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#106 March 2004
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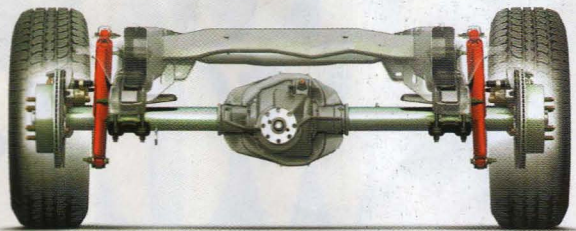
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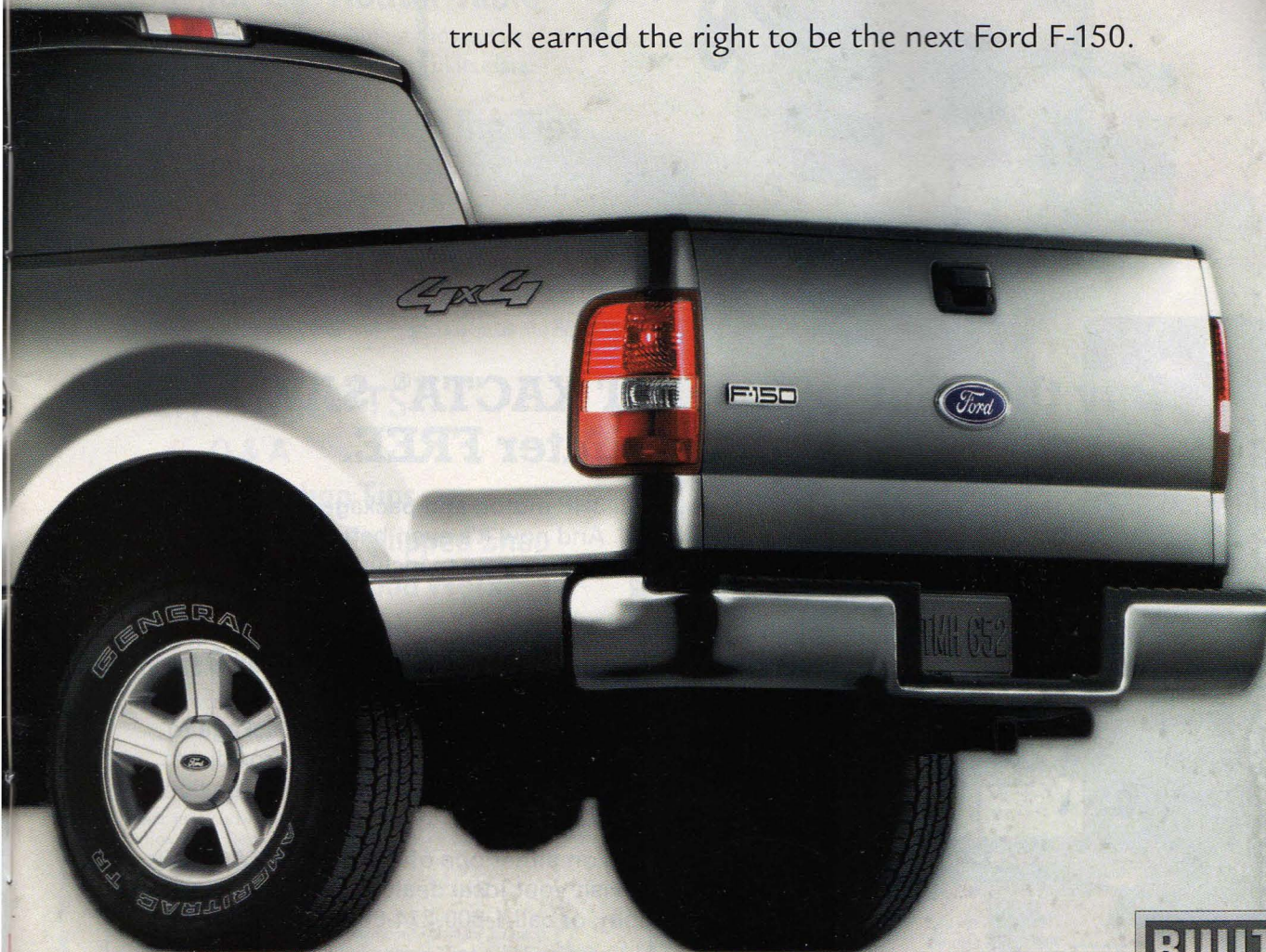
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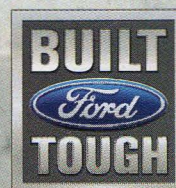
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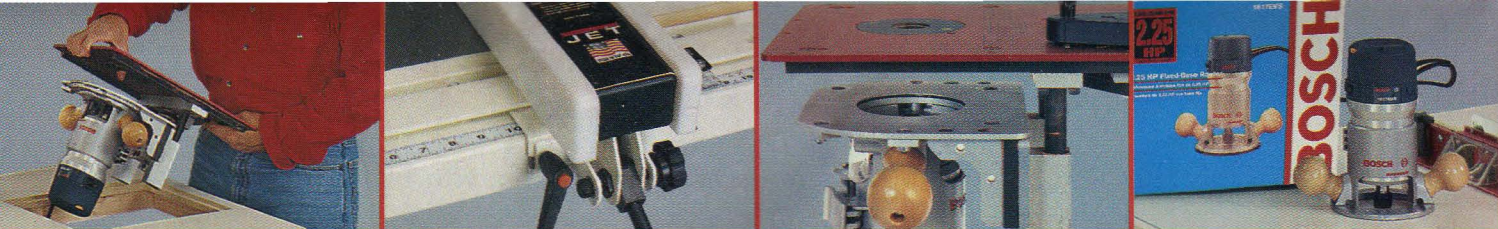
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JET®

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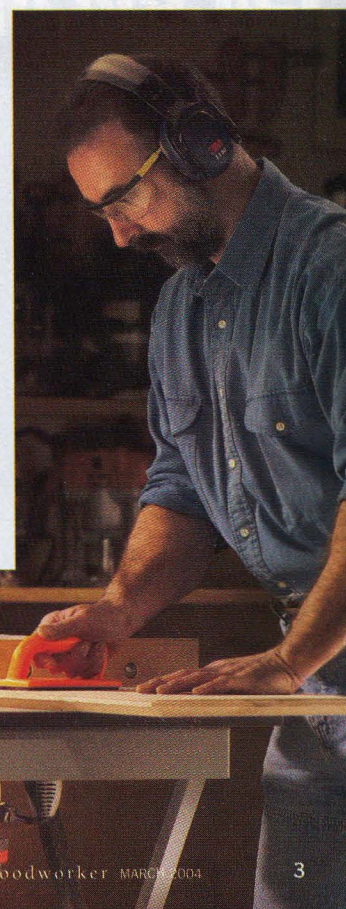
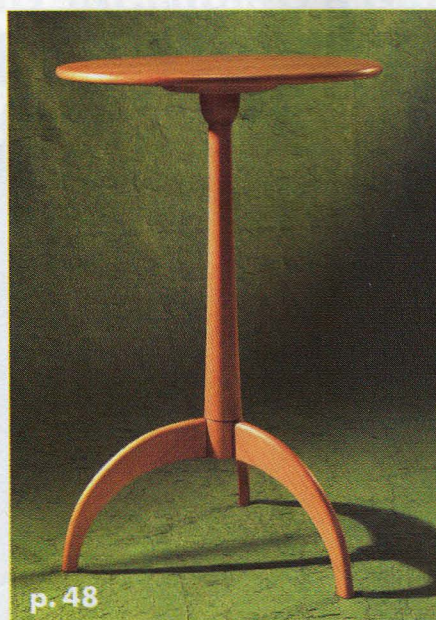
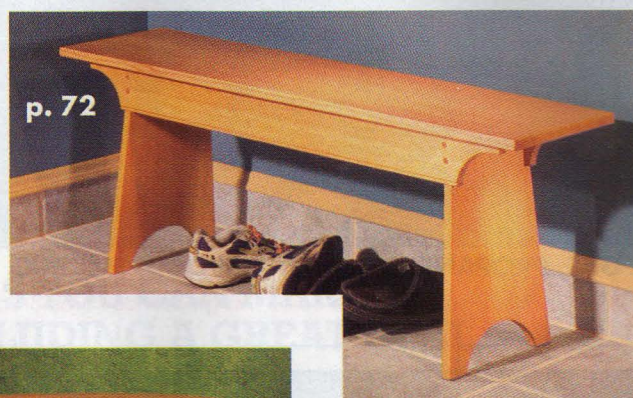
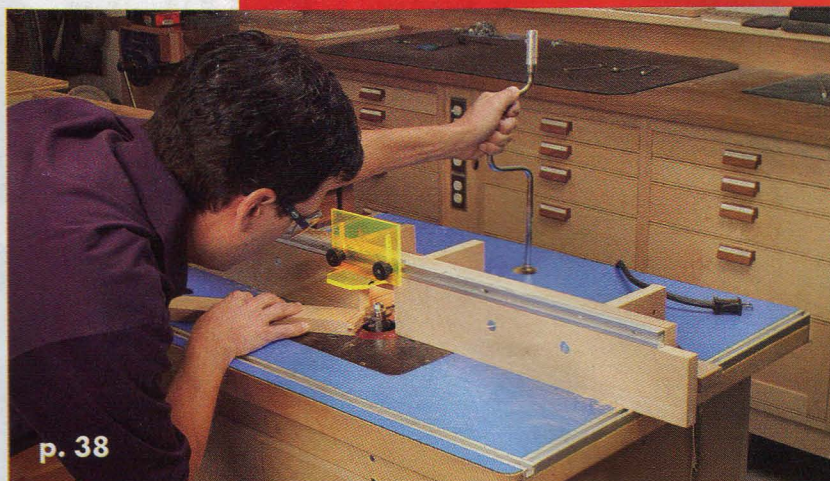
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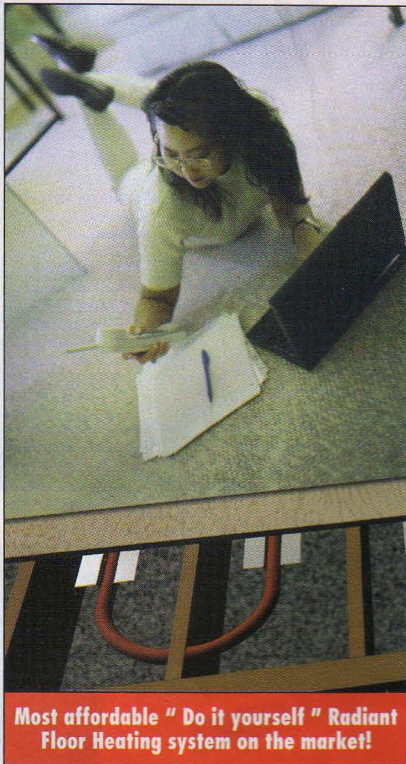
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Question & Answer

Edited by Dave Munkittrick

Is Wood Dust Bad for My Router?

Q. It gets pretty dusty inside my router table. Is all that dust gradually destroying my router?

A. This seems to be a persistent question, so we contacted just about every router manufacturer on the planet to answer it definitively. They all said the same thing: Router motors have sealed bearings and won't be damaged by a small amount of dust passing through them. The real problem is a buildup of shavings that can plug the air intake (inset photo), resulting in an overheated router.

Keep your cabinet clean! Make it a habit to clean out the chips in your table after each use. The best solution is to add a second dust collection port in the cabinet to supplement collection on the fence. This not only reduces dust build up, it boosts cooling airflow into the cabinet. Check to see where the shavings naturally collect inside your table and put the dust port there. We've found the lower left corner at the back of the cabinet is the best location in most cases.



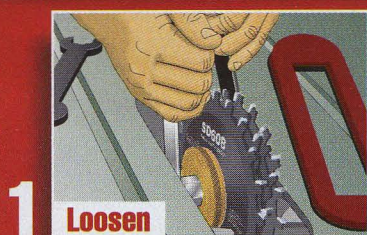
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1 **Loosen**



2 **Turn The Dial**



3 **Tighten**

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Choose Freud's Dial-A-Width Stacked Dado Set, which is a must for fast, easy, and accurate flat-bottom dado cuts.

No More Shims

For a perfect fit every time, all you need to do is dial. Freud's SD608 Dial-A-Width Dado set performs like an ordinary stacked dado set, but the shims have been replaced with a patented dial system, which allows you to adjust the width via an exclusive dial hub capable of micro adjustments. Each "click" of the dial adjusts the blade by .004"—that's thinner than a sheet of paper. The adjustable width range for the dial is 1/4" to 29/32".

Easy and Accurate

Freud's innovative adjustable-hub design not only eliminates the need for shims, but allows you to fine tune the width of the dado without ever removing the dado cutter from your table saw. No more wasted time making adjustments and re-adjustments. A simple click of the dial ensures accuracy the first time.

Flawless Finish

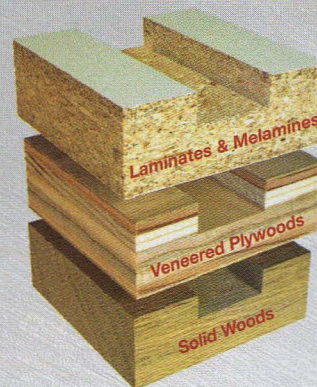
The SD608 features the same premium materials and quality as all of Freud products. The blade bodies are laser cut for extreme accuracy, and the precision-ground arbor holes ensure precise blade alignment on any table saw. The MicroGrain carbide is manufactured specifically by Freud for splinter-free, flat-bottom grooves in all materials—including problem materials like veneered plywood or melamine.

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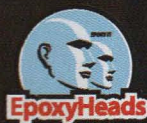
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How Do I Tell the Face From the Back on My Plywood?

Q. I often can't tell the face from the back on my hardwood plywood. Is there an easy way?

A. Here's a simple test: All graded plywood carries an edge stamp. Just lay the plywood on your bench so the lettering is right side up and you'll be looking at the face side. As you cut your plywood, mark the face side with a pencil.

If you still get mixed up, take a close look at how the veneers are matched. The face side will always be book matched (each veneer slice is a mirror image of the next) while the back will be slip matched (veneer slices are laid side by side). Finally, face knots can only be 1/4 in. in diameter with a 1/8 in. dark center. Backs can have 3/8-in. knots that are all dark.

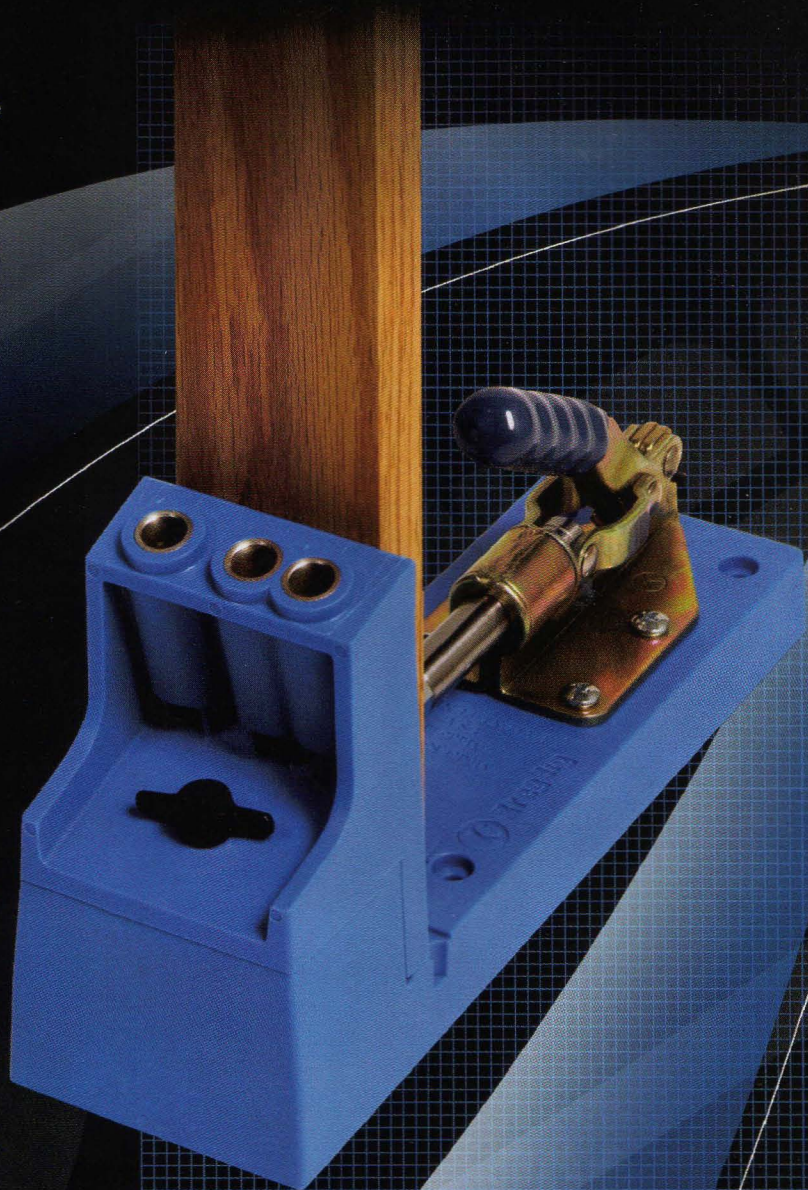
Most hardwood plywood on the market is graded "A1." "A" is the second-highest face grade and "1" is the highest back grade. That often makes the face hard to distinguish from the back. Of course, in the end it's all about appearance; if you can't tell the difference it probably doesn't matter. In fact, I have consciously used the back side as the face just because it looked better to me.

Circle No. 10

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Question & Answer



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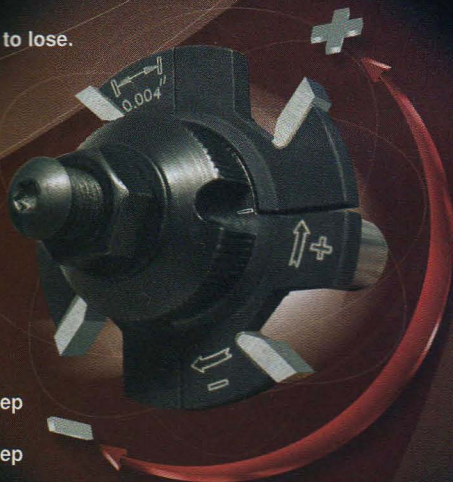
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Making Traditional Storm Windows

Q. I've got an older house and a couple worn-out storms need replacing. How can I make traditional window sashes with mullions?

A. Believe it or not, almost all the major router bit manufacturers have a stile and rail set designed for 1-3/8-in.-thick stock used to make window sashes or storm doors. Unlike cabinet doors, storm doors and windows must withstand the ravages of nature. That's why we like the sets designed around time-tested mortise-and-tenon joinery. The tenons are cut first on the tablesaw while a mortising machine or drill press makes quick work of chopping out the mortises. Other sets require a floating tenon with mortises in the ends of rails. This joinery is considerably more complicated.

The mortises and tenons are cut first. The routing is done the same way as any stile and rail door cutter where a cope cut is made to match the stile profile. The big difference is they automatically cut a deep rabbet for the glass and glazing putty.

Sources

CMT, (888) 228-9268, www.somerfeldtools.com
#855-801, window sash set, \$150.
Freud, (800) 472-7307, www.freudtools.com
#99-050, cope cutter, \$43
#99-051, stile cutter, \$71.
Jesada, (800) 531-5559, www.jesada.com
#655-801, \$80 (large bit).
Oldham, (800) 828-9000, www.oldham-usa.com
#1382VF, 2-pc. window sash set, \$120.

Circle No. 2

An Important Message for Those with Hardwood Floors

Is it Possible to do a \$3,200 "Refinishing" Job on Your Hardwood Floors for Only \$20?

When you first glimpse a solid hardwood floor, you sense the richness, warmth and natural beauty. Hardwood floors can be beautiful, but any homeowner knows that they get scratched and dulled from furniture and everyday foot traffic. Dirt, grit and furniture legs are your hardwood floor's worst enemies—they act like sandpaper on the finish, causing scratches, dents and dulling.



One Easy Application Lasts for 6 Months!

Just Pour and Mop. Dries to a clear and luxurious finish in under an hour.

- Fills in scratches and eliminates dull spots
- Provides enhanced traction to slippery floors
- Seals and protects from scratches, stains, yellowing, detergents, scuff marks and powdering

One Bottle Covers 325 sq.ft.

Refinishing sealed hardwood floors can cost the average homeowner over \$3,200!

That refinishing process creates so much dust that many homeowners need to put their furniture in storage and move into a hotel for up to a week in order to complete the refinishing process. Worse yet, chemicals used in refinishing a hardwood floor can give off dangerous fumes and are often flammable. Instead, most homeowners neglect their fine hardwood floors and let them become more and more scratched. The once elegant finish just gets duller and duller.

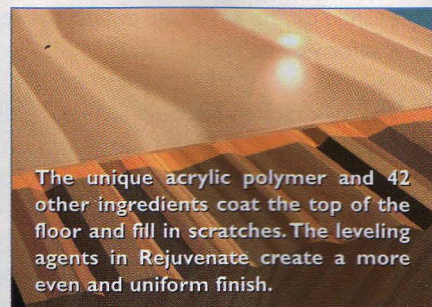
What can you do instead? Joe McDonnell and 2 other chemists from the University of Miami invented a revolutionary acrylic polymer that will renew sealed hardwood floors at a price of less than \$20 for 325 square feet. It's called "Rejuvenate" and it gives a new life to

sealed hardwood floors. It improves the appearance of sealed hardwood without

costly sanding and refinishing. Just pour it on and mop it in. It will dry in under an hour and the acrylic finish will fill in scratches and greatly improve the shine of your floor. We did a gloss rating test on a badly scratched wood floor and we were able to improve the optical brightness from

a very dull "20" all the way to a highly reflective "96". The special formulation of acrylic polymers and 42 other ingredients coats the top of the floor and fills in scratches. The unique acrylic formula protects the hardwood from stains and discoloration. The leveling agents in Rejuvenate create a much more even and uniform finish. But unlike a wax, there is no build-up, no yellowing and your floors get less slippery.

Not Just for Wood. Our chemists own more than a dozen patents and have developed surface refinishing techniques for the military. They made an amazing discovery when testing Rejuvenate. Not only would the formula work on sealed wood, but it was also remarkable on tile, stone, and linoleum. The exclusive polymer formula improved the shine and protected the flooring on all of these surfaces. The formula



The unique acrylic polymer and 42 other ingredients coat the top of the floor and fill in scratches. The leveling agents in Rejuvenate create a more even and uniform finish.

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- Laminates
- Marble
- Slate
- Grout
- Terrazzo
- Concrete
- Linoleum
- No-Wax
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- Fiberglass

created a rock hard barrier between the foot traffic and the flooring surfaces. If you look at floors with a microscope, it's hard to believe how the day-to-day wear and tear on a floor creates crevices in tile, stone, linoleum and wood. It makes sense to protect your floors with Rejuvenate. So avoid the costs and inconvenience of floor refinishing. Don't move out—just Rejuvenate!

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Question & Answer

Safer Ripping

Q. I recently had a thick piece of wood pull apart as it came off the blade of my tablesaw. The spreading wood pushed off the fence and against the spinning blade. Is there a safer way to rip?

A. Wood often has built-in tension due to drying stresses. Ripping the board releases the tension causing the wood to either pull apart or pinch together. A splitter keeps the wood from pinching the blade but it is ineffective when the wood pulls apart. In Europe, tablesaw fences end just past the blade. That way the wood is free to splay apart. In North America, we're used to a fence extending well past the blade but there's really no need for this additional fence length when rip-cutting.

You can easily make your own Euro-style fence. Use double-faced tape to add a subfence that ends just past the far end of the blade. Make the subfence exactly 1-in. thick and it'll make direct-read measurements easier. **AW**

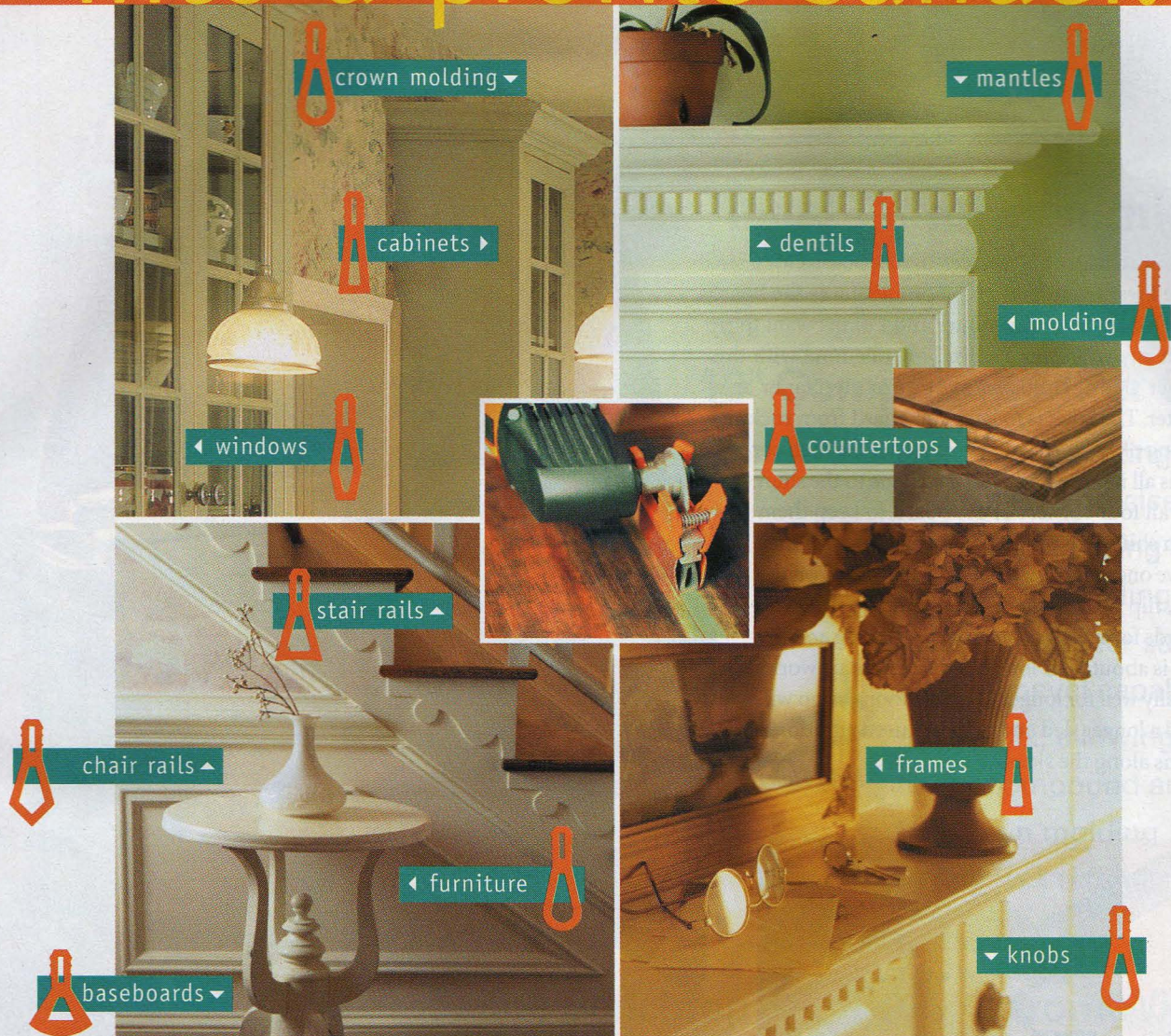


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is just
the beginning*

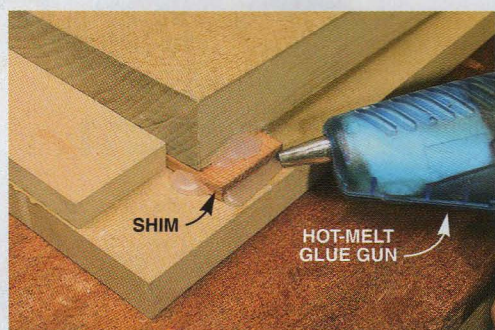
Fein 

Workshop Tips

Jointing with a Planer

I came across some wonderful oak boards for a small table I wanted to build. The problem was the boards were too wide for my jointer and I didn't want to rip them any narrower. I solved my dilemma with this planer sled that allows me to use my planer as a jointer. The trick is to keep the board from rocking during planing. A wood shim under the high corner is all it takes. I add hot-melt glue to the shim and all four corners of the board to keep them from shifting on the sled during planing. Once I have one side planed flat I take the board off the sled, flip it over and plane the other side. The boards for my table were only 4-ft. long and the sled is about 6-in. longer. This technique works equally well for longer boards although you will need a longer sled and you may need additional shims along the sides.

Mike Hofer



STOP

SLED

HIGH CORNER



ART DIRECTION: VERN JOHNSON • PHOTOGRAPHY: THIS PAGE, MIKE HABERMANN; ALL OTHERS, STAFF

WILTON[®] Benchtop Power Tools



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An ideal tool for the hobbyist because of its versatility and lightweight design. Suitable for straight line and bevel cutting, the Scroll Saw excels at the cutting of intricate curves and irregular shapes in wood, plastic and metals.

10" Tablesaw

The tablesaw is a convenient, extremely accurate and versatile tool. It's suitable for breaking down rough materials, machining stock to finished dimensions, and cutting extremely accurate joints.

9" Bandsaw

The bandsaw can cut the large radius of a cradle rocker as easily as it cuts the tight radius of a circle. While most people think of the bandsaw as a tool for cutting curves, it's great for ripping, crosscutting, mitering, and re-sawing.

10" Drill Press

A drill press is perfect for drilling straight holes in various materials. The Wilton[®] benchtop model features a large cast iron work table that can be adjusted to 45 degrees left or right for angle drilling, with rack and pinion table elevation system for easy, precise height adjustment.

Bench Grinder

Bench grinders are designed to remove excess metal rapidly and with minimal effort. Wilton[®] offers a Gold Series Bench Grinder, with patented oversized cast aluminum tool rests, in 5", 6", and 8" models. The Silver Series Bench Grinder, with stamped steel tool rests, is available in a 6" or 8" model.



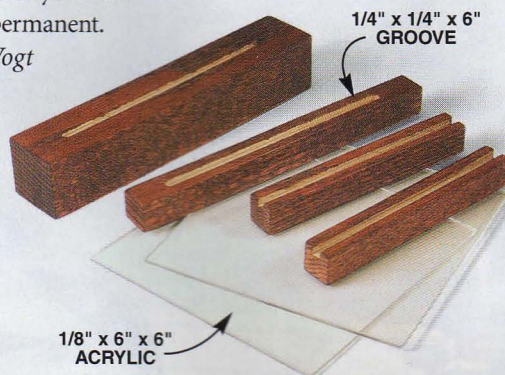
Available at **MENARDS**[®] and other fine Hardware/Home Centers.
For more information, call 1-800-519-7381, or visit www.wiltontool.com.

Workshop Tips

Picture Frames from Scrap

I finally found a great use for all those pieces of scrap wood that pile up around my shop: I make simple picture frames out of them. As you can see there's not much to them. The size shown here is for a 6- x 6-in.-square picture that I printed off my computer, but you can make them any size you want. I rout the groove on my router table using a 1/4-in. straight bit. I add an extra layer of thin cardboard behind the picture and between the acrylic so these pieces fit snugly into the grooves. The parts are simply held together by friction but you can add some hot-melt glue if you want to make it more permanent.

Ryan Vogt



SK-250TS series

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KUFO table saw model SK-250TS-L comes with professional features built-in.



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Workshop Tips



Simple Sharpening Jig

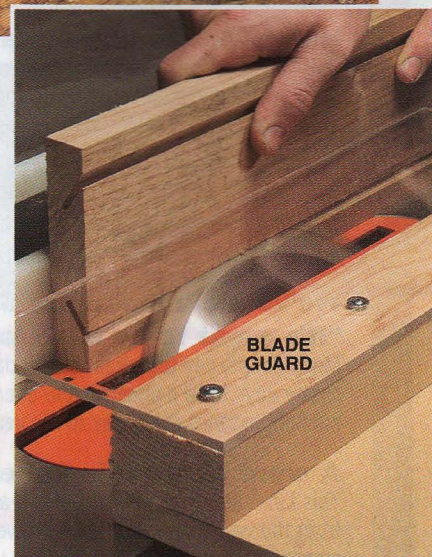
I've tried several different shop-made jigs for sharpening my jointer and planer knives but this one has proved the simplest to use and make.

When making this sharpening jig it's important to make the slots at the correct angle so the bevels of the blades lay perfectly horizontal. This way the sandpaper will have even contact. My jointer blades required a 38-degree angle but check yours because it may be different.

I also had to saw the angled slots with the board on its edge. That's because my tablesaw (like most) tilts to only 45 degrees. This is not far enough for the slot to be cut with the board laying flat. Cutting it on its edge solves this problem. Take a look at your saw and you will see what I mean. Double-check the angle of your jointer knives and saw the slots to match. I added a blade guard to keep things safe.

For the sanding block I used chunks of 3/4-in. MDF with sheets of silicon carbide sandpaper attached with spray-on adhesive. I started with 220 grit and worked my way up to 600 grit for a final honing.

Dan Reeve



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Workshop Tips

Snow Shovel Dust Pan

I've tried out a lot of different kinds and sizes of dustpans but I like this child's snow shovel the best. The long handle means I don't have to bend over very far and it's a lot lighter than a full-sized shovel. I bought it for only two bucks at my local hardware store.

Jack Jorgensen



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Scrub Brush Featherboards

I saw this featherboard idea on a routing tool called the WoodRat. I liked it so much I adapted it to my router table. The WoodRat uses a single wooden scrub brush glued to a board. I wasn't able to find wooden scrub brushes so I bought a pair of plastic ones. I simply screwed them to a mounting board, one for infeed and one for outfeed. They do a great job of holding the workpiece snug against the fence during routing.

Harold Hubbard

AW

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Example shown: 1"x6" to a 4"x4" offset joint for coffee table. 12 hardwood dowels to create a strong, precise corner assembly.

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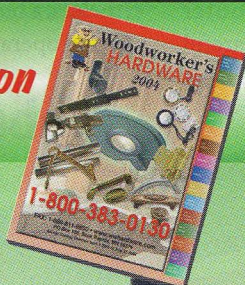
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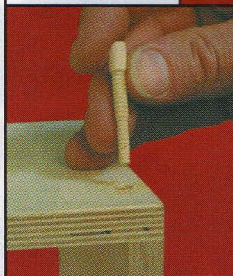
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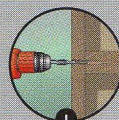
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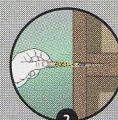
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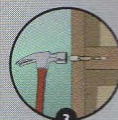
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2
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& INSERT



3
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FINISH

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Circle No. 23

The Well-Equipped

By George Vondriska

State-of-the-Art Router Table



Imagine making a small height adjustment on your router table with no bending, peering or unlocking—simply a twist of a front-mounted handle moves the bit a mere 1/64 inch. Finally there's a router table that's as easy to adjust as a shaper. This convenience comes at a fairly high price, however.

The new JessEm Mast-R-Lift Excel Router Table Top (\$550) includes a built-in lifting mechanism. (A complete package including the top, fence and base costs \$820.) Changes in bit height can be accurately measured with a dial that's mounted on top of the table. The lift raises the router collet high enough to change bits from above the table without removing the router motor. You do need to be careful not to nudge the front

handle with your leg or you could change the bit height.

The lift is designed to grip the motor of the Porter-Cable 7518 3-hp fixed-base router. Reducer rings (\$30) are available to fit most other routers.

The hole in the top of the lift is a generous 3-5/8-in. diameter, so even big panel-raising bits will fit through it. One 1-1/2-in.-diameter reducer ring is included. A set of four reducers, with hole diameters of 1/4, 1/2, 1-3/8 and 2-1/2 in., is available for \$25.

At \$550, the Excel Router Table Top is around \$200 more than a stand-alone router lift. Only a few bits, like lock miters and lock rabbets, really require the extreme precision a lift offers. Nevertheless, a built-in lift and height dial make any routing operation much easier.

Source

JessEm Tool Company
(866) 272-7492, www.jessem.com
Mast-R-Lift Excel, top and lift only, \$550;
with base and fence, \$820.



HEIGHT
ADJUSTMENT
HANDLE

HEIGHT
INDICATOR
DIAL

PHOTO COURTESY OF MANUFACTURER

opped Shop

New Tools, Supplies and Materials

Rugged Low-Cost Bandsaw

Resawing a wide board sure pushes a bandsaw to the max. The more rigid the upper arm, the better, because you'll get a smoother cut. The upper arm is generally stiffer on a saw with a welded frame than on a saw with a cast-iron frame and riser block. At only \$550, the 14-in. BW-14WBS from Bridgewood gives you stiff welded-frame construction at a not-so-stiff price.

This saw has an 8-in. thickness capacity. That's slightly more than other budget-priced welded-frame saws, but less than the 12-in. capacity of a standard cast-iron saw with a riser block.

This saw has ball bearing guides above and below the table, quick-release blade tension, rack-and-pinion blade guard and a 1-hp motor. A fence is included. This saw accepts blades from 3/16- to 3/4-in. wide. Its table is 42 in. above the floor, which is higher than most welded-frame saws. Low tables are handy for resawing, but a higher table makes it much easier to see the line on curved cuts.

Source

Wilke Machinery
(800) 235-2100, www.WilkeMachinery.com
Bridgewood BW-14WBS, \$550.



PHOTO COURTESY OF MANUFACTURER

Mini Drum Sander

No two ways about it, sanding stinks! A drum sander can eliminate the drudgery, but not everyone has room in their budget, or their shop, for a huge expensive machine. The new 10-20 Plus Drum Sander from Performax (\$500) is less expensive and takes up less space than other drum sanders.

The 10-in.-long drum is open on the end. You can actually sand stuff up to 20-in. wide by doing it in two passes. It handles pieces from 1/32- to 2-1/2-in. thick, and as short as 2-1/4 in. The machine is powered by a 120-volt 3/4-hp motor. You must use a dust collector with any drum sander, and this one requires a collector that pulls at least 400 cfm.

At 85 lbs., this machine is no lightweight. But if you don't mind lifting or sliding this sander around, you can bring it out as needed and store it when you're done.

Source

Performax
(800) 274-6848, www.wmhtoolgroup.com
10-20 Plus Drum Sander, #628900, \$500; Stand, #608004, \$90.

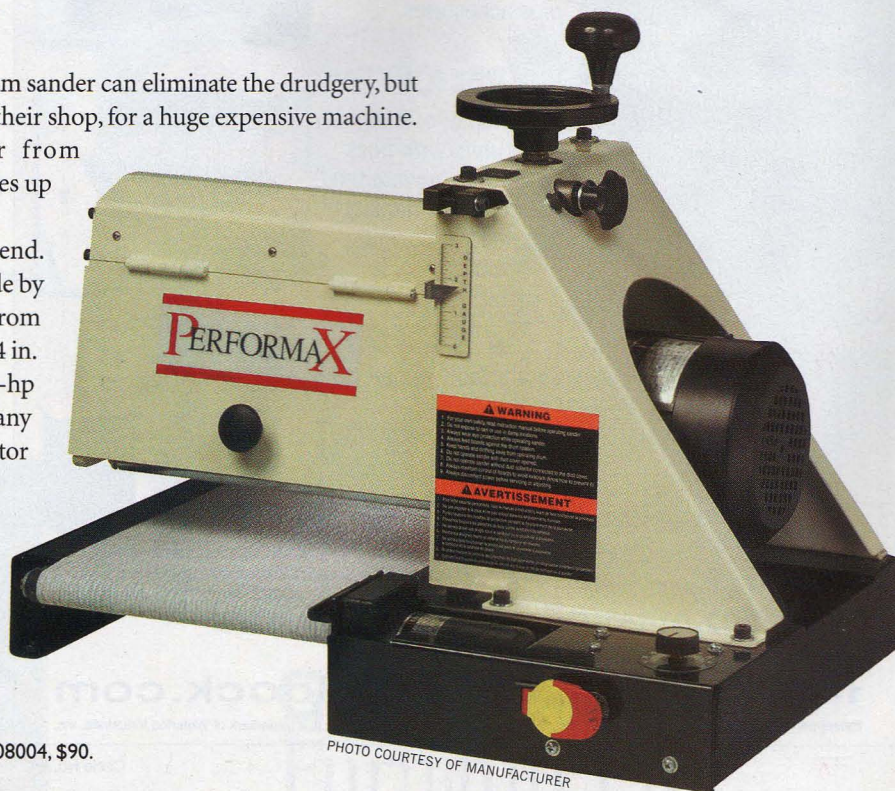


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The Well-Equipped Shop

Versatile Throat Plate

Zero-clearance throat plates are one of the best accessories you can put on your tablesaw. With a slot that



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tightly fits the blade, you get less tear-out and no trapped off-cuts, with both standard blades and dado sets.

Buying a whole stack of throat plates for every width of dado cut can really add up, though. Sure, you can make your own, but that takes precious shop time. With the Tru-Cut Insert System (\$80) you'll never have to make or buy another zero-clearance throat plate again. It's got replaceable inserts; when you switch blades, you leave the throat plate in the saw and simply swap one insert for another.

The throat plate is aluminum and the inserts are phenolic plastic. There are screws for leveling both the throat plate and the insert. Spring-loaded plungers keep the throat plate from wiggling around in the opening.

There's a notch in the rear of this throat plate for your saw's splitter. Most commercial zero-clearance throat plates don't have this notch, which is a real short-coming. Splitters really do prevent accidents and should always be used when practical.

The Tru-Cut throat plate comes in different sizes, and is currently made to fit some Delta, Jet, Powermatic and DeWalt saws.

Source

Art Betterley Enterprises
(800) 871-7516

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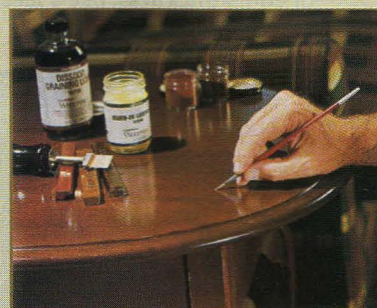
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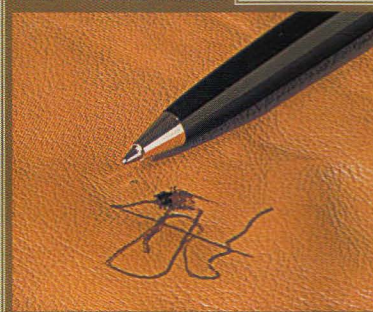
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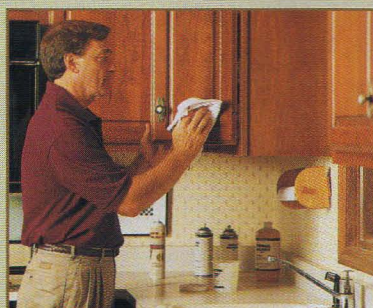
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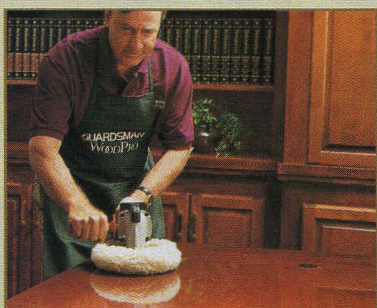
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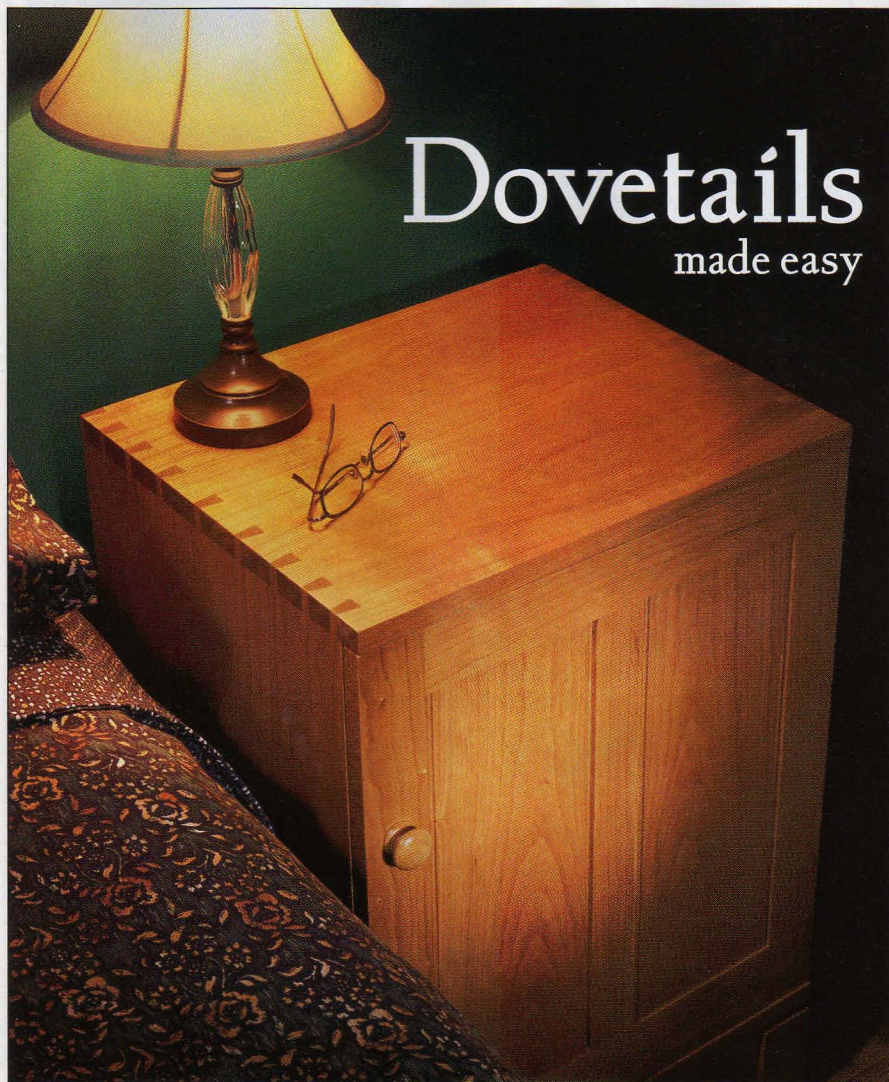
The most trusted name in furniture repair™

The Well-Equipped Shop

First-Rate Dowel Jig

Locating and drilling dowel holes is usually so fussy it drives you nuts! A self-centering jig works fine on stock of equal thickness, like a face frame,

but you may have a hard time setting it up to join parts of unequal thickness, like a thick table leg and a thinner rail. The DowelMax (\$170)



Dovetails

made easy



effortlessly with Leigh attachments. Joinery's never been easier.

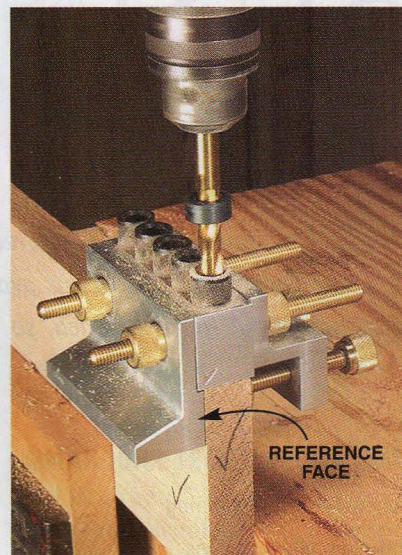
Create perfect dovetails easily with the Leigh Dovetail Jig. No other jig offers such versatility, precision and superb value. Whether you're a hobbyist or professional, you can rout through and half-blind dovetails up to 24" wide in boards up to 1 1/2" thick, with infinitely variable spacing of pins and tails – all on one jig. And you can easily rout sliding and angled dovetails too. Plus, create decorative Isoloc joints, finger joints and multiple mortise and tenons

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makes doweling much easier. It's a cinch to set up because the holes can be positioned any distance you want from the jig's reference face. It's a beautifully engineered tool, but it costs about twice as much as a self-centering jig.

Dowels are widely used in the furniture industry to join parts because they're quick and easy, but factories use expensive machines for accurate alignment. The best tool for making joints quickly in a home shop is a biscuit joiner, but biscuits have limitations. They don't work well with narrow pieces, for example. The DowelMax doesn't replace a biscuit joiner, but together they make quite a team.

In its standard configuration the DowelMax centers 3/8-in.-diameter dowels on 3/4-in.-thick material. Spacers are included to create offset joints or to center dowels on material thicker than 3/4-in. An indexing pin and rod are included for positioning the jig on long edges. One-quarter-inch drill guides are available for \$35 per set. **AW**

Source

O.M.S.Tool Company
(877) 986-9400, www.dowelmax.com
DowelMax, \$170.

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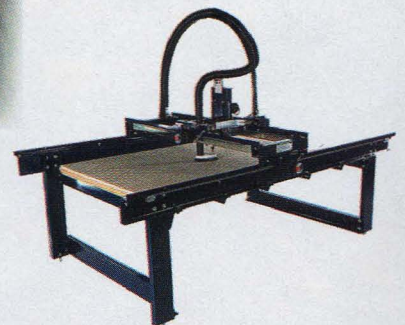
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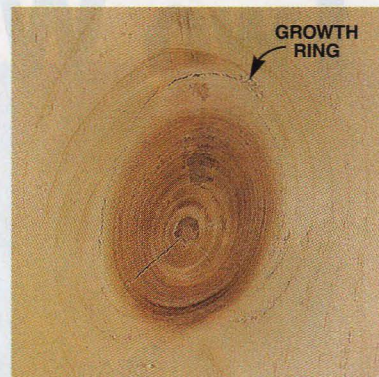
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Knots

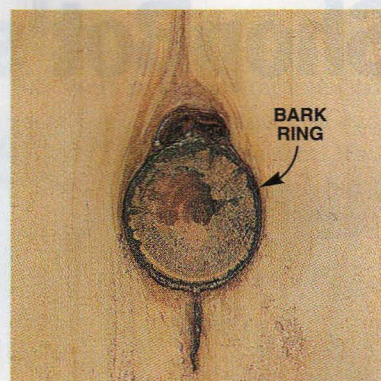
Knotty boards are beautiful, yet frustrating! Here's how to get the most out of them.

Knots are usually considered defects in wood. They're cut out of boards and thrown on a scrap heap. But take a closer look at a knot. In a hardwood, it's surrounded by stunning grain. Why not make it the focal point of your next project?

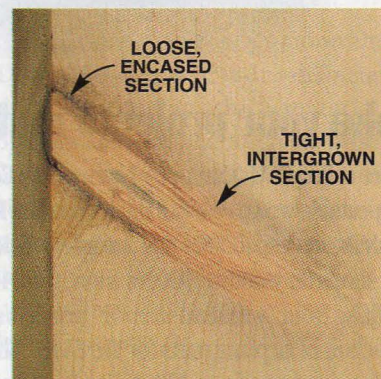
The best knots crop up on some of the least expensive, lowest grade boards available. Dealing with knots can add extra work to a project, but you don't need any special equipment. You just have to know what you're up against. To begin, take a look at where the three basic types of knots come from in the photos at right.



An intergrown knot is the base of a living branch within a tree. It's surrounded by a halo of circular growth rings. An intergrown knot is also called a "tight" knot because it's tightly bound to the wood around it.

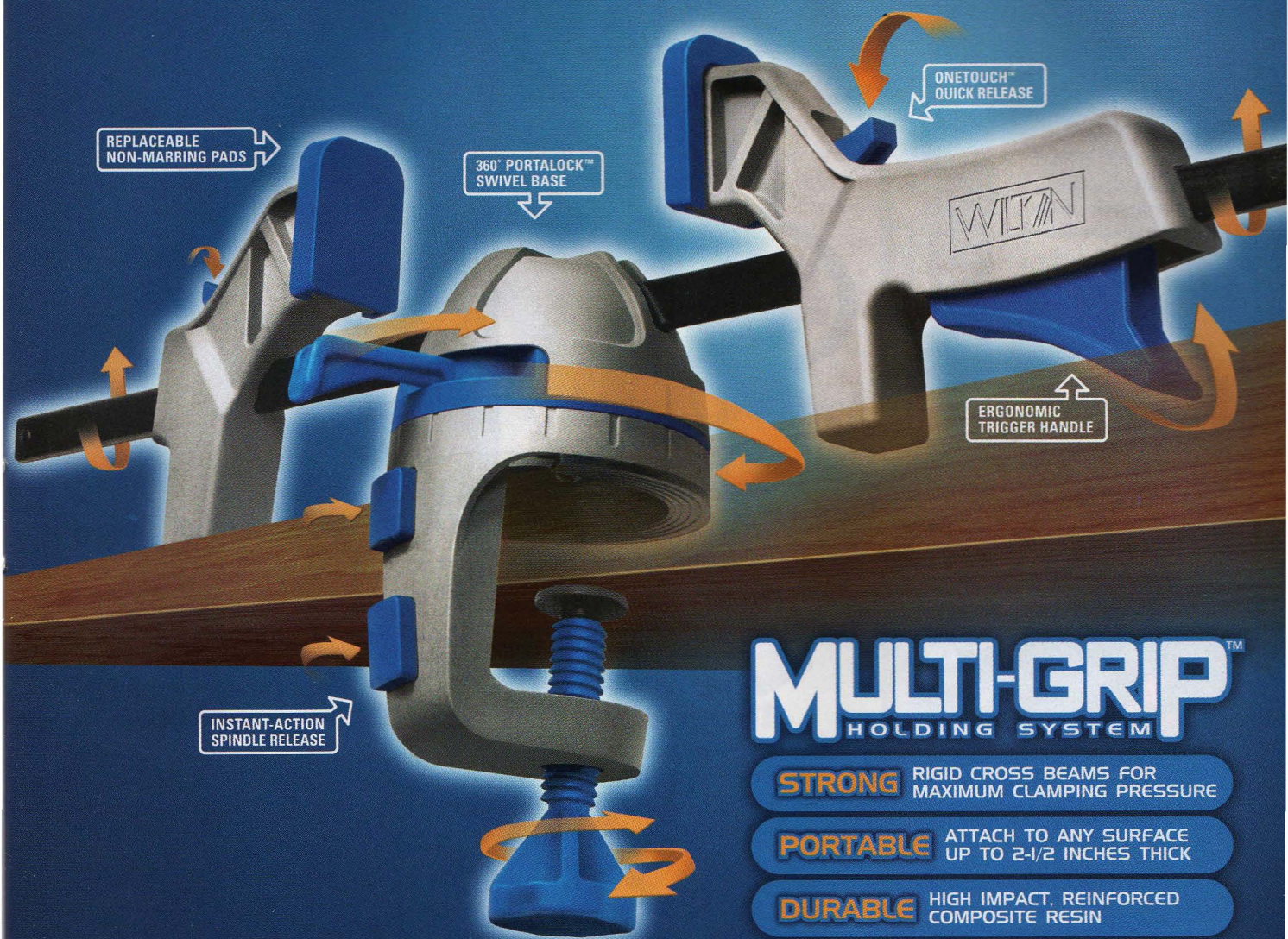


An encased knot is formed when a tree grows around a dead branch. It's surrounded by a dark ring of bark, and its center is often decayed. An encased knot is also called a "loose" knot, because the bark prevents the knot from tightly binding to the wood around it.



A spike knot is formed when a board is cut right through the length of a branch. A spike knot may be tight at its base (the intergrown portion) and loose at its end (the encased portion).

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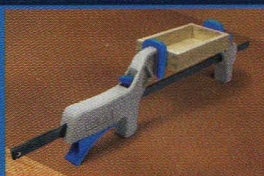
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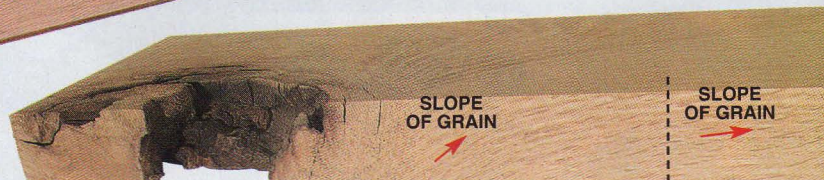
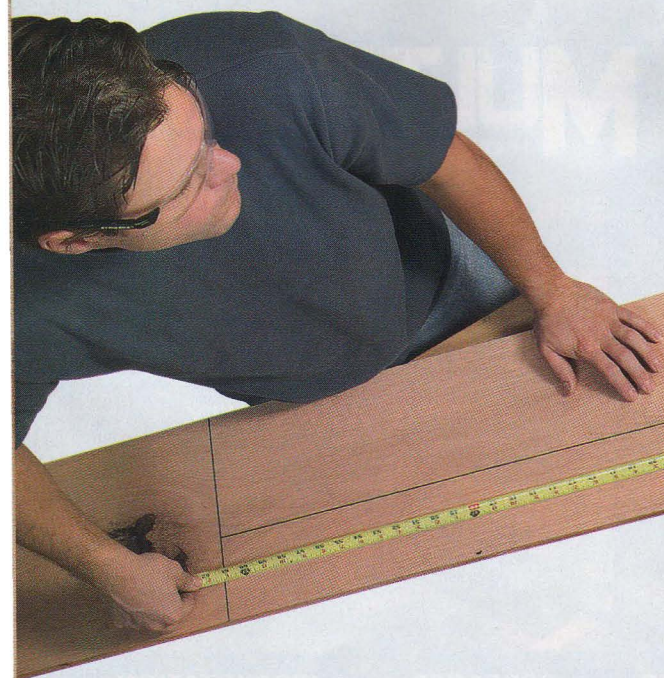
The Way Wood Works

SPIKE
KNOT

INTERGROWN
KNOT

Use knots for drama. Here's an opportunity to have fun with unusual patterns, as in this spalted-maple kitchen table. It has a comet-shaped pairing of a huge intergrown knot and a very long spike knot. Showing off the incredible swirling grain around a knot turns an inexpensive, lower grade board into a beautiful example of nature's art.

Resawing can be spectacular! A board with knots near an edge yields the most interesting mirror-image patterns, as shown in this piece of aromatic red cedar. Before you cut a board down its length on a bandsaw, hold the board on edge against a mirror. The outside of the board and its reflected image give you a pretty good idea of the book-matched pattern you'll get after resawing.



Keep your distance from knots when you're cutting them out. It's tempting to get the last inch out of every clear piece, but often it's not worth it. The wood fibers around a knot have a very steep slope. (Right next to the knot, they run almost vertically, the same direction as the branch grew on the tree.) Wood fibers with a steep slope are called "short grain." Short grain weakens the end of a board, making it unsuitable for rails and legs. Short grain may also cause the end to chip out when you joint or plane the board.

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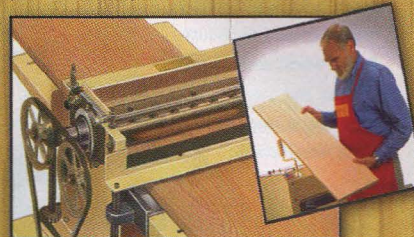
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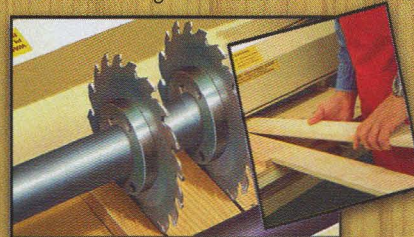
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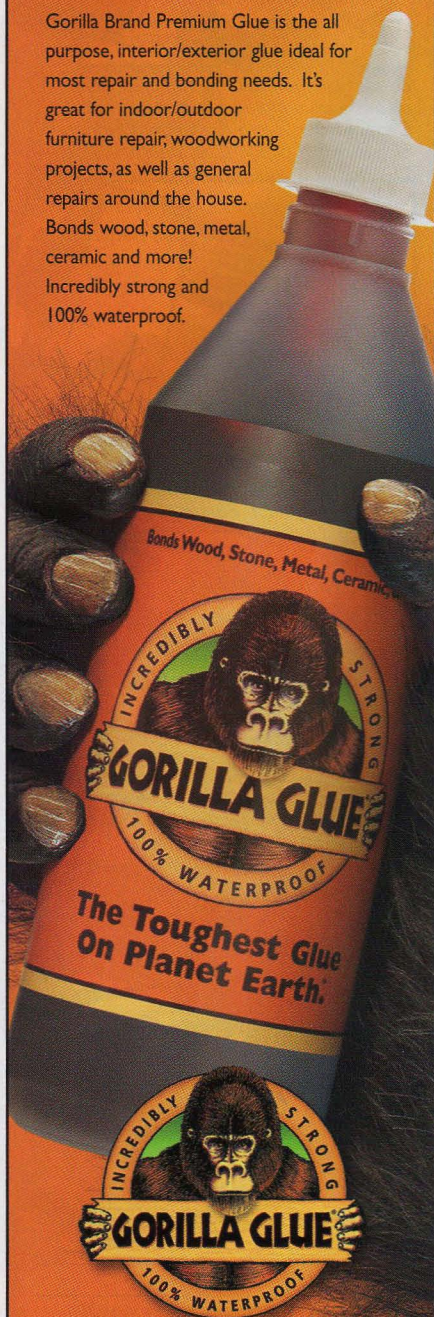
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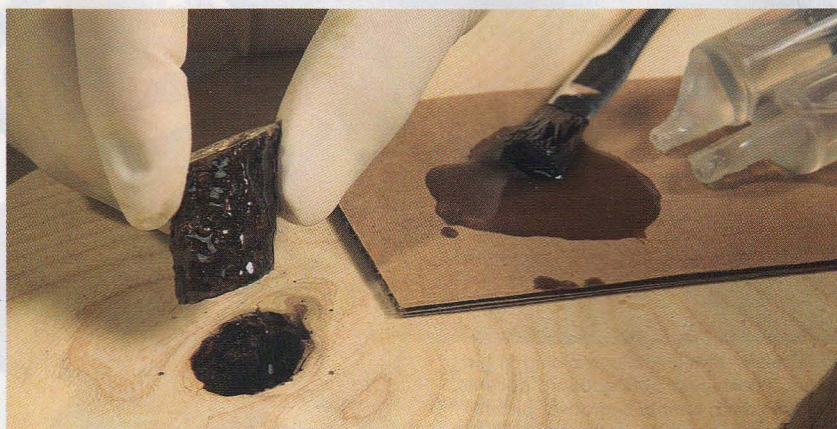
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The Way Wood Works

Pound out an encased knot before ripping a board on the tablesaw. If a saw blade were to catch this knot, it would launch it like a missile! The best tool to drive out a knot is a large dowel, rather than a slender metal punch. A punch can get stuck inside a decayed knot, but the wide end of a dowel pushes the whole knot through. Taper the dowel so its end is about the same diameter as the knot.



Glue a loose knot that you want to keep with 5-minute epoxy. Epoxy is the only type of glue that can span the gaps between the knot and the solid wood around it. Scrape off loose bark around the knot and inside the hole before gluing.



Sources

Woodworker's Supply
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Wizard Tint (concentrated dye), 2 oz., #913-567 medium walnut; #913-588 ebony, \$17 each.

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Fill voids around a knot with slow-set epoxy. Color the epoxy with a few drops of dark concentrated dye (see Sources, above). Slow-set is better than fast-set epoxy for this use. Slow-set epoxy takes a few hours to harden, so unsightly air bubbles have a chance to rise to the top and pop rather than get trapped inside. Mix the epoxy and dye very slowly to minimize the number of bubbles. Slightly overfill the hole and sand the hardened epoxy flush.

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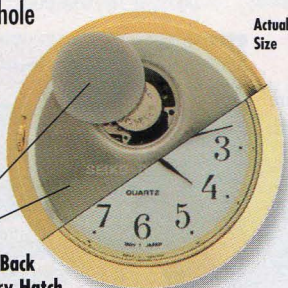
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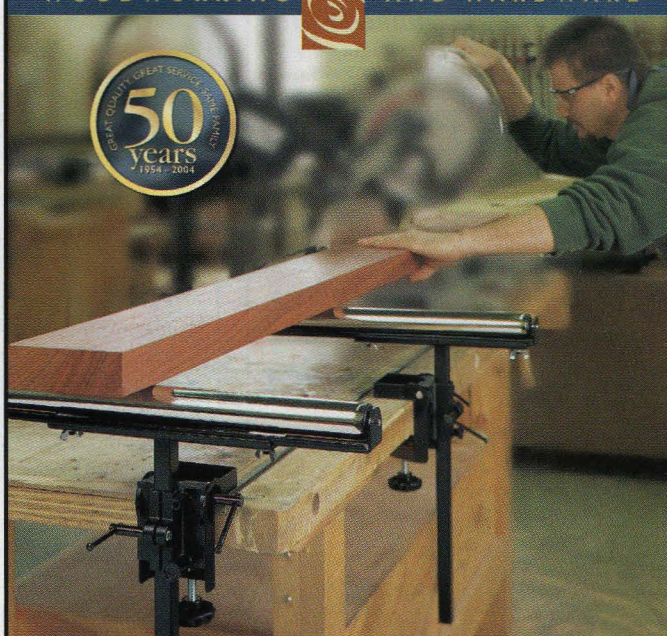


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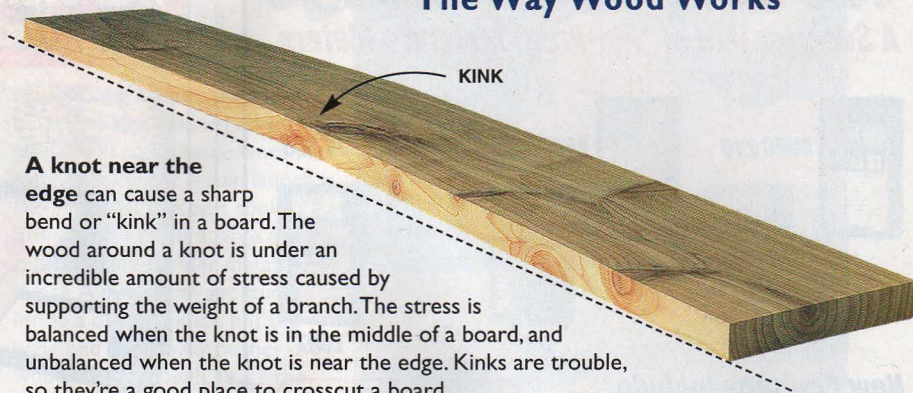
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The Way Wood Works



A knot near the edge can cause a sharp bend or "kink" in a board. The wood around a knot is under an incredible amount of stress caused by supporting the weight of a branch. The stress is balanced when the knot is in the middle of a board, and unbalanced when the knot is near the edge. Kinks are trouble, so they're a good place to crosscut a board.

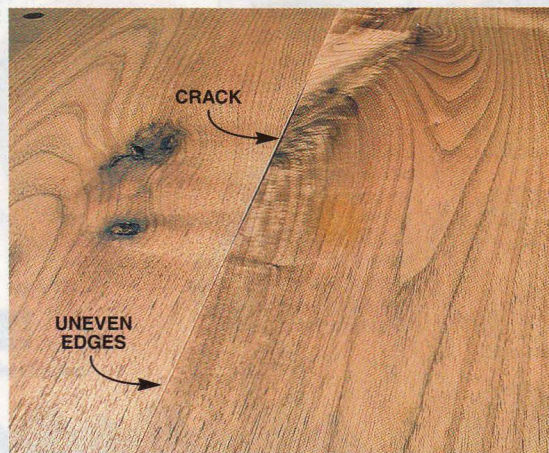


Avoid placing a knot in a slender piece. For example, a knot weakens this leg and may eventually cause it to kink. The small knot on this table's rail shouldn't cause any distortion problems, however. It's surrounded by a great deal of straight-grained wood. The knot can be hidden from sight by rounding over the edge.

A knot near a glue line may eventually cause the glue line to open up or the boards to become uneven. The extreme slope of the grain around a knot is the culprit. It causes the wood around a knot to expand and contract differently than the wood in the rest of a board.

Knots can be so beautiful that it would be a shame never to make a top like this, however. A little unevenness is perfectly acceptable in many fine antiques, after all!

Here's a tip for building a new piece: When you join boards in a top with knots near the edges, rout a 1/8-in.-deep V-groove down the center of all the glue joints. This will disguise any small cracks or unevenness that may crop up later.



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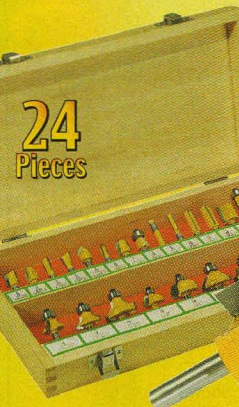
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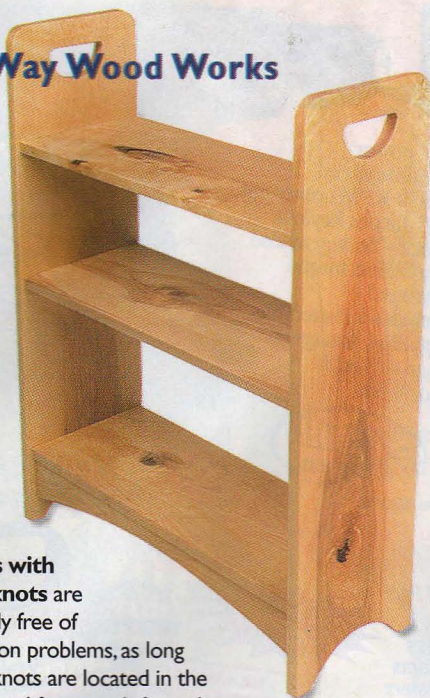
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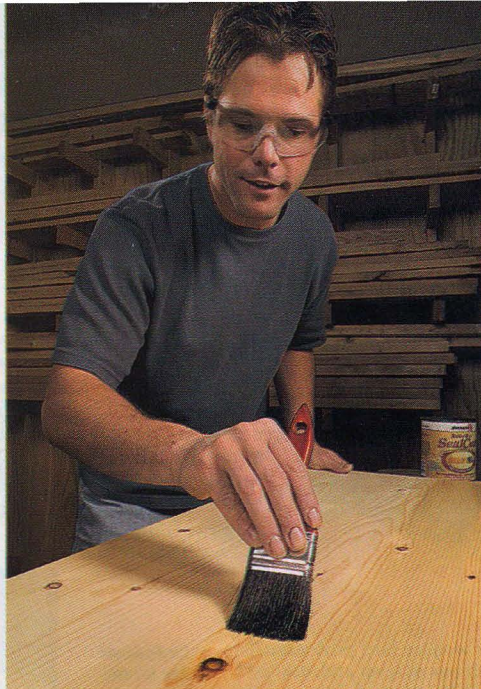
The Way Wood Works

Wide boards with large knots are generally free of distortion problems, as long as the knots are located in the middle and far enough from the ends. The stresses inside the wood around the knot are balanced, so the boards are unlikely to kink. The ends of the boards are plenty strong, and there are no uneven glue joints to worry about. Piles of 10- to 14-in.-wide lower grade wood often have beautiful knotty boards waiting to be discovered.



Seal knots with dewaxed shellac before applying a top coat. Brush on two coats of a two-pound cut. Without this seal coat, small bubbles may appear in your finish above the knots. The bubbles are called "bleed-through," and they're caused by oils in the knots reacting with the finish.

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Circle No. 178



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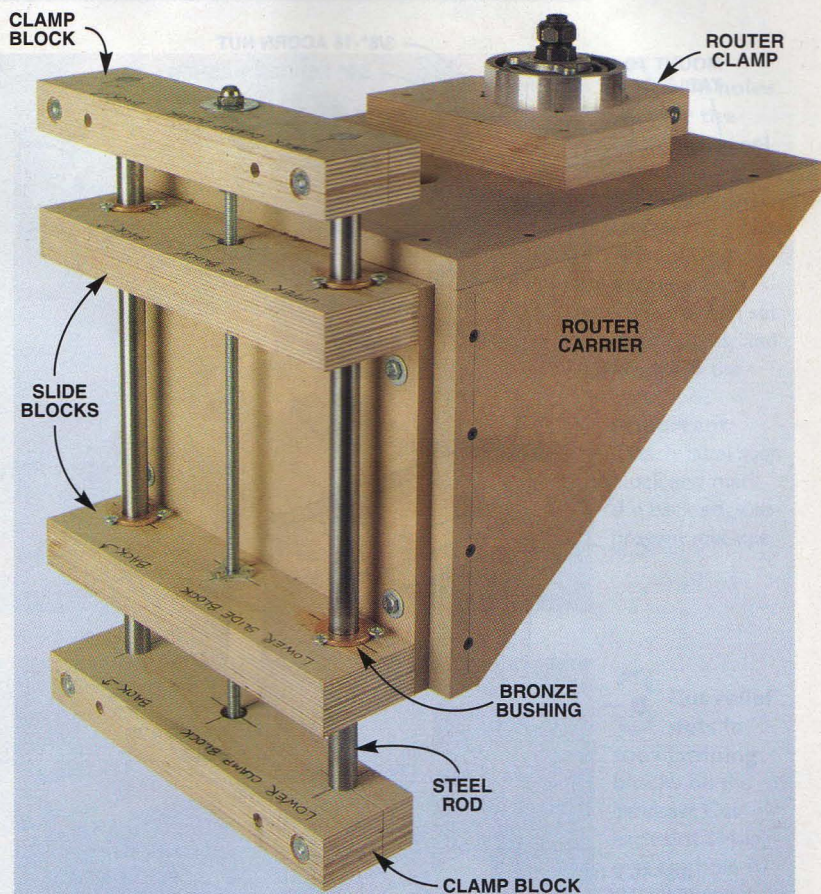
The AW Shop-Made Router Lift

Router lifts are hot items these days and for good reason. Veteran router table users love their ability to make super-fine micro adjustments or rapidly raise the bit right from the tabletop. No more fumbling under the table like a contortionist.

The only drawback is the price: \$200 to \$500. Ouch! That's why we were so thrilled when Richard Tendick walked into our offices with his idea for a shop-made router lift. Not only does Richard's lift offer above-the-table height adjustment (see "Benefits of the AW Router Lift," page 40) but it costs less than \$100. Plus, unlike the expensive commercial lifts, this lift allows you to change bits without cranking the router all the way up. It also features effective below-the-table dust collection. When combined with dust collection in the fence it results in near-perfect dust collection. This design also isolates the exhaust end of the router in the cavity. That leaves the router air intake sucking only clean, dust-free air. And, unlike all the other mechanical lifts on the market, Richard's lift hangs off the back of the router table, not on the top where the excess weight can lead to sagging.

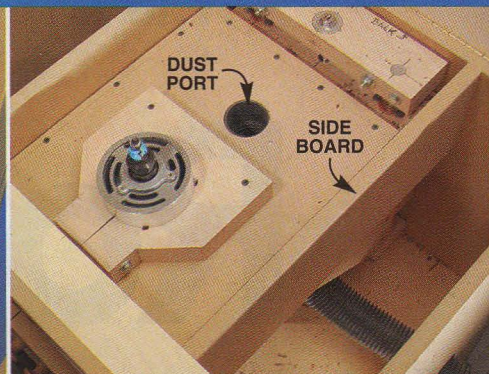
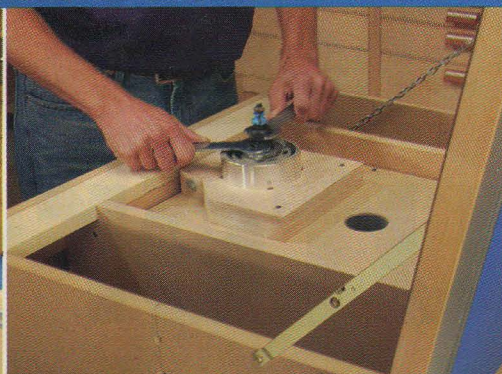
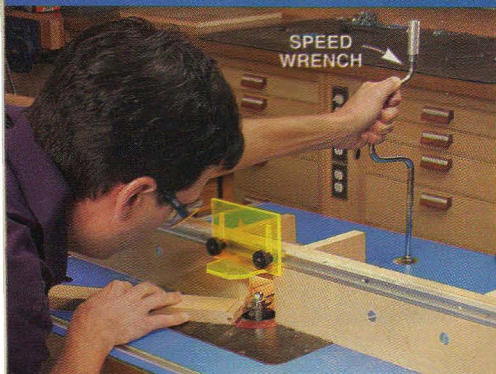
By Bruce Kieffer
& Richard Tendick

Features you can't buy at a price you won't believe



Our router lift consists of two components: the lift mechanism and the router carrier. The lift mechanism uses finely machined steel rods that slide through oil-impregnated bronze bushings set in upper and lower slide blocks. Upper and lower clamp blocks capture the ends of the steel rods and provide attachment points for securing the lift to the router table back. The router carrier attaches to the lift mechanism. A plywood router clamp holds the router motor in the carrier. Adjusting the height is as simple as turning the acorn nut on top of a threaded rod.

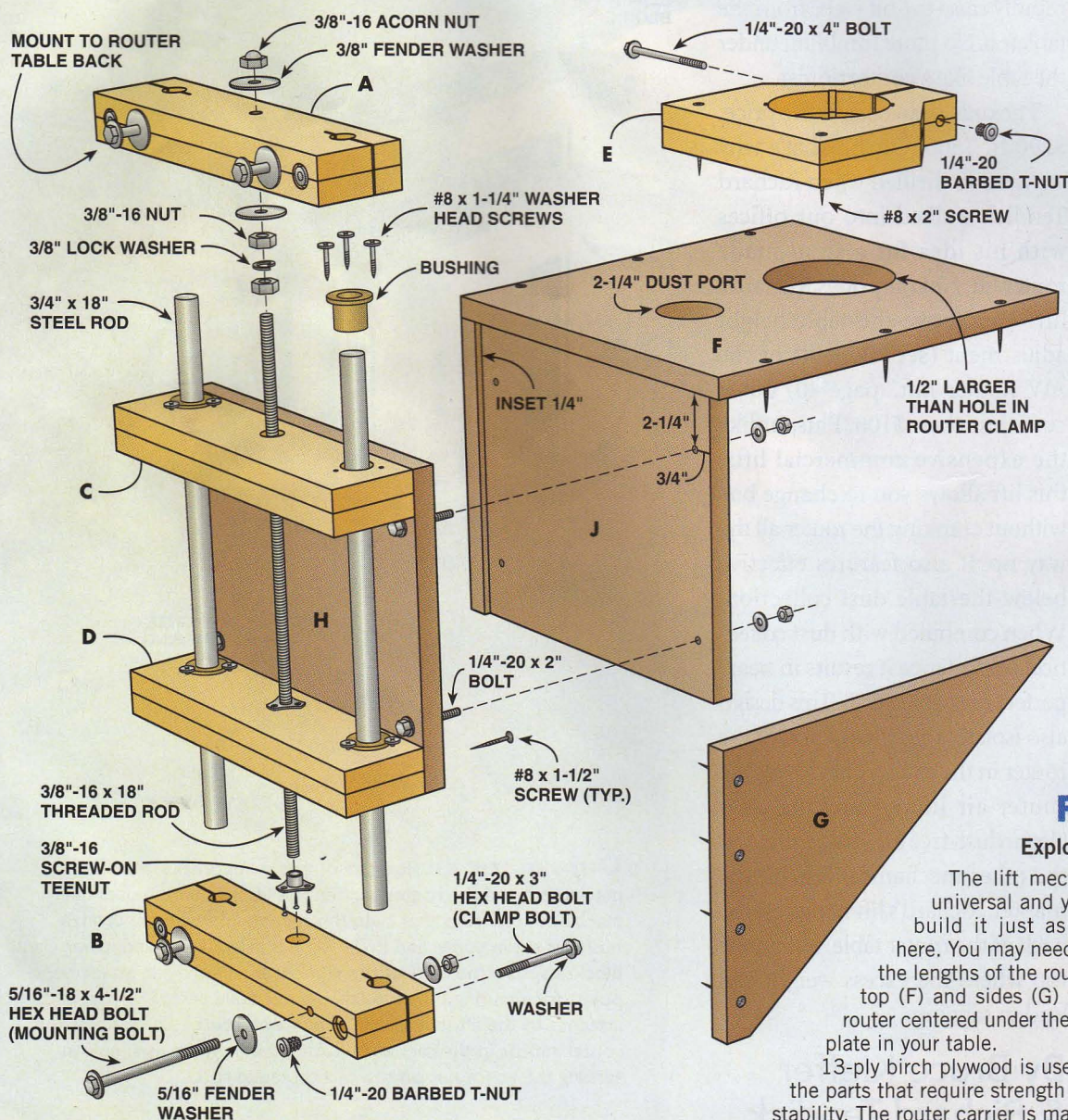
Benefits of the AW Router Lift



Bit height changes are quick and precise. A speed wrench allows you to raise the router bit to any height in seconds. For fine adjustments, a one-quarter turn of the wrench equals a mere 1/64-in. change in bit height.

Changing router bits is fast and easy. The lift is mounted to the cabinet, not the top. This allows you to hinge the top for easy access to the router. It makes bit changes a snap.

Router table dust collection that really works! Two side boards mounted alongside the lift create a cavity like an elevator shaft. Wood dust is captured in the cavity and vented out a dust port in the router carrier.



If you're groaning because this sounds like one of those tedious projects that require machinist-level tolerances, stop fretting. This project is really dirt simple. We'll show you a few simple tricks, like fine-tuning your drill press (see "Super-Tune Your Drill Press," page 42) that guarantee a smooth-running lift.

Will It Fit My Router Table?

If you already own a full-size router table don't sweat. A few simple modifications allow you to mount the AW lift into most commercial tables (see "Fitting the AW Lift to Your Router," page 45). We put our lift into our "AW Best Buy Router Table," featured in AW #99, March 2003, page 39. (See page 3 for information about ordering reprints.)

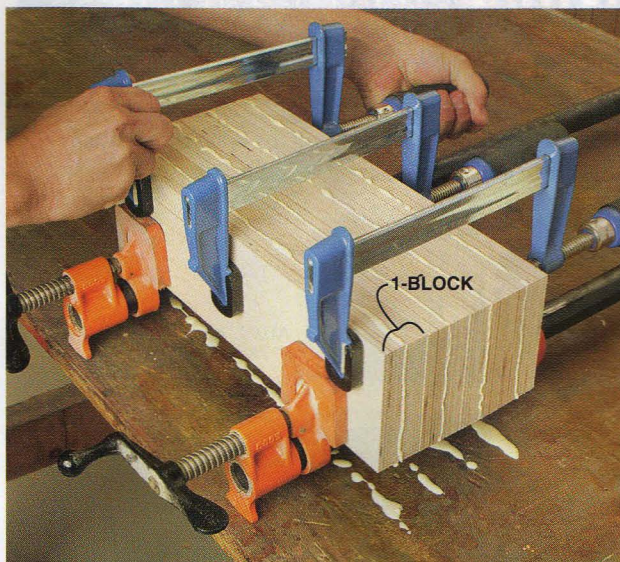
What You'll Need

This project requires some specialized hardware unfamiliar to most woodworkers, like bronze bearings and steel rod. We recommend you buy your lifter parts from the mail order sources we used (see Sources, page 46). We know all of these parts work in harmony with each other. Plus, our source for the steel rods will cut them to length for no charge and that'll save you a lot of work.

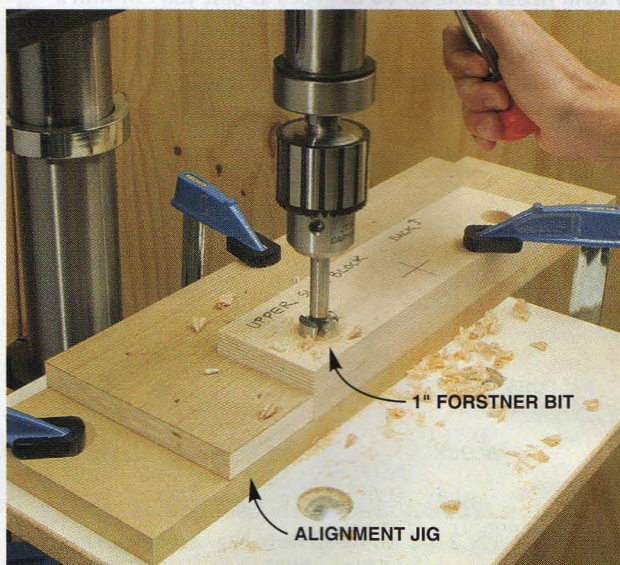
Besides the hardware, you'll need a tablesaw, bandsaw, drill press, heavy-duty circle cutter, and 3/4- and 1-in. Forstner bits.

Build the Lift Mechanism

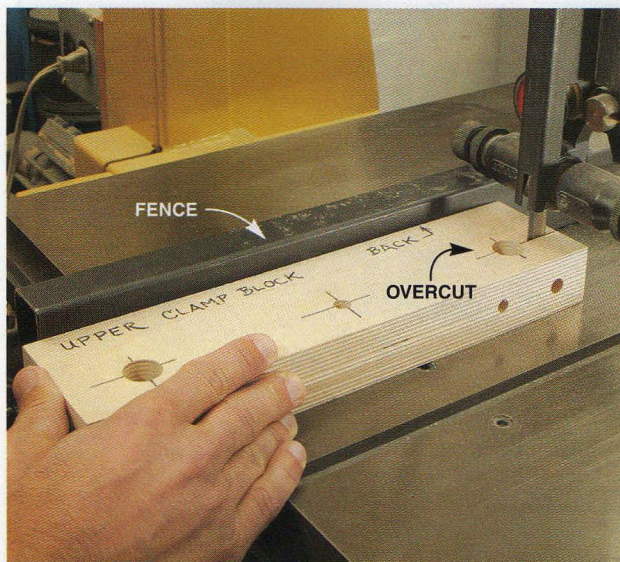
1. Cut and assemble the slide and clamp-block blanks (A-D) (Photo 1).
2. Lay out the holes on the clamp and slide blocks as shown in Figs. B through E, page 47. Be sure to mark the back edge of each blank.
3. Make a jig to register the clamp and slide blocks on the drill press (Photo 2). The jig is simply a board onto which pieces of wood are nailed to form a cradle around the plywood blanks. This guarantees perfect hole alignment from block to block, which is critical to the smooth operation of the lift mechanism.
4. With the jig and a blank in place, set the table height on your drill press low enough to allow the longest bit to be taken in and out without moving the table.



1 Build the slide and clamp blocks by gluing up plywood blanks in pairs. Keep the edges as flush as possible. Trim to finish size after the glue dries.



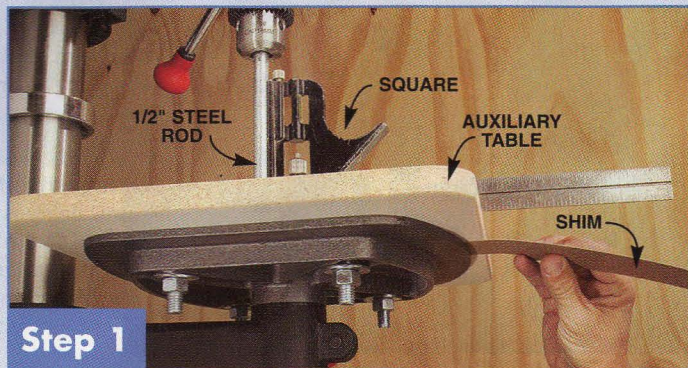
2 Drill holes for the bushings, steel rods and threaded rod on the drill press. A simple jig registers each blank so each set of holes is drilled in exactly the same spot. **Important:** Clearly label each block and mark the back edge to prevent mix-ups.



3 Cut relief slots in the clamping blocks on the bandsaw. Cut each slot 1/4-in. past the hole so the clamping blocks can squeeze tightly on the steel rods.

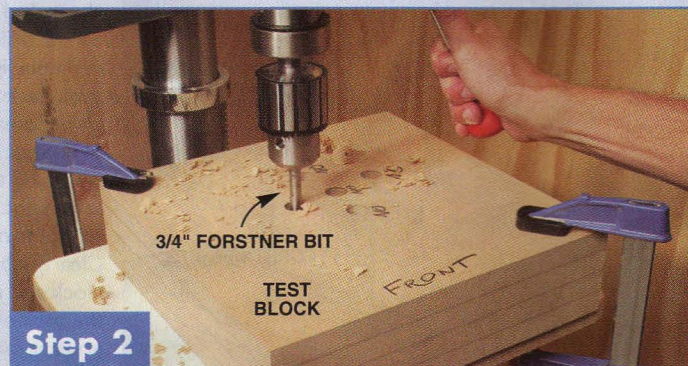
Super-Tune Your Drill Press

Before you start building, make sure your drill press will drill holes that are perfectly perpendicular. That's the key to a smooth operating lift mechanism. We found that just checking the table with a square is not enough. Here's how to super-tune your drill press:



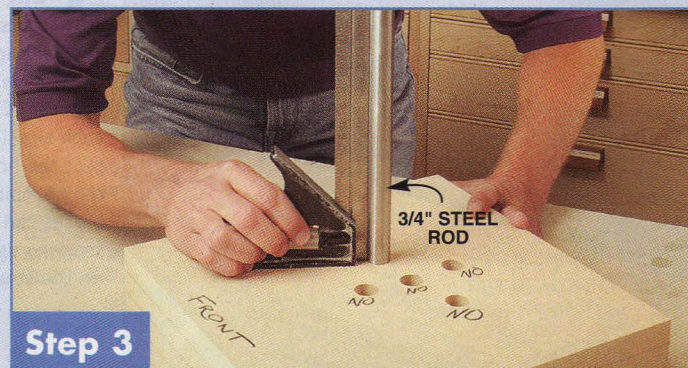
Step 1

Adjust your drill press table to 90 degrees as best you can with a square and a 1/2-in. steel rod chucked into the drill press. All drill press tables can be adjusted side-to-side but few can be adjusted front-to-back. Chances are your table is slightly off. Make adjustments by inserting paper shims between the drill press table and an auxiliary table.



Step 2

Drill a 3/4-in.-diameter x 2-1/2 in.-deep hole in a test block. The test block is just a four-piece stack of 3/4-in. MDF glued together. Label the front of the test block for reference so you know where to shim your table if necessary.



Step 3

Check the drilled hole for square using one of the 3/4-in.-diameter steel rods for the lift mechanism. Check all around on the rod to compensate for any error in the square. Label the bad holes and keep shimming the table until you get a drilled hole that's perfectly perpendicular.

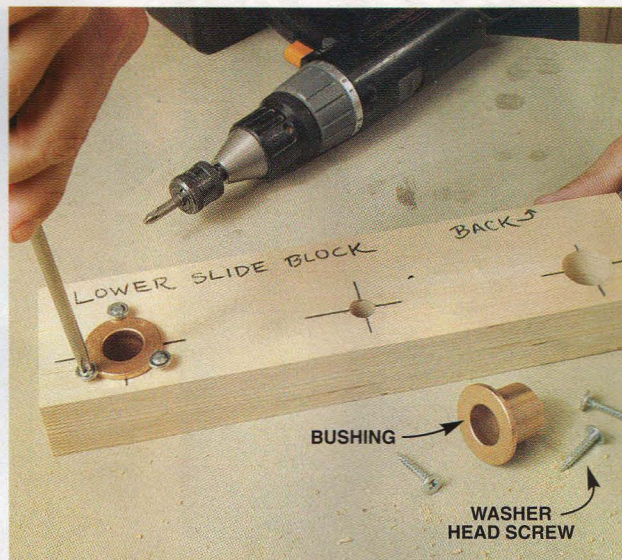
5. Clamp the upper slide block in the drilling jig. Insert a 1-in. Forstner bit in the drill press and align its point with a bushing hole center point. Clamp the drilling jig to the drill press table and drill this hole. *Don't move the drilling jig!* Pull the upper slide block out of the jig, clean the jig if necessary, and insert the lower slide block, clamp and drill.
6. Switch to a 3/4-in.-diameter Forstner bit and drill the clamp holes in the upper and lower clamp blocks.
7. Now position the drilling jig to drill the opposite side holes following the same drilling sequence. Don't be tempted to just flip the blanks over to drill the second set of outside holes. Any error in the perpendicularity of the holes will get magnified.
8. Move the drilling jig and drill the center holes for the threaded rod and the screw on teenuts.
9. Lay out and drill the counterbore holes (Figs. B and E) for the barbed T-nuts on the upper and lower clamp blocks.
10. Drill the through-holes for the clamp bolts and mounting bolts.
11. Saw relief slots in the clamp blocks (Photo 3).
12. Hammer the barbed T-nuts into the clamping hole recesses.
13. Mount the bronze bushings in the upper and lower slide blocks with washer head screws (Photo 4). Washer heads are screws with a built-in flat washer under the head. The edge of the washer head catches the flange of the bushing. Tip: A self-centering bit held next to the bushing flange provides the perfect setback.
14. Attach the top screw-on teenut to the lower slide block and run the threaded rod through.
15. Attach the bottom teenut (Photo 5). The double teenut system eliminates backlash (that annoying free-spin you get when changing direction on the lift mechanism) because the threads of the rod are always in tight contact with the threads of the screw-on teenuts.
16. Remove the threaded rod.
17. Cut the lift and carrier back plates (H and J) to size. Clamp these two pieces flush together and drill the four 1/4-in.-

diameter holes through them for joining the router carrier to the lift mechanism (Fig. A).

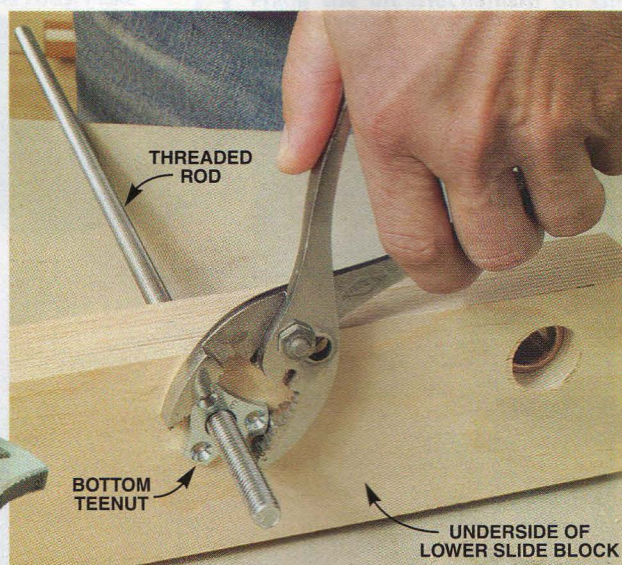
18. Drill four countersunk pilot holes near the bottom edge of the lift back plate for mounting the lower slide block. Make sure the pilot holes are positioned so the screws won't run into the bushings or threaded rod.
19. Glue the upper slide block to the lift back plate (Photo 6).
20. Grind or file a slight chamfer on the ends of the 3/4-in.-diameter steel rods. Smooth away any remaining burrs using a fine emery cloth.
21. Clamp (no glue) the lower slide block to the bottom edge of the lift back plate. Insert the steel rods through the bushings. Adjust the position of the lower slide block so both steel rods slide smoothly through the bushings (Photo 7), and attach with screws.
22. Attach the acorn nut to the top of the threaded rod (Photo 8).
23. Attach the threaded rod to the upper clamp block (Fig. A and Photo 9).
24. Slide the threaded rod with the upper clamp block attached through the hole in the upper slide block and into the screw-on teenuts mounted in the lower slide block.
25. Slide the steel rods up through the holes in the upper clamp block and tighten the clamping bolts (Photo 10).
26. Slide the lower clamp block over the steel rods and clamp it in place. The lift mechanism is now complete.

Installing the Lift

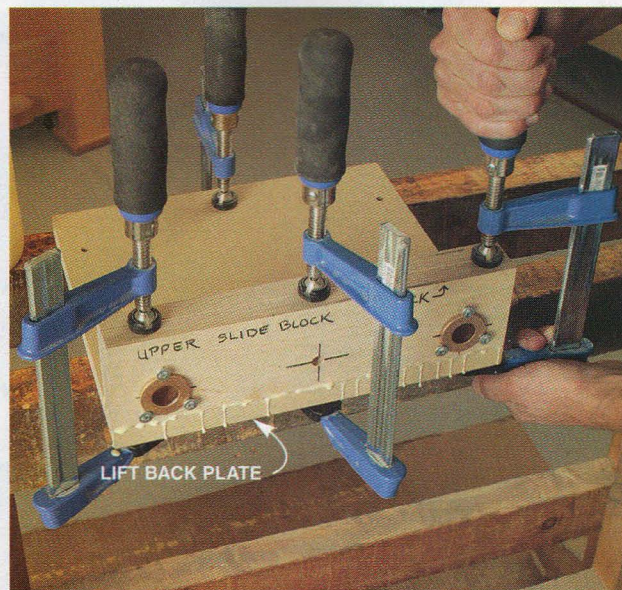
27. Alter your router table to accept the lift mechanism. Most tables will only require a 3/4-in. back added to the cabinet (see "Fitting the AW Lift to Your Router Table," page 45).
28. Locate the mounting bolt holes in the back of the cabinet by clamping the lift about 3/4 in. down from the top edge of the back.
29. Use the mounting holes in the clamp



4 Screw in three washer head screws around each bushing. Place these screws about 1/16 in. away from the bushing edges. Don't over tighten; you want the bushings to turn freely in their holes.

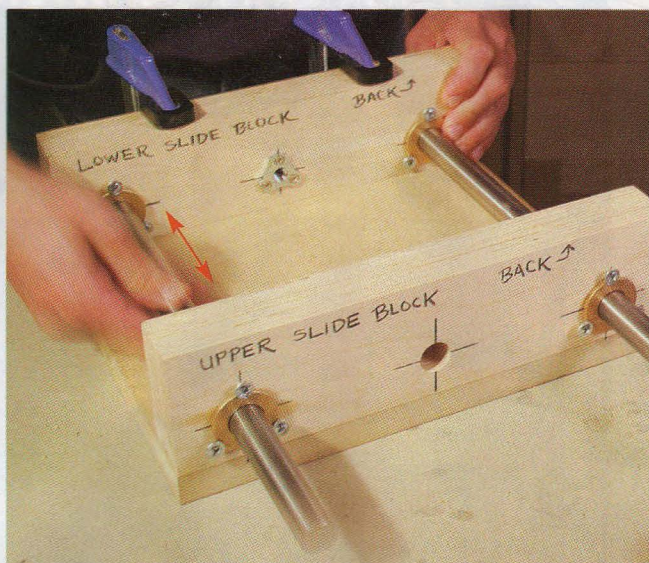


5 Attach the threaded rod to the lower slide block with a pair of teenuts, one on either side. Screw one teenut on the top of the block. File the prongs off the bottom teenut so it can spin freely in the hole, then tighten it until the threaded rod turns with just a bit of resistance. Insert the mounting screws and remove the rod.



6 Glue the upper slide block to the lift back plate. Make sure the side and top edges are flush with each other.

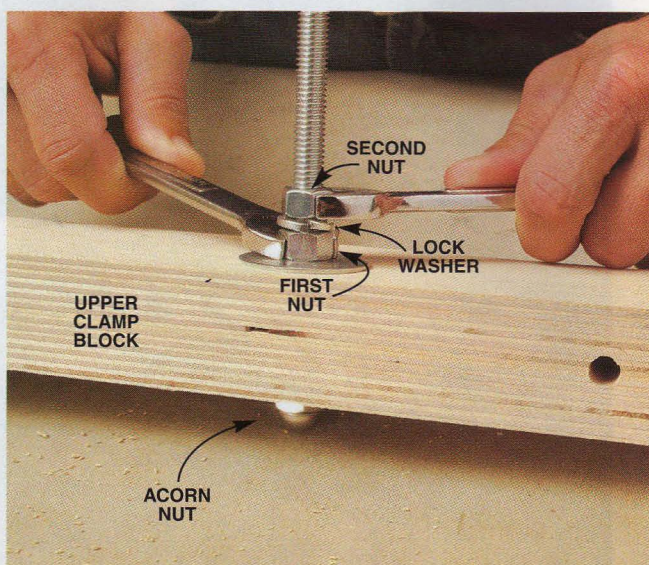
7 Clamp the lower slide block in place and check its alignment. The steel rods should slide smoothly. If they bind, give the lower slide block a tap with a mallet to the left or right until the rods move freely. Then secure the lower slide block with screws.



8 Lock an acorn nut onto the top of the threaded rod. Really jam it on! You want the nut locked on the rod so it can be turned in both directions without coming undone. Clamp the locking pliers close to the nut so any damaged threads get buried in the upper clamp block.



9 Attach the threaded rod to the upper clamp block by locking two nuts together. Fingertighten the first nut against the block so the rod turns with just a slight amount of resistance. Then add a lock washer and tighten the second nut against the first.



blocks as guides to drill through the back panel.

30. Insert the mounting bolts through the back and mount the lift mechanism (Photo 11).

Build the Router Carrier

31. Glue up and cut the router clamp blank (E). Then lay out the pattern for the router clamp (Fig. F).

32. Cut the hole for the router (Photo 12). You'll need some scrap to make test holes until you get a snug fit.

33. Cut off the side waste pieces, then lay out and drill the countersunk hole for the T-nut and the through-hole for the clamp bolt. Secure the router clamp in a vise for easier drilling.

34. Cut the router clamp relief slot on the bandsaw. Some routers have locating pins on their sides that require notches (Photo 14) to be cut inside the opening. This can also be done with the bandsaw.

35. Assemble the router carrier (F, G and J, Fig. A). Don't use glue for the carrier top (F). Be sure to keep a 1/4-in. inset on the carrier back. This creates the lip to hang the carrier onto the lift mechanism.

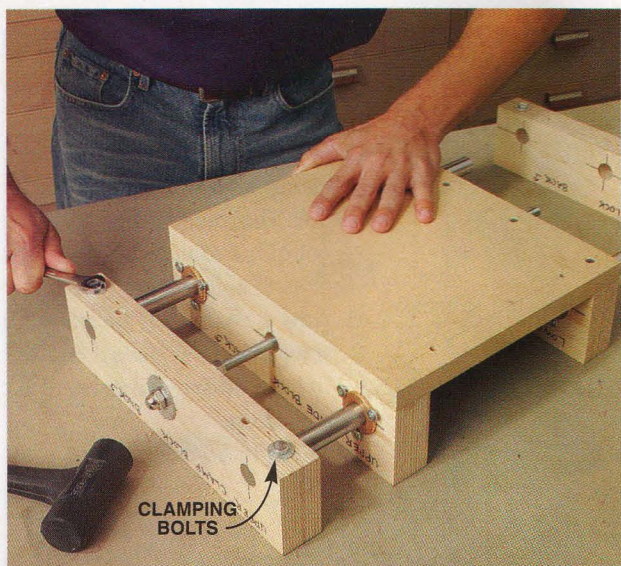
36. To locate the hole in the router carrier top, temporarily mount the carrier on the lift with a couple of bolts. Close the router tabletop and crank the lift all the way up. Scribe the bit opening in the tabletop onto the carrier top.

37. Remove the router carrier from the lift. Remove the carrier top and router clamp.

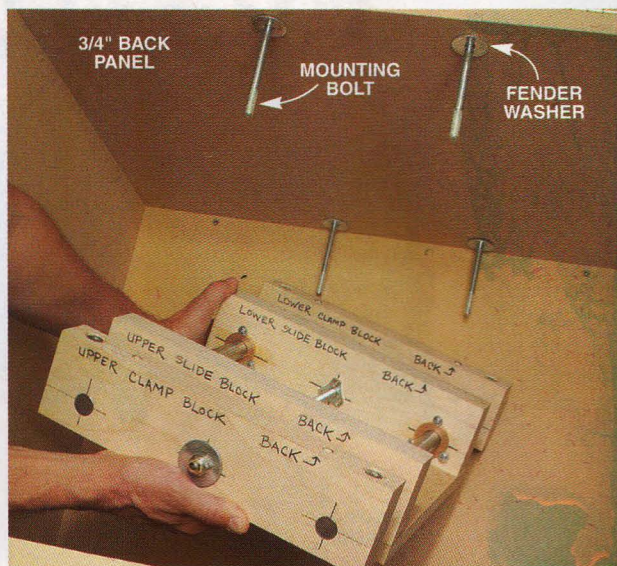
38. Drill a hole in the router carrier top using the bit opening as a center point. Make the hole 1/2-in. larger than the hole you drilled in the router clamp.

39. Adjust the circle cutter and cut the hole for the vacuum hose.

40. Reattach the carrier top. Set the router with the clamp attached in the hole. Close the top and center the router in the opening. Open the top and screw down the router clamp.



10 Tighten the clamp blocks on the steel rods. Make sure the tops of the rods are flush with the surface of the clamp block.

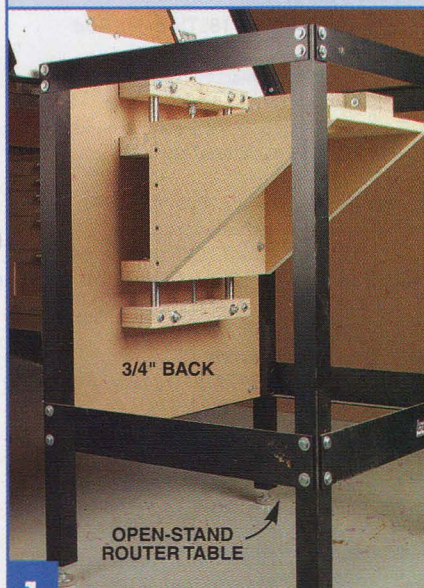


11 Hang the lift mechanism on the cabinet back. Washers keep the moving parts of the lift clear of the back. Note: The cabinet back must be 3/4-in. thick to support the lift.

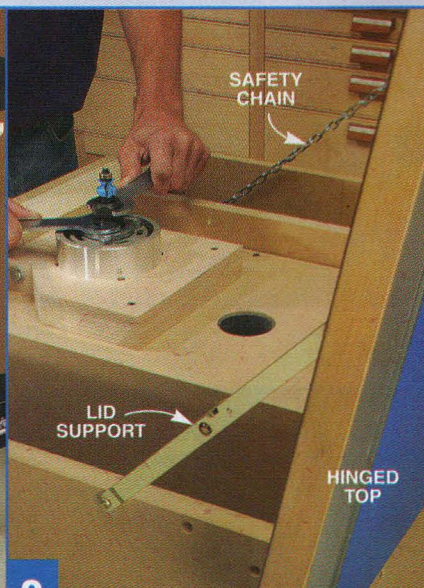
Fitting the **AW Lift** to Your Router Table

Our router lift will fit any router table, whether it's an enclosed cabinet or an open stand. No matter what style cabinet you have, you'll want to make these alterations: **1.** Add a stiff back (Photo 1). **2.** Hinge the top to the back (Photo 2). **3.** Add a lock-

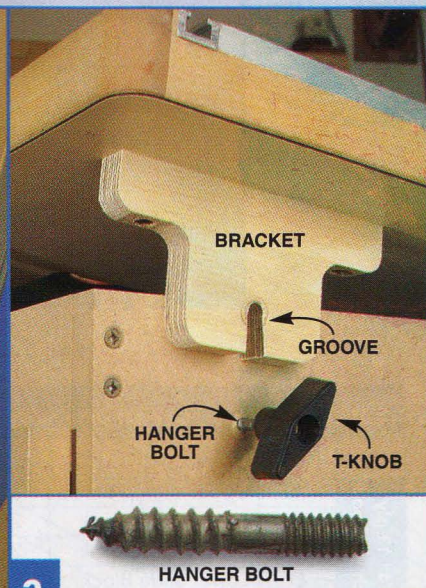
down bracket on both sides of the top. These brackets hold down the top and stop it from racking side-to-side (Photo 3). **4.** Drill a 1-1/4-in.-diameter access hole through the tabletop so you can get at the height adjusting acorn nut.



1 A stiff back is a must for mounting the router lift. No matter what style router table you own—open-stand or cabinet—you'll need to have a 3/4-in.-thick back.

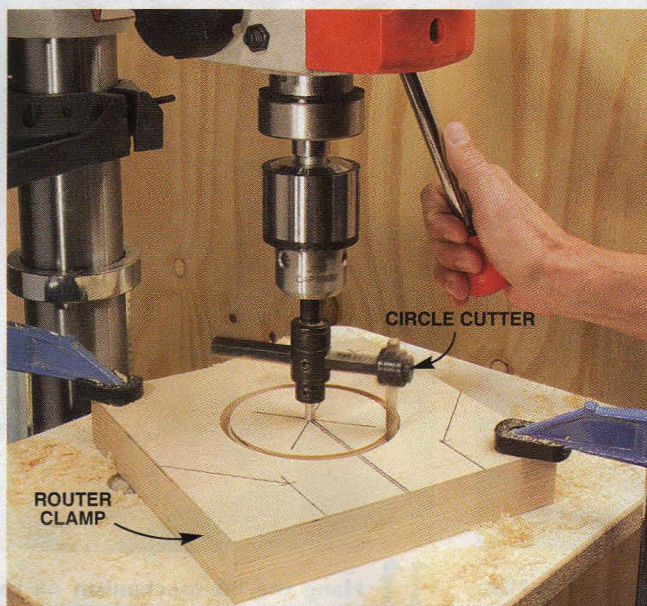


2 Add a continuous hinge and a lid support to the top. The lid support prevents the top from closing accidentally. The safety chain prevents the heavy top from opening too hard and stressing the hinges or lid support.

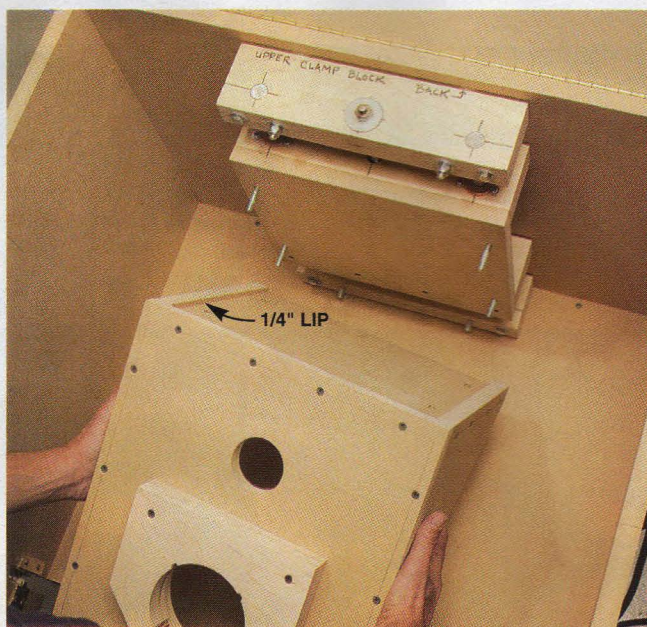


3 Secure the hinged top with a pair of locking brackets. Screw in hanger bolts centered in the bracket grooves, and lock down the top with plastic T-knobs.

12 To make the carrier for your router, drill the hole in the router clamp using a heavy-duty circle cutter. Make test cuts to ensure a snug fit on the router motor body.



13 Bolt the router carrier to the lift mechanism. The lip around the back edge of the router carrier makes it very easy to align the two components.



41. Remount the router carrier to the lift mechanism using bolts (Photo 13).
42. Mount your router in the router clamp and tighten the clamp bolt. The router should protrude out of the router clamp an inch or so (Photo 14).
43. Add a couple of 6-in.-wide sidepieces to enclose the router lift for more effective dust collection.
44. That's it! You're ready to rout!
AW

Sources

Home Depot
 One 3/4" x 24" x 48" MDF
 Four 5/16"-18 x 4-1/2" Hex Head Machine Bolts, Fender Washers, Washers and Lock Nuts
 Four 1/4"-20 x 3" Hex Head Machine Bolts and Washers
 Two 3/8" Fender Washers
 One 3/8"-16 Acorn Nut and Lock Washer
 Two 3/8"-16 Hex Nuts
 Four 1/4"-20 x 2" Hex Head Machine Bolts, Lock Nuts and Washers
 One 1/4"-20 x 4" Hex Head Machine Bolt and Washer
 One 3/8"-16 x 18" Threaded Rod

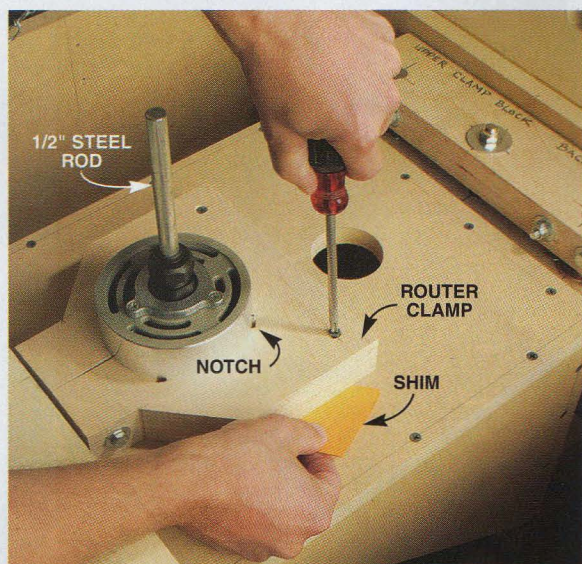
Metal Supermarkets, (651) 643-0600,
www.metalsupermarkets.com
 Two 3/4" dia. x 18" round ground shafting 1045, \$4 each, total cost, \$8.

Gopher Bearing, (800) 422-0940,
www.gopherbearing.com
 Four 3/4" ID x 1" OD bronze "Oilite" bushings, #FF1011-4, \$4 each, total cost, \$16.

Rockler, (800) 279-4441,
www.rockler.com
 One 3/4" x 24" x 30" Finnish Birch, 13-ply Plywood, #63453, \$29
 1" Forstner Drill Bit, #21200, \$13
 3/4" Forstner Drill Bit, #21186, \$11
 Heavy-Duty Circle Cutter, #42887, \$30
 Five 1/4"-20 Barbed T-Nuts, #32034, \$3 for 8-pack
 Two 3/8"-16 Screw-On Teenuts, #68387, \$7 for 10 pack
 Two 1/4"-20 x 1-1/2" Hanger Bolts, #24406, \$2 for 8-pack
 Two 1/4"-20 x 2" Plastic T-Knobs, #71506, \$1 each, total cost \$2
 Twelve #8 x 1-1/4" Washer Head Face Frame Screws, #38528, \$4 for 100-pack.

Cutting List Overall Dimension 13-1/2"W x 18"T x 18-1/2"D

	Part	Name	Qty.	Dimensions	Notes
3/4" 13 ply Birch Plywood	A	Upper Clamp Block	2	3" x 12"	Cut 1/4" oversize; face glue to form one, 1-1/2" thick block; trim to finish size
	B	Lower Clamp lock	2	3" x 12"	
	C	Upper Slide Block	2	3" x 12"	
	D	Lower Slide Block	2	3" x 12"	
	E	Router Clamp	2	8" x 8"	
3/4" MDF	F	Carrier Top	1	13-1/2" x 15"	Length determined by your setup
	G	Carrier Sides	2	10-1/2" x 15"	
	H	Lift Back Plate	1	10-1/2" x 12"	
	J	Carrier Back Plate	1	10-1/2" x 12"	



14 Mount the router in the clamp. Chuck the 1/2-in.-diameter steel rod in the router and check that it's square to the table. If you find the router is not perfectly perpendicular to the table, shim the router clamp. Note the notches cut in the clamp to accommodate pins on the motor housing.

Fig. F Router Clamp

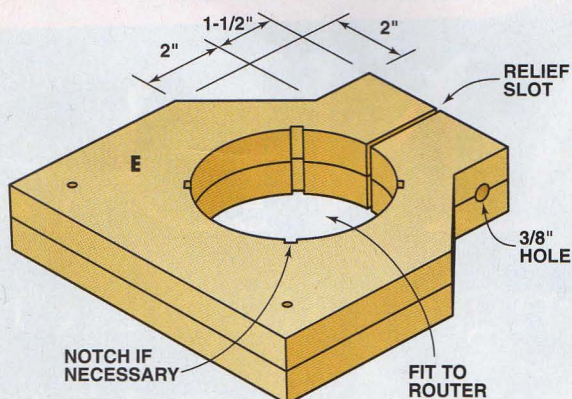


Fig. B Upper Clamp Block

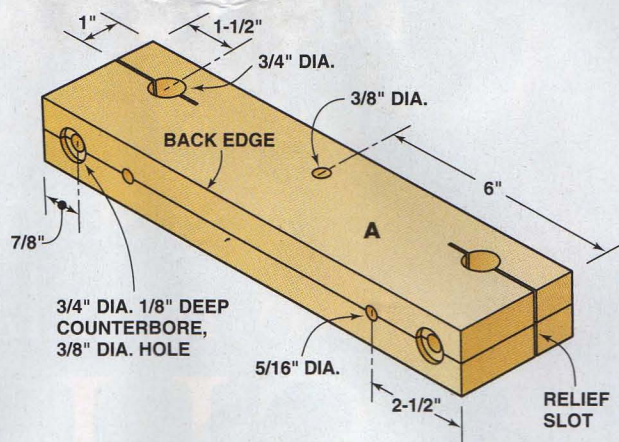


Fig. C Upper Slide Block

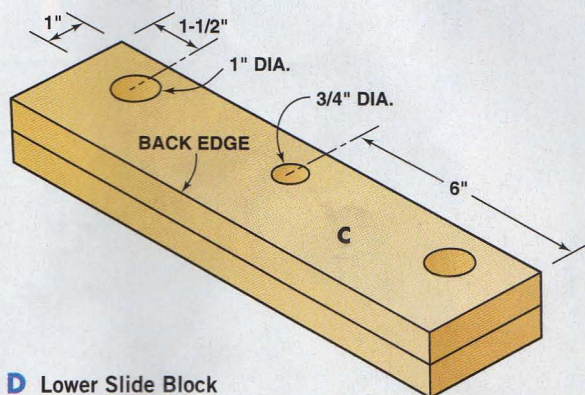


Fig. D Lower Slide Block

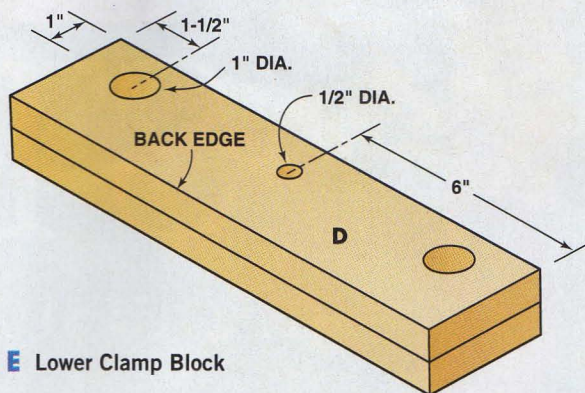
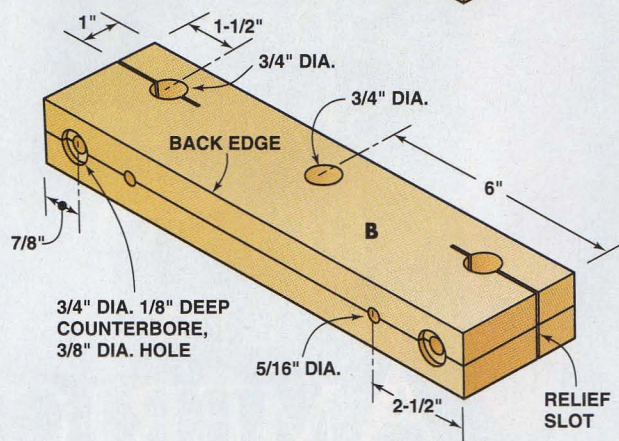
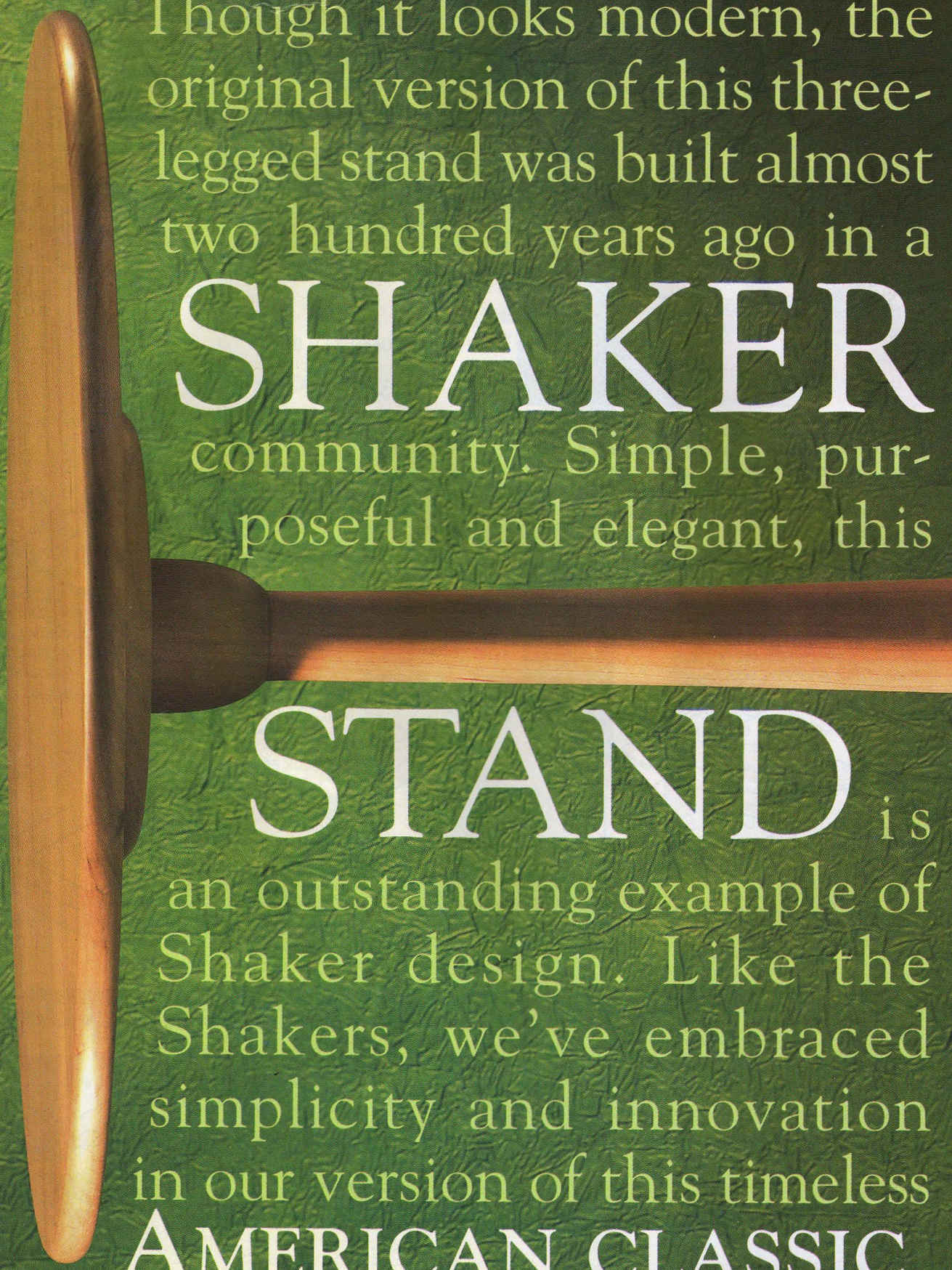


Fig. E Lower Clamp Block



The Building Plans for the "AW Best Buy Router Table" featured in this story can be found in AW #99, March 2003, page 39. Please refer to the box on page 3 of this issue for information about ordering back issues or copies of past articles.



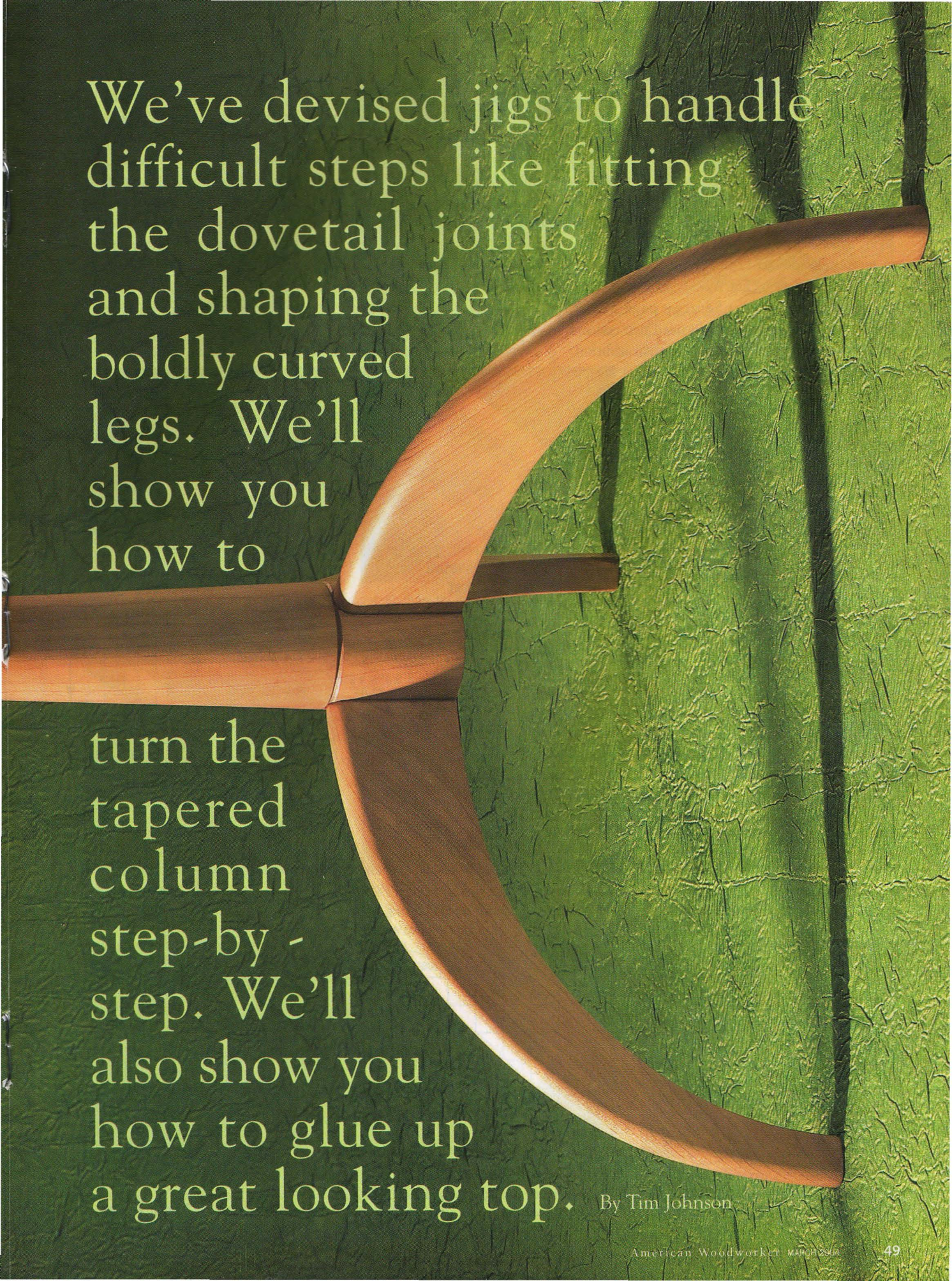
Though it looks modern, the original version of this three-legged stand was built almost two hundred years ago in a

SHAKER

community. Simple, purposeful and elegant, this

STAND is

an outstanding example of Shaker design. Like the Shakers, we've embraced simplicity and innovation in our version of this timeless **AMERICAN CLASSIC.**



We've devised jigs to handle difficult steps like fitting the dovetail joints and shaping the boldly curved legs. We'll show you how to

turn the tapered column step-by-step. We'll also show you how to glue up a great looking top. By Tim Johnson

Tools and Materials

You'll need turning tools and a lathe with 20-in. spindle capacity for this project. You'll also need a tablesaw, a jigsaw or bandsaw, a router, a router table and a pair of tin snips. A jointer and planer are recommended, but not essential (you can have your stock milled to thickness at the lumberyard). Also necessary are a pair of round-over bits, a pair of straight bits, a 1/2-in. dovetail bit with a long shank, a flush-trim bit with a top-mounted bearing, a 1-1/4-in. template guide and a 1-in. Forstner bit (see Sources, page 57).

Make the column (Fig. A, Part A, below) from a 2-1/4-in. turning square (see Sources, page 57) or by laminating 3/4-in. stock. You'll need two column blanks (one is for practice and setup). In addition, you'll need about 10 bd. ft. of 4/4 cherry for the top (B), subtop (C) and legs (D). We spent \$105 for our lumber, including the turning squares.

Prepare the Column Blank

You don't have to be an expert to turn the column. The curves are gradual, there are only a couple of abrupt transitions, and only one of the diameters is critical (see Oops!, page 52). Practice your technique on the extra blank. (You'll use it later to set up the dovetail jig.)

First, make the square blank round (Photo 1). Hold the roughing gouge firmly on the tool rest and gently engage the spinning blank, slightly above its center axis. Then slide the gouge along the tool rest. Repeat the motion, making slightly deeper cuts with each pass. You'll feel and hear the difference when the blank becomes round. Turn the last 3 in. of both ends to 2-in.-diameter cylinders (Photo 2).

Use the column template (Fig. A, Detail 2, below) to make a story stick. The story stick allows you to

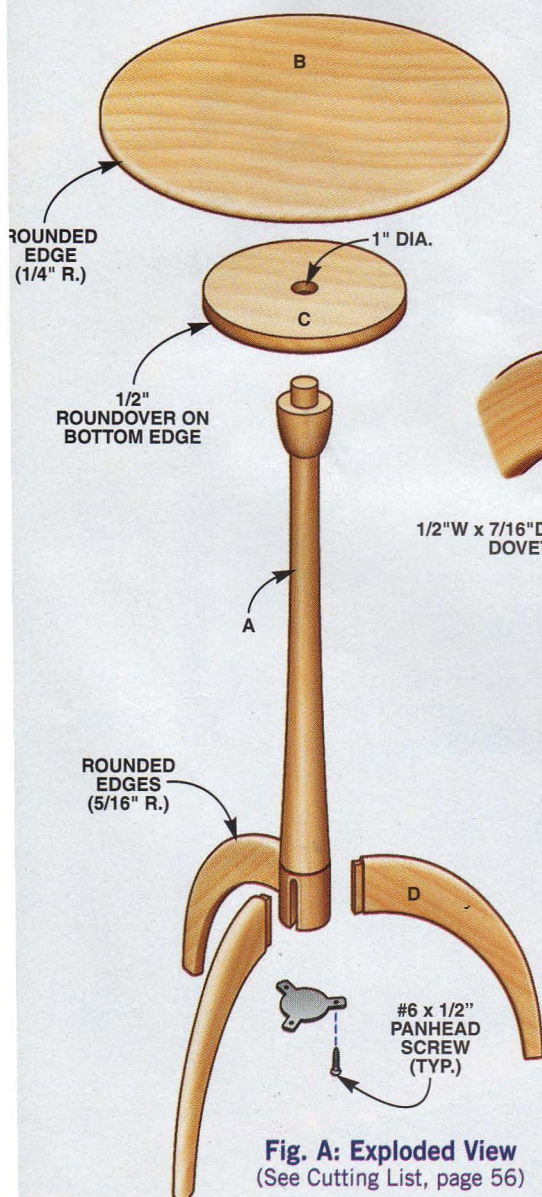
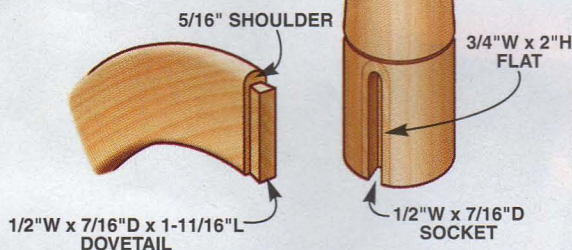
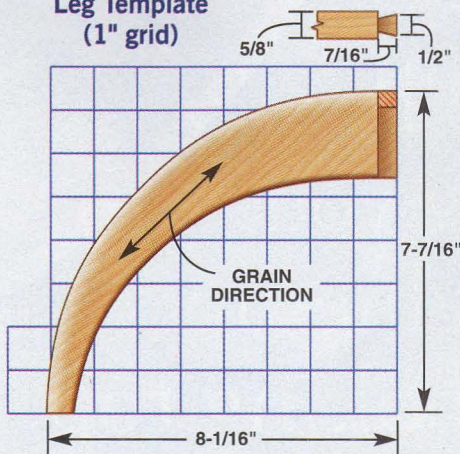


Fig. A: Exploded View
(See Cutting List, page 56)

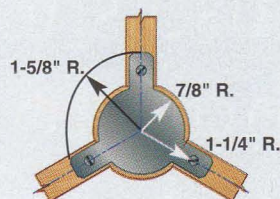
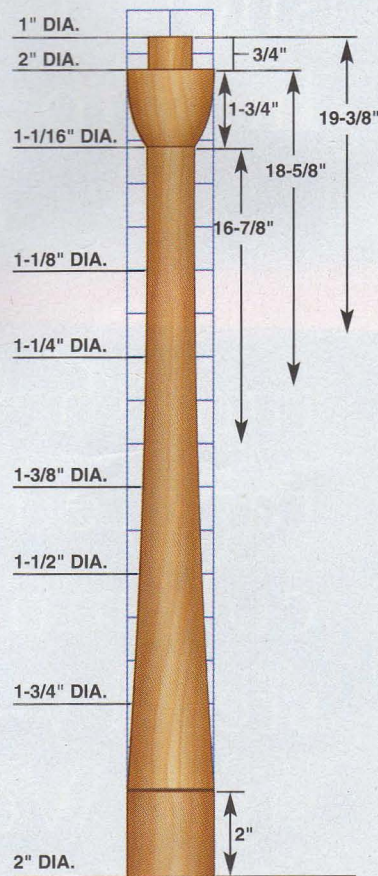
Detail 1: Dovetail and Socket



Detail 3: Leg Template (1" grid)



Detail 2: Column Template (1" grid)



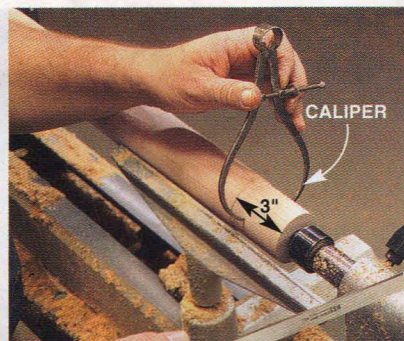
Detail 4: Metal Plate

Turn the Column

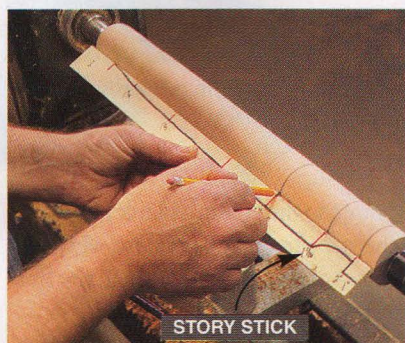
Turning the column is the first step of this project. It's a fairly simple task, with no complex shapes and no scary skew-work required. To make it even easier, we'll show you how to do it with a "film-strip" so you can see every step of the process.



1 Turn a rough cylinder using a 3/4-in. roughing gouge. You'll have to relocate your tool rest at least once.



2 Turn down to 2-in. diameter on both ends using a parting tool and a caliper to establish the correct diameter.



3 Mark reference points on the blank from a shop-made story stick.



4 Cut in to final diameter at all the reference points, using a parting tool and a caliper.



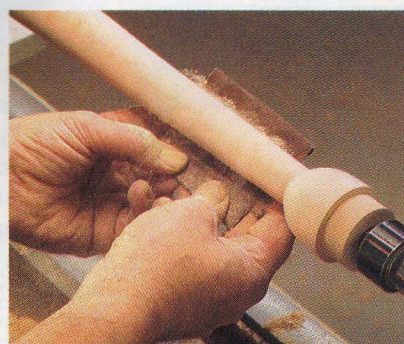
5 Gradually shape the column with a 3/4-in. spindle gouge, using the cut-in diameters for reference.



6 Finish the tapered body with a continuous smoothing cut.



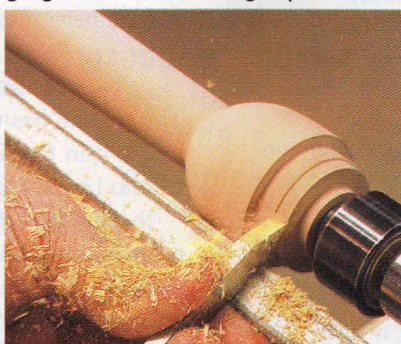
7 Finish the top with a 3/8-in. spindle gouge. Work downhill, rotating the gouge to continue cutting as you bear in.



8 Sand everything smooth, starting with 100-grit paper and working through 280 grit.



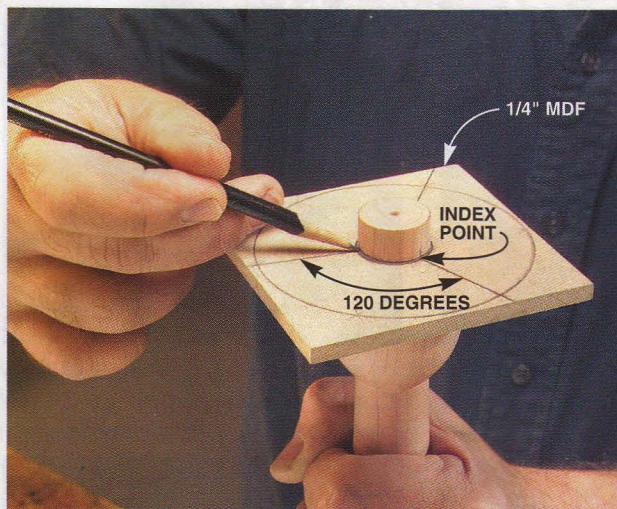
9 Cut a shallow V-groove to mark the top of the legs and the base of the column.



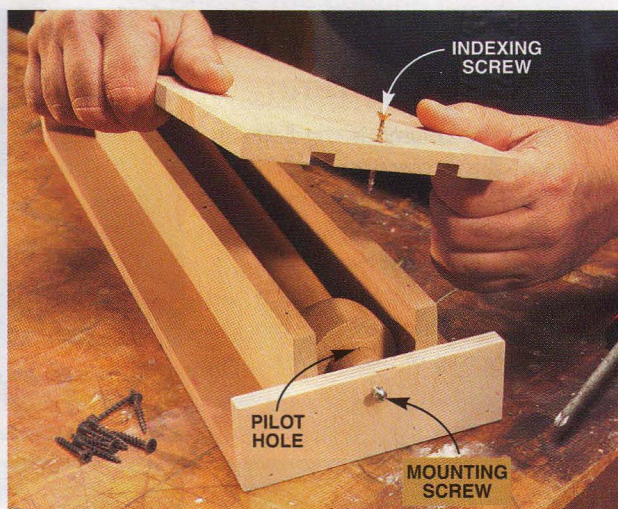
10 Establish the tenon at the top with a parting tool and a caliper.



11 Cut the tenon shoulder at a slight inward angle so the tabletop will sit flush on the shoulder's outer edge.



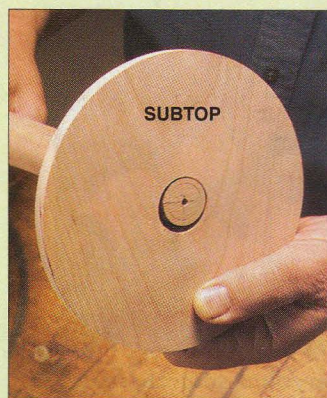
12 Divide the column into three equal sections so you can index it in the dovetail jig (Photo 13). Drill pilot holes at the three index points.



13 A simple indexing jig registers the column so you can rout dovetailed sockets for the legs.

Oops!

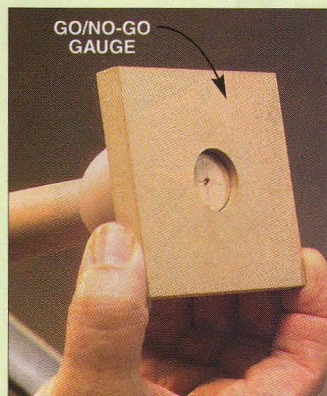
I Made the Tenon Too Small



When I turned the tenon on the top of the column, I forgot that gauging diameters with a caliper isn't always foolproof. I didn't discover my mistake until after I made the subtop.

To make sure this critical diameter was correct, I should have used a "go/no-go" gauge, which is simply a block of wood with the correct hole size drilled in it (bottom photo).

To fix the problem I made a go/no-go gauge using the next-smaller-sized Forstner bit. I remounted the column on the lathe and turned the tenon down until the gauge slipped on without binding (bottom photo). Then I made a new subtop with the new, smaller center hole.



transfer key reference points to the column blank (Photo 3). Make sure the ends of the stick and blank are flush when you mark the reference points. At these points, cut in to the final diameter with a parting tool (Photo 4).

Shape the Column

Remove waste along the entire length of the blank as you shape the body and top (Photo 5). Finish the tapered body by reducing diameters until your reference cuts disappear (Photo 6). Switch to a small spindle gouge and finish the cup-shaped top (Photo 7).

Sand the shaft and top (Photo 8). Coarse paper (100 grit) can actually change the profile, so be careful or aggressive, as your situation demands. Each step up through the grits leaves smaller, less noticeable scratches. 280-grit scratches are so small they're hard to see. If you soften the crisp transition between the neck and the cup while sanding, reestablish it with the parting tool.

Define the column's base with a scored line at the top of the legs (Photo 9). On the original stand, this line served as a stop point for cutting dovetails and fitting the legs. Now it's simply a visual design element.

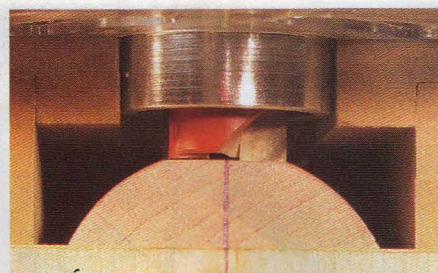
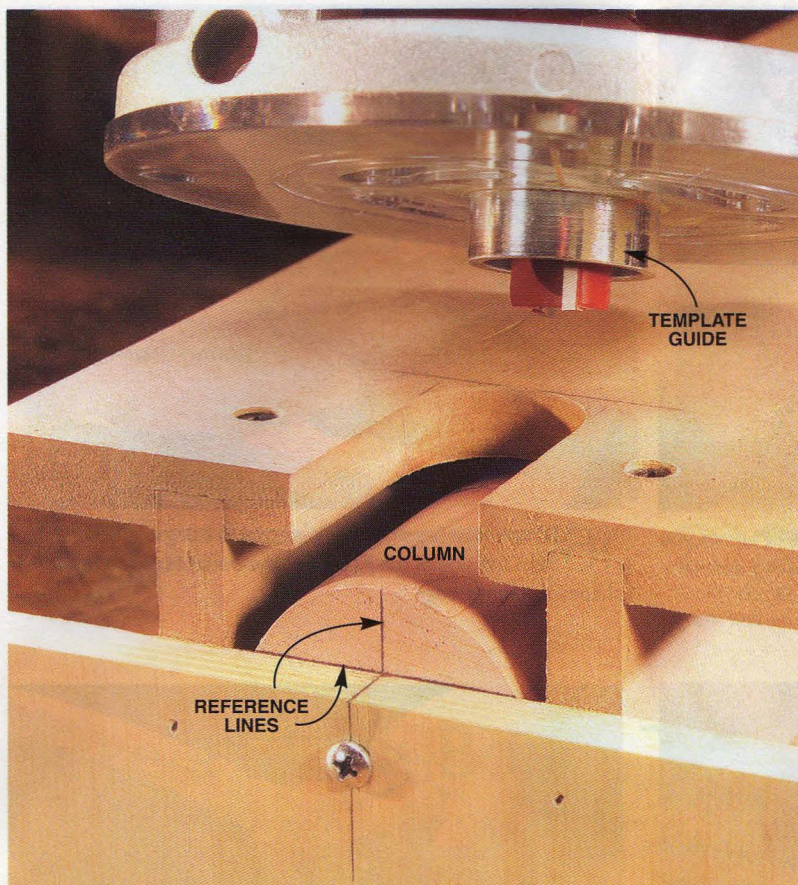
Finally, turn the top tenon (Photos 10 and 11). Its length and diameter must be sized exactly (see Oops!, at left).

Make a Jig and a Protractor

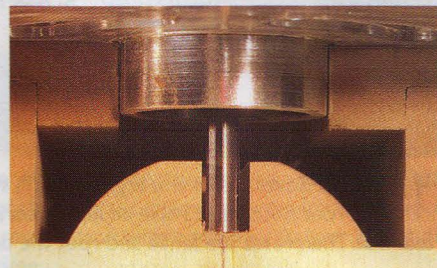
The column has to be indexed (Photo 12) before you can install it in the jig used to cut the three dovetail sockets (Photo 13 and Fig. B, page 56).

To index the column, make a simple 120-degree protractor on a piece of 1/4-in. stock by scribing intersecting arcs around a circle. Drill out the center and fit the protractor over the column's tenon. Mark both the circumference and the index points so you can drill the pilot holes for the indexing screw.

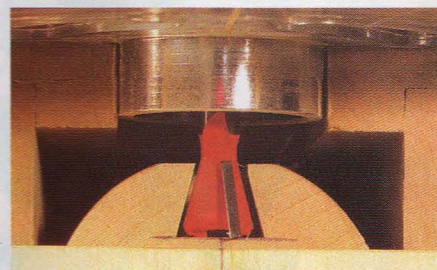
Drill out the holes made by the lathe in the ends of the column to make pilot holes for the jig's mounting screws.



Step 1 Create a flat surface to shoulder the leg with a 3/4-in.-diameter straight bit.



Step 2 Rough out the socket by routing a groove with a 1/4-in.-diameter straight bit.



Step 3 Rout the dovetail with a standard 1/2-in. dovetail bit.

14 Rout dovetail sockets in three steps, using a template guide and three different bits. To complete each step, you have to index the column at each socket location. Horizontal and vertical reference lines drawn at each index point allow you to return to exactly the same location for subsequent steps.

Rout Dovetailed Sockets

Each socket takes three steps to complete, and each step requires three routing passes (Photo 14 and insets). Step 1 creates a wide flat surface to shoulder the leg. Step 2 removes waste and Step 3 creates the dovetail.

Using your practice column, set up for Step 1 and make a test cut. The bit leaves a rounded shoulder at the top, which acts as a stop for the leg. The top of this shoulder should end at the center of the V-cut on the column (Fig. A, Detail 1, page 50). If it doesn't, simply reposition the top of the jig on the base so it will. Make additional cuts to set the depth so the bit leaves as wide a flat surface as possible.

When you rout, remember two things: First, always orient your router the same way when you operate it in the jig, in case the bit isn't exactly centered inside the guide. Second, if the slot on your jig ended up a bit wide, make two passes so you can bear against both edges. Your routed surfaces and sockets will be slightly wider, but this won't affect the strength of your joints.

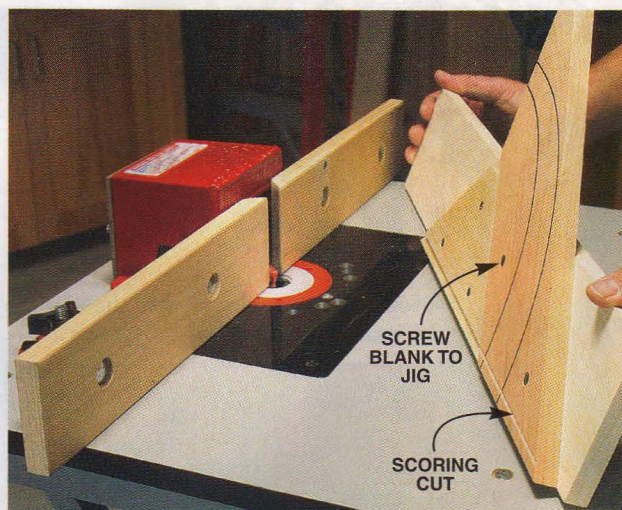
Using our jigs,
it's easy to
produce these
great-looking
stands in
multiples.

Dovetail the Legs

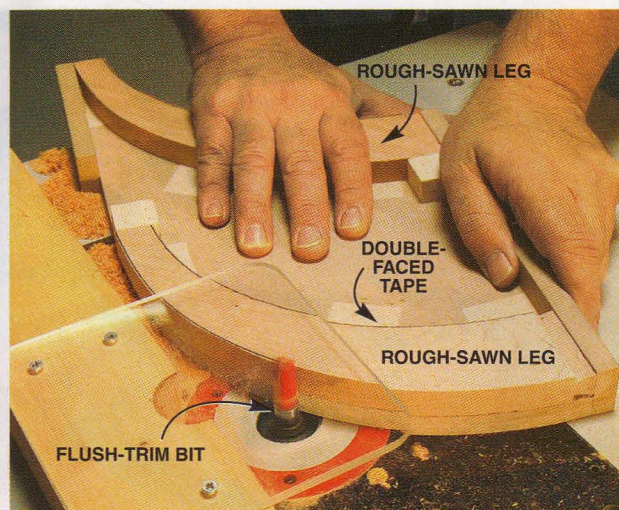
Using a template (Fig. A, Detail 3, page 50), lay out the legs on straight-grained blanks that have one end mitered at 45 degrees. For strength, the grain should run diagonally across the leg, from the dovetailed end to the toe. Miter the other end of your blanks after the legs are laid out, so they're all the same size. Make an extra leg blank to use while setting up the router table and test-fitting the joints.

Another jig makes it easy to rout dovetails in the legs (Photo 15). To make this jig, fasten a 5/8-in.-thick block with 45-degree miters to a 24-in.-long support board. Make sure the block and board are flush at the bottom. Rout one face of the blank on the front edge of the mitered block and the other face on the back edge. When you fasten the blank to the jig, make sure the screws don't go through the leg's profile.

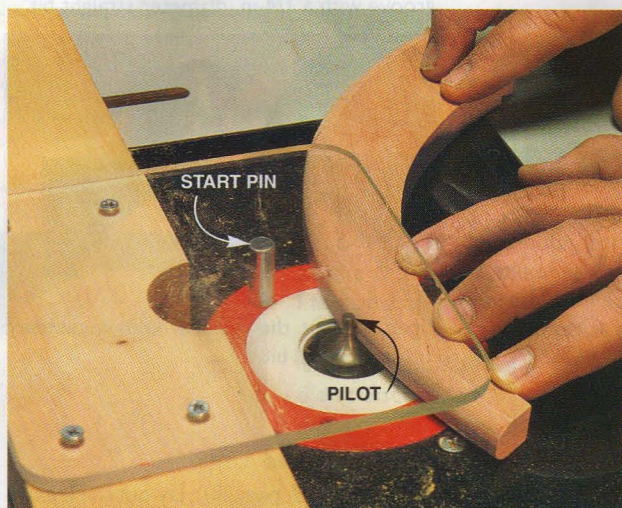
Install the dovetail bit and set the height, just a hair less than the depth of the dovetail sockets. Then set the fence to



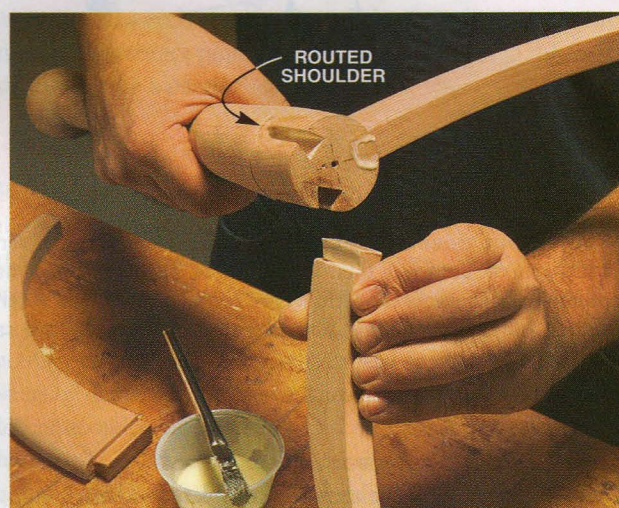
15 Rout dovetails in the leg blanks. A simple jig allows you to rout both faces. Make an initial scoring cut to eliminate tear-out. Then reset the fence and rout the dovetail.



16 Shape the legs on the router table using a jig (Fig. C, page 56). One side of the jig creates the outer edge, the other side shapes the inner edge.



17 Round over the top of the legs. To prevent kickback, hold the leg against a start pin when you engage the bit. Move away from the pin and bear against the pilot as you rout.



18 Glue the legs into the column. Slide each leg into the socket and seat it against the routed shoulder.

make shallow scoring cuts on all of the blanks. Otherwise one side of each blank will tear-out badly, because you have to rout against the grain. Reset the fence, make one full-depth pass on each side of your test blank and test the fit. The dovetailed leg should slide into the socket without binding or rattling. Make any necessary adjustments and rout the dovetails.

Shape the Legs

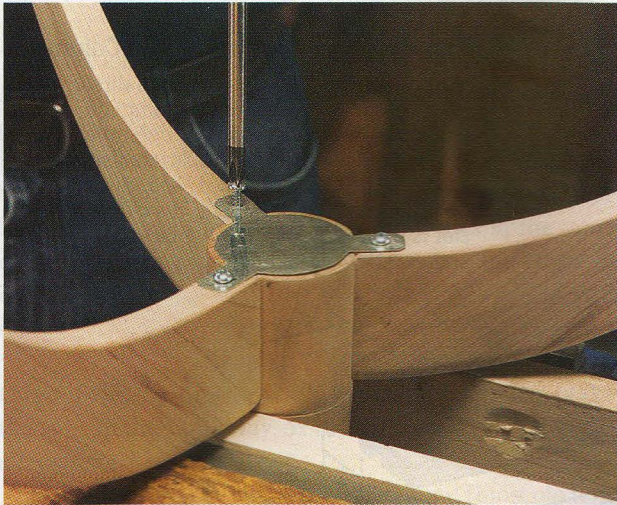
Use your leg template to make a jig for shaping the legs (Photo 16). Using double-faced tape, install a rough-sawn leg in the jig and rout the outer profile first. Go easy, because you'll be routing against the grain at the start. When you rout the inner profile, you go against the grain at the end.

Round the top of the legs using a bit with a pilot (Photo 17). When you rout a half-round shape by rounding over both edges, a bit with a pilot leaves a smaller flat surface in the middle than a bit with a bearing.

Assemble the Base

Notch the leg dovetails so they'll slide all the way into the column (Fig. A, Details 1 and 3, page 50). Saw away most of the waste, then pare the top shoulder flush with a chisel. Now glue the legs in place (Photo 18).

Grab your tin snips and cut out the metal plate that reinforces the dovetail joints from a small sheet of "solder tin" (about \$2 at hardware stores). Drill pilot holes and fasten the plate (Photo 19).

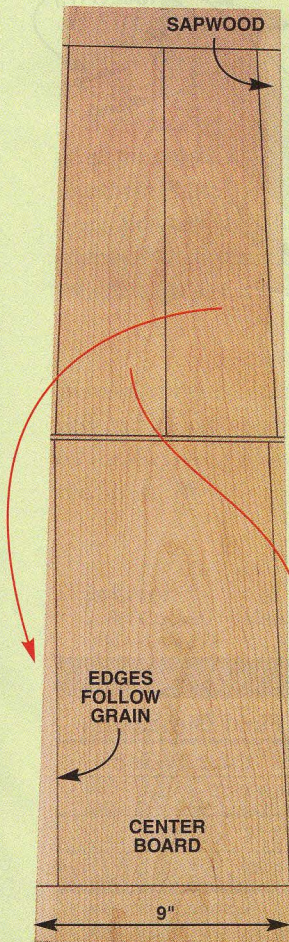


19 Reinforce the leg joints with a shop-made metal plate, just like the Shakers did.



20 Wet the edge of the top before you rout. It may seem goofy, but this technique really minimizes tear-out, especially on this round shape, where you have to rout against the grain half of the time.

Fake a Single-Board Top

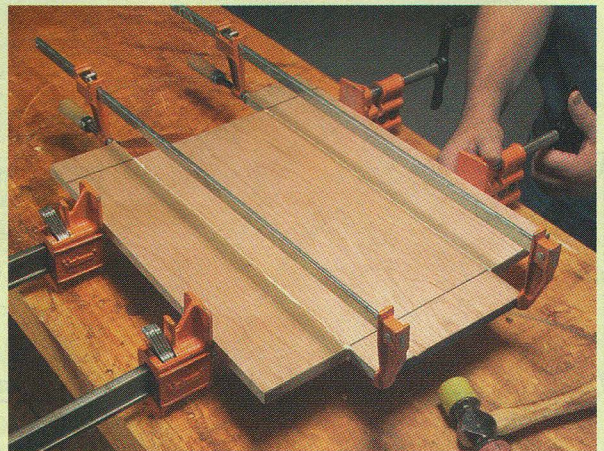
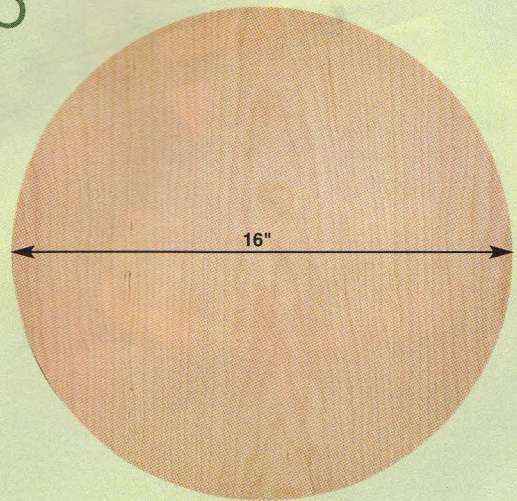


One characteristic of antique furniture that's hard to duplicate today is that pieces were made from really wide boards.

Today, wide boards are rare, and cherry boards usually contain unwanted light-colored sapwood at the edges, which further reduces the useful width. But it's possible to create the illusion of a wide-board top by carefully cutting and reassembling a narrow board. The trick is to cut all the edges so they follow the grain. Then, when the pieces are glued the joints are almost invisible. And since the three pieces come from the same board, they match perfectly.

Choose one half of the narrow board to be the center of the wide top. Cut the other half down the middle and move each half to the opposite side of the center board. Cut off the sapwood and joint the outer edges so they follow the grain.

Glue the boards together. The boards are likely to be tapered, so the glue joints will be angled. A couple of clamps running end-to-end keep the boards from sliding out of position when you apply pressure across the glue joints.



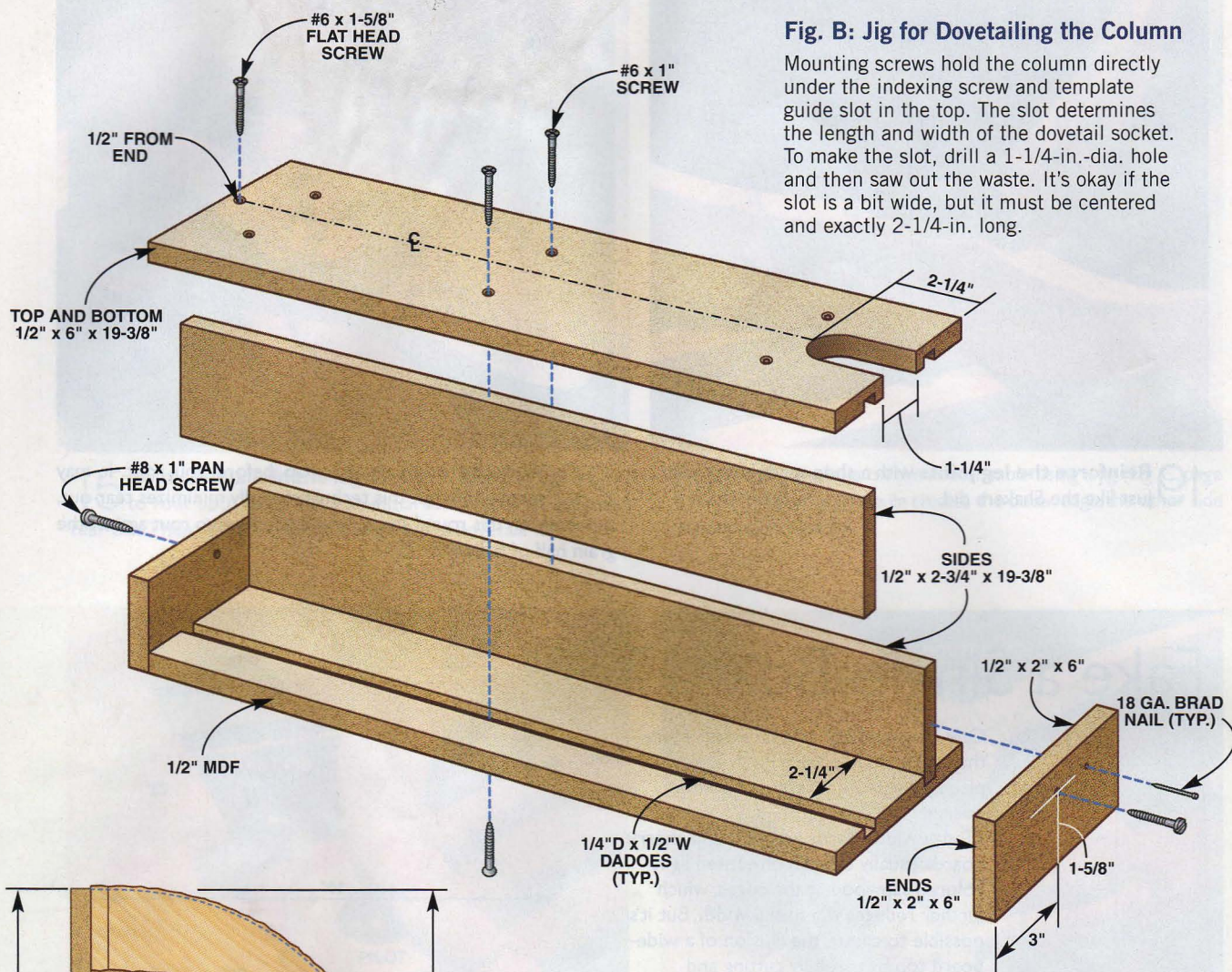


Fig. B: Jig for Dovetailing the Column

Mounting screws hold the column directly under the indexing screw and template guide slot in the top. The slot determines the length and width of the dovetail socket. To make the slot, drill a 1-1/4-in.-dia. hole and then saw out the waste. It's okay if the slot is a bit wide, but it must be centered and exactly 2-1/4-in. long.

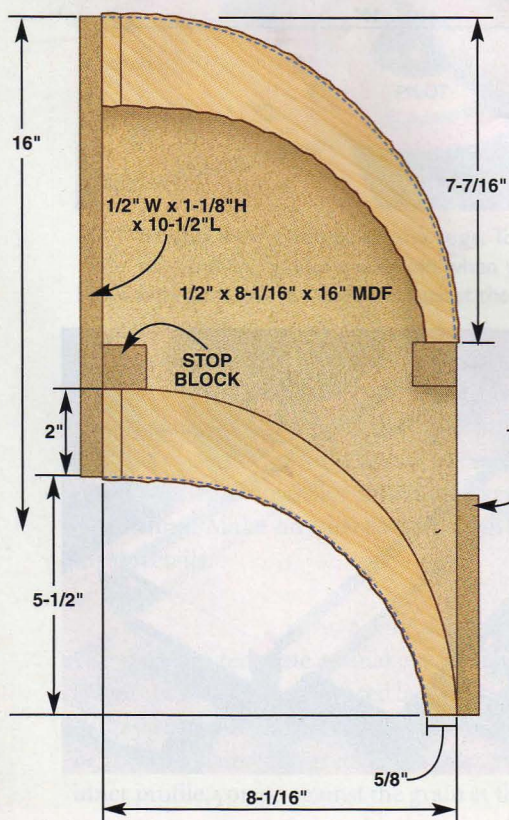


Fig. C: Jig for Shaping the Legs

Use the leg template to create the outside and inside edges of the jig. Attach fences and stop blocks to position the legs and use double-faced tape to hold the legs in place.

Cutting List Overall Dimensions 17" dia.* x 25-5/16" H

Part	Name	No.	Blank Dimension	Final Dimension
A	Column	2**	2-1/4" x 2-1/4" x 20"	2"-dia. x 19-3/8"
B	Top	1	1/2" x 17" x 17"	1/2" x 16" dia.
C	Subtop	1	3/4" x 7-1/4" x 7-1/4"	3/4" x 7" dia.
D	Legs	4**	5/8" x 4-1/2" x 14"***	5/8" x 7-7/16" x 8-1/16"

* at feet

** one for setup

*** one end mitered at 45 degrees

Glue Up the Top Boards

There are lots of ways to arrange boards (see “Fake a Single-Board Top,” page 55 for one) but here are a couple of guidelines. First, make sure your top doesn’t feature a glue joint smack-dab in the middle. Three boards often look better than two. Second, avoid a “herringbone” appearance by orienting your boards so the grain slopes in the same direction. Determine the slope by viewing the edges of each board.

Complete the Top

Cut out the top on the bandsaw or with a jigsaw. Make the subtop the same way, or turn it on your lathe, using a faceplate.

The top doesn’t have to be perfectly round (most old tops aren’t), but its edge should be rounded smoothly, without notches or flat spots. A disc sander is great for truing up a rounded edge, but a belt sander mounted in a jig will do the job, too. If you have to smooth the edge by hand, use a sanding block and start with 80-grit paper.

The top’s edge is rounded over on the router table, like the tops of the legs. Because of the top’s round shape, you have to rout against the grain, which often causes tear-out (Photo 20). You can also take other simple steps to reduce tear-out. First, make sure your bit is sharp. Second, make sure your variable-speed router is set to operate at its highest speed. And finally, don’t rush.

Don’t fasten the subtop with screws. At least one is sure to go all the way through the thin top. Instead, glue the two tops together (Photo 21). Tack the subtop in place or hold it with finger pressure until the glue gets tacky. Then apply cauls and clamps. When you glue the top and base together, adding weight is the easiest way to “clamp” them (Photo 22).

Great-Looking Finish

Aerosol spray lacquer is perfect for this project. It’s fast, easy and it looks great. It won’t darken the top’s end grain, like oil finishes, yet it allows cherry to darken naturally beneath the finish. **AW**

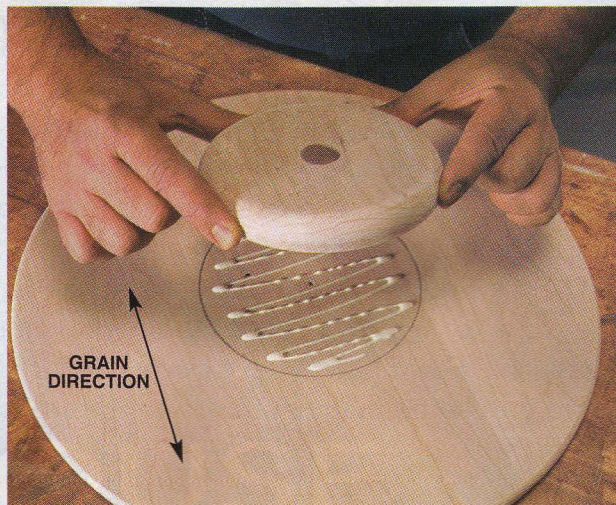
Sources

Seven Corners Hardware
(651) 224-4859
www.7corners.com
#42021 1-1/4" o.d. template
guide, \$8
#85118 1/4" bit with pilot
(1/4" shank), \$12
#85119 5/16" roundover bit
with pilot (1/4" shank), \$12.

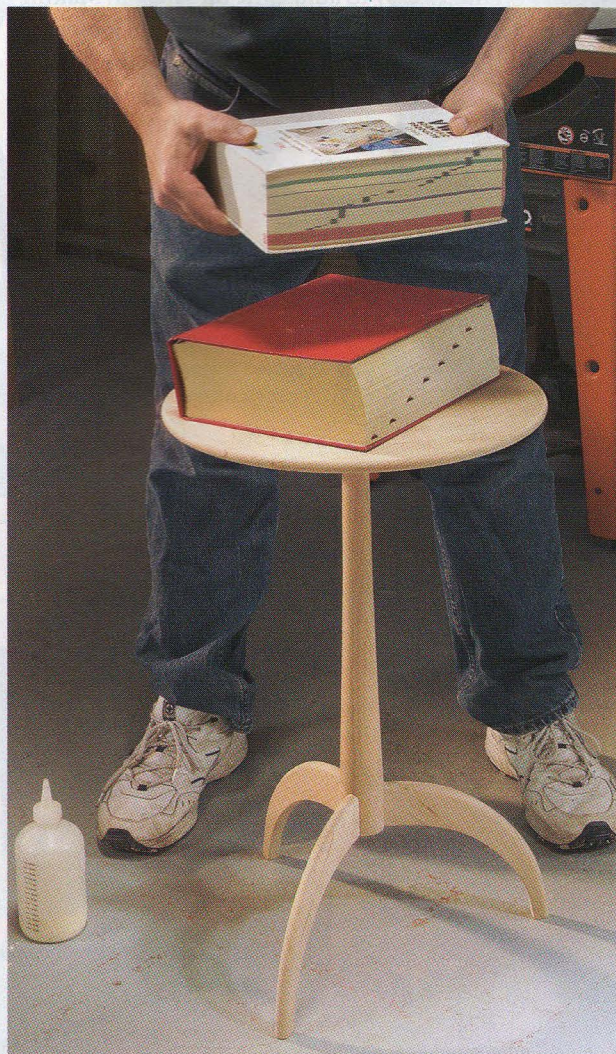
Freud
(800) 334-4107
www.freudtools.com
#04-108 1/4" straight bit (1/4"

shank), \$18
#04-140 3/4" straight bit (1/4"
shank), \$20
#50-102 1/2" top-bearing
flush-trim bit (1/4" shank), \$26
#22-124, 1/2" 14-deg. bevel
dovetail bit (1/4" shank), \$19.

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#S1029 2-1/4" x 29" solid-
cherry turning square, \$12.



21 Glue the subtop to the top with the grain running the same direction, using a centered circle for positioning.



22 You don’t need clamps to glue the top to the base. Just add weight.

What's the one thing you need most when you're shaping dozens of raised panels on a router table? Power! These 3-hp monsters deliver plenty.

There are two completely different kinds of 3-hp routers: fixed-base and plunge. Both types have 15-amp motors with variable speed (a must for big bits), soft start (so your arm isn't wrenched when turning the machine on in a hand-held cut) and feed back circuitry (which helps the motor maintain rpm as it bears into a heavy cut).

There's a huge difference between fixed-base and plunge routers, however, in how easy they are to use in a router table. Adjusting some of these big routers can be a real headache. Few of them have been specifically designed to be used upside down in a router table, but some manufacturers are clearly catching on.

Fixed-Base Routers

A fixed-base router is our first choice for use in a router table. It has two distinct advantages: it's easy to change a bit quickly and it's easy to adjust the bit's height. Making a coarse height adjustment is a simple matter of loosening a clamping mechanism and twisting or lifting the router's motor (Photo 1). To change bits, all you have to do is remove the router motor from the base (Photo 2). The collet is right out in the open.

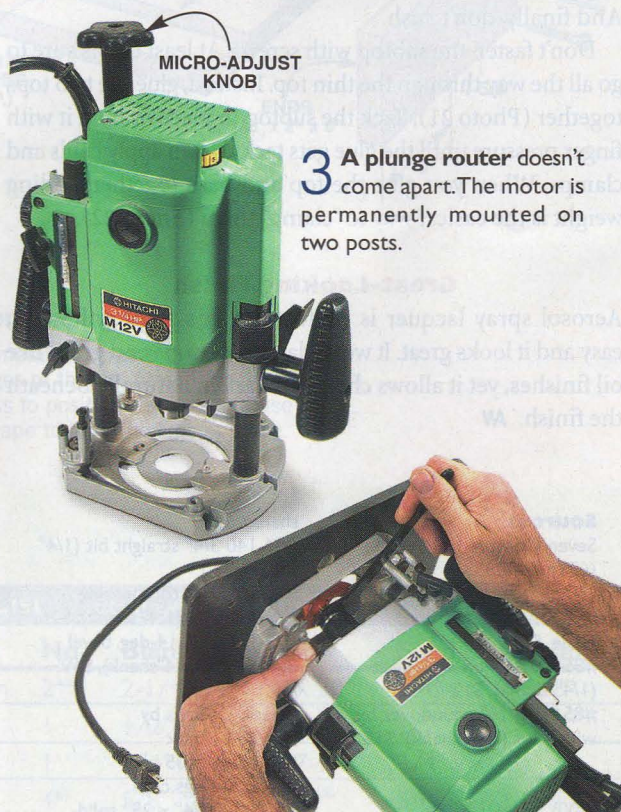


1 A fixed-base router has two independent parts: the motor and the base.

2 Changing any bit on a fixed-base router is a breeze. All you've got to do is remove the motor.

Plunge Routers

A powerful plunge router is a great tool for cutting large dadoes and mortises, but the features that make it handy for hand-held work get in the way when you hang the machine in a router table (Photo 3). Adjusting the bit height is awkward on most plunge routers because there's no coarse height adjustment. Instead, you end up turning and turning a micro-adjust knob. Changing bits can be even more of a hassle, particularly when the bit has a large diameter, like a panel-raiser (Photo 4).



3 A plunge router doesn't come apart. The motor is permanently mounted on two posts.

4 Changing large bits on a plunge router can be difficult, particularly if the base has a small opening. You can't retract the motor to give you more room around the collet.

Tool Test

POWERHOUSE Routers

for the Router Table



By George Vondriska

Router Table-Friendly Features

Discombobulating problems crop up when you turn a router upside down and tuck it under a router table. Labels are difficult to read. Switches are backwards. Whether you choose a fixed-base or a plunge router for your router table, here are some features that make any machine safer and easier to use.



5 A micro-adjust knob is a must-have on a plunge router. It should project beyond the motor so you can easily wrap your hand around it. These knobs are included on some routers, but cost about \$25 as an accessory on others.



6 The speed control should be front and center, right where you can see it. Your safety depends on having a big bit spinning at the right speed, especially when it starts up. Some speed controls are mounted on top of the motor, out of sight when the router is upside down.



7 The On/Off switch should be easy to reach and easy to read. A router ought to be unplugged when you change bits. It's usually pretty dark under a router table, though. Can you be sure the router is turned off when you plug it back in? A big slider switch like this is the next best thing to having an externally mounted switch on your router table.



8 The hole through the router's metal base ought to be large enough for big bits to pass through. Many metal bases have holes that are too small because they're designed to accommodate template guides. Changing big bits is difficult with a plunge router that has a small opening (see Photo 4, page 58).

Make beautiful kitchen doors and drawers.

MLCS Pro Cabinetmaker 6 Piece Router Bit Set

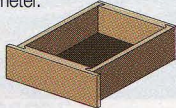
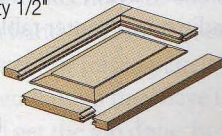
This professional quality 1/2" shank set contains six carbide tipped bits needed for fine cabinet making, raised panel doors, kitchen table top and drawer assembly. Designed for up to 3/4" wood thickness.

1. The **Ogee Raised Panel** bit (in the Standard Set) puts a classic ogee edge on the free floating central panel in your door. 2-3/4" large diameter.

2. The **Ogee Raised Panel with Undercutter** (in the Undercutter Set *ONLY*) produces a flush or reduced upper panel profile. 3-1/8" large diameter.

3. Our **Matched Rail and Stile** set creates precisely mated rails and stiles that form an extremely durable, classic frame for your door. 1-5/8" large diameter.

4. Use the **Glue Joint** bit when the central panel needs to be wider than



your stock. Rout two or more pieces of stock (1-1/4" max.) with reverse cut edge joints to reach the required width.

1-3/4" large diameter.

5. The **Drawer Lock** bit creates a strong joint that fits precisely

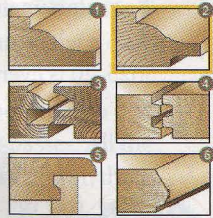
because one bit makes the cut in both the drawer front and the drawer side. 1-3/4" large diameter.

6. The **Round Over & Ogee Door Lip** bit finishes your door edge professionally in one pass.

All bits are intended for use in a router table only.

#1453 6 Piece Undercutter Set\$135.95

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Watch a woodworking professional make a raised panel, rail and stile frame, and other types of cabinet doors. 40 minutes of instruction.

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SAVE OVER \$150! Make stylish picture frames!

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Solid micrograin carbide for smooth, fast, accurate cuts and a sharp, long lasting edge. Perfect for mortise and tenon joints and removing material.

Includes 1/4" shank 1/4" LD bit, 1/2 shank 3/8" and 1/2" LD bits.

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2 Fixed-Base Routers

Unfortunately, there are only two 3-hp fixed-base routers on the market. The Porter-Cable 7518 has been around for quite a while, and was our Editors' Choice when we last tested 3-hp routers in AW #78, February, 2000. The new Milwaukee 5625-20 is even better. Both routers pack plenty of power, but the Milwaukee is easier to adjust in a router table.



Milwaukee 5625-20

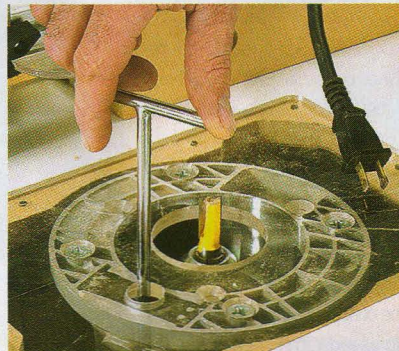
\$330

Without question, the Milwaukee is the finest machine to mount under your router table. It combines the brute strength of a very powerful 3-hp router motor with the finesse of an elegant bit-height adjustment mechanism.

This machine has both coarse and fine height adjustment. For a big change in the height of your bit, you simply unsnap a quick-release handle on the motor and press a quick release on the height adjustment. For a small change, you turn a micro-adjust handle with a T-wrench from a convenient position above the table (see photo, right). The motor travels straight up and down within the base, so the cord doesn't end up twisted around the motor. The handles are removable, so there's no problem getting this router into a table. The hole in the base is a generous 4-1/8-in. diameter.

Source

Milwaukee Electric Tool Corp
(262) 781-3600, www.milwaukeetool.com



STAFF



Porter-Cable 7518

\$280

This classic router is still a great choice for heavy use in a router table. It's not quite as convenient as the Milwaukee, but easier to set up than most plunge routers. There's no micro-adjust knob. You change the height of a bit by rotating the router motor, which is basically a coarse adjustment. For fine-tuning bit height you simply give the motor a little nudge. All this involves constantly turning a wing nut that tightens the motor to the base. We wish this nut was a quick-release clamp instead.

The sliding speed control reads in real rpms, which is handy (other machines have arbitrary scales that require a chart to translate). However, the speed control is located on top of the router, along with the On/Off switch. Both are very difficult to see when the router is hanging under a table. The hole in the base is huge (4-1/2 in. diameter).

Source

Porter-Cable, (800) 487-8665, www.porter-cable.com

You Should Also Know About... Mid-Sized Combo Kits



PLUNGE BASE

FIXED BASE

A 15-amp, 3-hp router isn't the only good choice for a router table. Mid-sized routers with 12-amp, 1-1/2- to 2-hp motors work perfectly well for light-duty jobs and occasional raised panel work.

Our favorite routers in this category are combo kits. For about the same price as one of the less expensive 3-hp routers (\$220 to \$250), you get one motor that fits a fixed base and a plunge base. You can have the best of both worlds by leaving the fixed base in the router table and using the plunge base for virtually all hand-held work.

For more about combo kits, see our Tool Test in AW #99, March 2003, page 64, or go to www.americanwoodworker.com.

9 Plunge Routers

There are three significant differences among 3-hp plunge routers: actual power under load, the depth-of-cut guide system and dust collection. Of the three, power is the one that counts in a router table. The other two features are only important in hand-held work (see “Plunge Routers Off the Table,” page 64).

We cut dozens of raised panels with these plunge routers and noticed a distinct difference in how much power each one delivered, even though they have the same specs. With the best machines, we could feed faster and take fewer passes. All the routers could get the job done, however, and we didn't notice any difference in the quality of the cut. For extra power, three plunge routers stood out from the rest: the DeWalt DW625, \$230; the Porter-Cable 7539, \$340; and the Triton TRC001, \$320.

Bosch 1619EVS

\$310

The Bosch is easier to set up and adjust in a router table than most other plunge routers. The hole in the base is exceptionally large (3-3/4-in. diameter), making bit changes easier. You can override the spring-loaded plunge mechanism and make both coarse and fine adjustments in the height of the bit. On the downside for router table use, the speed control is on top of the motor and is difficult to see. The micro-adjust handle is inconveniently short. The depth-of-cut scale is clearly legible and can be zeroed. A dust shroud is included.

Source

Bosch Power Tools, (877) 267-2499, www.boschtools.com

Craftsman 26835

\$250

The Craftsman comes with a micro-adjust knob and has a decent depth-of-cut scale but you can't zero it out. No dust shroud is available. An easy-to-use spindle lock disables the On/Off switch—a good safety feature. There's a chance of confusing the On/Off switch with the plunge lock, as they're both built into the handles. The hole in the base is 2-1/2-in. diameter. Craftsman does not recommend using a bit larger than 2-1/2-in. diameter on this machine.

Source

Craftsman, (800) 377-7414, www.sears.com

DeWalt DW625

\$230

For a standard plunge router, the DeWalt is about as good as it gets. It's got loads of power and many of the key features that make router table work easier. The speed dial and On/Off switch are quite good. A micro-adjust knob is a \$25 accessory. The opening in the base is an average size (2-1/2 in. diameter).

This router really shines at hand-held work. The handles are well-placed, giving it a conveniently low center of gravity. It's got a clearly legible scale that can easily be zeroed. The cursor line is very thick, however, making it difficult to read precisely. The router comes with a dust shroud.

Source

DeWalt, (800) 433-9258, www.dewalt.com

Fein RT-1800

\$300

This router is well-balanced. It's easy to guide for hand-held work. The depth-of-cut scale is easy to read and can be zeroed. It comes with a dust shroud and a small micro-adjust knob (a larger knob that's recommended for router table work is \$20 extra). The speed control is mounted on top of the motor and is hard to see under a router table. The base has a 3-in.-diameter hole.

Source

Fein Power Tools, (800) 441-9878, www.feinusa.com



Plunge Routers Off the Table

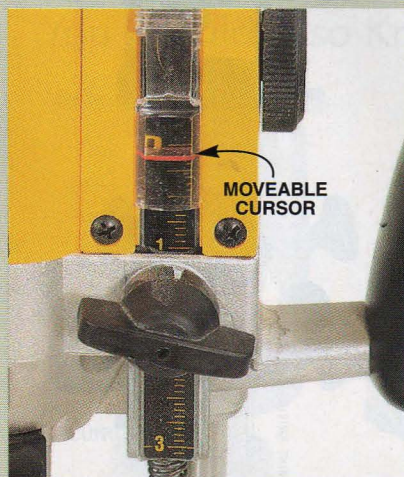
Our favorite 3-hp router for a router table is a fixed-base machine, but when you want to stretch your tool dollars as far as they'll go, a big plunge router makes a lot of sense. You can't make stopped dadoes and mortises with a fixed-base router, after all.

Out of the table, a 3-hp plunge router is large and heavy (most weigh 12 to 13 lbs.), but it's a great machine to drive big bits. Take a wide roundover bit, for example (see photo, right). It's risky and impractical to make this huge cut in one pass, but with a plunge router you can lower the bit in stages, taking one small last bite for an ultra-smooth surface. Of course, you can do this with a fixed-base machine, too, but a plunge router has a multi-step depth stop that allows you to repeat the same series of measured cuts over and over again.

Setting the exact depth of cut is certainly critical when you're using a plunge router to make dadoes and mortises. A good depth guide makes a huge difference, and they vary widely in quality from one machine to another. The best ones have a clearly marked scale that can be adjusted to the zero mark

when your bit is even with the bottom of the router (see photo below, left). Then you lift a rod connected to the scale to directly indicate how deep the cut should go. The scales on other routers cannot be "zeroed out," so you must count off 1/16-in. marks from an arbitrary starting point on the scale to set the depth of cut.

A dust shroud is a fairly new and very welcome addition to many plunge routers (see photo below). The shroud directs chips and dust to a small exhaust port. Hook up a vacuum and you can rout virtually dust-free.



The depth-of-cut guide on a plunge router should be legible and easy to "zero out," so you don't have to make a lot of test cuts to hit an exact depth.



A dust shroud keeps that obnoxious stuff from flying all over your shop. Cutting dadoes and mortises is pretty much dust-free.

Freud FT2000EP

\$185

The Freud has three good router table features: a micro-adjust knob is included, the On/Off switch is quite accessible and the speed control is easy to see. The opening on the base is only 2-3/8-in. diameter, though. It's a mixed bag for hand-held work. The depth-of-cut system can't be zeroed (see "Plunge Routers Off the Table," page 64) and the scale is hard to read, but you do get a dust shield.

Source

Freud USA, (800) 334-4107, www.freud-tools.com



Hitachi M12V

\$160

The Hitachi is a good, no-frills machine. In the router table, the On/Off switch and speed control are easy to see and use. A micro-adjust knob (highly recommended) is a \$25 accessory. The hole in the base is very small (2-in. diameter). For hand-held use, the depth-of-cut scale is clearly legible and can be zeroed, but a dust shroud isn't available.

Source

Hitachi Power Tools, (800) 829-4752, www.hitachi.com



Makita 3612C

\$250

This is the only machine with a brake, a feature we'd like to see on more routers. This router's small size makes it very comfortable to use for hand-held cuts. It comes with a micro-adjust knob. The speed control is very easy to see under a router table. The depth-of-cut scale is difficult to read and can't be zeroed. The dust shroud is a \$23 accessory. The hole size in the base is 2-3/8-in. diameter.

Source

Makita USA, (800) 462-5482, www.makitatools.com



Porter-Cable 7539

\$320

This is one heck of a powerful plunge router, but adjusting it in a router table can be awkward. Thank goodness it has a large hole in the base (3-1/2-in. diameter) for big bits, but adding the micro-adjust knob (a \$25 accessory) involves removing some small parts that you'll need to reassemble for hand-held work. In a table, you must use two hands to adjust the bit height: one to turn the handle and the other to depress the plunge-lock lever. The speed control is on top of the motor where it's difficult to see upside down. The handles span 11-1/4 in. It may be difficult to fit this router through some router table openings.

Every other 3-hp router weighs a hefty 12 to 13 lbs., but this machine tops the scale at 17 lbs. It has a decent depth-of-cut scale that can be zeroed. A dust shroud is a \$45 accessory.

Source

Porter-Cable, (800) 487-8665, www.porter-cable.com



Triton TRC001

\$320

This unusual machine stands head and shoulders above the plunge-router pack as the easiest to set up and adjust in a router table. It's got plenty of power, as well. To change bits, you raise the collet above the surface of the table. No other plunge router can do this, and it means you don't have to remove the router from the table to swap cutters. The Triton is also the only plunge router with a rack-and-pinion system for raising and lowering the motor. This system gives you both a coarse adjustment and a fine adjustment micro-dial. The speed control is easy to see under the table. A dust shroud is included. The hole in the base is 3-1/8-in. diameter.

Unfortunately, the Triton is not equally good for hand-held plunge routing. It's top-heavy and tippy. Its handles are mounted too high for easy control. The depth-of-cut system is easy to read but can't be zeroed.

Source

Triton, (888) 874-8661, www.tritonwoodworking.com



MIKE KRIVIT

AW

Template



If you want to get the most from your router, you need to master template routing. Once you learn the basics you can spend a lifetime exploring its many possibilities. You'll be able to build more kinds of projects, more accurately and more easily.

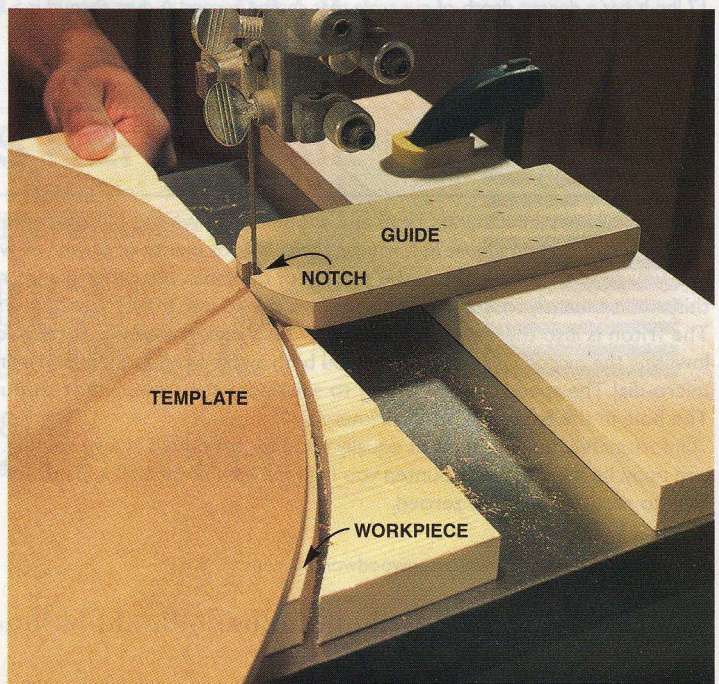
Template routing has two big benefits. The first is repeatability. With template routing you can make one or 100 parts that are exactly alike. Second, template routing simplifies the job of making curved or complex shapes.

A midsize fixed- or plunge-base router is fine for most template routing. We prefer router bits with a 1/2-in. shank for their strength but many 1/4-in. shank bits will do a good job as well.

By Randy Johnson

Bandsaw Guide for Rough Cutting

A template-following guide on a bandsaw makes it easy to rough cut workpieces prior to routing. The bandsaw blade sits in a notch about 1/8-in. back from the round end of the guide. The guide follows the edge of the template while the workpiece is cut oversize by 1/8 in., which is just right for most projects. Rough cutting your workpiece removes excess material so your router doesn't have to work as hard. You will also get less chipping and burning.



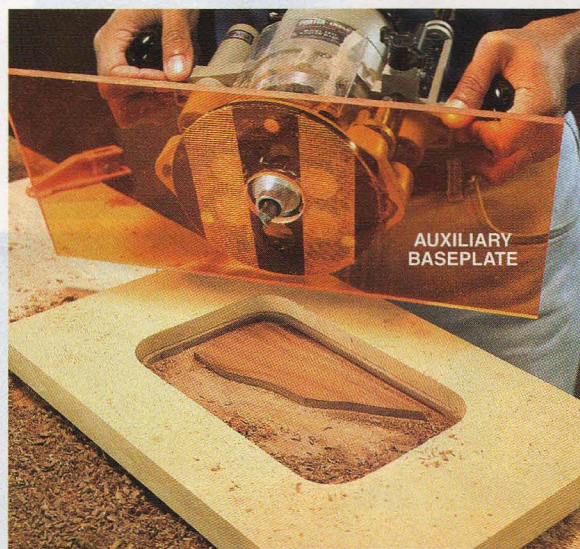
Routing Tips

Use the Right Bit

There are three basic template router bits: a pattern bit with a top bearing, a flush-trim bit with a bottom bearing and a straight bit combined with a guide bushing which fits in a router's baseplate. When possible, use the largest diameter bit that your router, template or wallet can handle, because large diameter bits are less likely to burn, chip or chatter.

The diameter of the bearing on the pattern bit and flush-trim bit equal the cutting diameter of the bit. This simplifies template design because the template is made the same size as the finished workpiece.

Using a guide bushing for template routing requires the template to be bigger or smaller than the final shape of the workpiece, depending on whether you rout on the inside or the outside of the template. Sizing the template can be a pain, but a guide bushing allows you to use any shape bit that will fit through the hole.



Span the Area

A wide auxiliary baseplate is the best way to span open template spaces. It can be made of plastic or wood and should be long enough to prevent the router from falling into the template opening. Double-faced carpet tape works well for attaching the auxiliary baseplate to the router's main baseplate.

Tools for Template Shaping

The two most useful tools for shaping and smoothing router templates are a disc sander for outside curves and an oscillating spindle sander for inside curves. A drum sander on a drill press and a belt sander also work well.



Peel-and-Stick Template

Carpet tape is a quick way to attach a template when you are only making one or two parts. Make sure your parts are dust-free so the tape sticks tight. Once the template is in place, give it a few raps with a mallet. This will also help the tape take hold. When you're done routing, use a putty knife to pry the pieces apart. Carpet tape sometimes leaves a residue, but it's easily cleaned off with mineral spirits. Also, carpet tape comes in different styles. The indoor/outdoor fiberglass type works the best, and is available at home centers.



Clamp it Down

Toggle clamps are hard to beat for their ease of use. They hold the work securely and make it easy to change parts. They are available in various sizes but the 6-1/2-in.-long style shown is a good size for most router jigs.

Source

www.amazon.com, #MSI-225D Toggle Clamp, \$10 each.



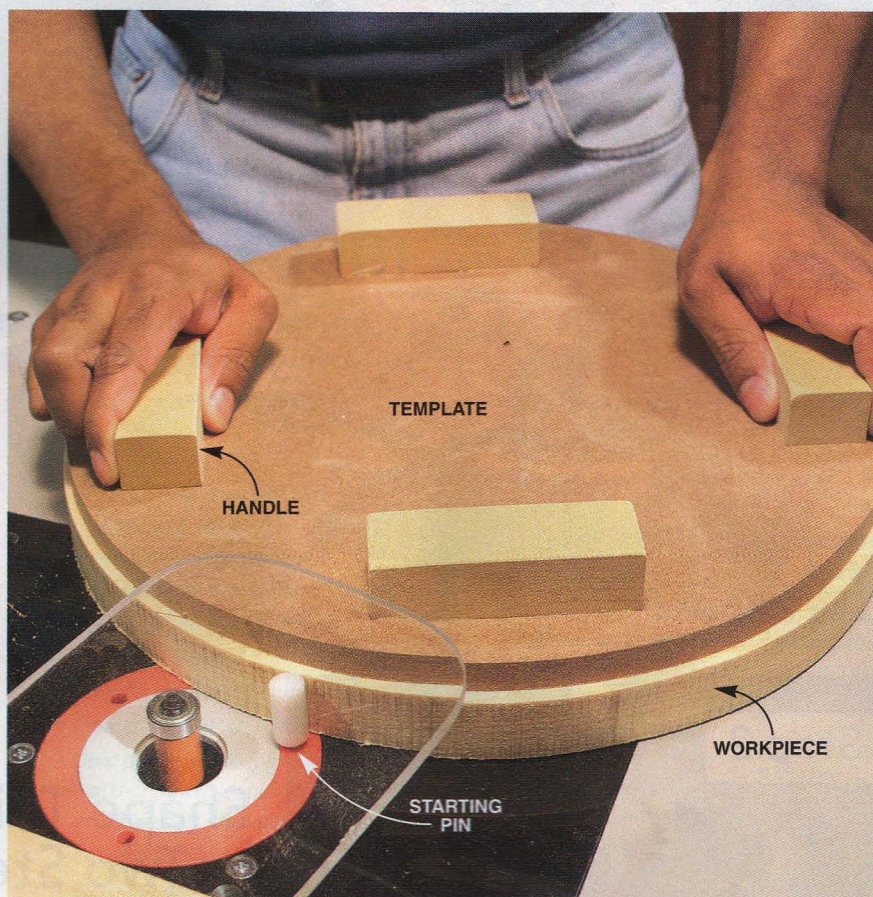
Secure it with Screws

Screws are a very secure way to attach a template. They do leave holes but that's not a problem if one side of the workpiece won't be seen, as in the case of this chair seat.

Use a Starting Pin for Safe Starts

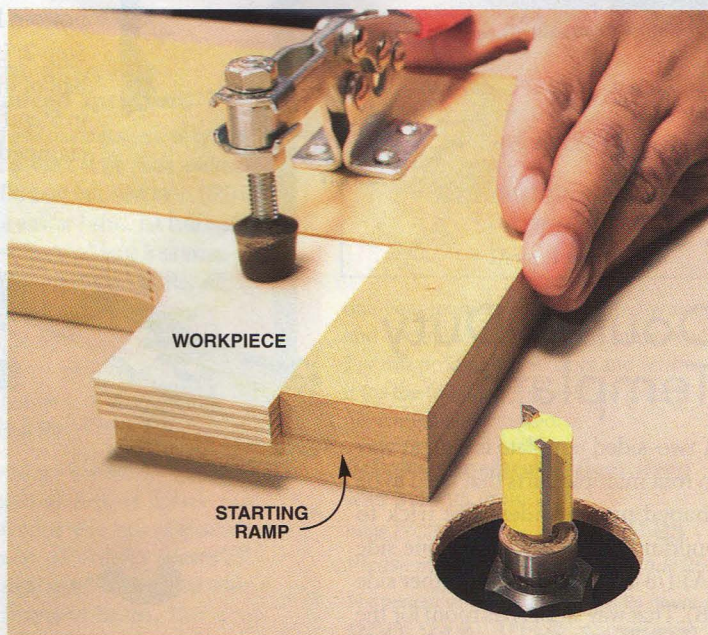
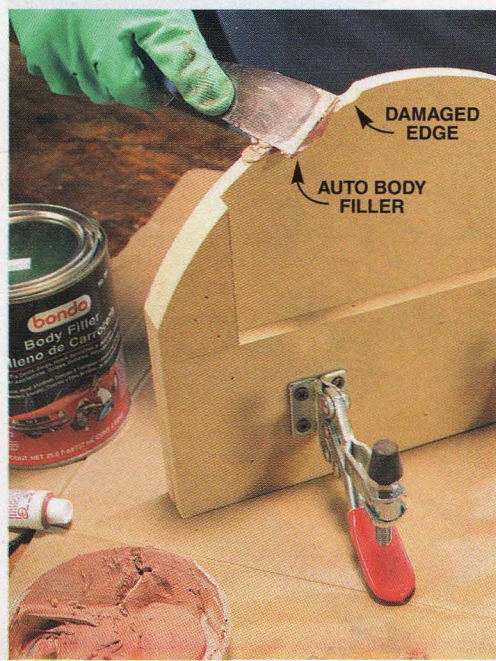
Use a starting pin with templates that require routing all the way around. This reduces the chance of kickback and gives you something to bear against, much like a fence does for straight cuts.

To use the starting pin, push your rough-cut workpiece against the pin and then slowly rotate the workpiece into the router bit until it starts cutting. When the bearing of the bit completely contacts the template, you can swing away from the starting pin. Rout around the workpiece in a counterclockwise direction. Keep a good grip on your workpiece while routing. Don't let go of the workpiece while it's in contact with the router bit or your project may turn into a high-speed flying object!



Oops!

Here's an easy fix if you accidentally put a gouge in your template with the router bit. Use auto body filler to repair the damage. Apply excess filler to the damaged area and after it's hardened, rasp and sand it to final shape.



Ramp-Up for Easier Starts

A starting ramp provides a safe place for the router bit to contact the template before it starts cutting. A ramp eliminates the need for a starting pin, so build a ramp into your jigs whenever possible. An exit ramp on the other side of the template provides the same advantage at the end of the cut.

Step 1

PATTERN BIT

Step 2

FLUSH TRIM BIT

Shape Thick Parts in Two Steps

Step 1: Use a top-bearing pattern bit and template-route the bottom half of the thick part.

Step 2: Use a bottom-bearing flush-trim bit to rout the top half of the thick part. The bearing rides on the surface created in Step 1. The thick part is removed from the template jig and clamped to the table for this step.

Double-Duty Template

A two-sided template is a great way to rout multiple parts that need to be shaped on two sides. The trick to building the jig is to make one side (A) 1/8-in. wider than the other side (B). That way side A has room for the rough-cut inner edge of the workpiece. Side B is made to final width.

Before using the template, band-saw the workpieces oversize by about 1/8 in. on each side. Then clamp one workpiece in side A and make the first pass. Next move that part to side B and rout the second side. **AW**

ROUGH-CUT EDGE

ROUT FIRST

ROUT SECOND

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The Balanced Spectrum™ floor lamp will change the way you see and feel about your living or work spaces. Studies show that sunshine can lift your mood and your energy levels, but as we all know the sun, unfortunately, does not always shine. So to bring the benefits of natural daylight indoors, use the floor lamp that simulates the full spectrum of daylight. You will see with more clarity and enjoyment as this lamp provides sharp visibility for close tasks and reduces eyestrain.

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- See with clarity and enjoyment
- Creates natural, glare-free light
- Dual position switch for 27 and 18 watts of power is equivalent to 150 and 100-watt incandescent bulb
- Provides sharp visibility
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What's the difference with Balanced Spectrum™?

The value of a light source is measured by how well it renders all colors of the visible spectrum without bias. The Color Rendering Index (CRI) is measured on a scale of 1–100. The bulb used in the Balanced Spectrum™ lamp is an exceptional light source with a CRI of 84. This will provide better vision and energy savings through a full spectrum of light with a brighter bluish tint verses the same area lit by lighting with more of an orange or reddish tint.

Height as shown: 50"

We've looked at lots of lights, but this one offered the benefit of dual light levels of 27 and 18 watts of power equivalent to 150 and 100-watt incandescent bulbs. This lamp has a flexible gooseneck design for maximum efficiency, with an "Instant On" switch that is flicker-free. The high-tech electronics, user-friendly design, and bulb that lasts five times longer than an ordinary bulb make this product a must-have.

Try the Balanced Spectrum™ floor lamp with this special offer! Due to our overwhelming customer response, TechnoScout can offer this fantastic floor lamp for under a \$100. The Balanced Spectrum™ floor lamp also comes with a



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This light can change the way you live and work

As a commercial photographer, I probably give more attention to lighting than most people and therefore was impressed with the smooth, soft daylight quality of your lamp.

Dennis M.
Richmond, VA

I sit in my comfortable chair after my husband has gone to bed, and I turn that lamp on. It makes it so nice because it's like daylight over my chair...I don't get sore eyes like I used to.

Grace A.
Margate, FL

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Stowaway BENCH

This country-style bench will cut the clutter by the door and serve as a resting spot to put on your shoes. The lid opens up to reveal a handy storage area. At only 11-in. wide by 44-in. long, it neatly fits in an entryway or mudroom. And it's simple enough to be a good weekend project.

Tools and Materials

You'll need a tablesaw, dado blade, jig-saw, router and beading bit. We used 15 lineal ft. of 1x12 Douglas fir dimensional lumber (see Sources, page 78). Dimensional lumber comes planed on all four surfaces and measures 3/4-in. thick by 11-1/4-in. wide. This is wide enough for the widest parts, so there is no edge gluing of boards required for this project. The Douglas fir lumber costs approximately \$100.

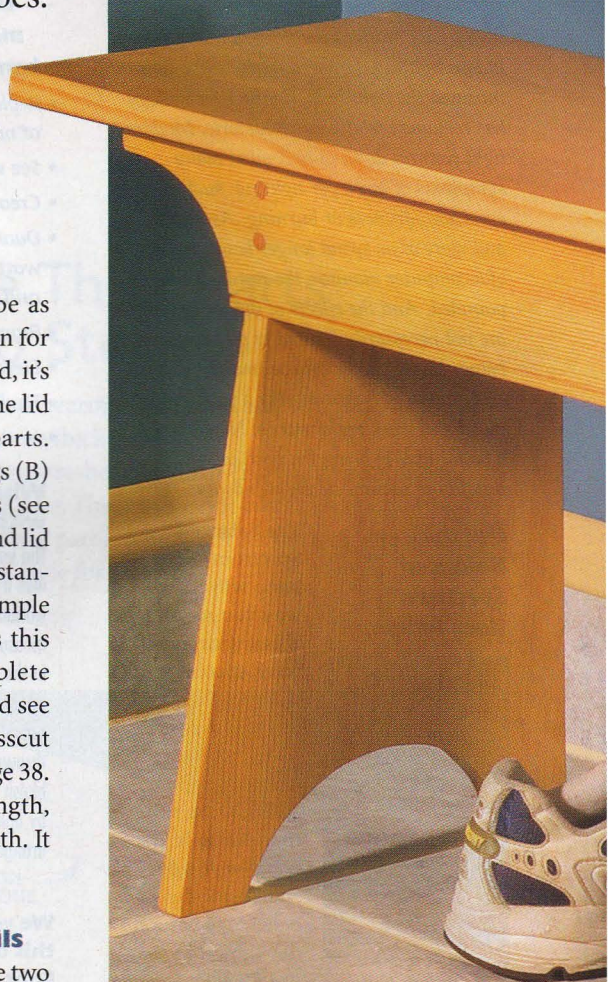
Cut the Parts

It's important that the lid (A) be as flat as possible. Since it's common for wide boards to be slightly warped, it's best to pick the flattest one for the lid before cutting out any other parts. Then rip and crosscut the lid, legs (B) and rails (C) to final dimensions (see Cutting List, page 78). The legs and lid are too wide to crosscut with a standard tablesaw miter gauge. A simple shop-made crosscut sled solves this problem (Photo 1). For complete details on building a crosscut sled see "The Ultimate Shop-Built Crosscut Sled," AW #75, October 1999, page 38. Cut the bottom (D) to final length, but leave it 1-in. oversize in width. It will be custom fit later on.

Shape the Legs and Rails

Start by cutting the dadoes in the two legs (Photo 2 and Figs. A and B). Then cut the notches in the upper corners of the legs. This is a three-step process. First, make two vertical cuts in each leg (Photo 3). Most tablesaws will not be able to cut the full 3-1/2-in. depth that's required for this cut. This is not a problem and has the benefit of preventing the scrap from falling out during the final cuts.

text continued on page 75



by Jon Stumbras

This bench will fit
in any entryway,
and store your
umbrella and
gloves too!



Fig. A Exploded View

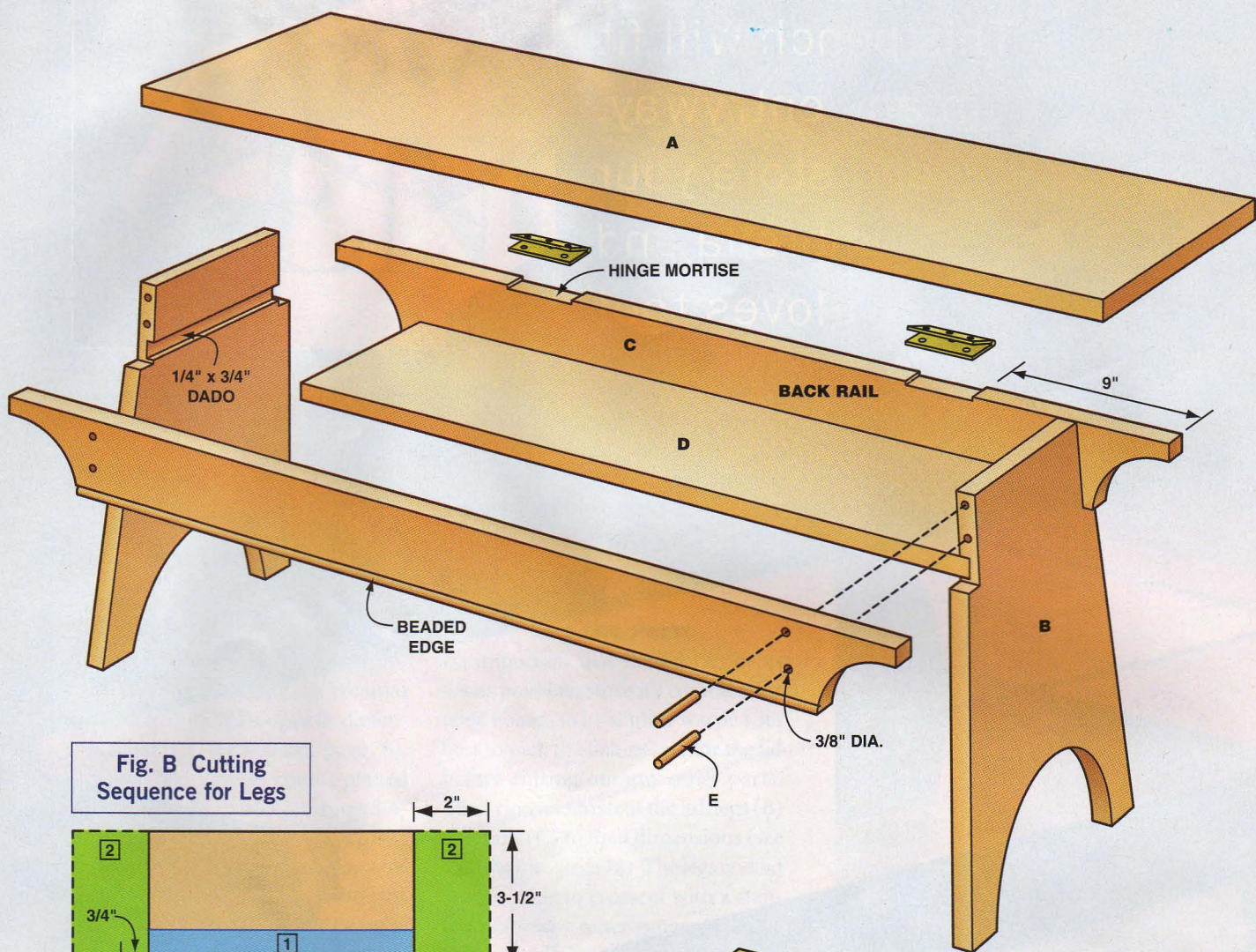
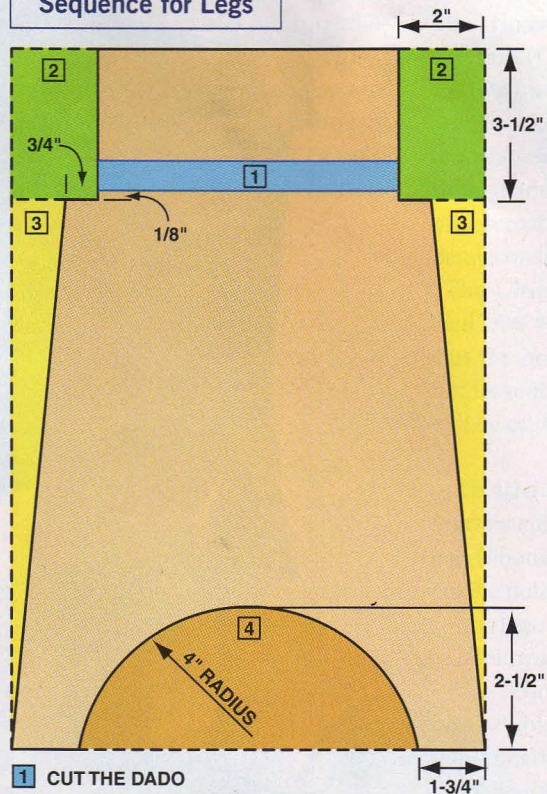


Fig. B Cutting Sequence for Legs



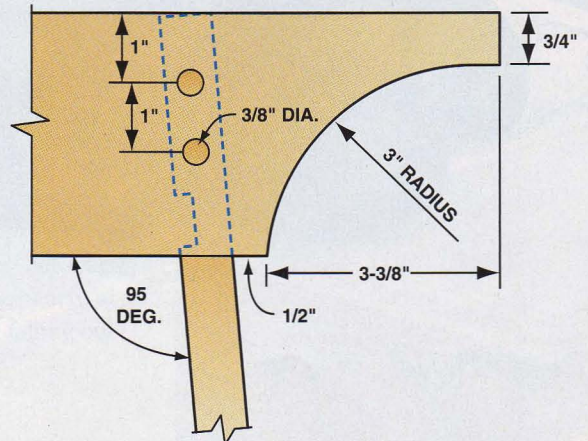
- 1 CUT THE DADO
- 2 CUT THE NOTCHES
- 3 CUT THE ANGLED SIDES
- 4 CUT THE ARC

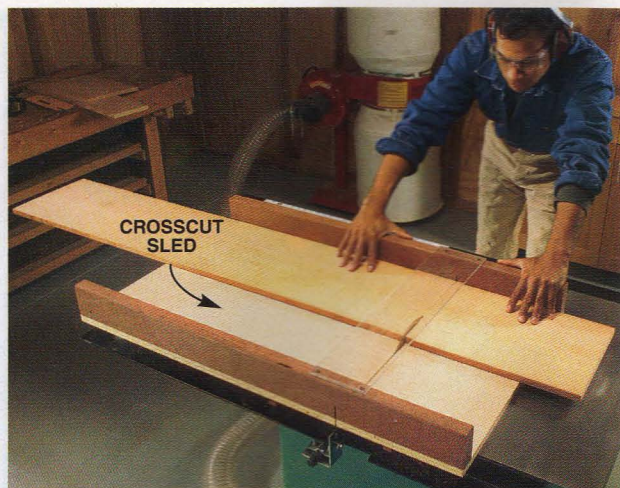
Fig. D Hinge Detail



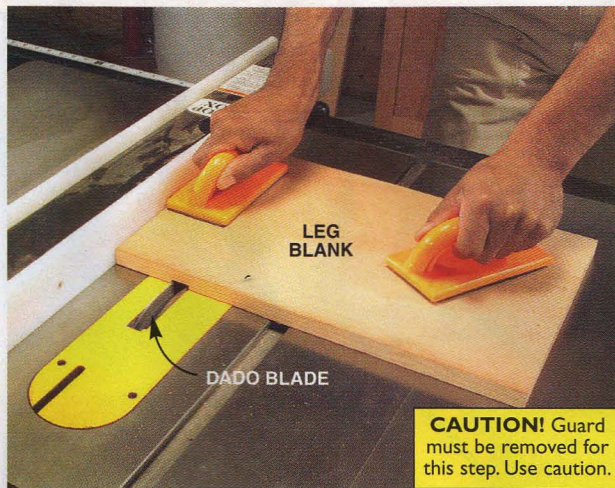
Measure hinge thickness with hinge closed. Cut the hinge mortises in the back rail to this depth.

Fig. C Rail Detail

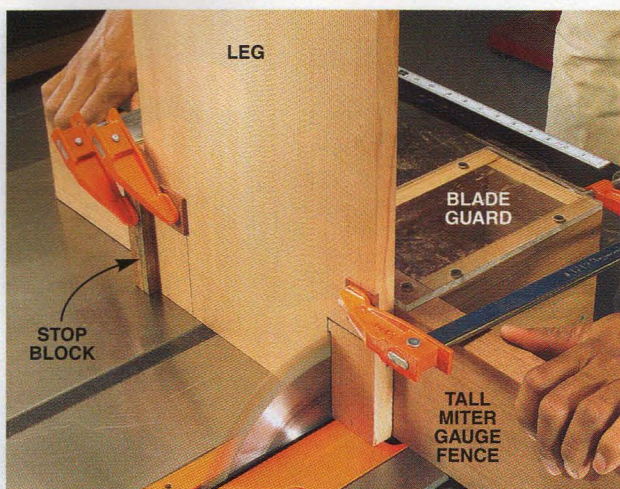




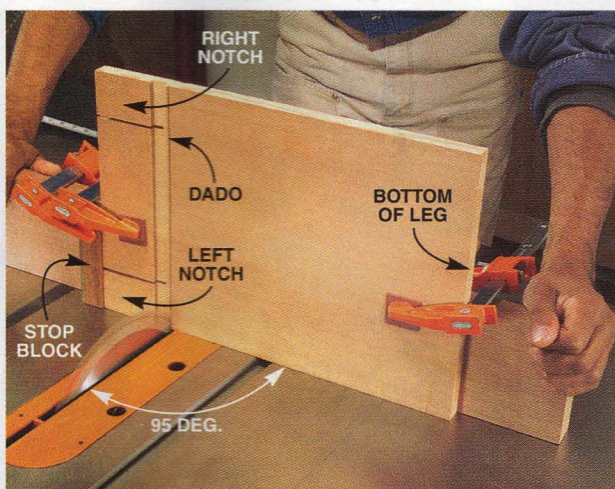
1 Cut the lid and legs using a crosscut sled because it's difficult to safely and accurately cut such wide boards with a standard miter gauge.



2 Cut the dados in the legs for the bottom of the storage compartment.



3 A vertical cut is the first step in cutting the notches in the legs. Set the miter gauge at 90 degrees and the blade to its maximum height. Your saw may not be able to cut the full 3-1/2 in. that's required for this cut, but that's a good thing because the uncut part will keep the scrap from falling out in the next step. Use a tall fence on the miter gauge to support the leg and a stop block on one end to ensure identical cuts on both legs.



4 Crosscut the side of the left notch with the miter gauge set at 95 degrees away from the left side of the blade. Clamp the leg to the tall fence with the dado facing toward the blade and with the bottom end of the leg positioned as shown. Make this cut for the left-side notch on both legs. **Do not cut the right-side notch with this setup!**

text continued from page 72

Second, set the miter gauge 95 degrees to the left of the blade and crosscut the left-hand notches (when facing the dado) on each leg (Photo 4).

Third, set the miter gauge 95 degrees to the right and crosscut the right-hand notches (Photo 5). Break off the waste with your hand, and clean up the remaining wood with a chisel (Photo 6). Now test fit the rails into the notches. The tops of the rails and the tops of the legs should be flush. If

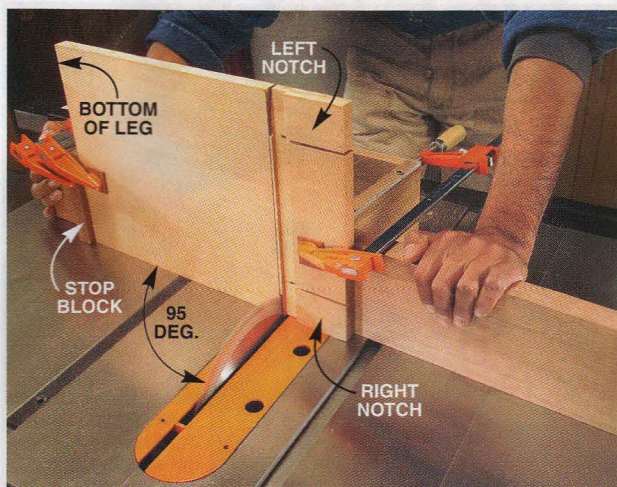
either is proud, trim it flush. Next, cut the angle on the sides of the legs (Fig. B) with a jigsaw and smooth the cut with a hand plane or sanding block.

The arcs at the bottom of the legs come next. Start by drawing a 4-in.-radius circle on a piece of cardboard. Cut it out and use it as a template. Position it according to the dimensions in Fig. B and draw the arc. Then cut the arc out of the leg with a jigsaw. Clean up the rough edges with sandpaper.

Next, rout the bead on the bottom edge of the rails (Photo 7). A beading bit creates this classic profile (see Sources, page 78).

Then draw the arc at the ends of the rails using a cardboard circle template and saw out each arc (Photo 8). Clean up the rough edges as you did before.

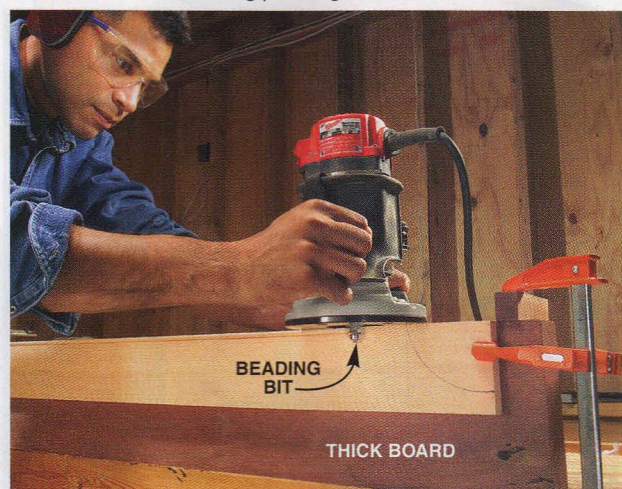
Next, cut mortises for the hinges in the back rail. The depth of the mortise should equal the thickness of the hinge (Fig. D). Mark the locations of the



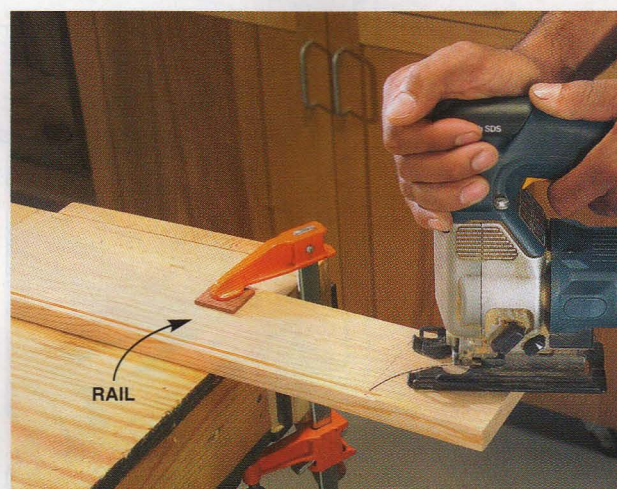
5 Crosscut the right notch with the miter gauge set at 95 degrees away from the right side of the blade. Again, clamp the leg to the tall fence with the dado facing toward the blade and with the bottom end of the leg pointing as shown.



6 Clean up the remaining wood inside the corner of the notch that is left after you break off the waste piece by hand. A sharp chisel makes quick work of this task.



7 Rout a bead along the bottom of the rails. Clamp the rail to a thick board. This provides a wide surface on which to balance the router.



8 Cut the curves on the ends of the rails and sand them smooth.



BEADING BIT

Assemble the Parts

Begin by building an assembly jig to hold the legs upright during the glue-up (Photo 11). A 2x4 sheet of plywood works fine for the base and some scrap 2x2 material is all that's needed for the supports. Rip the edge of the 2x2 lumber on the tablesaw with the blade set at a 5-degree angle. Then crosscut it so you get four 12-in.-long pieces. Orient the supports so they hold the legs angled toward each

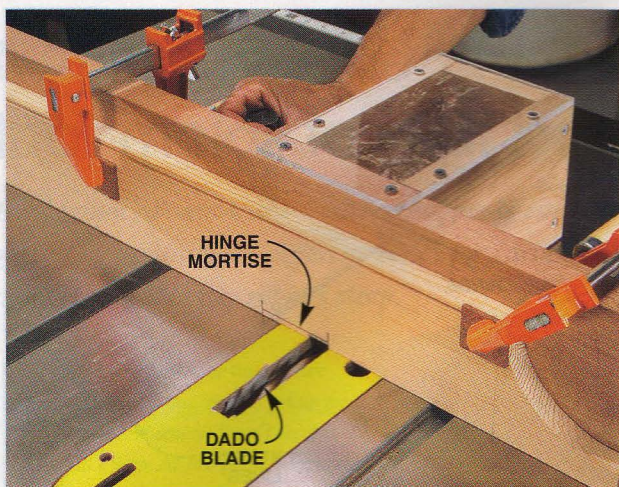
other. Double-faced tape works well to fasten the four angled scraps to the plywood. Position the supports so the bottom inside edges of the legs are 32-1/2 in. apart. The sides are now held at the right distance from each other, angled at 5 degrees, and with no hands! Dry-fit the rails in the leg notches to make sure they extend by 1/2-in. at the ends (Fig C). Adjust the 2x2 supports if needed.

Sand all the parts before gluing. Start with 150 grit and work your way up to 320 grit if you plan to use an oil

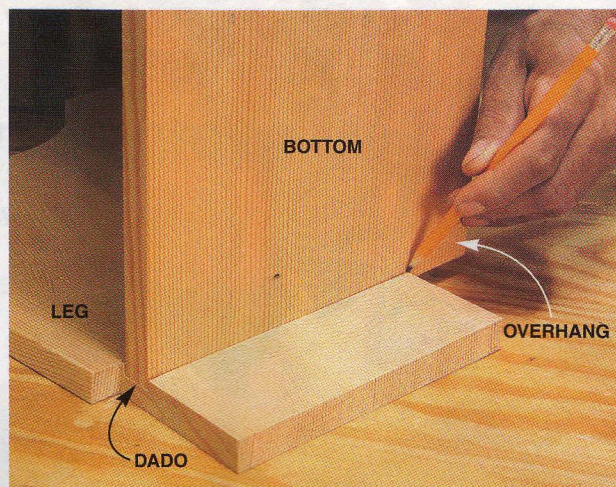
hinges (Fig. A) and use the tablesaw and a dado blade to remove the waste (Photo 9). Test fit the hinges in the mortises and drill pilot holes for the screws.

Custom Fit the Bottom.

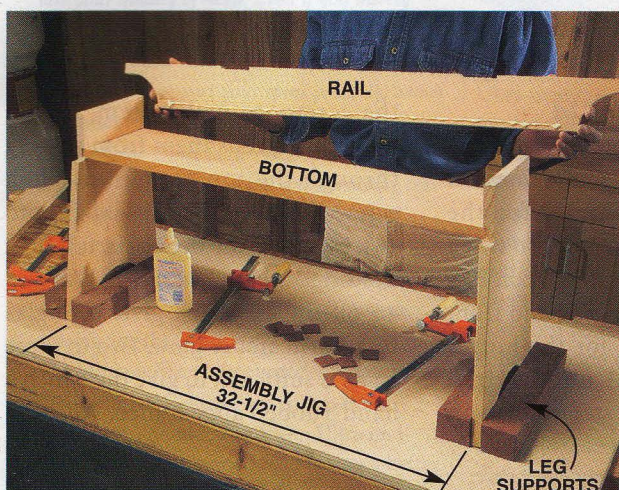
The bottom needs to be exactly the same width as the length of the dado in the legs (Fig. A). Place the oversized bottom in the dado, flush-up the edge of the bottom with the dado on one side and mark the exact width on the other side (Photo 10). Now cut the bottom to final width.



9 Cut mortises in the back rail for the hinges. Use a dado blade and make multiple passes. Clamping the rail to the fence ensures accuracy and prevents the rail from slipping.



10 Custom fit the bottom. Insert the bottom in the leg dado so it's flush on one side and overhangs on the other. Mark the overhang and saw it off. The bottom needs to be exactly as wide as the dado is long.



11 Glue the bottom and rails to the legs. A shop-made jig simplifies the glue-up process. Wood scraps cut at a 5-degree angle support the legs. It's like having two shop assistants to help you.



12 Add clamps to hold the parts together. One clamp across the top will hold the bottom in the leg dados. Clamps along the lower edge of the rails and at the ends will hold the rails in place. Use little blocks of wood as clamping pads to prevent the clamps from marring the bench.

finish. You can stop at 180 grit if you plan to use varnish. Also round over any sharp edges on the lid or legs that will be exposed after final assembly.

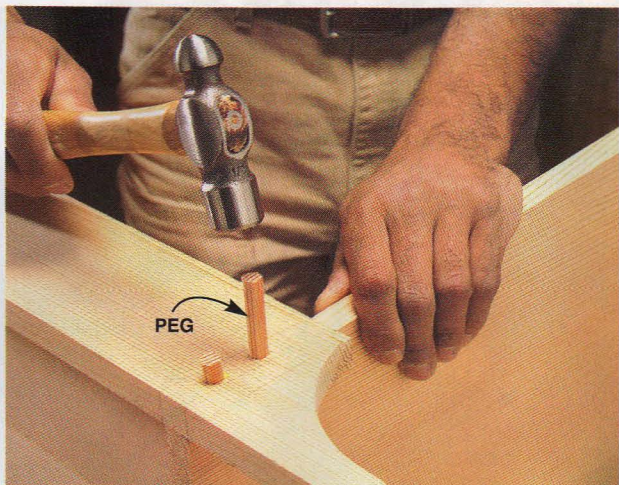
To assemble, start by gluing the bottom into the leg dados. You'll notice that the dados are at a slight angle because the legs are angled in (Fig. C). It's nothing to be concerned about and the bottom will still fit fine. Clamp across the top of the legs to pull the bottom securely into the dados. Apply glue to the rails and set them in place. Clamp along the bottom of the rails and at the

ends (Photo 12). Clean up glue squeeze-out with a putty knife after the glue becomes semi-dry. Then let the bench sit until the glue has completely dried.

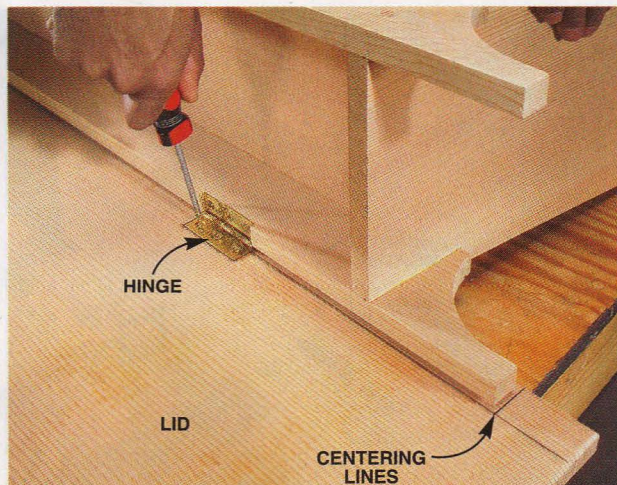
Peg the Rails to the Legs

When the glue is dry, remove the clamps and drill the holes for the pegs (E) that help hold the rails to the legs (Figs. A and C). Drill the holes 1-3/4-in. deep. Store-bought 3/8-in. dowel rod will work fine for the pegs but making your own from the same wood as the bench adds a nice touch.

To make your own pegs, rip some scraps into 3/8-in. x 3/8-in. square strips and round them with a rasp or chisel. Next, cut the strips into 2-in. lengths. Slightly taper one end of the pegs to make them easier to drive in. Then use a small dowel or stick to smear glue inside the peg hole. Insert the peg and tap it in with a hammer (Photo 13). Trim off the remaining dowel with a handsaw and sand it flush. Be careful you don't damage the rail when trimming the dowels. See Oops!, page 78, for a tip on how to avoid this.

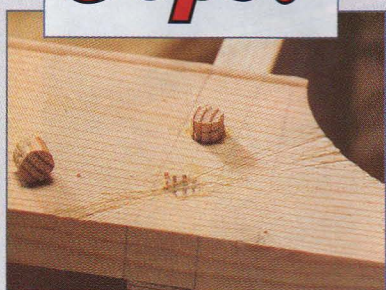


13 Glue and tap the pegs into predrilled holes in the rails and legs. Taper the ends of the peg with a chisel or rasp to make driving the pegs in easier. Cut off the waste with a handsaw and sand the pegs flush with the rail.

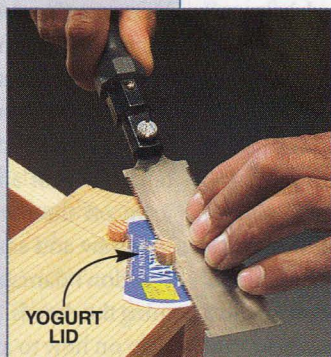


14 Attach the hinges to the back rail first and then to the underside of the lid. The hinges should be located so the lid sits centered on top of the bench.

Oops!



It happens. While on the home-stretch, disaster strikes to prolong the project. In this case the teeth from my saw dug into the wood while I was cutting the dowels flush with the rails. Sanding out the scratches wasn't a big deal, but to prevent it from happening on the other dowels I used a cut-out yogurt lid with a hole in the middle to protect the wood while sawing. A piece of cardboard or a playing card will also work. I cut the rest of the dowels worry-free and it was a breeze to sand off the small amount of dowel that remained.



Hinge the Lid

Screw the hinges into mortises in the back rail. Then mark lines on the underside of the lid for the hinges. Position these lines so when the lid is attached to the bench it is centered from side to side and front to back. Drill holes for the hinges screws. Be careful not to drill through the lid. Now snip the tips off

the screws to make them 5/8-in. long. This keeps them from poking through the top of the lid. Then screw the hinges to the lid (Photo 14). Now give the bench parts a final sanding and apply a finish. We used an oil finish, which gives Douglas fir a warm amber glow. Two to three coats is sufficient to give the bench a hand-rubbed appearance. **AW**

Sources

Woodcraft Supply, (800) 225 1153 www.woodcraft.com
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Cutting List

Overall Dimensions: 17"H x 44"W x 11"D

Part	Name	Qty.	Dimensions
A	Lid	1	3/4" x 11" x 44"
B	Legs	2	3/4" x 11" x 16-1/4"
C	Rails	2	3/4" x 3-1/2" x 39-3/4"
D	Bottom	1	3/4" x 7" x 30-3/4"
E	Pegs	8	3/8" x 1-3/4"

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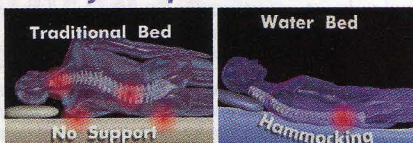
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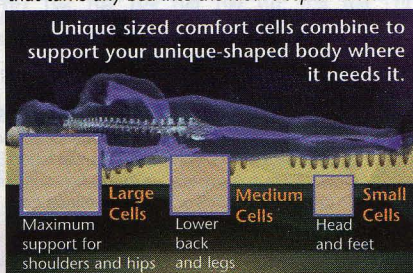
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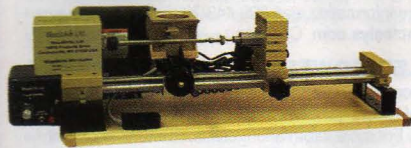
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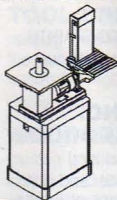
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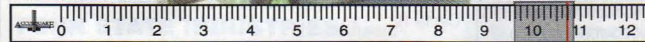
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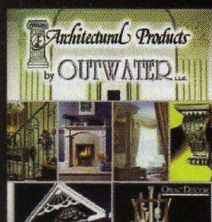


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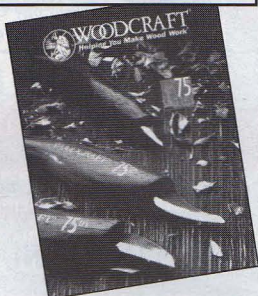
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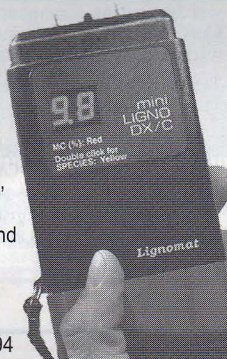
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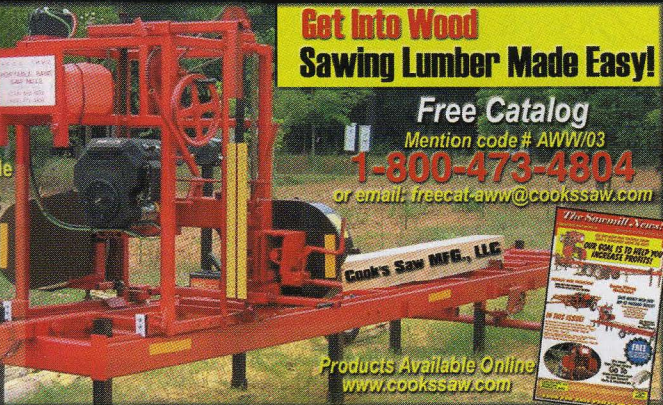
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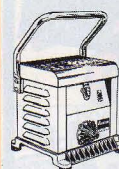
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TYPE OF TOOL	BUYING BASICS	TOOL TEST	SPEC CHART
Bandsaw	Buying Basics	Tool Test	Spec Chart
Cordless Drill	Buying Basics	Tool Test	Spec Chart
Dado Blades	Buying Basics	Tool Test	Spec Chart
Dovetail Jig	Buying Basics	Tool Test	Spec Chart
Drill Press	Buying Basics	Tool Test	Spec Chart
Drum Sander	Buying Basics	Tool Test	Spec Chart
Dust Collector	Buying Basics	Tool Test	Spec Chart
HVLP Sprayers	Buying Basics	Tool Test	Spec Chart
Jointer	Buying Basics	Tool Test	Spec Chart
Lathe	Buying Basics	Tool Test	Spec Chart
Mini-Lathes	Buying Basics	Tool Test	Spec Chart
Miter Gauges	Buying Basics	Tool Test	Spec Chart
Miter Saw	Buying Basics	Tool Test	Spec Chart
Moisture Meters	Buying Basics	Tool Test	Spec Chart
Mortiser	Buying Basics	Tool Test	Spec Chart
Planer	Buying Basics	Tool Test	Spec Chart
Plate Joiner	Buying Basics	Tool Test	Spec Chart
Portable Sander	Buying Basics	Tool Test	Spec Chart
Router	Buying Basics	Tool Test	Spec Chart
Router Tables	Buying Basics	Tool Test	Spec Chart
Scrollsaw	Buying Basics	Tool Test	Spec Chart
Sharpening Machines	Buying Basics	Tool Test	Spec Chart
Shop Vacuums	Buying Basics	Tool Test	Spec Chart
Spindle Sanders	Buying Basics	Tool Test	Spec Chart
Tablesaw	Buying Basics	Tool Test	Spec Chart

With a click of your mouse, download hundreds of pages of great tool buying advice, **TOTALLY FREE!** Just log on to www.americanwoodworker.com and discover our new Online Tool Buyer's Guide. You'll find:

Brand & Model	List Price	Speed (rpm)	Motor HP	Chuck Size (in.)	Comments & Features
Bridgman M4.11	229	None	1/2 HP	3/4"	Right-hand only
Contract Machinery 3570	144, 348, 102	1/2 HP 2.3A @ 110V	3,595	Both sides	
Contract Machinery 3700S	160	1/4, 3/4, 1 1/2 HP 2.3A @ 110V	3,595	Both sides	
Chicago Electric 45007	180	None	1/2 HP 2.3A @ 110V	3,595	
Craftsman 21906	199	3/8	1/2 HP 2.3A @ 110V	1,725	Both sides
Delta 14-651	144, 516, 348, 102	1/2 HP 5A @ 120V	1,725	Both sides	Cast iron base, fence 37" tall
Delta 14M505	144, 516, 348, 102	1/2 HP 5A @ 120V	1,725	Both sides	
Festool (BTR) 44582	250	None	1/2 HP	1,725	Both sides
General Int'l. 75-250 M1	350	1/4, 5/16, 3/8, 1/2	1/2 HP	1,725	
Jet JMS-5	239	1/2	1/2 HP	1,725	Both sides
Metabo PM105P	739	1/2	1/2 HP	3,470	Both sides
Multico PM200	1209	None	1/2 HP	3,470	Both sides
Multico PM202	1995	3/16, 1/2	1/2 HP	3,470	Both sides
Multico PM112	540	1/2	1/2 HP 5A @ 110V	3,470	Both sides
Record RW475	None	3/4 HP	3,490		
Skil S100	265	1/2	3/4 HP	3,490	Both sides
Woodes 876	240	None	1/2 HP 5A @ 110V	1,725	Right-hand only
Woodes 880	389	None	1/2 HP	1,725	

Specifications Charts

We've compiled data on hundreds of tools. These charts have current listings of prices, specifications and features—just what you need to comparison shop. You'll find more tools, more specs, more details here than anywhere else on the Web.

How to Buy a Tablesaw

A reliable accurate tablesaw is essential in a well-equipped woodworking shop.

The Family

These portable saws with small tables are best suited for occasional use or jobs that require a portable saw. They are usually powered by a 120V AC motor and have a maximum cutting depth of 3/4" to 1 1/4". They are usually powered by a 120V AC motor and have a maximum cutting depth of 3/4" to 1 1/4". They are usually powered by a 120V AC motor and have a maximum cutting depth of 3/4" to 1 1/4".

Customer's View

These portable saws with small tables are best suited for occasional use or jobs that require a portable saw. They are usually powered by a 120V AC motor and have a maximum cutting depth of 3/4" to 1 1/4". They are usually powered by a 120V AC motor and have a maximum cutting depth of 3/4" to 1 1/4". They are usually powered by a 120V AC motor and have a maximum cutting depth of 3/4" to 1 1/4".

Buying Basics

If you're unfamiliar with the tool, you can download general buying advice that will acquaint you with the different types of tools in the field, how suitable they are to different kinds of work, how big they are and how expensive. This will help you make sure the tool you buy is the best one for you.

How to Buy a Cordless Drill

The cordless drill is a versatile tool that can be used for a wide variety of tasks. It is a must-have tool for any DIYer or professional woodworker.

Key Features:

- Power:** The power of a cordless drill is measured in foot-pounds (ft-lb). A good cordless drill should have at least 10 ft-lb of power.
- Speed:** The speed of a cordless drill is measured in revolutions per minute (RPM). A good cordless drill should have at least 1,000 RPM.
- Chuck:** The chuck is the part of the drill that holds the bit. It should be able to hold bits of various sizes.
- Handle:** The handle should be comfortable to hold and easy to grip.
- Weight:** The weight of a cordless drill should be light enough to use for extended periods of time.

How to Buy a Mid-Size Cordless Drill

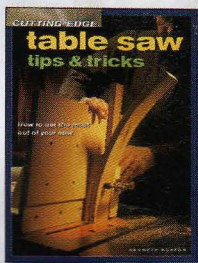
The mid-size cordless drill is a more powerful tool than the standard cordless drill. It is used for more demanding tasks such as drilling into metal or concrete.

Key Features:

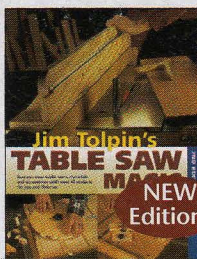
- Power:** The power of a mid-size cordless drill is measured in foot-pounds (ft-lb). A good mid-size cordless drill should have at least 20 ft-lb of power.
- Speed:** The speed of a mid-size cordless drill is measured in revolutions per minute (RPM). A good mid-size cordless drill should have at least 2,000 RPM.
- Chuck:** The chuck should be able to hold bits of various sizes.
- Handle:** The handle should be comfortable to hold and easy to grip.
- Weight:** The weight of a mid-size cordless drill should be light enough to use for extended periods of time.

Complete Tool Tests

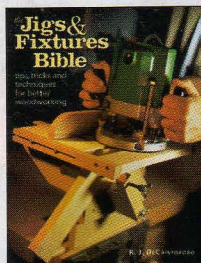
Click on these links, and you'll be able to download copies of *American Woodworker* Tool Tests, the most complete and detailed in the industry. Learn what features are really important, which tools have them, and which tools we recommend, either as an Editors' Choice or Best Buy.



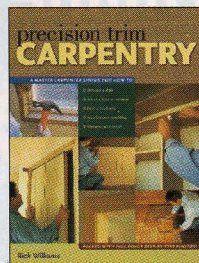
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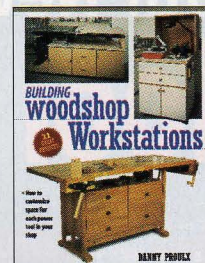
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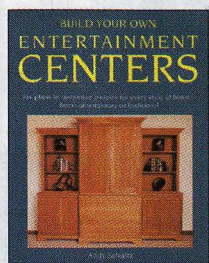
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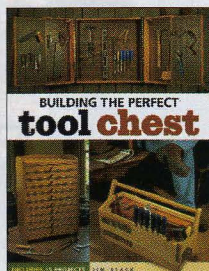
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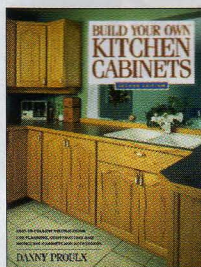
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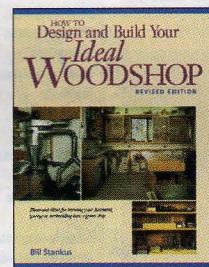
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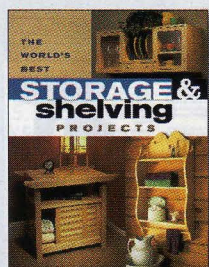
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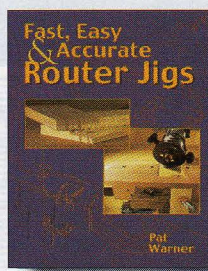
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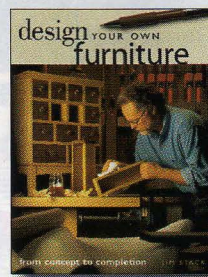
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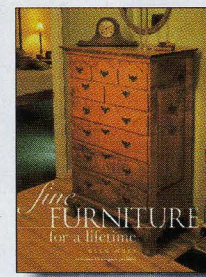
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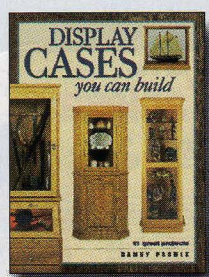
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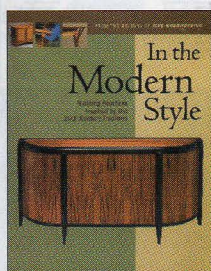
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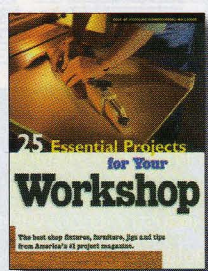
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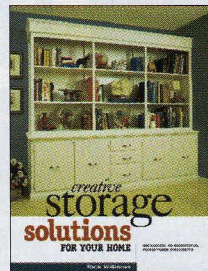
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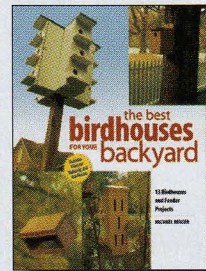
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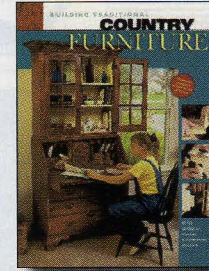
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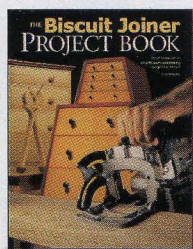


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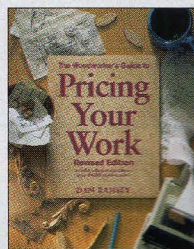


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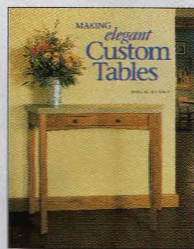
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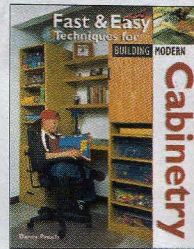
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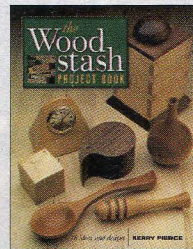
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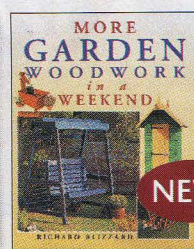
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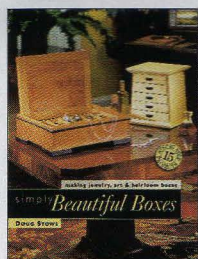
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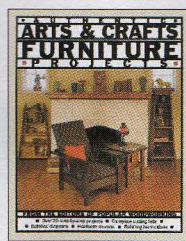
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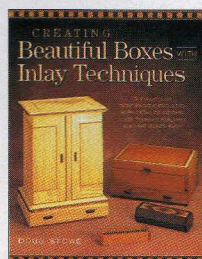
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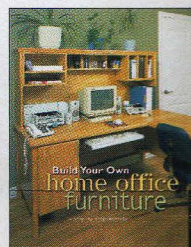
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Edited by Randy Johnson

Small Shop Tips

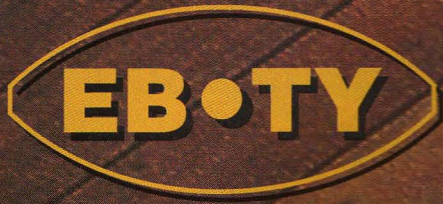


Swing-Out Plywood Storage

I was looking for a way to keep my small inventory of plywood organized and easy to access. The garage at my town house is small, but I did have a narrow space along one of the sidewalls next to the overhead door. After some head scratching I designed this swing-out storage unit. It fits the space perfectly and allows me to access any piece of plywood that I want because it works like a file folder.

I bought all the materials for it at my home center for around 75 bucks. The hinge is made out of 1-in. pipe parts and fastened to the end of the storage container with 1-1/4-in. pipe straps. The pipe is connected to the wall with pipe flanges. The unit rolls on four 3-in. non-swiveling casters.

Tim Reagan

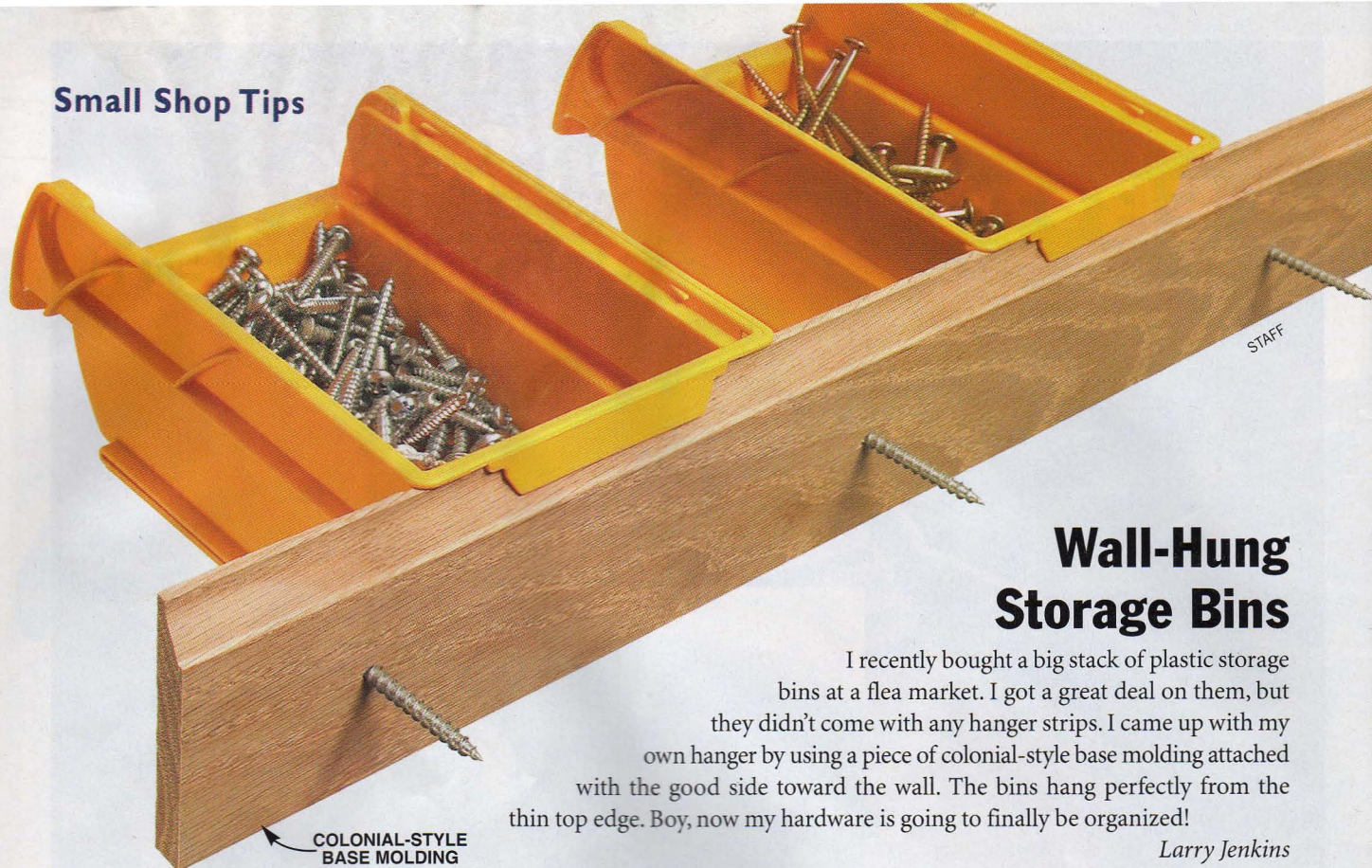


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I recently bought a big stack of plastic storage bins at a flea market. I got a great deal on them, but they didn't come with any hanger strips. I came up with my own hanger by using a piece of colonial-style base molding attached with the good side toward the wall. The bins hang perfectly from the thin top edge. Boy, now my hardware is going to finally be organized!

Larry Jenkins

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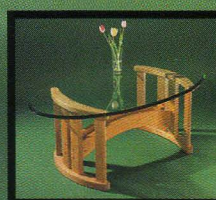
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No aiming, rotating or tuning.

XiumAir's new 83-channel technology combines an all-in-one device for receiving high-energy TV reception. Unlike most external antennas, the XiumAir doesn't have to be pointed in the direction of transmitters. That's the beauty of spilateral technology. You can mount the dish-like antenna indoors or outside (on your roof or a horizontal mast). The higher the elevation,

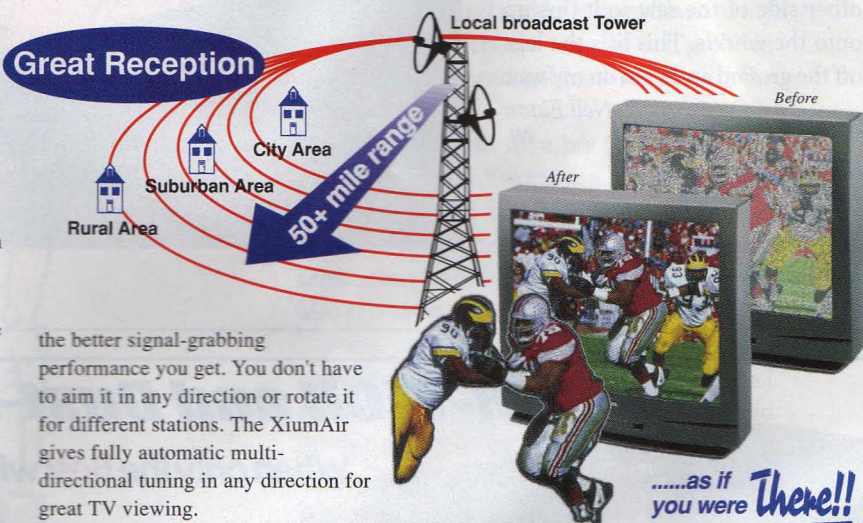
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No matter where you live, the Xium spilateral "dish" antenna will collect all of the signals available, from any direction without the need for rotating or tuning.



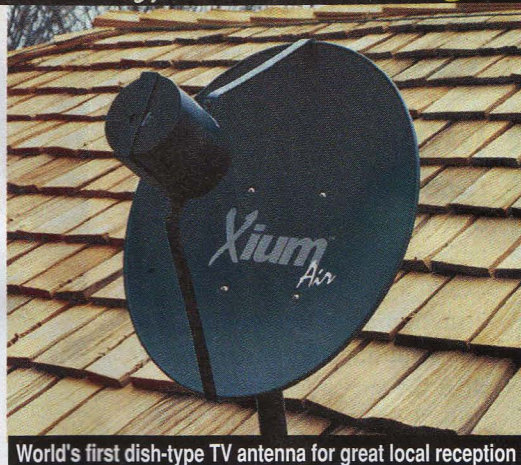
the better signal-grabbing performance you get. You don't have to aim it in any direction or rotate it for different stations. The XiumAir gives fully automatic multi-directional tuning in any direction for great TV viewing.

The versatile antenna with many uses.

If you have a DSS satellite system, the XiumAir is the ideal complement for receiving local channels without monthly fees. And when high definition broadcast TV arrives in a few years, you will be ready. Plus you can use the antenna now for AM / FM stereo, home-based CB systems, and shortwave radio. The XiumAir Antenna features compact, modern styling that will blend in with almost any decor. The UV-protected housing is made of impact-resistant copolymer, making the exterior resistant to weathering and color change. It includes a standard cable connector for any cable-ready hookup. The XiumAir Antenna delivers maximum local broadcast reception to any television, stereo or any other audio or video receiver, without the use of unsightly, ugly or 'wind damaged' antennas.

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Small Shop Tips

Two-Wheel Mobile Base

Here's my quick and cheap solution for making a contractor-style tablesaw mobile. I glued a piece of 2x4 to a 2x6 and added a pair of 2-in. non-swiveling casters. (For this setup they are easier to steer than the swiveling type.) Then I bolted the 2x6 portion of this assembly to the legs of my saw so the casters just touched the floor. To move the saw I lift up the on the other side of the saw so it tips up onto the wheels. This lifts the legs off the ground and I am on my way.

Neil Eaton
AW



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\$289.00

Model 750-ER



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Specifications

Motor.....	1.5 HP
Max CFM.....	1250
Fan.....	11"
Inlet Dia.....	1-5"/2-4"
Bag Capacity.....	42 gallons
Decibels.....	67-77
Electrical.....	110/220
↳ Switch Prewired for 110V	



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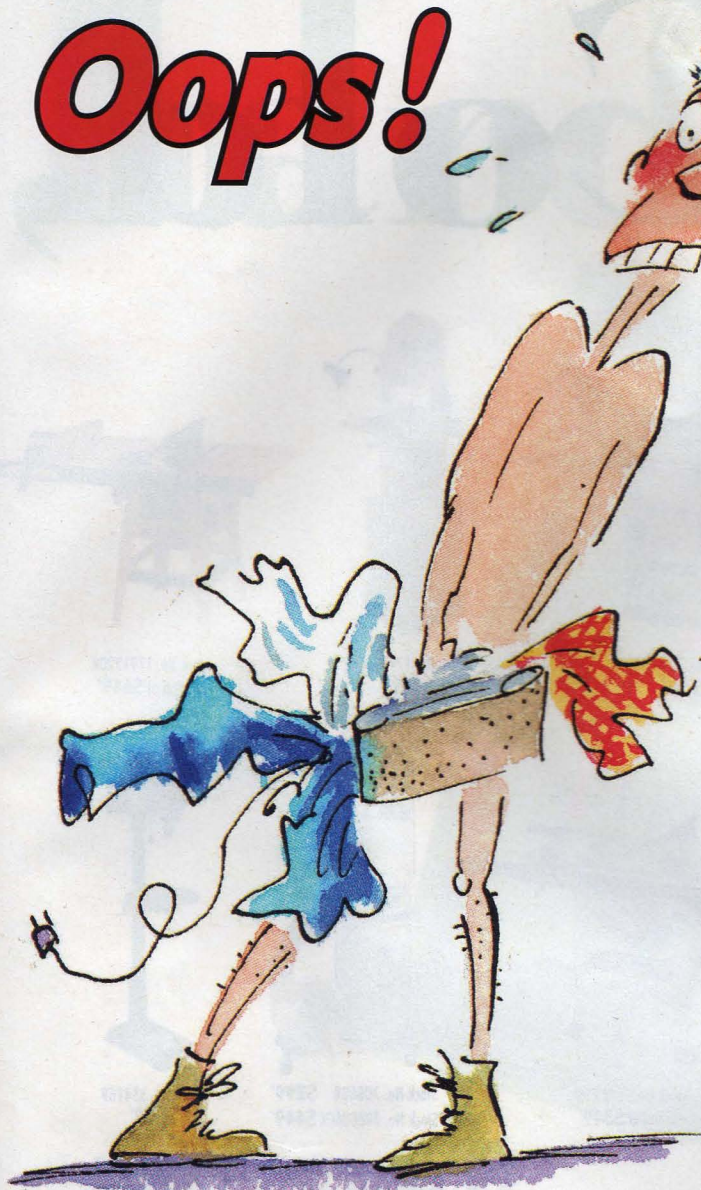


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Oops!

Edited by **Tim Johnson**



Sanding *au naturel*

I'm so handy, I thought as I flipped over the board I had just sanded *without* stopping my belt sander. I simply lifted the sander out of the way with one hand and let it drop down to my side. Unfortunately, the rotating belt grabbed my shop apron and gobbled it up until the motor stopped.

Things felt a little tight, but I thought I could extricate myself from the sander by removing the apron. Then I discovered my denim shorts were also caught up in the belt. When I tried to remove my shorts, I found my boxers were also captured in the mess.

Sooo, the only thing I could do was take everything off and go upstairs *au naturel*. As I sneaked past the living room, my wife looked up from her reading and said "I thought you were sanding, not stripping!" From now on I'll keep two hands on the belt sander until it stops.

Forrest Bennett

Unstable Table

Early in my career as a restorer of antiques I took in a very old antique tea table that needed some minor repairs. I quoted the owner \$60 to do what should have been a one-hour job. I glued and clamped the first loose joint, not realizing that the bar clamp I

used made the table top-heavy. A few minutes later, while working on another repair, I inadvertently bumped the clamped-up table, pushing one of its legs off the workbench.

I watched helplessly as the table went crashing to the floor,

its delicate scrollsawn gallery splintering into 200-year-old toothpicks. It took me nearly four days to repair the damage, but I got to be quite adept at scroll-sawing.

David Peters

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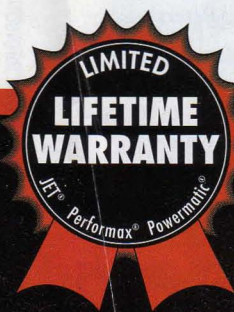
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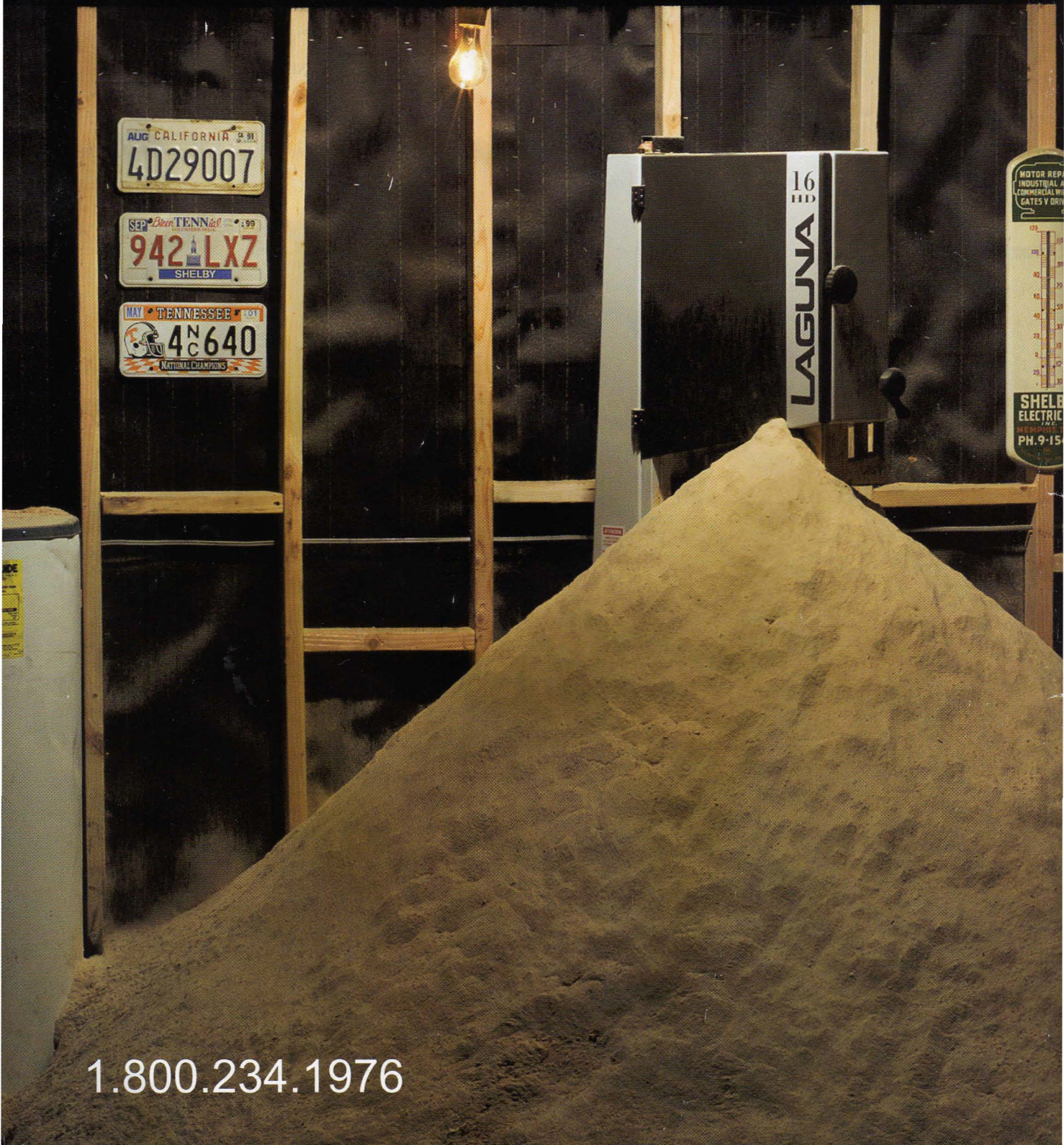
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