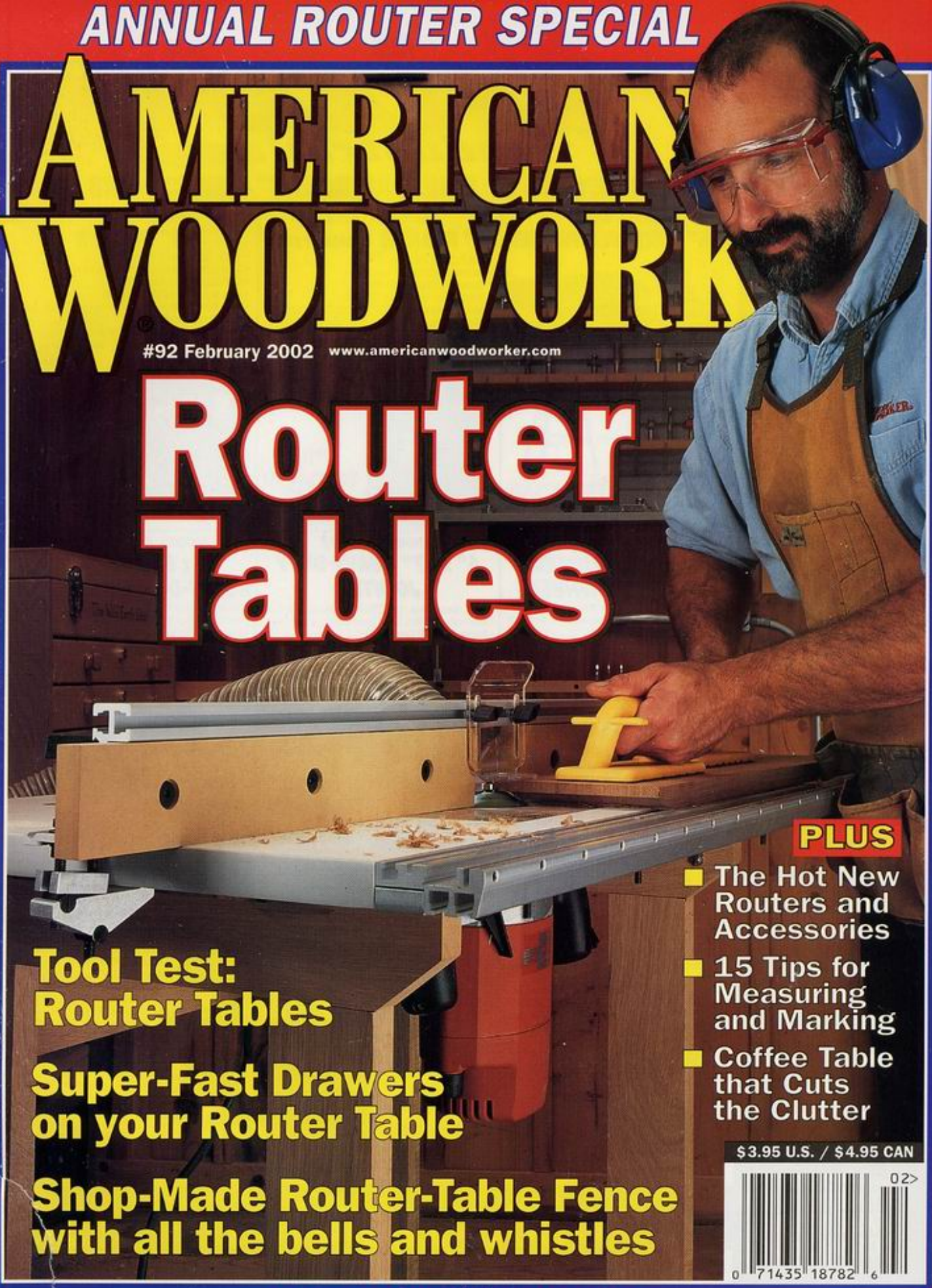
ANNUAL ROUTER SPECIAL

AMERICAN WOODWORKER

#92 February 2002 www.americanwoodworker.com



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- 15 Tips for Measuring and Marking
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Tool Test: Router Tables

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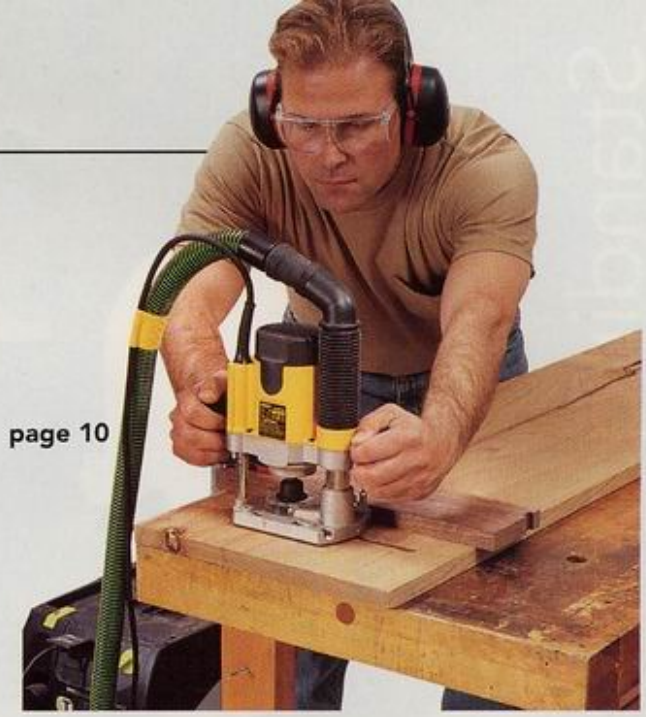
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Editor's Letter

Routers I Have Known

Right now, I'm a three-router guy. Although some of you may be just starting off, dreaming of your first router, many of us are on number two, three, four or beyond. American woodworkers do love their routers, and I am no exception.

My three routers are a pretty classic combination: small, medium and large. I probably reach for my medium-sized fixed-base more than the others, but that little trim router gets a surprising amount of play. Even though I bought it for plastic laminate work, it's so lightweight and easy to use, I find myself grabbing it for all sorts of roundovers and profiles. The big router is a 3-hp plunge, and I use it for router-table work. I've cut a heck of a lot of wood with those three machines (and the busted ones that preceded them) and I can't imagine doing woodworking without them. With a tablesaw and a router, I feel like I could make just about anything.

Which is not to say my routers are perfect. I wish I didn't have to remove the big router from the table to do plunge work, and I wish I could dial down the speed on the medium-sized one. But until I spring for router number four, they'll do. And of course, powerful as they are, there's the noise, the spewing dust and the general scariness. But in spite of those shortcomings, no other tool has made modern woodworking as accessible, interesting and just plain fun as the router.

STAFF

My favorite router, though, 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 we love ours.

Ken

Ken Collier

AMERICAN WOODWORKER

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Edited by **Tom Caspar**

Question & Answer

Dust Collection for Routers

Q. I'm sensitive to wood dust, so I'd like to reduce the amount of dust my router throws. What are my options?
Drew Klassman

A. The best way to fight dust is to remove it right at the source. Collecting dust is fairly easy with a dust hood on a router table, but trapping and sucking up the dust from a moving router is no picnic.

Routers can shoot dust in two completely different directions. When you cut grooves or mortises or do inlay work, for example, all the dust shoots up and out the sides of the router. But when you cut a profile on the edge of a board or use a flush-trim bit, most of the dust flies out below the router. The trick is to find a way to collect dust from both above *and* below the baseplate.

Router manufacturers haven't yet come up with the perfect solution. At right, you'll find some of the best ideas on the market. In general, plunge routers are better equipped than fixed-base routers.

Sources

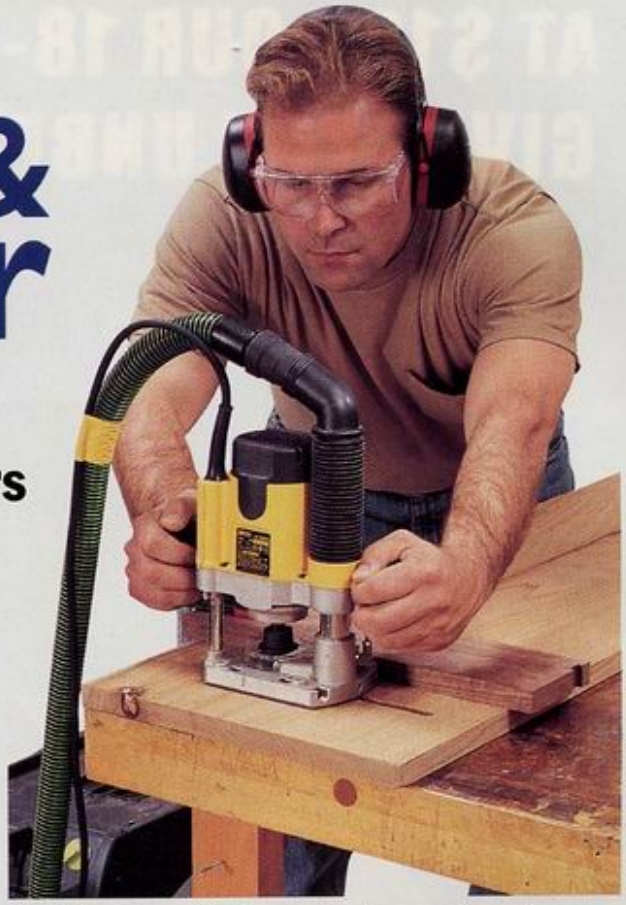
Black & Decker
(800) 544-6986, www.blackanddecker.com
Plunge router, #RP400; $99.

DeWalt
(800) 433-9258, www.dewalt.com
Plunge router, #DW621; $210
Universal edge guide, #DW6913; $40.

Festo
(888) 463-3786, www.toolguide.net
Plunge router, #OF 1000 E-plus; $330.

Leigh Industries
(800) 663-8932, www.leighjigs.com
Router vacuum attachment, #RVA1; $39.

Porter-Cable
(800) 321-9443, www.porter-cable.com
Dust collector for Porter-Cable 5-3/4-in. sub base, #39690; $50, #39700 for 7-in. sub base; $50.



RAMON MORENO

A built-in dust collection system for mortising and grooving is mighty convenient. You'll find this feature on DeWalt, Festo and Black & Decker plunge routers. DeWalt also makes an edge guide with a dust-collection port.

Inexpensive ($10 to $15) dust-collection accessories sold by many plunge router manufacturers are not quite as effective at capturing dust. Also, their molded plastic edges may obscure your view of the bit.

This nozzle attachment, from Leigh, is perfectly suited for use on a dovetail jig, but only somewhat effective for edge work. It fits most routers (see Sources, at left). For maximum efficiency, you can position the nozzle very close to the bit. Unfortunately, you can't use this attachment and an edge guide at the same time because the attachment fits into one of the edge-guide holes.

This accessory baseplate for Porter-Cable routers collects the dust made by almost every kind of router operation (see Sources, at left). Once attached to your router, it's virtually a built-in system. You can use an edge guide with it, also. Too bad this superb accessory doesn't fit on other manufacturer's routers!

ART DIRECTION: PATRICK HUNTER • PHOTOGRAPHY: STAFF, UNLESS OTHERWISE INDICATED • ILLUSTRATION: STAFF

Question & Answer

Sawdust in the Garden?

Q. I spend as much time tending plants in the garden as making sawdust in my shop. Are there any problems with using the sawdust and chips in my dust-collector bag as mulch in the garden?

James Lindquist

A. Go for it! A one- to 2-in.-thick layer of shavings and sawdust is excellent mulch. It holds moisture well, keeps down the soil temperature and prevents weeds from sprouting. Cedar, walnut and treated lumber, however, contain chemicals that plants don't like, so avoid putting their chips or sawdust on the garden.

Contrary to popular belief, sawdust mulch will not leach nitrogen from the soil (and turn your plants a sickly yellow) as long as the mulch is left alone on the surface of your garden. It's true that the microbes feasting on your shop waste will seek an additional source of nitrogen to flourish, but they won't rob much nitrogen from the soil below if the mulch above is a separate layer. However, if you mix your sawdust with compost or dirt, or turn over last year's layer of mulch into the dirt around your plants, add some high nitrogen (21-0-0) fertilizer to prevent nitrogen leaching.

Question & Answer

Knocking Apart Loose Joints

Q. I tried reversing a clamp to pull out the rungs of an old chair that needed regluing, but I couldn't get all of the rungs out. What do I do?

Al Klemperer

A. Spreader clamps can be helpful, but the most effective weapon for disassembly is a heavy, hard mallet or a deadblow hammer (about $25 at hardware stores). Sharp blows are faster and more effective at separating loose joints than gradual tugs with a clamp. It's the sudden impact that counts.

The secret to success is to *cushion* the blow. Lay the joint on a sturdy worktable covered with a soft blanket. (A quilted moving blanket or old wool blanket are ideal, although a few layers of corrugated cardboard work okay, too.) Hold onto the part you want to remove, then strike as near the joint as possible. You can strike pretty hard because you're hitting straight down. Unless a nail is holding the joint together, a few blows should do the trick.

Thanks to veteran furniture restorer Bob Flexner for help with this answer.

Router Speed Limits

Q. I love my new variable-speed router but I haven't a clue about selecting the right speed for the job. Any tips?

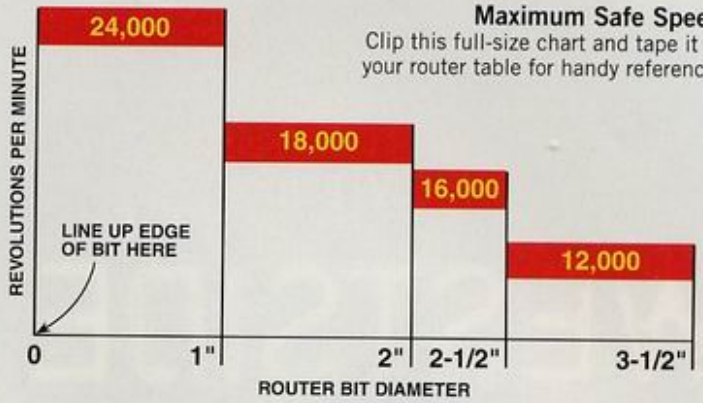
Bill Martinez

A. Four factors determine how fast your router should go:

- The diameter of the bit.
- The rate at which you move the router or the workpiece.
- The depth of cut.
- The type of wood.

For safety's sake, bit diameter is the most important. Large-diameter bits *must* be slowed down because their tips turn dangerously fast at a router's normal speed. Select your router's speed using the chart at right. The chart shows the *maximum* speed for your router, but to get the best results, the right speed could be much slower.

Maximum Safe Speed
Clip this full-size chart and tape it to your router table for handy reference.



Take mortising with a plunge router, for example. You're using a small-diameter bit, but your feed rate is usually quite slow. Slowing the router often makes a mortise with smoother walls.

Experiment on scrap wood to find the best speed for a particular operation. If the bit is burning the wood or leaving a poor finish, it's turning too fast. If the bit is chattering and leaving scallop marks, it's going too slow. With a little trial and error you'll find an ideal speed that leaves a perfectly smooth finish.

Can I Sharpen My Router Bit?

Q. I've got a carbide router bit that's caked with pitch and leaves a rough cut. Can I rescue it or should I buy a new one?

Curt O'Gorman

A. A bit *can* be brought back from the dead. Take a close look at the cutting edge. If it's rounded over or lightly nicked, take your bit to a pro for evaluation and sharpening. Most bits can be professionally sharpened four or more times for about $5 to $7 a pop.

There's a good chance that all your bit needs is a good cleaning and a light honing. Cleaning removes pitch and resin that can make your bit cut inefficiently and run hot. (A caked and dirty cutting edge will dull faster than a clean one.) Commercial bit and blade cleaners work far better and faster than common solvents like WD-40 or denatured alcohol (see Sources, below, right).

Hone your carbide bit with a diamond paddle lubricated with water. Two grits might be necessary, coarse 325 grit for a somewhat dull bit, and fine 600 grit for final honing and routine touch-up. Lap the flat face of the bit (not the profile). Four to six passes should do it. *AW*

Sources

Tools On Sale
(800) 328-0457, www.7cornershdwe.com
DMT diamond hones; fine, #FWF; $20, coarse, #FWC; $20, combination #FWFC; $30.

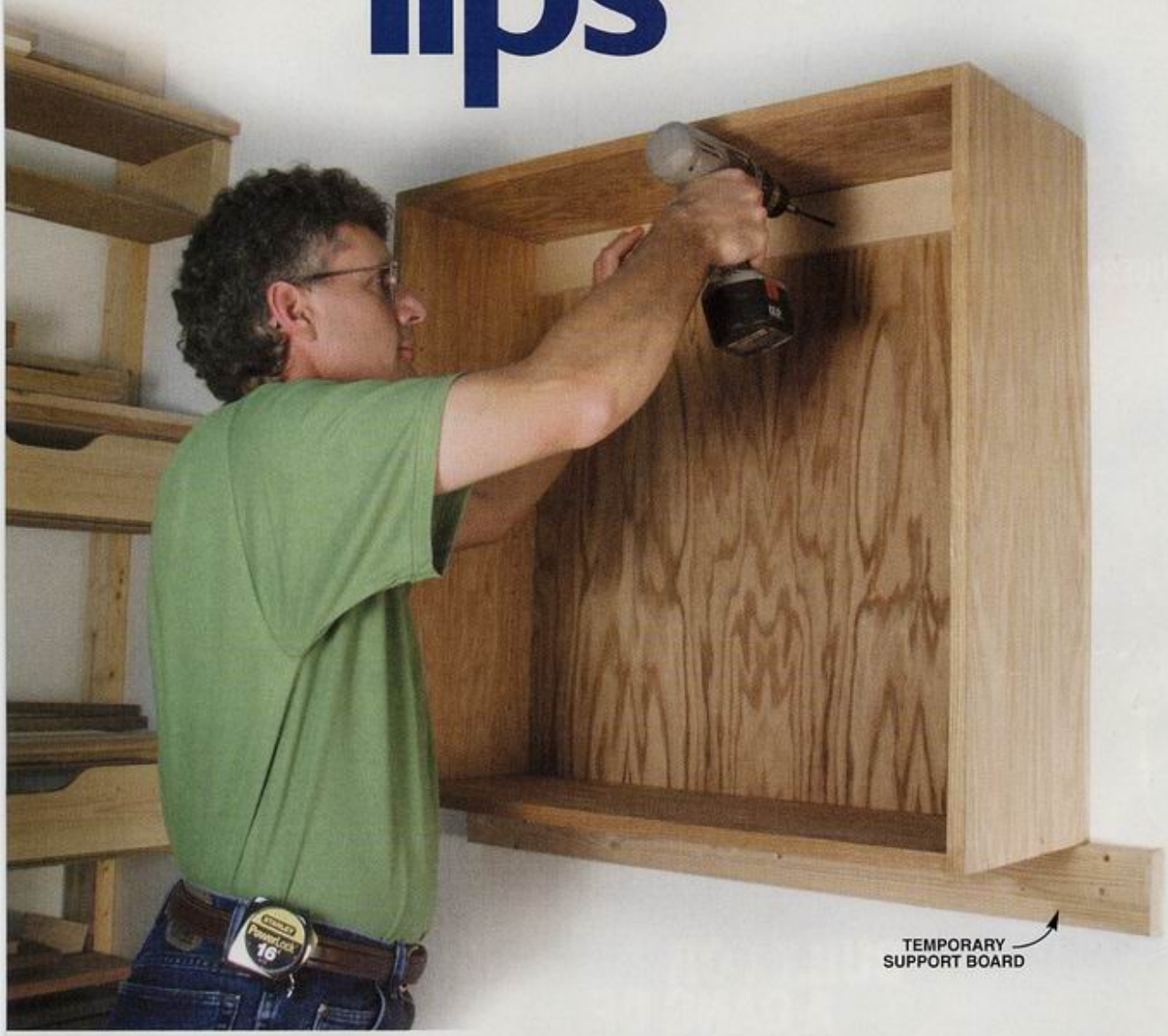
Woodworker's Hardware
(800) 383-0130, www.wwhardware.com
CMT bit and blade cleaner. #CMT998.001.01; $11 for 18 oz.

Ask Us

If you have a question you'd like answered, send it to us at: **Question & Answer, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121.** Sorry, but the volume of mail prevents us from answering each question individually.

Edited by **Randy Johnson**

Workshop Tips



Solo Cabinet Hanging

Hanging a wall cabinet is usually a two-person job—one to hold the cabinet level and one to screw it to the wall. I'm nearly always working alone, so I came up with this safe way to wall-mount a cabinet by myself.

Screw a 2x4 to the wall to rest the cabinet on and screw the cabinet to the wall. As long as the 2x4 is level and at the right height, all should go well. When you remove the 2x4 you will have a couple of holes to repair but it's a small price to pay for the hassle you'll avoid.

M. Sue Smelser

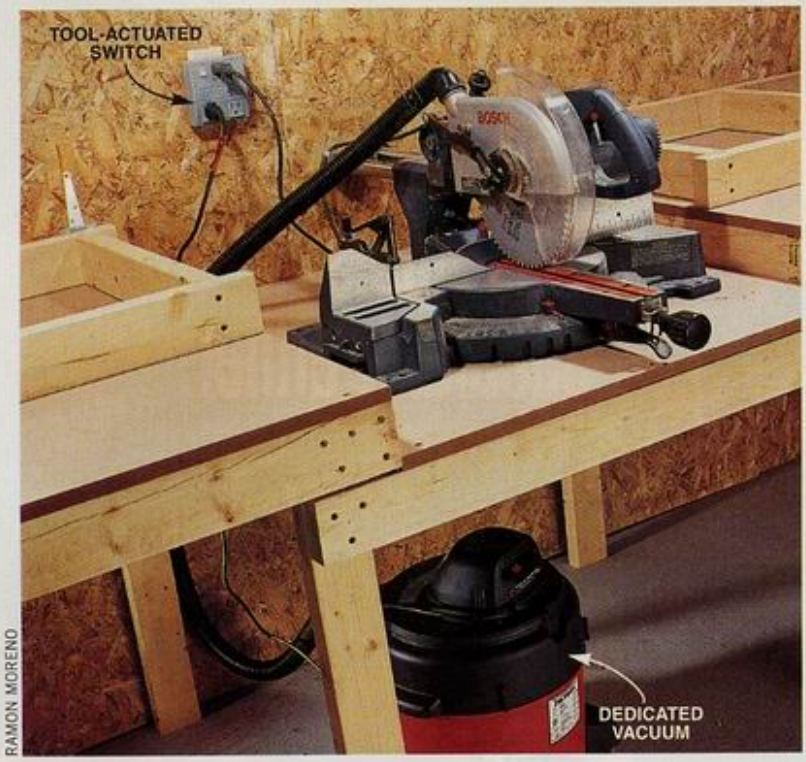
ART DIRECTION: VERN JOHNSON • PHOTOGRAPHY: STAFF, UNLESS OTHERWISE INDICATED • ILLUSTRATION: DON RAYMOND

Instant Rasp

I recently built a chest of drawers with sliding-dovetail joinery. During assembly, I found that the fit was just a little too snug. Rather than trying to realign my router jig, I looked around for another solution. I needed something that could slip in along the dovetail. I decided to stick some sandpaper to a scrap of wood with double-faced tape. I beveled the edge of the board, which allowed me to get right in where I needed to be.

Now this instant rasp is almost indispensable in my shop when I'm shaping, sizing or final sanding the edges of parts. I've made myself a whole set, ranging from very coarse to very fine grits.

Bob Letcher



RAMON MORENO

Dedicated Dust Collection

Many woodworkers don't have central dust collection. Instead, they repeatedly have to haul their shop vacuum between tools. This is a big hassle with a chop saw, because you usually only need it for a couple of cuts at a time. The solution? Buy an inexpensive extra vacuum and put it under the chop-saw bench permanently. Buy a tool-actuated switch so the vacuum comes on automatically when you start the chop saw. It's not the most elaborate system, but it works!

Tom Caspar

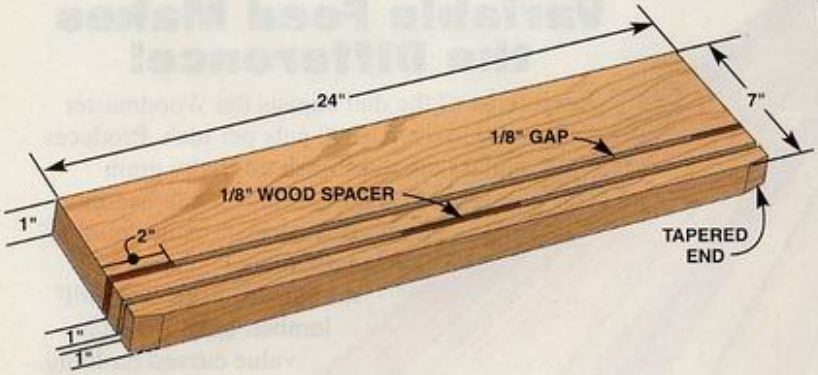
Source

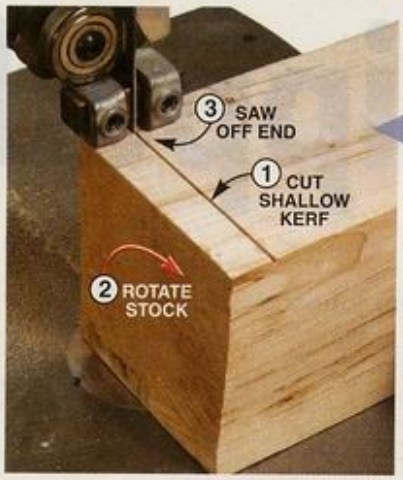
Sears 6-gal. Wet-Dry Vacuum, #00917781000; $40.
Sears tool-actuated switch, #00924031000; $20.
Sears Craftsman, (800) 377-7414,
www.sears.com/craftsman

Router Table Spring Board

I saw this device in an old woodworking book. I gave it a try and now I use it all the time. With this spring board you get even pressure along the entire fence and better results than either hand feeding or just featherboards. I still use a featherboard on the top to provide some anti-kickback protection.

Dave Munkittrick





Quick Squaring Cuts on a Bandsaw

Here's a simple way to square the ends of large stock using your bandsaw: Make a shallow cut on one face of the workpiece and rotate it a quarter turn. Using this shallow kerf as a guide, simply saw off the end. As long as your blade is set at 90 degrees to the table, you should get near-perfect results. *AW*

Jim Vasi

Scrollwork Finishing Bath

For all you scrollsawers out there, here's a slick finishing tip. You know how tough it can be to brush or spray finish into all those tiny sawed-out areas? Well, give your handiwork a bath instead! The finish will get into all those little areas and seal the wood nicely. Wipe off drips and excess finish with a clean shop cloth and set your project aside to dry. Then, brush or spray the final coats on the faces and sides only. Trying to build up the finish on the inside areas is unnecessary.

Luke Callahan

If you have an original Workshop Tip, send it to us with a sketch or photo. We pay $100 for each one we print. Send to: **Workshop Tips, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121.** Submissions can't be returned and become our property upon acceptance and payment.

The Well-Equipped Shop

Edited by Tim Johnson

Innovative Mid-Size Router

The distinctive handgrip on Milwaukee's new BodyGrip router grabs your attention, but its excellent height-adjustment system is an even better innovation.

The height-adjustment mechanism works just like the quick-release on a vise. A threaded rod on the motor engages a spring-loaded bar enclosed in the base. You make fine adjustments by turning a large dial attached to the top of the threaded rod. For coarse adjustments, or to remove the motor for bit changes, you just push a button to disengage the bar.

Because the motor simply tracks up and down when you adjust the height, the on-off switch stays put. A smooth-operating quick-release lever locks the motor and base.

The best feature of this innovative bar-and-rod system is that when the BodyGrip is mounted in a router table, you can adjust the bit's height from above, using the T-handle wrench (an $8 accessory) or a 3/8-in. socket wrench. With other routers you either have to reach under the table (awkward as heck) or buy an aftermarket device ($90 to $300).

The molded handgrip lets you hold the BodyGrip like a laminate trimmer. Milwaukee also packages this new router with a traditional D-handle base with an integrated trigger-style on-off switch.

The BodyGrip is a single-speed, 24,000-rpm machine. Its stock base plate has a generous 2-1/2-in.-diameter hole, large enough to give a good view while routing. A second baseplate with a smaller hole, designed for mounting guide bushings, is available as an accessory. Milwaukee's new guide bushings (complete set available in February, 2002) are compatible with most other routers.

Expect to see the BodyGrip with 1/4- and 1/2-in. collets, wrenches and the case, with its unique removable base, for about $179. An edge guide will also be available in February, 2002.

Sources

#5615-21 BodyGrip Router Kit; $179.
#5619-20, router with D-handle base (not available with case); $185.

Above-the-Table Depth Adjustment Wrench, #49-96-0370; $8.
Baseplate for guide bushings, #49-54-1040; $13.

Milwaukee Electric Tools
(800) 414-6527
www.mil-electric-tool.com

Adjust the bit's height without having to reach under your router table.

The case includes a removable base with a deep well, so you can store the router upright on your workbench.

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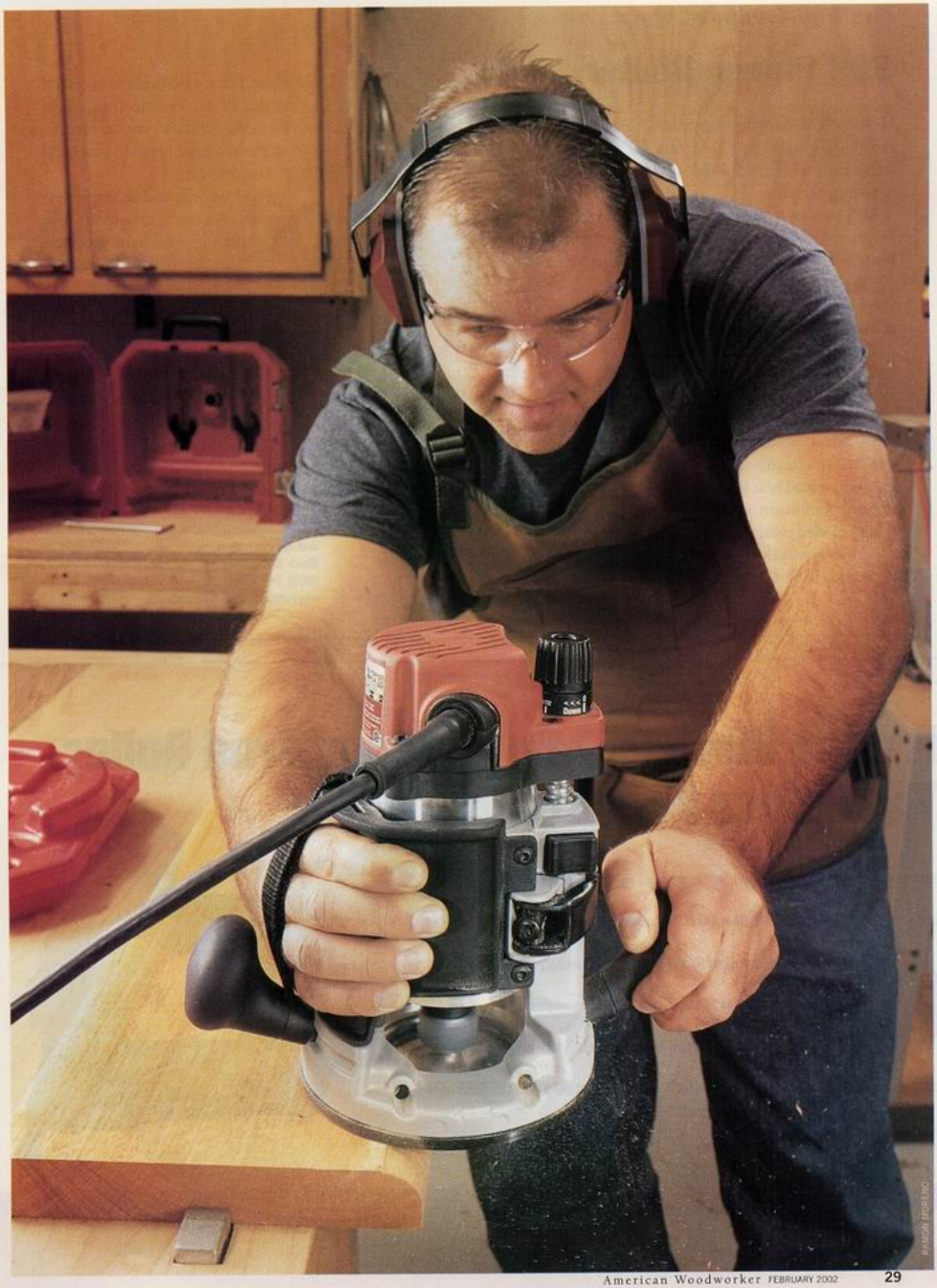

$99 Plunge Router

The new RP400 router from Black & Decker packs plunge capability, integral dust collection and a 2-hp motor with electronic variable speed and soft start for less than a sheet of walnut plywood.

Unfortunately, one important component, a 1/2-in. collet, is missing. The RP400 only accepts bits with 1/4-in. shanks. This is a peculiar setup for a 2-hp plunge router with variable speed. It horse-collars the router's capabilities and limits your choice of bits.

What you *do* get is a router that's well balanced and comfortable to operate. Both handles have soft-grip surfaces. A trigger-style on-off switch is located in the right handle. An effective plunge-lock lever is mounted near the left. The body rides up and down smoothly on two spring-loaded columns.

There's no depth-stop turret, so the depth-stop bar has to be raised for each pass. The bar is easy to adjust, but not particularly accurate.

The RP400 works adequately for fixed-base routing. Its light weight and comfortable handles make it easy to control, although it's difficult to set the bit's height exactly, a problem on most plunge routers.

The body's funneled shape near the collet, combined with the large opening in the base, provide a clear view of the work surface. Chips and dust are extracted adequately when a shop vacuum is connected to the dust port.

The RP400 is a lot of router for the money, but it isn't built as heavily as a machine designed to run all day, every day, and its undersized 1/4-in. collet limits it to small-scale tasks.

RP400 Plunge Router, $99

Sources

RP400 Plunge Router; $99.
Accessory package #76-234 (Includes edge guide and deluxe baseplate for template routing); $20.
Black & Decker
(800) 544-6986
www.blackanddecker.com

Adjustable Tongue-and-Groove Set

Lots of tongue-and-groove router bit sets are designed for 3/4-in. material. They cut 1/4-in. tongues and 1/4-in. grooves. A new bit set from Freud ($70) is adjustable. So why is this a big deal? Adjustability means you can use this set for stock from 1/2-in. to 1-1/4-in. thick.

You can make grooves (and matching tongues) from 7/32-in. to 3/8-in. wide in .004-in. increments, by slipping shims between the cutters. Each bit has its own set of shims. According to Freud, the tongues and grooves will match as long as you shim each bit by the same amount.

Tongue-and-groove joints can be used for mounting breadboard ends on tables or to make cabinet doors. When making doors, the adjustable slot cutter is great because you can adjust it to make grooves that fit 1/4-in. plywood, which is almost always less than 1/4-in. thick.

Sources
Freud Tongue-and Groove bit set; $70.
(800) 334-4107
www.freudinc.com
Note: This set is available with 1/2-in. shanks only.

Glass-Panel Door Set

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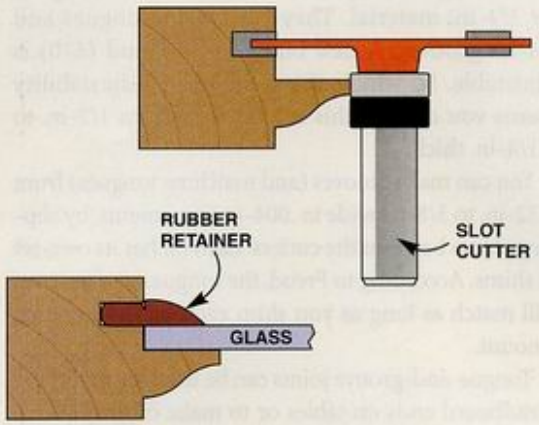


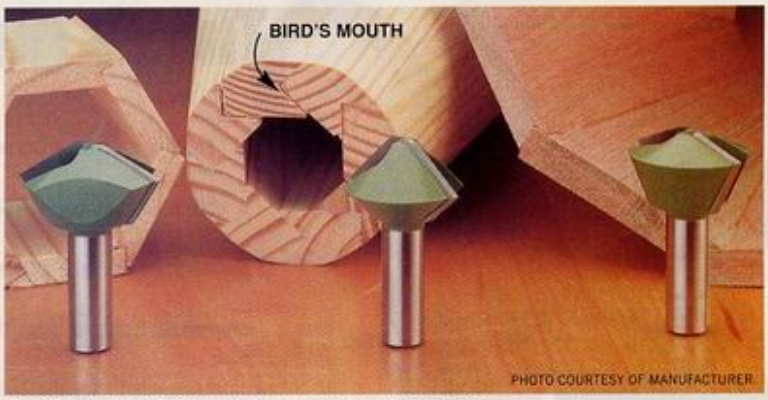
A new router bit set from CMT takes the "pane" (sorry) out of making glass-panel doors. The Sommerfeld Glass Panel Set, $130, works like a set of rail-and-stile router bits with a couple of important differences. First, instead of cutting grooves for panels, this set leaves a rabbet (for a piece of glass) on the back side of the door frame.

Second, after machining the stiles and rails, you cut slots in them, for barbed-rubber retainers ($14/25 ft. from CMT) that hold and cushion the glass. These removable retainers make glass installation easy—you won't have to fret about making and nailing-in wooden retainers. The downside is that when the door is open, these rubber retainers don't look as good as wooden ones.

When cutting the slots, you need to stop short of the stile ends (the vertical pieces) so the slot won't show after the door is assembled. Other than that, the setup is straightforward. CMT is working on an instructional video showing how to use this set to create the look of divided-light doors.

CMT, Glass Panel Set, #268-2487; $130.
(888) CMT BITS
www.sommerfeldtools.com

Birds-Mouth Stave Construction



Bird's-mouth joints lock staved pieces together.

Stave construction can be complicated, but the new Bird's-Mouth Joinery Bits from Lee Valley ($27 each) greatly simplify the process. These bits are used in a router table to produce 6-, 8-, 12- or 16-sided assemblies. They're designed to produce flush joints in material up to 7/8-in. thick. They'll work with thicker material too, but you'll need to plane or sand the joint flush after assembly.

Unlike standard flat-edged staves, these nest within each other. This is great at glue-up time because it prevents the parts from constantly slipping past each other as you try to put them together. The bird's-mouth also increases the glue surface area that holds the joint together.

The bits come with excellent instructions, including how to calculate part sizes. Setup in the router table is straightforward. I really enjoyed using these bits!

This is a handy way to do stave construction for planters, lamps, rounded box lids or any other multi-sided project.

Lee Valley Bird's-Mouth Joinery Bits; $27 each.
(800) 871-8158
www.leevalley.com

Dewaxed Shellac in a Can

You've probably read the warnings on cans of polyurethane varnish: "Don't apply over shellac." That's because shellac usually contains wax, which makes it incompatible with other finishes.

If the wax is removed, however, these adhesion problems disappear and you have one of the handiest tools around for finishing.

Dewaxed shellac works great as a tie coat between incompatible finishes. For example, if you want to put waterborne poly over an oil stain, use dewaxed shellac in between. If you want to put a fresh coat of finish on an old piece, but don't want to strip off the existing finish, use a coat of dewaxed shellac first to make sure the fresh coat adheres.

Dewaxed shellac also works great as a barrier coat. It keeps stains from blotching and individual layers of ground colors and glazes separate.

Up until now, the only way to get your hands on dewaxed shellac was to buy it in aerosol cans, decant it from wax-containing liquid shellac, or get it as dry flakes. These options are expensive, a hassle, or both.

Now you can buy liquid dewaxed shellac in a can. Look for Bulls Eye SealCoat Universal Sanding Sealer. According to the manufacturer, SealCoat is 100-percent wax-free shellac, and guaranteed to be compatible under and over any clear finish, including oil-based and waterborne polyurethanes, lacquers, varnishes and catalyzed finishes.

Whether you spray or brush it on, SealCoat dries in less than an hour.

Sources

Bulls Eye SealCoat Universal Sanding Sealer; $7.50/qt.; $18.50/gal.
Wm. Zinsser & Co.
(732) 469-8100
www.zinsser.com

Extra Hands in the Shop

How often have you wished for an extra hand in the shop? Any time you need extra support, the Multi-Stand can be that extra hand for you.

The Multi-Stand ($70) works a lot like a roller stand. But, instead of rollers, it has slick plastic surfaces for your material to glide across. Unlike rollers, these guides don't have to be meticulously aligned with the feed direction to work easily. Just set the stand at the right height, and you're ready to go. The Multi-Stand easily adjusts from 26- to 36-in. tall and the large footprint of the tripod base makes the stand very stable.

The Multi-Stand also has a U-shaped channel into which you can lock a 2x4 to create a very long support. Or, fasten a 2x4 cleat to the bottom of a piece of plywood and have an instant worktable. AW

The Multi-Stand features low-friction glide surfaces, adjustable height and a wide stance.

PHOTOS ON THIS PAGE COURTESY OF MANUFACTURER

The U-shaped head swivels, rotates and holds objects up to 2-1/16-in. wide.

Triton Multi-Stand; $70.
(888) 874-8661
www.multi-stand.com

Curly Wood

How to buy, machine and finish this amazing wood.

Hidden within a few trees in every forest lies a mysteriously distorted wood that has always fascinated woodworkers.

You can't spot curly wood from the outside, but inside the tree a peculiar switch has been flipped, turning straight tree cells into wavy cells. Cut the tree open, plane the wood and you get spectacular, three-dimensional rippling wood grain.

But beauty comes at a price. You can tear your hair out trying to tame this unruly wood. Here are some practical tips on how to buy, machine and finish curly wood.

What Is Curly Wood?

The stripes you see in a finished board of curly wood come from the play of light on grain that waves from side to side (Photo 1). The troughs and crests of the waves reflect light in different directions. As you turn a curly board around in your hands, its surface actually shimmers. Light areas turn dark and dark areas turn light.

The biology of curly wood is as mysterious as its appearance. No one really understands why some trees have this wavy grain. It's not genetic. You can take seeds from a curly tree, plant them near their parent and get nothing but straight-grained timber. The best guess is that stressful growing conditions, such as cold and drought, turn on the curly switch in a few trees, but no one has figured out how to duplicate these conditions in order to grow curly trees.

Curly grain can appear and disappear within a single tree. One side of a tree can be curly, and the other side straight. Young outer layers may be curly, but not older inner layers. It's totally baffling!

1 Split open a curly log and you'll find grain that bends back and forth like a wave. Planing the wood cuts through the waves, producing a shimmering effect like light bouncing off the ripples on a pond. This chunk of white oak is spectacular-looking wood!

ART DIRECTION: PATRICK HUNTER • PHOTOGRAPHY: STAFF, UNLESS OTHERWISE INDICATED

2 **Curly wood** is found in every kind of tree under the sun. Environmental factors probably turn normal trees into curly ones, but nobody knows for sure how it happens. Soft maple and birch are the most common domestic curly woods.

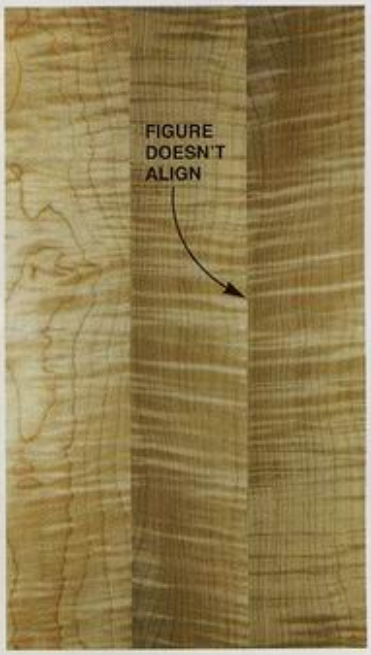
Buying Curly Wood

Any kind of tree can become curly, but some species that grow in tough northern climates produce a greater percentage of curly wood than others (Photo 2). Flame birch and tiger maple are well-known examples, but you can uncover curly walnut, curly cherry and curly oak, just to name a few.

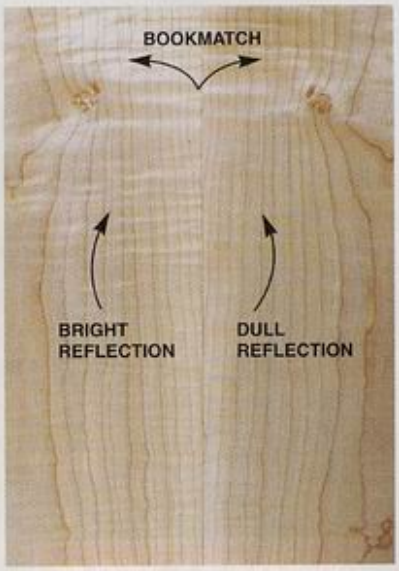
If you're lucky, you can find curly wood in any pile of lumber for the same price as a straight-grained board. Many lumber mills process logs so fast they don't stop and cull the unusual curly ones. If you search for curly boards in the rough, look for a striped barber-pole surface or alternating areas of smooth and fuzzy grain.

A few folks in the lumber trade make it their business to find curly logs. Wood prospectors mine for curly gold in the hundreds of average trees felled by a lumber mill. The prospectors peel back the bark of some logs before they're sawn. If they hit pay dirt, they'll purchase the log and gamble that most of it is truly curly. No one will really know how spectacular or faint the curl is until it's sawn.

Each dealer has their own system of grading curly wood, based both on general figure and the number of curls per inch. They'll be the first to tell you that curly wood is so unusual that it defies classification. Your best bet for consistency is to stick with a dealer who has a large stockpile and familiarity with this enigmatic wood.



3 **Glued-up curly boards** may not go well together. Curly figure is unusual because it runs at right angles to the edge of a board. It's difficult to align figure like this in a group of narrow boards. Instead, look for wide boards.



4 **Resawing a curly board** into two bookmatched pieces makes a wide panel, but you may not like what you see. Although the grain structure is the same in both boards, the figure doesn't look the same. Bright areas on one side may look like dull areas on the other side.

The Benefits of Wide Boards

Many dealers in curly wood hoard wide stock. Their logs are custom sawn to maximize the width of each board.

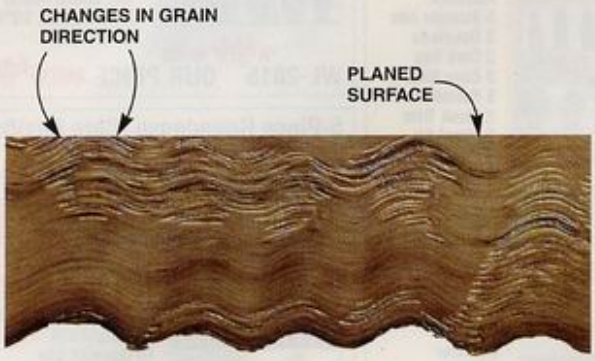
Why go to so much trouble? Imagine a drawer front made of three curly boards glued together. Individually, each board looks fantastic, but they don't work together (Photo 3). One wide board for the drawer front would look much better. Experienced builders of reproduction furniture look high and low for wide boards.

Seek out *wide* curly boards for sides and panels.

Bookmatching

If you resaw and bookmatch curly wood, light can play tricks on you (Photo 4). Sure, you've made a wide board with mirror-image grain (the physical structure of the cells), but look what happens to the figure (the surface appearance of the cells). The grain runs uphill on one side of the board and downhill on the other.

What does that do to the figure? One side of the board can be light, the other side dark. Shift your viewpoint and the brightness shifts the other way. Again, a wide board may be a better choice. Musical instrument makers routinely bookmatch the curly wood they call fiddleback maple, but they're awfully picky about selecting just the right boards.



5 **The planed surface** of a curly board slices right through the waves of grain. Making a curly surface smooth and free of tear-out is pretty tricky, because the grain constantly changes direction. Half the time you're actually cutting against the grain!

Reducing Tear-Out

Curly boards are notoriously difficult to joint and plane, but armed with some woodworking savvy you can usually produce a blemish-free surface. The problem is the grain, which changes direction with every ripple (Photo 5). It runs downhill on one side of a wave and uphill on the other side. So no matter which way you feed a board, whole hunks of wood can be yanked off the surface by a machine's knives, leaving an ugly pit behind. If you've just spent a pile of money on some special wood, this can be heartbreaking. Here's how to minimize tear-out:

- **Change your knives.** Dull knives on a jointer or planer pull on wood grain; sharp knives cut it cleanly.
- **Take a light cut.** Set your machine to remove 1/64 to 1/32 in. at a time. Sure, you'll take many more passes, but you'll minimize the depth of any tear-out.
- **Wet the wood.** Green wood is easier to cut than dried wood, because wet cells are easier to separate and less likely to pry out their neighbors. You can temporarily achieve the same effect on kiln-dried wood by *lightly* sponging the surface of a board before you joint or plane (Photo 6). Give your jointer bed a good waxing and the board won't drag. Rest

assured, you won't rust your cutter heads as long as you clean and dry them right away.

■ **Feed slowly.** Go slow on the jointer, about half the speed you normally use.

■ **Scrape, don't plane.** If you're working with hand tools, use a No. 80 scraper plane (#03.12.05; $33 from Highland Hardware, 800-241-6748). Its steep cutting angle allows you to quickly remove milling marks without any fear of tear-out. A card scraper is the perfect tool for smoothing small areas of shallow tear-out.

Despite your best efforts, a little tear-out when working curly wood is inevitable. Don't get too discouraged. Some curly boards are so wild that even the finest woodworkers turn to two more tools: drum sanders and putty. A drum sander is a surefire (and expensive) way to surface curly wood perfectly smooth. It's slower than a jointer or planer, but you're guaranteed a clean shave. For tiny pits of tear-out that run pretty deep, use putty. If you scrape or sand down to the bottom of the tear-out you might end up creating a whole new problem: a shallow, dished out divot. You may not see it right away, but it'll show up under a finish.

6 **Wetting the surface** of curly wood before jointing or planing virtually eliminates tear-out. This may be hard to believe, but temporarily softening the fibers really works!

7 Finishes that are slightly colored emphasize the curls more than perfectly clear finishes. Amber shellac has an extra amount of color, enhancing the effect.

Finishing Tips

The amount of color in a finish can make a big difference in bringing out the curl. The explanation lies in looking once more at curly wood's grain structure. Remember how the surface of a flat board cuts right through the rising and falling grain? When the grain rises up to the surface it exposes the ends of many cells. These end-grain cells are thirsty to absorb a finish, just like the end grain of any board. But the side-grain cells on the crests and troughs of each wave don't absorb as much finish. The result is that some areas of a board soak up more finish (and color) than others.

Finishes such as shellac, oil and varnish are slightly colored. The thirsty parts of a board soak up an extra amount of this color. This extra color really makes the curl pop. Orange or amber shellac has more color than blond shellac, making the effect particularly striking (Photo 7).

Other finishes such as lacquer and waterborne polyurethane don't have much color in them. You can still see the curl under them, but it's not as dramatic. However, if you apply these finishes over a coat of dewaxed shellac you can have the best of both worlds. (See page 34 for a great new dewaxed shellac product or see AW #80, page 98 for a way to make your own.)

Dyeing Curly Figure

Here's a neat trick using dyes instead of stains to emphasize the dark figure of curls. This is a shop-tested recipe to simulate the look of antique curly maple furniture:

1. Sand your maple to 220 grit and apply one coat of Dark Mission Brown water-soluble dye, mixed 1/8 tsp. powder to 1 cup water. Let dry.
2. Re-sand with 220 grit paper. Sand until the wood surrounding the dark-colored curls is light.
3. Apply Early American water-soluble dye mixed 1/2 tsp. powder to 1 cup water. Let dry.
4. Apply a liberal amount of boiled linseed oil. Wipe off the excess after 30 minutes. Let dry at least three days.
5. To further warm the color of the wood and give it an aged look, apply a burnt umber glaze. Visit the Web site listed below for more on using glazes.
6. Apply your favorite topcoat. If you're using a waterborne finish, apply dewaxed shellac first. *AW*

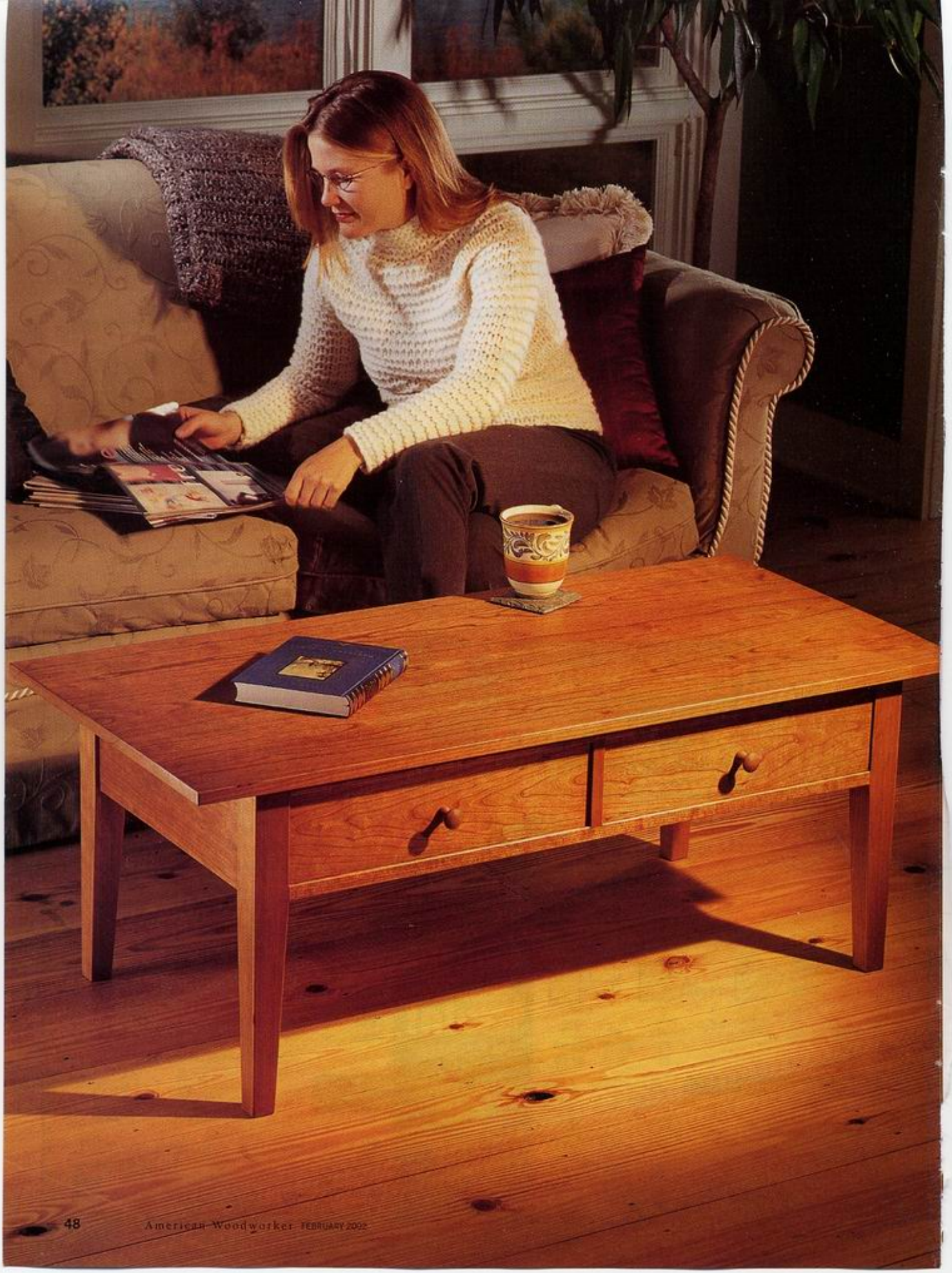
Sources

Homestead Finishing Company
(216) 631-5309
www.homesteadfinishing.com

Water-soluble dyes
Dark Mission Brown, #3274 and Early American Maple #3273; $7.25 for 1 oz.

Japan color
Burnt Umber, #7002, $6.25 for 8 oz.

8 **Dye penetrates deeply** into the thirsty end-grain areas of the curls. It makes them stand out from the surrounding wood. For even more contrast, sand the board. The curls remain dark while the surrounding wood stays light. Then, apply a second coat of dye.



By Tim Johnson

Two-Drawer Coffee Table

Pass-through drawers offer two-sided convenience

A coffee table isn't just for coffee. It displays interesting reading and serves the Saturday night pizza. It hosts Scrabble games, labors under kids' crafts and gives you a place to rest your feet. It's a real workhorse that has to be well built and versatile.

Our table is rock-solid, featuring mortise-and-tenon joints, splines, and dovetailed drawers. It's also easy to build, because simple, shop-made jigs ensure perfect-fitting joints. Its two drawers act like four, because they open from both sides. A standard dovetail jig is all you need to make them. Rare-earth magnets work like magic as two-way drawer stops (see Sources, page 59).

This table requires only 25 bd. ft. of 4/4 stock and 9 lineal ft. of rough-cut 2-in.-square stock. If you don't have a jointer and planer, buy turning squares and rip them down to make the legs (see Sources, page 59). Buy 3/4-in.-thick boards for everything else but the drawer sides. Get 1/2-in.-thick boards for them and a 2 ft. by 4 ft. piece of 1/4-in. plywood for the drawer bottoms. We built our table from cherry, and used birch for internal parts and drawer sides. Our cost, including one-half sheet of 3/4-in. birch plywood for the jigs and clamping cauls, came to about $250.

The only must-have power tools for this project are a tablesaw and a plunge router equipped with an edge guide. You'll also need a drill, a coping saw, a sharp 1/4-in. chisel, glue and the usual assortment of clamps, including four 4-ft. pipe clamps.

Start at the Top

I always make the top of a table right off the bat, for two reasons. First, it's the most important part, visually, so it deserves the best-looking boards. Make

ART DIRECTION: VERN JOHNSON • PHOTOGRAPHY: BILL ZUEHLKE • ILLUSTRATION: FRANK ROHRBACH

the aprons, rails and drawer fronts from the leftovers.

Second, you can start finishing the top early, so the finish will have plenty of time to cure. This is especially important if you plan to build up layers of finish for long-lasting protection. Be sure to apply equal layers to both sides of the top, to keep it stable.

I like to use hide glue when I work with cherry, because of its dark color. Its long open time also makes it easy to fine-tune the joints between the top boards (Photo 1). Wait 24 hours before you remove the clamps. Hide glue takes a long time to dry.

Cut the top (A) to size, smooth it and soften all the edges. I use a router with a 1/8-in. round-over bit for this, but sandpaper and a block will work. If you have children, you may also want to round the four corners for safety.

Size Up the Legs

The four legs (B) are mortised, dadoed and tapered (Fig. A, Detail 1), but they're not identical. Be sure to make two opposing pairs, one left- and one right-sided. Mark your blanks carefully, so you don't mess up! You'll need all three jigs (Figs. B, D and E) to complete the legs; I find it easiest to make them as I go.

Plunge-Rout the Mortises

Use one of the leg blanks for sizing when you build the mortising jig (Fig. B). Make sure the leg fits snugly between the rails of the jig and is perfectly flush with them at the top.

Plunge-rout mortises for the aprons (Photo 2 and Fig. A, Detail 1), after marking the start/stop points (Fig. C). All four mortises are cut with the edge guide at the same setting. Create the groove for the haunched tenons (Fig. F) by routing the first couple passes full length. Then use the start/stop marks to finish plunging the individual mortises.

Next, plunge side-by-side mortises for the lower rails (Fig. A, Detail 1). Both of them are cut from the same edge guide setting. After cutting the first mortise, flip the leg end-for-end to cut the second. Each mortise has its own pair of start/stop marks.

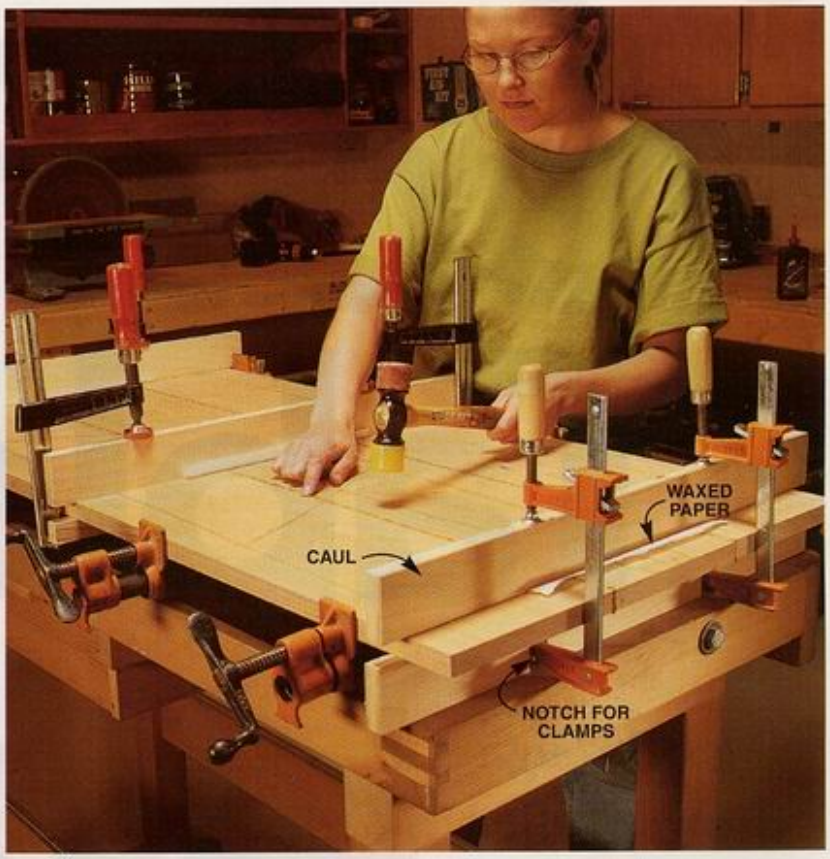
By flipping the leg, the side-by-side mortises will be perfectly centered and their outer shoulders will be identical.

After routing, square the ends of the mortises (Photo 3).

Cut Dadoes and Tapers

The top rail joins the leg in a lapped joint (Fig. H). The leg has a centered through-dado on its top end. To cut this dado safely on the tablesaw, clamp the leg in the tenoning jig (Fig. D) and make two passes (Photo 4). Be sure to dado the face with the side-by-side mortises.

Building the tapering jig (Fig. E), takes longer than using it to taper the legs! Orient the leg so you can clamp it flat on the jig for both tapering cuts (Photo 5).



1 USE YOUR BEST BOARDS FOR THE TOP. Choose 'em and use 'em right away, so you don't get caught short later. Cauls above and below keep the boards aligned and flat during glue-up. Use a non-marring mallet to make minor adjustments.

Oops!

Shoot! I wish I'd paid attention while I was laying out the legs. The left one looks weird because its figure pattern runs against the taper. What's more, matching the figure and taper on one face isn't enough—legs are usually tapered on two faces. From now on, I'll be sure to look for taper-friendly figure patterns on two adjacent faces of my leg blanks.

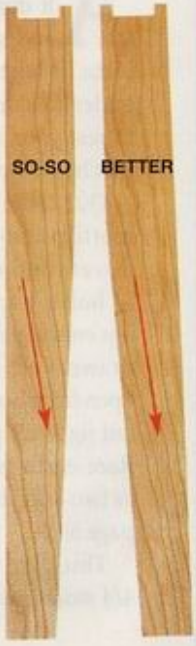
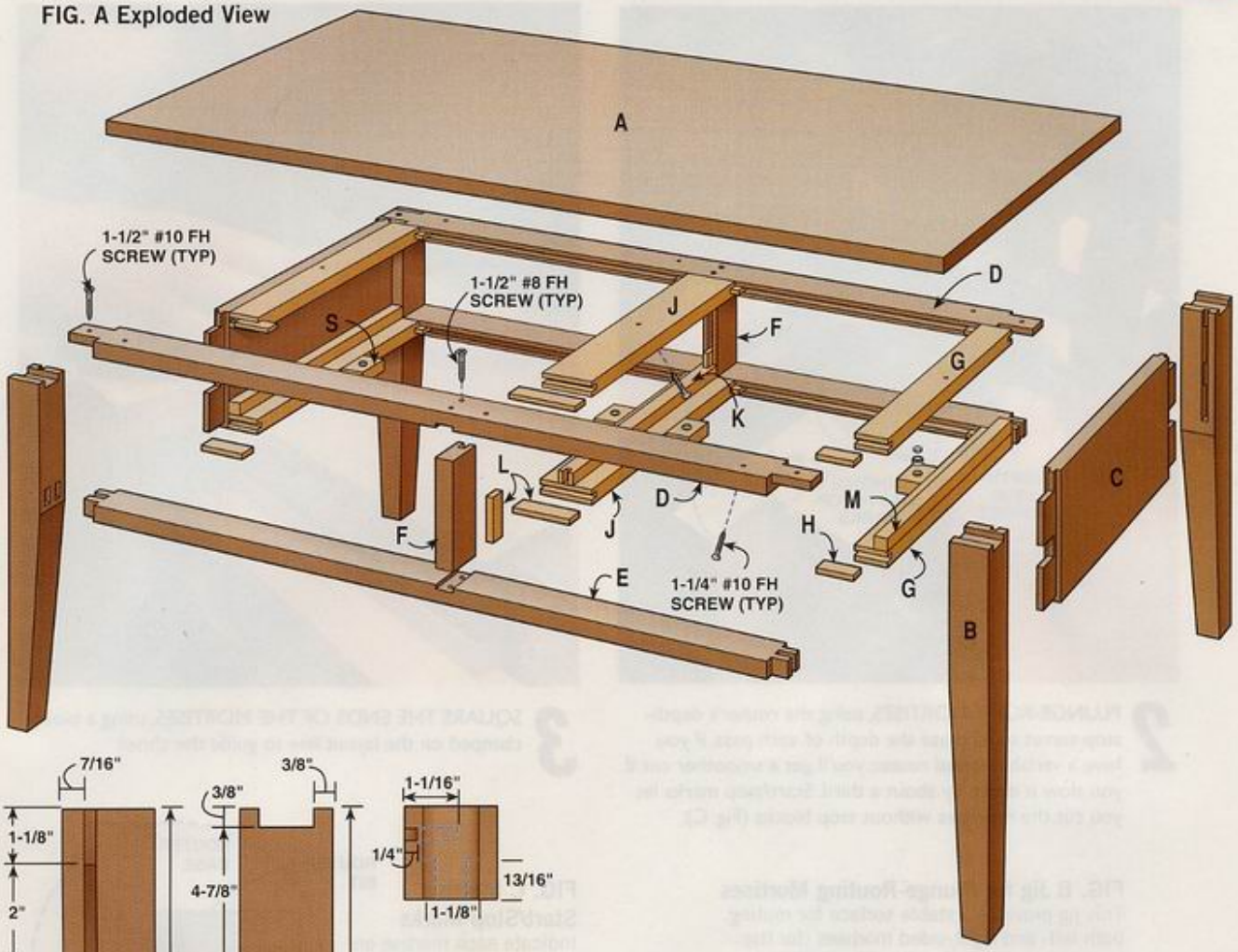
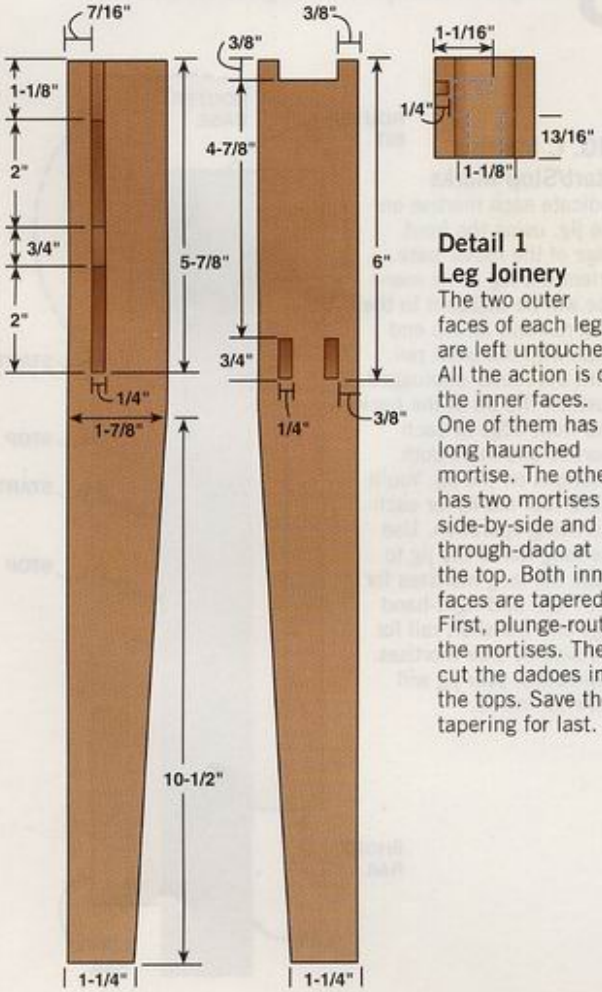


FIG. A Exploded View

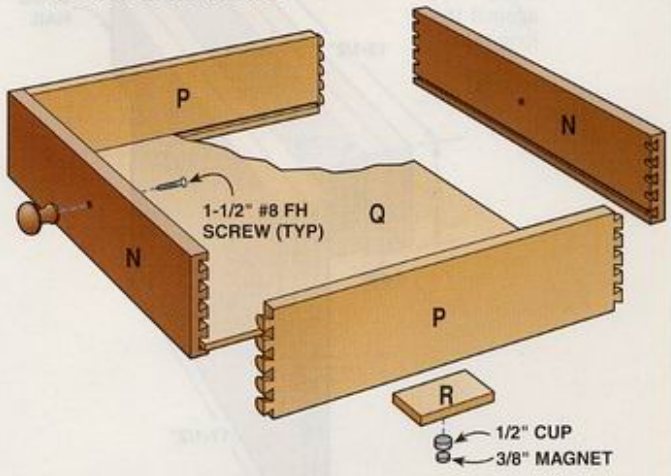


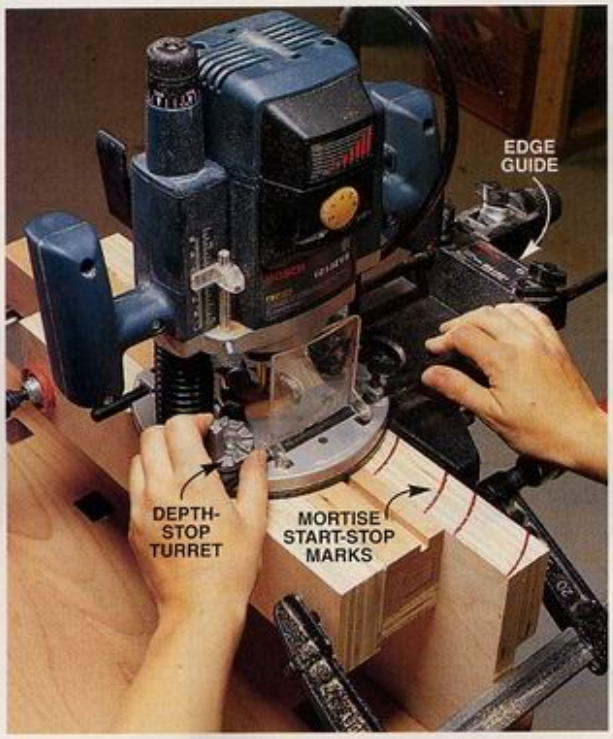


Detail 1
Leg Joinery

The two outer faces of each leg are left untouched. All the action is on the inner faces. One of them has a long haunched mortise. The other has two mortises side-by-side and a through-dado at the top. Both inner faces are tapered. First, plunge-rout the mortises. Then cut the dadoes in the tops. Save the tapering for last.

Detail 2
Drawer Construction





2 PLUNGE-ROUT MORTISES, using the router's depth-stop turret to increase the depth of each pass. If you have a variable-speed router, you'll get a smoother cut if you slow it down by about a third. Start/stop marks let you cut the mortises without stop blocks (Fig. C).

3 SQUARE THE ENDS OF THE MORTISES, using a block clamped on the layout line to guide the chisel.

FIG. B Jig for Plunge-Routing Mortises
This jig provides a stable surface for routing both left- and right-sided mortises (for the aprons) as well as side-by-side mortises (for the front rails). The leg tops align with one end of the short rail or the other, depending on which mortise is to be cut. The router's edge guide always rides against the long rail.

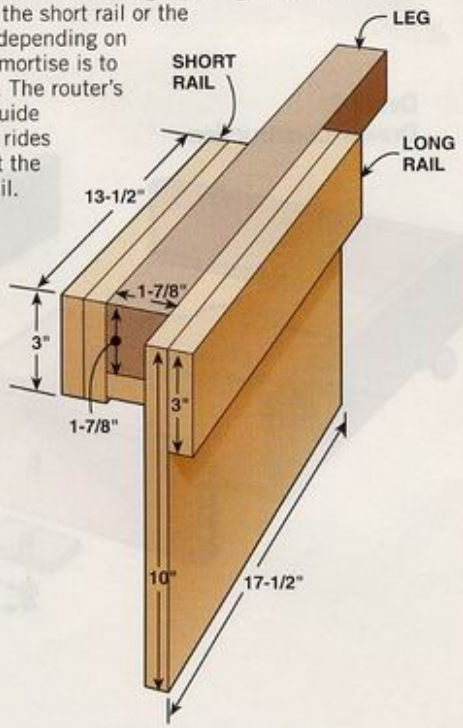
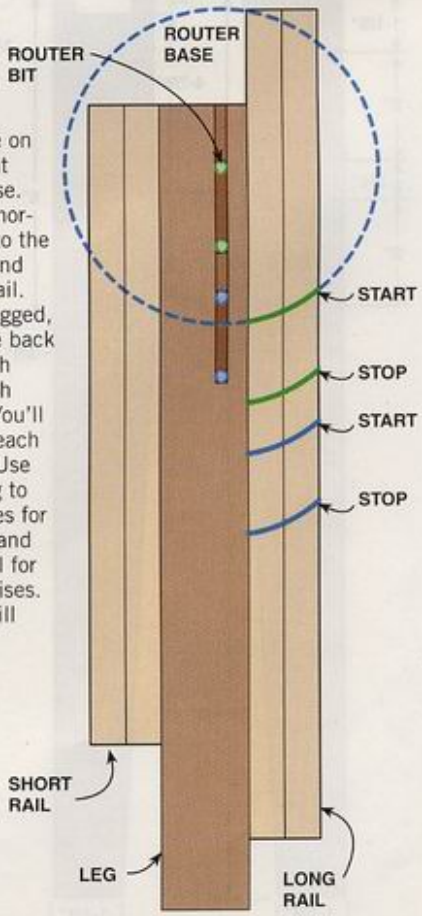
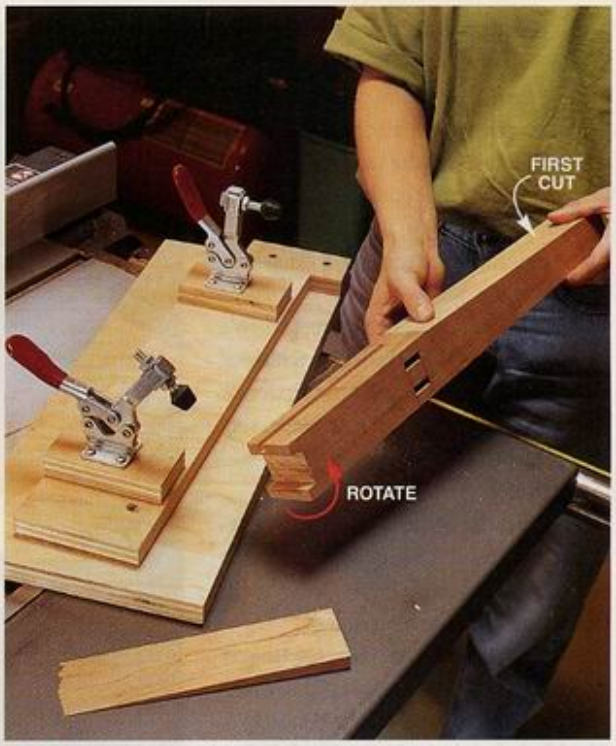


FIG. C Mortise Start/Stop Marks
Indicate each mortise on the jig, using the front edge of the router base. Orient the leg so its mortise will be adjacent to the long rail and its top end flush with the short rail. With the router unplugged, position the bit at the back and front edge of each mortise and mark both locations on the jig. You'll make four marks for each mortising operation. Use the long rail of the jig to mark the long mortises for both left- and right-hand legs and the short rail for the side-by-side mortises. Ultimately, your jig will have 12 marks.



Caution: The blade guard must be removed for dado cuts. ***Be careful.***

4 CENTER A WIDE DADO in the top of each leg, using a shop-made tenoning jig (Fig. D). Make two passes, one on each opposing face, so the shoulders are the same thickness.



5 TAPER THE TWO MORTISED FACES. Clamp the leg with one mortised face toward the blade and the other face down on the tapering jig (Fig. E). After cutting the first taper, rotate the leg clockwise to cut the second taper.

FIG. D Tenoning Jig
This jig rides against the rip fence and allows you to safely make accurate cuts with the workpiece standing on its end. Fasten the stop block with screws only so it's easy to replace.

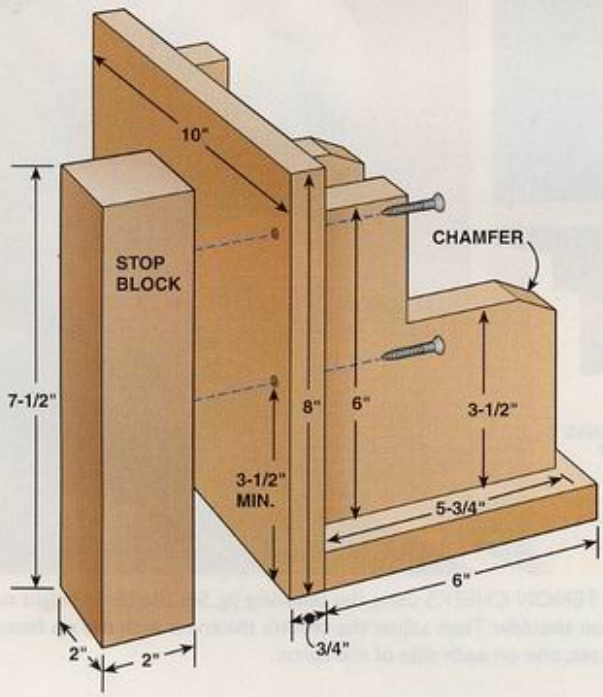
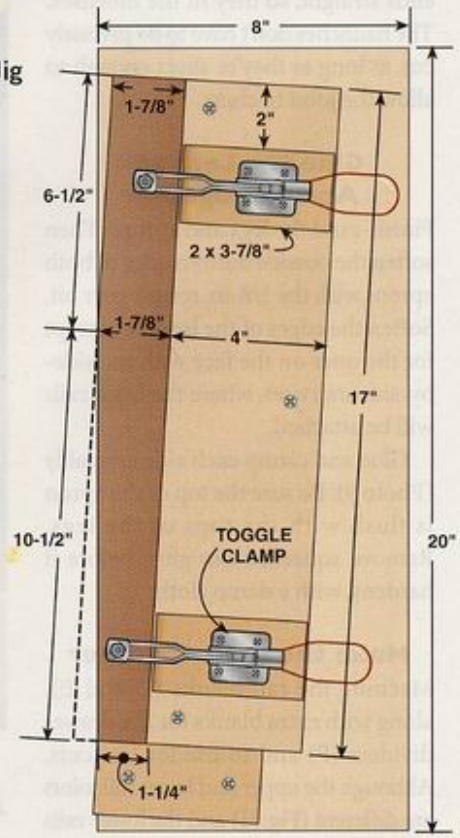


FIG. E Tapering Jig



Make the Aprons

When you machine the apron blanks (C), make an extra one. Use it for testing when you set the blade and fence on your tablesaw. Cut the tenon shoulders first, using the miter gauge and rip fence (Photo 6). Be careful when you set the blade height. A cut that's too deep will weaken the tenon.

This cut establishes the tenon's length. Be sure to include the width of the saw kerf when you set the rip fence (with a standard 1/8-in. kerf blade, setting the fence at 7/8-in. results in a 1-in.-long tenon).

Next, set the blade and fence for cutting the tenon cheeks, using a test piece with correct shoulder cuts. Test the fit, using one of the mortised legs.

In this operation, the fence setting is most important because it determines the thickness of the tenon (Photo 7). The blade height isn't as critical. Being a bit too deep won't weaken the tenon.

After the cheeks are cut, saw individual tenons from the full-length blanks (Photo 8 and Fig. F). Cut the ends straight, so they fit the mortises. The haunches don't have to be precisely cut, as long as they're short enough to allow the joint to close.

Glue the Legs and Aprons Together

Finish-sand the legs and aprons. Then soften the outside bottom edge of both aprons with the 1/8-in. round-over bit. Soften the edges of the legs too, except for the ones on the face with the side-by-side mortises, where the front rails will be attached.

Glue and clamp each side assembly (Photo 9). Be sure the top of the apron is flush with the tops of the legs. Remove squeezed-out glue, before it hardens, with a damp cloth.

Make the Rails Together

Machine the rail blanks (D and E), along with extra blanks for the drawer dividers (F) and to use for test cuts. Although the upper and lower rail joints are different (Fig. H) and the lower rails

Caution: The blade guard must be removed to make this cut. ***Be careful.***

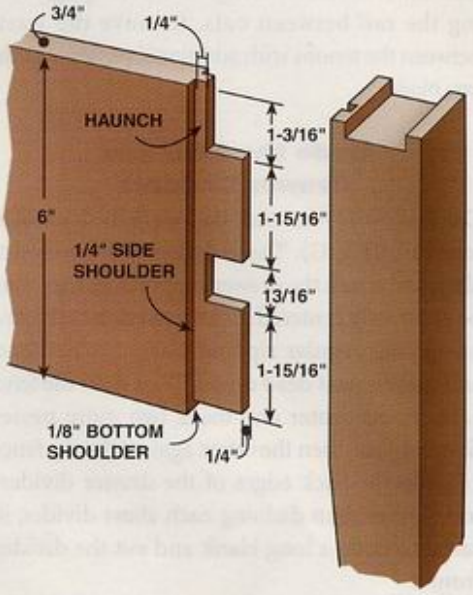
6 CUT SHOULDERS IN THE APRONS with the blade set to leave 1/4-in. remaining in the center. You can use both the miter gauge and rip fence for this operation because you're not making a through cut.

Caution: The blade guard must be removed to make this cut. ***Be careful.***

7 CUT APRON TENON CHEEKS using the tenoning jig. Set the blade height to score the tenon shoulder. Then adjust the tenon's thickness with the rip fence. Make two passes, one on each side of the apron.

8 FINISH SAWING THE TENONS with a coping saw or on the bandsaw. Be careful with your layout to make sure the haunches are properly located.

FIG. F
Haunched Apron Tenons
A haunched mortise-and-tenon joint is a super-strong version of a tongue-and-groove. Haunches, like the tongue, provide full-width support for the apron. Tenons make a stronger joint than short tongues. They also have much larger gluing surfaces. On this wide apron, two tenons are stronger than one long one. The shoulder at the bottom hides the mortise.



9 GLUE THE SIDE ASSEMBLIES. Brush hide glue on the walls of the mortises and on the tenon cheeks. Use blocks to distribute the pressure when you clamp things together.

end up being shorter, the four rail blanks must be identical, and cut square on both ends.

First, cut dadoes for the drawer dividers across the inside faces of all four rails (Fig. G). These dadoes must be carefully sized to fit the dividers and precisely centered on the rails. Equip your miter gauge with a fence and stop block to make these cuts.

After cutting the dadoes, separate the rails into pairs and cut the tenon shoulders (Photo 10). Make a third shoulder cut on the inside faces (the ones with the dadoes for the dividers) of the two upper rails (Photo 11).

Next, remove the waste from the tenon sides. Clamp a test piece on the tenoning jig, with its face against the stop block. Raise the blade, set the fence and cut the outer side of the tenon. Then rotate the test piece 180 degrees and cut the other side.

Test the tenon's fit in the leg-top dadoes. Adjust the fence, if necessary, and finish cutting the tenons on all four rails.

Finish the Rail Joints Separately

Re-mount the upper rails in the tenoning jig and cut their half-lap tenon cheeks (Photo 12).

Shorten the lower rails so the tenons extend only 3/4 in. Then mark these tenons so you can cut them into the side-by-side tenons (Photo 13). Cut their inner shoulders using the tenoning jig, rotating the rail between cuts. Remove the waste between the tenons with additional passes over the saw blade.

Dado the Rails and Drawer Dividers

Cut shallow 1/4-in.-wide dadoes in the back of all four rails (Fig. G). These dadoes will be used to align and attach the drawer supports, so they must be accurately centered. Cut them on the tablesaw, using your regular ripping blade. Set the fence and make a pass dead center. Then reset the fence 1/16-in. off-center and make two more passes, first one face, then the other, against the rip fence.

Dado the back edges of the drawer dividers, too. Rather than dadoing each short divider, it's safest to dado a long blank and cut the dividers from it.

After drilling countersunk pilot holes for screws in the rails, dry-assemble the base on a flat surface. Clamp it together and test the drawer openings with a gauge block (Photo 14).

Glue the Base Together

Hide glue is a good choice for this job. Its long open time gives you the opportunity to check the drawer openings and measure diagonals to make sure everything is square before you drive the screws (Photo 15). Be sure to work on a flat surface.

Cut the drawer supports (G and J) to length and dado their ends to match the dadoes on the rails, using the tenoning jig. Then make the splines (H and L). Apply glue, slide the supports in place and insert the spline. Make sure the support stays flush with both rails when you add the clamps (Photo 16).

The ends of the center drawer guide (K) are also dadoed. Splines keep it flush with the dividers (Photo 17). Glue the outer drawer guides (M) flush with the inner leg faces. Install the upper center drawer support last.

Drill countersunk pilot holes through all three upper supports for fastening the top with screws, dead center (Fig. A). Then drill slightly larger diameter holes in the upper rails so the top has freedom to move with changes in humidity.

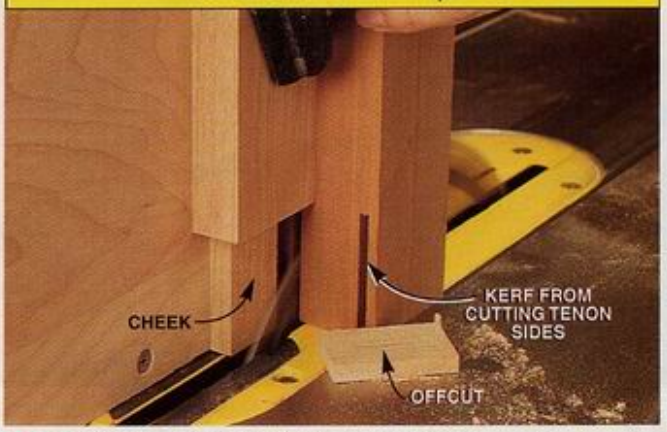
Caution: The blade guard must be removed to make this cut. ***Be careful.***

10 CUT THE RAILS' TENON SHOULDERS SIMULTANEOUSLY. Gang them together in pairs, one upper and one lower, and make sure they're precisely mated when you make the cuts.

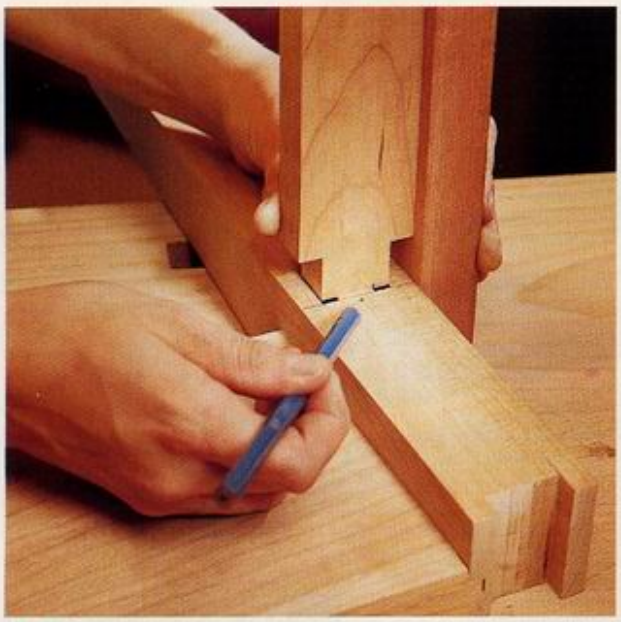
Caution: The blade guard must be removed to make this cut. ***Be careful.***

11 CUT HALF-LAP SHOULDERS on the inside faces of both upper rails. Use the same setup you just used to cut the tenon shoulders.

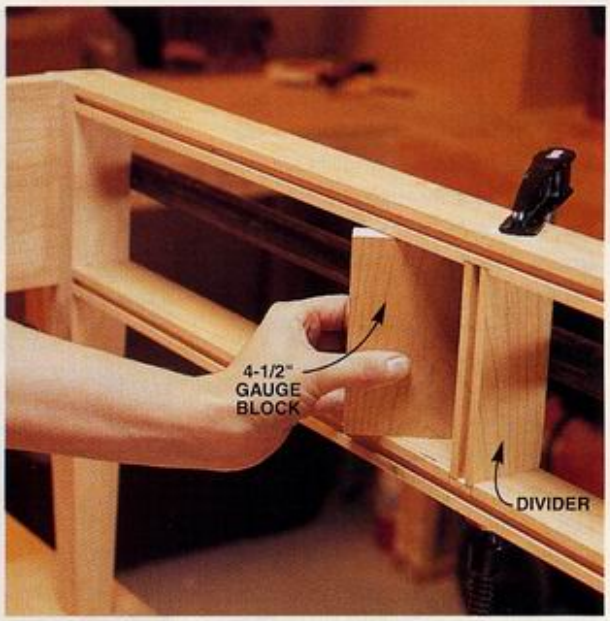
Caution: The blade guard must be removed to make this cut. ***Be careful.***



12 CUT HALF-LAP CHEEKS on the inside faces of the upper rails, using the tenoning jig. Orient the rail so the offcut falls out of harm's way.



13 MARK THE INSIDE SHOULDERS of the two lower-rail tenons right from the mortises on the leg, after shortening the rail's long tenon.



14 FIT THE DRAWER DIVIDERS while the base is clamped together in a dry assembly. A shop-made gauge block that measures the width of the drawer opening lets you know when the dividers are the right length.

FIG. G Rail Dadoes

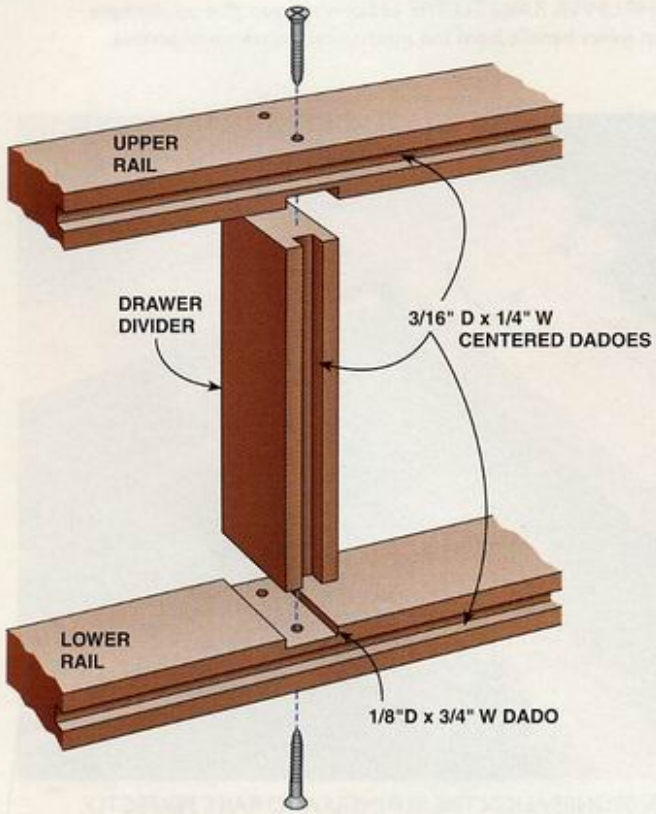
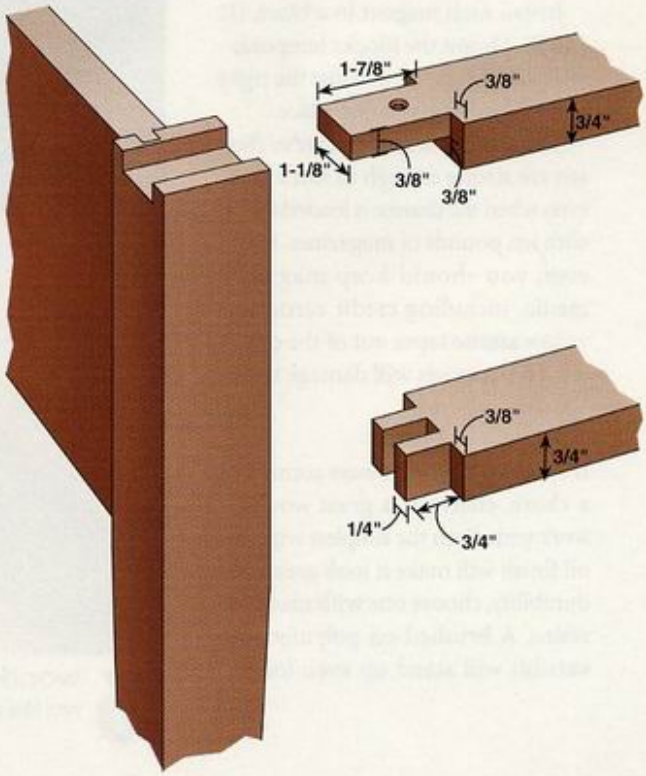


FIG. H Rail Tenons

The upper rails end in half-lapped open tenons that are glued and screwed in the dado on the top of the legs. The lower rails are double-tenoned to fit the side-by-side mortises in the legs. The tenon shoulders of both rails are identical, to ensure a square assembly.



Make and Install the Drawers

We used a dovetail jig and standard bit to make our drawers (Photo 18). Their finished length is 3/8-in. shorter than the pass-through openings, so they'll sit 3/16-in. back from both fronts. This reveal matches the ones between the legs and aprons. The length of your drawer sides (P) may vary from ours, depending on the length of the dovetail your jig makes.

For a good fit, the drawers should be up to 1/16-in. narrower, but only 1/32-in. shorter than the front openings. Center the dadoes for the drawer bottoms (Q) in the lowest dovetail socket of the drawer fronts and on the corresponding tails of the sides. Then they'll be hidden when the drawer is assembled.

Rare-earth magnets (see Sources, page 59) act as two-way drawer stops. Mount them in pairs (one on the drawer bottom, the other on the frame), on both sides of each drawer. They're self-aligning, so they've got to be precisely located, end-to-end and side-to-side.

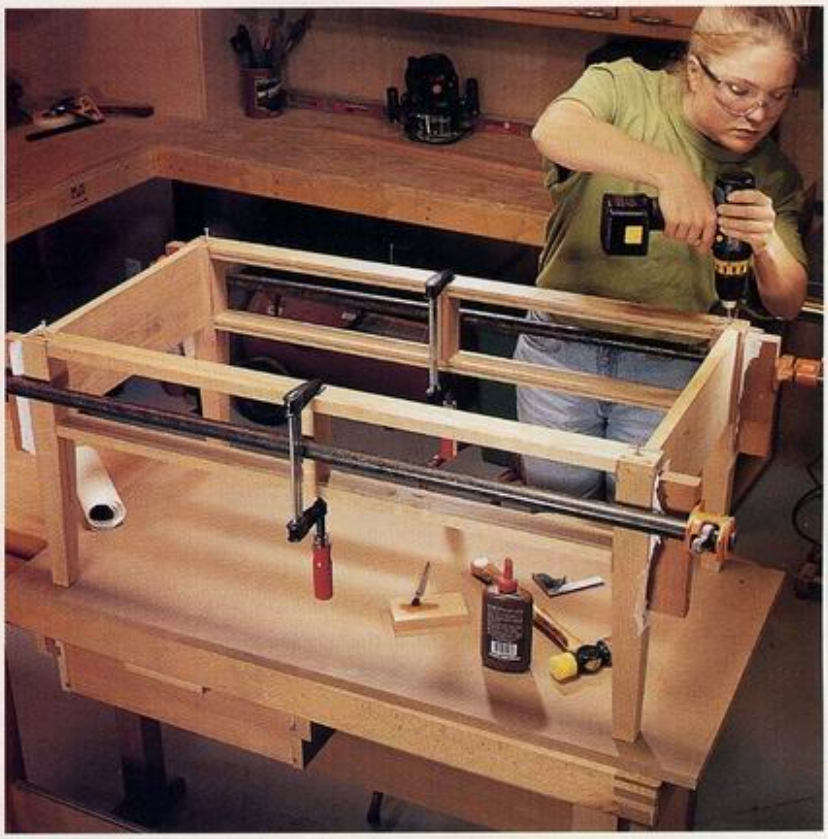
Install each magnet in a block (R and S). Mount the blocks temporarily until you get them in just the right spots. Then glue them in place.

The rare-earth magnets we've chosen are strong enough to work great even when the drawer is loaded down with ten pounds of magazines. However, you should keep magnetic media, including credit cards and videocassette tapes out of the drawers. The magnets will damage them.

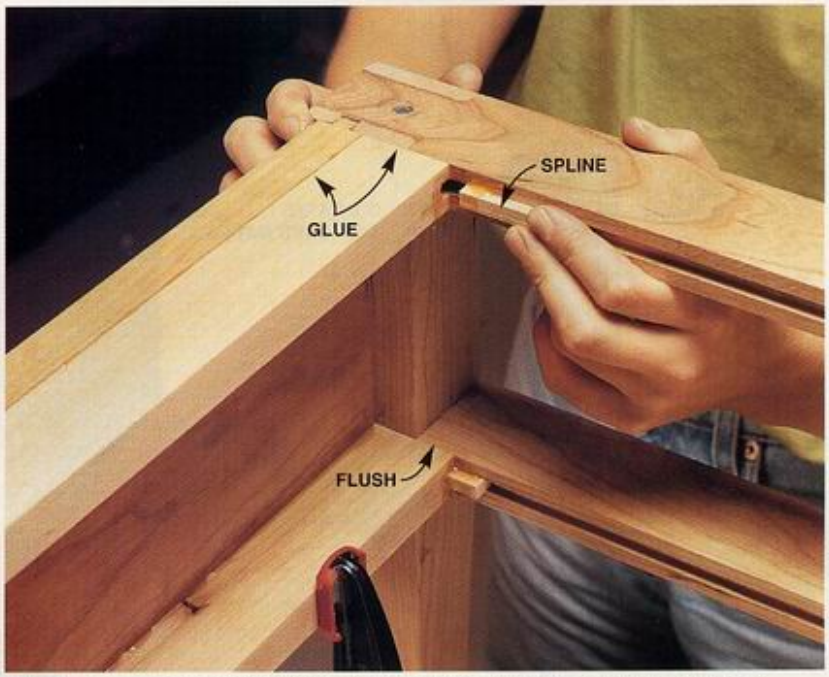
Finals

If applying a finish always seems like a chore, cherry is a great wood to work with. Even the simplest wipe-on oil finish will make it look great. For durability, choose one with urethane resins. A brushed-on polyurethane varnish will stand up even longer.

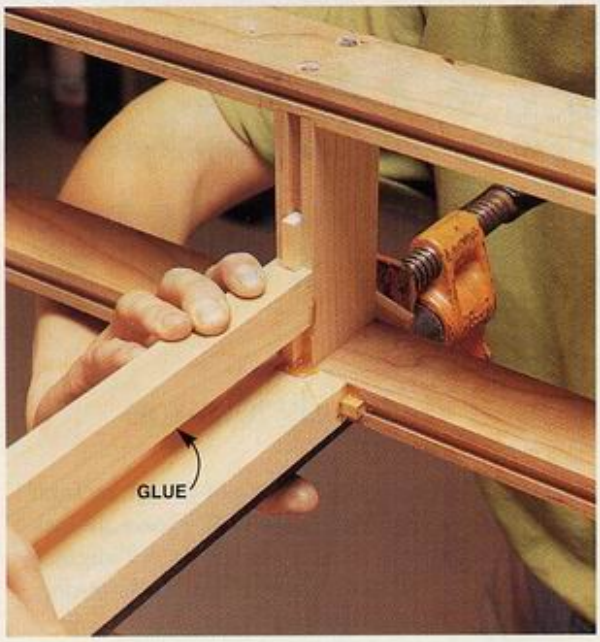
AW



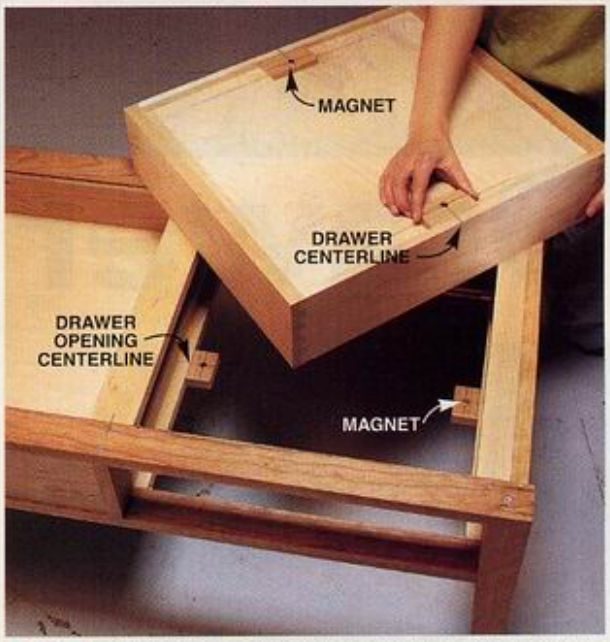
15 SCREW THE UPPER RAILS TO THE LEGS when you glue up the base. These open joints benefit from the mechanical assistance of screws.



16 WOODEN SPLINES ALIGN THE RUNNERS AND RAILS PERFECTLY, just like a tongue-and-groove joint.

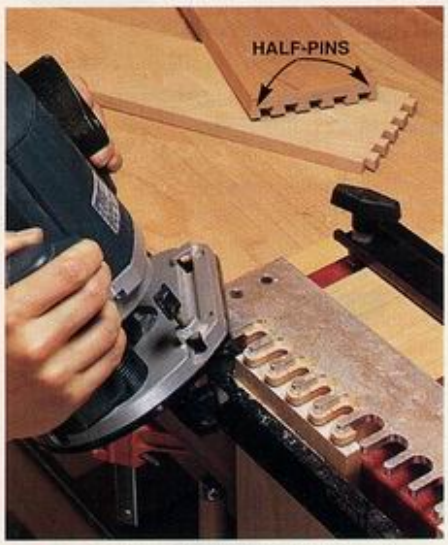


17 SLIP THE CENTER DRAWER GUIDE OVER THE SPLINES, and glue it to the dividers and the lower rail.



19 CAREFULLY POSITIONED RARE-EARTH MAGNETS stop the drawers dead center, so you can shut them from either side.

Rare-earth magnets work like magic to stop the drawers.



18 DOVETAIL THE DRAWERS, using a standard jig. They're sized so you'll end up with half-pins at the top and bottom of the drawer fronts.

Cutting List			Overall Dimensions 17-3/4 x 22 x 46	
Part	**Name**	**Pieces**	**Dimensions**	**Comments**
A	Top	1	3/4 x 22 x 46	
	Base Dimensions		17 x 20 x 39	
B	Legs	4	1-7/8 x 1-7/8 x 17	
C	Aprons	2	3/4 x 6 x 18-1/4	Includes 1" tenons on both ends
D	Upper Rails	2	3/4 x 1-7/8 x 39	
E	Lower Rails	2	3/4 x 1-7/8 x 36-3/4	Start with 39"-long blank
F	Drawer Dividers	2	3/4 x 1-7/8 x 4-3/4	Mill as long blank with Rails (D and E)
G	Outer Drawer Supports	4	3/4 x 1-1/2 x 16-1/4	
H	Outer Splines	8	1/4 x 3/8 x 1-1/4	
J	Center Drawer Supports	2	3/4 x 2-1/8 x 16-1/4	
K	Center Drawer Guide	1	3/4 x 1 x 16-1/4	
L	Center Splines	6	1/4 x 3/8 x 2-3/4	
M	Outer Drawer Guides	2	3/4 x 13/16 x 16-1/4	Glue 13/16" side on Drawer Support
	Drawers	2	4-1/2* x 17-1/4* x 19-5/8	* Exact sizes of drawer front openings
N	Drawer Fronts	4	3/4 x 4-7/16 x 17-7/32	
P	Drawer Sides	4	1/2 x 4-7/16 x 18-3/4*	* Sized for 5/16"-long dovetails at each end
Q	Drawer Bottoms	2	1/4 x 16-5/8 x 18-1/2	Plywood; fit in 3/16"-deep dadoes
R	Drawer Magnet Blocks	4	1/4 x 1-1/2 x 3	
S	Rail Magnet Blocks	4	3/4 x 1-3/8 x 2	

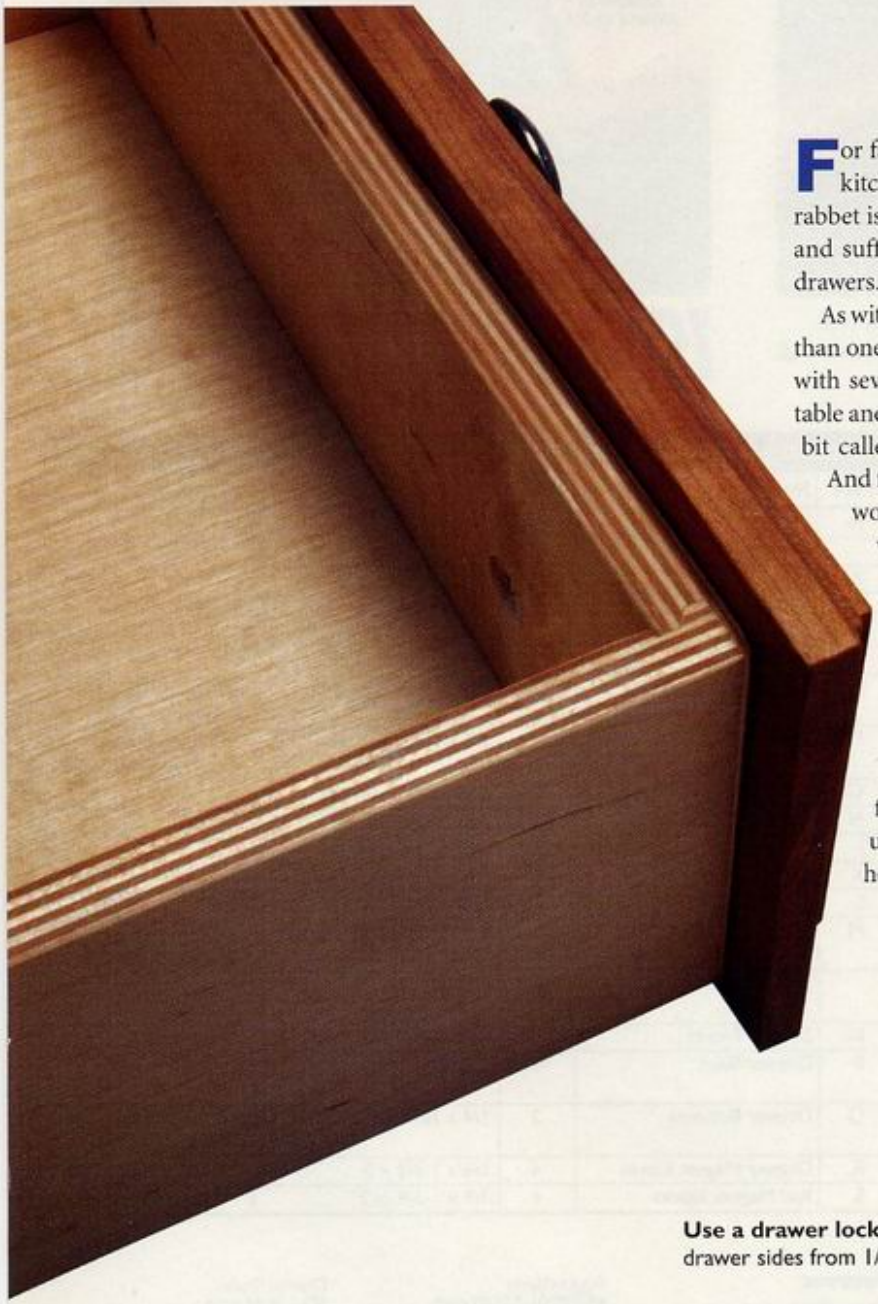
Sources

Cherry Turning Squares
2-15/16" square x 22" long
ASQ3322-3 (call for current price).
Adams Wood Products
(423) 587-2942
www.adamswoodproducts.com

Toggle clamps
#88F05.01; $14.50 each.
Rare-earth magnets
4 sets req'd
3/8" disc #99K32.03; $ .43 each
1/2" cup #99K32.52; $ .45 each.
Lee Valley Tools, (800) 267-8767
www.leevalley.com

Drawer Knobs
SO-118; $1 each.
Smith Design and Woodworks
(908) 832-2723
www.niceknobs.com

Lock Rabbet Drawer Joinery



By Randy Johnson

For fast, easy, accurate joinery in everything from kitchen-cabinet drawers to jewelry boxes, the lock rabbet is the way to go. Lock rabbets are self-aligning and sufficiently strong for light- and medium-duty drawers.

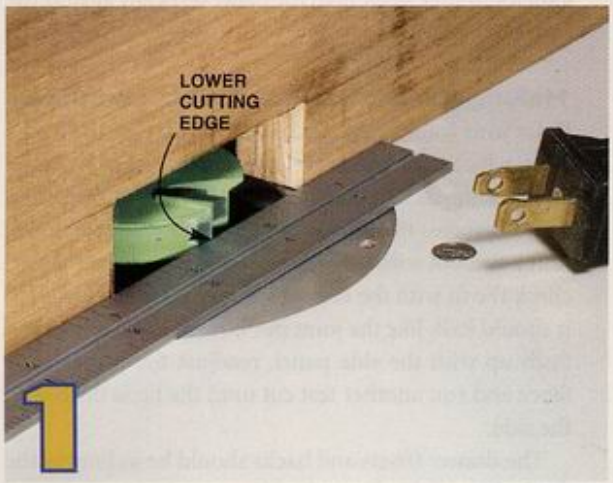
As with most woodworking techniques, there is more than one way to make a lock rabbet. We experimented with several methods using the tablesaw and router table and settled on this as our favorite. It uses a router bit called a drawer lock bit (see Sources, page 63). And for the wood, we chose 1/2-in. Baltic birch plywood. Its multiple layers and lack of internal voids make it strong and stable.

Router Bit Setup

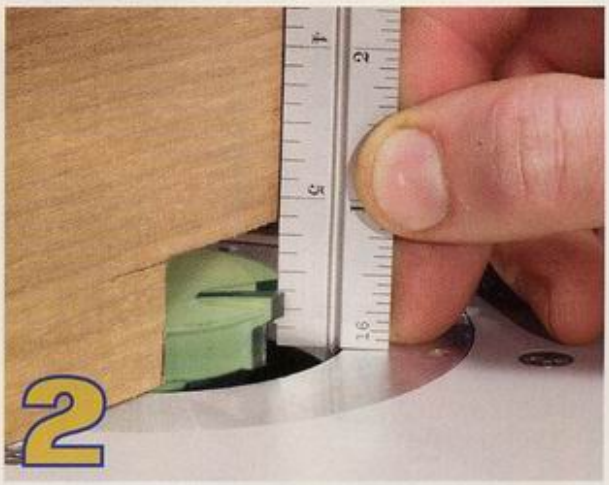
Setting up the drawer lock bit is not difficult. Start by aligning this bit with the fence, as shown in Photo 1. Next, adjust the height of the bit to approximately 3/8 in. (Photo 2). Run a couple of test boards (Photo 3) and check the fit (Photo 4). The first test boards you make are unlikely to give you a perfect fit, so adjust the bit's height until the fit is just right.

Use a drawer lock router bit on drawer sides from 1/2- to 1-in. thick.

Here's a router-made drawer joint that's quick, simple and self-aligning.

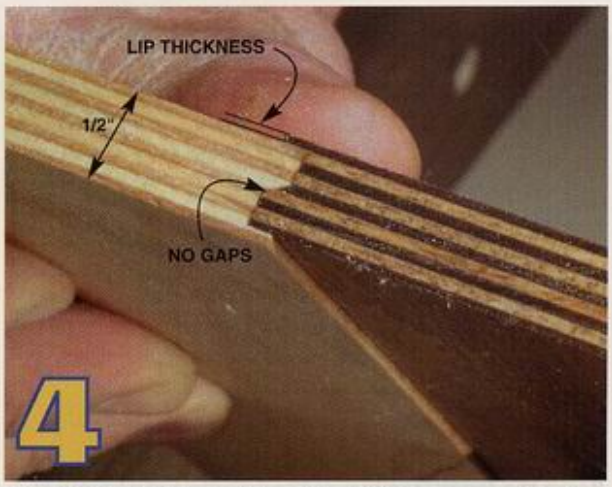


Adjust the router fence until the lower cutting edge just touches the straightedge, which is tight against the fence. Be sure your machine is unplugged during this adjustment.



Adjust the height of the router bit to approximately 3/8 in. above the table. This is not the final setting, but a starting point. Be sure your machine is unplugged during this adjustment.

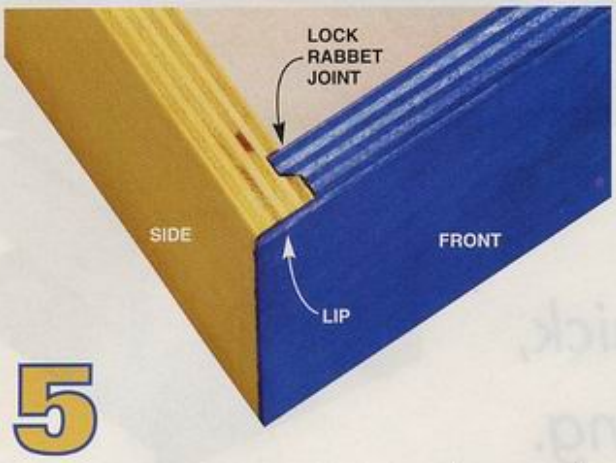
Test the setup by routing a couple of scrap boards.



Check the fit. The test joints should fit together easily, but without any gaps. *Remember: Lower to loosen and heighten to tighten.* Lip thickness will be between 1/16 in. and 1/8 in. when using 1/2-in. material.

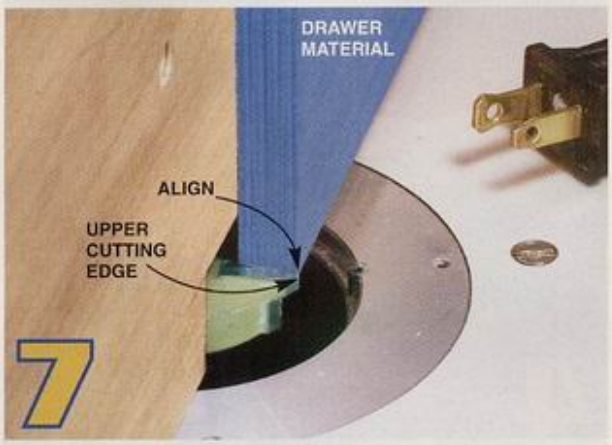
ART DIRECTION: PATRICK HUNTER • PHOTOGRAPHY: STAFF

Lock Rabbet Drawer Joinery



Make both cuts for a lock rabbet joint with one router bit. To clarify the process, we've colored the sides yellow and the front and back blue.

Rout the panels for the drawer sides. Keep even pressure on the panel so it stays against the fence and in constant contact with the table. Use a tall fence for good support.



Reset the fence for fronts and backs using a scrap piece of drawer-box material. Move the fence back so the upper cutting edge aligns with the outer edge of the material.
Be sure your machine is unplugged during this adjustment.

Making the Drawer Sides

To determine the length of your drawer sides, subtract two times the thickness of the lip on your test board (Photo 4) from your final drawer box length. For example, if you're making a 12-in.-long drawer box and the lip on the test board is 1/16 in., the material for the drawer sides should be 11-7/8-in. long. Here's the math:

$$1/16" \times 2 = 1/8"$$
$$12" - 1/8" = 11\text{-}7/8"$$

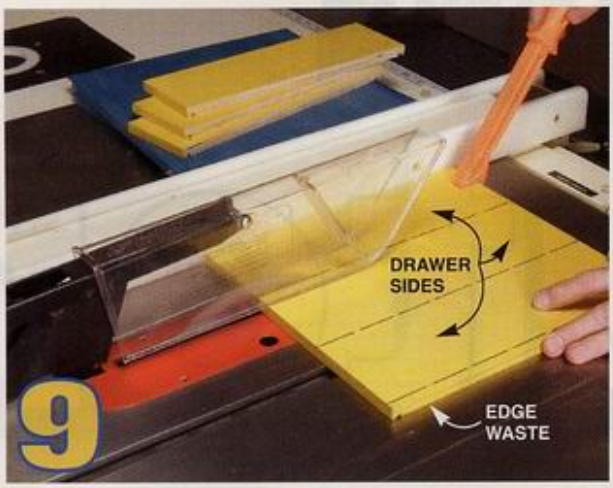
Prepare your plywood by cutting it into panels that equal the length you calculated with the formula above and are two to three drawer-sides wide (Photo 9). Add 1 in. to the width to allow for saw kerfs and edge waste. The edge waste will accommodate the chip-out that usually occurs when the router bit exits the cut. To rout the joint for drawer sides, hold the panel vertically against the fence (Photo 6).

Making the Drawer Box Fronts and Backs

Reset your router-table fence before you rout the fronts and backs. Set a scrap piece of your drawer-box material on top of the bit and move the fence back until the cutting depth matches the thickness of the material (Photo 7). Run a test cut with a scrap of drawer-box material and check the fit with the drawer side panels you cut earlier. It should look like the joint in Photo 5. If the lip doesn't flush up with the side panel, readjust the router-table fence and run another test cut until the lip is flush with the side.

The drawer fronts and backs should be as long as the final width of the drawer box because they span the full width (Photo 5). These front and back panels are routed flat on the table (Photo 8).

Rout the front and back panels. Hold the panel firmly against the table to prevent it from lifting, or you'll spoil the joint.



Rip the drawer parts to final width and then saw or rout the dado for the drawer bottoms.

Hold the parts of smaller drawers together with masking tape. Be sure the boxes are square before setting them aside to dry.

Final Sizing

Now you can saw the drawer parts to final width (Photo 9). Then, saw or rout a 3/16-in.-deep dado in the parts for the drawer bottoms. Make the drawer bottoms out of 1/4-in. plywood and test fit all the parts by assembling a drawer without glue.

Assembling the Drawer Boxes

On small drawers, masking tape works fine as a clamping tool (Photo 10). For larger drawers or thicker material, a few small brads or metal clamps work well. Apply glue to the joints and the dado for the bottom. By gluing the plywood bottom in place, the drawer ends up considerably stronger. *AW*

What about solid or thick wood?

A drawer lock router bit works equally well in solid wood. However, it's not safe to rout anything narrower than 6-in. wide with this technique. For narrower parts, start with a wider board and rip the parts to final width like we did with the plywood.

The bit we used is good for material from 1/2- to 1-in. thick. With thicker material, the settings for the router bit and fence are determined just as they were for our 1/2-in. Baltic birch. You'll notice that if you use thicker material, the lip will also be thicker.

Sources

1/2-in. Baltic Birch, 5 ft. x 5 ft.;
$34, plus shipping and handling
The Hardwood Store of North Carolina, (888) 445-7335
www.hardwoodstore.com

The following companies sell drawer lock router bits. Prices average about $32 for 1/4-in.-shank bits and $43 for 1/2-in.-shank bits.

Amana, (800) 445-0077
Bosch, (877) 267-2499
CMT, (888) 268-2487
Craftsman, (800) 377-7414
Eagle America, (800) 872-2511
Freud, (800) 334-4107
Jesada, (800) 531-5559
Katana, (800) 533-9298
MLCS, (800) 533-9298
Oldham Viper, (800) 828-9000
Rockler, (800) 279-4441
Whiteside, (800) 225-3982
Woodline, (800) 472-6950
Woodworker's Choice, (800) 892-4866

TOOL TEST

Router

By Dave Munkittrick

The router revolutionized home shop woodworking. It's an incredible tool; capable of doing anything from edge-shaping to making sliding dovetail joints. It didn't take long for innovative woodworkers to discover that mounting their router in a table adds a whole new dimension to an already useful tool.

MIKE HABERMANN

Photo 1 **Featherboards, bit guards and dust collection** allow you to safely do things with a router table that would be impossible with the router alone.

A router table offers many benefits:

- **Safety**
  Router table routing is safer than hand-held routing (Photo 1).
- **Versatility**
  With a router table you can do things that are impossible to do with a hand-held router. You can put an edge profile on narrow stock or small parts, make raised-panel doors, lock miters and drawer joints.
- **Stability**
  Freehand routing is inherently unstable. The slightest tip or bump and you'll be starting the job over. A router table and fence support and guide your stock for a stable ride over the cutter.

Today there are literally hundreds of manufactured tables that when combined with a 1-1/2- to 3-hp router approach, if not equal, the capabilities of a full-sized shaper.

The Test

We worked with a panel of experienced woodworkers to evaluate 24 tables for this test. We went over each table from top to bottom, checking out the fences, tops, inserts and bases. We found that no single table system was perfect. Nevertheless, we discovered a number of truly excellent tables that can give you a lifetime of reliable, accurate service. Here's the skinny on router tables.

Benchtop or Floor Model

Router tables come in two basic types: benchtop (Photo 2) and floor model (Photo 3).

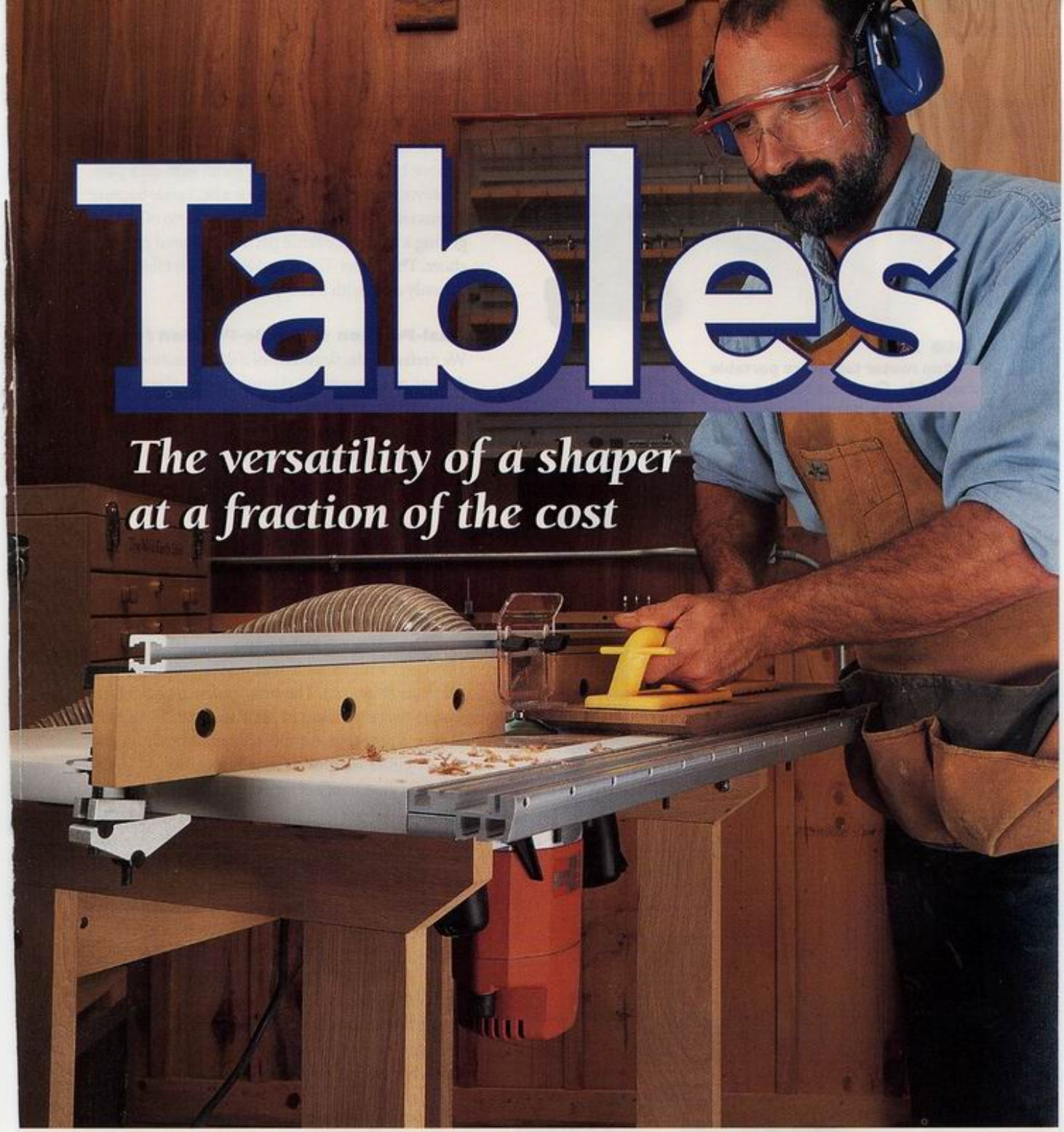
Floor models are our first choice. They offer the size and stability you need to handle large stock and big routers.

The benchtop models are small and light enough to be both portable and storable. If you really need a portable,

ART DIRECTION: VERN JOHNSON • PHOTOGRAPHY: STAFF, UNLESS OTHERWISE INDICATED, LEAD PHOTO: MIKE HABERMANN

Tables

The versatility of a shaper at a fraction of the cost



storable router table, or you know you'll always be working with small stock, then a benchtop router table is a good choice.

A word of warning: A benchtop router table set on a typical workbench is uncomfortably high. You want your router-table top height to fall in the 34- to 40-in. range. Unless you have a bench that's under 25-in. tall, you'll need to build a separate bench for your benchtop router or set it up on a pair of low sawhorses.

The Fence

The fence is the heart of any router table system. Here's what we think makes a great fence:

One-Piece vs. Two-Piece Fences

A one-piece fence is the clear favorite. By one piece we simply mean a fence with the main body made from a single piece of metal. A one-piece fence guarantees a continuous surface

Photo 2
Benchtop router tables are portable and storable. Capable of handling most routing operations, they're the way to go when shop space is extremely limited.

Photo 3 **Floor model router tables have larger tops and longer fences** to better support and guide large stock.

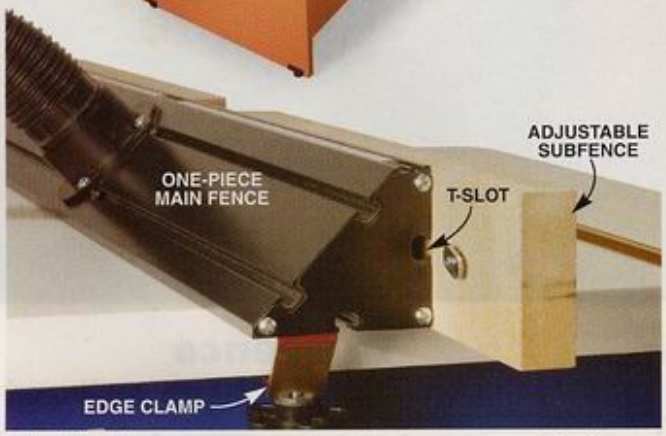


Photo 4 **Here's what to look for in a router-table fence: Edge clamps** allow you to position the fence anywhere on the table. **A one-piece main fence** doesn't have the alignment hassles of a two-piece fence. **T-slots** make convenient attachment points for subfences and accessories.

in a single plane for guiding your stock.

Two-piece fences are modeled after shaper fences where the infeed and outfeed halves move independently. This is handy on a shaper where the cutters remove 1/32 in. from the stock width with each pass. However, on a router table this is a big hassle because 99 percent of your routing tasks require no offset and getting a two-piece fence perfectly aligned can be a chore. The Porter-Cable and PortaNails tables were the only ones with a two-piece fence.

Dual-Position vs. Single-Position Fences

We preferred the flexibility of a dual-position fence. A dual-position fence clamps to the edges of the tabletop (Photo 4), allowing it to be positioned on either side of the router. This is a big advantage on tables with offset router mounts (see "Offset Router Mounts," page 68). It allows you to work with a shallow or deep setback depending on the amount of support your stock requires.

A single-position fence is secured to the top through slots or by metal T-slots. It can only be placed on one side of the router.

Subfence

Don't buy a router table that won't accommodate a subfence (Photo 5). The best subfence systems are simple-to-make pieces of MDF that slide along slots in your main fence. A subfence can be made long or tall to guide long or vertically positioned stock. They are easy to offset for edge jointing (Photo 6).

T-Slots

A T-slot in the main fence works best for attaching subfences and accessories. Some manufacturers cut the T-slots in the subfence instead (Photo 7). But, this kind of subfence is trickier to make yourself.

Tool-Free Adjustments

The best fence systems use top-mounted knobs to secure the fence to the table (Photo 8). Knobs under the table make adjustments unnecessarily cumbersome. Subfence adjustments should also be tool-free.

Dust Collection

Routers create gobs of dust and shavings so there's no excuse for a table to come without dust collection. Most models had good dust collection built right into the fence. As long as the fence is near the bit, these designs performed well. Cabinet-style bases offer the possibility of retrofitting a hose in the enclosed cabinet where the chips missed by the fence dust port can be extracted.

The Table Top

The router-table top has two simple but crucial functions. It must support the weight of a router without sagging and provide a flat, obstruction-free surface to run your stock over. A router-table top's worst enemy is sag. This creates all kinds of problems because the board you are machining must conform to the dip in your table.

To help prevent a sagging top, remove that heavy router when it's not going to be used for long periods of time.

Top Material

Router-table tops are made from one of three basic materials:

1. Metal
2. MDF
3. Phenolic resin

Phenolic resin is the best choice for a router-table top. It offers the strength and durability of metal but will never rust or corrode. Phenolic resin is so strong it's used in the landing gear of fighter jets and as skids for nuclear missiles on submarines. Unlike MDF, you can set a phenolic top in a steam bath overnight and it won't lose its shape or strength.

Metal tops also offer strength and stability. But, steel can rust and requires preventative maintenance just like cast iron, and aluminum is prone to leaving gray metallic streaks on your stock.

Most router-table tops have an MDF core. High-pressure plastic laminate (p-lam) applied to the top and bottom of a thick core make the best MDF tops. The p-lam provides a slick surface and greatly increases the strength of the MDF core.

Moisture is a real problem for MDF. Get it wet and it's ruined, and long-term exposure to humid conditions can cause MDF to swell and weaken. This leads to sagging over time.

Most manufacturers use vinyl T-molding to protect the edges of MDF tops (Photo 9). This is a good thing, but it can cause a serious problem (Photo 10). As shown in the photo, the T-molding can cause the MDF to split and flare the edges, which lead to a less-than-flat top. We're at a loss to explain why this problem appeared on some tables but not on others. None of the Editor's Choices or Best Buy tables had flared edges from the T-molding.

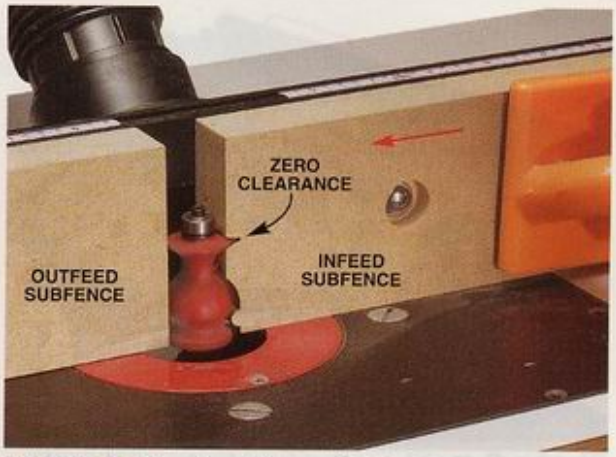


Photo 5 An adjustable sacrificial subfence is a must-have feature. The subfence allows you to adjust the fence opening to accommodate any sized bit. With the main fence secure, you can even push the infeed fence into a spinning bit and create a zero-clearance opening to eliminate chip-out.

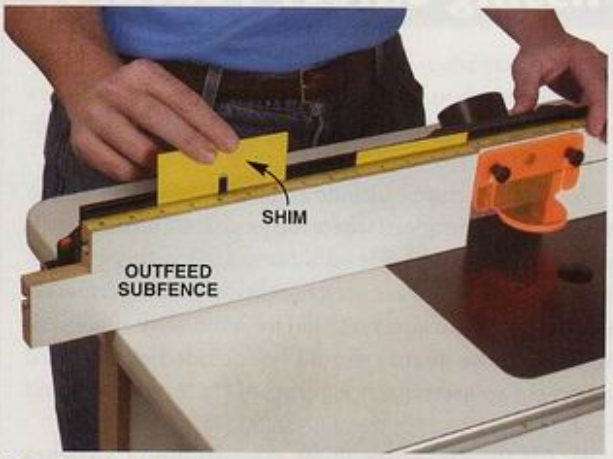


Photo 6 A subfence allows you to offset the outfeed fence with shims for edge jointing. Some manufacturers include shims, but you can easily make your own from paper, cardboard or plastic laminate.

Photo 7 T-slots in the subfence work great, but in order to make your own subfence, you'll need to purchase a specialized router bit ($25). We prefer the easy-to-make subfence shown in Photos 4 and 5.

Photo 8 Tool-free adjustment knobs are the only way to go. The last thing you need to keep track of is another screwdriver or Allen wrench.

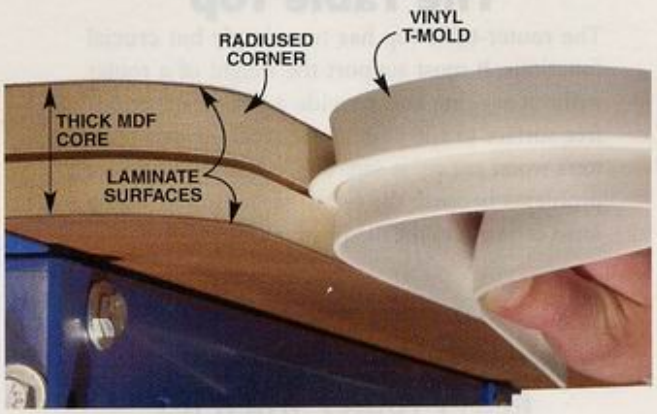


Photo 9 The best MDF tops are at least 1-1/16-in. thick and faced on both sides with high-pressure plastic laminate for a slick, durable, sag-resistant surface. Vinyl T-molding protects the raw MDF edges and radiused corners protect you when you back into them.

Missing Safety Features

We're sticklers when it comes to safety. That's why we were disappointed when bit guards and external power switches were sold as accessories. We feel they should be included with every table!

Most manufacturers include a small bit guard attached to the fence. For operations where the fence can't be used, such as putting an edge profile on a curved piece, this guard is useless. Fortunately there are a number of good aftermarket guards available for larger bits and freehand work (Photo A). We think these guards should be included as standard equipment so users aren't tempted to try to work without them.

We felt the same way about external power switches (Photo B). Should the need arise, you don't want to be feeling for the power switch that's tucked in under the table. That off button should be right up front.

Photo A Bit guards, such as this one from Hartville, are essential for safe hand-held routing. Unfortunately, specialized guards are sold as accessories and do not come with any of the tables.

Photo B An external power switch adds safety and convenience. It beats the heck out of fumbling around under the table looking for the on-off switch. In an emergency, it becomes an important safety feature.

TIP: No matter what kind of top you buy, put a straightedge on it right away. If it sags in the middle, send it back and get a new one.

Offset Router Mounts

Routers are either mounted dead center on the table, or they're offset to the front or back of the table. Offset router mounts (Photo 11) are a real advantage when combined with a dual-position fence. For most routing operations it's good to have the router positioned close to the operator. It makes feeding the stock and adjusting the router easier. Occasionally, you need extra support for raising panels or edging wide stock. With an offset router you can flip the fence to the other side of the table giving you extra table support. Look to the chart on pages 70 and 71 for tables with both dual-position fences and offset router mounts.

Direct-Mount vs. Mounting Plates

Some router tables use a direct-mount where the router is fastened directly to the tabletop (Photo 12). Others have router mounting plates that allow you to lift the router out of the table for bit changes and hand-held operations (Photo 13).

If you don't mind dedicating a router or a router base to your table, we think a direct-mount top has several advantages over mounting plates. It's a stronger, smoother top because there's no large cutout for a mounting plate which weakens the top and there's no mounting plate to level flush with the top. On the downside, removing the router for hand-held work requires unscrewing the base from the top. That's why it's best to devote a router or an extra base to a direct-mount table.

Mounting plates replace the base plate on your router. The router is attached to the mounting plate, which in turn hangs in a rabbeted hole cut into the table's top. This sys-

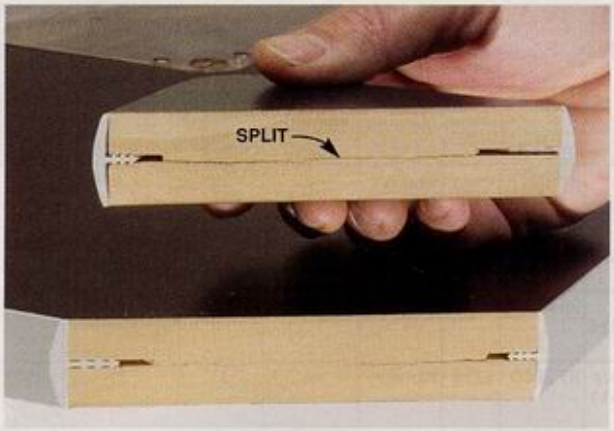


Photo 10 **Vinyl T-molding has a downside.** It caused splits in a number of the tops we tested. These splits flared the edges of the top, ruining the flatness of the surface.

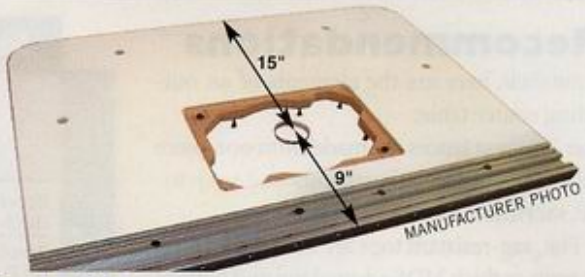


Photo 11 **An offset router mount,** when combined with a dual-position fence, allows you to choose the amount of table support between you and the router depending on which side of the bit you mount the fence.

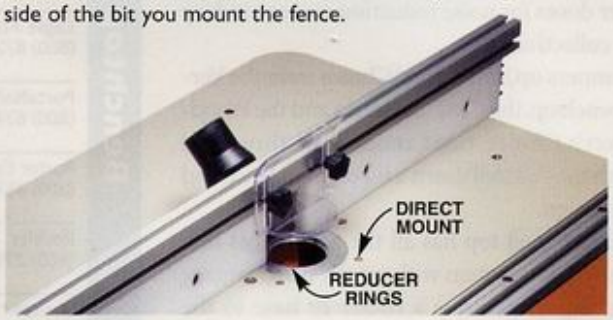


Photo 12 **Direct mounting the router** to the top creates an uninterrupted surface free of catch points caused by a mounting plate. Direct mounting also requires a much smaller hole, which results in a stronger top. On the downside, it's a hassle to remove the router for hand-held work.

tem makes it easy to lift the router and mounting plate out of the table for bit changes and hand-held work. If yours is a one-router shop, like mine, a mounting plate is what you want.

The best plates are made from metal or phenolic resin to resist sagging. Plates should fit flush or have levelers.

Predrilled or DIY Router Mounting

Predrilled plates eliminate the chance of screwing up your mounting plate or top with misplaced holes. Some manufacturers include a DIY mounting kit while others leave you to go it alone. If it's available, we strongly recommend having the manufacturer drill the holes.

Photo 13 **Mounting plates allow you to** easily lift the router and mounting plate out of the table for bit changes and hand-held work. On the downside, you need to level the plate with the top, and the large cutout can weaken the top.

The Best Base

There are three types of bases; the cabinet, the open stand and the folding stand. Cabinet bases are our first choice for floor (Photo 14) and benchtop models. Made from melamine, a plastic-coated MDF product that weighs a ton, cabinet bases provide a rock-solid foundation for your router-table top.

Cabinet-style bases allow you to enclose the area under the table with doors. This makes it easy to add a second dust collection point under the table by simply drilling a new dust port into the back of the cabinet. Doors also help to muffle that screaming router.

We didn't care for the open stands on the floor models. They are lighter than the cabinet bases, making them less stable and prone to scooting around the floor when machining large, heavy stock.

Folding stands all have one major defect—they wobble. Believe me, you don't want a router table that moves! If you need a portable router table, we suggest you stick to the benchtop models.

Photo 14 **Three things to look for in a floor-model cabinet base:**
Doors create an enclosed space under the table for additional dust collection. They also help quiet a screaming router.
A support beam for the top.
Levelers for uneven floors.

Recommendations

In a nutshell, here are the elements of an outstanding router table:

Fence: The best fences are made from one-piece metal with tool-free adjustments and easy-to-make, sacrificial subfences.

Top: Flat, sag-resistant tops are made from phenolic resin or thick MDF covered top and bottom with high-pressure plastic laminate.

Base: A solid, stable melamine cabinet base with upper doors for noise reduction and secondary dust collection.

Runners up for Editors' Choice were the Veritas benchtop, the CMT Industrio and the Woodworker's Choice floor model. All three had superb tops but fell down a bit on their fence and base design.

Veritas' steel top has all the advantages of a direct-mount system without the disadvantage of having to dedicate a router or base to the table. That's because Veritas has an ingenious router-mounting system that allows you to pop your router, base plate and all, in and out of the table in seconds. But, the table does not come with bit guards or dust collection and the fence requires tools to adjust the bit opening and subfences. Plus, the Baltic birch base simply wasn't very sturdy.

CMT's Industrio table, with its dead-flat, solid-phenolic top and direct-offset router mount, was the best top of the bunch. The heavy melamine base was great, although we'd rather see the doors mounted at the top to enclose the router.

The CMT fence was outstanding in every respect except one; the clamps that hold the fence to the table were prone to slipping. CMT's engineers are currently addressing the problem and a new fence-clamping system is in the works.

The Woodworker's Choice is an excellent table. We really liked the dead-flat, extra-thick top and mounting plate. We ran into trouble with this fence's locking mechanism. The adjustment knobs and clamping brackets are located under the table which makes them awkward to use.

Manufacturers who sell both floor and benchtop models inform us that the floor models are always their best sellers.

	Stats			Fence				Top
		MODEL	PRICE	T-SLOTS IN MAIN or SUB-FENCE	TOOL-FREE FENCE AND SUB-FENCE	MAIN FENCE LENGTH (in inches)	OFFSET ROUTER MOUNT & DUAL POSITION FENCE	TOP MATERIAL + = vinyl edging
Benchtop	Bench Dog (800) 786-8902	RT 100	$220	Main	Y	22	Y	MDF/ P-LAM +
	Bosch (877) 267-2499	RA 1180	$249	Main	Y	27	N	Aluminum
	Craftsman (800) 377-7414	26463	$250	Main	Y	27	N	Aluminum
	Eagle America (800) 872-2511	RT 2000	$228	None	Y	37	N	MDF/P-LAM
	PortaNails Inc (800) 634-9281	PNI 121	$290 w/fence	None	N	21	Y	Aluminum
	Porter Cable (800) 487-8665	698	$150	None	N	14	N	Aluminum
	Rockler (800) 279-4441	38121	$120	Sub	Y	20-3/4	N	MDF/ Melamine
	Veritas * (800) 871-8158	Router Table System	$279	Main	N	28	Y	Steel
	Woodhaven (800) 344-6657	8120 Benchtop	$295	Main	N	25	Y	MDF/P-LAM +
	Woodstock Int'l (800) 840-8420	The Rebel	$190	None	N	26	N	Aluminum
Floor Model	Bench Dog (800) 786-8902	RT400	$420	Main	Y	36	Y	MDF/P-LAM +
	Bosch (877) 267-2499	RA 1200	$369	None	Y	24	Y*	MDF/P-LAM +
	CMT (888) 268-2487	Industrio	$499	Main	Y	35-3/4	Y	Phenolic
	Eagle America (800) 872-2511	RT 4000	$368	None	Y	37	N	MDF/P-LAM+
	Hartville (800) 345-2396	46603	$260	Main and Sub	N	32	N	MDF/P-LAM +
	HTC (800) 624-2027	HTR-202	$300	Main	N	33	N	MDF/ Melamine +
	Jesada (800) 531-5559	Top, fence, base	$210	None	Y#	33-3/4	N	MDF/P-LAM +
	JessEm (800) 436-6799	Router table system	$500	Main	N	36	Y**	PVC-Coated Phenolic
	Rockler (800) 279-4441	23286	$271	Sub	Y	31-3/4	N	MDF/ Melamine +
	Rousseau (800) 635-3416	3350-DLR-MT	$335	None	Y	24-1/4	Y*	MDF/P-LAM +
	Woodworker's Warehouse/ Trendlines (800) 767-9999	RT 89	$180	None	Y	36	N	MDF/ Melamine
	Woodhaven (800) 344-6657	8136 ProKit 7	$490	Main and Sub	Y	33	N	MDF/P-LAM +
	Woodworker's Choice (800) 892-4866	998	$400	Main	N	39	N	MDF/P-LAM +

= NO SUBFENCE
* = MUST DRILL SECOND SET OF MOUNTING HOLES
** = MUST USE YOUR OWN CLAMPS FOR SECOND FENCE POSITION

	Plate		Base		Overall		
TOP SIZE (Rounded to nearest inch) W x L x H	MOUNTING PLATE (material) or DIRECT MOUNT	(PD) PRE-DRILLED or DIY	BASE TYPE	EXTERNAL POWER SWITCH	WEIGHT (in lbs.)	TABLE HEIGHT (in inches)	COMMENTS
16 X 22 x 1-1/8	Plate (acrylic)	DIY	Cabinet	N	37	14	A ton of great accessories available; subfence included; predrilled acrylic plates available for $30, phenolic $35, aluminum $99.
18 x 27 x 1/4 (ribbed)	Plate (glass-filled polycarbonate)	PD for Bosch	Open metal stand	Y	34	14-5/8	Adjustable featherboard, guard combo is cumbersome to operate; reducer rings not flush with plate; optional leg set available $50; predrilled for most Bosch routers.
18 x 27 x 1/4 (ribbed)	Mounting Plate (polycarb/glass)	PD for Craftsman	Open metal stand	Y	32	14-1/2	Reducer rings not flush with top; floor stand available $50; predrilled for Craftsman routers but adapter plate for other brands available $35.
19 x 24 x 1-1/16	Mounting Plate (acrylic)	DIY	Cabinet	N	44	13-3/4	Melamine tape on square edges prone to damage; poor-fitting reducer rings; dust port requires a $10 to $12 part; subfence included; polycarbonate and phenolic inserts available $10.
16 x 20 x 3/8 (ribbed)	Mounting Plate (polycarbonate)	DIY	Open metal stand	N	42	16- 5/8	Unique routing options with pin router arm $55 or "Joint Maker" horizontal router mount $190, table $270 and fence $20 sold separately; two-piece fence.
17 x 20 x 1/4 (ribbed)	Direct Mount	PD for PC only	Open metal	Y	25	13-3/4	Reducer rings not flush with top; top predrilled for P-C routers only; includes extra-long mounting screws; subfences included; two-piece fence.
16 x 21 x 3/4	Direct Mount	PD for PC 690 only	Open wood stand	N	16	14-1/2	Lightweight but sturdy; dust port avail. as $13 accessory; easy to clamp to bench; predrilled for PC690, predrilled adapter plates available for other routers $10; subfences included.
16 x 24 x 3/16	Direct Mount	N/A	Open plywood stand	N	46	16-1/8	Includes a fence micro-adjust; reducer rings fit flush; bit guards are $8 extra; magnetic dust hood a $20 option; component prices: top $139, fence $129, base $48; great accessories avail.; subfences included.
19 x 24 x 1-1/16	Mounting Plate (phenolic)	DIY	Cabinet	N	47-1/2	15-5/8	Best mounting plate; component prices: base $93, top $167, fence $104; predrill service available $15; subfences included.
18 x 24 x 1/4 (ribbed)	Mounting Plate (Aluminum)	DIY	Open metal stand	N	34	17-1/8	Great top, poor fence; need to drill own holes in metal top to mount router; optional external switch $13; subfences included.
24 x 32 x 1-1/8	Mounting Plate (acrylic)	DIY	Cabinet	N	94-1/2	35	Great accessories available; component prices: top $135, fence $150, base $160, predrilled plates available, acrylic $30, phenolic $35 or aluminum $99; Cab Loc mobile levelers $60; subfences included.
24 x 44 x 1-1/4	Mounting Plate (phenolic)	PD for Bosch	Folding metal stand	Y	64	36-1/2	Stingy fence on a generous table; effective but cumbersome guard/hold-down combo; flared edges from vinyl T-molding; subfences included.
23 X 31 x 3/4	Direct Mount	DIY	Cabinet	N	117	35-1/2	The best top; component prices: top $225, fence $196, base $173, offset wrench allows bit change w/o removing router; subfence incl.
24 x 32 x 1-1/8	Mounting Plate (acrylic)	DIY	Cabinet	N	70	35-1/8	Poor fit on reducer rings; phenolic or polycarb plate for $10; cabinet leg levelers $10, top $110, fence $140, cabinet $160; dust port requires a $10 to$12 part; subfences included.
24 x 32 x 1-1/16	Mounting Plate (phenolic)	DIY	Open metal stand	N	62	34-1/2	Casters $40 extra; top only $110; fence only $80; legs only $70.
24 x 32 x 1	Mounting Plate (acrylic)	DIY	Folding metal stand	N	42	34-1/4	Flared edges from vinyl T-molding; top w/legs $160; top only $90; folding table w/top $180; fence $120; subfences included.
24 x 32 x 1-1/16	Mounting Plate (phenolic)	DIY	Open metal stand	N	62-1/2	33-3/8	User must rout through slots in top for fence adjustment; top $80; RTF-034 fence $90; Incra Intellifence $170.
24 x 32 x 3/4	Mounting Plate (phenolic)	PD-	Open metal	N	64	36	Reducer ring set is $25 extra; adjustable snuggers for a tight-fitting mounting plate; component prices: top $150 (no plate), plate $70, fence $170, stand $150; subfences included.
24 x 32 x 1-1/8	Mounting Plate (aluminum)	PD-	Open wood stand	N	48	36	Dust port a $13 extra; component prices: table and fence $160; oak leg set $111; pine legs $70; top $110; fence $80; pre-machined subfences included, extras available for $6 each.
23 x 44 x 1-3/16	Mounting Plate (phenolic)	DIY	Folding metal stand	N	63	36-1/2	Stingy fence on a generous table; flared edges from vinyl T-molding; many models and sizes available; deluxe fence with roller hold-downs and miter slot are options; subfences included.
24 x 36 x 15/16	Mounting Plate (polycarbonate)	DIY	Open metal stand	N	47	32-7/8	Thin 15/16-in. top prone to sag; unprotected edges; no subfence adjustment.
24 x 32 x 1-1/16	Mounting Plate (phenolic)	DIY	Cabinet	N	110	37-1/4	Best mounting plate; predrill service $15; subfences included; component prices: top $190; Ultrafence $160; #374 cabinet base $190.
24 x 32 x 1-3/8	Mounting Plate (phenolic)	DIY	Mobile metal stand	N	82	35-3/4	Includes tall subfence with metal T-slot plus short subfence is very versatile; tall subfence must be made with 1-in. MDF to accommodate T-slot.; component prices: top $110; fence $160; top and fence $280 stand $110; wheel kit $40; table insert $50.

Floor Model Award Winners

Bench Dog RT400; $420.

Pros

- The best fence in the business. It's a tool-free, one-piece fence with easy-to-make subfences.
- T-slots on the fence and table for accessories, such as featherboards and bit guards.
- Dual-position fence with an offset-mounted router.
- 12 leveling screws for a well-supported, flush-fit mounting plate.
- Adjustable miter track.

Cons

- No levelers for the cabinet base.
- No reduction rings for the mounting plate.

JessEm; $500.

Pros

- PVC-coated, sag-resistant, moisture-proof phenolic top.
- Phenolic subfence.
- Phenolic mounting plate has well-designed universal router mounting system.
- Reducer rings fit flush and are easy to remove.

Cons

- Allen wrench required for subfence adjustment.
- Open metal stand.

Woodhaven 8136 ProKit 7; $490.

Pros

- One-piece, tool-free fence with adjustable subfences and T-slots.
- Thick, plastic-laminate/MDF top.
- Tight flush-fitting mounting plate.
- Outstanding, flush-fit, snap-in reducer rings.
- Sturdy base cabinet with levelers is predrilled for dust collection.

Cons

- T-slots in the subfences mean an extra step and an extra router bit when making your own.
- Cabinet base lacks a support beam.

Hartville 46603; $260.

Pros

- T-slots for mounting subfences and accessories.
- Phenolic mounting plate with levelers.

Cons

- You must adjust the fence face square to the table.
- Does not come with subfences.
- T-slots in the subfences equal an extra step and an extra router bit when making your own.

Rockler 23286; $270.

Pros

- Tool-free, aluminum fence with subfences.
- Predrilled aluminum mounting plate.

Cons

- T-slots in the subfences mean an extra step and an extra router bit when making your own.
- Open stand.
- Dust port is $13 extra.
- Melamine top.

PHOTOS ON PAGES 72 AND 73 COURTESY OF MANUFACTURER, UNLESS OTHERWISE INDICATED

Benchtop Award Winners

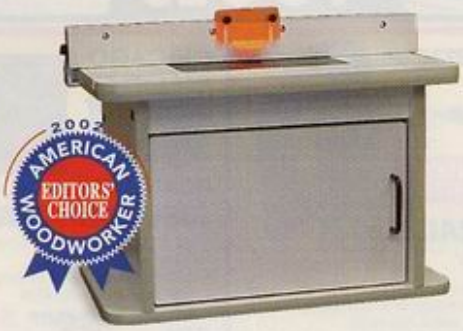
Bench Dog RT 100; $220.

Pros

- Tool-free, one-piece fence with easy-to-make subfences.
- T-slots on the fence and table for adding a host of really cool accessories.
- 12 leveling screws for a well-supported, flush-fit mounting plate.
- Adjustable miter track.

Cons

- No reduction rings for the mounting plate.



Woodhaven 8120; $295.

Pros

- One-piece fence with adjustable melamine subfences.
- Tight, flush-fitting mounting plate.
- Outstanding flush-fit reducer rings that snap in and out with ease.
- Larger cabinet and top than the Bench Dog.
- Adjustable miter track.

Cons

- Tools needed to adjust subfences.

Rockler 38121; $120.

Pros

- One-piece, tool-free fence with adjustable subfences.
- Router mounts directly to table.
- Compact and lightweight.
- Stand is easy to clamp to a bench.

Cons

- T-slots in the subfences mean an extra step and an extra router bit when making your own.
- 2-in. bit opening limits bit selection.
- Dust port is $13 extra.

You Should Also Know About:

Router Table Joint-Making Systems

Some router tables go way beyond the basics to become a complete joint-making systems. Dovetails and box joints are only the beginning of what you can do with these sophisticated fence and table systems.

Incra, (972) 242-9975, www.incra.com
ULTRA24SYS joint making jig router kit; $250, no table or base included.

JessEm, (800) 436-6799, www.jessem.com
Rout R Slide sliding carriage router table; $529.

Jointech, (800) 619-1288, www.jointech.com
JCM-1232 cabinetmaker's system; $429, no table included.

RBI, (800) 487-2623, www.rbiwoodtools.com
#RS29 Router Shop; $569.

Triton, (888) 874-8661, www.tritonwoodworking.com
Triton Router Table RTA300; $329.

Oak Park Enterprises, (800) 665-0252, www.oak-park.com
Oak Park RW 20001 Router Workshop; $330.

Router Tables for Tablesaw Extensions are made by:

Bench Dog Tools, (800) 786-8902, www.benchdog.com
RT250 Protop left extension wing; $320.

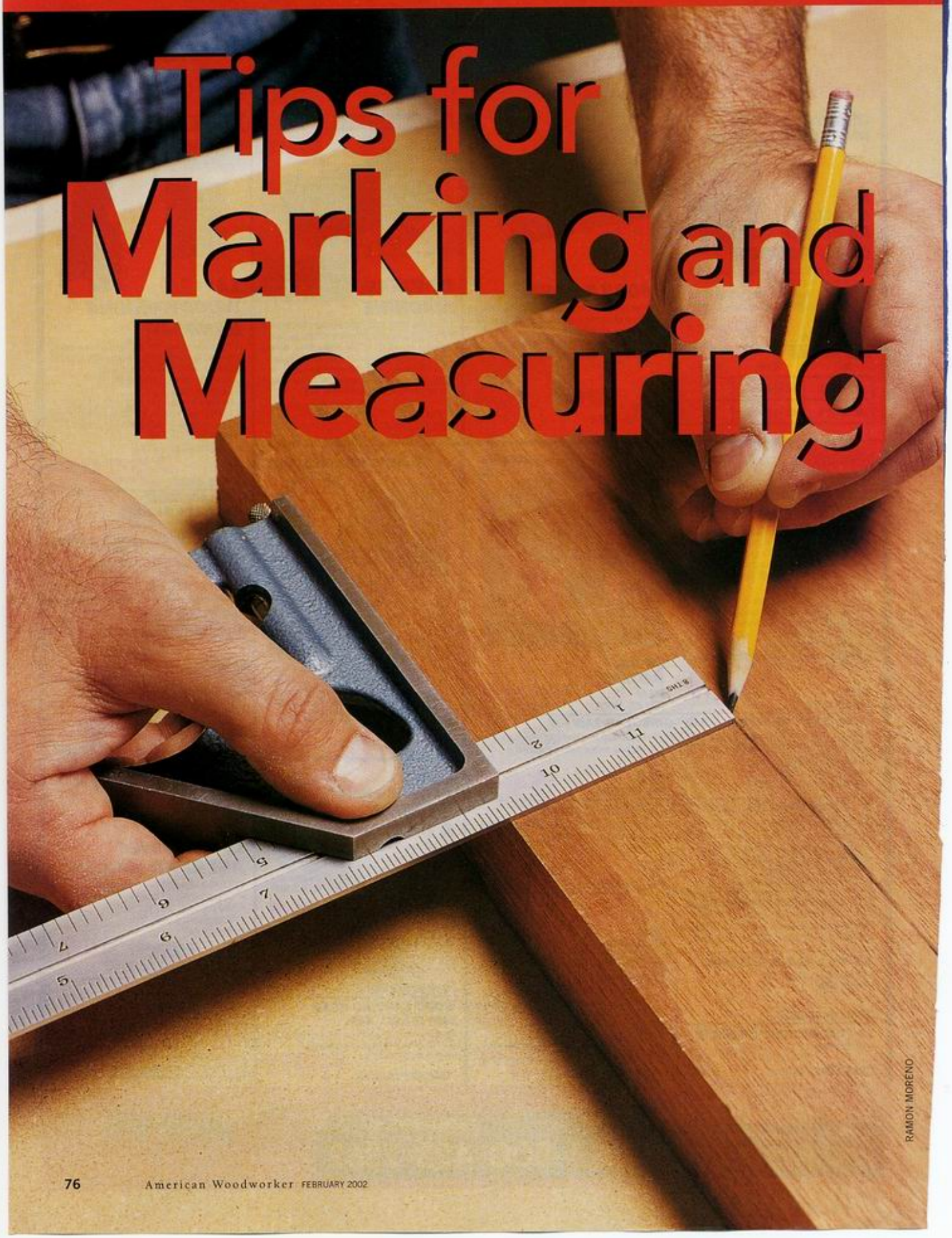
Jet, (800) 274-6848, www.jettools.com

Rockler, (800) 279-4441, www.rockler.com
23335 23-1/2 in. x 27-in. router-table extension with fence; $160. *AW*


JessEm Rout R Slide

The manufacturers have generously donated the tables shown in this article to **Rebuilding Together** (www.rebuildingtogether.com), a volunteer organization dedicated to preserving and revitalizing low-income houses and communities.

Tips for Marking and Measuring



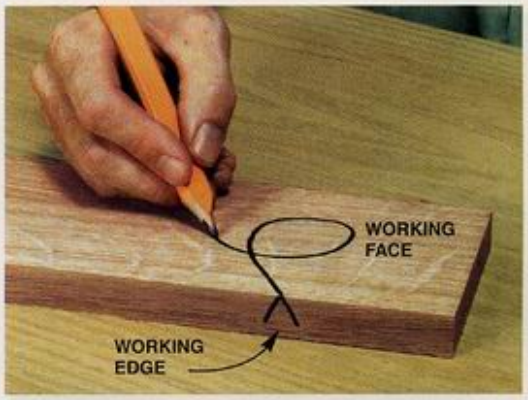
RAMON MORENO

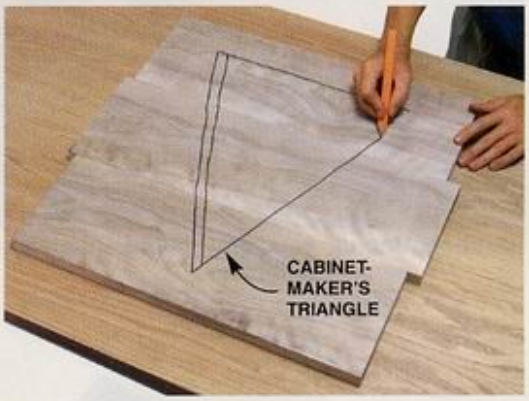
Customary Marks

These furnituremaker's symbols are an international language. They've been used for generations because they're easy to make and easy to understand.

A board's working face and edge are the surfaces that all measurements are taken from. This dates back to when boards were planed by hand. You couldn't count on every side to be strictly parallel, so two were designated as reference surfaces. It's still a good idea. These marks can mean front and top, too.

The cabinetmaker's triangle is a straightforward method of marking boards to be joined together. Imagine an old-time shop. The master carefully arranges the boards to make the most pleasing pattern, then scrawls this triangle across the boards and hands them off to an apprentice to glue up. These days, this mark is just a handy reminder of what our intentions were when we laid out the boards last weekend!





Quickie Center Finder

Woodworkers are both cursed and blessed with our hopelessly archaic system of measuring. When it comes time to divide any distance in half, like marking the center of a board's edge for resawing, it's best to avoid arithmetic altogether. A combination square will do the trick; just ignore the numbers.

Finding the center takes no time at all. Set the square to project an amount that appears to be about halfway across the edge of the board. Then draw two lines, one from either side of the board. No matter whether you've guessed too long or too short, the middle of the board lies exactly halfway between the two lines.

For resawing, you can probably just follow a path right between your lines. If you must know the precise center, slightly readjust your square and repeat the process. Chances are you'll be right on.

ART DIRECTION: PATRICK HUNTER • PHOTOGRAPHY: STAFF, UNLESS OTHERWISE INDICATED • ILLUSTRATION: DON RAYMOND

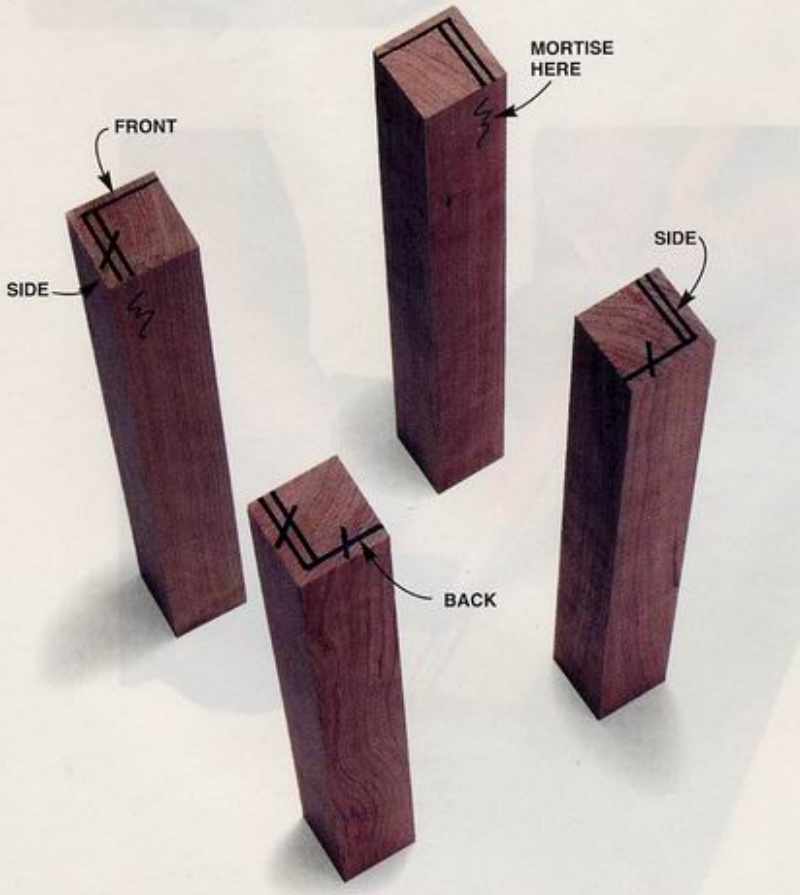
Caution: Unplug your saw before placing any measuring tool against its blade.

Thrifty Square

You can't beat a 12-in. standard drafting triangle for an extremely accurate and inexpensive set-up tool. It's particularly useful for adjusting a tablesaw's miter gauge at both 90 and 45 degrees to the blade.

This precision tool is superior to a combination square or a framing square for setting up a saw. While a combination square has only one long arm, a drafting triangle has two. A metal framing square is unwieldy and can bang against the fragile carbide teeth of your saw blade. This plastic triangle is compact and can't possibly damage your blade. Hang it under the saw or store it with your saw blades.

In addition, kid gloves aren't required when handling this precision tool, even when you're in the thick of cutting on your tablesaw. Unlike a very expensive metal square, this tool can take a beating and is easily replaced. Buy one for about $5 to $10 at any office supply store.



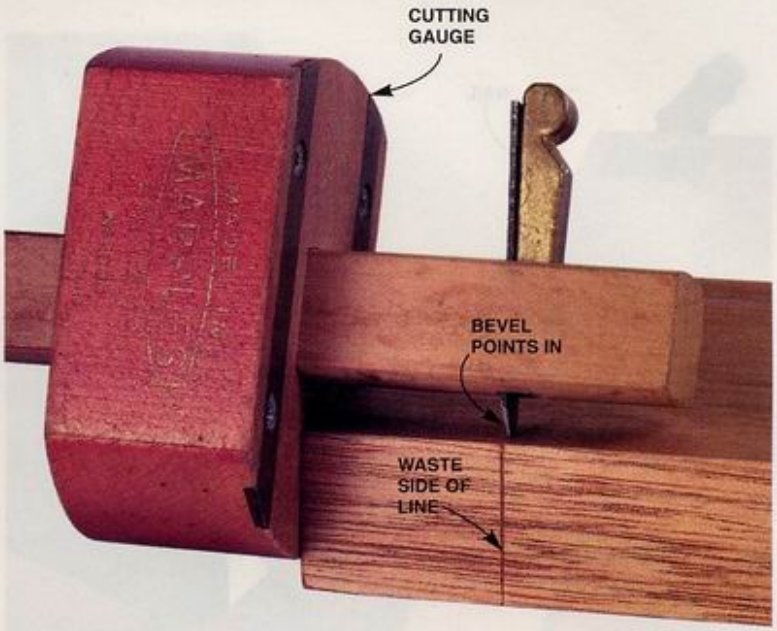
Which Leg Goes Where?

This marking system might look as complicated as ancient hieroglyphics, but its logic is quite simple. Ultimately, it gives you this fair warning, "Don't make a mortise on the wrong side of the leg!"

This is a method of marking four legs to identify once and for all which leg goes where. Indicate the outside faces of your legs by marking them on the top. (The marks are easy to draw. Just hold your pencil like a marking gauge.) You won't touch this surface again, so there's no danger of losing your bearings by removing the marks in tapering or bandsawing the legs. Once you've laid out the marks, you can jumble up the four legs to your heart's content and still be able to return them to their correct positions in seconds.

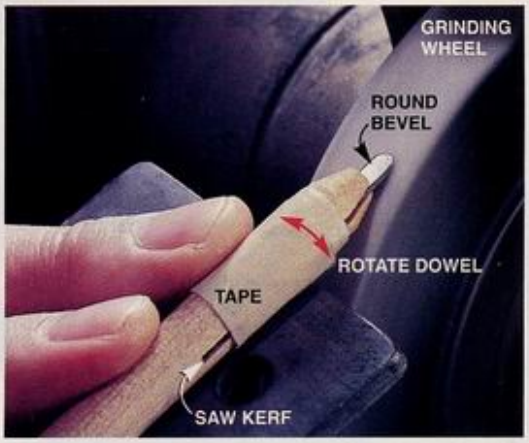
Stand the legs up on your bench and with a bold, squiggly line, mark where all the mortises go. When it comes time to actually make the mortises, if you're not staring directly at one of those squiggles, something's wrong!

Precision Gauge Lines



Draw a cutting gauge across a board and you should get a razor-sharp line that will become the precise shoulder of a handmade dovetail or tenon. But that's not the kind of line you get with a new gauge, right out of the box. A new gauge makes a pretty wretched line that skips and jumps, with fuzzy, torn edges.

An effective marking gauge knife should have a single bevel and a slightly rounded tip. A single-bevel edge starts the joint off on the right foot. It cuts a groove with one vertical wall and one sloped wall. The vertical wall is the beginning of the joint's square shoulder. The sloped wall goes on the waste side of the joint. (A double-bevel knife makes two sloped walls.) A rounded, fingernail-shaped tip stays sharp longer than a standard triangular point because there's lots more wear surface. You'll rarely have to resharpen it.



Here's how to reshape a new cutting gauge knife on a grinder or belt sander:

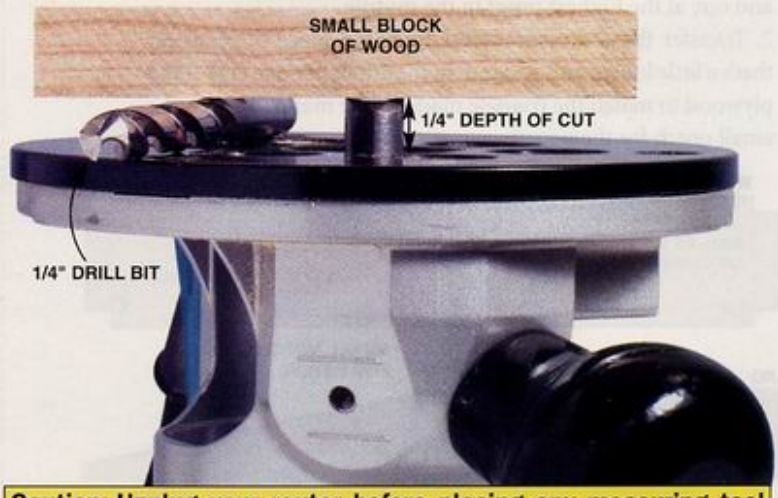
1. Remove the knife from the gauge.
2. Bandsaw a 1-in.-long slot on a 6-in.-long piece of 3/8-in. dowel.
3. Insert the knife in the slot. Wrap masking tape around the dowel to hold the knife in place.
4. Grind the knife past the existing bevels. It's only a thin piece of steel, so quench often to avoid bluing.
5. Rotate the dowel on the tool rest to create a rounded bevel. Remove the burr by honing.

Drill Bit Depth Gauge

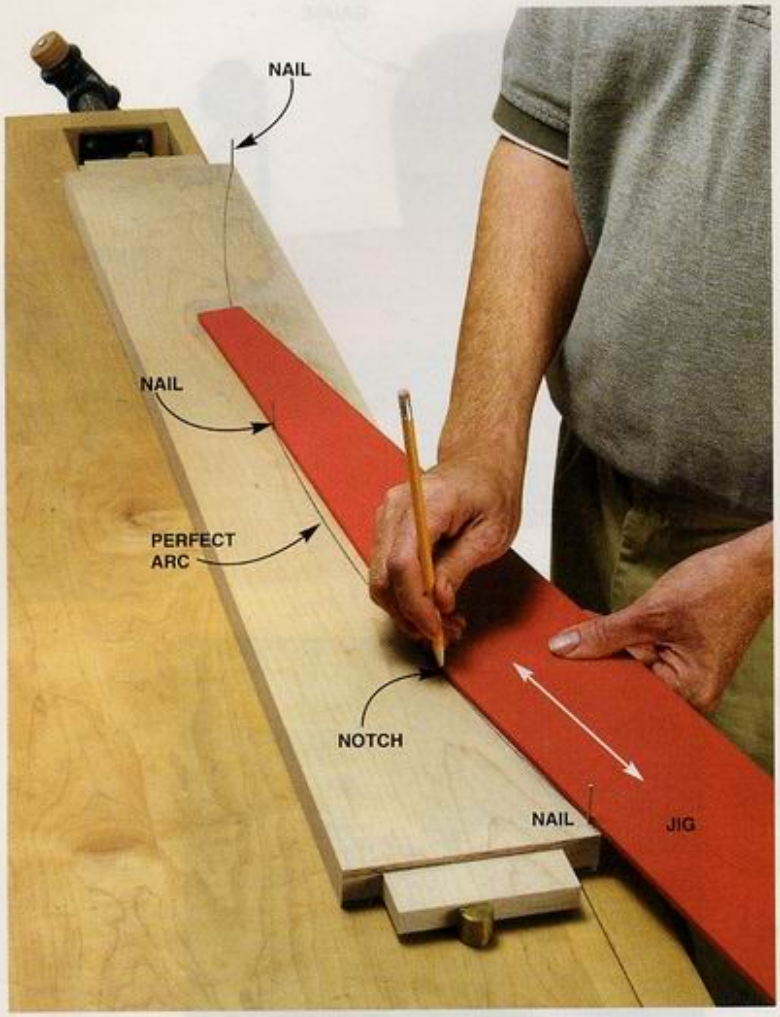
Did you know that a simple drill bit is also an extremely accurate measuring tool? Let the light bulb go off in your head and you'll probably think of dozens of ways to measure with your bits. Here's an old favorite.

Setting the height of a router bit with a ruler can drive you nuts. Where, oh where, should the end of the ruler stand? You can't put it next to the bit because there's a huge hole in the base of the router.

Span the hole with a drill bit that's the same diameter as the depth of the groove you want to cut. Lay a small block of wood across the tips of the router bit, then adjust the router until you can just slide the drill bit under the wood block, like a feeler gauge.

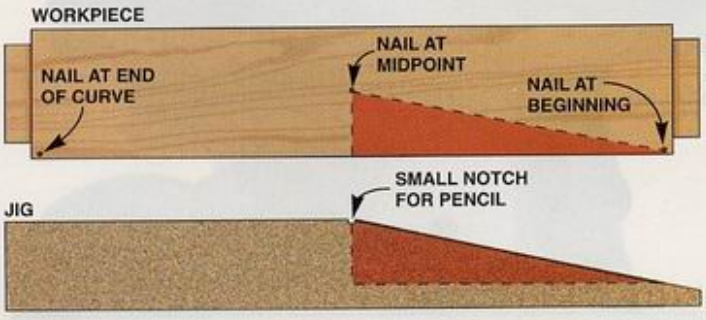


Caution: Unplug your router before placing any measuring tool against its bit.



How to Make the Jig

1. Make three marks on your board, two at the ends of the arc and one at the highest point in the middle.
2. Transfer these measurements to a thin piece of plywood that's a little longer and wider than the arc. Taper one end of the plywood to match the triangle made by the marks. Then, cut a small notch for the pencil.



Look Ma, No Compass!

All you need to draw a perfect arc of *any* diameter is three small nails, a piece of thin plywood and this old boatbuilder's trick.

Why use this weird geometry? Other methods have their drawbacks. A curve drawn around a bent stick flattens out at the ends. A curve drawn with a trammel or giant compass requires you to know the exact radius of the circle and its center point, and both may be difficult to figure out.

This method is easy. You can work directly on a board or make a template. First, figure out where the arc begins and ends. Nail two brads at those spots. Then decide how high the arc will be. Nail another brad in the center and top of the arc.

Now make the jig, as shown below, left. Draw one half of the arc at a time. Start by removing one of the end brads. Butt the jig against the two remaining brads, as shown. Slide the jig back and forth along the brads. A pencil placed in the notch will mark a perfect arc. Replace the brad you removed and repeat the operation to make the other half of the arc.

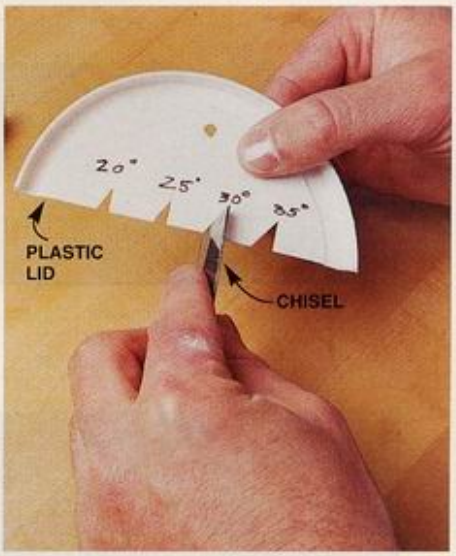
Plentiful Pencils

Buy a box of pencils, march up to the bandsaw and cut the box right in half. In one stroke you've doubled the number of pencils to scatter around your shop. Plus, they're shorter and more convenient to carry around in your pockets.

Bright Lines on Dark Wood

Honestly, can you follow a faint pencil line on dark wood in the shadow of a bandsaw? Next time you trace around a pattern on walnut or cherry try a *blue* ballpoint pen instead. This color stands out like a neon sign. A pen makes a slightly wider line than a pencil, but that's okay for a rough cut.

Chisel Angles

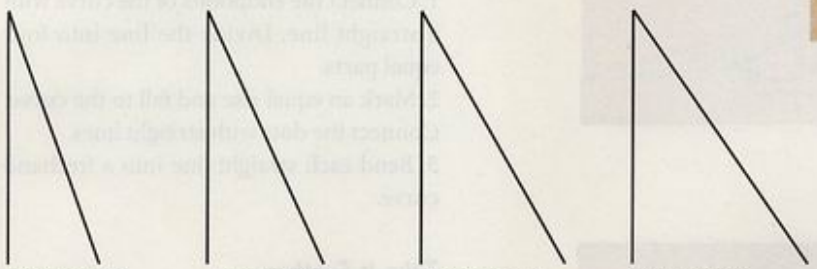


It's a great feeling when you can *make* a tool that's better than one you can buy. And it's a bonus when all you need is a plastic lid and a pair of scissors!

Every chisel must be reshaped on a grinder every so often. Setting the angle of a grinder's tool rest isn't a precise science. You give it your best shot, check the results, and readjust. This gauge is an easy way to check your progress.

Granted, it's not accurate to within a tenth of a degree, but that's no big deal. If you're within a full degree or two, you're okay, and that amount of accuracy is easy to achieve with this gauge.

Basic Grinding and Honing Angles
Make a photocopy of these angles, tape the copy to a plastic lid and cut the lid with scissors.

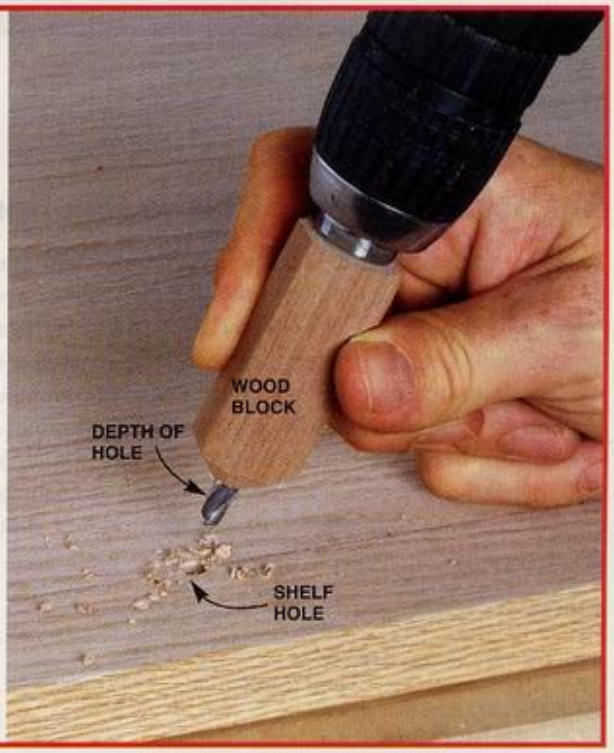


This home-made gauge can't be beat!

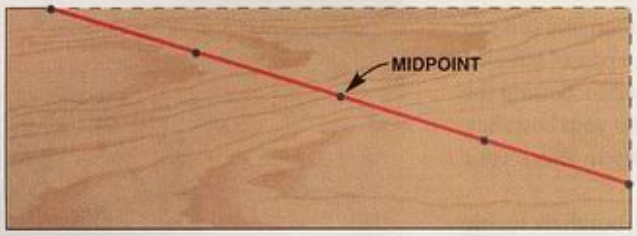
Oops!

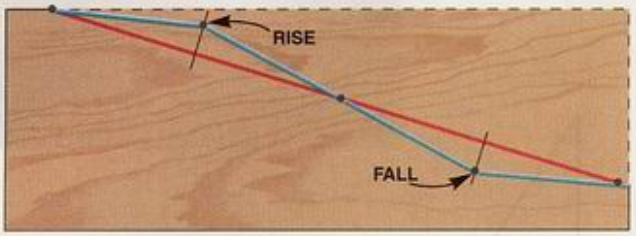
I used to think wrapping tape around a drill bit was a slick way to make an instant depth stop. But one memorable day I got burned by accidentally drilling all the way through the side of a cabinet! It happened on the 20th shelf hole. I was almost home free, but my drill bit was pretty hot and the adhesive on the tape started to let go. Little by little, the tape crept back up the bit. Everything looked fine from the inside of the cabinet. But on the outside I felt a little hole, and then another. Rats!

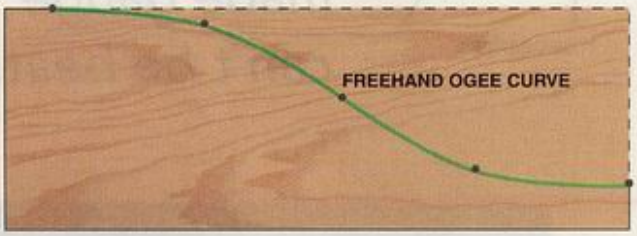
Next time I've got any high-stakes shelf-holes to drill, I'll pull out the positive stop I made that evening. It's simply a block of wood with a slightly oversized hole through it, and it will last forever. Tape is still fine for the occasional hole, but I'll never put my absolute trust in it again!



Freehand S-Curve







You don't need complicated geometry to draw one of the most beautiful lines in furnituremaking, the reverse curve, or ogee. All it takes is a pencil with an eraser, a straightedge and confidence in your ability to freehand a series of very short curves.

The idea is to break up the large task of drawing the entire curve into smaller tasks. There's a lot of symmetry in an ogee, so it's easy to lay out a few points that the curve will pass through and connect the dots. Follow these three easy steps to draw a graceful reverse curve:

1. Connect the endpoints of the curve with a straight line. Divide the line into four equal parts.
2. Mark an equal rise and fall to the curve. Connect the dots with straight lines.
3. Bend each straight line into a freehand curve.

Take It Further

Once you get the hang of it, you can use the same strategy to draw a more dynamic reverse curve with unequal sides. Simply set the midpoint of the curve off center in Step 1, then mark two different sizes of rise and fall in Step 2.

Big Stamps Prevent Little Mix-Ups

You know this is the left side of the front right leg. Or is it? After dry-fitting your project for the umpteenth time, have you ever caught yourself trying to figure out which two parts go together? You can write notes on the parts themselves until you're blue in the face, but no marking system beats stamping a number right on the joint, especially for complex jobs in dark wood.

Most steel stamps are so tiny that they're not legible in wood, but these jumbo stamps work fine. When you finally get around to gluing your project, there'll be no doubt about which parts belong together.

Source
MSC
(800) 645-7270, www.mscdirect.com
3/8-in. large, 9-pc. figure set of steel stamps, #00200246; $23 (plus $7 shipping).

Calculating Proportions *Without* a Calculator

Using proportions to design furniture sounds great in the abstract, but the reality can be awfully complicated. After all, how do you actually figure out two-fifths of 31-7/8 in.? You could use a calculator, but here's an old-fashioned draftsman's method that's far more elegant and won't give you answers in decimal form!

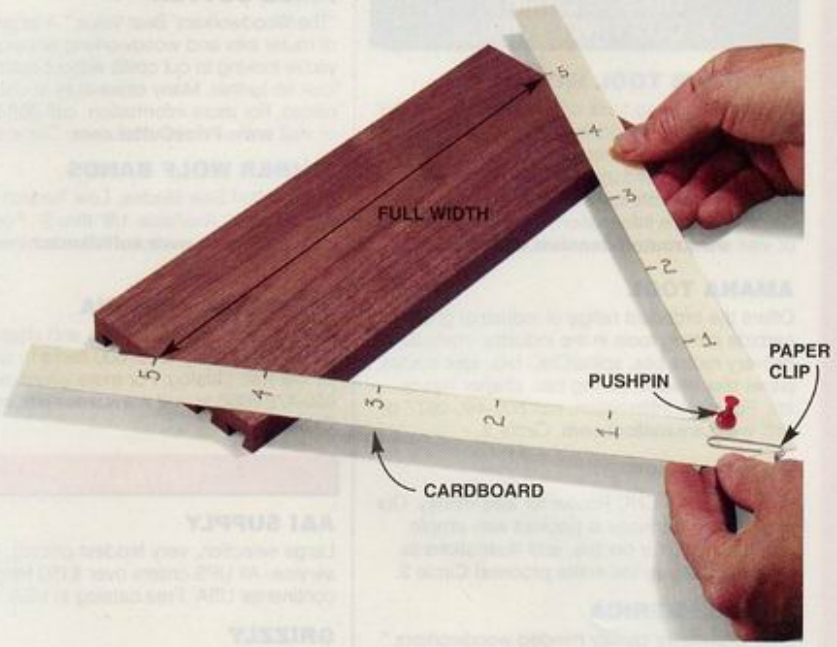
This method is based on a tool called a sector. You can make a rough and ready sector in only a few minutes with cardboard, a pushpin and a paper clip. The arms pivot on the pushpin, like a compass. The paper clip holds the arms tight at any angle you choose. Mark each arm with equally spaced divisions of any length you want.

Divide any distance into equal parts with this simple tool.

Take It Further

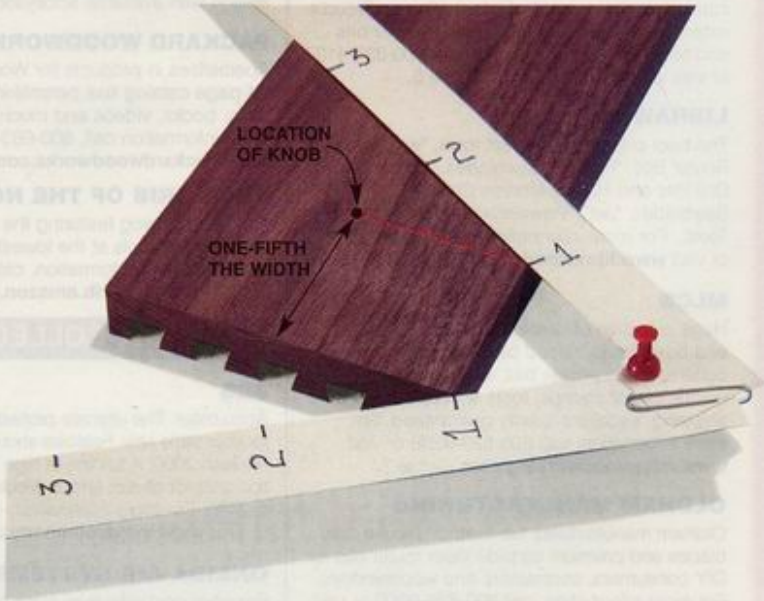
You can increase proportions with a sector, too. Here's an example: You're designing a door, on paper, in the proportion of five to eight. Open the sector so the fives correspond to the width. The distance between the eights gives you the height.

Where do you put two knobs on this drawer front? One rule of thumb places them one-fifth of the way in from each end. You must divide the board into five equal parts. That's awkward to do, even *with* a calculator, but it's easy with this homemade tool, called a sector. Spread the arms so the fives touch the ends of the board.



Locate the exact distance by reading off the sector. The distance between the ones is one-fifth of the length of the board.

You can calculate other proportions as well. The distance between the twos is two-fifths the length of the board. If you start out with the threes, the distance between the ones is one-third the length of the board. Start out with sevens, and you'll have one-seventh, and so on.

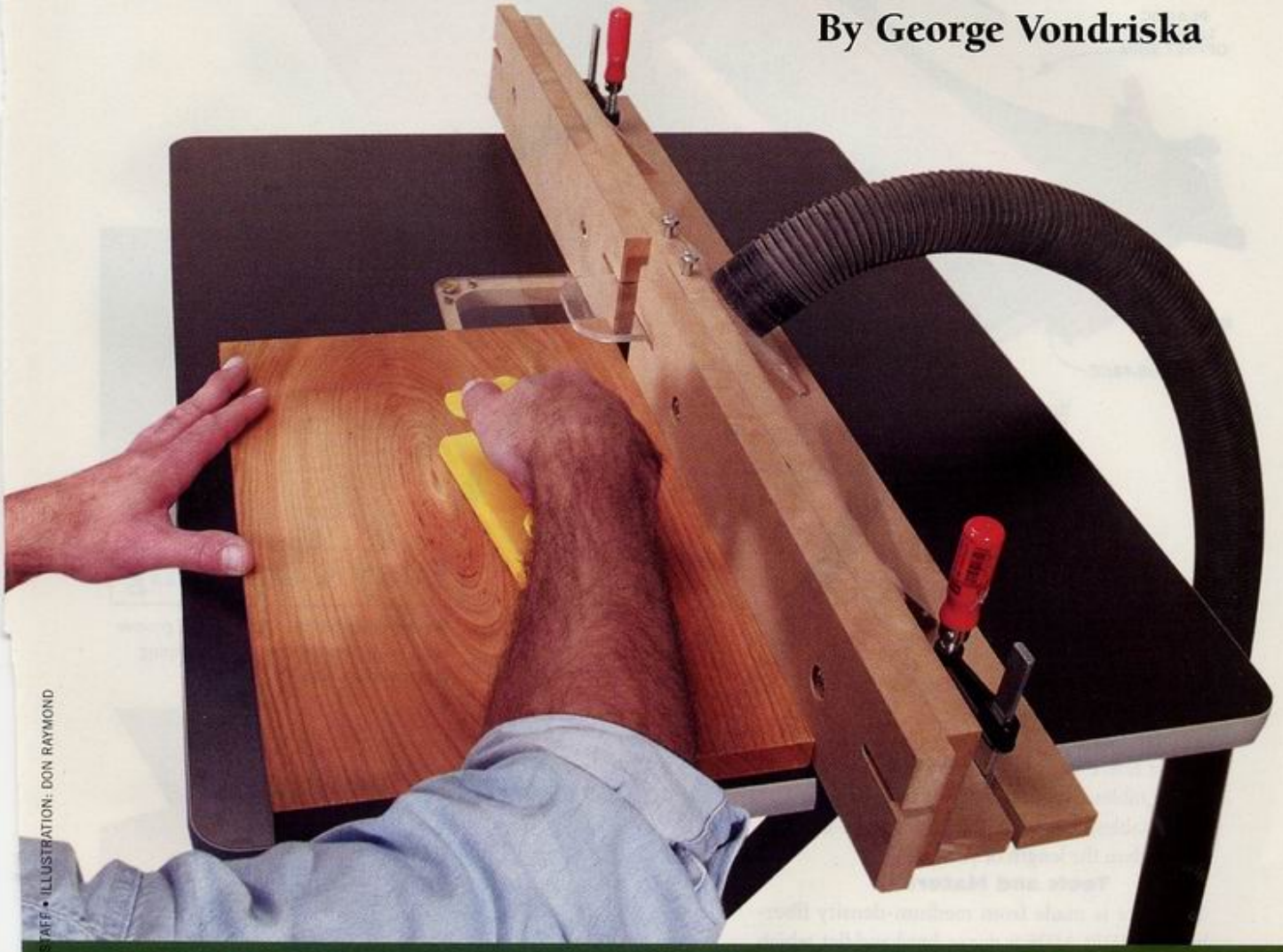


Square By Feel

When you're checking an edge with a square, go by feel as well as by sight. Your sense of touch is more reliable and doesn't involve any squinting! All you have to do is hold the square tight to the corner on both sides of the board. If the square fits snugly on one side but rocks on the other, your board is out of whack. If it fits snugly on both sides, you're good to go. **AW**

Feature-Filled ROUTER TABLE FENCE

By George Vondriska



ART DIRECTION: VERN JOHNSON • PHOTOGRAPHY: STAFF • ILLUSTRATION: DON RAYMOND

This $50 fence can make your router table sing!

You can build this completely tricked-out router table fence in an afternoon for about 50 bucks, using easily available parts. Here's what you get:

- **Flexibility.** Tall or short, it's easy to swap between the faces of this fence, so you always have the right one for the job.
- **Adjustability.** It's a breeze to adjust the faces to surround the bit and make a tear-out-limiting, zero-clearance fence.
- **Interchangeable fences.** The left and right faces can be swapped. If you need a fresh end for a zero-clearance fence, just trade left for right. The faces are so easy to make, you can have plenty of replacements ready to go.
- **Offset outfeed fence.** Use your router table as a jointer by adding a simple shim to the outfeed fence.
- **Dust collection.** Just hook up to a standard 2-in. hose.
- **Safety.** The guard is easy to make and easy to use.
- **Easy clamping.** Two simple clamps hold the fence to the table, making fence adjustments simple. Plus, you won't have any trouble clamping featherboards to this fence.

The Whole Package

Here's the fence with all its options.

Easy Clamping

Small clamps are trapped in a groove for a rock-solid, dirt-simple clamping system that's easy to adjust.

The fence we show here works for router tables from 28- to 34-in. long. For longer tables, simply cut the fence parts 4-in. longer than the length of your table.

Tools and Materials

The fence is made from medium-density fiberboard (MDF). MDF is dense, hard and flat, which makes it a great choice for this fence and other shop-made jigs. It's also darn heavy, at almost 100 pounds per 4x8-ft. sheet. You'll need help handling it. The fence requires about a half sheet, so you could share a sheet with a fellow woodworker.

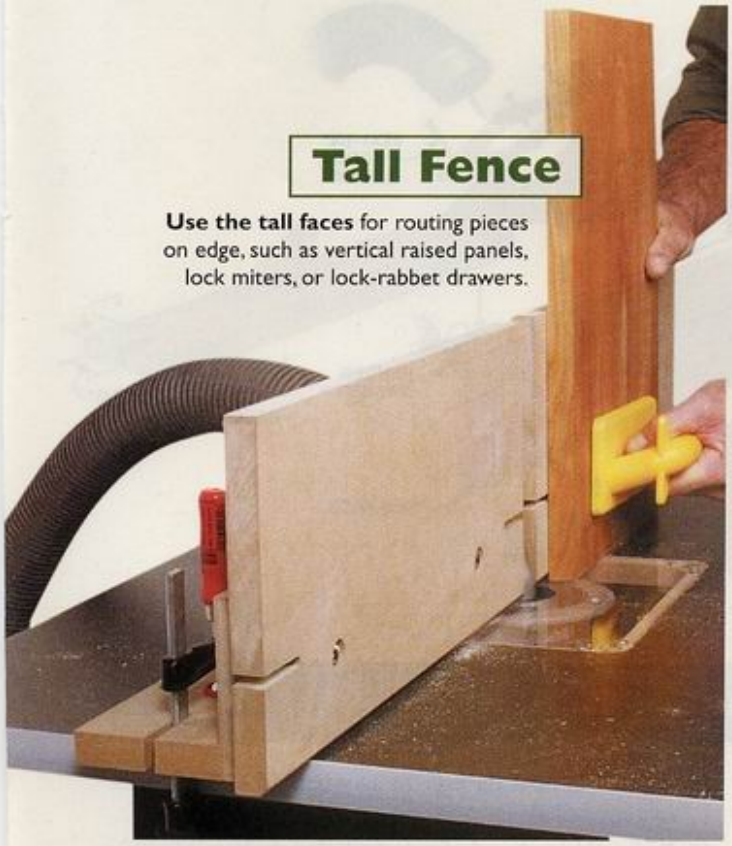
To make this fence you need a tablesaw and a router table equipped with a carbide-tipped 1/4-in. straight bit (see Sources, page 91). The routing required to make the fence is simple. A straight board clamped to the table is all it takes. You don't need to have a good router table fence already in order to make one!

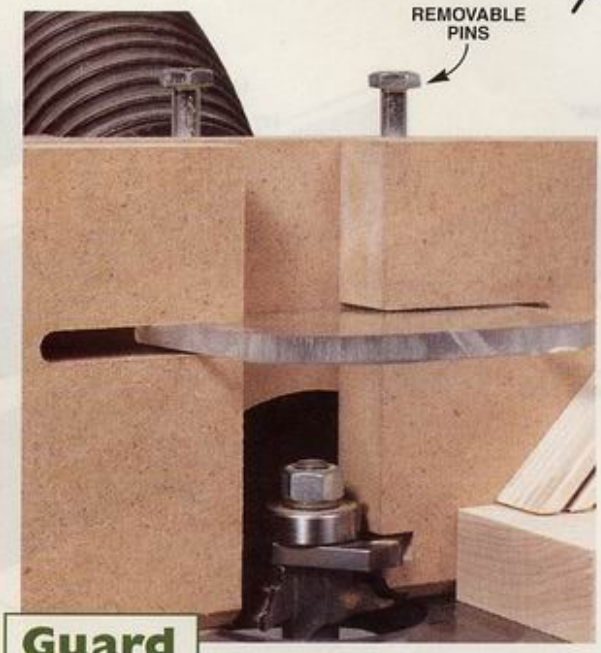
Short Fence

Use the short faces for common routing operations, such as making dadoes.

Tall Fence

Use the tall faces for routing pieces on edge, such as vertical raised panels, lock miters, or lock-rabbet drawers.



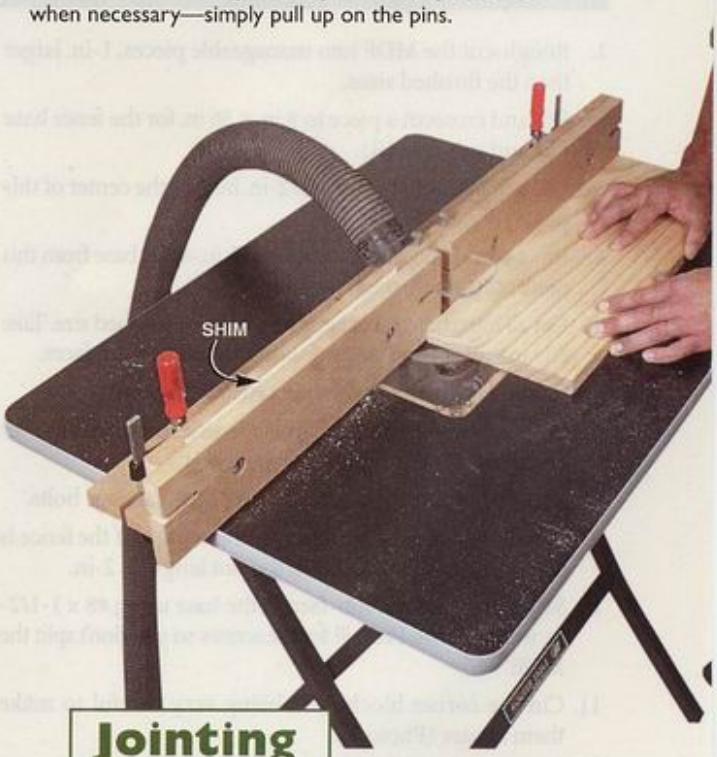


Guard

This polycarbonate guard keeps your fingers away from the bit when edge routing, but is easily removed when necessary—simply pull up on the pins.

Zero Clearance

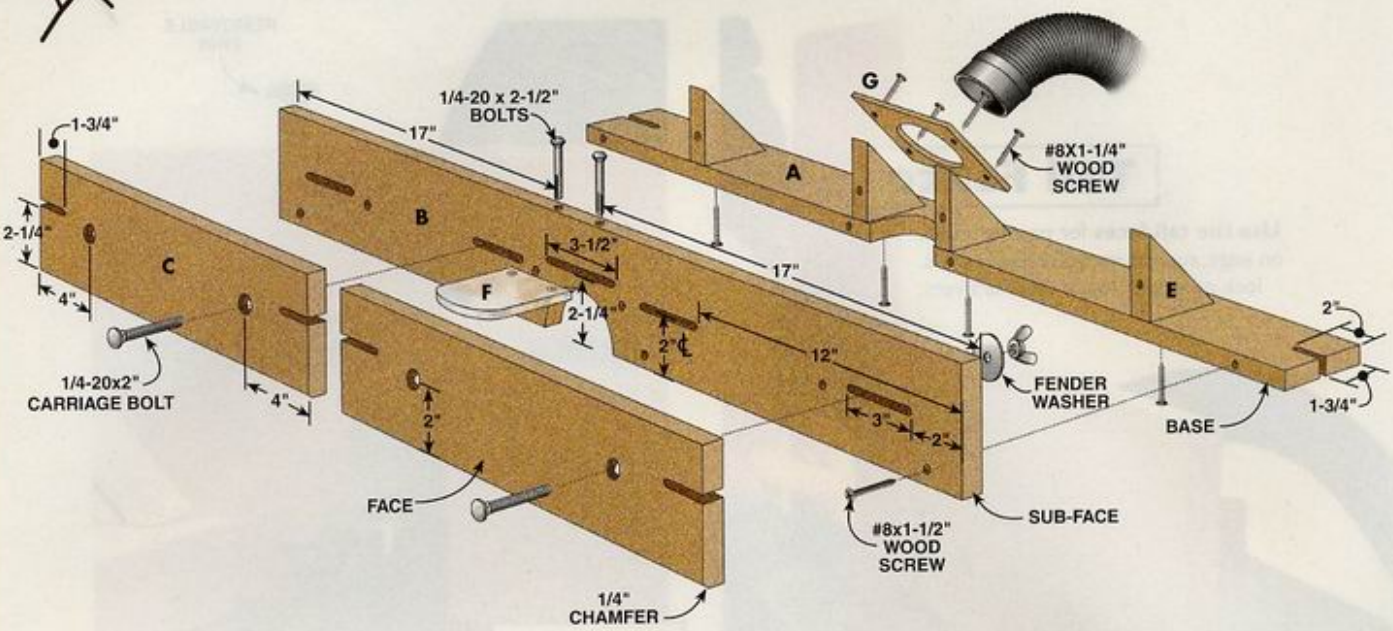
Reduce tear-out by adjusting the infeed face so the bit cuts into it, eliminating the clearance around the bit. Each face slides sideways in slots to permit this. The chamfer on the bottom edge of the face creates a dust relief so your material can ride tight to the face of the fence.



Jointing

Slip a shim between the outfeed face and the fence. This offset allows you to joint edges. Joint with a straight bit by aligning the cutting edge with the face of the outfeed fence.

FIG. A Exploded View



Build This Fence

1. Rough-cut the MDF into manageable pieces, 1-in. larger than the finished sizes.
2. Rip and crosscut a piece to 8 in. x 36 in. for the fence base (A) and sub-face (B).
3. Use a hole saw to bore a 3-1/2-in. hole in the center of this piece (Photo 3).
4. Rip a 4-in.-wide sub-face and 3-1/2-in.-wide base from this piece, cutting through the hole.
5. Cut all interchangeable faces (C and D) to finished size. Take advantage of your tablesaw setups to make extra faces.
6. Rout a 1/4-in. slot in the sub-face for the guard.
7. Rout slots in the interchangeable faces so they can slip over the guard ("Guard" photo on page 89).
8. Rout 1/4-in. slots in the sub-face for the carriage bolts.
9. Rout 1/4-in. slots in the base for the clamps. If the fence is 4-in. longer than your table, the slot length is 2-in.
10. Screw and glue the sub-face to the base using #8 x 1-1/2-in. wood screws. Predrill for the screws so you don't split the MDF.
11. Cut the corner blocks (E), being very careful to make them square (Photo 1).
12. Screw and glue the corner blocks to the fence. The corner blocks are small pieces, so use #8 x 1-1/4-in. screws to prevent splitting.
13. Bore 3/4-in. holes to a depth of 1/4 in. in the interchangeable faces (for the carriage-bolt heads).
14. Bore 1/4-in. holes through the interchangeable faces (for the carriage bolts).
15. Rout a 1/4-in. chamfer for dust relief on the bottom corner of each interchangeable face.
16. Cut the polycarbonate guard to size using a fine-tooth blade on the tablesaw or bandsaw.
17. Cut a 1-in. radius on the front corners of the guard using a bandsaw or jigsaw. Use a felt-tip marker to lay out the radius on the plastic.
18. Bore 1/4-in. x 2-in.-deep holes for the guard pins in the fence sub-face.
19. Place the guard in its slot and use a felt-tip marker to transfer the locations of the guard-pin holes to the guard.
20. Bore 1/4-in. holes in the guard. It's best to use a twist bit on polycarbonate.
21. Cut a piece of 1/4-in. plywood or hardboard for the dust collection shroud. Don't worry about beveling the edges to match the corner blocks; you can fix that with caulk later.
22. Bore a 2-1/4-in. hole in the center of the dust collection shroud.
23. Screw and glue the dust collection shroud to the corner blocks. Use silicone caulk to seal the dust collection box where it doesn't fit perfectly around the fence.
24. Bolt a pair of faces to the fence, hook up the dust collection, clamp the fence to your table, and you're ready to rout!

Cut these supports dead square. If they're off, the fence will be, too.

Forget fancy tracks and hardware! This fence uses common hardware-store parts.

CUTTING LIST

Part	Name	Qty.	Dimensions	Material
A	Base	1	3/4 x 3-1/2 x 36	MDF
B	Sub-Face	1	3/4 x 4 x 36	MDF
C	Faces	2	3/4 x 4 x 18	MDF
D	Tall Faces	2	3/4 x 8 x 18	MDF
E	Corner Blocks	4	3/4 x 2-3/4 x 2-3/4	MDF
F	Guard	1	1/4 x 3-1/4 x 3-1/4	Polycarb.
G	Dust Shroud	1	1/4 x 5 x 4	Plywood

Sources

Available at home centers:
One sheet 3/4-in. x 4-ft. x 8-ft MDF; $20.
Two 1/4-in. x 2-1/2-in. hex head bolts; $ .15 each.
Four 1/4-in. x 2-in. carriage bolts; $ .15 each.
Four 1/4-in. fender washers; $ .10 each.
Four 1/4-in. wing nuts; $ .15 each.

1/4-in. router bit, Freud #04-108, www.amazon.com; $15.
Two clamps, #130926, Woodcraft, (800) 225-1153; $6 each.
One 1/4-in. x 12-in. x 12-in. polycarbonate plastic, Cal Plastics and Metals, (619) 575-4633, www.calplasticsandmetals.com; $7.50, plus shipping and handling.

AW

2

Rout the 1/4-in. slots using a straight board clamped to the router table as a temporary fence.

3

Create clearance for the bits in the fence base by drilling a 3-1/2-in. hole in the center of an 8 x 36-in. piece of MDF. Then rip the fence bottom and front from this piece.

Combination Eye & Ear Protection

By Randy Johnson

Whether it's a seat belt in your car, a life jacket in your boat, or goggles and earplugs in your shop, if safety gear is a hassle, we're less likely to use it. Although few woodworkers would dispute the importance of eye and hearing protection in the woodshop, even fewer actually do anything about it. The grim reality is that even the smallest flying chip can cause serious eye injury and noise-induced hearing loss is permanent—no surgery or medication can bring it back.

Because it's important to protect both your eyes and your hearing, we took a look at combination devices that promise more convenience and therefore the greater likelihood of actually being used. We wanted to know just how comfortable, convenient and effective they really are.

Our Field Test

We distributed sets of combination eye and hearing protection devices to 12 professional woodworkers and asked them to use the devices in their shops for seven days. The woodworkers ranked the eye/hearing protectors for comfort, convenience and effectiveness. Here are the results:

Optimuff

The Optimuff (Photo 1) received high marks from almost everyone. Prescription eyeglass wearers liked the attached safety glasses because they didn't interfere with their regular glasses. Most people found the Optimuff to be comfortable to wear and effective at blocking out noise. Marks were a bit lower for convenience because it takes a few tries before you get the hang of putting them on.

Optimuff

Pros

Comfortable
Model OM-77L can be worn over prescription glasses
Lenses are replaceable.

Cons

Takes practice to put on properly
Muffs can be uncomfortable in hot weather.

Comments

Glasses meet ANSI Z87.1 performance standard
Noise reduction rating: 26 dB
Price: $21.50.

Tiger Tails with wrap-around-style safety glasses.

Tiger Tails

Pros

Can be added to any style safety glasses
Lightweight
Earplugs are washable and replaceable.

Cons

Earplugs are not comfortable for all people.

Comments

Must have separate safety glasses
Noise reduction rating: 24 dB
Price: $5 (for Tiger Tails only).

Tiger Tails with over-the-glasses safety glasses.

Tiger Tails

Tiger Tails (Photos 2 and 3), which attach to any standard safety glasses, received high marks from woodworkers who were accustomed to wearing earplugs.

For our test we used wrap-around-style safety glasses for people without prescription glasses (Photo 2) and these also received high marks. For people with prescription glasses, we attached the Tiger Tails to a pair of over-the-glasses (OTG) safety glasses (Photo 3). The Tiger Tails still received high marks among those who were used to wearing earplugs, but the OTG safety glasses were a real bomb. Most of our testers didn't like them. Prescription eyeglass wearers said the OTG safety glasses interfered with their prescription eyewear, caused excessive reflection, and obstructed peripheral vision.

If you wear prescription eyeglasses, you do have another option—*prescription* safety glasses. You can attach the Tiger Tails directly to them for personalized dual protection. See your eye-care professional for a recommendation on what style frame and lens you should buy. Most cost between $150 and $250.

How much protection do you need?

For Your Eyes

Safety glasses have to meet the American National Institute Standard Z87.1. In Canada it's standard Z94.3. Glasses that meet these standards have one or both numbers stamped right on the lenses or frame. Safety glasses should also have side shields (Photo 3) or be wrap-arounds (Photos 2 and 4).

For Your Ears

Hearing protection should have a noise-reduction rating (NRR) of between 20 and 30 dB. The rating is usually printed on the packaging. You should limit your exposure to noise above 85 decibels (dB) as much as possible. Most shop equipment exceeds 85 dB and can top 100 dB. You must protect yourself from shop noise.

Radians AV

Pros

Compact design, Wrap-around safety glass design, Soft "jelly pod" earplugs, Neck strap included.

Cons

Will not fit over prescription glasses, "jelly pods" (earplugs) may dislodge during use, allowing sound in.

Comments

Glasses meet ANSI performance standard Z87.1
Lenses and plugs are replaceable.
Noise reduction rating: 25 dB
Price: $21.

Radians AV

The most compact of all the dual designs is the Radians AV (Photo 4). This device is made only for people who don't wear prescription eyeglasses. The Radians AVs received a mixed response. The wrap-around safety glasses were judged effective and comfortable and the neck strap keeps them conveniently close at hand.

The "jelly pods" (earplugs) are very soft and easy on the ears, but most testers found them less effective in blocking sound than the Optimuffs or Tiger Tails. The problem is that the pods don't insert very far into the ear canal and can be dislodged by head movement or a bump to the glasses.

One of our testers replaced the jelly pods with the earplugs from his Tiger Tails and said the hearing protection was much improved.

Buying Advice

Of the three types of combination protection, we like the Optimuffs and the Tiger Tails the best. But since these are personal-preference products, try a few different ones until you find something you like. Whether it's one of the combination devices or individual products, make a habit of wearing them every time you walk into your shop. *AW*

Wearing eye and hearing protection should be as routine as flipping on the shop lights.

Sources

Optimuff, #OM-77L, for over prescription glasses; $21.50, #OM-77, standard; $21.50.
Sound Safety Products
(800) 557-2338
www.soundsafetyproducts.com

Tiger Tails, #3083; $5.
Shannon Safety Products
(800) 235-8474
www.shannonsafety.com

Radians AV, clear lens, black frame; $21.
Radians, Inc.
(877) 723-4267
www.radians.com

Edited by **Randy Johnson**

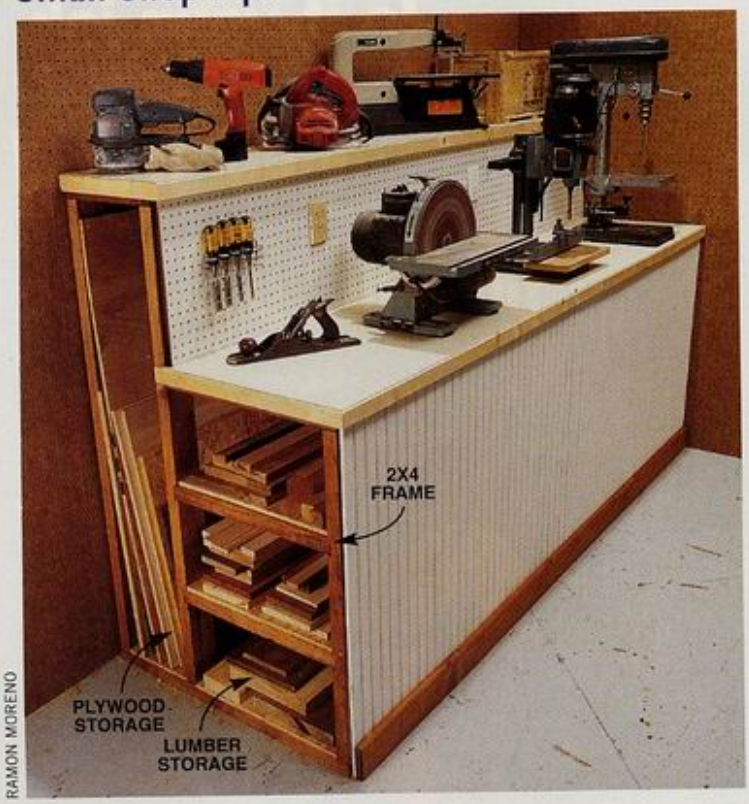
Small Shop Tips

Drill Press Storage

I packed plenty of storage under my drill press by recycling an old kitchen cabinet. To make it fit around the column of the drill press, I moved the cabinet's back panel in about 8 in. and shortened up the drawer a few inches. I added a new plastic-laminate top and mounted pull-out dividers inside, using full-extension drawer slides. A set of casters makes the whole thing easy to move when I have to sweep. The removable drill bit indexes make storing and handling different bits a breeze.

Kevin Gibson

ART DIRECTION: VERN JOHNSON • PHOTOGRAPHY: STAFF, UNLESS OTHERWISE INDICATED • ILLUSTRATION: DON RAYMOND

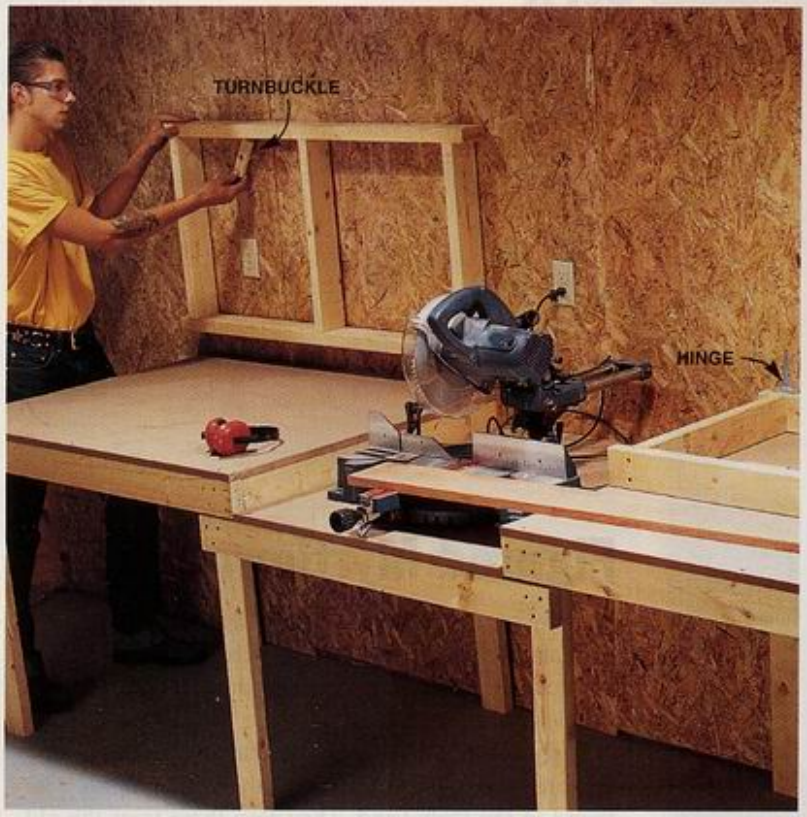


RAMON MORENO

Lumber Storage Workbench

I felt like I won the storage-space lottery when I came up with this bench design for my shop. I wanted a way to store lumber *and* my benchtop tools. The backbones of this bench are the 2x4 frames. For my 8-ft. bench I made four frames. The rest of the materials were mostly scrap I had laying around—total cost, $75.

Paul Smith



RAMON MORENO

Flip-Up Miter-Saw Fence

I was so excited when I bought my sliding miter saw, until I realized how much bench space it took up. My Bosch needs a bench at least 38-in. deep. I also wanted an extension fence on both sides, but this made my benchtop almost unusable for other work. I fixed my problem by hinging the fences to the walls. Now when I want to use the benchtop for something else, I just flip up the fence. I hold it to the wall with a simple wooden turnbuckle.

Dave Bissell
MN

If you have an original Small Shop Tip, send it to us with a sketch or photo. We pay $100 for each one we print. Send to: **Small Shop Tips, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121.** Submissions can't be returned and become our property upon acceptance and payment.

by Dave Munkittrick

Great Wood!

MYRTLE TABLE BY AARON LEVINE • PHOTO BY TERRY REED

Figured Myrtlewood

Have you ever been mesmerized by the shifting shapes and forms in clouds? Add a rich palette of colors to those clouds and you've got a good representation of figured myrtlewood.

Early settlers of Oregon were amazed to see what appeared to be gigantic versions of the smaller myrtle trees found in the Holy Land. They gave these trees the old name, but our myrtlewood (*Umbellularia californica*) is an all-American treasure. Along with sassafras, it's the northernmost representative of the tropical laurel family.

Myrtlewood has many nicknames, including baywood and pepperwood, which describe the aromatic, peppery scent of the leaves and bark. Myrtlewood is a large evergreen tree that grows exclusively along a narrow band that runs from the southern coast of Oregon into California. Fortunately, myrtlewood has its own reforestation program. It is a tenacious tree that can regrow from its own stumps as well as from the olive-shaped nuts that fall from the tree.

Myrtlewood trees grow to heights of more than 100 feet and diameters of 36 to 72 inches. It's a slow-growing tree that takes well over a century to reach full size. Although it is an evergreen, myrtlewood is a hardwood comparable to walnut in density with similar machining and finishing characteristics and cost.

We got our myrtlewood from Gilmer Wood Co. Available in 4/4 to 12/4, prices for figured myrtlewood range from $8 to $20 per board foot, depending on the thickness of the wood and intensity of figure. *AW*

Note: Color and figure vary from tree to tree and from board to board. Expect variations in the wood you order.

Source
Gilmer Wood Co.
(503) 274-1271
www.gilmerwood.com

Know of some Great Wood? We'd love to hear about it. Write Dave Munkittrick at dave_munkittrick@readersdigest.com.

ART DIRECTION: PATRICK HUNTER

PHOTO BY MIKE HABERMANN

The curly figure in this olive-gold colored myrtlewood board has a crinkled look with sharp-edged peaks and valleys that fade into softer, rolling curls.