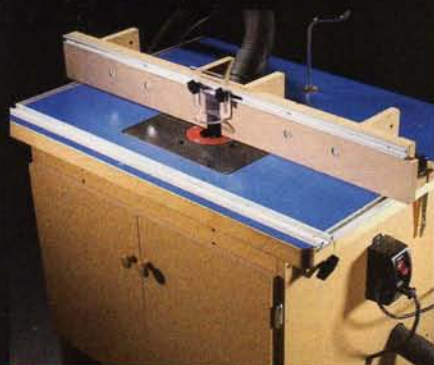


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#146, FEBRUARY/MARCH 2010



20 Router Table Tricks



The Art of Resawing



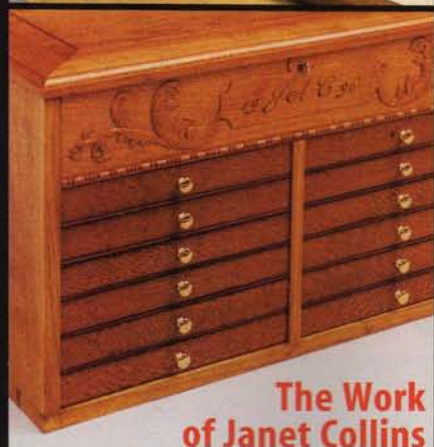
The World's Simplest Router Table



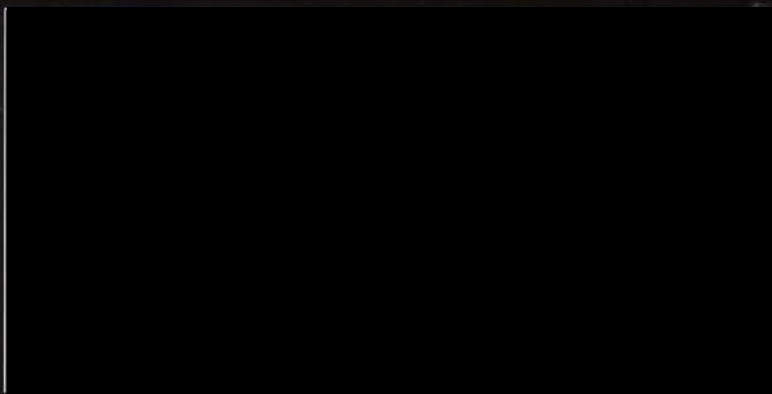
10-Minute Raised Panel Doors



Routed Box Joints—Fast



The Work of Janet Collins





downloaded from www.cro-wood.com

American Woodworker

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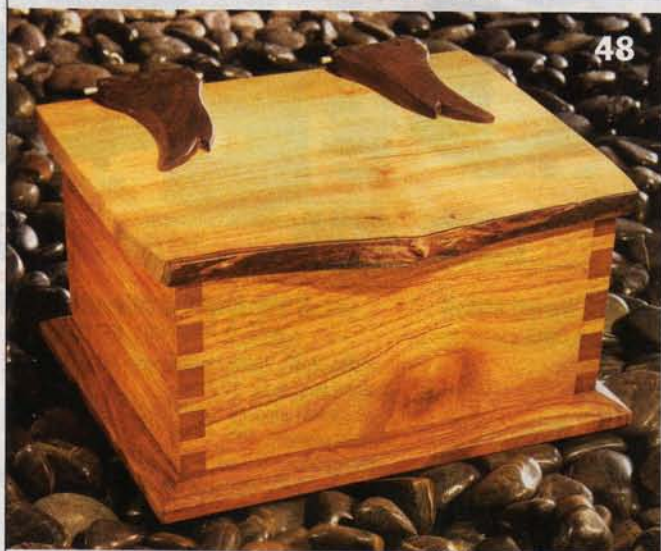
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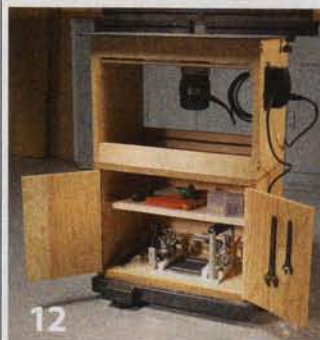
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Correction

"Stickley Dining Chairs" (issue #143, Sept '09) contains errors in some of the technical drawings and in the cutting list. The correct drawings and dimensions are now posted on the website. Go to www.AmericanWoodworker.com/143/StickleyChairs.



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#146, February/March 2010

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From the Editor's Desk

1001 Router Jigs and Counting

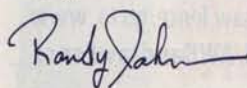
OF ALL THE WOODWORKING MACHINES that I own, my routers feel the most like an extension of my hand. Routers lend themselves so easily to so many kinds of work, it seems I'm almost always using one. Thanks to the amazing variety of available bits and cutter sets, routers can cut, joint, mold, plane, shape, dado and drill. Attached to the right jig, they can produce intricate joinery, carvings and inlays; and the number of jigs and accessories available for routing defy counting. On more than one occasion, a router's compact size, portability and accuracy have made it my first choice, even though I have other machines that can do the same job—without a doubt, routers are the most versatile machines in my shop.

This issue of *American Woodworker* is our 10th Annual Router Special, and like the previous nine, it's chock-full of new router gear and useful techniques. That's a real testimony to the versatility of the router, the creativity of woodworkers, and the ingenuity of router product developers.

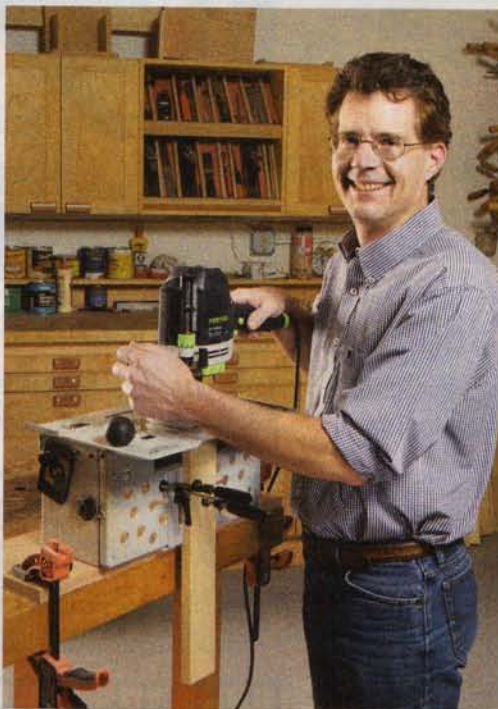
One new product that particularly intrigued me was the new Leigh Super FMT jig for routing mortises and tenons (page 20). I reviewed the original Leigh FMT (now called the FMT Pro) when it was first released in 2003 and found it to have "spot-on accuracy." You can view the complete article at www.AmericanWoodworker.com/146/FMTpro. For comparison, I tried out the new Super FMT and found it just as precise and easy to use as the original FMT Pro. So if you've had your eye on this tool, you can now get all its great benefits for about half the price of the original.

Do you have a favorite router jig, tool, technique or project? We've designated February and March, 2010, as "Router Tips and Techniques" months on our website. Post your router tip, technique, project or story to our website and you'll automatically be entered to win some great router-related prizes. Visit www.AmericanWoodworker.com/146/RouterTips for the details.

Enjoy,



Randy Johnson



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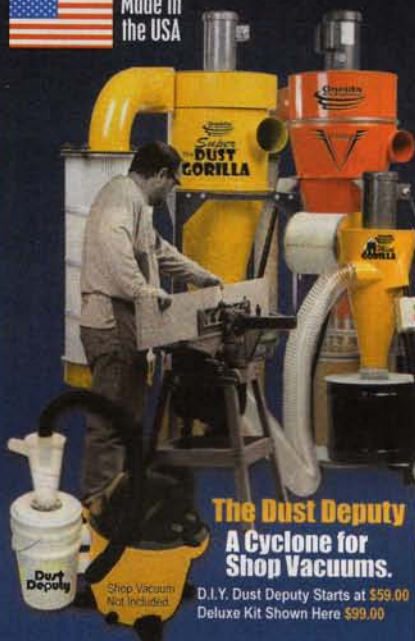


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Top-Notch Router Table

To see complete plans for a top-notch router table, go to www.AmericanWoodworker.com/146/AWRouterTable



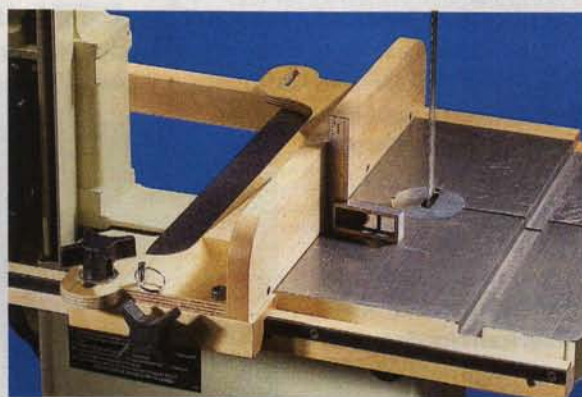
Bandsaw Blades

For advice on choosing a bandsaw blade for resawing, go to www.AmericanWoodworker.com/146/ResawBlades



Marbled Finish Video

To see a video on creating a marbled finish on wood, go to www.AmericanWoodworker.com/146/MarbledTop



Bandsaw Fence

To see plans for a shop-made bandsaw fence, go to www.AmericanWoodworker.com/146/AWBandsawFence

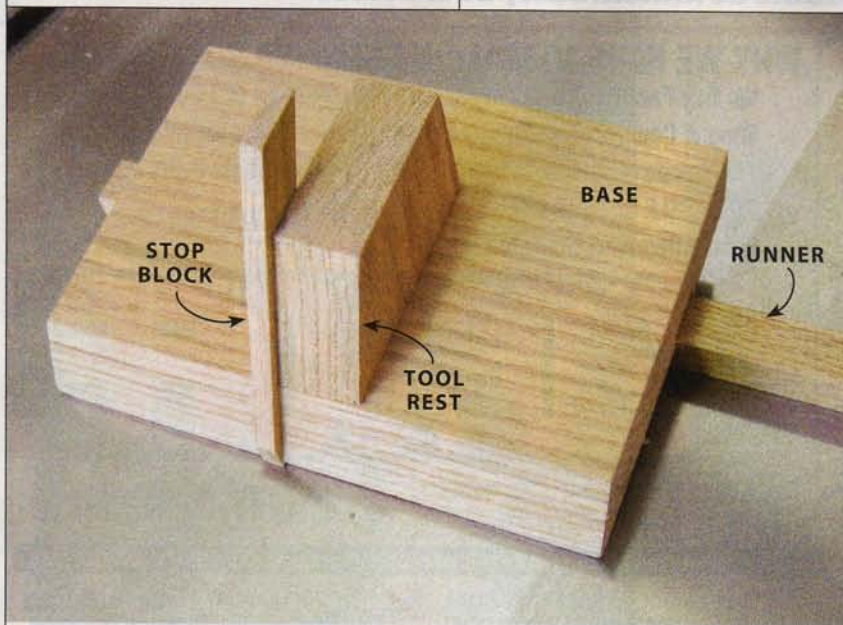


Finger Joints

To learn how to make finger joints on the tablesaw, go to www.AmericanWoodworker.com/146/BoxJoints

Video Pick of the Week

Be sure to check out the latest Video Pick of the Week at: <http://videos.americanwoodworker.com>



Terrific Tip!

Chisel Sharpening Jig

IF YOU'VE HAD TROUBLE GRINDING a straight edge on a chisel or plane iron, try using your disc sander. All you need is a guide that slides in your sander's miter gauge slot and an 80 or 100-grit disc.

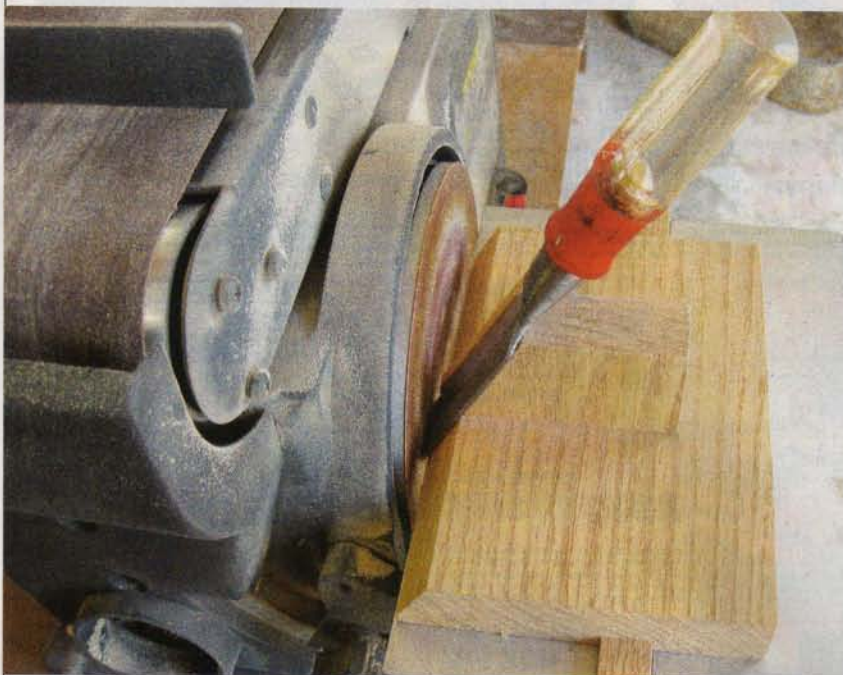
To make the guide, start with a $\frac{3}{4}$ " x 5" x 8" base. Cut a groove for a runner in its bottom that puts the base's edge about $\frac{1}{32}$ " away from the sanding disc. Cut the front edge of the base at 25°. This is the standard grinding angle for a general-purpose chisel. Later, use a stone to hone a 30° bevel on the chisel. If you want to use the chisel direct from the disc sander, which is OK for rough work, cut the base's front edge at 30°.

Add a runner to the base, then make the tool rest. It's just a block of hardwood with a stop block glued on one side. The stop block keeps the edge of your tool square to the sanding disc. Cut the front face of the tool rest at the same angle that you cut the base. Glue and screw the tool rest to the base, lining up the angled portions, and you're ready to go.

Before you begin, here's an important cautionary note: To prevent sparks from starting a fire, disconnect your disc sander from your vac or dust collector. Also, clean up any piles of sawdust inside or under the sander; an ember may smolder there and start a fire later on.

To use the jig, position it a little left of center of the sanding disc—if your disc rotates counterclockwise. (The disc's rotation should push down on the chisel, not up.) Place the chisel against the stop block, then slide the chisel down the tool rest until it makes contact with the disc. Slide the jig back and forth.

Fred Adams

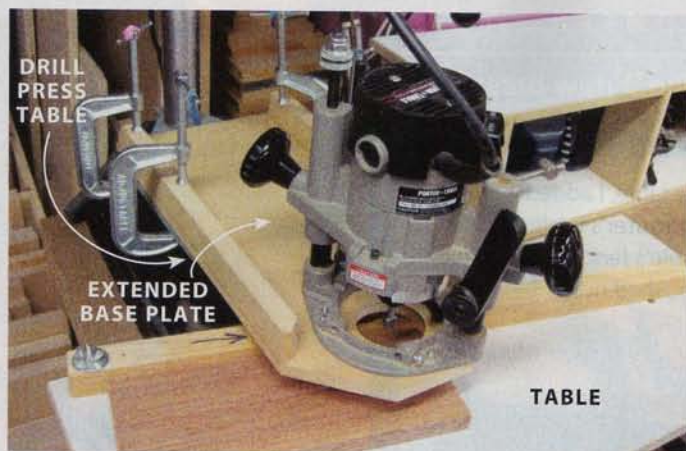


Terrific Tips Win Terrific Tools!



We'll give you \$100 for every original workshop tip we publish. One Terrific Tip is featured in each issue. The Terrific Tip winner receives a 12" Leigh Super Jig with VRS (Vacuum and Router Support), a \$239 value.

E-mail your tip to workshoptips@americanwoodworker.com or send it to American Woodworker Workshop Tips, 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.



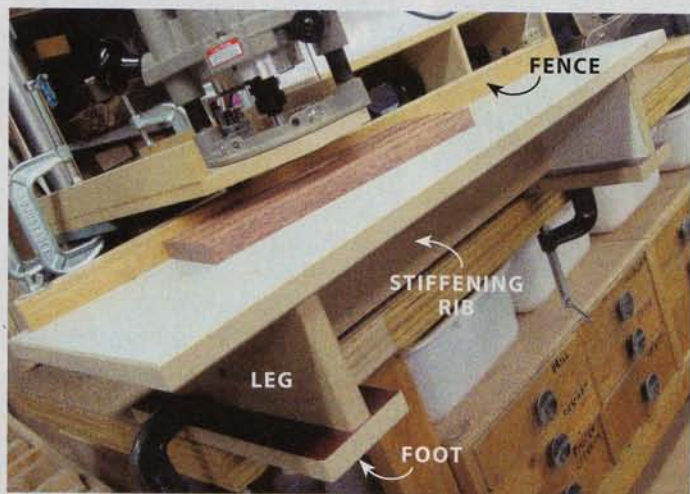
Overhead Router Table

I'VE BUILT AN OVERHEAD ROUTER TABLE to simplify a few milling operations, such as making V-grooves, flutes and mortises. On an overhead table, the workpiece faces up. This makes it a lot easier to see the layout marks that indicate where to start and stop a groove or flute.

After some trial and error, I came up with a design that uses a plunge router. It works great, and cost almost nothing. Besides the router, there are essentially three parts: an extended baseplate, a fence and a table. The baseplate is made from 1/2" MDF with 3/4" x 1-1/2" stiffening ribs along the edges. The plate has a 2-1/2" dia. bit hole, large enough for seeing when you get close to your layout lines. I clamp the baseplate to my benchtop drill press table, which is flat, sturdy and adjustable.

The table is made from 3/4" melamine. It has two legs with feet for clamping to a bench, and a stiffening rib between the legs to prevent sagging. The table's fence is a 1" x 1" piece of hardwood, fastened to the table at one end with a 1/4-20 x 2" bolt and a wing nut. The other end of the fence pivots for adjustment and is secured with a clamp. It's important to note that you push the stock from left to right.

Serge Duclos



Benchtop Router Table Cabinet

MY FIRST ROUTER TABLE was a simple benchtop model. It was convenient to park on a shelf, but not convenient to use on an actual bench—that put the router table's surface too high. To place the table at the right height, I built a small cabinet to go underneath it, and added a mobile base sized for a drill press. I stored my wrenches, extra collet, starting pin, featherboards and coping sled in the cabinet, away from all the dust.

Tom Caspar



Router Table Dust Sleeve

TO IMPROVE THE DUST COLLECTION on my router table, I added a 4" dia., 4" long piece of flexible vacuum hose around my router's body. This helps direct all the dust into the port on the router table's fence. The flexible hose snugs up to the table's plate and can easily be pushed out of the way in order to change bits.

Mark Thiel



Miniature Plug Cutter

THE SMALLEST STANDARD PLUG CUTTER I own is a 1/4" dia., but occasionally I need to make plugs that are smaller. No problem—I use a countersink bit instead. I just remove the drill bit, chuck the countersink portion in my drill press, and make plugs the usual way.

Mark Thiel

Sliding-Head Beam Compass

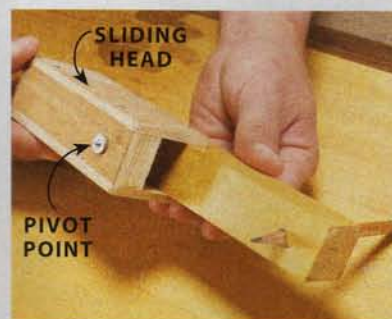
MY BEAM COMPASS is perfect for drawing huge arcs. It's super easy to make, and I can adjust it quickly without using screws or clamps. To change the arc's radius, I just slide a

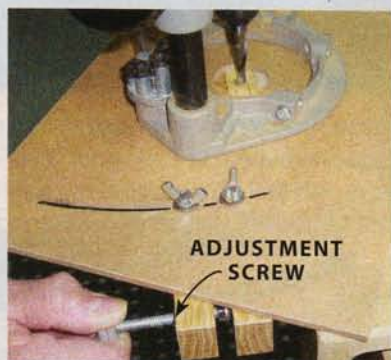
saddle-style head along the beam.

Make the beam from a piece of hardwood. Mine is 1" x 1-1/4" x 36", but you can make it any size you want. Make the sides of the sliding

head from 1/4" plywood, and the bottom from 1/2" or 3/4" plywood. The head should fit snugly on the beam, but still be able to slide. For the pivot point, I drilled a hole in the head's bottom and inserted a dowel center. (A nail would work just as well.) Drill a hole in the beam's other end to hold the pencil.

Larry LaBeau





Micro-Adjust Fence

A MICRO-ADJUST FENCE is the perfect accessory for making grooves, mortises, or other milling operations using a hand-held router. It allows you to precisely adjust the distance between the bit and the fence.

This device operates in two steps. First, move both fences together, with the micro fence against your workpiece, within 1/8" of your final setting. Lock the macro fence. Then, by turning a screw, adjust the micro

fence to the precise setting.

For lumber, you'll need a 1/4" x 10" x 10" MDF baseplate and two 3/4" x 1" x 13" hardwood pieces. For hardware, you'll need three 1-1/2" carriage bolts, one 2-1/2" carriage bolt, three washers, three wing nuts, two square nuts, and a high-quality hinge that doesn't have any play.

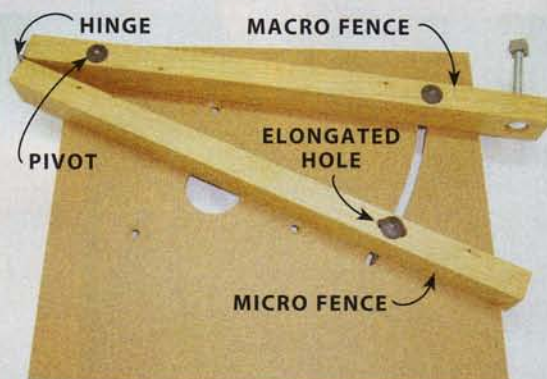
To make the baseplate, first drill the pivot hole. Then, rout the slot using a 1/4" straight bit. Make sure you leave enough room for your router between the slot and the pivot hole. Next, drill the mounting holes and the bit hole.

Mount the hinge to the ends of the fences, and then position the fences under the baseplate to mark where to drill the fence's holes.

Because the micro fence has a different pivot point, you'll need to elongate its hole about 1/2" toward the hinge.

The adjustment screw is a 1/4" - 20 x 2-1/2" long carriage bolt threaded through the macro fence, with two 1/4"-20 square nuts or a jig knob for a handle. Sink the carriage bolt's head into the macro fence.

Serge Duclos



Never-Lost Push Stick

I REALLY GOT TIRED OF DIGGING AROUND to find my table saw's push stick each time I needed it, so I figured out a way to attach it to the fence using a rare-earth magnet. I drilled a 1/2" counterbore in the push stick's face, 1-1/2" up from the bottom (so the magnet won't be hit by the blade), and super-glued the magnet in the hole. I drilled a similar hole in my fence, on the right side, to hold the magnet's mating washer.

Jim Dailey

Source: Lee Valley, www.leevalley.com, (800) 871-8158, 1/2"

Rare-Earth Magnet, #99K31.03, \$1; 1/2" Washer, #99K32.62, \$.58.



Mobile Tool Wall

TO GET THE MOST FROM MY LIMITED SHOP SPACE, I built a two-sided "mobile tool wall" to park in front of my overhead garage door. The wall is just basic carpentry construction, with a 3/4" plywood bottom and bracing, a stud wall with perf-board panels on both sides, and heavy-duty 4" casters. When I need to use the garage door, I just roll the wall out of the way.

Larry Powell



Two-Sided Tablesaw Insert

I NEEDED A 1/4" ZERO-CLEARANCE THROAT PLATE for cutting dados the other day, but my throat plate only had a 3/4" slot in it. I didn't want to interrupt my project to make or buy a new throat plate, so I turned the old one 180° and cut a new slot in it. Why hadn't I thought of that before? Now, whenever I make a new throat plate, I make it two-sided right off the bat.

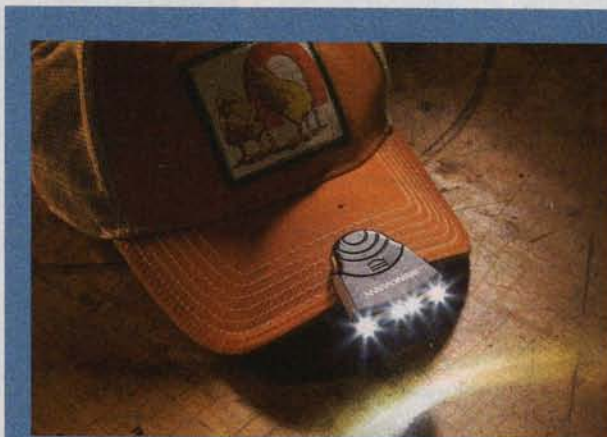
Dean O. Travis



Magnetic Dust Pan

WHENEVER I SWEEP my shop's floor, I find loose screws, nuts, bolts and assorted hardware mixed in with the sawdust. To retrieve the hardware, I put a couple of rare-earth magnets in my metal dustpan. (If your dustpan is plastic, you can glue the magnets in place.) Whenever I scoop up sawdust, I just shake the pan side to side over the trash before dumping it out. I always find something worth saving!

Bruce McBride



Spot-On Task Lighting

EVEN THOUGH MY SHOP is well lit, sometimes I need more light right on my work area. Instead of rigging up additional lights, I attach a small clip-on LED light to my cap's brim. It's great for working inside cabinets or doing close work of any kind. The light shines right where you're looking. You can buy these lights at your local home center for about \$5.

Gary L. Curry

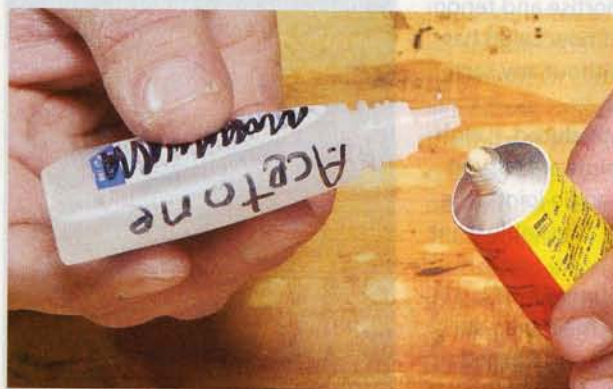


Slippery Paraffin

WITH ALL THE HIGH-TECH, expensive tools in my shop, I still find a dozen uses for a simple, inexpensive hunk of paraffin wax. I use it anywhere I need lubrication to slide material: the tops of my tablesaw, router table and jointer, the sides of my miter gauge, the bottom of my router base plates, and so on. I apply paraffin to drawer sides, too, and rub it on the bottom of a plane every ten strokes or so, which makes the plane much easier to push.

If you're using an oil-based finish, you needn't worry about contaminating parts for finishing, because paraffin is a petroleum-based product. Paraffin is easy to find—it's sold as canning wax at grocery stores. You can get a supply that'll last years for less than \$5.

Cliff Thornton



Putty Stabilizer

A CLOGGED TUBE OF WOOD FILLER is really annoying. I don't want to throw it away—but I can't use it, either! To solve the problem, I filled an empty eye drop bottle with acetone (and remembered to clearly re-label the bottle). When I find a clogged tube, I just put a couple drops of acetone into its nozzle and let the solvent do its magic. As a preventative measure, I now put a drop in the tube after each use.

Ed Hackleman

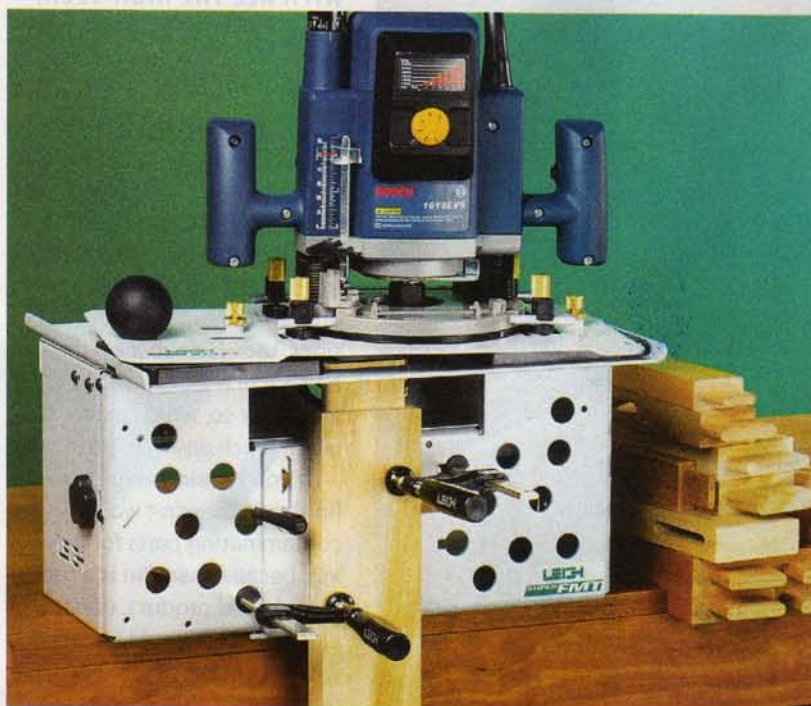


Phillips Tip Repair

WHEN YOUR PHILLIPS TIP gets beat up, don't throw it away. Make a stop at your bench grinder first, and grind about 1/16" off the tip's end. This allows it to sink deeper into a screw's head, so you can get a little more use out of the tip before tossing it.

Bill Nedelka

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Super Mortise and Tenon Jig

LEIGH INDUSTRIES HAS LONG BEEN KNOWN FOR its line of sophisticated dovetail jigs and, more recently, the FMT, a jig for making mortise and tenon joints. The original FMT came with a pretty big price tag, but now Leigh has introduced a much less expensive model—the Super FMT—without any sacrifice in precision or versatility.

We gave the original FMT high marks when it was first introduced. (Leigh has renamed it the FMT Pro.) Standard mortise and tenon joints are easy to make with it, but the jig really shines in making compound-angle joints, the ones that can drive you crazy when building a chair. With its adjustable front face, the FMT can handle those angles with ease.

So, what's the difference between the FMT Pro and the Super FMT? Mostly, it's what they're made of. The FMT Pro's body is CNC machined aluminum, while the Super FMT's body is made of CNC punched and formed steel. The only other significant difference is how work is clamped to the jig's face. The FMT Pro uses cam-action clamps that slide in track built into the face; the Super FMT uses standard F-style clamps that you position in holes in the jig's face. Rare-earth magnets hold the clamps tight to the jig while you adjust them. There are a few other minor changes, but they have little effect on the convenience and versatility of the jig.

Using a small or mid-sized plunge router, the Super FMT can make over 70 sizes of mortises and tenons, ranging from a tiny 1/16" x 1/8" to a massive 1/2" x 5". It's capable of nearly any combination of angled and compound angled joints as well as single, double (tandem & side-by-side), triple and quadruple joints. Five 5/16" joint guides and a HSS spiral upcut bit with a 1/2" shank are included with jig, but you can also purchase 21 additional joint guides for 1/4", 5/16", 3/8", and 1/2" bits.

Source: Leigh Industries, www.leighjigs.com, (800) 663-8932, Super FMT Frame Mortise & Tenon Jig, \$449.



The Next Twist in Door-Making Bits

COPED JOINTS ARE FINE for lightweight doors or doors with glued-in plywood panels, but what do you do for doors that need more strength? The answer is easy: Make long tenons. At least, it's easy with Freud's new stile and rail bits, which allow you to make tenons of any length. That's a welcome new feature in this field.

Freud's bits come in a variety of familiar profiles: roundover, ogee, bevel and roundover with bead. They'll accommodate stock from 5/8" to 1-1/4" thick. As with the best stile and rail bits, they can be adjusted with shims to fit the exact thickness of your plywood or solid wood panels.

Source: Freud, www.freudtools.com, (800) 334-4107, Roundover bit set, #99-760, \$119.99; Ogee bit set, #99-761, \$119.99; Roundover Bead bit set, #99-763, \$119.99; Bevel bit set, #99-764, \$119.99; Optional cutter for double-sided profiles, \$95.99; Optional glass cutter, \$35.99.



Improved Trim Router

RIDGID WENT BACK TO THE DRAWING BOARD for a complete redesign of their trim router. This router is heads and shoulders above the last model, the R2400.

New features include an improved micro-adjust dial for setting the depth of cut and a flat top that allows the router to stand upside down. Both features make it easier to measure a bit's height. The router also has a quick release lever for separating the motor from the base in order to change bits. A 5.5 amp, variable-speed, soft-start motor delivers 20,000 to 30,000 rpm. It has electronic feedback to maintain speed throughout a cut.

The router comes with a square base and a round base, which got us to thinking: Why use one or the other? When routing along a guide, a square base guarantees that the bit is a constant distance from the guide. But you must hold it solid against the guide—wobble it a bit, and your cut is off. A round base allows you to hold the router at any angle when following a guide. Wiggling the base may affect the path of the cut, because the base may not be concentric to the bit. If so, the cut won't be off by much.

Source: Ridgid, www.ridgid.com, (800) 474-3443, Trim Router R2401, \$99.97.

Deluxe Benchtop Router Table

JESSEM HAS INCLUDED

nearly everything you could ask for in their new benchtop router table. It features a 1" thick, 16" x 24" laminated MDF top with edge banding; a phenolic router plate with a 2" i.d. insert ring; an extruded-aluminum fence with sliding MDF faces, a dustport and a T-track slot; an extruded-aluminum miter track; a built-in on/off switch, and four leveling feet. Whew.

JessEm has mounted the top on a heavy-duty welded tubular frame (which brings the total weight of this table to a hefty 45 lbs.). The frame holds two side storage bags for bits, collets and whatnot. A canvas dust bag fits inside the frame, under the top.

Source: JessEm Tool Company, www.jessem.com, (866) 272-7492, Bench Top Router Table, Model 03200, \$259.



Precise Dados

NO DOUBT YOU'VE MADE A

JIG at some time for cutting dadoses with a router. Did you figure out how to make that jig accommodate any plywood thickness? Or clamp instantly to almost any cabinet part? Well, the folks at Woodline USA have cracked that nut, with a fine new product they've named The DadoMax.



The DadoMax is a hefty chunk of machined aluminum. To rout a dado, you mount a 1" o.d. Porter-Cable style template guide (included) in your router, install a 1/4", 3/8" or 1/2" bit (not included), set the router on the jig and go. The DadoMax rides back and forth on a cam-operated guide clamp. (You can purchase the clamp from Woodline or use an equivalent clamp from another supplier.)

The DadoMax can make dados from 1/4" to 1-1/8" wide. So, how do you tweak the dado's width to fit your plywood? It's really very clever: The opening for the template guide is adjustable. No measuring is required. You place the DadoMax on the edge of your plywood and turn a knob to clamp the wood between the jig's jaws. This action also opens or closes the opening. When the jaws are tight around the plywood, the opening is exactly the right size. The jaws are stepped—each one corresponds to one of the three bits. The DadoMax is serious about giving you a perfect fit: The jig has a "Run-Out Compensator," a moveable tab that adjusts the size of the opening to deal with runout in your router or bit.

The DadoMax can also be used to make dados and female dovetail cuts.

Source: Woodline USA, www.woodline.com, (800) 472-6950, DadoMax, #DMAX, \$90; DadoMax kit, including DadoMax, case, and 25" clamp, #DM25, \$139.



Mini Bits

MOST TINY BITS HAVE SOLID PILOTS, which can burn your workpiece or leave a groove, particularly if you're routing a soft wood such as pine. If those problems sound familiar, check out these new bits from Amana. They've got bearings on their ends instead of pilots.

Amana's bits are ideal for delicate or small projects, like sign making, building musical instruments, routing the edges of letters and flush trimming tight corners. They come in a variety of profiles including roundover, chamfer, flush, bevel trim and rabbet. The cutters are carbide, and the bearings are 3/16" dia. These bits work well in both wood and plastics.

Source: Amana Tool, www.amanatool.com, (800) 472-6226, Miniature Bearing Router Bits, \$18 - \$27 each.



Twin Outlet Switch

KREG'S NEW UPGRADE for your router table allows you to turn on the router and a vac with one flick of a switch. It has two outlets capable of taking a combined load of 15 amps and can mount to any table.

Kreg has added a large on/off paddle that's easy to turn off with your knee or thigh. The switch also has a removeable lock; your router can't accidentally be turned on while the key is removed. And it comes with a generous 8' power cord. All in all, adding this switch is an easy way to make your router table easier and safer to use.

Source: Kreg, www.kregtool.com, (800) 447-8638, Router Table Switch, #PRS3100, \$34.99.



Quick-Change Offset Base

HAVE YOU EVER DINGED UP AN EDGE PROFILE by accidentally tipping your router? An offset base helps prevent that—it's a very handy accessory. A new one from Milescraft is so easy to click onto your router that there's no excuse not to use it.

To install the Milescraft base, you first install a 7" universal base plate on your router. (It's included with the offset base, and is used with other Milescraft router accessories.) The offset base then locks securely into the universal base, without requiring any tools. Both of the bases are clear, so you can see your piece as you're working.

The offset base is 13" long and has a generous, oversized handle. When you're done routing an edge, it's easy to remove the offset base and install a Milescraft edge guide or other Milescraft accessory for the next job.

Source: Milescraft, www.milescraft.com, (847) 683-9200, Offset Base, #1205, \$19.99.

3 New Plungers

MAKITA MUST FIGURE THAT ONE TYPE of plunge router won't satisfy everyone because they've come out with three: a compact, high-speed 1-1/4 hp unit; a larger, 3-1/4 hp single-speed model; and a 3-1/4 hp unit with variable speed.

The compact RP0900 features an 8 amp motor that delivers 27,000 rpm. It only accepts 1/4" shank bits, but that's OK for a machine that's best for decorative routing with relatively small bits. Its plunge depth capacity is 1-3/8".

RP2301FC

The larger 3-1/4 hp RP1800 and RP2301FC plunge routers feature 15 amp motors. The RP1800 is a single-speed machine, running at 22,000 rpm—good for straight bits and smaller-diameter profile bits. (The extra power is really helpful for deep mortises.) The RP2301FC is a variable-speed router, running from 9,000 to 22,000 rpm—good for larger



RP0900

diameter bits that should be run at a lower speed for safety. This model also has electronic speed control (to maintain constant speed under load), soft start and an electric brake.

Both of the larger routers have tall depth-of-cut knobs, which makes them easy to adjust upside down in a router table. Their plunge capacity is 2-3/4". The RP2301FC also features a specially designed fan to keep dust from entering the tool and twin LED lights to illuminate your work area.

Source: Makita Tools, www.makitatools.com, (800) 462-5482, 1-1/4 HP Plunge Router, RP0900K, \$159; 3-1/4 HP Plunge Router, RP1800, \$259; 3-1/4 HP Variable Speed Plunge Router, RP2301FC, \$329.



Precision Mortising Guide

THE MORTISE PAL IS A PRECISE, well-machined, robust jig for mortising with a plunge router. Setup couldn't be easier. First, install a mortise template in the jig and guide bushing (included) on your router. Next, make layout lines on your stock and align the jig with them. You're ready to cut the mortise.

The kit comes with templates for 1/2", 1", 1-1/2" and 2" long mortises. You can make longer mortises by overlapping cuts. The width of the mortise is determined by the bit you use, of course—the guide bushing accommodates bits up to 7/16" dia.

You can also make angled and compound joinery with the Mortise Pal. Attach the jig directly to your stock, and then shim it to get odd or compound angles.

The Mortise Pal works with stock up to 3" thick. With optional guide templates, you can use the Mortise pal for dowel joinery, too.

Source: R.G. Jig Co., www.mortise-pal.com, (619) 459-7951, Mortise Pal Jig Kit, MPJK2, \$189; Double 1" Mortise Template, \$10; Doweling Template, \$10.

Entry-Level Dovetail Jig

DOVETAIL JOINTS ARE A HALLMARK OF SERIOUS WOODWORKING.

Still, many woodworkers shy away from them because dovetail jigs are often complicated and expensive. Fear no longer! General Tools and Instruments has made a jig that's neither complicated nor expensive. It's perfect for woodworkers ready to take their craft to the next level without a substantial investment.

This is a pretty basic jig, made from machined aluminum and plastic inserts. It can be used to rout half-blind and through dovetails. The kit comes with a bearing-guided dovetail bit. It has a 1-1/4" depth of cut and accommodates stock up to 1-1/2" thick (for half-blind dovetails).

The width of your joint isn't hampered by the size of this jig; a simple plastic key helps align the jig for routing joints wider than 6" (you just move on down the line). The jig can be used on a bench with a hand-held router or with a router table.

Source: General Tools and Instruments, www.generaltools.com, (800) 697 8665, E-Z Pro Dovetail Jig, Model No. 860, \$39.97.





Router Table Box Joints

IF YOU'VE EVER BEEN FRUSTRATED trying to set up a tablesaw to make box joints, here's an alternative: Make them on your router table with a new jig from Rockler. It requires little measuring and minimal setup.

This jig can make 1/4", 3/8" and 1/2" wide notches, which should cover most small to medium-sized joints. The jig secures to any router table with a standard 3/4" miter slot. Setup simply requires installing the desired bit and an indexing key (the jig includes three keys, one for each joint width), fastening a sacrificial face to the pre-drilled backer sled, and adjusting the jig into position.

The solid-aluminum indexing key keeps your piece in proper alignment to cut each pass and also aids in holding the piece upright in the jig. The right-angle backer sled moves easily on ABS runners in two grooves. To prevent cutting through the backer board, stop dadoes in both grooves engage the sled shortly after the bit clears the cut. Using an up-cut spiral bit delivers the cleanest cuts and helps prevent blowout.

Source: Rockler, www.rockler.com, (800) 279-4441, Router Table Box Joint Jig, #29502, \$79.99.



DELUXE COPING SAFETY SLED



PROFESSIONAL COPING SAFETY SLED



PROFESSIONAL DELUXE COPING SAFETY SLED

Three Economical Sleds

NEW COPING SLEDS from MLCS are equipped to help you make a perfectly square end-grain cope cut, free of tearout—and keep your fingers safe. Each sled comes with a 500 lb. toggle clamp, a solid base, an abrasive surface to keep a workpiece from shifting, replaceable backer blocks and two large handles.

The Deluxe Coping Safety Sled

(left) is the most basic. Measuring 4-3/4" wide, it's best for short or narrow pieces.

The Professional Coping Safety Sled (middle) is larger than the Deluxe, and has an adjustable front fence which prevents the workpiece from twisting as its being cut. This sled measures 3/8" x 6-1/2" x 16" thick and will hold stock up to 4-3/4" wide. The rear handle can be repositioned on the opposite side of the base for shaper and reverse-feed

operations.

The Professional Deluxe Coping Safety Sled (right) has all the same features as the Professional, but adds an upgraded clamp with two hold-downs. With this setup, your piece is really locked solid.

Source: MLCS, www.mlcswoodworking.com, (800) 533-9298, Deluxe Coping Safety Sled, #9544, \$34.95; Professional Coping Safety Sled, #9546, \$64.95; Professional Deluxe Coping Safety Sled, #9548, \$74.95.

Very Smart Router

BOSCH'S NEW MR23EVS COMBINATION ROUTER takes the next step forward in router design, continuing the legacy of their popular 1617EVS routers. You'll notice a difference as soon as you pick one up. Where's the switch?

It's on the base, right near the handles. The power cord still runs to the motor, but the power switch connects to the motor via a low-voltage electrical track.

Not only is this arrangement convenient, but it also brings a new measure of safety to using a router by preventing an accidental startup while changing bits. (And you know what a surprise that can be!) You can't turn on the motor unless it's attached to the base.

The new design also has an LED light that stays on whenever

the motor is plugged in, providing light during setup (where it's often more useful) as well as operation. That's way better than an LED light that only illuminates when a router is running, as you may find on other machines.

The 15-amp, 2.3 hp variable-speed motor has a range of 10,000 to 25,000 rpm, and features electronic feedback control to maintain a constant speed under load. The motor also employs a soft-start to reduce torque upon start-up. The plunge range of 3" is larger than most routers.



The combination kit includes a fixed base and a plunge base. If you install the fixed base in a router table, you can adjust the height of the bit from above the table using a hex wrench.

Source: Bosch, www.boschtools.com, 877-267-2499, MR23EVS Series Router Combo Kit, \$319.

Inexpensive Benchtop Router Tables

IF YOUR SHOP DOESN'T HAVE SPACE for a full-size, stationary router table, take a look at Skil's portable benchtop tables.

The RAS800, weighing in at just under 17 lbs., features a 14" x 24" laminated MDF top, a miter gauge, a guard, an external switch, one featherboard and accessory storage.

The RAS900, with a 16-1/2" x 26" top and weighing in at just over 23 lbs., also features a quick-release router mount, a taller fence with laminated MDF sides, dual featherboards, a starter pin and a guide for working with curved pieces, and a bit-height gauge.

Recommended for routers up to 2-1/4 hp, these tables aren't suitable for large-diameter raised-panel bits, but they'll work fine for other routing tasks, like rounding edges, cutting grooves and routing profiles. These models are a great introduction to the benefits of having a router table in your shop.

Source: Skil, www.skiltools.com, (877) 754-5999, Skil RAS800 Router Table, \$99.99; Skil RAS900 Router Table, \$150.



Log Cabin Shop



MY SHOP MAY APPEAR RUSTIC, but you won't find a dirt floor or antique machinery inside. In fact, my friends all make fun of me for having a shop that's so nice, someone could actually live in it. One friend even asks if he has to take off his shoes before entering. While painstakingly detailing the shop wasn't my intended goal, projects like this can take on lives of their own.

The structure consists of lodge pole pine logs that were salvaged after a pine beetle infestation that occurred in eastern Oregon about 25 years ago. I had the dead trees cut down and hauled by a team of horses to a portable mill. There, flat, parallel faces were sawn on each log, following its natural taper, to prepare it for use in log construction. After the logs had been milled, I hauled them back across the mountains (by truck this time) to my home in the Willamette Valley.

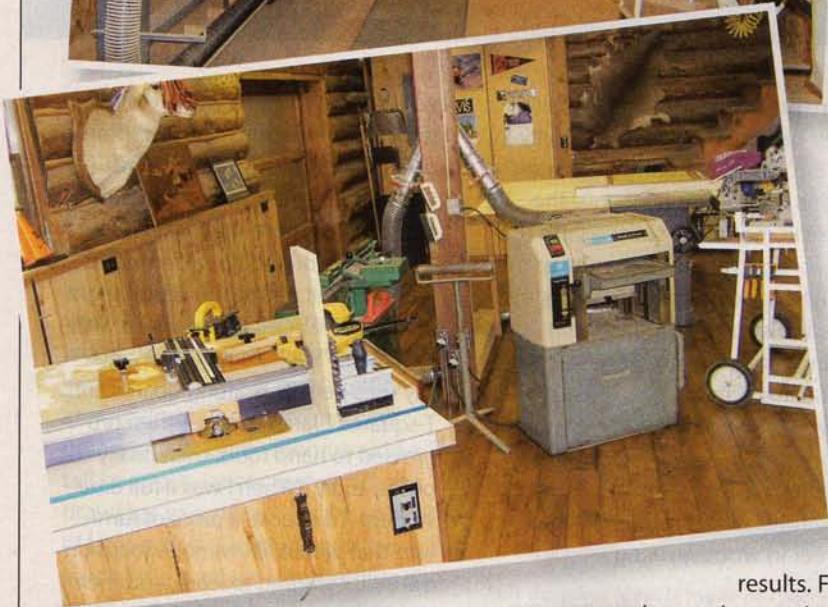
I hired a young guy with a boom truck and log construction know-how to erect the building (one of



the smarter things I've ever done). I served as the grunt/gopher/log peeler and general flunky. After six weeks of backbreaking labor, my shop took shape. (Concurrently, my own shape cast a thinner shadow, as I lost ten pounds.) We cut out the window and door openings and notched the joists into the top course of logs, so we could install the metal roof, windows and doors.

The tedious job of chinking between all the logs was the last step. Inside the shop, I installed Alaskan yellow cedar flooring. I distressed the boards by whacking them with hex head bolts and then carefully applied stain and finish to get the "old world" look I wanted.

Although the log walls and distressed flooring create a rustic



tools. I bought my planer as a used machine over 25 years ago, about the same time I purchased my jointer as new. When a neighbor bought a new Legacy machine, I acquired his old first-generation one and upgraded it with a 3-1/2 hp variable speed plunge router. The stroke sander was a throwaway tool for which I built the plywood housings to catch and disperse dust. My workbench and roll-around sheet goods rack are shopmade.

To make the 24' x 32' main floor of my shop as versatile as possible, almost everything is mobile. The stroke sander and Legacy machine reside upstairs, along with the dust collector, which is remote controlled. Dust collection ducts run downstairs to service the tablesaw, bandsaw, jointer and planer. Overhead airlines are located throughout both levels. Both levels are also serviced by variable speed air filtration systems that I turn on whenever I am in the shop.

I really enjoy my shop, especially when a warm fire is burning (did I mention the woodburning stove?) and my next project is taking shape. But it's safe to say that I will never, ever, build another shop. Once in a lifetime is enough for me!

John Tyler
Dexter, Oregon

Tell Us About Your Shop

Send us photos of your shop, a layout drawing, and a description of what makes your shop interesting. Tell us what you make in it and what makes your shop important to you. If "My Shop" features your shop, you'll receive \$100.

E-mail your entry to myshop@americanwoodworker.com with digital photos attached. Or mail your description with digital photos on a disc to My Shop, American Woodworker, 1285 Corporate Center Drive, Suite 180, Eagan, MN 55121. Please include your phone number. Submissions cannot be returned and become our property upon acceptance and payment. We may edit submissions and use them in all print and electronic media.

appearance, my shop is modern when it comes to tools. I like to build fine furniture, unique cabinetry, and anything that requires attention to detail and precision. So over the years, I've amassed a sizeable collection of new and "new to me" woodworking tools that help me achieve these

results. For example, my shopmade routing station is equipped with a Woodpecker router lift mechanism, a super-accurate Jointech fence, and a Fein vacuum system. My Delta tablesaw sports an Incra Miter 3000, and I upgraded my bandsaw with Laguna's Driftmaster fence. I also have a Leigh FMT jig and a whole suite of Festool power



Janet Collins

by Spike Carlsen

A life of tradition, teaching and talons

GLANCE AT THE LIST OF COURSES that Janet Collins has taught, and you get a feel for the breadth and depth of her woodworking talents: Introduction to Spindle Turning, Decorative Inlay, Building an Arts & Crafts Table, Hand Tool Restoration, Relief Carving, Building a Dove-Tailed Shaker Stepstool, Intro to Chip Carving—she teaches them all.

How does one acquire such a vast repertoire of skills? Janet feels it's due partly to nature, partly to nurture—and partly to tackling the restoration of an old house. "Working with your hands is something you can learn, but it's also part genetics," she explains. "My father, grandfather, great-grandfather and uncles were all tool and die makers and woodworkers. Even the women in my family

were proficient with working with their hands, so it comes naturally."

But it was restoring a decrepit 1890s house that really put the tools in motion. "I started with the cosmetic stuff, Janet says, "but then started tackling the plumbing, electric and structural work." That led to doing more refined work, such as installing windows and trim molding ... which led to building the kitchen cabinets ... which led to thinking, "Well—maybe I could make some furniture" ... which led to a lifetime career in woodworking.

Traditional woodworking with a twist

Janet honed her woodworking skills at the North Bennett Street School, a school—appropriately founded by a woman in 1885—created to teach trades and life skills to new immigrants. After taking a few one-week courses, Janet enrolled in the two-year furniture making school, during

which time she also worked as a workshop assistant. Within a month of graduating, she became the school's Program Director, a position she held for more than ten years.

Her love of traditional furniture was born out of the approach taught at NBSS. The curriculum started with drafting—"Yep, the type that actually uses pencils, drafting boards and T-squares," Janet recalls—then progressed to hand tools, then finally to power tools. "When I was a full time student, I'd choose a piece of furniture that would allow me to focus on the skills I wanted to learn, and then build it," Janet recalls. "I always picked pieces that would challenge me the most and teach me the most."

Most of Janet's work retains its roots in traditional early American furniture. "You really can't improve on the designs, curves and styles of that era," she explains. "But there are so many features within those styles to challenge my skills; I'm constantly



Turned, carved, fluted, reeded, and inlaid, Janet's bedposts showcase the enormous range of her skills.



An antique piece that Janet saw in a magazine photo inspired this stripe-grained sapele, holly and ebony chest.

learning. Most of my work takes components from that era and integrates them into something new."

From pencil tip to final finish

By building the piece—usually full-size—on paper before touching wood, Janet is able to figure out the joinery, the order of construction and assembly, and the materials going into it. Even when turning a 7' tall bedpost, Janet creates full-size drawings in order to get a true sense of proportion. Clearly, the drawing part of the process is something she takes very seriously. The mahogany Newport-style Lowboy (page 31) required nearly 20 hours at the drafting table.

Most of Janet's work is commissioned—a state of affairs she finds to be both a blessing and a curse. "Commissioned work means making things others want rather than what I want to make," she says. "But



This dressing glass is made of cherry, with holly and rosewood inlay adorning the top. Its frame and drawer fronts are madrone burl veneer, and the beading, mirror mounts and feet are rosewood.

often I get to combine the two." A piece she recently completed exemplifies this (page 30, left). The clients' house was filled with museum-quality antiques, and they



This stunning curly maple Queen Anne transition chair is one of a set of twelve. Because the original chair was diminutively sized, Janet artfully upsized the design while maintaining its graceful proportions, at her customer's request.

Designed to fit the period surroundings in a house filled with antiques, this mahogany king size bed features fluted posts and carved ball and claw feet.

wanted a king-size bed that would blend in. The couple had a general idea of what they wanted, but they gave Janet the liberty to embellish and add ornamentation as she saw fit. "They wanted a particular style, but they also told me they wanted something that would be a star in my portfolio, something that would further my career."

Collins prefers to work alone when crafting individual pieces; and she prefers to take the project from rough board to completed piece. "I always apply my own finishes," Collins says. "I know others can do just as good a job, but I like seeing the process through to the end."

1,000 Students and counting

Though some of Janet's early learning came from reading books and



In addition to building these chairs to match a period chair, Janet also installed appropriate upholstery on the slip seats, consisting of silk fabric over loose horsehair and cotton.



Janet built this cherry, lacewood and padauk tool chest when she was a student at the North Bennett Street School. It now houses her ever-growing collection of new and antique carving tools.

watching *The New Yankee Workshop*, she's spent much of the past fifteen years in the classroom—as both student and teacher. “Every time I teach something, I learn something,” she claims. During her ten years as Program Director at NBSS, Janet not only hired some of the best teachers in the field—Windsor chairmakers, wood turners, furniture conservators—but also learned from them. And these skills are something she's

passed on to more than one thousand students over the past decade.

Has she ever found it problematic teaching woodworking in a field traditionally dominated by men? “I have four brothers and my father was a police officer. I've been around strong men all my life,” Janet muses. “It's rarely a problem.”

A helpful tenet that Janet likes to pass along to her students is one she learned early in her own woodwork-

ing education: “There are no such things as mistakes in woodworking; only design opportunities.”

For information on Janet's class offerings and to view more photos of her work, visit

www.jacwoodworking.com

Spike Carlsen is the author of *A Splintered History of Wood: Belt Sander Races, Blind Woodworkers and Baseball Bats*, published by HarperCollins. Now available in paperback.

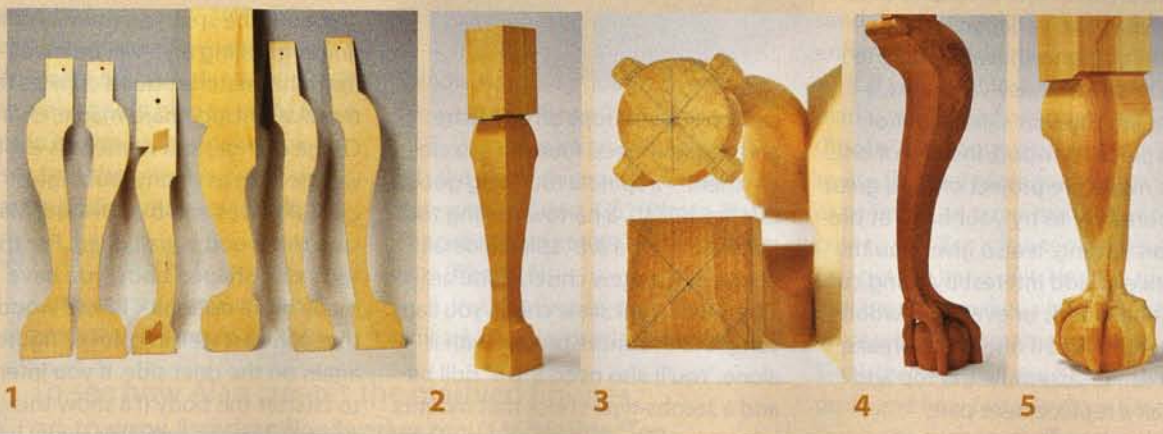
The Fine Art of the Ball and Claw Foot

THE ORIGIN of the ball and claw foot is debatable; Janet's skill at creating them is not. Some trace the foot's history back to the Chinese motif of a dragon clutching a pearl. Early versions can be found in Dutch and English furniture, with the British favoring the lion's claw. The American version favors the eagle's claw. In the U.S., four major variations emerged, from New York, Boston, Philadelphia and Newport—each with a slightly different twist. Janet favors the Newport style, which is perhaps the most intricate and graceful of all, with delicate spaces between the claws and ball.

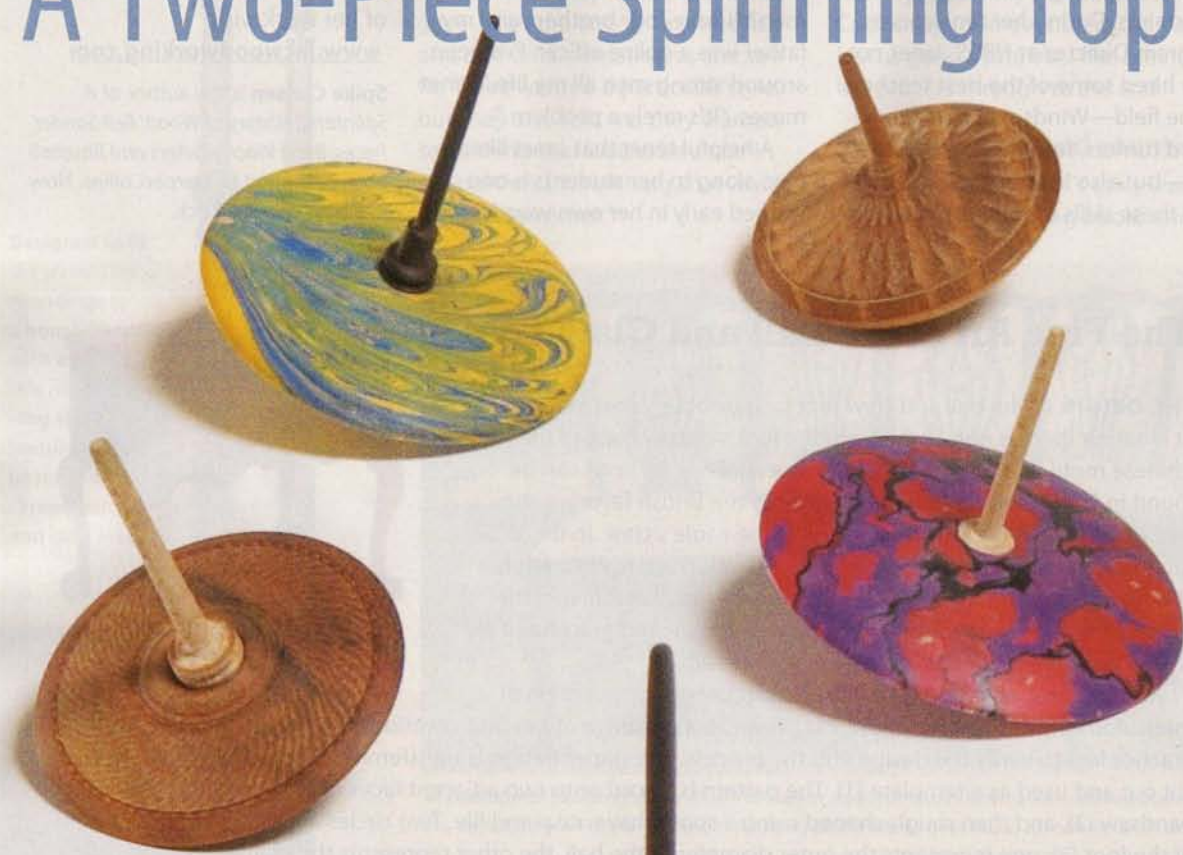
As with most of her woodworking, Janet uses a combination of meticulous drawings, hand tools and power tools to arrive at her final creation. She always starts by carving a practice leg, to verify the design and the process. The paper design is transferred to plywood, which is in turn cut out and used as a template (1). The pattern is traced onto two adjacent faces of a wood blank, cut with a bandsaw (2), and then rough-shaped using a spokeshave, rasp and file. Two circles are drawn on the bottom of the foot (3); one represents the outer diameter of the ball, the other represents the diameter of the ball where it meets the floor. The talons are laid out in each corner, then defined with a fine-tooth dovetail saw.

When Janet switches to carving mode, she uses spoon gouges, flat paring chisels and backbend gouges to shape the ball and talons. Janet imbues personality into each foot. If the centerline of the claw is above the centerline of the ball (4, a practice leg for the Newport lowboy), the foot appears to be “taking off,” she says. Placing the claw's centerline below the ball's centerline, or slightly flattening the ball (5, a practice leg for the bed shown on page 30) makes the foot appear to be “landing.” “Both are accurate,” according to Janet. “It just depends on what you want the finished piece to look like.”

After completing the carving, Janet finishes up by using sandpaper to blend the rough areas together.



A Two-Piece Spinning Top



by Alan Lacer

MOST OF US PICTURE a spinning top as a simple wooden toy that stands upright when it spins. But in other parts of the world, the perception can be quite different. In Japan, for example, it is said that there are over one thousand different types and variations of tops.

I'm going to show you how to create one of those variations, a spinning top that's made out of two pieces of wood, instead of one. This miniature project offers a great opportunity to try your hand at precision turning. It also gives you the chance to add interest by using contrasting woods or even non-wood materials. And if one piece breaks, you can disassemble the top and install a replacement part.

Despite their diminutive size, you

can make these tops on any lathe, and you only need four tools to create them—a spindle roughing gouge (3/4" to 1-1/4"), a narrow parting tool (3/16" to 1/4"), a 3/8" spindle detail gouge and a skew chisel. If you are adept with your skew chisel, you can complete the entire project with it alone. You'll also need a 1/4" drill bit and a Jacobs-type chuck that mounts into your tailstock (see Sources, page

37). Using a scroll-type chuck to hold the pieces is most convenient, but it's not necessary (see "No-Frills Mounting," page 37 and Sources).

The wood you use is part of the design. Choose a hard, dense wood for the top's shaft, as both the spinning point and the finger-gripping area will be made from this material. Good choices for the shaft include hard maple, cherry, Osage orange, and numerous exotic woods such as ebony, bubinga, gonzalo alves and bloodwood. Make sure this wood is well dried. For the top's disc-shaped body, you have many more options. Choose woods that contrast well in color or figure, again on the drier side. If you intend to chatter the body (I'll show this option), be sure and pick a very hard



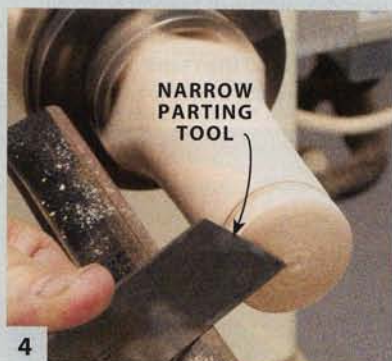
1 Use the tailstock center to hold the blank for the disc-shaped top bodies in position as you tighten the scroll chuck.



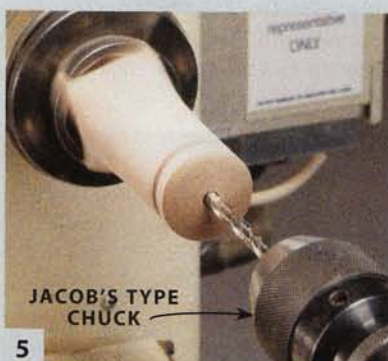
2 Round the blank with the spindle roughing gouge.



3 Cut in with the narrow parting tool to establish the disc.



4 Exactly center a tiny recess in the disc's face.



5 Use the recess and a Jacobs-type chuck mounted in the tailstock to drill a hole through the disc. This hole must be precisely centered for the top to spin without wobbling.



6 Shape the body as you would roll a bead. Start at the edge and cut toward the center, rotating the gouge as you go. When shaping the back, don't cut all the way to the center hole.

wood such as hard maple or one of the exotics mentioned above. To explore non-wood possibilities, consider materials such as solid surface composites, hard plastics, antler or even soft metals.

These tops operate by spinning them with your fingers, so they should be less than 1-3/4" in diameter. Most of the finger-spun tops that I make measure 1-1/4" to 1-1/2". Also, you should plan to make these tops in multiples, because you can easily turn three to five of the disc-shaped bodies from a single blank.

Turn the body

1. Cut a square blank of wood, approximately 4" long. Mark the

center of one end of the blank.

2. Mount the block loosely in the scroll chuck, with the marked center towards the tailstock.

3. Engage the point of the tailstock center on your mark, to hold the blank perfectly centered while you tighten the chuck (**Photo 1**). Then back off the tailstock.

4. Round the blank using the spindle roughing gouge or your skew chisel (**Photo 2**).

5. Use the parting tool to establish the disc's thickness—usually between 1/4" and 3/8" (**Photo 3**). Then mark the center of the disc's face (**Photo 4**).

6. Install a Jacobs-type chuck and drill a 1/4" hole, precisely centered

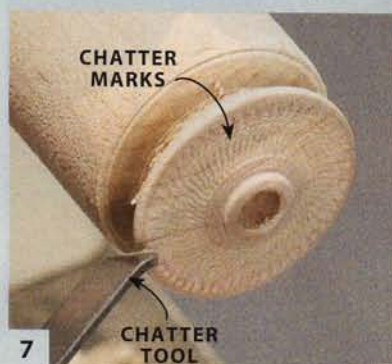
and about 1" deep (**Photo 5**).

7. Shape the body on both sides, using the spindle detail gouge (**Photo 6**). A slightly rounded body is more appealing than one that is cut straight in. Take care to cut the outside face cleanly. It will be the most visible part of the top. Finish-sand this face, unless you want to enhance it by adding chatter marks.

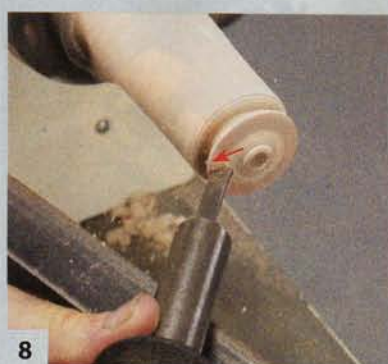
8. If you want to add chatter marks, you'll need a chatter tool (**Photo 7** and Sources). Learning to use this tool takes practice, so experiment on scrap materials, or plan to sacrifice a few top bodies as you get the hang of it. Here's a tip: a chatter tool makes a high-pitched noise when it's working properly. The lathe's speed, how hard you push, and how fast you draw the tool across the surface all effect the chat-

To see how Alan creates the marbled finishes, go to www.AmericanWoodworker.com/146/MarbledTop

Tool Talk



Create interesting texture with a chatter tool. A chatter tool's thin shaft is designed to vibrate when it contacts the wood, causing its tip to leave squiggly marks on the surface.



To chatter the top of the body, move the tool rest back and hold the chatter tool as shown. Start near the center and draw the tool toward the edge.



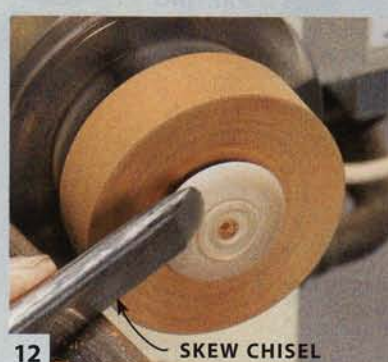
Accentuate chatter marks with color. Use a delicate touch to color only the high points, or flow the color into the crevices and then sand lightly, to remove the color from the high points.



Free the completed body by cutting in with the narrow parting tool. Catch the body in your hand or let it to fall onto a paper towel draped over the lathe's ways, and you're ready to go again.



To finish turning the body's bottom face, turn it around and re-mount it on a stub spindle that you've turned on a scrap block.



Complete the bottom face with light cuts and finish-sanding.

ter pattern. (Photo 8).

9. Another option is to add rings of color, using Japanese paint pens, such as Tombow dual brush pens (Photo 9 and Sources). Color adds interest to both chattered and smoothly sanded surfaces.

10. Part off the top body, either catching it in your hand or allowing it to fall into a paper towel (Photo 10).

11. Turn as many top bodies as the blank allows, until about 1" remains protruding from the chuck.

12. Using the narrow parting tool, turn a 1/4" dia. spindle on a scrap block, so you can mount the bodies backwards, to finish the bottoms (Photo 11). This spindle should be slightly longer than the

bodies' thickness. The goal is a fit that's snug enough to allow working the body, yet free enough to allow removing the body when it's done. Turning this spindle is actually great practice for an upcoming step—turning the hub that secures the body to the shaft. Finish the bottom face of each body to the same level as its top face (Photo 12).

Turn the shaft

13. I turn the shafts one at a time. Start by mounting and truing a blank (Photo 13).

14. Rough out the shaft's components (Photo 14). I usually make the hub a bit longer than the body's thickness, and the gripping area

(for spinning the top) about 1-1/4" long. I like to make the gripping area pretty slender, but not less than 1/8" dia. Finish-sand the gripping area.

15. Create a cradle to seat the body (Photo 15).

16. Size the hub (Photo 16).

17. Shape the bottom, but don't cut it off just yet (Photo 17). Finish-sand the bottom. Do not sand the hub, where the body mounts.

18. Use the skew chisel or the narrow parting tool to cut the shaft from the blank, leaving the bottom's spinning point slightly rounded.

19. Assemble the top (Photo 18). If the fit isn't quite tight enough, a small amount of glue will hold the two pieces together.

No-Frills Mounting



Here's how to mount both blanks without using a scroll chuck. Shape the end of the blank for the top's body to a #2 Morse taper, so it fits snugly inside the drive shaft. Turn a concave shoulder on the blank, so it nests firmly against the driveshaft threads. Use the knockout bar for removal.



To mount the blank for the shaft, simply jam a 9/16" square length into the drive shaft. You can chamfer the corners at the end if you want, to make it easier to get started. Again, use the knockout bar for removal.

Sources

- Packard Woodworks, www.packardwoodworks.com, (800) 683-8876, Talon 3-1/2" 4-Jaw Scroll Chuck, #112670, \$225; Talon #1 Spigot Jaws, 112671, \$40.95; Jacobs-Type Chuck #2MT, 111012, \$36.95; Dennis Stewart Chatter Tool, #106419, \$54.95.
- Dick Blick, www.dickblick.com, (800) 828-4548, Tombow Dual Brush Pens, #21334-0069, Set of 6 Bright Colors, \$12.99.

Alan Lacer is a woodturner, writer and instructor who lives near River Falls, WI. You can find out more about Alan and his work at www.alanlacer.com.



13

To create the top's shaft, start with a 1/2" square x 3" long blank mounted in the scroll chuck. Turn the blank round with the spindle roughing gouge or skew chisel. Then taper the end.



14

Rough out the shoulder that will seat the top's body, the hub that it will mount on, and the gripping area for your fingers. Reduce this area to a diameter that's smaller than the hole in the top's body.



15

Create a cradle to seat the disc-shaped body by hollowing the shoulder with either the skew or a narrow parting tool.



16

Here's the tricky part. Turn the hub's diameter to snugly fit the hole in the body—tight enough to hold the body on, but not so tight that you can't remove it. This step requires patience and lots of test fitting.



17

Shape the bottom like the outside of a tiny bowl, and create the spinning point as you part off the shaft. The spinning point's tip should be slightly rounded.



18

Press the body onto the shaft and give the top a spin.

Mastering the Router Table

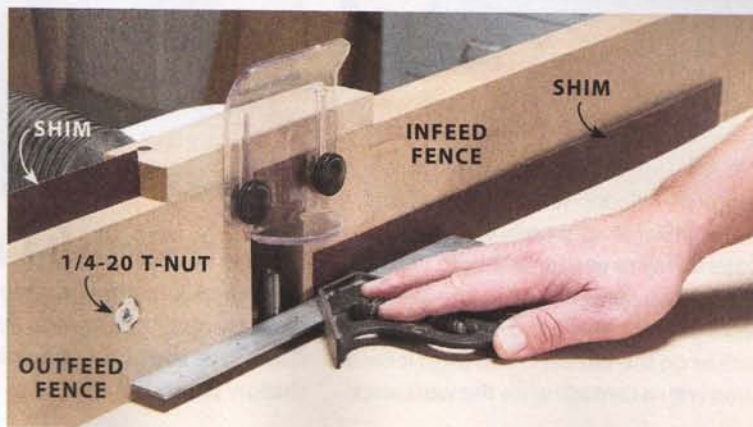
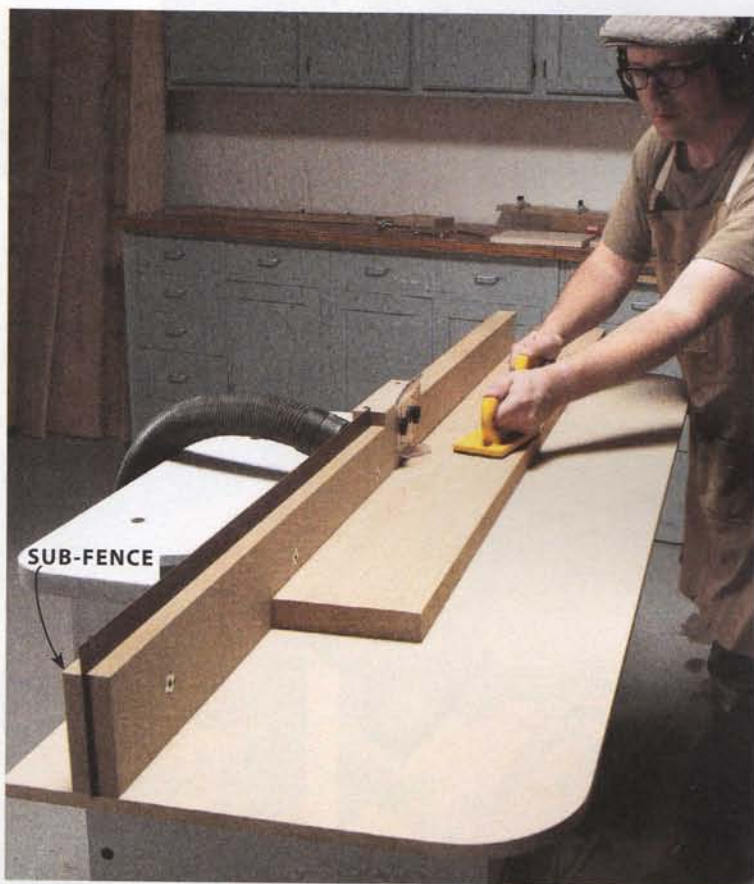
Edge Jointing

If you don't have a jointer, this is a really slick way to straighten the edges of your boards. You'll need a long, straight router bit (the larger its diameter, the better) and an auxiliary table.

To build the table, make a $1/2" \times 18" \times 72"$ MDF base. For the infeed fence, glue two pieces of $3/4" \times 4" \times 35"$ MDF, then glue and screw this assembly to the base, 4" from the base's back edge. The outfeed fence is composed of two separate pieces: a subfence, which is glued and screwed to the base, and a face, which is fastened to the subfence. Both the subfence and face are single pieces of $3/4" \times 4" \times 35"$ MDF. Fasten the two pieces together with three $1/4-20$ bolts and T-nuts, then take them apart. Glue and screw the subfence to the base, exactly parallel to the back side of the infeed fence. Next, make a shim from plastic laminate or other thin material. Cut it the same size as the outfeed fence and notch it to fit around the bolts between the subfence and face. Place the shim on the subfence, then bolt the face to the subfence.

To set up the jointing table, loosely clamp it to the top of your router table (place the clamps on the back side of the base). Next, place a piece of the shim material on the front of the infeed fence. Place a straightedge on top of the shim, and align the table so that the straightedge is flush with your router bit (see photo at right). Tighten the clamps.

You should be all set to go, but test the setup with a scrap board first. The depth of cut should exactly equal the thickness of the shim. If it's not, loosen the clamp on the infeed side of the jointing table and rotate the table a bit to increase or decrease the depth of cut.

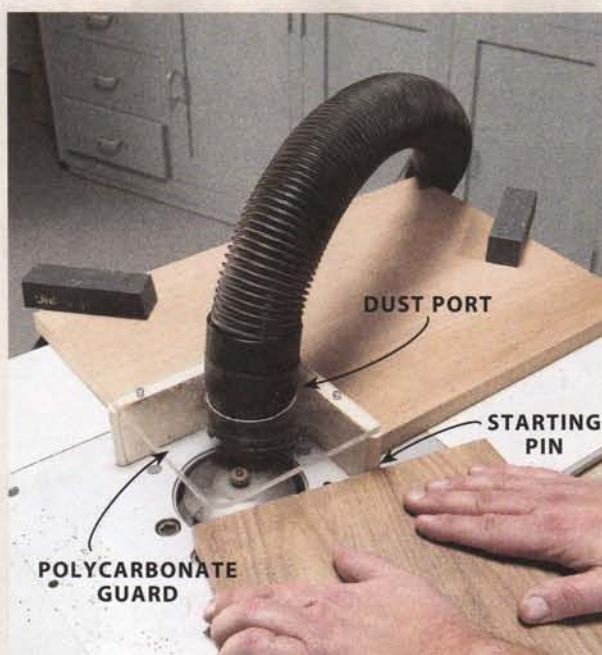


Mastering the Router Table



Tall Fence

A tall fence is essential for running large parts on edge. Use it with vertical panel-raising bits, lock miter bits, drawer-lock bits, etc. Support blocks on the back secure the fence at 90° and house a dust collection port. An adjustable guide bar holds the workpiece against the fence.



3-in-1 Jig

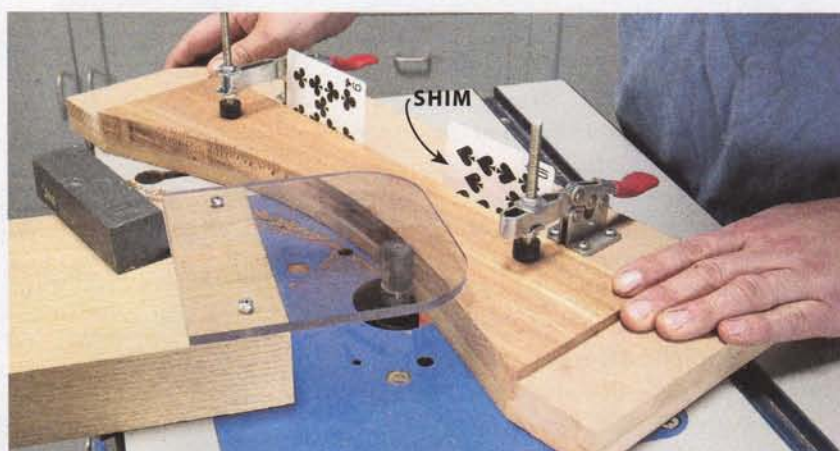
If you find large bits intimidating—especially when you can't use a fence—join the club. Here's a 3-feature jig that controls the cutting action as well as the dust.

First, it has an integral starting pin (a rounded corner on the right wing). The pin is a pivot point for rocking your work into the bit, making the cut easier to start. Second, it has a 1/4" polycarbonate guard, which helps keep your fingers away from the bit while allowing you to see what you're doing. And third, it has a port for a dust collection hose. The jig's wings help direct dust into the hose.



Half Template

Why make a full template when a half template will do? Many furniture parts have similar shapes on both ends. The easiest way to ensure that both ends match is to make a single template and flip it over to rout each end. Mark a centerline on the template and align it each time with a centerline on the workpiece.



Micro-Finish Cut

Here's a trick to remove a burn from pushing your workpiece too slow, or to erase tearout from routing against the grain: Make your template so that it cuts a little shy of the layout line. Then, slip in a couple of shims for a final, shallow pass.



Angled Cut

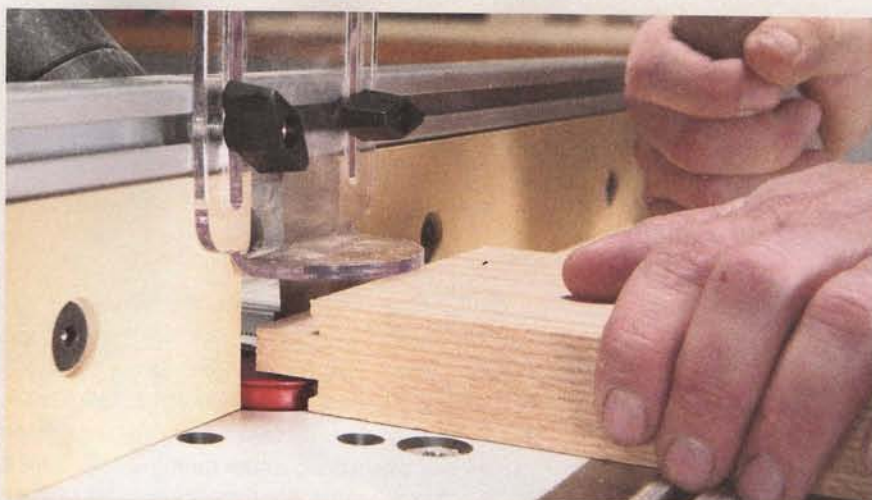
To make an unusual profile, you can run a board at an angle to the fence by clamping a guide rail to your table's top. Saw a kerf in the guide rail to help steady the workpiece.



Push Block

Use a push block to rout narrow parts, such as door rails. A push block steadies the part and prevents blow-out on the back of the cut.

Make the block about 1-1/2" thick and trim it perfectly square. Screw a handle of any type to it. After each use, trim off the routed portion of the block in order to present a fresh surface for the next job. Reposition the handle as needed.



Bit for Long Tenons

A drawer lock bit is designed to make a mating pair of corner joints, but it can also be used to make tenons up to 1-3/4" long. It's better than using a small diameter straight bit, which can leave an uneven surface and requires moving the fence a few times. A drawer lock bit is about 2" in diameter, and has cutting edges on its top surface that may cut the entire length of a long tenon in one pass.

Raise the bit in steps to avoid hogging off too much material. Square the tenon's shoulders with your tablesaw.

Source: Freud, www.freudtools.com, (800) 334-4107, #99-240 2" Drawer Lock Bit, \$30.



Handled Template

Even with guards in place, template routing can leave your fingers vulnerable. To remedy this, glue or screw handles to the template. Nothing fancy required—plain blocks will do.

10 Key Features

What's the most useful piece of woodworking equipment introduced in the last 20 years? We think it's the router table.

Router tables have come a long way since someone first mounted a router under a piece of plywood. We've seen a lot of router tables at *American Woodworker*, and built quite a few ourselves. They've ranged from basic models to very sophisticated machines. Basic router tables can perform a few jobs quite well, but may be awkward to set up. Sophisticated router tables can tackle a wider range of work, and are more convenient to use.

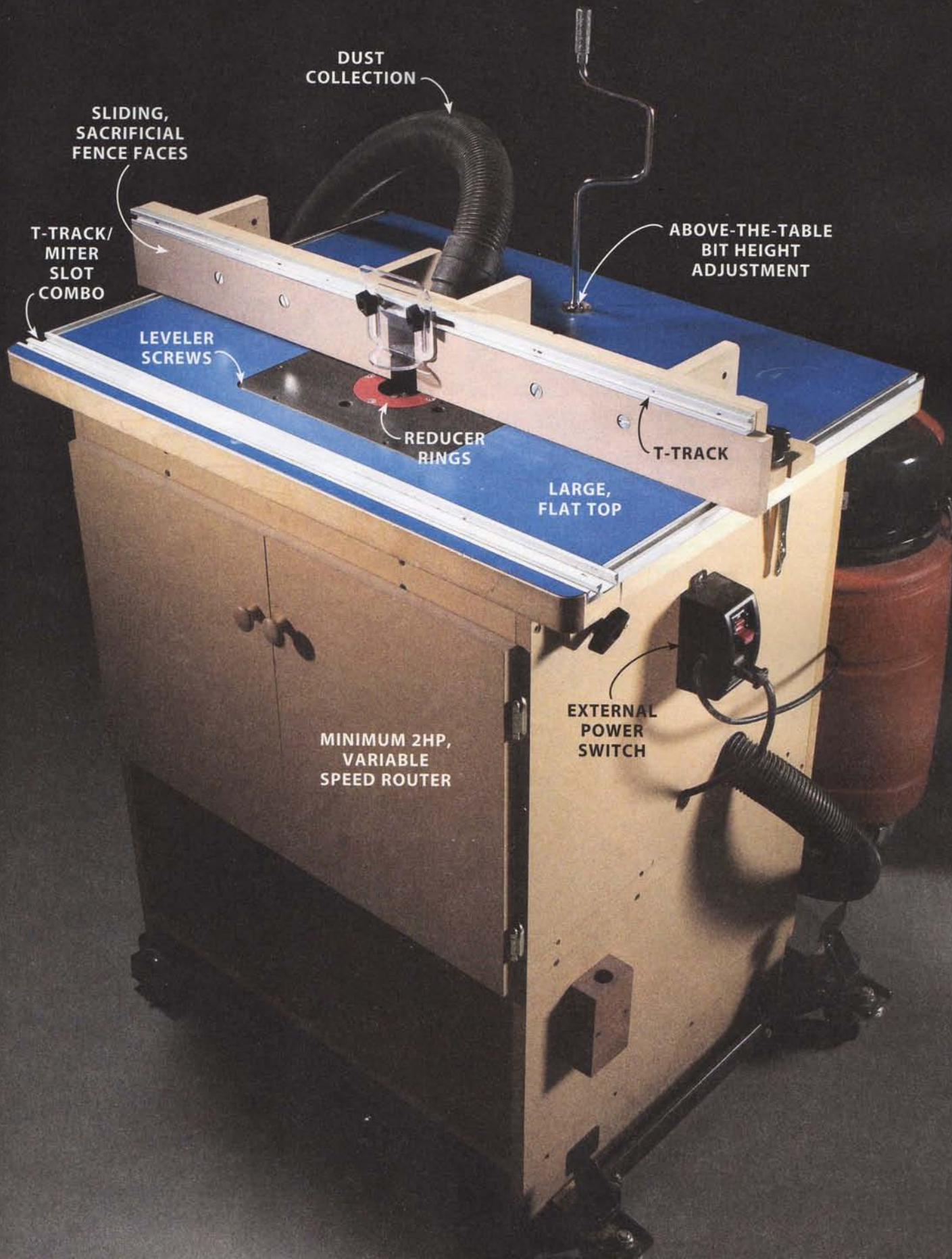
What would an ideal router table look like? We've put together a shop-made unit that combines all the best features we've seen so far. Here are ten of the most important ones:

- **A LARGE, FLAT TOP.** A big top helps prevent work from tipping. A top must be flat, to within a paper thickness from end to end, so a cut doesn't vary down the length of a board.
- **A FENCE WITH SLIDING, SACRIFICIAL FACES.** For safety's sake, the opening around a bit should be as small as possible. Cutting a bit's profile into a fence's face reduces tearout.
- **POWERFUL ROUTER.** You'll need a router with at least 2 hp, and variable speed, to run bits that remove lots of material.
- **T-TRACK ON THE FENCE AND TABLE.** Use this for mounting stops and featherboards. Featherboards make cuts safer and more consistent.
- **DUST COLLECTION.** There should be one dust collection port above the bit and another under the table.
- **LEVELING SCREWS UNDER THE INSERT PLATE.** The plate must be exactly even, all around, with the top of the router table.
- **REDUCER RINGS.** The insert plate should accommodate rings of different diameters, to minimize the opening around the bit.
- **ABOVE-THE-TABLE BIT HEIGHT ADJUSTMENT.** A commercial or shop-made lift, or a mechanism built into the router, is very convenient for fine-tuning a bit's height. On some routers, the spindle has enough travel to allow you to raise the collet above the table. That's handy for changing bits.
- **EXTERNAL POWER SWITCH.** It's easier to turn the router on and off from outside the table than fumbling with the switch on the router.
- **MITER SLOT.** Routing the ends of narrow boards is much easier if you guide the pieces with a miter gauge. Alternatively, you could use a sled.



To see complete plans for a top-notch router table, go to
www.AmericanWoodworker.com/146/AWRouterTable

Mastering the Router Table



DUST
COLLECTION

SLIDING,
SACRIFICIAL
FENCE FACES

T-TRACK/
MITER
SLOT
COMBO

LEVELER
SCREWS

REDUCER
RINGS

ABOVE-THE-TABLE
BIT HEIGHT
ADJUSTMENT

T-TRACK

LARGE,
FLAT TOP

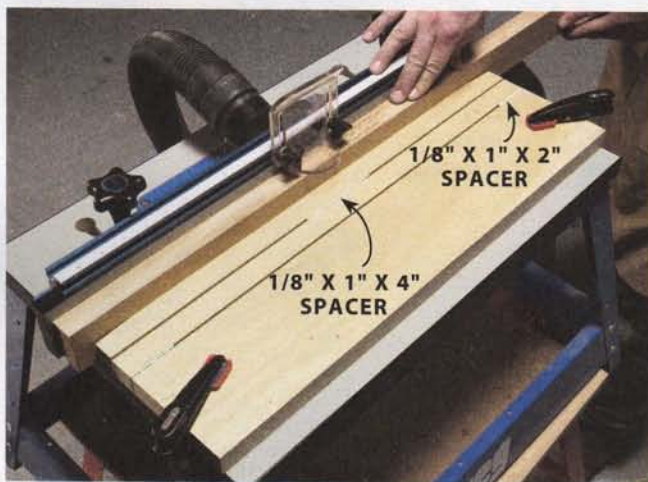
EXTERNAL
POWER
SWITCH

MINIMUM 2HP,
VARIABLE
SPEED ROUTER



Flush Cutting

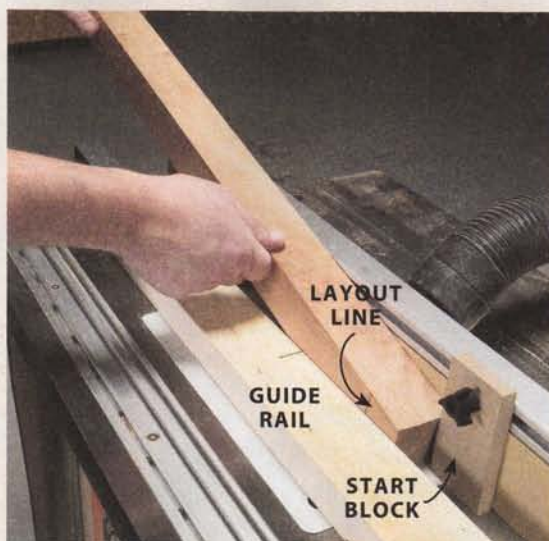
To flush-cut thick edge banding, screw auxiliary 3/4" x 12" x 12" faces on both the infeed and outfeed sides of the fence. Position these faces so there's a gap underneath them. The gap should be large enough to allow the edge banding to slide underneath. Install a straight bit, align the fence flush with the bit, and you're ready to trim.



Springboard

This is a nice alternative to a featherboard. A featherboard only covers a small area, but a springboard provides support the whole length of the fence—in a really clever way.

Make the board from solid wood, 1" thick, about 7" wide, and as long as your fence. Rip two 1" strips from the board's edge. Glue the first strip back on with a 1/8" x 1" x 2" spacer at each end. Glue the second strip back on with a 1/8" x 1" x 4" spacer in the center.



Mortising

Router table mortising is simple—but it's usually not safe to do it freehand. You'll need one or two stop blocks and a guide rail.

Adjust the bit and the fence first, to set the depth of the mortise and the mortise's distance from an outside face. Clamp a guide rail in front of the fence, using the piece you will be mortising as a spacer.

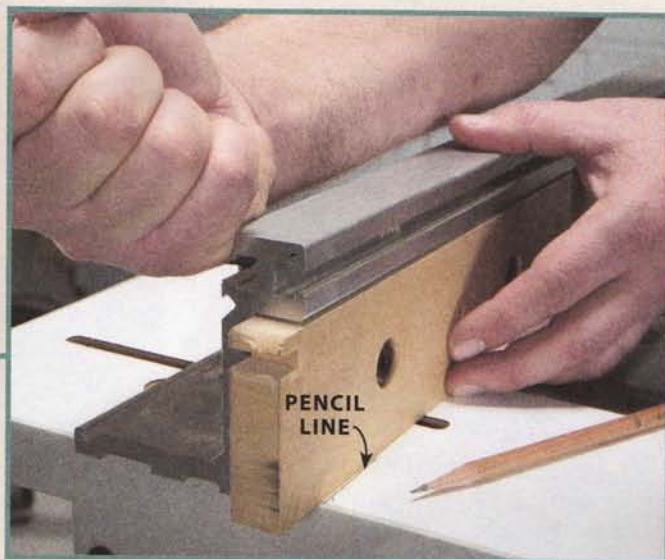
To rout the mortise, lower your workpiece onto the bit, and then move the workpiece from right to left. To control the mortise's length, clamp start and stop blocks to the fence or table. (For safety, it's always a good idea to begin the cut by resting the piece against the start block on the right side of the router table.) If your workpiece is too long for blocks to work, use layout lines on the workpiece and start and stop lines on the guide rail.

3 Micro-Adjust Methods

Accurate cuts usually require precise adjustments to the fence. Here are three tried-and-true methods.

No-Tech Bump

Mark the fence's location on the table's surface using a sharp pencil. Loosen the fence's clamp at that end, and bump the fence with your fist until half or all of the line is covered by the fence. Re-tighten the clamp.

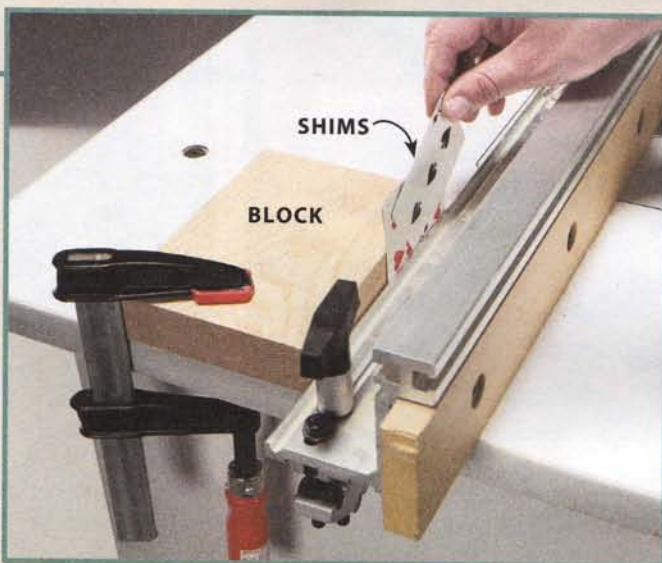


Low-Tech Shims

This method may look crude, but it's really very precise. The basic idea is to use shims to position the fence.

Here's how it works: Place a number of shims behind the fence and clamp a block to the table, tight against the shims. Loosen the fence's clamp nearest the block and add or subtract shims to re-position the fence.

Using playing cards as shims, you can move a 24" long fence in increments of approximately 0.01", measured at the bit—half the thickness of a card. Using standard copier paper, you can adjust the fence by as little as 0.003", give or take a few thousandths.

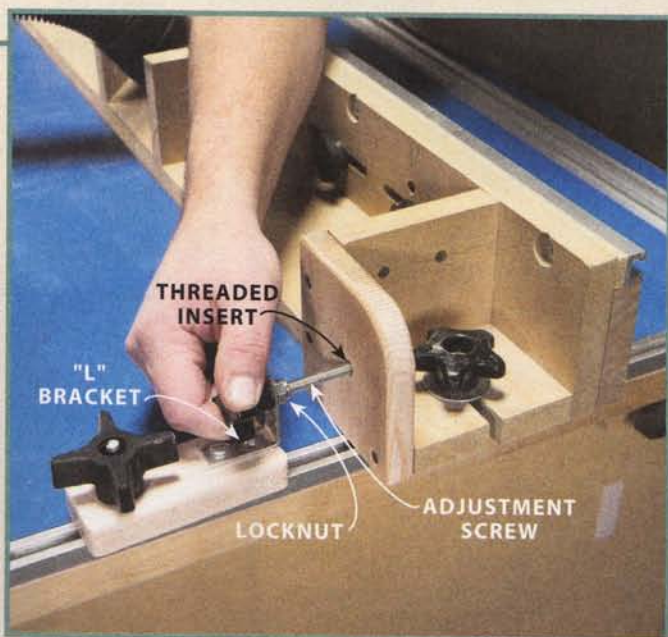


High-Tech Bolt

Well, not that high-tech, really—no electronics are involved. This micro adjuster is an elegantly simple mechanical device. It's just a block, clamped to the table, that's connected by an adjustment screw to a plate that's fastened to the fence.

To make the adjuster, screw a small L-bracket to the front edge of the block. (I used T-track and a threaded knob to clamp this block, but you can omit the T-track and use an ordinary clamp to achieve the same result.) Slide a bolt with a knob attached to it through a hole in the bracket's arm. Thread a locknut onto the bolt, tight against the L-bracket. Drill a hole in the plate and run a threaded insert into the hole. Fasten the plate to the fence and thread the bolt into the insert.

To use the adjuster, position the fence close to where you want it, then clamp the block to the table. Turn the handle on the bolt to move the fence. Clamp the fence before routing.





Fluting Setup

Here's a simple way to move the fence in large, evenly spaced steps. It's perfect for routing flutes or beads.

Position the fence to cut the flute that requires the fence to be the farthest distance away from the bit. Clamp a board to the table, butted against the back of the fence. Cut the flute, then loosen the fence and insert a spacer between the clamped board and the fence. Rout the next flute, and continue with as many spacers as needed.



Small Parts Handle

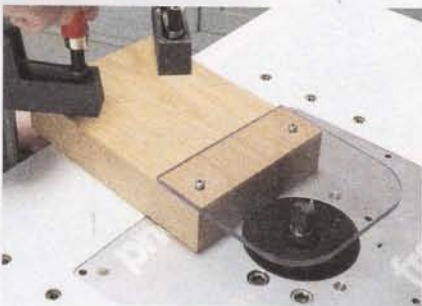
When you rout a small part, get your fingers out of harm's way by hot-gluing a handle onto it. When you're done routing, cut the part free on the bandsaw.



Setup Blocks

The most time-consuming part of making stile and rail doors is setting the bits to the right height and depth. The next time you're routing door parts, make an extra stile and rail to record these exact settings.

Cut off the ends of the stile and rail and save these pieces as setup blocks. Label them with pertinent information, such as the bit used and the stock thickness.



Fence-less Guard

When you can't use a fence, you should still use a guard. To make one, screw a piece of 1/4" polycarbonate to a block of wood and then clamp it to your table.



Zero-Clearance Fence

If tearout is a problem, rout into your fence to make a zero-clearance opening. This works best when your fence has sacrificial faces that can slide back and forth.

To rout a profile into one of the faces, align the fence with the bit and clamp the fence to the router table. Loosen the face's clamping screws, position the face well away from the bit, turn on the router, and gradually feed the face into the bit.



THE GIFKINS BOX

"**THE GIFKINS IS EATING MY WOOD!**" claimed the post on an Australian woodworking forum. "What the heck is that?" I wondered, "a newly discovered marsupial?" I quickly learned that "the Gifkins" is a dovetailing jig that's designed for use on a router table. It's similar to most other dovetailing jigs, except that it's upside down—just as someone might expect from a jig made in Australia (See "A Dovetail Jig for the Router Table," page 53). This jig was appealing because it's perfectly sized for making small boxes, which are one of my special interests. And unlike routing with a typical dovetail jig, you can see exactly what you're doing with the Gifkins jig, because of its "Aussie" orientation.

A new jig routs perfect dovetails and finger joints on the router table

by Doug Stowe

To thoroughly test my new jig, I decided to make some boxes with dovetailed corner joints and finger-jointed wooden hinges. But you don't have to have a Gifkins jig to make these boxes. You can cut the dovetails by hand, or make them with a regular dovetail jig that's equipped with a template for small dovetails. And you can create the finger joints on the tablesaw with a shopmade jig.



To see how to make finger joints on the tablesaw, go to: www.AmericanWoodworker.com/146/BoxJoints

Make the box pieces

Accurately mill and cut the box sides and ends (A and B, Fig. A, page 50 and Cutting List, page 54), including extra pieces to use for test cuts. For the jig to work effectively, the edges of each piece must be parallel, their ends must be square, and all of the pieces must be uniform in thickness (Photo 1).

Dovetail joints have pins on one board and tails on the other. Set up the Gifkins jig to create tails in the end pieces first. Position the stock so its outside edges are precisely centered on the template fingers. Then set the jig's adjustable stops. Install the dovetail bit and set its height slightly higher (about 1/32") than the combined thickness of the template and the stock. This will make the ends of the tails protrude slightly when the joint is assembled, so they can be easily sanded flush. Rout tails on both ends of both end pieces (Photo 2).

To rout the pins, remove the dovetail bit and install the straight



1 Start by preparing the box pieces. A sled and a stop block are great for making repetitive cuts, especially if you're making multiple boxes.



2 Rout tails in the end pieces first, after setting the jig's adjustable stops to correctly hold the workpiece in position. Once the stops are set, routing is a breeze.



3 To rout pins in the side pieces, simply change to a straight bit and turn the jig around. The stops automatically position each workpiece correctly.

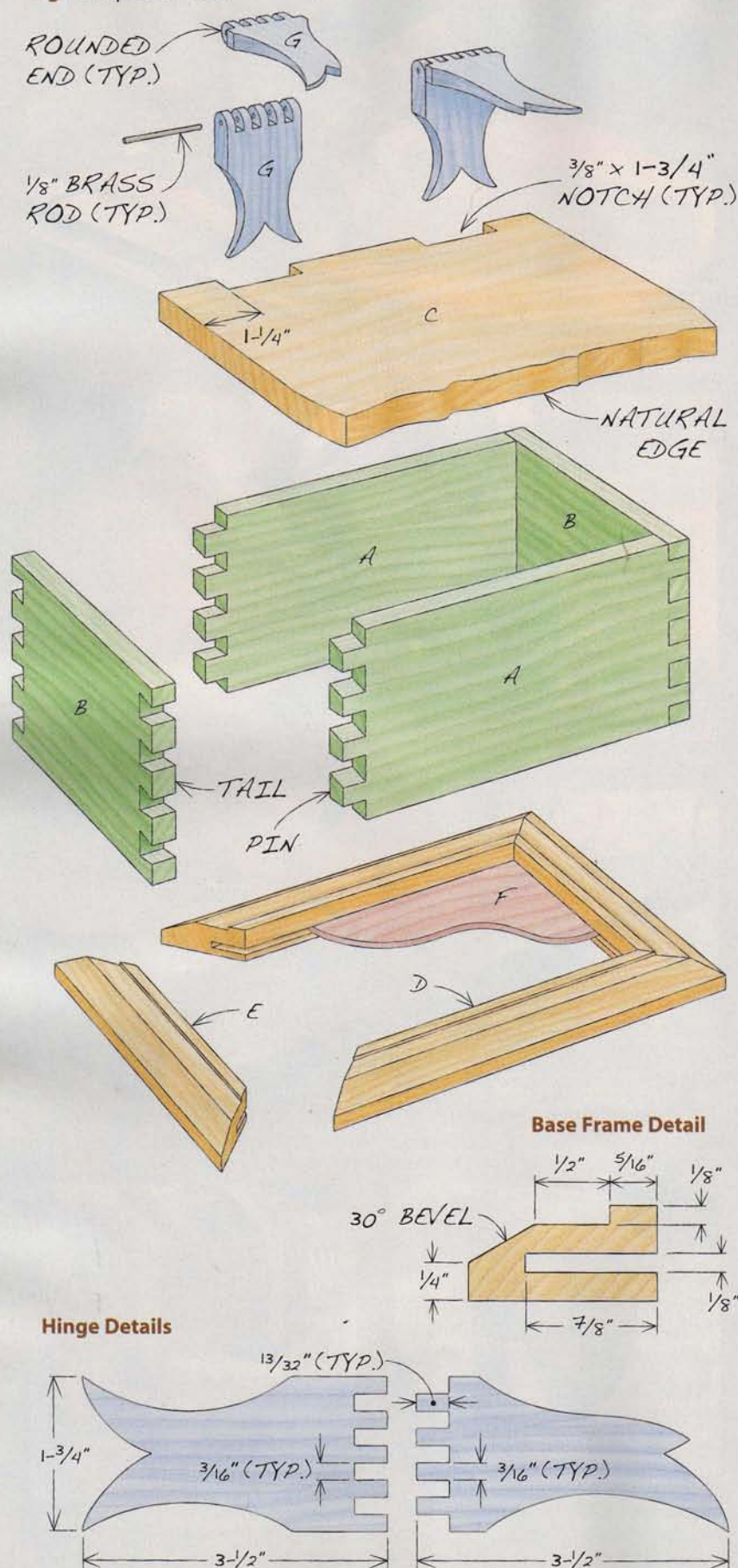


4 Glue each box together after spreading glue on the pins.



5 Large rubber bands act as clamps and make it easy to remove the squeezed-out glue.

Fig. A Exploded View



bit at the same height, slightly proud. With other dovetail jigs, the template has to be flipped between routing the tails and the pins. You simply turn the Gifkins jig around and use the other side. Install a test piece and rout the pins (**Photo 3**). Assemble the joint without glue to test the fit. (You can adjust the fit by adding or removing paper shims between the sacrificial face and the workpiece on this side of the jig.) When the fit is satisfactory, rout pins on both ends of both side pieces. Then glue the box together (**Photos 4 and 5**).

Make the lid and the base

To add interest to the boxes, I chose a piece of spalted maple for the lids (C), and took advantage of its natural (or "waney") edge (**Photo 6**). First, cut each lid oversize, bearing in mind that it overhangs the box by about 3/8" on all four sides—the front overhang may vary because of the lid's natural edge. Joint the back edge to create the desired overhang on the front. Then cut the lid to length (**Photo 7**).

Plane stock for the base frame (D and E) and rip it to width. Then miter the ends of each piece, making sure that each pair (the two sides and the two ends) are identical in length. Next, cut deep grooves in the inside edge of each piece for the bottom panel (F). Glue the base together (**Photo 8**).

Create a lip to position the box on the base. Set the fence at 1/2", raise the blade to 15/16", and cut rabbets all around (**Photo 9**). Then bevel the edges, leaving a 1/2" wide flat surface for the box to sit on. Sand the base and the box, and glue them together (**Photo 10**).

Make the finger-jointed hinges

Creating finger joints for the wooden hinges (G) requires the Gifkins finger joint template and dedicated bit (they're packaged together as an extra cost accessory item). You'll also need a spacer that's included with the jig. The process is similar to routing dovetails, but a bit more complex. Installing the hinge pins so the hinge operates smoothly is a bit tricky, too, so it's a



6

Create an interesting lid by using a board with a natural edge. Slide each box along the board to find a pleasing profile. Mark each location and then cut out the lid.



7

Cut each lid to final length.



8

Glue the base together after mitering the frame pieces and cutting grooves for the panel. Apply a bit of glue in each groove to lock in the panel.



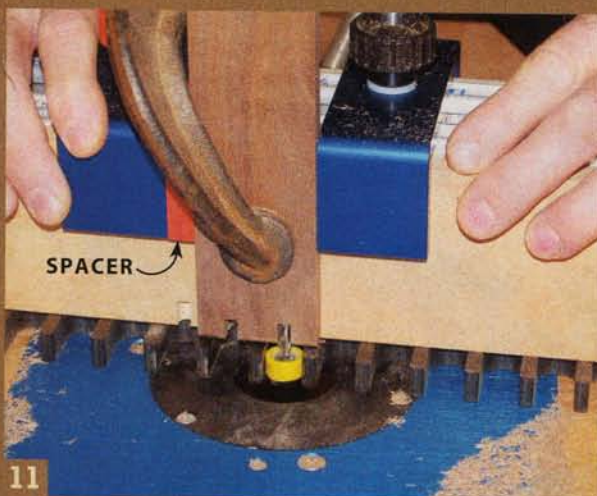
9

Shape the profile on the tablesaw. Stand the base on edge and rabbet each face, to create a lip for the box to fit around. Then reset the fence and tilt the blade to bevel the edges.



10

Glue the box on the base after spreading a bead of glue around the lip. This method virtually eliminates squeeze-out.



11

Routing the fingers for the wooden hinges requires two steps, because the fingers are so small. Make the first cuts with the spacer on one side of the hinge blank.

good idea to make extra hinges and use only the best ones.

Size the width of the hinge stock according to the width of the joint fingers. Start with an 8" long blank (long enough to include both hinge parts) and plan to create one hinge knuckle at each end before cutting the blank into two pieces. The first step is to round both ends of the blank to create the hinge barrels. I complete this step on the router table, using a 3/16" roundover bit. Prepare extra blanks for making test cuts and extra hinges.

Routing each hinge part requires two steps (**Photos 11 and 12**). Set-up is the same as for routing dovetails, except for inserting the spacer. And as with routing dovetails, the

two parts of each hinge are created on opposite sides of the jig.

You can fine-tune the joint's fit by changing the plastic sleeves that install over the bit's guide bearing. For wooden hinges, the fit between the fingers should be slightly looser than it would be for a corner joint.

For a hinge to operate smoothly, its pin holes must be perfectly centered. As small bits tend to flex and wander when drilling deep into hardwoods, it's a good idea to install the bit as far as possible inside the drill press chuck, so the shortest length is exposed. I go even further, by grinding down a drill bit to shorten it. The other part of my strategy to keep the holes perfectly centered is to drill over halfway through the hinge from

each side, so the holes meet in the middle.

I use a fence and stop block on my drill press to accurately position the hinge parts for drilling, and I link the hinge fingers in place, holding both halves carefully against the fence and stop block at the same time (**Photo 13**). Set the depth stop to drill just over halfway through. You'll feel the bit enter the hole when you drill through from the opposite end. Assemble the hinges and install the brass hinge pins (**Photo 14**).

Fit the hinges to the lid

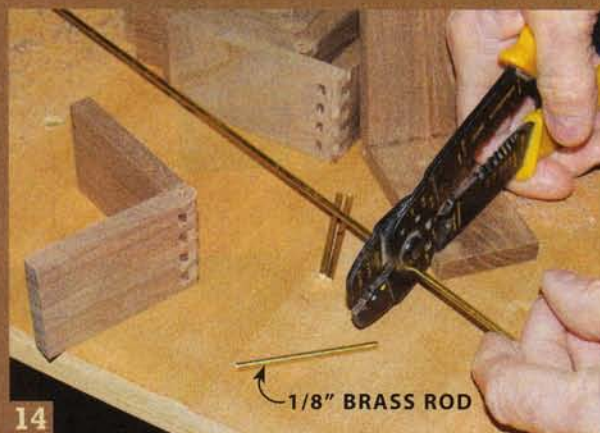
In order to maintain an equal overhang on all sides of the box, cut notches for the hinges in the back edge of the lid (**Photo 15**). These



12 Rout the remaining fingers after moving the spacer to the other side of the blank. To create the matching hinge part, simply turn the jig around and repeat the two-step process on the other end of the blank.



13 Drill the pin hole with the hinge assembled. Advance slowly and carefully, to keep the tiny bit from wandering. Drill slightly over halfway through, then turn the hinge over and drill to the same depth from the opposite end.



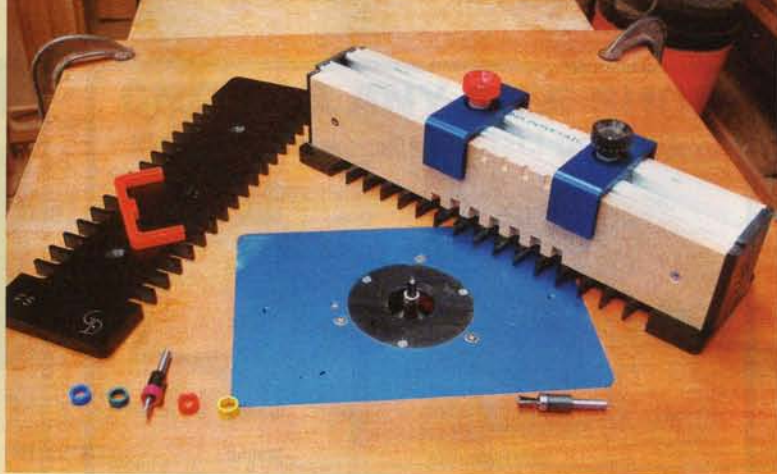
14 Cut the hinge pins to length. Then sand a slight taper on the ends, so they'll guide themselves through the holes in the hinge fingers as you tap them into place.



15 Cut notches for the hinges in the back edge of the lid, using a pair of stop blocks and multiple passes. After cutting the first notch, flip the lid around to cut the second notch.

A Dovetail Jig for the Router Table

IMAGINE TURNING A TYPICAL DOVETAIL JIG upside down, so you could use it on a router table. Make it easy to use and virtually goof-proof, and you've got the Gifkins jig. This jig holds a two-sided finger template that allows routing tails on one side, using a dedicated dovetail bit, and pins on the other, using a dedicated straight bit. Adjustable stops position the workpiece—one setup works for both operations. Sacrificial faces on both sides of the jig minimize blowout. The Gifkins jig comes equipped for routing through dovetails with 3/8" pins in stock up to 1/2" thick and 12" wide. The pin spacing is fixed at 13/16", although spacers for adjusting the pin locations are available as an extra cost accessory. Other accessories include additional templates and dedicated



bits that allow routing dovetail joints of different sizes, as well as finger joints (also called box joints). To make the wooden hinges for this project, I used the finger joint template kit (shown above, on the left).

Source: Japan Woodworker, www.japanwoodworker.com, (800) 537-7820, Gifkins A10 Boxmaker's Dovetail Jig, #95.900.10, \$269; F-5 Finger Joint Template and Cutters Kit, #95.907.05, \$180.



16

Shape one hinge and then use it as a pattern for the other hinge. Leave the edges square where the hinge fits the notch in the lid.



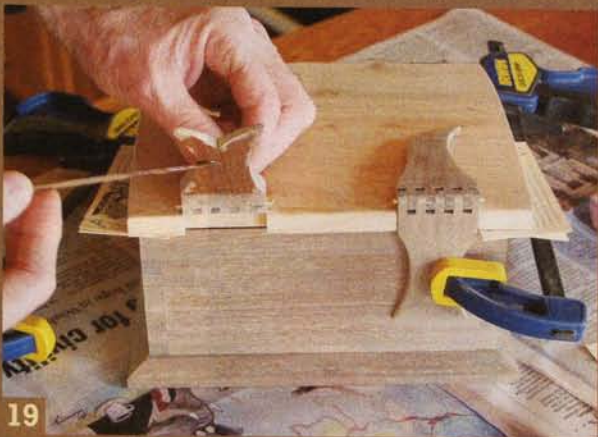
17

Taper the hinge faces, using the stationary belt sander. This takes a firm and careful grip.



18

Use your eye to shape the ends of the lid, so the organic feel of the lid's natural front edge continues around the sides.



19

Attach the hinges to the box with epoxy. Glue the hinges to the top first. Then glue them to the box. Insert business card shims to slightly lift the lid, so it won't bind at the back of the box.

Cutting List: Overall Dimensions: 9" L x 7" W x 4-15/16" H

Part	Name	Qty.	Material	Th x W x L
A	Side	2	Walnut	7/16" x 3-1/2" x 8-1/16"
B	End	2	Walnut	7/16" x 3-1/2" x 6-1/16"
C	Lid	1	Spalted Maple	1/2" x 6-3/4" (a) x 8-3/4"
D	Base Frame Side	2	Walnut	5/8" x 1-1/4" x 9"
E	Base Frame End	2	Walnut	5/8" x 1-1/4" x 7"
F	Base Panel	1	Baltic Birch	1/8" x 6-1/4" x 8-1/4"
G	Hinge	4	Walnut	3/8" x 1-3/4" x 3-1/2"

(a) The lid's width may vary because of its natural front edge.

cuts will also help to accurately position the hinges when it is time to glue them in place. Shape the hinges to make them lighter and more decorative (**Photo 16**). I draw the shape freehand and then cut the design on the scroll saw. Taper the hinge faces by sanding (**Photo 17**).

Install the hinges on the lid (without glue), place the assembly on the box, and have a look. If the straight, square profile of the lid's ends appear to be at odds with its natural front edge and organically shaped hinges, consider tempering them (**Photo 18**). Sketch a line and then create the shape by sanding or hand-planing. Finish sand the lid and the hinges.

Final assembly

Use quick-setting (5 minute) epoxy to attach the hinges to the box lid and base (**Photo 19**). First, apply a very thin layer to the upper hinge leaves and clamp them in place on the lid, using the notches to precisely locate them. Before the epoxy sets, make sure that both hinges are square to the lid's back edge. Remove the clamps after the epoxy has set. Then spread a thin layer of glue on the lower hinge leaves and clamp them to the back of the box.

Apply your preferred finish. I use three coats of Danish oil. I apply the first two coats within thirty minutes of each other. After about 45 minutes, I carefully rub the second coat with a dry cloth. The next day, I apply the third coat, allow it to sit 45 minutes or so, and then carefully rub. This method produces a lustrous satin finish.

Replace a Defect with a Diamond!



Here's how to disguise a small defect that appears in an inopportune spot (left). This one is too deep to remove by sanding or scraping, and wood putty won't match. The best solution is to shape a small diamond from wood with matching grain and color to use as a plug. Why a diamond? Because once installed, a dia-

mond-shaped plug—especially one that's asymmetrical—is much less noticeable than a round or square plug. Place the diamond over the defect and trace its outline on the surface. Next, remove the waste and establish a uniform hole depth by drilling inside the outline with a small Forstner bit. Then chisel at the inside edges of the marked lines to create a diamond-shaped hole (A). Spread glue inside the hole (B), and then tap the diamond into place, using a block of wood to evenly distribute the force, so the hammer won't mash the delicate patch (C). Let the glue dry, and then level the diamond to the surrounding surface, using a block plane and/or a sanding block. Pencil in grain lines to add to the illusion, and the patch should be almost invisible (D).



DOUG STOWE began his career as a woodworker in 1976, making custom furniture and small boxes. In 1995, he began writing how-to articles for a variety of woodworking magazines. His first woodworking book was published in 1997 and his sixth in the fall of 2009. Doug is the author of two Taunton DVDs, "Basic Box Making" and "Rustic Furniture Basics."

MDF Faux Panel Doors

Rout raised panel look-alikes in minutes.

by Ralph E. Sullivan

RAISED PANEL DOORS made with traditional stile and rail joinery are my first choice for cabinets. But I don't always use them. For example, cabinets for the shop or laundry room usually don't require fine woodworking. But that doesn't mean they can't have good-looking doors, especially

if the doors can be made in minutes, instead of hours.

Here's how to turn a piece of MDF into a door that mimics its traditional counterpart without going through all the traditional time-consuming steps. Making doors in multiples is a breeze with this method (**Photo 1**). The only

caveat is that these doors must be painted—unless, of course, you're a fool for the look of "natural" MDF.

The basic process requires a specialty router bit (**Photo 2** and Source, page 58), a shopmade template, and a plunge router equipped with an edge guide.

Start by cutting a piece of MDF to the finished size of the door. Then make a template that has the same outside dimensions. Use solid wood for the template's stiles and rails and assemble it with pocket screws. The stiles and rails must all be the same width and the joints must all be flush. Attach the template



to the door blank with 1" finish nails (**Photo 3**). I pre-drill shank holes for the nails in the template.

If you're making multiple doors of different sizes, you'll need one template for each size. My strategy is to make the largest doors first. When these doors are finished, I disassemble the template, cut the stiles and rails down to fit the next size door, and reassemble the new, smaller template.

Install the plunge-grooving bit in your router and set the plunge depth (**Photo 4**). Attach the router's edge guide and adjust it (**Photo 5**). Leave a little play in the setup.

Rout each profile in two passes (**Photo 6**). Make the first pass while pressing the edge guide against the template's outside edge. Make the second pass with the bit's bearing pressed against the template's inside edge. This method creates a slightly wider groove, but it guarantees that both sides of the groove will be straight.

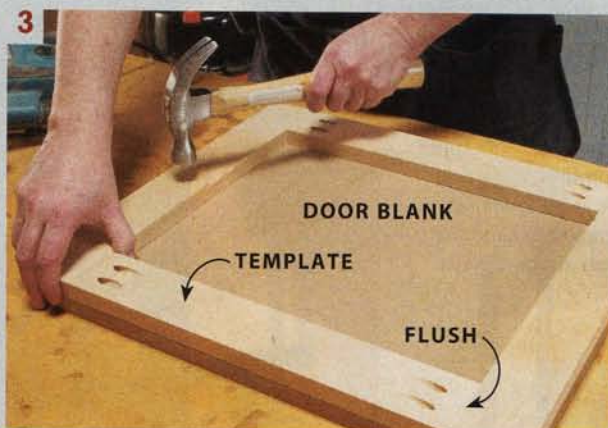
Routing MDF produces such copious clouds of dust that no single method of dust collection is effective. When you pull the router toward you, the dust will be directed away from you. But when you push the router away, the dust will be directed toward you. So be sure to wear eye protection and a respirator mask. Turn on your air purifier and keep a broom handy. The most effective system I've found is to attach the dust collection hose directly behind the router, and to remove the bulk of the material while pulling the router forward. I also make several shallow passes to complete each groove, instead of hogging out all the material at once.

After routing the first groove, rotate the door/template assembly counter-clockwise and position the support piece, so you can rout the adjacent groove. Repeat this process until all four grooves have been routed (**Photo 7**). Remove the template and make sure the edges and bottom of the grooves are consistent all around. If something requires a re-do, reinstall the template, using the nail holes in the door, and go again.



Because this door-making process requires no joinery, it saves an enormous amount of time on projects featuring wall-to-wall doors.

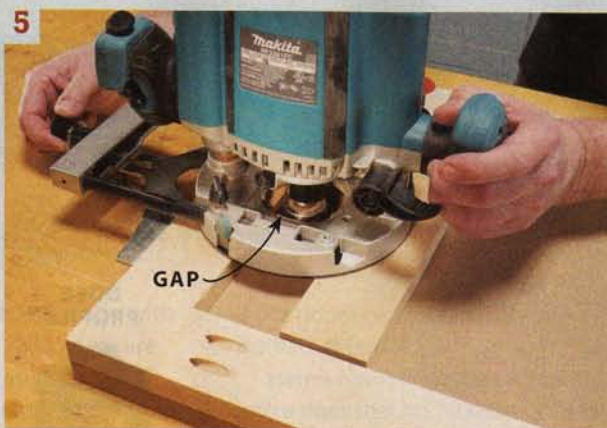
Attach a routing template to the door blank with finish nails. The outside dimensions of both pieces must be identical. Make sure the faces of the template's joints are flush, so the router won't catch. Cut additional pieces of template stock to support the router.



Set the router's plunge depth. Place the router on the template and a support piece, so you can zero the plunge-grooving bit on the surface of the blank. Then set the plunge depth to 3/8".



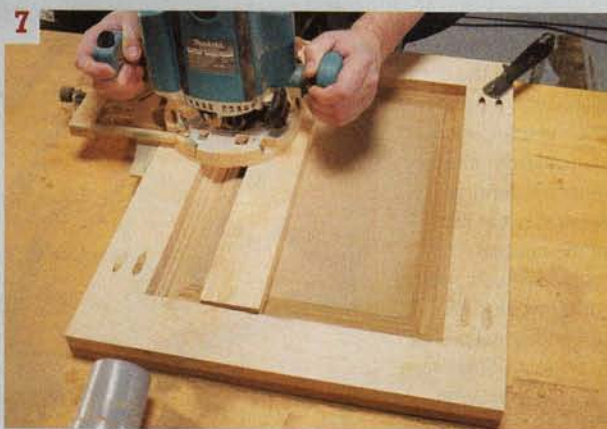
Set the router's edge guide. Leave a little gap (less than 1/16") between the bit's bearing and the template's inside edge. The gap keeps the bit from cutting into the template when you plunge in to start the cut.



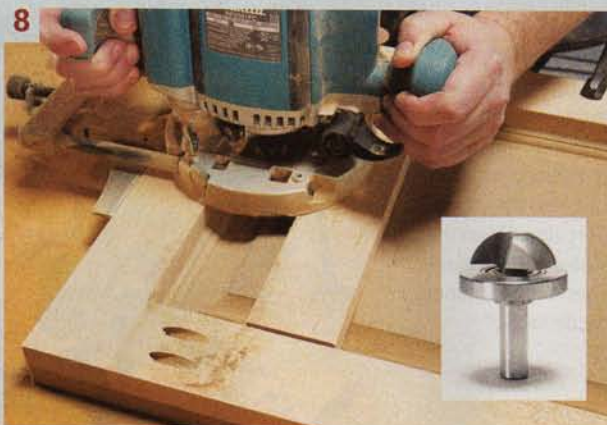
Route the first profile. With the edge guide pressed against the template, plunge the bit and rout to the end. Keep the bit plunged to complete the profile. Move the router sideways, so the bit's bearing rides against the template, and make another pass.



Rotate the work-piece and reposition the support piece to rout the other three profiles. If the door is rectangular, you'll need a second, longer support piece.



You can rout a unique profile for the panel by using a panel profile bit (inset, at right). After routing with the stile and rail bit, install the panel bit, reset the edge guide to accommodate its larger bearing, and make a second pass around the door.



If you make a mistake, you don't have to throw the door away. Instead, fill the damaged area with wood putty, let it dry, and sand it smooth. Reinstall the template and rout that section of the groove again. After the door has been painted, you'll never see the mistake.

Sand the door after filling the nail holes with putty. Use a sanding sponge to remove any fuzz from the routed areas and a sanding block or a power sander to touch up the flat surfaces. The door is now ready for priming and painting.

You can go several steps further, to make your faux panel doors look more authentic. Square the rounded corners. This step requires chisels and gouges. Rout a decorative edge around the door's outside perimeter, using a profile bit. Or use a different bit-and-bearing combo to create a unique profile for the panel (**Photo 8** and Source). The routing process is identical. Just make a second pass around the template. An oversize bearing keeps this bit from cutting into the door's stile profile.

RALPH SULLIVAN is a retired business executive who resides in Jackson, MO with Donna, his wife of 46 years. Ralph has always enjoyed woodworking, but didn't have the time to devote to it until he retired in 1999. Since then, his 1100 sq. ft. well-equipped shop has provided him with many hours of relaxing enjoyment.

Source

Librawood, www.librawood.com, (229) 941-5513, Whiteside 1-3/8" MDF "Stile" Profile Bit, Classical Flat Bottom, #3780, \$40; 1-3/8" Bearing (required for #3780 bit), #B17, \$12.80; Whiteside 1-1/4" MDF "Stile" Profile Bit, Traditional Pattern #5620, \$40 (other patterns available); 1-1/4" Bearing (required for #5620 bit), #B16, \$12.80; Whiteside 1-1/2" MDF "Panel" Profile Bit, Cove Pattern, #5710, \$57.60 (other patterns available); 1-7/8" Bearing (required for #5710 bit), #B24, \$15.20; Bearing Lock Collar for 1/2" Shank (required for all Whiteside MDF profile bits), \$2.60.

2010 Design In Wood Exhibition

Call For Entries

**Entries Due:
April 30, 2010**

Show dates:
June 11 - July 5, 2010.

22 Entry classes,
from Traditional
Furniture to Wood
Carving. \$21,000
in Prizes!

Design in Wood Exhibition is co-sponsored by the San Diego Fine Woodworkers Association and the San Diego County Fair.

Design in Wood is the largest juried woodworking exhibition of its type anywhere. The exhibition is open to all interested adult woodworkers.

Download an entry form from www.sdfwa.org/designinwood2010 or send a #10 self-addressed stamped envelope to Design in Wood, San Diego County Fair, PO Box 685, Solana Beach, CA 92075. Online registration will start in mid-March 2010 and must be submitted at www.sdfair.com/entry/designinwood by 5:00pm Pacific Time on Friday, April 30, 2010. Digital photographs must accompany each entry along with fees. See photographs of previous exhibitions at www.sdfwa.org. For further information, contact Bob Stevenson, Design in Wood Coordinator, at 619-422-7338.



Oak Medicine Cabinet

by Bruce Kieffer

EACH MORNING, you probably look at a plain old medicine cabinet. Why not upgrade it?

As a focal point in your bathroom, a new cabinet is a golden opportunity to display your skills. You're sure to get praise from everyone who visits! But build it with care, because it will be hung right at eye level.

Design notes

I made this cabinet from rift-sawn white oak. Rift-sawn figure, on both

faces and edges, is mainly composed of straight lines. Looking at the end grain of rift-sawn wood, you'll see that the growth rings generally run from corner to corner, and that's why faces and edges look alike. I chose rift-sawn wood because I like its straight-grained appearance, but it also allows the edges of the door to blend seamlessly with the cabinet's sides.

I didn't skimp when selecting the wood. Using wood with similar figure is often more important on a small project than on a large one, because the few pieces in a small project are so close together. An oddball stands out like a sore thumb.

I used dovetailed corners, an arched rail and decorative plugs to give the cabinet a unique look. To make the dovetails, I used a jig that allowed me to make the tails wider than the pins.

The door hangs on Euro-style hinges. I'll admit that they're big and ugly, but I really like their functionality and adjustability. I added a soft-close device to the hinges that enables the door to close without making a sound (see Sources, page 65).

The cabinet and door backs are thin slats connected by tongue and groove joints. Making them in solid wood eats up lots of time and material, but they look fantastic compared to a piece of plywood.

The mirror is 1/8" thick glass with vinyl backing. (The backing will hold the glass together should it accidentally break.) I had the mirror cut by a glass supplier, who also added the backing. You may want to ask your local building inspector if there are bathroom-mirror code requirements

for your area.

Removing the towel storage door for a refill is very simple. It sits in a 1/8" deep groove in the bottom shelf and a 3/8" deep groove in the fixed shelf above. To take off the door, you just lift it up, then out.

Speaking of doors, you've probably noticed that the front door doesn't have a handle. The door extends below the cabinet; to open it, you just pull on this lower lip. That's the way I like my design—clean and simple.

Make the cabinet

1. Cut the cabinet sides (A1) and top and bottom pieces (A2) to size. I made all of these pieces 1/16" extra-long, and set up my dovetail jig so the tails and pins protruded 1/32". Rout the dovetail joints (**Photo 1**, Figs. B & C). I used a Leigh Super Jig.

2. Lay out stopped rabbets on the side pieces (Fig. B). Cut the ends of the rabbets with a handsaw (**Photo 2**). Rout the rabbets and square their ends with a chisel. Rout through rabbets on the top and bottom pieces. Drill 5mm shelf-pin and hinge mounting-plate holes in the sides.

3. Cut the fixed shelf (A6) and towel storage sides (A8) to size. Rout grooves for the towel storage door (A9) in the cabinet bottom and the fixed shelf (**Photo 3**, Fig. C). Cut biscuit slots to join the fixed shelf, towel storage sides, cabinet bottom and cabinet sides.

4. Make an oval template for the towel dispenser hole (Fig. C). Cut the hole in the cabinet's bottom using a scroll saw or jigsaw. Round over the hole's outside edge.

5. Finish sand the interior surfaces of all of the parts you've made.



Hidden Towel Dispenser

Peek inside the cabinet and you'll find a built-in dispenser for folded paper towels. It has a window in front to let you know when you're running low.

**Add
style
to your
bath**

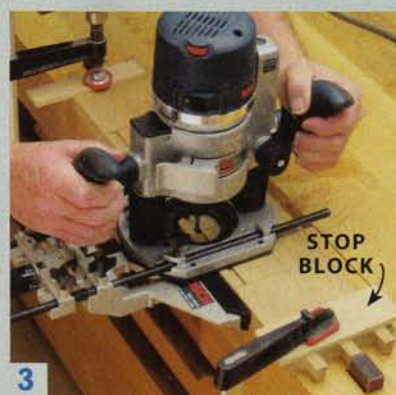




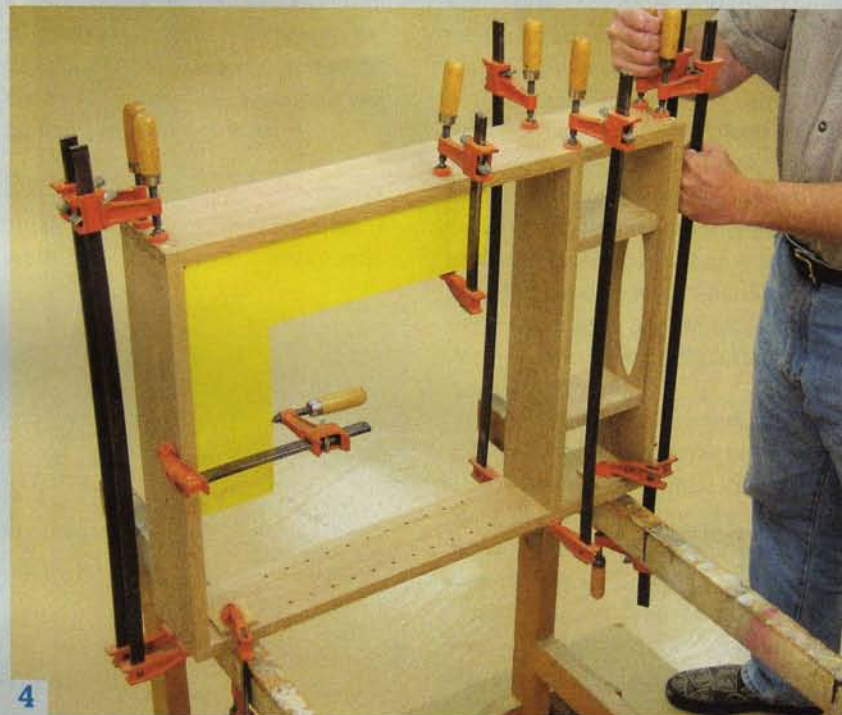
1 Begin by building the cabinet's case, which is dovetailed together. I used a Leigh jig to make joints with wide tails and narrow pins.



2 Saw the ends of the cabinet's sides, prior to routing a stopped rabbet. This will make squaring the rabbet's ends much easier.



3 Rout a groove in the cabinet's bottom for the towel storage door. Control the groove's length with stop blocks.



4 Glue the case in stages, ending with one of the sides. Use a large L-shaped block to keep the case square.



5 Moving on to the door, use a Forstner bit to remove most of the waste in the holes that will receive square decorative plugs.



6 Square the holes with a chisel.

Assemble the cabinet in stages. Make sure the parts are square and aligned during assembly, and allow the glue to dry before proceeding to the next stage. First, join the cabinet bottom, towel storage sides and fixed shelf. Add one cabinet side. Next, add the cabinet top, and finally, the remaining side (**Photo 4**).

6. Use a belt sander to make the dovetails flush, then finish sand the outside of the cabinet. Ease all edges with sandpaper.

Make the door

7. Cut the door stiles (B3) 1" longer than their final size. Mark the finished length 1/2" from each end (you'll trim the stiles to their finished length after assembling the doorframe). The extra 1/2" makes assembly easier—aligning the parts during assembly isn't as critical. Cut the rails (B1 & B2) to final size. Make extra stiles and rails for testing your mortise and tenon setups.

8. Lay out the plug holes on the door stiles (Fig. D). Make sure they are exactly 5/8" square. Drill holes to clear most of the waste (**Photo 5**), then square the holes with a chisel (**Photo 6**).

9. Cut mortises in the stiles (**Photo 7**) and tenons on the rails (**Photo 8**). I used my scroll saw to cut away the waste between the double tenons on the arch rail and cleaned up the cut with a chisel.

10. Make a template of the arch rail's curve (Fig. D). Lay out and cut the curve, then sand it smooth (**Photo 9**).

Fig. A Exploded View

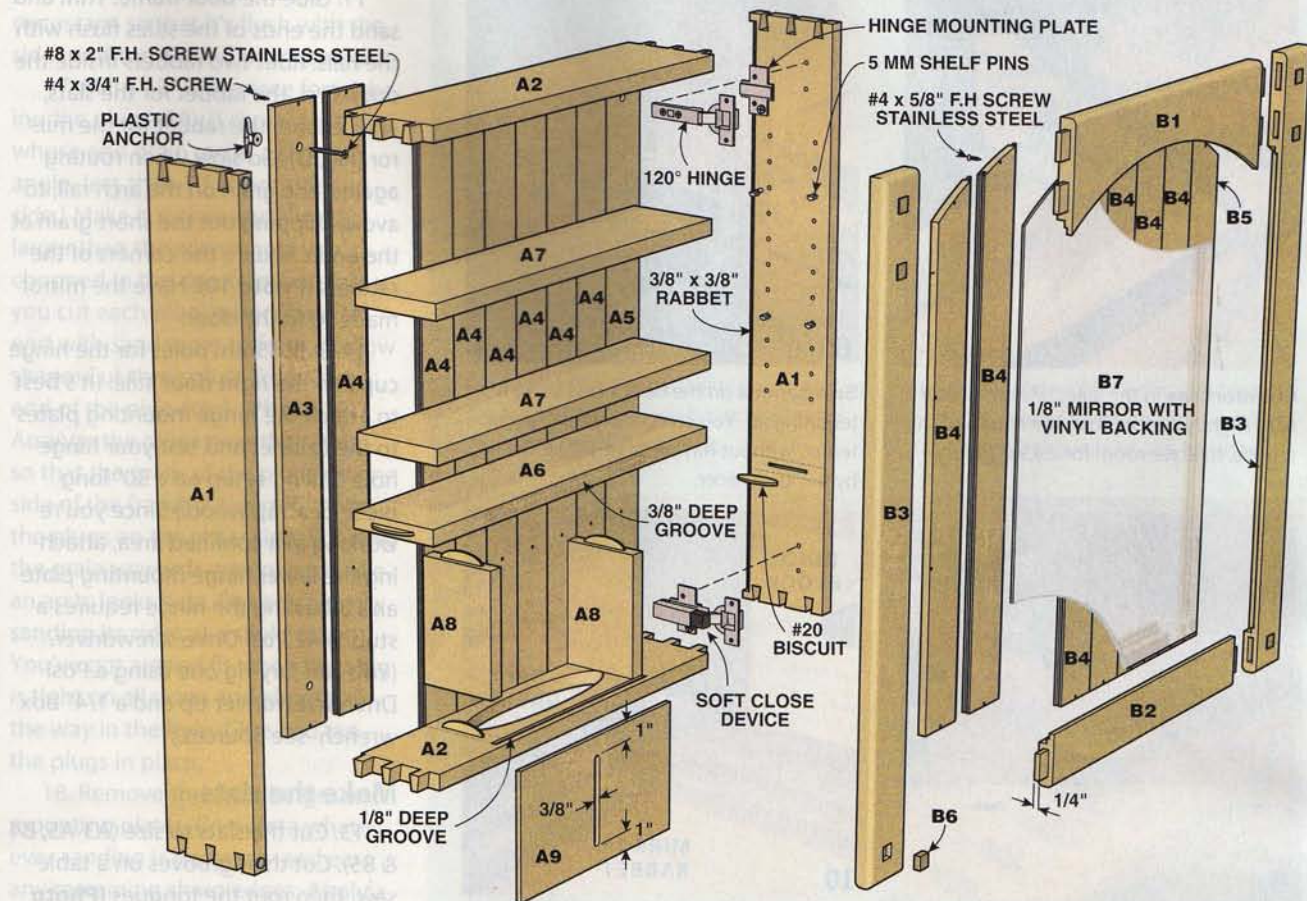


Fig. B Side

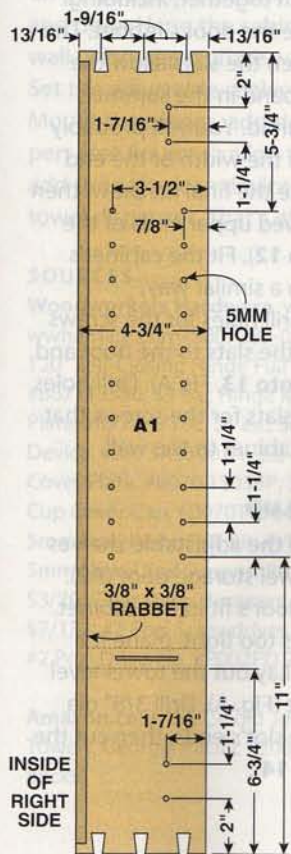


Fig. C Fixed Shelf & Bottom

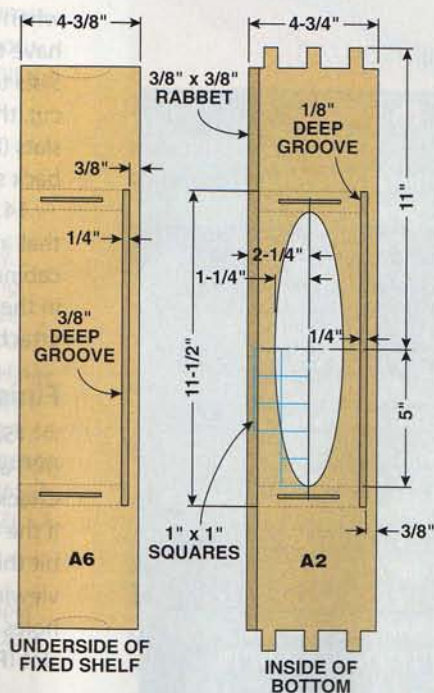


Fig. D Door Details

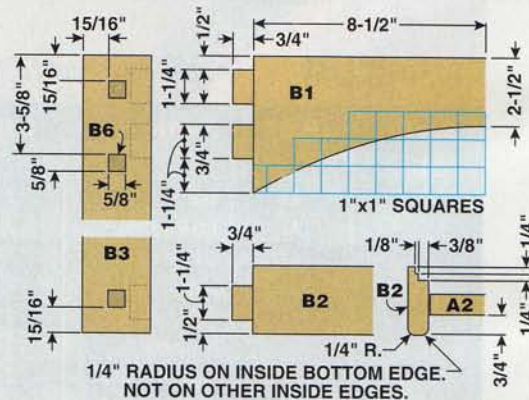
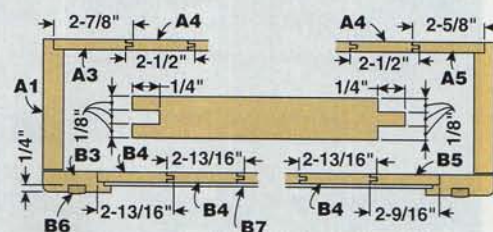


Fig. E Slats





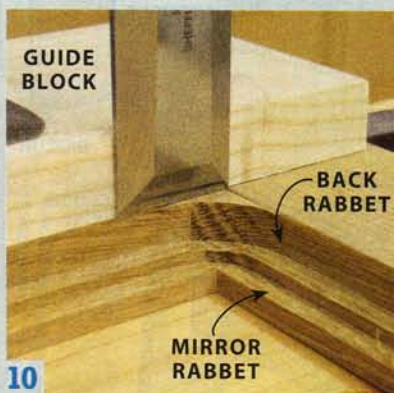
7 Cut mortises in the stiles. Make the mortises slightly deeper than the length of the tenons, to leave room for excess glue.



9 Bandsaw an arch in the top rail and sand it smooth. To fair the curve, use the cutoff to hold a piece of self-adhesive sandpaper.



8 Saw tenons on the door's rails using a tenoning jig. You can cut both sides of a tenon, without having to re-adjust the jig, by using a spacer.



10 Glue the door together, then rout two rabbets inside it: one for the mirror, and one for the back. Square their ends using a guide block that's clamped to the door.

11. Glue the door frame. Trim and sand the ends of the stiles flush with the rails. Rout two rabbets inside the door: first, the rabbet for the slats, and second, the rabbet for the mirror (Fig. D). Go slow when routing against the grain on the arch rail, to avoid chipping out the short grain at the ends. Square the corners of the rabbets (Photo 10). Have the mirror made to fit the door.

12. Drill 35mm holes for the hinge cups on the right door stile. (It's best to attach the hinge mounting plates to the cabinet and test your hinge-hole drilling setup on a 30" long piece of scrap wood.) Since you're working in a confined area, attaching the lower hinge mounting plate and adjusting the hinge requires a stubby #2 Posi Drive screwdriver. (You can jury-rig one using a Posi Drive screwdriver tip and a 1/4" box wrench—see Sources.)

Make the slats

13. Cut the slats to size (A3-A5, B4 & B5). Cut their grooves on a table-saw, then rout the tongues (Photo 11, Fig. E). Assemble the door slats first. Fit them together, including shims, inside the door's rabbet. The gaps between the slats allow the wood to expand in the summer, when it's humid. You will probably have to trim the width of the end slats to make the final fit. Draw, then cut, the curved upper ends of the slats (Photo 12). Fit the cabinet's back slats in a similar way.

14. Pre-drill holes for the screws that attach the slats to the door and cabinet (Photo 13, Fig A). Drill holes in the back slats for the screws that attach the cabinet to the wall.

Finishing up

15. Make the adjustable shelves (A7) and towel storage door (A9). Check the door's fit in the cabinet. If the door is too tight, plane it a bit thinner. Lay out the towel-level viewing slot (Fig. A). Drill 3/8" dia. holes at the slot's ends, then cut the slot (Photo 14).

Cutting List

Overall Dimensions: 22"W x 30"H x 5-1/2"D

Section	Part	Name	Qty.	Th x W x L
Cabinet	A1	Side	2	3/4" x 4-3/4" x 29-1/4"
	A2	Top & bottom	2	3/4" x 4-3/4" x 22"
	A3	Left back slat	1	3/8" x 2-7/8" x 28-1/2"
	A4	Mid back slat	7	3/8" x 2-1/2" x 28-1/2"
	A5	Right back slat	1	3/8" x 2-5/8" x 28-1/2"
	A6	Fixed shelf	1	3/4" x 4-3/8" x 20-1/2"
	A7	Adjustable shelf	2	3/4" x 4-3/8" x 20-7/16"
	A8	Towel storage side	2	3/4" x 3-3/4" x 6"
	A9	Towel storage door	1	1/4" x 6-1/4" x 11-1/2"
Door	B1	Arch rail	1	3/4" x 5" x 18-1/2"
	B2	Rail	1	3/4" x 2-1/2" x 18-1/2"
	B3	Stile	2	3/4" x 2-1/2" x 30"
	B4	Slat	6	3/8" x 2-13/16" x 26"
	B5	End slat	1	3/8" x 2-9/16" x 26"
	B6	Plug	6	5/16" x 5/8" x 5/8" (A)
	B7	Mirror	1	1/8" x 17-1/2" x 25-1/2" (B)

(A) End grain faces (B) Fit to door

16. Trim the cabinet's door, if necessary, so that it's flush with the sides and top. Round over its edges.

17. Mill a 12" long piece for making the plugs (B6). (I chose a piece whose end grain ran at a slight angle—less than 10°—from side to side.) Make it square and slightly larger than the widest hole you chopped in the doorframe. Before you cut each plug, round over its end with sandpaper to form a pillow shape. Cut three plugs from each end of the plug stock (Photo 15). Arrange the plugs near their holes so that the grain of the plugs on one side of the frame is a mirror image of the plugs on the other side. Running the grain upwards and inwards, like an arch, looks best. Fit each plug by sanding its sides at a slight taper. You've got a good fit when the plug is tight on all sides, and almost all the way in the hole. Glue and tap the plugs in place.

18. Remove the slats, hinges and mounting plates. Complete whatever sanding is necessary and ease any remaining sharp edges. Apply a clear protective finish—I used wipe-on poly. Reassemble the cabinet and door. Hang the cabinet on the wall using appropriate wall anchors. Set the adjustable shelves in place. Mount the hinges, add door bumpers (see Sources), align the door, add the soft-close device, and fill the towel dispenser. That's it! 🛠️

SOURCES

Woodworkers Hardware, www.wwhardware.com (800) 383-0130,

120° Self-Closing Hinge Full Overlay, #B071T5550, \$3 ea.; Hinge Mounting Plate, #B174H710E, \$1 ea.; Soft Close Device, #B973A0500.01, \$3; Hinge Arm Cover Plate, #B070.1503BP, \$5/20; Hinge Cup Cover Cap, #B070T1504, \$6/20; 5mm Brad Point Drill Bit, #VB5MMBIT, \$6; 5mm Nickel Self Support Pins, #THB6144, \$3/20; Clear Door Bumpers, #3MSJ6553, \$7/132; #2 Pozi Screwdriver, #B POZI, \$7; #2 Pozi Drive Tip, #P002PD 2, \$2.

Amazon.com, Big C-Fold Junior Paper Towels, Georgia Pacific #20886, \$30/10 packs.



11 Make slats for the back of the door and the back of the cabinet. Rout tongues on the slats using a straight bit.



12 Space the slats with cardboard shims, then set the door frame on top. Trace the curve and cut the slats on the bandsaw.



13 Install the slats in the back of the cabinet. Drill pilot holes and fasten the slats with small screws.



14 Make the door that hides the paper towels. Cut a viewing slot in the door so you can tell when it's time for a refill.



15 Lastly, add the decorative plugs. Saw them in a shop-made miter box. Draw a line on the box to indicate their length.



The Art of Resawing

by Mario Rodriguez

RESAWING CAN BE A WILD RIDE.

You never know exactly what's going to happen when you cut open a board! Just getting your tablesaw or bandsaw to work right can be an adventure, too. Resawing often pushes those machines to their limits.

If you've tried resawing, and have had only had limited success, I hope that I can help you. I've been a professional woodworker for umpteen years, and now run a school devoted to fine woodworking, the Philadelphia Furniture Workshop. I've taught dozens of students how to resaw—folks who came to class with many tales of frustrating experiences, but left with a solid grounding in how to succeed. You can, too.

Why resaw?

Here are four ways you can improve your woodworking by mastering the art of resawing:

- **Make bookmatched panels and tops.** When you cut down the length of a board and lay the two pieces side by side, you'll see that they are mirror images of each other—sort of like a folded inkblot. They're "bookmatched." It's an effect that can be quite stunning, particularly when your pieces have irregular figure (**Photo 1**). Before you saw, you can get an idea of what the bookmatch may look like by holding a mirror alongside your board. Bookmatched boards are widely used to make panels, cabinet sides, and most notably, beautiful tabletops, such as those made by the famous craftsman George Nakashima.



To see plans for a shop-made bandsaw fence, go to:
www.AmericanWoodworker.com/146/AWBandsawFence

• **Make bent laminations that look like solid wood.** Bent laminations are made by gluing a number of thin strips over a form (**Photo 2**). The most efficient way to make these strips is by resawing thicker wood. If these strips are randomly arranged, the lamination may look like it's obviously made from many layers; by using resawn strips, you can essentially re-assemble the original board by stacking the strips in the same order that they were cut. The layers all blend invisibly into one another—as if the bent piece were solid wood.

• **Make extra-thick veneer.** Veneering is a way to employ beautiful, but unstable, wood in your furniture. However, most veneer isn't available over 1/32" thick. By cutting your own (**Photo 3**), you can make veneer for tops and edges that's more durable than the thin stuff.

• **Stretch special wood.** You can make one board go a long way by resawing all or part of it into thinner pieces (**Photo 4**). If that board has a unique look, resawing it allows you to mix veneered and solid pieces, maintaining uniformity of grain and color throughout a project. You can also salvage material that would otherwise end up as waste.

Choosing your stock

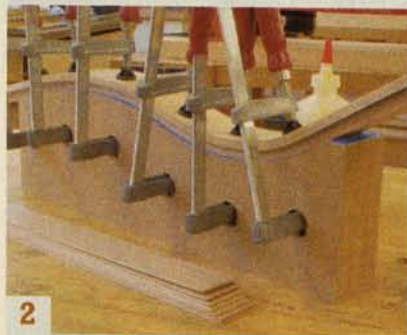
Most stock for resawing should be dry, having 6-13% moisture content (**Photo 5**). Kiln-dried wood should be fine, but check air-dried wood with a moisture meter. If your material isn't dry, it won't be stable. If it's not stable, it won't remain flat after resawing.

There are no guarantees that resawn boards will stay flat, however. No matter how dry the wood is, or how stable the species is reputed to be, sometimes a board will cup or bend right off the saw. There's no sure-fire way to predict whether a board will warp before you saw. If the first board off your pile warps, assume the rest may warp, too. Resaw the next pieces thicker, if you can, or settle for thinner pieces, once they're jointed and planed.



1

Resawing can produce stunning results, such as these bookmatched boards for a large table. You can achieve the same effect—with smaller boards, of course—in your home shop.



2

On a much smaller scale, resawing is also used to make strips for bent laminations. All of these strips were cut from the same board; by putting them back together in the same order, the glue joints will be almost invisible.



3

Mastering the art of resawing allows you to make your own veneer. You can saw it thicker than commercial veneer in order to make a more durable surface.



4

Resawing also allows you to “stretch” a special board. These legs are solid walnut, but the rails are faced with thick veneers, created by resawing the same board.



5

Good material is essential for success. Your wood should be dry and free from defects. Knots and other flaws make resawing more difficult—but it’s still possible.



6

For the best results, flatten one face and square one edge of a board before resawing it.

Consider how your resawn pieces will be used. A bookmatched crotch slab can make a spectacular tabletop, but wild material like this can be a little unpredictable—you never know if it’s going to stay flat. A slab-topped table won’t suffer much if the top twists a little, so go ahead—take the chance. But be wary of using resawn pieces for door frames or thick door panels. If these pieces warp, you’re really in trouble.

Preparing your stock

Let’s say you’re starting with rough lumber. To get the straightest cuts when resawing, and to minimize waste, mill at least one face and one edge of your boards before you begin (**Photo 6**). If you’re resawing a board into more than two pieces, it’s usually a good idea to re-joint the face of the board after each cut.

How much should you allow for waste? If I don’t expect my lumber to move much after resawing, I’ll add 1/8" for cleaning up. If I need 1/2" thick material for drawer sides, for example, I’ll re-saw it at 5/8". Adding in the saw kerf and initial jointing, I need to start with 5/4 material (1-1/4" thick) for these drawer sides. The lesson: You can’t get two 1/2" thick pieces from a 1" thick board. Adding an extra 1/8" is playing it safe. It’s definitely possible to resaw with a smaller margin, but you’re taking a chance that one or more pieces won’t clean up at the thickness you originally intended.

If I’m pretty sure that a board is going to warp after resawing, I’ll add 1/4" rather than 1/8". In any case, I usually resaw in stages, letting a board sit for a few days between cuts. It can move the way it wants to, and then I re-flatten it before going back to the bandsaw.

Of course, resawing strips for laminations doesn’t require such wide margins. For strips, add an extra 1/32" to 1/16".

Using the tablesaw

You can get pretty good results by resawing on your tablesaw (**Photo 7**), but there are a few things you

should know before trying it.

First, think about safety. You should use a splitter or riving knife to avoid kickback (**Photo 8**). If your pieces are fairly narrow, and you can cut all the way through them in one pass, the splitter that came with your tablesaw will work fine. But if you're making non-through cuts on wider pieces, this splitter won't work. Your best bet is to add a short splitter to a shop-made throat plate.

A riving knife will work for through and non-through cuts. It rises and falls with the blade, and can usually be adjusted to sit just below the top of the blade. Most older saws do not have a riving knife, and are difficult to upgrade with one; new saws are required to have a riving knife.

Still thinking about safety, it's a good idea to use a zero-clearance throat plate when resawing pieces less than 1/4" thick. The throat plate's narrow opening supports your workpiece throughout the cut and prevents thin offcuts from wedging themselves between the blade and throat plate.

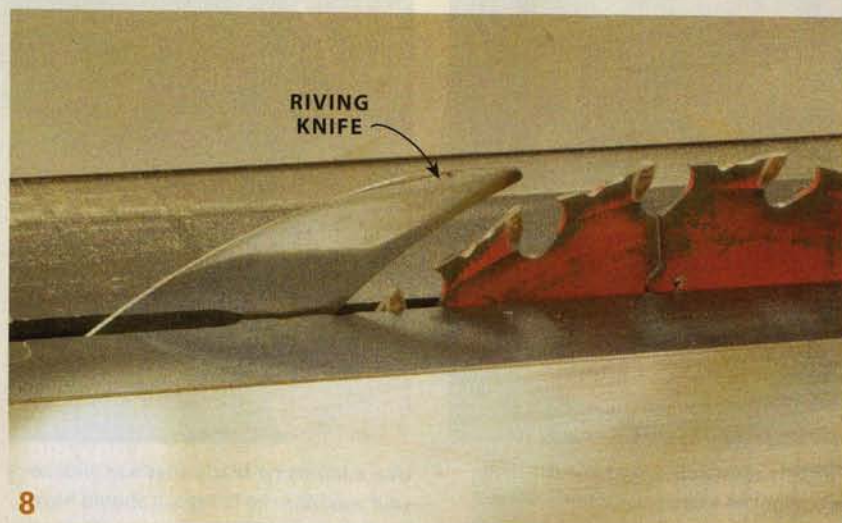
Choosing the right blade can ease the strain on your saw's motor, particularly if the motor has less than 2 hp. For re-sawing hard material, use a 18-tooth ripping blade. This will give you clean, straight cuts—without burning or binding. For soft wood, a 40-60 tooth combination or general-purpose blade will be fine. As you cut, listen to your saw. It should run smoothly and quietly (more or less), and not generate an ear-splitting racket or a blinding cloud of smoke.

I also use a featherboard and a push stick (**Photo 9**). The featherboard helps maintain a straight cut (see Sources, page 73), which minimizes waste. (After all, you're already losing a saw kerf's worth of wood with each cut!) Without the guard in place, a push stick is essential for keeping your fingers safe.

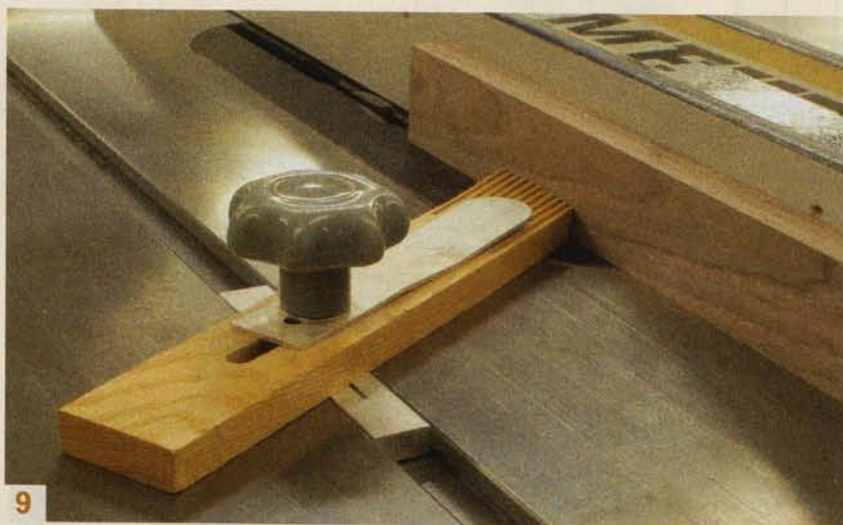
How well does the tablesaw method work? Pretty good—but it's not perfect. In my experience, no matter how carefully you guide and support the material during the operation, your cuts probably won't line up perfectly



7 If you don't have a bandsaw, you can use a 10" tablesaw to resaw boards up to 6" wide. Make a shallow cut from both sides, then gradually raise the blade and repeat until the cuts meet.



8 Be sure to use a riving knife or splitter behind the blade when resawing a board. Both of these devices prevent the cut from closing up, which could cause the board to kick back at you.



9 You'll get a more accurate cut by using a featherboard to hold the workpiece tight against the fence. This featherboard locks into the saw's miter slot.



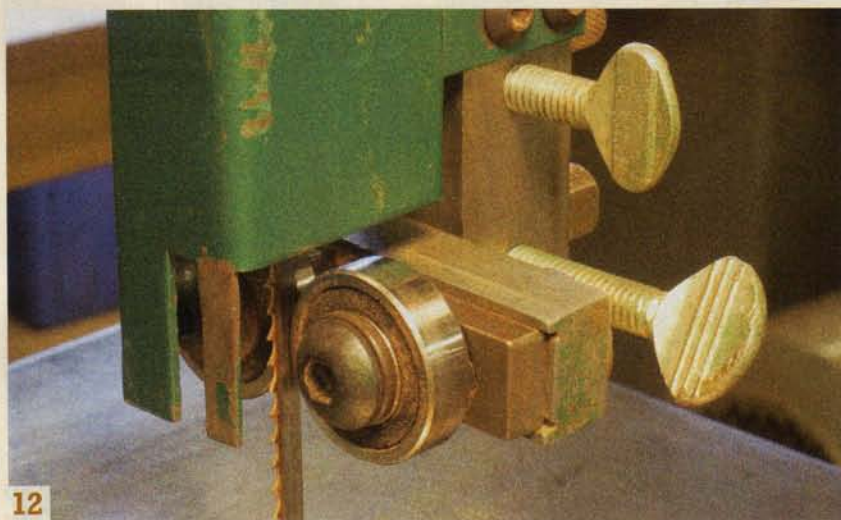
10

Partially resawing a board on the table saw might be a good idea even if you do have a bandsaw. Your final cut may be straighter, and your bandsaw's motor is less likely to bog down.



11

Use a bandsaw blade that's as wide as your machine can handle. It should have hook teeth with deep gullets to efficiently clear debris from the cut.



12

Before you resaw, make sure that the guides and thrust bearing are within a paper's thickness of the blade. Check the guides and bearing under the table, too.

and will require some clean up.

One last note: Starting to resaw a board on the table saw may be the most effective strategy for you to resaw wide boards on your bandsaw (Photo 10). If you have a 14" or smaller bandsaw, with a 1 hp or smaller motor, this is definitely the way to go.

Using a bandsaw

The bandsaw is the ideal machine for resawing. It can handle much wider boards than a table saw, and, using a narrower blade, yield thicker resawn pieces—or more of them—from one board.

In helping you to succeed in using the bandsaw, there are three topics I'd like to talk about: your saw, selecting the blade and adjusting the saw, and choosing a fence and setting it up.

Any bandsaw can resaw a board, but the more powerful the saw's motor, the better the job it can do with wide boards. Most 14" or smaller saws have 120 volt motors, which can produce up to 1-3/4 hp. While that's adequate for resawing a board up to 12" wide (adding a riser block to a 14" saw increases its capacity from 6" to 12"), you have to feed at a slow and steady rate to avoid bogging down the motor. When the motor slows down, the blade has a greater tendency to wander—and that's not a good thing.

Bandsaws that are 16" or larger generally have 240 volt motors, from 2 to 5 hp. This extra power really helps (try one once and you'll see!), but a larger saw offers another advantage: You can use a wider blade. The wider the blade, the less tendency it will have to wander, because there's less chance it will bend backward and twist, causing a wandering or bowed cut.

No matter what size your saw is, it's a good idea to add or build an outfeed table to support boards over



For advice on choosing a bandsaw blade for resawing, go to: www.AmericanWoodworker.com/146/ResawBlades

3' long. To get that ideal, straight cut, your workpiece needs that support, just like on a tablesaw.

The blade

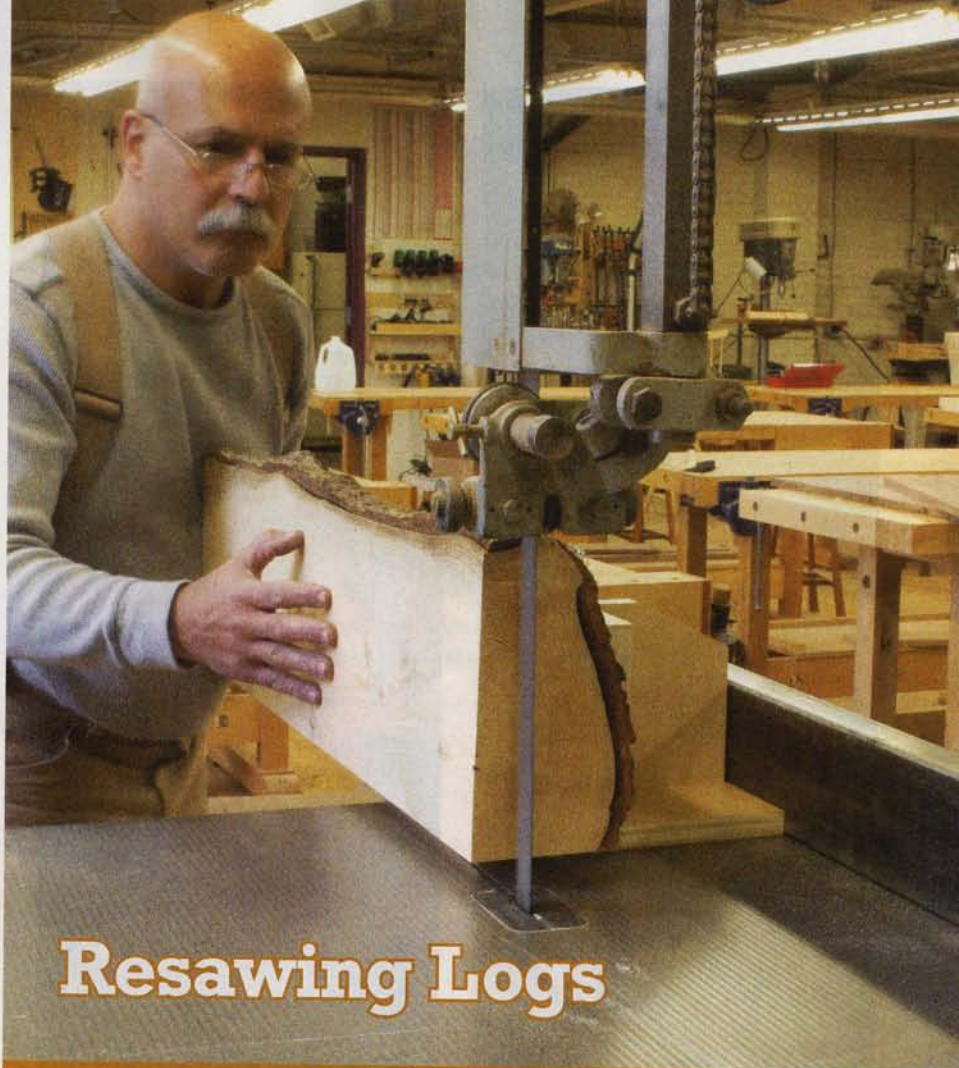
Use the widest blade your saw can handle (**Photo 11**). For most 14" saws, this will be a 1/2" blade. Many 14" saws can accept a 3/4" blade, but you have to watch what you're buying. Many 3/4" blades are .032" thick—too thick for 14" wheels—and will break prematurely from metal fatigue. If you want a 3/4" blade, look for one that's .025" thick (see Sources). Most stock 1/2" blades are .025" thick.

Now, about the blade's teeth. Using the wrong blade for resawing can lead to a small disaster. A blade that's too fine will have a hard time clearing sawdust from the cut. The blade will get very hot, which can distort it and produce an uneven cut—or even cause the saw to stall. I use an aggressive hook-tooth blade, with 3-6 tpi. A hook-tooth blade has large gullets and teeth configured to efficiently remove sawdust from the kerf. The cut surfaces might be a littler rougher than if I had used a finer blade, but the resawn material will be flatter and of more uniform thickness.

When you install the blade, adjust the tension according to the scale on the saw; there's really no need to over-tension the blade. Position the side guides and thrust bearing one paper thickness away from the blade (**Photo 12**). Raise the guidepost and make sure that your table is square to the blade (**Photo 13**). Then lower the guidepost so the guides are no more than 1/2" above your workpiece.

The long fence

If your requirements aren't exact, you don't need a fence at all—you can guide the material freehand. However, in order to perform this operation safely, don't freehand boards that are over 6 times taller than they are thick. A 1" board, for example, should be no more than 6" tall, standing on edge on the saw. The wider the board (and the higher the cut), the more unstable freehand



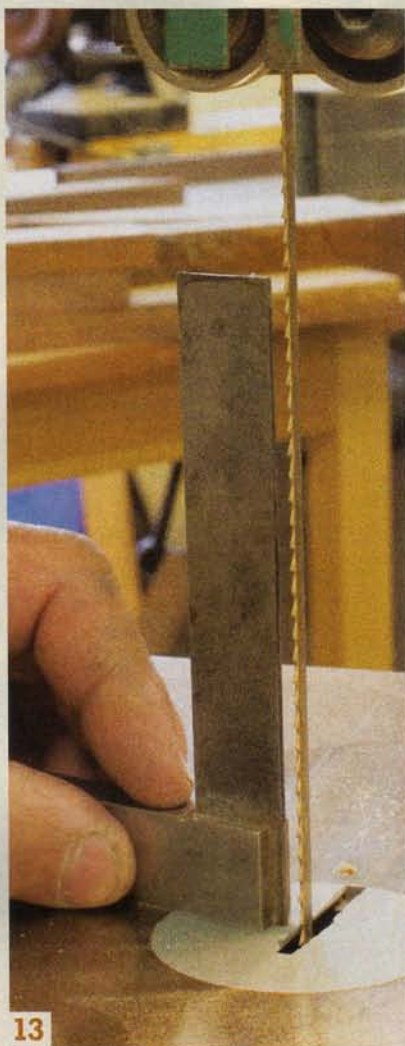
Resawing Logs

DID YOU KNOW that you can resaw a log? Resawing is a great way to convert small logs and tree limbs into useable lumber. At the Philadelphia Furniture Workshop, the woodworking school I help run, we bandsaw green logs to build Windsor chairs. The traditional method is to split the logs, but bandsawing gives us a better yield.

The trick is to support the log so that it doesn't roll. I use a shop-built plywood carriage that's braced for strength. I nest the log into the corner of the carriage, then fasten the log to the carriage's vertical face with a lag screw (see photo, right). After making the first cut, I unscrew the log, turn it 90°, and screw it to the carriage again. Once the log has been squared, I treat it like any other board with a jointed face and edge.



When sawing a log, be sure to fasten it securely to a carriage.



13

Lift up the guidepost and check that your table is square to the blade. For a critical operation like resawing, it's best not to take anything for granted!



14

To make the straightest cut possible, use a long fence. Ideally, the fence should be almost as tall as your board to prevent the board from tipping.



15

Make sure that the fence is exactly parallel to the blade. I use a graduated tapered gauge to measure the distance from the blade to the fence at both the top and bottom of the cut.

cutting becomes.

Using a fence is safer than sawing freehand and should yield more accurate results. The only limit in board width is what your saw can handle. There are two types of fences: long and single point. I use both, depending on the situation.

A long fence extends the full length of the table. Some manufacturer's long fences are OK, but a long fence should have three key features: 1) it should have or accommodate a tall face; 2) for a 14" or smaller saw, it should be adjustable to compensate for drift (more on that below); and 3) there should be some provision for tilting its face to be exactly parallel to the blade.

We use a pretty simple homemade fence in my shop (**Photo 14**). It has leveling screws at each corner of its base to ensure perfect alignment with the blade. I use a commercial tapered gauge to adjust the fence (**Photo 15**; see Sources), but you could use a ruler, square, or just a wooden wedge.

To get the best results, I often use a featherboard with a long fence. This indispensable shop fixture firmly presses the material against the fence as it passes the blade, ensuring uniform material thickness—and keeps my fingers safely away from the blade. My favorite featherboard has two adjustable arms (**Photo 16**). For narrow boards, I either remove the higher arm or push it out of the way.

Whether you use a featherboard or not, pay attention to your fingers near the end of the cut. To get your hand out of the way, push the board with a hooked push stick or a piece of scrap. Alternatively, stop pushing, walk to the opposite side of the saw, and pull the board through.

Compensate for drift

There's one major hassle in using a long fence, and that's the issue of drift. On a tablesaw, you set the fence parallel to the blade and saw away. On 14" and smaller bandsaws, the best position for the fence may be a bit skewed to the blade (16" and larger saws usually don't have this problem). If you set the fence in

line with the blade (parallel to the table's miter slot) the cut may want to wander, or "drift." The trick is to figure out what this drift angle is before you set up your fence. Don't be tempted to fight drift—learn to compensate for it.

Begin by scribing a line parallel to the edge of a 12" long board. Feed the work into the blade, following the scribed line. As you progress with the cut, you may have to angle the board to keep to the line—that's the drift angle. About 2/3 through the cut, stop cutting and draw a line along the edge of the board, onto the bandsaw's table. That is your drift line. Adjust the angle of your fence to this drift line.

The single-point fence

I often use a single point fence when I only have a few pieces to cut, or when a board is thick enough that I can afford to let the cut wander a little bit.

A single-point fence only contacts the material at one place, where the blade's teeth engage the wood (**Photo 17**). This type of fence is very easy to make—just be sure to round over the fence's nose. When you clamp the fence to your saw's table, align the nose with the saw's teeth.

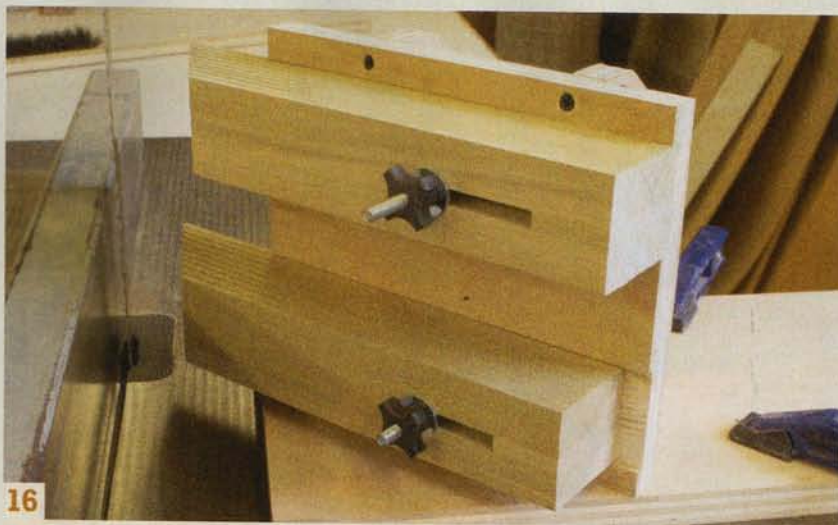
Why the rounded nose? It's a pivot point. It allows you to compensate for drift as you saw (**Photo 18**). Instead of angling the fence, you angle the board. This makes a single-point fence much easier to set up than a long fence on 14" and smaller saws. The downside is that your cut won't be as straight as with a long fence, so you'll get minor variations in the thickness of your resawn pieces.

SOURCES

Lee Valley, www.leevalley.com, (800) 871-8158, Featherboard, #03K04.02, \$13.95; Veritas Fractional Tapered Gauge, #05N38.01, \$32.50.

PS Wood Machines,

www.pswood.com, (800) 939-4414, Timber Wolf AS-S bandsaw blade, 3/4" wide, .025" thick, 3 TPI, #SKU715, \$25.



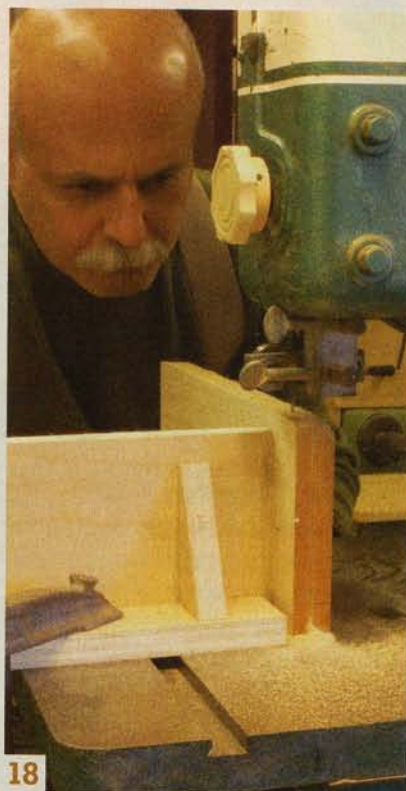
16

A tall featherboard helps you produce straight and smooth resawn boards of a consistent thickness. Having two arms, this featherboard works well for bearing against a roughsawn face.



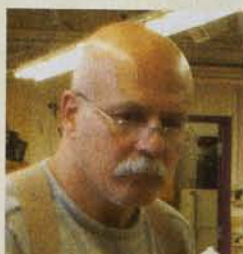
17

A single-point fence is an alternative to the long fence. It's easier to set up, but you probably won't get an absolutely straight cut.



18

When using a single-point fence, steer your work from side to side until you find the angle at which the blade cuts straight down the line.



Welcome Back, Mario!

The last time Mario wrote for us was over 15 years ago. Since then he has taught woodworking restoration in New York City, run a small school of his own in Warwick, NY, written two books, and restored an 18th century farmhouse. He's now teaching at the Philadelphia Furniture Workshop, www.philadelphiafurnitureworkshop.org.

A Simple Router Table



By Doug Stowe

WHILE MANY WOODWORKERS spend weekends making stationary router tables, mine have always been very simple, driven by expediency, and the desire to get other things done. My first was just a router base screwed to the underside of a piece of plywood. I simply clamped the plywood to a workbench, installed the router and bit, clamped on a board as a fence, and let her rip.

Things haven't changed much in my shop. I still like the convenience of a router table that I can quickly disassemble and store, so I don't lose the floor space that a stationary router table would require. One thing that has changed, however, is that the router table I use today is more sophisticated. It has an aluminum router plate and a pivoting fence with dust collection. This table takes only

an hour or two to build, and it can last for years. To make your own, you'll need a router plate and a plunge router equipped with a template guide.

Manufactured router plates work great. They include zero clearance inserts for safer routing and they make it even easier to put the router table away when I'm done with it. The method I use to install the router plate is nearly foolproof, and it'll work for any square or rectangular router plate (the one shown here came from Rockler, see Source, page 76). This method is very accurate, too, so it's suitable to use on even the most deluxe router table.

Make the table and install the plate

The first step is to choose a suitable piece for the table (A, Fig. A, page 76), which must be absolutely flat and very rigid. I usually use 3/4" plywood. The table's dimensions can vary, but

I prefer a large surface, with at least 12" of support on both the infeed and outfeed side of the bit.

Clamp the table with one end overhanging your bench, so you can rout the hole for the router plate. Locate the plate on the table so it's centered between the sides and offset toward the front edge. This orientation makes the table more versatile: The short side works for most routing operations; the long side provides additional support for large pieces such as door panels.

Use the router plate to create a template to rout the hole. Position the plate on the table and then frame it with scrap pieces that are uniform in thickness. The pieces at the ends of the plate must be exactly the same width as the plate. Securely clamp the pieces around the mounting plate, making sure the joints are flush (**Photo 1**). Then remove the router plate.

Use a plunge router equipped with a 3/4" O.D. template guide and a 1/4" spiral bit to cut out the center (**Photo 2**). Move counterclockwise around the form and hold the template guide fast against the template. For the best results, complete the cut in several passes, plunging the router bit slightly deeper with each successive pass.

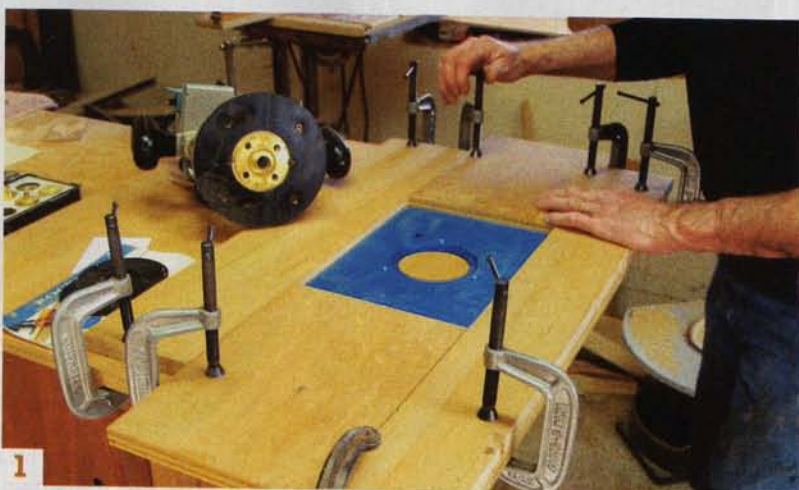
Install a 3/4" dia. pattern bit and use the clamped-on template to rout a 1/4" wide rabbet to house the router plate in the table (**Photo 3**). A pattern bit is a plunge-style flush-trim bit; its bearing is mounted above the cutters. Set the plunge depth slightly shallow to start, and rout only a small spot. Measure the depth of the rabbet, adjust the plunge depth and go again. When the depth of the rabbet exactly equals the thickness of the mounting plate, go ahead and rout all the way around. Remove the template pieces. Then mark and drill the 3/8" pivot hole for the fence.

Disassemble your router by removing the motor from the base and the base plate from the router base. Then screw the router base to the router plate, using the screws from the base plate (**Photo 4**). Reinstall the router motor and then install the router plate assembly in the table.

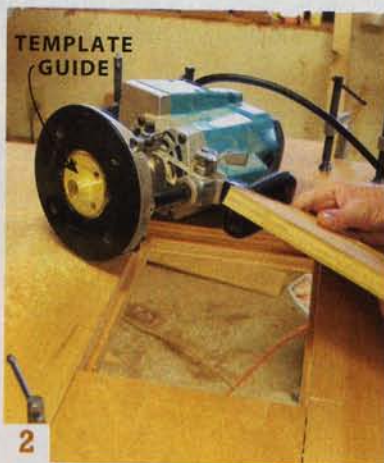
Build the fence

The table's pivoting fence is easy to use and adjust, and it includes dust collection. A wing nut at one end and a C-clamp at the other hold the fence securely, and it's adjustable by tiny increments—a slight change at the C-clamp end of the fence translates to a fraction of that change at the center, where the bit is located. The fence itself consists of two pieces. Shape the face (B) and drill a 3/8" hole in the base (C) at the pivot point. Then glue the two pieces together (**Photo 5**).

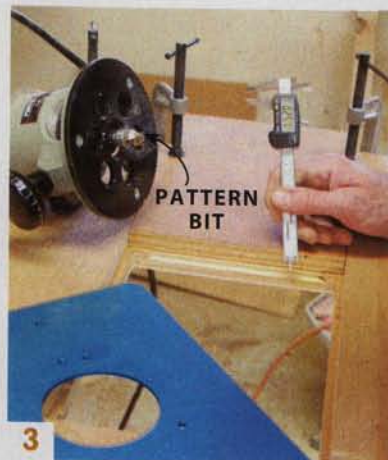
Miter the dust collection box top (D) and sides (E) and glue them



1 Start by positioning the router plate on the router table blank. Clamp pieces of uniform thickness all around it, to create a routing template. Then remove the plate.



2 Remove the waste by plunge routing, using a spiral bit and a template guide. This operation leaves a 1/4" lip inside the clamped-on routing template.



3 Rout a rabbet to house the router plate, using a pattern bit. The depth of the rabbet must match the thickness of the plate.



4 Fasten the base from your router to the router plate. Reinstall the router motor and then fit the router plate assembly in the table.



5 Assemble the pivot fence with biscuits and glue. Make sure the joint is flush on the bottom when you clamp the parts together.

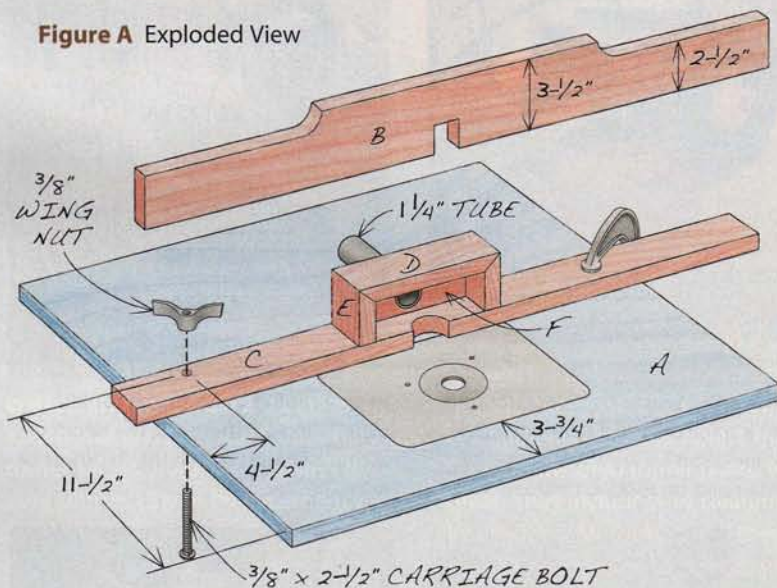


6 Check the fence to see that its face is square to the surface of the table. If it is not, use the jointer to make it square.



7 Mark the location of the router bit and drill a pilot hole through the bottom of the fence at that point. Then raise a larger router bit through the hole and into the fence to create a suitable opening for routing and chip removal.

Figure A Exploded View



Cutting List: Simple Router Table

Part	Name	Qty.	Material	Th x W x L
A	Table	1	Plywood	3/4" x 28" x 28"
B	Fence Face	1	Hard maple	3/4" x 3-1/2" x 41"
C	Fence Base	1	Hard maple	3/4" x 2-3/8" x 41"
D	Dust Box Top	1	Hard maple	3/4" x 2-3/8" x 7"
E	Dust Box Side	2	Hard maple	3/4" x 2-3/8" x 2-3/4"
F	Dust Box Back	1	Hard maple	3/4" x 2" x 5-1/2"

together. Cut the back (F) to fit and drill a hole in it for the dust collection hose. To create a durable connecting piece, I saw off an old extension tube from a vacuum cleaner and glue it into the hole, using construction adhesive. Vacuum parts can often be found at thrift stores.

Install the pivot fence and make sure its face is absolutely square to the table's surface (**Photo 6**). Then create clearance for the router bit (**Photo 7**). Pivot the fence over the router and mark the center of the bit. Remove the fence and drill a 3/4" dia. hole in the bottom at the mark. Reinstall the fence over the router and incrementally raise a slightly larger bit through the hole and into the fence. Screw on the vacuum box and you're ready to rout.

SOURCE

Rockler Woodworking and Hardware, www.rockler.com, (800) 279-4441, Aluminum Router Table Plate, #24060, #27556, #27563, #28347 (different versions for different routers), \$59.99.



Doug Stowe

To demonstrate the effectiveness of using crafts in general education, and to support the rationale for it, Doug Stowe began a woodworking program at Arkansas' Clear Spring School in 2001. This program stimulates and reinforces learning by integrating woodworking activities into the school's academic curriculum. In 2009, the Arkansas Department of Heritage and Arkansas Arts Council named Doug an "Arkansas Living Treasure" for his contributions to traditional crafts and craft education.



Pa, Hoss and the Whole Gang

I DON'T HAVE TWENTY ROUTERS, like Norm—I only have four. But my routers have names. People name their cars, their guitars, etc., so why not routers, too?

I've named all of my routers after characters on *Bonanza*, one of my favorite TV shows. My oldest router, a Milwaukee 1-3/4 hp, is "Pa." "Hoss" is a Milwaukee 3-1/2 hp, and he stays in my router table. I call a Ridgid laminate trimmer "Little Joe." A DeWalt 2 hp plunge router, which I don't use a lot (or "in every episode"), is named "Adam". Maybe I should name my shop "The Ponderosa"!

Mitch Palmer

First-Gen Router

MY FAVORITE ROUTER sits on a shelf in my office. I don't know when it was made, but it looks like it was number one off the assembly line. It has a sewing machine-like motor, two threaded rods for height adjustment, and a set-screw collet. And it's worn—*seriously* worn. I'm sure its original owner used it and loved it just as much as I do, but for different reasons!

Ken Collier



Not Just An Old Drill

ABOUT 30 YEARS AGO, my girlfriend led me to a dark, cluttered basement workshop to meet a sweet, 70-ish gem of a man: her grandfather, Hayes. He was surrounded by a lifetime's collection of tools, and it was obvious that this was his domain. This was the first of my many enjoyable visits to his shop.

One day, he gave me a paper bag containing an assortment of hand tools and one well-preserved electric drill. He said that he couldn't see well enough to use the tools, and knew I would put them to good use. There was no sadness or resignation in his voice, only the peace from knowing that he'd lived life to the fullest.

I often think of Hayes when I'm in my own cluttered basement workshop. I married his granddaughter, and use his tools now and then—especially the drill, which has become dedicated to my pocket screw fixture. I like its size and heft, but I love its connection between different generations, and the pleasant memories it creates of a wonderful, special man.

Bob Winkler

We'll pay you \$100 to share your favorite tools, new or old, with fellow readers. Contact us by e-mail at toolnut@americanwoodworker.com, or mail us at American Woodworker, 1285 Corporate Center Drive, Suite 180, Eagan, MN 55121. If possible, please include digital photos of your tools.

Breezy Bandsawing

REASONING THAT I'D ONLY BE CUTTING

small stuff in my basement shop, I parked my bandsaw diagonally in a corner. Then I decided to make one of those arched-top garden arbors. My old jig saw had burned out, so I took the two 5' long cross beams down to the bandsaw. Everyone knows you can't saw a 5' piece of wood in a 4' space, but I tried, anyway.

Backed into the corner, somehow I managed to get the first piece started. Unfortunately, cutting the curved shape pressed the board harder and harder against me. I sucked in my XXL gut and kept going. Those of you who have a waistline that's bigger around than your butt know the story: As soon as I sucked in, my pants dropped down around my ankles. Like a trooper, I finished the cut. With all the noise, I didn't notice my wife coming down the stairs. She smiled, "That stuff really turns you on, doesn't it?"

Bob Endlerle



Tipped Off

HAVING PAINSTAKINGLY BUILT a dining table for my son and his fiancée, I had nightmares about driving screws through the finished top while attaching the extension glides for the leaves. So I carefully tested the screws, using a scrap piece from the top, to make sure they weren't too long. I disassembled the table, packed it in my car, and transported it to the wedding, which was in California. Just before leaving, I threw in a couple of extra screws, to make sure that I had enough.

Later, while gathered in my son's home to meet the new in-laws, I unpacked the table parts, turned the top over, and installed the slides. Everyone "oohed" appropriately as we tipped over the assembled table. Proudly, I reached across the top to brush off what appeared to be a shiny bit of wrapping paper—only to have my finger catch on a protruding screw tip! Argh! I hadn't noticed that the extra screws I'd tossed in for reassurance were too long. Fortunately, with a bit of sanding and finishing, the hole virtually disappeared.

Phil Tiewes



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