

SPECIAL 2008 ROUTER ISSUE!

17 Super-
Useful
Router Tips
page 58

AMERICAN WOODWORKER

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Amazing New Router Innovations

Shop-Built Router Table

Feature-Rich for only \$100 p.40

FIVE NEW HARDWORKING ROUTERS p.24

FAST GUIDE to Frame and Panel Doors p.82

4 Quick-to-Make Router Projects

Enter America's Biggest Woodworking Competition

p.56

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#134 March 2008

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See it on Page 23 of the 2008 Catalog.

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Spiral Cutterhead

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See it on Page 47 of the 2008 Catalog.

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- Cutterhead speed: 4950 RPM
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New!



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- Motor: 3 HP, 220V, single-phase, w/reversing switch
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- Filter: 0.2-2 micron
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20 ingenious new router innovations.

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Routers are hot!
New ideas just keep on coming.

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5 cubes-in-a-cube: a new record?

11 Question & Answer

Rout a lock miter joint, use a bandsaw to rip short stock, and take photos of boards before deciding how to glue them together.

15 Workshop Tips

Build a rack for turning tools, feed plywood from a pivoting support, improve a Long Ranger, organize cutoffs, hold down short pieces on a miter saw, build a horizontal flush-trimming machine, double-up Quick-Grips, and use a latex glove to store liquid finish.

22 Tool Nut

17 routers in one shop
and a Stanley dinosaur.

94 My Shop

Martha Stewart likes this shop—not!

96 Oops!

Vacuuming sawdust off the chandelier
wasn't part of the plan.



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On The Cover

Peter Schmitt is a young furniture-maker with a lot of ambition. Inspired to pursue woodworking as a career by a visit to the Steinway piano-building shops, Peter attended the Chippendale International School of Furniture in Gifford, Scotland, which offers a 30-week course in furniture design, construction and restoration. Peter currently runs his own custom woodworking business as a member of the Fourth Street Guild, a cooperative shop in Minneapolis, Minnesota. Visit www.schmittcustomfurniture.com to see examples of Peter's work.

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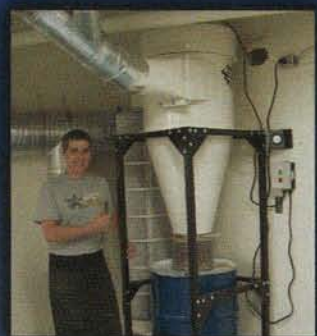
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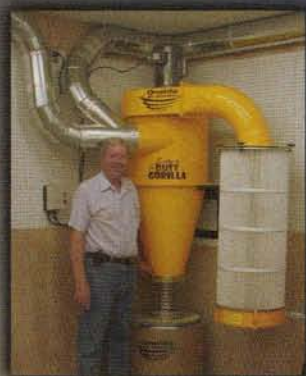
"I am so impressed it is unreal! The suction that thing has is amazing! The system is extremely good quality and works so well we are all finding it a little hard to believe. We have already filled one 55 gallon drum with fine dust and after checking the pan under the filter, there is virtually no dust!! The cyclone really does separate the dust like they claim!! I think anyone even slightly serious about woodwork needs an Oneida system no questions! A huge thumbs up to Oneida for offering such a great American made product when others only offer imported junk! She is a real thing of beauty and money well spent!"

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Vancouver, BC



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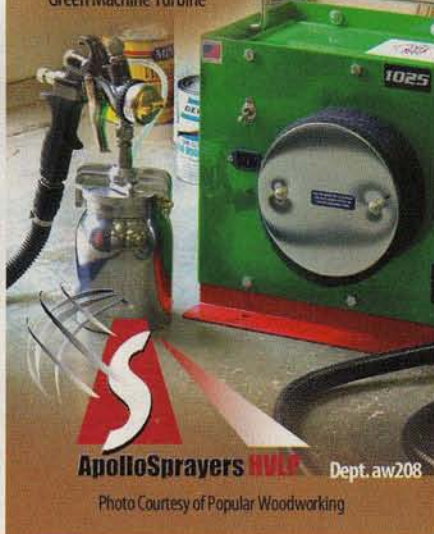
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EDITOR'S LETTER

Woodchips and Router Bits

Do you remember your first router? Mine was a Makita 3600BR plunge router—I still have it. But my first exposure to a router goes back to when I was a kid poking around my Dad's garage. He had an old all-metal router, much like the Stanley pictured on page 22. Dad's router fascinated me, even though I didn't have a clue what it did. Even its sturdy flip-top metal storage case struck me as an engineering wonder.

Later, as a teenager, I had a chance to use a Craftsman router my Dad owned. The router bits all had 1/4-in. shanks and were made from high-speed steel. Routing a round-over on cherry or walnut was a tall order that required a lot of hand sanding to get rid of the burns. But I was hooked! Now, like most woodworkers, almost every one of my projects involves routing of some kind.

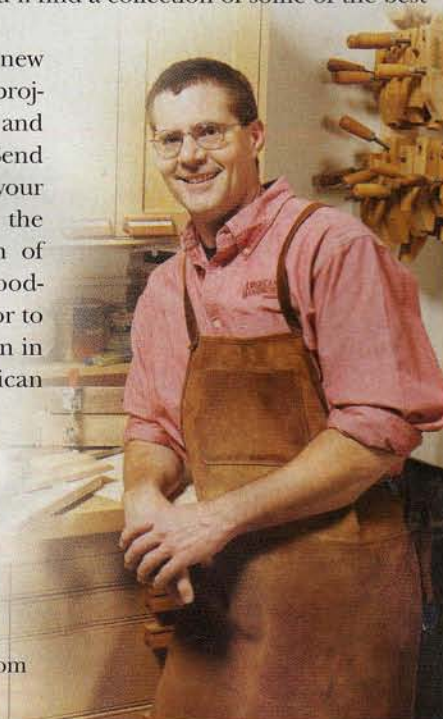
Routers have come a long way from those early monsters that shook, screamed and spewed blizzards of wood chips. Manufacturers and inventive woodworkers continue to develop better, faster and more useful machines, bits and accessories. This issue of American Woodworker includes 20 router-related innovations in a special expanded "Well-Equipped Shop," starting on page 24. There you'll find the newest routers and high tech equipment, as well as router accessories that will improve your woodworking without breaking your budget. If you're in the market for a router, check out the exciting new models available from several manufacturers including Craftsman, Festool, Freud, Porter-Cable and Trend. They each deliver new features that will make your routing easier and more accurate.

This issue also includes several projects that make use of both hand-held and table routing. For a foolproof way to make frame and panel doors check out the technique story on page 82. If you're looking for useful routing tips and tricks, you'll find a collection of some of the best on page 58.

As you try out some of this new gear or build one of our router projects, drop me an email or letter and tell me about your experience. Send in some good digital photos of your projects and we'll add them to the new Readers' Showcase section of our website (www.americanwoodworker.com/readersshowcase), or to the Woodworkers' Gallery section in an upcoming issue of American Woodworker.

Until next time, happy routing,

Randy Johnson
rjohnson@americanwoodworker.com





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- C. Tapered Oval Nozzle 03J67.23 \$5.50
- D. 2 1/2" Hose Adapter 03J67.24 \$4.50
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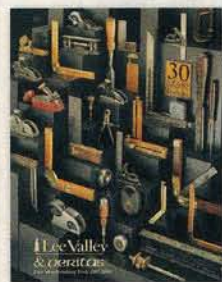
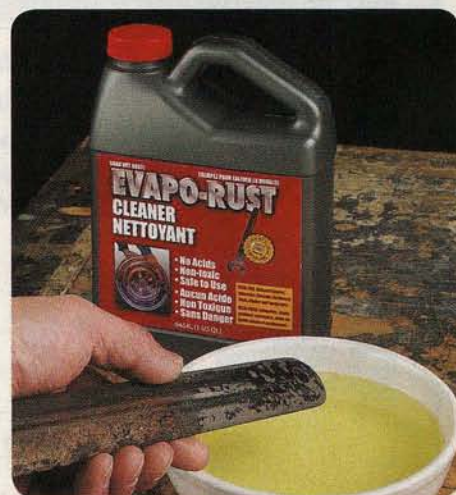
size stores larger tools (e.g., bench planes up to a #4); the 12" x 18" bags can contain planes up to a #5 jack or a set of gardening hand tools. Available by size or in a sample pack that contains two each of the 6" x 8" and 10" x 12" bags, along with one 12" x 18" bag. Economical and reliable insurance against moisture damage.

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BENCH BUDGET

I recently had a lot of fun building your plywood and 2x4 bench (AW#89, October 2001) and should get a lot of good use out of it. I changed your plans a bit and used bead board on the outside of the two ends. Your cost estimate of \$250 is a bit low, six years later, and must have omitted the vice hardware. I spent \$300 for the lumber, \$160 for the quick-release face vise, and \$26 for the hand-screw tail vise, so my total cost was \$486. I'm pretty happy with the bench—it weighs a ton!

Bruce Boehmke



ROUTER SUCCESS

Here's a photo of a stool I made using your method of routing its round parts, rather than turning them (AW#128, April/May 2007). I had very limited experience with routers before tackling this project, as I was somewhat intimidated, but your jigs worked very well. I look forward to using them on more projects. Last week I went out and bought a new and bigger router!

Rick Finney



COPING SAW CONTROVERSY

I have been a shop teacher for 27 years. Either I have been giving my students the wrong information about coping saws or you made a mistake. In the October 2007 issue (AW#131) you have an article entitled "Which way do the teeth go?" You wrote that the teeth could go either way, but I've taught my students that the teeth should always point toward the handle, so that the handle is pulling the blade through the wood. If the teeth point away from the handle, the saw's frame can bend, which will cause the blade to loosen and come off. Please tell me if I am right or wrong, or at least tell me if you think my reasoning makes sense.

Dave Jensen

Yes, your reasoning does make sense, and many other readers wrote us with the same concern. I've never experienced a problem with the blade coming off, but I suppose it could happen with some saws, particularly if the blade is dull or not fully tensioned. I always stretch the blade as tight as the saw allows. —Tom Caspar

COMPRESSOR CAUTION

Chris Cardinal did a wonderful job restoring his 1945 Kellogg air compressor (AW#132, Nov. 2007), but I'd be concerned about the tank, which could fail from corrosion. The result would be catastrophic. Any compressor tank over ten years old should have a thorough inspection—its thickness should be measured using an ultrasonic thickness gauge.

Tom Codispoti

Chris responds:

Thanks for the caution. You're correct regarding corrosion as the number one cause of tank failure—it was my first concern. I worked closely with the owner of a large air-compressor maintenance and repair facility when I restored my machine. We did not find any rust inside the tank, so it must have been drained on a regular basis. Someone took good care of this baby!



5 CUBES IN ONE

A light bulb went off midway through reading "Cube In A Cube" (AW#130, September 2007). I

thought, why not make even more cubes inside each other—and use a plunge router and template guide instead of a drill press?

I started out with a 4-3/4-in. basswood cube and figured out on graph paper that I could make four smaller cubes inside the big one. I made four templates from thin plywood, one for each size circle. I got so excited about it all that I destroyed my first blank by forgetting to put the template

guide in the router. I also destroyed one of my templates by lifting up the router before it stopped. Focus, focus, focus! Which I did, and it worked.

Martin Dohnalik



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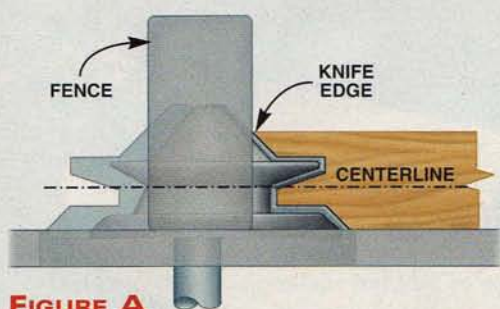
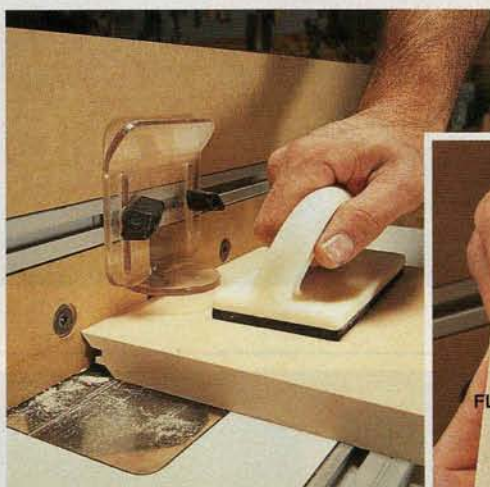
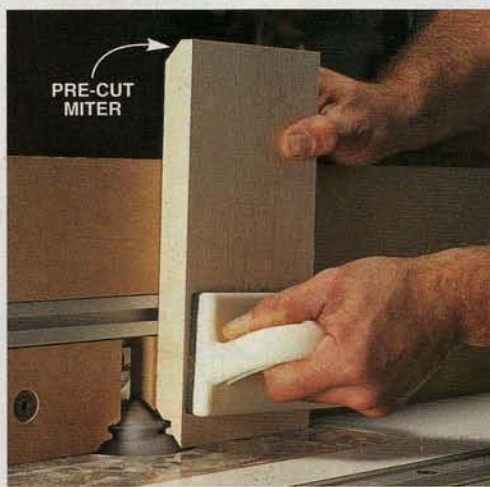
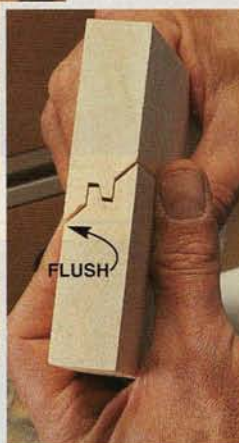


FIGURE A

To make a lock miter joint, align the center of the bit with the center of your material. Then, position the fence to produce a knife edge.



1 To check the bit's height, rout two test pieces and fit them together (see inset). If their outside edges are flush, you're good to go.



2 Rout the mating piece of a lock miter joint by standing it upright. Pre-cut the ends of all your pieces on a tablesaw to make the job easier.

Lock Miter Joint

Q How do you set up a lock miter bit?

A There are two critical adjustments (Fig. A). First, you set the bit's height; second, you position the fence. Once that's done, you can rout both sides of a lock miter joint without changing anything.

To get started, you must use a variable-speed router set at 10,000 rpm to slow down this large-diameter bit to a safe speed. Make some test pieces that are exactly the same thickness as the parts you'll join together. Then adjust the bit's height by eye until it looks like it's centered on the workpiece. Position the fence by eye, too.

Make test cuts on two pieces (Photo 1). Put the pieces together and see whether their outside edges are flush. Raise or lower the bit as needed, without moving the fence, and make more test cuts until you've got the bit exactly centered on the thickness of your material.

Next, tweak the fence's position in or out and make some more test cuts. Your goal is to make a sharp edge on top of the workpiece, leaving just a whisker of its original edge. If the fence is too far out, you'll make a blunt edge on the workpiece, and the joint won't have a sharp outside corner. If the fence is too far in, you'll get a jog along the workpiece's edge, and the board will snipe at the end of the cut.

Once you've set the fence, machine half of your pieces flat on the table. Cut the other half by holding them vertically against the fence (Photo 2).

Source:
Woodcraft Supply,
www.woodcraft.com (800)
225-1153, Whiteside Lock
Miter Bit, 2" Dia. for
1/2"- to 3/4"-thick
stock, 812508, \$95.





SWITCH TO A BANDSAW

Q How can I safely rip short pieces of wood?

A Use a bandsaw, not a tablesaw. It's not good shop practice to rip a board less than 12 in. long on the tablesaw because it may kick back at you. A bandsaw won't kick back. Use a fence to guide the cut and a push stick to keep your fingers out of harm's way. Smooth the rough surface with a sanding block or a hand plane, or rub it on a piece of sandpaper taped to a flat surface, such as your tablesaw.

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VIRTUAL GLUING

Q I've got three unusual boards to glue together, but I'm having a hard time visualizing all the combinations of which board should go next to which. Any tips?

A Here's one idea: make "virtual" tops. Take photos of the boards, cut up the pictures, and tape them together in different arrangements. Make copies of the arrangements you like, so you can directly compare one with another.

Let's assume that you've got three boards and both sides of each board are good enough to face up in your top. Pick one side of each board and mark it as A1, B1 or C1. Lay the boards together, in any order, and take a photo. Turn the boards over, mark the opposite faces as A2, B2 and C2, and take another photo. Print several copies of both photos and you've got your virtual boards.

Cut up the photos and arrange the pieces as you wish. You can even "rip" a board with a pair of scissors to see how the figure in one board may best blend with the figure in another.

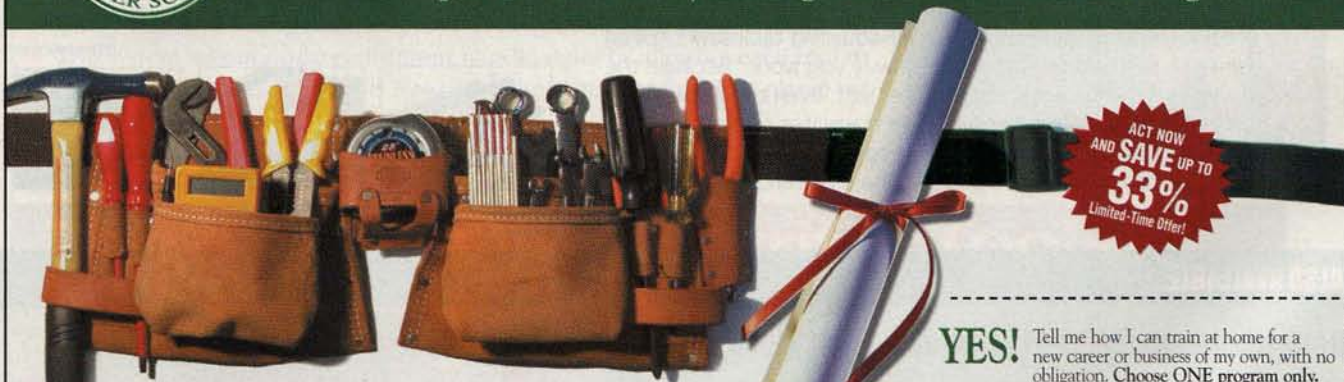


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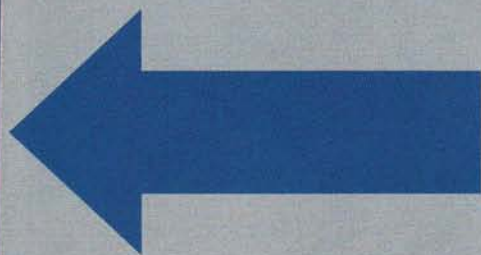
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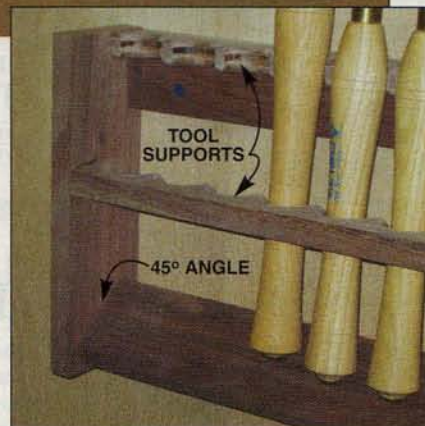
edited by
Tim Johnson



WEDGED LATHE TOOL RACK

My lathe tool rack is based on a fishing rod rack that I made some time ago. Made from 3/4-in.-thick walnut, it measures 3-1/8-in. by 10-in. by 30-in. I made the front and back tool supports by ripping a 3-1/8-in.-wide board in half after drilling centered 1-1/2-in.-dia. holes on 1-7/8-in. centers. I installed the 2-3/4-in.-wide bottom board at a 45-degree angle to gently wedge the long handles between the bottom and the two supports. This system accommodates different handle styles by allowing each tool to find its natural resting point. Now my lathe tools rest firmly in place, yet are easy to remove and replace.

Dick West



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SLED - #1464

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XL SLED - #1465

\$64⁹⁵



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PLYWOOD TIPPER

Hoisting heavy sheets of plywood and MDF onto my tablesaw is not my idea of workshop fun. That's why I devised this pivoting rack—and began storing my sheet stock vertically.

The rack's frame fits around the two base uprights and pivots on bolts. A cleat at the bottom keeps the sheet from sliding off.

After installing a sheet on the rack, I simply tip it down toward the saw. A horizontal stop with adjustable feet holds the rack at tablesaw height. The feet are oriented upside down, so they thread into the top of the stop.

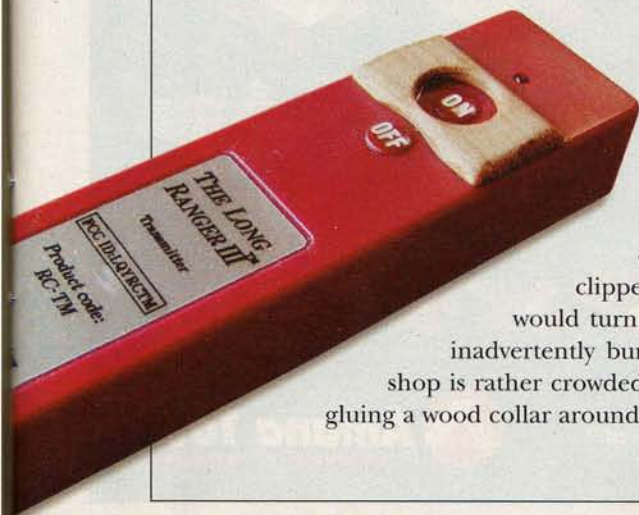
Miles Clay



REMOTE CONTROL COLLAR

The remote control module for my dust collection system used to drive me crazy: When it was clipped to my belt or pocket, it would turn the system on whenever I inadvertently bumped into something (my shop is rather crowded). I solved the problem by gluing a wood collar around the "on" button.

Mark Thiel



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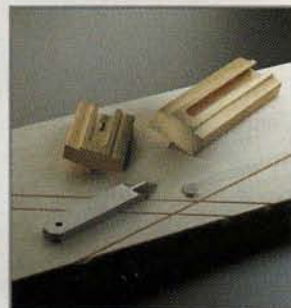
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ORGANIZED STORAGE FOR SHORT STOCK

My storage bin makes it easy to find the perfect offcut by automatically organizing pieces by length. It has one fixed center divider and six that I can quickly add or remove, to customize the storage as my collection of short pieces changes.

I made the box from a sheet of plywood cut into two 4-ft. by 4-ft. pieces. I cut one piece in half to create the 24-in. by 48-in. bottom, the 24-in. by 18-in.-tall front and 24-in. by 30-in.-tall back. I cut the other 4-ft. by 4-ft. piece diagonally to form the two sloping sides. The 4-in.-wide dividers were cut from scrap stock. They install in stopped dados routed in the sides. I mounted four heavy-duty swivel casters under the bin, so it steers easily.

Serge Duclos

JIG FOR SHORT CUTS

When I need to cut a bunch of small, equally sized pieces, I install this simple jig. It holds short pieces securely during and after cutting, so they don't get caught by the blade and thrown around the shop.

My jig is just a hold-down clamp attached to a squarely-cut piece of plywood. This clamp is designed for T-Track use, but it can also be attached to a work surface. I simply slide the jig in position and use the saw's hold-down clamp to secure it.



George Davis

Source

Grizzly Industrial, www.grizzly.com, (800) 523-4777, Hold-Down Clamp, #H0879, \$4.

REVOLUTION

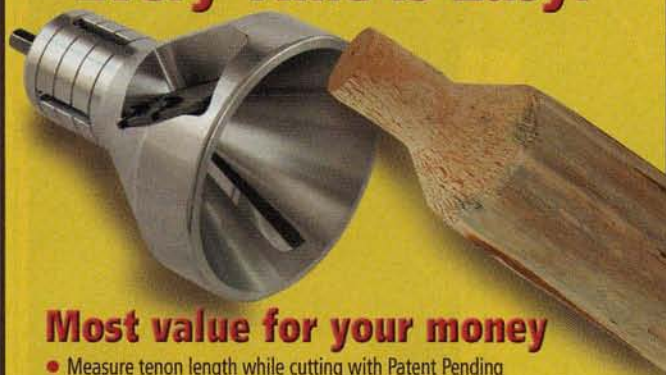
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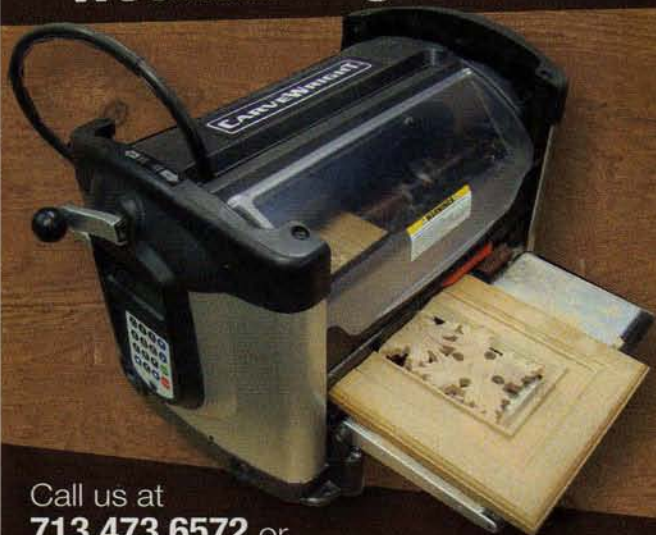


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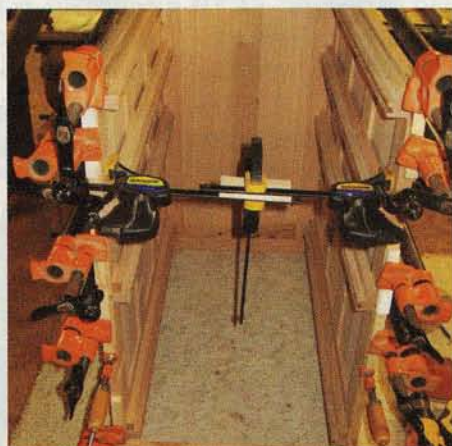
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No-Fuss Flush Trimming

My flush-trimming setup allows trimming veneer and solid wood edging up to 7/8-in. thick. It consists of a router with a 1/2-in. straight bit, a table and a perpendicular fence. A 1-in.-thick spacer separates the fence and table. The router mounts to the fence so the bit is flush with the tabletop. I attach my shop vacuum's hose to a hole drilled through the cleat, under the bit. I size the edging so it overhangs by 1/16-in. or less.

Richard Helgeson



CLAMP SPACERS

While I was gluing up the pedestals for an oak desk, I realized I needed a way to hold the sides parallel at the front. Three Quick-Grip clamps and a scrap wood spacer did the trick. They installed in seconds and were easy to adjust.

Steve Keller

GLOVE SAVE

After brushing the first coat of finish on my shelf project, quite a bit remained in the disposable cup. I didn't want to pour it back, because that would contaminate the fresh finish that remained in the can. But I did not want to waste the finish by throwing it away, either.

Knowing the shelves were going to need a second coat the next day, and because I was using a disposable brush, I decided on a third option. I simply stretched a latex glove over the brush and around the top of the cup. This option saved both the finish and the brush, so I was ready to put on the next coat with a minimum of fuss.

Ray Lanham



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ROUTER WRANGLER

I guess you could say that I'm obsessed with routers. I'm only 36 years old, but I've got 17 of them. It's not just a whim, though. I've been a professional woodworker for 18 years, and I've learned that in a good cabinetmaking shop you're likely to find several routers dedicated to specific jobs, with their bits set up ready to go. I've adopted this strategy in my home shop, too, where I make traditional country furniture and modern cabinets.

My collection has grown as I've found more and more uses for my routers. I keep a special ogee bit for making door edges in a Bosch D-handle 2-1/4-hp router, for example. There's always a 1/2-in. flush-trimming bit in a 1-3/4-hp Milwaukee router for evening up face frames with cabinet sides. And I can count on having a dovetail bit pre-set at exactly the right height in my 1-3/4-hp Porter-Cable router, for use in a dovetail jig. One of my pals and I always joke around about how nice it would be to have a router for every bit we own. Well, I'm off to a good start!

Jeff Corns



MEET STANLEY, THE ROBOT

My ancient Stanley M1-A 1-1/2-hp router was already 20 years obsolete when I bought it in 1973 at a grungy used tool shop in Chicago. Made from highly polished aluminum, it looks like a robot out of a fifties sci-fi movie and routs all that stands before it just as relentlessly. The 18,000 rpm motor makes up in torque what it lacks in speed—if you're not braced when you start it, it can wrench your wrists. There must be a fortune in copper in the motor's windings; this beast feels like it's twice the weight of a modern router.

The on-off toggle switch is on the router's base, not on the motor—you have to plug the motor into it, like a modern D-handled router. The switch is situated so it can be operated with a flick of the thumb while your hand is still on the knob. The knobs, like those on treasured old Stanley/Bailey planes, are Brazilian rosewood, a material now as illegal to import as ivory. Close to sixty years old, the router is still going strong. I've replaced the bearings a couple of times but I'm down to my last pair of brushes. I hope they don't wear out before I do.

Glenn Gordon



Are you a Tool Nut, too? You'll get the new Leatherman Charge AL aerospace aluminum multi-tool if we publish your story. Send your tale to toolnut@american-woodworker.com, or mail it to American Woodworker, 1285 Corporate Center Drive, Suite 180, Eagan, MN 55121. Please include digital photos of your tool if possible. For more on the Charge AL, visit www.leatherman.com

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Circle No. 175

Calling all Tool Nuts!

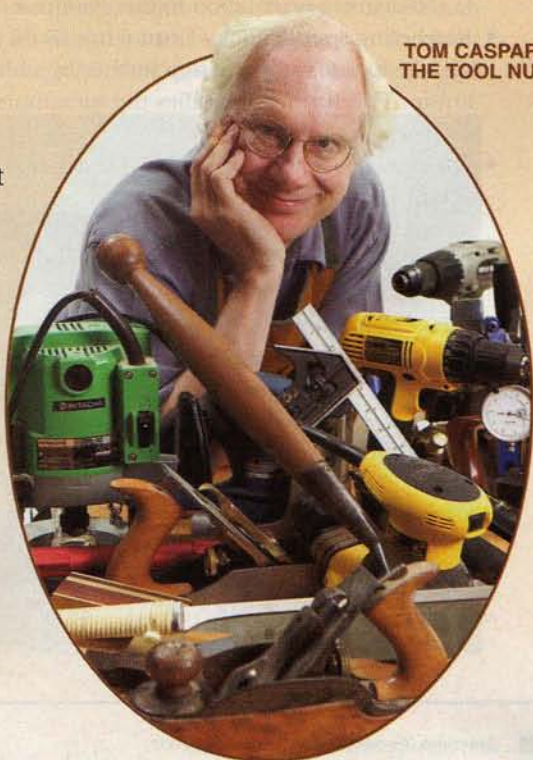
I really don't need five cordless drills, seven routers or 24 antique hand planes, but I can't help it. I'm a tool nut. **Are you?**

Have you ever bought an old woodworking machine just because it looked cool? Tried a new tool and said, "Wow! This just changed my life!" Used a big, industrial machine and wondered how in the world you could sneak it into your shop?

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E-mail your entry to toolnut@americanwoodworker.com or write to us at The Tool Nut, American Woodworker Magazine, 1285 Corporate Center Drive, Suite 180, Eagan, MN 55121.

**TOM CASPAR,
THE TOOL NUT**



Router Innovations



FEATURE-RICH, POWERFUL AND ERGONOMICALLY SMART

Festool set the bar high when it set out to develop the new OF2200 plunge router. An initial look at the machine suggests they made it over that bar, with room to spare. To accomplish this, Festool took a fresh look at this workhorse of a tool, and developed the OF2200 to better fit the routing habits of woodworkers. The number of user-friendly features reads like a wish list. Here's a quick run-down:

- Tool-free quick-release base plate – provides rapid changing of guide bushings and various accessory bases.
- 30-degree rotated base – positions the handles at a more ergonomic (30-degree) orientation to the work piece for routing.
- Ratcheting spindle lock – Festool has taken the much-appreciated spindle lock feature one step further by adding a ratcheting mechanism. This further simplifies the sometimes knuckle-banging job of changing bits.
- Other noteworthy features include a powerful 3-1/4 hp soft-start, self-braking variable speed motor, exceptional dust collection, double column clamping, over 3 inches of plunge, and fine adjustment in steps of 1/256-in. For an expanded discussion on these and other features visit www.americanwoodworker/festoolOF2200.



Source

Festool, www.festool.com, (888) 337-8600, Plunge router, OF2200, Available late spring or early summer 2008, price was not available at time of publication.



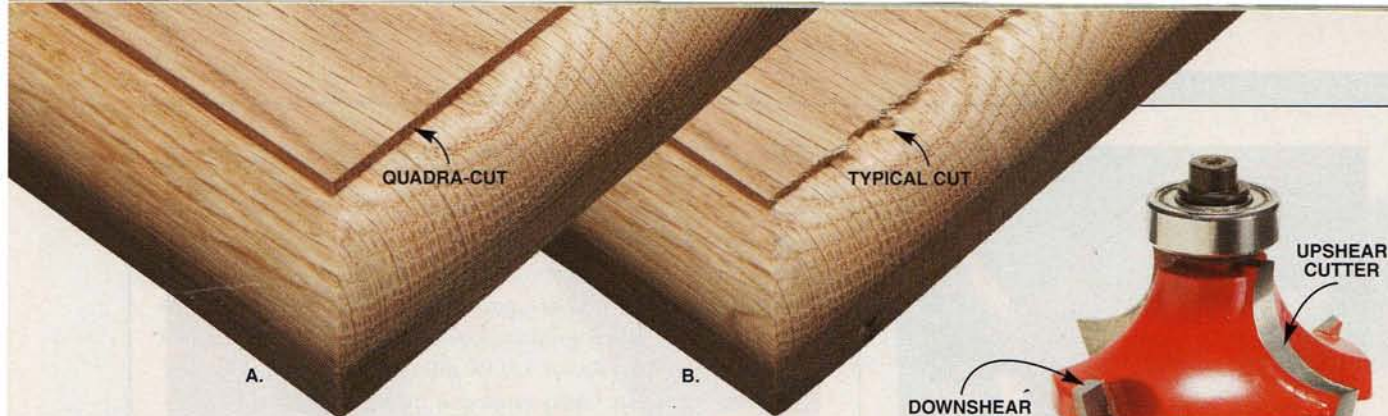
3-SIDED MOLDER

For years, the Woodmaster 12-in. Molder/Planer has been a faithful friend to small and medium-sized shops. It cuts a wide variety of moldings on the top surface of a board. Someone at Woodmaster just had a great idea: why not add two 3.5-hp Milwaukee routers to the machine and make three-sided moldings in a single pass? Well, they've figured it out.

Three-sided molders are standard in large production shops, and cost many thousands of dollars. Woodmaster's new system is far less expensive. A new 12-in. Woodmaster Molder/Planer with the 3-Side Molding System starts at \$3,995. (The two routers can also be retrofitted to existing Woodmaster 18-in. and 25-in. molder/planers.) As you know, commercially-made molding can really add up in cost, and there's a limited number of species available. With your own 3-sided molder, you can turn out hundreds of feet of tongue-and-groove flooring, crown molding, base molding, and more, for far less cost, and you can use any wood you want.

Source

Woodmaster Tools, www.woodmastertools.com, (800) 821-6651, 3-Side Molding System, \$3,995.



ELIMINATE FUZZY FILLETS

Freud's new Quadra-Cut router bits produce routed profiles with little or no tear out or fuzz even on cross-grain cuts. These unique, patented bits employ four cutting edges instead of two. The large profile cutters remove most of the stock with an upshear cut. Then a pair of downshear cutters makes the final cut to produce an ultra clean edge with no fuzz or splinters at the top surface.

Freud is introducing the new Quadra-Cut technology in select edge-forming bits with 1/2-in. shanks. We got our hands on a round-over bit and tried it out on some red oak panels. The results were amazing (see photos above). Both bits were brand new, but the difference in cut quality, especially at the fillet on the top, was quite noticeable. We made full-profile cuts in a single pass to really put the design to the test. The Quadra-Cut bit left a near-perfect surface requiring only a light sanding before finishing (Photo A). A standard bit of the same profile left a lot of fuzz and tearout at the top of the fillet (Photo B). Needless to say, we were very impressed with this bit design.

Source

Freud, www.freudtools.com

UPGRADE YOUR LIFT WITH DIGITAL ACCURACY AND REPEATABILITY

The Digi-Router is the newest member of the Digi-Kit family from Accurate Technologies. The Digi-Router is made in the U.S.A. and designed to retrofit JessEm and Bench Dog router lifts with other router lift models in the works.

The Digi-Router permits router height adjustments to within 0.010 inches and the readout can be set for decimal inches, millimeters, or fractions. The fraction setting features a bar graph that shows height changes in 1/64-

in. increments

(Photo left).

The remote LCD digital display has 1/2-in.-tall digits for easy reading. The system installs in under 30-minutes. It's easy to calibrate, allowing you to start at zero or preset any starting position. You can also toggle between absolute and incremental readings at the push of a button.

The Digi-Router comes with a 1-year warranty and a CR123 Lithium battery that lasts up to 24 months, plus full color installation and operation manuals.

Source

Accurate Technology, www.digi-kit.com, (800) 233-0580, Digi-Router, \$150.





A HUNDRED JIGS IN ONE

The Router-Ease Guide is an American-made tool designed to meet the needs of both the weekend enthusiast and the professional.

The Router-Ease Guide functions as a two- or four-sided adjustable jig/template. The Router-Ease Guide eliminates downtime used to design and makes jigs or templates for particular routing tasks. It can be set for cutting dadoses, stop dadoses, rabbets, hinge mortises, pocket mortises, fluting or sink cutouts on countertops. The Router-Ease Guide can even be used to cut dadoses on an angle such as the short, stopped dadoses used in louvered shutters or doors.

Two innovations make this guide easy to use: the Gauge Block and the Dado Block. Both are included with the Router-Ease Guide and are used to quickly and accurately set the guide arms. The Dado Block is used with a 1/2-in. straight bit and the included subbase. The Gauge block is stepped to allow for the use of 1/2-in., 3/8-in., and 1/4-in. bits. Simply set the appropriate block along a guide arm, move the arm until the block touches your layout line and tighten the lock-down knob.

Available in three stock sizes and custom sizes.

Source

REG, Inc., www.routereaseguide.com, Router-Ease Guide, \$176 - \$236 depending on size.



DOUBLE SIDED INSERT IS LIKE TWO BITS IN ONE

Amana's V-Groove CNC Router Bits Use a high-grade carbide-insert knife to create perfect signs and miters on your CNC machine. They are available in both 1/2-in. and 3/4-in. shanks and several cutter angles ranging from 22.5 to 80 degrees.

The inserts have two cutting edges.

When one side gets worn, rotate the insert for a brand new cutting edge. A secure locking screw system ensures maximum safety and cutting accuracy.

We used Amana's V-Groove bit (above) in a ShopBot to carve our name in solid oak (below), and to cut a long miter on veneered plywood (top). The bit and the ShopBot performed flawlessly to produce a beautiful sign with crisp lettering with little or no tear out and a flawless mitered edge.

Source

Amana Tool, www.amanatool.com, 800-445-0077.



PERFECT SCRIBE EVERY TIME

Cabinets and countertops seldom fit perfectly to a wall. The traditional solution involves holding the cabinet in place and using a compass to transfer the wall contours to the cabinet's scribe strip then machining, sanding and filing the profile on the strip. It's a time-consuming battle for perfection. The QuickScribe eliminates all the hassle and imperfection.

The QuickScribe is an accessory plate that attaches to several popular offset trim routers, including Bosch, DeWalt and Porter-Cable. The offset bit is centered in a non-marking wheel in the plate. The router's original base plate is then reattached to the QuickScribe. The wheel follows the wall, transferring the exact contours to the edge being cut for a perfect fit without sanding or filing.

The ScribeMate and the EuroScriber are accessories designed for specialized jobs such as multi-sided scribes, and frameless, Euro-style scribes. Both tools are used in conjunction with the QuickScribe.

The ScribeMate fits on a larger router and is designed to follow a template made with the QuickScribe. The Euroscriber is used to fit Euro-style or frameless cabinets to a wall. The EuroScriber clamps the cabinets' scribe strips exactly one inch from the wall. The QuickScribe is then used to cut the scribe strip to fit the wall.

Visit www.thescribingtool.com for great videos on all three products.

Source

QuickScribe, www.thescribingtool.com, (402) 965-4360, QuickScribe or ScribeMate, \$80; Set of three Euroscribers, \$60.



FULL-FEATURED BENCHTOP ROUTER TABLE

A small benchtop router table should have all the important features of a large floor model: a thick top with a slick plastic-laminate skin; a miter slot, for holding a miter gauge or featherboard; a large phenolic insert plate that's easy to level; a split fence, for creating minimal-clearance openings around a bit; T-track above the fence, for installing a safety shield or additional featherboard; and a 3-in.-dia. dustport. Whew. Let's see: did we leave anything out? You get all of this, and more, with Kreg's new compact router table.

Its top measures a generous 16-in. by 24-in. The unit stands 20-in. tall, including the 4-in. tall fence, and weighs only 26 lbs.—perfect for carrying across the shop from a storage shelf to your bench, or for hauling to a jobsite.

Source

Kreg Tools, kregtool.com, (800) 447-8638, Precision Benchtop Router Table, Model PRS2000, \$230.



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NEW OMNIJIGS FROM PORTER-CABLE

Porter-Cable's Omnijig has earned its reputation as a dependable and accurate dovetailing system over almost two decades. Arriving soon are two new Omnijig Joinery System models: the 16-in. Model 55160 and the 24-in. Model 77240.

Both models share important features. They come completely assembled and include a stabilizer bar that keeps the router from tipping forward. It also deflects chips down to the floor (an accessory dust chute is available). Dedicated set-and-forget stops position each template. According to the manufacturer, that means the templates don't have to be readjusted when you change from one operation to another. Onboard depth gauges make it easy to accurately set the router bit's height. And onboard instructions remind you how to set up each operation, so you won't have to reread the owner's manual each time you use the jig (incidentally, each jig comes with an instructional DVD featuring Norm Abrams). Both jigs accept stock up to 1-1/2 inches thick.

Each model is uniquely outfitted. The 16-in. 55160 is equipped with a template for cutting fixed half-blind dovetails in a single pass (think production-style drawers). This template also allows you to cut sliding dovetails. A 16-in. variable finger template will be available as an accessory.

The 24-in. 77240 comes with a variable finger template for cutting both full and half-blind dovetails. This template features split fingers that allow adjusting the width of the pins as well as their location. A 24-in. template for cutting production-style half-blind dovetails will be available as an accessory.

Source

Porter-Cable, www.deltaportercable.com, (888) 848-5175, 16-in. Omnijig Joinery System Model 55160, \$429; 24-in. Model 77240, \$599.



CAST-IRON TOP ROUTER TABLE

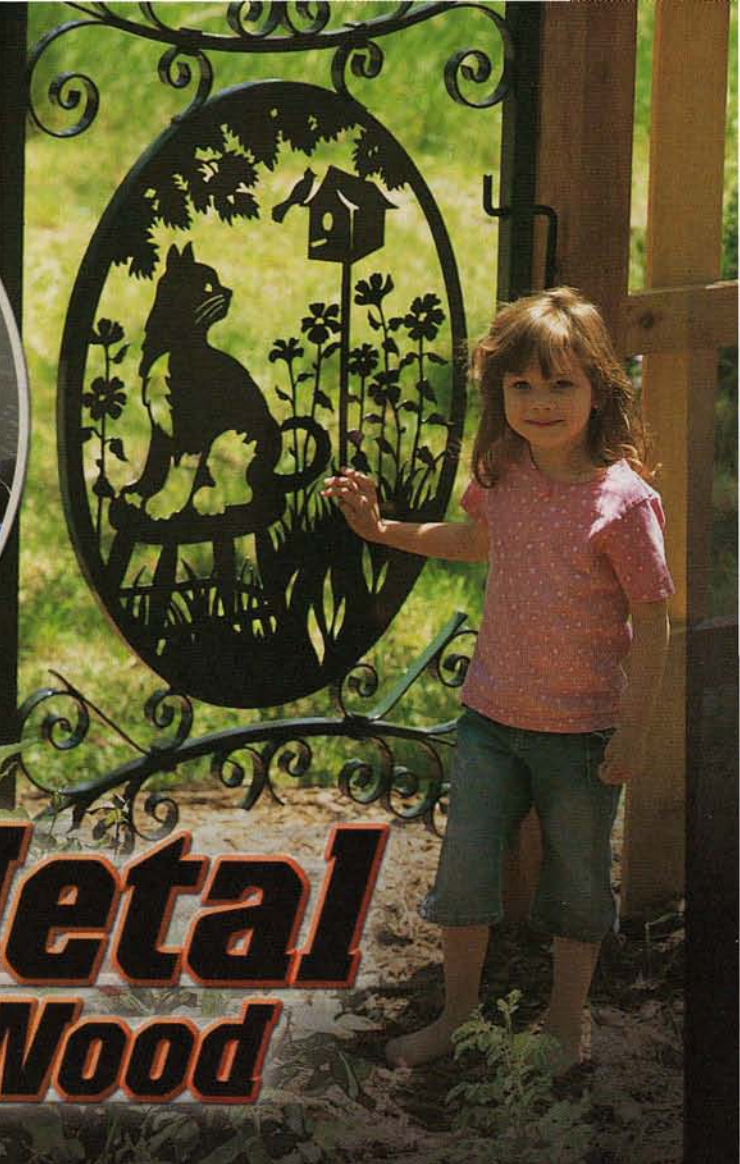
Bit by bit, high-end router tables are beginning to look more like classic shapers, the heavy-duty workhorse machines used in professional shops. Bench Dog has taken the latest step along that path with the introduction of a substantial cast-iron top. Other than the obvious virtue of being almost indestructible (Bench Dog calls it "bomb-proof"), a cast-iron top will stay as flat as the top of your tablesaw, which is critical for precision routing. You can also purchase this top separately and bolt it to your tablesaw, replacing the right-side support table.

This top is part of a modular set of router table combinations from Bench Dog which allow you to mix and match from three types of tops (cast iron, solid phenolic, and MDF) and three types of bases (Baltic Birch or melamine closed stands, and a Baltic Birch open stand). You can also add drawers, doors, an external power switch, and locking casters as accessories.

Source

Bench Dog Tools, www.benchdog.com, (800) 786-8902, ProMAX Complete, Model 40-087, \$869; ProMAX top only, with fence, Model 40-031, \$399.





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DIGITAL PLUNGE ROUTER

Digital readout has finally arrived on a mainstream router. This new 10-amp plunge router from Craftsman has an integrated LED screen that allows you to precisely set the depth of cut, in fractions of an inch or millimeters, without using a scale or ruler.

Adjusting the depth of cut on many plunge routers can be a real hassle, but not on this machine. The Craftsman system is easy to use because it's so intuitive. As with all plunge routers, the first step is to lower the bit until it touches your workbench and engage the plunge lock lever to hold the bit in position. Next, rotate a depth-of-cut knob to lower a stop rod until it contacts the router's base. Standard procedure so far, but now comes the new, digital part. Press a zeroing button, then dial up the stop rod. As you turn this knob, the readout screen clearly indicates how deep the bit will cut, to the nearest 1/64-in. A simple twist of another knob locks the stop rod in place, and you're ready to go.

Other good features on this router include 1/4-in. and 1/2-in. collets, variable speed, soft start, a conveniently located on/off switch, and a dust shield and dust port.

This router would work well in a router table, but it lacks a couple of user-friendly features. Although you get a long extension knob for setting the height of a bit from underneath the table, you can't raise the collet high enough to change bits from above the table. Another small problem: when the router's upside down, the digital readout is also upside-down; it would be nice if the readout had a button for flipping the numbers. Or a plug for a separate, external readout (like the digi-router, page 25) –wouldn't that be neat!

Source

Sears, www.sears.com, (800) 349-4358, Craftsman Digital Router, Model 17517, \$140.

ECONOMICAL THROUGH DOVETAIL JIG

Forget worrying about limited dovetail jig capacity. The ChestMate dovetail jig allows cutting through dovetails anywhere on boards of any width. The process is pretty simple. The jig has an indexing pin that fits 1/8-in. kerfs sawn in a story stick that you make: You mark the story stick as you lay out the pin locations on the board and then cut the kerfs. When the story stick is indexed and clamped onto each workpiece, the saw kerfs position the jig for each socket and pin.

The jig has dedicated inserts for cutting the sockets and the pins. You cut the sockets first with a dovetail bit (top photo, at right). Reposition the story stick on the second board to cut the pins (bottom photo). Install a straight bit in your router and the pin insert in the jig. The pin insert allows adjusting the pin width to fit the sockets you've already cut. Once you've dialed in the perfect pin width on a test piece, you're good to go.

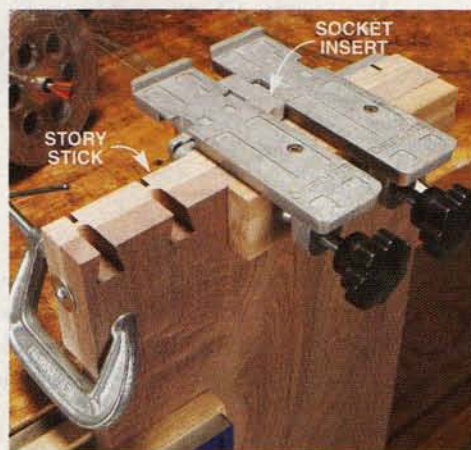
To orient the joint with half-pins at the ends, instead of half-tails as shown, you'll need a longer story stick with kerfs at the ends of the workpiece.

Routing dovetails with this jig is precise, but it isn't very fast, because you have to reposition the jig to cut each socket and pin. For widely-spaced pins, a third routing pass is required to clean out the waste.

The ChestMate is designed for use with 3/4-in.-thick stock and routers with 6-in.-dia. bases. Inserts for 14-degree dovetail bits are included with the jig. You supply the router bits and guide bushing.

Source

Prazi USA, www.praziusa.com, (800) 262-0211, ChestMate Dovetail Jig, PR3900, \$99.



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— James Tolley, President, J&D Woodworks Inc., Black Hawk, SD



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LARGER-CAPACITY AKEDA JIG

We gave the 16-in. Akeda dovetail jig our Editor's Choice award last year because it was precise and easy to use. Akeda has recently introduced a 24-in. model, suitable for a blanket chest or other large casework, using the same clever system of snap-in, indexed guide fingers.

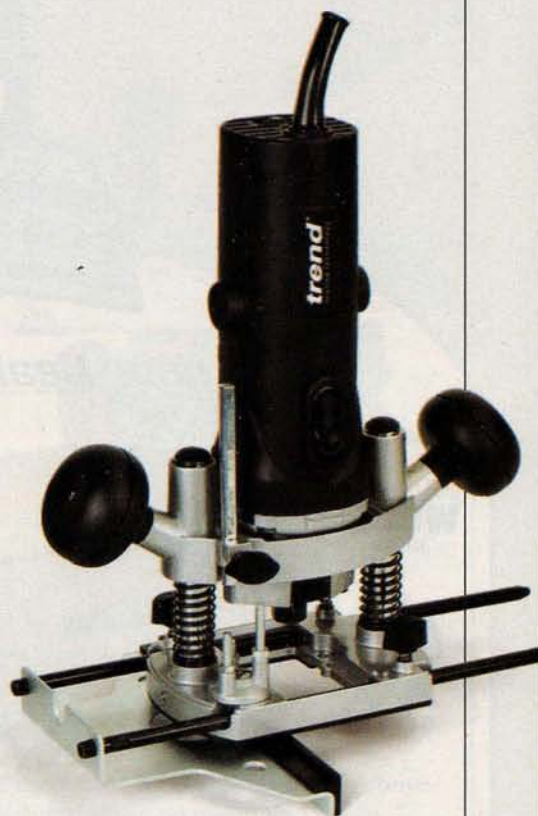
The Akeda DC16 and BC24 jigs excel at creating variable-spaced half-blind or through dovetails. (Variable-spaced dovetails generally have wide tails and narrow pins, following the tradition of hand-cut work.) The guide fingers may be positioned anywhere along the jig in 1/8-in. increments. These jigs offer five different dovetail angles, from 7 degrees to 20 degrees, for 1/4-in. to 3/4-in.-thick stock. (A new 6-degree bit and pin guide for 1 in. stock will be available sometime this year.) Why all the choices? Akeda suggests that dovetails with a wide angle look best in thin stock, and are stronger, while dovetails with a narrow angle are best used for thick stock. These angles are produced by using five matched sets of guide fingers and dovetail bits.



Using the Akeda is very simple. You don't have to adjust the jig or do a lot of trial-and-error cutting to get the joint to fit right. The key to this simplicity is a set of dovetail bits and Porter-Cable-style guide bushings manufactured by Akeda. Standard bits and bushings won't work. The basic jigs do not come with any bits, however; they're available in various sets to suit your needs. Akeda bits have 8 mm shanks, which produce less vibration than bits with smaller 1/4-in. shanks. You'll need a reducer, available from Akeda, to use them in a 1/2-in. collet. The dust collection port, which works very well, is a \$30 accessory.

Source

Akeda, www.akeda.com, (877) 387-6544, Akeda BC24 Blanket Chest Jig, \$440; BC24 Jig, 7 pc. Bit Set and Dust Collector Kit, \$499.



LIGHT DUTY PLUNGE ROUTER

The T4EK, a compact plunge router from Trend Routing Technologies, is equipped with a 1.1-hp motor and electronic variable speed from 11,500 rpm to 32,000 rpm. Other features include a pressed steel edge guide, a three-stage turret-style depth stop, a spindle lock to facilitate bit changes and a dust collection housing with a 1-3/8-in.-dia. hose port. A Trend guide bushing and an adaptor plate for Porter-Cable-style guide bushings are also included.

The T4EK can be used with several Trend routing jigs, including both dovetail jigs and both ellipse jigs. It can also be removed from the base and used as a rotary tool.

Source

Trend Routing Technology, www.trend-usa.com, (270) 872-4674, T4EK Plunge Router, \$129.

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ROUTER-TABLE-FRIENDLY MACHINES

Freud's newest line of routers will make your router-table setups a lot easier: you can raise, lower, and change bits from above the table, rather than by reaching underneath it. These new routers are available in three packages: a 13-amp, 2-1/4-hp fixed-base machine, a 2-1/4-hp combination kit containing interchangeable plunge and fixed bases, and a 15-amp, 3-1/4-hp plunge router. All of the motors have variable speed; their bases have openings that can handle bits up to 3-5/8-in. dia.

The plunge router bases have two access holes for above-the-table adjustments. One allows you to raise and lower the bit; the other lets you engage a shaft lock when changing bits. You use the same hex-ended tool for both adjustments and a convenient crank-handled wrench for loosening and tightening the router's self-releasing collet. The fixed bases have two holes as well—one for loosening and tightening the motor housing from the base, the other for raising or lowering the bit. The shaft lock automatically engages when the collet is raised above the table. All in all, this is a very clever system, and it works extremely well. (We wish the hex-ended adjustment tool had a ratcheting mechanism, though!) You'll need to drill additional holes in your router plate to access the adjustment screws.

Even out of the router table, these routers are easy to adjust. All of them have a micro-adjust knob conveniently located near the top of the router; one-quarter turn of the knob varies the bit depth by 1/32-in.

Source

Freud, www.freudtools.com, (800) 334-4107, 2-1/4-hp fixed base router, FT1700VCEK, \$170; 2-1/4 hp combination kit, FT1702VCEK, \$200; 3-1/4-hp plunge router, FT3000VCE, \$290.



SCREW-SLOT BITS

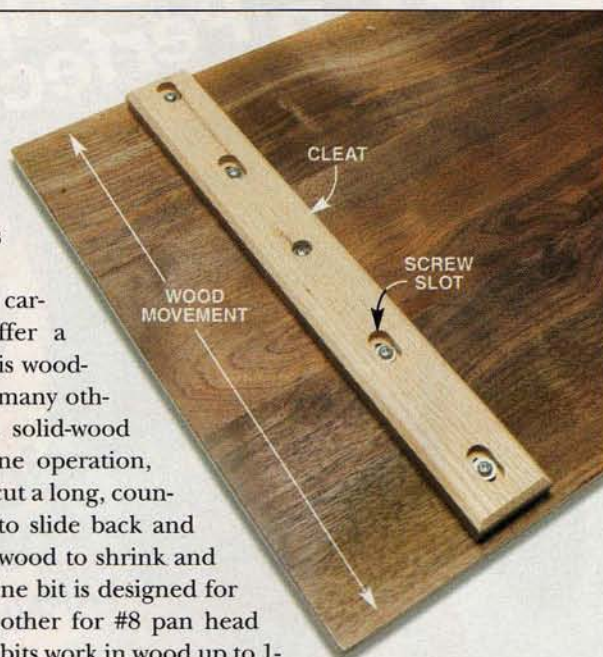
Have you ever seen a big, ugly crack in the lid of a chest? Underneath, you'll probably find a few cleats running across the grain to hold the lid flat. Chances are the cleats' screws caused the crack by preventing the lid from shrinking and swelling with the seasons. It's

a classic mistake.

Two new 1/2-in shank carbide bits from CMT offer a quick way to deal with this wood-movement problem and many others, such as fastening a solid-wood tabletop to a base. In one operation, they allow you to plunge-cut a long, counterbored slot for screws to slide back and forth, which allows solid wood to shrink and swell without cracking. One bit is designed for #8 flat head screws, the other for #8 pan head screws, plus washers. The bits work in wood up to 1-in. thick.

Source

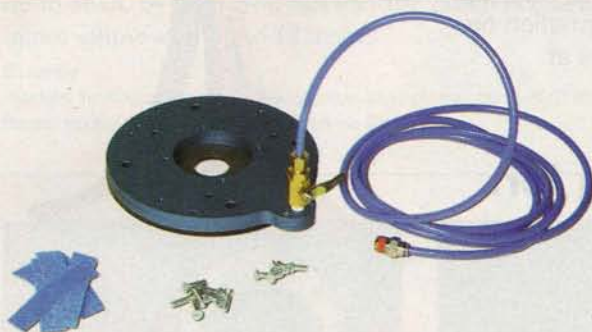
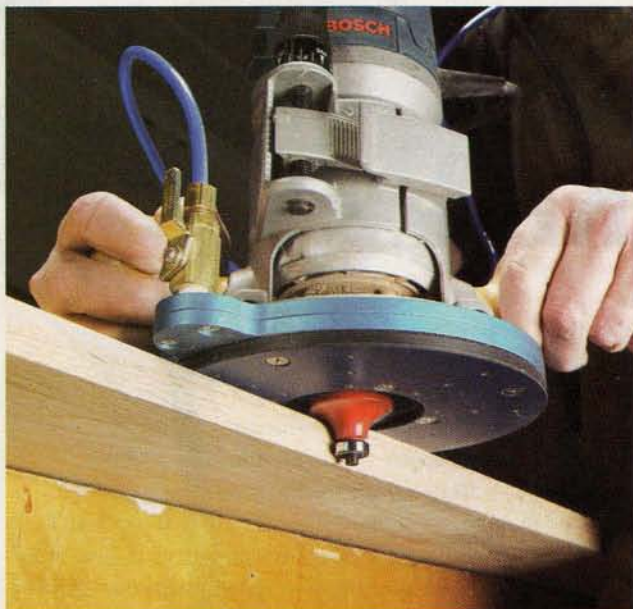
CMT, cmtusa.com, (888) 268-2487, Flat Head Screw Slotting Bit, 813.601, \$37; Washer Head Screw Slotting Bit, 813.701, \$37.



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FLOAT THROUGH YOUR ROUTING TASKS

If you've ever played a game of air hockey, you'll appreciate how a router might feel floating on a cushion of air. The Betterley Air-Glide Router Base mounts onto most routers in minutes. Even big 3-hp routers glide with ease. Surface scratches are now a thing of the past. With the cutter alone providing resistance, the job of controlling the router is made easier with the Air-Glide.

We tried the base on edge cuts (above) to see how the base performed when over half the air jet holes are hanging in thin air. There's still plenty of lift and the router slid with ease. Additional subbases are available with different bit hole diameters including one sized for Porter-Cable template guides. There's even a square subbase with an offset hole that gives you three dimensional steps, 1/8-in., 1/16-in. and 1/32-in. from different edges. This allows you to make your initial cut followed by a slight clean-up pass simply by rotating the router.

Note: At a minimum, you need a 5CFM @90 psi compressor for the Air-Glide to keep your router afloat.

Sources

Betterley Industries, Inc., www.betterleytools.com, (800) 871-7516, Air-Glide Router Base, \$150; Round Sub-Base, \$29; Square Sub-Base, \$49.

FEATURE-PACKED PLUNGE BASE

Porter-Cable's state-of-the-art 890-series variable-speed 2-1/4-hp routers now have a plunge base to match. The new Model 8931 (it replaces the old model with the same number) has been completely redesigned.

Machined brass bushings and steel guide rods now guide the plunge mechanism for smooth operation. Through-the-column dust collection directs the vacuum hose up over your shoulder, so it's out of the way. A swiveling six-position turret allows precise plunge depth control. An opening in the base's motor housing provides access to the router's body-mounted switch, so you can cut the power without removing your hands from the pommels.

The 8931 is available separately and in several multi-base 890-series router kits.

Source

Porter-Cable, www.deltaportercable.com, (888) 848-5175, Plunge base Model 8931 \$115; Multi-base kits: #893PK (router, plunge base and pommel-handle fixed base), \$269; #894PK (router, plunge base and D-handle fixed base), \$289; #895PK (router, plunge base and pommel-handle fixed base with above-the-table adjustment tool), \$289.



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MULTI-FUNCTION ROUTER BASE

The Router Buddy is a 7-in.-dia. base plate that's bored to fit most popular routers. It's equipped with an integral edge guide/circle-cutting jig and a center hole that's counterbored to accept Porter-Cable guide bushings. Changing from one operation to another takes only seconds. The circle-cutting jig routs circles from 2-in.-dia. to 18-3/8-in.-dia. Install the fence and you've got an edge guide that allows routing dados and grooves up to 8-1/4-in. from the edge of the workpiece. This setup is compact and light as a feather, so it doesn't

upset the router's balance. Attach the included half-rounds and you can rout grooves parallel to rounded edges. The half-rounds are also used during installation, to center the base around the bit shaft.

The Router Buddy System includes extension rods, adjustable pivot pins and a cross-routed base. It extends the Buddy's versatility by adding the capacity to cut circles up to 60-in. in diameter and ellipses up to 58-in. by 46-in. You can vary the difference between major and minor ellipse axes up to 12 inches.

Source

Practical Technologies, LLC, www.practical-technologies.com, (603) 818-8442, Router Buddy, \$70; Router Buddy System, \$200.



SUPER DOVETAIL JIGS

Leigh Industries' Super Jigs present many virtues found on Leigh's legendary D4R dovetailing jig. Available in 12-, 18- and 24-in. models, there's a Super Jig priced to fit every budget. Super Jigs allow cutting variably-spaced through and half-blind dovetails, fixed half-blind dovetails in a single pass, sliding dovetails and box joints. Half-blind dovetail joints can be rabbeted, to create lipped drawer fronts. Quick-action cam clamps make it easy to install and remove workpieces.

Super Jigs require simple assembly. Plan to spend a while with the owner's manual. It's fully illustrated and well written, so it's easy to read and understand. Switching from one operation to another requires minor changes, such as flipping over the guide finger assembly or installing snap-in adaptors—a small price to pay for the jigs' versatility. A handy pull-out quick-reference set-up guide stores under the jig.

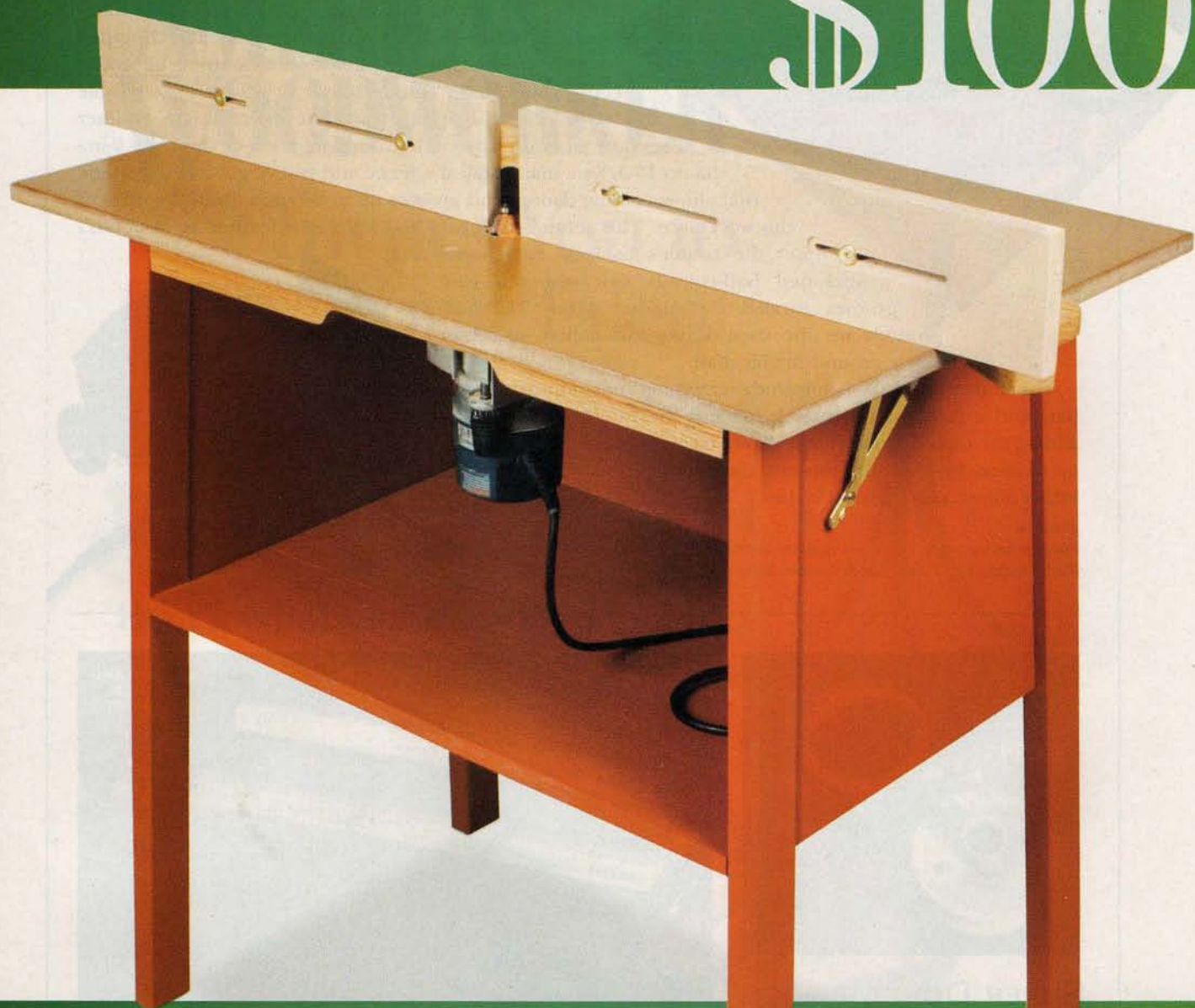
Three router bits and Leigh's new "e-Bush" (left photo, above) are included with each Super Jig. The e-Bush is an eccentric guide bushing that's used to adjust the fit of sliding dovetail and box joints. The Super Jig is shown above with the vacuum and router support (VRS) installed. An added-cost accessory we recommend, the VRS corrals dust and adds front support that will keep your router from tipping.

Source

Leigh Industries Ltd, www.leighjigs.com, (800) 663-8932, Super Jig 12, \$219; Super Jig 18, \$299; Super Jig 24, \$369; VRS (vacuum router support), \$72-\$84, depending on jig size.

by Bill Hylton

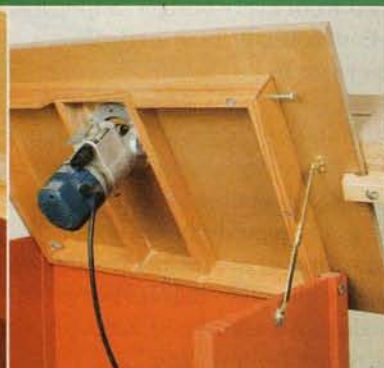
\$100



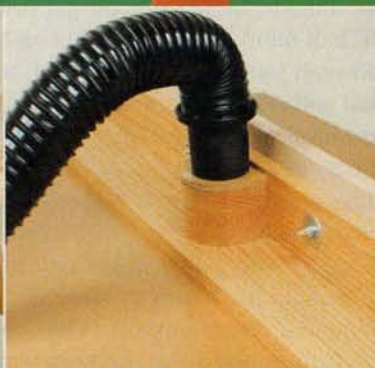
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The cutout at the front of the support frame provides better access to the router when the top is down.



With the tabletop tilted up, it's easy to pop open the base clamp and pull the motor to change bits.



Dust collection is built-in to the fence, yet allow it to be added under the table.



Integral clamps stay with the fence, yet allow it to be adjusted one end at a time. Big plastic wing nuts are easy on the fingers.

Router Table

AS EASY TO USE AS IT IS TO BUILD.

Sometimes, less really is more. Take router tables for instance. It's not at all difficult to ring up a big tab for a manufactured router table, complete with a new router, loaded with convenience, durability, adjustability and precision. But to me, the compelling thing about a router table is that it converts a portable power tool into a stationary power tool and thus expands its utility and versatility.

A router table can be simple and quite inexpensive to make without sacrificing functionality. A basic table can be just as versatile, accurate and easy to use as one of those grandees but cost far less.

I just finished making a \$100 router table (excluding the router). I bought most of the materials and hardware at a local home center. There's no router mounting plate to buy; the router attaches directly to the hinged top.

FEATURE-PACKED

Despite the low cost, this is no bare bones router table. It's packed with

great features: an easy-to-adjust zero-clearance fence with sacrificial faces, an offset router mounting that allows you to use more of the table for work support, table inserts to accommodate different bit sizes, a tilt-top for easy access to the router and quick bit changes (even with a plunge router), and built-in dust collection.

Of course there's a host of possible enhancements to the basic \$100 router table including enhanced dust collection below the table, a front-mounted switch, and even bit storage. All these add-ons are covered at the end of the article.

BUILD THE BASE

1. Cut the leg blanks (E, Fig. A, page 42) oversize from 2x6 lumber that's been seasoned in your shop for two weeks or more.
2. Cut 3-degree compound miters on the tops and bottoms of the legs. All the cuts are made with the head tilted 3-degrees. Divide the legs into 2-pairs consisting of one front and one back leg.

3. Cut the plywood panels (F-H). First, crosscut a 30-3/4-in. piece from a sheet of plywood. Rip it into a 19-in.-wide piece for the bottom, a 13-in. wide piece for the back apron, and a 16-in.-wide piece for the side aprons. Crosscut the side-aprons piece in half.

4. Tilt the tablesaw blade 3-degrees and cut a bevel on all four edges of the bottom panel, reducing it to its final length and 1/8-in. shy of its final width.

5. Glue a strip of solid wood (J) to the front edge of the bottom panel. Trim flush after the glue's dried.

6. Return the tablesaw blade to 90-degrees and set the miter gauge to 3-degrees. Cut the tapered ends on the side and back panels.

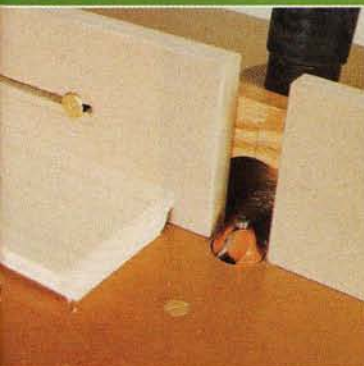
7. Lay out marks for biscuit slots on the ends of the side and back aprons. Align the legs with the aprons and transfer the marks.

8. Lay out biscuit slots on the bottom shelf and transfer them to the bottom edge of the aprons.

9. Cut the biscuit slots. Set the joiner's fence to 87-degrees to slot the beveled

EDITOR: DAVE MUNKITTRICK • ILLUSTRATION: FRANK ROHRBACH • PHOTOGRAPHY: BILL HYLTON

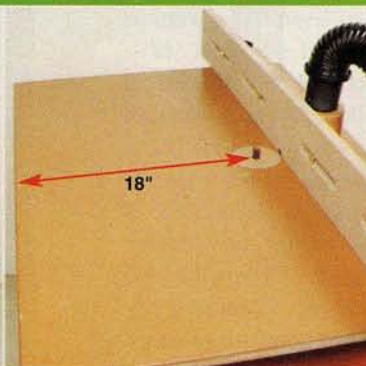
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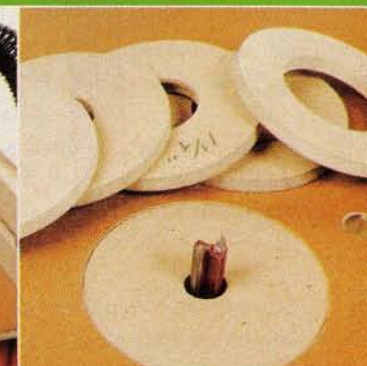
Adjustable fence faces are counterbored on both sides giving you four faces that can be turned over as the ends get chewed up.



An offset router location puts the router close to you for the lion's share of router-table operations.



Flip the fence around to the back side of the top for a big offset. The extra support is ideal for panel raising.



Shop-made reducers improve the safety of your router table at virtually no cost.

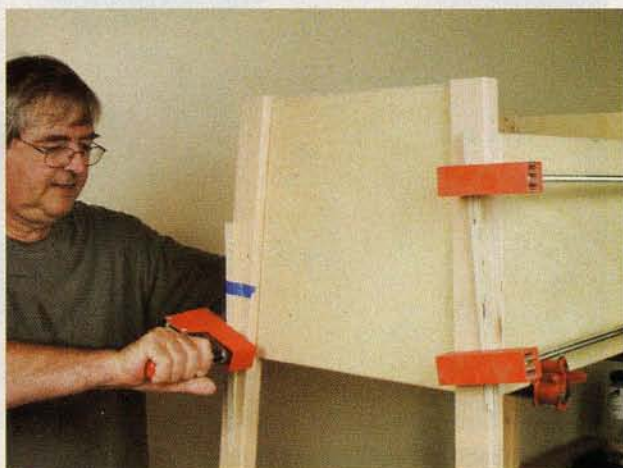
FIGURE A EXPLODED VIEW



I spent less than
three days and \$100
on this full-featured
router table.



1 Glue and clamp the two side assemblies. Use the offcuts from tapering the aprons as cauls so the clamps have parallel surfaces to address.



2 Glue and clamp the side assemblies to the back apron and bottom shelf. Use the tapered cauls to keep the clamps from slipping as they're tightened.



3 Mark the locations of the router mounting screws on the top with a transfer punch—a.k.a. a spotter.

edges of the bottom panel.

10. Glue and clamp the two side assemblies together (Photo 1) as well as the back and bottom panel assembly.

11. Join the two leg assemblies to the back and bottom panel assembly (Photo 2). Use masking tape to attach the tapered scraps from the panels to the legs so clamps will have parallel bearing surfaces.

BUILD THE TABLETOP

12. Cut the tabletop panel (A). Chamfer all four edges, top and bottom, to minimize chipping.

13. Lay out the bit hole location on the top (Fig. A.). Install a V-groove bit and park the router with the bit on the penciled crosshair. Orient the router exactly the way you want it—handles side-to-side, front-to-back, or on a diagonal. Mark the center points for the mounting screws (Photo 3).

14. Drill and countersink the mounting holes in the top. Mount the router to the tabletop.

15. Cut the support frame parts (B, C and D). Cut rabbets in the ends of the front and back pieces.

16. Dry assemble the frame on the tabletop. Use your router base to determine the spacing between the stretchers. Lay out the dados and rabbets in the front and back frame members as well as the cutout in the front.

17. Machine the front and back rails. Then assemble the frame on a surface you know is flat.

18. Drill 1/4-in. holes through the frame edges. Set the frame on the tabletop and transfer the hole locations to the tabletop (Photo 4).

19. Drill and tap stopped holes in the MDF for 1/4" - 20 machine screws (Photo 5). Threaded MDF has better holding power than wood screws driven into pilot holes.

20. Mount the tabletop to the frame (Photo 6). You could glue the frame, but if you ever changed routers, you'd need to build a new top.

21. Drill the holes for the hinge bolts in the frame (Photo 7, Fig. A). Cut threads in the rest bolt holes for 1/4" - 20 bolts.

22. Set the top on the stand. Use shims between the top edge of the stand and the MDF top. This keeps the top floating above the stand so all the weight from the top is carried by the framework underneath.

23. Transfer the hinge bolt holes from the top frame to the back legs of the stand. Drill the hinge-bolt holes through the back legs (Photo 8). Install the hinge bolts and rest bolts.

24. Mount the stay to hold the top open (Photo 9 and 10).



4 Transfer the mounting-bolt holes in the framework to the MDF top using a transfer punch.



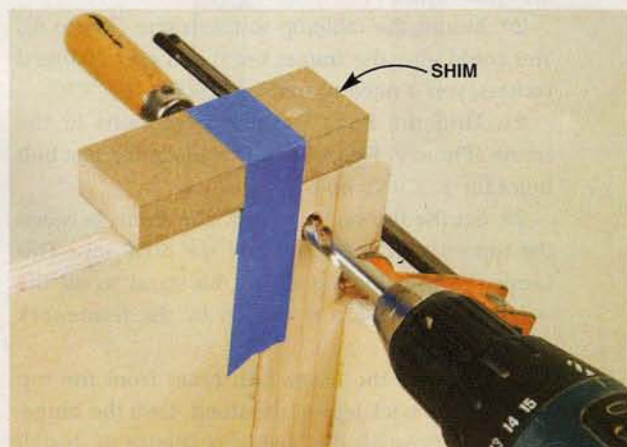
5 Cut threads in the top with a 1/4"-20 tap. Use a 13/64-in. bit to drill a 5/8-in. deep stopped hole at each mark, first. Make sure you clear all the chips from the holes. Then turn the tap into the hole until it bottoms out.



6 Reposition the frame on the tabletop and fasten it with 1/4"-20 flathead machine screws. I used seven 3-in.- long screws in the perimeter frame members and two 2-in.- long screws in the stretchers.



7 Lay out and drill the two 3/8-in. hinge-bolt holes in the frame. Clamp a backup scrap to the inside of the frame to prevent blowout.



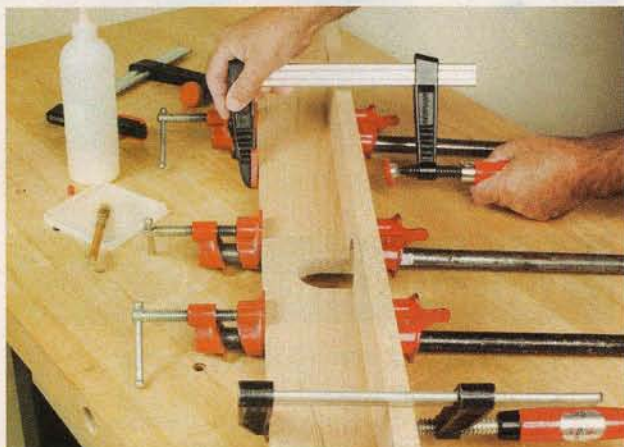
8 Drill hinge holes through the back legs. Tape 3/4-in. shims to the top edges of the stand and rest the tabletop on them. Use a transfer punch to mark the hinge-bolt hole locations on the back legs, then drill.



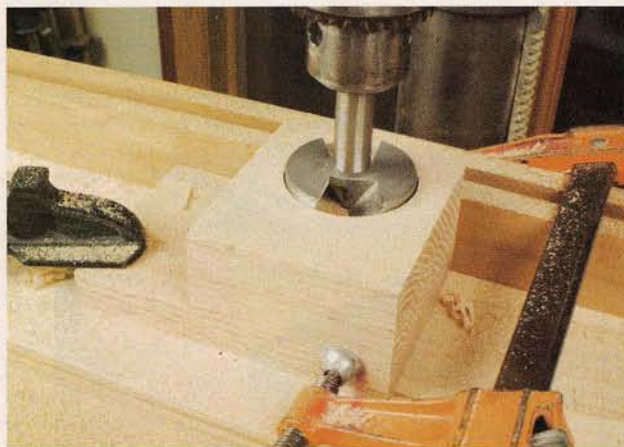
9 Mount the folding stay to the stand first. Measure down 1-in. from the stand's top edge and scribe a line. Hold the folded stay on the line so it clears the front leg and mark the screw location.



10 Attach the stay to the top. Hold the stay in position with a clamp. You decide the degree of tilt that suits you.



11 Glue and clamp the base and fixed face together.



12 Bore a 2-1/4-in. hole through the dust pickup housing block with a Forstner bit or holesaw.

BUILD THE FENCE

25. Cut the fence base (K) and fixed face (L).

26. Cut the bit opening in the two fence pieces with a Forstner bit or a holesaw. From the near edge, saw into the hole, transforming it into a U-shaped notch.

27. Assemble the base and fence. Glue the edge of the base to the upright's face (Photo 11).

28. Round off the outside corners at the ends of the fence face and base on a bandsaw, then sand smooth.

29. Cut and glue-laminate scraps of hardwood to form the dust-pickup block (N).

30. Bore a 2-1/4-in. hole through the block (Photo 12).

31. On the bandsaw, cut a U-shaped hole and the outside profile of the block. Sand the sawed surface smooth.

32. Cut the dust pickup's cap (P). Bore a hole to fit your dust collector hose. Glue the cap to the dust pickup and the pickup to the fence (Photo 13).

33. Square the face of the fence to the base on a jointer (Photo 14).

34. Lay out the two clamp jaws on some scrap (Q) (Fig. A, Detail I) and cut on the bandsaw. Sand the faces and edges.

35. Lay out and drill mounting bolt holes in the fence base and the clamp jaws (Fig. A).

36. Drive a round head or pan head screw into the clamp jaws near the bolt hole to act as an alignment screw. Drill oversize holes for the bolts in the fence base and add a shallow hole to house the alignment screw head (Photo 15).

37. Make the sliding facings (M) from pieces of leftover MDF. Cut faces to size, then use your new router table to rout stopped slots for the mounting bolts (Photo 16).

38. Drill mounting holes for the adjustable facings in the fence (Fig. A).

39. Use your largest bit to rout the opening in the tabletop. Cut a narrow rabbet around the opening, so its depth matches the thickness of the material you use for the inserts.

40. Cut one insert that fits nice and snug, and use it as a pattern for routing out a half-dozen more. When you put a hole in an insert, label its diameter.

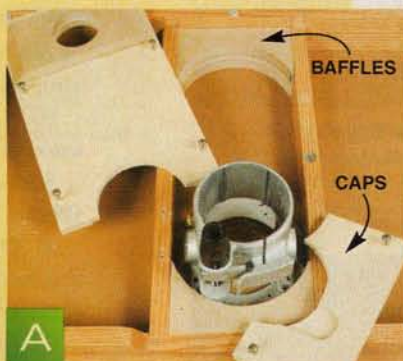
Enhancement 1

BELOW-THE-TABLE DUST COLLECTION CAPTURES FUGITIVE DUST

Capturing all the chips and dust generated by router-table operations is a tough proposition. A fence-mounted pickup is important, but without a pickup under the table, a lot of the dust will escape capture.

You can use the support frame's stretchers as the basis of a very effective dust chute. Make a two-piece cover from scraps of MDF or plywood. Insert rounded baffles to close off corners where dust gets trapped. Fit the caps as close as possible around the router base and drill a hole for a dust-hose connector (Photo A).

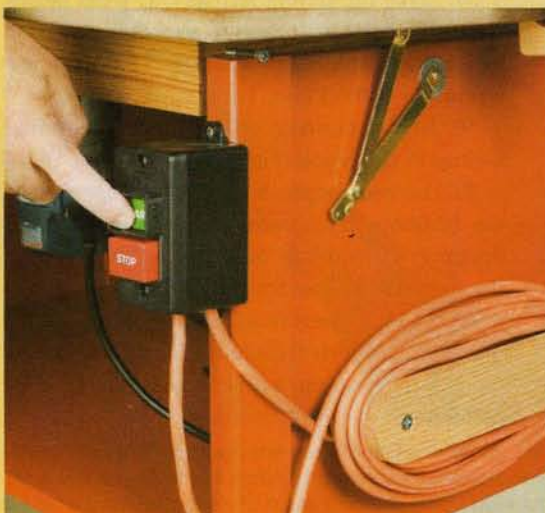
Extend a hose from this under-the-table channel and splice it into the hose from the fence-mounted pickup with a wye fitting. Leave enough slack in the hose to permit tilting the tabletop (Photo B).



Enhancement 2

EXTERNAL SWITCH ADDS SAFETY AND CONVENIENCE

Powering up a table-mounted router with the router switch is usually a nuisance. And many of us are uneasy about fumbling for an out-of-sight switch in an emergency. So a front-mounted switch is a worthwhile addition to any router table (see Sources, p. 47). I wired the switch to an extension cord. The cord wrap is made from hardwood scraps.



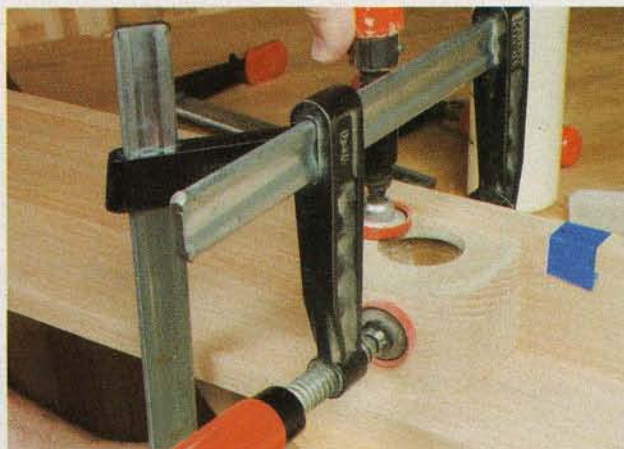
Enhancement 3

CONVENIENT ONBOARD BIT STORAGE

Bit storage is a practical addition to the table, and there's enough plywood left to construct a small box for two or three drawers. The drawer fronts require an additional 4-ft. piece of 1-in. x 4-in. oak. The drawer bottoms are 1/4-in. plywood and are cut wide enough to fit in slots cut in the box sides.

Two drawers have the bottoms drilled for 1/2-in. and 1/4-in. shank bits; together they'll accommodate about 80 bits. The top drawer holds wrenches, collets, bit-opening inserts, and other accessories. It is exposed when the tabletop is tilted up for easy access during bit changes.

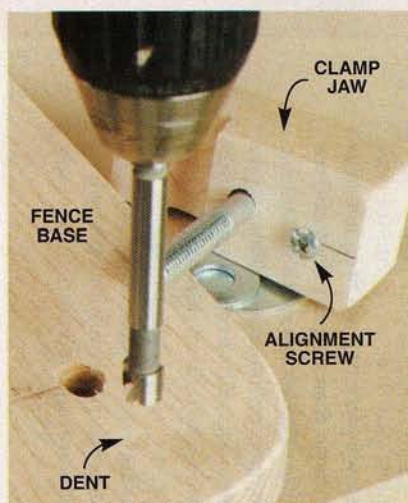




13 Glue and clamp the dust pickup to the fence. Tape scrap across the openings in the face to provide a bearing surface for the clamps.



14 Joint the glued-up fence to square the face to the base. Joint the base surface first to flatten it, then joint the fence face with the base against the jointer fence.



15 Drill a stopped hole in the fence base that will hold the alignment screwhead and keep the clamp block aligned perpendicular to the tabletop. To mark the hole, tighten the clamp block in place so the alignment screwhead dents the base.



16 Use the fence to cut the countersunk grooves in the adjustable faces.

Sources:

Home Centers, 1/4 sheet of 3/4" MDF, \$8; 1 sheet 3/4" plywood, \$33; one 2 x 6 x 8' studs, \$4; 14.25 lineal feet of 1 x 3 red oak, \$19; 8 linear feet of 1 x 4 red oak, \$16; 1/4" x 3" flathead stove bolts (7 req.), \$3; 1/4" x 2" flathead stove bolts (2 req.), \$1; 1/4"x2" connector bolts (4 req.), \$4; 1/4" x 1-1/4" fender washers (4 req.), \$1; 1/4" wing nuts (4 req.), \$1; 3/8" x 3" carriage bolts (2 req.), \$1; 3/8" cut washers (4 req.), \$0.50; 3/8" stop nuts (2 req.), \$1; folding support, National # N208-11/V1890L, \$3; 3/8" x 3-1/2" carriage bolts (2 req.), \$1; 3/8" x 1 1/4" fender washers (2 req.), \$0.25; 1/4" x 2" cap screws (4 req.), \$4.

Woodcraft, www.woodcraft.com (800) 225-1153, Wing Knobs (2 req.), #85J94, \$4.

Optional Upgrades:

Switch Jet, www.jettools.com, click on "Shop Parts", switch #994542, \$26; switch box, #523028, \$4; strain relievers, #998654, (2 req.), \$4.

Hardware Store, 12/4 extension cord, \$12.

Dust Collection Woodcraft, www.woodcraft.com (800) 225-1153, 2-1/2" x 10' hose with 2 end fittings, #128689, \$16; 2-1/2" Y-fitting, #144282, \$4; 2-1/2-in. end fitting, \$3.

Bit Storage 3/4" plywood parts cut from leftover material 1/4" plywood for drawer bottoms, 3/4" oak for drawer fronts.

CUTTING LIST

Overall Dimensions: 24" D x 36" W x 34-1/2"H

	Part	Qty.	Dimensions	Material
A	Tabletop	1	3/4" x 24" x 36"	MDF
B	Frame front/back	2	3/4" x 2-1/2" x 27-1/2"	hardwood
C	Frame ends	2	3/4" x 2-1/2" x 17-1/8"	hardwood
D	Stretchers	2	3/4" x 1-3/4" x 17-1/8"	hardwood
E	Legs	4	1-1/4" x 2-1/4" x 33"	2 x 6
F	Side aprons	2	3/4" x 16" x 15-3/16"	plywood ¹
G	Back apron	1	3/4" x 13-1/8" x 29-3/16"	plywood ¹
H	Bottom	1	3/4" x 18-15/16" x 29-3/16"	plywood ²
J	Edge band	1	3/4" x 1/4" x 29-3/16"	2 x 6 ³
K	Fence base	1	3/4" x 3-1/2" x 42"	hardwood
L	Fixed face	1	3/4" x 3-1/2" x 42"	hardwood
M	Sliding faces	2	3/4" x 4" x 24"	MDF
N	Dust pickup block	3	3/4" x 3-1/2" x 3-1/2"	hardwood ⁴
P	Dust pickup cap	1	1/4" x 3-1/2" x 3-1/2"	1/4-in. MDF
Q	Clamp jaws	2	1-1/2" x 2-1/2" x 3-1/2"	2 x 6 ³

¹ Miter ends at 87°

² Bevel edges at 3°

³ Cut from scrap

⁴ Stack and glue

Sapele Display Cabinet

QUIET BEAUTY COMES
FROM SUBTLE DETAILS

designer and author Richard Helgeson
builder Laurie McKichan

I designed this display cabinet to be a versatile, understated piece that will fit comfortably into a variety of interiors. The cabinet claims little more than a square foot of floor space, but will hold numerous objects on glass shelves. The back is quickly reversible (see photo below), giving collectors different presentation options. Simple, rectilinear geometry frames and displays objects without competing for attention. The linear nature of ribbon stripe sapele veneers enhances the verticality of the piece. The built-up sides and top give the piece a sense of increased mass.

The cabinet is constructed using knockdown (KD) fittings—it will break down, pack flat and move or store easily. The structural core of the piece, a torsion box base with leveling feet, ensures that the cabinet reassembles consistently and will stand square and plumb on any floor surface.





BASE ASSEMBLY

1. Cut the torsion box parts (A1-A3). Lay out the rib positions on the top and bottom panels and assemble with brads and glue (Photo 1). I use polyurethane glue here because it does not require much clamp pressure.

2. Cut the base panel (A4) and veneer with sapele (V1) on both sides (see "Veneer The Panels", page 53). Use scrap veneer for the underside where it won't be seen.

3. Locate the base panel so it overhangs the torsion box by 1/8-in. on all four sides and mark the outline on the shelf. Clip the heads from four small brads and set them point-up in predrilled holes inside the marked corners on the base panel. Align and press the torsion box onto the brads before gluing. This will locate the shelf during glue-up, and resist slippage as clamps or weight is applied.

4. Glue the bottom panel to the torsion box (Photo 2).

5. Cut the baseboards (A5 and A6) and run a stopped groove on the top edge of the back baseboard to accept the back panel flange (Fig. A, Detail 1, page 52). Ease the outside edge of the groove slightly to make panel insertion easier.

6. Miter the baseboard to fit around the base panel.

7. Cut biscuit slots to join the baseboard to the base panel (Photo 3) and to reinforce the baseboard miters. Position the slots so the baseboards are slightly higher than the top of the panel.

8. Glue and clamp the baseboard to the panel (Photo 4).

9. Clean up glue squeeze-out, and plane the base-

The back panel has a light colored maple veneer on one side and dark Macassar ebony on the other. The panel is secured at the top by rare earth magnets so the panel can be reversed in seconds.



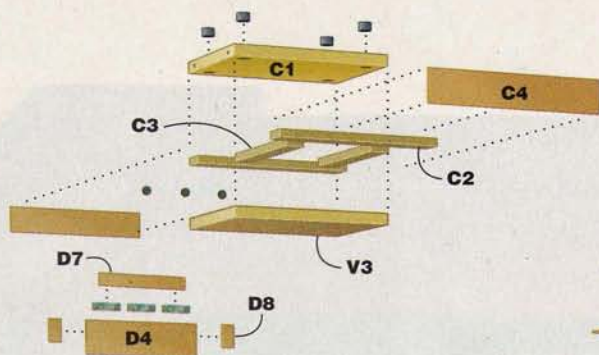


FIGURE A EXPLODED VIEW

The cabinet base is built around a flat and structurally rigid Baltic birch torsion box with leveling feet. The glass shelves are supported on shop-made aluminum shelf pins. The long pins suspend the shelves, which are the same width as the veneered portion of the back panel, so they appear to float in the cabinet.

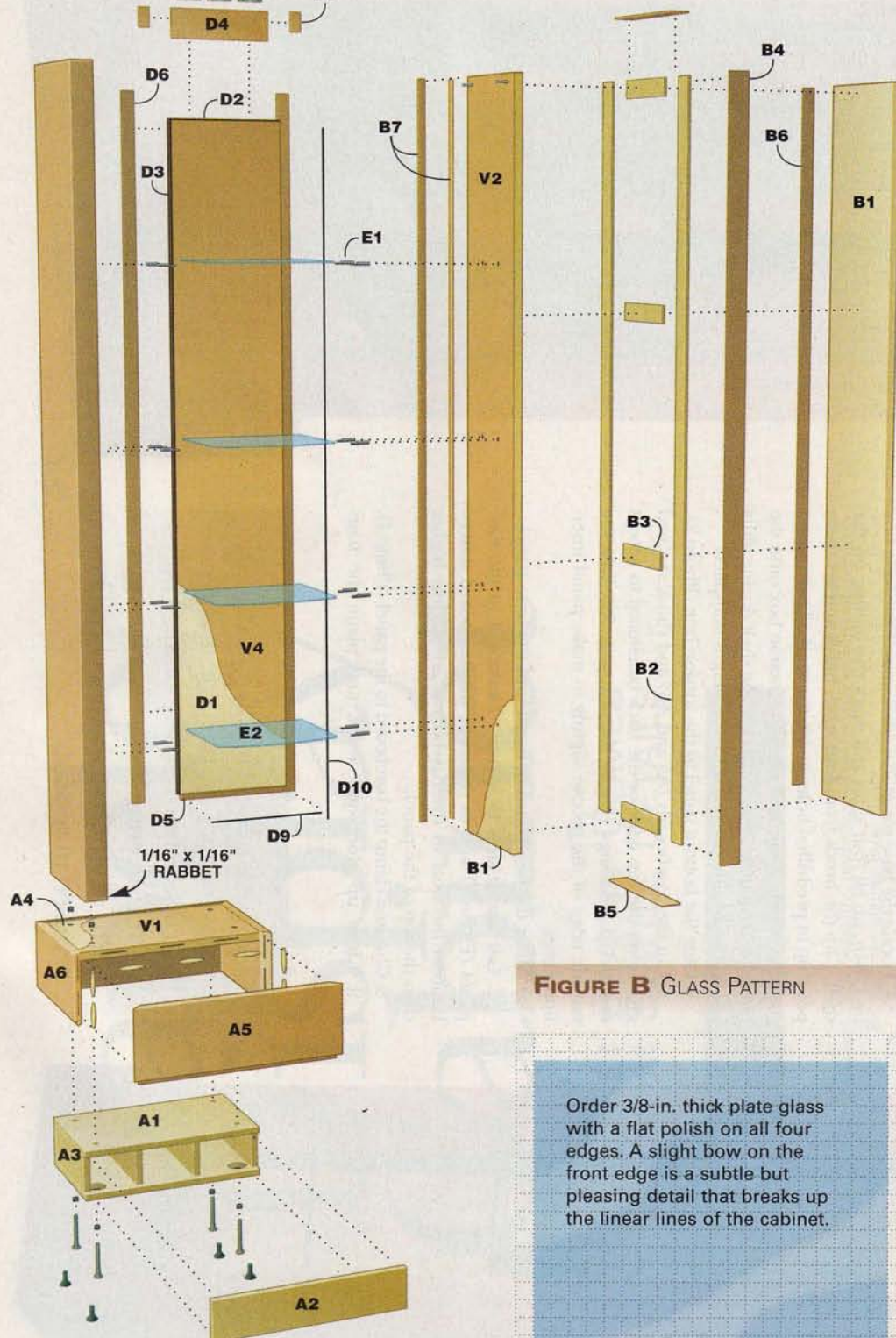


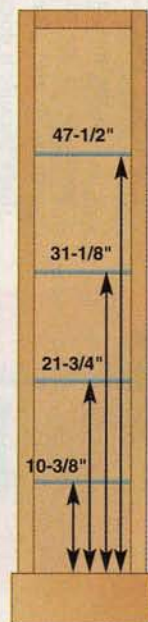
FIGURE C
SHELF PLACEMENT

Drill 1/4-in. holes for the shelf pins. You can drill a series of holes for adjustability if you like, but the cabinet looks best with just enough holes to support each shelf.

The spacing grows by an inch for each shelf from bottom to top. I think the impulse would be to space the shelves with the tallest opening at the bottom (like a chest of drawers). For this display cabinet, I like the tall opening at the top, because it puts the largest display area at eye level, and it balances the mass of the plinth-like base at the bottom.

FIGURE B GLASS PATTERN

Order 3/8-in. thick plate glass with a flat polish on all four edges. A slight bow on the front edge is a subtle but pleasing detail that breaks up the linear lines of the cabinet.



boards flush with the base panel and with one another.

10. Cut a small rabbet along the bottom of the baseboard (Fig. A, Detail 1) to create a shadow line at the floor and lighten the visual mass of the base.

11. Locate and drill the holes for the threaded inserts in the base to accept the levelers (Fig. A, Detail 2, page 52). The threaded insert should be set under an outside rib.

12. Drill holes in the base for the confirmat screws (Fig. A, Detail 2).

SIDE AND TOP PANEL CONSTRUCTION

13. Rough cut panels (B1 and C1) about 1/2-in. oversize.

14. Glue-up the panels with spacers (B2, B3, C2 and C3) to create the thick sides and top (Photo 5). Pin the parts in place first with a brad nailer to keep them from skating under pressure. Use weight to clamp the panels.

15. Trim the panels square on the tablesaw (Photos 6 and 7).

16. Drill three shallow holes for the rare earth magnets across the back edge of the top panel and about 1-1/2-in. in from either end (Fig. A.).

17. Apply the top and bottom edging (B5) to the side panels and the front and back edging (C4) to the top panel then plane flush.

18. Rip the side panels to final width, making a cut on each edge to leave the end caps perfectly flush with the sides.

19. Cut the top panel to final length in the same manner.

20. Apply the front and back edge bands (B4, B6) on the side panels last to hide the end grain of the top and bottom edge bands. Applying the edge bands before veneering creates a seamless looking panel.

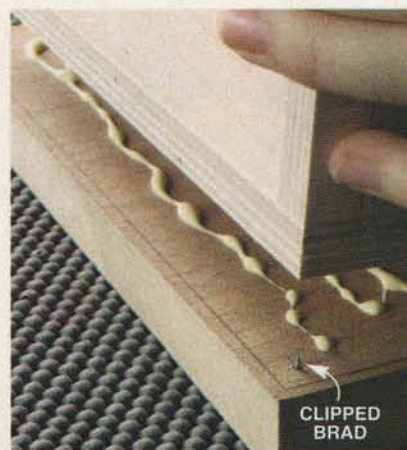
21. After the panel is veneered, cut the rabbet at the back inside edge of the sides panels (Fig. A, Detail 3, page 52). Add trim pieces (B7) to the rabbet.

VENEER THE PANELS

Note: If you can't find veneer wide enough to cover the panel, you'll have to seam it down the middle. If that is the case, try to order veneer that is



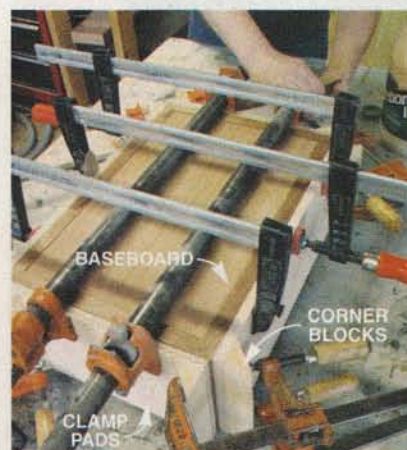
1 The display cabinet is built on and around a simple but strong torsion box. Use weight to clamp the top and bottom onto the web. Check for square before the glue sets.



2 Glue the torsion box onto the base panel. Clip the heads off of brads and set them point up in holes in the panel. The brads keep the parts from shifting under clamp pressure.



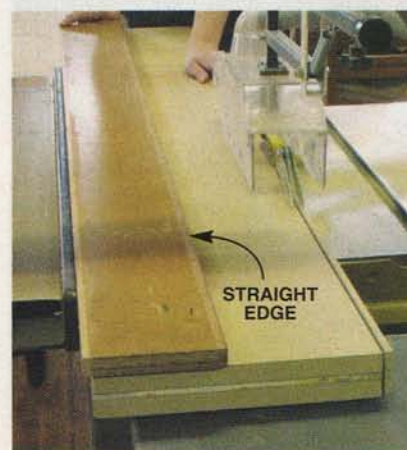
3 Cut biscuit slots in the base panel and the baseboard. The baseboard attaches to the shelf and floats free of the torsion box to allow for seasonal wood movement.



4 Clamp the baseboard to the base panel. Clamp pads made by gluing corner blocks to strips of plywood pull the miters tight. Use slow setting glues like Titebond III or Extend to ease the time pressures on the glue-up.



5 Assemble the side panels with glue and a brad nailer. Spacers add thickness to the sides and are positioned to support the panel when pressed for veneering.



6 Rip the sides slightly oversize. Brad-nail a straightedge on the side to guide the first cut, then remove the straightedge and rip the opposite edge.



7 Crosscut the ends of the side panel. Use a sled or miter gauge with a long fence.



8 Cut the seam where two veneers will join with a veneer saw. The veneer saw is designed to cut with several pull strokes. Lay the veneers face-to-face and hold them down with a straightedge as you cut.



9 Joint the two sawn veneer edges with a plane. Clamp the veneer face-to-face between two boards so it protrudes about 1/8-in. Then make a few light passes with the plane.

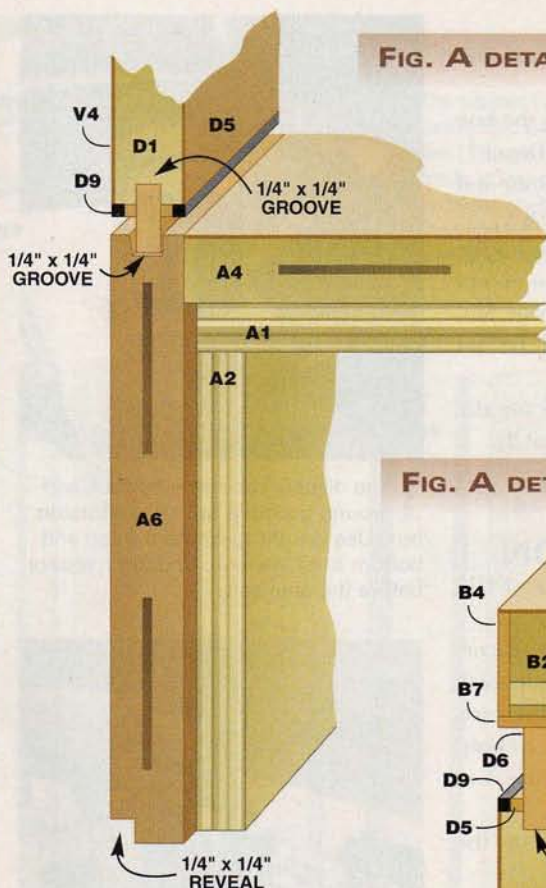


FIG. A DETAIL 1 BACK TO BASE

Note: Stop the groove 1-7/8-in. from either end of the back base-board (A6)

FIG. A DETAIL 3 BACK TO SIDE

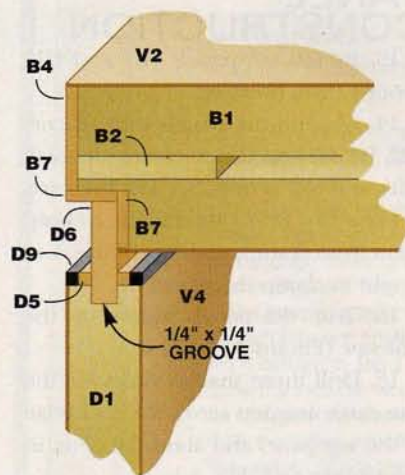
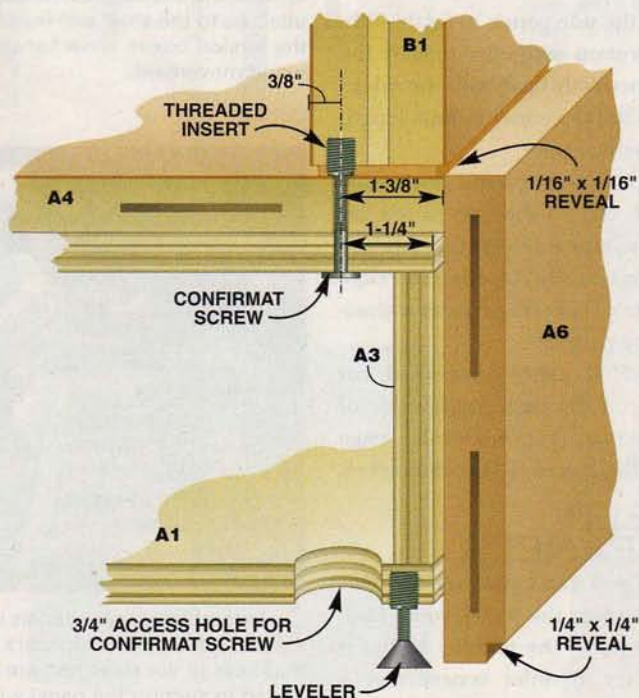


FIG. A DETAIL 2 BASE CUTAWAY



slightly over half the finished width.

22. Cut the veneers (V2 and V3) to length and width with a straightedge and a veneer saw (Photo 8). For each seam, fold the faces against each other and cut them together. This creates a perfect 180-degree edge when the two leaves are unfolded.

23. Joint the sawn edges of the veneers with a plane (Photo 9).

24. Hold the veneer together with veneer tape (Photo 10). Tape every two inches perpendicular to the seam. Then add a long piece over the entire seam.

25. Apply glue in an even coat to the substrate and lay down the veneer (Photo 11). Specialized veneering glue, such as Titebond's Cold Press for Veneer, has a generous open time and is mixed with wood flour to minimize bleed through.

26. Prepare the panels for pressing by laying kraft paper over the veneer to absorb glue squeeze-out. Next add 3/4-in. MDF platens under and over the panels to help distribute clamping pressure.

Note: In a vacuum press, the top platen should not overhang the substrate by more than 1/2-in. or it will lever up as the bag draws down and create areas of insufficient pressure.

27. Press the veneer onto the panels with a vacuum bag or by using platens with cross beams and clamps.

28. Trim the overhanging veneer with a router and a flush-cutting router bit.

29. Remove the veneer tape with a gentle sanding or dampen the tape and peel it off.

Note: Wait overnight before dampening to make sure the glue is fully cured.

30. Layout and drill the holes for the shelf pins (Fig. C, page 50), the threaded inserts (Fig. A, Detail 2) and the KD fittings at the top (Fig. A, Detail 4, page 55). Use a jig to locate and drill the KD fitting holes (Photo 12). Install the inserts and the KD fittings.

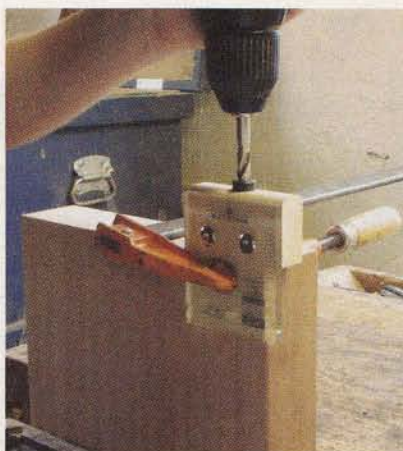
Note: KD fasteners are designed for very tight installation tolerances. Mock up the assembly and get the layout right before proceeding to the finished piece.



10 Tape the two veneers together with veneer tape. Solid, non-perforated tape works well as it can be stretched slightly when it is applied. This helps pull the two pieces together.



11 Apply glue on the substrate only and lay down the veneer. A small roller works well to spread the glue quickly and evenly.



12 Use a commercial jig to locate and drill holes for the knock-down fittings between the top shelf and sides.



13 Clamp the back panel's ebony string detail with masking tape. The ebony comes in short lengths so butt-join the pieces end-to-end.



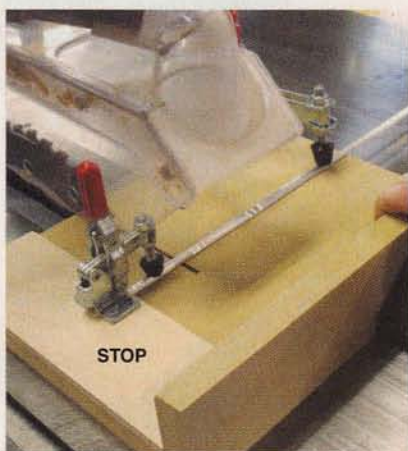
14 Use a thin kerf blade to cut a groove in the back's upper flange. Featherboards and push sticks are a must for this operation.



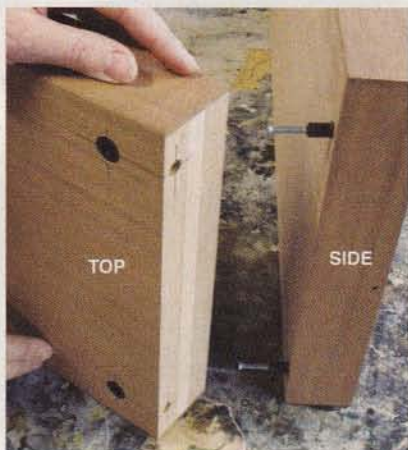
15 Mending plates are placed in the upper flange so magnets in the cabinet can hold the back in place. Add filler strips to encase the mending plates and fill the groove.



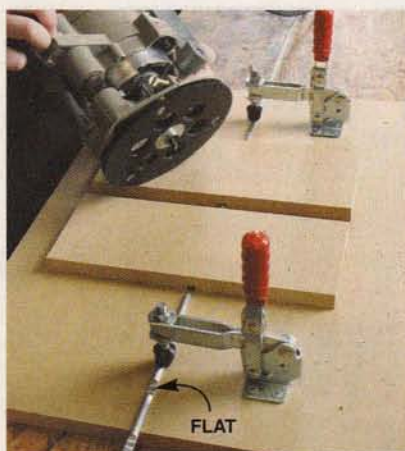
16 Glue the top and bottom flanges into the back first. Clamp dummy side flanges tight against the bottom of the side grooves to position the top and bottom flanges.



18 Crosscut the shelf pin blanks using a carbide blade and a slow feed rate. Secure the rod in a cut-off jig with two hold-down clamps. Place a stop at the desired length.



20 To assemble the cabinet, start by attaching the two sides to the top.



17 Rout flats on aluminum rod to create the shelf pins. Carbide bits can cut aluminum with ease. A 1/4-in. deep V-groove in the jig holds the rod steady under the clamps.



19 Smooth and polish the shelf pins with a mill file, sandpaper and steel wool.



21 Thread a confirmat screw through the torsion box holes to attach the base to the sides. It helps to magnetize the wrench by rubbing it with a rare earth magnet first.

BACK PANEL CONSTRUCTION

31. Cut the MDF panel (D1) and apply the top edge band (D2) first. Cut and plane the edge band flush to the panel and apply the side edge bands (D3).

32. Seam and press veneer (D6) and trim flush.

33. Cut a 1/8-in. x 1/8-in. rabbet around the perimeter on both sides of the back. Glue the top and bottom ebony stringing (D9) on oversize (Photo 13). Do one side at a time, then plane flush. Apply the side stringing (D10) last.

Note: It's hard to find Gabon ebony long enough for the height of the back panel. Shorter pieces can be butt-joined in place. The dark wood disguises the joints.

34. Cut a groove centered on all four edges of the back panel (Fig. A, Detail 5, page 55) to accept the back flanges.

35. The top flange (D4) on the back has metal mending plates buried inside for the rare earth magnets to grab onto. Use a thin kerf blade on the tablesaw to cut a groove along the top edge of the flange (Photo 14).

36. Insert the mending plates and glue in filler strips (D7 and D8) to hold the plates in place (Photo 15).

37. Glue the flanges (D4 – D6) into the groove on the back panel. Glue the top and bottom flanges in first (Photo 16). Glue on the side flanges last.

SHELF PINS

38. To make the shelf pins, create a small flat on a length of 1/4-in. aluminum rod with a carbide-tipped straight bit (Photo 17).

39. Cut the shelf pins to length (Photo 18).

40. File or sand the machined edges smooth (Photo 19).

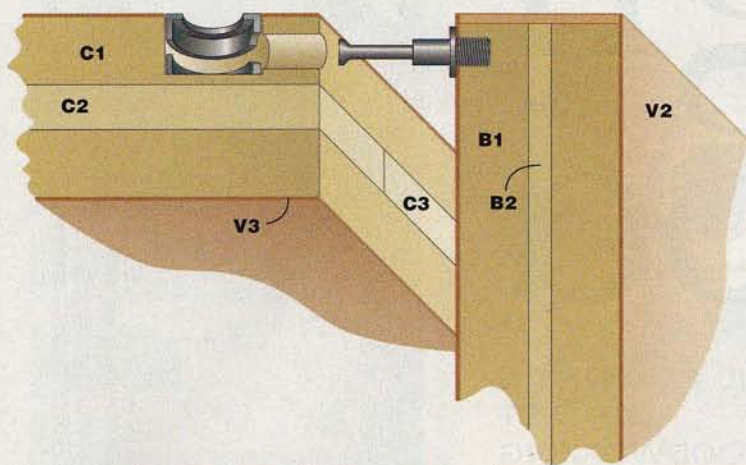
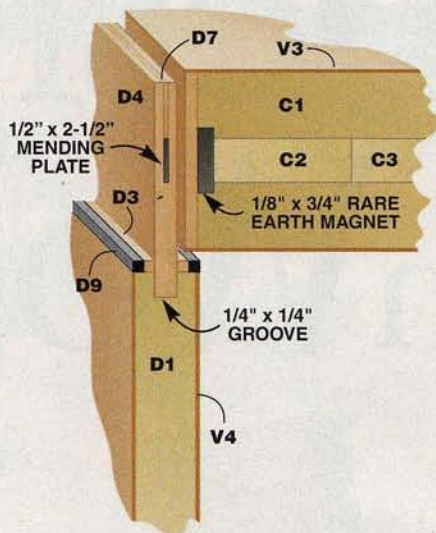
FINISH UP

41. Sand to 220-grit and finish the cabinet with oil, shellac, varnish or lacquer.

42. Attach the top shelf to the sides (Photo 20).

43. Attach the base to the sides with the confirmat screws (Photo 21).

44. Stand the cabinet up and adjust the feet to plumb the cabinet. Insert the pins and shelves, and you're ready to go.

FIG. A DETAIL 4 TOP KD FITTING

FIG. A DETAIL 5 BACK/TOP CUTAWAY


SOURCES:

Rockler, www.rockler.com (800) 279-4441, Threaded Inserts 1 pack of 8, #31872, \$5; Levelers, 1 pack of 4, #32498, \$3; Connector Bolts, 1 pack of 8, #31849, \$4; Minifix KD Fittings, 1 pack of 8, #22161, \$6; 8mm Brad Point Bit, #26406, \$5; 8mm Stop Collar, #93237, \$3; 15mm Forstner Bit, #21249, \$8; 10mm Stop Collar, #93253, \$3; Brown Caps, #30676, \$1; Minifix Jig-It Template, #92114, \$30; Rare Earth Magnets, 1/8" x 1/2" 1pack of 10, #30810, \$7; Titebond Cold Press for Veneer, #31844, 1-qt., \$9. Certainly Wood, www.certainlywood.com (716) 655-0206, Rotary Cut Bird's Eye Maple, 6 sq. ft. @ \$9/ sq. ft., \$54; Macassar Ebony, 6 sq. ft. @ \$7/sq.ft., \$42; Quartered Sapele, 29 sq. ft. @ \$1/ sq. ft., \$29. Tropical Exotic Hardwoods, www.anexotichardwood.com (888) 434-3031, Gabon Ebony, 2-lbs. @ \$5/lb., \$10; 4/4 Sapele, 6 bd. ft. @ \$10/ bd. ft., \$60. Home Centers, 1 sheet of 3/4-in. MDF, \$30; 1/2-in x 2-1/2-in. mending plates (4 req.), \$5.

CUTTING LIST

Overall Dimensions: 70" H x 17" L x 10-3/4" D

Part	Name	Qty.	Dimensions (Th x W x L)	Material
Base				
A1	Torsion Box Top/Bottom	2	1/2" x 9" x 14-1/4"	1/2" Baltic Birch
A2	Torsion Box - Front/Back	2	1/2" x 3-1/2" x 14-1/4"	1/2" Baltic Birch
A3	Torsion Box Sides/Ribs	4	1/2" x 3-1/2" x 8"	1/2" Baltic Birch
A4	Base Panel	1	3/4" x 9-1/4" x 14-1/2" *	MDF
A5	Baseboard Front/Back	2	3/4" x 6" x 16"	Solid Sapele
A6	Baseboard Sides	2	3/4" x 6" x 10-3/4"	Solid Sapele
Side Panels				
B1	Side Panels	4	3/4" x 9-3/4" x 63-3/4" *	MDF
B2	Spacers - Long	4	1/4" x 1-1/2" x 63-3/4"	Poplar
B3	Spacers - Short	8	1/4" x 1-1/2" x 6-3/4"	Poplar
B4	Edge banding - Front	2	1/8" x 1-3/4" x 64"	Solid Sapele
B5	Edge banding - Top/Bottom	4	1/8" x 1-3/4" x 9-3/4"	Solid Sapele
B6	Edge banding - Back	2	1/8" x 1-1/8" x 64"	Solid Sapele
B7	Edge banding - Rabbet	4	1/8" x 5/8" x 64"	Solid Sapele
Top Panel				
C1	Top Panel	2	3/4" x 9-1/4" x 11" *	MDF
C2	Spacers-Long	2	1/2" x 1-1/2" x 11"	Poplar
C3	Spacers-Short	2	1/2" x 1-1/2" x 6-1/4"	Poplar
C4	Edge banding	4	1/8" x 2" x 11"	Solid Sapele
Back Panel				
D1	Back Panel	1	3/4" x 9-3/4" x 60-3/4"	MDF
D2	Edge band - Top/Bottom	2	1/8" x 3/4" x 9-3/4"	Solid Sapele
D3	Edge band - Sides	2	1/8" x 3/4" x 61"	Solid Sapele
D4	Flange - Top	1	1/4" x 2-5/8" x 9-1/2"	Solid Sapele
D5	Flange - Bottom	1	1/4" x 1" x 9-1/2"	Solid Sapele
D6	Flange - Side	2	1/4" x 1-3/8" x 64-3/8"	Solid Sapele
D7	Fill Strip	1	3/32" x 5/8" x 7-1/2"	Solid Sapele
D8	Fill Strip Ends	2	3/32" x 1-1/8" x 1"	Solid Sapele
D9	Ebony Stringing - Top/Bottom	2	1/8" x 1/8" x 9-3/4"	Gabon Ebony
D10	Ebony Stringing - Sides	2	1/8" x 1/8" x 61"	Gabon Ebony
Veneer				
V1	Base Panel	2	9-1/4" x 14-1/2" *	Sapele
V2	Side Panels	4	10" x 64" *	Sapele
V3	Top Panel	2	9-1/2" x 11" *	Sapele
V4	Back Panel	2	10" x 61" *	Bird's Eye Maple & Macassar Ebony
Misc.				
E1	Shelf Pins	20	1/4" x 1-3/4"	1/4" Aluminum Rod
E2	Glass Shelves	5	3/8" x 8-3/4" x 10"	Plate Glass

* Cut oversize to allow for trimming

Design in Wood

THE COUNTRY'S LARGEST WOODWORKING COMPETITION CELEBRATES ITS 27TH YEAR.

Three hundred and fifty entries, \$20,000 in prize money, and a three-week run. Those eye-opening numbers give you a brief taste of Design in Wood, a huge show sponsored by the San Diego Fine Woodworkers Association (SDFWA). It's being held during the San Diego County Fair at the Del Mar Fairgrounds in Del Mar, California, from Saturday, June 14, to Sunday, July 6, 2008.

The SDFWA is the nation's largest woodworking association, with over 1,400 members. They sponsor Design in Wood each year, and the caliber of entries just gets better and better, as you can see from these photos of recent prize winners. The competition is open to all woodworkers, with awards given in 21 categories that recognize the enormous breadth of skill and talent among SDFWA members. The awards include Art Furniture, Clocks, Model Building, Laminated/ Segmented Wood Turning, Marine Animal Wood Carving and Intarsia—something for everybody.

Entry forms for the show will be available in early March 2008. Entries can be made online at www.sdfair.com. The deadline for entering the show is Friday, May 2. For more information about the show, contact Bob Stevenson, Exhibition Coordinator, at (619) 422-7338, or email Bob at bobscvw@cox.net.



STEVEN M. WHITE



DAVE NEAL



DAN LEAF



BILL COX



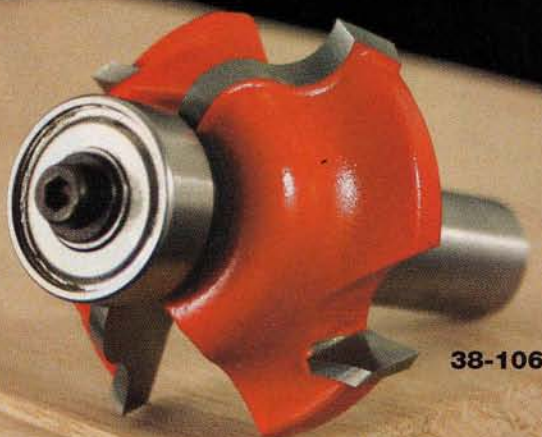
STEVEN M. WHITE



ROB OPIE

What's The Secret To Flawless Edge Profiles With NO REWORK?

Quadra-Cut™



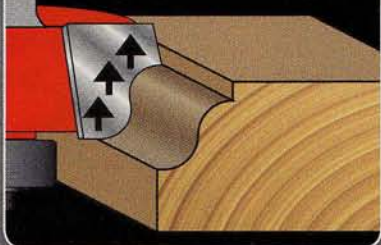
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Freud's New Quadra-Cut™ 4 Cutter Design

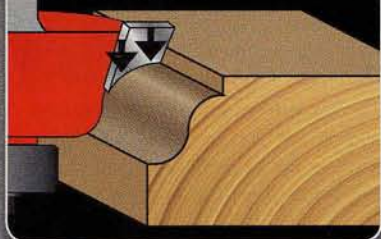


How It Works!

Two large cutter wings shear upward to remove most of the stock for fast, extremely smooth cuts.



Two small cutter wings shear downward for an ultra-fine finish, even when routing crossgrain in delicate materials!



U.S. Patent No. 8,899,252

For A Smooth Sanded Finish...

...Without The Rework!

Freud's Exclusive 4 Cutter Design



All Other Router Bit 2 Cutter Design



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— Chris Marshall, *Woodworker's Journal*

"Super-smooth cuts!"

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Look For These Popular Profiles in 1/2" Shank Quadra-Cut™ Design:

- Classical Cove & Round Bit
- Rounding Over Bit, 3/8" Radius
- Rounding Over Bit, 1/2" Radius
- Rounding Over Bit, 1" Radius
- Beading Bit, 5/16" Radius
- Beading Bit, 1-1/8" Radius
- Table Top Classical Bold Bit
- Table Edge Bit
- Rounding Over Bit, 5/8" Radius
- Rounding Over Bit, 1-1/2" Radius
- Raised Panel Bits



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17 Router Tips

FLATTENING WIDE BOARDS

A huge, wide board makes a stunning tabletop. If it won't fit through your planer, flattening that board can be a lot of hard work. You could use a belt sander, but it's much easier to use your router.

To get started, you'll need a large, flat surface, such as a big workbench or a hollow-core door. Lay the board on the bench and place shims underneath the board so it won't rock. Next, mill two guide boards about 1-ft. longer than your workpiece. Screw or clamp them to the bench top an equal distance apart. Make a sliding carriage for your router from two 1-in. by 1-in. pieces of aluminum angle, and fasten them to two cleats.

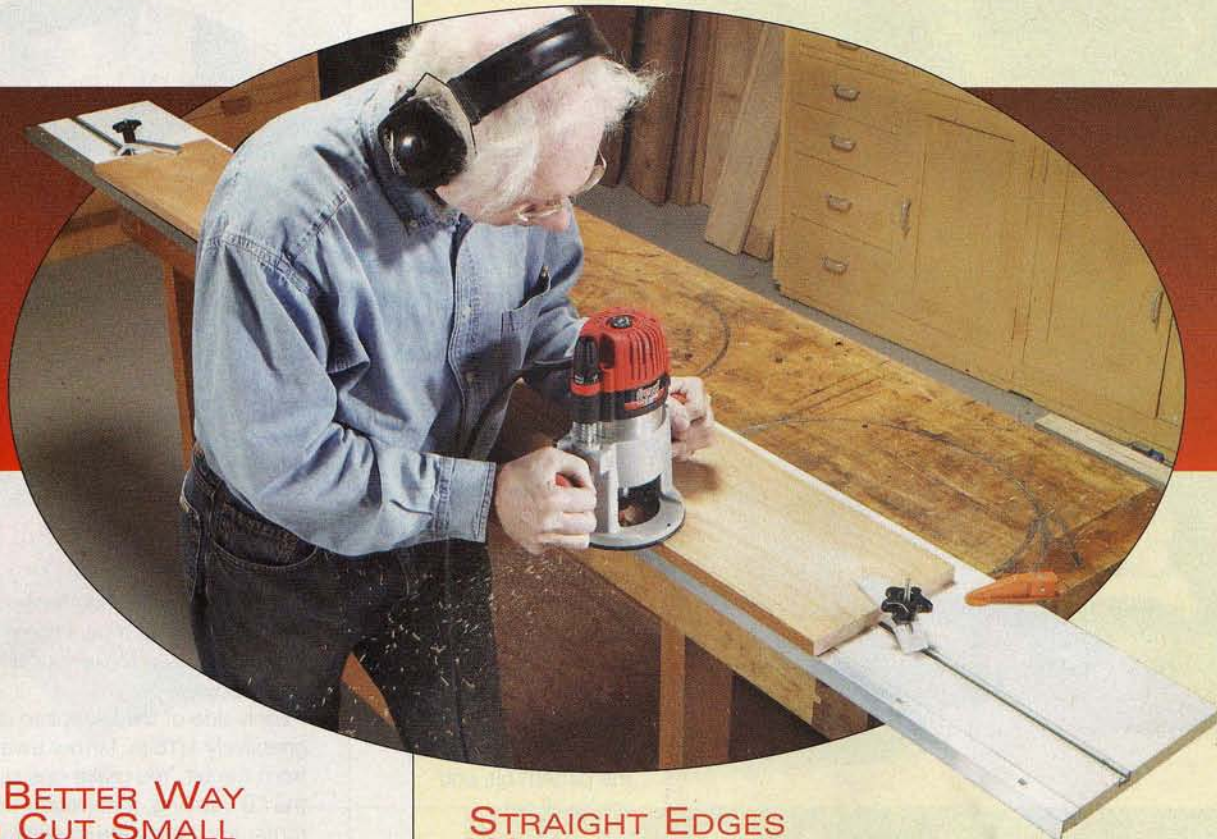
Install a large-diameter bit in your router and you're ready to go. Slide the router back and forth on the carriage, then advance the carriage down the length of the board.



TWO FEATHERBOARDS ENSURE ACCURACY

It's best to use two featherboards when cutting narrow moldings in order to get a straight, smooth cut. However, it's almost impossible to safely feed the stock all the way through. The solution: make the molding extra-long and leave some uncut wood on the end, to serve as a handle. When you've routed as far as possible, turn off the router, remove the piece and cut off the handle.





A BETTER WAY TO CUT SMALL MOLDINGS

It's hard to keep thin or narrow stock from chattering while its being cut on the router table. For narrow strips such as this bead molding, it's safer and easier to rout the profile on a wide

board (Photo 1), then cut off the shaped edge on the tablesaw (Photo 2).

1



2

STRAIGHT EDGES WITHOUT A JOINTER

Here's a device for jointing boards using only a router. It's a long straightedge equipped with clamps for holding a workpiece plus a durable metal edge for guiding a flush-trim bit. When not in use, it easily stores against a wall.

To make the straightedge, you'll need an 8-ft.-long, 12-in.-wide piece of plywood, such as melamine shelving, an 8-ft.-long piece of 1-in. by 1-in. aluminum angle, 8 ft. of T-track, and some commercial clamps made for T-track or their shop-made equivalents (see Source, below).

Rout the plywood so the T-track and aluminum angle are flush with its surface. Epoxy the T-track into its groove; drill and countersink holes in the angle so you can screw it to the plywood.

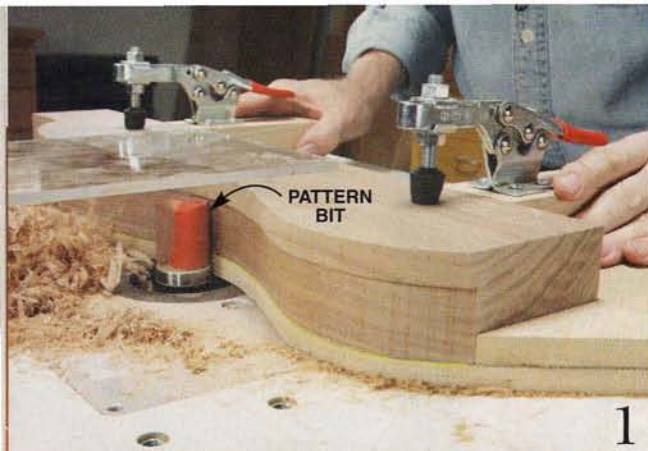
To use the jig, clamp your board so its uneven edge just overhangs the straightedge, install a bottom-bearing flush-trim bit in your machine, and rout away.

Source: Kreg, www.kregtool.com, (800) 447-8638, Mini Trak, KMS7506, 4 ft. long, \$19; Trak Clamp, KMS7511, \$5.



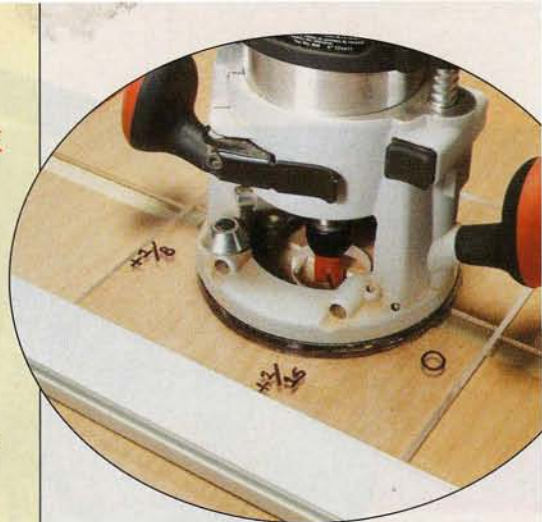
CHIP-FREE BITS

Spiral bits often make a smoother, more accurate cut than straight bits. An up-cut spiral bit pulls chips up and out, making it perfect for cutting mortises in solid wood. A down-cut bit pushes chips downward, ideal for making chip-free dados in plywood and melamine. (Down-cut bits are not recommended for use in a router table, however, because they can push the workpiece up off the table.) A compression bit has spirals running both ways, up and down, pulling chips toward the middle of the bit. It's the best bit for routing the edges of plywood or melamine—you'll get a chip-free surface on both sides.



SHAPE THICK PARTS IN TWO STEPS

The best way to make identical parts is to use a template and a top-bearing pattern bit. Most pattern bits aren't very long, however, so you might think that you can't use one for thick parts. You can, and here's how: First, rout the bottom half of the part (Photo 1). Second, remove the part from the template and install a bottom-bearing flush-trim bit in your router (Photo 2). Adjust the bit's height so its bearing rides on the surface created by the pattern bit, and you're all set.



FOUR DADO SIZES WITH ONE BIT

Here's a custom-made baseplate that saves setup time. Using just one bit, you can make four different dados.

Each side of the baseplate is progressively 1/16-in. farther away from the bit. You make one cut at the "0" setting, then rotate the router and baseplate to enlarge the dado. For example, if you use a 1/2-in. bit, you can also make 9/16-in., 5/8-in., and 11/16-in. wide cuts. Alternatively, you can make the baseplate with 1/32-in. or 1/64-in. progressions for fitting undersized plywood into dados.

Making the baseplate requires accurate layout. It's best to make it slightly oversized at first and mount it on your router. Nibble away at its edges on the tablesaw until the dimensions are perfect.



PERFECT MITER JOINTS

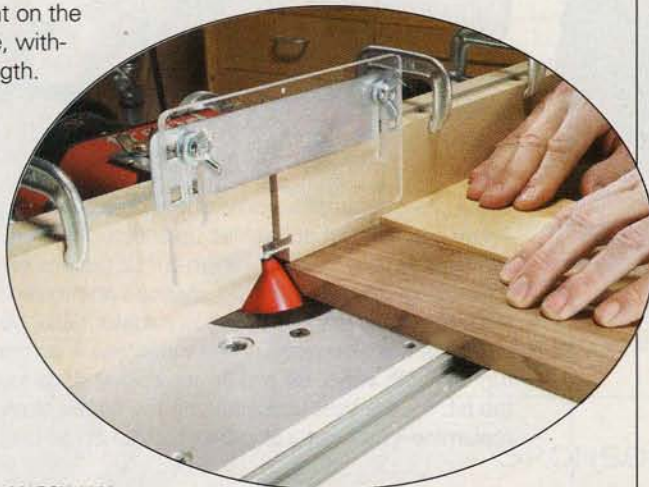
Some contractor-style tablesaws don't do a very good job cutting miters when the blade is tipped over to 45 degrees.

The blade shifts out of alignment just enough to produce a burnt or out-of-square edge. If you've experienced those problems, try using a chamfer bit, which always cuts a precise 45-degree angle.

Chamfer bits come in a variety of sizes. Here are a few tips that will improve your results:

- Use your tablesaw or bandsaw to remove most of the waste before you rout. Your chamfer bit will perform best when it's only removing a small amount of wood.
- Cut your router table's fences to make a zero-clearance opening around the bit. This prevents the workpiece from tipping into the bit as you cut.
- Hold a backboard behind the workpiece to prevent blow-out.

When you set up your router table, aim for leaving a point on the end of the workpiece, without shortening its length. You may adjust your fence or the bit's height to achieve this result. Either way, the adjustment should be very small—but once you're set, miters are fast and easy to cut.



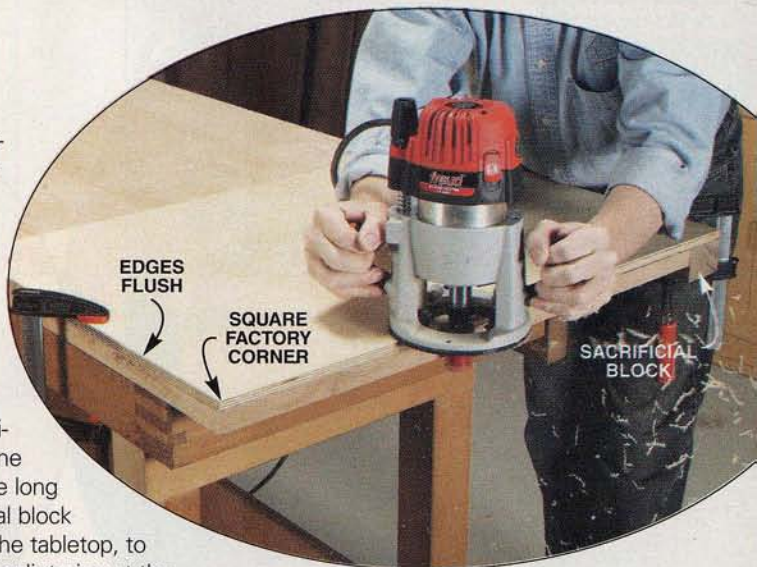
SQUARE UP A LARGE TOP

How do you trim the end of a top that's too large to cross-cut on the tablesaw? Simple: use a router and a large pattern bit.

Before you rout, use a jigsaw to cut the end of the top close to its final length. (The less end grain you rout, the easier the job will be.) Next, find a piece of plywood or fiberboard that has two adjacent factory edges. This piece guides the router; the factory edges guarantee that your top will be square. It should be 2 to 3 in. longer than the width of the tabletop.

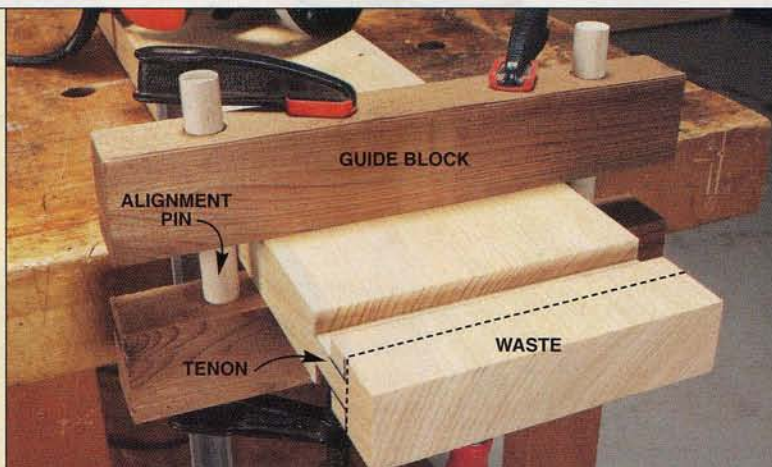
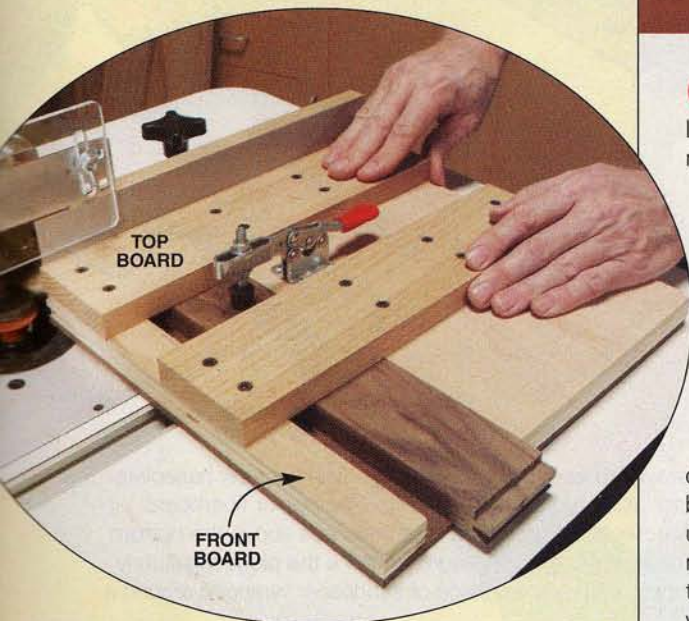
Place the guide piece on a pencil line indicating the end of the tabletop. Clamp one side of the guide piece flush with the long edge of the top. Clamp a sacrificial block on the opposite side, tight to the tabletop, to prevent the end grain from splintering at the end of the cut.

You can use a standard 1/2-in. flush-trim bit for this technique, but that requires placing the guide piece under the top, which can be a hassle. A pattern bit makes setup much easier. You'll get the best results by using a pattern bit that's at least 1-in. dia. It makes a smoother cut in end grain than a bit with a smaller diameter.



RIGID ROUTING SLED

You can't beat a sled and a toggle clamp for coping the ends of rails and stiles, but many sleds have a subtle problem that produces a misaligned joint. The problem is with the base, which is typically 1/4-in. thick. Pressure from the toggle clamp causes the base to bend, resulting in a rail that's not evenly aligned with its mating stile. The answer is to add a board at the front of the sled, plus two top boards that bridge over the workpiece. This produces an absolutely rigid sled, and perfect joints.

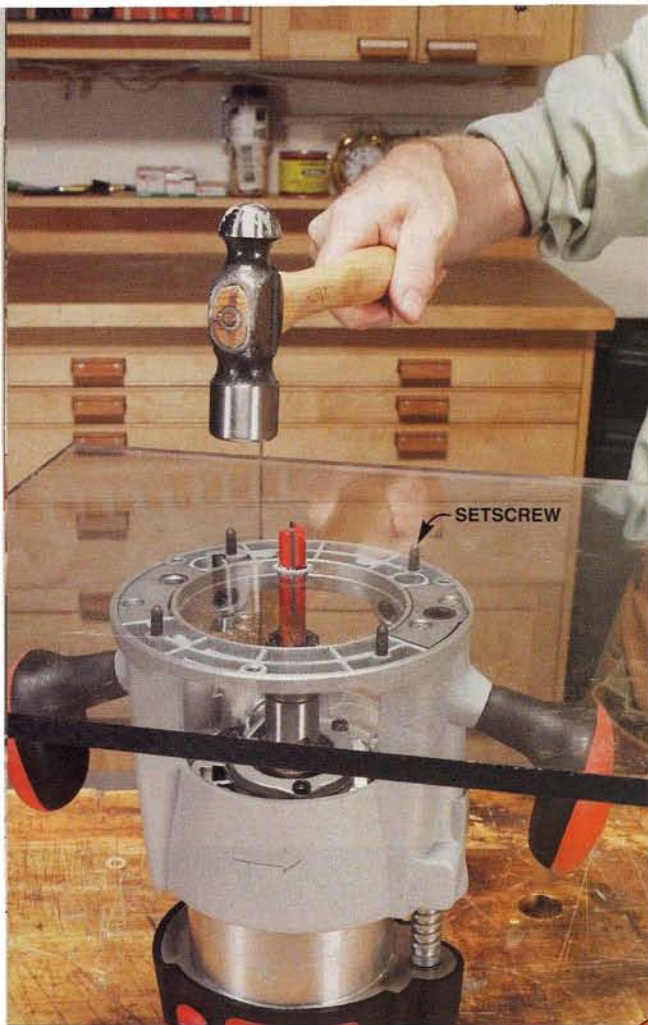


CUTTING TENONS ON LONG BOARDS

Let's say you're building a bed or dining table that requires very long rails. Cutting tenons on those rails can be unwieldy using a tablesaw, but it's quite easy using a router and a set of parallel guide blocks. The guide blocks are just two large pieces of wood connected by a pair of alignment pins.

Cut your rails an inch or two longer than their final length. (The extra wood will support the router, preventing it from tipping.) Install a 1/2-in. dia. bit in your router and measure how far it cuts from the edge of the router's baseplate. Mark the tenons, then clamp the guide blocks onto the rail. Make sure they're square to the rail and set back the correct distance from the tenon's shoulder.

You're all set to rout both sides of the rail. Adjust the bit's cutting depth to 1/16-in. less than the final depth you'll need. Make a pass on both sides of the board, measure the thickness of the tenon, and gradually lower the bit until the tenon is the correct thickness. To cut the rest of the tenon's width, unclamp the guide boards, move them closer to the rail's end, re-clamp them, and rout another pass. Cut off the waste when you're done.



ALIGN HOLES FOR A NEW BASEPLATE

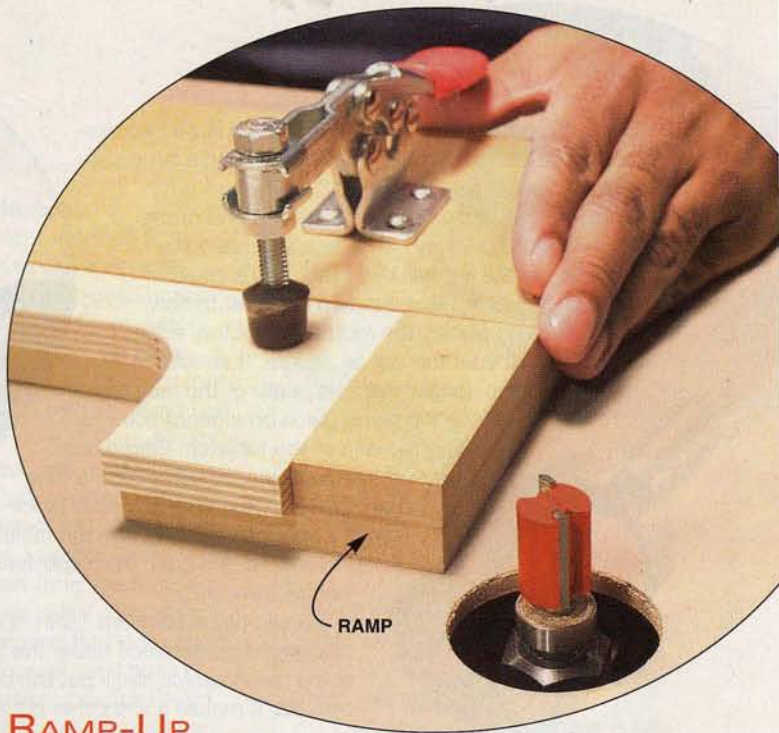
Additional baseplates for your router can really come in handy—for spanning a wide distance, for example, or for use as an insert in a router table. Drilling the screw holes for fastening the baseplate to your router is a precision job, though, particularly if you want the bit to be located exactly in the center.

Special cone-pointed setscrews make the job easy (see Source, below). They come in various thread sizes; to determine what you need, take your baseplate screws to the hardware store and match them with an appropriate nut.

To center your baseplate, draw diagonal lines from corner to corner and drill a 1/4-in. hole where the lines meet. Chuck a 1/4-in. bit in your router. Install the pointed setscrews in your router base and slide the new baseplate over the bit. Tap the baseplate above each screw to make a dimple for centering a drill bit.



Source: SC Fastening Systems, scfastening.com (800) 232-2659, Cone Point Socket Set Screws, phone for price.



RAMP-UP FOR EASIER STARTS

Next time you make a template for pattern routing, be sure to include a starting ramp. This provides a safe place for the router bit to contact the template before it starts cutting. Add an exit ramp on the far end of the template, too.



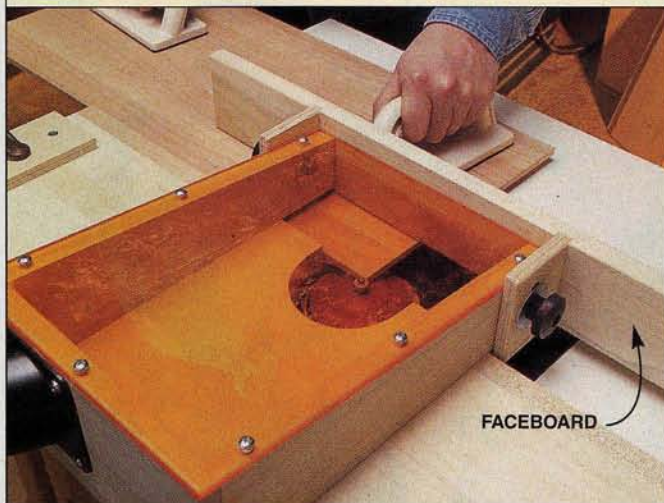
PLUG-TRIMMING ROUTER BASE

Here's a fast way to level screw-hole plugs. Make a new baseplate for your router using two pieces of 1/2-in. plywood or fiberboard. Adjust your router bit so it cuts a paper-thickness above the bottom of the baseplate, then rout the plugs. To make the plugs absolutely flush, sand them with a small piece of sandpaper wrapped around a hard block.

BOX FENCE FOR BIG BITS

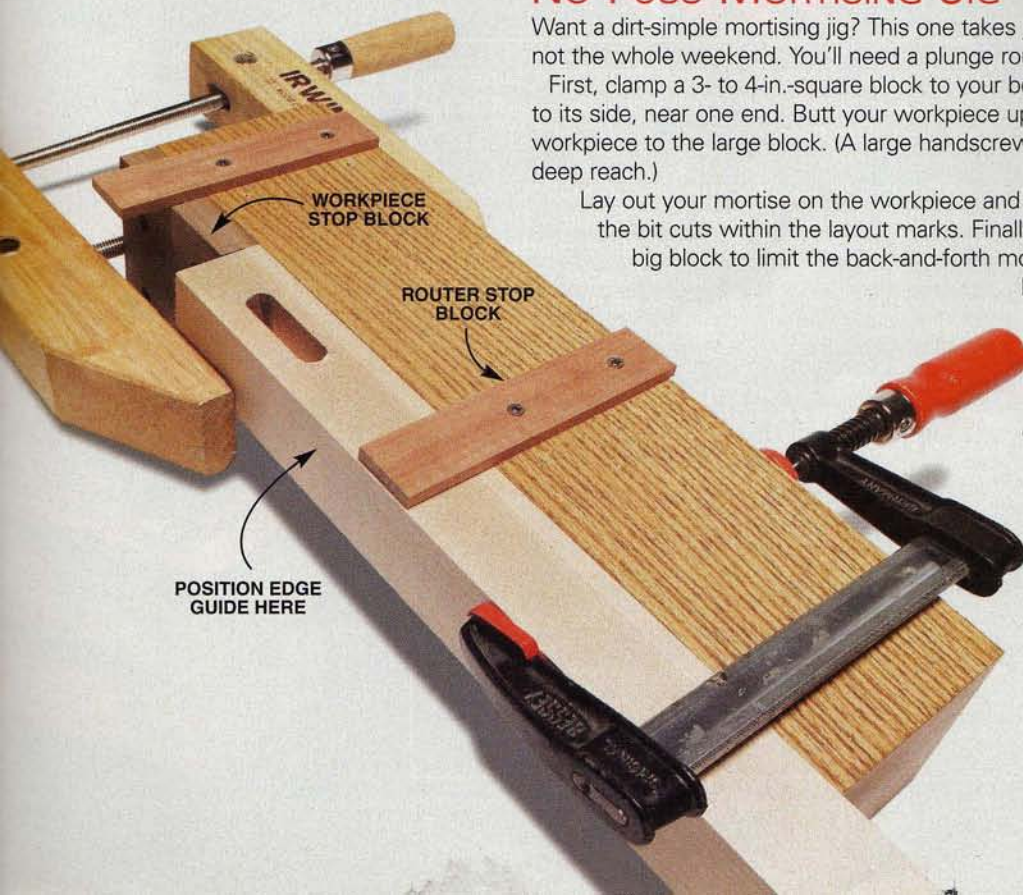
A large raised-panel bit should be treated with a certain amount of respect. Not only do you have to slow your router way down to reduce the speed of the bit's outermost tips, but you've got to watch your fingers, too. Here's a custom-made fence that will make this operation much less scary.

This fence is really just a large box with a plastic top and dust port, clamped to your router table. There's a faceboard attached to the box's front end that is adjustable up or down. Set it so that it bears down on your panel, like a featherboard, to produce a smooth cut.



SANDWICH CLAMP

Use a double-sided template to avoid tearout on a curved piece. By simply turning the template over and placing the handles on the other side, you can always cut downhill, following the wood's grain direction.



NO-FUSS MORTISING JIG

Want a dirt-simple mortising jig? This one takes just a few minutes to put together, not the whole weekend. You'll need a plunge router equipped with an edge guide.

First, clamp a 3- to 4-in.-square block to your bench. Fasten a 5-in.-long stop block to its side, near one end. Butt your workpiece up to the stop block and clamp your workpiece to the large block. (A large handscrew is ideal for this job because it has a deep reach.)

Lay out your mortise on the workpiece and adjust the router's edge guide so the bit cuts within the layout marks. Finally, add two stop blocks on top of the big block to limit the back-and-forth movement of your router. These blocks define the mortise's length.

If your mortises are centered, go ahead and cut all of them.

If they're offset, simply change the fence setting as needed. Our cover shows this jig in action.

This article is sponsored by **Freud Tools**. For more information on the bits shown here, go to www.freudtools.com or call (800) 334-4107.

Premier

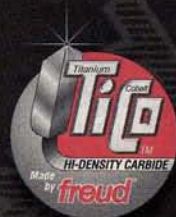
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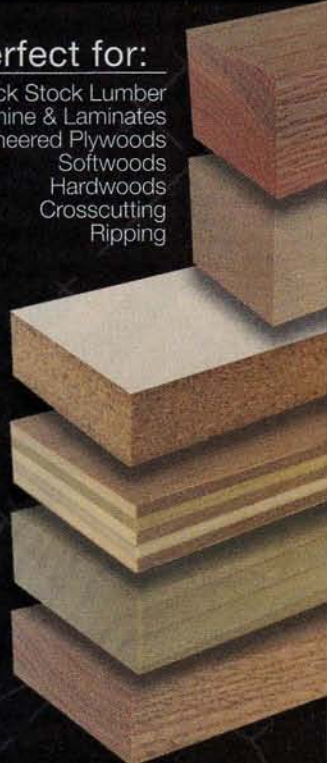
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picture frames

by Tim Johnson

Mitered corner joints define most picture frames—but not these! The Framed Frame (top right) goes together with half-laps, the Magnetic Frame (middle) employs butt joints and the Grooved Frame (bottom) is simply edge-glued. These distinctive frames share another common trait—they're routed. All three frames are made using a router table; the Framed Frame also requires a small hand-held router. Most of the routing is done with different types of straight bits (flush trim pattern bits and a spiral bit). You'll also need a slot cutter.

You can make any one of these frames in less than a day. They're all made from 3/4-in.-thick boards—at most, you'll need a couple board feet per frame. Simple jigs and fixtures make each frame a perfect candidate for making multiples, so they could also be a great solution for your scrap stock problem.



Framed Frame

This frame consists of four pieces that are identical except for length (Fig. A). Each piece has two rabbets for the half-lap corner joints, one on each face. The pieces assemble “elephant” style (nose-to-tail). The framed edges are created prior to assembly, by routing away the center of each piece, using a custom-made jig (Fig. B).

You can make a simple version of this frame from a single piece of solid stock that’s 2-in.-wide by 36-in.-long. Just plane it to final thickness and you’re ready to cut the four pieces. To create the two-tone version shown here, start with three pieces of 3/4-in. by 2-in. by 18-in. stock. Glue the pieces together with the contrasting piece in the middle. Resaw the blank in half (Photo 1). Then plane the resawn blanks to final thickness. Each blank contains two frame pieces, one long side and one

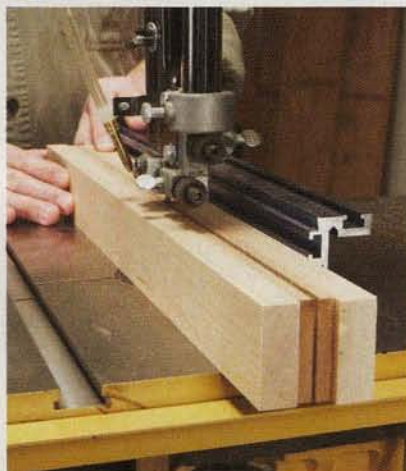
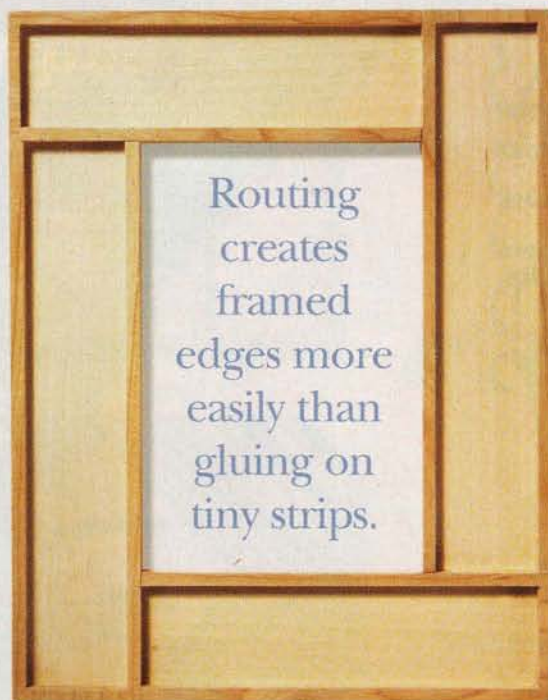
short side. Cut the four pieces to final size. Then cut the rabbets on each piece (Photo 2).

Plane the center-routing jig’s solid

wood spacers to 9/16-in.—the same thickness as the frame pieces. During assembly, center one frame piece between the side spacers. The frame piece must fit snugly. Install the support block. Then add the guide pieces, making sure they overhang the frame piece equally, by 3/16-in., the width of the framed edges. Slide each frame piece into the jig. After routing and squaring the corners (Photo 3), use the finger notch to grip the piece and remove it from the jig.

Dry-assemble the frame and mark the inside edges of each piece. Then use a straight bit to rout rabbets for the glass (Photo 4 and Fig. C). Fit one corner joint

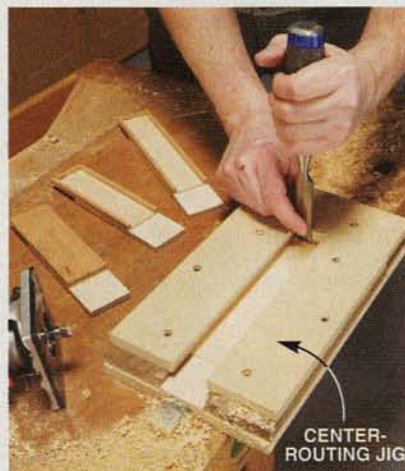
at a time when you glue the frame together (Photo 5). Clamping the frame between cauls assures a flat result (a good thing!).



1 Create two-tone blanks for the frame pieces by resawing a lamination of 3/4-in.-thick boards. Plane the cherry faces to 3/16-in. thickness. Then plane the maple faces until the stock reaches final thickness.



2 Saw rabbets for the half-lap joints on both ends of each piece. One rabbet goes on the top face; the other goes on the bottom face.



3 Create the framed edges by routing each piece, using the jig and a mortising bit (at right). Rout just deep enough to remove the top layer of wood. After routing, square the corners with a chisel.



FIGURE A EXPLODED VIEW

OVERALL DIMENSIONS:
9/16"TH x 7"W x 9"H

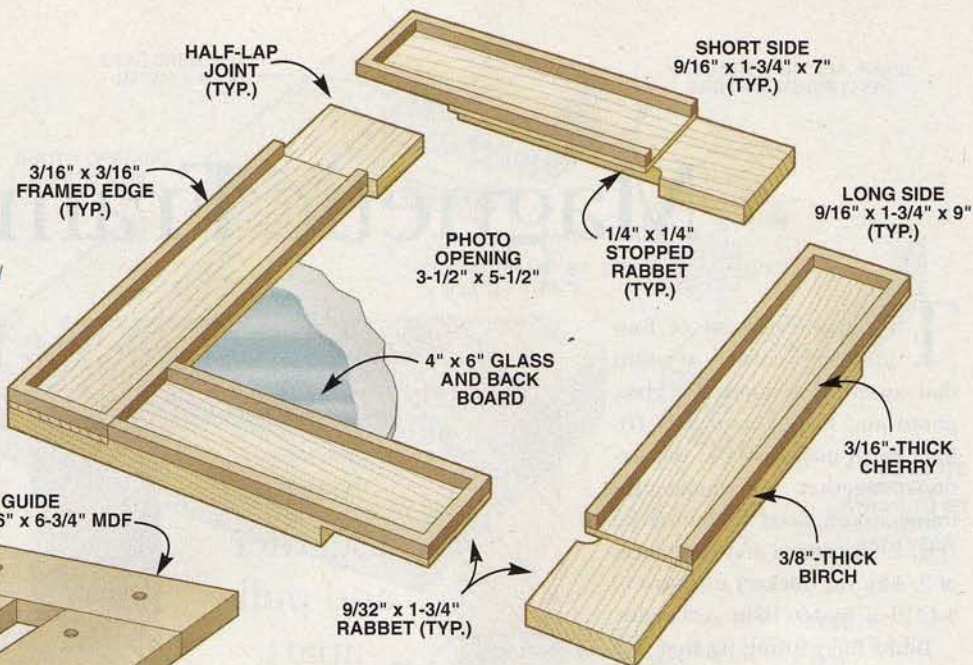


FIGURE B
CENTER-ROUTING JIG

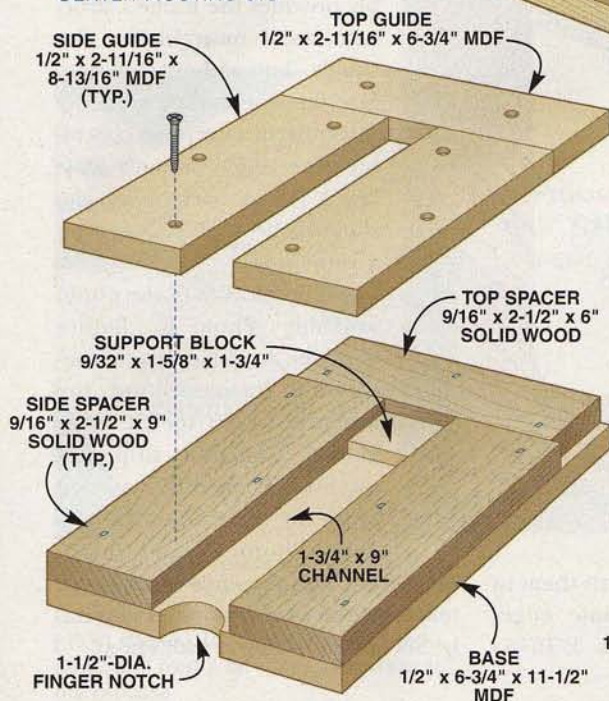
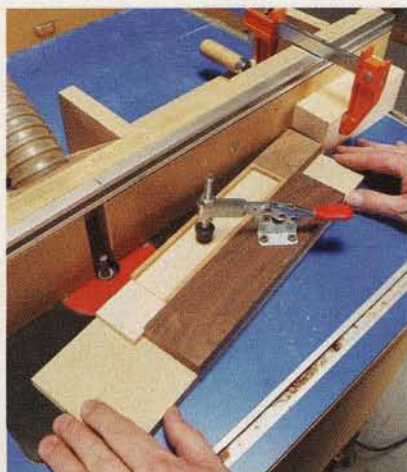
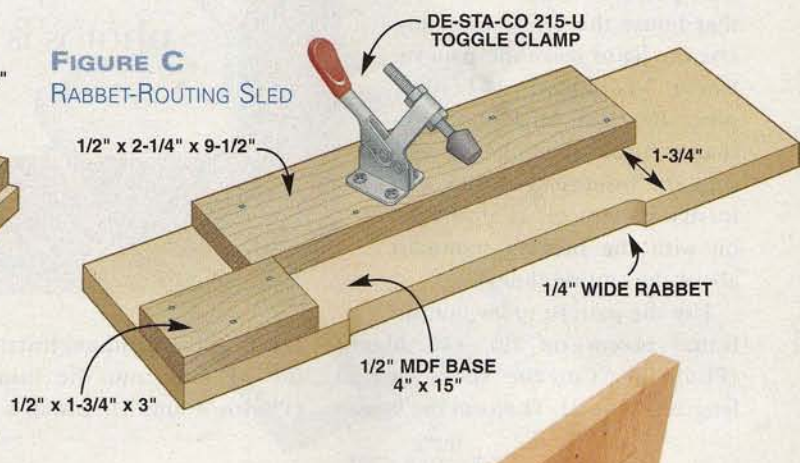
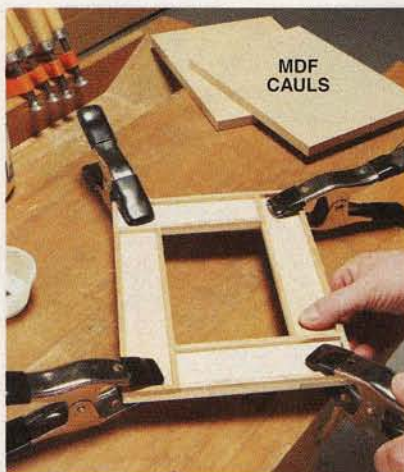


FIGURE C
RABBET-ROUTING SLED



4 Rout stopped rabbets for the glass. Create clearance for the glass's square corners by making the rabbets extra long. A sled makes the short, narrow frame pieces easier to handle.



5 Clamp the joints with spring clamps for a couple minutes, until the glue tacks. Then switch to adjustable clamps and re-clamp the frame between MDF cauls, to evenly distribute clamping pressure across the joints.



PRO-QUALITY STAND

The EaselMate frame stand screws on in a minute and can be adjusted to any angle. Available from Albin Products Inc., www.albinproducts.com, (800) 225-6821, \$6 for two, \$16 for six, \$28 for 12.

Magnetic Frame

This frame consists of four identical corner sections that assemble around the glass, photo and back board (Fig. D). Rare earth magnets hold the sections together. To make this frame, you'll need a routing jig (Fig. E), a pattern and two pieces of 3/4-in. (or thicker) stock cut to 4-1/16-in. by 4-9/16-in. rectangles.

Build the routing jig first. It's used to rout the inside edge of each piece as well as the grooves that house the photo assembly. Use the jig to make the pattern. Saw a 3-1/16-in. by 4-1/16-in. piece of 1/2-in. MDF into an L-shape. Install it in the jig and rout the inside edges with a 1-in.-dia. pattern bit (a flush-trim bit with the bearing mounted above the cutting flutes).

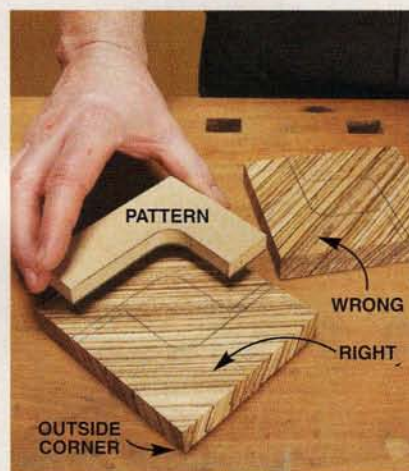
Use the pattern to lay out the frame pieces on the two blanks (Photo 1). Cut the short legs to length (Photo 2). Then cut the blanks



wide slot cutter and rout a 1/2-in. deep slot for the photo assembly (glass, photo and back board) in each piece (Photo 5). The photo assembly provides the frame's structure, so it must fit the slot snugly, but without binding. Size the slot's width to fit the thickness of your photo assembly (for single-strength glass and a 1/8-in. back board, the slot will be slightly less than 1/4-in.-wide).

Fill the slots to fit the photo assembly (Photo 6). Before you glue in the strips, assemble the frame around the assembly to test the fit. After gluing, flush each strip with the end. Then drill centered holes for the rare-earth magnets (Photo 7) and install them flush with the ends—make sure to orient the magnets' poles correctly! Secure the magnets with epoxy.

apart on the bandsaw, install them in the jig and rout the inside edges (Photos 3 and 4). Install a 3/16-in.-



1 Lay out two corner sections on each blank. Make sure the grain runs across the outside corner. If it runs toward the corner, as on the blank in the background, the pieces will be impossible to rout.



2 Cut the short legs to final length using the miter gauge with a fence and a stop.

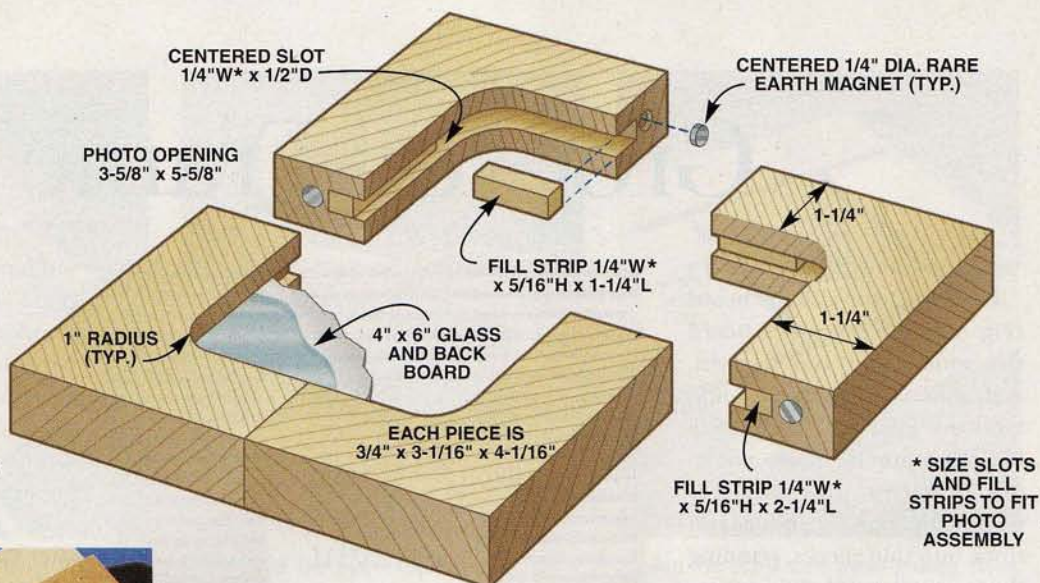
Caution: The blade guard must be removed for this operation. Be careful!



3 Rout the inside edges with a 1-in.-dia. pattern bit. Because of the grain's direction, you can only rout one leg at a time. Stop before the bit touches the adjacent leg or disastrous tearout will occur.

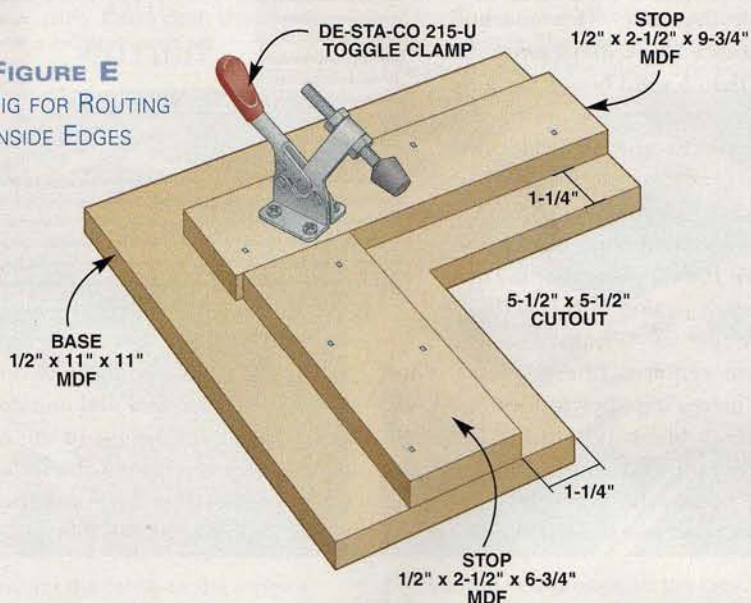
FIGURE D
EXPLODED VIEW

OVERALL
DIMENSIONS:
3/4"TH x 6-1/8"W x 8-1/8"H



4 Flip the workpiece over to rout the other leg. Routing into the corner can still cause tearout, so complete the job in stages. Rout a bit, flip the workpiece and rout a bit more. Then repeat the process.

FIGURE E
JIG FOR ROUTING
INSIDE EDGES



5 Rout a centered slot in each piece. Center the bit by eye. Then make two passes, one on each face. Rout halfway, as before, then flip the workpiece. Once the slot is established, you can rout against the grain to widen it.



6 Reduce the slots' depth to 3/16-in. by gluing in fill strips. Leave the inside corner 1/2-in. deep, to accommodate the square corners of the glass.



7 Drill holes for the rare earth magnets using a fence and a stop block. The fence centers the hole between the faces; the stop block centers it between the edges.

Grooved Frame

This frame looks as if it's made from a single board (Fig. F). But it isn't: A board this wide could cup or twist, and seasonal movement could bind the glass and cause trouble. To minimize these potential problems, this frame is made by ripping plainsawn stock into thin pieces, standing them on edge and gluing them back together. This method creates a blank that's more stable than a solid board, because it has quartersawn grain, narrow pieces and multiple glue joints.

Start by crosscutting a 6-in.-wide by 30-in.-long board into three 10-in.-long sections. Then rip each section into 1-1/16-in.-wide pieces (Photo 1). This frame requires fifteen pieces. Glue the pieces together to form a 1-1/16-in.-thick blank (Photo 2). Level the blank's top and bottom faces by sanding. Create the frame by cutting the blank apart and reassembling it (Photo



3). Rip the blank into three pieces, two that are 2-1/8-in. wide and one that's 5-5/8-in. wide, the height of the photo opening. Next, crosscut the wide center piece into three sections. The center section must be 3-1/2-in.-wide, the

width of the photo opening. Glue the frame blank together (Photo 4). Knock out the center section. Then crosscut the ends of the blank to create 2-in.-wide frame rails. Joint or rip the two stiles to final width—make sure these widths are identical, so the photo opening is perfectly centered.

Set up for routing the grooves after installing a 1/8-in.-dia. spiral bit (Photo 5). Install sixteen 5/16-in.-thick spacers at both ends of the fence. Firmly press stop blocks against the spacers and clamp them to the table. Rout the first groove on the face and both edges (Photos 6 and 7). Adjust the fence (Photo 8). From here on in, you rout two grooves on the face and edges between each fence adjustment (Photo 9).

Use a rabbeting bit with a 7/8-in.-dia. bearing to rout 1/4-in.-wide glass rabbets. Square the corners with a chisel. The rabbeted opening should measure 6-1/8-in. across the grain, to allow for seasonal movement around the 6-in.-tall glass and back board.

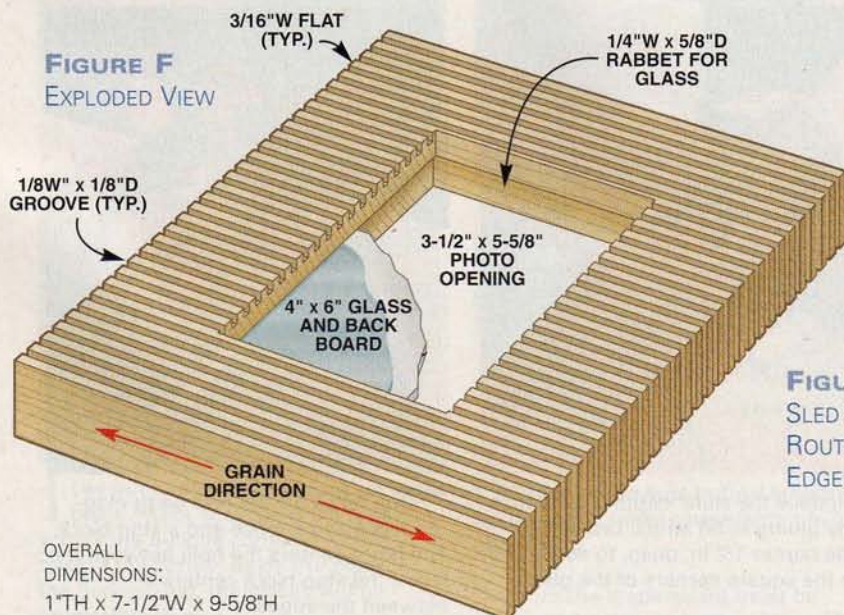


FIGURE G
JIG FOR RIPPING
THIN STRIPS

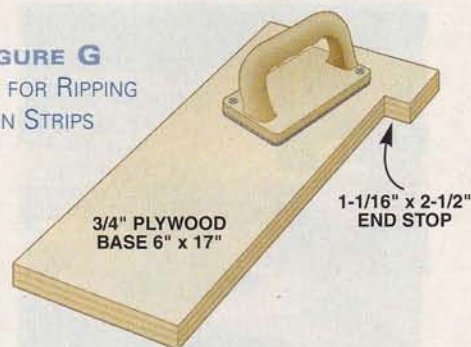
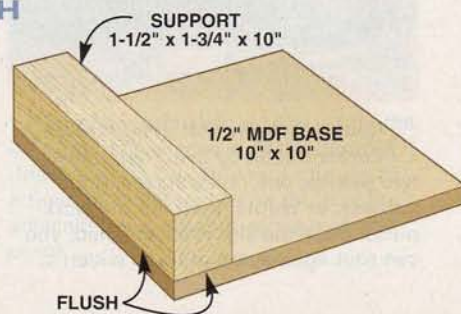


FIGURE H
SLED FOR
ROUTING
EDGES

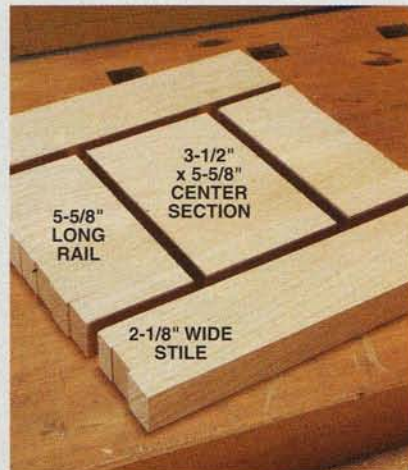




1 Rip 1-1/16-in.-wide pieces from 3/4-in.-thick blanks that have been cut to length. A thin-rip jig (Fig. G) makes the process simple and safe.



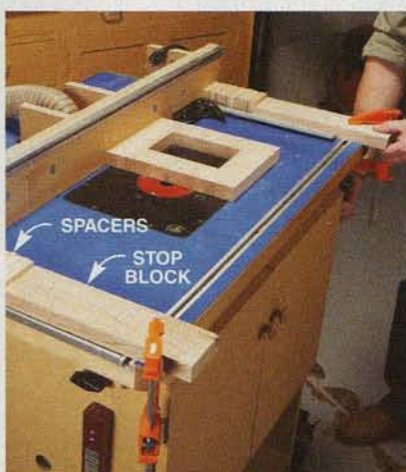
2 To glue the blank together, stand the pieces on end and clamp them between cauls. Cauls keep the pieces flush, to minimize sanding.



3 Rip the blank into three pieces. Then crosscut the center piece into three pieces. The outer pieces are the frame's stiles and rails. The middle section is exactly the size of the photo opening.



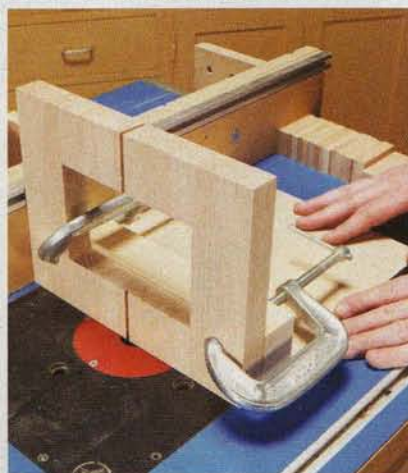
4 Glue the outer pieces back together to create the frame blank. The center section automatically creates the photo opening. Bevel its corners so it doesn't get stuck by glue squeeze-out.



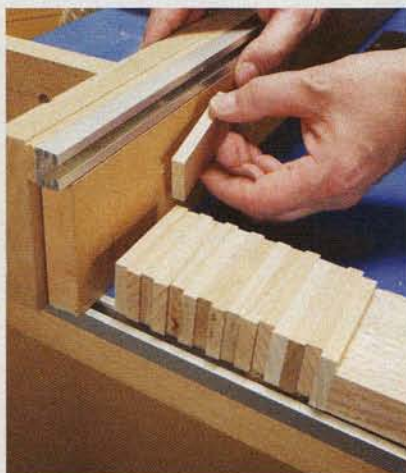
5 Position the fence so the frame's first groove will be exactly centered. Install spacers at both ends and clamp on stop blocks.



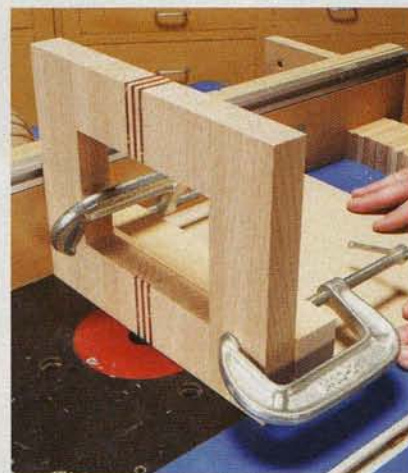
6 Rout the first groove on the face.



7 Use a sled with a support block (Fig. H) to rout the edges.



8 Remove one spacer from each side. The spacers' thickness determines the distance between the grooves. Reposition the fence against the remaining spacers and lock it in place.



9 Rout the remaining grooves in pairs. Rout one groove, then flip the frame end for end to rout the other groove. Ditto for routing the edges.

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DESK PAD

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AN OLD
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Desk pads make a great writing surface and/or mouse pad. Unfortunately, they're often a bit drab in appearance. Put your woodworking skills to use and dress up this basic office accessory with an attractive inlaid wood tray. The tray looks great and it serves to corral pens, paper clips and other desktop sundries.

Cherry is a good choice as it contrasts well with the black desk pad. The pad itself is made of Rhinolin, a non-reflective, anti-static, fatigue-reducing, self-healing, foam-backed pad made from 43% post-industrial recycled raw materials (Sources, right).

Milling the small tray parts is manageable if you do all the machining on a large piece of

wood first then cut the parts loose (Photo 1 and Fig. A).

Once the parts are cut, sand them smooth to 180-grit. Assemble the tray with glue (Photo 2). Spray on a couple coats of satin lacquer after the glue sets.

Mount the tray to the pad with screws. The tray parts make a small target, so it's best to make a paper template of the tray and use it as a guide for drilling the holes (Photo 3). Locate the holes so each short rail (C) gets a screw in the middle. Place the other screws every 2-3 inches along the long rails. To prevent scratches on your desktop, tighten the screws so they countersink themselves into the foam.

SOURCES

Discount Office Supplies,
www.discountofficesupplies.com
(800) 734-6020, Artistic Office's 12" x 19"
Black Desk Pad, Item # ARZLT91, \$16
Woodcraft www.woodcraft.com
(800)225-1153, Inlay Banding 1/4-in. x 36-in.,
#13V56, \$10

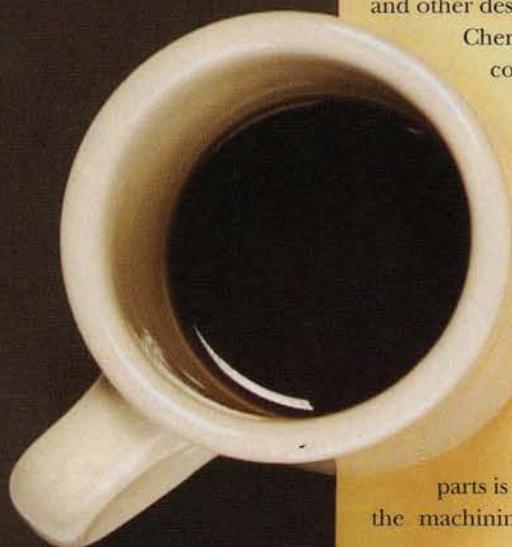




FIGURE A
SHORT RAILS

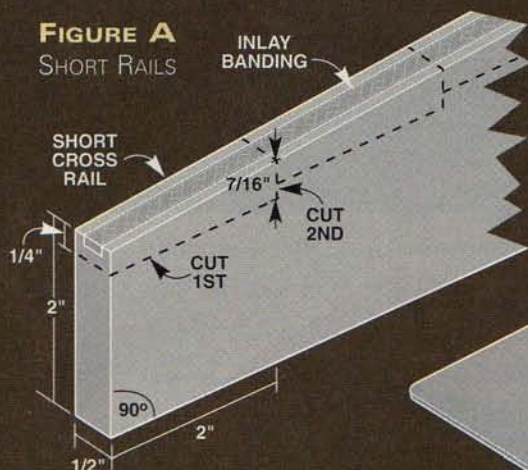
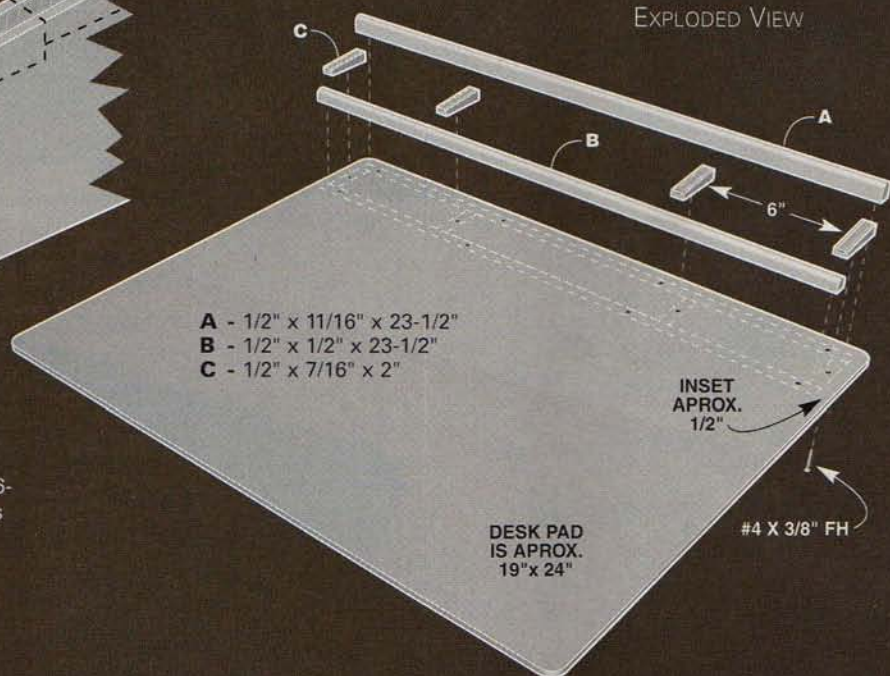


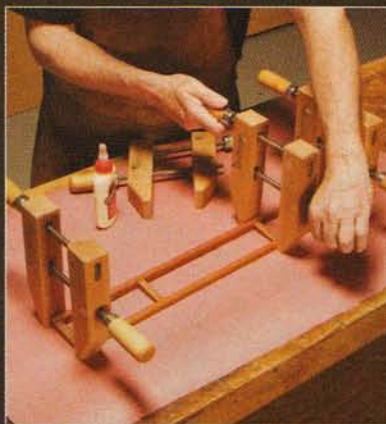
FIGURE B
EXPLODED VIEW



Mill a cherry blank to 1/2-in. x 3-1/16-in. x 12-in. Rip the blank so it tapers to 2-in. on one end. Rout a shallow dado on the top edge for the inlay. Glue the inlay in place. Lay out the cuts as shown and bandsaw the short rails to length.



1 Cut the tray parts from a 1/2-in. x 3-in. x 24-in. cherry blank. Shape both long edges with a 1/4-in. round-over bit then rip to width and crosscut to length.



2 Glue and clamp the tray together. The joints will be reinforced with screws driven in through the bottom of the desk pad.



3 Pre-drill the pad for #4 x 3/8-in. flathead screws. Use a paper template of the tray as a guide.

Asian-Inspired Humidor

AN ELEGANT BOX FOR CIGARS OR JEWELRY

by Suwat Phruksawan





I love to create projects from my scrap pile. Boxes are my favorites. I built this humidor for a friend to keep his cigars fresh. The humidor will fit Churchill cigars one way and Coronas the other. It's lined with Spanish cedar; traditionally used to impart delicate flavors to fine cigars.

The box doesn't have to be a humidor, though. Simply omit the cedar liner and the humidifier to transform the box to hold jewelry or keepsakes.

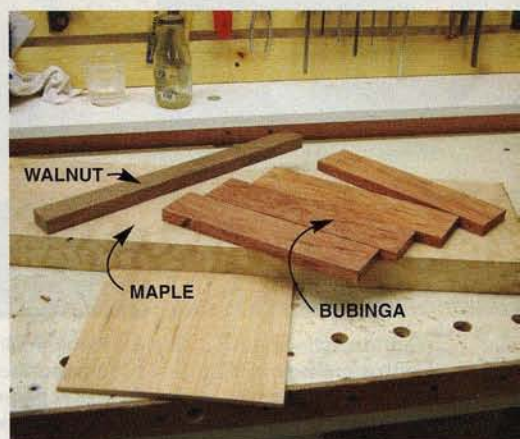
The design was inspired by Japanese architecture. At first glance it looks complex, but it's just a basic mitered box with a few added details to dress it up.

I like small projects like this because the building process moves swiftly and allows for more hand tool work than I can normally afford. I hope you enjoy building this humidor as much as I did.

BUILD THE BOX

1. Select the woods you want to use with an eye towards contrast and harmony (Photo 1).
2. Cut the box sides and ends (A and B) to size, then cut grooves to house the bottom panel (G) (Fig. A, page 78).
3. Use a router to create the rabbets on the top edges of the box sides (Fig. A).
4. Glue up quartersawn red oak for the bottom panel. The quartersawn oak will expand

I mostly used scrap wood for this project: bubinga for the box, figured maple for the lid, walnut for the feet and red oak for the bottom. I bought the Spanish cedar for the linings. The first step is to miter the box's sides and glue them together around the bottom.



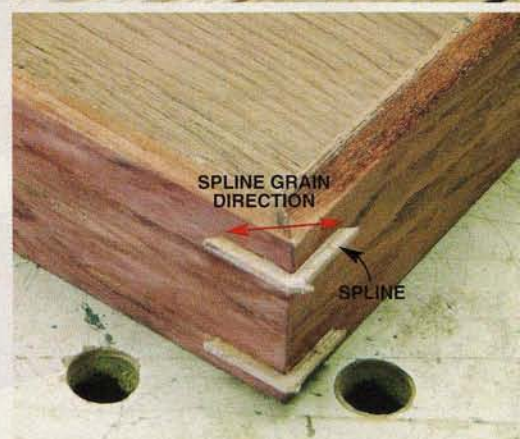
Next, line the box with Spanish cedar. The slightly undersized bottom panel is installed first. The side pieces are installed last and cover the bottom's expansion gaps.

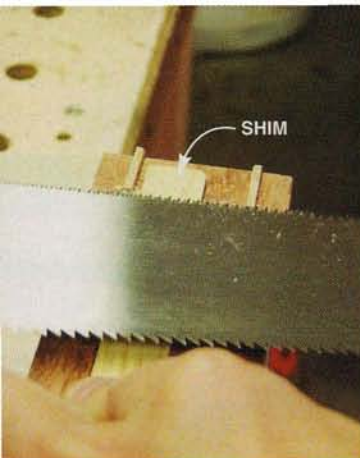


Cut the spline slots in the humidor box. Build a sled that straddles your saw's fence to make accurate, safe cuts. Use a thin kerf blade.



Cut splines so their grain runs diagonally across the corner of the box, then glue them in the slots. This method of cutting the splines ensures that they have uniform-looking edges.





5 Cut the splines flush with a pull saw. Use a thin shim between the saw and the box side to prevent saw marks on the sides.



6 Plane a 1-in.-wide bevel around the perimeter of the lid. A panel-raising bit in a router table can do the job too.

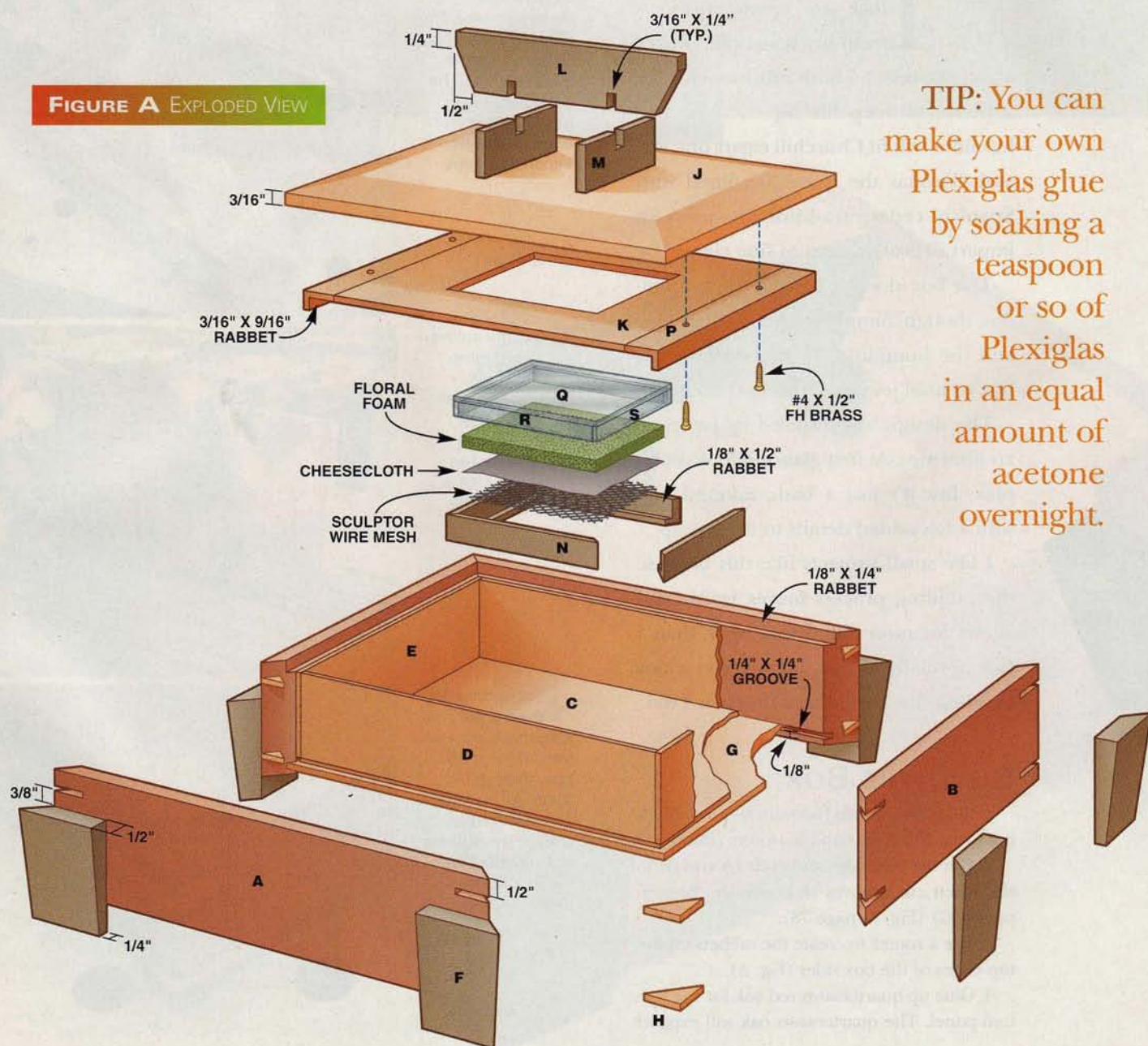


7 The humidifier case is made from 1/8-in. Plexiglas that is glued to the bottom of the lid.

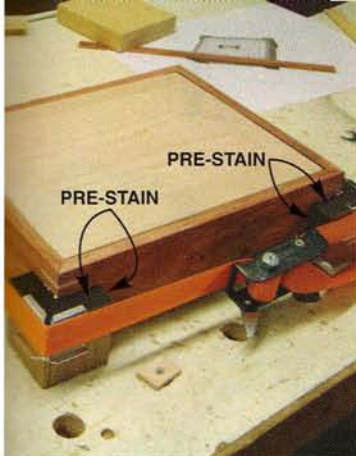


8 The lid is also lined with Spanish cedar. Cut a hole in this piece to house the humidifier.

FIGURE A EXPLODED VIEW



TIP: You can make your own Plexiglas glue by soaking a teaspoon or so of Plexiglas in an equal amount of acetone overnight.



9 Glue the walnut leg blanks onto the box using a band clamp. Pre-stain the walnut ends and edges adjacent to the bubinga.



10 Use a block plane to taper the legs and ease the sharp corners.



11 Cut the angled ends of the handle with a miter gauge. Lay out the angles and cut to the pencil mark.



12 Cut notches in the handle and supports on the bandsaw. The joint needs to be snug enough to hold together without glue.

and contract much less than a flat sawn panel.

5. The bottom panel is a raised panel with the bevel facing down. Bevel the panel on a router table.

6. Cut the miters on the box parts and assemble with the bottom panel.

7. Cut the Spanish cedar bottom liner (C) to size. Add a couple dabs of water-resistant glue at the center and place it at the bottom of the box. Leave a 1/16-in. gap between the lining and the box sides for expansion.

8. Cut the side linings and glue them in place. (Photo 2).

9. Use a sled to cut slots for the splines (H and Photo 3).

10. Glue the splines in the slots (Photo 4). I used maple to contrast with the bubinga and to tie in with the top.

11. Trim the splines flush (Photo 5) and sand the sides to 220-grit. Be careful not to roundover the corners or it will leave a gap where the feet attach.

BUILD THE LID

12. Cut the lid to fit inside the rabbeted top of the box. I used figured maple to contrast with the bubinga.

13. Plane a bevel on the edges of the lid (Photo 6). I found a 1-in. bevel looks best.

14. Create the lid braces (P) from a 3/8-in. thick x 14-in. long piece of wood (I used scrap red oak). Cut a rabbet

along the length (Fig. A). Then rip it 3/4-in. wide, and crosscut it to length.

15. Glue the braces to the lid at the middle only, then use screws towards the ends.

16. Cut the top liner (K) to fit the space between the lid braces.

MAKE THE HUMIDIFIER

17. Create a waterproof box from 1/8-in. Plexiglas (Q, R and S) (Photo 7).

18. Cut the humidifier trim (N) and assemble to fit the humidifier. Pre-stain the walnut cover (see "Ebonize and Finish" at right).

19. Cut green floral foam to fit the humidifier. Cover the foam with cheese-cloth. Cover the cloth with sculpture's wire mesh (available at hobby stores).

20. I used clear silicone caulk to glue the wire mesh and the cloth on the rims of the Plexiglas box.

21. Rout a hole in the top liner for the humidifier (Photo 8). Glue the liner in place.

22. Glue the humidifier to the under side of the lid with silicone caulk.

ADD THE LEGS

23. Edge miter two 1/2-in.-thick x 15-in.-long pieces of walnut to form an L-shaped blank.

24. Crosscut the blank into four legs (F). Ebonize the edges of the leg blank that are adjacent to the box sides.

25. Attach the legs to the box (Photo 9).

26. Plane tapers on all four legs (Photo 10, Fig. A).

BUILD THE HANDLE

27. Cut the handle and its supports (L and M) to size.

28. Lay out and cut angled ends on the handle (Photo 11, Fig. A).

29. Create notches for bridle joints on both the handle and the support pieces (Photo 12).

30. Glue the handle to the supports (Photo 13). Sand the handle smooth and soften the edges (Photo 14).

EBONIZE AND FINISH

31. To create the ebonizing stain, soak steel wool in vinegar overnight. Use a coffee filter to strain out the rust particles. The rusty vinegar reacts with the walnut's tannin and turns it black. 32. Raise the grain of the legs and handle assembly by wiping them down with water and sand smooth.

33. Brush the rusty vinegar mix on the legs and handle (Photo 15). The walnut will turn black almost immediately. Be careful when staining the legs because any spill will color the bubinga. 34. Glue the handle to the lid.

35. I finished the box with a 50/50 mix of mineral spirits and pure tung oil.



13 Glue the handle assembly together. Just a spot of glue is all that's needed if the joints are snug.



14 Shape and smooth the handle with sandpaper.



15 Ebonize the walnut by brushing on rusty vinegar—a mixture made from soaking steel wool in vinegar.



16 The humidifier is ready to charge with water. To moisten, lift the lid and add a few drops of distilled water through the wire mesh.



Source:

Rockler, www.rockler.com, (800)279-4441, 3/8" Spanish cedar, #18392, \$9.

Suwat Phruksawan



"I was born in Thailand and earned a degree in Architecture there. Although I have made a career change since I moved to the USA, I am still fascinated with design and always try to practice it in my woodworking. By day, I manage a software development team. In the evening, however, I can be found in my garage shop tinkering with all things woodworking."

CUTTING LIST

Overall Dimensions: 9" D x 11" W x 5" H

Part	Name	Qty.	Material	Th x W x L
A	Box Side	2	Bubinga	1/2" x 2-3/8" x 10"
B	Box End	2	Bubinga	1/2" x 2-3/8" x 8"
C	Bottom Lining	1	Spanish Cedar	1/8" x 6-7/8" x 8-7/8"
D	Side Lining	2	Spanish Cedar	3/16" x 1-3/4" x 6-5/8"
E	End Lining	2	Spanish Cedar	3/16" x 1-3/4" x 9"
F	Leg	4	Walnut	1/2" x 1-3/4" x 2-1/8" (A)
G	Bottom Panel	1	Red Oak	3/8" x 7-1/2" x 9-1/2" (B)
H	Spline	8	Maple	3/32" x 1-1/2" x 18" (C)
J	Lid	1	Figured Maple	3/8" x 7-3/16" x 9-3/16" (D)
K	Top Lining	1	Spanish Cedar	3/16" x 6-7/8" x 7-3/8"
L	Lid Handle	1	Walnut	3/16" x 1-1/2" x 5-3/4"
M	Handle Support	2	Walnut	3/16" x 1" x 2-3/4"
N	Humidifier Trim	4	Walnut	1/4" x 5/8" x 3-9/16"
P	Lid Brace	2	Red Oak	3/8" x 3/4" x 6-1/2"
Q	Humidifier Bottom	1	Plexiglas	1/8" x 3-1/4" x 3-1/4"
R	Humidifier Sides	2	Plexiglas	1/8" x 3/8" x 3"
S	Humidifier Ends	2	Plexiglas	1/8" x 3/8" x 3-1/4"

Notes:

- (A) Cut from an L-shaped board made by edge mitering two 1/2" x 15" walnut boards.
- (B) Glued-up from quartersawn strips
- (C) Cut into triangles with the grain running parallel to the hypotenuse
- (D) Width and height dimensions are approximates. Should be cut to fit box opening.

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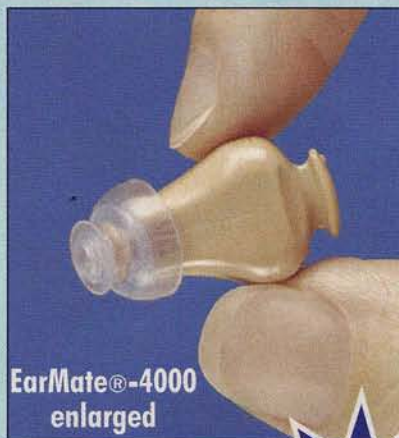
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Name a cabinet's parts, and you're sure to

include doors—one of woodworking's elemental structures. Cabinet doors come in every shape and form and they can be made a hundred different ways. This story features a popular form and a foolproof method: Using a router table equipped with stile and rail cutters to create a frame and panel door.

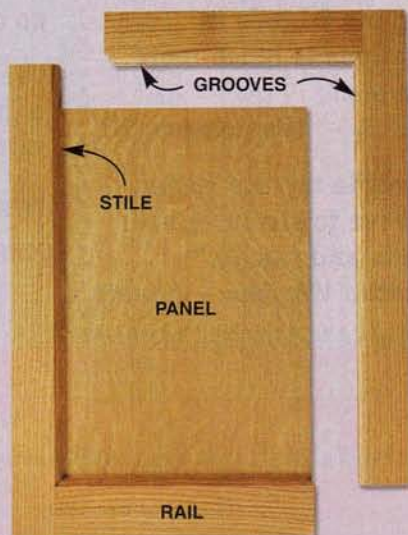
THE DOOR

A frame and panel structure creates a stable solid-wood door (see Door Structure, at right). Vertical stiles and horizontal rails form a rigid frame with minimal seasonal movement. The panel floats inside the frame, housed in grooves, so its seasonal movement is hidden, especially if the panel is stained and finished before it's installed.

Usually, the stiles and rails are the same width, but making the bottom rail 1/4-in. to 1/2-in. wider subtly balances the door. Doors look best when the stiles and rails are made from straight-grained stock. This provides an orderly appearance and focuses attention on the panel. Using straight-grained stock also minimizes the door frame's seasonal movement. Panels look best when they're thoughtfully constructed, either to show striking figure or cohesive grain patterns.

DOOR STRUCTURE

A typical cabinet door consists of vertical stiles and horizontal rails that surround a panel. The panel is housed in grooves cut in the stiles and rails. The panel can be flat, as shown here, or have a raised center, with the edges tapered to fit in the grooves. Raised panels are enormously popular, but it's hard to top the understated elegance of a flat panel with pleasing grain or figure.



Panel Door

by Tim Johnson

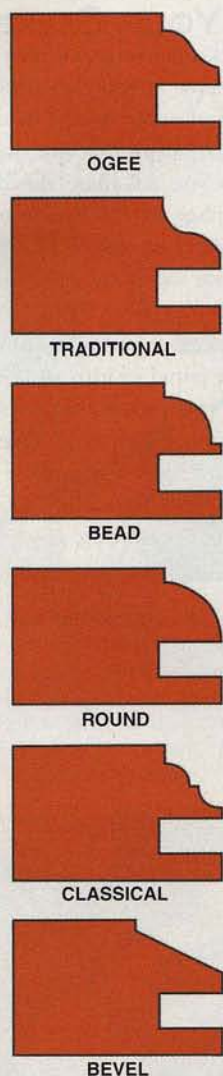


Figure A Profiles
Stile and Rail Cutters are available in a variety of decorative profiles.

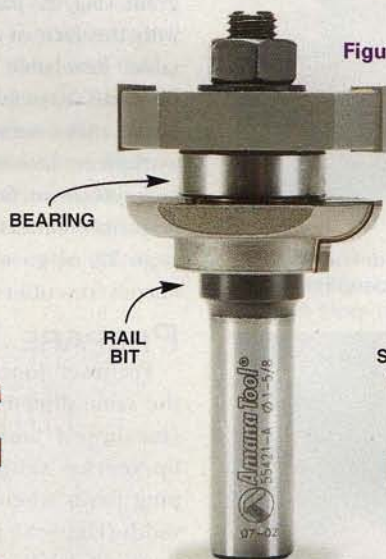


Figure B The Cutters

The rail bit is used to make end grain cuts on the rails. It creates a tongue with a profile and a rabbet.



The stile bit is used to make edge grain cuts on both the stiles and rails. It creates a mirror-image groove and profile.

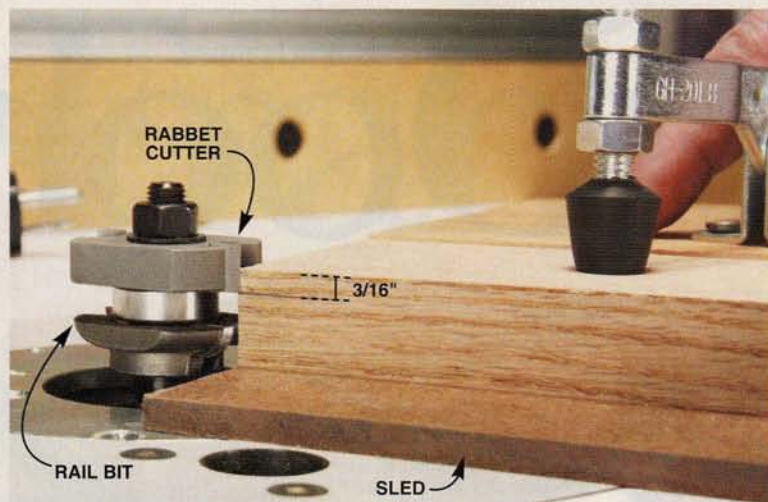
Figure C Door Width Calculations



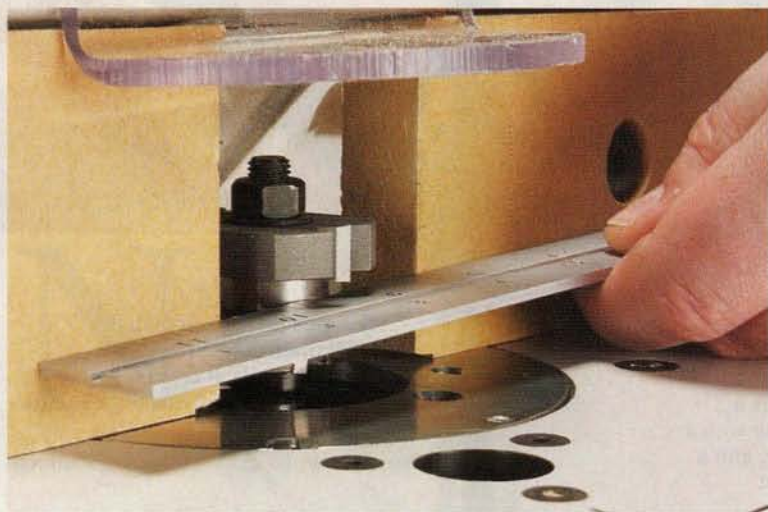
Because the joints overlap, the sum of the parts (the two stile widths plus the rail's length) is larger than the overall width of the door. Measure the depth of the groove to determine the overlap—it's usually 3/8-in. per joint. Add the extra length to the rail. Once you've determined the correct part sizes to make the door exactly fit the opening, add an additional 1/8-in. to the width of each stile and rail (Photo 1).

1 Rip all the stiles and rails 1/8-in. oversize in width. Then cut all the pieces to final length. The extra width allows a second routing pass on the edge grain, if the initial pass causes tearout.





2 Set the rail bit's height with a test rail installed on the sled. For 3/4-in.-thick stock, position the rabbit cutter to create a 3/16-in.-deep rabbet.



3 Set the fence flush with the rail bit bearing. This assures a smooth cut, by allowing use of the fence to guide the sled that carries the rails.

Routing Sled for the Rails

Use this sled to make end grain cuts safely and easily. It holds narrow rails squarely and securely and tracks against the router table's fence, which keeps your fingers out of harm's way. It also supports the rails' back edges, to prevent blowout.



THE CUTTERS

Stile and rail cutters create a decorative version of the tongue and groove joint (Fig. A, page 83). They're available as a single reversible bit or in dedicated sets. Reversible bits usually cost less; dedicated sets are more convenient to use. Dedicated sets include separate bits for the end grain and the edge grain (Fig. B, page 83). All cuts are made with the face of the workpiece against the table. Reversible bits have to be disassembled and reassembled between cutting operations. Also, some cuts are made with the workpiece face-side-up; others are made face-side-down. For more information about reversible cutters, see AW #78, Feb. 2000, page 72, or go to www.americanwoodworker.com/revcutters.

PREPARE YOUR STOCK

For inset doors, plan to make your door the same dimensions as the door opening (for lipped and overlay doors, add the lip/overlay widths). Consider the overlapping joints when you calculate the door's width (Figure C, page 83). Determining the door's length is easy: Just cut the stiles to the length of the door opening. Door panels are housed on all four sides in the frame's groove, so include the overlaps when you calculate both the panel's width and height.

Include extra test pieces when you rip your stile and rail stock (Photo 1). Once the pieces are cut to length and width, mark their back sides. Use these marks to correctly orient the pieces for routing.

MAKE THE END GRAIN CUTS FIRST

Begin by routing the rails' end grain. (To remember to rout the rails before the stiles, think of the alphabet: "R" comes before "S.")

Install the rail bit and make a test cut. (Photos 2 through 4). On the test piece, check the profile's top lip and bottom rabbet. For appearance and strength, the lip should measure at least 1/16-in. and the rabbet should measure at least 3/16-in. For maximum support, don't cut into the jig's backboard during your test cuts. Wait until the bit is set at the correct height.

After you've completed the end grain cuts on the rails, install the stile cutter



4 Make a test cut to check your set up. Adjust the bit's height and the fence, if necessary. Then rout the ends of all the rails—your marks on the back faces show when the rails are oriented correctly, face-side down.

Dealing with Tearout



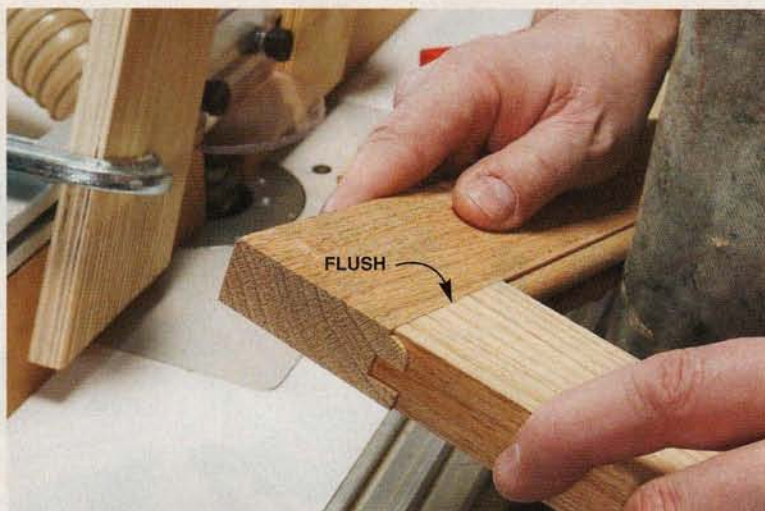
Tearout can occur when you have to rout against the grain (above). First, thank your lucky stars for ripping the pieces oversize in width. Then rip the stile to remove the tearout (below) and rout again. The lighter cut is less likely to tear out.



5 Set the height of the stile bit by aligning its groove cutter with the tongue on one of your rails. Then reset the fence flush with the bearing.



6 Cut a test piece, using featherboards to hold it in position and a push stick to move it through.



7 Check the fit by installing one of the rails. The faces should be flush. Adjust the cutter height, if necessary, then rout all the inside edges. After routing, rip and joint the stiles and rails to final width.



8 Create 1/4-in.-thick tongues all around the panel to fit the grooves in the stiles and rails.

and rout the inside edges of both the stiles and rails (Photos 5 through 7).

FIT THE FLAT PANEL

With solid-wood flat panels, starting thick and rabbeting is easier than planing the entire panel to exact thickness (Photo 8). If your door frames are 3/4-in.-thick, your panels must be thinner than 7/16-in., so they don't protrude beyond the back of the frame.

ASSEMBLE THE DOOR

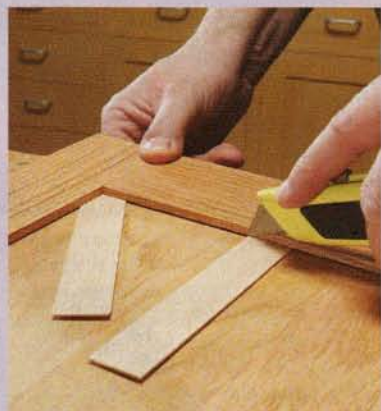
Before you assemble the door (Photos 9 and 10), sand and finish the panel, including all the edges. Finishing prevents unsightly strips of unfinished wood from appearing in the winter, when the panel shrinks in width, due to seasonal movement. Finishing the panel's edges seals the wood so glue can't soak in and bind the panel to the frame.

Fitting Plywood Panels

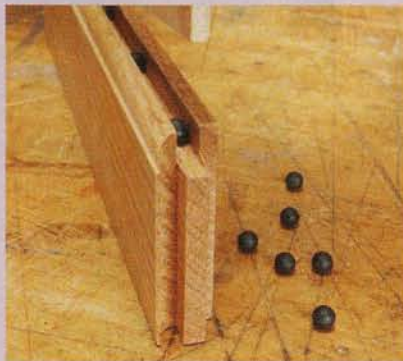
The bane of using 1/4-in. plywood for door panels, of course, is that it's often less than 1/4-in. thick. That means unsightly gaps or annoying rattling can result when it's installed in 1/4-in.-wide grooves. Here are three ways to cope.



Solution 3: Use adjustable stile and rail bits, such as these from Amana's In-stile and Rail System, which is designed specifically for use with plywood. These bits allow adjusting the groove's width (and the tongue's thickness) by installing or removing shims. Five different profiles are available (Amana Tool, www.amanatool.com, (800) 445-0077. List prices range from \$190 to \$245 per set).



Solution 1: Wedge the panel from the back to eliminate gaps on the front. Trim the wedges flush to the frame.



Solution 2: Eliminate rattling by installing space balls to stabilize the panel (available from Woodcraft, www.woodcraft.com, (800) 225-1153, #142284, \$6 per 100).



9 Glue the door together one joint at a time. As you go, make sure the outside edges of each joint are flush. First assemble one corner (1). Next, install the panel (2). You should never glue in a solid wood panel, because of seasonal movement, but it's okay to glue in a plywood panel. Position the remaining rail (3) and then install the remaining stile (4).

TIP

NO GLUE



Minimize squeeze out by carefully brushing glue onto the rail ends. Keep glue away from the groove so it doesn't come in contact with the panel.



10 Assure the door is flat and square. Tighten the clamps gently; stop as soon as the joints squeeze shut. Too much pressure will bow the door—make sure it remains flat on the clamp bars. Measure both diagonals. The door is square if the measurements are identical. You can draw an out-of-square door true by angling the clamps slightly (so they're not quite parallel to the rails) and retightening them. Measure again—if the measurements are farther off than before, simply reinstall the clamps, angled the opposite way.

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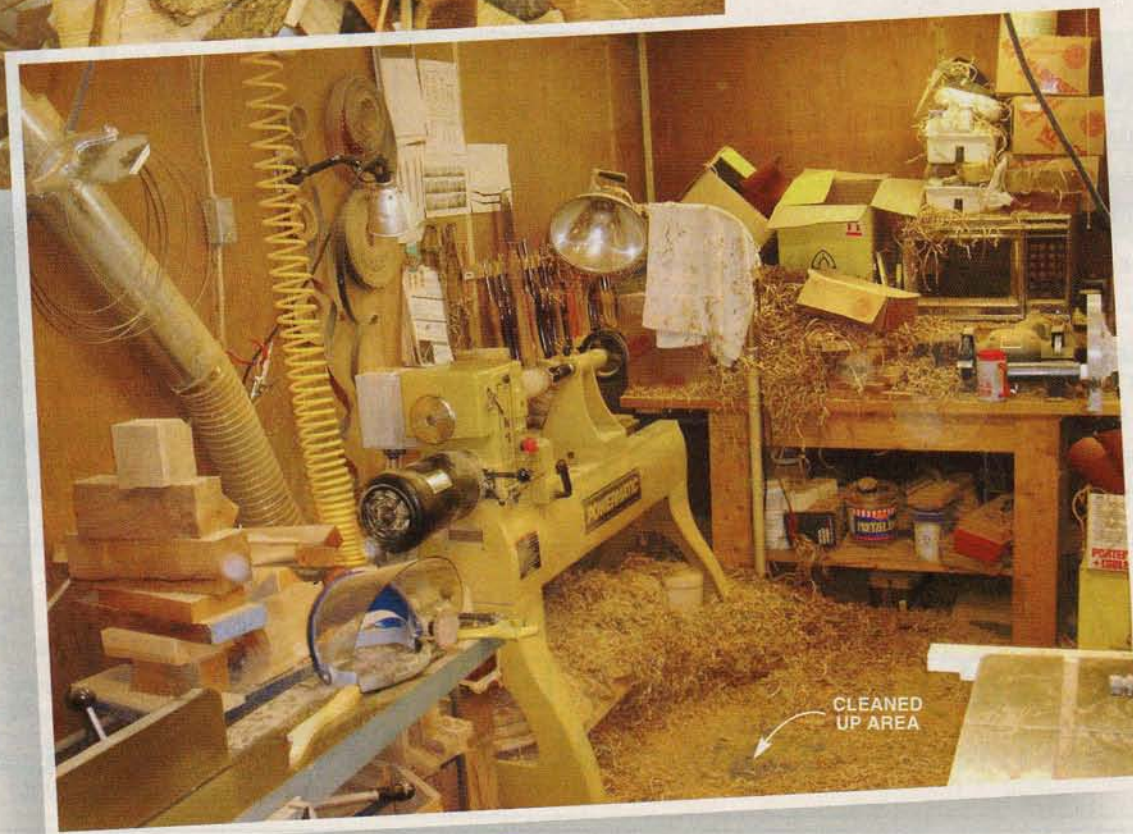
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My Normal Workshop

I'm sure I'm not the only reader who is astounded by the pristine, seemingly unused shops that frequently appear in this department. Here are a couple of pictures of my shop, showing the carnage after turning two salad bowls and sixteen serving bowls as wedding gifts. Piled in front of my bandsaw are left-over scraps from sawing the logs. Under the saw is sawdust. Stacked not-so-neatly behind the saw are short pieces of wood that are too beautiful to burn. The old filing cabinet in the back is full of machine manuals, paper, patterns and other shop essentials. I found the blue tackle boxes that are stacked next

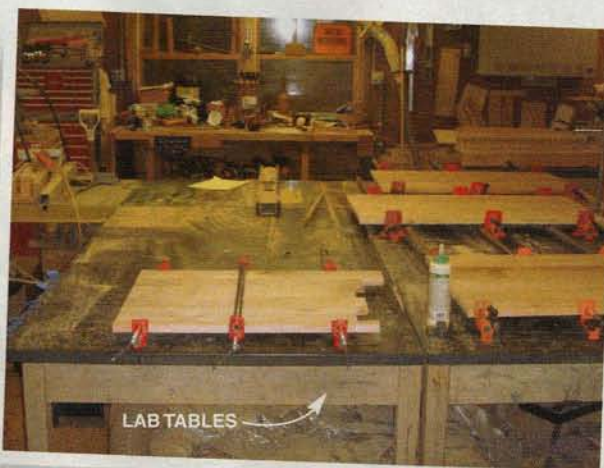


to the saw at the town dump. They're now loaded with square drive screws.

I took the lathe photo after removing most of the mid-calf pile of shavings created during the bowl-turning. As any turner knows, you need lots of sandpaper—check out the yellow Klingspor bargain boxes that surround the micro-wave oven. I use the oven to dry some of my green turnings. The old hospital light (I'm an ER physician by day) provides great illumination for bowl turning.

My outfeed table consists of two soapstone chemistry lab tables that I rescued from the old high school. Dead flat and impervious to mallet blows, they also make excellent assembly tables.

Visitors always ask why my shop is so untidy. The answer is simple: My six-month backlog of projects and orders doesn't leave a lot of time for cleaning. So please give ordinary woodworkers—those of



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*Roger Lafleur
Brookfield, MA*

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Here is your chance to share your best work with fellow woodworkers across the country and around the world.

As woodworkers, we love to build things, but we also love to share our work and the ideas behind them. American Woodworker Magazine is debuting a new department called "**Woodworker's Showcase.**" We're looking for projects that range from practical, everyday pieces to one-of-a-kind artistic masterpieces.

Here's how to submit your work! We ask that the piece you submit be made primarily of wood by your own two hands. Only high quality photos will be selected for publication so make sure you put some time and effort into your photograph. Check out our web page (www.americanwoodworker.com/phototips) for tips on taking good photographs. Digital photographs are preferred but slides and color negatives are also acceptable. If you want your slides or negatives back, you must include a stamped, self-addressed envelope with your submission.

Send your pictures along with a description of the piece that includes the wood(s), joinery and finish that you used. It seems like every piece has a story behind it – please feel free to share yours. We look forward to hearing from you.

Send entries to: Showcase@AmericanWoodworker.com or mail to: American Woodworker Magazine, 1285 Corporate Center Drive, Suite 180, Eagan, MN 55121.



**Cherry
Cabinet**
*by Dave Munkittrick
River Falls, WI*



HOUSE OF DUST

To keep airborne dust from getting into the house, I bought a dust collector for my basement workshop. I wanted to start with a clean slate, so I decided to rid the shop of a decade's worth of dust that had collected on the ductwork, pipes, lights, shelves, and so forth.

I opened the basement doors and turned on the whole house fan, which is located in the hallway ceiling on the second floor. Then I used my shop vacuum as a blower to dislodge the dust. It worked like a charm. The clouds of dust that billowed off everything I pointed the wand at were efficiently drawn up the stairs.

Unfortunately, most of the dust never left the house. Instead, it took up residence on every furnishing, from tables to tea cups. I am now on upstairs cleanup duty until further notice. No good deed goes unpunished.

Randy Walker

NAILED

I inherited a walnut secretary that was made by my great-grandfather over 100 years ago. A drop-front desk with a bookcase on top, it had numerous coats of finish. The most recent, a very heavy coat of white paint, was probably applied over fifty years ago. I used paint remover to get down to the wood, followed by hours of sanding by hand.

While sanding the inside, my sandpaper caught on something sharp. The space was difficult to look into, so without thinking, I felt inside—and caught my finger on the sharp end of a protruding nail. Not wanting to get caught again, I tried to grind down the nail point with a hand-held grinder.

I ran my finger over the area once again, to make sure the nail was gone—and got pierced by a red-hot sliver of metal. At least this time the wound was sterilized!

Tom Lambert



Make your woodworking mistakes pay!

Send us your most memorable "What was I thinking?" blunders. You'll receive \$25 for each one we print. **E-mail to oops@americanwoodworker.com or send to AW Oops!, American Woodworker, 1285 Corporate Center Drive, Suite 180, Eagan, MN 55121.** Submissions can't be returned and become our property upon acceptance and payment. We may edit submissions and use them in all print and electronic media.

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