening, it always seems to be off just a bit.

My solution is to attach self-adhesive foam weatherstripping to the front of the box, apply ink, and press the drywall against the box (see Photo below). This gives me a perfect outline of the box that shows me exactly where I need to cut (Inset Photo). Note: Ink bottles are available at most stationery stores.

Jerry Syfert
Naples, FL



get super-smooth SCROLL CUTS

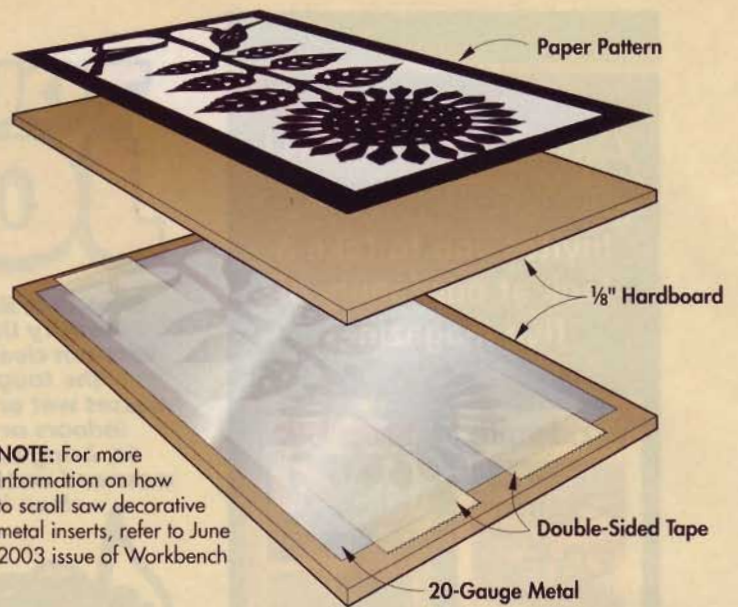
Recently, I built the outdoor wall lantern project from the June 2003 issue of *Workbench*. When it was time to scroll saw the decorative metal inserts, I used a different method of preparing the cutting package for the thin sheets of metal, which resulted in a crisp, clean cut.

With this method, the metal is “sandwiched” between two pieces of 1/8" hardboard. To prevent the metal from slipping around during the cut, it's secured to the bottom piece with strips of double-sided tape (see *Illustration at right*). The tape also holds the whole package together. As for the paper pattern, it's applied to the top piece of hardboard with spray adhesive.

Once the cutting package is put together and you start scrolling (see *Photo at right*), the real beauty of this technique comes into play (even though you won't be able to see it just yet). As the scroll saw blade moves up and down, the hardboard acts as a rigid backerboard, preventing the freshly cut edges of the thin metal from lifting.

Since the metal remains flat, you'll end up with crisp, clean cuts when you open the package, requiring little, if any, sanding.

Loren Gunderson
Bethalto, IL



NOTE: For more information on how to scroll saw decorative metal inserts, refer to June 2003 issue of *Workbench*



vacuum-sealed brush

“Cans” Clean-Up

Those “vacuum packer” kitchen appliances that you've undoubtedly seen advertised on TV infomercials are good for more than just storing dinner leftovers in airtight plastic bags. To avoid having to clean my paint brushes, I save them overnight in a vacuum-sealed bag (see *Illustration below*).

The bag prevents air from getting inside, so the brush won't dry out. This means I can pick right back up where I left off the day before.



Vacuum-Sealed Bag

John Szarek
Smithfield, VA

dust separator upgrade FOR EASY EMPTYING

I purchased a dust separator recently to put on a plastic trash can. The idea behind the separator is that the heavy chips fall into the trash can, while the smaller particles are pulled into the dust collector.

To make it easier to empty the trash can, I lined it with a plastic bag. The only problem is when I turned on the dust collector, the bag got sucked into the exit port of the separator, causing it to clog. To prevent that, I made a T-square to hold the bag down. It's just a couple of scrap 1x4s that are cut to fit snugly in the trash can.

William Simmons
Potsdam, NY

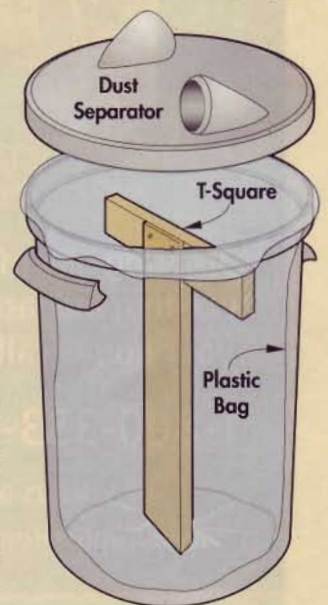




Table Saw WORK SUPPORT

Crosscutting long boards or sheet material on a table saw can be a challenge. This is especially true if you don't have proper support on the side of the saw for long pieces.

Here's a quick solution — a pair of shop-made supports that hold a length of PVC pipe. The pipe has a slick surface, so workpieces will easily slide across it as you make a cut.

Adjustable Height — Another useful feature of these supports is they can be adjusted up and down. This makes them ideal to use as a side support for a drill press, as well (see page 26).

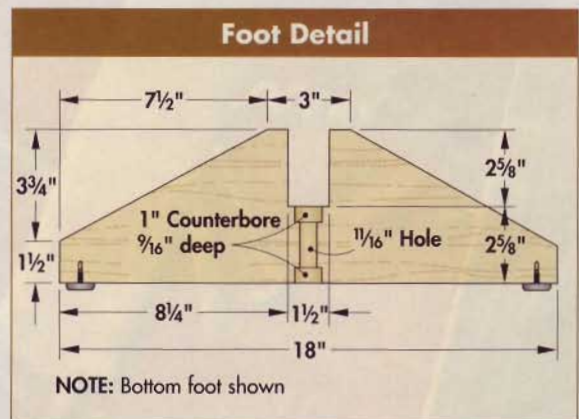
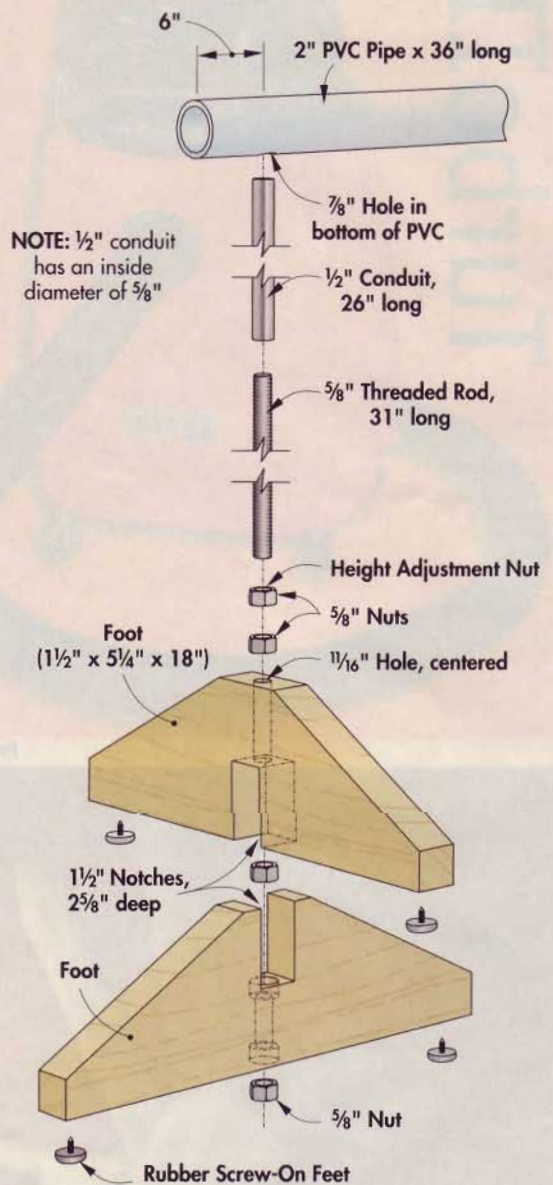
To make the supports adjustable, the base of each unit holds a tall, threaded rod. A length of electrical conduit fits over this rod. This conduit is what actually supports the

plastic pipe. To adjust the height of the pipe, just turn a nut up or down against the bottom end of the rod to raise or lower the conduit.

Build the Base — The base of each support is made up of two interlocking feet (Illustration, right). Each foot is cut from a 2x6, notched as shown in the *Foot Detail*, and then trimmed at an angle to give the foot a slimmer profile.

One thing to note is that, unlike the top foot, the bottom foot has two counterbored holes drilled in it. These counterbores form pockets for two hex nuts that are used to secure the threaded rod in the base.

Add the Pipe — After completing the bases, it's just a matter of cutting the pipe to length, drilling holes to fit over the conduit, and then assembling the support.



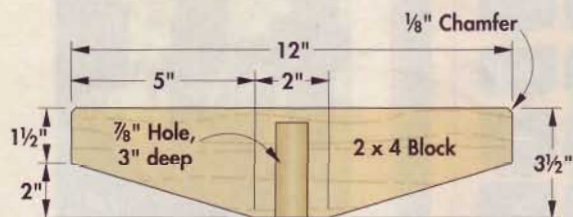
drill press SIDE SUPPORT

The work support also comes in handy for use with a drill press. After all, you frequently need to adjust the height of the drill press table, so the support's built-in height adjustment mechanism means it's tailor-made for helping keep things level when drilling long boards.

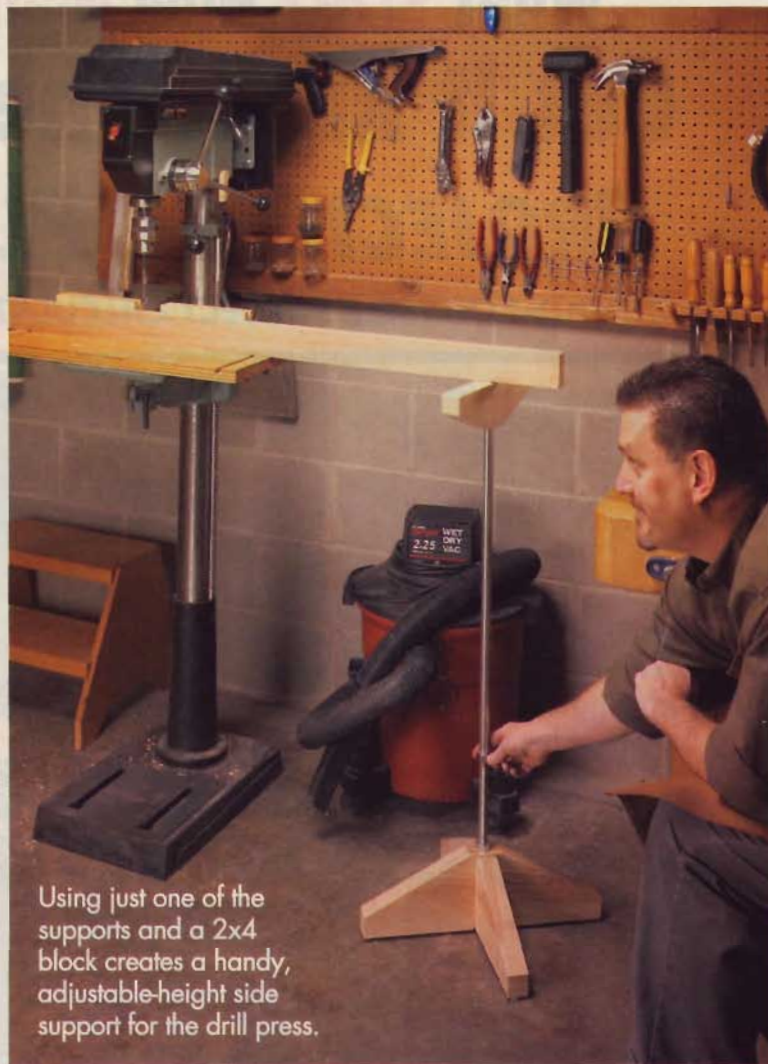
In this case, the long plastic pipe isn't needed. In fact, a short 2x4 block is all it takes to convert the table saw work support into a side support for a drill press.

Here again, you'll need to drill a hole in the bottom of the block to fit onto the conduit (see *Illustration below*). I also trimmed the bottom edge of the 2x4 at an angle as shown, and routed a chamfer around the top edge.

Breaks Down for Storage — This work support can be partially disassembled to fold flat for storage (see *Figs. 1 and 2 below*). Then stand the folded unit on the floor, and snap it into broom clips mounted on the wall.



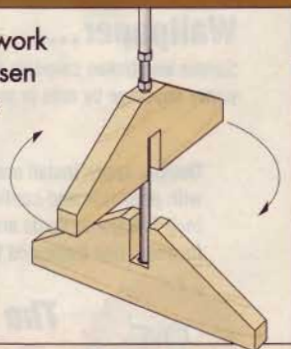
DRILL PRESS SUPPORT



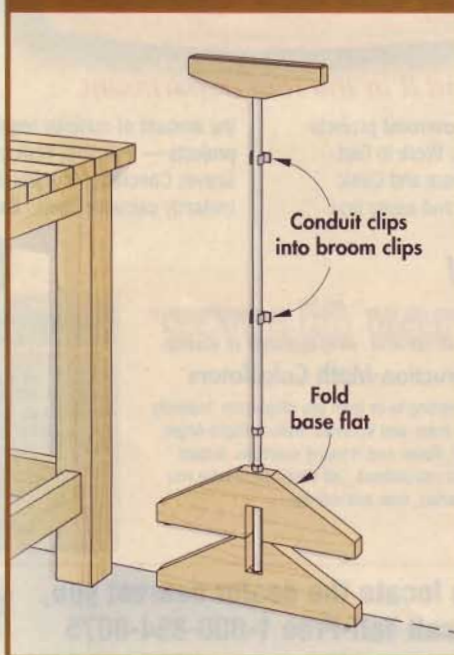
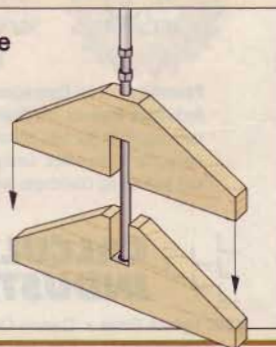
Using just one of the supports and a 2x4 block creates a handy, adjustable-height side support for the drill press.

COMPACT STORAGE

1 To store the work supports, loosen the top two nuts so you can separate the base pieces. Then lift the upper foot and spin it around.



2 Now slide the upper base piece against the lower piece and hand tighten the two nuts to hold them together.



\$350

Send Us Your
SHOP
IDEAS

If we publish plans for one of your shop jigs or accessories in *Reader's Workshop*, you'll receive \$350!

Mail your ideas to:

Workbench Reader's Workshop
2200 Grand Avenue
Des Moines, IA 50312

Email: editor@workbenchmag.com

a better way to CUT COVE MOLDING



Cutting a cove in the face of a board can be a bit tricky. The common method is running a board diagonally across a table saw blade.

Although this approach works okay, it's not exactly what a table saw blade is designed to do. And the usual result is a cove with a bunch of saw marks that require a lot of time-consuming sanding or scraping to remove.

New Way to Cut Covs — Enter Lonnie Bird's Cove Cutterhead from CMT. The cutterhead mounts on a table saw just like a regular saw blade (see Bottom Photo).

The first time I cut a cove with this tool, everything went smoothly. There was much less vibration than with a table saw blade. And the cove itself was smooth and nearly free of saw marks. In fact, cleanup just took a couple passes with some sandpaper.

Cutterhead Anatomy — The reasoning behind this smooth cut can be traced to the design of the cutterhead. It's a beefy, $\frac{5}{8}$ "-thick steel disk that's built to handle the force

of a workpiece being fed diagonally across it. Six thick carbide teeth with rounded profiles easily scoop out material as you make a cut.

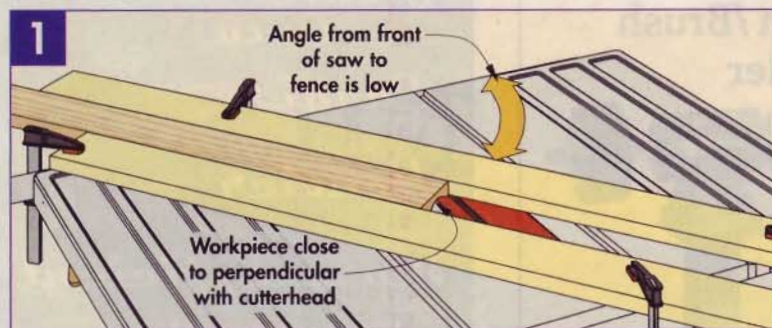
Cutting Covs — To cut a cove, the first step is to clamp two fences to the table saw at an angle to the cutterhead. This angle will determine the final profile of the cove (see Figs. 1 and 2, below).

With the fences in place, set the height of the cutterhead $\frac{1}{16}$ " above the table and make the first pass. Raise the cutterhead $\frac{1}{16}$ " after each pass until you reach the desired depth (Main Photo). For the final pass, raising the cutterhead just a hair produces a smooth, almost polished surface.

Pricing — The Cove Cutterhead sells for \$180 by itself, or as part of a Crown Molding Set for \$340. The set includes six router bits that allow you to make your own custom crown molding. All in all, the cutterhead and router bit set are worth a closer look. Call 888-268-2487 or visit CMT's website at www.cmtusa.com

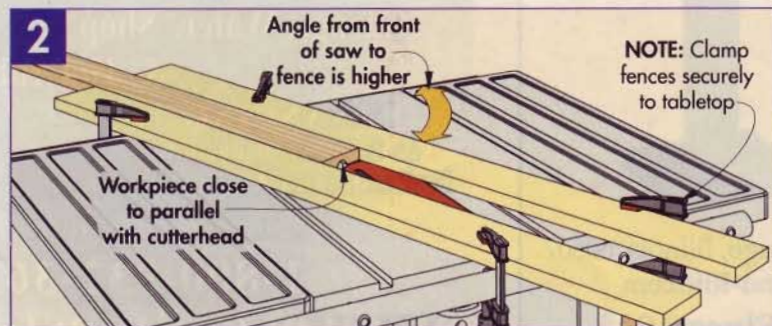


▲ This beefy cutterhead produces an amazingly smooth cove cut. Just feed the workpiece across it at an angle, raising the cutter $\frac{1}{16}$ " between passes.



◀ WIDE COVES

To cut a wide cove, set the two auxiliary fences at an angle that is nearly perpendicular with the cutterhead.



◀ NARROW COVES

For a narrower cove, simply adjust the fences so that they are almost parallel with the cutterhead.

a blade for great GLUE-UPS

This new Glue Line Rip Blade from Freud Tools is the type of cutting technology I like to see — a blade that eliminates a step from a common woodworking task.

Smoother Edges — Edge-gluing two boards together usually requires two tools: a table saw to rip the boards and a jointer to produce a straight edge. But Freud's new blade leaves such a smooth edge when ripping that I feel comfortable going straight to glue-up without jointing. This is possible for several reasons.

A New Tooth Design — First, between each raker tooth on the blade is a triple chip tooth with the corners ground off (see *Illustration below*). This feature keeps saw marks to a minimum.

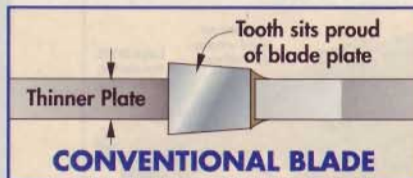
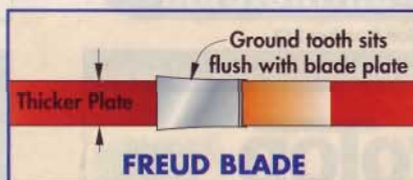
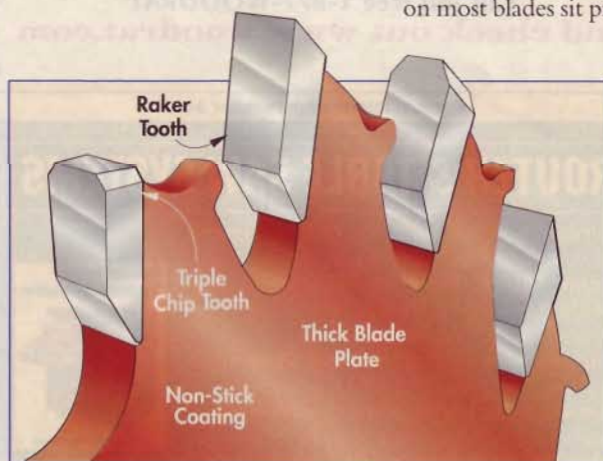
Ground Sides — Second, while the teeth on most blades sit proud of the blade

plate, the teeth on Freud's blade are ground on the sides to sit almost flush with the blade (*Details*). This enables the teeth to smooth the cut edge, much like a burnishing tool.

Thick Plate — Compared to a conventional blade, the plate on the Freud blade is noticeably thicker (*Details*).

This ensures that the blade will stay flatter and more stable for a longer cutting life. Like most Freud blades, it also has laser-cut slots to reduce vibration (see *Photo*).

Freud's Glue Line Rip Blade sells for between \$60 and \$70, which is comparable to most other 30-tooth rip blades on the market. For more information, call 800-472-7307 or visit www.FreudTools.com



Invincible Utility Knife Blades?

Nearly everyone has snapped a utility knife blade at one time or another. But Lenox may have put an end to these moments with their new Lenox Edge blades.

Most utility knife blades are made of inflexible carbon steel. But the Lenox Edge has a cutting edge of high-speed steel (a steel alloy designed for high-speed machining) joined with a flexible alloy backing. The result is a blade with a sharp cutting edge that won't snap. Lenox also squared up the blade ends to eliminate the part that breaks most often — the tip.

The Lenox cuts great for daily use, so I decided to really put it to the test — I clamped a Lenox Edge and a standard utility knife blade in a vise and hit them both with a hammer. While the standard blade broke after just one blow, I struck the Lenox Edge repeatedly and could only bend it (see *Photo*).

Lenox blades sell in packs of five for about \$3 and 50 for \$19. Call 800-628-8810 or visit Lenox's website at www.LenoxSaw.com



The Cutting EDGE

a cleaner cutting COUNTERSINK

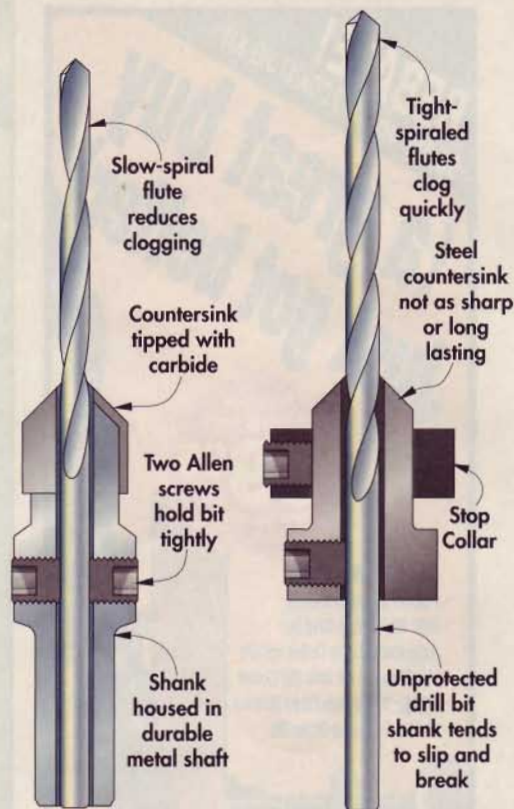
The first time I used Amana's Carbide-Tipped Countersink, it definitely made me take notice. The bit cut a much cleaner hole than a steel countersink, with less chipout around the rim of the hole.

Carbide Tip — And you can bet that the Amana Countersink will continue to cut better than conventional bits. That's because the countersink is carbide-tipped, so it stays sharper longer, which is especially important when working with plywood or MDF.

Slow-Spiral Bit — Another feature is that the flutes on the Amana drill bit wrap around in a "slow spiral" (see *Illustrations at right*). As a result, it doesn't clog with shavings as readily as the tight spirals on a conventional bit.

Metal Shaft — As a final innovation, the shank of the Amana bit is housed in a metal shaft. This prevents the bit from slipping or breaking like conventional countersink bits sometimes do.

Amana's carbide countersinks cost about \$25. Call 800-445-0077 or visit www.AmanaTool.com



**AMANA
COUNTERSINK**

**STANDARD
COUNTERSINK**

Your best efforts deserve Weyerhaeuser ChoiceWood™ hardwood.

Traditional Red Oak, easy-to-work Poplar, and select Maple in a wide variety of convenient sizes — all ready-to-use and readily available at home improvement centers and hardware stores from coast to coast. Get your

hands on ChoiceWood hardwood, and put heirloom quality at your fingertips.

**Weyerhaeuser
ChoiceWood™**

*Absolutely defect-free —
every piece, every time.*

 **Weyerhaeuser**

Product Information Number 210



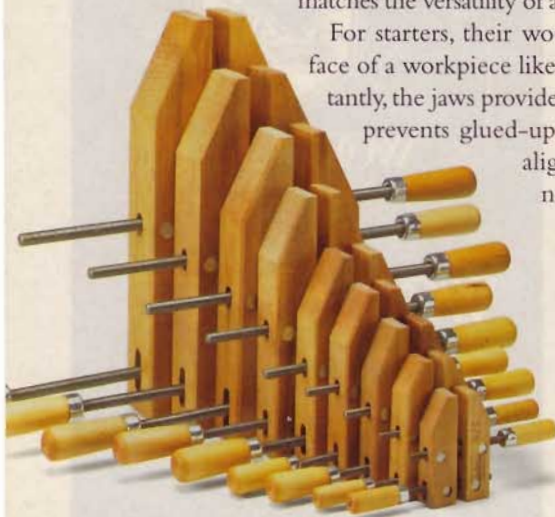
HANDSCREW CLAMPS REVISITED

Simply put, handscrews can handle a lot of jobs other clamps can't. No matter how many different clamping devices become available, none matches the versatility of a traditional handscrew clamp.

For starters, their wood jaws won't mar the surface of a workpiece like metal clamps. More importantly, the jaws provide even clamping pressure that prevents glued-up parts from twisting out of alignment. This makes them a natural for laminating thin wood strips (see Photo above).

Of course, there are many other clamping operations that make handscrews invaluable around the shop. For example, their deep reach makes them ideal for clamping a workpiece to a bench. They provide an extra hand for safely machining small parts. And the jaws of a handscrew have the unique ability to be offset, which is essential for clamping non-parallel surfaces.

Well, the list could go on. Actually, it *does* go on — we've compiled a list of our ten favorite handscrew tips, beginning on page 36. But first, take a look at the next page for a quick refresher on how they work.



HANDSCREW CLAMP SOURCES

Handscrew clamps are available in a variety of sizes from the sources at right. The jaws range from 4" to 24" long, with multiple sizes between.

- **Adjustable Clamp Company**
312-666-0640, www.adjustableclamp.com
- **Bessey**
800-828-1004, www.besseyclamps.com
- **Woodcraft**
800-225-1153, www.woodcraft.com

Handscrew Anatomy

There's a good reason handscrew clamps have been around so long — ingenious design. A handscrew consists of two wood jaws and a couple of metal spindles (a tuner and a tightener) that thread through steel dowels. Near the middle of each spindle, the threads reverse, allowing you to quickly open and close the jaws. Slots in the jaws provide clearance for spindle movement when clamping non-parallel surfaces.

THREADS REVERSE in the middle of each spindle, enabling the handscrew to open and close quickly

WOOD JAWS have a long reach and won't mar workpieces like metal clamps

SLOTS allow the jaws to be offset for clamping non-parallel surfaces

WOOD HANDLES attach to the spindles with steel ferrules

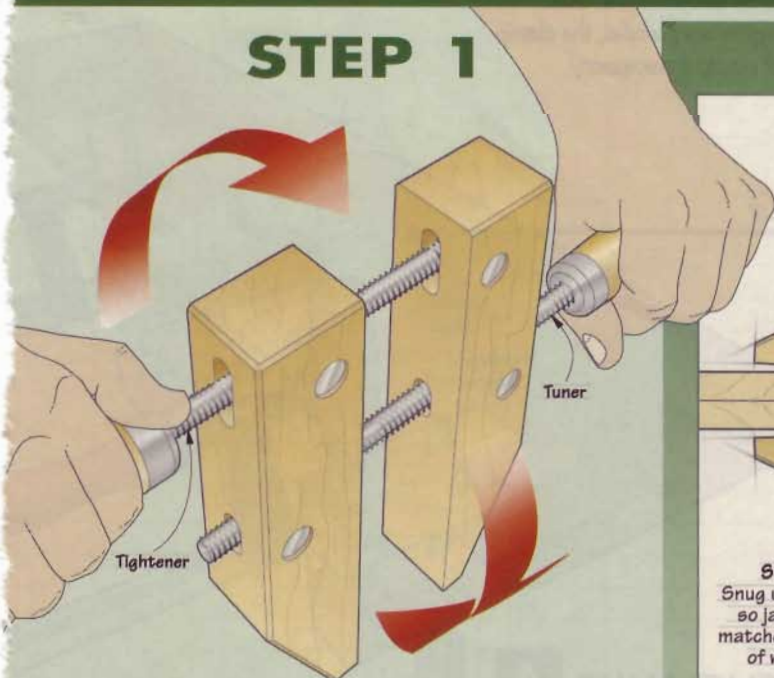
THE TIGHTENER is the threaded spindle that applies the clamping pressure

STEEL DOWELS accept the threaded spindles for easy adjustments

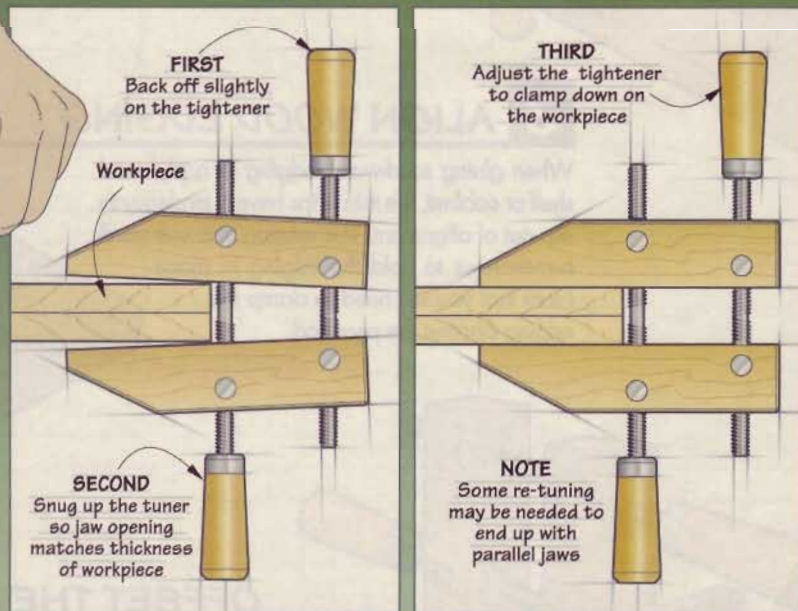
THE TUNER is the spindle used to make fine adjustments to the jaw opening

TWO-STEP HANDSCREW ADJUSTMENT

STEP 1



STEP 2



▲ Adjust Jaw Opening

To adjust the size of the jaw opening quickly and evenly, grasp the tuner handle in one hand and the tightener in the other. Then crank the spindles like you're pedaling a bicycle. Rotate the jaws away from you (shown here) to close the opening. Spin them toward you to open it.

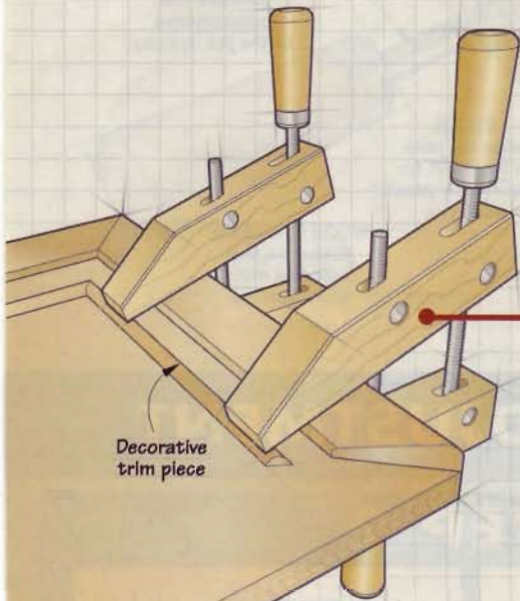
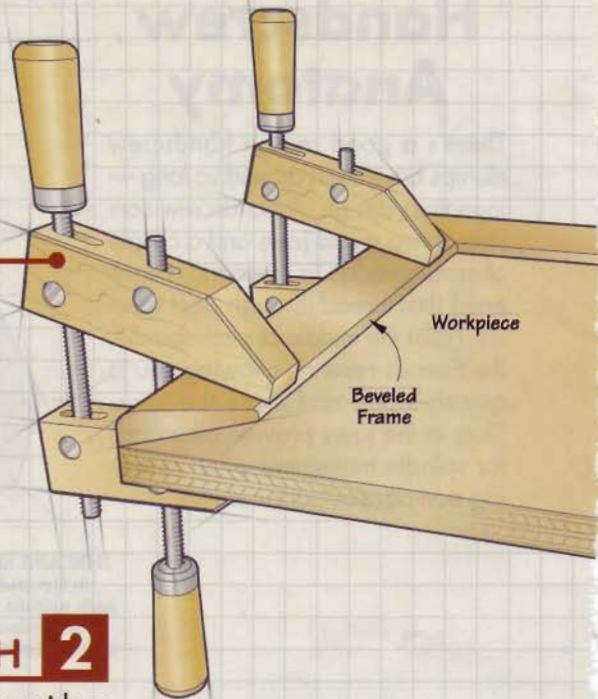
▲ Apply Clamping Pressure

After adjusting the jaw opening to roughly match the thickness of the stock, slip the handscrew over the workpiece. Then back off on the tightener and snug up the tuner. Next, turn the tightener handle to apply clamping pressure. The goal is to end up with tightly clamped jaws that are parallel to the faces of the workpiece. If this isn't the case, readjust the tuner as needed, and re-apply pressure with the tightener.

10 BEST HANDSCREW TIPS

1 NON-PARALLEL SURFACES

The two independently threaded spindles of a handscrew enable the jaws to apply even pressure to non-parallel surfaces, as on this beveled frame. Simply adjust the tightener to open the jaws wide. Then, adjust the tuner to close the front of the jaws.

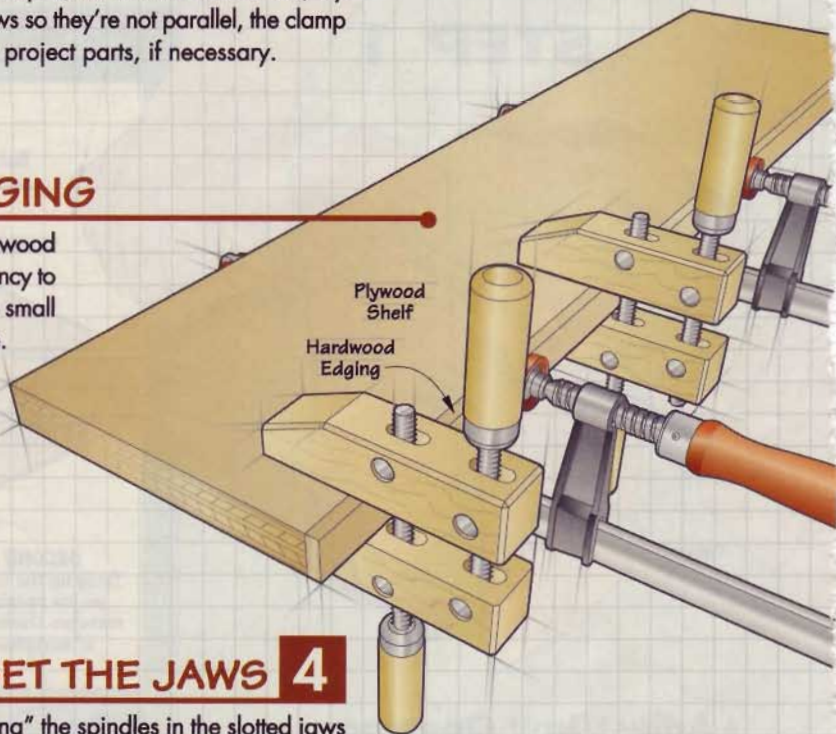


A DEEP REACH 2

The long jaws on this handscrew provide a tremendous amount of reach, extending farther in from the edge of a workpiece than other types of clamps. That's just the ticket for applying decorative trim to a project, as shown here. Also, by adjusting the jaws so they're not parallel, the clamp can reach over project parts, if necessary.

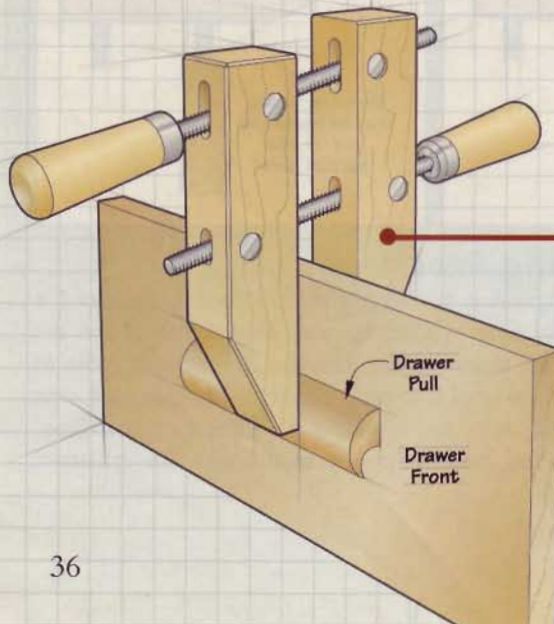
3 ALIGN WOOD EDGING

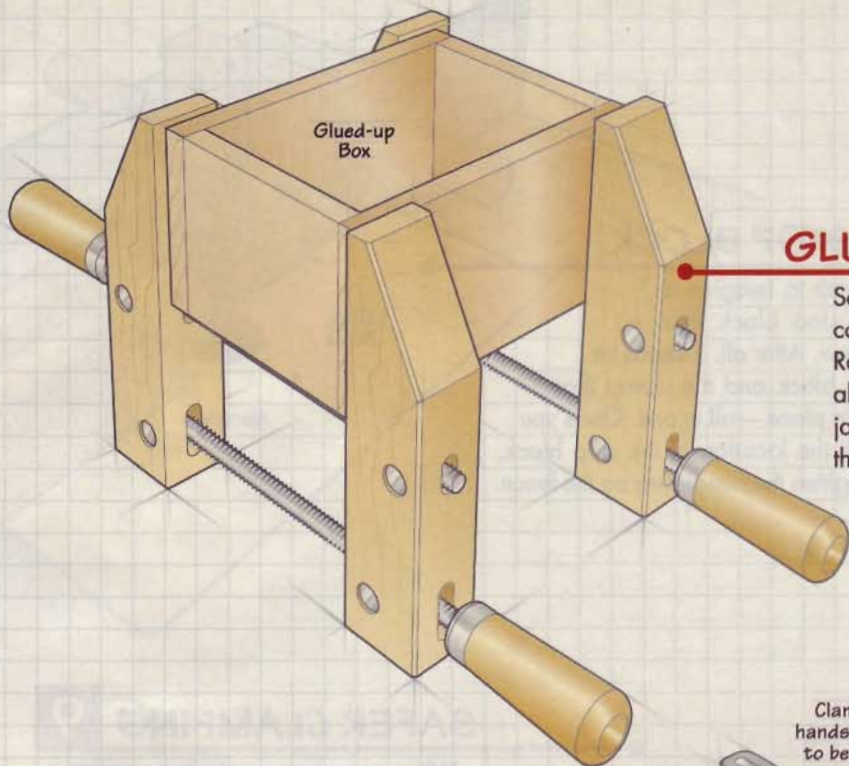
When gluing solid-wood edging to a plywood shelf or cabinet, the thin strips have a tendency to slip out of alignment. The solution is to use small handscrews to hold the edging in place. Note that you still need to clamp the edging against the plywood.



OFFSET THE JAWS 4

By "racking" the spindles in the slotted jaws of a handscrew, you can offset the tips of the jaws. This comes in handy when you need to apply clamping pressure to two parts that don't align with one another, as when gluing a drawer pull to the front of a drawer.



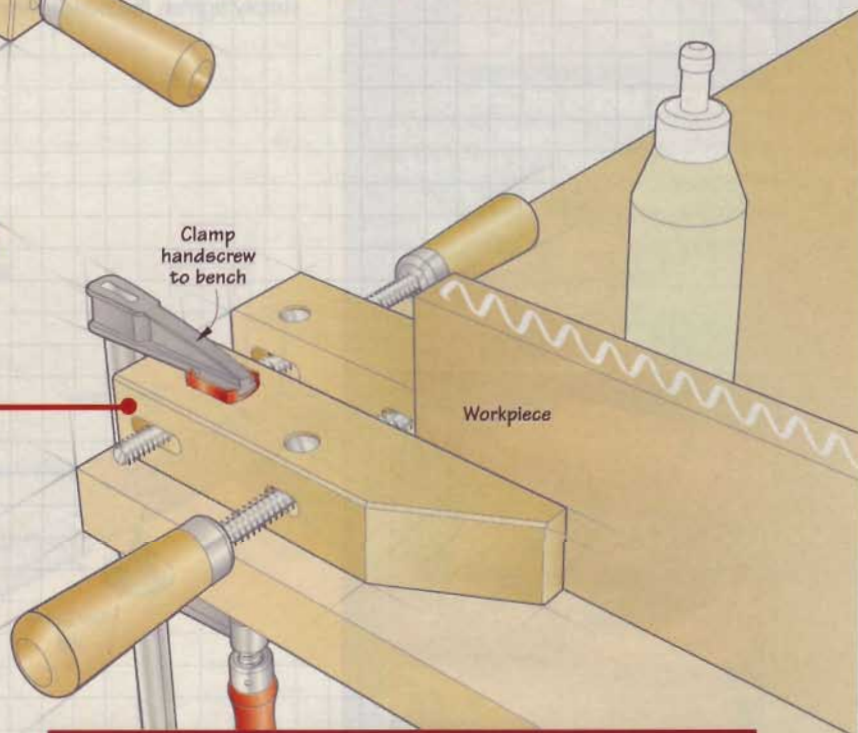


GLUING SMALL PROJECTS 5

Sometimes you can glue up an entire project with just a couple of handscrews. Take this small box for instance. Rather than using a number of clamps to apply pressure all around the box, simply nestle the box between the jaws of the handscrews and tighten them. Just make sure the jaws are parallel to one another.

6 BENCHTOP VISE

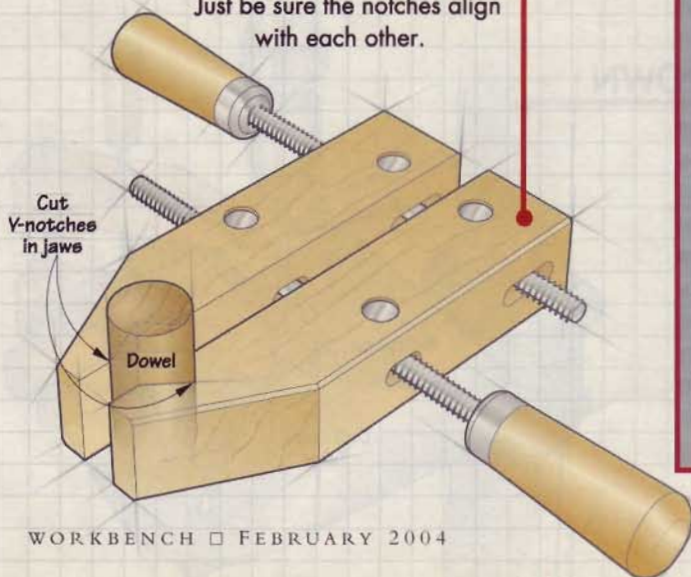
The flat sides of the jaws make a handscrew a convenient benchtop vise. For example, when applying glue to the edge of a workpiece, you can keep it from tipping over by clamping it in a handscrew, which in turn is clamped to the benchtop.



7 ROUND PIECES

By cutting a V-shaped notch in each jaw of a handscrew, you can make a great clamp for holding dowels or other round objects. This comes in especially handy when you need to hold a dowel steady for drilling.

Just be sure the notches align with each other.

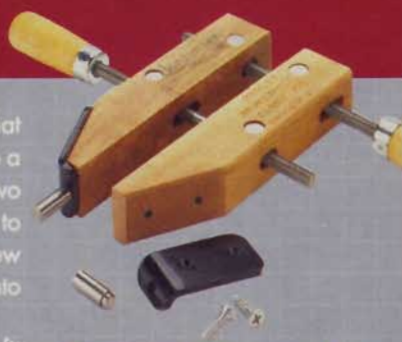


Miter Kit

Here's a neat accessory that converts a handscrew into a miter clamp. It consists of two metal brackets that mount to the jaws of the handscrew and two pins that thread into holes in the brackets.

To clamp a miter joint, fit the pins into holes drilled in the back of the pieces. Then apply even clamping pressure, carefully drawing the mitered pieces together.

For more information, visit AdjustableClamp.com or call 312-666-0640.



Handscrew Maintenance



▲ **REMOVE EXCESS OIL**—The wood jaws of new handscrews are pre-oiled to prevent glue from sticking to them. But this oil can transfer to the surface of a workpiece. To soak up excess oil, clamp the jaws against a paper towel overnight before using the handscrew.



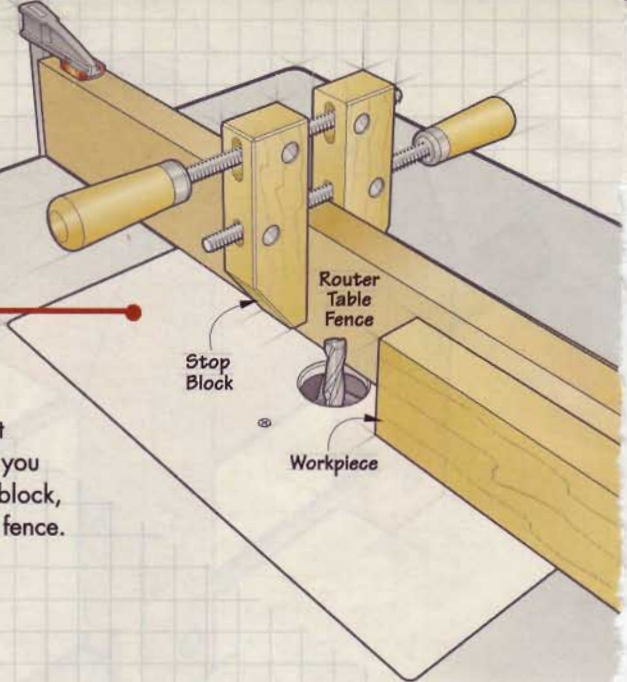
▲ **SAND THE FACE**—To avoid marring a workpiece, sand off any dried glue. Then apply a coat of oil-based finish.



▲ **LUBE THE SPINDLES**—Spraying the spindles with WD-40 will keep them operating smoothly and prevent rust.

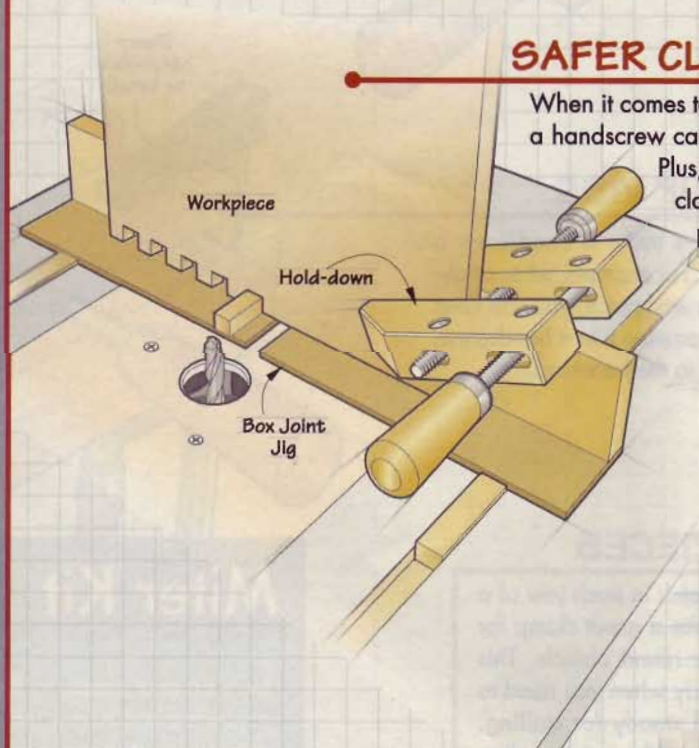
8 STOP BLOCK

It's difficult to imagine a simpler stop block than a handscrew. After all, it serves as the stop block *and* the clamp that holds it in place—all in one. Once you establish the location of the stop block, simply tighten the handscrew on the fence.



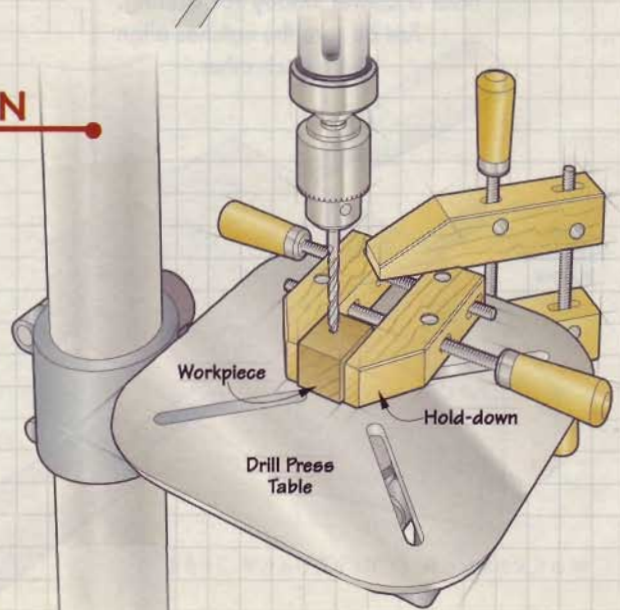
9 SAFER CLAMPING

When it comes to machining operations, a handscrew can be a real finger-saver. Plus, it can go where a metal clamp can't or, more to the point, where it *shouldn't*. Unlike a metal clamp, it's not a big deal if a bit or blade comes in contact with the wood jaws of a handscrew.



10 HOLD-DOWN

A handscrew is ideal for securing a small piece on the drill press. After clamping the workpiece, secure the handscrew to the drill press table, as shown. Now you can drill the hole without having to worry about the workpiece spinning around.



WORKBENCH

TOP 10

INNOVATIVE

TOOLS

2004

From many come 10 — The Top 10.

Once again, the editors of *Workbench* have culled the lengthy list of new tools introduced in the past year to recognize the most extraordinary among them. And in acknowledgment of their breakthrough contributions to the way we work with wood, we are pleased to honor these tools as the *Top 10 Innovative Tools for 2004*.



Powermatic 15S

SPIRAL BLADES — SMOOTH CUTS

TOP 10 TOOLS
2004 WINNER

One of the most well-worn shop tips is the one about feeding a board through a planer at a slight angle so the knives will slice the wood instead of tearing it. It's a good tip — until you find yourself planing a board that's at, or close to, the full capacity of your planer. This leaves no space to angle the board as you feed it.

Fortunately, Powermatic took that tip and applied it to the design of their newest 15" thickness planer. The 15S planer features a three-knife cutterhead in which the knives spiral around the head (see Photos on page 40).

The obvious benefit to this design is that the blades are always at an angle to the stock. Based on our extensive use of this planer, the results are fantastic.

We fed a variety of soft and hardwoods through the planer and without exception, we've been completely satisfied with the quality of cut. Even at the higher feed rate of 20 fpm (this planer also has a slow-feed speed of 16 fpm), the spiral cut-

ters leave a smooth, flawless surface in most stock. Only when working with the most demanding stock (such as bird's-eye maple) was it necessary to shift the planer into low speed to get the best possible surface quality.

The key to this system lies in the flexibility of the knives, which allows them to follow the spiral of the cutterhead (Fig. 1). These single-edge, high-speed steel knives are held in place with five gibs (blade hold-downs). The gibs are curved to follow the spiral.

Replacing blades is simple. The blades and gibs both have indexing holes. Combine that with a blade adjustment tool (included with the planer) and getting the blades perfectly aligned is automatic.

Making the 15S an even more outstanding planer are features such as cast-iron support tables, a digital scale, and built-in casters (Fig. 2 and Photo at right).

At a Glance

Price:	\$1,800
Motor:	230-volt, 3-hp
Capacity:	147/8" x 6"
Feed Rate:	16 & 20 FPM
Number of Knives:	3
Cuts Per Minute:	13,500
Warranty:	1 year

Virtues: Spiral cutterhead makes shearing cut for a smooth surface. Large cast-iron tables. Built-in casters. Two-speed.

www.WMHToolGroup.com
847-851-1000

The digital scale on ▶ this planer can be set to indicate either the desired thickness, or the amount of material being removed.

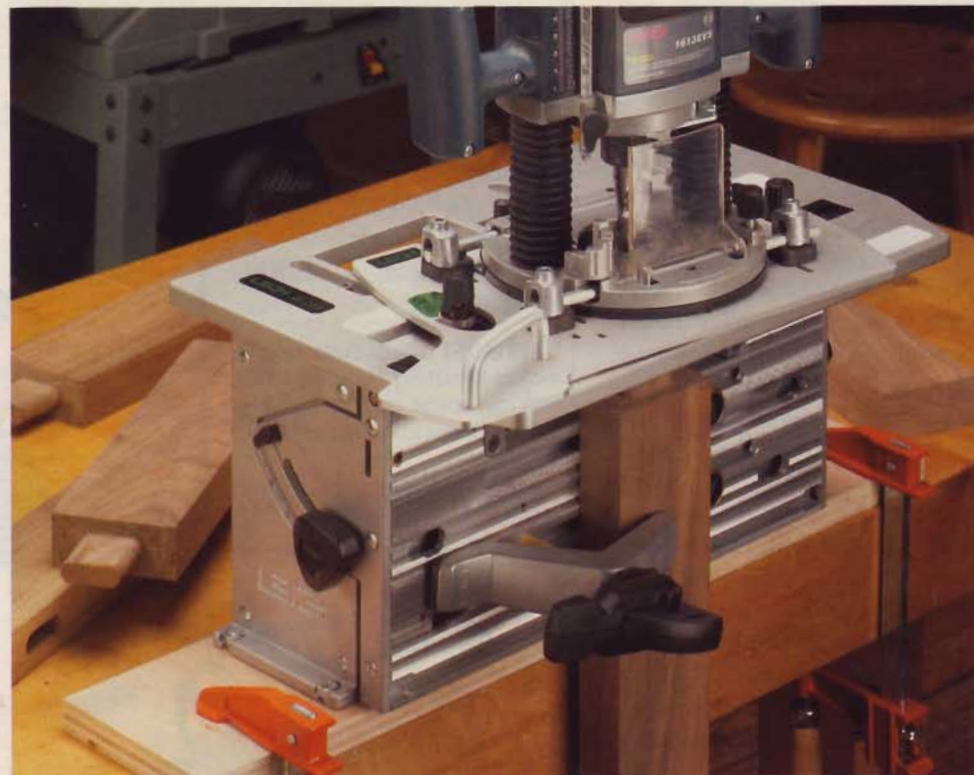
◀ Flexible steel knives follow the spiral contour of the cutterhead. Curved gibs hold the knives in place.



▲ Cast-iron infeed and outfeed tables combine for an impressive 48" of total stock support. The enclosed cabinet also has built-in casters for moving the heavy machine.

Leigh Industries FMT Jig

SIMPLIFIES MORTISE & TENON JOINERY



At a Glance

Price: \$800

Requires: 1/2" plunge router

Dimensions: 8" x 12" x 14"

Max Tenon: 1/2" x 2 1/2" x 5"

Warranty: 5 years

Virtues: Simplifies mortise and tenon joinery with inventive guide system and logical, clear instructions for use.

www.LeighJigs.com

800-663-8932

◀ Leigh's FMT jig partners with most plunge routers to become an incredibly versatile mortise and tenon machine.

Until the advent of the Frame Mortise and Tenon Jig from Leigh Industries, my technique for making mortise and tenon joinery involved a minimum of two large power tools and a great deal of time and effort.

Typically, I'd cut the mortises by drilling several holes with a Forstner bit and then square them up with a chisel.

The tenons I cut on my tablesaw with a tenoning jig.

After a few large projects using this methodology, I felt I'd become quite efficient setting up and cutting dead-on mortise-and-tenon joints. The FMT, however, changed my idea of what efficient is.

Quite simply, the FMT takes all the hard work and fussiness that's inherent

to mortise and tenon joinery and very nearly eliminates it. If you can operate a plunge router and follow simple instructions, you can easily use the FMT jig to build furniture using mortise and tenon joints.

Shown in action (*above*) and as a kit (*below*), the FMT consists of a jig body that positions the workpiece and guides the router, a sub-base that will accept most brands of plunge router, a 5/16" spiral upcut bit, five templates that make over 20 sizes of mortise and tenon joints, and all the necessary tools, hardware, and clamps.

The most important component of this system, however, has to be the user's manual. This clearly illustrated and plainly-written manual guides you through the setup and operation of the jig with a perfect blend of theory and step-by-step instructions.

Setup and Operation

The FMT requires you to do little more than decide the size of mortise





▲ Cam-action clamps and adjustable stops ensure perfect and secure placement of the workpiece. Clamps and stops can be used in various locations to accommodate different stock sizes.

and tenon you wish to cut and then match that to the appropriate bit and template combination. From there, locate the center of the cuts. Then use the adjustable stops to position the workpiece and the cam clamps to hold it firmly in position (Fig. 1).

At this point, the FMT pretty much takes over. A set of pins in the router sub-base positions the router on the jig body (Fig. 2).

One pin rides in a fixed track to control the side-to-side movement of the router. The second pin tracks around the perimeter of the template to cut the tenon and inside the template to cut the matching mortise (Fig. 2a). This template pin is microadjustable, which allows you to fine-tune the fit of the joint.

Versatility

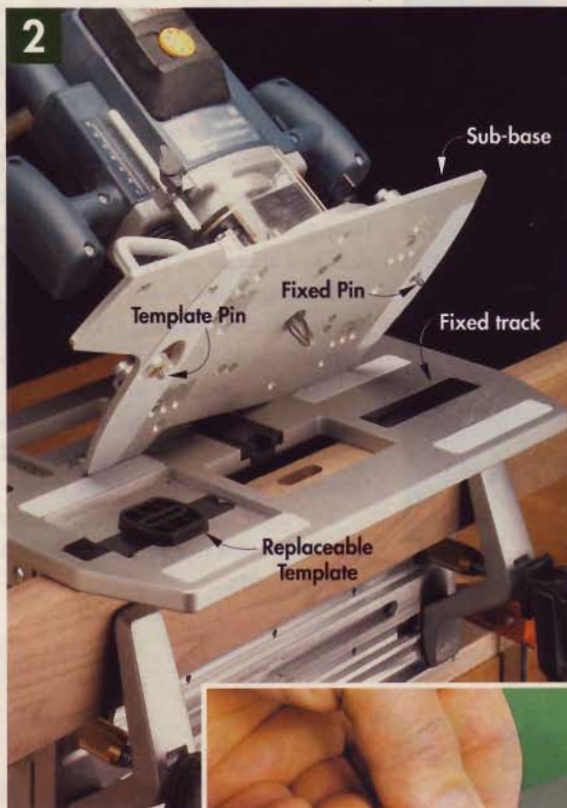
The FMT also receives high praise for the incredible array of mortise and tenon joints it can cut — anywhere between a matchstick and a

3"-wide x 5"-long tenon is all in a day's work for this versatile jig (Figs. 3 and 3a).

Likewise, the FMT simplifies even very challenging variations of mortise and tenon, including angled tenons and even double, triple, and quadruple mortise and tenon joints.

It's important to note here, however, that this range of versatility requires you to purchase additional templates and router bits. This adds significantly to the cost of the FMT (about another \$320 if you want every possible variation).

And on the subject of cost, there's no denying that FMT is a sizable investment. On the other hand, when I compare it to the price of the nearest alternative — that being a dedicated mortiser and a tenoning jig for the table saw — and then factor in how much faster and more accurate this system is than any other manner of cutting mortise and tenon joints, it looks like a bargain to me.



◀ Pins on the sub-base follow guides on the jig top to cut perfect-fitting mortise and tenon joints.

▼ The basic FMT jig comes with five templates that are capable of more than 20 sizes of mortise and tenon joints.



▲ From matchstick-sized tenons to triple and quadruple joints, the FMT offers almost endless possibilities for mortise and tenon design.



VersaSaw

DRILL-DRIVEN 'RECIP' SAW

TOP 10 TOOLS

2004 WINNER

The VersaSaw from Pro Tool Manufacturing represents the first viable alternative to shelling out about \$100 for a moderately priced reciprocating saw that you might only use a few times a year. For about \$40, this innovative accessory turns your drill into a potent, occasional-use recip saw. The VersaSaw will chuck into any 3/8" or larger drill and accepts all types of reciprocating saw blades.

The capability of the VersaSaw is limited only by the power of the drill driving it. The manufacturer recommends a minimum of 14.4 volts if you use a cordless drill.

The saw operates smoothly, and it's comfortable to grip and operate. It also rotates 360° around its own shaft, letting you cut upward or downward without changing the position of the drill.

The light weight and compact size of the tool mean you can store it in a tool box or even a drill case to keep it at the ready.

At a Glance

Price:	\$40
Requires:	A corded drill or a 14.4-volt cordless drill (1,000 rpm minimum)
Blade Chuck:	Keyed
Blade Type:	Recip
Warranty:	1 year

Virtues: Alternative to pricey reciprocating saws. Lightweight and small for easy storage. Rotates 360°.

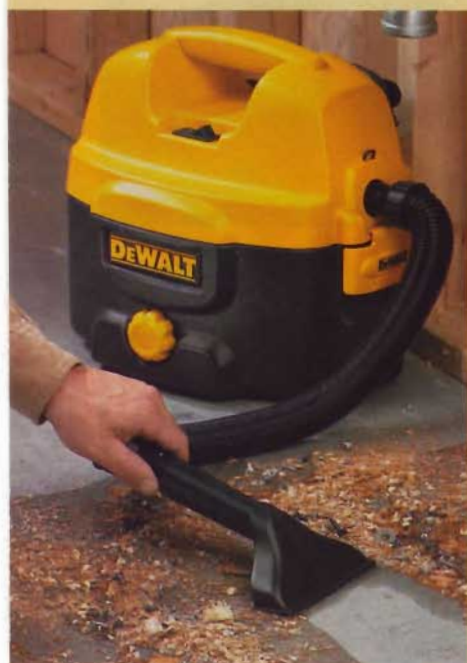
www.VersaSaw.com
877-374-5572

DeWalt DC500

CORDLESS/CORDED SHOP VACUUM

TOP 10 TOOLS

2004 WINNER



▲ Wet or dry, corded or cordless, DeWalt's DC500 redefines what a "portable" vacuum should be.

DeWalt makes the list of innovators this year with the first ever shop vacuum that's both corded *and* cordless. For versatility, the DC500 can be powered by any of DeWalt's 12-, 14.4-, and 18-volt battery packs. Or it can be plugged into a 120-volt outlet for unlimited run time.

With an 18-volt battery pack, the vac weighs less than 10 pounds and provides ample power (50 cfm) for most spills and messes.

The vac comes standard with one high-efficiency wet/dry filter. The filter doesn't need to be removed for wet pickup, is washable, and rated to trap 99.7% of particles larger than 0.3 microns. Other worthwhile features of the DC500 are an expanding hose that stretches up to 6-feet long and a drain port for easy emptying.

Included with the vac is a crevice tool, a wide nozzle, and an onboard storage rack. Battery packs are *not* included.



At a Glance

Price:	\$100
Power:	12-, 14.4-, 18-volt battery pack or 120-volt AC
Weight:	10 lbs
Capacity:	2 gallons
Filtration:	99.7% over 0.3 microns
Warranty:	1 year

Virtues: A truly portable vac that goes where power lines don't. Filter works wet or dry.

www.DeWalt.com
800-433-9258

◀ The DC500 wet/dry vac is compact and self-contained for storage and portability. The battery pack shown is *not* included with the vacuum.

TOP 10 TOOLS
2004 WINNER

Craftsman Twin Cutter

COUNTER-ROTATING BLADES



At a Glance

Price:	\$180
Motor:	7.8 amp
Weight:	8 lbs
RPM:	4,600
Blades:	6 1/8", 36T carbide
Max Depth at 90°:	1 7/8"
Warranty:	1 year

Virtues: Will cut just about anything. Almost no tendency for kickback, even during plunge cuts. Leaves clean edges.

www.Craftsman.com
800-549-4505

One part angle grinder, one part circular saw, and one part unconventional thinking bring us the Twin Cutter from Craftsman.

Just for clarity, the angle grinder part is the motor, the circular saw part is the blade, the unconventional part is the two counter-rotating blades.

Yes, two. And yes, counter-rotating (Photo, below).

For pure power and speed, two blades spinning in opposite directions while cutting at virtually the same point means that this saw chews through just about

whatever you put in its path. Cutting metal, plastic, wood, nails — you name it — they were all part of our Twin Cutter evaluation. And it handled each one with ease.

But there are benefits to the two-blade design that go beyond just raw cutting power.

First is safety. The counter-rotation of the blades cancels the natural tendency of a circular saw to kick back. So plunge cutting (Photo, right) or even chopping through unyielding materials offers little risk of kickback or blade binding.

Another advantage of this design is a remarkably clean cut. In wood, and plywood especially, we noticed a lot less chipout than with a conventional circular saw. When cutting metal, there weren't any of the typical razor-sharp burrs around the cut.

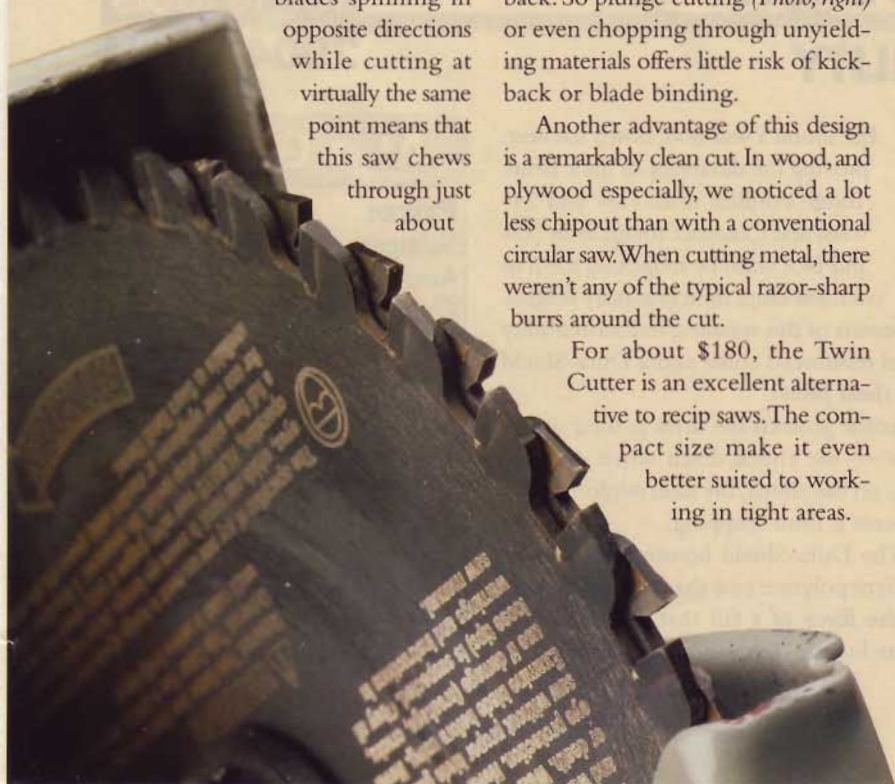
For about \$180, the Twin Cutter is an excellent alternative to recip saws. The compact size make it even better suited to working in tight areas.



▲ Plunge cuts in plywood are safe and relatively tear-out free thanks to the counter-rotating blades of the Twin Cutter.



▲ Both blades are clearly marked to ensure proper installation. The teeth are ground flat on the inside so the blades can run side by side.



Palmgren HipShot

A CORDLESS COMPRESSOR

TOP 10 TOOLS
2004 WINNER

If you've ever dragged an air compressor for more than a couple of feet you'll appreciate the irony of the adage "lighter than air." You'll also appreciate Palmgren's new cordless air compressor. At about the size of a lunch box, the HipShot is the perfect quick-fix compressor.

Powered by a 12-volt battery pack, the HipShot generates 115 PSI, which is enough for any finish nailer and many framing and roofing nailers.

Air storage is limited to the hose and the tool, so the compressor cycles between each pull of the trigger. Even so, a fully-charged battery is good for about 150 to 200 fasteners, depending on fastener size.

At a Glance

Price:	\$229
Power:	12 volt
Weight:	6.6 lbs.
Air Pressure:	115 PSI
Run Time:	150 - 200 fasteners
Warranty:	1 year

Virtues: Lightweight and compact, this is truly a portable compressor. Offers adequate power and run time for most quick nailing jobs.

www.Palmgren.com
800-621-6145



◀ The HipShot kit includes two batteries, charger, air hose, carrying case, and shoulder strap. The finish nailer is not included. The HipShot will work with other brands of nailers.

Bosch Brute Tough

DESIGNED FOR DURABILITY

TOP 10 TOOLS
2004 WINNER



For almost a year now, Bosch has been proving the durability of their Brute Tough cordless drills (18- and 24-volts) and Compact Tough drills (12- and 14.4 volts) by subjecting them to countless drops from one-story heights.

The secrets of this seeming indestructibility are a steel reinforced collar and a Dura-Shield housing (*Inset photo*).

The collar protects the drills at their weakest point — the chuck. Even when dropped directly on the chuck, the steel reinforcement prevents it from snapping.

The Dura-Shield housing is a pliable, resilient polymer case that absorbs enough of the force of a fall that the drills can, quite literally, bounce back unharmed.

At a Glance

Price:	\$250
Voltage:	18
Amp Hours:	2.4
Chuck Capacity:	1/2"
Torque:	500 in./lbs.
No Load RPM:	0-1,300
Warranty:	1 year

Virtues: Resilient housing and reinforced collar make this drill able to survive most drops without significant harm.

www.BoschTools.com
877-267-2499

TOP 10 TOOLS
2004 WINNER

Ridgid Pulse Drill

POWER AND PRECISION

At a Glance

Price: \$170

Motor: 120 volt, 9 amp

Drill Speed: 0 - 3,000 RPM

Hammer Speed: 0 - 57,000
Beats Per Minute

Warranty: 3 years

Virtues: Pulse mode allows for exact bit placement and delicate drilling in fragile materials. Sturdy keyless chuck. Illuminated cord end. Extended-life motor.

www.Ridgid.com
800-474-3443



▲ An illuminated cord end makes it easy to see which cord goes to the drill and whether power is present.



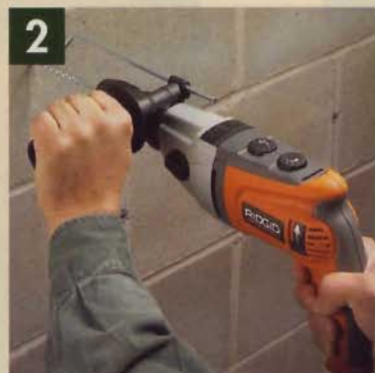
▲ The pulse mode on the R5010 makes it possible to drill tile without the bit wandering or the tile breaking. For heavier applications, the 9-amp motor provides all the necessary power and torque.

Ridgid's new R5010 1/2" variable-speed pulse drill brings an unprecedented "light touch" to the otherwise heavy-handed category of hammer drills.

The magic is the pulse mode. When running in pulse mode, the motor operates in short bursts. This is a real benefit when starting a masonry bit in ceramic tile (Fig. 1).

The pulse operation of the drill eliminates the tendency of the bit to "wander" across the surface of the tile. The first burst breaks the glaze on the tile precisely where you want it to and starts the bit on the desired path. Continuing in pulse mode minimizes the pounding of the hammer drill, significantly reducing the risk that the tile will crack.

Of course, this is also a hammer drill, so it's capable of powering a bit through a concrete block wall (Fig. 2). And the pulse mode is just as useful in this situation to ensure starting the hole in the right place. A 9-amp extended-life motor provides the necessary "umph" for the heavy work.



Switching from one operation to another is a simple matter of setting the speed and torque dials for the work at hand (Fig. 3).

Beyond the revolutionary pulse mode, Ridgid added some other features we really like.

First on the list is a rugged keyless chuck that will not loosen even during relentless hammer drilling. An illuminated cord end is another simple, but worthwhile, highlight (Photo left).



▼ With two gears, seven speeds, nine torque settings, hammer mode, drill mode, and pulse mode, the R5010 can be customized for any job.



Freud Dado Blade

"DIALS-IN" PERFECT WIDTH

TOP 10 TOOLS

2004 WINNER

Freud has taken the idea of "dialing in" a dado blade quite literally and come up with the best thing to happen to blades since carbide.

The Dial-A-Width dado stack is just that — a dado blade with a dial on it for making those fine adjustments to precisely match the width of a cut to the thickness of stock.

Of course, everyone knows that such fine-tuning has long been possible with the calculated application of shims.

But we also know what a pain it can be to take a dado stack apart three or four times — removing the insert, wrenching the arbor nut off, removing the outboard cutter and probably one or two chippers and shims, then putting it all back together, making sure to keep a close eye on all those carbide teeth to ensure they're not touching — all

in search of the perfect combination of cutters, chippers, and shims.

With Freud's SD series of dado blades (available in 6" or 8" diameters), finding the perfect stack begins with a quick check of the user's manual to find the correct dial setting and to select the best combination of chippers to get you close to your target width.

From there, a couple test cuts, and a few clicks (.004" adjustment per click) one direction or the other on the dial is generally enough to perfect the setup. The dado stack stays on the saw the entire time since you only need to loosen the arbor nut to make those fine adjustments with the dial.

Another important aspect of these dado blades is that they cut flat-bottomed dados, just like conventional stack dado sets do. So, in essence, the

At a Glance

Price:	\$300
Diameter:	6" or 8"
Teeth:	24 per cutter, 4 per chipper
Chippers:	(4) 1/8", (1) 3/32"
Hook Angle:	12°
Top Bevel Angle:	15°
Warranty:	Lifetime

Virtues: Enables incredibly precise and fast adjustment of dado stack width.

www.FreudTools.com
800-334-4107

SD series of dado blades offer the clean cutting performance of a stack dado set with the rapid adjustability of a wobble dado set.



◀ A dial on the outboard cutter allows you to adjust the width of cut in increments of .004".

TOP 10 TOOLS
2004 WINNER

Delta X⁵ Band Saw

INDEXING BLADE TENSION

Delta's X⁵ 14" band saw is an excellent example of taking a great tool and making it even better with the judicious application of some cutting-edge upgrades.

In the case of the X⁵, those upgrades focus on the blade tensioning system.

The first of two noteworthy improvements is a quick indexing blade tensioning system (Fig. 1).

This works by aligning the tension lever to the corresponding blade width and pulling the handle forward until it locks (Inset Photo).

The lever has a position for all blade sizes between 1/8" and 3/4".

And even with the quick indexing system, you have ultimate control over the blade tension and can fine-tune the system so the lever applies exactly the tension you desire.

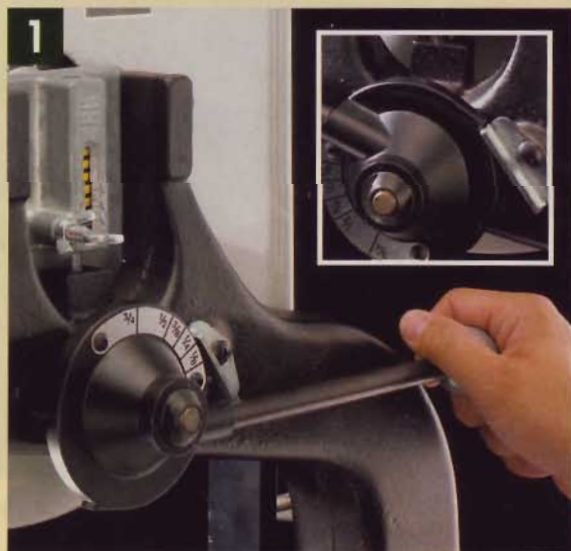
The second enhancement is a heavy-duty spring. The spring is made of chrome-vanadium alloy stock that's coiled and milled flat on the ends. The spring offers greater resistance for tensioning wide blades and suffers less deflection under load because its ends are perfectly flat. This spring is also less likely to take a set or suffer damage from premature fatigue, which is an all too common problem with conventional springs.

At a Glance

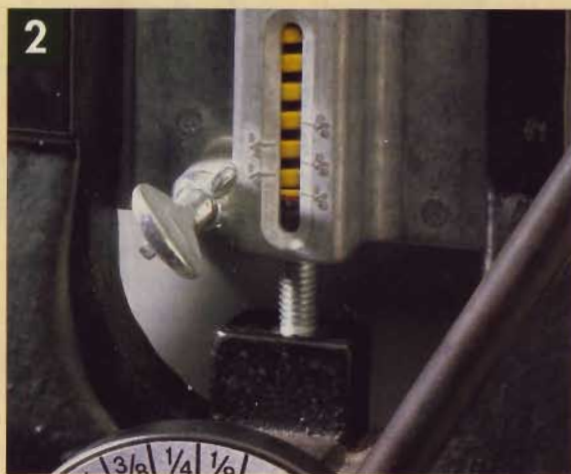
Price:	\$900
Motor:	1 1/2 hp
Resaw capacity:	6 1/4"
Rip Capacity:	13 3/4"
Blade Range:	1/8" to 3/4"
Blade Speed:	3,000 SFM
Warranty:	5 years

Virtues: Quick indexing blade tension speeds blade changing. Improved spring offers more tension, longer life.

www.DeltaWoodworking.com
800-438-2486

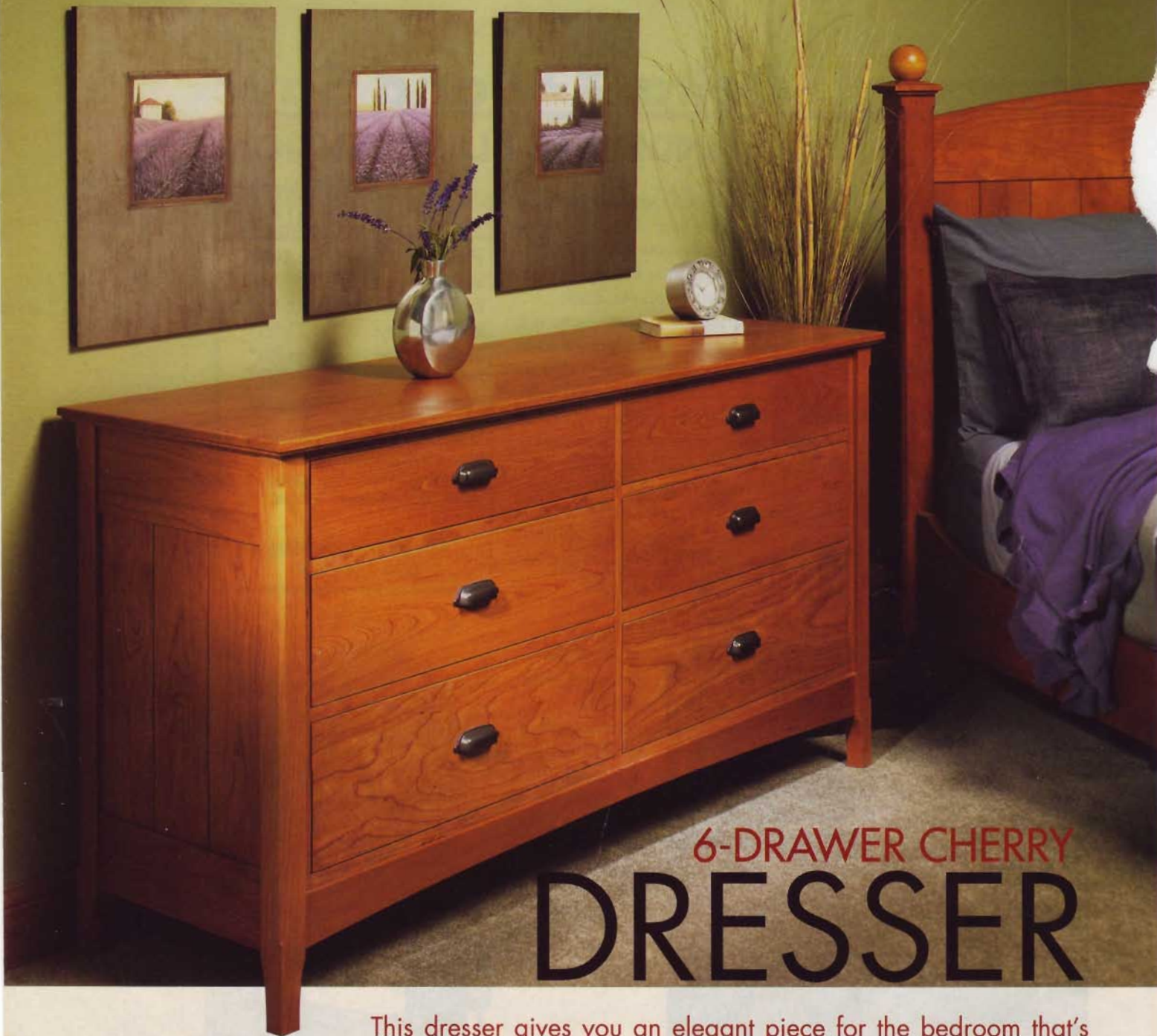


◀ Align the indexing lever with the corresponding width (3/4" in this case). Then pull the lever forward until it locks (Inset Photo).



◀ The improved, heavy-duty spring offers much greater tension and longer life than most conventional springs.





6-DRAWER CHERRY DRESSER

This dresser gives you an elegant piece for the bedroom that's easy to build. The secret is a simple plywood case for the drawers.

A couple of years ago, we built an heirloom bed and a matching bedside table for a bedroom suite of furniture (see the March/April and May/June 2001 issues of *Workbench*).

These pieces ended up being so popular that we received a number of requests for more furniture pieces for the set. So many requests, in fact, that we felt it was only fitting to build a third piece to round out the bedroom suite. That's how the idea

for this six-drawer cherry dresser first got off the ground.

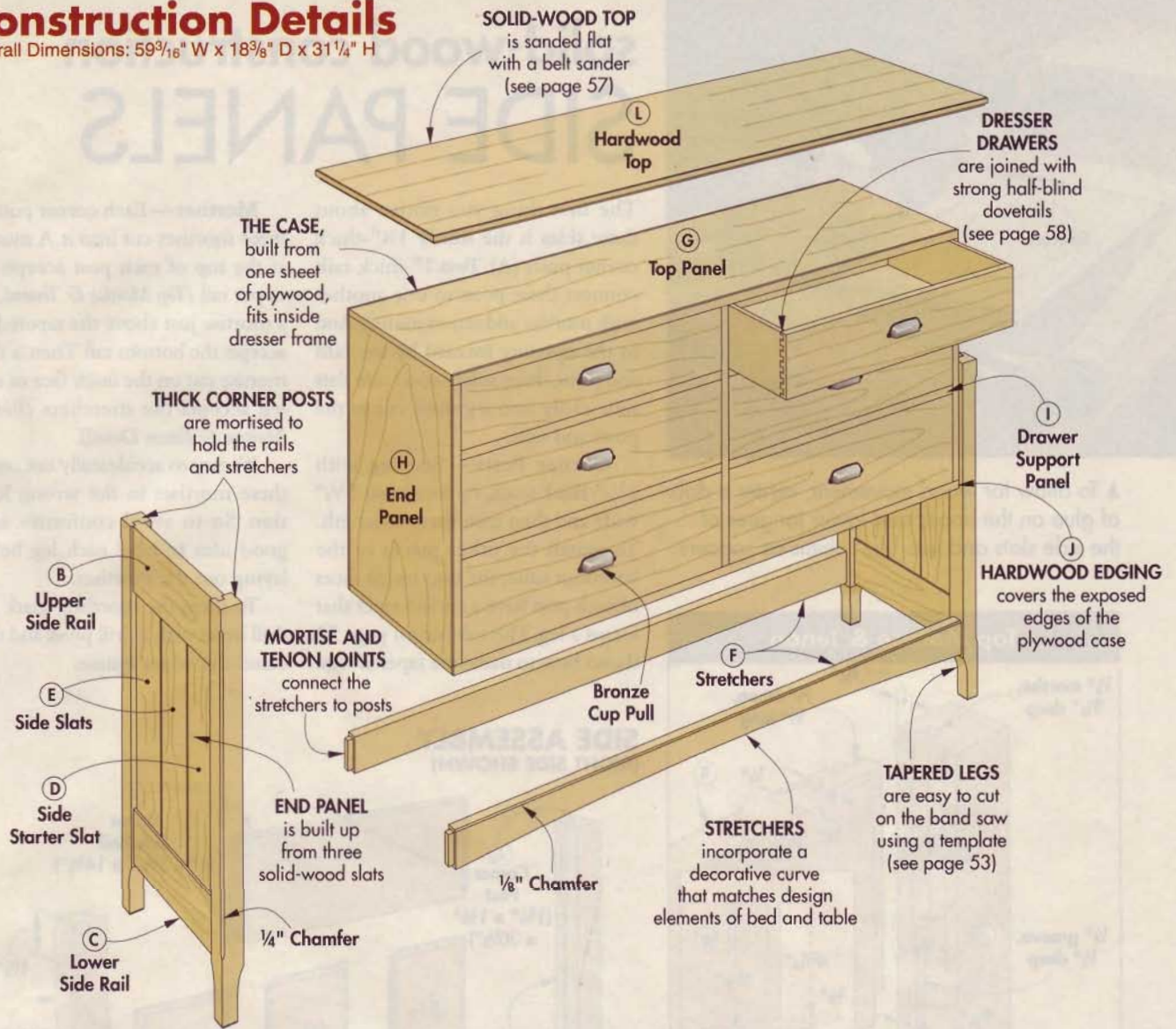
This dresser features all the same great design elements we liked about the bed and the table. Just a few of note are the thick corner posts with decorative curved tapers cut in the bottom; the end panels made up of three individual solid-wood slats; the six drawers joined with strong half-blind dovetails; and the front stretcher connecting the two sides with a gentle curve along the bottom edge.

Even though this dresser is a large project, don't let its size intimidate you — it's surprisingly easy to build. Basically, the frame of the dresser consists of two end panels joined by a couple of long stretchers.

Then, a case built up from a single sheet of plywood slides right inside the frame. This case is wrapped with hardwood edging and holds the dovetailed drawers. A solid-wood top completes this heirloom project — and the cherry bedroom suite.

Construction Details

Overall Dimensions: 59³/₁₆" W x 18³/₈" D x 31¹/₄" H



► Along with the heirloom bed and matching bedside table, the six-drawer dresser is part of our three-piece cherry bedroom suite. For complete plans for all three projects, visit www.PlansNow.com



solid-wood construction SIDE PANELS

The first thing you notice about these sides is the sturdy $1\frac{3}{4}$ "-thick corner posts (A). Two 1"-thick rails connect these posts to one another with mortise and tenon joinery. And in the opening formed by the rails and posts, three solid-wood side slats slide easily into a groove cut in the posts and rails.

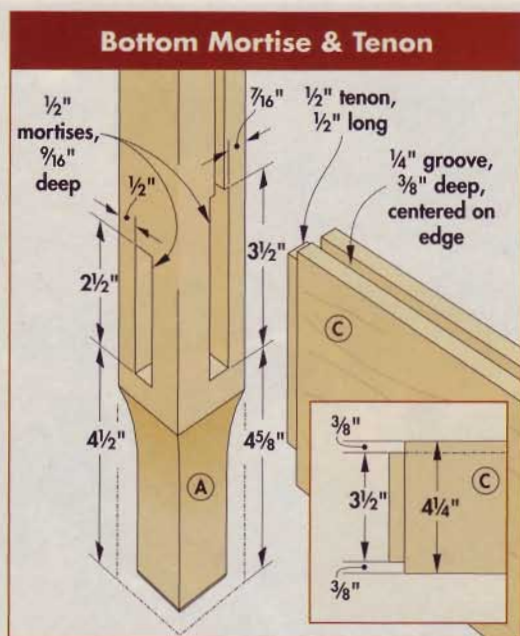
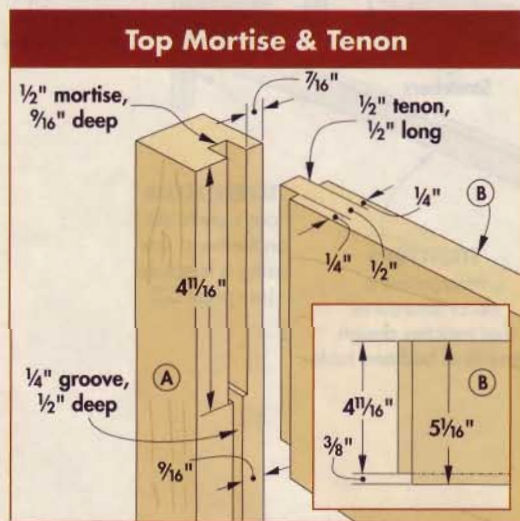
Corner Posts—Starting with $1\frac{3}{4}$ "-thick stock, rip four posts $1\frac{3}{4}$ " wide and then trim them to length. To match the other pieces of the bedroom suite, the two inside faces of each post have a curved taper that forms a leg. The sidebar on page 53 shows how to make the tapered legs.

Mortises—Each corner post has three mortises cut into it. A mortise at the top of each post accepts the upper rail (*Top Mortise & Tenon*), and a mortise just above the tapered leg accepts the bottom rail. Then, a third mortise cut on the *inside* face of each leg accepts the stretchers (*Bottom Mortise & Tenon Detail*).

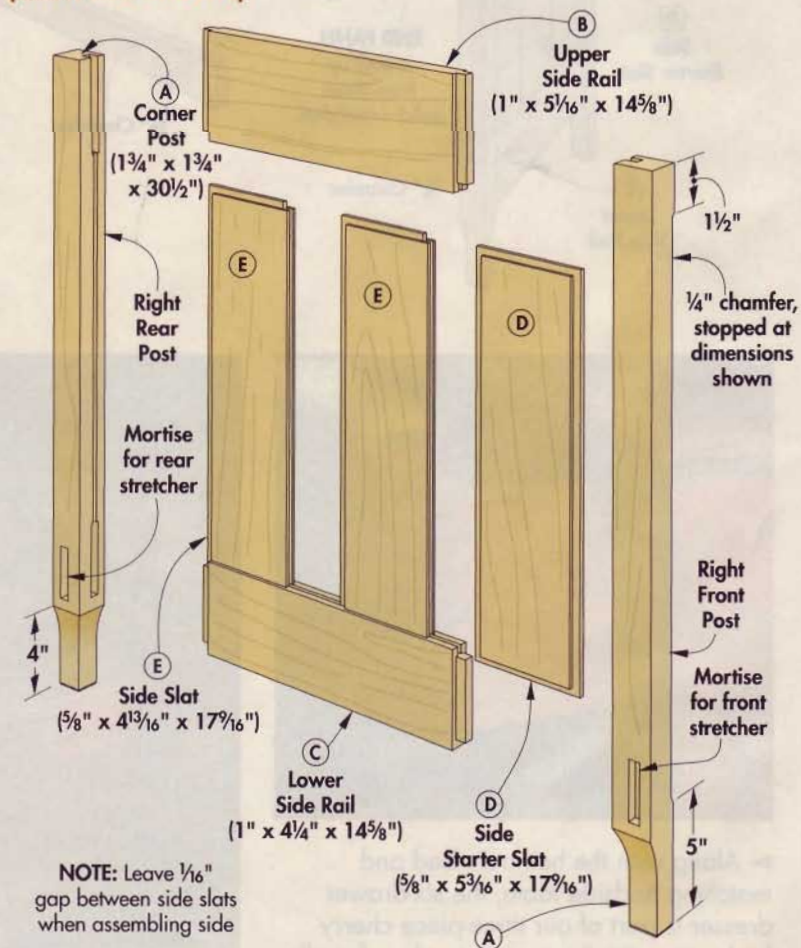
It's easy to accidentally cut one of these mortises in the wrong location. So to avoid confusion, it's a good idea to label each leg before laying out the mortises.

To form the mortises, mark and drill holes with a drill press, and then chisel the edges square.

▲ To allow for wood movement, center a dab of glue on the upper and lower tongues of the side slats and use $\frac{1}{16}$ " shims as spacers.



SIDE ASSEMBLY (RIGHT SIDE SHOWN)



Grooves—With the mortises cut, the next step is to cut grooves in each post to accept the side slats. These are easy to cut by using a straight bit in a table-mounted router. Start the cut at the top mortise and end it when you reach the bottom mortise.

Decorative Chamfers—The last thing to do to each post is to rout a decorative chamfer on the outside corner. Notice in the *Construction Details* on page 51 that this is simply a $\frac{1}{4}$ " stopped chamfer. The chamfer starts 5" from the bottom end of each post and extends to $1\frac{1}{2}$ " from the top (*Side Assembly*).

Rails—With the posts complete, the upper (B) and lower (C) side rails should go quickly. Each 1"-thick piece has tenons on the ends to fit into the mortises in the corner posts. And a groove cut in the inside edge of each rail accepts the side slats.

Slat Construction—All that's needed to complete each side of the dresser is to add three slats. These slats are simply $\frac{5}{8}$ "-thick pieces of hardwood with tongues and grooves that allow them to fit into the posts, rails, and adjacent slats.

There are two different widths of slats. A wide starter slat (D) has a tongue on all four sides (*Starter Slat Detail*). A side slat (E) has a tongue on three sides only (*Side Slat Detail*). The fourth edge is grooved to fit over the tongue in the adjoining slat.

In addition to cutting the tongues and grooves in the slats (*Figs. 1 and 2*), the outside faces of the slats have a decorative chamfer cut along both edges. The tongue on these slats makes this chamfer difficult to cut with a router table, so I cut the chamfer using a table saw with the blade positioned just slightly above the tabletop and tilted to 45° (*Fig. 3*).

So I wouldn't have to move the fence when cutting the chamfer on the grooved side of the slat, I made a $\frac{3}{4}$ "-wide temporary hardboard "tongue." I put this tongue in the groove when cutting the chamfer on the grooved side of the slat (*Fig. 4*).

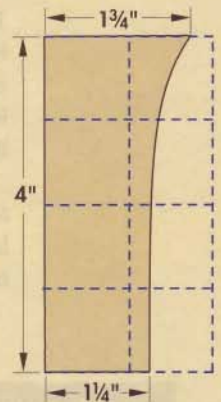
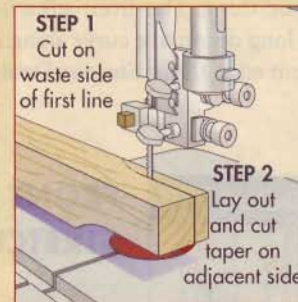
Side Glue-Up—To allow for wood movement, the side slats should have a $\frac{1}{16}$ " gap between them. To accomplish this, I spot-glued the tongue on each slat and used shims to space them apart during glue-up (*see Photo on page 52*).

Bandsawn Tapers

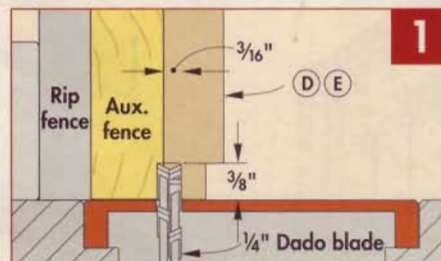
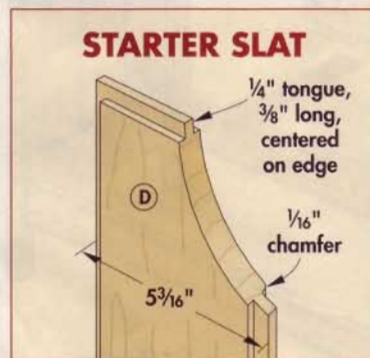
The curved, tapered leg near the bottom of each corner post takes just two cuts on the band saw.

Before making the first cut, you'll need to transfer the curve to one side of each post using a hardboard template (*see Pattern below*). Then, simply lay out the curve on an adjacent side of the post and make the second cut.

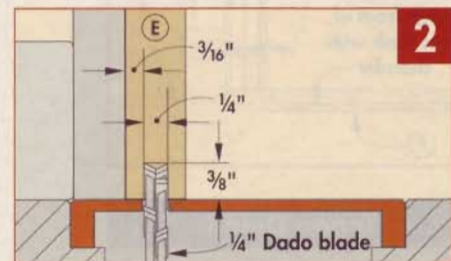
Once the two cuts are made, complete the leg by sanding it smooth.



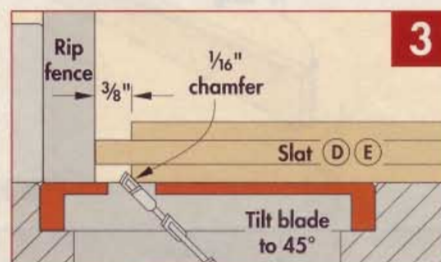
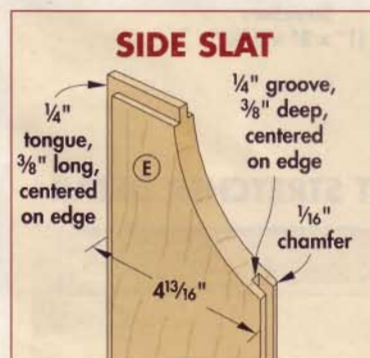
TAPER PATTERN
(SQUARES EQUAL 1")



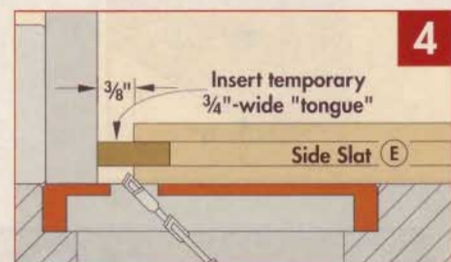
▲ To form the tongue on the slats, bury a dado blade in an auxiliary fence and cut a rabbet in each side.



▲ Cut the groove in the side slats by standing the piece on edge and making a single pass over a dado blade.



▲ Chamfer the tongued edge of each slat by tilting the blade, setting the rip fence, and making a pass.



▲ To avoid moving the fence to chamfer the grooved edge, fit a $\frac{1}{4}$ " hardboard "tongue" in the groove.

bringing it together STRETCHERS & CASE

One nice thing about this dresser is how easily it goes together. The sides are connected by a front and back stretcher (F) (see *Main Illustration below*). Then, a plywood case is built to fit between the sides.

Stretchers

The stretchers are pieces of 1"-thick hardwood with tenons cut on the ends (*Tenon Detail*). These tenons fit into the mortises that were cut earlier in the corner posts.

The stretchers are identical except for one thing. The front stretcher has a long decorative curve along its bottom edge (*Front Stretcher Detail*).

An easy way to lay out this curve is to use a flexible strip of wood as a guide. Get a helper to align the strip with the end points and center of the curve, and then strike the arc. Then, cut the stretcher to shape using a band saw or jig saw.

To complete the front stretcher, I routed a chamfer along the top front edge.

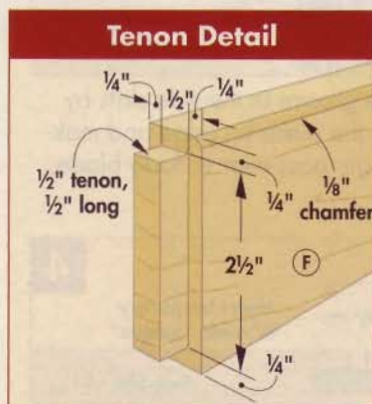
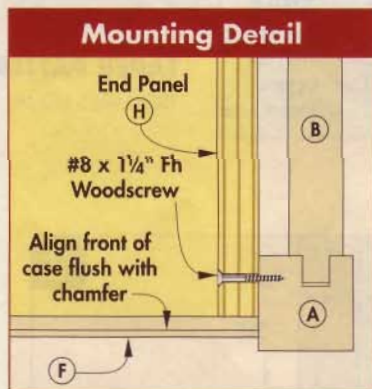
Assembly—At this point, the stretchers can be assembled to the sides. The only problem is that tightening the clamps could rack the sides out of square. To prevent this, cut a scrap piece of wood to fit tightly between the sides near the top. Put

this piece in place to hold the sides square during glue-up.

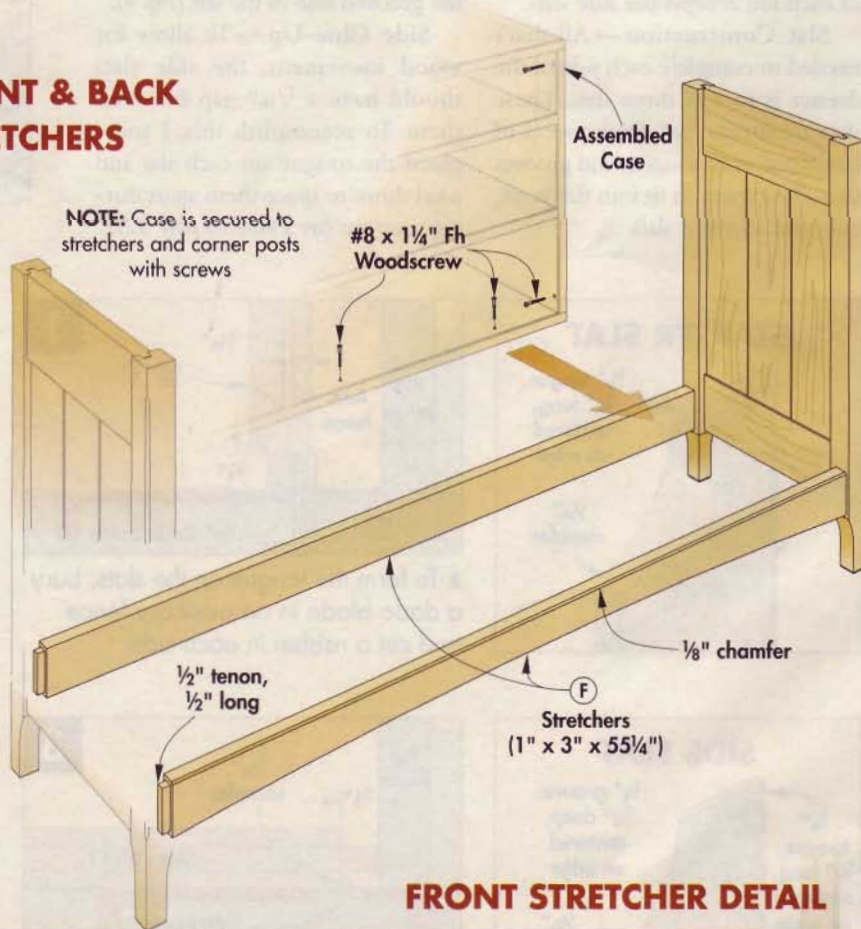
Plywood Case

While the glue dries, you can get started on the case. It's a simple assembly of $\frac{3}{4}$ " plywood panels—identical top and bottom panels (G), a couple of end panels (H), and a center panel (I) (*Case Assembly*).

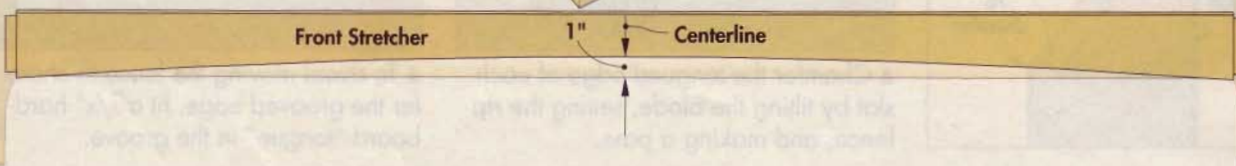
You'll need to cut a series of dadoes and rabbets in these panels to join the case together. The ends of the top and bottom panel are rabbeted to hold the end panels, and a centered dado holds the center panel. You'll also need to cut dadoes



FRONT & BACK STRETCHERS



FRONT STRETCHER DETAIL



in the end and center panels to accept the drawer support panels (see *Case Assembly below*).

Before assembling the case, you'll need to drill eight counterbored shank holes into the underside of the top panel (see *Case Assembly*). Later these holes will be used for attaching the solid-wood top of the dresser (see page 56). Then just assemble the case with glue and screws.

Drawer Supports—The next step is cutting the four drawer support panels (I) to size. The purpose of these panels—as their name indicates—is to hold the drawers in place when the dresser is assembled.

Once the drawer support panels are cut to size, there's just one challenge—sliding these panels in place without having them “seize up” before they're fully seated.

Rather than whacking the panels into place with a mallet, I eased the ends of the supports by routing $\frac{1}{8}$ " chamfers on the top and bottom edges (*Photos at right*). Just be sure to stop the chamfers shy of the front edge, so they're not visible once the drawer supports are in place.

As far as the actual assembly goes,

I'd recommend applying glue near the front of the dados. This way, when you slide the drawer support panels in place, they'll spread the glue to the back of the dados. With the support panels in place, install screws to help to strengthen the case.

Edging—To cover the exposed edges of the case, I added $\frac{1}{4}$ "-thick strips of solid-wood edging (J). They're glued and clamped to the edge of the case. Since the back of the case is still open, it's no problem clamping across the panels.

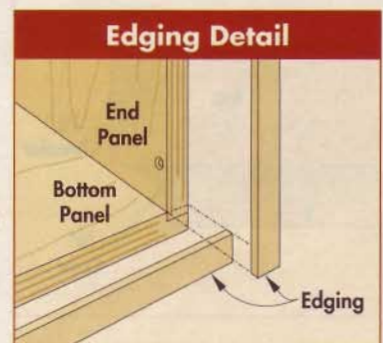
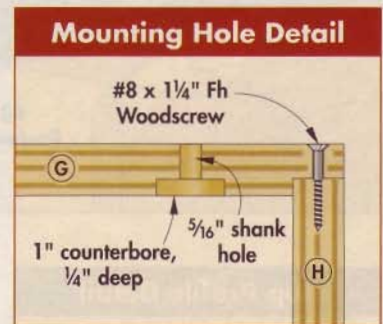
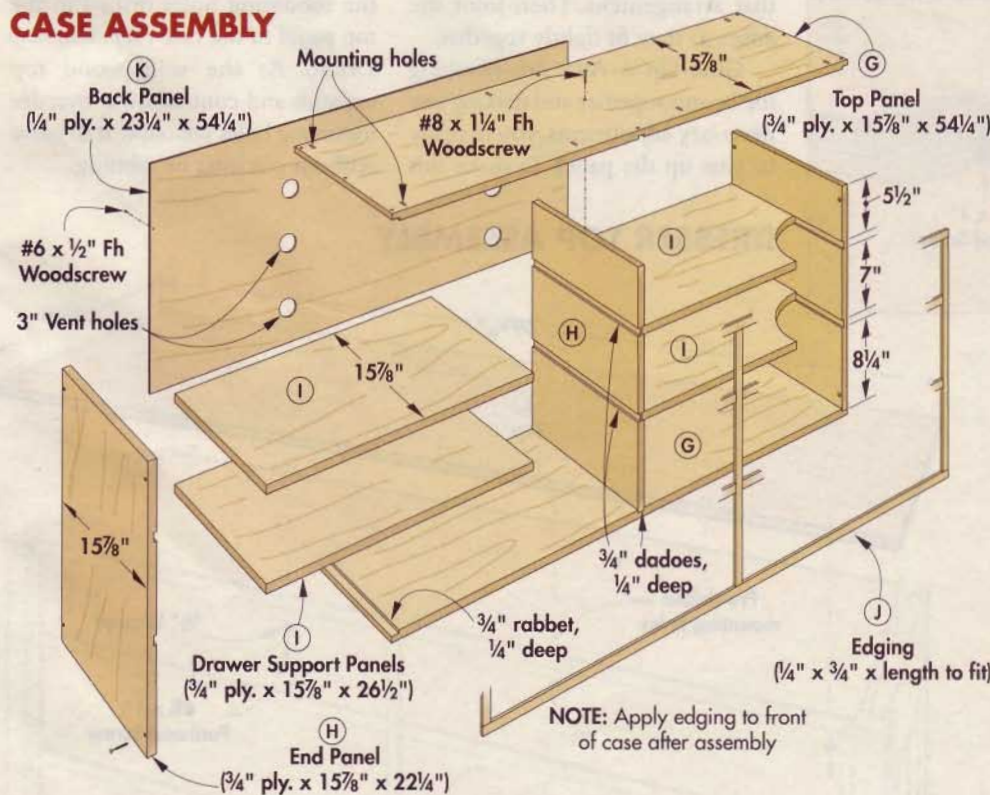
Install the Case—Once the case is assembled, it rests on the stretchers and between the sides. To secure the case, drive screws through the end panels into the corner posts and through the bottom panel into the stretchers (see *Front & Back Stretchers and the Mounting Detail on page 54*).

Add the Back—With the case in place, it's just a matter of adding a $\frac{1}{4}$ " plywood back (K). Notice that the back has 3" vent holes centered on the drawer openings. These holes allow air to escape when closing the drawers, which makes them easy to shut. After cutting the holes, just screw the back in place.



▲ To make it easy to slide the panels into place, rout chamfers on the top and bottom edges, stopping them about 2" from the front edge (*Inset Photo*).

CASE ASSEMBLY



build a solid-wood DRESSER TOP



▲ A belt sander makes quick work of smoothing the solid-wood top of the dresser. To ensure a flat surface, use the guidelines explained on page 57.

Like the bedside table that's part of this set of bedroom furniture, the top of this dresser is a solid-wood panel.

Panel Thickness — My goal was a $\frac{3}{4}$ "-thick top. So I started by selecting 1"-thick boards and then planed them to $\frac{13}{16}$ ". That would give me a little "extra" for sanding.

Sizing the Panel — As for the size of the panel, plan on making it a couple inches wider and longer than needed. It will be cut to final size later.

Arrange Boards

Once you select the boards, take time to arrange them for the best-looking panel possible. Look for consistent color across the panel. If one board varies in color, consider using a different board. Also, shuffle the boards so the grain flows naturally from one board to the next.

Once you're satisfied with the appearance of the panel, label the boards so you can return them to that arrangement. Then joint the edges so they fit tightly together.

Glue-Up — After dry-clamping the boards together and making any necessary adjustments, you're ready to glue up the panel. To make this

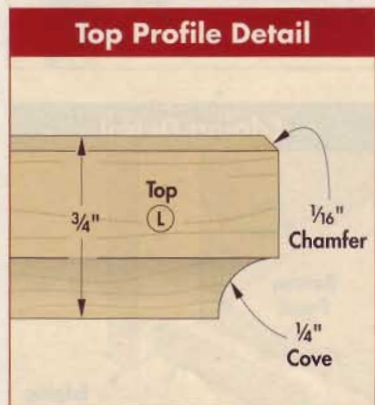
process as manageable as possible, I'd recommend gluing two or three boards together first. As you tighten the clamps, use a straightedge to check whether the panel is flat. If not, tap the boards with a mallet. When the glue dries, add the remaining boards to complete the glue-up.

Flatten the Top — Despite your best efforts, the panel may not end up perfectly flat. A belt sander will make quick work of sanding it flat (see page 57).

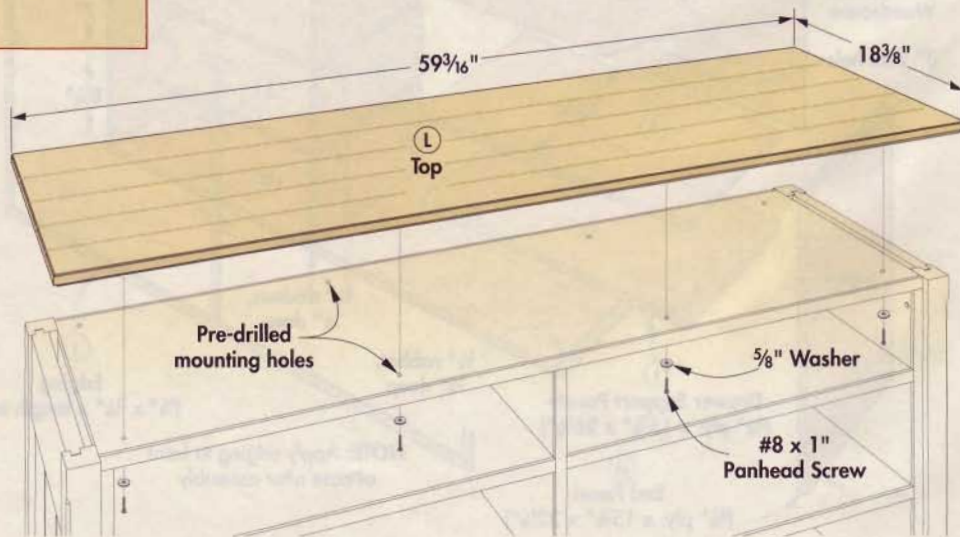
Cut Panel to Size — Now it's just a matter of ripping and cross-cutting the panel to final size. Note: For a tip on crosscutting wide panels on the table saw, see page 18.

Rout Decorative Profiles — There are just two more things to do before attaching the top. First, I routed a small chamfer on the top edge. Then I routed a cove in the bottom edge (*Top Profile Detail*).

Attach Top — The top is held in place with screws that pass through the mounting holes drilled in the top panel of the case (*Top Mounting Detail*). As the solid-wood top expands and contracts, the oversize mounting holes will allow it to move without cracking or splitting.



DRESSER TOP ASSEMBLY



4 Easy Steps to SAND A PANEL FLAT

Using a belt sander is a fast and effective way to flatten a glued-up panel. But because it removes material so quickly, it can do more harm than good. The guidelines that follow ensure good results.

Mark High Spots—The first step is to take a straightedge and move it along the surface of the panel, marking the high spots with a pencil every few inches (Fig. 1).

Cross-Grain Sanding—With the high spots clearly marked, the next step is to remove them by sanding *across* the grain (Fig. 2). I know, usually, you want to sand *with* the grain, but this situation is different. The reason is simple—if you were to sand with the grain, the sander would just follow the highs and lows of the panel.

But by sanding across the grain, the sander rides on the high spots,

quickly grinding them down. To prepare for this step, load an 80-grit belt on the sander. Then sand across the grain, keeping the sander moving at all times to avoid gouging the wood.

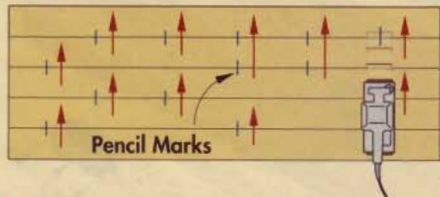
Level the Surface—The next step is to level the entire surface. To do this, first load a fresh 80-grit sanding belt and sand across the grain one more time. This time, work the sander all the way back and forth across the panel. Sand in a long “W” pattern (Fig. 3).

Final Sanding—Once the surface is smooth and flat, switch to a finer (120-grit) sanding belt and sand *with* the grain. This removes all the cross-grain scratches on the surface, which would show up like a sore thumb if you applied a finish directly over them (Fig. 4). After sanding the top smooth, repeat the process for the other side of the panel.



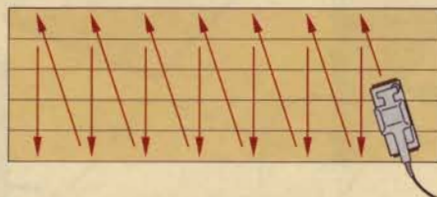
1 MARK HIGH SPOTS

The first step in flattening a panel is to mark the high spots. Holding a metal straightedge across the width of the panel makes this an easy task. Gaps between the straightedge and panel indicate low spots. High spots, which will be touching the straightedge, are marked as shown. Check the entire length of the panel, moving the straightedge a few inches at a time.



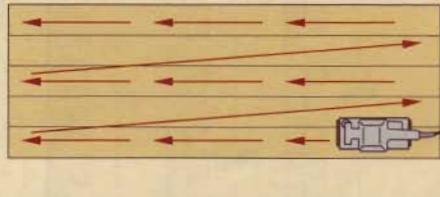
2 REMOVE HIGH SPOTS

To “knock down” the high spots, hold the sander so it faces *across* the grain and move it back and forth over the pencil marks. Keep the sander moving to avoid gouging the wood.



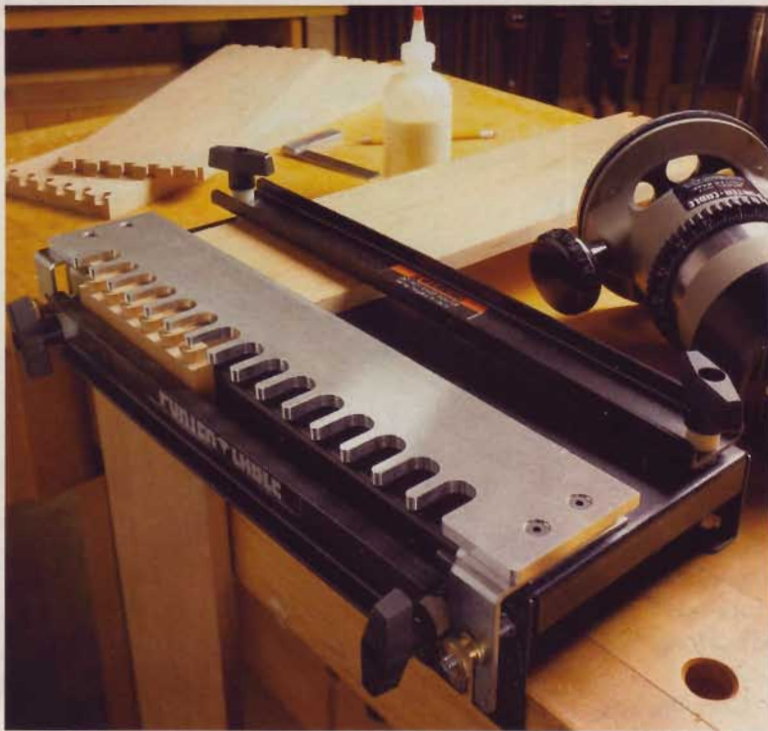
3 LEVEL THE SURFACE

Load on a fresh belt and continue to sand across the grain. Move forward, backward, and slightly sideways in a long “W” pattern to level the entire surface of the panel.



4 SAND WITH GRAIN

Finally, switch to a finer-grit sanding belt and sand the panel *with* the grain. This will remove any cross-grain scratches and smooth the panel out before you apply a finish.



dovetailed DRAWERS

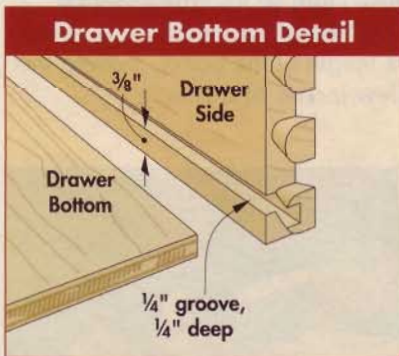
The last step in the construction of this dresser is to build the drawers to fit the openings in the case. These will be quite heavy when they're loaded with clothes, so the joinery used to hold them together needs to withstand the stress produced from constantly opening the drawers. Dovetail joints are the answer.

There are two identical banks of drawers in the dresser, with three drawers on each side. If you turn back to the *Construction View* on page 51, you'll see that the drawers in each bank get progressively taller from top to bottom (see *Drawer Heights* below).

Aside from their height, though, the drawers are identical. Each drawer front is made of $\frac{3}{4}$ "-thick hardwood, while the sides and back are $\frac{1}{2}$ "-thick hardwood. The pieces are sized to allow for a $\frac{1}{16}$ " gap on each side and above the drawer.

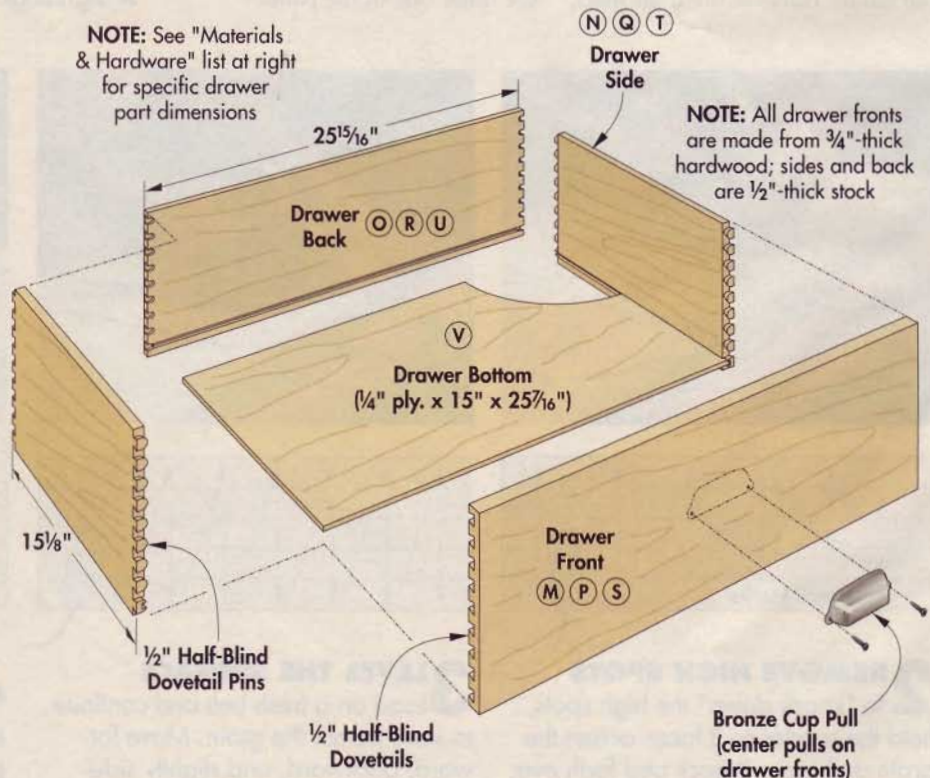
Dovetails—After cutting all the drawer parts to size, you can concentrate on the dovetail joints. The term "half-blind" means the dovetails are visible on one side of the joint, but not on the adjacent side (*Drawer Assembly*).

▲ With both pieces clamped in a jig, routing around a comb-shaped template allows you to cut both parts of a half-blind dovetail joint at the same time.

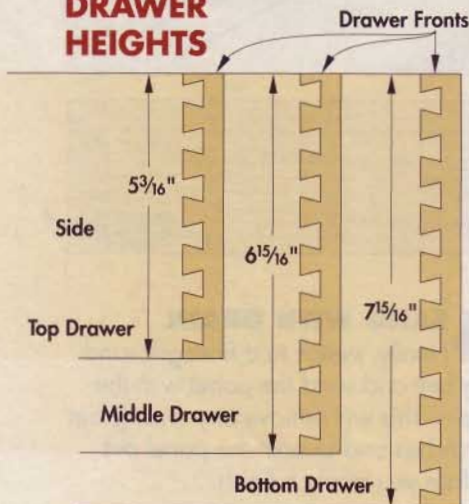


DRAWER ASSEMBLY

NOTE: See "Materials & Hardware" list at right for specific drawer part dimensions



DRAWER HEIGHTS



An easy way to cut half-blind dovetails is with a handheld router and a dovetail jig. There are a number of dovetail jigs available. I used a 12" Dovetail Machine (Model 4112) manufactured by Porter Cable (see *Photo on page 58*), but other jigs also would work fine.

Regardless of the jig used, the basic principle is the same. The two pieces that will be joined together are clamped in place. Then, after mounting a guide bushing and a 1/2" dovetail bit in the router, you simply rout along a comb-shaped template. Both the pins and tails are routed in one operation.

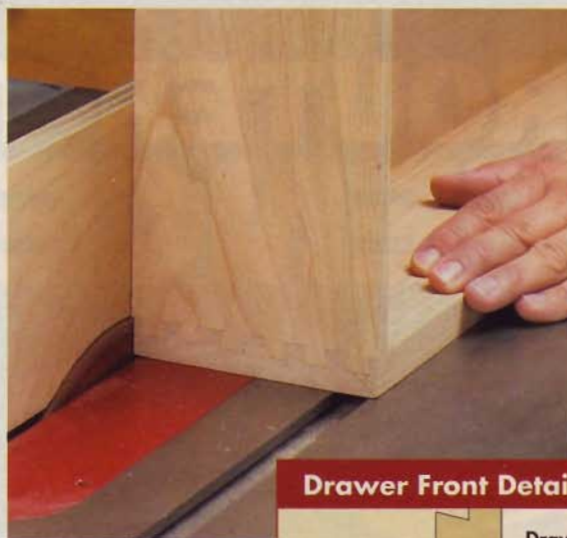
Groove for Bottom—After cutting and fitting all the drawer parts, the next step is to cut grooves for the 1/4"-thick plywood drawer bottoms (V). I cut my groove so that it was perfectly centered on the lowest dovetail pin, 3/8" up from the bottom (see *Drawer Bottom Detail*). By centering the groove on a pin this way, you won't be able to see it from the side of the drawer. After cutting the drawer bottoms to size, the drawers can be glued and clamped together.

Shadow Line—There's one last thing to do before installing the drawers. That's to create a small "shadow line" underneath each drawer that will match the 1/16" gap on the sides and top of the drawer.

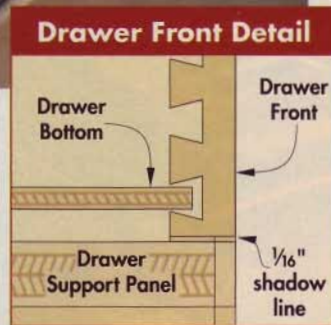
An easy way to accomplish that is to trim a 1/16" from the bottom edge of each drawer front (*Drawer Front Detail*). To do that, partially "bury" a saw blade in an auxiliary fence, set the drawer front face down on the saw, and make a single pass, as shown in the *Photo* above.

Stain & Finish

Now all that's left to complete the dresser is to apply a stain and finish. To match the other two pieces in this set of bedroom furniture, I used a stain I originally came up with for the heirloom bed. It's a combination of



▲ With a table saw blade partially buried in a tall auxiliary fence, trim 1/16" off the bottom of the drawer front to create a shadow line.



three parts Zar Cherry stain and one part Woodkote Jel'd Cherry stain. After mixing the two together, I applied the stain to the entire project, with the exception of the case and drawer parts that were hidden from view.

Finish—When the stain had dried, I followed up with three coats of a wipe-on varnish. I gave the entire dresser a gentle sanding after the first two coats.

Dresser, bedside table, and bed—the cherry bedroom suite now has the final piece of the puzzle. 📖

MATERIALS & HARDWARE

Part	Qty.	T	W	L	Material	Part	Qty.	T	W	L	Material
A	4	1 3/4"	1 3/4"	30 1/2"	Cherry Hardwood	O	2	1/2"	5 3/16"	25 15/16"	Cherry Hardwood
B	2	1"	5 1/16"	14 5/8"	Cherry Hardwood	P	2	3/4"	6 15/16"	25 15/16"	Cherry Hardwood
C	2	1"	4 1/4"	14 5/8"	Cherry Hardwood	Q	4	1/2"	6 15/16"	15 1/8"	Cherry Hardwood
D	2	5/8"	5 3/16"	17 9/16"	Cherry Hardwood	R	2	1/2"	6 15/16"	25 15/16"	Cherry Hardwood
E	4	5/8"	4 13/16"	17 9/16"	Cherry Hardwood	S	2	3/4"	7 15/16"	25 15/16"	Cherry Hardwood
F	2	1"	3"	55 1/4"	Cherry Hardwood	T	4	1/2"	7 15/16"	15 1/8"	Cherry Hardwood
G	2	3/4"	15 7/8"	54 1/4"	Maple Plywood	U	2	1/2"	7 15/16"	25 15/16"	Cherry Hardwood
H	3	3/4"	15 7/8"	22 1/4"	Maple Plywood	V	6	1/4"	15"	25 7/16"	Cherry Plywood
I	4	3/4"	15 7/8"	26 1/2"	Maple Plywood						
J	1	1/4"	3/4"	24 lin. ft.	Cherry Hardwood						
K	1	1/4"	23 1/4"	54 1/4"	Maple Plywood						
L	1	3/4"	18 3/8"	59 3/16"	Cherry Hardwood						
M	2	3/4"	5 3/16"	25 15/16"	Cherry Hardwood						
N	4	1/2"	5 3/16"	15 1/8"	Cherry Hardwood						

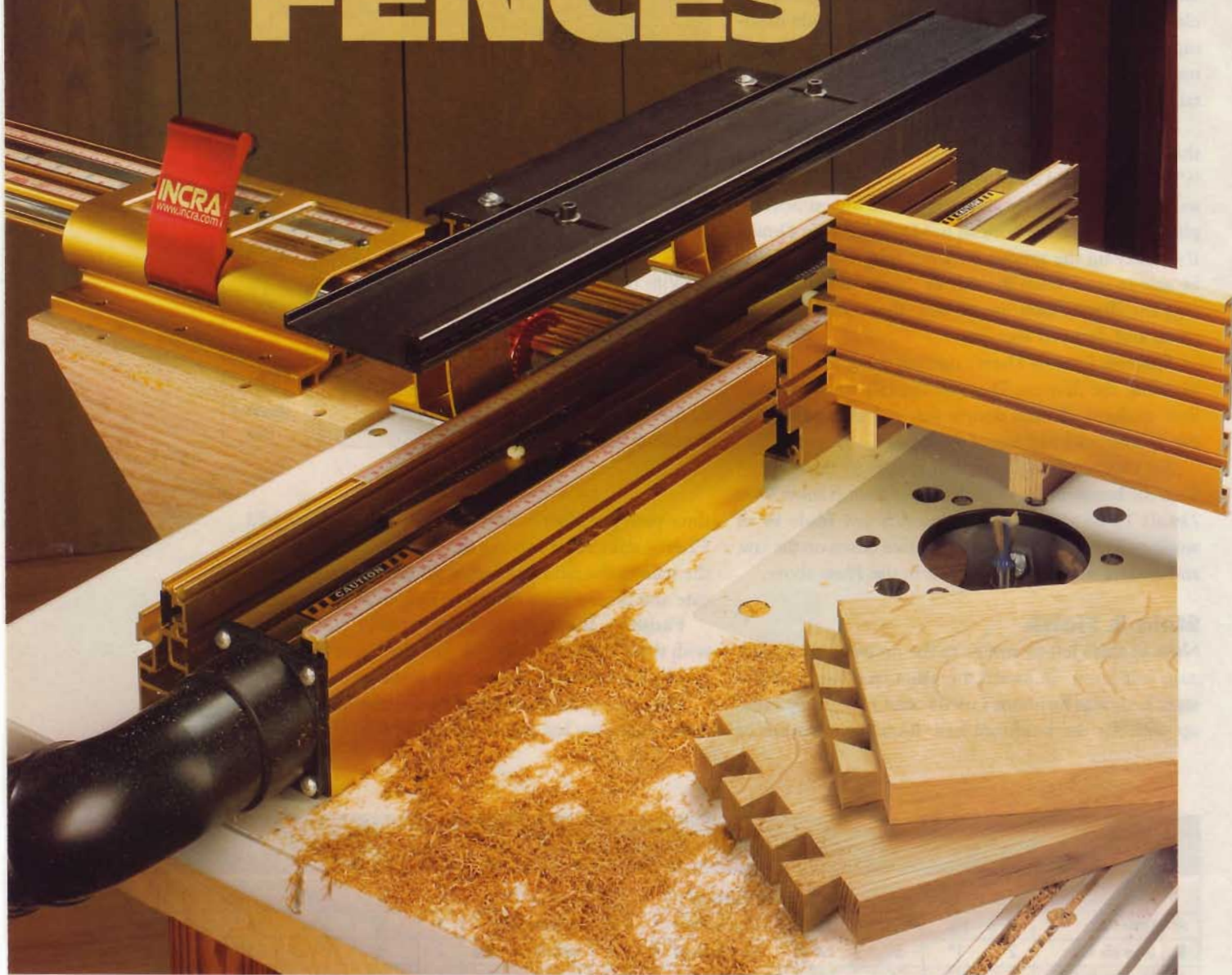
- (68) #8 x 1 1/4" Fh Woodscrews
- (8) #8 x 1" Panhead Screws
- (8) 5/8"-diameter Washers
- (6) Bronze Orb Core Cup Pulls (#2402-0273)

Cup pulls available from Restoration Hardware at 800-762-1005 or www.RestorationHardware.com

ONLINE Extras
Cutting Diagram, & Routing Half-Blind Dovetail Joints
WorkbenchMagazine.com

WORKBENCH
TOOL TEST

ROUTER TABLE FENCES



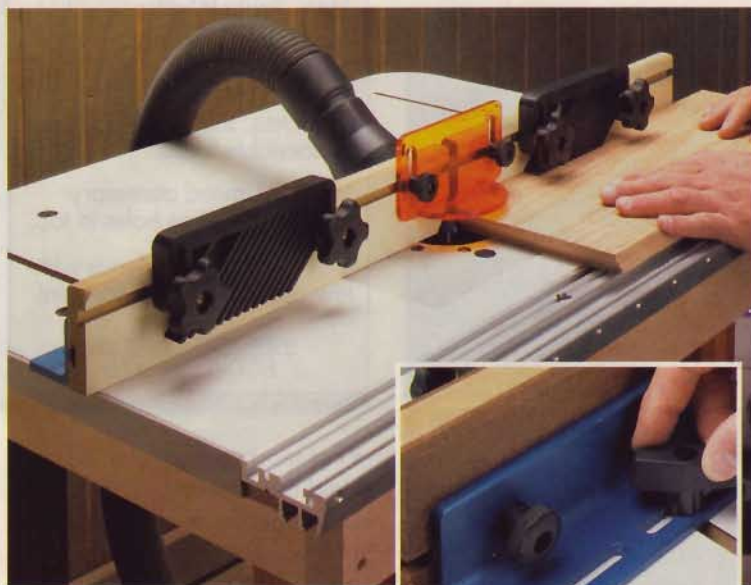
Read any review of router tables and it's immediately clear that what distinguishes one table from another is the fence. So when we set out to evaluate router table setups, we bypassed the cabinets and tops and got straight to the heart of the matter — router table fences.

For this survey, we examined six fences ranging in price from \$60 to nearly \$500. Given the wide range of prices, it seemed unreasonable to compare the fences in search of the “best” and “worst.” Instead, we considered each fence based on what it can do in relation to how much it costs.

If there was one constant that ran through this survey, it was the question of what's involved to adapt the fence to an existing table. Again, there's quite a difference between the fences on that score. And this is something you'll want to pay particular attention to as you decide which fence best suits your needs.

Beyond that, however, we found that each of these fences has its own unique offerings. A couple fences in particular stand out as exceptional, each for their own reasons, and we've highlighted those as Top Value (Bench Dog AF400, page 63) and Editor's Choice (Incra LS17 Super System, page 66).

Rockler



Rockler's router table fence is about as basic as they come, and it's priced accordingly.

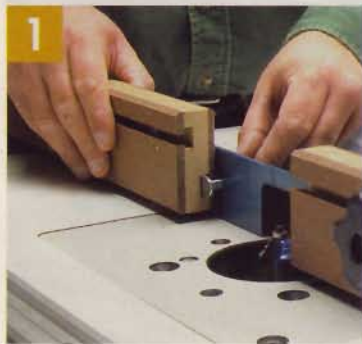
Despite its simplicity, this fence is perfectly capable of the most common router table operations.

The base fence itself consists of an anodized aluminum angle bracket, two sliding MDF sub-faces, a safety shield, and the necessary mounting hardware. The MDF sub-faces are slotted to accept a variety of accessories, which can be attached with flange bolts and star knobs.

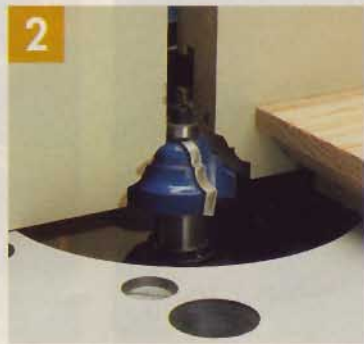
The sub-faces are relatively easy to duplicate, so you can replace them without much fuss if they get chewed up (Fig. 1). I feel like this is

a worthwhile point because I regularly use sub-faces as "zero-clearance" supports when routing profiles (Fig. 2). I do this to minimize tearout on the workpiece and to keep the piece from "tipping in" as it passes the bit.

Being able to use the fence this way is a key benefit of sliding, replaceable fences. It does, however mean that I build a lot of replacement sub-faces. (Which is why I spend so much time belaboring the point that simple sub-faces are the best sub-faces.)



▲ New sub-faces for the Rockler fence are easy to make by laminating hardboard over MDF.



▲ The MDF sub-faces can be positioned with zero-clearance to eliminate chipout.

At a Glance:

Price:	\$60
Max. Table Width:	NA
Max. Table Thickness:	1 1/2"
Table Alterations:	Yes

Virtues: Inexpensive; Easy to accessorize; Replaceable sub-faces.

Vices: Requires routing a rabbeted slot in tabletop.

Verdict: A great fence for basic operations.

www.Rockler.com
800-279-4441

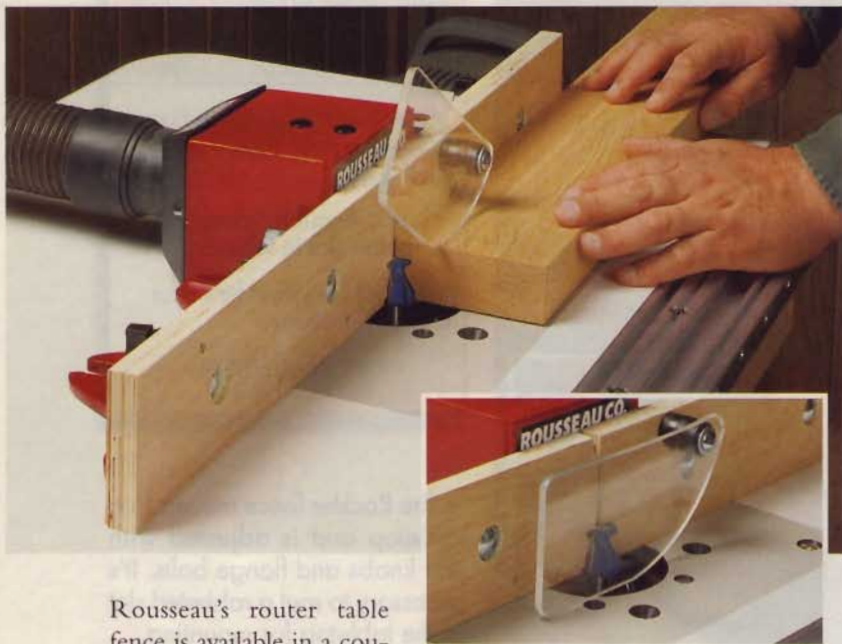
◀ The Rockler fence mounts to a tabletop and is adjusted with star knobs and flange bolts. It's necessary to rout a rabbeted slot in the tabletop for mounting.

My one gripe about the Rockler fence is that it requires slots routed in the tabletop to install it (Inset Photo). This isn't terribly difficult or even time-consuming, but it's a substantial alteration to the top you built or bought. And if you ever upgrade to a more elaborate fence, those slots might become an issue.

As an aside, I wanted to point out the four-piece accessory kit that I purchased along with this fence. The kit includes three featherboards and a dust collection port. These are worthwhile add-ons that make any fence safer and more pleasant to use. And paying the extra money (about \$20) makes a lot of sense when you consider that, all told, this is still one of the least expensive fences in this group.

All in all, I'd characterize the Rockler as an excellent choice if you need a basic but very capable router table fence. The price is certainly attractive, and if you don't mind a little "customizing" to your tabletop, you'll be well pleased with this one.

Rousseau 3301



Rousseau's router table fence is available in a couple different configurations: the Basic Fence (model 3301) and the Deluxe Fence (model 3301DL).

The basic model includes a cast body with built-in dust collection, two Baltic-birch plywood sub-faces, a pivoting safety shield, and the necessary mounting hardware (*Main Photo*). The deluxe package adds a spring-loaded, adjustable, stock hold-down (*Fig. 2*).

The basic model is a capable fence with a wide range of adjustability and easily replaceable sub-faces. One outstanding feature on this unit is the safety shield (*Inset Photo, above*).

My one quibble with the safety shield is that removing it requires a screwdriver. And that black spacer between the shield and the sub-face is actually a stack of nylon washers. It's the kind of complication that might tempt one to leave it off permanently after removing it for the first time.

As for the deluxe model with the roller stock support, the support is effective and certainly unique. But I can't see much reason to spend the extra money (about another \$75). I found the support

At a Glance:

Price:	\$90
Max. Table Width:	NA
Max Table Thickness:	1 1/2"
Table Alterations:	Yes

Virtues: Inexpensive; Easily replaceable faces.

Vices: Limited accessory options; Requires holes in top.

Verdict: A basic fence with few options for enhancement.

www.RousseauCo.com
800-635-3416

◀ For most routing jobs, a safety shield that moves out of the way automatically is a good thing. But if you need to remove it, you may decide it's too much trouble to put it back on.

troublesome to set up since it requires an Allen wrench and quite a bit of torque to adjust each of the pieces independently.

For either model, you'll need to drill holes through your tabletop to mount the fence (*Fig. 1*). Again, this isn't a difficult alteration, but it's still an alteration.

All in all, the Rousseau is a capable and affordable fence that lacks much in the way of available accessories. It's fine for basic operations, but don't expect this fence to grow as your demands at the router table do.



▲ The Rousseau requires bolt holes to be drilled through the tabletop for the mounting hardware. Adjustments are made by loosening the star knob and sliding the fence.



▲ This rather industrial-looking stock hold-down does a nice job controlling the workpiece, but requires a lot of effort to set up.

At a Glance:

Price:	\$150
Max. Table Width:	32"
Max. Table Thickness:	1 1/2"
Table Alterations:	No

Virtues: No alterations required; Easily replaced sub-faces; Convenient jointing setup; Easy to accessorize.

Vices: None

Verdict: Convenient, capable, expandable, and affordable. An easy choice for Top Value.

www.BenchDog.com
800-786-8902

Bench Dog AF400



◀ Bench Dog's cantilever clamps mean no drilling or routing is necessary to mount this excellent fence.



The Bench Dog AF400 inches us a little closer to the middle of the price range but offers substantially more than the lesser-priced units. In fact, the moderate price of this fence and its extensive adaptability earned it Top Value honors in this survey.

The AF400 consists of an extruded aluminum fence with an integral dust port, two sliding MDF sub-faces, shims for jointing operations, and a safety shield.

Two things in particular impressed me about this fence. First is the mounting system. A cantilever clamping system adapts this fence to tabletops ranging between 3/4" and 1 1/2" thick with no modifications to the top (*Inset Photo, above*).

The second high point is the jointing shims. Jointing with a router table fence requires the outfeed sub-face to be shimmed outward, slightly beyond the infeed sub-face. There are a number of ways to accomplish this, but none as simple as Bench Dog's. The shims slide into channels in the aluminum extrusion (*Fig. 1*). Oriented one way, they shim the sub-face 1/32". Rotate them 90°, and they shim it a full 1/16".

Not surprisingly, I'm also a fan of the sliding MDF sub-faces on

this fence. They have a wide range of adjustment for different bit diameters and are easy to duplicate.

It's also important to point out how easy it is to accessorize this fence. I'm especially fond of the Power-Loc and Feather-Loc for day-to-day use (*Main Photo*), and the Panel-Loc anytime I work with large diameter bits (*Fig. 2*).

But even without accessories, the AF400 is a solid investment. Dollar for dollar, there's no better value to be had in a router table fence.

▲ T-slots in the aluminum fence make it easy to mount a variety of accessories. Shown here are the Power-Loc remote switch and Feather-Loc featherboards.

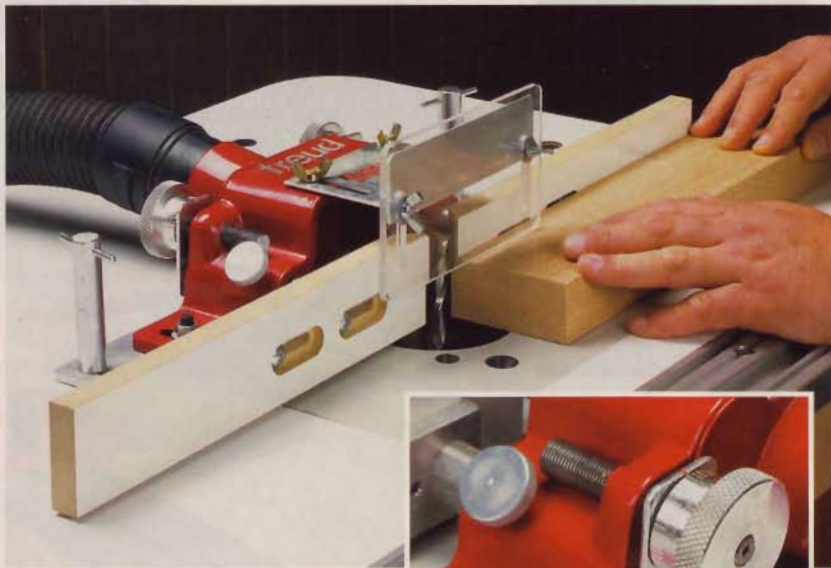


▲ Placing the included shims behind the sub-face provides up to 1/16" of jointing capability.



▲ One excellent accessory to Bench Dog's AF400 fence is the Panel-Loc, which pulls double duty as a hold-down and handguard.

Freud SH-5



Freud's SH-5 router table fence is a dead ringer for shaper fence systems. This shaper-inspired design has a couple of advantages.

First, the one-piece cast steel body is incredibly rigid, so there's little chance of the fence deflecting.

The best feature, though, is that the fences are independently micro-adjustable (*Inset Photo*). This makes the fence work very much like a regular jointer in that you can customize the setup for your work. For instance, when working with figured wood or putting a finished edge on something, the outfeed sub-face can be set for an incredibly fine cut. If you're just looking

to square an edge, then you're able to quickly position the outfeed face for a more aggressive cut.

However, while the SH-5 shines as a jointer, it has some quirks you'll have to decide if you're willing to work around.

First are the sub-faces. They're too short for clamping stop blocks or other accessories to and they have a limited range of adjustability (*Fig. 1*). Plan on replacing these to make the fence fit your needs.

I'm also not crazy about the way this fence is mounted. At a mini-

At a Glance:

Price:	\$110
Max. Table Width:	N/A
Max. Table Thickness:	N/A
Table Alterations:	Yes

Virtues: Micro-adjustable; Solid construction.

Vices: Complicated installation; Small sub-faces.

Verdict: Best reserved for Freud router tables.

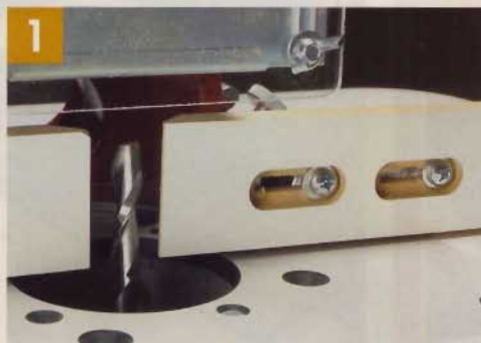
www.FreudTools.com
800-334-4107



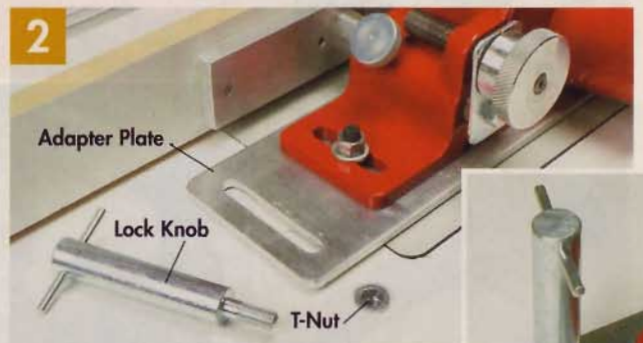
◀ Each fence is independently adjustable. The large knob moves the fence and has indicator marks graduated with .001" increments. The smaller knob locks the fence.

mum, threaded inserts have to be installed in the top to accept knobs (*Fig. 2*). More likely, you'll need an adapter plate to make this fence fit over your table insert since it's sized to work with Freud's smaller inserts. The threaded inserts and knobs come with the fence. The adapter plate is a \$20 accessory.

In general, I'd recommend this fence if you're already using Freud's tabletop and router insert. Otherwise, the complications of fitting this fence to your table may not be worth the extra effort.



▲ Short sub-faces with limited adjustability are a real hindrance to the versatility of this fence. Best to plan on making your own.



▲ Threaded inserts, knobs, and an adapter plate make mounting this fence a complicated procedure.

At a Glance:

Price:	\$130
Max. Table Width:	32"
Max. Table Thickness:	1 1/2"
Table Alterations:	No

Virtues: Sliding scales for precise positioning; Solid construction; Simple installation;

Vices: Jointing shims are bothersome to install.

Verdict: A well-built fence at a competitive price. Mite-R-Slide is interesting, but spendy.

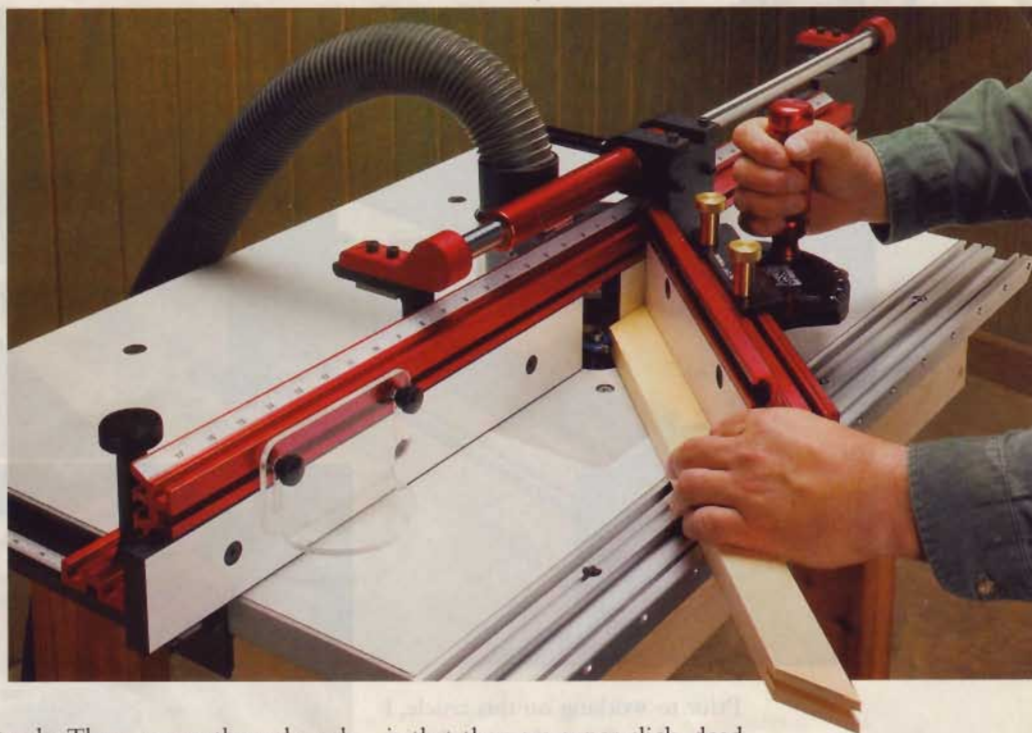
www.JessEm.com
866-272-7492

Might as well just say this right up front: JessEm's Mast-R-Fence is one cool-looking router fence. All that red and black anodized aluminum, the sparkling white sub-faces, the miter fence with its burly locking handle and those shiny brass knobs — it's nearly enough to make a tool guy weep.

Fortunately, I was able to dry my tears long enough to find out if the fence is as functional as it is ornamental. The setup I evaluated included the Mast-R-Fence and the optional Mite-R-Slide.

Focusing first on the fence, there are a few things about the JessEm that are unique to its design. First, the fence is attached to the table with two aluminum mounting

JessEm Mast-R-Fence



tracks. Three screws through each track and into the underside of the tabletop keep damage to the top at a minimum and make for a quick installation. Each track has an adjustable scale that can be set for a zero-reference, which is handy for fine adjustments or duplicating a previous setup (Fig. 1).

The phenolic sub-faces (which have a PVC coating) are also out-of-the-ordinary. The upside to these

is that they are super-slick, dead flat, and notably rugged. On the other hand, I'd advise making some sacrificial sub-faces rather than letting these get chewed up.

I'm also ambivalent about the jointing shims that come with this fence (Fig. 2). I do appreciate that JessEm included them, but they're unfortunately bothersome to get on and off.

As for the Mite-R-Slide (which adds another \$200 to the cost), I am once again torn.

This is definitely a high-test miter gauge that allows for incredibly precise settings, but I'm not entirely convinced that it adds enough to the fence to justify the extra expense. Beyond a few specialized operations (such as cutting slots for mitered splines as shown in the Photo, above), I can't imagine too many ways to use this.

The Mast-R-Fence by itself is an excellent tool. It's well-built, has some exceptional features, and the price is reasonable. The Mite-R-Slide, while impeccably constructed, is a bit pricey for its limited applications.



▲ "High-boy" knobs and sliding scales offer fast, precise positioning.

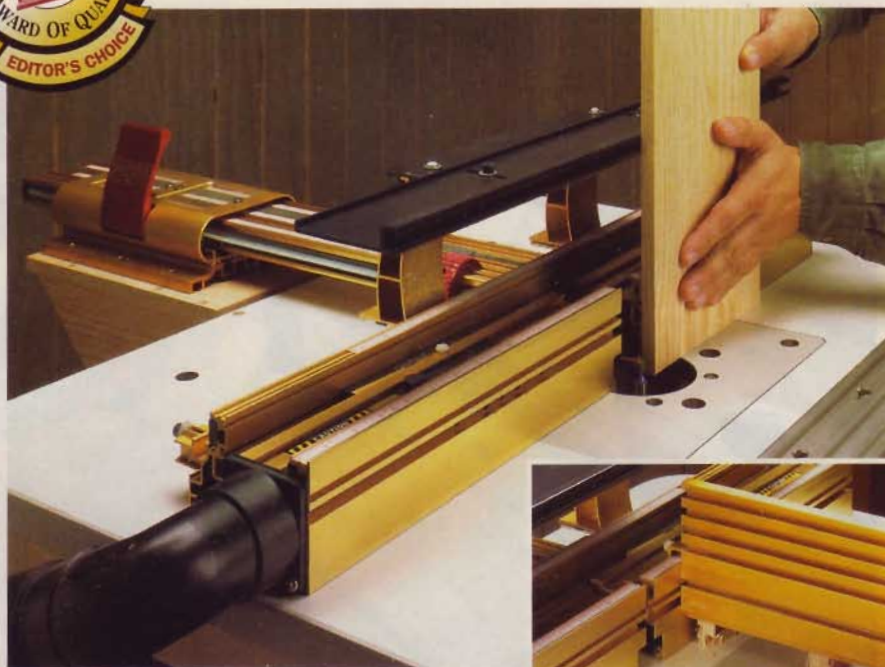


▲ The Mast-R-Fence uses plastic shims to offset the outfeed sub-face for jointing. They're a bit tricky to install, however.

▲ Solid construction, large controls, and a micro-adjustable scale are highlights of the impressive, though pricey, Mite-R-Slide.



Incra LS17 Super System



At a Glance:

Price:	\$450
Max. Table Width:	N/A
Max. Table Thickness:	N/A
Fence Dimensions:	22 ⁷ / ₈ "
Table Alterations:	Yes

Virtues: Accuracy; Joint-making capabilities.

Vices: None

Verdict: Quality, accuracy, and versatility that justify the premium price.

www.incra.com
972-242-9975

Prior to working on this article, I knew Incra's products only by reputation. This was my opportunity to find out if the three beliefs I held about the Incra fence (very accurate, very expensive, very complicated) were at all correct.

After spending a considerable amount of time with the LS17 Super System, I decided I was wrong on two of the three counts. Turns out that this fence is incredibly accurate, but it's not

terribly expensive nor is it all that complicated.

Don't get me wrong, you'll have to shell out about \$450 for the system shown here. So it's no small investment. But when you compare that cost to the combined cost of a great router table fence, a great box joint jig, and a great dovetail jig — all of which the

Incra is — the price of this single system seems quite reasonable.

As for being complicated, it's more accurate to think of the Incra as complex. There's a lot here to learn and understand. But the manual that comes with the system does an outstanding job of communicating the intricacies of this system in plain, easy-to-follow

ONLINE Extras

Video: Routing Dovetails

WorkbenchMagazine.com



▲ The three-position lever allows you to select from gross or fine adjustments, or locked.



▲ Interchangeable scales are marked for specific joint types and sizes. The steel rule slides in its slot to allow the fence to be "zeroed" out.



▲ A micro-adjustment knob and "zeroable" scale allow for adjustments as fine as .001".

steps. And once you understand it, well, you understand it.

Understanding It

At the heart of this system is the positioner. This is where most of the adjustments and fine-tuning are done. The three-position lever toggles the positioner between gross adjustment (lever all the way down), fine adjustment (lever in the middle position), and locked (lever all the way up) (Fig. 1).

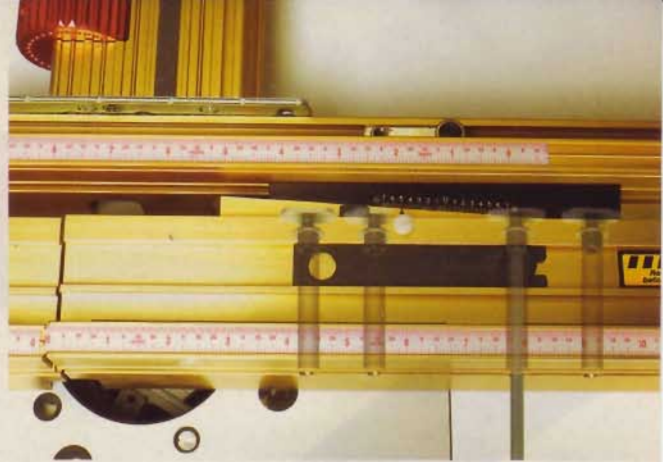
By looking through the window in the top of the positioner, you can align the fence on the appropriate scale to within $\frac{1}{32}$ " (Fig. 2). But if that's not quite fine enough, you can use the micro-adjustment knob to fine-tune the fence in .001" increments (Fig. 3).

The scales are another important part of this system. The steel rule is a constant and serves for


most basic positioning. For more involved operations, such as box joints or dovetail joints, the plastic scales are replaceable. A large assortment of these scales comes with the Incra, and each one is marked for a specific size and type of joint. (For more on cutting dovetails using the Incra LS17, see the *Sidebar* below).

Of course, every other function and operation of this fence is equally precise. For instance, adjusting the outfeed face for jointing is done by sliding it along a wedge that allows for an offset as small as .002" (Photo above).

Other standard equipment with the LS17 is a right-angle fixture (Inset Photo, previous page) and a micro-adjustable stop block. Both of these are essential to box and dovetail joinery, but they have a variety of other uses as well.



I should point out that mounting this system on most tables will require some type of auxiliary platform (Main Photo). But for all this system does, the extra effort pays off in spades.

And in truth, I've run out of space well short of lauding all that this system is capable of. It will have to suffice for me to name it our Editor's Choice and assure you that it's worth every dime. 

▲ Use the supplied hex tool to loosen the wedge locking screws. Then adjust the offset of the fence by sliding the black rear wedge.

Cutting Dovetails By The Book

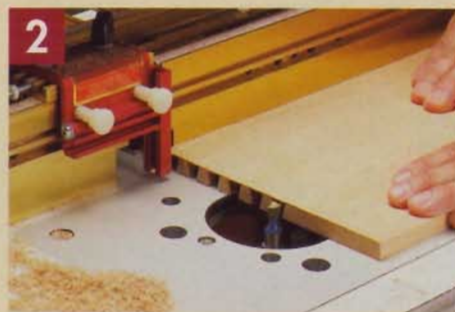
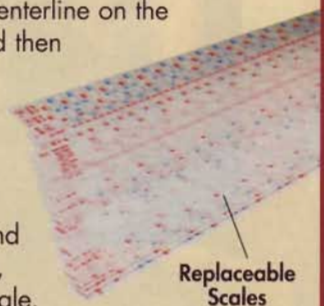
Cutting dovetails on a router table is an unusual operation but one that Incra has made about as simple as it can get. The keys to this system are the user's manual (Fig. 1) and a collection of scales.

By comparing your workpiece to the full-size patterns in the manual, you can quickly select a scale that corresponds to your stock. With the scale loaded in the positioner, the only setup steps are to find the center of your workpiece and "zero" the fence to that point. Then make a few test cuts to set the bit height.

After that, cutting the pins (Fig. 2) and tails (Fig. 3) is a simple matter of using the graduations on the scale to set the fence in position for each new cut.



◀ Mark the centerline on the workpiece and then compare the board to the patterns in Incra manual to select the best pattern and corresponding, replaceable scale.



▲ Use the stop to control the length of the pin cuts. Position the fence according to the replaceable scale in the positioner.



▲ The tail boards are cut two at a time using the right-angle fixture. Notice the shallow rabbet cut in the boards.



BUILD A BOX-BEAM ceiling with class

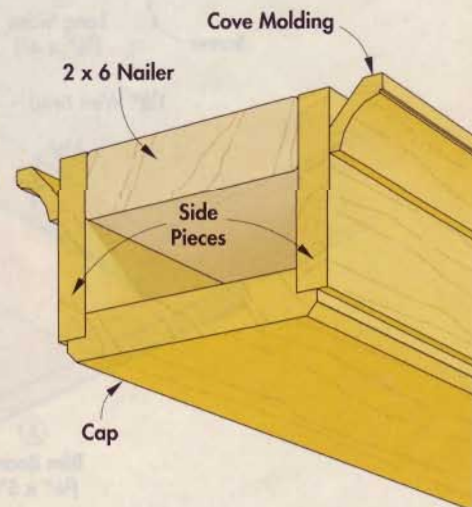
If you can build a box, you can build these ceiling beams. The results speak for themselves.

Sometimes a simple project can have an immediate and dramatic impact on a home. These ceiling beams are one such project. As you can see, they helped to convert an attractive, though fairly ordinary room ('Before' Photo below) into a warm, inviting space (Photo, left).

Box Beams — At a glance, it appears that these beams are thick, solid timbers. But a look at the *Beam Anatomy Illustration* at right will show you that each beam is really just a hollow box, which is built up one board at a time. That makes constructing box-beams a very "do-able" project.

Besides their simple construction, these box beams feature several design elements that make it look like they've been there since the house was built. For example, the long beams are *thicker* than the intersecting short beams, creating a multi-dimensional look. In addition, inset cap pieces with a decorative chamfer and cove molding contribute to their distinctive appearance.

Stain and Pre-Finish — One last note. When building box beams, it's best to stain and pre-finish all of the pieces *before* you install them. I used red oak, stained it to match the room's trim, and applied three coats of varnish.



Ceiling fan in the Photo left provided by Hunter Fan (52" Model 21490, "Oak Park") www.HunterFan.com 888-830-1326

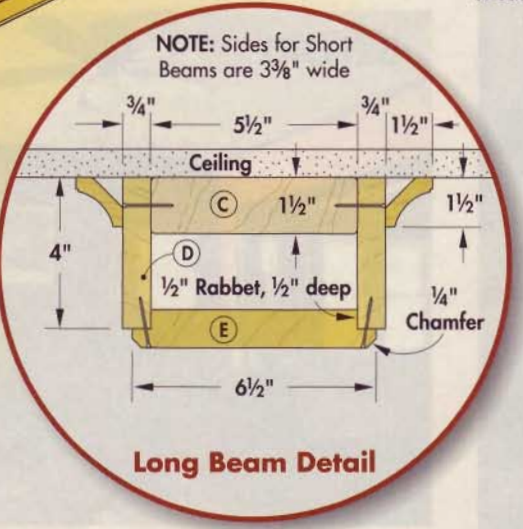
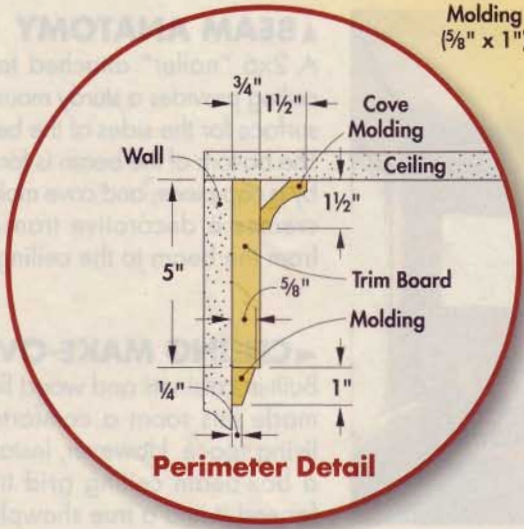
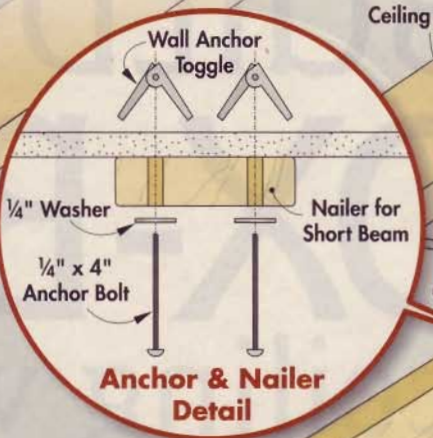
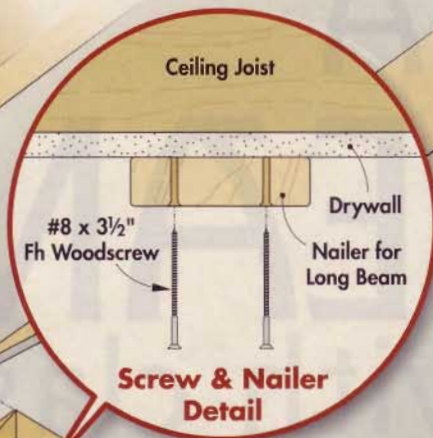
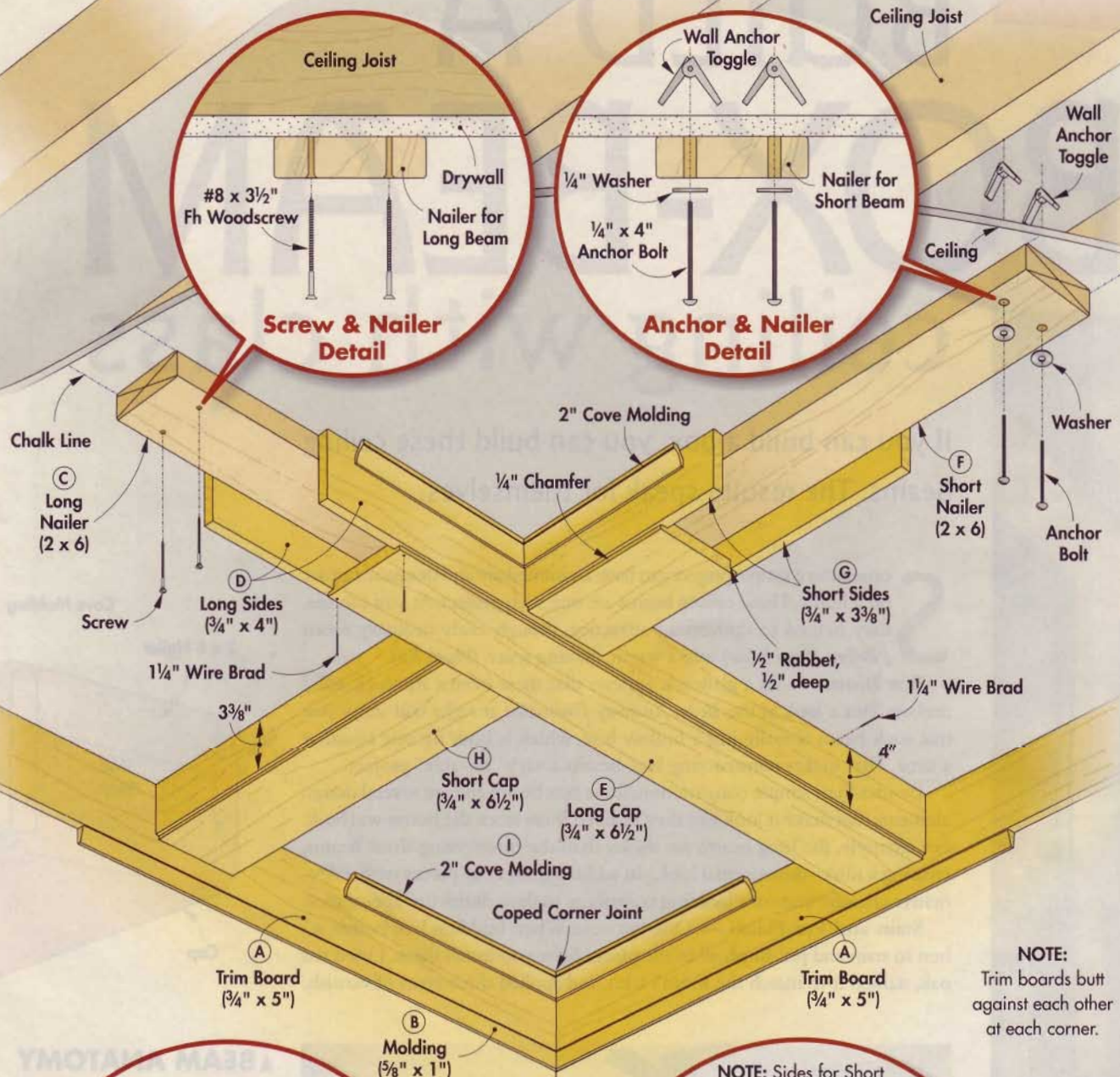
▲ BEAM ANATOMY

A 2x6 "nailer" attached to the ceiling provides a sturdy mounting surface for the sides of the beam. The bottom of the beam is formed by a cap piece, and cove molding creates a decorative transition from the beam to the ceiling.

◀ CEILING MAKE-OVER

Built-in cabinets and wood floors made this room a comfortable living space. However, installing a box-beam ceiling grid transformed it into a true showplace.

Construction Details



NOTE:
Trim boards butt against each other at each corner.

NOTE: Sides for Short Beams are 3 3/8" wide

planning, layout & TRIM TIPS

A little planning before you start building the box beams goes a long way toward ensuring good results.

Layout — The first consideration is the location of the beams. I wanted a symmetrical grid, so I spaced the beams evenly apart (see *Construction Details* on page 70). I also decided to run the long beams perpendicular to the ceiling joists and the short, intersecting beams parallel with the joists. But arranging the beams the other way around would be fine. Either way, you'll want to snap chalk lines on the ceiling to mark the location of the 2x6 nailers.

Install Perimeter Trim Pieces — The next step is to install trim pieces around the perimeter of the room. I used two types of trim: a wide trim board (A) made from 3/4"-thick oak and a small, wedge-shape molding (B) that creates a transition between the trim board and the wall (see *Photos at right and Perimeter Detail* on page 70).

Scarf Joints "Extend" Boards — If your room is large, you might need a longer trim board or molding to cover the whole span. A simple way to do that is to "extend" the piece with a scarf joint (see *Sidebar at right*).

Scribing — Another situation you're likely to run across is uneven ceilings. In that case, the wide trim boards won't fit tightly against the ceiling, so you'll have to scribe and cut the boards to fit (*Sidebar, below*).



◀ After laying out the location of the beams, nail the trim boards around the perimeter. Then install a small molding underneath (*Inset Photo*).

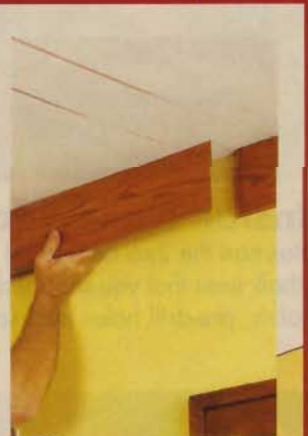


Scarf Joints Made Simple

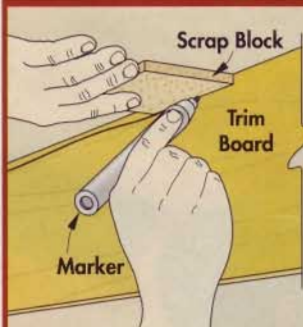
In a project like this, where the pieces may be longer than 10 feet, it can be difficult to find boards that are long enough.

The solution is to join shorter boards together with scarf joints. With this type of joint, the ends of the mating boards are beveled at 45° (see *Illustration*). Since the ends overlap, a scarf joint is less likely to separate than a butt joint.

To create a solid nailing surface, I located the scarf joint for the trim boards over a wall stud. Note that it also aligns with the beam location to conceal the joint.



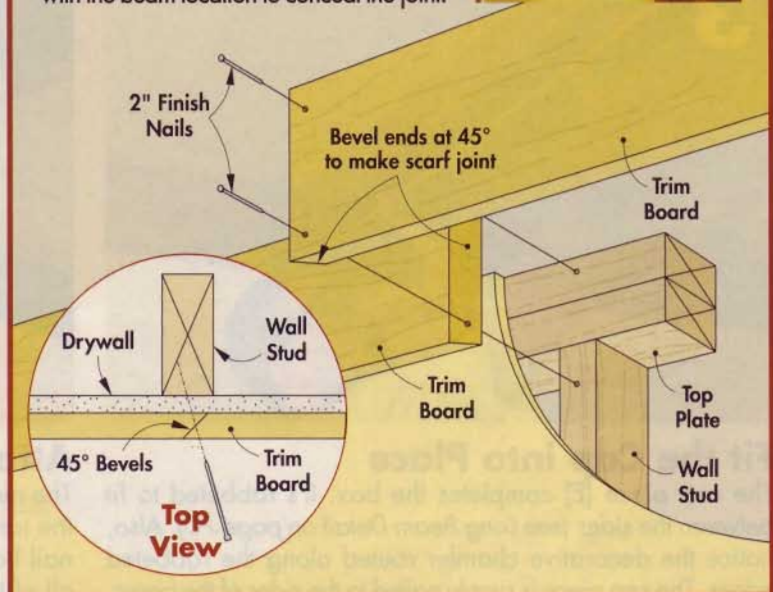
Scribing to Fit



In a perfect world, all ceilings and walls would be flat. But that wasn't the case for this ceiling. When I held a trim board up against it, the irregular surface of the ceiling was

quite obvious. To ensure a tight fit, I had to scribe, or mark, a line on the board that "follows" the irregular contours of the ceiling.

To do this, start by temporarily tacking the trim board in place. Then locate the widest gap between the board and the ceiling, and cut a block that's at least as thick as this gap. Now slide this block along the ceiling, holding a marker against it, as shown above. (I used a marker so the line would show up on the dark-colored board.) Finally, use a jig saw to cut along the scribed line.



step-by-step

BUILDING BOX BEAMS

As I mentioned earlier, box beams are built up “one board at a time.” Each board is simply measured, cut to fit, and then attached.

Long Beams First — To simplify construction, I built the long beams first (the thicker beams that run perpendicular to the ceiling joists). The idea is to install *all* the nailers, sides, and cap pieces that make up these beams before working on the short beams (see Steps 1-3 below). This way, you won't have to notch the boards in one beam to fit around those in the intersecting beam.

Here again, you might have to use a scarf joint to “extend” the sides or cap pieces of the beams. In this case, screw cleats across the joint on the back side of the boards to provide a solid nailing surface. Also, you may need to scribe the end of a piece to fit against the perimeter trim board (see *Sidebar on next page*).

Short Beams — As for the short beams, the installation is essentially the same (see Steps 4-6). The only difference is I used anchor bolts to secure the nailers since there were no joists above them.



Install Nailers for Long Beams

Position the 2x6 nailers (C) for the long beams between the chalk lines that you snapped earlier. After locating the ceiling joists, pre-drill holes and screw the nailers in place.



Fit the Cap into Place

The cap piece (E) completes the box. It's rabbeted to fit between the sides (see *Long Beam Detail on page 70*). Also, notice the decorative chamfer routed along the rabbeted edges. The cap piece is simply nailed to the sides of the beam.



Attach the Sides of the Beam

The next step is to use a finish nailer to attach the sides of the long beams (D) to the nailers. Don't worry about the nail holes. They'll be covered by the cove molding once all of the box beams are completed.



4

Anchor Nailers for Short Beams

Since the nailers (F) that are used for the intersecting short beams run parallel to the ceiling joists, you'll need to use anchor bolts to secure them to the ceiling.



5



6

Capping It Off

All that's left to complete the short beams is to add the cap piece (H). As before, it's rabbeted to fit between the sides, chamfered on the long edges, and secured with nails.



Install Sides of Short Beams

The short beams aren't as thick as the long beams, so the sides (G) are ripped $3\frac{3}{8}$ " wide (the long beams have 4"-wide sides). Here again, the sides are simply nailed in place.

Scribing — A Second Look

Several of the beam boards had to be scribed and cut to follow the irregular surface of the ceiling (see page 71). But the ceiling wasn't the only problem. The walls weren't square or plumb. This meant that the ends of the cap pieces and beam sides had to be scribed and cut to fit against the trim board.

If you face a similar situation, test fit a scrap piece against the trim board (a cap piece is shown at right). At the

widest gap, hold a marker against the trim board at an angle so the tip of the marker touches the end of the cap piece. Then slide the marker along the trim board to scribe a line.

Now simply cut along the scribed line, transfer this cut line from the scrap piece to the actual cap piece, and then trim the end. Before installing the cap piece, you may still have to do a little sanding or filing for a perfect fit.



installing the cove MOLDING

To ease the transition from the ceiling to the beams, I installed cove molding around each ceiling grid. These moldings are cut, or coped, to produce a snug fit, a technique that's explained in detail on page 76.

You'll find that coping one end of a molding isn't difficult. But it would definitely complicate things if you had to cope both ends *and*, at the same time, end up with a piece of molding that's exactly the right length.

Single Cope — My solution was to cope only *one end* of each molding and then crosscut the other end square. The key to this method is a "starter" piece, a short scrap of cove molding that's temporarily tacked in place in one corner (*see Step 1, below left*).

With the starter piece in place, cope one end of an extra-long piece of cove molding to fit against it (*Step 2*). Once you're satisfied with the fit, crosscut the opposite end so the molding is about $\frac{1}{16}$ " longer than needed. Then "spring" it into place, as shown in the *Photo* above.

At this point, it's just a matter of repeating the process for the next two pieces of molding, coping one end of each one and crosscutting the other end (*Steps 3 and 4*).

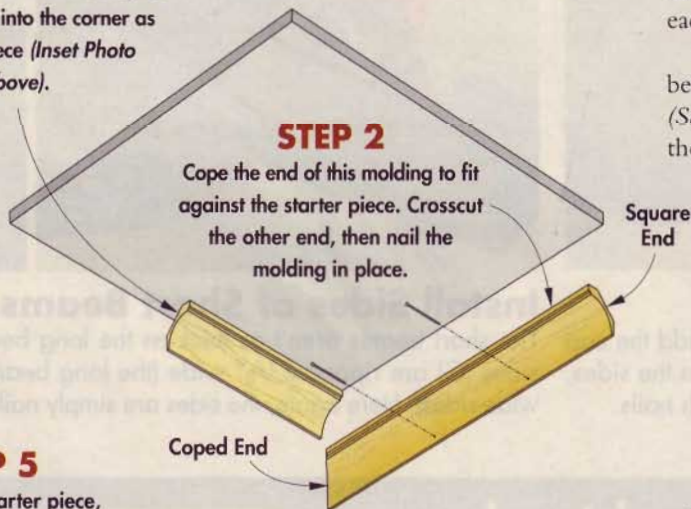
The final piece of molding is coping and crosscut as before. But here, you'll need to remove the starter piece (*Step 5*). Then tuck the square end of the molding into the recess that was formed by the starter piece (*Step 6*).



▲ To produce tight-fitting joints, this cove molding is coped at one end and square at the other end. Then it's "sprung" into place against a temporary starter piece (*Inset Photo*).

STEP 1

Temporarily tack a short scrap of cove molding into the corner as a starter piece (*Inset Photo above*).

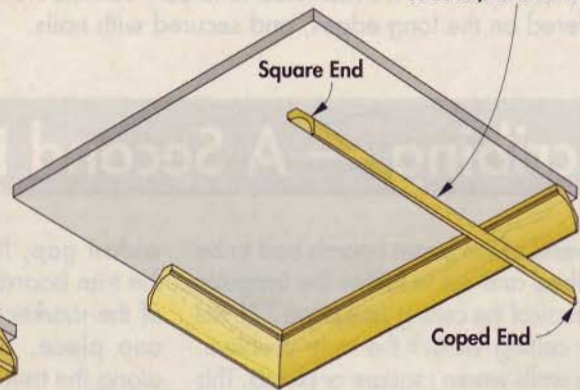


STEP 2

Cope the end of this molding to fit against the starter piece. Crosscut the other end, then nail the molding in place.

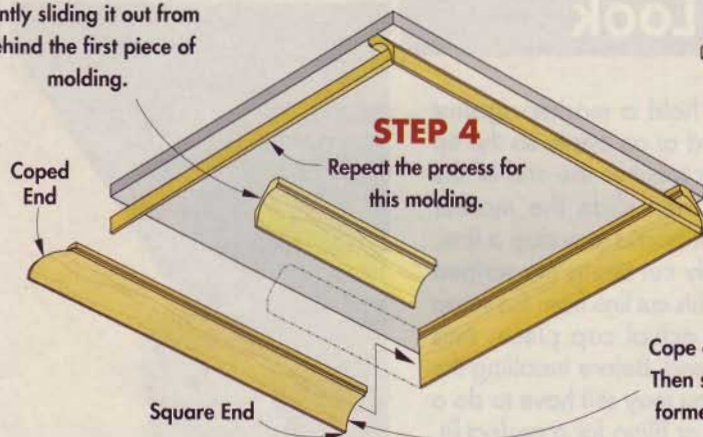
STEP 3

Repeat the coping and crosscutting technique for this molding and attach it, as shown.



STEP 5

Remove the starter piece, gently sliding it out from behind the first piece of molding.



STEP 4

Repeat the process for this molding.

STEP 6

Cope and crosscut this piece of molding. Then slip the square end into the recess formed by the starter piece and nail the molding in place.

NOTE:

Repeat all steps for each square in the ceiling grid.

Skill Builder

the case for COPED JOINTS



▲ The secret to a tight-fitting coped joint is to cut the end of one piece of molding to match the profile of the adjoining piece. Hold the coped end against a scrap piece (right) to check the fit.



Small details can make a big difference in the appearance of a project. For instance, in the box-beam ceiling project (page 68), one of those details is how well the pieces of cove molding fit together at the inside corners.

The best way to produce a tight fit is to cut a coped joint. With this type of joint, one piece of molding is cut, or coped, to match the shape of the other (see *Illustrations below*). The other piece has a square end, which is hidden behind the coped end.

Since the coped end of the molding fits over the adjoining piece of molding, a coped joint will fit tight — even if the walls and ceiling aren't square. And unlike a miter joint, there's little chance a gap will develop as the wood shrinks and swells.

Learning to cut a coped joint isn't difficult, but it does take some practice. (I had the opportunity to "practice" 36 times on the cove moldings for the box-beam ceiling project.)

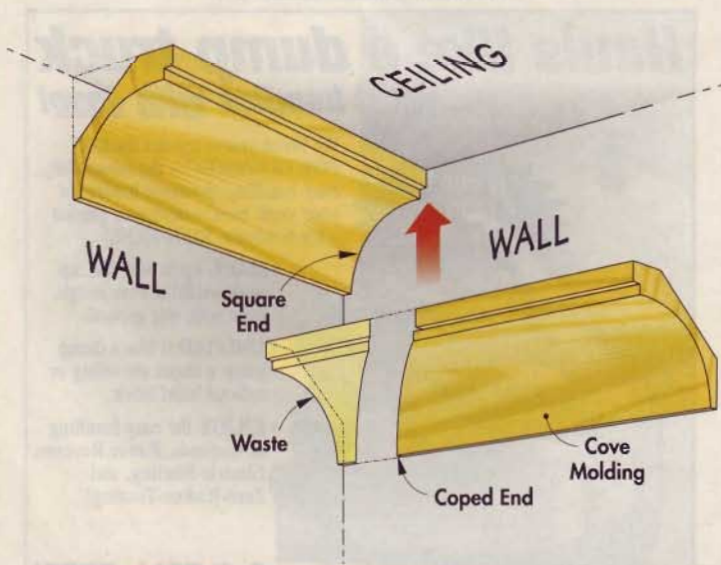
Miter the Molding — The first step is to cut a 45° miter on one end of the molding. The idea here is to cut the miter in such a way that it reveals the profile of the molding. This profile will become a visible guide to follow as you make the cope cut with a coping saw.

To reveal the profile, I use an old trim carpenter's trick. That is, to position the molding on the miter saw so it's upside down and backwards. To see what I mean, take a look at the *Photo* in Step 1 on the next page.

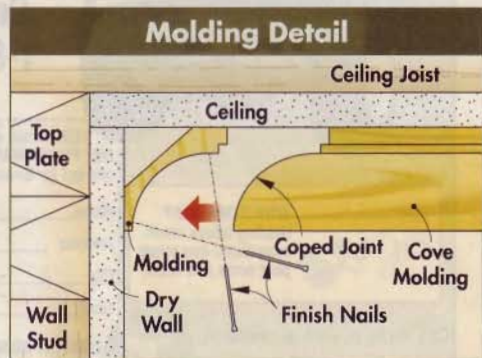
Notice that the top edge of the molding is sitting on the table of the miter saw, and the bottom edge is against the fence. In short, it's upside down. (Think of the saw table as the "ceiling" and the fence as the "wall.")

Okay, that explains upside down, but what about backwards? That's simple. If you're going to cope the right end of the molding, cut the miter on the left end, and vice versa.

Cope the Joint — After cutting the miter, you're ready to make the cope cut. To prevent chipout, use a coping saw blade with at least 20 teeth per inch. Mount the blade so the teeth point toward the handle. Then clamp the molding to a work-surface, and carefully cut along the profile that was revealed by the miter cut (see *Steps 2 through 6*). The idea is to cut as closely as possible to this profile. Then follow up with a file to smooth the back side of the molding (*Step 7*).



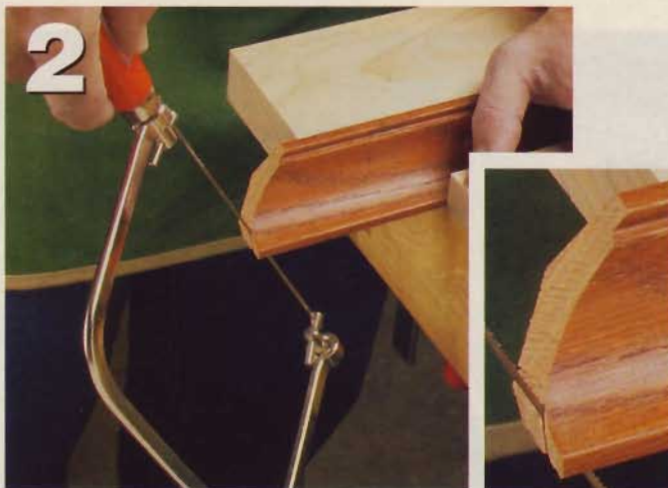
ONLINE Extras
Video: Cutting Coped Joints
WorkbenchMagazine.com





1 Cut 45° Miter in Molding

Set the molding in the miter saw, upside down. Think of the table as the ceiling and the fence as the wall. Then cut the miter to reveal the profile of the molding.



2 Starting the Cope Cut

With the molding clamped between two scrap blocks, hold the coping saw at a steep angle. Then backcut the mitered end, starting at the bottom edge.



3 Follow the Curved Profile

Now continue the cope cut, closely following the line of the curved profile of the molding. Stop when you reach the decorative detail near the top edge.



4 Remove Waste Block

After backing the coping saw out of the kerf, make a short cut from the back of the molding. As this cut intersects the cope cut, the waste block will fall free.



5 Nibble Off Remaining Waste Material

To remove the remaining waste material, start where you left off, holding the saw at the same steep angle and cut toward the top edge of the molding (Step 5). Another short cut removes the waste (Step 6).



7 File to Fit

Smooth the edge and back of the molding with a file. Then check the fit against a scrap piece (See Photo on page 76). If necessary, continue filing until you're satisfied with the fit. The back of the molding will look like the Photo left.



small-shop SPRAY BOOTH

At last — practical spray finish solutions for a small shop.

When setting up our *Ultimate Home Woodshop*, one important consideration was to include an area where we could apply a spray finish. This area required two things: a partition to protect against overspray and a fan to exhaust vapors.

Temporary Partition

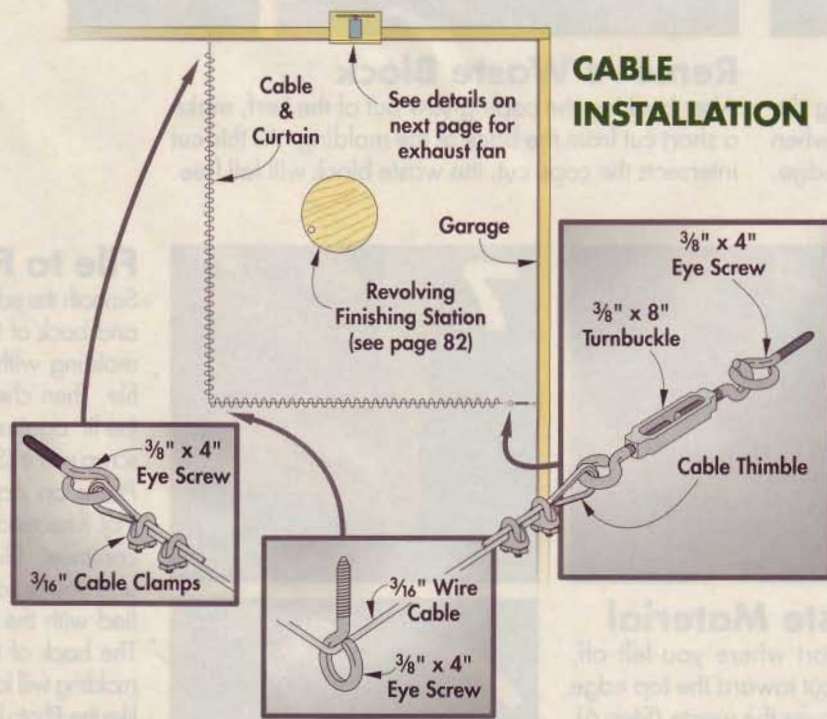
As you can see in the *Photo* at left, we used a lightweight curtain as a temporary partition. Pulling the curtain closed creates a simple, inexpensive spray booth that seals the finishing area from the rest of the garage.

Curtain Considerations — This curtain consists of two 8 x 10-foot dropcloths (available at most paint stores). The dropcloths enclose a corner of the garage, providing plenty of room for spray finishing (see *Illustration* at left).

Of course, you can enclose a larger area, if needed. In fact, even if you don't plan to set up a spray booth, you may want to consider sealing off an area of the shop to prevent dust from migrating through the garage.

In either case, the curtain is hung from shower hooks that slide on a plastic-covered wire cable. To prevent the hooks from tearing the fabric, I sewed a hem around all four edges and installed metal grommets, spacing them about 8" apart. There's a quick look at how to install grommets on the next page. Installation kits are available at most home centers.

Installing the Cable — Before hanging the curtain, you'll need to install the cable. If you look at the *Cable Installation Drawing*, you can see that the ends of the cable are attached to two eye screws that fasten into wall studs. I used cable clamps to secure the cables to these eye screws. The cable makes a 90° turn



at the outside corner. Here, it passes through another eye screw installed in the ceiling joist.

To prevent the curtain from sagging, the cable has to be extremely taut. The solution is to install a turnbuckle, as shown. Here again, the turnbuckle is attached with cable clamps.

Install the Fan

The second requirement for this spray booth is to install a fan to exhaust fumes and vapors. Your installation may vary from the one shown here, but the following guidelines should help.

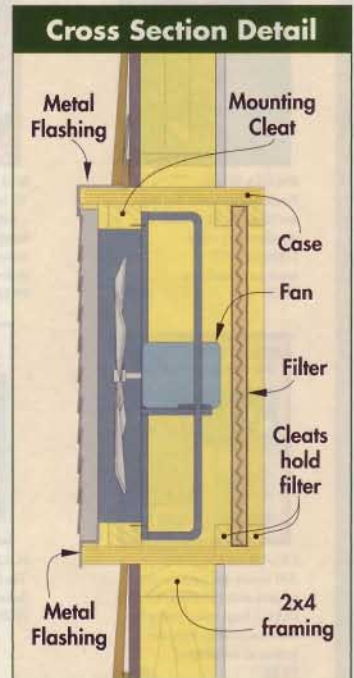
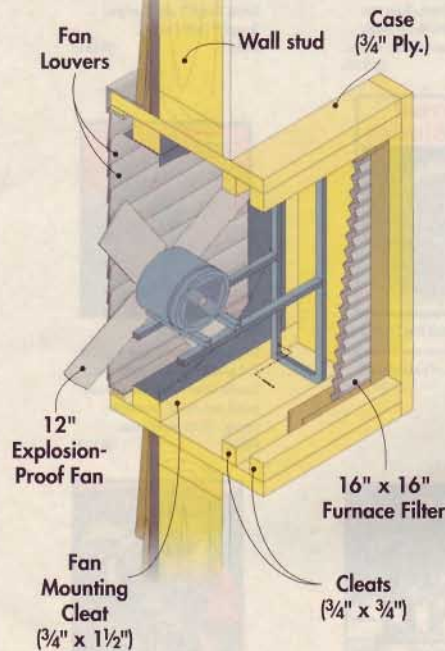
Explosion-Proof Fan — Because many finishing vapors are flammable, you'll need to use an explosion-proof fan. A small space like this spray booth doesn't require a large fan. I purchased a 12" unit with a 1/4-hp motor.

Build a Case — The fan is housed in a 3/4" plywood case, which is sized to accommodate the fan (see *Fan Housing*). Notice that the fan mounts to wood cleats inside the case. I also added two cleats to hold a furnace filter that removes finish particles before they enter the fan. When the filter gets clogged, simply slide in a new one.

Frame the Opening — Once the case is complete, cut an opening in the wall for the case and then frame it with 2x4s.

FAN HOUSING

NOTE: Build plywood case to fit fan, then size opening to fit case



PROJECT SUPPLIES

Grainger

www.grainger.com

800-487-3279

• Fan no. 3XK51

Four-Step Grommet Installation



STEP 1:

Cut a hole in the fabric by striking the hole punch with a hammer.

STEP 2:

Set the grommet on the anvil and then fit the hole in the dropcloth over the grommet.

STEP 3:

After slipping a washer over the grommet, insert the former tool into the grommet.

STEP 4:

Give the former tool a sharp blow with a hammer. This rolls the lip of the grommet over the washer, creating a secure and durable fitting.



WORKBENCH revolving FINISHING STATION

Spray ... spin ... spray. This revolving station makes it as easy as that to produce a smooth, uniform spray finish.

There's more to spraying a finish than squeezing the trigger on a spray gun. To get a smooth, even finish, you need to spray *all* sides of a project, if possible. Which is precisely the idea behind this spray finishing station. You simply set the project on the rotating turntable, then spray, spin, and spray again. So it's much easier to get even spray coverage than having to drag an air hose and spray gun *around* the project.

Saves Space — Another benefit of this finishing station is its nifty space-saving design. As you can see in the *Storage and Setup Sidebar* on page 83, it folds flat for compact, wall-mounted storage when it's not in use. And when you're ready to go to work, it only takes a few seconds to set up.

Construction

Before getting started on this project, take a minute to study the *Construction View* on page 83. Notice that the base consists of two A-shaped side panels connected by a hinge. Another hinge connects this side assembly to the turntable, which is made up of two plywood disks and a Lazy Susan. I made all these parts from $\frac{3}{4}$ " Baltic birch plywood, but fir plywood would also work fine.

Start with the Side Panels — The first step is to lay out and cut the side panels (A) to shape (*see Side Panel Parts View*). If you're wondering about the large opening in each side panel, it's there to reduce the weight of the station. After cutting the side panels to shape, simply join them together with a continuous hinge.

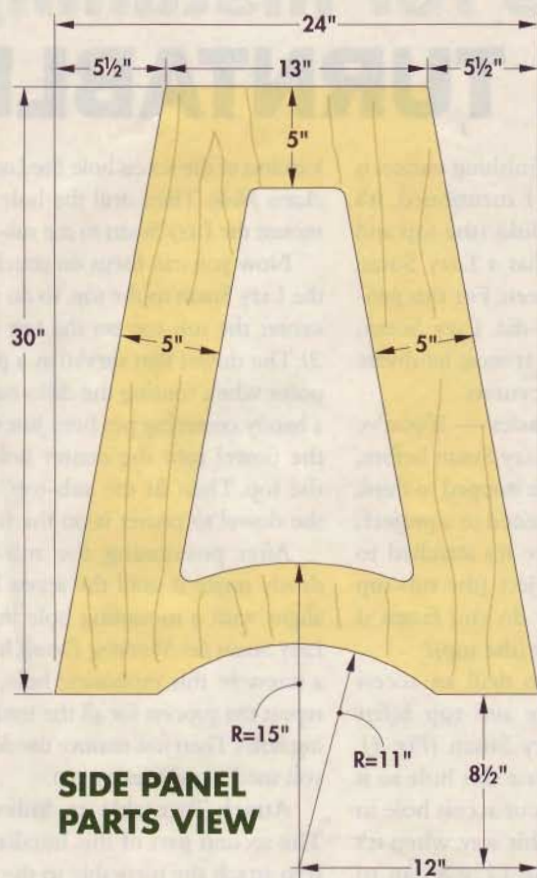
Turntable — Set this side panel assembly aside for now, and concentrate on the turntable. It consists of two disks: a large top (B) and a smaller sub-top (C). I made each disk from an over-size workpiece (about 2" larger than the finished size).

A quick, easy way to cut these parts to shape is to mount a straight bit in a router and use a shop-made circle-cutting jig. This routing technique is explained on page 85. But before you do any routing, locate and drill a centered hole in the workpiece for a dowel that will be used as a pivot point for the jig.

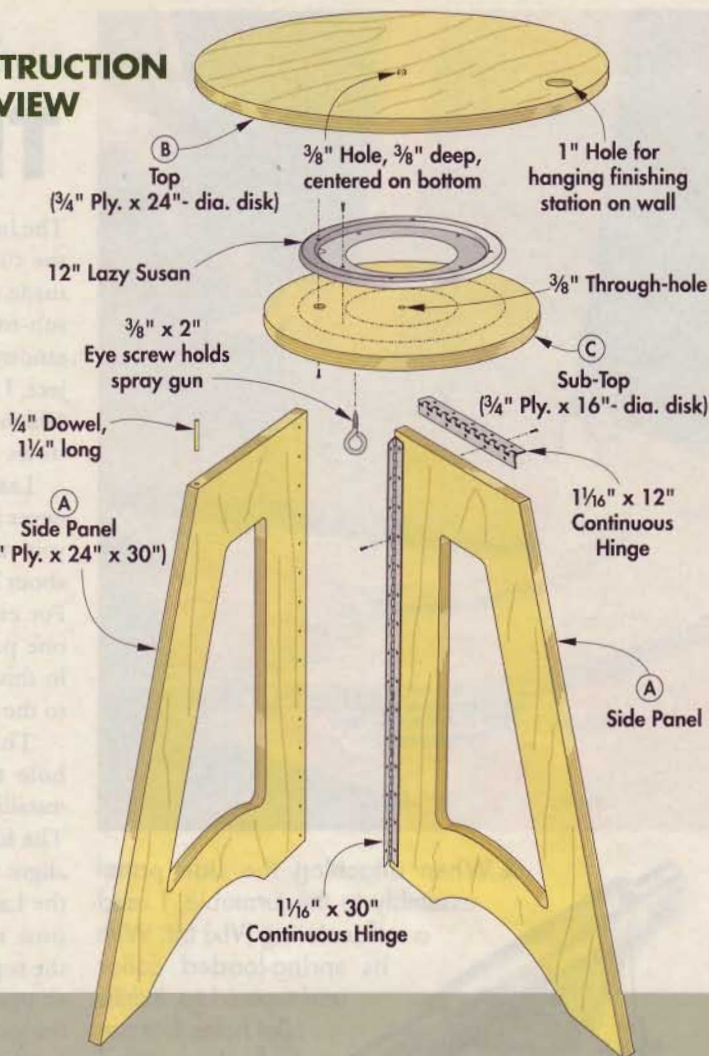
SPRAYING SMALL PROJECTS

Forget the brush — with this finishing station, even spraying a small project is a snap.





CONSTRUCTION VIEW



Storage & Setup



▲ Thanks to its unique, space-saving design, the finishing station can be folded flat and hung on the wall.



▲ To set up the finishing station, raise the turntable, which is hinged to one side, and then swing the other side open.



▲ Now lower the turntable until it engages a dowel in the side.



tips for installing THE TURNTABLE



The heart of this finishing station is the turntable. As I mentioned, it's made up of two disks (the top and sub-top), and it has a Lazy Susan sandwiched between. For this project, I used a 12"-dia. Lazy Susan, which is available at most hardware stores and home centers.

Lazy Susan Basics — If you've never installed a Lazy Susan before, you might not have stopped to think about how it's fastened to a project. For example, once it's attached to one part of a project (the sub-top in this case), how do you fasten it to the second part (the top)?

The trick is to drill an access hole through the sub-top *before* installing the Lazy Susan (Fig. 1). The idea is to locate this hole so it aligns with a pre-cut access hole in the Lazy Susan. This way, when it's time to attach the Lazy Susan to the top, the two access holes create an opening that will let you screw the rotating mechanism on the Lazy Susan to the top.

With that in mind, center the Lazy Susan on the sub-top, and mark the

location of the access hole (see *Locating Access Hole*). Then drill the hole and mount the Lazy Susan to the sub-top.

Now you can focus on attaching the Lazy Susan to the top. To do that, center the sub-top on the top (Fig. 2). The dowel that served as a pivot point when routing the disks makes a handy centering pin here. Just stick the dowel into the center hole in the top. Then fit the sub-top over the dowel to center it on the top.

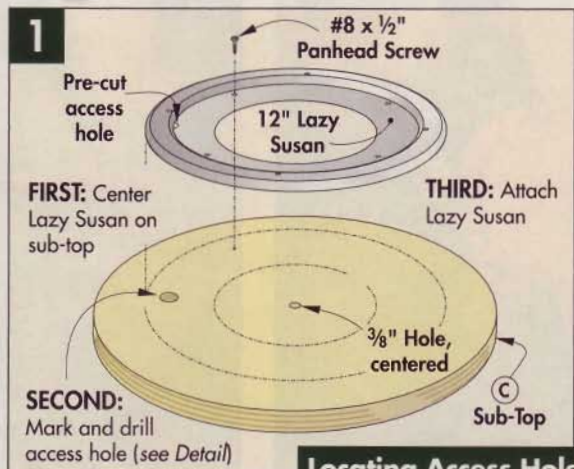
After positioning the sub-top, slowly rotate it until the access hole aligns with a mounting hole in the Lazy Susan (see *Mounting Detail*). Install a screw in this mounting hole, and repeat the process for all the remaining holes. Then just remove the dowel you used as a centering pin.

Attach Turntable to Sides — The second part of this installation is to attach the turntable to the side assembly. Like the sides, the turntable is designed to fold flat for storage. So it's hinged to the leg assembly, as shown in the *Photo* at left.

The easiest way I found to do that is to first screw one leaf of the

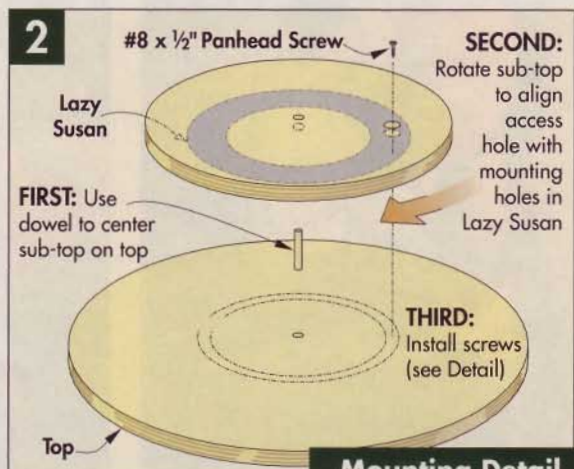
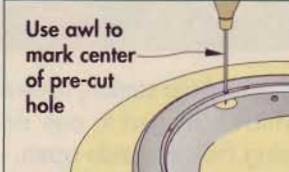


▲ When attaching the side panel assembly to the turntable, I used a self-centering (Vix) bit. With its spring-loaded collar and tapered tip, it drills pilot holes that are perfectly centered on the mounting holes in the hinge.

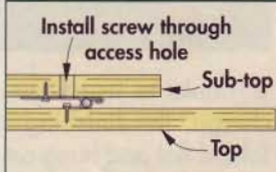


▲ After drilling a 3/4" access hole in the sub-top, center the Lazy Susan on the disk and then screw it in place.

Locating Access Hole



Mounting Detail



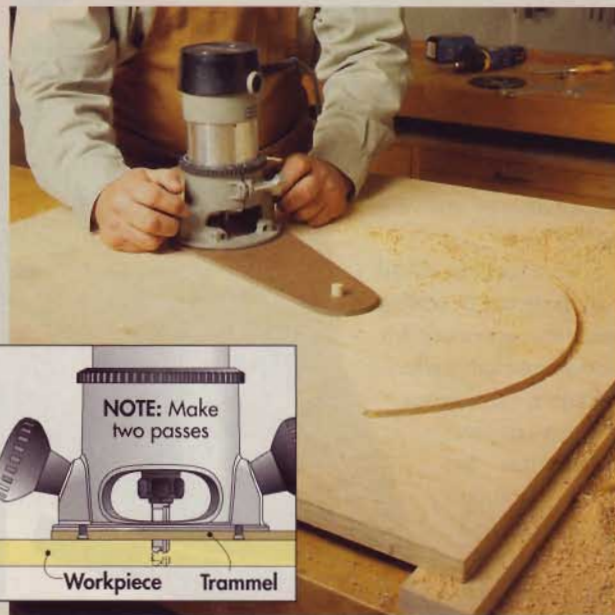
▲ Now rotate the sub-top so the access hole aligns with a mounting hole and install a screw. Repeat for the other mounting screws.

simple trammel for ROUTING PERFECT CIRCLES

hinge to one of the side panels (see Fig. 3). Then lay out the location of the side panels on the sub-top like they'll be when they're in the "open" position. To create a stable platform, the station is designed so the sides are 60° apart. Now just set the side assembly on the subtop and mount the hinge (see Photo on page 84).

Install Dowel — All that's left to complete this project is to provide a way to keep the sides from swinging closed if they get bumped while you're working at the station. That's the job of a short dowel, which is housed in the top edge of the side that's not hinged to the turntable (Fig. 4). Part of this dowel sticks up above the side. So when you lower the turntable, a hole in the sub-top fits down over the dowel, "locking" the station in the open position.

To align the hole and the dowel, it's best to drill the hole for the dowel first. Then insert a dowel center in the hole and lower the turntable onto it to create a dimple in the sub-top. Now drill the hole in the sub-top and glue the dowel in the side.



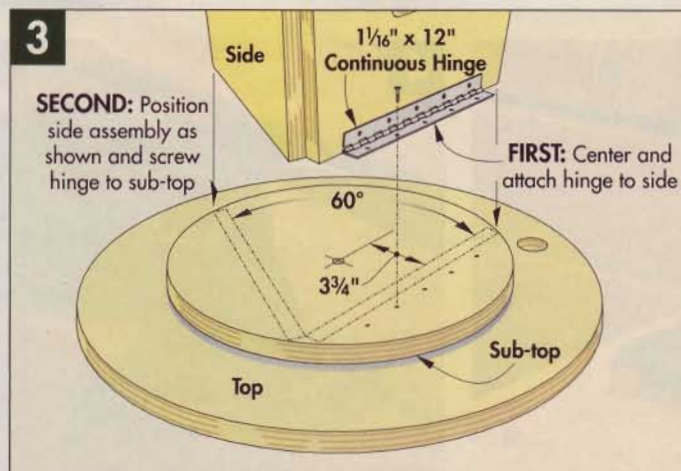
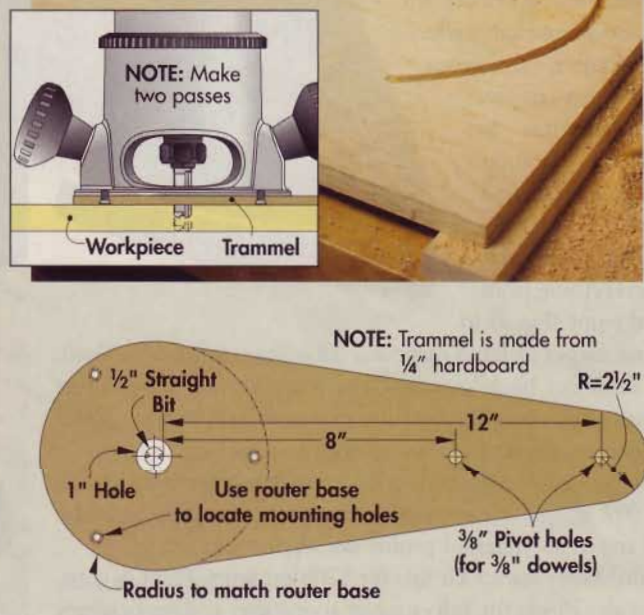
To cut the two disks for the turntable, I used a router, a 1/2" straight bit, and a hardboard trammel (circle-cutting jig) that pivots on a dowel.

There are three holes in the trammel, a clearance hole for the router bit and two pivot holes, one for each disk. The distance between the centerpoints of the pivot holes and the inside edge of the bit is important. It should match the radius of the disk.

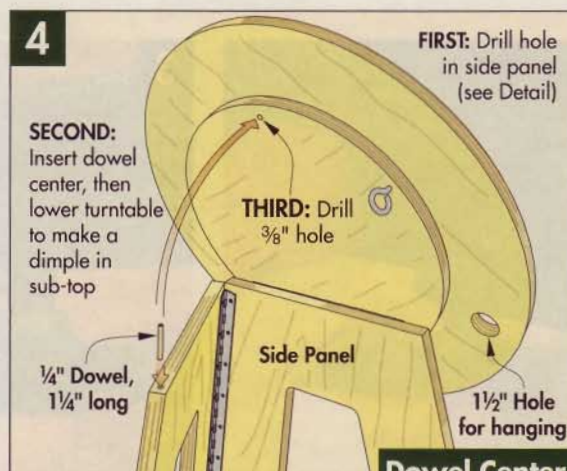
It's best to rout the disks in two passes, the first with the router set for a 3/8"-deep cut, and the second with it set to cut all the way through.

For each pass, position the trammel on the workpiece using the dowel as a pivot pin. Then turn on the router, lower the bit into the workpiece, and rout from left to right.

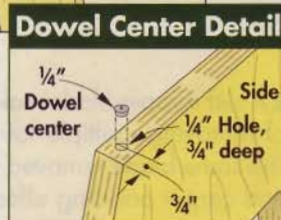
Note: To avoid cutting into the bench, be sure to elevate the workpiece with blocks.



▲ The next step is to attach the side assembly to the turntable. Start by mounting a hinge to one side. Then lay out the location of the sides in their "open" position, as shown. Now set the side assembly in place, drill pilot holes for the screws (see Photo on page 84), and mount the hinge to the sub-top.



▲ To locate the hole in the sub-top that fits over the dowel, insert a dowel center in the side. Lower the turntable to make a "dimple," and then drill the hole.



TOOL
Close-Up

not just another DETAIL SANDER

To consider the Fein MultiMaster just another detail sander is to miss the unique capabilities of one very versatile tool.

While it is an excellent detail sander made all the better by adding the dust extraction accessory kit (Fig. 1), it is also a remarkably effective power scraper, rasp, grout remover, and flush-cut saw.

The MultiMaster has earned a place in my shop primarily as a scraper and flush-cut saw.

As a scraper, I've used it to remove everything from layers of old paint (Fig. 2) to vinyl flooring, carpet pad, and carpeting (all at the same time, no less).

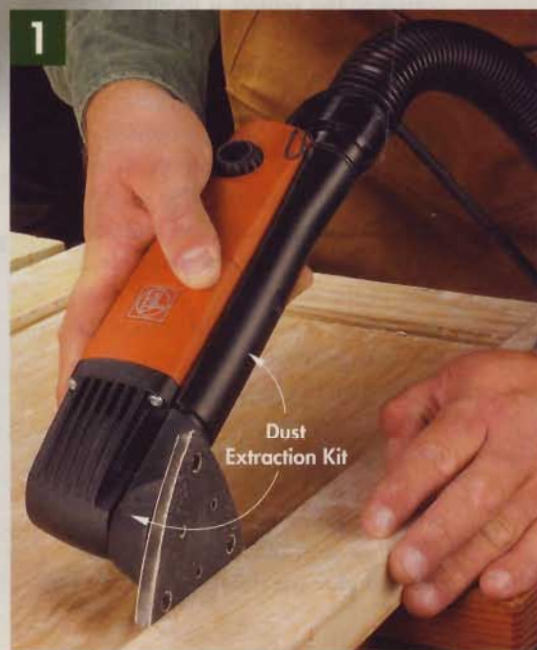
With a flush-cut blade attached, the MultiMaster makes short work of plugs or dowels (Fig. 3). It also makes an excellent jamb saw to create clearance for a tile or wood floor installation.

Of course, the MultiMaster does come in handy for detail sanding as well (Fig. 4), and it can be made even more versatile with the addition of any of six different profile sanding attachments.

The MultiMaster starter kit lists for \$208 on www.FeinUS.com. The Website also shows the full range of accessories and applications for this unique tool. You can also contact Fein at 800-441-9878.



◀ Oscillating action (instead of orbiting or rotating action) makes the MultiMaster more adaptable than typical detail sanders.



▲ A stiff scraper blade makes easy work of removing multiple layers of paint. The same blade removed vinyl, carpet, and carpet padding effortlessly.



▲ A flush-cut blade on the MultiMaster is a fast and clean way to remove plugs or caps. It's also a great jamb saw for undercutting walls or molding.



▲ Tight corners are no problem for the tapered, triangular sanding pad of the MultiMaster. Note also the effectiveness of the dust-free accessory kit (Fig. 1).



point-and-click LASER MEASURE

When a job requires you to make repetitive measurements, a metal tape measure can become cumbersome in a hurry. Luckily, the Strait-Line Laser Tape makes these kinds of tasks simple. Just point and click to take measurements from 2' to 50'.

After you've pointed the device's red laser beam at the location to

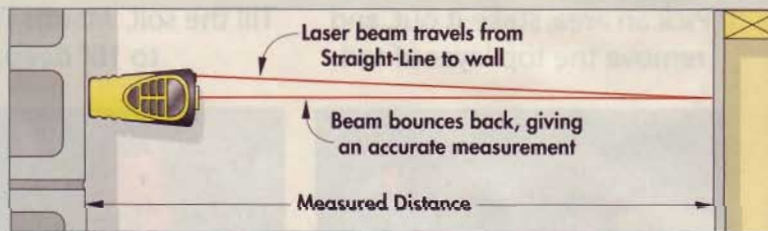
which you want to measure, push the "READ" button, and the distance is displayed on a LCD screen in feet/inches or metric dimensions.

Seven function buttons on the easy-to-grip Laser Tape guide users through the measuring process, and the unit can calculate distance, area, and volume.

The Laser Tape is available at home centers and department stores for about \$40. For more information, visit www.Strait-Line.com, or call 800-464-7946.



► Hold the Strait-Line Laser Tape against one surface, and it bounces a beam off another object to give you a measurement of the distance between the two objects.



TAPE MEASURE

magnetic holder

The Fast-Grip is a convenient docking station to keep your tape measure secured at your side when not in use. An easy twist releases the tape. You can attach Fast-Grip's magnets to the back of most tapes, or buy a tape with the magnets attached. Without the tape, Fast-Grip sells for about \$12 and is available at most major retailers. Go to www.EndeavorProducts.com for more information.



multipurpose HAND SAW

Think of it as a hand tool descended from a reciprocating saw.

The Job Saw from Milwaukee Electric Tool Corp. has a comfortable ergonomic handle and comes

with one standard Milwaukee Sawzall reciprocating saw blade. The Quik-Lok clamp makes blade changes fast and tool-free.

Besides the saw blade, 10 other attachments are available, including a putty knife, scraper, flooring knife, straight knife, file, roofer blade, utility knife, hunting knife, and two styles of grout removers. The Job Saw fits on a paint roller pole or telescoping pole for accessing hard-to-reach areas. It retails for between \$20 and \$30. For more information, call 877-729-3878 or visit www.Mil-Electric-Tool.com





now you can COLOR CAULK



You've planned your building or remodeling project so everything matches perfectly. Why should you expect less from your caulk? With Red Devil's Create-A-Color caulk coloring system, the caulk can match, too. The same latex paint used in your project is hand-mixed with a specially formulated caulk (about \$6 a tube). The mixing hardware is available in two versions: a metal professional model (\$100) and a plastic standard model (\$30). The mixer comes with a syringe for extracting paint and step-by-step instructions. Call 800-247-3790 for more information, or visit www.RedDevil.com



▲ Use the included syringe to add the proper amount of paint to the tube of caulk base.



▲ Attach the mixing tool. It takes about two minutes of mixing for the color to be blended.



▲ On application, the caulk is lighter than the paint on the siding (left), but it dries to a perfect match (above).



ladder-top TOOL ORGANIZER

Constantly climbing up and down a ladder to retrieve tools and materials can be frustrating and tiring. With a Ladder Boss, however, you'll have plenty of room to keep the supplies you need right on hand to complete the job.



Ladder Boss (\$50) and Ladder Boss Pro (\$80) are two versions of a product that slip right over the top of a ladder and keep tools organized and within easy reach. Both versions are constructed of heavy-grade canvas and are designed to hold either a 2-gallon or 5-gallon bucket. Besides construction materials like paint and nails, the bucket pouch can also hold large tools like saws or nail guns.

Both Ladder Boss products feature a detachable drill holster, 17 tool pockets, a drill-bit holster, four hammer-tie loops, and a carry handle.

A shoulder strap, shown at left, allows you to climb a ladder and still have both hands on the rails for safety.

For more information, visit www.LadderBoss.com or call 760-751-7383.



▲ Dennis Williams rebuilt the body of this 1926 Ford Model-T Depot Hack “from the floorboards up” using quartersawn white oak and black walnut. This is no small feat, considering what the vehicle looked like when cousin Terry Janssen first bought it (*below*).

Rebuilding HISTORY



The Ford Model-T Depot Hack holds the distinction of being the first motorized taxi (“hack” is an old word for taxicab). But nearly a century after rolling off the assembly line, this 1926 Hack (*shown above*) looked like its glory days were well behind it (*see Photo, left*).

Back to Life — Even though his family called the old car a “pile of junk,” Terry Janssen of Clive, Iowa, was determined to salvage the classic. He began the long process of rebuilding the engine and chassis of the old Model-T, using as much of the original vehicle as possible.

Chassis of Steel, Body of Wood — One unique thing about Depot Hacks is their wood bodies. The body of Terry’s was rotting away, so he brought his cousin Dennis Williams onto the project to rebuild it. (See page 96 for details of Dennis’ woodworking on the Depot Hack.)


After more than four years, Terry’s original \$2,500 purchase has yielded a classic car valued at over \$15,000. But what’s even more valuable is the enjoyment Terry gets from giving rides in this historic car.

Depot Hack DETAILS

Unlike the assembly line vehicles of today, Henry Ford hired cabinetmakers to build the wood bodies of his Depot Hacks. As a result, each one was different than the next. But most Depot Hacks had one similarity: The wood these cabinetmakers used to make them was from oak crates provided by Ford.

Old and New — Keeping both these things in mind, Dennis Williams created a body for this Hack that represents the best of both worlds — quartersawn white oak to match the old-fashioned materials, and black walnut trim, coupled with finely crafted joinery, to give this Hack its own style.

A Sturdy Structure — Starting with a rotten wood body, Dennis had no choice but to rebuild the Depot Hack “from the floorboards up.” One of Dennis’ greatest challenges was building a wood body sturdy enough to handle the rigors of automotive travel, which led him to use a number of tried-and-true joinery techniques: pegged mortises and tenons, brass bolts through threaded brass inserts, and finger joints, just to name a few.

Terry’s restored Depot Hack will be on display at the Woodsmith Store in Clive, Iowa, through January 2004. 



▲ Dash — The wood dash continues the theme of quartersawn oak accented by black walnut trim. Holes drilled in the face of the oak dash accept an antique speedometer and temperature gauge.



▲ Sides — With quartersawn oak rails and “floating” black walnut panels, the Hack’s sides are joined like a cabinet. The doors have original latching hardware and new handles.



▲ Roof — If this roof looks like wainscoting to you (*inset*), that’s because it is. Dennis used $\frac{5}{16}$ ” thick oak boards and routed a beaded profile along one edge and a bevel on the other. For contrast, the crossbeams and Roman ogee trim pieces are black walnut.

