

TOOL TEST: 53 New Cordless Drills

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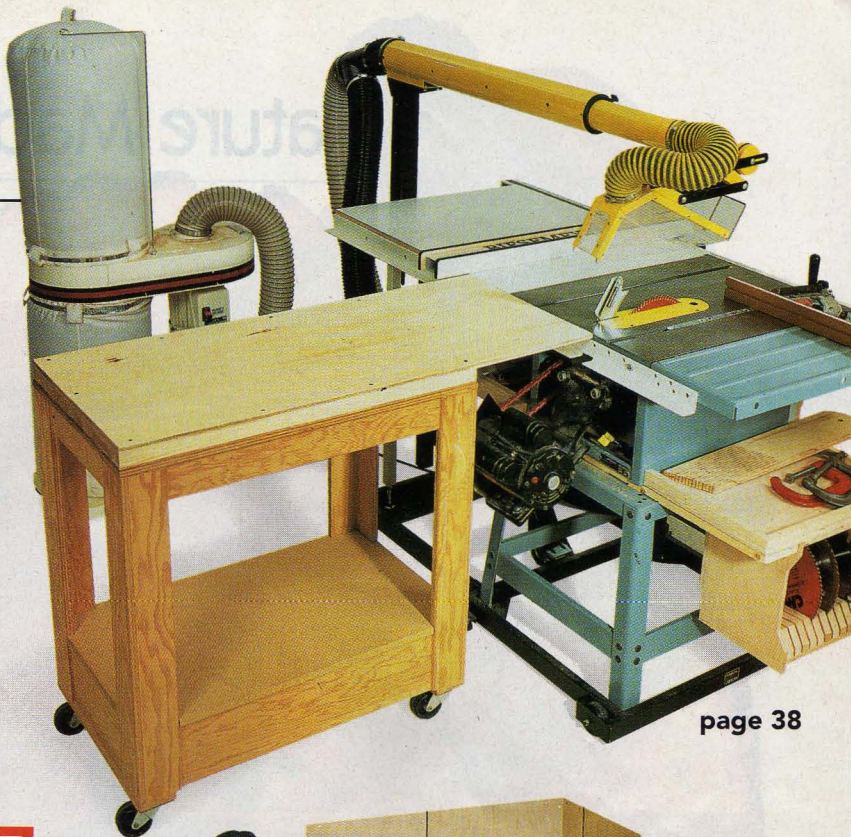
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Soup Up Your Shop! 38

Take your power tools and crank them up a notch. With these accessories, whether store-bought or shop-made, you'll get peak performance.



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Mid-Size Cordless Drills 47

Everyone remembers their first cordless drill, right? We brought more than 50 into our shop and ran them ragged. Find out who won Editors' Choice and Best Buy.

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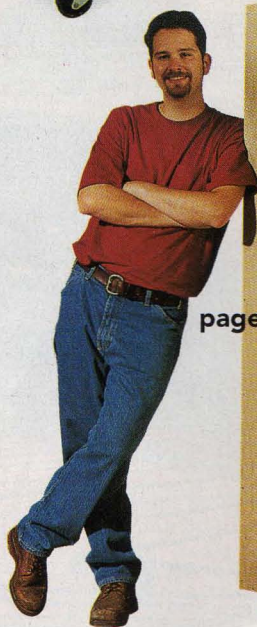
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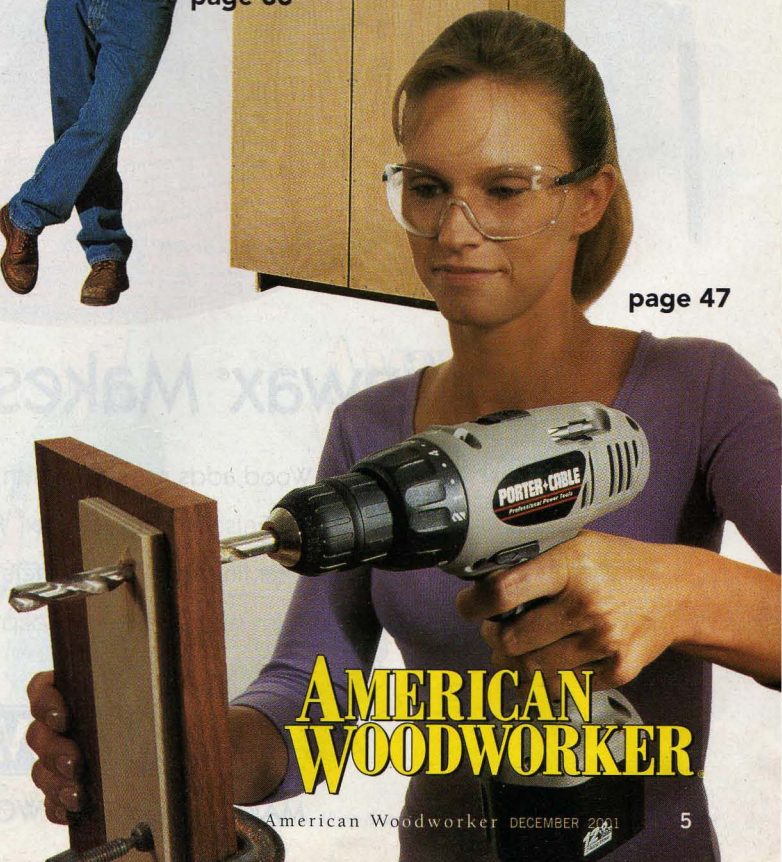


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Premium Resaw Bandsaw Blades 103

The blades we tested are the cream of the crop. If you want the best for resawing, check out our picks.



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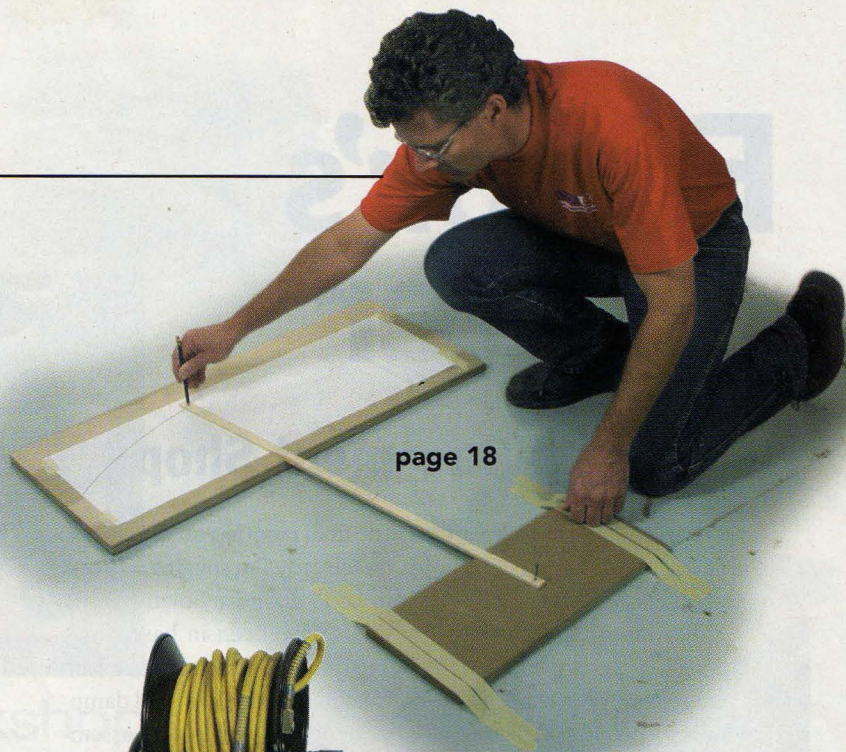
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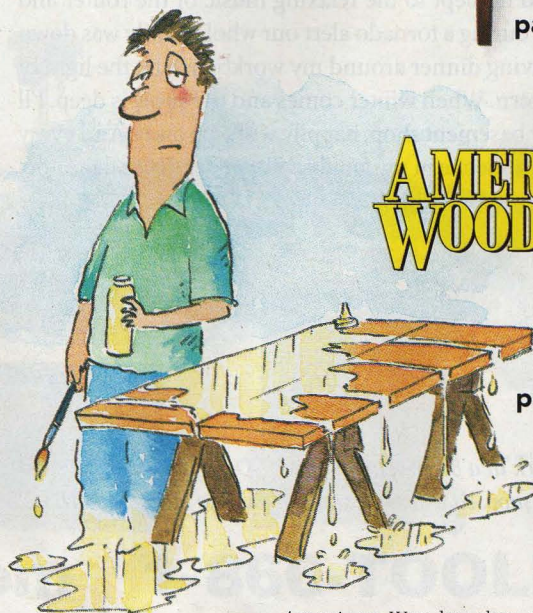
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Editor's Letter

Life in a Basement Shop

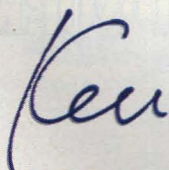
I've still got to rake leaves, do a little final painting on the garage, and a few other outdoor chores, but already I'm starting to think about getting down into the shop. And I do mean down.

For more than 20 years my shops have been in basements. And I've developed a love/hate relationship with subterranean woodworking. I've had water pouring in the windows, and dampness seeping through the walls. I've struggled with how to assemble tall cabinets when the ceiling is only 7-ft. tall. My first basement shop was the worst; the ceilings were so low, I had to dig a hole in the floor so I could stand my bandsaw up! I've struggled with every sheet of plywood that's had to come down the stairs, to say nothing of the 600-lb. planer. I've had to share space with washing machines, furnaces and cats, complete with litter boxes.

There have been good things, too. My shops have always been warm in winter and cool in summer. And with some work, I've always been able to get the moisture levels to match the upstairs of the house. It's handy to be able to just run downstairs for a tool or a piece of wood to fix something in the house. I've even learned a lesson from the cats. I religiously sweep up my sawdust every night; otherwise any little pile becomes a nice, fresh litter box!

Best of all, though, is that my basement shops always seem to be close to the heart of our home. When I'm down in the shop, I'm only a holler away from Nancy and the boys. My oldest son, Cyrus, now a gigantic teenager, had a crib above the shop when he was a baby, and he slept to the relaxing music of the router and tablesaw. Once during a tornado alert our whole family was down in the shop, having dinner around my workbench by the light of a camping lantern. When winter comes and the snow is deep, I'll be down in my basement shop, happily working away. And every once in a while someone in my family will wander down there, too.

Enjoy your woodworking.



Ken Collier

P.S. Do you work in a basement shop, too? Drop me a line, or send a photo of your shop. I'd love to hear from you (see How to Reach Us, page 7).

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Question & Answer

Jointer Quandary

Q. I've been having trouble getting boards straight their full length on my new jointer. I spent an hour carefully resetting the knives, but that didn't help. Do you think it's me or the machine?

Derek Helf

A. Could be either! First, we'll assume that your jointer's infeed and outfeed tables are straight and parallel. Then, the answer may lie in changing your jointing technique or minutely adjusting the height of your jointer's outfeed table. Here are three common pitfalls and how to avoid them.



Problems

Persistent Convex Edge

Sometimes an edge remains curved every time you joint it.



Solutions

Joint the Belly First

This is a problem of technique, not an incorrectly adjusted machine. Jointing a long, convex board is difficult because rocking it is so easy. Try this: Joint the center of the board first. Take a few passes to make a solid and true reference surface. Then make longer and longer cuts until you joint the full length of the board.

A Sniped End

Sometimes a jointer takes a heavy bite at the tail end of a board.



Raise the Outfeed Table

Although you did your best to set the knives level, it doesn't always work. You'll see the dreaded snipe if the outfeed table is even a tiny bit below the tallest knife. Loosen the gib screws on the back side of your jointer, raise the outfeed table a hair and try jointing again. Keep raising the table by very small amounts until the snipe disappears, then lock down the gib screws.

A Tapered Cut

Sometimes a cut mysteriously trails off to nothing.



Lower the Outfeed Table

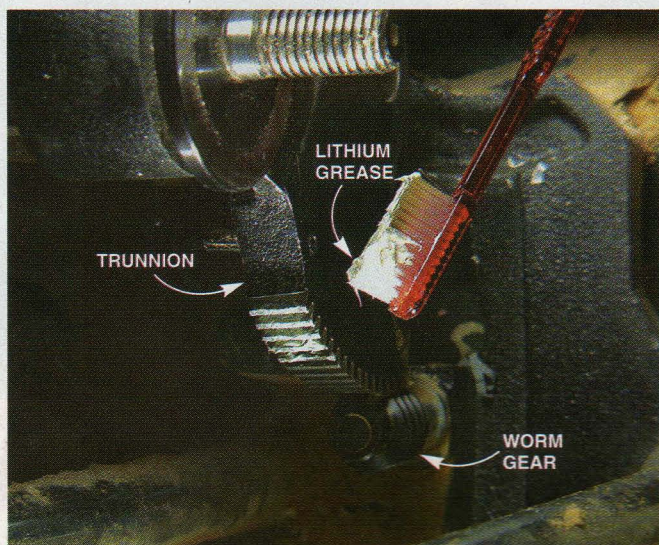
Rule out the possibility that you're dealing with a slightly convex edge before changing any settings. Start fresh with a 2- to 3-ft.-long board that's been ripped straight on the tablesaw. Draw a pencil line down the sawn edge and joint the board. If the tail end of the line remains visible, you've got an outfeed table that's too high. Lower the table until you get a sniped cut, then raise the table until the snipe goes away.

Question & Answer

Silencing a Squeaky Tablesaw

Q. My tablesaw screeches like nails on a chalkboard whenever I adjust the blade. WD-40 made the noise go away for a while, but now it's back. What do I do?

John Norcross



A. That sound can drive you crazy! It's a clear sign that the gears under your saw are due for lubrication. The original lubricant has either hardened or worn off, so now you're hearing the bare steel of the worm gears scrape the bare cast iron of the tilting trunnion and raising gear. You're unlikely to wear out the gears this way, so it's not a cause for alarm, but the noise will continue to get worse.

The best fix is to lubricate the gears with lithium grease, the same stuff they use at the factory. You can buy a lifetime's supply (\$6 for a 1-lb. tub) at an auto supply store. An alternative is powdered graphite, available at a hardware store or a locksmith's shop for about \$2 a tube. One advantage: it won't attract dust and chips the way grease does.

Clean the gears with a small brass brush or an old toothbrush and WD-40, which helps soften the grease. Apply a thin layer of new grease to the teeth of the raising gear and the trunnion. Turn the handles a few cranks to transfer the grease to the worm gears and enjoy the sound of silence.

Thanks to Chris Cooper at Powermatic and Roger Amrol at Delta Tools for help with this answer.



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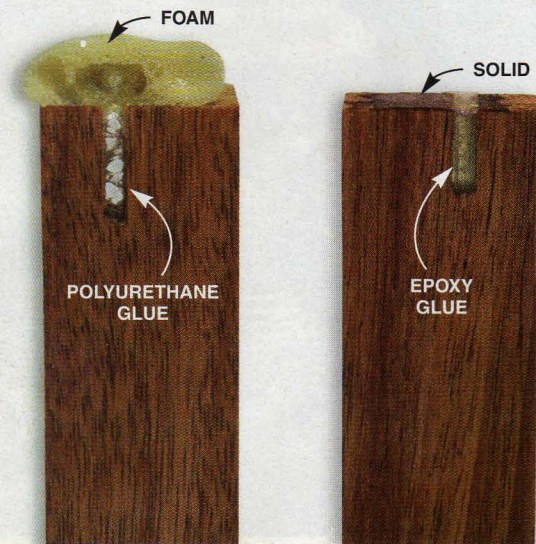
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TOOL CRIB

Question & Answer

Does Polyurethane Glue Fill Gaps?

Q. I hate it when I slip up and make a joint that doesn't fit tight. I heard that polyurethane glue will fill gaps and hold a loose joint together better than yellow glue. Is that true?

Terry Gray



A. The largest gap that polyurethane glue will adequately bond across is about .005 in. (That's pretty small. The cover of this magazine is .004-in. thick.) The outside limit for yellow glue is about the same. Polyurethane glue will expand in a gap larger than .005 in. It foams and forms very small bubbles of carbon dioxide gas, hardening into the equivalent of styrofoam. These bubbles may "fill" the gap, but *they form a very weak bond*. Filling and bonding aren't the same thing. Polyurethane glue has many good properties, but bonding very loose joints isn't one of them.

Use epoxy when parts don't fit well. It dries by chemical reaction rather than the loss of water, so it doesn't shrink. Neither does it form bond-weakening bubbles. Epoxy will both fill and bond a gap as large as 1/16 in. **AW**

Ask Us

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



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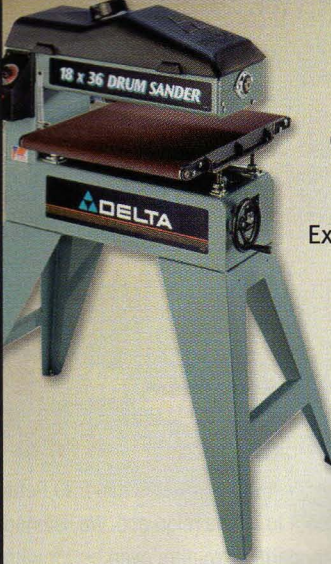
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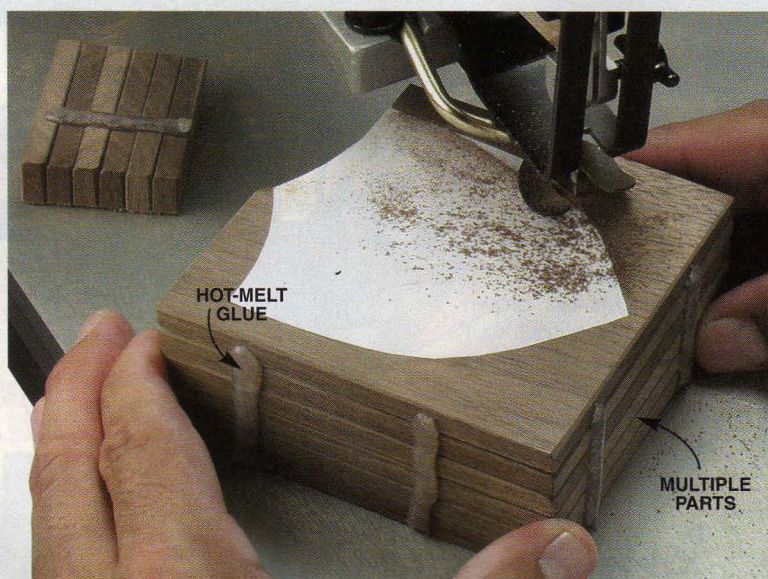
Workshop Tips



Large-Arc Layout

With this shop-made trammel, you can draw an arc of almost any dimension. Start with a 1/4 in. by 3/4-in. strip to use as the trammel stick. Mark dimensions for the radius you need on this stick. Then, drill a 1/8-in. hole at each mark. Put a small nail through one hole and tack this end to a board that you've taped to the floor. Next, position your drawing board and paper at the appropriate location at the other end of your trammel stick. Insert a pencil through the drilled hole at this end and draw your arc.

Randy Johnson



Cutting Multiple Parts

One day my wife asked me if I would make her 58 shields for awards day at her school. Usually when I cut multiples on my scroll-saw I tape or screw the parts. This time I hot-melt glued them together. It not only worked great, but was much faster and easier.

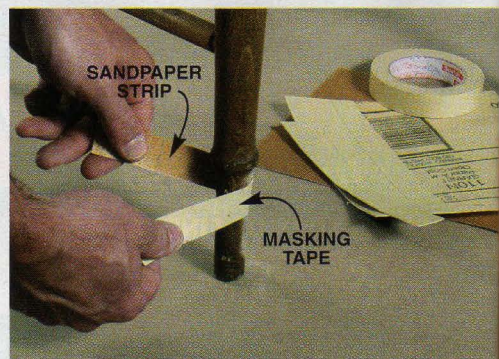
Wayne Johnson

Workshop Tips

Reinforced Flexible Sandpaper

While refinishing some old chairs, I discovered an easier way to sand the turned legs. I'd been using plain strips of sandpaper, but they tore and wore out so quickly. I reinforced the sandpaper strips with a couple layers of masking tape and they lasted longer and the added stiffness gave them a little extra bite. I save money, too, because this do-it-yourself taped sandpaper costs half as much as cloth-backed abrasives.

David Healey



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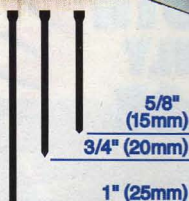
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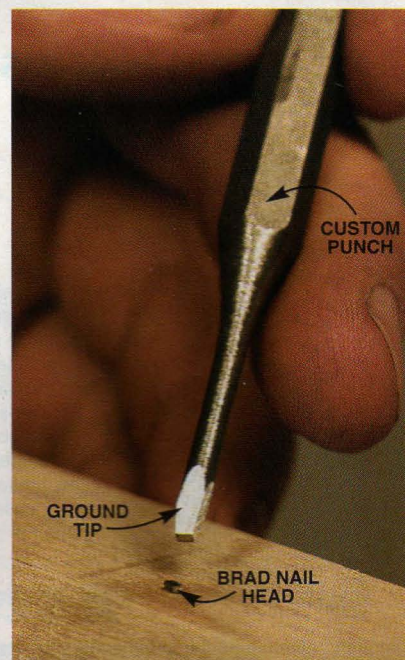
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Rectangular Nail Setter

Sometimes my pneumatic brad nailer fails to set the nail head fully beneath the surface of the wood. The brads I use have rectangular-shaped heads and a regular nail set makes a round hole that's too big.

I solved this problem with a custom punch. Using my benchtop grinder, I ground down the tip of a punch to match the size and rectangular shape of my brads. This modified punch works just like a regular nail set but the rectangular shape blends better with the wood's grain and is less visible when finished.

Steve Glover



Easy Sliding Drawers

Wood cleats make good drawer runners for shop storage cabinets because they don't gum up like ball-bearing slides and they're cheap. The downside is that wood runners wear down and are likely to stick. The fix is simple: Glue a strip of plastic laminate to the top of the cleats. The drawers will slide like they're on ice.

AW

Ken Collier

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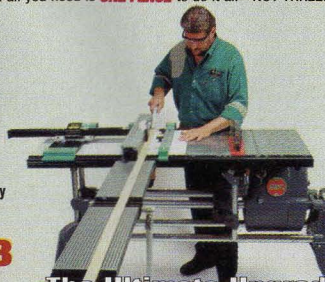
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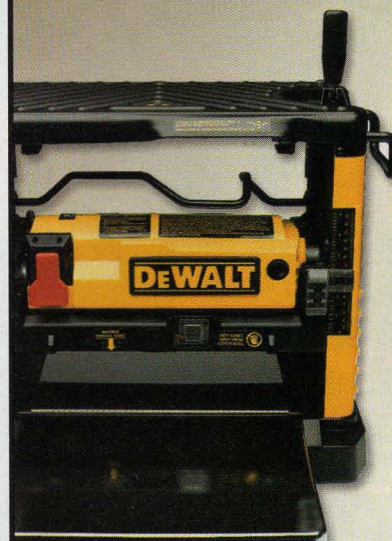


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New and Interesting Shop Stuff Edited by George Vondriska

New Products

Big Bandsaw in a Small Package

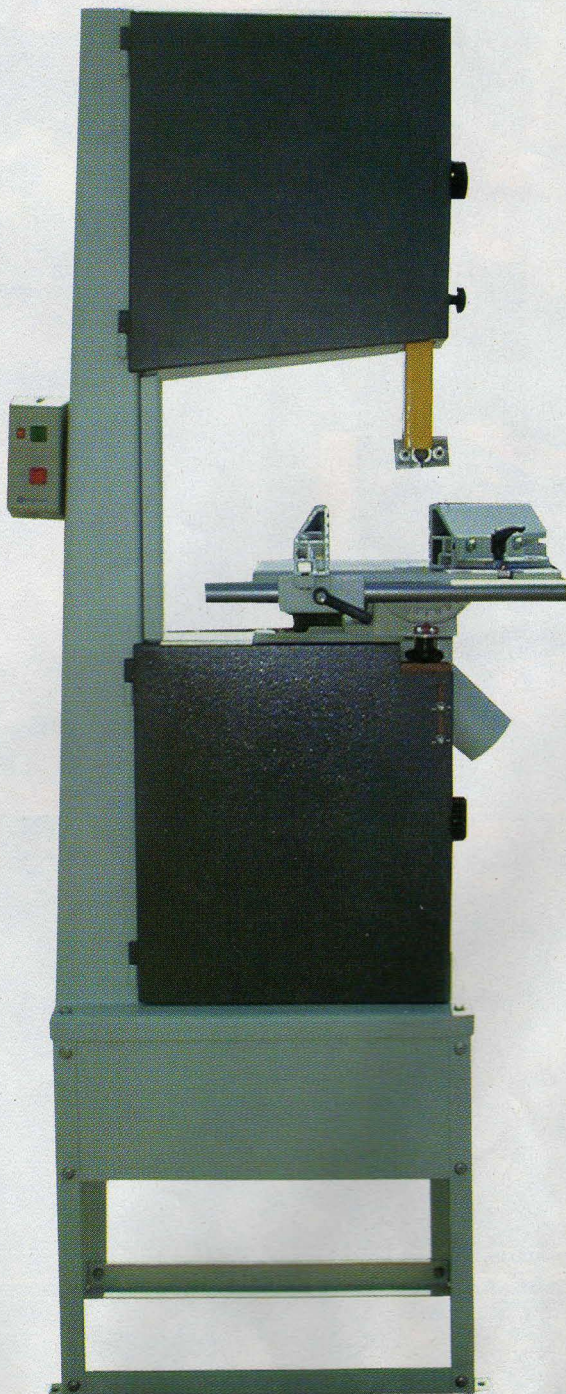
Laguna's new LT14 bandsaw (\$895) packs big-saw features into the footprint of a 14-in. saw. Its welded-steel frame is built for heavy work like resawing, and the table, trunnions and wheels are solid cast iron for extra weight and vibration control. The saw table is a generous 15-in. deep by 19-in. wide.

The LT14 also features an innovative guide system. Ceramic blocks (instead of steel or phenolic plastic) provide both side and rear blade support. According to Laguna, these blocks can be run directly against the blade without creating heat build up (which is a problem with steel blocks). This dramatically reduces blade twist and drift, making resawing easier. The closely set blocks are said to constantly clear pitch from the side of the blade—a big deal if you cut lots of wet wood. This saw has just become available through retailers, so we haven't had a chance to test these claims.

The throat capacity (the maximum width you can cut) is 13-1/4 in. and the maximum thickness you can cut is 8-5/8 in. For comparison, most 14-in. saws have 6-in. thickness capacity, and 12 in. if you add a riser block. The LT14 takes 105-in. blades from 1/4-in. to 3/4-in. wide and is driven by a substantial 1.7-hp, 220-volt, 8.2-amp motor. Most 14-in. saws come with a 1-hp motor. A fence comes standard with this saw.

According to Laguna, dust collection on the LT14 is improved over other bandsaws by the dust box; a confined area directly under the table that you connect to a dust collector. The only problem is the odd-sized 3-1/8-in. dust port, for which you'll need to buy an adapter.

Laguna Tools, LT14; \$895.
(800) 965 3533
www.lagunatools.com



ART DIRECTION: BARBARA PEDERSON • PHOTOGRAPHY: COURTESY OF MANUFACTURERS

New Products

Fast, Strong Glue

Combine the fast setup of hot-melt glue with the strength of polyurethane and you've got Franklin's new glue system. According to the folks at Franklin, you can use this glue almost any place you currently use brads or pin nails.

The glue uses a cordless, heated gun (like regular hot-melt), that costs a rather steep \$120. (That's the price you pay for cutting-edge technology, I guess.) The gun stays hot out of the base for about 20 minutes. After you squeeze out the glue, it grabs and cools in 30 to 75 seconds. If you screw up, you can reheat the joint with a heat gun and separate the parts. After that first minute or so, the glue reacts to moisture in the air to cure. It reaches full strength in about 24 hours. When the bond is complete, the strength is amazing. It can even securely bond end grain to end grain.

Glue cartridges cost \$8 each and there are different glues available for different applications. WW30 is wood-working glue that sets up in 30 seconds. WW60 fills gaps and sets up in 60 seconds. MP75 is multi-purpose and works on melamine, ceramics, metal, marble, glass, brick and more.

This may not be a must-have tool, but you can use it

to instantly set glue blocks, build jigs, and even fasten trim to cabinets without nail holes. You can haul it to the bathroom to stick a soap dish on ceramic tile, or to the garage to reattach the weather strip on your car door. HighPURformer glue won't completely replace white or yellow glue, but it's a handy addition to your adhesive arsenal.

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JDS AIR-TECH 2000™**Model 750, Still the Best!**

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- **Ultra Quiet**
- **1/4 H.P. Motor for heavy duty performance**
- **Antimicrobial 1 Micron Internal bag filter**
- **UL Listed**
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The National Institute for Occupational Safety and Health (NIOSH) recommends limiting wood dust exposures. The JDS Air-Tech 2000 will dramatically improve the quality of the air you breathe. Our new model 750 variable speed allows you to dial in your desired air flow, from a whisper quiet 200 cfm to an ultra performance 750 cfm. This will clean the air in a 30'x30'x8' shop every ten minutes. For larger areas our models 8-12, 10-16 and 2400 are available. The JDS systems will remove 99% of particles as small as five microns and 80% of particles as small as one micron. For the removal of odors, fumes and smoke, our optional charcoal filter is available. To place an order or for the dealer nearest you call us toll-free.

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Manufactured in the U.S.A.

www.thejdscompany.com

\$259.00

Model 750

**JDS
COMPANY**

New Products

Four 18-Volt Cordless Tools at a Great Price

Now you can arm yourself with the tools you need for woodworking *and* home repair without breaking the bank. Ryobi's 18-volt Super Combo Kit has a cordless drill/driver, circular saw, reciprocating saw and flashlight, all for \$200!

The drill/driver features a 1/2-in. keyless chuck, 24-position clutch, two-speed gearbox and a powerful magnet on top for holding screws and bits (it works better than your mouth!).



The 5-1/2-in. circular saw has a maximum cutting depth of 1-9/16-in., so it can handle 2x4s. The variable-speed reciprocating saw has a 3/4-in. stroke.

The kit comes with two 18-volt batteries and a one-hour charger. The Super Combo Kit is available only at The Home Depot.

Ryobi, 18-volt Super Combo Kit; \$200.
(800) 323-4615
www.ryobi.com



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Hardwoods, softwoods, pressure-treated or exotics – Gorilla Glue® is tough enough to hold them all. Incredibly strong, nearly invisible glue lines, and 100% waterproof. Just the way serious woodworkers demand it. Call 800-966-3458 for a dealer near you, or visit www.gorillaglu.com to find out more.



The Toughest Glue on Planet Earth™





New Products

of air hose dangling behind you.

If all your brad nailing is done in the shop, the on-board compressor is not a big deal. But if your needs take you away from a conventional compressor, you'll like the portability of this tool.

Porter-Cable, BN200V12; \$260
(800) 487-8665
www.porter-cable.com

Battery-Powered Brad Nailer

The cordless revolution is alive and well. This time Porter-Cable has marched into the nail gun arena, and the result is pretty cool.

This 7-lb. gun (\$260) has an on-board mini compressor that runs off a rechargeable 12-volt battery. If you're near an air compressor, take out the battery, hook up a hose, and run the gun the old fashioned way. Either way, the gun shoots 18-gauge brads from 3/4-in. to 2-in. long. Under battery power, the nailer will drive about 300 brads before it needs a charge.

The mini compressor makes the gun a little heavy toward the back, but it's not much more awkward than 25 feet



Inkra®
MITER1000

- ◆ 41 Indexed Angle Stops over $\pm 90^\circ$ range
- ◆ 18" Incra Track Fence with Slide Stop
- ◆ Steel GlideLOCK™ Miter Bar with 6 Width Adjustment Points

SALE

\$89

Inkra®
MITER3000

- ◆ 364 Indexed Angle Stops over $\pm 90^\circ$ range
- ◆ 27" Miter Fence + Dual-Flip Stop
- ◆ Steel GlideLOCK™ Miter Bar with 8 Width Adjustment Points

SALE

\$219

Inkra®
MITER5000

- ◆ 364 Indexed Angle Stops over $\pm 90^\circ$
- ◆ 36"-64" Miter Fence + Dual-Flip Stop
- ◆ Steel GlideLOCK™ Miter Bar with 10 Width Adjustment Points
- ◆ Integral Hold-down Clamping System
- ◆ Renewable Zero Clearance Right Panel

SALE

\$299

Produce perfect gap-free hairline glue joints on the mitered corners of any multi-sided object on your first try without trial-and-error setups.

All models include: Adjustable GlideLOCK Miter Bar, Incra Specified Fence with Stop Positioner, and FREE Video Brochure.



Woodpeckers Inc.
The Incra Tool Source

www.woodpeck.com

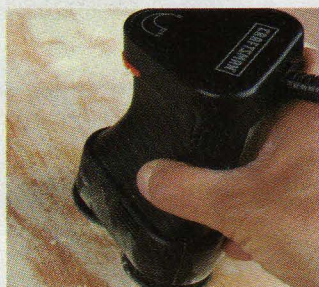
1-800-752-0725

CRAFTSMAN

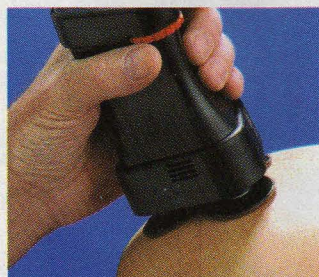
Your projects aren't all flat, so why use a flat sander?



Sands all shapes and contours
Three rotating sanding discs wrap and hug convex, flat and concave surfaces like no flat sander can.



Let the 3-D sander do the work
Requires very little pressure to remove rust, paint and stain from a variety of materials and surface contours.



Precise fingertip control
The 3-D sander's compact design fits comfortably in your palm for one-hand operation. Turn the dial to adjust sanding speeds of 800 to 2600 rpm.

Available at Sears, Sears Hardware,
sears.com and the Craftsman
Catalog at 800-437-9686

SEARS
Where else?

New Products

New Gear for the New Year

Two-Stage Collector on a Can

Jet's new two-stage dust collector (\$300) fits on a 20-gallon steel or a 32- or 42-gallon plastic garbage can. When the can is full, lift the dust collector off the top and haul the can out to the curb. No messy bags to empty.

Jet couples this convenience with innovative filter cartridges. These cartridges filter to 2 microns and provide the same filtration surface area as a huge bag (about 48 in. x 48 in.), without taking up nearly as much space. According to Jet, you'll also find it easier to clean the cartridge than you would a filter bag with a zipper. Just slide off the cartridge, bang it inside a barrel (like the one under the dust collector), and slip it back on.



This collector's 1-hp motor pulls 650 cfm of air through its 4-in. port, comparable to other 1-hp collectors, and it weighs only 38

lbs. Its compactness makes it a good choice for woodworkers who are really short on space.

Jet Tools, DC 650TS; \$300.
(800) 274-6848
www.jettools.com

Notice of Recall:

Ryobi, in cooperation with the U.S. Consumer Product Safety Commission, is recalling to repair about 125,000 circular saws. The lower blade guards on these saws can stick in the open position, posing a risk of serious injury to the operator and bystanders.

Ryobi has not received any reports of incidents. This recall is being conducted to prevent the possibility of injury.

The recalled 7-1/4-in. circular saws have a blue plastic body and a metal blade guard. The recalled model numbers CSB120, CSB130, CSB1308, CSB130K and CSB130JS can be found on a white label on the motor housing. Any Ryobi circular saw with a green dot on the warning label on the power cord, or on the product's packing, is not included in this recall.

Consumers should stop using the saws and contact Ryobi's consumer Response Team for a free repair kit. Consumers should call (800) 867-9624 between 8 a.m. and 5 p.m. ET Monday through Friday, visit www.ryobitools.com, or write to Ryobi Technologies, Inc., P.O. Box 1207, Anderson, SC 29622, Attn: Consumer Response Team.

New Products



Monstrous Lathe

Delta's rugged new 46-745 variable-speed lathe (\$1,800) is made for big work. This behemoth features:

- a 16-in. swing
- 42-in. between centers
- 1 1/4-in. (8 tpi) spindle, driven by a 1-1/2-hp motor
- electronic speed control
- three speed ranges (0-1100, 0-2200, and 0-3200 rpm)
- a spindle lock that has a 24-division index for ornamental work like flutes or reeds.

You can add mass to this already hefty 400-lb. machine by pouring sand, concrete, or other ballast into the hollow legs and bed. The open design of the feet also allows you to slide a 4x4 through to increase the machine's footprint. This is one BIG lathe.

Delta Machinery, 46-745; \$1,800.
(800) 438-2486
www.deltawoodworking.com

32

American Woodworker DECEMBER 2001

It's The World's Only Cordless Brad Nailer That's Also Pneumatic.

Cordless. Pneumatic. Our new cordless brad nailer gives you the option of both,

using exclusive **TPS Technology™** (Twin Power Source System). It's cordless,



thanks to a mini-compressor powered by our rechargeable,

interchangeable 12-volt battery. It's also pneumatic,

courtesy of a 1/4" valve that allows you to use it with traditional

compressors. To get one of your own, visit your Porter-Cable dealer or call 1-800-487-8665

(519-836-2840 in Canada).



PORTER-CABLE
PROFESSIONAL POWER TOOLS

Modular Workshop Stations

If you'd prefer to buy your shop cabinets and give yourself that much more time for building other projects, Waterloo has a product you'll be interested in.

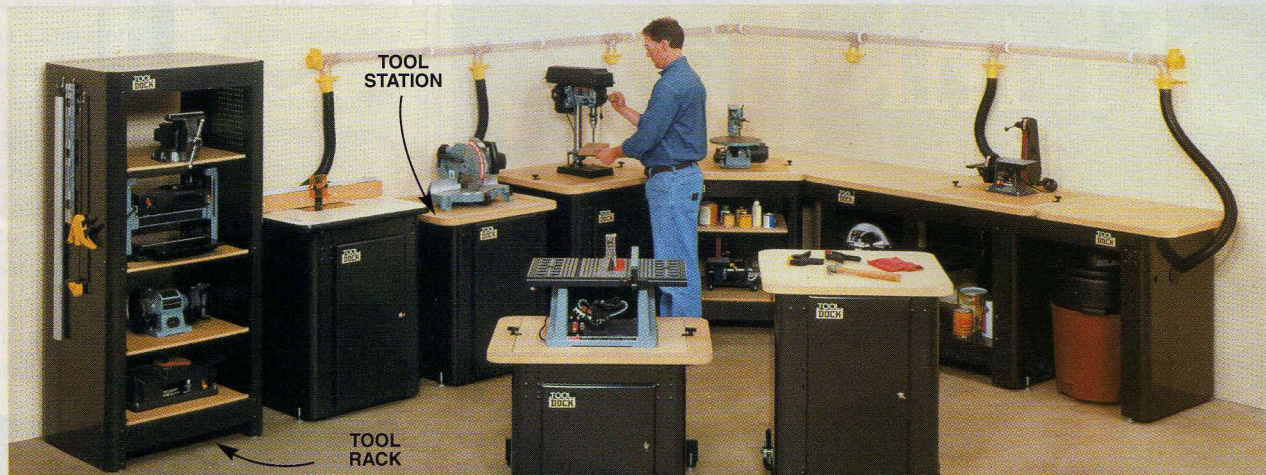
The Tool Dock is a heavily built system. You can buy one station or a shop full, depending on your needs. Prices range from \$260 to \$550 per station.

In the Tool Station (shown below, \$350), a removable insert (\$19 each) gets fastened to each tool. Done with the planer? Unlock the insert, pluck out the planer, and drop in your miter saw. Each tool keeps its own insert. Tools you're not using can go into the Tool Rack (shown below, \$300), a ver-

tical storage bin that accepts the inserts.

Interchangeable parts are key to this plug-and-play system. Most of the units come with drawers and casters. They all require assembly.

Waterloo Industries, Tool Dock; \$260 to \$550
(866) 573-0335
www.tooldock.com



American Woodworker DECEMBER 2001

33

It's The World's Only Pneumatic Brad Nailer That's Also Cordless



Pneumatic. Cordless. Our new cordless brad nailer gives you the option of both, using exclusive **TPS Technology™** (Twin Power Source System).

It's pneumatic, courtesy of a 1/4" valve that allows you to use it with traditional compressors. It's also cordless, thanks to a mini-compressor powered by our rechargeable, interchangeable 12-volt battery. To get one of your own, visit your Porter-Cable dealer or call 1-800-487-8665 (519-836-2840 in Canada).

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PORTER-CABLE
PROFESSIONAL POWER TOOLS

WWW.PORTER-CABLE.COM

New Products

Stripped-Screw Remover

Argh! No matter how hard you push, your driver just won't grip that blasted stripped screw. You stripped it, and you stripped it good.

The Craftsman Screw-Out (\$20) may save the day. Unlike some screw extractors, it doesn't require drilling into the stripped screw. Simply chuck



the bit into a reversible drill and place it in the center of the damaged screw head. The bit tip grabs the screw head when you reverse the drill. The three bits in the set will handle screws from #6 to #14 with Phillips, slotted, Torx, or square-recess heads.

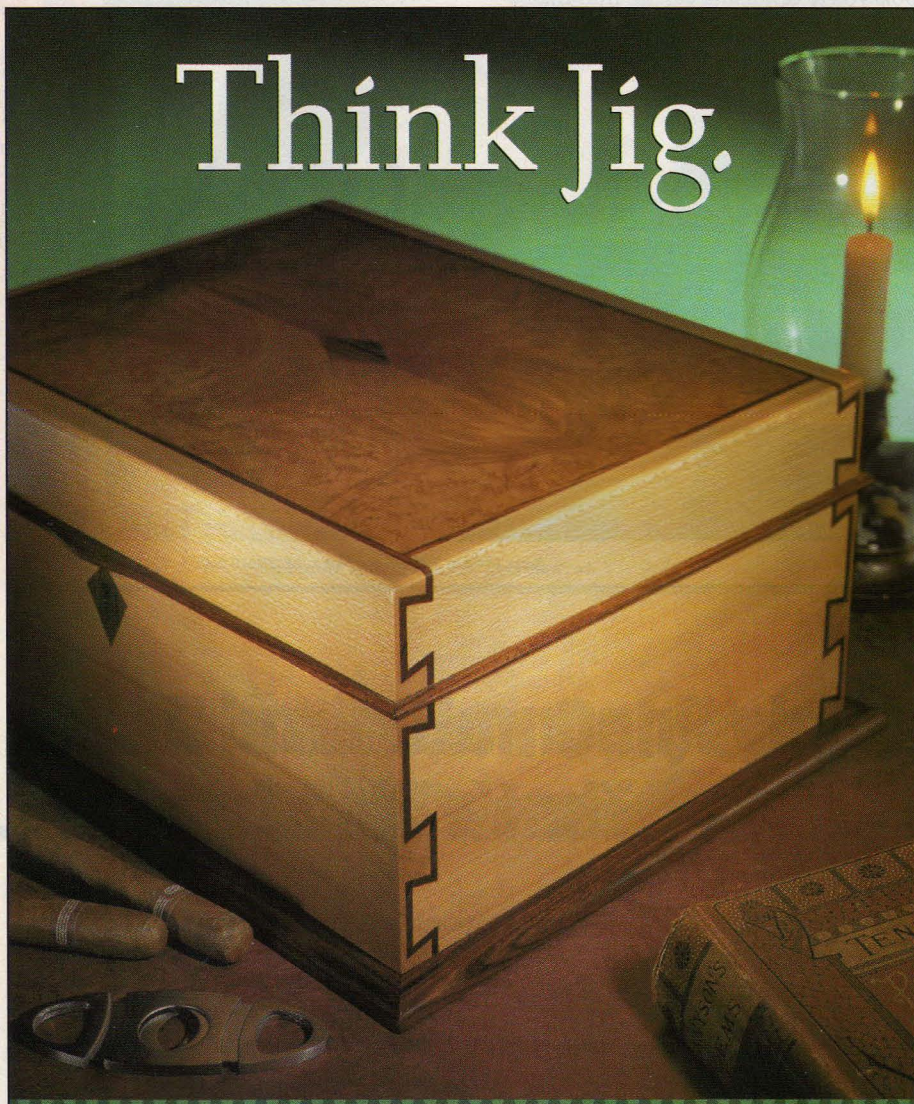
Note: This remover isn't for broken screws, just stripped ones.

Sears, Screw-Out; \$20

Sears retail store

www.sears.com

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Thinking Jig? Think Leigh.
Whether you're a hobbyist or a

professional, the Leigh Jig will help you create your best work. Versatility with precision make the Leigh Dovetail Jig better than the rest. Rout through and half-blind dovetails, with variable spacing of pins and tails, on one jig. Create decorative Isoloc joints, finger joints, and multiple

mortise & tenons easily with Leigh attachments. And our easy-to-follow user guide will help make it happen fast! Call toll free now to learn more.

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Leigh Industries Ltd., PO Box 357, Port Coquitlam, BC, Canada V3C 4K6 Tel. 604 464-2700 Fax 604 464-7404 Web www.leighjigs.com

Instant Organization

You don't need a tidy shop to produce fabulous projects, but if you've lost sight of your workbench top and have not seen your belt sander in months, consider trying the storeWALL.

One piece of storeWALL, 15-in. wide and 48-in. long, costs \$35. Hooks, baskets and storage bins are available for \$6 to \$33 and you can also use standard 1/4-in. Peg-Board hooks. StoreWALL is available in a variety of colors and faux wood grains. The Wall Workshop package puts together a group of commonly used hangers and two pieces of storeWALL for \$200.

A huge advantage of storeWALL is its strength. Properly secured to the wall, it'll handle tools from chisels to

routers with ease. It's made from plastic, so it isn't affected by moisture like wall storage products made of MDF. If you turn into a hyper neatnick, you could hose the whole thing down with water. **AW**

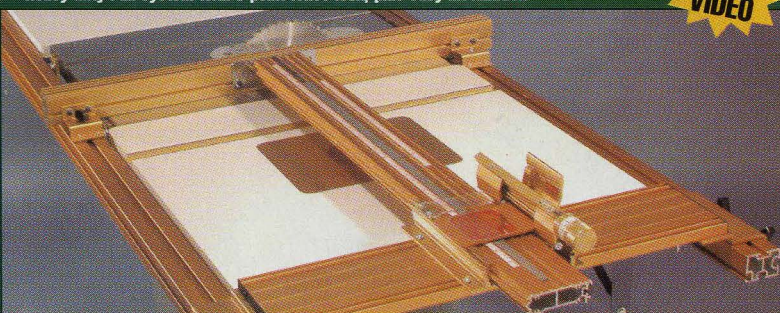
storeWALL; \$35 to \$220.
(866) 889-2502
www.storewall.com

New Products

Incra® Ultra TS-3a

- ♦ True machine shop accuracy ... perfect repeatability ... exceptional strength
- ♦ INCRA precision on both sides of the blade with micro adjustability to 0.001"
- ♦ Heavy-duty rail system with 5-point fence lock, plus easy installation

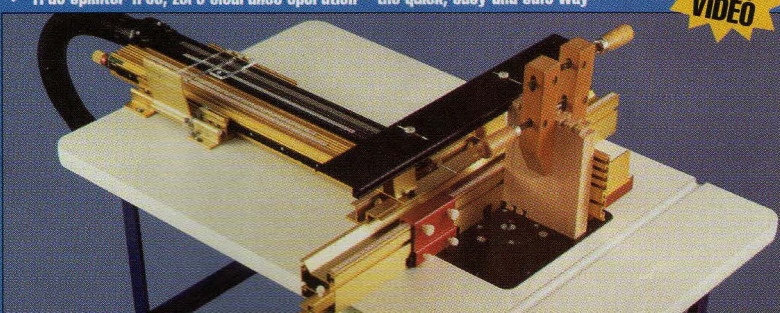
Call for **FREE VIDEO**



Incra® Twin Linear

- ♦ Dual carriage, split fence universal woodworking system for the router or shaper table
- ♦ Infeed and outfeed carriages lock together for making box joints and dovetail joinery
- ♦ True splinter-free, zero clearance operation – the quick, easy and safe way

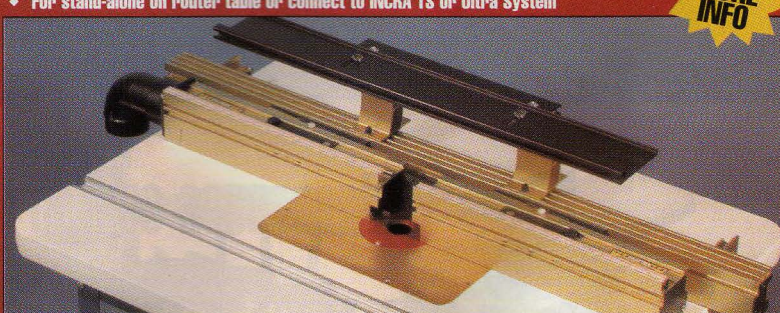
Call for **FREE VIDEO**



Incra® Wonder Fence

- ♦ Variable throat, offset adjustable router table fence sets a new standard for accuracy
- ♦ Make raised panels, perfect edge jointing or offset fence halves for accurate shaping
- ♦ For stand-alone on router table or connect to INCRA TS or Ultra System

Call for **MORE INFO**



Make ordinary woodworking operations quicker, easier, and more accurate than ever with these great tools from INCRA.



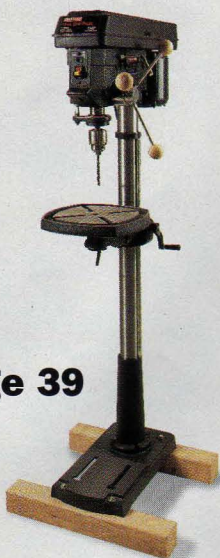
Woodpeckers Inc.
The Incra Tool Source

www.woodpeck.com

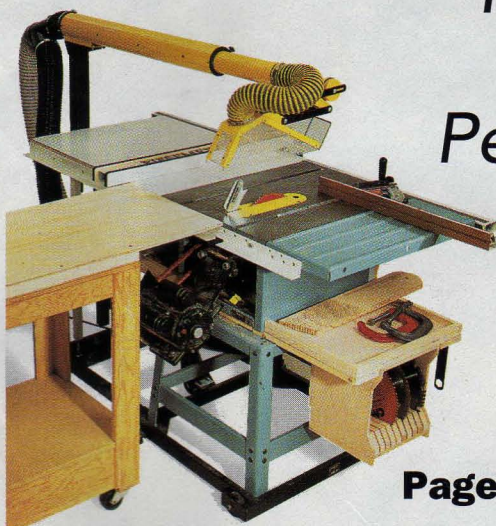
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Soup Up Your Shop

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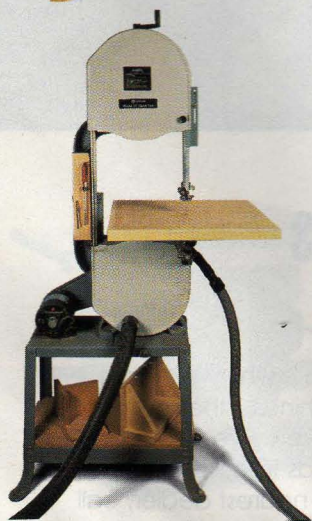
*The Right Accessories
for Maximizing
Performance and Safety*



Page 40

Here at American Woodworker we see a lot of tools and accessories. We've been impressed by how the right accessories—either store-bought or shop-made—can dramatically improve the performance, convenience and safety of shop tools.

Most of us have something we'd like to change or improve about our shop equipment. What we've done is assemble a list of accessories, tune-ups and shop-made attachments that solve some of the more common problems. Some are cheap, some are expensive, all work well. Look for the ones that fit your needs and give 'em a try.



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Shop Tip Special

Drill Press

A drill press is a common tool in most woodworking shops, but many have features that are designed primarily for metalworking. Here are a few tips that'll make your drill press more user-friendly and effective.



Reduce Vibration

Do you really need 15 speeds on a drill press? Perhaps for metalworking, but not for woodworking. The only difference between a 15-speed and a 5-speed drill press is an idler pulley and a second drive belt. The pulley and extra belt can create a lot of vibration in a drill press. Reduce vibration by removing the idler pulley (they just lift right out), then flip over the pulley on the motor and add a link belt. Cost: \$6.50/ft.



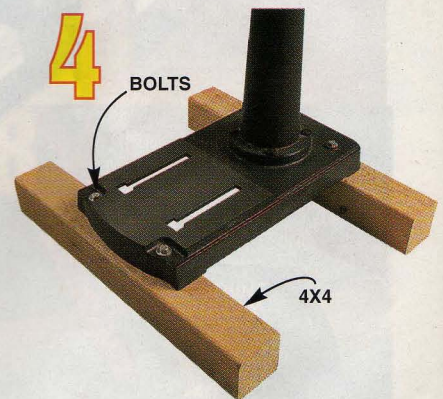
Better Handles

Here's a great tip that's so simple and makes such a huge difference, you've gotta give it a try. Sometimes it's the little things that drive you nuts, like those undersized knobs on the quill-feed levers of your drill press. Throw them out and replace them with 2-in. wooden balls. I guarantee you'll be more than pleasantly surprised at the comfortable feel. It's like going from a go-cart to a Cadillac. Cost: \$1.50 each.



Chuck Your Chuck

Inexpensive chucks can be a real headache. If you are experiencing slipping bits or excessive run-out, replace your stock chuck with a high-quality, aftermarket chuck. Generally a few taps with a wooden mallet on the side of the old chuck will release it. Wipe the mating surfaces of the new chuck and arbor clean with denatured alcohol. Slide the chuck onto the arbor and set it with a single mallet tap. Cost: \$100.

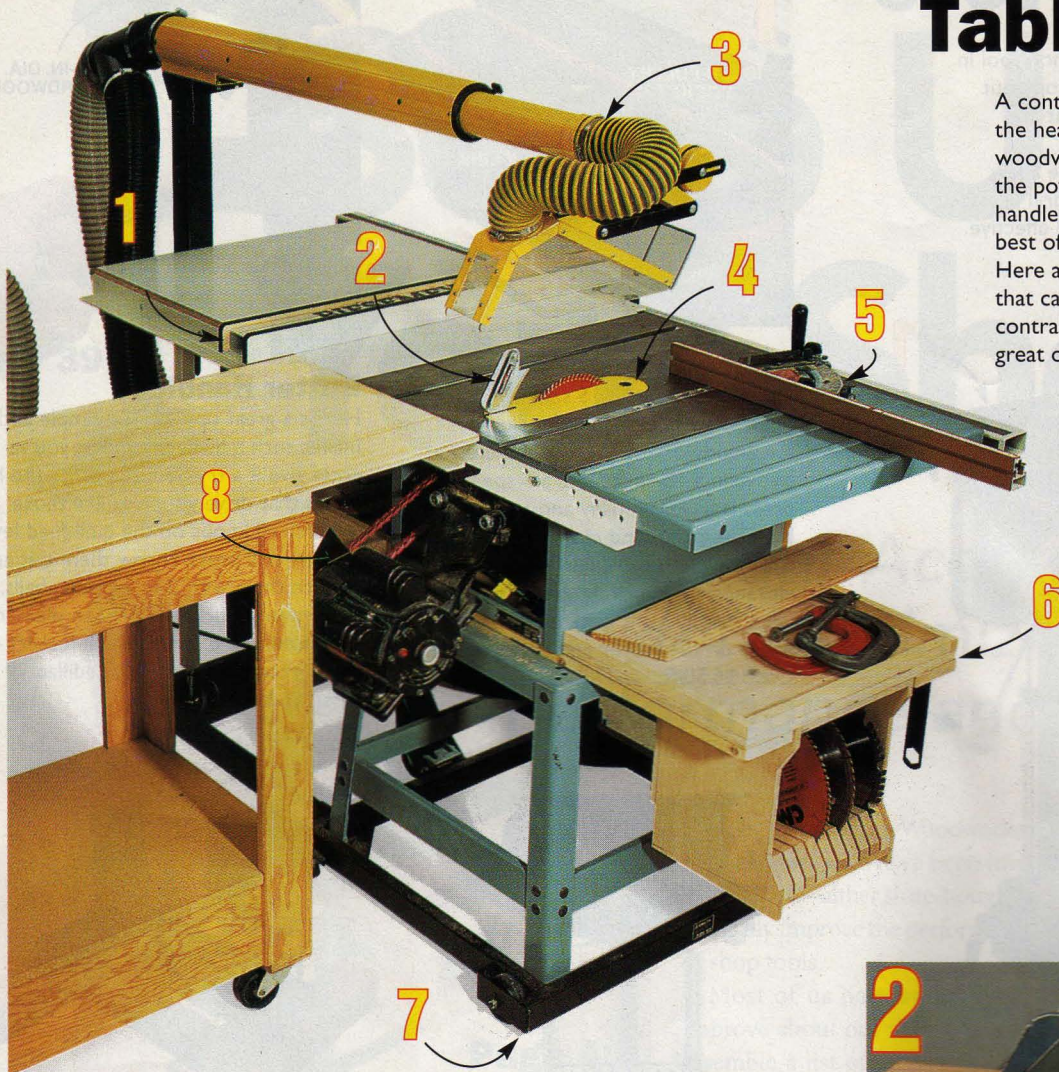


Better Base

Take note of your posture the next time you're drilling. Chances are you're slouched a bit and your head is tilted a little to one side to give yourself a decent line of sight. Here's a dirt simple tip that'll straighten things out for you; just cut a couple lengths of 4x4 and bolt them to the base. Not only will it bring things up closer to eye level, but it also gives those dinky little bases a larger, more stable footprint. Cost: \$5.

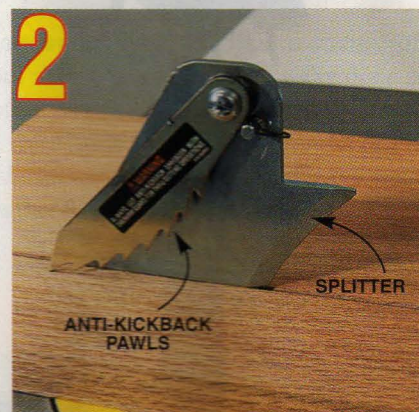
Tablesaw

A contractor's tablesaw is the heart of many woodworking shops. It has the power and capacity to handle most projects and best of all, it's affordable. Here are some accessories that can turn a good contractor's saw into a great one.



A Better Fence

I remember the first time I used an accurate direct-read fence. What joy! No more checking each setting with a tape measure. A hairline cursor allows you to set the fence for precise cuts every time. If you're still struggling with the fence on an older model contractor's saw, you owe yourself this upgrade. (The old-style fence is best used as a boat anchor!) Cost: \$265.



Splitter

This is one of the best accessories you can buy for your tablesaw. Unlike stock splitters that are bolted to the saw, this one snaps in and out in seconds! It also comes with anti-kickback pawls that can protect you from a kickback. Combine it with an overarm cover for the best in both safety and convenience. We know it ain't cheap, but if it prevents just one accident, it's worth every penny. Cost: \$120.

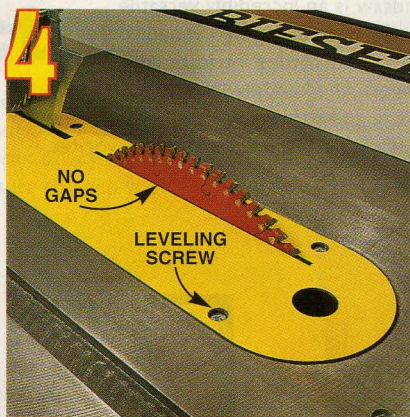
Shop Tip Special



Overarm Blade Cover

Let's face it, stock guards on most saws are a pain to use. The new breed of overarm blade covers is the answer. They easily retract or swing out of the way when necessary and the counterbalanced basket allows for fast and easy positioning. But what puts them over the top is the built-in dust collection feature. No more irritating plumes of dust thrown back at your belly!

Cost of model shown: \$350.



Zero-Clearance Throat Plate

Stock throat plates have wide slots that allow the blade to be set at an angle. But most sawing is done with the blade at 90 degrees, where narrow cut-offs can get stuck in the throat plate and possibly kickback. Also, the open area around the blade aggravates tear-out.

A zero-clearance throat plate eliminates these problems. You can make your own or buy one with top-accessible leveling screws plus side and end adjustment screws.

Cost of model shown: \$22.



Precision Miter Gauge

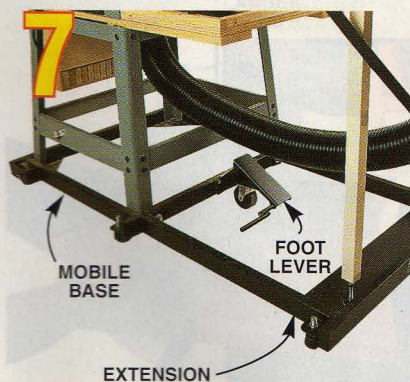
The miter gauge that comes with most saws is inaccurate and difficult to set precisely. A precision miter-gauge has an adjustable bar for a perfect fit in your saw's miter slot. The result is greatly improved accuracy. Plus, these gauges have plenty of dead-on positive stops for fast, precise angle settings.

Cost of model shown: \$170.



Storage Wing

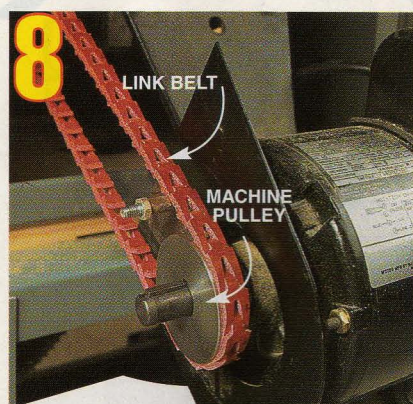
More than any other machine, the tablesaw requires a lot of paraphernalia. Various blades, a wrench to change the blades, the miter gauge, inserts, featherboards, jigs; the list goes on. Here's a great do-it-yourself project that'll keep all that stuff together and at your fingertips. Just bolt a piece of plywood between the base and the saw to create a platform for storing and hanging all kinds of tablesaw stuff. Cost: \$5.



Mobile Base

Most of us dream of a big shop space, but in reality we have to make do with whatever nooks and crannies we can find. A set of wheels for your stationary tools can help stretch your precious useable space. There's a mobile base out there for just about every stationary tool, but none benefit from mobility like a tablesaw.

Cost: \$160.



Link Belt and Pulleys

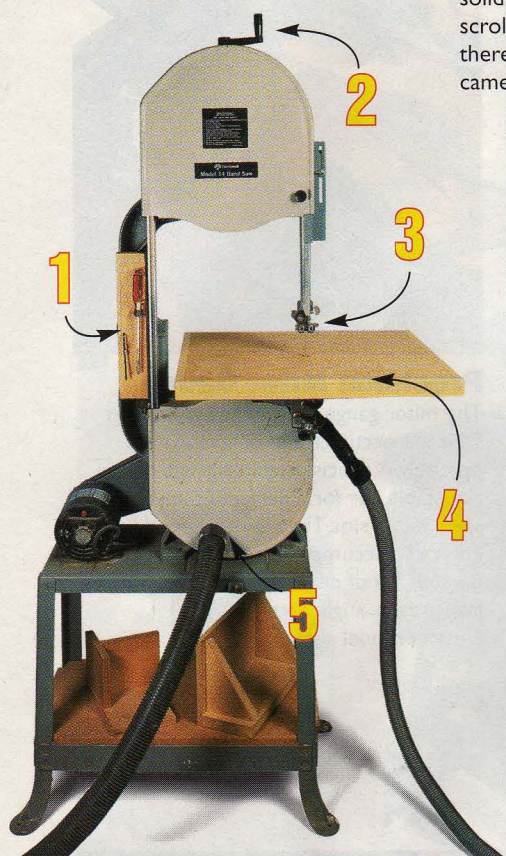
Are vibrations in your machine giving you the jitters? Consider this simple solution. Replace your old V-belt with a link belt. Normal belts develop a memory as they sit idle on your machine's pulleys. Once the machine is turned on, the out-of-shape belt causes vibration. Link belts can't develop a memory because they're built like a bicycle chain.

If that doesn't solve the problem, try aftermarket machined pulleys that are precision balanced and perfectly round. Cost: \$50 for link belt and two pulleys.

Soup Up Your Shop

Bandsaw

A bandsaw is an incredibly versatile machine. From slicing thin veneer off of solid stock to cutting intricate curves in scrollwork, the bandsaw can do it all. Still, there are a few things we wish all bandsaws came with. Here are a few of our favorites.



1
MAGNETS
ON BACK
OF 2X4

Magnetic Tool Holder

Epoxy a couple of rare-earth magnets onto the back of a 2x4 that's customized to hold your tools. It can hang on any metal part of your machine.

Cost: 0.50 in. x 0.125 in.: \$.80 each.



Quick-Crank

Working on cars, I've often cursed the engineers who seem to have a knack for putting bolts in the most awkward places. I have the same reaction working the tension knob on my old bandsaw. Then along comes a product like the Quick-Crank. It's such a simple solution you wonder why no one thought of it before. A Quick-Crank transforms your bandsaw, allowing you to quickly change and tension blades so you can get back to productive work without skinning your knuckles. Cost: \$30.



Cool Blocks

A set of Cool Blocks is an inexpensive way to raise your bandsaw's performance. Made of graphite-impregnated phenolic resin, Cool Blocks allow you to bring the guides much closer to the blades without worrying about excess friction. They're particularly useful for 1/8-in. and 1/16-in. blades, which can be completely trapped—teeth and all—between the blocks. You can achieve almost scrollsaw-like curve cutting. Cost: \$12.



Auxiliary Table

Tired of the balancing act you must perform on an undersized bandsaw table? You don't have to put up with it any more. A simple 24-in.-square plywood table with a blade slot can be mounted to your stock table. Just drill mounting holes right through the cast table. Cut the blade slot on a tablesaw so it lines up with the one on your bandsaw and bolt on the plywood. Cost: \$5.



Add a Dust Port

It is notoriously difficult to collect dust from a bandsaw. The small port under the table gets maybe one quarter of the dust thrown off by the saw. The rest gets spun around the lower wheel creating a dust storm while you work. Solution: Add a larger port to the lower wheel door. Trace the outline of a 2-1/2-in. dust port onto the lower door. Drill a series of 1/4-in. holes for the dust to pass through and screw on the dust port. Cost: \$2.

Dust Collector

Most dust collectors should be thought of as a kit. They often aren't ready to do the job we expect right out of the box. Inadequate bags, leaky joints and poor seals can turn your dust collector into a dust spewer. These tips are sure to keep your shop and lungs cleaner.

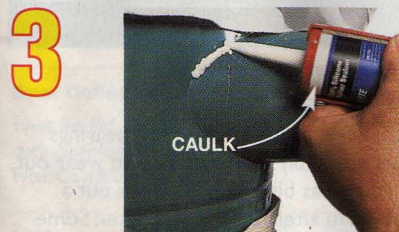
1 Felt Bags

The bags that come with most dust collectors aren't designed to filter out the *fine* dust. A bag made with 10-oz. felt that's triple-stitched together is a huge improvement. The filter bag on top should be sized to handle all the air flow from your collector. A lower bag made of durable cotton duck lets no air through, but it can handle the rigors of being taken on and off the machine. The folks at American Fabric Filter Co. will custom-design the right size bags for your collector. Cost for filter bag shown; \$80. Cost for lower bag shown: \$85.



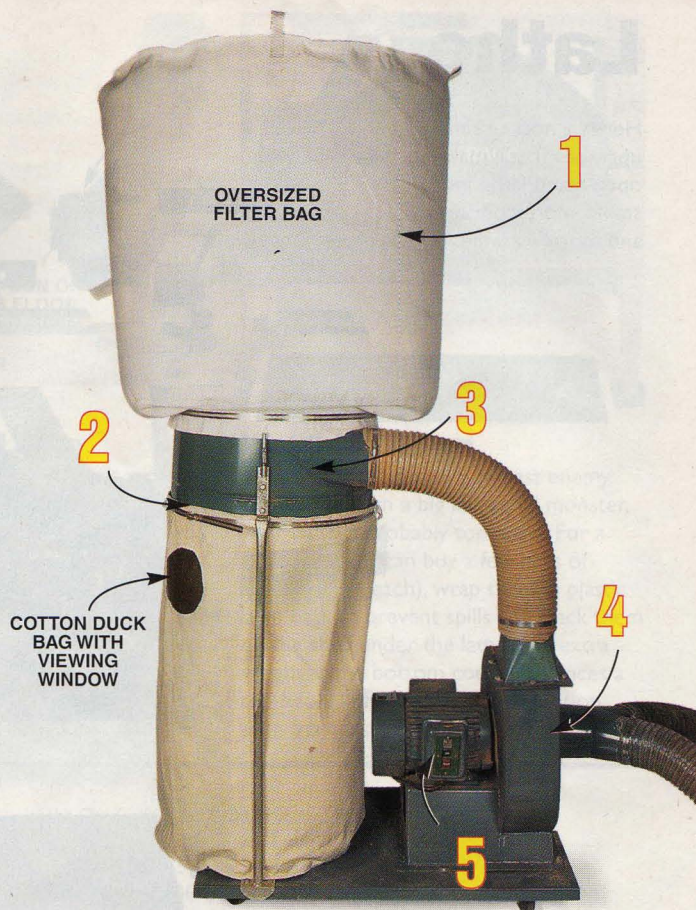
Weather Strip Dust Seal

A tight seal around the bag flange is crucial. Small kinks and folds in the bag create escape routes for dust particles, no matter how hard you tighten the clamps. For a better seal, make your own gasket with some closed-cell, self-stick weather strip, available at home centers and hardware stores. Cost: \$3.



3 Seal the Leaks

Seal off leaks around welds with caulk. It's a quick but effective fix. Cost: \$3.



Better Impeller

Has your shop outgrown your 2-hp collector? Before you buy a 3-hp collector, consider upgrading the impeller on your old machine.

An aftermarket impeller from Oneida Air Systems will fit most 2-hp collectors and improves cfm by 30 to 80 percent. In testing, we found the more you load your collector, the greater the benefit. The large fins offer greater surface area to move more air. Plus, these impellers are statically and dynamically balanced so they run truer and help extend the life of your motor. Cost: \$110.



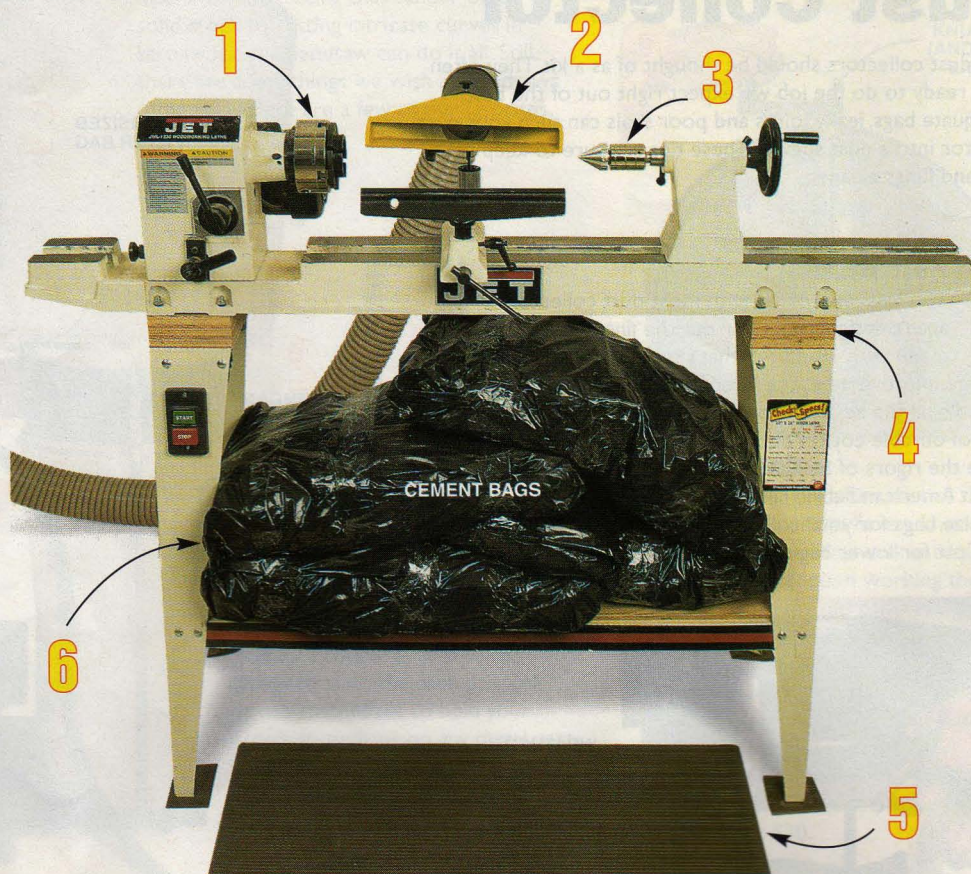
Remote Control

Can you imagine life without your TV remote? You'll feel the same way about this dust collector remote the first time you use it. It requires no additional wiring, just plug it in and go. No more running back and forth between the collector and a tool. Of course, just like the TV remote, it'll mean less exercise for you. Is there such a thing as a shop potato? Cost \$60.

Soup Up Your Shop

Lathe

Here's a host of simple upgrades that'll make an open-stand lathe more stable, more comfortable and more versatile.



4-Jaw Chuck

Tired of gluing and screwing bowl blanks onto faceplates? A 4-jaw chuck is a great upgrade for your lathe. It allows you to quickly and easily mount anything from bowls to miniatures to goblets—any work that's not held between centers. There's a wide variety of accessory jaws available for special applications. Cost of model shown: \$260.



Effective Dust Collection

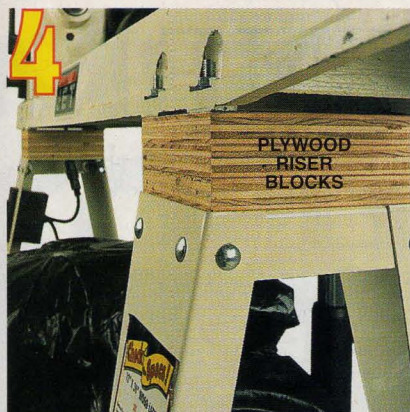
Sanding on the lathe creates clouds of dust. You need something that's adjustable in height and can be positioned around the lathe for optimum collection. Here's a commercial hood on a stand (\$60) that's very convenient, but a variety of shop-made solutions work very well, too. The simplest is a length of flexible aluminum dryer duct (\$1/ft.) that can be bent to reach different locations.



Sealed Bearing Live Center

Stock live centers have open bearings that inevitably fill with dust and wear out. If yours has bit the dust, check out a premium aftermarket live center. Some have the capacity to self-center any kind of work up to 3-1/4-in. diameter, including round or square spindles up to 3-in. Cost: \$100.

Shop Tip Special



4 Raise the Bed

The correct height is critical for comfortable and safe lathe operation. Many lathes are simply too low. Try this test: bend your arm and measure the distance from your elbow to the floor. Your drive center should be the same height. Add stacked plywood blocks where the bed of the lathe joins the stand. Cost: \$2.



5 Cushion the Lathe

A rubber floor mat kills two birds with one stone. It helps prevent user fatigue and it levels slight imperfections in your shop floor. A gap as thin as a piece of paper under a leg of your lathe will magnify vibration. Cut squares of floor mat material and slip them under each foot of the lathe. The mat material is stiff enough to take the weight but gives enough to even out small irregularities in your floor. Cost: \$14.



6 Weight It Down

Vibration is the turner's biggest enemy. Unless you own a big industrial monster, your lathe is probably top heavy. For a few bucks you can buy a few bags of concrete (\$4 each), wrap them in plastic lawn bags to prevent spills and stack them on the shelf under the lathe. The extra weight at the bottom counterbalances a top-heavy lathe and absorbs vibration even from a spinning blank. **AW**

Sources

Drill Press

Link Belts, #25N67; \$6.50/ft.
Woodcraft Supply, (800)225-1153,
www.woodcraft.com

2-in. hardwood balls, # 214935 (other sizes available); \$1.40 ea.
Rockler Hardware, www.rockler.com

Jacob's Chuck, #954-539; \$100. (If your drill press has a Morse Taper, you'll also need an arbor; #954-539; \$12.) Woodworker's Supply, (800)645-9292

Table Saw

40-in. Home Shop Fence, # 78-931; \$265.
Highland Hardware, (800) 241-6748,
www.highlandhardware.com
T-Square Anti-kickback Snap-in Spreader; \$120. Tools On Sale, (800)328-0457,
www.7cornershdwe.com

Penn State Table Saw Dust Collection Guard, #TSDGI; \$300. Penn State Industries,
(800) 377-7297, www.pennstateind.com

Leecraft Zero-Clearance Throat Plates (sizes to fit most table saws); \$22.
Highland Hardware, (800) 241-6748,
www.highlandhardware.com

Incra's Miter Gauge 2000; \$185.
(972) 242-9975, www.incra.com
Also check out Incra's 1000 series for less than \$100.

Delta Mobile Base, #DL50-277; \$95.
With extension, #DL50-285; \$65.
Tools On Sale, (800)328-0457,
www.7cornershdwe.com

Contractor's Saw Performance Package (includes link belt and pulleys), #25N66 for pre-1988 Deltas, #25N68 for 1988 and up Deltas, #25N69 for pre-1991 Sears, #25N70 for 1991 and up Sears; \$54.
Woodcraft Supply, (800)225-1153,
www.woodcraft.com

Excalibur Telescoping Overarm Blade Cover, #EXBC; \$350. Highland Hardware, (800) 241-6748,
www.highlandhardware.com

Woodhaven Miter Gauge Deluxe Starter Kit; \$170. (800) 344-6657,
www.woodhaven.com

Bandsaw

Rare-Earth Magnets, 1/2" x 1/8", #99K31.03; \$.80. Other sizes are available. (800) 871-8158, www.leevalley.com

Quik-Crank Bandsaw Tensioner, #08.60.85; \$30., Highland Hardware, (800) 241-6748,
www.highlandhardware.com

Cool Blocks, #08.60.01 (other sizes available to fit most bandsaws); \$12.
Highland Hardware, (800) 241-6748,
www.highlandhardware.com

2-1/2-in. Dust Port, #03J61.10; \$2.
Lee Valley, (800) 871-8158,
www.leevalley.com

Dust Collector

10-oz. felt filter bag; \$80. #8 cotton duck lower bag; \$85. American Fabric Filter Co., (800) 367-3591

Aluminum fan wheel for most 2-hp collectors; \$110. Oneida Air Systems, (800) 732-4065

Long Ranger III remote control, #LR110-3 for 120 volt; \$60. #LR220-3 for 220 volt; \$70. Penn State Industries, (800) 377-7297, www.pennstateind.com

Lathe

Oneway Stronghold Chuck, (various threads available to fit most lathes); \$270. The Woodturners Catalog, (800) 551-8876
www.woodturnerscatalog.com

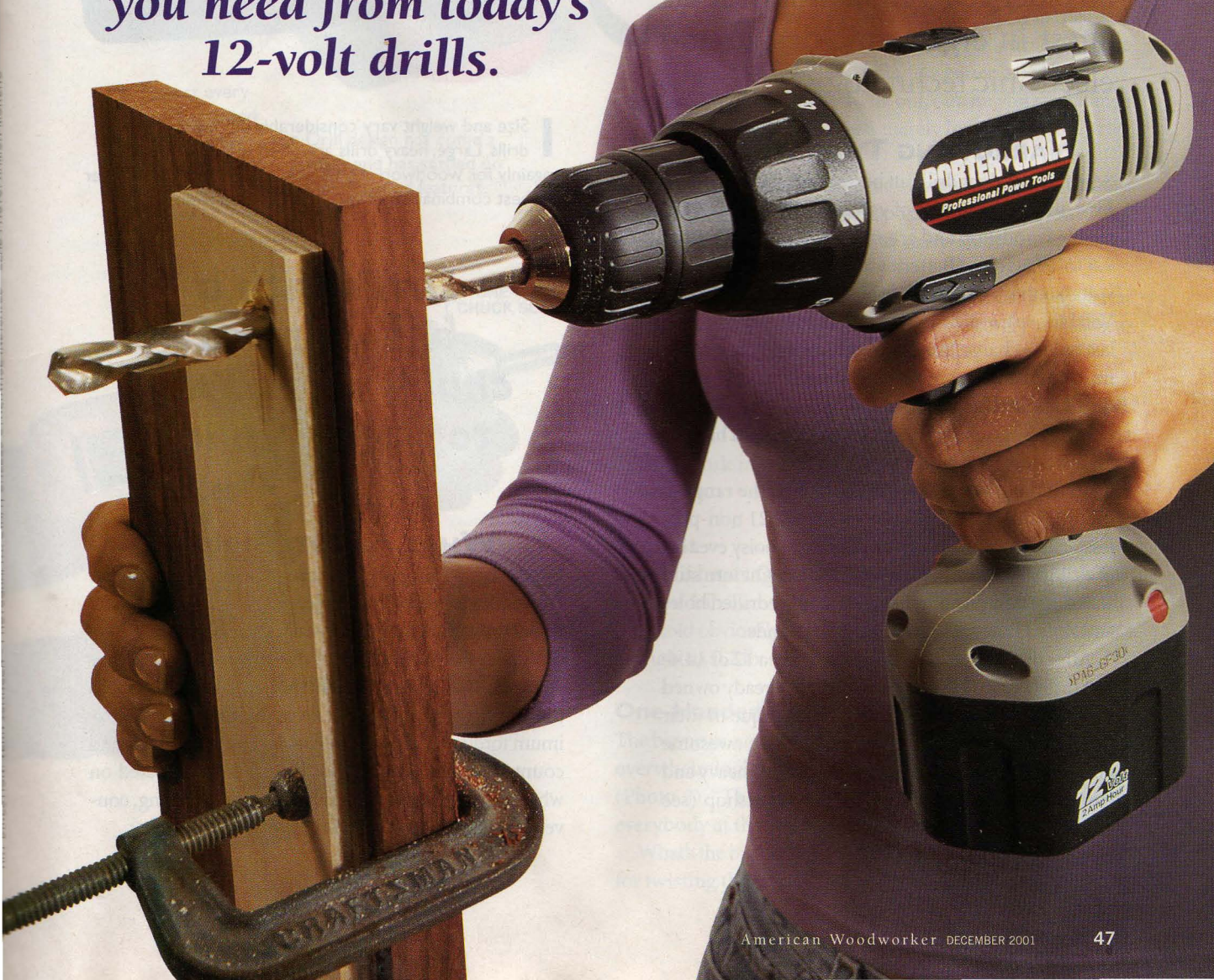
Floor Stand Suction Head, #812399; \$60. Woodcraft, (800) 225-1153,
www.woodcraft.com

Oneway Revolving Center, 130-2100, #1MT, \$100, or #130-220, #2MT; \$100.
The Woodturners Catalog, (800) 551-8876
www.woodturnerscatalog.com

Anti-Fatigue Mats, 27 in. x 36 in., #G3817; \$14.
27 in. x 60 in., #G3818; \$20.
(800) 523-4777, www.grizzly.com

MID-SIZE CORDLESS DRILLS

*You'll get all the power
you need from today's
12-volt drills.*



If there's one tool that all woodworkers know and love, it's the cordless drill. We count on it every day for the ordinary jobs of drilling holes and driving screws, but you've got to admit that a favorite drill is simply fun to use! Their batteries don't last forever, though, so read on if you're in the market to replace an older generation drill with the latest in ergonomic design and electronic technology.

NARROWING THE CHOICES

Selecting the right drill can be a confusing experience. First, there's the matter of voltage. Drills appropriate for the woodshop and around the house range from 9.6 to 19.2 volts. (Batteries are made in units of 1.2 volts, so that's where the odd numbers come from.) Voltage isn't a measure of how long a battery will last on one charge. Voltage is a rough indication of the maximum amount of turning force, or torque, that a drill can exert. As you increase voltage, however, you also get a larger, heavier tool. What's the right balance for a woodworker?

To find out, we ordered every drill in the range—that's 53 and counting! Then we invited 21 non-professional woodworkers to our shop for a noisy evening of drilling. We ran 1/4-in. lag bolts straight into stud walls, inserted tiny hinge screws into predrilled holes and noted how each drill felt in our hands.

After the dust settled, the verdict: buy a 12 or 14.4-volt drill (Photo 1). Many of our testers already owned 9.6-volt drills and wanted a bit more torque in their next drill. Other testers were lured by the awesome power of 18-volt drills, but found them too heavy and cumbersome to be practical in the woodshop (see "You Should Also Know About," page 53).



Size and weight vary considerably among cordless drills. Large, heavy drills are often tiring to use and ungainly for woodworking. 12-volt and 14.4-volt drills offer the best combination of weight, size and power.

Drills with a one-handed chuck rose to the top of the pile.

WHAT ABOUT TORQUE?

Power simply isn't much of a problem for a woodworker with today's drills. There's plenty of punch in a 12-volt drill to build furniture and install cabinets. Sure, there are differences between drills of the same voltage because some drills are more efficient than others. But it's not a difference to lose sleep over, so we didn't measure maximum torque. (That's a rat's nest of competing claims and counter-claims anyway!) Instead, we concentrated on what our testers told us mattered more: handling, convenience and getting the most life out of a battery.

GOOD BASIC DESIGN

On the outside, most drills look pretty much alike. All the manufacturers have arrived at a common, basic design that works extremely well (Photo 2). You can count on finding these features on almost every drill:

- **Keyless chuck.** The days of fumbling for a loose chuck key are long gone, thank goodness.
- **Removable battery.** None of the drills we tested plug directly into an outlet. If you've got an extra battery charged and ready to go, running out of juice should never be a problem.
- **Multiple clutch settings.** You simply dial in the right amount of pressure to tighten any size screw. The number of settings isn't terribly important.
- **Center-mounted handle.** The battle between this new style and the older pistol-style (where the handle is in the rear) seems to be over, and guess who won? The centered handle is definitely better balanced.

- **Centered reversing switch.** In, out, out, in: you can change the direction you drive screws merely by shifting your trigger finger.
- **Two speed ranges.** High speed is useful when you want to get those holes drilled as fast as possible. Switch to low speed when you need more torque to drive stubborn screws or big bits.
- **Variable speed trigger.** You can fine-tune the speed at which you drive a screw with your trigger finger and slow to a crawl at the end so your bit doesn't slip.

FEATURES THAT MAKE A DIFFERENCE

Once we got beyond those common features and put the drills to work in our shop, subtle but important differences showed up.

Weight

Lighter is better. Our testers generally agreed that drills heavier than 5 lbs. are more tiring to hold and control, but this threshold obviously differs from person to person. Differences as slight as 0.2 lb. are noticeable.

One-Handed Chuck

The big news came when we had our testers change bits. They overwhelmingly preferred the new one-piece style chuck (Photo 3). "This is really slick!" said one excited guy, and everybody at the test agreed.

What's the big deal? An older-style chuck has two rings, one for twisting the jaws tight and another for grabbing onto so



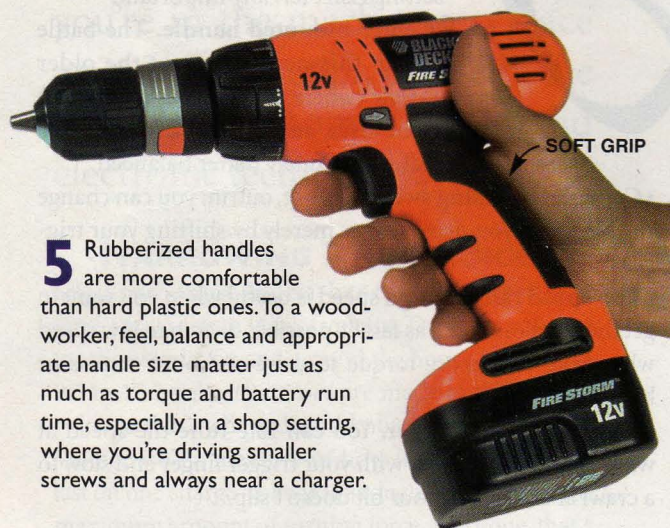
2 Almost every drill we tested has the basics down pat. Drill design has come a long way in the past few years and has settled on a common set of useful, well-designed features.



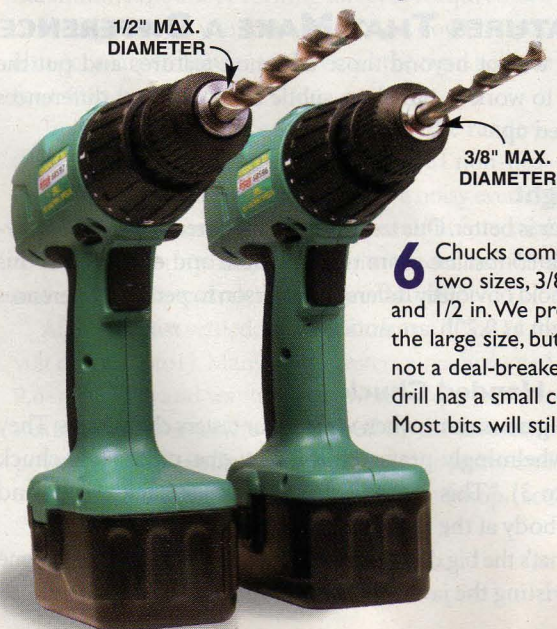
3 We were delighted with easy-to-tighten, one-handed chucks that are found only on a few drills. Getting a firm grip on a bit requires only a simple twist of the wrist.



4 Handle size varies a lot. A 1-in. difference in circumference makes a huge difference in how a handle feels. No matter how good a drill is in other respects, a handle that feels too large is a deal-breaker. Everybody's got a different preference, so we've categorized the handles in our chart (pages 52 and 53) as Small, Medium and Large.



5 Rubberized handles are more comfortable than hard plastic ones. To a woodworker, feel, balance and appropriate handle size matter just as much as torque and battery run time, especially in a shop setting, where you're driving smaller screws and always near a charger.



6 Chucks come in two sizes, 3/8 in. and 1/2 in. We prefer the large size, but it's not a deal-breaker if a drill has a small chuck. Most bits will still fit.

the chuck doesn't spin. To really tighten a bit, you've got to grab one ring in each hand and give a good twist. Those rings are typically pretty narrow, so it's hard to get a good grip. What do you do instead? Grab the chuck with one hand, turn on the drill, and hold on for dear life until the jaws clamp down on the bit. If you've got the drill in drive, a spinning chuck can burn the heck out of your hand. It's not a safe method.

The one-piece chuck sleeve is much more user-friendly. You can still use the trigger to quickly adjust the size of the jaws, but when it comes to putting the final grip on a bit, all you need to do is twist the sleeve with one hand. Whether you use power or not to tighten a chuck, the large size of the one-piece sleeve is much easier to grab. Older and sensitive hands will find this a welcome relief.

Handle Size

The size of the handle made an immediate impression. Few testers complained about a handle that was too small, but if they thought one was too big, forget it. We measured all the handles just below the trigger and found a wide range of sizes (Photo 4). Admittedly it's a bit subjective to categorize, but we divided the handles into three sizes to help you find the right drill without having to pick up every one.

Handle Comfort

Rubberized handles were a big hit (Photo 5). They simply felt more comfortable than plain, old hard-plastic handles. You'll really appreciate this difference if you use a drill for more than a few minutes at a time.

Chuck Capacity

Many drills now have 1/2-in. chucks (Photo 6). A large chuck is convenient, but shouldn't be the single factor for choosing between two drills. Let's be realistic: you'll rarely use a bit with a shank larger than 3/8-in. diameter, and you can always buy a set that has stepped down shanks in the larger sizes. All chucks can handle bits as small as 1/16-in.

Low-End Clutch Settings

Less is more. It's not often that you'll use a cordless drill to drive in tiny screws that are easy to break or strip out. You have more control (but more wrist-twisting) with a plain old screwdriver. But a cordless driver with a magnetic tip can be mighty appealing in some situations, so we prefer a drill with a clutch that easily releases at settings 1 and 2. Most drills performed just fine, but the Makitas, Metabos and Porter-Cables stood out. The DeWalts' and the Fein's minimum clutch settings were a bit too powerful for setting small hinge screws.

Batteries

Gone are the days when you had to buy a second battery for your cordless drill. Most now come with two (Photo 7). For a rock-bottom price you can still buy some drills with only one battery (see the Comments section of the Chart, pages 52 and 53), but having two is more practical. If it's not provided, count on ordering a second battery.

Time was that all batteries used the same chemistry: nickel-cadmium, or Ni-Cd for short (Photo 8). But now there's a rival: Nickel-metal hydride batteries (Ni-MH). Why? It's about run time: how long one charge will last. Engineers had run up against a ceiling with Ni-Cds, but found they could drive significantly more screws in the lab before a Ni-MH battery needed recharging.

Run time is measured in amp-hours, but to be honest, it's not an absolute standard. Two drills can have the same amp-hour rating and drive a different number of screws per charge because some motors and transmissions are more efficient than others. The run time of inexpensive batteries can also fall off faster over time. You'll probably get fewer recharges from an inexpensive battery, too. The bottom line: take amp-hour numbers with a grain of salt.

When you're in your shop, near a charger, a difference in run time isn't a big deal. It's easy to pop a fresh battery in your drill whenever one goes kaput. But if you're up on a roof or out in the woods, yeah, it could matter.

In defense of Ni-Cd batteries, you can recharge them more times over a lifetime of use than today's Ni-MH batteries. Shorter run time, but more charge-ups: what should you choose? In the end, you'll drive about the same number of screws with either type before you wear out the battery.

Used Ni-Cd batteries must be recycled, because cadmium is a hazardous waste. Under most current regulations, used Ni-MH batteries can be tossed in the trash, but we recommend that you recycle them anyway.

Chargers

Don't overlook the lowly charger! It can make the difference between a drill that's always ready to go and one that's not (Photo 9). Most chargers take one hour to replenish a battery, but others take three hours or more.

One-hour chargers generally contain sophisticated electronics to diagnose a battery's temperature and voltage as it's charging. Slow chargers do not. The practical difference for users is one of convenience and maximizing battery life. You can walk away and forget about a battery left in a diagnostic charger for a few days. If you leave a battery plugged into a slow charger, you'll shorten the battery's life. It's best to take that battery out immediately after it's charged. That's fine, as long as you remember to do it!

7 Two batteries are a must. Batteries can quit with little warning, so it's mighty convenient to have a freshly charged battery ready to go, even for small jobs.



8 Batteries come in two types, the older, standard nickel-cadmium (Ni-Cd) and a newcomer, nickel-metal hydride (Ni-MH). Ni-MH batteries offer longer run times than Ni-Cd batteries, but take fewer charges over their life span.



9 One-hour chargers typically contain sophisticated electronics to maximize a battery's life. Replacement batteries can be quite expensive (\$25 to \$100), so it makes sense to take care of the ones you've got.

TOOL TEST: MID-SIZE CORDLESS DRILLS

	Brand	Model	Street Price	Weight (lbs.)†	One-handed chuck	Handle size*	Rubber grip	1/2-in. chuck	Amp hours	Average recharge time	Charger diagnostic features	Price of additional battery
12 Volt	Black & Decker	FSD122K	\$80	3.5	N	S	Y	N	1.3	3 hrs.	N	\$26
	Bosch	3360K	\$160	4.9	Y	M	Y	Y	2.0	1 hr.	Y	\$50
	Craftsman	27121	\$160	4.5	Y	M	Y	N	2.0	1 hr.	Y	\$45
	Craftsman	27122	\$160	4.6	Y	L	Y	N	2.0	1 hr.	Y	\$45
	DeWalt	DW980 K-2	\$170	5.0	Y	S	Y	Y	1.7	1 hr.	Y	\$47
	Fein	ABS12-2EUQ	\$250	4.3	N	S	N	Y	1.3	1 hr.	Y	\$75
	Festo	CDD12ES	\$340	4.3	N	L	N	N	1.7	15 min.	Y	\$81
	Hitachi	DS13DV2	\$175	4.2	Y	S	N	Y	2.0	1 hr.	Y	\$83
	Makita	6216DWBE	\$225	4.8	N	S	N	N	2.2	1 hr.	Y	\$89
	Metabo	BST12Plus	\$230	4.5	Y	M	N	Y	2.0	1 hr.	Y	\$64
	Milwaukee	501-23	\$180	4.3	N	L	Y	Y	1.3	1 hr.	Y	\$41
	Milwaukee	502-23	\$180	3.8	N	S	N	N	1.3	1 hr.	Y	\$41
	Panasonic	EY6407NQKW	\$195	4.3	Y	S	Y	Y	3.0	45 min.	Y	\$85
14.4 Volt	Porter-Cable	9866	\$140	4.5	N	M	Y	N	2.0	1 hr.	Y	\$75
	Ryobi	HP1202M	\$59	3.4	N	S	Y	N	1.4	3 hrs.	N	\$39
	Black & Decker	FSD142K	\$110	4.0	N	S	Y	N	1.3	3 hrs.	N	\$30
	Bosch	3660K	\$180	5.1	Y	M	Y	Y	2.0	1 hr.	Y	\$63
	Chicago Electric	34793	\$40	3.4	N	M	N	N	1.3	3 hrs.	N	\$30
	Craftsman	27123	\$190	4.8	Y	M	Y	N	2.0	1 hr.	Y	\$55
	DeWalt	DW983 K-2	\$200	5.3	Y	S	Y	Y	1.7	1 hr.	Y	\$53
	Grizzly	G8595	\$55	3.5	N	M	N	N	1.3	3 hrs.	N	\$30
	Hitachi	DS14DV	\$200	4.6	Y	S	N	Y	2.0	1 hr.	Y	\$80
	Makita	6236DWBE	\$240	5.0	N	S	N	N	2.2	1 hr.	Y	\$100
	Milwaukee	511-21	\$190	4.6	N	L	Y	Y	1.7	1 hr.	Y	\$52
	Milwaukee	516-22	\$210	5.4	N	S	Y	Y	2.4	1 hr.	Y	\$60
	Porter-Cable	9878	\$195	5.2	N	M	Y	Y	2.0	1 hr.	Y	\$85
15.6	Ryobi	HP1442M	\$85	4.2	N	M	Y	N	1.5	1 hr.	Y	\$49
	Metabo	BST15.6Plus	\$285	5.0	Y	M	N	Y	2.4	1 hr.	Y	\$92
	Panasonic	EY6431NQKW	\$210	4.5	Y	S	Y	Y	3.0	45 min.	Y	\$90

† Rounded to nearest tenth of a lb.

* S=Small, M=Medium, L=Large.

You Should Also Know About

Our candidates for the best all-around shop drills are 12-volt, 14.4-volt and 15.6-volt models, but there's plenty of good qualities to small 9.6-volt drills and powerful 18-volt beasts.

9.6 volt: They're compact, light weight and have enough torque to drive just about any screw in a pre-drilled hole. In fact, for a lot of work in the shop, they're perfect. However, if you frequently push any drill to its limit you can permanently shorten the life of its battery, and these

drills simply have a lower threshold than their more powerful cousins.

Look for models that have 1-hour chargers, two batteries, and two speed ranges.

18 volt and 19.2 volt: Most are large, heavy, and have more torque than you'll typically need in a woodshop. But you've gotta admit there are times when power is everything, such as running large lag bolts into garden structures without predrilling. These drills won't let you down.



A 9.6-volt drill has all the power you need for most furniture making jobs, but can bog down under the larger torque requirements of garden furniture projects or household carpentry jobs.



18-volt and larger drills are mighty powerful, but you'll be surprised when you pick up most of them. Man, are they heavy! They're overkill for the woodshop.

Comments

Contact

Single speed; can take chuck off to access a second driver; magnetic twist bit storage; LED level.	(800) 544-6986
Side handle included.	(877) 267-2499
Bubble level.	(800) 377-7414
Pistol grip; nose heavy; bubble level.	(800) 377-7414
3 speeds; top speed faster than other drills; 15-min. charger and Ni-MH batteries available.	(800) 433-9258
Battery may go below or behind drill to change balance.	(800) 441-9878
Very short length (7 in.) for cramped quarters; pistol style handle.	(888) 463-3786
Tippy when standing on battery; sleeve locks chuck.	(800) 829-4752
Ni-MH battery; very sensitive clutch at lowest settings; easy-to-access brushes.	(800) 462-5482
Impulse drive option.	(800) 638-2264
Pistol-grip handle; nose heavy, battery reversible to change balance; Ni-MH batteries available.	(262) 781-3600
Battery reversible to change balance; rocker reversing switch; smallest handle; Ni-MH batteries available.	(262) 781-3600
Ni-MH battery; chuck ratchets rather than spins free; Ni-Cd battery available.	(800) 338-0552
Broad, easy-to-reach reversing switch.	(800) 487-8665
Bubble level; may charge battery with 14.4-volt 1-hr. charger (\$39).	(800) 323-4615
Same as Black & Decker 12-volt.	(800) 544-6986
Side handle included.	(877) 267-2499
Comes with 1 battery; single speed.	(800) 423-2567
Bubble level; a bit nose heavy, but well-balanced in vertical position.	(800) 377-7414
3 speeds, with top speed faster than other drills.	(800) 433-9258
Comes with 1 battery; single speed range; non-diagnostic 1-hr. charger available for \$15.	(800) 523-4777
Sleeve locks chuck.	(800) 829-4752
Ni-MH battery; very sensitive clutch at lowest settings; easy-to-access brushes.	(800) 462-5482
Pistol grip; battery is reversible to change balance; Ni-MH batteries available.	(262) 781-3600
Battery is reversible to change balance; Ni-MH batteries available.	(262) 781-3600
Broad, easy-to-reach reversing switch.	(800) 487-8665
Bubble levels; magnetic tray on battery.	(800) 323-4615
Impulse drive option.	(800) 638-2264
Ni-MH battery; chuck ratchets rather than spins freely; Ni-Cd battery available.	(800) 338-0552

Turn the page for more on our picks.

RECOMMENDATIONS

You'll get plenty of power from any of the 12-volt drills we tested. 14.4 and 15.6-volt drills just add icing to the cake. They're slightly heavier and thus a bit more unwieldy than their 12-volt cousins. In most other respects, a 12-volt and a 14.4-volt drill made by the same company have very similar features.

Drills under \$100 are a tempting buy. On the plus side, they're very light and comfortable to use. If you don't push them too hard, too often, they'll do just fine in your shop. On the downside, they generally come with only one battery, a slow charger and one rather than two speeds.

The second tier of drills takes a pretty healthy jump in price and quality. They go from \$140 to \$340 and have all the features that would satisfy most woodworkers. There's a wealth of good drills to choose from, but one difference stood out: the one-handed chuck. We wish (and half-expect) that every drill will someday have one.

With so many great drills, picking an Editors' Choice wasn't easy. We chose drills that had 1/2-in., one-handed chucks, small or medium-sized handles and weighed 5 lbs. or less. The Panasonic 12-volt slightly edged out the rest, primarily because it's so compact.



Best Buys



Ryobi 14.4-volt HP1442M; \$85.

Pros: It has two speeds, a 1-hr. charger and comes with two batteries.

Cons: It has a two-handed, 3/8-in. chuck and less maximum torque than more expensive drills.



Black and Decker 12-volt FSD122K; \$80.

Pros: Snap off the chuck and the drill turns into a driver without switching bits. It also has horizontal and vertical levels indicated by a light.

Cons: It's only got a single-speed. It has a two-handed, 3/8-in. chuck and a slow charger.



Editors' Choices

Panasonic 12-volt EY6407; \$195.

Pros: This drill is light weight, compact and has a long run time.

Cons: The chuck doesn't spin freely, but ratchets into position.



Bosch 12-volt 3360K; \$160.

Pros: It comes with a removable side handle.

Cons: It's a bit on the heavy side and has a medium-sized handle.



DeWalt 12-volt DW980K-2; \$170.

Pros: It has a generously sized chuck with very smooth action. It's the only drill with an additional extra-fast speed range.

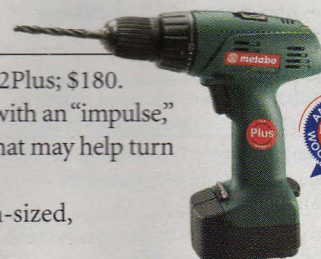
Cons: It's a bit heavy.



Hitachi 12-volt DS13DV2; \$175.

Pros: It's light weight and has a chuck that locks shut.

Cons: It has an uncushioned handle and it's a little tippy standing up (although the 14.4-volt model shown here is just fine).



Metabo 12-volt BST12Plus; \$180.

Pros: It's the only drill with an "impulse," surging drive option that may help turn stubborn screws.

Cons: It has a medium-sized, uncushioned handle.



Craftsman 12-volt 27121; \$160.

Pros: It's got a vertical and horizontal bubble level.

Cons: This drill is fairly large in size and has a 3/8-in. chuck.

Bookcase Craftsman

by Randy Johnson

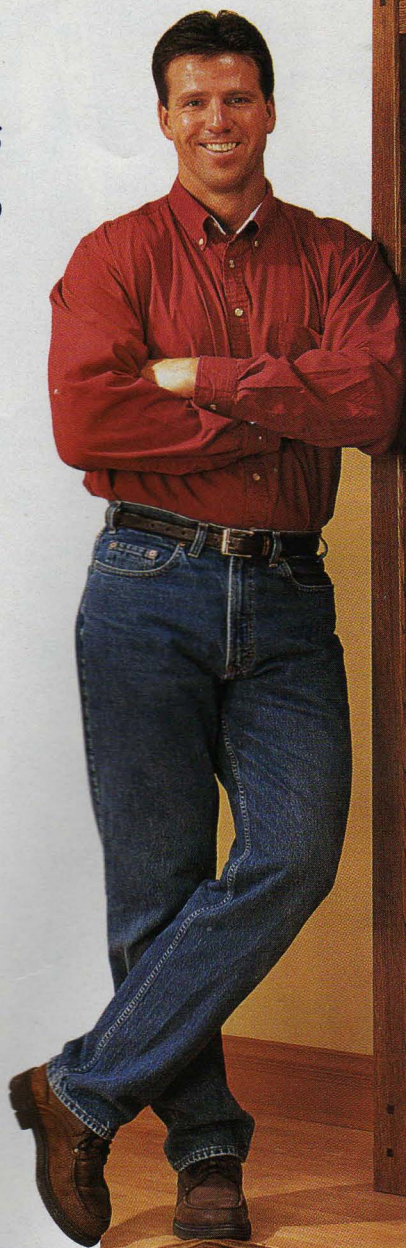
Knockdown joinery makes this cabinet easy to build, easy to assemble and easy to move.

Everyone loves bookcases. This beauty, with its Arts and Crafts overtones, offers abundant storage and style. We used rift-sawn white oak and built-up plywood parts to give this case the look of solid wood. The thick shelves will not sag even under a heavy load of books. Graceful arches, decorative pegs and hammered-copper hardware enhance the hand-crafted feel of this grand cabinet.

Construction Techniques

This is a large cabinet, but knockdown joinery allows you to build it even in a small shop. The knockdown design makes moving it into your house less of a hassle because there are no big or awkward parts to handle. To achieve this knockdown design, we used a combination of pocket screws and biscuits to join the cabinets together.

The thick side panels are built like a sandwich made up of two outer panels with fillers in between to give additional thickness. What you end up with is a hollow panel that is strong but relatively light in weight.



No need to lug a big cabinet from your shop to the living room. This bookcase breaks down into easy-to-handle components.



ART DIRECTION: PATRICK HUNTER • PHOTOGRAPHY: RAMON MORENO, UNLESS OTHERWISE INDICATED • LEAD PHOTO: BILL ZUEHLKE • ILLUSTRATION: FRANK ROHRBACH

Getting Started

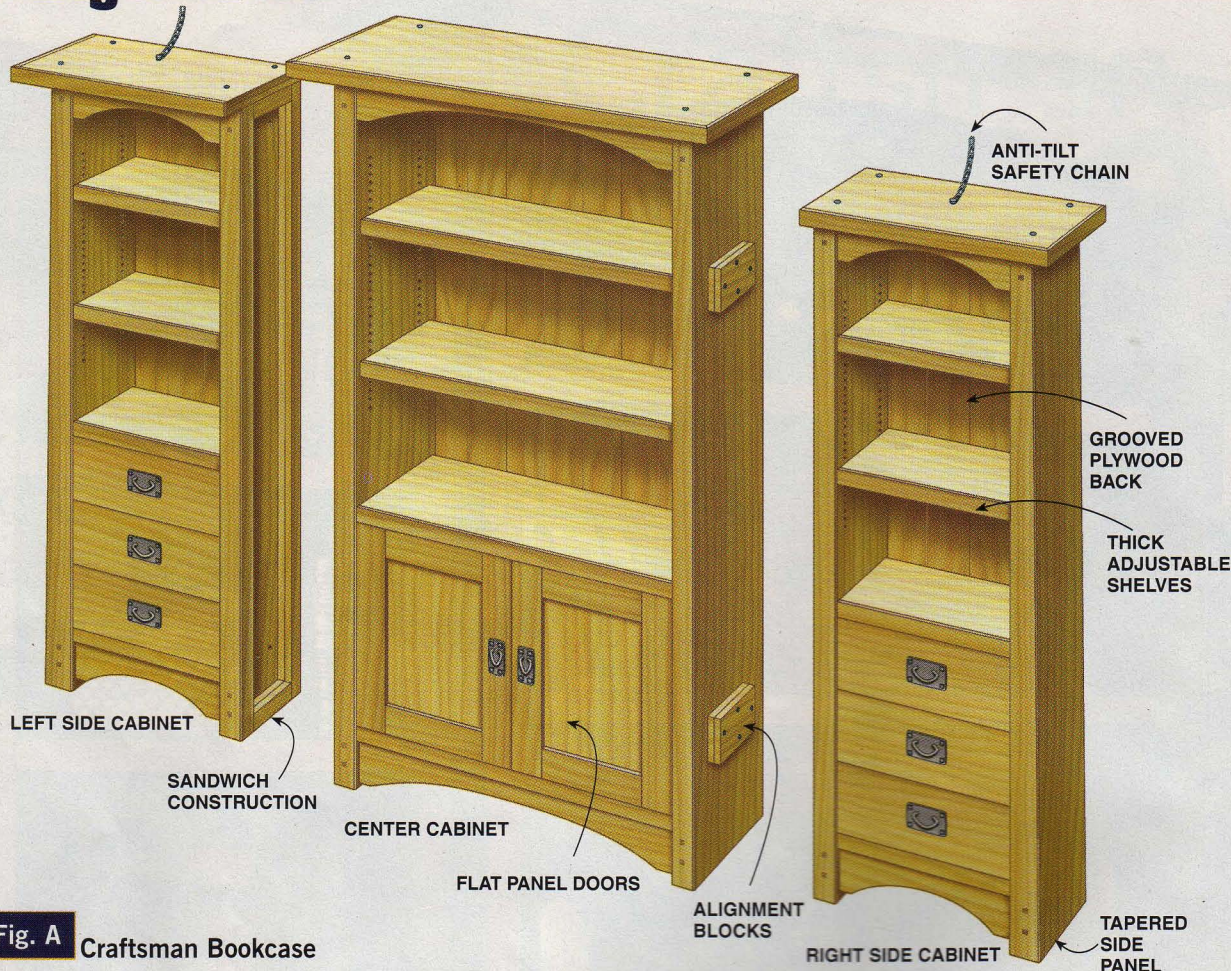


Fig. A Craftsman Bookcase

IS THE BOOKCASE TOO BIG FOR YOUR ROOM?

If you don't have space for all three cabinets, consider making just one. Here are a couple of options:

1. Make the center cabinet only. Doors can be left off for a full-height bookcase. Make all the shelves adjustable and you'll have room for lots of books and collectibles.

2. Make a side cabinet only. If you need a tall, narrow bookcase, this is the way to go. To use the side cabinet alone, make both side panels tapered and extend the applied top for an equal overhang on both sides.

Built-up plywood side panels give this cabinet a strong, solid look.

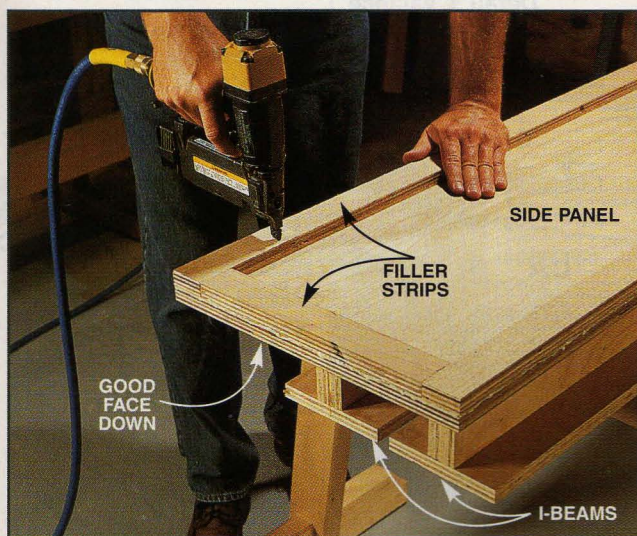
There's one potential problem with these built-up side panels: plywood is not perfectly flat. To make matters worse, if you glue up the plywood sides after simply laying them on a couple of sawhorses, the weight of the clamps will cause the sandwiched sides to bow and they'll end up looking more like the St. Louis Arch than part of a bookcase. To prevent bowing, we built a set of plywood I-beams to work on (Photo 2 and Fig. B, page 61). When you're done using the I-beams for this bookcase, add a sheet of plywood and you've got a quick, sturdy workbench.

Tools and Materials

To build this bookcase, you'll need a tablesaw, a jointer, a planer, a bandsaw or jigsaw, a router, a drill, a brad nailer and compressor, a biscuit joiner, a pocket-screw drilling jig and a variety of common hand tools. You'll also need a big bunch of clamps.

Materials for our bookcase, including hardware, cost about \$1,500. If you substitute plain-sliced red oak for the rift-sliced white oak, your total cost will be about \$700.

Building the Center Cabinet



1 Glue filler strips to one side panel. Add a few brad nails to keep the filler strips from sliding. Locate brad nails near the inside edge of the fillers so they don't interfere when the panels are cut to final size later. The second side panel goes on top of this assembly.

Building the Center Cabinet

Start by roughing out the plywood parts. Pay special attention to the Notes section of the Cutting List, page 68. This section tells you how much to add to the length and width measurements for the necessary waste. The amount you add, which gets sawn or routed off later, varies from part to part.

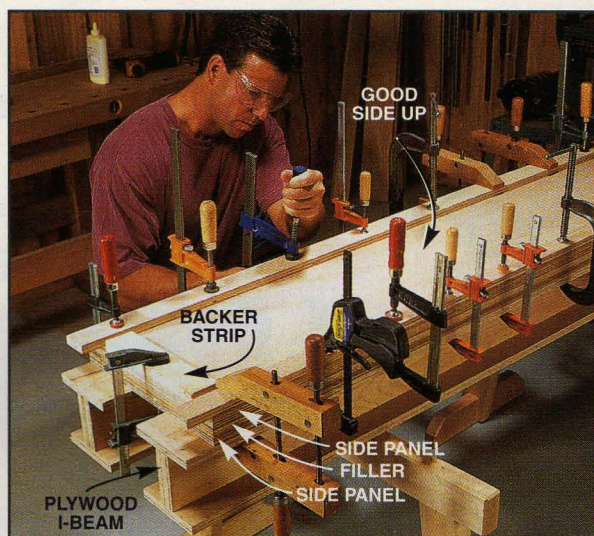
Making the Built-Up Panels

To assemble your first sandwich, lay a side panel (C1), with its good side down, on the plywood I-beams (Photo 1). Add some glue, and brad nail the filler strips (C2, C3) in place. The brad nails just have to keep the fillers from slipping when clamped, so you don't need very many. And don't worry if the filler strips don't line up perfectly with the edges of the side panel. The whole sandwich gets cut to final size later on. Apply glue to the top side of these fillers and add the next panel (C1), good side up this time. Add some backer strips to protect the wood and clamp the three-layer plywood sandwich to the lip of the I-beams (Photo 2).

Cutting the Sandwiched Parts to Final Size

Before you cut the sandwiched parts to final size, it's a good idea to remove excess glue drips from the edges of the sandwiches. A paint scraper works great. If you don't remove them, these hardened drips will

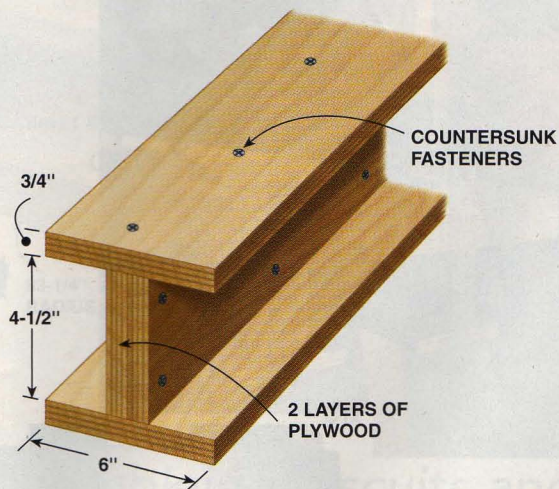
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2 Beg, borrow or buy two dozen clamps. Add some backer strips to protect the good side of your plywood. Then, clamp the whole sandwich to the plywood I-beams.

Fig. B Plywood I-Beams

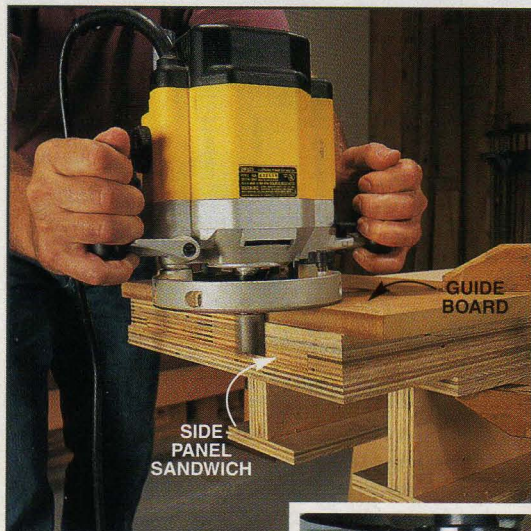
These I-beams provide a strong, flat surface for clamping. It takes only one sheet of plywood to make them. We glued, clamped and stapled our I-beams together but screws will do the job, too. Just make sure all fasteners are well sunk or they will scratch your project.



Plywood I-beams ensure that the panels are glued up perfectly flat.

Building the Center Cabinet

Trimming sides to length is a two-step process.

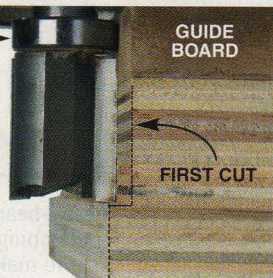


3

First Cut.

Use a guide board and a top-bearing bit to make the first trimming cut.

TOP-BEARING BIT



4

Second Cut.

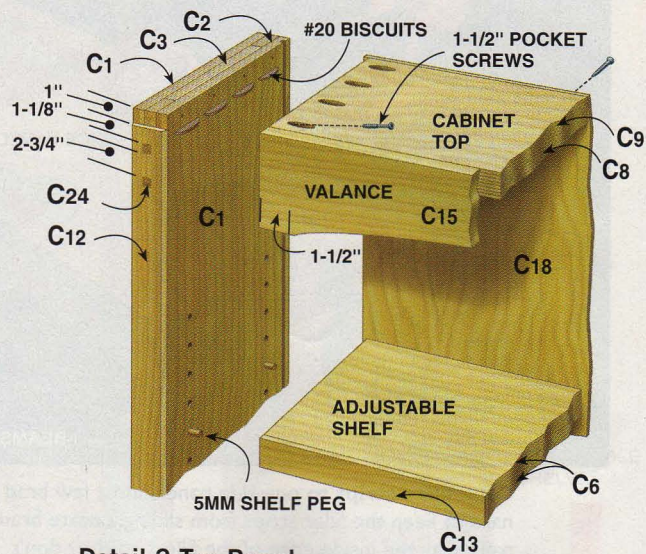
Flip the panel over and trim the remaining edge with a bottom-bearing bit. The bottom-bearing bit will run on the previously routed surface.

BOTTOM-BEARING BIT

REMOVE WITH SECOND CUT

Detail 1 Valance

The valance is glued to the cabinet top. This assembly is then screwed to the side panels.



Detail 2 Toe Board

The toe board is glued to the cabinet bottom. The bottom's edge banding aligns with the back of the chamfer.

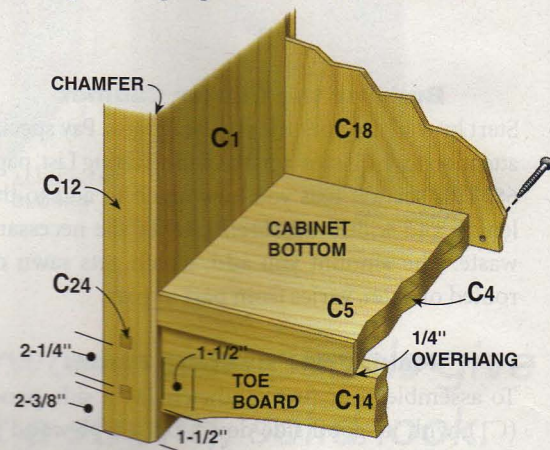
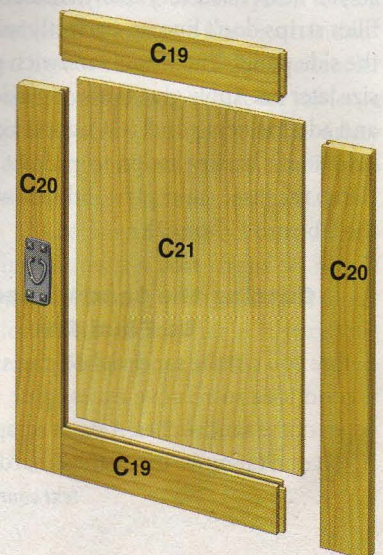


Fig. C

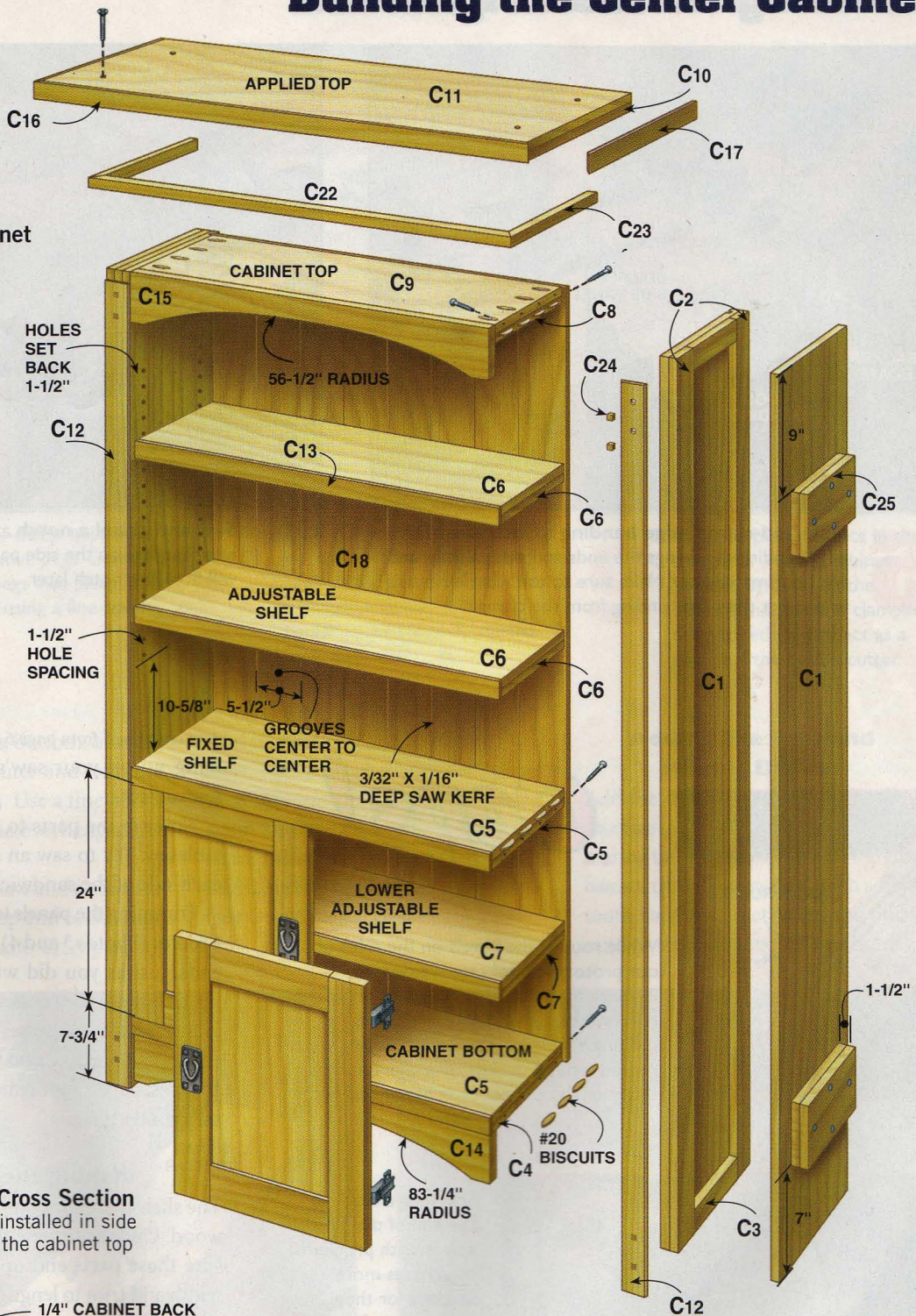
Flat-Panel Door

We used a tongue-and-groove router bit set to make the door parts.



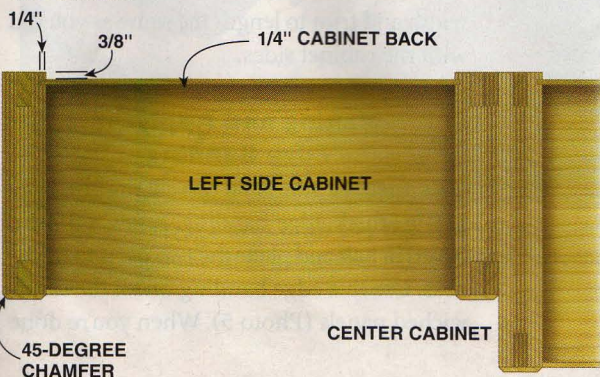
Building the Center Cabinet

Fig. D Center Cabinet



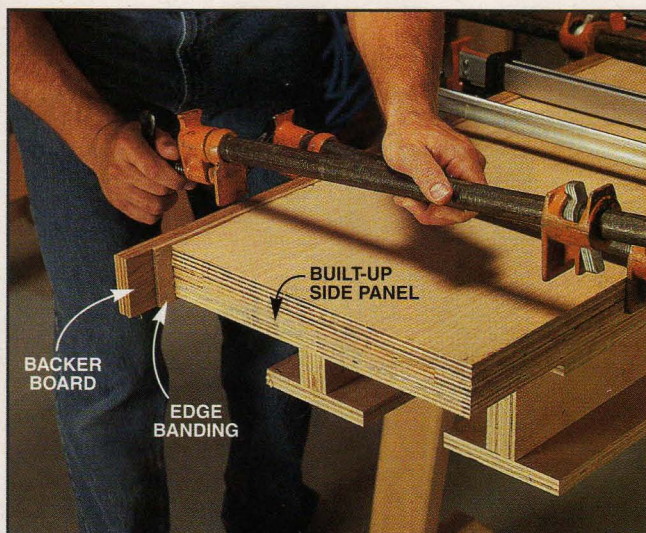
Detail 3 Cabinet Cross Section

The cabinet back is installed in side dados but overlaps the cabinet top and bottom.

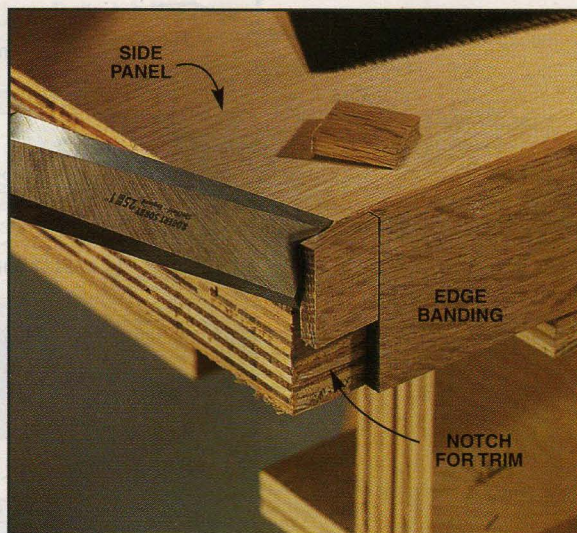


Combining biscuits and pocket screws makes the knockdown joinery simple and strong.

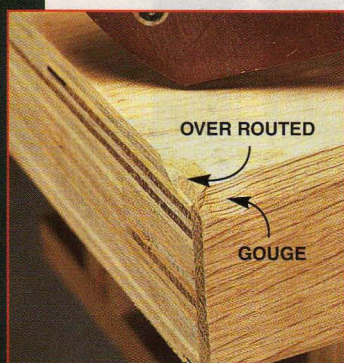
Building the Center Cabinet



5 Glue and clamp edge banding to each panel. The edge banding overhangs the ends and sides a little, and will be trimmed later. Make sure to use a backer board to protect the edge banding from the clamps.

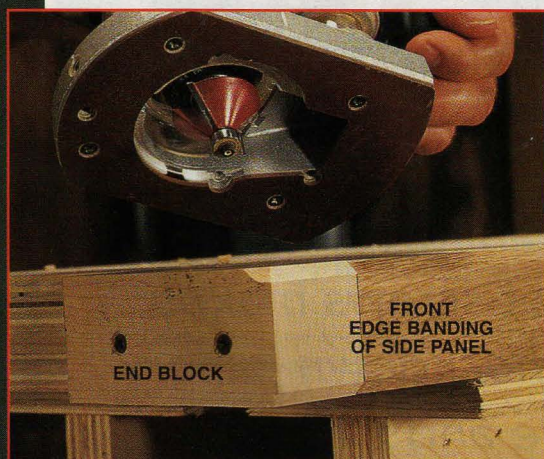


6 Saw and chisel a notch at the top end of the edge banding on the side panels. A piece of trim will fit in this notch later.



Oops!

While routing the bevels on the sides of our prototype bookcase we oopsed. Because the router had less support at the corner, it tipped and gouged the edge banding. While reacting to this tipping we routed around the corner. Unfortunately, this is one oops that can't be sanded out.



Screwing a block to the end of the panels solves both problems: it provides more support for the router and eliminates the possibility of routing around the corner.

text continued from page 61

hang up on your saw's fence, causing an uneven cut.

Now rip the parts to final width on your tablesaw. Try to saw an equal amount from each side of the sandwich.

Trimming the panels to length is done with a router (Photos 3 and 4). Trim some off both ends, just as you did with the sides. When making these trim cuts, don't hog it all off in one pass. Multiple passes give you a smoother cut and it'll be easier on your router, too (see *Sources*, page 72 for where to buy the necessary router bits).

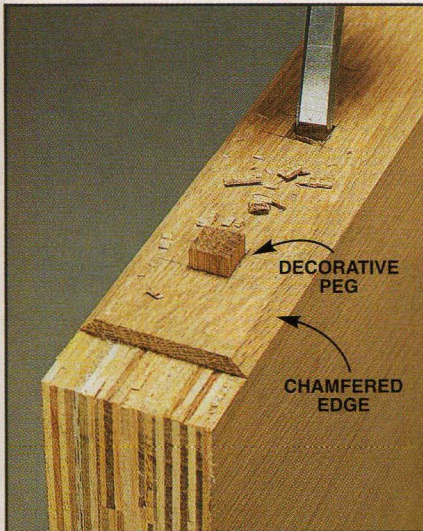
Making the Shelves

The shelves are made up of two layers of plywood. Once again, use the I-beams to make sure these parts end up flat. Cut shelves to width and trim to length the same as you did with the cabinet sides.

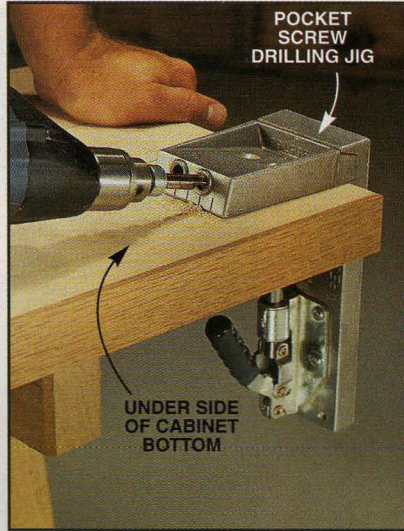
Making and Applying Edge Banding

To conserve material when making the 1/4-in.-thick edge banding, resaw a 3/4-in. board in half and plane the two parts to thickness. Use this edge banding on all the sandwiched panels (Photo 5). When you're done

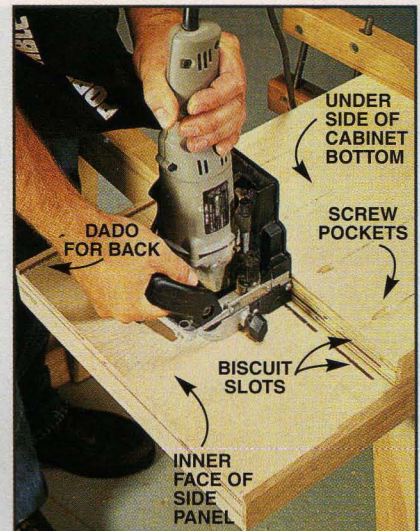
Building the Center Cabinet



7 Chisel 1/4-in.-deep mortises for the decorative pegs. Glue and hammer the pegs into place. Trim the pegs flush using a fine-tooth handsaw.



8 Drill pocket screw holes in the cabinet's bottom, top and fixed shelf. Pay special attention to which side you drill the screw pockets into. A mistake here is difficult to fix.



9 Cut the biscuit slots in the side panel and the cabinet bottom. By lining up the bottom and side and clamping them together, they act as a guide for the biscuit cutter.

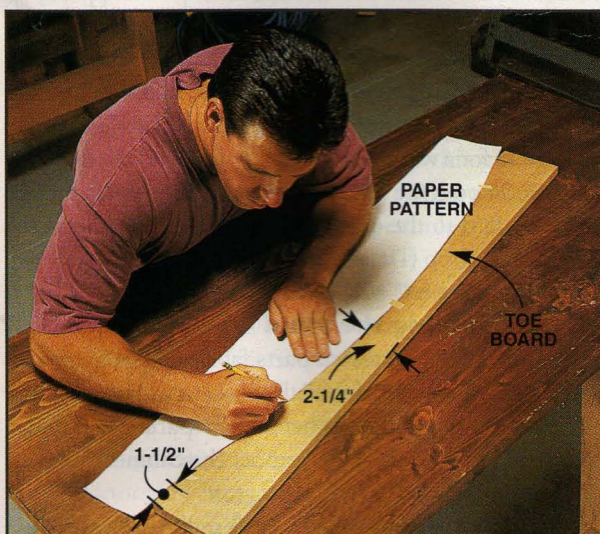
edge banding, put a bottom-bearing trim bit in your router and trim the edge banding flush. Use a fine-tooth handsaw to trim the overhang at the ends.

Now use a handsaw and a chisel to cut a notch in the top end of the edge banding (C12) (Photo 6). A piece of

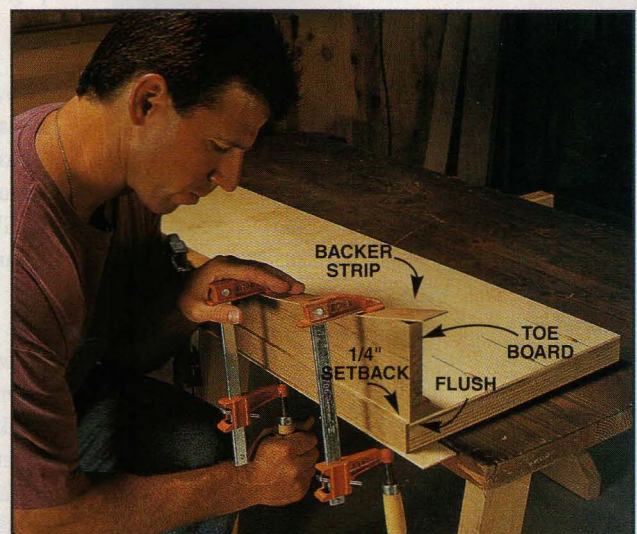
trim (C22) fits in this notch later on. Next, add a block to the bottom of each side panel. Get out your router again and install a 45-degree chamfering bit. Rout the bevels into the edge banding (C12) of the side panels (see Oops! page 64).

Adding the Pegs and Making Dadoes

Add the decorative pegs by chiseling mortises (Photo 7) and gluing and hammering the pegs in place. Once the glue has set, trim the pegs flush with a fine-tooth handsaw. Later, when you finish sand, you can remove any saw marks.

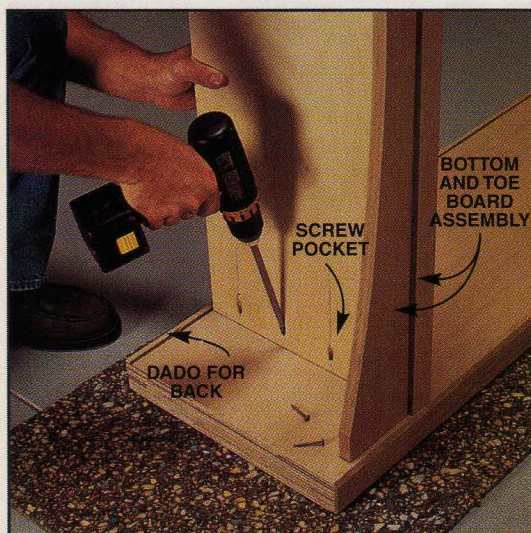


10 Trace arcs onto the toe and valance boards. The arcs stop 1-1/2 in. from each end.



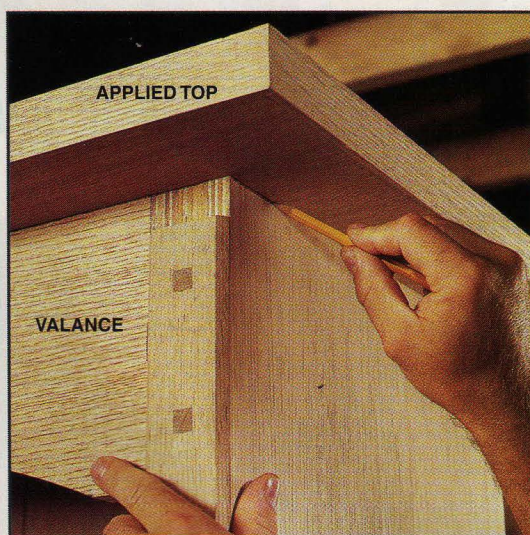
11 Glue and clamp the toe board to the cabinet bottom. Set the toe board back the thickness of the edge banding. Use backer strips to protect your work.

Building the Center Cabinet



12 It's time to assemble. Just add the biscuits and pocket screws. Do not glue.

Now it's time to cut the dados in the side panels for the 1/4-in. back (Detail 3, page 63). Clearly mark your two upright panels left and right and then mark where the dados go. Cut the dados with a dado head on your tablesaw or a router with an edge guide.



14 Trace around the cabinet to mark the location for the trim strips that get glued to the applied top.



13 Check the cabinet for square by measuring from corner to corner. The diagonal measurements should be the same. If you need to, bump the cabinet a little to make it square, then screw the back in place.

Drilling and Cutting the Knockdown Joinery

The knockdown joinery we've built into this project is a combination of pocket screws and dry-fit biscuits. The biscuits provide alignment between the parts and the pockets screws pull everything together good and tight.

First, take some time to examine all the cabinet parts and clearly mark the locations for the pocket-screw holes. Double-check your marks because a mistake here will be difficult to fix. Then drill the pocket screw holes using a pocket-screw jig (Photo 8, see Sources, page 72). Now, cut the biscuit slots (Photo 9).

Making the Arched Toe and Valance Boards

You need to make a paper pattern to trace the arched shape on the toe and valance boards (Photo 10). See Workshop Tips "Large Arc Layout," on page 18 for a way to do this. Use your bandsaw or jigsaw to cut the arches. Smooth the saw marks with a file or drum sander.

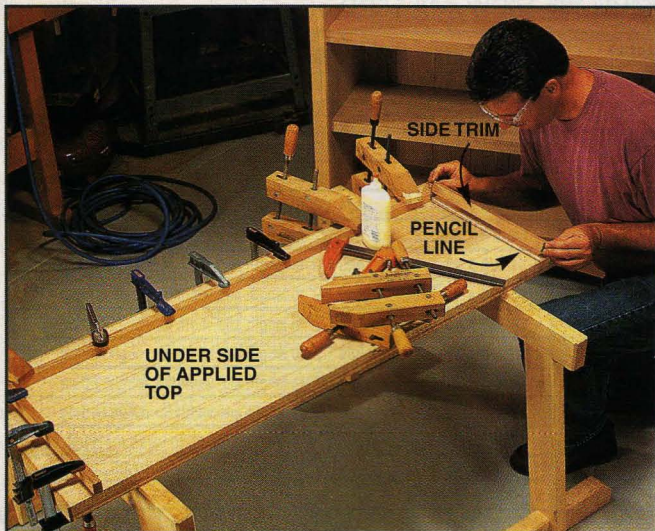
Glue the toe board to the cabinet bottom (Photo 11) and the valance to the cabinet top (Detail 1, page 62).

Assembling the Main Cabinet

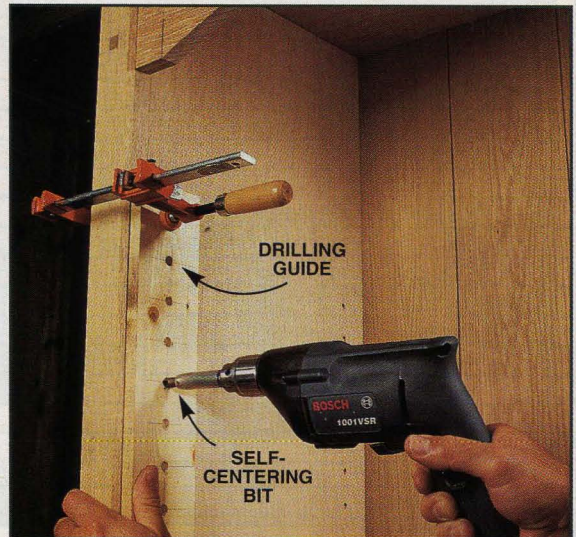
Now that you have all the sandwich parts fabricated, you can dry assemble the cabinet (Photo 12). Install the biscuits, *without glue*, and pocket screw the parts together. When all the parts are screwed together, place padding on the floor and lay the cabinet down on its face.

It's time to make the back (C18). The kerfs in the back are made on the tablesaw using a thin-kerf (3/32 in.) saw blade (see Sources, page 72). A standard 1/8-in.-kerf blade will work too, if you prefer wider lines. After you've made the kerfs, slide the back into the dados along the cabinet sides. Check the cabinet for square by

Building the Center Cabinet



15 Align trim strips with the pencil lines. Then you can glue and clamp them to the underside of the applied top.



16 Drill shelf peg holes using a shop-made drilling guide and a self-centering bit.

measuring corner to corner (Photo 13). Attach the back by screwing it to the top and the bottom and to the fixed shelf.

Adding the Applied Top

With the back panel in place, stand the cabinet up and screw the applied top in place, centered and flush with the back edge of the sides. Make sure to install it with the birch side up and the oak side down. Trace around the top edge of the cabinet with a pencil (Photo 14). This line is used to position the trim strips that are glued to the applied top (Photo 15).

Drilling for Shelf Pins

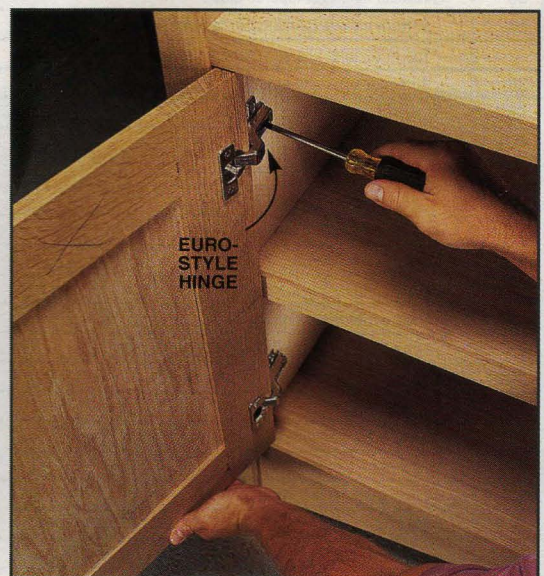
Make a shelf-pin drilling guide from a piece of 1/2-in.-thick wood. Drill 7/16-in.-diameter guide holes in this board at the appropriate locations (see Fig. D, page 63). Clamp this guide to the cabinet side to prevent it from slipping. Use a 5mm self-centering bit (see Sources, page 72) to drill the shelf pin holes (Photo 16).

Adding the Doors

There's nothing tricky about these doors. We used a tongue-and-groove router bit set (see Sources, page 72), but they could be doweled together or assembled with mortises and tenons. If you haven't made panel doors before, be sure to check out George Vondrisk's article "Raised Panel Doors," AW #86, April 2001, page 32.

The doors are hung on Euro-style hinges (Photo 17). These hinges have the big advantage of being easy to adjust up and down, left and right, and in and out. Installing Euro-style hinges does, however, require the use of a 35mm drill bit (see Sources, page 72). For more information on using Euro-style hinges see AW #82, October 2000, page 64.

The cabinet back is screwed on so it can be removed for easy finishing.



17 Hang the doors with Euro-style hinges. They make door installation and adjustment a real snap.

Cutting List

Overall Dimensions: 86-3/4"H x 105-1/2"W x 18-1/2"D

Part	Qty.	Name	Material	Dimensions T x W x L	Notes
CENTER CABINET					
C1	4	Side panels	Oak plywood	3/4 x 15-1/4 x 85-1/4	Add 1" to length and 1/2" width for rough cutting.
C2	4	Vertical fillers	Oak Plywood	3/4 x 1-3/4 x 85-1/4	Add 1/2" to length for rough cutting.
C3	4	Horizontal fillers	Oak Plywood	3/4 x 1-3/4 x 12-1/4	
C4	1	Underside of cabinet bottom	Birch plywood	3/4 x 14-3/8 x 43-1/2	Add 1/2" to length and width for rough cutting.
C5	3	Upper side of cabinet bottom / both parts of fixed shelf	Oak plywood	3/4 x 14-3/8 x 43-1/2	Add 1/2" to length and width for rough cutting.
C6	4	Upper adjustable shelf parts	Oak plywood	3/4 x 14-3/8 x 43-7/16	Add 1/2" to length and width for rough cutting.
C7	2	Lower adjustable shelf parts	Oak plywood	3/4 x 13-5/8 x 43-7/16	Add 1/2" to length and width for rough cutting.
C8	1	Underside of cabinet top	Oak plywood	3/4 x 13-7/8 x 43-1/2	Add 1/2" to length and width for rough cutting.
C9	1	Upper side of cabinet top	Birch plywood	3/4 x 13-7/8 x 43-1/2	Add 1/2" to length and width for rough cutting.
C10	1	Under side of applied top	Oak plywood	3/4 x 18-1/4 x 53-1/2	Add 1/2" to length and width for rough cutting.
C11	1	Upper side of applied top	Birch plywood	3/4 x 18-1/4 x 53-1/2	Add 1/2" to length and width for rough cutting.
C12	2	Edge banding for sides	Oak	1/4 x 2-1/4 x 85-1/4	Add 1/2" to length and 1/4" to width for rough cutting.
C13	5	Edge banding for cabinet bottom and shelves	Oak	1/4 x 1-1/2 x 43-1/2	Add 1/2" to length and width for rough cutting.
C14	1	Toe board	Oak	3/4 x 4-3/4 x 43-1/2	
C15	1	Valance board	Oak	3/4 x 7 x 43-1/2	
C16	1	Front edge banding for applied top	Oak	1/4 x 1-1/2 x 54	Add 1/2" to length and 1/4" to width for rough cutting.
C17	2	Side edge banding for applied top	Oak	1/4 x 1-1/2 x 18-1/2	Add 1/2" to length and 1/4" to width for rough cutting.
C18	1	Back	Oak plywood	1/4 x 44 x 79	
C19	4	Door rails	Oak	3/4 x 3-9/16 x 15-3/8	Dimensions make doors that fit the opening exactly. Joint doors for clearance after assembly.
C20	4	Door stiles	Oak	3/4 x 3-9/16 x 24	
C21	2	Door panels	Oak plywood	1/4 x 15-3/8 x 17-5/8	
C22	1	Front trim strip	Oak	3/4 x 1 x 49-1/2	
C23	2	Side trim strips	Oak	3/4 x 1 x 16	
C24	8	Pegs	Oak	1/2 x 1/2 x 1/4	Add 1/4" to length for rough cutting.
C25	4	Alignment blocks	Oak plywood	1-1/2 x 5 x 8-3/8	Glued up from two layers of 3/4" plywood.
SIDE CABINETS					
S1	2	Panels for inner sides	Oak plywood	3/4 x 11-1/2 x 78-1/4	Add 1/2" to length and 3/8" to width for rough cutting.
S2	4	Panels for tapered sides	Oak plywood	3/4 x 11-1/2 x 78-1/4	Add 1/2" to length for rough cutting, cut to exact width.
S3	8	Vertical fillers for inner sides	Oak plywood	3/4 x 1-3/4 x 78-1/4	Add 1/2" to length for rough cutting.
S4	8	Horizontal fillers for inner sides	Oak plywood	3/4 x 1-3/4 x 8-3/8	
S5	4	Vertical fillers for tapered sides	Pine or poplar	2 x 1-1/2 x 78-1/4	Glued up from two layers of 3/4" wood.
S6	2	Bottom horizontal fillers for tapered sides	Pine or poplar	2 x 1-1/2 x 8-1/2	Glued up from two layers of 3/4" wood.
S7	2	Top horizontal fillers for tapered sides	Pine or poplar	3/4 x 1-1/2 x 8-1/2	
S8	6	Both sides of cabinet bottom / underside of fixed shelf	Birch plywood	3/4 x 10-5/8 x 21-1/4	Add 1/2" to length and width for rough cutting.
S9	2	Upper sides of fixed shelf	Oak plywood	3/4 x 10-5/8 x 21-1/4	Add 1/2" to length and width for rough cutting.
S10	8	Adjustable shelf parts	Oak plywood	3/4 x 10-5/8 x 21-3/16	Add 1/2" to length and width for rough cutting.
S11	2	Under sides of cabinet top	Oak plywood	3/4 x 10-5/8 x 21-1/4	Add 1/2" to length and width for rough cutting.
S12	2	Upper sides of cabinet top	Birch plywood	3/4 x 10-5/8 x 21-1/4	Add 1/2" to length and width for rough cutting.
S13	2	Under sides of applied top	Oak plywood	3/4 x 14-1/2 x 28-1/2	Add 1/2" to length and width for rough cutting.
S14	2	Upper sides of applied top	Birch plywood	3/4 x 14-1/2 x 28-1/2	Add 1/2" to length and width for rough cutting.
S15	2	Edge banding for inner sides	Oak	1/4 x 2-1/4 x 78-1/4	Add 1/2" to length and width for rough cutting.
S16	2	Edge banding for tapered outer sides	Oak	1/4 x 3-1/2 x 78-1/4	Add 1/2" to length and width for rough cutting.
S17	8	Edge banding for cabinet bottom and shelves	Oak	1/4 x 1-1/2 x 21-1/4	Add 1/2" to length and width for rough cutting.
S18	2	Toe boards	Oak	3/4 x 4-3/4 x 21-1/4	
S19	2	Valance boards	Oak	3/4 x 5 x 21-1/4	
S20	2	Front edge banding for applied top	Oak	1/4 x 1-1/2 x 28-3/4	Add 1/2" to length and 1/4" to width for rough cutting.
S21	2	Side edge banding for applied top	Oak	1/4 x 1-1/2 x 14-3/4	Add 1/2" to length and 1/4" to width for rough cutting.
S22	2	Front trim strips	Oak	3/4 x 3/4 x 26-1/2	
S23	2	Side trim strips	Oak	3/4 x 3/4 x 12-1/4	
S24	2	Backs	Oak plywood	1/4 x 21-3/4 x 72	
S25	6	Drawer fronts	Oak	3/4 x 7-7/8 x 21-1/16	Allows for 3/32" clearance around drawer fronts.
S26	12	Drawer box sides	Oak	5/8 x 7 x 10	Based on using biscuit joinery.
S27	12	Drawer box fronts and backs	Oak	5/8 x 7 x 19	
S28	6	Drawer bottoms	Oak plywood	1/4 x 9-1/4 x 19-1/2	Based on 1/4" deep dadoes in drawer sides.
S29	12	Pegs	Oak	1/2 x 1/2 x 1/4	Add 1/4" to length for rough cutting.

Building the Side Cabinets

Side Cabinets

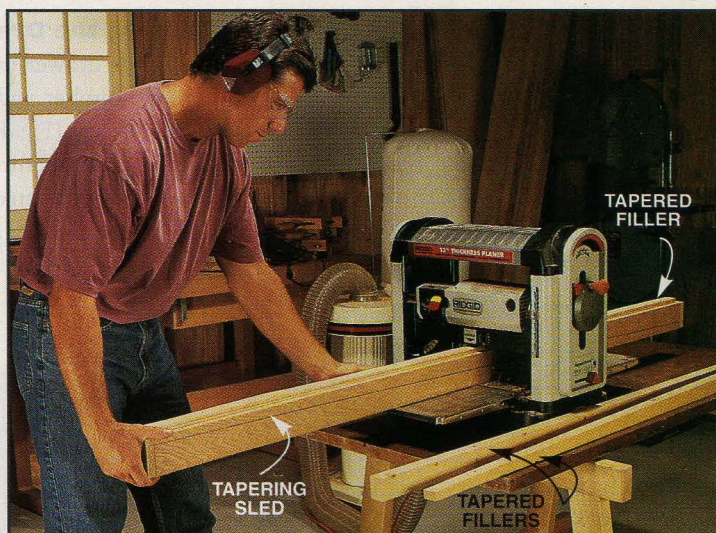
The side cabinets are built like the center cabinet except for a couple of important differences: The inner side panels (S1) are open on one side (Fig. G, page 71) and the outer side panels (S2) are tapered.

There are three important construction details to understand before building these unique tapered panels. The first is that they need to be cut and built to final width. They're 3-1/2-in. thick, which is too thick to saw on most 10-in. tablesaws. The second detail is that the panel sandwiches are made with tapered fillers. Making these tapered fillers requires a special tapering sled for your planer. Finally, trimming the tapered sandwiches to final length requires a shimmed guide board to accommodate the tapers.

Without question, making the tapered sides is the most difficult part of this project. We've tried to simplify the process a bit with these step-by-step directions. First, build the tapering sled for your planer (Fig. E, at right). The 1-1/2-in.-thick material for the fillers is made from two pieces of 3/4-in. stock, glued together. When the glue is dry, joint one edge and rough cut the taper on the band-saw. Use the tapering sled to plane the fillers to final size (Photo 18). Make sure to mark the tapered sides of these fillers.

Now you can glue up the tapered sandwiches. Start by gluing and clamping the tapered fillers (tapered side up) to one of the plywood sides. This makes it easier to keep the edges aligned, which is important because these side panels are already cut to final width. Next, add the short horizontal fillers. When the glue is dry, sand these short fillers to match the angle of the vertical fillers (Photo 19). Complete the sandwich by adding the other plywood side. Make sure to mark this top panel as the tapered side. Now repeat this process for the other tapered side.

The next step is to trim the top and bottom of these panels to final length. Lay the panel, tapered side up, and clamp the shimmed guide board to the bottom (thick) end of the panel (Photo 20). Make the trim cut with a top-bearing bit. Next go to the top end of the panel and use the shimmed guide board again. The angle



18 Plane tapered fillers for the side cabinets using a shop-made tapering sled.

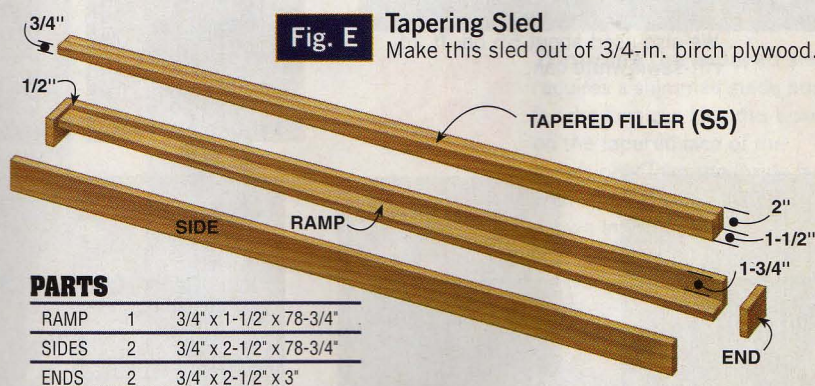
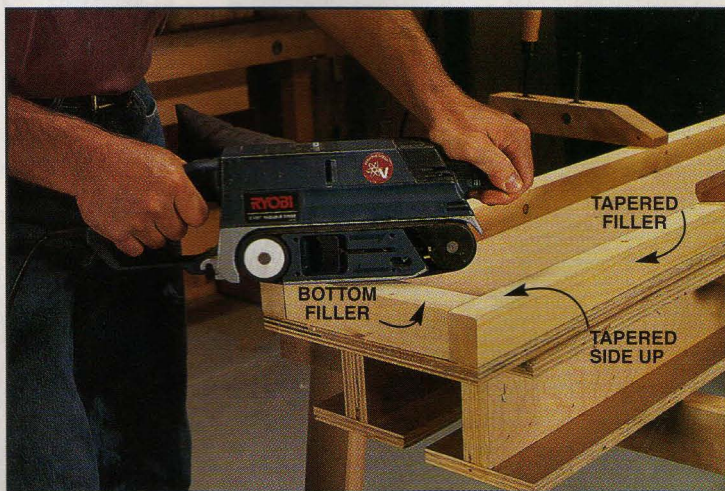


Fig. E Tapering Sled
Make this sled out of 3/4-in. birch plywood.



19 Sand horizontal fillers to match the slight angle of the tapered fillers. Add the outside panel, then glue and clamp.

Building the Side Cabinets

here is on the opposite side, so place the shim under the router side of the guide board this time. Now flip the panel over and use the bottom-bearing bit to complete the trimming. No shimming is needed because this is the straight (inside) face of the panel.

Making the Drawers

We made our drawer boxes out of 5/8-in.-solid lumber and joined the sides with biscuits (Fig. H, page 71). Our drawer slides required a 1/2-in. installation clearance on each side, so we sized the drawer parts accordingly.

With the drawer boxes installed, drill the holes for the screws that will hold the drawer fronts in place. Use nickels and double-face tape to align and attach the drawer fronts until the screws are added (Photo 21).

Fig. F Plywood Cutting Diagrams

For our bookcase we used:

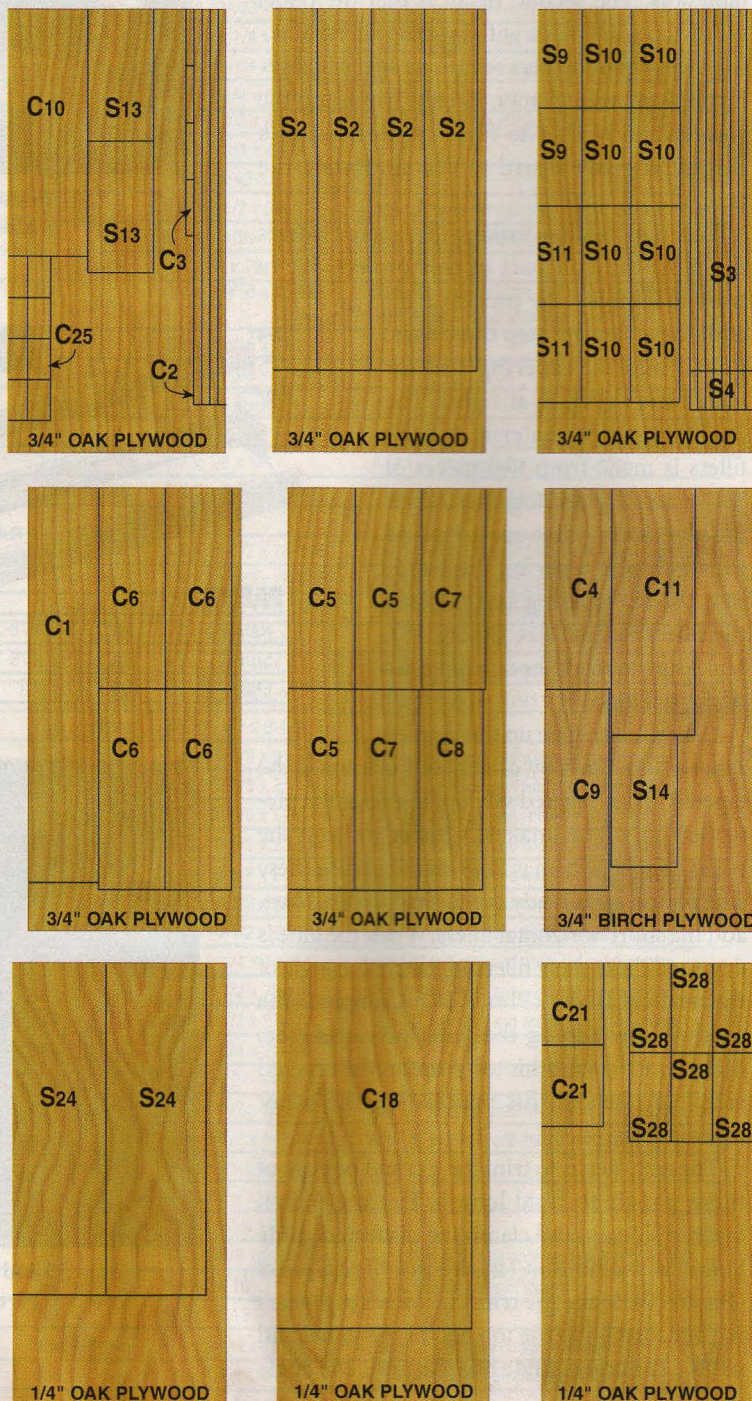
7 sheets of 3/4-in. rift-sliced plywood

1 sheet of 1/4-in. rift-sliced plywood (S21, S28)

2 sheets of 1/4-in. plain-sliced plywood (S24, C18)

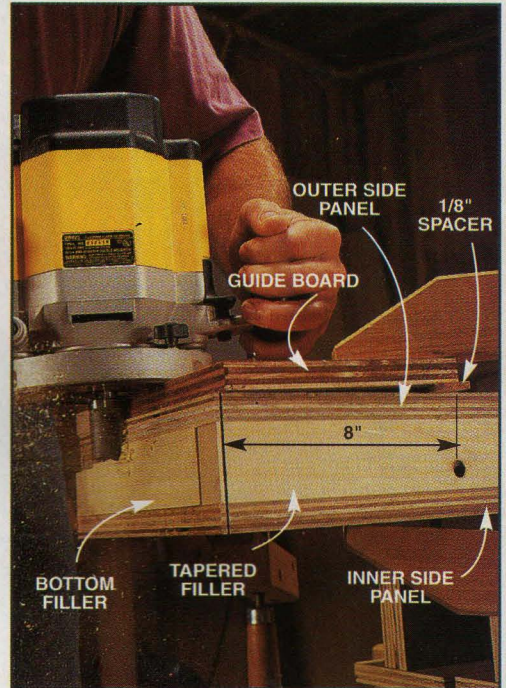
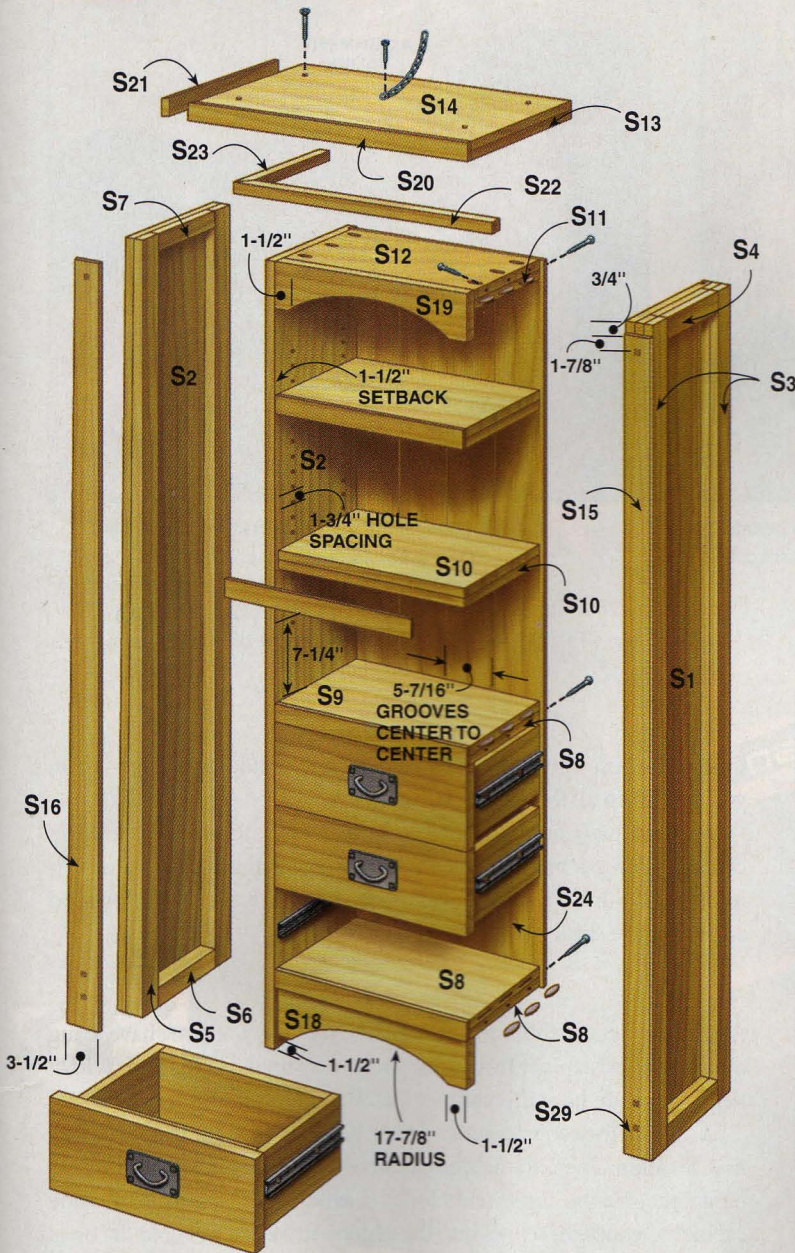
3 sheets of 3/4-in. birch plywood

We also used about 55 bd. ft. of rift-sawn white oak.

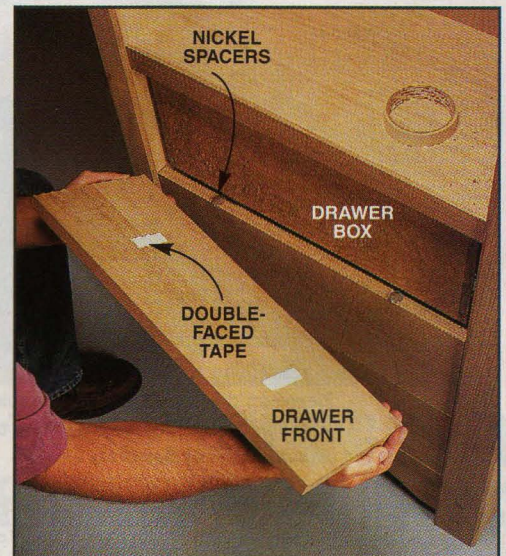


Building the Side Cabinets

Fig. G SIDE CABINETS



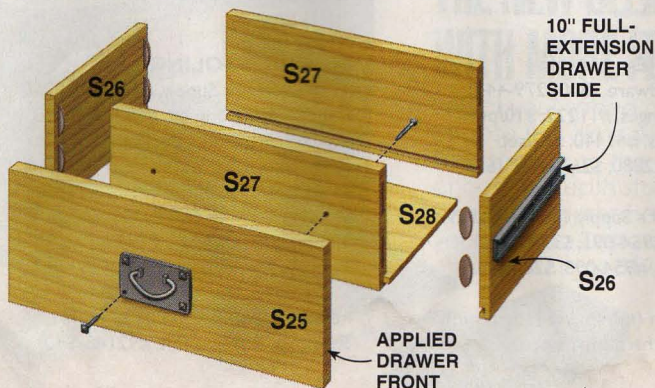
20 Trimming the tapered sides requires a shimmed guide board for the first cut. Use this board on the tapered face of the panels only. Trim the inside face with a bottom-bearing bit, as shown in Photo 4.



21 Position the drawer fronts and temporarily hold them in place with double-faced tape. A couple of nickels used as spacers provide just the right amount of clearance between the drawer fronts.

Fig. H Drawer Assembly

Biscuit joinery and an applied front are two ways to keep drawer construction simple.

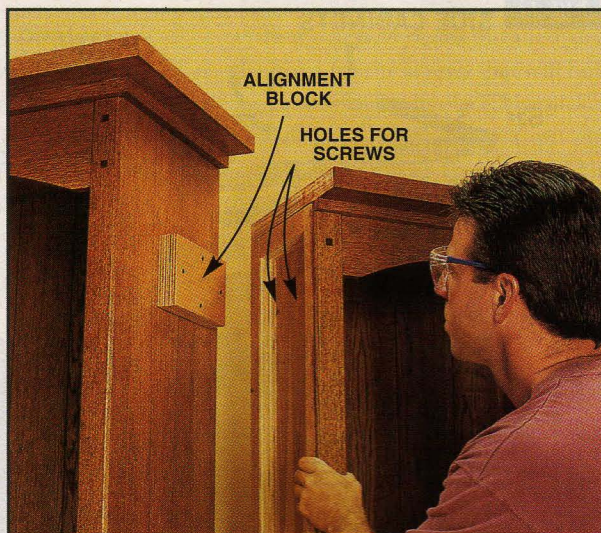


Finishing and Installation



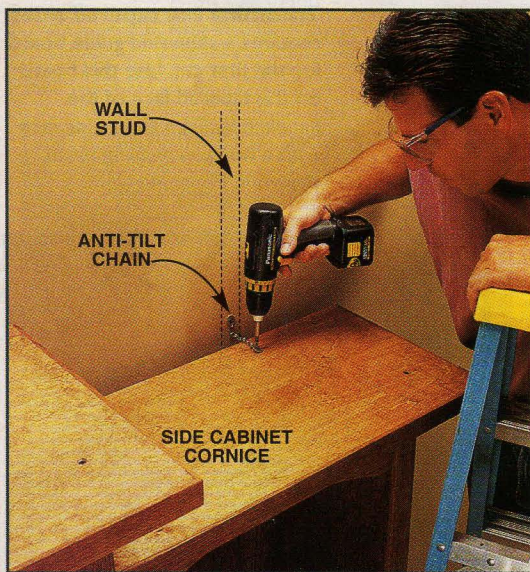
22

Staining and finishing is a breeze because the knockdown design allows each part to be finished separately.



23

Attaching the cabinets is as simple as a two-piece jigsaw puzzle. Line up the side cabinet with the alignment blocks and slide them together. The cabinets are then secured with a couple of screws from inside the side cabinet.



24

Attach the anti-tilt chain between the top of each side cabinet and a wall stud. For cabinets this tall, this is essential for safety.

Finishing

One of the best things about this cabinet's knockdown joinery is that you can finish all the parts separately.

We used two coats of Minwax Early American oil stain and top coated it with a couple coats of Minwax tung oil. Tung oil is an easy-to-use wipe-on finish that can be built up to a rich luster. The more you add the more shine you get.

Final Setup

Another benefit of this knockdown design is that you don't have to lug the completed cabinet from your shop to its final destination. With a helper, you can have this cabinet installed in less than two hours.

Start with the center cabinet. Assemble it, stand it up, and set it in its final location. Then do the side cabinets. These interlock with the center cabinet via the alignment blocks (Photo 23). From inside the side cabinets, a couple of screws into the alignment blocks will hold the units together. Now get a stepladder and add the anti-tilt chains. Because this bookcase is tall and shallow these must not be overlooked. Finally, add the shelves, doors, drawers and hardware. **AW**

Sources

WOOD PRODUCTS.

Lake Elmo Hardwoods, (651) 777-1431
3/4" rift-sliced white oak plywood; \$25/sheet
1/4" rift-sliced white oak plywood; \$65/sheet
1/4" plain-sliced white oak plywood; \$65/sheet
3/4" birch plywood; \$45/sheet
4/4" white oak lumber; \$5/bd. ft.
(Prices do not include shipping.)

HARDWARE

Rockler Hardware, (800) 279-4441
Euro-style hinges, #11222; \$10/pr.
Drawer slides, #61440; \$12/set
Shelf pins, #22880; \$2/pack of 16.

Woodworker's Supply, (800) 645-9292
Door pulls, #954-091; \$22 each
Drawer pulls, #954-098; \$20 each.

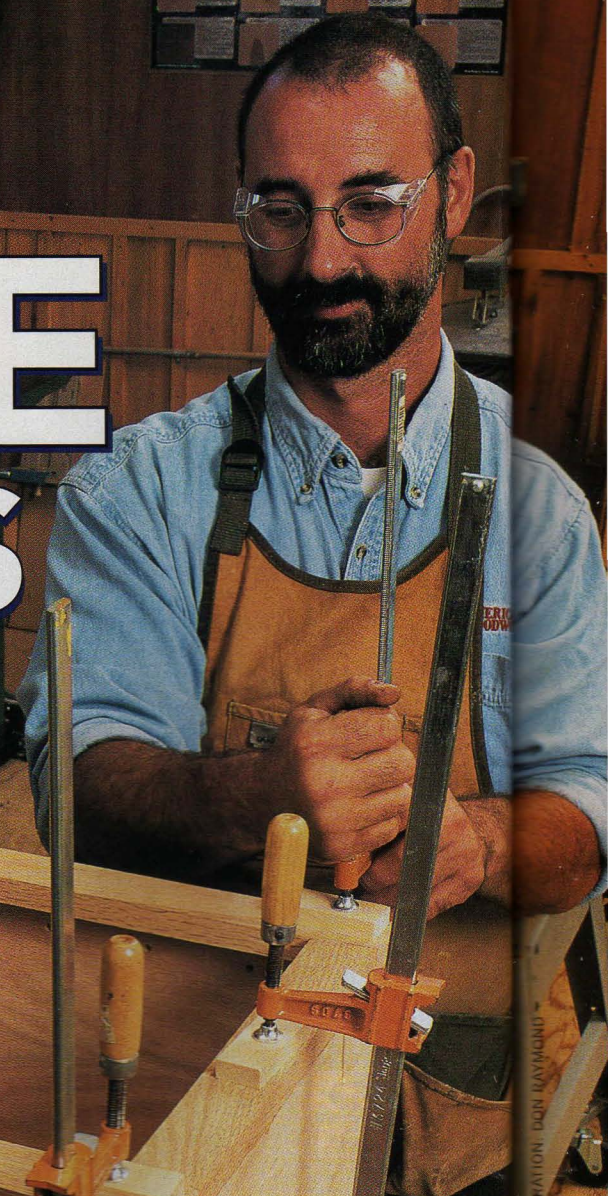
Anti-tilt chain (#3 double-loop chain); \$4/15 ft. at a hardware store.

SPECIAL TOOLING

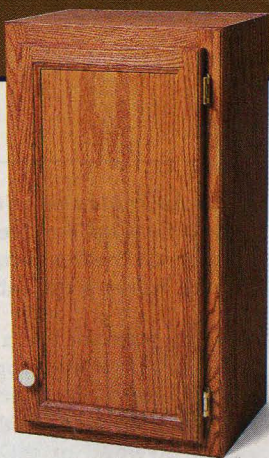
Woodworker's Supply, (800) 645-9292
Self-centering drill bit, #897-303; \$30
Top-bearing router bit, #50-126; \$25
Bottom-bearing router bit, #42-116; \$25
45-degree chamfering bit, #40-114; \$30
Thin-kerf saw blade, TK-306; \$30
35mm drill bit, #913-707; \$6
Kreg jig, 934-918; \$130.

Rockler Hardware, (800) 279-4441
Tongue and groove bit, #92145; \$40.

FACE FRAME CABINETS



*Master these
techniques to
open up a world of projects.*



If you can make dados, rabbets and face frames, you can make almost any cabinet. Master this foundation of skills and you'll be ready to launch into complex variations of the simple cabinet shown in this story. Here's how:

Face-frame cabinets are little more than plywood boxes covered by a solid-wood frame. The frame adds strength and rigidity to the box, while covering the ugly plywood edges. In this story I'll take you through the building of a typical freestanding wall cabinet. The concepts and techniques can also be used for kitchen cabinets, bathroom vanities and bookcases. There's plenty of room for mistakes, and I've made them all over the years. To stay in business, and provide my students with shortcuts to success, I've developed systems for avoiding these kindling-producing errors.

The heart of my system includes avoiding rulers and tape measures whenever possible. Learn to transfer measurements and you'll ensure accurate results. There are lots of ways to build a face-frame cabinet, but in this story I use a tablesaw, jointer, planer and screw pocket jig. I think you'll agree, it's a simple system.

Choose Your Material

Cabinet carcasses, (Fig. A, at right), are commonly made from sheet stock like plywood or medium-density fiberboard (MDF). I use plywood almost exclusively because:

- Plywood weighs half as much as MDF. For a one-man show like mine, ease of handling, in both building and installing cabinets, is important.

- When machined, plywood throws less fine dust in the air than MDF.

- Plywood corners and edges don't ding as easily as MDF, so it's more forgiving when I'm handling it.

Home centers generally carry plywood and MDF with oak or birch veneers. More specialized hardwood suppliers sell sheet stock in almost every species of wood.

Now, let's build a cabinet.

Getting Started

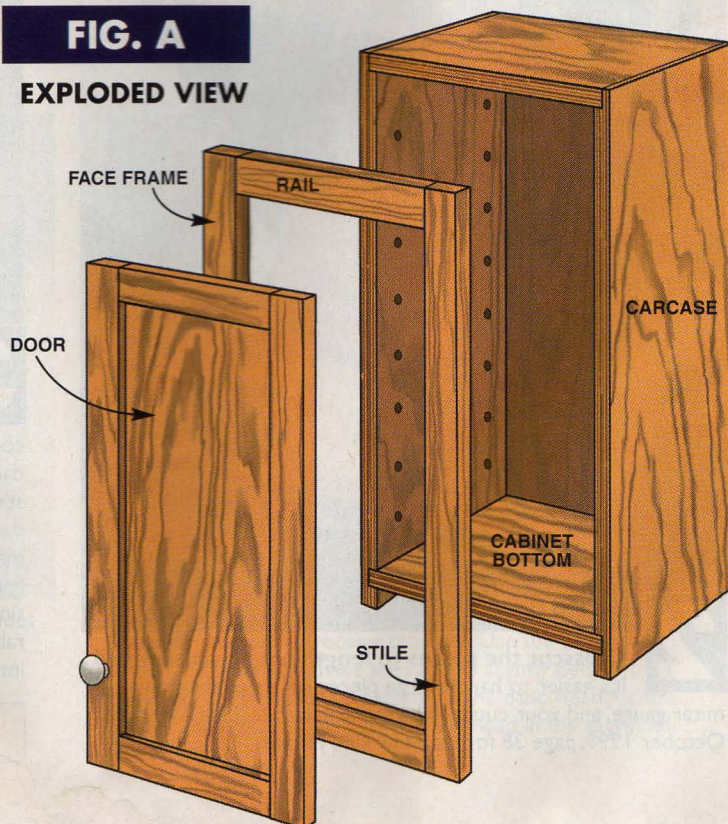
The outside edges of sheet stock are called factory edges. Between the lumberyard and your shop, they get pretty beat up. Here's a dandy way to make sure those ugly edges don't

make it into your project:

1. Rough cut parts 1-in. larger (in both directions) than your finished parts, using a circular saw or jigsaw.
2. Mark the best face of each piece.
3. Run the factory edge against the rip fence for a first cut, making the piece 1/2-in. larger than its finished size. This is your reference edge. Label all reference edges so you can keep track of them.
4. Run the reference edge against the fence, and cut the piece to final size, removing the factory edge in the process.

FIG. A

EXPLODED VIEW



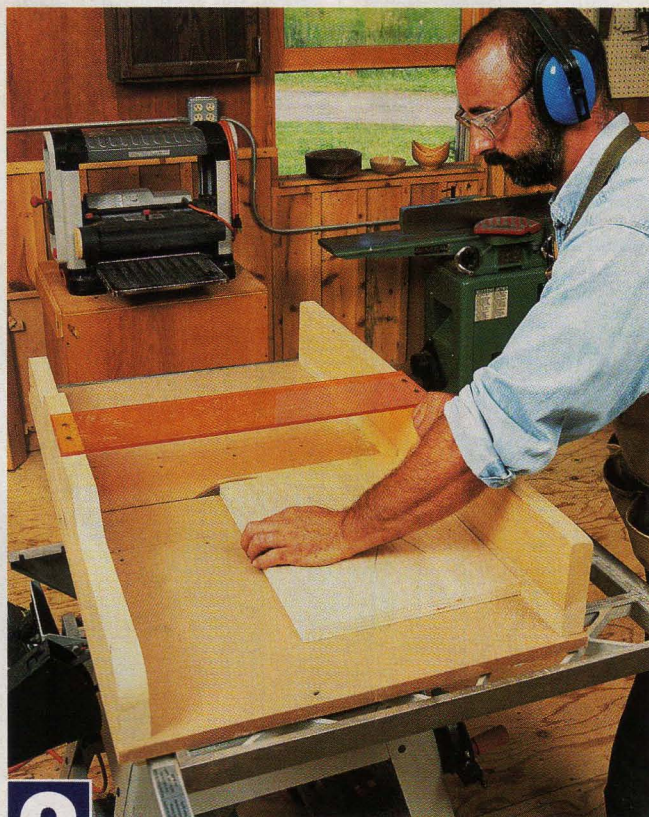


1

Cut plywood parts to width following the four steps on page 75. Feed the pieces smoothly past the blade to get the best-quality cut.

TIPS

- X** Cut all material with the good face up. Any tear-out will be on the bottom, which is the inside of the cabinet.
- X** For sheet stock, use a 60- to 80-tooth, alternate-top bevel blade for a high-quality edge joint right off the saw. Don't edge joint plywood or MDF. The glue in these materials is hard on jointer knives.
- X** Organize your cutting so all same-sized parts are cut together. It's hard to get your rip fence back in exactly the same spot twice.



2

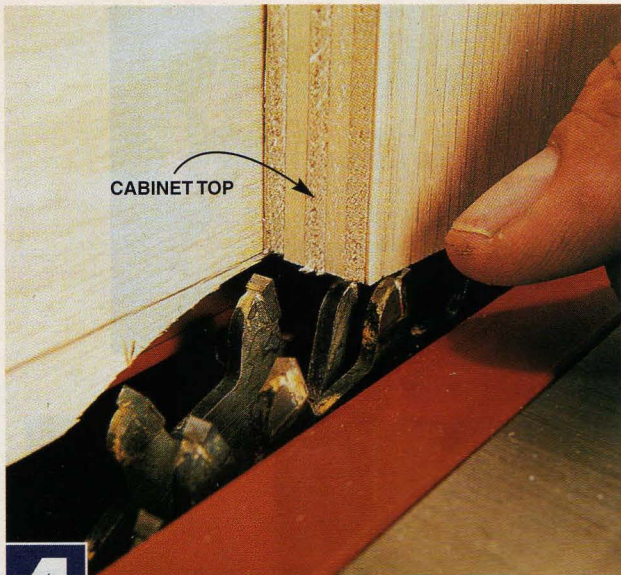
Crosscut the pieces to length using a tablesaw sled. It's easier to handle large pieces on a sled than on a miter gauge, and your cuts will be more accurate. (See AW #75, October 1999, page 38 for tablesaw sled plans.)



3

Dado the case sides to receive the cabinet bottom. Be certain the dado head is set up correctly for your sheet stock. The shelf should slip into the dado with no more than hand pressure, and the parts should stick together when you try to separate them. Setting up the dadoes can be fussy, and may require dado shims (thin material that allows you to change the width of the head a few thousandths of an inch; see Sources, page 86). Take the time to get it right. The correct depth for dadoes and rabbets is one-half the thickness of whatever they're being cut into. 3/4-in. plywood gets a 3/8-in. dado.

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

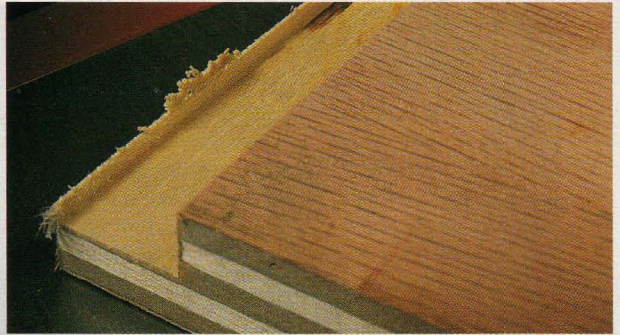


4

Position the rip fence for rabbeting. It's almost impossible to get every rabbet perfect, so I intentionally make them 1/32-in. too deep. (Too deep is better than too shallow!) With the saw unplugged, position the fence by using a cabinet top as a gauge. Feel for a fingernail catch where the dado head projects past the face of the top.

TIP

All sheet stock varies in thickness. When possible, cut all the bottoms for multiple cabinets from the same sheet. That way when the dado is right for one piece, it's right for all of them.

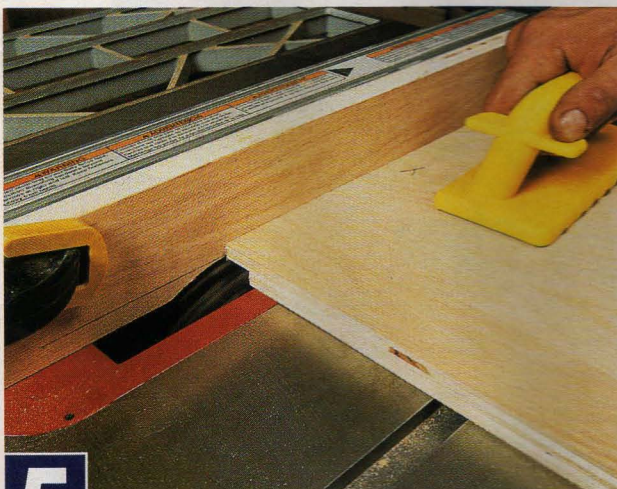


Make a test cut in scrap material to check the fence position. There should be a thin leaf of material on the edge of the rabbet. Slice this off with a sharp chisel.



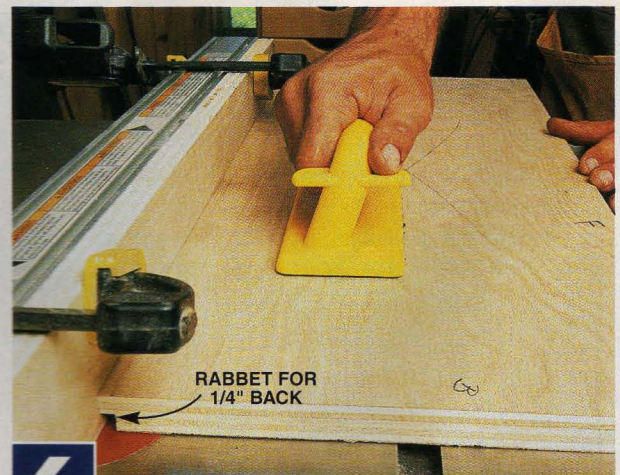
This will leave "rabbet ears" that can be trimmed off after the cabinet is assembled.

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



5

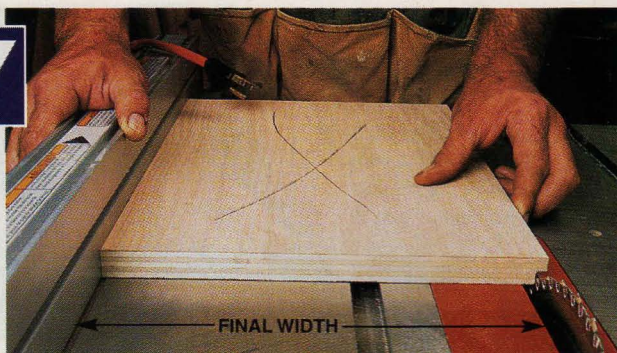
Cut the rabbets on the top ends of the case sides using a push block to hold the material down.



6

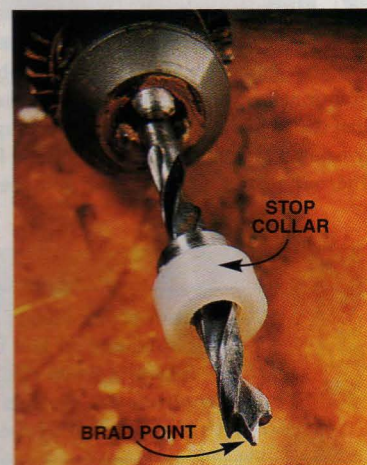
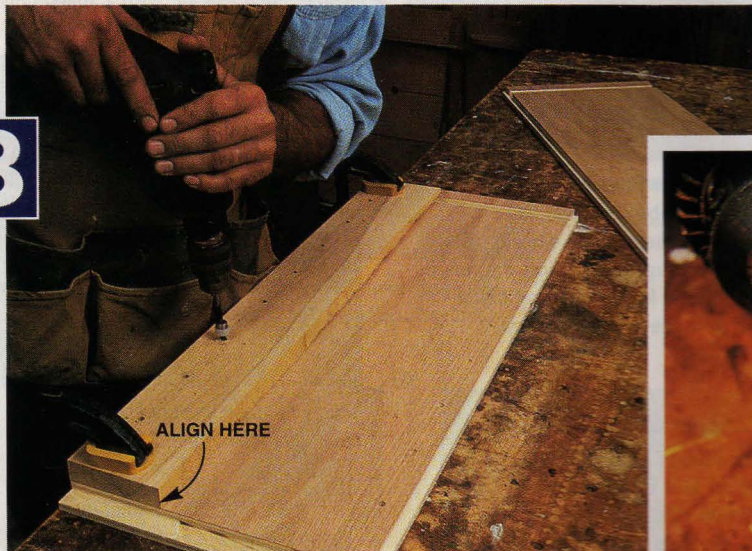
Rabbet the back edges of the case sides, top and bottom to receive the back. Use the procedure shown in Photo 4 to make the rabbets slightly deeper than the back requires. Don't disassemble the dado head for this thinner material, just bury part of the head in the sacrificial fence.

7 Set the fence for ripping the cabinet bottom to its final width. Cutting off the rabbet allows the cabinet back to run full length to the bottom of the case sides. On a wall full of cabinets, I rabbet only one bottom, use it as a gauge, and rip all the bottoms to that dimension.



8 Drill 1/4-in. holes for an adjustable shelf

using a simple jig. Just predrill a hardwood scrap with 1/4-in. holes every 3 in. Mark the bottom end of the jig and line up that end with the dado. Clamp the jig in place, and drill. Two things will give you cleanly drilled holes: a brad-point drill bit (see inset photo), and a slow feed rate as the bit enters the material. A stop collar on the bit prevents unsightly ventilation holes on the outside of the cabinet (see Sources, page 86).



Making a Sacrificial Fence

A sacrificial fence on the tablesaw prevents you from nicking your rip fence on setups (like for rabbets) that require the fence to be very close to the blade. It's an easily made, must-have tablesaw jig.

You can make a sacrificial fence from any scrap you have, as long as it's flat. (The one shown here is an offcut from my cabinet project.) Here's how to make one:

1. Machine a piece of flat scrap wood to the height and width of your rip fence.
2. Put a 3/4-in.-wide dado head on the saw. Set the head below the surface of the table.
3. Position the rip fence at the right edge of the blade opening in the insert so when you raise the dado head, it won't hit the rip fence.
4. Mark the height you want the scallop to be on the sacrificial fence. I make the scallop 1/16-in. higher than the rabbet I'll be cutting.
5. Clamp the sacrificial fence to the rip fence.
6. Turn on the tablesaw, and raise the dado head until you hit the mark on the fence.



Caution: The blade guard must be removed for this cut. Be sure to clamp your sacrificial fence firmly.

Cut a scallop into the sacrificial fence by raising the spinning dado head to the correct height. If you cut too high, the scallop will be too deep, and the parts you're machining can get caught in it.

9

Assemble the case, keeping the front edges flush.

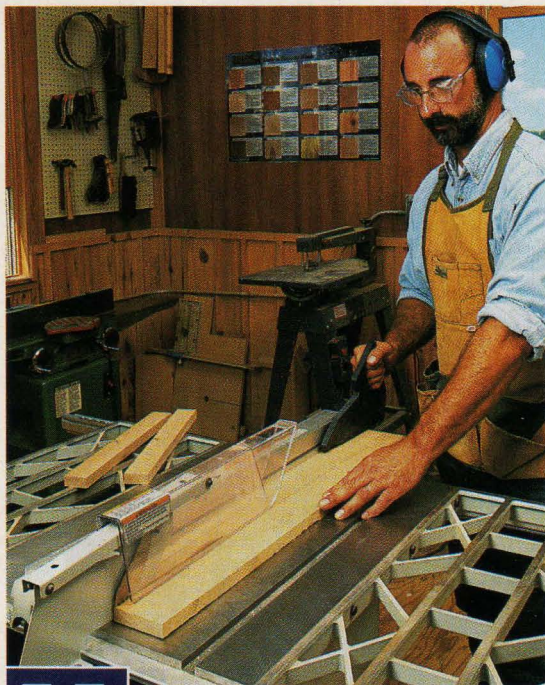
Clamp pads protect the wood surface. Old plastic honey bottles make great glue bottles—just keep them out of the reach of children. Use just enough glue in the joint to cover the surface; it's just like applying paint.



10

Check the cabinet for square

by measuring from corner to corner. The two dimensions must be the same. If they're not, squeeze the long diagonal by hand, to make it match the short diagonal.



11

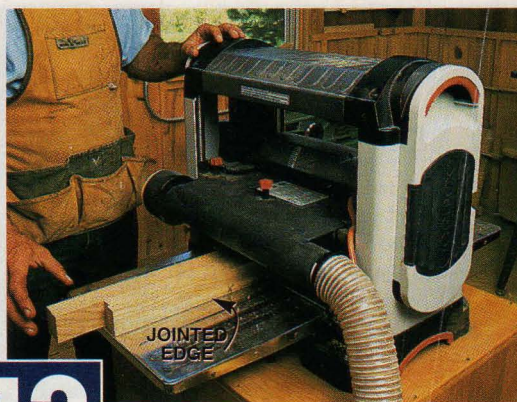
Rip the face frame pieces to width with a jointed edge against the fence.

Make them 1/16-in. wider than the finished size so the sawn edge can be cleaned up. Use a push stick for these narrow pieces. My rule of thumb for keeping both thumbs is to use a push stick on rips less than 3-in. wide.

To fit the face frame, throw away your ruler and mark the pieces directly from the case.

Transfer the stile length directly from the cabinet sides. Make the face frame slightly longer than the cabinet.

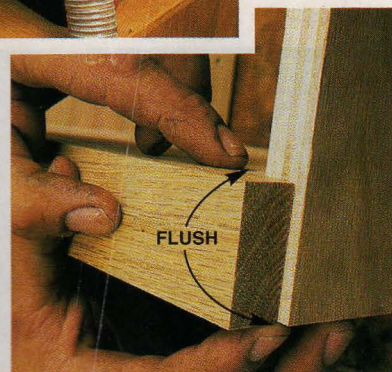
The rabbit-ear overhang provides the perfect allowance, creating a frame overhang on the top of the case. The excess will be trimmed off after the face frame is glued on.



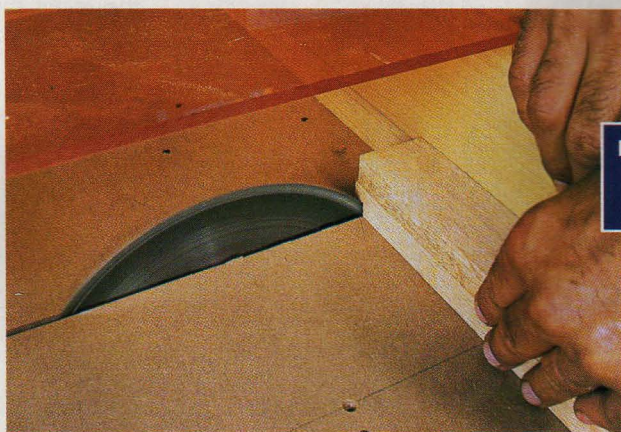
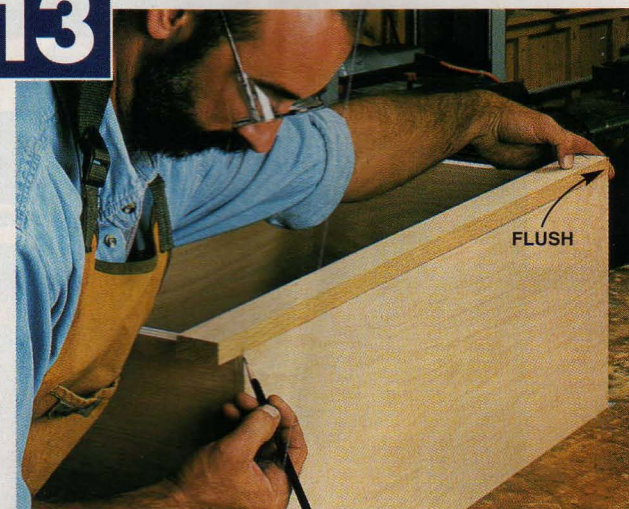
12

Plane the face frame parts

to width. Gang planing is an excellent way to make sure all the parts are uniform. Plane the parts until they line up with the bottom of the case sides and the top of the case bottom.



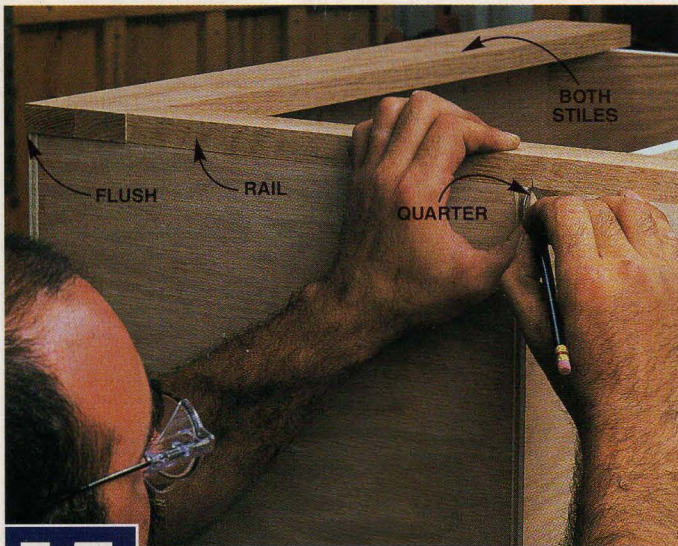
13



14

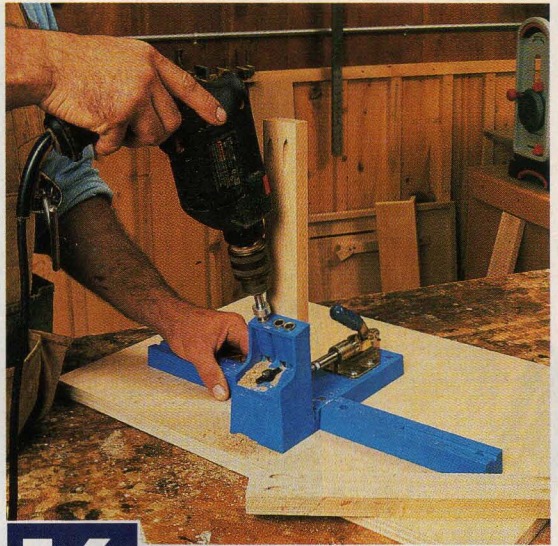
Cut the stiles to length using the

tablesaw sled. Cutting both stiles at the same time ensures they'll be the same length.



15

Transfer the rail length from the cabinet, again building an overhang into the frame. This time use the thickness of a quarter to create the overhang. Start with the two stiles flush with the case side. Butt the squarely cut reference end of a rail to the stiles. Hold a quarter against the case side, and mark the rail flush with the face of the quarter. Cut the rails to length in the crosscut sled.



16

Use screw pockets to join the rails to the stiles. Face frames can be joined by dowels, mortises and tenons, mini-biscuits or simple, fast, effective screw pockets. Mark the rail faces and be sure the holes get drilled only in the backs of the rails. Incorrectly flipping parts around has put some rails in my scrap pile.



17

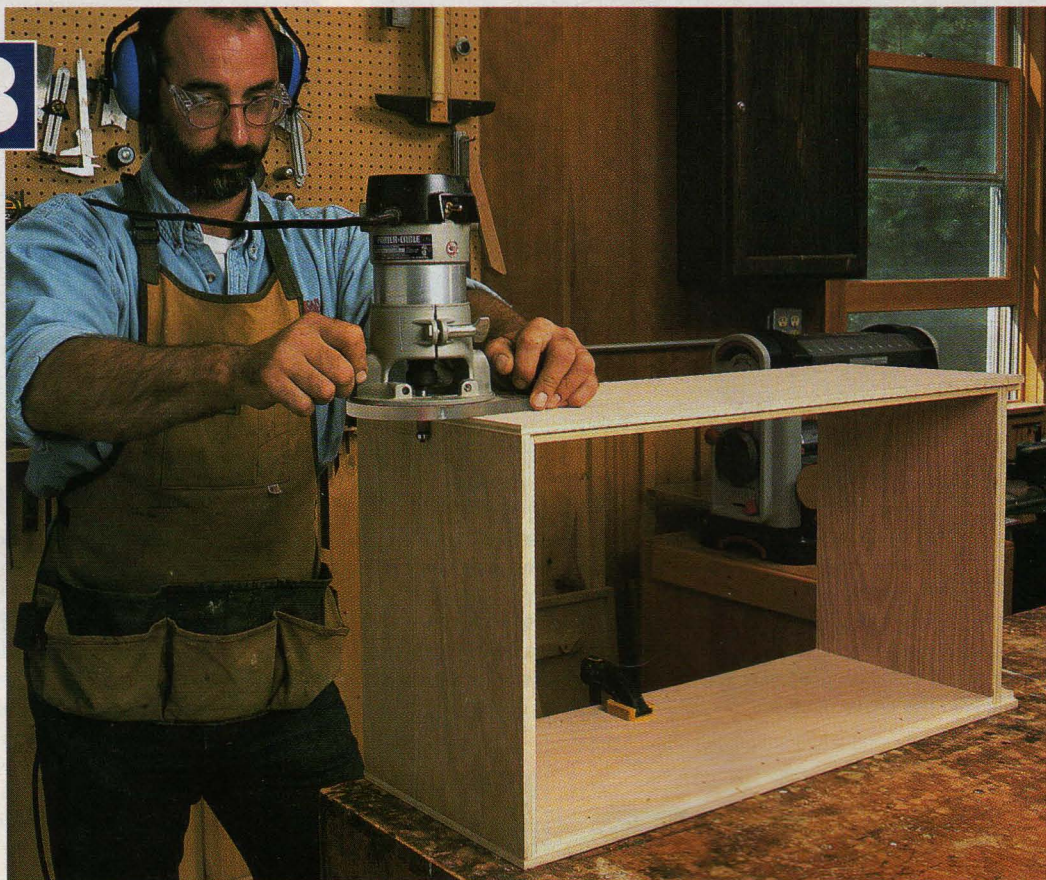
Assemble the face frame in a simple jig. The toggle clamp holds the pieces down firmly. Use a screw designed for screw-pocket joinery (see photo, at right). They don't require predrilling of the stiles, and their wide, flat heads make them less likely than conventional wood screws to split the rail ends.



Pocket screws are perfect for face frames—they're fast, strong and easy.

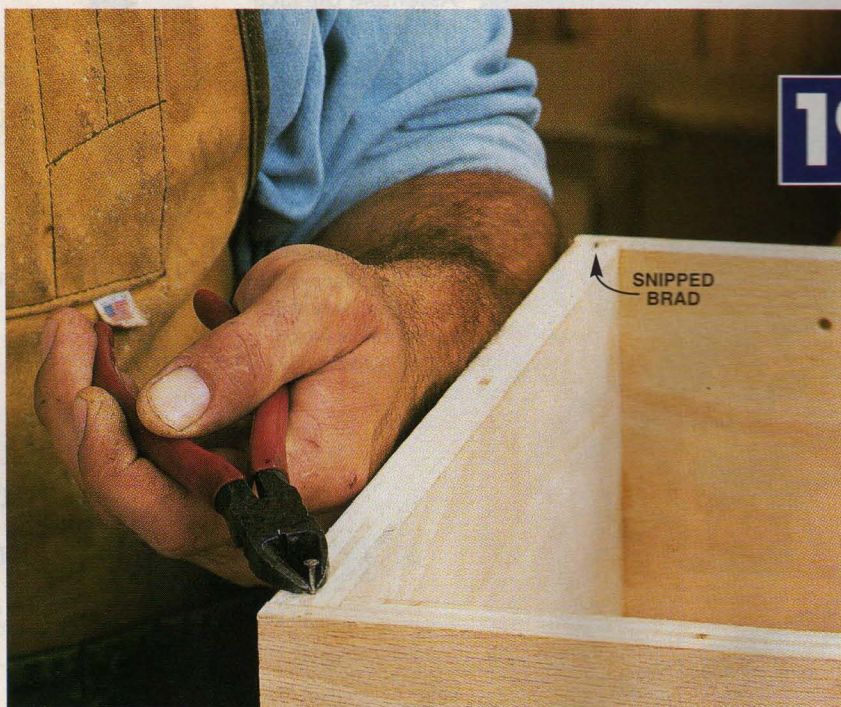
18

Trim the rabbet ears using a flush-trim router bit (photo below, see Sources, page 86). This guarantees the case sides are even with the top.



19

Tap a brad into each corner of the case front and snip off the heads. The sharp spur left behind prevents the face frame from slipping and sliding around while you're gluing it on.



20

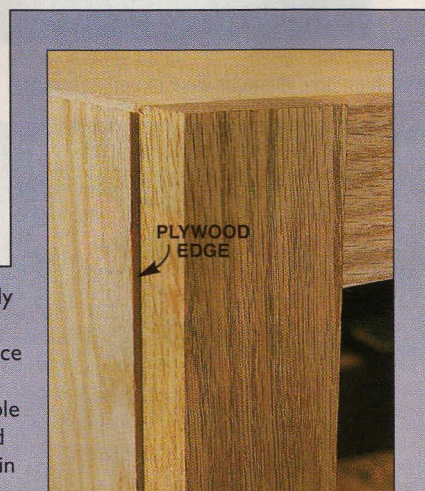
Glue and clamp the face frame to the carcass. The frame should be flush with the case bottom, have equal overhangs on the left and right, and an overhang on the top. Use clamp pads, and be careful not to crush the rabbet on the back of the case.



21

Trim the face frame flush with the case using a flush-trim router bit.

Building an overhang into the frame and flush trimming to fit after glue-up guarantees a perfect match between the frame and case.

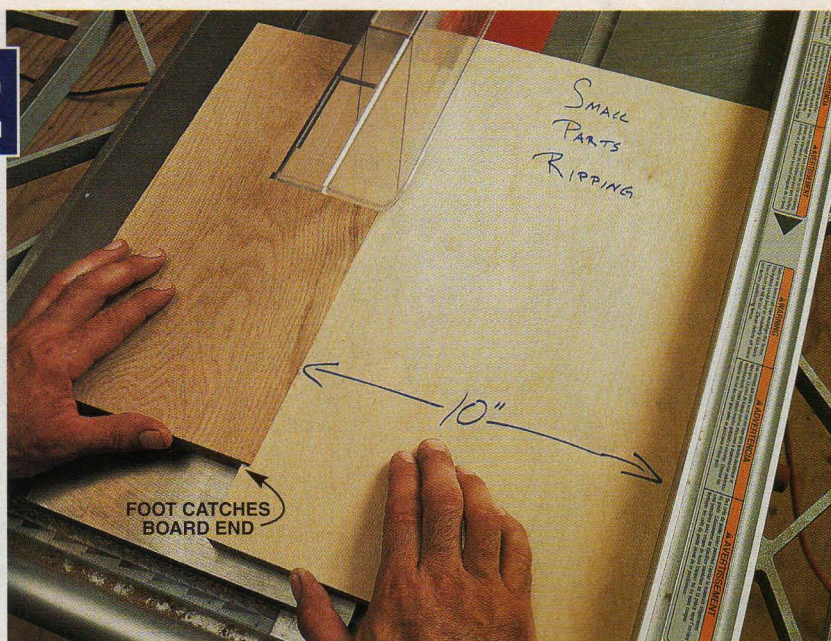


Oops!

It's a temptation to cut the face frame exactly the same size as the case. Unfortunately, this often leads to disaster. When you glue the face frame on, it often slips sideways a bit, so you can end up with the unfortunate and unfixable result shown at right. The solution is to build the face frame slightly oversize, as we show in Photos 13 and 15.

22

Rip 1/4-in. edging for the plywood shelves using this jig. It lets you leave the guard in place, and safely push the material past the blade. Just set the fence to 10-1/4 in., and allow the foot to carry the material through the saw.



23

Hang the door on the cabinet using the hinges of your choice. For information on making a frame and panel door, see *AWW*, #86, April 2001, page 32.



Oops!

Sometimes with big cabinets, or if you don't have enough clamps, there may be gaps between the frame and the case. Want a cool fix? Try a flush-trim bit with a V cutter (see Sources, page 86). Line up the point of the V with the seam, flush trim the frame, and the V groove left behind disguises any gaps.



Extraordinary Flexibility

The techniques in this story can easily be adapted to make many other projects besides classic kitchen cabinets. Here are three examples:



Bookcase

Add another top, cut curves in the sides and the face-frame rails, and put thicker, wider edging on the shelves. A beading router bit decorated the edge of the face frame.

Sources

Woodworker's Supply
(800) 645-9292

Push block, #95-410; \$16
1/4-in. brad-point drill bit,
#120-117; \$7
Dado shim, #801-547; \$10
Drill stop collar, #908-309; \$4
Glue brushes, #875-247;
\$2.40/12
Flush-trim router bit, 1/2-in.
shank, #42-110; \$15. 1/4-in.
shank, #42-104; \$15

Flush-trim router bit with
V groove, 1/2-in. shank,
#923-712; \$17.
1/4-in. shank, #923-705; \$16
Face-frame screws, #931-191;
\$3/100
Toggle clamp, #173-003; \$14.

Note: If your router will accept
them, buy router bits with
1/2-in. shanks for less chatter
and a smoother finish.

AW



Rolling Shop Cabinet

Make the cabinet out of shop-grade birch plywood, the face frame from birch, and the doors from birch plywood. Locking casters make it mobile.



Bathroom Cabinet

Add some storage in your bathroom with a shallow, wall-hung cabinet. A second plywood top, edged in solid wood with a molding below it, gives the cabinet a more finished look.

By Tim Johnson

Giant Shop Cabinet



Organize tons and tons of woodworking supplies with room to spare.

If your workshop seems cluttered and your workbench is always covered with stuff, you need this cabinet. It packs 30 cubic ft. of storage, enough for all of those got-to-have supplies, from screws to paint cans. Everything is readily accessible, without reaching, because the big pantry-style doors open wide. We've packed a room-full of storage into a cabinet the size of a fridge—only 30-in. wide, 24-in. deep and 6-ft. tall. Best of all, this cabinet is easy to build. You and a buddy could whip together a couple of these beasts over a three-day weekend.

Tools and Materials

To build this cabinet, you'll need a tablesaw with a 30-in.-capacity rip fence and an outfeed table, a dado set and a router with a 1/2-in. diameter straight bit. You'll also need a drill/driver, a bunch of clamps, glue, lots of screws, a hinge bit, a hack saw and help from a friend to cut the big sheets of plywood.

All of the materials you need to build the cabinet, except for the rare-earth magnet door catches, are available at your local home center (see Sources and Shopping List, page 96). It can be built for as little as \$250. By using birch

plywood and metal shelf standards and clips throughout, we spent \$350. You can save close to \$60 by substituting AB exterior grade plywood, but it's considerably harder to work with. Besides, it's just plain ugly. Standards and clips work great to mount the shelves in the outer doors, but by mounting the ones inside the cabinet with wooden cleats or by drilling holes for shelf pins, you can save another \$25.

Getting Started

Measure the thickness of your sheet stock before you start cutting. It's often up to 1/32-in. thinner than you'd expect. The Cutting List on page 96 shows which pieces will be affected if you've got skinny plywood. It's best not to cut these pieces until you need them, so you can adjust the dimensions.

We've arranged the cabinet's pieces on the plywood so you can cut them all to final size on your tablesaw, using only the rip fence. You should recruit a

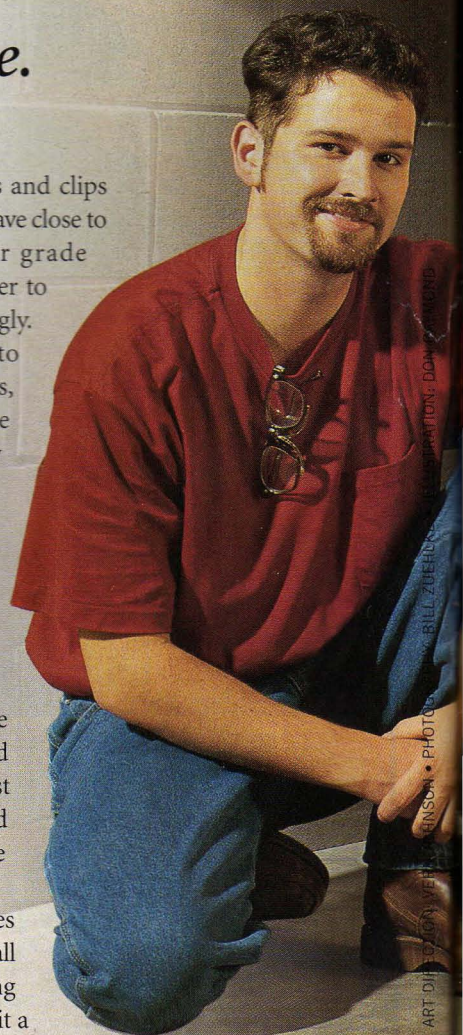




FIG. A: CABINET AND OUTER DOORS

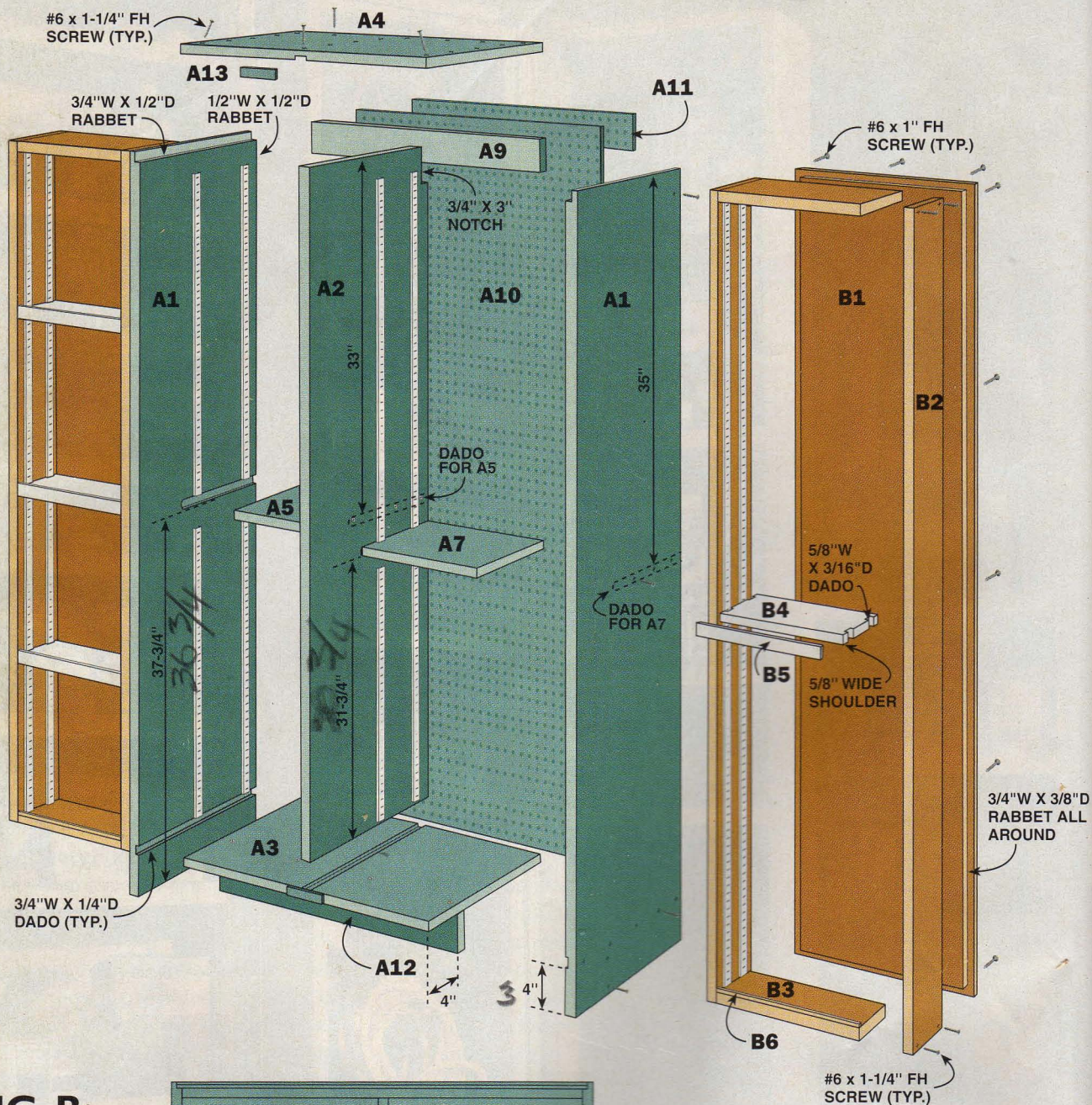
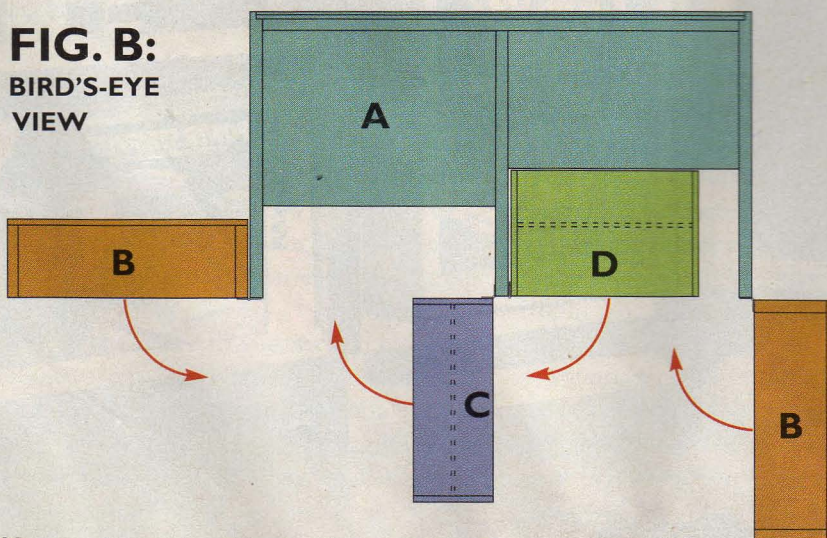
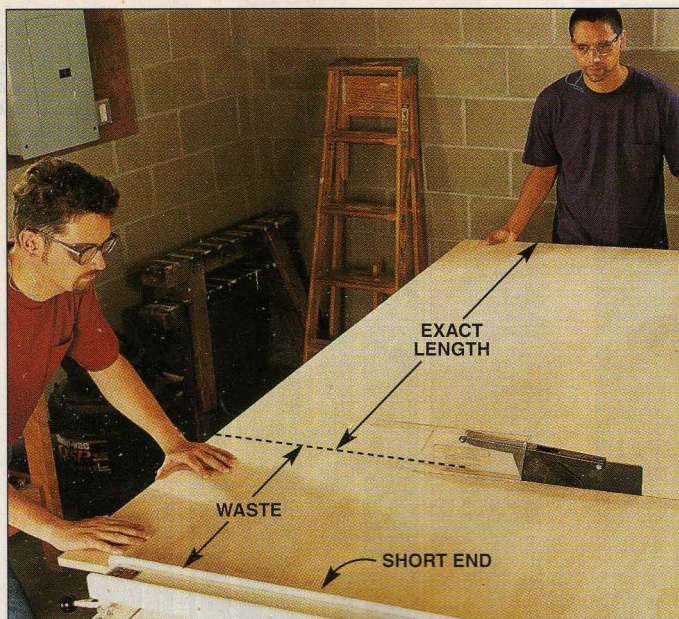


FIG. B:
BIRD'S-EYE
VIEW



*Simple
glued-and-screwed
joinery makes
this cabinet
easy to build.*



1 CUT THE CABINET'S LONG PIECES from the short end of full-sized sheets. You'll need a buddy to help maneuver the ungainly sheet and keep the big offcut under control. With careful measuring, the cut-off piece will be exactly the right length, ready to be ripped to width.

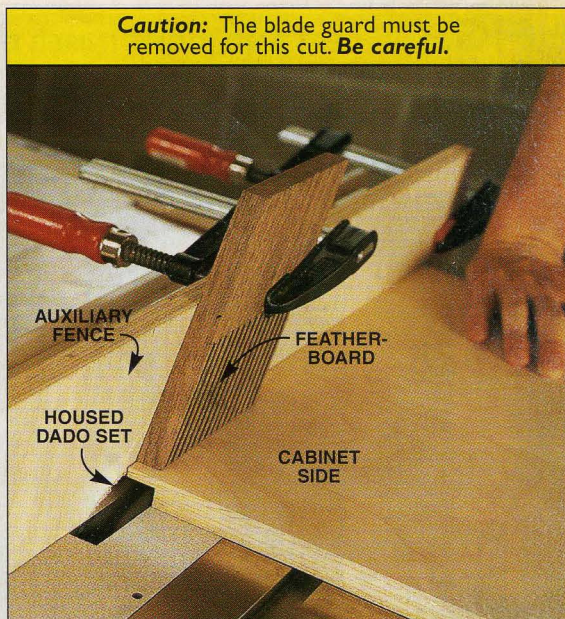
buddy to help you make the first cuts in each sheet (Fig. D "Buddy Cuts," in red). If you're a lone wolf, it's safest to make these cuts with a circular saw and a straightedge.

The long pieces (cabinet sides, center divider, door fronts and frame sides) are arranged so you can cut them to exact length from the short end of the full-length sheets (Photo 1). First, mark their exact length on the plywood. Then, make a second mark 1/8-in. beyond the first, to mark the width of the saw kerf. Set the fence to cut the distance from the waste end of the plywood to the second mark.

Initial crosscuts leave most of the cabinet's long pieces cut to length. They also result in manageable-sized pieces that you can handle yourself. Crosscut the remaining long pieces (one door frame piece and the center divider) to length the same way, from full-length sections, after making an initial rip cut in the fourth sheet of plywood. Convince your buddy to stick around and help you make these cuts, too.

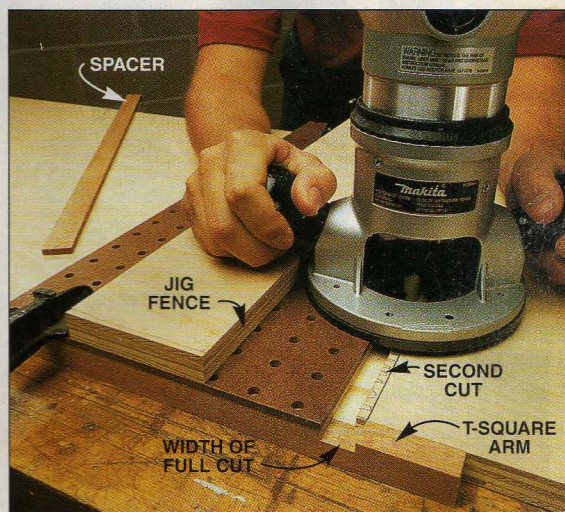
Build the Cabinet

Rabbet the top and back edges of the cabinet sides (Fig. A, Parts A1 and Photo 2). Then cut dadoes for the center divider (A2) and fixed shelves (A3, A5 and A7).

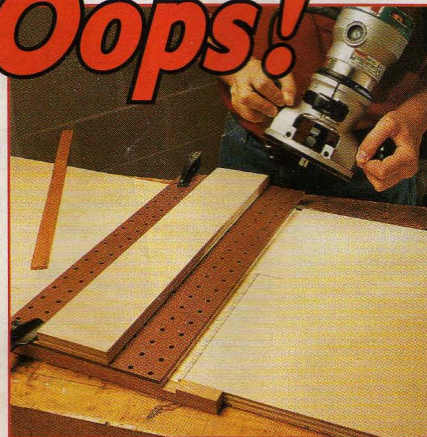


2 RABBET THE CABINET SIDES for the top and back, using an auxiliary fence (Part X1) and a featherboard. By housing the dado set, the fence allows you to match the width of the rabbet to the thickness of the plywood top. The featherboard acts as a blade guard and ensures a consistent depth of cut.

3 ROUT PERFECT DADOES FOR THE SHELVES with a 1/2-in. straight bit and a T-square-style jig made from scrap. Make the wide dado in two passes, the second with a spacer held between the jig's fence and the base of the router.



Oops!

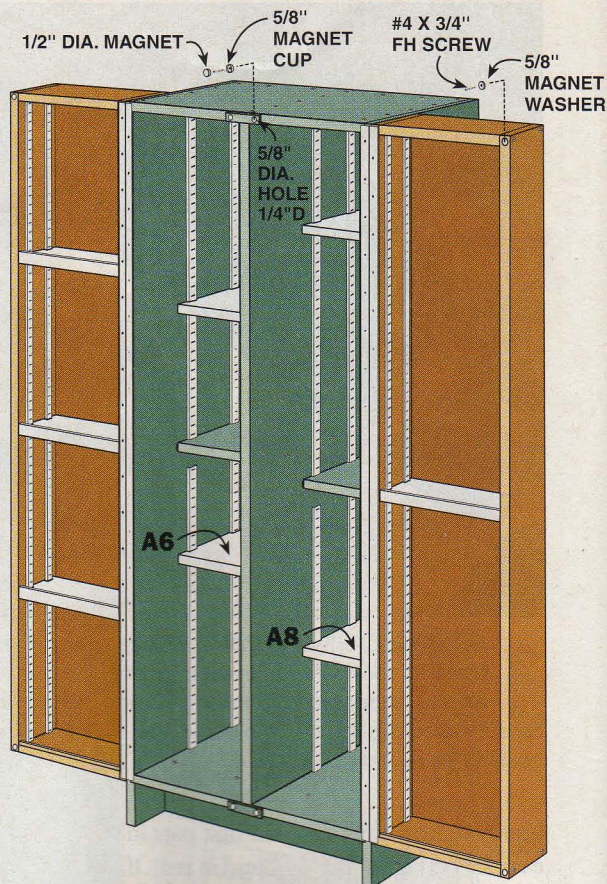
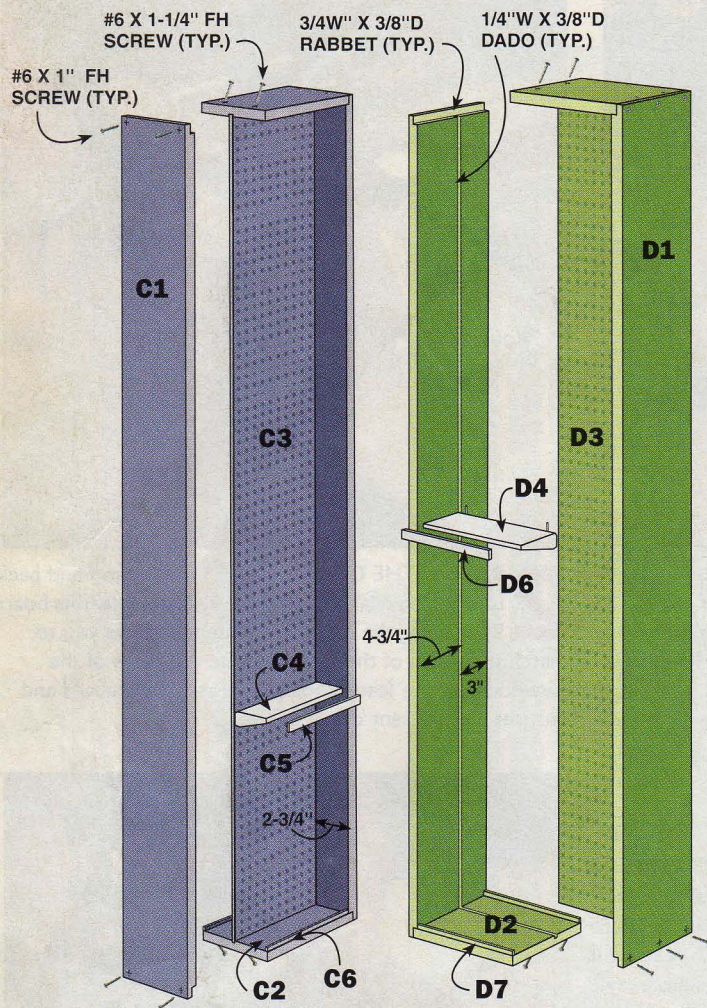


I forgot to stop! The phone rang just as I was ready to cut the stopped dado for the middle shelf. Distracted by the call, I went back to work and zipped right through my stop mark.

Oh well, it's only a shop cabinet. The through dado won't hurt anything but my pride. Had I thought of it, a clamped-on stop block, instead of a pencil line, would have kept me from screwing up.

Next time I'll just let the phone ring. That's safer, anyway.

FIG. C: LEFT AND RIGHT INNER DOORS



DETAIL I: INNER DOOR SHELVES

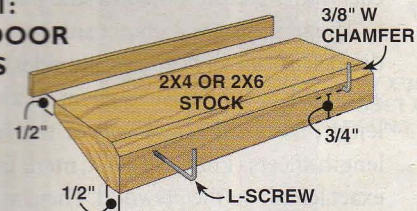
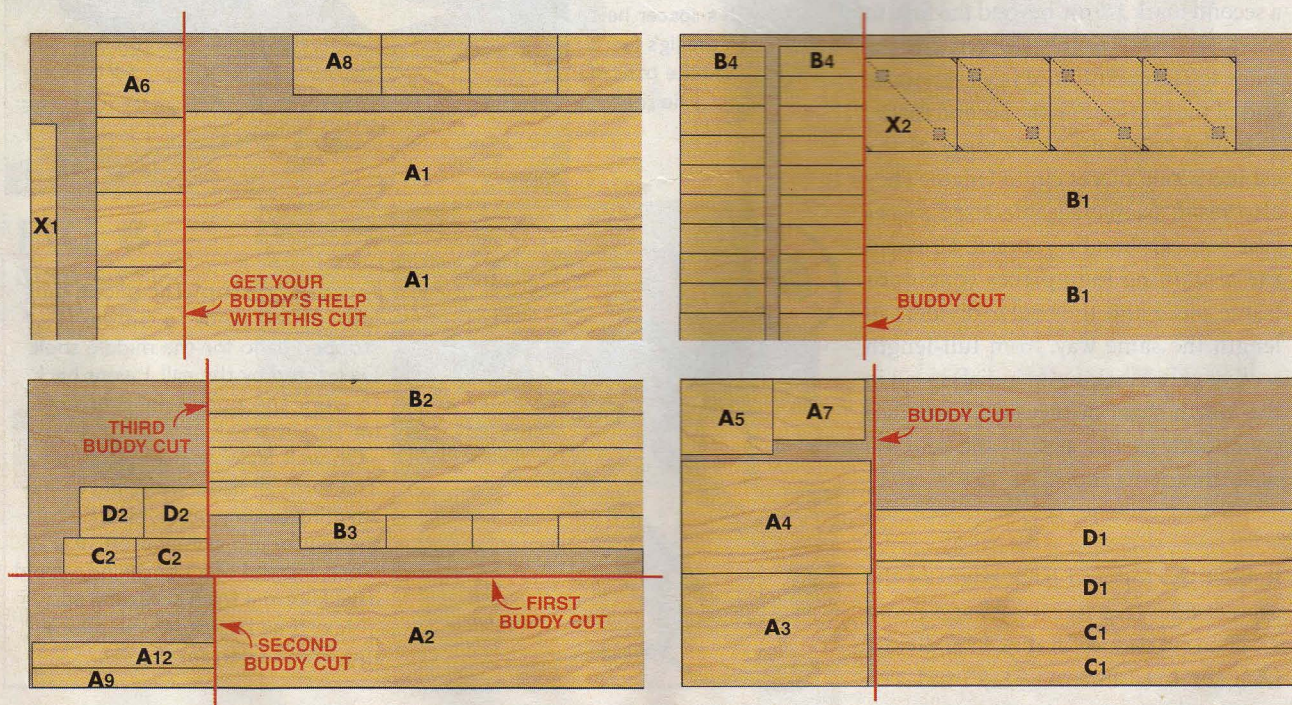


FIG. D: PLYWOOD CUTTING DIAGRAM



Perfectly fitting dados are easy to cut with a router equipped with a 1/2-in. straight-cutting bit, a spacer and a T-square jig (Photo 3). Used on the second pass, the 1/4-in. spacer makes a 3/4-in.-wide dado. If your plywood is on the thin side of 3/4-in., your spacer will have to be thinner. Rout end-to-end dados for the full-depth bottom shelf, and stopped dados for the narrower middle shelves.

Every joint is glued and screwed. Assemble the cabinet, using clamping brackets (X2) to hold it square (Photo 4). Then, fit the center divider and secure it. Install the middle shelves. They're offset so both sides can be fastened to the center divider.

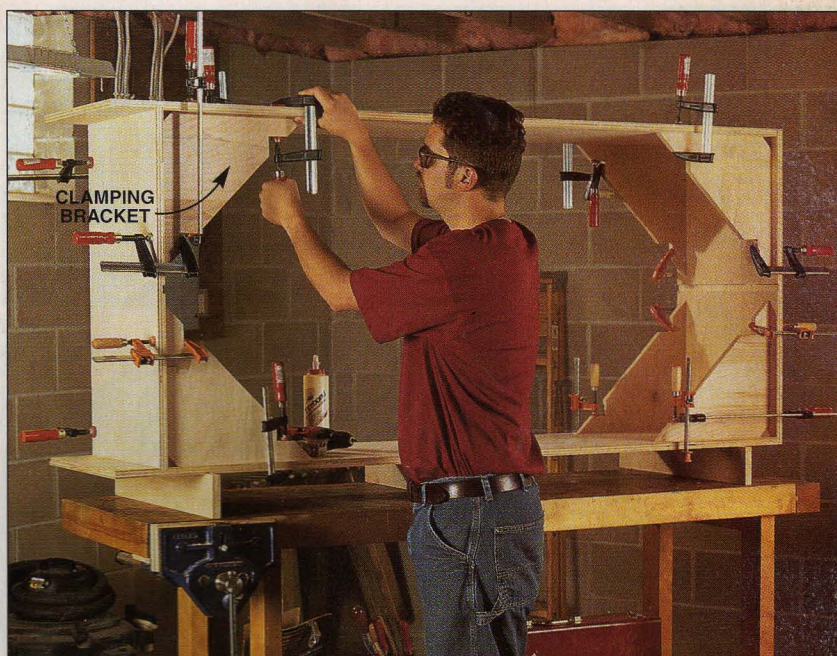
Install the nail strip (A9), perf-board back (A10) and fill strip (A11). The top of the perf-board should be flush with the top of the cabinet. Finally, install the toe kick (A12) and glue on the door stops (A13).

The Outer Doors

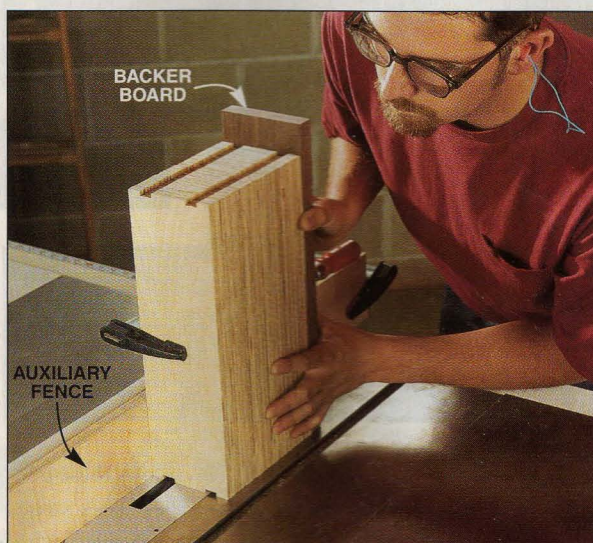
Rabbet the edges of the door fronts (Fig. A, Parts B1). Fasten the frame sides (B2), and add the ends (B3). Next, dado the shelves (B4) to fit around the shelf standards (Photos 5 and 6). Add a shim to your dado set to allow a bit of side-to-side clearance for the standards. You have to flip and re-clamp the pieces for each pass. After all four dados are cut, glue lips (B5), made from ripped-down 2x4 stock, on the shelf fronts. Then, use the shelves to install the standards in the doors. Be sure to push the standards to the bottom of the door frame before nailing so the shelves will sit level.

Clamp the doors to the cabinet so you can install the hinges (Photo 7). Prop the door in place on a simple stand. Then, clamp it to a cantilevered straightedge (use piece X1) and to the cabinet. The straightedge ensures the door will be flush with the top of the cabinet. Clamping the door and cabinet sides together removes any bow, so the door will swing freely, once it's hinged. A perf-board spacer between the door and the cabinet side creates room for the hinge barrel.

When you've got the door positioned, cut the piano hinges to length and install



4 PLYWOOD CLAMPING BRACKETS KEEP THE CABINET SQUARE and let you glue and screw it together, one side at a time, without big pipe clamps. We've included the eight brackets you need in the plywood cutting diagrams (Fig. D, Parts X2).



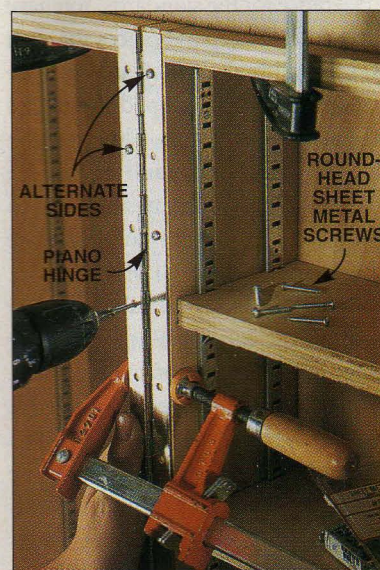
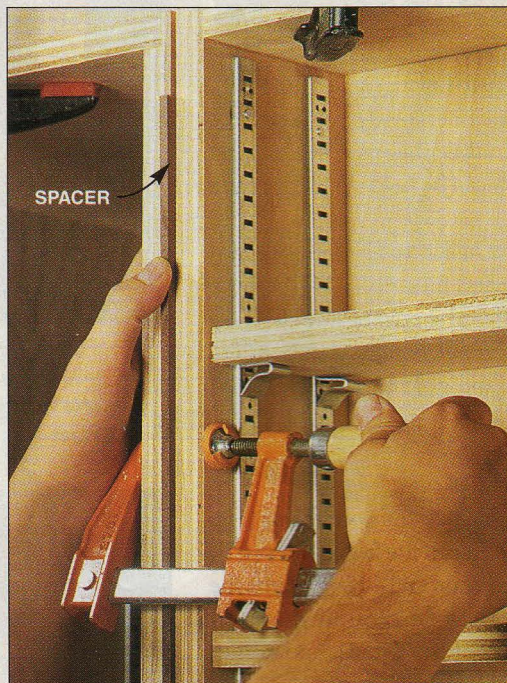
5 GANG THE SHELVES TOGETHER FOR DADOING. A backer board keeps the dado set from blowing out the backside of the last shelf. The auxiliary fence's extra height keeps the stack steady.

6 NAILING THE STANDARDS IS A CINCH because the dadoed shelves hold them in place for you. Needle-nosed pliers are much better nail-holding devices than your fingers!





7 CLAMP THE DOORS IN POSITION BEFORE INSTALLING THE HINGES, using a shop-made stand, a perf-board spacer and a straightedge extending from the top of the cabinet. Make sure the edges of the door and cabinet are flush.



8 MOUNT THE HINGES WITH SHEET METAL SCREWS. They have sharp threads that grip much better than the puny screws supplied with the hinges. Alternate the screws between the cabinet and the door so their heads won't bind.

them, using sheet metal screws (Photo 8). Center the hinge between the edges of the cabinet and door, with the barrel facing you, and predrill holes for the screws with a self-centering hinge bit.

The Inner Doors

Rabbet the door frame sides (Fig. C, Parts C1 and D1) for the ends (C2, D2). Then cut dados in them for the perf-board panels (C3, D3). Like plywood, perf-board is often thinner than its stated thickness. If yours is less than 1/4-in. thick, you'll have to use a regular blade in your tablesaw instead of your dado set. Make two passes, adjusting the fence between cuts.

Once glued in the dados, these perf-board panels make the doors strong and rigid. Hold the frames square when you glue and screw the doors together.

Mounting the inner doors is similar to mounting the outer doors, but the hinges are fastened to the plywood faces instead of the edges.

To prop the inner doors at the right height, just stack two pieces of 3/4-in. plywood (door shelves work great) on top of the little stand used for mounting the outer doors. Tape an 11/16-in.-wide perf-board spacer to the front edge of the center divider. Position the door against the front of the cabinet, opened 180 degrees and resting on top of the

raised-up stand. In this position, the door you're mounting will cover the opening on the opposite side of the cabinet and its hinge side will be flush with the hinge side of the center divider. They'll be separated by the spacer.

Hold the door against the spacer and cabinet with a clamp at the top. Center the barrel of the hinge (with the barrel facing you, just like on the outer doors) in the space between the door and cabinet and install one screw on each side, in alternating holes. Then install a couple screws at the bottom of the hinge, using knee pressure to hold the door against the cabinet. With the hinge secured top and bottom, finish installing the hinge screws.

Finishing Touches

Notching the cabinet's adjustable shelves (Fig. C, Parts A6 and A8) makes it easy to mount the shelf standards in the cabinet. You can also add shelves made from 2x4 and 2x6 stock to the perf-board doors (Fig. C, Detail 1). Fasten lips (B5, C5, D6 and D7) to all door-mounted shelves.

Mount the door handles, rare-earth-magnet catches (two per door) and the latch. Move the cabinet into position, level it and *anchor it securely to the wall*. Then get organized. **AW**

CAUTION: THIS CABINET MUST BE SECURELY ANCHORED TO A WALL.

Sources

Rare-Earth Magnet Catch Sets (4 required),
1/2-in. dia. magnet, #99K31.03; \$.80 each
5/8-in. dia. magnet cup, #99K32.53; \$.50 each
5/8-in. dia. washer, #99K32.63; \$.43 each
Lee Valley Tools Ltd., (800) 871-8158, www.leevalley.com



CUTTING LIST

OVERALL DIMENSIONS W/ DOORS CLOSED 23-7/8 D x 30 W x 72 H

OVERALL DIMENSIONS W/ DOORS OPEN 18 D x 60-1/2 W x 72 H

PART	DESCRIPTION	PIECES	DIMENSIONS
A	CABINET	1	18 x 30 x 72
A1	Sides	2	3/4 x 18 x 72
A2	Center Divider	1	3/4 x 17-1/2 x 67 <i>65 1/4</i>
A3	Bottom Shelf	1	3/4 x 17-1/2 x 29
A4	Top	1	3/4 x 17-1/2 x 29-1/2
A5	Left Fixed Shelf	1	3/4 x 11-11/16 x 14-3/8
A6	Left Adjust. Shelves	4	3/4 x 11-11/16 x 13-3/4
A7	Right Fixed Shelf	1	3/4 x 9-7/16 x 14-3/8
A8	Right Adjust. Shelves	4	3/4 x 9-7/16 x 13-3/4
A9	Nail Strip	1	3/4 x 3 x 28-1/2
A10	Back	1	1/4 x 29-1/2 x 68-3/4
A11	Fill Strip	1	1/4 x 3 x 29-1/2
A12	Toe Kick	1	3/4 x 4 x 28-1/2
A13	Door Stops	2	1/4 x 3/4 x 3
B	OUTER DOORS	2	5-5/8 x 14-15/16 x 68
B1	Fronts	2	3/4 x 14-15/16 x 68
B2	Frame Sides	4	3/4 x 5-1/4 x 68
B3	Frame Ends	4	3/4 x 5-1/4 x 13-7/16
B4	Shelves	20	3/4 x 4-5/8 x 13-5/16
B5	Shelf Lips	20	3/16 x 1 x 13
B6	Bottom Shelf Lips	2	3/16 x 5/16 x 13
C	LEFT INNER DOOR	1	5-3/4 x 11-1/2 x 65-1/2
C1	Frame Sides	2	3/4 x 5-3/4 x 65-1/2
C2	Frame Ends	2	3/4 x 5-3/4 x 10-3/4
C3	Panel	1	1/4 x 10-3/4 x 64-3/4
C4	Shelves	8	1-1/4 x 2-1/2 x 9-7/8
C5	Shelf Lips	8	3/16 x 3/4 x 9-7/8
C6	Bottom Shelf Lips	2	3/16 x 5/16 x 9-7/8
D	RIGHT INNER DOOR	1	8 x 10-1/4 x 65-1/2
D1	Frame Sides	2	3/4 x 8 x 65-1/2
D2	Frame Ends	2	3/4 x 8 x 9-1/2
D3	Panel	1	1/4 x 9-1/2 x 64-3/4
D4	Front Shelves	4	1-1/4 x 4-1/2 x 8-5/8
D5	Back Shelves	4	1-1/4 x 2-3/4 x 8-5/8
D6	Shelf Lips	8	3/16 x 3/4 x 8-5/8
D7	Bottom Shelf Lips	2	3/16 x 5/16 x 8-5/8
X1	Auxiliary Fence	1	3/4 x 4 x 34
X2	Clamping Brackets	8	3/4 x 13-1/2 x 13-1/2

DIMENSIONS IN BLUE: Sheet stock may be thinner than stated dimension.

DIMENSIONS IN RED: Cut slightly longer if plywood is thinner than 3/4 in.

You won't believe how much junk you can fit into this amazing cabinet.

Shopping List

PIECES	DESCRIPTION
4	3/4" x 4' x 8' Birch Plywood
2	1/4" x 4' x 8' Perf-Board
4	1-1/2" x 72" Piano Hinges
16	6' Shelf Standards
112	Shelf Supports (as shown)
2	8' 2x4s (clear)
1	4' 2x6 (clear)
32	#3 1-3/4-in. L-screws
4	Rare-Earth Magnet Catch Sets
1 box	1" #6 Flat-Head Sheet Metal Screws
2 boxes	1-1/4" #6 Flat-Head Sheet Metal Screws
1 box	3/4" #6 Round-Head Sheet Metal Screws

TOOL TEST

Premium Resaw Bandsaw Blades

Straight-cutting blades that won't let you down

A bandsaw is an amazing machine. It's capable of making extremely precise cuts; from slicing sheets of thin veneer to cutting intricate curves. Yet many of us think of our bandsaws as being for rough work only. Why? Probably because our first attempts at precision work, like resawing, were thwarted by ordinary blades. It's probably not your saw or your technique, it's your blade that's the problem. Take a premium bandsaw blade for a spin and you'll be amazed at the difference.

Most bandsaws come with ordinary carbon-steel or spring-steel blades. These blades are okay for general bandsaw work but the untreated metal is not designed to withstand the rigors of resawing. Resawing wood is essentially rip cutting a board across its width (Photo 1). There's a tremendous amount of wood to remove and the heat and abrasion caused by resawing will quickly wear out an ordinary blade.

Premium blades have hardened teeth, and they far outlast ordinary blades. There are three basic types of premium blades; flex-back, hard-back and bi-metal (see Fig. A, page 104).

Shopping for bandsaw blades is like trying to pick a long distance phone company. There are so many variations and confusing terminology it's hard to know what you're getting. For starters, you've got silicon steel, tungsten steel, carbon manganese spring steel, or, my personal favorite, cobalt/molybdenum high-speed steel.

The real question is "How do the blades perform?" That's what we looked at in this test.

By Dave Munkittrick

Premium Resaw Bandsaw Blades

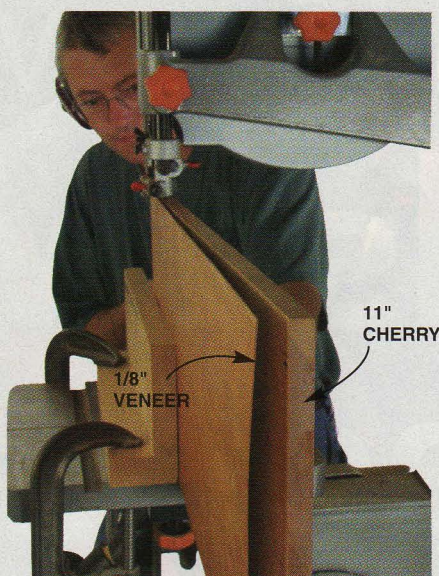
The Test

Resawing is by far the most demanding job asked of a bandsaw blade. A straight, even cut that doesn't require a great deal of clean up was our gold standard. We tested all the premium resaw blades we could find that can safely be used on a 14-in. bandsaw (see "Blade Thickness," page 106, for more on this topic).

The test itself was straightforward. We cut 1/8-in.-thick veneer from 8 in. x 24-in. slabs of 8/4 maple, oak and pine. After each cut we ran the cut face of the slab over a jointer set to take a 1/32-in. cut. If the saw marks cleaned up in a single pass (Photo 2), the blade was declared a winner and was included in our chart on page 110. If at first the blade did not succeed, we tried again; adjusting the tension or altering the feed rate.

Results

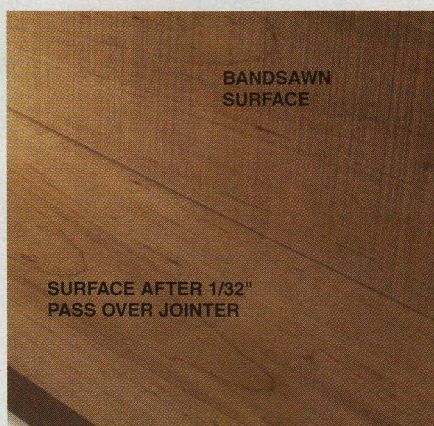
If you only resaw on occasion and want a blade primarily for general-purpose work, a flex-back or hard-back blade is your best choice. For hard-core resawing, the hard-back or bi-metal hook-tooth blades with three tpi did the best overall job. A bi-metal blade is considerably more expensive but it will far outlast a hard-back blade because of the extra-hard, high-speed steel used to form the teeth (Fig. A).



1 Resawing wood is tough on bandsaw blades.

Only premium bandsaw blades with hardened teeth can hold their edge and produce straight, smooth cuts in wide stock like this.

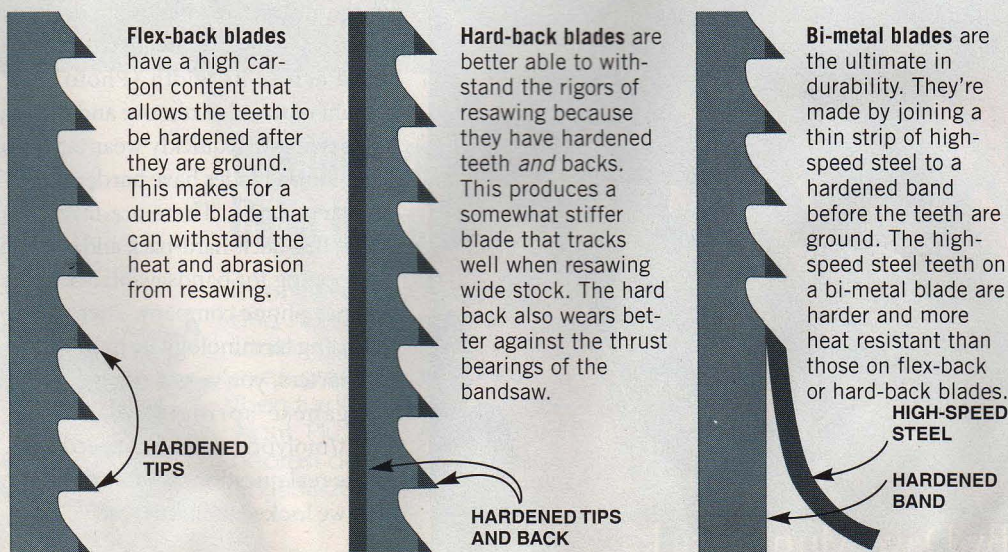
TIP: Keep a new premium resaw blade on hand to use when maximum performance is critical. Like that best suit in your closet, use it only for special occasions.



2 We resawed 1/8-in. veneer from 8/4 slabs of maple to test the blades. The sawn surface of the slab was then passed over a jointer set for a 1/32-in.-deep cut. If a single pass cleaned up all the saw marks, the blade made it onto our chart on page 110.

The key to a clean cut is a slow, even feed rate and a premium blade.

Fig. A Premium Bandsaw Blades



Premium Resaw Bandsaw Blades

5 Increased durability is the big benefit you get from bi-metal blades. They cost twice as much, but will likely last two to three times longer than flex-back or hard-back blades.



Durability

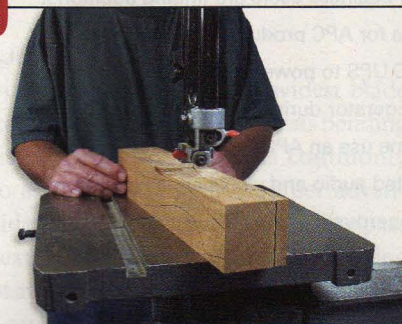
If you do a lot of resawing, you may find bi-metal blades worth the extra money because the extra-hard teeth are designed to outlast hardened carbon-steel blades.

Our Recommendations

There were two blades we considered to be firsts among equals. Highland Hardware's Wood Slicer blade and the Timber Wolf AS-S gave the smoothest cuts of all the blades we tested.

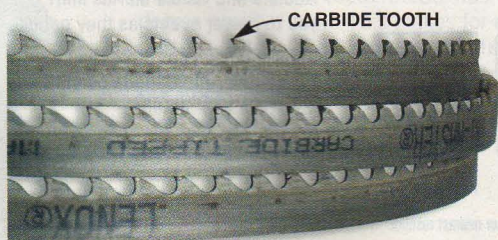
We didn't choose a Best Buy because there are so many good blades at the lower end of the price range (less than \$15).

Tip

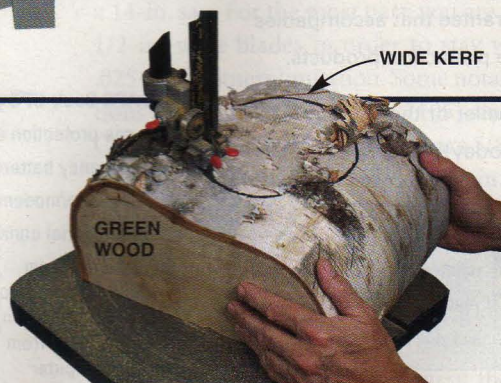


Hang onto those resaw blades that no longer perform at their peak. They still work great for general-purpose cutting.

You Should Know About These Blades



Carbide blades are the ultimate in durability. Production shops and people who cut a lot of exotic hardwood that contains abrasive chemical extractives love these long-lasting blades. The Lennox carbide blade we tried made beautifully smooth cuts. But, the \$120 price tag keeps it out of reach for most shop owners.



The Timber Wolf 1203AS is a specially designed wet resaw blade. The extra-wide kerf is designed to help clear the moist, stringy fibers in green wood. The blade is thicker than we recommend (.030-in.) for a 14-in. saw, but the Timber Wolf has a blade body made of flexible silicon steel that can handle the small-diameter wheels without fatigue. If you cut a lot of green wood, you may want to give one of these blades a spin.

Premium Resaw Bandsaw Blades

Editors' Choices



FINE
TEETH
(4 TPI)

COARSE
TEETH
(3 TPI)

MIKE HABERMANN

Highland Hardware's Wood Slicer is a unique blade among our picks. It made extra-smooth cuts with less noise. Part of the reason is the Wood Slicer's unique variable tpi design. The tpi varies from three to four, which helps reduce vibration and produces a smoother cut. Reduced vibration also results in reduced noise. Most bandsaw blades sound like a catfight as they're cutting through wide stock. The Wood Slicer is noticeably quieter.

The Wood Slicer also has the thinnest blade of the bunch at .020-in. thick, with an exceptionally narrow kerf (about 1/32 in.). The thin kerf results in increased yield with less horsepower required from your saw (1/2-hp saw owners, take note). On the downside, the kerf is so narrow that the blade will not cut curves very well. Once the Wood Slicer has lost its edge, it can't be retired to general-purpose duty as readily as the other blades.

For icing on the cake, the back of the Wood Slicer blade is rounded and polished at the factory to eliminate any source for fatigue cracks in the body.



Suffolk Machinery's Timber Wolf AS-S

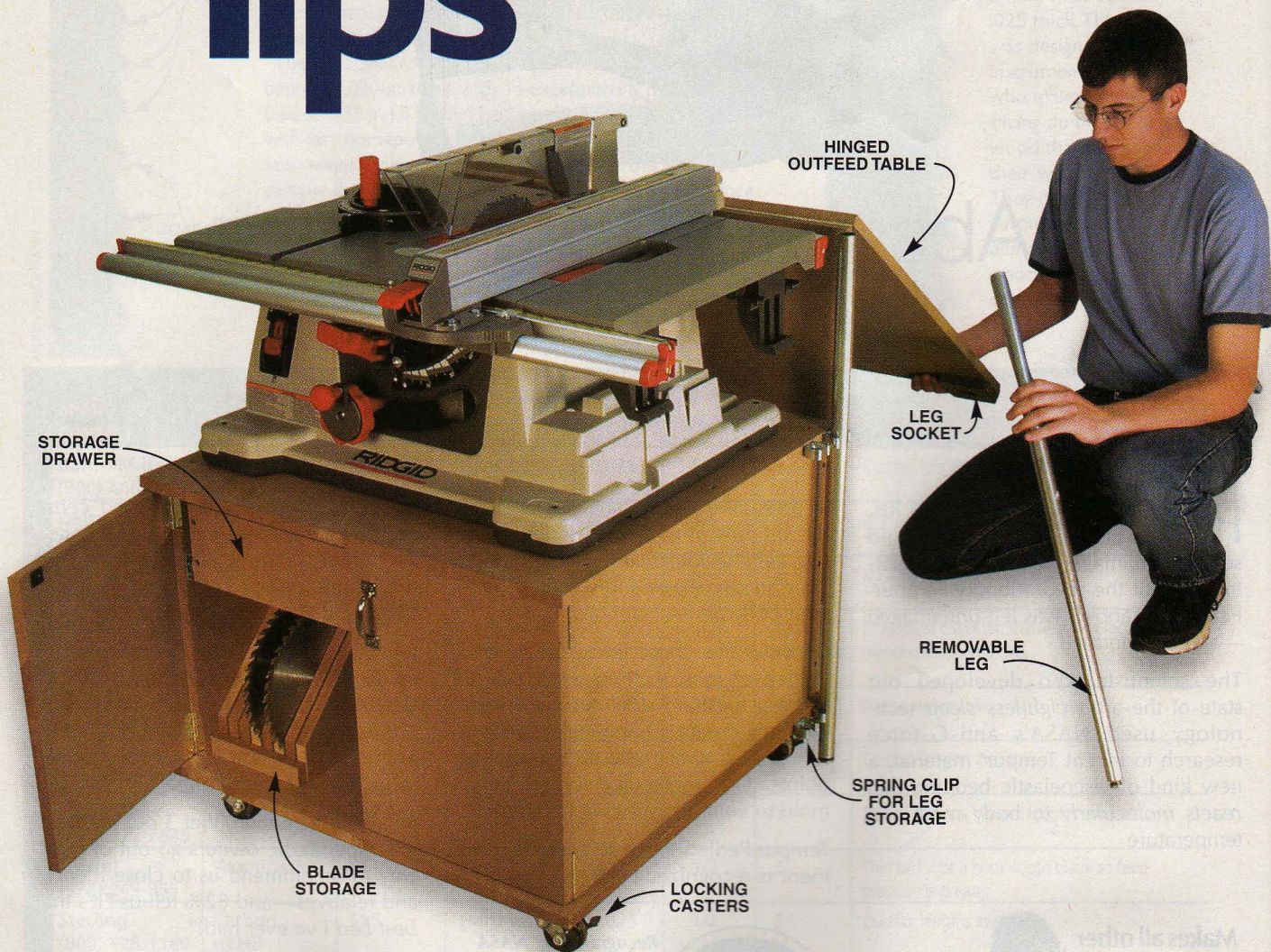
is specifically designed for straight-line slicing veneer. It's the only blade that's a full 3/4-in. wide but only .025 thick. This blade was designed for instrument makers who make a living slicing up blocks of wood that are worth their weight in gold. They can't afford any cutting problems and demand the smoothest possible cuts. **AW**

	BRAND CONTACT	BLADE NAME	PRICE*	Flex-Back Hard-Back or Bi-Metal	THICKNESS (in inches)	WIDTH (in inches)	TPI	Comments
Flex-Back/Hard-Back	Bahco/Milford (800) 446-7404	Highhard	\$10 to 12	Hard-back	0.025	1/2	3 or 4	Custom lengths available.
	Delta (800) 438-2486	Premium	\$23	Flex-back	0.025	3/8	6	Also available in 3/8-in., 6 tpi.
	Grizzly (800) 523-4777	Carbide Embedded	\$50	Flex-back	0.025	5/8	3	No 105 in. available.
	Highland Hardware (800) 241-6748	Wood Slicer 	\$30	Hard-back	0.022	1/2	3 to 4 variable	Smoothest cut of all; thin kerf; not recommended for curved cuts.
	Jesada (800) 531-5559	BSB 115	\$12 to 19	Flex-back	0.025	1/2	3	Frequently on sale.
	MK Morse (800) 733-3377	ZHBDH03	\$12 to 17	Hard-back	0.025	1/2	3	Custom lengths available.
	Olson All-Pro (800) 272-2885	AP77105	\$20 to 24	Hard-back	0.025	5/8	3	5/8" width a plus; custom lengths available.
	Starret (978) 249-3551	Woodpecker	\$11 to 15	Hard-back	0.023	1/2	3	Thin kerf; not a hook-tooth blade so feed pressure is greater.
	Sterling (800) 828-1180	Carbon HEHB	\$15	Hard-back	0.025	1/2	3	Custom lengths available.
	Timber Wolf (800) 234-7297	AS-S 	\$20	N/A	0.025	3/4	3	Very smooth cut, second only to the Wood Slicer; custom lengths available.
Bi-Metal	Tufftooth (800) 461-3895	Superflex	\$9**	Hard-back	0.025	1/2	3	\$25 (Canadian) min. order; custom lengths available.
	Tufftooth (800) 461-3895	Industrial Silicon	\$12**	Hard-back	0.025	1/2	3	\$25 (Canadian) min. order; custom lengths available.
	Bahco/Milford (800) 446-7404	Sandflex NF	\$18 to 29	Bi-metal	0.025	1/2	3	Custom lengths available.
	Jesada (800) 531-5559	BBB 103	\$29 to 47	Bi-metal	0.025	1/2	4	Frequently on sale.
	Lenox (800) 628-3030	Diemaster	\$24 to 40	Bi-metal	0.025	1/2	6	No 3 or 4 tpi avail. in .025 band thickness; custom lengths available.
	Olson MVP (800) 272-2885	MVP82305	\$29 to 33	Bi-metal	0.025	1/2	3	Custom lengths available.

* All prices based on 105" blades; Lower prices reflect sale prices; **U.S. dollar price at present exchange rate (Sept. 2001)

Small Shop Tips

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



Mobile Saw Base with Bonus Storage

My tools need to be mobile because I share my shop with two cars. This mobile tablesaw base offers portability and abundant storage. The base provides enclosed storage, including a full-extension drawer for small items. I made a hinged outfeed table and added a couple of wood blocks under the outer corners to provide a place for drilling the leg sockets. The legs are 1-in.-metal electrical conduit with leveling feet inserted in one end. When the outfeed table is folded down, I store the legs in a couple of spring clips on the side of the base. The locking casters keep everything stationary when sawing. I used MDF because it's cheaper than plywood and the extra weight seems to help the case absorb vibrations better. I found all the materials at my local home center for about \$100.

Thomas Moore

Small Shop Tips

Portable Compressor Station

I have to pack all my tools into the back of my garage when I'm not woodworking. To conserve space, I bought a pancake-style compressor for its compact size and portability. At 55 lbs. it's portable, but lugging it around is no picnic.

To make it easier to move I put it in a small open cabinet on wheels. I bolted the compressor to the bottom to keep it from vibrating its way out. To make the setup even more versatile, I mounted an air hose reel on top. I put a 12-in. lazy-Susan bearing between the hose reel and cabinet so I can unroll the hose in any direction.

Forrest Nerbitt

Sources

12-in. lazy-Susan bearing,
#TR12C, Woodworker's Hardware,
(800) 383-0130; \$5.
Hose reel, #AR050-I, Tools On Sale,
(800) 328-0457; \$67.



Heavy-Duty Workbench on Wheels

My shop is so small that even my workbench is on wheels! I used Delta's mobile base kit and it worked great.

The directions call for 1-1/2 in. by 1-1/2-in. wood connecting rails up to 30-in. long. If these wood rails are made longer, they tend to bow. For my 62-in.-long workbench I used square metal tubing instead. It cost me about \$20 from a metal distributor. This tubing is even strong enough to support a lower shelf. This doubles my tool storage area and it's all mobile!

If you're not up to sawing and drilling your own metal tubing, here's another option: Grizzly makes 36-in. metal connecting tubes that can be added to their mobile base. This extends the Grizzly base to a 44-in.-long capacity. *AW*

Roy Ettinger

Sources

Delta mobile base kit, #50-345, (800) 328-0457; \$50.
Grizzly mobile base kit, #G7315; \$90 and
Grizzly metal connecting rails, #G8685, (800) 523-4777; \$30.

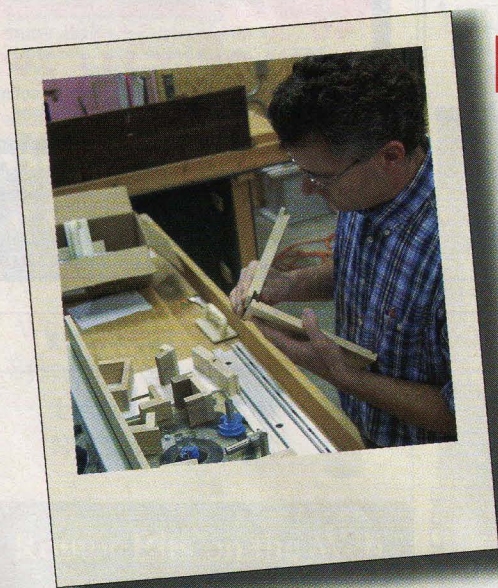
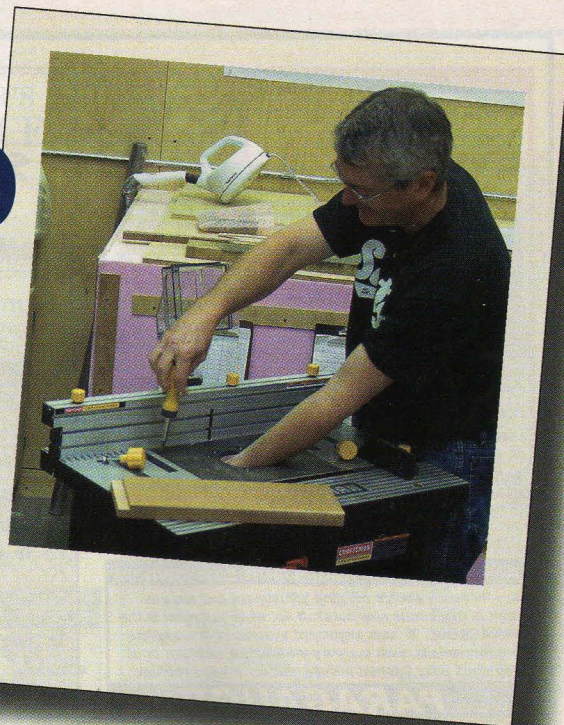


What's Coming Up

in **AW #92**, February 2002
our annual Router Special issue

Tool Test: Router Tables

Woodworkers love router tables, and we're not exceptions. For our annual Router Special issue, Dave Munkittrick's got 28 of them back in the shop, ready for making the tool-test chips fly, and he's like a kid in a candy store. Trust me, we didn't have any trouble finding volunteers to come join our Consumer Test Panel, either! This promises to be a most informative test. Want to add your two cent's worth? Send your router table comments to: amwood@concentric.net.



Lock-Rabbit Drawers

Ever had to make lots and lots of small drawers? Well, this router joint is the perfect answer. One bit, one setup, easy assembly and plenty strong. Randy Johnson's working out the bugs right now, so you can churn out drawers like rabbits.



Cherry Coffee Table

It's not for cherry-flavored coffee (ew...), but this table is great for anyone who's ever been plagued by too many magazines piling up. Tim Johnson designed drawers that are accessible from *both* sides and this great-looking table is built with strong, traditional joinery. Oh yeah, it looks great, too!

Router Table Fence

Sure, you can clamp a straight board to your router table and it works fine. But why not take a little extra time and make a router table fence with all the bells and whistles: adjustable, zero-clearance, guards—the works. George Vondriska is making one now, and he'll show you how to make yours in the February 2002 American Woodworker.

**AMERICAN
WOODWORKER**

Great Wood!



CHAIR BY ROSS S. PETERSON

PHOTO COURTESY OF ROSS S. PETERSON

Bubinga

From the heart of Africa come some of the world's finest tropical hardwoods. Bubinga, also known as African rosewood, is a wetland wood that thrives in the swamps around rivers and lakes in equatorial Africa. The trees often exceed 100 ft. in height and average 3 to 10 ft. in diameter. Bubinga is a heavy wood; a cubic foot weighs approximately 57 pounds, compared to 46 lbs. for white oak. A single log can weigh in excess of 10 tons.

Once considered a sacred tree with mystical powers by certain tribes in Africa, bubinga has earned a worldwide reputation as a cabinet wood. A popular choice of furniture makers since the French Renaissance, bubinga has become a favorite of modern furniture makers because of its availability, moderate price and rich color.

Bubinga has similar qualities to East Indian and Brazilian rosewood but with a finer texture and a rich, deep-red colored heartwood containing dark brown and purple veining. Wavy, interlocking grain patterns produce a mottled figure in the wood. Although it's hard and heavy, it doesn't have the problems associated with some of the more oily tropical hardwoods. Bubinga works, glues and finishes much like hard maple. It is a surprisingly versatile wood used in everything from boat building and fine furniture to tool handles and flooring.

We bought our Bubinga from Willard Brothers of Trenton, NJ. All of their lumber is kiln dried and milled to random width, length and thickness. Available in 4/4 boards at \$10 per bd. ft. and 8/4 for \$11 per bd. ft. **AW**

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

Source

Willard Brothers,
(800) 320-6519,
www.willardbrothers.net

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

Bubinga (*Guibortia demeusei*)
is richly colored and more
affordable than many exotic
species.

PHOTO BY MIKE HABERMANN

ART DIRECTION: PATRICK HUNTER

Oops!

Edited by **Tim Johnson**

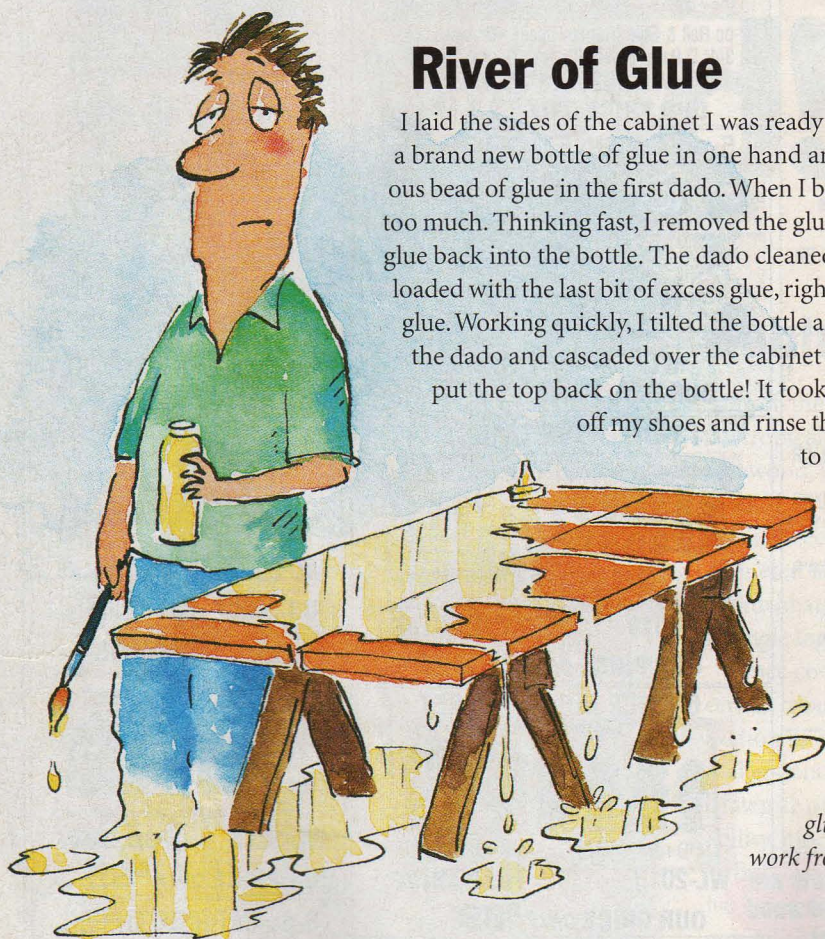
River of Glue

I laid the sides of the cabinet I was ready to assemble on a pair of sawhorses. Armed with a brand new bottle of glue in one hand and a small brush in the other, I squirted a generous bead of glue in the first dado. When I began to brush it out, I realized I'd squeezed in way too much. Thinking fast, I removed the glue bottle top and used the brush to transfer excess glue back into the bottle. The dado cleaned up nicely, and I expertly transferred the brush, loaded with the last bit of excess glue, right to the next dado. Soon, however, I needed more glue. Working quickly, I tilted the bottle and squeezed. A river of glue immediately flooded the dado and cascaded over the cabinet side onto my shoes and the floor. I'd forgotten to put the top back on the bottle! It took half an hour to sop up all the spilled glue, clean off my shoes and rinse the cabinet side so I could try again. Oh yeah, I had to sand everything a second time, too.

Duane Johnson

When you have a complicated glue-up, Duane, use glue that has a long open time so you can work without rushing things. Typical carpenter's glues start to skin over in only five minutes. White glues and extended-open-time yellow glues give you up to fifteen minutes to work.

Polyurethane and liquid hide glues set up even slower. I've made spills, too, so now I pour glue into a small paper cup or plastic container and work from it instead of the bottle. T. J.



Cullen's Calamity

I wanted to repair a small gash on our dining room table, which is knotty pine with a honey finish. I decided to use walnut-colored wood dough, so the repair would blend in with all of the dark-colored knots. But before I realized what was happening, I'd stripped away an area of finish the size of a half-dollar. The putty dissolved any finish it touched.

After sanding and trying a half dozen different stains in an attempt to at least match the knots, if not the rest of the table, my wife decided to cover my expert "repair" with a table runner.

Cullen J. Swanier

Cullen, next time use latex wood dough or a putty stick. Wood doughs make durable repairs because they dry hard. Unfortunately, the one you chose was solvent-based, and your table's lacquer finish couldn't stand up to it.

Putty sticks, like kids' crayons, never completely harden. They're used to fill nail holes after a finish has been applied. You just select the stick that most closely matches the color of your finish, rub it into the defect and buff away the excess.

If you don't mind leaving the gash, you could just disguise it with a special finisher's touch-up pen or (gasp!) an ordinary brown or black felt-tip pen. T. J.

AW

If you have a woodworking blunder you're willing to share, send it to us with a sketch or photo. We pay \$100 for each one we print. Send to: **AW Oops!, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121.** Submissions can't be returned and become our property upon acceptance and payment.