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#84 December 2000

Dovetail Jigs

Home Theater

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Shaker Sewing Cabinet

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Dovetail Jigs

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Cover photo by Mike Habermann

Home Theater

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Oh yes you can! Build this grand, expertly designed entertainment center even in a small shop.

Building an Assembly Table

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A foolproof, step-by-step approach to making these drawers with your half-blind dovetail jig.

Tool Test:

Compound Slide Miter Saws

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Accuracy, capacity and portability all in one tool. We did the test and picked the best.

AMERICAN WOODWORKER

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How to reach us

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Question & Answer

Planing Without Jointing

Q. Help! For the life of me, I can't get the twist out of rough lumber when I run it through my planer. I don't own a jointer yet, but isn't there some way to make flat boards with a planer?

Larry Beaucom
North Bend, OR

A. As the saying goes: "Garbage in, garbage out." Normally, a planer can't take the twist out of a board; it merely makes the top side parallel to the bottom. To get a board flat without a jointer, fool the planer into thinking the bottom of your board is already flat.

Build a sled from two 3/4-in. medium density fiberboard (MDF) shelves.



These shelves are cheap and widely available. Two of them make a really stiff sled. Shim the high spots with playing cards taped to the sled. Using

shallow cuts, run the board through the planer until you've cleaned up the top side. Then flip the board over and plane to thickness.



What Wood Is That?

Q. I've got a bet to settle. I think our antique chest is made of American pine and my wife believes it's Scandinavian spruce. How can I find out what wood it really is?

Mike Kindersley
Bishopville, SC

A. Color, texture and odor can help in identification, but the only scientific way to verify what wood you have is to

look at a magnified view of its end grain. You can use a powerful hand lens and Bruce Hoadley's book "Identifying Wood" (Taunton Press, \$32), or the Forest Products Laboratory Wood I.D. Web site, listed at right. The problem is, softwoods are especially tough to positively identify.

You can also try taking a sample of end grain to your local Extension Office and let them take a crack at it. If

that doesn't pan out you can have the wood analyzed for free at the Forest Products Lab, but there's a long wait.

Forest Products Laboratory
Center for Wood Anatomy Research
One Gifford Pinchot Drive
Madison, WI 53705
(608) 231-9200, fax (608) 231-9592
www.fpl.fs.fed.us/WoodID/ifact.html for complete identification.

Question & Answer

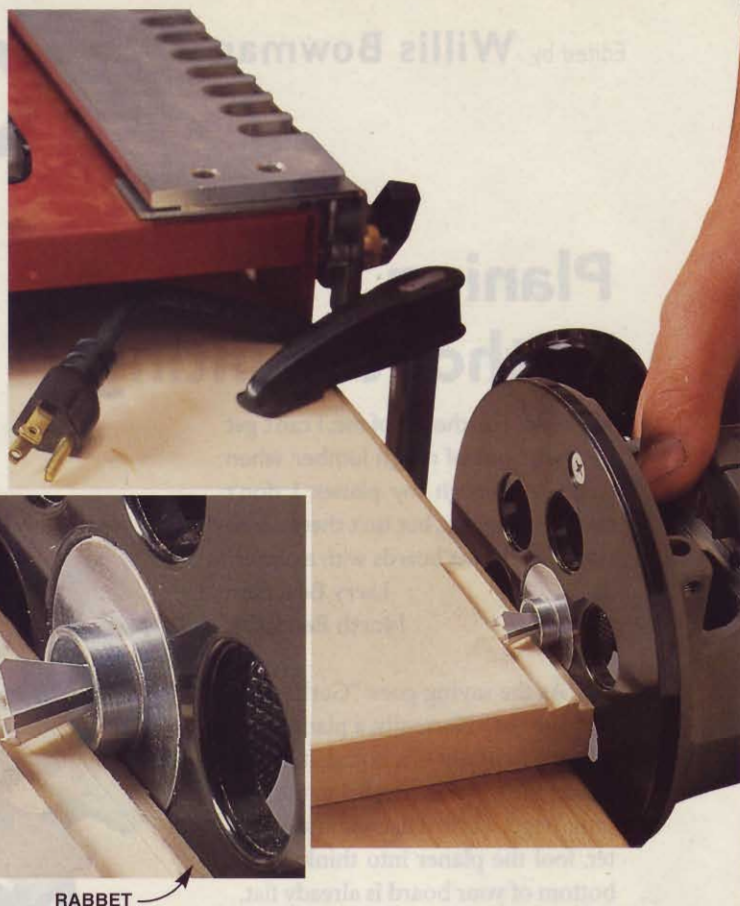
Dovetail Jig Set-Up

Q. I've fallen in love with my dovetail router jig, but my big frustration is setting the depth of the dovetail bit each time. I've tried measuring how much the bit should stick out, but that's awkward and I spend too much time on trial and error test cuts. Is there an easier way?

Raymond Dell
Woodland Park, MI

A. Put away your ruler! Next time you cut dovetails, set your bit directly from a gauge on the jig's mounting board. You'll need a mounting board that's about 8-in. longer than the jig. Cut a 1/8-in. deep-rabbit along one edge on the tablesaw, then attach the jig. Set up the jig and adjust the dovetail bit to its proper depth by trial and error. While holding the router base against the edge of the jig's mounting board, cut a dovetail-shaped groove.

Next time you want to use the jig, simply extend the dovetail bit until it fits perfectly into the dovetail groove. You're set!



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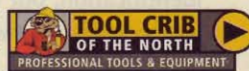
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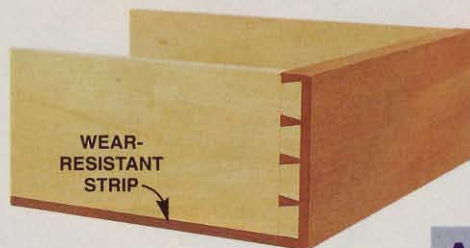
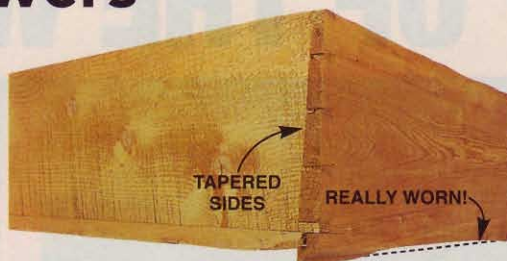
Question & Answer

Worn Drawers

Q. I've noticed in some antique chests of drawers that the pine drawer sides are really worn. I want to build a chest of drawers meant for daily use but don't want the drawers to wear away before my grandchildren get to use it. Is there a way to build better, long-lasting drawers?

Steve Maxwell
Shenandoah, PA

A. Yes, there is. Furniture makers often used wood that was fairly soft for drawer sides because it was easy to work with. These sides wore away because the pine couldn't handle the repeated rubbing of soft wood on soft wood. (As a cure, some Shaker cabinetmakers even tried tapering the drawer sides to make a wider bearing



surface, as shown above.) Sides made from a soft wood are still a good idea, but for the longest-lasting drawers, add a strip of wear-resistant wood only where needed: on the *bottom* of the drawer side.

Before building the drawer sides, glue a 1/4-in. strip of a hard wood to the bottom of the drawer side blanks. Build the runners from the same wood.

Why not make the sides entirely from a hard wood? Here are three good reasons:

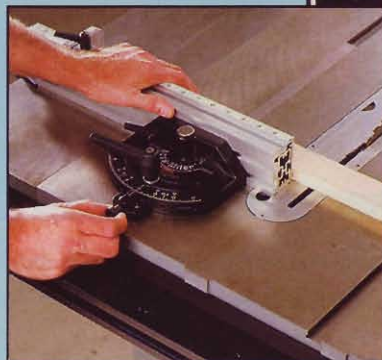
- Softer woods are less expensive.
- It's much easier to cut dovetails in a soft wood.
- Soft woods usually weigh less, causing less wear. **AW**

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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From Our Readers

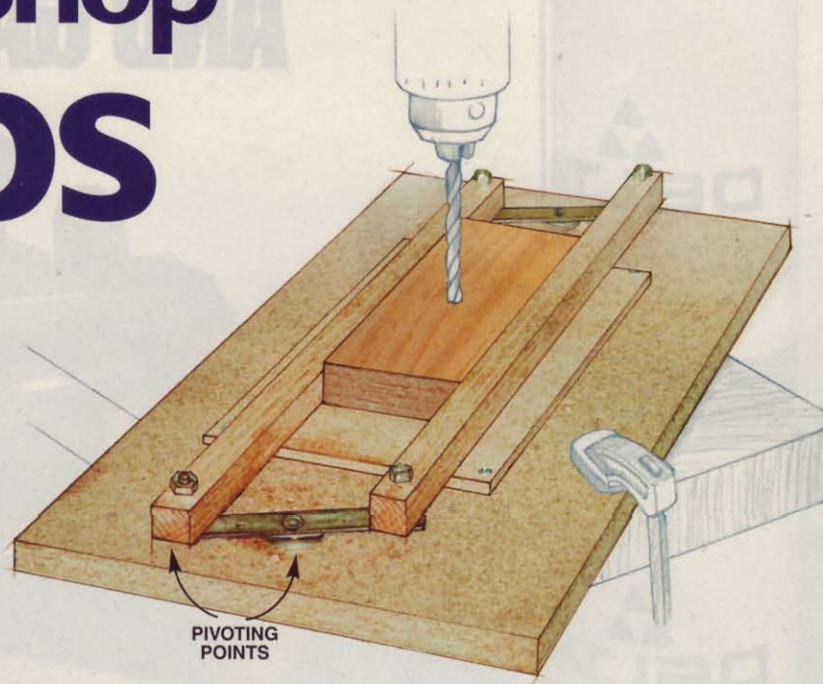
WorkShop Tips

Drill Centering Jig

There are many times when you need to drill holes down the center of a board. This drill-press jig automatically centers the bit. With some imagination, this design could also be used to center your piece to a saw blade or a router bit.

The jig is made of two wooden side bars and two metal end pieces. These are joined to form a rectangle that pivots into a parallelogram. The rectangle is elevated above a piece of MDF with washers and joined to it by screws running through the center of the metal ends. A sacrificial backer board is placed underneath the rectangle.

To set up the jig, lower the bit so the tip is trapped between the wooden sides. "Squeeze" the rectangle onto the drill bit and clamp the MDF board to the drill press table. The drill bit will be centered on any piece held by the jig.

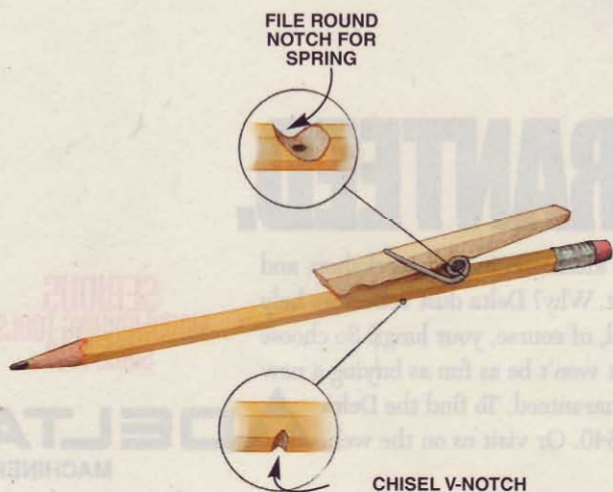


David Swanson
Tustin, CA

Clothespin Pencil

Finding a sharpened pencil in my shop was hopeless. The more pencils I left around, the more they'd disappear! So, I made a pencil that can be clipped anywhere by attaching it to a clothespin. Now I have one clipped to every blast gate, near the phone and on my apron.

Mark Safford
Edgartown, Martha's Vineyard, MA



If you have an original Workshop Tip, send it to us with a sketch or photo. We pay \$200 for each one we print. Send to: Workshop Tips, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121. Submissions can't be returned and become our property upon acceptance and payment.

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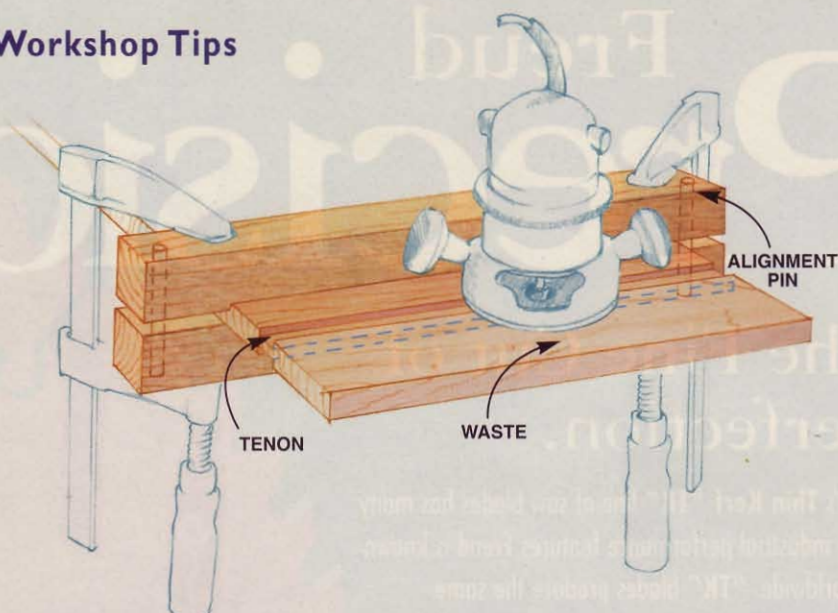
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Workshop Tips



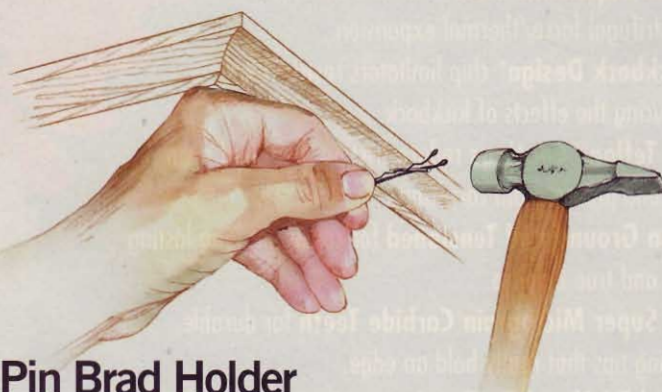
Cutting Tenons on Long Boards

I built a bed with rails 6-in. wide and more than 80-in. long. I needed to cut tenons on each end of these boards but the boards were too long to cut on the tablesaw. This jig allows me to router-cut tenons on any length board. It also allows both the cheeks and faces of the tenons to be cut in one setup.

To cut the tenons, first I mark my layout lines on each board. The guide blocks are set square to an edge of the board and clamped. Running a router against the pinned blocks, I make a shallow "skim cut" on all four sides to prevent chip-out. I sneak up to the layout lines with additional deeper cuts. When the last cut is completed, I make a few more passes to develop the length of the tenon. I remove the uncut end of the board with a handsaw.

Finally, I test-fit the tenon into the mortise and take additional cuts on the tenon to make a good fit.

Otto Beasler
Cedar Rapids, IA



Bobby Pin Brad Holder

Here's a classic tip that's worth repeating:

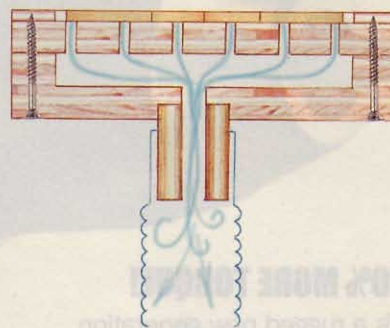
The last time I nailed molding to a piece of furniture I whacked my thumb with the hammer. It's tough to hold a small brad in a tight place. I've tried to hold a brad by piercing it through cereal-box cardboard but the cardboard blocked my view. My simple solution is to use a bobby pin to hold the nail in place. Not only is my thumb grateful but I can see the point of the brad to boot.

Steve Moroukian
Goshen, IN

Workshop Tips

Vacuum Clamp

Last winter I made the snowflake ornaments featured in AW #70, December 1998, page 75. The construction went well but sanding the thin snowflakes proved difficult. I tried double-sided tape but removing the tape from the flakes was more trouble than it was worth. I devised a holder that would both anchor the snowflakes and remove



the sanding dust. The snowflakes sit in a pocket above a closed cavity connected to my shop vacuum. The vacuum flowing through the holes in the cavity below securely holds the snowflake and removes any sanding dust.

*Jim Culler
Bellville, OH*

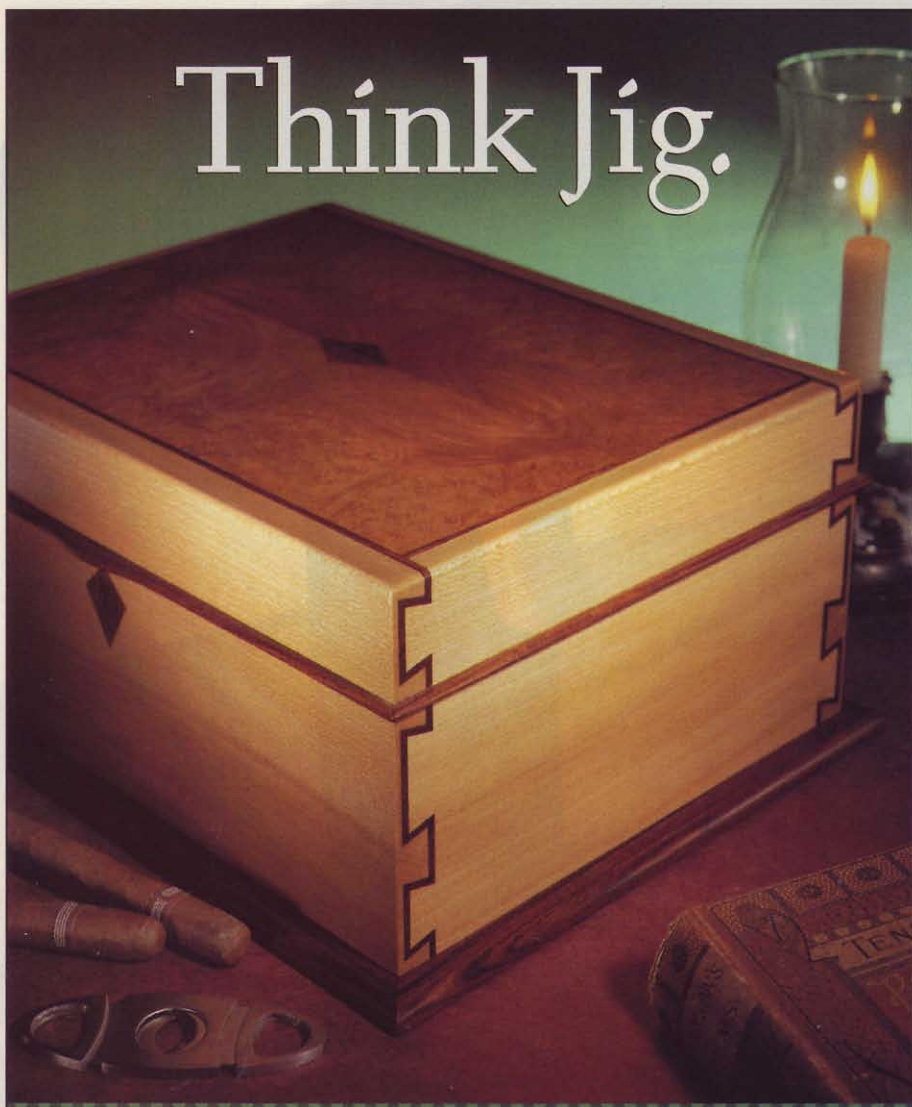
Metal Detector for Recycled Lumber

When you use recycled lumber from old buildings, it's essential to find any embedded metal before you hit it with your bandsaw, or worse, the thickness planer. I use a hand-held, battery operated metal detector that's reliable to a depth of 6 to 8 in. I figure it has already paid for itself several times over.

*Adrian Fieldhouse
Yorkshire, England*

Source for metal detectors: White's 5900 (\$500) or their Classic 3 that scans 4- to 6-in. deep (\$350); visit their Web site at: www.whitemetaldetectors.com or call (800) 547-6911.

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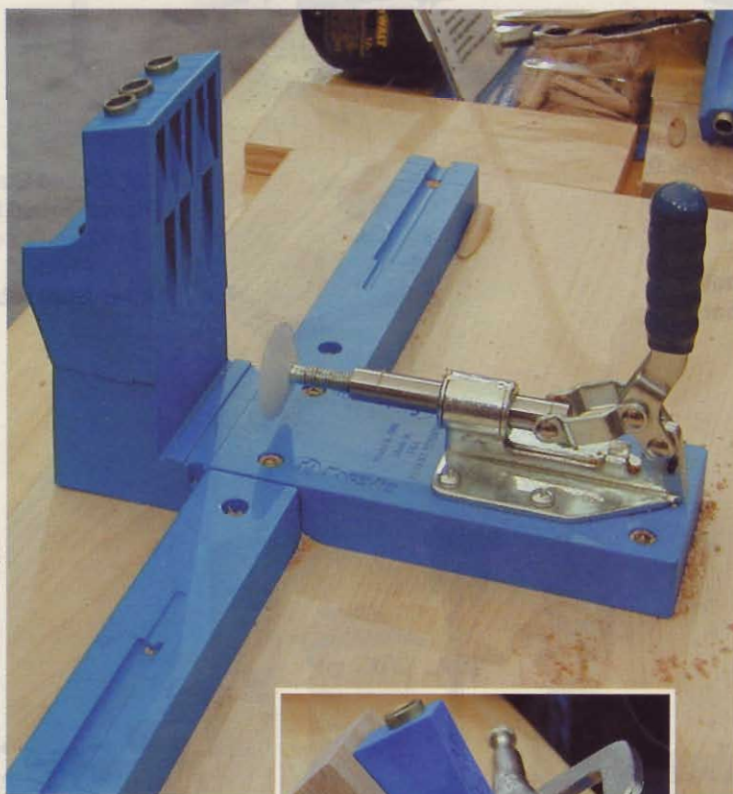
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Product Reviews

More Versatile Pocket-Hole Jig



PHOTOGRAPHY BY GEORGE VONDRISKA



The Mini Kreg with a face clamp.

Kreg Tool has developed the latest generation of pocket-hole jigs, the brand-new K2000. With this system you can drill pocket holes in both thick and thin material in almost any project.

Most pocket jigs are designed to center the pocket hole only on 3/4-in.-thick material. They just don't work very well with material that's thicker or thinner. Kreg has solved this problem by creating a modular system. You adapt to different thicknesses by easily adding or removing spacers. Now you can make pockets that are centered in 1/2 in., 3/4 in. and 1-1/2-in.-thick material.

Drilling in a variety of thicknesses requires you to reposition the stop collar on the drill bit. Kreg has incorporated a depth-collar guide, built into the support wings, to make setting the collar easy.

The K2000 also allows you to vary the spacing of the pocket holes across the width of your material. Three holes, lined with hardened-steel drill guides, allow you to space holes at 9/16 in., 7/8 in., or 1-7/16-in. on center. The drill guides carry Kreg's lifetime warranty.

The K2000 comes with:

- two wing supports for wide or long material
- a portable Mini Kreg that can be clamped to your work and used in place
- a face clamp to help with assembling parts
- a 3/8-in. drill bit
- a case for the (w)hole thing!

This tool solves lots of screw pocket problems, and is priced competitively at \$150.

\$146

Kreg Tool

(800) 447-8638

www.kregtool.com

Product Reviews

Revolutionary Laminate Trim Bit

I hate cleaning contact cement from bearings on flush-trim bits when I'm working with plastic laminate. I also hate it when those bearings scratch the laminated surface they're riding on.

The Euro-Trimmer, \$30, seems to have solved these problems by adding a square Teflon bearing to a flush-trim bit. According to the manufacturer, glue won't stick to the Teflon, so you

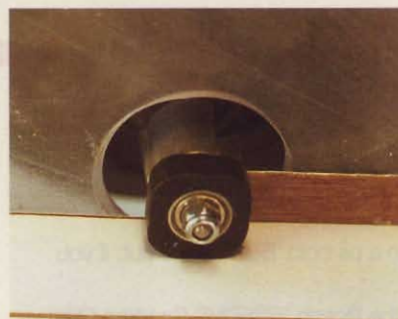


PHOTO COURTESY OF MANUFACTURER

never get glue build up. Another benefit is that the Teflon won't scratch the laminate on adjacent surfaces.

\$30

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Say good-bye to caustic blade cleaners. CMT's Formula 2050 Blade and Bit Cleaner (\$12 for 18 oz.) is completely non-toxic, non-flammable and biodegradable.

I've used this stuff on tablesaw and band saw blades, router bits and drill bits. Spritz it on, let it set for five minutes and wipe clean. It also leaves a thin film on the cutter to act as a lubricant.

\$12

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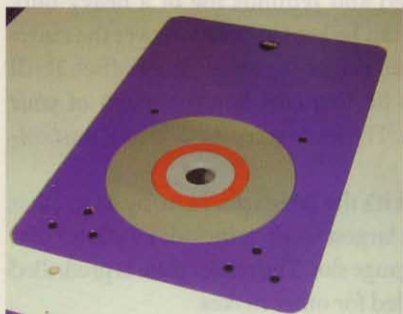


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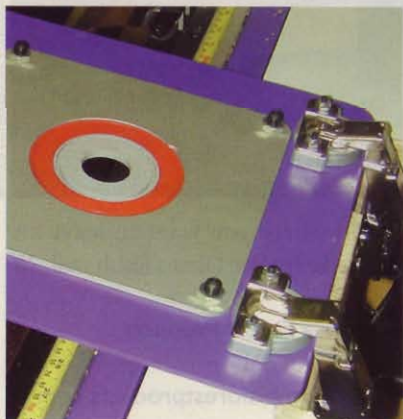


PHOTOGRAPHY BY GEORGE VONDRISKA

Excalibur's versatile EXRT2 router table insert (\$120) comes with 1-3/16 in., 2-5/8 in. and 3-7/8-in. dia. removable-steel insert rings. These insert rings can accommodate a variety of bit diameters and make routing safer by keeping the opening as small as possible for the bit you're using.

In addition to the handy insert rings, the EXRT2's also features:

- A steel plate that's 9/64-in. thick and measures 11-3/4 in. by 18 in. It's hard to imagine this heavy-duty plate bending, even under the heaviest router.
- A center plate (where your router attaches) that's laser cut to precisely fit the main plate. It rests on jackscrews, so it can be micro-adjusted for perfect alignment with the main plate. You'll need to drill mounting holes for your router in the center plate, but the included centering guide makes it easy to keep your router in the middle of the plate.



PHOTOGRAPHY BY GEORGE VONDRISKA

- European-style hinges that allow the insert to pivot up out of the table to make router adjustments or bit changes easier. The hinges quickly release from their mounts, so you can use the insert like an oversized router base in hand-held operations. This is handy when

Product Reviews

you need lots of support to prevent the router from tipping.

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Product Reviews

Sturdy Folding Router Table

Sturdy and folding? Yep, Bosch has done it. The first time I saw this table I kept leaning on it trying to get it to tip. Didn't happen. One leg even has an adjustable foot to help compensate for uneven floors.

The fence on this table is well designed and reminds me of a heavy-duty shaper fence. The guard is adjustable, so it can be kept in position over the cutter at all times. Shims are included so the outfeed side of the fence can be offset. You'll need to offset a router fence if you use a bit that cuts into the width of your material, for example when jointing an edge. The fence accepts a 2-1/2-in. dust collection hose.

The table is a comfortable 36-in. tall. But it's the table size, 24 in. by 44 in., that really sets it apart. That's plenty big for the largest work. It includes a starter pin, for work like cathedral doors, and a miter-gauge slot. The router plate is predrilled for Bosch routers, and may need to be drilled for other makes.

Another great feature is the power switch. It's included with the table, and has an 8-ft. power cord. It's significantly safer to use a table switch like this, instead of reaching under the table for the router switch.

\$350
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cation where you want to leave an exposed edge that takes a finish well. **AW**

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Finishing Tips

Reuse Your Mineral Spirits

When you use solvent-based finishes, brush cleaning is a pain. It's costly and the dregs you end up with are more than a nuisance—they could be toxic. Luckily, you can save the dirty spirits and use them over and over. You'll get clean brushes, save money and practice conservation at the same time. Here's how:

IT TAKES THREE RINSES and lots of mineral spirits to clean varnish from a brush. But, if you save the spirits from previous cleanings and reuse them as the first two rinses, you'll only need a small amount of clean spirits for the final rinse.

Keep separate sealed containers for each rinse of recycled spirits. Because the first rinse removes most of the varnish, its container accumulates most of the sludge and the spirits take longer to renew themselves. The spirits in the second rinse contain less residue, and revive quickly. Pour the spirits used for the final rinse into the second-rinse container. Numbering helps you keep the containers straight.

The first rinse container eventually gets full of sludge. Dispose of it properly (see recommendation at right) and replace it with the second-rinse container.

Then start a new container for the second rinse.



VARNISH SETTLES OUT of mineral spirits quickly. Within a couple of days after cleaning out a brush the spirits are clean enough to use again. Repeated reuse of the same spirits results in a layered buildup of sludge.

Be sure to provide adequate ventilation whenever you work with mineral spirits. Store them in a safe place, away from the risk of fire and out of the reach of kids and pets.

Disposing of Mineral Spirits

Most of us don't think twice about tossing out small amounts of mineral spirits. We should, however, because mineral spirits release smog-producing and ozone-destroying volatile organic compounds (VOCs) when they evaporate. Small amounts of mineral spirits tossed out by individual woodworkers (there are over 17 million of us in the U.S.!) add up. The EPA recommends that all used mineral spirits be disposed of at a hazardous waste collection facility. For professional woodworkers and finishers, the transportation and disposal of mineral spirits and other solvent wastes may be regulated. Check with the appropriate state agency.

Finishing Tips



Make Your Own Wood Putty

Tired of never having fresh wood putty when you need it? You've probably opened a can and found its contents dried out, unusable or the wrong color.

If you plan to use a clear finish, you can make your own putty from sanding dust (save some when you're sanding your project) and varnish. Just mix the two into a thick dough by adding the varnish to the dust, a little at a time. Varnish makes a good binder. Even though it takes a long time, once dry, it stays dry. Shellac and lacquer may dry

faster, but putty made with them tends to dissolve under a fresh topcoat of the same finish.

Apply the dough with a putty knife and let it dry (at least overnight) before sanding. Under a clear finish, this putty closely matches the wood tone, although it may be a slightly darker color.

Seal Porous End Grain with Epoxy

Outdoor furniture will last longer if the legs can't wick up moisture from the ground. A thin-bodied epoxy soaks in the best. Hobby stores usually carry it in several formulations. Just pick the

runniest one. It'll probably have an extended open time. If you get too exuberant and drip epoxy over the edges, clean it off with acetone before it cures.



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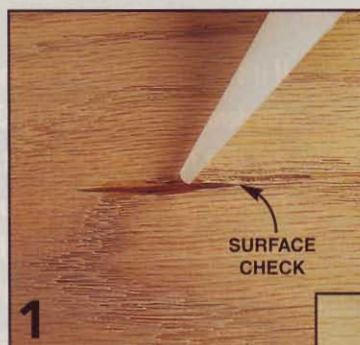
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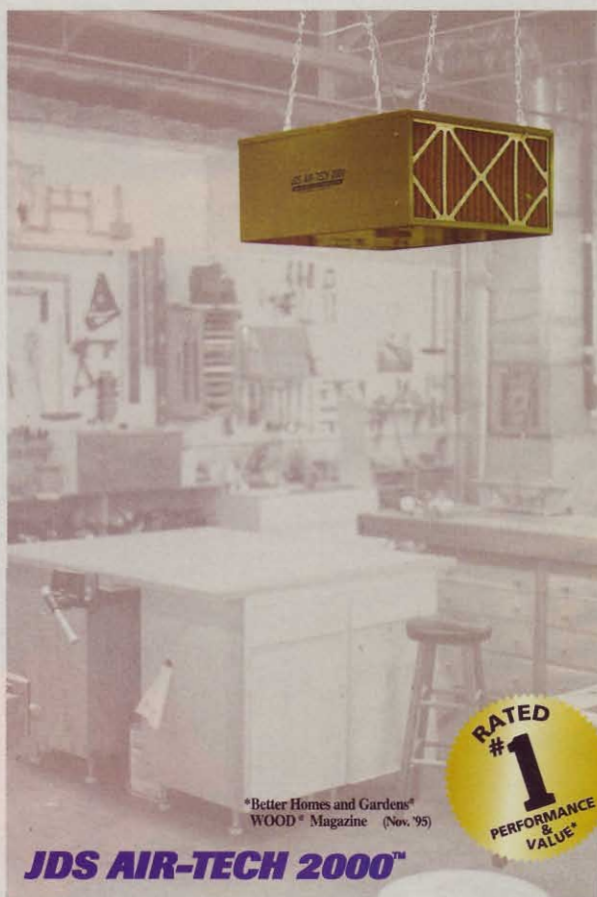
Don't let small surface checks keep you from using an otherwise good board. Got a minute? You can make those checks disappear.

Squeeze cyanoacrylate (CA) glue into the crack. CA glue works better than yellow glue because it dries very quickly. Any brand of gap-filling CA glue with a 5- to 15-second open time will work (about \$5 at home centers and hardware stores). Use a tip with a pin-sized hole (you can get replacement tips for 50 cents at hobby stores).



Immediately sand the area, mixing sanding dust with the glue and packing it in the cavity. Keep sanding until the crack is filled and the excess glue is removed. You may need to repeat the process. Under a finish, the sanding dust/glue mixture is almost invisible.

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JDS AIR-TECH 2000™

The Virtues of No. 1 Common

Save money by using boards that aren't perfect.



Want to make your head spin? Just try to figure out how hardwood lumber is graded. Lumber is such an incredibly diverse material that there are enough grades, rules for grading and exceptions to the rules to make you dizzy. Professional lumber graders use standards, administered by the National Hardwood Lumber Association, to classify every board. While you don't need to be a pro, knowing the difference between No. 1 Common and the higher "select" grades can keep you from wasting your money.

Everybody likes to buy "the best." But when choosing lumber, it's a mistake to pay top dollar for big, clear boards if you're going to cut them up into small pieces. The best boards to buy aren't always the most expensive ones.

DEFECTS DON'T MAKE A BOARD DEFECTIVE; just cheaper. If your project calls for small parts, like stiles and rails, lumber that's graded No. 1 Common is an economical choice. You can harvest perfectly good pieces by cutting around the knots.

NO. 1 COMMON IS GREAT FOR FURNITURE

Take a look at No. 1 Common lumber. It costs a lot less than the higher grades because the boards are smaller and they've got some knots and other defects. They also contain a lot of perfectly clear material. You just have to be willing to buy a little extra stock and spend some time working with it. It can be a challenge to figure out how to harvest the pieces you need, but it's also enjoyable and rewarding when you do.

No. 1 Common lumber is well suited to furniture making. It's an economical

source for narrow stock, perfect for moldings, or stiles and rails for face frames and frame-and-panel structures like doors or cabinet sides. You'll also find boards in the common pile that are wide, with enough clear lengths between defects to make good-looking panels, cabinet sides or small tabletops.

YOU CAN FIND TREASURE BOARDS IN NO. 1 COMMON

No. 1 Common lumber often contains striking grain and figure patterns that are usually absent in the select grades. That's because these "abnormalities"

The Way Wood Works



often occur around knots and near other natural defects. With selective or innovative cutting, you can remove and showcase them. Or perhaps you prefer a look that *includes* knots, splits and natural edges. Common grade boards can be downright beautiful, making more expensive higher grade boards look plain by comparison!

THE REAL DIFFERENCE: A PRETTY FACE

When you look at a chart of the various lumber grades (Fig. A, page 42), No. 1 Common appears to be a full step lower than Selects and Better. But look closely—the difference is really only a half step.

First, Selects and Better (the highest

FINDING HIDDEN BEAUTY in an unsightly board is rewarding and well worth the head-scratching it takes. In spite of serious end checks, an awkward grain pattern and a wane edge, the \$8 piece of No. 1 Common walnut shown above contains all the parts for an eye-catching cabinet door. There's straight grain for stiles and rails and a piece that, when resawn, made a great bookmatched panel. No. 1 Common boards often contain unusual grain and interesting color and figure. Because these usually occur around defects, you aren't as likely to find them in the higher (clearer) grades.

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grade you're likely to see at most lumberyards) isn't the highest grade. It's a combination of the top three grades (think *Selects and better*). To make Selects and Better, boards only need to meet the minimum requirements of Selects.

Second, boards are always graded on both faces. Here's the rub: To grade Selects, only one face of a board has to make the top grade (Firsts and Seconds; another combination). The other face only has to make No. 1 Common. That means the difference between No. 1 Common and Selects and Better is one (good) face!

(text continued on page 40)

GET MORE WOOD FOR YOUR MONEY! Depending on the species, No. 1 Common lumber typically costs 25- to 40-percent less than the next higher grade, Selects and Better. There are two reasons for this: availability and desirability. No. 1 Common boards are cheap because the raw material is plentiful. Most of the boards cut from a log contain too many natural defects to make the top grades, and boards without

defects are rare. No. 1 Common boards cost less because they contain a fair amount of unusable material. You get a price break because you have to buy up to 30 percent more to compensate for the waste. Don't worry! The math usually works out in your favor. Buying No. 1 Common is almost always cheaper.

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EXPECT LESS CLEAR LUMBER, but don't be surprised when you get more. No. 1 Common grade allows defects to occupy up to one third of the board. But like any grade, it contains boards that barely qualify (bottom) and boards that just missed being graded higher (top).

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THE NATURE OF NO. 1 COMMON LUMBER



No. 1 Common boards usually come from the interior of large logs or from small logs. The center of a log, or pith, is unusable. Boards cut near the pith contain more defects. Boards from small logs are either narrow or cut close to the pith.

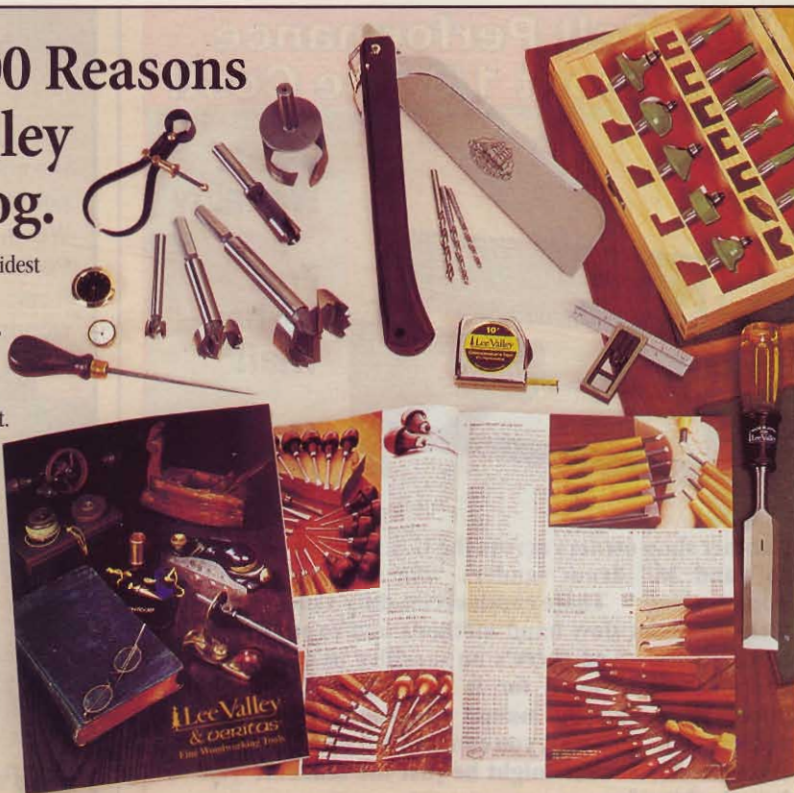
Expect to find these defects, alone or in combination, when you look at No. 1 common:

- **Knots.** The boards are likely to have several knots, clustered, loose or even open.
- **Bark.** There'll be edges containing bark (wane), including up to one third of a board's width and up to half of its length. Light-colored sapwood, typical in cherry (shown) and walnut, isn't considered a defect when grading. You'll just find more of it in No. 1 Common because of the smaller logs.
- **Bad ends.** All it takes to drop a board into No. 1 Common grade is one bad end. Long or numerous checks and clusters of knots that extend more than 12 in. are typical.
- **Warp.** The boards can be bowed, crooked, cupped or twisted, as long as the clear cuttings from them can be planed flat on two sides to the standard surfaced thickness (13/16 in. for 1-in. rough stock, for example).

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While having a good face is important, the closeness in quality between these grades, compared with the difference in price, makes No. 1 Common worth considering. Remember, just as some of those expensive Selects and Better boards are going to have one No. 1 Common side, some of the cheaper No. 1 Common boards may have one face that's a gem.

WHEN SELECTS AND BETTER IS BETTER

It makes sense to buy big, defect-free boards for big, smooth surfaces, such as table- or desktops, plank-style cabinet sides or perhaps a head- or footboard. A group of Selects and Better boards may have more consistent color and grain patterns. Defect-free boards are less distracting to look at and generally easier to work with. Working with No. 1 Common takes time and patience.

SOME NO. 1 COMMON IS VERY CLEAR, but simply short or narrow. If a board is under 6-ft. long, or less than 4-in. wide, it won't qualify for a higher grade.



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HEARTWOOD

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DARK-COLORED HEARTWOOD, typical in maple, birch and ash, isn't considered a defect unless the board is also specifically graded for light color. You'll find considerable dark-colored heartwood in No. 1 Common grades of these species, just as you'll find more light-colored sapwood in No. 1 Common cherry and walnut.

LOWER GRADING STANDARDS apply to walnut and its close cousin butternut, allowing smaller boards and more defects. And unlike other species, the best side of a walnut board is used to determine its grade. In general, grading rules are tailored to specific species. Walnut trees usually don't get to be giants, so the typical log is undersized. That fact is considered when the boards are graded.

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FIG. A Basic Grade Requirements for Hardwoods

The National Hardwood Lumber Association's grading standards are based on the assumption that every board will be cut into defect-free pieces, called "cuttings," for use as furniture components.

A board's grade depends on the number and size of the clear pieces it contains. Aesthetics aren't considered. **AW**

	Grades	Minimum Board Size	Yield	Minimum Size of Clear Pieces	Maximum Cuttings Allowed
Best	Firsts and Seconds (FAS)	6-in. wide x 8-ft. long ^Δ	83 to 100%	4-in. x 5-ft. or 3-in. x 7-ft.	4
	First One Face (F1F)	Same as FAS [†]	Each face graded separately: One face must make FAS grade. The second face grades #1C.		
	Selects (SEL)	4-in. wide x 6-ft. long			
	Selects and Better (SEL/BTR) (combines FAS, F1F and SEL)	4-in. wide x 6-ft. long	83 to 100% * 67 to 83% **	4-in. x 5-ft. or 3-in. x 7-ft. * 4-in. x 2-ft. or 3-in. x 3-ft. **	4 * 5 **
	No. 1 Common (#1C)	3-in. wide x 4-ft. long	67 to 83%	4-in. x 2-ft. or 3-in. x 3-ft.	5
Worst	No. 2 Common (#2C)	3-in. wide x 4-ft. long	50 to 67%	3-in. x 2-ft.	7
	No. 3 Common (#3C)	3-in. wide x 4-ft. long	33 to 50%	3-in. x 2-ft.	unlimited

^Δ Smaller boards allowed in some species

[†] Depends on particular species being graded

* On best face

** On worst face



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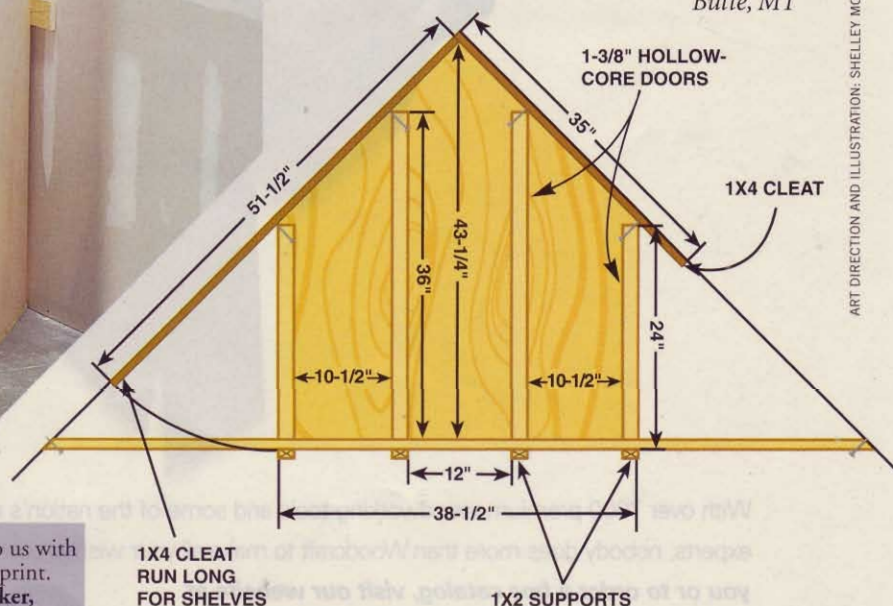
Small Shop Tips

Utilize Your Corner Space

If you use a lot of sheet stock like I do, you know what a problem storage can be. A growing colony of sheet goods, offcuts and scrap forced me to get organized and build this lumber rack. The rack makes perfect use of wasted corner space without taking up a lot of floor and wall space. The center slot can handle full sheets of plywood and the two outside slots work for partial sheets and scrap. I added shelves in one corner for general storage and left the other open for stacking lumber vertically.

Hollow-core doors make perfect dividers because they're flat, smooth and cheaper than plywood. I used two 36-in. and two 24-in. doors for my rack. If you're lucky, you can find used or damaged doors really cheap. Even with new doors, the entire rack can be built for less than \$80.

John Linden
Butte, MT



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Small Shop Tips

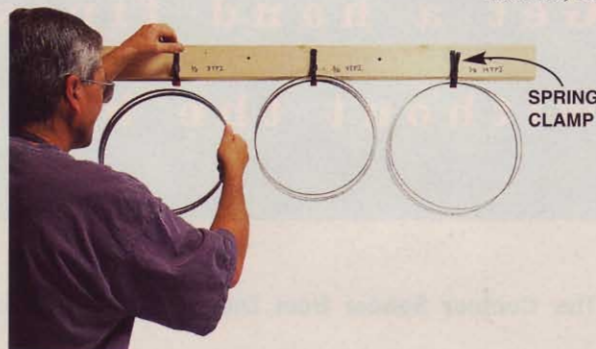


Up and Away

I've found the perfect place to store small quantities of long, narrow offcuts and moldings—right over my head! I've got open trusses in my garage shop (high ceilings in the basement work too), so I built this set of overhead storage racks. I used 2x6s for the hangers and doubled up 3/4-in. plywood for the angled supports. The angled supports keep the lumber securely in place.

Note: Trusses aren't designed to carry heavy weights on the bottom members. Use this rack only for light material.

Oliver Miller
Atlanta, GA



Spring Clamp Blade Storage

I like to keep my bandsaw blades on the wall next to my saw. To save space, I fold them into coils. The trouble comes when the coiled blade is hung on a peg or nail. I've had the blades suddenly come uncoiled and spring off the wall! That's unpleasant and potentially dangerous. I tried using twist ties, but they wore out quickly and it was a pain having to tie up and untie the blade every time I used it.

I came up with this handy hanger made with a 2x4 and some very small spring clamps. I notched the edge of the 2x4 with a dado blade and screwed a spring clamp into each notch. Now when I go to change blades, all I have to do is squeeze the spring clamp to release the blade. **AW**

Ryan Vogt
Urich, MO





Modular construction and a knockdown TV cabinet allow this home theater to be built even in a small shop.

By Dave Munkittrick

Home Theater



Once a luxury, a home theater is fast becoming a popular addition to the average home. High definition TV and surround-sound systems provide a viewing experience equal to the finest theaters. Plus, the food is a lot cheaper and the floors aren't as sticky!

At first glance, a project of this scale may seem impossible for anyone other than a professional with all the tools and plenty of room. But take a closer look. The largest of the five cabinets, the one for the TV, breaks down into seven easy-to-assemble pieces. You'll be able to get the finished product out of your basement shop with no trouble.

Beaded moldings and pilasters not only dress up the cabinet, but also hide screw holes and seams where the cabinets are joined together (Fig. H).

We'll show you how to handle the cove molding and introduce a construction technique that simplifies building large casework like this.

You can build this home theater for about \$2,000. That's less than one-third the cost of manufactured cabinets of similar quality!

The basic design is five cabinets strung together and adorned with moldings. The big TV cabinet is built in pieces and assembled in its final location.

Even so, this is not a beginner project. A familiarity with building panel doors and drawers as well as installing Euro-style hardware are a must (see For More Information, page 61). You'll need a tablesaw, router, miter saw, jigsaw, planer, drill and a brad nailer to build this project.

Installing a home theater may require hiring a pro to do the following:

- Reinstall the carpeting around the cabinet.
- Wire a dedicated 20-amp circuit.
- Move blocked air registers.

DESIGN CONSIDERATIONS

We went all out with this home theater. It's 12-ft. long with room for a 53-in. projection TV, all the electronic gear a person could wish for and tons of storage space.

The surround-sound system consists of five speakers: left and right channel speakers, a center channel speaker, a sub-woofer and two surround speakers. The speaker cabinets not only hide the speakers, but keep them up off the floor for maximum sound quality. The sub-woofer sits on the floor behind a dummy drawer bank in the storage cabinet. The sound is vented through the side of the cabinet into the lower section of the speaker cabinet.

Too Big for Your Living Room?

You can easily downsize the unit to about 7 ft. 3 in. by dropping the equipment and storage

cabinets. Your electronic gear can be kept anywhere as long as it can be wired to the infrared remote sensor in the TV cabinet (Fig. F). A closet, another wall in the room or even a different room are all possibilities. The non-directional sub-woofer can also go anywhere in the room.

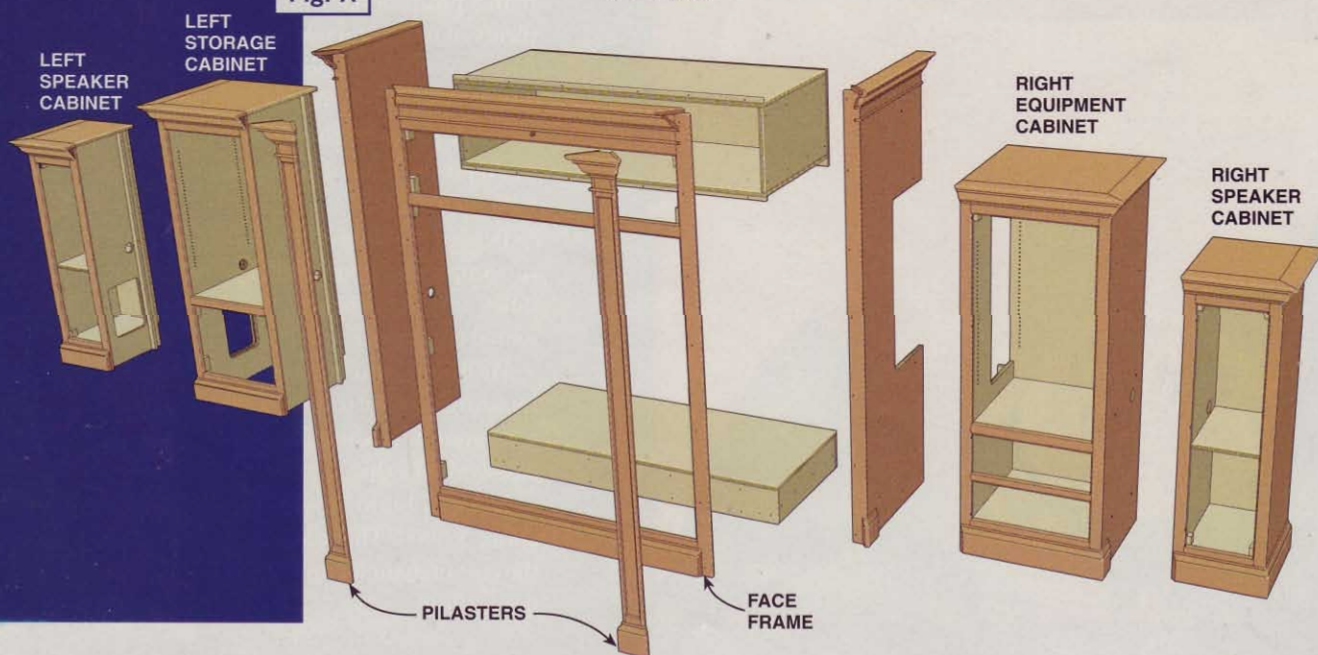
UNIQUE CONSTRUCTION

A professional builder and installer of home theaters developed the construction technique we used. Each cabinet has an inner box made from less expensive birch plywood and joined with butt joints and screws. Only the inside of the box is visible while the exposed sides are covered by an adjoining cabinet or sheathed with cherry plywood (Fig. G). The box interior is essentially flush with the face frame opening. This gives a clean look to the inside while providing an ideal surface for mounting Euro-style cup hinges and drawer slides. The face frame is wider than the inner box, so it extends beyond the sides by 1-1/16 in. One stile butts up to the side of an adjoining cabinet while the other receives a finished cherry side panel.

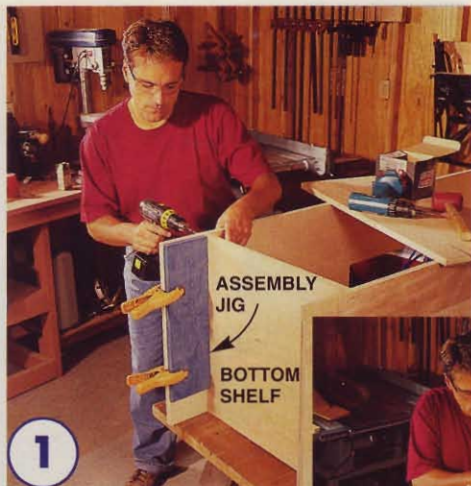
All the moldings are shop-made with the exception of the crown and base cap. If you're planning to make the home theater a built-in, consider ordering enough base and base cap to replace the existing baseboard in the room.

Fig. A

TV CABINET



Build the Cabinets



Use a 6-in. x 16-3/4-in. scrap board to set the fixed shelves in the four side cabinets. Set the bottom shelf with the jig, then turn the jig lengthwise to set the middle shelf.



Rip the beading off a wide board. Run the bead on two edges of a wide board with a router and a 3/16-in. bead cutter. Rip the bead a little thick. Run the sawn edge of the bead through a planer to the desired thickness.

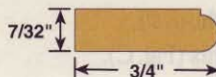
Build the Inner Boxes

1. Cut the 3/4-in. sheet stock and hardwood according to the Cutting List, page 61.
2. Assemble the birch inner boxes for the four side cabinets. (Photo 1 and Figs. B, C and D).
3. Rough-cut the sound ports in the left storage and speaker cabinets (Figs. B and C) and the wire access opening in the right equipment cabinet (Fig. C) with a jigsaw. Use the template shown in Photo 6 and a router to smooth the edges.

Add Face Frames and Side Panels

4. Build the face frames and speaker cover frames. The front edges of the speaker frames have a 1/8-in. round-over and are painted flat black before they're covered with fabric.
5. Machine the beading (Photo 2).
6. Attach face frames to the speaker and equipment boxes and nail on the beading (Photo 3).
7. Cut and rout the sound port in the cherry side panel (E1).
8. Attach spacer strips (G1 and G2) to the side panels (Photo 4).
9. Glue and clamp the front of the side panel to the face frame. Drill and countersink for

Detail:
Beading



The beading is a dual-purpose detail that runs inside all the face frame openings. It makes the cabinets look great while hiding the screw holes where one cabinet is joined to another (Photo 18 and Fig. H).



Nail on beading after clamping the face frame onto the inner box. Leave the beading loose on the stiles where the cabinet is screwed to the adjoining cabinet (Fig. H).

Build the Cabinets



4 Fasten spacer strips on the inside face of the side panel. The spacer strips shim out the side panel so it can be glued flush to the face frame.



5 Drive screws (from inside the inner box) into the spacer strip after the finish panel is glued and clamped onto the face frame.

1-1/2-in. #8 screws to attach the panel to the inner box at the back (Photo 5).

10. Attach mounting strips (G3 and G4) to the TV side of the assembled boxes (Fig. B, C and D).

11. Cut out the wire chases in the equipment cabinet shelves (Photo 6).

12. Drill out adjustable shelf-pin holes (Photo 7).

13. Make the drawers and false drawer fronts (Fig. C).

TIP: Use a 1/8-in. round-over bit to ease the edges of the wire-chase openings. This prevents any sharp edges from chafing the wire jackets.

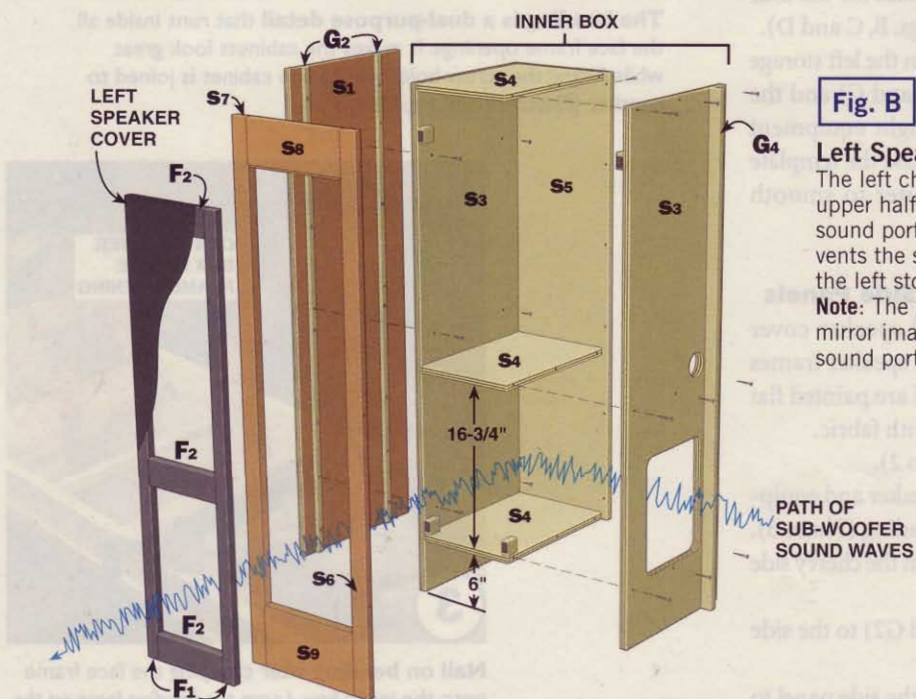


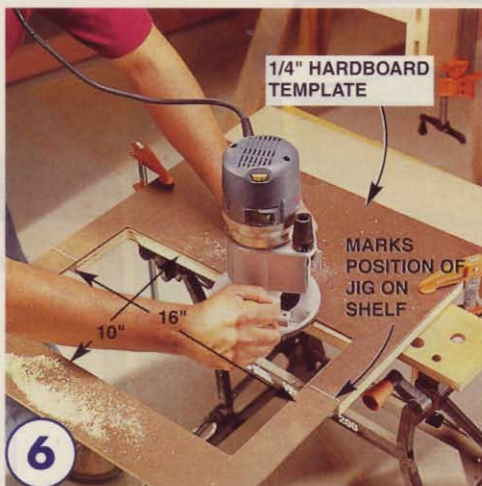
Fig. B

Left Speaker Cabinet

The left channel speaker sits in the upper half of this cabinet while the sound port cut into the bottom half vents the sub-woofer's sound from the left storage cabinet.

Note: The right speaker cabinet is a mirror image of the left, minus the sound port.

Build the Cabinets



Use a template and a flush pattern bit to put a smooth edge on the cutouts (wire chases) on the adjustable shelves in the right equipment cabinet (Fig. D) as well as the access and sound ports in the cabinet sides.



Use a template to drill holes for shelf pins. Shelf pin spacing should be $\frac{3}{4}$ in. to minimize wasted space between components. Add notches where the shelf rests on the pin to keep them from being inadvertently pulled out.

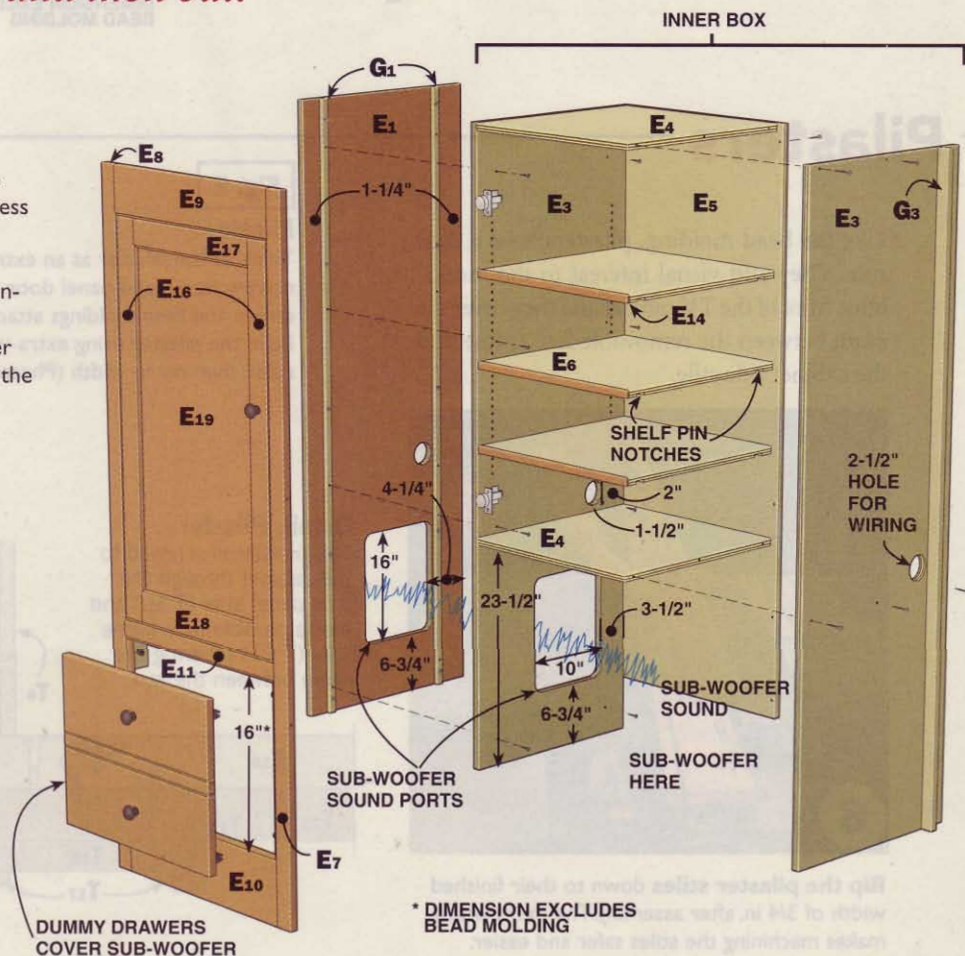
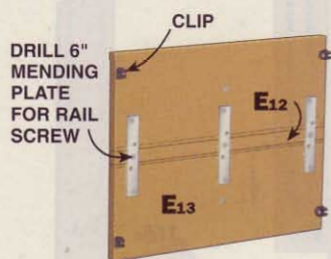
Hidden inside a cabinet, the sub-woofer's booming bass travels through openings between cabinets and then out.

Fig. C

Left Storage Cabinet

Dummy drawer fronts hide the sub-woofer. Set on the floor, the deep bass of the sub-woofer is less likely to cause vibrations in the cabinet itself. Even though the speaker is facing forward the non-directional sound is effectively delivered to the adjacent speaker cabinet by sound ports cut into the cabinet sides.

Detail: Dummy Drawer Front



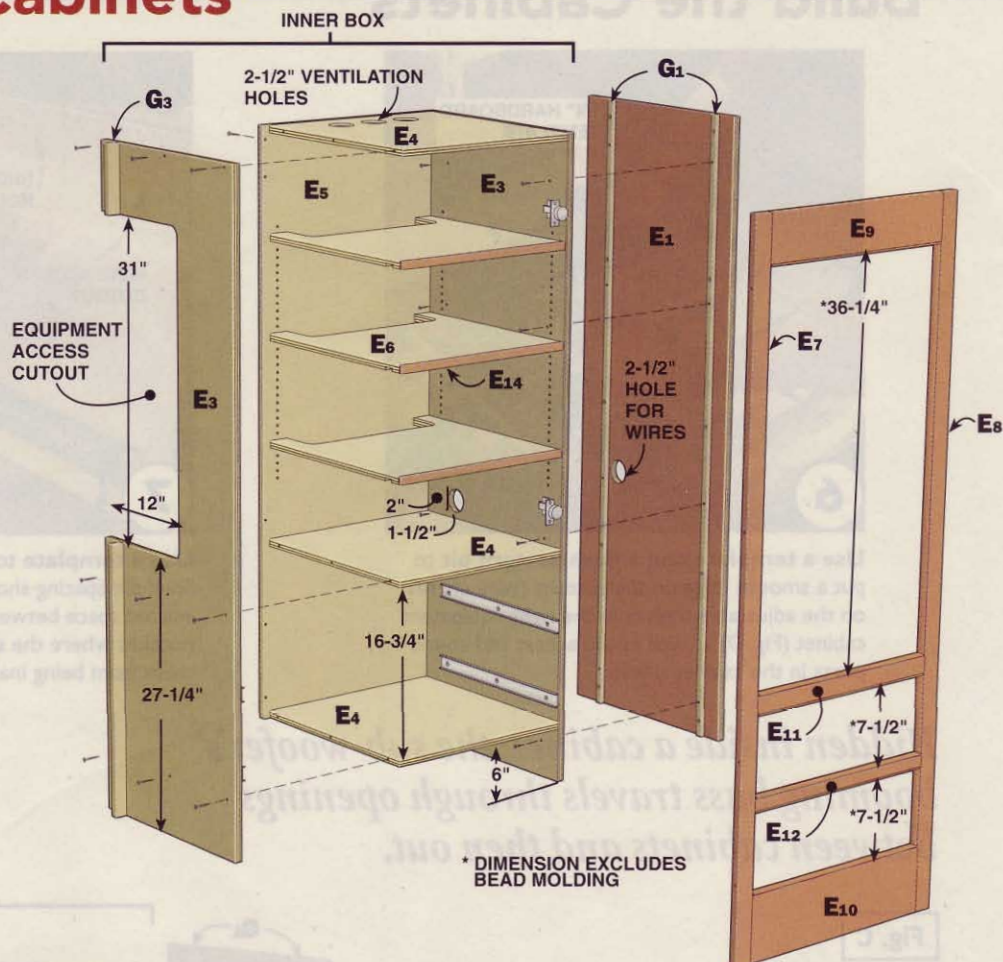
Build the Cabinets

The large cutouts provide easy access to the backs of your electronic equipment for hassle-free wiring.

Fig. D

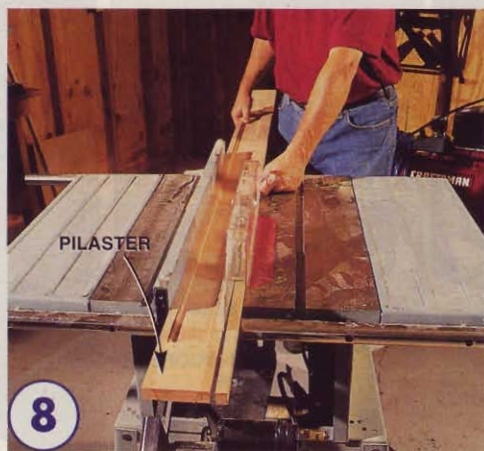
Right Equipment Cabinet

This is the cabinet that holds your electronic gear. The 3-in.-deep cutouts in back of the shelves (wire chases) allow the wires to freely run from one piece of equipment to another. The access cutout is an invaluable aid when attaching wires to the equipment backs.



Pilasters

Like the bead molding, pilasters have a dual role. They add visual interest to the monolithic front of the TV cabinet and they cover the seam between the removable face frame and the cabinet side stile.



Rip the pilaster stiles down to their finished width of 3/4 in. after assembly. The extra width makes machining the stiles safer and easier.

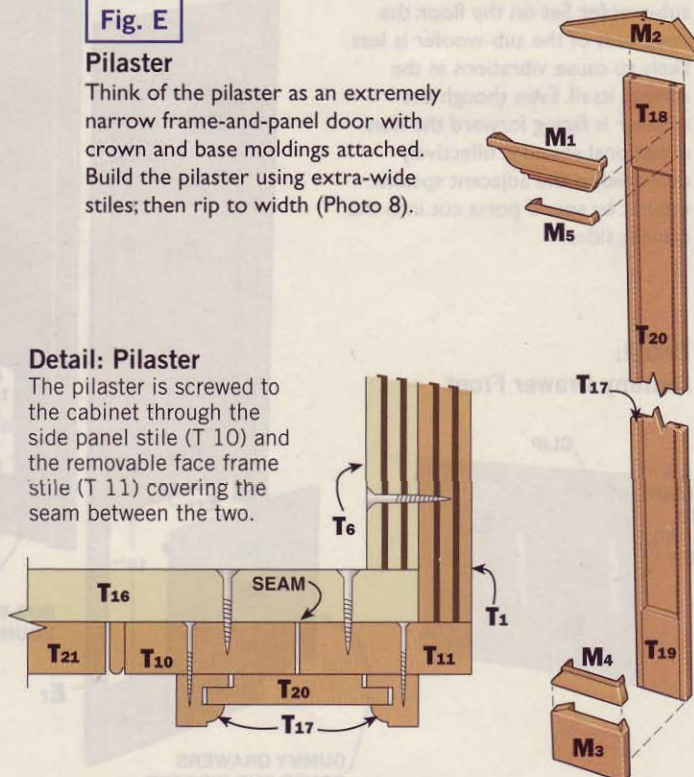
Fig. E

Pilaster

Think of the pilaster as an extremely narrow frame-and-panel door with crown and base moldings attached. Build the pilaster using extra-wide stiles; then rip to width (Photo 8).

Detail: Pilaster

The pilaster is screwed to the cabinet through the side panel stile (T 10) and the removable face frame stile (T 11) covering the seam between the two.



Build the TV Cabinet

Remember, the TV cabinet breaks down into seven pieces (Fig. H, page 62) so don't use glue where any of these pieces are joined.

1. Assemble the center channel speaker box and TV base.
2. Glue and clamp side panel stiles (T11) to their respective sides (T1) (Fig. F).
3. Cut the access port in the right-hand side panel.
4. Assemble the TV carcass on its back (Photo 9).
5. Build and attach the face frame and beading (Photo 10).
6. Build the pilasters and while you're at it, build the doors, TV bezel and dummy panel because they're all made with the same stile-and-rail cutters.
7. Attach the pilasters (Photo 11).
8. Cut and attach crown cap with screws and glue (Photo 12). Note: Take care not to use glue where the joints disassemble (Fig. H).
9. Cut and attach crown molding (see Install the Crown Molding, page 57).
10. Finish trimming the TV cabinet and drill a 1/2-in. hole in the center of the upper rail (Fig. F) for the infrared remote.
11. Disassemble the completed TV cabinet.
12. Join one pair of side cabinets to a trimmed side panel of the TV cabinet (Photo 18).
13. Drill the wire-chase holes with a 2-1/2-in. hole saw.
14. Add the tops to the two cabinets and trim.
15. Disassemble the cabinets and repeat the process on the other side.
16. Disassemble, sand and finish the cabinets. We used Cherry Watco Danish Oil and a top coat of varnish.

Tip: Build a 6-3/4-in. high, 30-in. x 66-in. assembly platform to bridge any unevenness in your floor. Even if you have a level floor, it's nice to elevate the cabinets for trim work and you'll use the platform again to get the TV into the finished cabinet (Photo 26).



9 Screw the side panels to the TV base box. Make sure the bottom edges are flush. Keep the screws back 5-in. from the front of the cabinet where the base molding will be attached. Screw the center channel speaker box to the sides from inside the box. Scraps of 1/2-in. plywood hold the interior boxes in position. Use #8 by 1-1/4-in. screws.



10 Set the face frame in the cabinet opening. Drive screws through the cleats on the center channel speaker box into the two upper rails to attach the top of the face frame and through the TV base box into the lower rail.

Build the TV Cabinet



11 Attach the pilasters with screws from the back side of the face frames (see Detail: Pilaster, page 54). A 3/4-in. spacer stick helps locate the pilaster on the stiles.



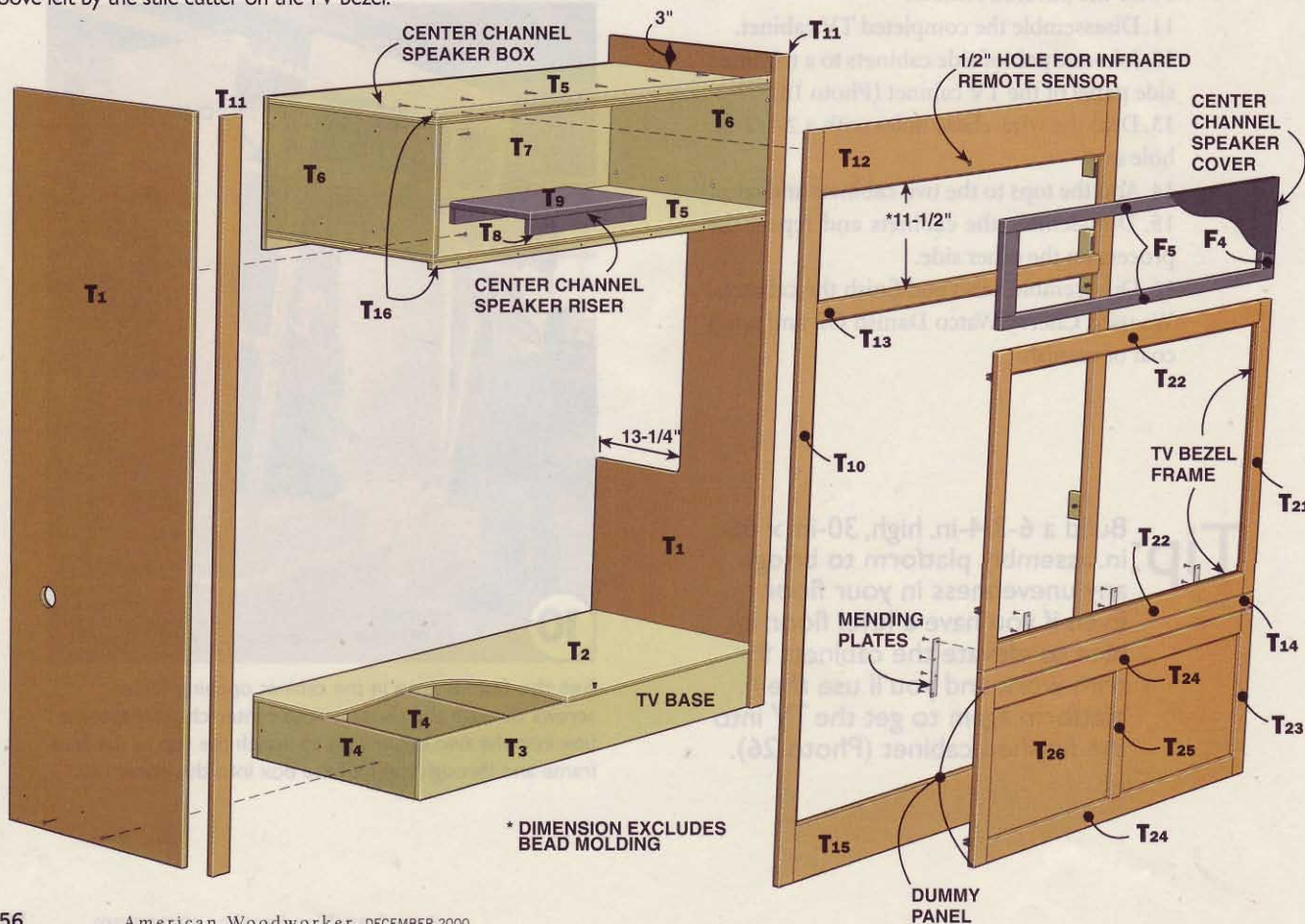
12 Attach crown cap with screws and glue. Don't glue the mitered returns on the pilasters. They need to be removable for cabinet knockdown.

Fig. F

TV Cabinet

The snap-in TV bezel and panels are built in the same way as the doors and pilasters. The mid-rail (T14) is held to the bezel and panel with mending plates to form a single, snap-in panel that leaves only the TV screen visible. Cut strips of hardwood to fill the groove left by the stile cutter on the TV bezel.

Take a couple of simple boxes, screw on sides, add a face frame and cover the seams with pilasters. Now you've got one big cabinet!



Install the Crown Molding

Compound miters and tiny returns make crown molding look hard to install. The truth is, with a utility knife and a simple shop-made auxiliary fence on a miter saw, the job is no more difficult than cutting simple miters for a picture frame.

To cut crown, it has to be held upside-down on a miter saw, which is handy because you mark the crown for cutting on the bottom edge. Think of the bed on the miter saw as the cap and the fence as the cabinet side.

For this size crown, the fence has to be taller so the

molding can "bridge" between it and the bed. To properly support the crown molding for cutting you'll need to build the simple auxiliary fence shown in Photo 13. Cut the long crown for the sides and front first. Mark, cut and fit the small pieces around the pilasters (Photo 15).

The returns are too small to nail, so glue them up by hand (Photo 16), then nail up the larger piece (Photo 17).



A shop-made auxiliary fence and bed simplifies cutting crown molding. Make the fence and bed from 1/2-in. plywood and attach it to your saw's fence. Place the molding upside-down in the saw. Check to see that the two flats on the back of the cove are tight against the base and fence. Add a 1/4-in. stop on the miter saw's bed to automatically position the crown and hold it securely in place for cutting.

Nail the crown bottom, into the cabinet side, and the top into the crown cap.



Tip: After cutting the short returns, hold the saw down until the blade stops turning or the spinning blade may catch the small piece and ruin it.



Mark your cuts with a utility knife. To safely cut the short returns around the pilasters, cut an inside miter on long stock and hold it in position on the cabinet for marking. Then, cut the short return off the long stock.

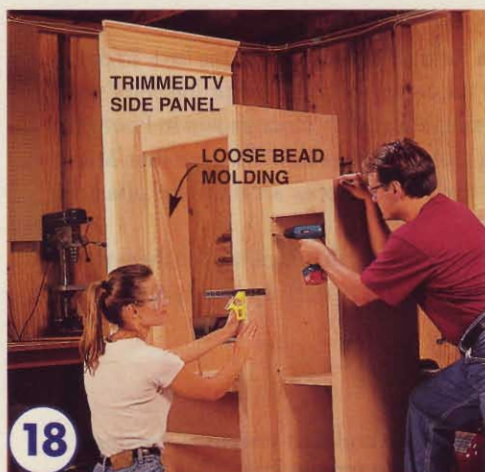


Hand pressure and a little glue are all that's needed to make a strong, tight-fitting joint where the pieces are too small to nail.



Position the glued-up pilaster crown and nail it to the pilaster and cap. Remember to leave the glue out of these two miters so the pilaster can be removed for knockdown.

Join the Boxes

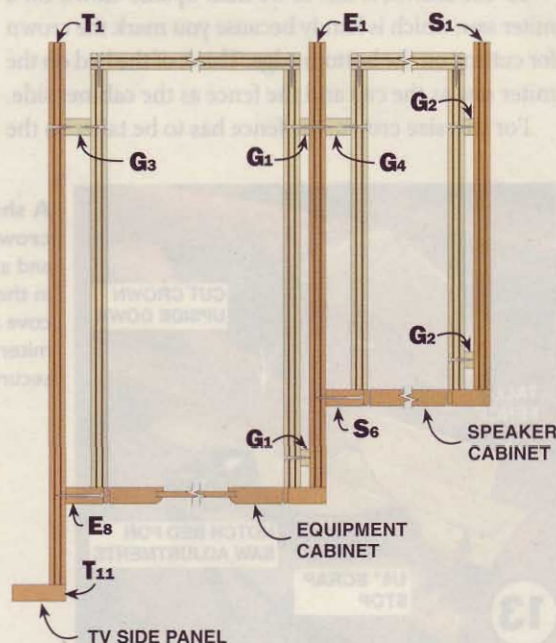


Screw together a side cabinet assembly using the already trimmed side panel of the TV cabinet as a starting point. (The loose bead molding will be used to cover the holes in the face frame after final installation). Trim the cabinets, with the moldings, being sure not to glue the joints where the cabinets break apart.

Fig. G

Plan View of Side Cabinet Assembly

Join the cabinets with screws through the face frame and at the back through the mounting strip.



Oops!

Rats, I sanded right through the veneer! Sanding hardwood flush with veneer can be tricky, especially if you use a belt sander. A little too much time in one spot or even the slightest tip of the sander and you're through the veneer. If this happens to you, don't panic. Your project is not sunk and here's a trick that'll bail you out: Rout a shallow groove to remove the sand-through (top photo, at right). Then find a piece of hardwood with *edge grain* that's similar in color and grain to the veneer. Run the board through the planer until the thickness equals the width of the dado. Rip a 1/16-in.-thick strip off the edge of the board and glue it into the dado for an almost invisible repair. There, you're back in business.

Avoid the problem in the future by marking the veneer with pencil. When the pencil marks begin to disappear you know you're getting close and it's time to hand sand the rest of the way.

Rout a 1/16-in.-deep groove using a straightedge and a cutter of sufficient diameter to remove the sand-through.



Glue a 1/16-in. strip of hardwood into the groove to complete the repair.



Installation

If your room is carpeted, roll back the carpet and pad so the cabinet can be installed on a solid surface. Remove the baseboard from the wall and reassemble the TV cabinet in the room. Lay out the stud locations and mark where the cabinet is to be centered on the wall (Photo 22). Level and mount the TV cabinet to the wall (Photo 23). (For more on installing cabinets see

AW # 78, February '00, page 56). Install the remaining cabinets and anchor them to the wall. Reinstall the baseboard and base cap in the room.

OK, now the fun really begins—installing the electronics. You'll feel like a kid on Christmas morning unpacking all the equipment. Take your time and read the directions! They'll save you headaches later on.

Reassemble the Finished TV Cabinet



19

Screw the finished sides onto the two inner boxes to reassemble the TV cabinet.



20

Drop the face frame into place and secure with screws.



21

Add the pilasters and you're done!



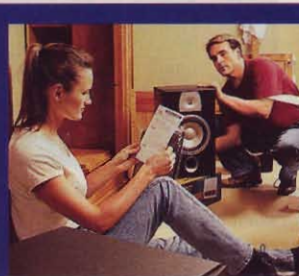
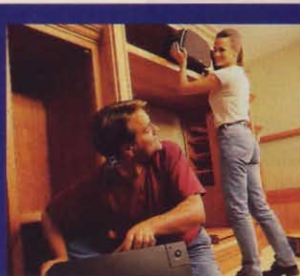
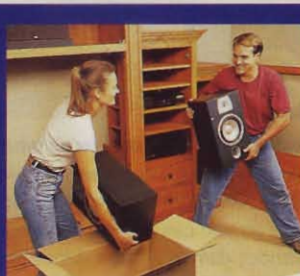
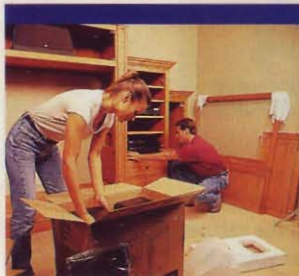
22

Use masking tape to mark the stud locations on your wall. (Use an electronic stud finder to locate the studs.) Mark the tape where you want the cabinets centered (red tape).



23

Level the TV cabinet with shims and fasten to the wall through the 3/4-in. back.



It's best to consult your electronics supplier for specifics regarding the wiring of your particular system. But, here are some tips to help prevent wire-management headaches.

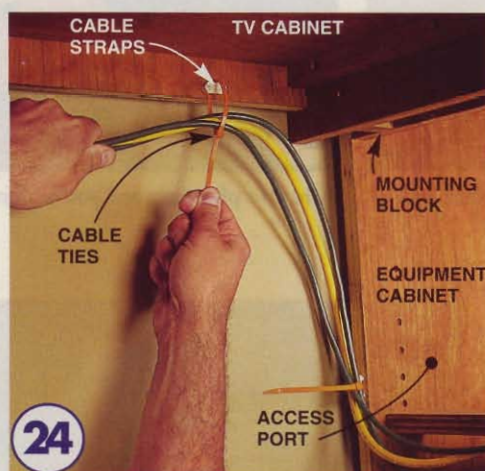
1. Start by fishing the loose wires through the cabinet's wire chases. Leave the wires a little long, you can always trim them later.
2. Use common electric-cable straps and cable ties to support the loose wire bundles that run behind the TV (Photo 25).
3. Label both ends of each wire for easy identification (Photo 24).

Install the speakers and the electronic equipment in their respective places. (Remove the speaker

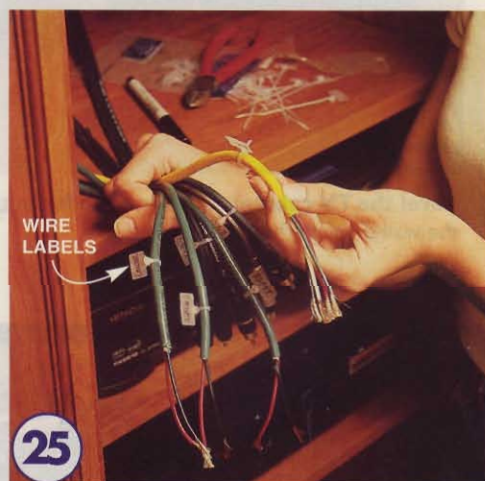
covers that come with the speakers.) Give some consideration to the order in which you stack your electronic equipment:

- The receiver is the biggest heat generator and should go on top.
- The VCR should be easy to reach.
- The DVD player should be positioned so you can look down into the tray when loading.

Man, all that equipment's in place and ready to be hooked up. Now it's time to bring in the main attraction; that giant TV! But first, run back to the shop and get that platform you built for assembling the cabinets. Place it in front of the TV cabinet and add a couple of 3/4-in. skids that run from the platform and butt into the front edge of the TV base. Set the TV on the skids but leave enough room to get behind the TV to attach wires. Once the wiring is complete, the TV can be rolled into the cabinet (Photo 26). Put up the speaker covers and snap in the TV frame and dummy drawer panel and you're ready to go. Now, you just have to figure out how to program that VCR!



24 Tie down the loose-wire jungle at the back of the TV cabinet with cable straps and ties.



25 Label both ends of each wire with tags available from home centers and electronics retailers.

Tip: Use cable straps and cable ties to tame the wire jungle.



26 Roll the TV home. Here's where your construction platform earns its keep a second time. The 3/4-in. skids bridge your platform to the TV base so you can roll the behemoth into the cabinet without damaging the cabinet, the TV or yourself!

What You'll Need

CUTTING LIST

Overall Dimensions: 80" H x 145-1/2" W x 31" D

3/4" Birch Plywood, except where noted.

TV Cabinets (A): 3/4"

T1 Side Panels	2	26-1/4" x 79-1/4"
cherry ply		
T2 TV Base Top	1	25-3/4" x 61-3/4"
T3 TV Base Front		
and Back	2	6-5/8" x 61-3/4"
T4 TV Base Ribs & Sides	5	6-5/8" x 24-1/4"
T5 CCHS* Top		
and Bottom	2	25" x 61-3/4"
T6 CCHS* Sides	2	25" x 14-1/2"
T7 Back	1	17-1/4" x 61-3/4"
T8 CCHS* Riser	2	1-3/4" x 21"
paint flat black		
T9 CCHS* Riser Top	1	12" x 21"
paint flat black		

Equipment/Storage Cabinets (B)

E1 Side panels	2	21-3/4" x 64"
cherry ply		
E2 Roofs	2	23-1/2" x 25"
cherry ply		
E3 Box Sides	4	20-1/2" x 64"
E4 Fixed Shelves	5	20-1/2" x 20-1/8"
E5 Back	1	21-1/2" x 58-3/4"
E6 Adj. Shelves	8	20" x 20"

Speaker Cabinets (C)

S1 Side Panels	2	17-1/4" x 52"
cherry ply		
S2 Roofs	2	19" x 15-1/2"
cherry ply		
S3 Box sides	4	16" x 52"
S4 Fixed Shelves	6	16" x 10-5/8"
S5 Backs	2	12" x 46-3/4"

1/2" Baltic Birch Ply

Drawers

D1 Fronts	2	5-3/4" x 18-1/8"
D2 Backs	2	5" x 18-1/8"
D3 Sides	4	5-3/4" x 18"

1/4" MDF Cherry

D4 Bottom	2	18-1/2" x 17-3/4"
E19 Door Panels	2	15-7/8" x 31"
T26 Dummy Panels	2	23-3/8" x 14-5/8"

3/4" Cherry Hardwood

TV Cabinet (A)

T10 Stiles	2	2-1/2" x 79-1/4"
T11 Side Panel Stiles°	2	2-9/16" x 79-1/4"
T12 Top Rail	1	6-1/2" x 53-1/4"
T13 Mid Rail	1	1-3/4" x 53-1/4"
T14 Mid Rail	1	1-1/2" x 53-1/4"
T15 Bottom Rail	1	6-3/4" x 53-1/4"

Pilaster

T17 Stiles	4	1-3/4" x 79-1/4"
T18 Top Rails	2	5-3/4" x 2-5/8"
T19 Bottom Rails	2	6-3/4" x 2-5/8"
T20 Panels	2	1/2" x 2-5/8" x 68-1/8"

TV Bezel Frame†

T21 Stiles	2	2-1/2" x 32-3/8"
T22 Rails	2	2-9/16" x 48-3/8"

Dummy Panel†

T23 Stiles	2	2-1/2" x 18-3/4"
T24 Rails	2	2-1/2" x 48-3/8"
T25 Mullion	1	2-1/2" x 14-3/8"

Equipment Cabinets (B)

E7 Stiles	2	1-3/4" x 64"
E8 Side Panel Stiles°	2	1-13/16" x 64"
E9 Top Rails	2	4-1/4" x 20-1/2"
E10 Bottom Rails	2	6-3/4" x 20-1/2"
E11 Mid Rails	2	1" x 20-1/2"
E12 Lower Mid Rails	2	1" x 20-1/2"
E13 Drawer Fronts	4	7" x 20"
E14 Shelf Banding	8	3/8" x 20"
E15 Roof Trim		1-1/2" x 60"

Doors

E16 Stiles	4	2-1/2" x 35-3/4"
E17 Top Rails	2	2-1/2" x 15-5/8"
E18 Bottom Rails	2	3" x 15-5/8"

Speaker Cabinets (C)

S6 Stiles	2	1-3/4" x 52"
S7 Side Panel Stiles°	2	1-13/16" x 52"
S8 Top Rails	2	4-1/4" x 11"
S9 Bottom Rails	2	6-3/4" x 11"
S10 Roof Trim		1-1/2" x 40"

Applied Moldings (E): Add 30 percent for waste.

M1 Crown	26'	5/8" x 3-1/4"
M2 Crown cap	11'	3/4" x 3-3/8"
M3 Base	18'	5/8" x 3-5/8"
M4 Base Cap	18'	1-1/16" x 1-3/8"
M5 Astragal	9'	1/2" x 3/8"
M6 Bead	95'	7/32" x 3/4"

Secondary Wood

Speaker Cover Frames

F1 Stiles	4	1-1/2" x 52-5/8"
F2 Rails	6	1-1/2" x 8"
F4 Stiles	2	1-1/2" x 8"
F5 Rails	2	1-1/2" x 52-5/8"

Spacer Mounting Strips and Cleats

T16 Cleats	2	3/4" x 61-3/4"
G1 Spacer Strips	4	1/2" x 3/4" x 64"
G2 Spacer Strips	4	1/2" x 3/4" x 52"
G3 Mounting Strips	2	3/4" x 1-1/4" x 64"
G4 Mounting Strips	2	3/4" x 1-1/4" x 52"

* CCHS = Center Channel Speaker Box

† TV bezel and dummy panels need to be dimensioned for your TV.

° 1/16" overhang for positioning on side panel.

HARDWARE LIST

Woodworker's Hardware (800) 383-0130

Hinges	4	Blum BO75M565	\$2.30 ea.
Hinge Base Plates	4	Blum B175H719	\$1.55 ea.
Bumpers	8	LA4715	\$5 for 108
Drawer Slides	2	KV8405 B18 EB	\$11 ea.
Panel Connectors	11	SYK6100S	\$0.71 ea.
Ventilation			
Grommets	3	HCI6435 014 BLK	\$4 ea.

Rockler Hardware (800) 279-4441

1-1/4" Oil Rubbed Bronze Knobs			
	6	43063	\$7 ea.
Micro Link System	1	90036	\$150
Dual Emitters	2	90041	\$20
Speaker Cloth	2	17899	\$60

Eagle America (800) 872-2511

3/16" Square Edge Beading			
163-0302	1/4" shank or		\$27
163-0305	1/2" shank		\$28
3/8" Edge Beading			
163-0602	1/4" shank or		\$33
163-0605	1/2" shank		\$34
3/4" Round-over			
156-1205	1/2" shank		\$48
1/8" Round-over			
156-0202	1/4" shank or		\$21
156-0205	1/2" shank		\$25
Flush-Trim Pattern Bit			
104-0832P	1/4" shank		\$60

Wall Lumber Company (800) 633-4062

4/4 Cherry			
S3S-25/32"	70 bd. ft.		\$4.50/bd. ft.
3/4" Birch ply	7		\$48/sheet
3/4" Cherry Ply	3		\$71/sheet
1/2" Baltic Birch Ply	1		\$28/sheet
1/4" Cherry			
MDF Core	1		\$49/sheet

Hyde Park Lumber (513) 271-1500

Crown Molding	40 ft.		\$5/bd. ft.
Base Cap (optional)	24 ft.		\$2/bd. ft.

For More Information

"Installing Cabinetry and Shelving Like a Pro," AWW #78, February 2000, page 56.

"Stile and Rail Joinery," AWW #78, February 2000, page 72.

"European Hinges," AWW #82, October 2000, page 64.



Exploded View

Fig. H

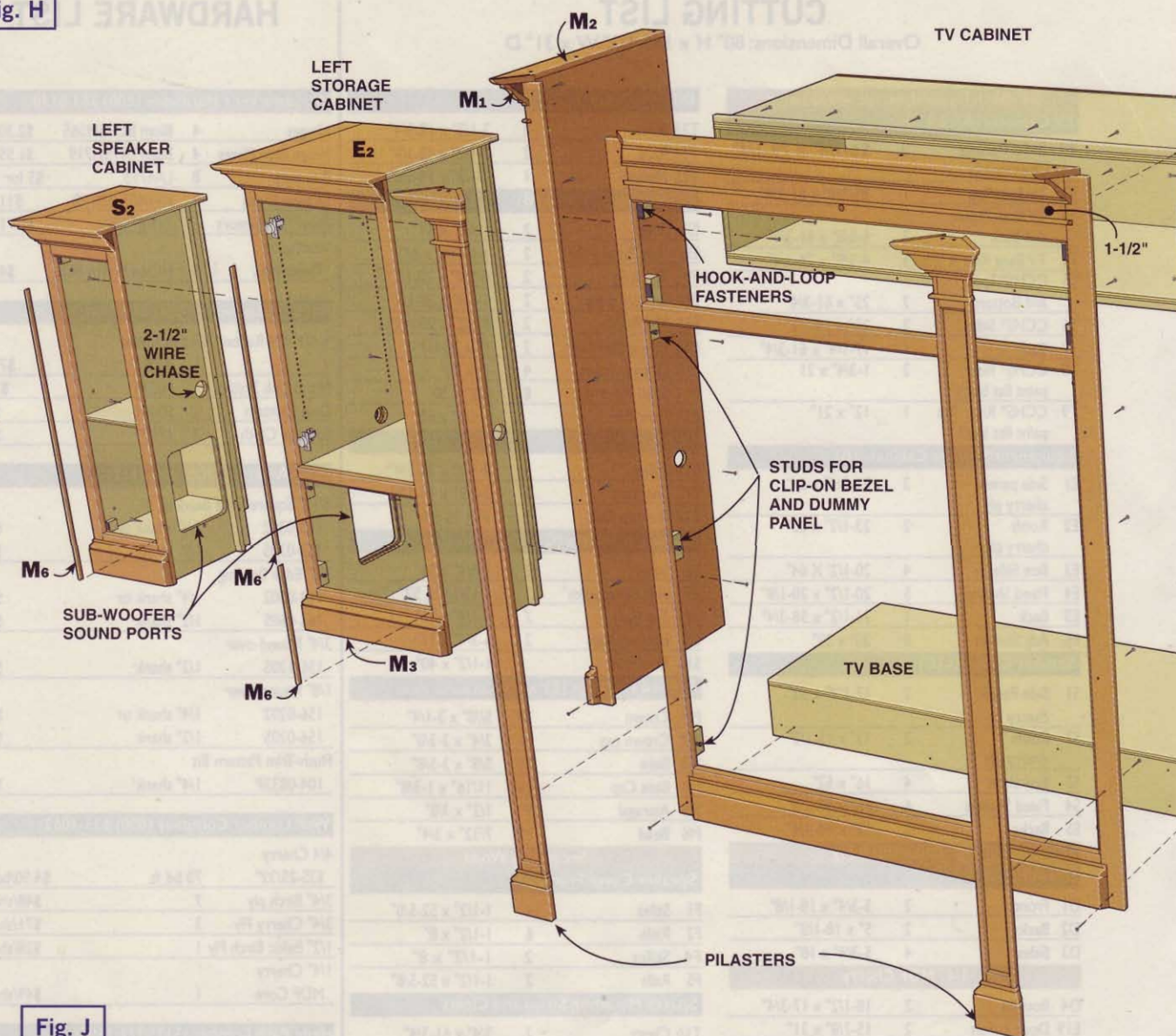
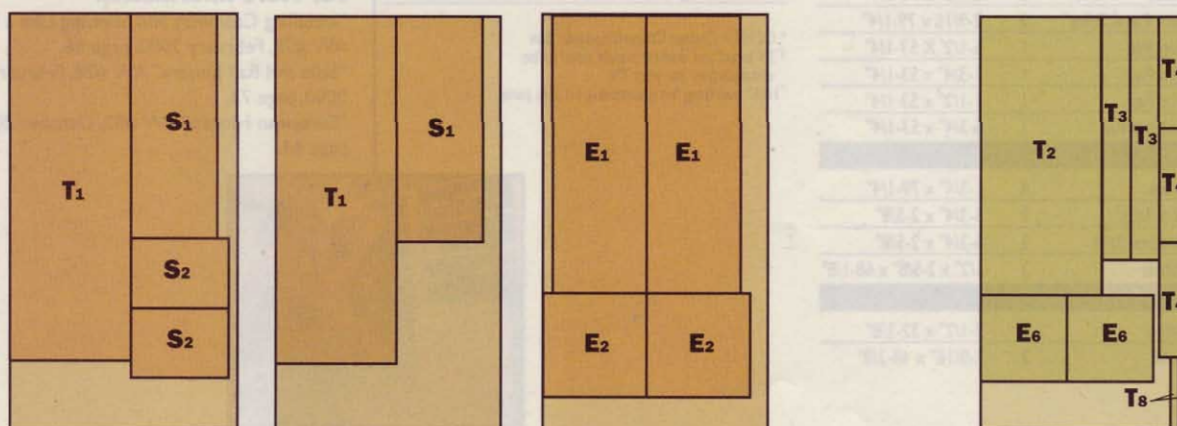


Fig. J

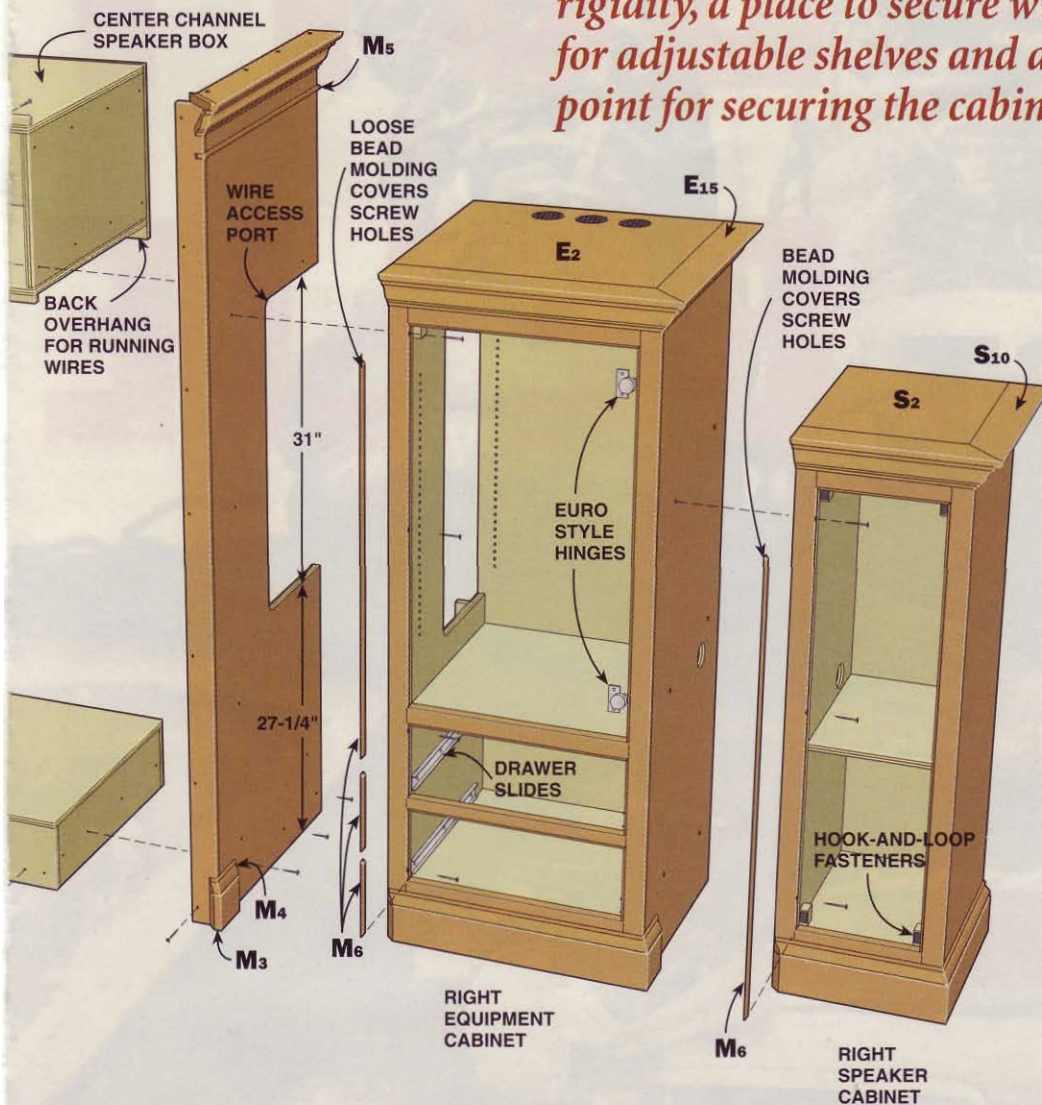
Plywood Cutting Diagrams

Cherry Plywood

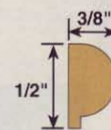


Exploded View

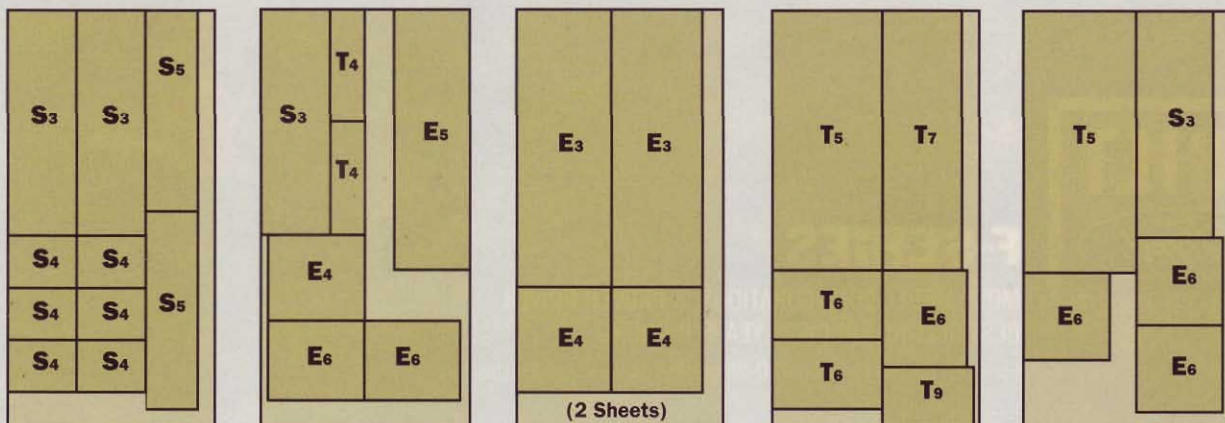
We used 3/4-in. plywood for the backs. It provides rigidity, a place to secure wire hangers, support for adjustable shelves and a strong attachment point for securing the cabinets to the wall.



Detail:
Astragal



Birch Plywood



Dovetail



By Bruce Kieffer and Tom Caspar

If you ever face the task of making an entire set of kitchen drawers, think dovetail jig. Armed solely with a router, you can use a simple half-blind dovetail jig to bang out those drawers in an afternoon. Speed and convenience; that's what dovetail jigs have to offer.

Basic dovetail jigs are only used for making half-blind dovetails (Photo 2). We've taken a close look at all the half-blind dovetail jigs on the market and rated their features. If you simply want to make drawers, this basic jig is the way to go.

If you want to go beyond drawers and into case joinery, there are other dovetail jigs to consider. These jigs fall into two classes: those that cut through dovetails only and combination machines that cut both through and half-blind joints. The basic half-blind only jigs are all very similar, but the rest have many differences. Rather than pick an Editors' Choice and Best Buy among these, we've summarized the strong and weak points of each jig.

ART DIRECTION: JOEL SPIES, DAVID FARR AND
MELANIE HAUBRICH • PHOTOGRAPHY: MIKE KRIVIT

Jigs

Three types of jigs to make you a more versatile woodworker.

Half-Blind Dovetail Jigs



Easy to set up, simple to use; half-blind jigs are workhorses in many shops. They're most commonly used for making drawers, but you can build many kinds of boxes and even do some casework with them (see Shaker Sewing Cabinet, page 82). With a router

adjusted and ready to go, it takes only a few minutes to cut all the dovetails for a drawer.

All the half-blind jigs are based on the same idea. One bit cuts both pins and tails on two boards in a single operation (Photo 1). Fold the two boards together and you've got an extremely strong joint with plenty of surface area for glue (Photo 2). With this kind of jig, the pins and tails are exactly the same size. You can't vary their spacing. Accessories for most jigs include templates for smaller dovetails and templates for box joints.

All the half-blind jigs have a 12-in.-wide maximum capacity. The jigs' basic features are quite similar. Flush, overlay and lipped drawers are fairly easy to turn out no matter which jig you buy.

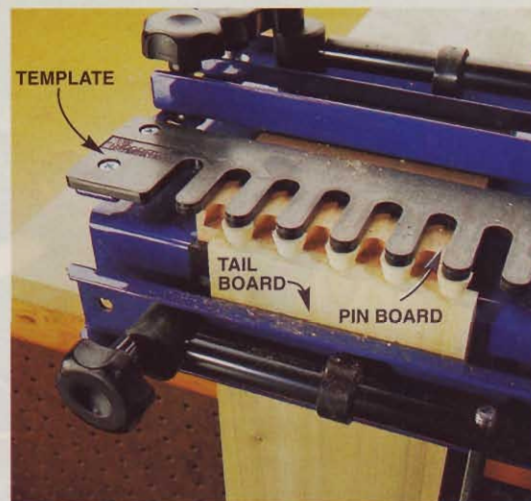
Tools Required

To cut dovetails with any jig, you'll need a fixed-base router. A 1-1/2-hp router is the perfect size for good control on top of the jig's template. It also has plenty of power for removing the waste all in one shot. The fit of the dovetails made with a half-blind jig depends on a fine adjustment of the router. The best routers for this job are those whose depth-of-cut can be smoothly adjusted in small increments.

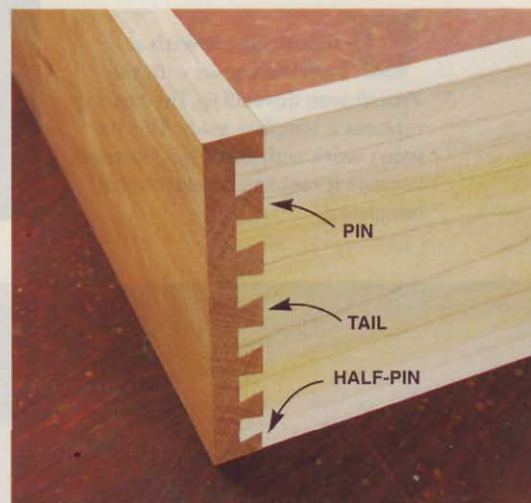
You can use a plunge router with a half-blind jig in a pinch, as long as you lock down the motor so it can't possibly pop up when you're cutting the dovetails. Not only would your joint be ruined if it did pop up, but quite possibly the template as well.

Regardless of the type of router you use, most jigs require a template guide that fits into the openings of the template (Photo 3). Each jig requires a different-sized guide (see Chart, page 70). The dovetails won't fit if you use the wrong guide! However, the Woodhaven jig doesn't require a guide at all, but comes with a special bit with a bearing (Photo 4). This could be a godsend if you have an older router and can't find template guides for it.

No half-blind jig is ready to cut dovetails right out of the box. You'll have to spend some time putting the jig together and calibrating it, which requires a number of test cuts with your router.



1 Cut both pins and tails in one pass on a half-blind dovetail jig, such as the Woodstock, shown here. Guided by the template, your router makes equally spaced dovetails.



2 Half-blind dovetails make an incredibly strong joint. They're particularly suited for drawers: you can't pull dovetails apart by yanking on a drawer front. Half-blind dovetails are only visible from one side of a corner: you can't see them from the front (that's why they're called "half-blind").

Half-Blind Dovetail Jigs

FEATURES



3 You'll need a specific-diameter guide to follow the template of a half-blind dovetail jig (see Chart, page 70). Woodworking catalogs offer template guides for most fixed-base routers, but you may have to special-order yours from a dealer.

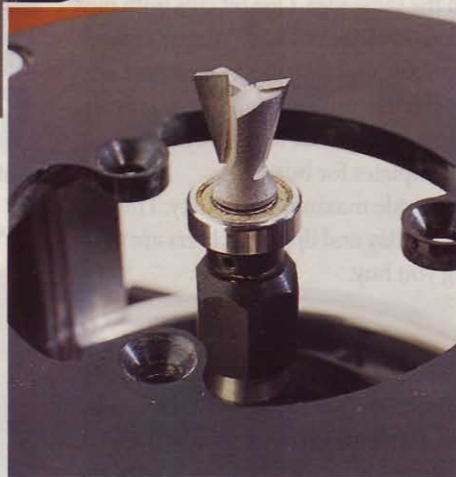


You'll get good results with every jig once it's properly set up, but some jigs are more user-friendly than others.

Here are the features that matter most:

RIGID TEMPLATE

It's easier to align the pin and tail boards under a rigid template than a slightly flexible one (Photo 5). When you insert the boards in the jig, you've got to make sure their tops are flush before you clamp them in their final position. With a template that flexes, you must use your finger to feel when the boards are flush. It can take a couple of tries. A rigid template sits tight on the horizontal pin board. To flush up the vertical tail board, simply butt it up to the bottom of the template. Double-check with your finger for a flush fit. It's usually right on the money.



4 A special bit with a bearing comes with the Woodhaven dovetail jig. The bearing replaces a template guide. This bit won't work with other jigs, however, because it requires an extra-thick template.

ADJUSTABLE BOARD CLAMPS

Once the boards are properly aligned in the jig, you have to be able to count on them staying in place. That's the role of the board clamps. Although the clamps on all the jigs are acceptable, we especially liked those that could be snugged up right to the side of a board (Photo 6).

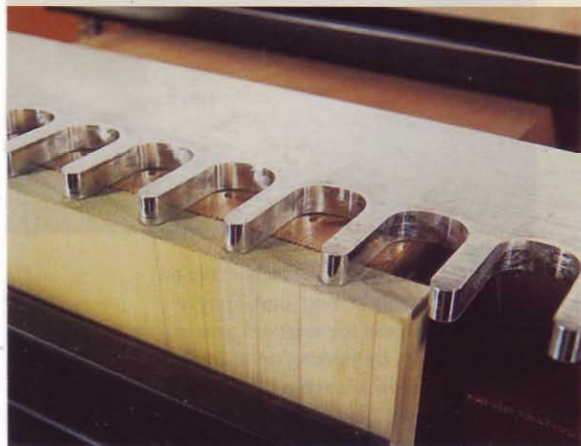
COMFORTABLE HANDLES

You'll appreciate large-diameter handles on the board clamps after tightening and loosening them a dozen times!

ADJUSTABLE STOPS

A jig's stops position your boards under the template. Three characteristics distinguish them. First, most jigs have stops with built-in offsets for switching between flush or rabbeted joints (C in the Chart, page 70). Second, most stops

5 A rigid template makes it easier to align the pin and tail boards. You're more likely to get consistently accurate results with a rigid template (such as the Hart, shown here) than with one that bends slightly.



can also be adjusted sideways, allowing you to fine-tune the width of the lowest dovetail in a drawer, called the half-pin (Photo 7 and D in the Chart). Lastly, for those stops that require adjusting, easy accessibility is a plus (E in the Chart, page 70).

DOUBLE-SIDED TEMPLATE

All jigs have optional templates for cutting different-sized dovetails or box joints, but two jigs are equipped with double-sided templates with two rows of fingers (Photo 8). With the Craftsman you can make standard 1/2-in. and 1/4-in. dovetails (although you'll need another bit and template guide for the smaller ones). With the Woodhaven you can make 1/2-in. dovetails and wider 3/4-in. dovetails using the same bit.

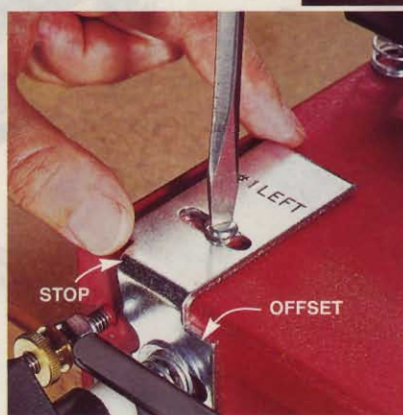
The Bottom Line

Once we got the hang of using it, every jig we tested turned out fairly good joints, so you really can't go wrong with any of these jigs. However, jigs with the best features listed above generally produce more consistent results and make life in the shop more pleasant.

6 Adjustable board clamps

on the Woodhaven jig ensure that your work won't slip while you're cutting. The clamps slide back and forth to deliver even pressure on both wide and narrow boards.

Large knobs on the clamps are easy to grip and tighten. They're an important feature if you've got lots of boards to cut.



7

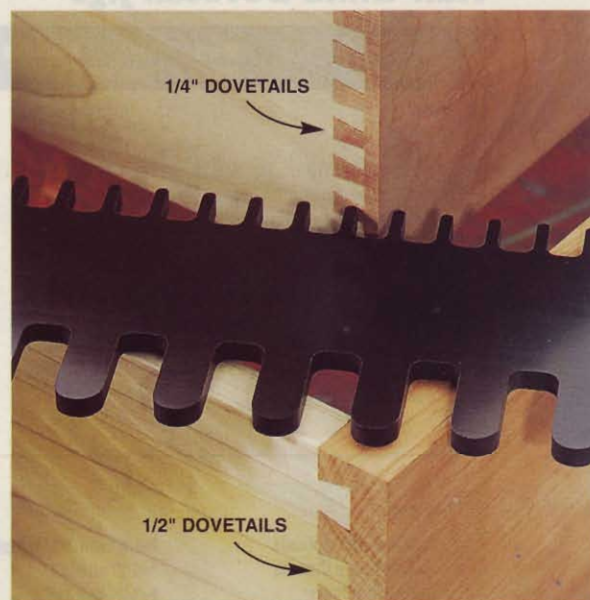
Adjustable stops allow you to fine-tune the width of the half-pin at the bottom of a dovetail joint. The stops on the Porter-Cable jig shown here are easily accessible.

You Also Should Know About...

ROUTER-TABLE BASED JIGS. You can make a bazillion dovetail variations with the **Inkra Jig Ultra** (972-418-4811 or www.inkra.com; 16-in., \$200; 24-in. \$240) or the **Jointech** (800-619-1288, www.jointech.com; 12-in. \$320; 18-in. \$350). These jigs are sophisticated fences for your router table. Versatility comes at the price of being quite complicated. These jigs aren't for the faint of heart.

A TEMPLATE-MAKING JIG. In theory you can make your own templates and complete dovetail jig with the **DoveTail TemplateMaster** (fax 502-244-6047, www.stots.com; \$40), but in practice we found it difficult to pull off.

A NEW MINI-JIG. Too new to test, the **Katie Jig, Jr.** (Hampton House, 317-881-8601, www.katiejig.com; \$230) is a baby sister to the Katie Jig (page 71). It cuts variable-spaced through-dovetails in 3/16-in. to 1/2-in.-thick wood; perfect for small boxes and pigeonhole-sized drawers.



8

Make two sizes of dovetails with a double-sided template. All the jigs offer a smaller template as an accessory, but it's standard equipment on the Craftsman shown here.

Half-blind Dovetail Jigs

BEST BUY

The red jig. Porter-Cable and Hart Design make very similar solidly built jigs. You can pick one up for about \$100, including a bit and template guide. Without these accessories, the jig sells for as little as \$80.



EDITORS' CHOICE

The Woodhaven has all the best features in a well-designed package. It's got adjustable clamps, large knobs, a universal bit and a rigid, double-sided template.



Half-Blind Dovetail Jigs

Model	Street Price	Rigid Template	Knobs and Clamps	Stops	Double Template	Accessories	Specs	Source	
							THICKNESS CAPACITY	TEMPLATE GUIDE O.D.	
Porter-Cable 4112 and Hart Design	\$80 to \$100	Yes	A	C,D,E	No	F,G	7/16" to 1"	5/8"	Delta (800) 438-2486 Hart Design (800) 345-2396
Sears Craftsman 315.25790	\$60	No		C,E	Yes*		1/2" to 3/4"	5/16" and 7/16†	Sears (800) 377-7414
Woodhaven 775	\$170	Yes	A,B	C,D,E	Yes#	G, J	3/8" to 1"	N.A.	Woodhaven, Inc. (800) 344-6657
Woodstock International W1099 and Reliant NN825	\$50	No	A	D	No	F,G,H	5/16" to 1-1/4"	7/16"	Grizzly Industrial (800) 523-4777/ Trend-Lines (800) 767-9999

KEY

A=Comfortable Knobs
B=Adjustable Clamps
C=Preset Offsets
D=Adjustable
E=Accessible
F=1/4" Template
G=Box-Joint Template
H=7/16" and 9/16" Template

J=1/4" and 3/8" template
*=1/2" and 1/4"
#=1/2" and 3/4"
†=Both included with jig, for Craftsman router only

Identifying Jigs in a Catalog

Jigs by Porter-Cable and Hart Design appear to differ in only one detail: a minor difference in the size of the dovetails they make. Some woodworking catalogs show an unidentified red jig with an aluminum template. Chances are, it's a Hart Design.

Jigs by Woodstock and Reliant are also very similar. If you see an unlabeled blue jig that has cam-action clamps in a catalog, it's probably one of these.



Through Dovetail Jigs

Reviewing the through and combination jigs (see next page) is like comparing apples to oranges. We can't recommend one jig over another. Here's a summary of their strengths and weaknesses.



KELLER DOVETAIL JIGS \$150 and up

Keller makes four jigs for quickly making through-dovetail joints only. The size and spacing of the dovetails is determined by each jig's template. It's possible to make variable-spaced dovetails by manually shifting the jig on your work.

It's easy to make dovetails that fit fairly tight, because the *template* does it for you. Unlike a half-blind jig, the fit is not determined by micro-adjusting the router's depth of cut.

Pictured above is the 1500 Journeyman, \$150. Its template is made of phenolic plastic. The three other Keller jigs are aluminum and come in pairs, one template for pins and one for tails. The smallest aluminum jig cuts the same size dovetails as the Journeyman. The other jigs cut progressively wider dovetails. Each model comes with two special router bits with bearings. Optional bits for thin wood are available.

Pro: Keller jigs are user friendly.

Con: It's awkward to alter the dovetail spacing. (See Chart, page 73 for specs.)



THE KATIE JIGS \$270 and up

Here are two through-dovetail-only jigs with a twist: you can shift their guide forks and change the space between dovetails.

Katie jigs make looser-fitting dovetails than the Keller's, on purpose. They're easier to glue up. Katie recommends using polyurethane glue, which they claim tolerates a thicker glue line than yellow glue. You can make thinner backer boards for tighter-fitting dovetails.

You'll need to replace the backer boards as they wear out. The boards' thickness is critical, so you have to plane them yourself or buy them from the manufacturer (\$9 each).

You get two bits with 3/8-in. shanks (less vibration than with 1/4-in. shank bits). They come with an adapter for a 1/2-in. collet. The length of the bits makes them best suited for 3/4 in. and thicker wood. With thinner wood you end up with dovetails that are too long and must be planed or sanded flush after glue up.

Pro: Katie jigs make variable-spaced through dovetails.

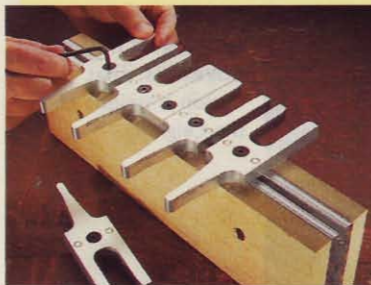
Con: For wide stock you must shift the jig, buy more forks and spacers or double up two jigs. (See Chart, page 73 for specs.)

ONE OUTSTANDING FEATURE



It's dirt simple. There's no fussy setup or complicated instructions to remember. Simply clamp your work to the jig and go for it.

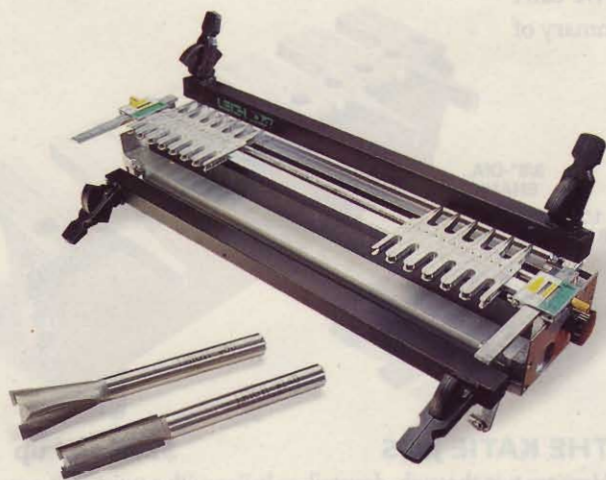
ONE OUTSTANDING FEATURE



It's adjustable. Move the jig's guide forks to customize the spacing between dovetails.



Combination Dovetail Jigs



LEIGH D4-24

\$370

This is the most versatile jig available. It'll make half-blind or through dovetails in boards up to 24-in. wide. This jig allows you to determine each individual dovetail's size and spacing. Fortunately, a comprehensive manual takes you through every setup because it takes a while to get the hang of using such a complicated jig. Half-blind dovetails require cutting the pin boards and tail boards separately, for example. You flip and reset the template between cuts. There are many optional templates and bits that allow you to work in a wide range of wood thicknesses and make unusual-shaped dovetails. The basic package includes the bits you need for most through-dovetail work, but Leigh recommends upgrading to thicker-shanked 8 mm bits for less chatter. They'll fit in a 1/2-in. collet with a reducer.

Pro: The Leigh jig cuts every dovetail you're likely to need.

Con: Its complexity can be intimidating. (See Chart, page 73 for specs.)



ONE OUTSTANDING FEATURE



Customize the spacing of half-blind dovetails. That option is unique to the Leigh jig.



PORTER-CABLE OMNIJIG 5116

\$320

Rugged, heavy and made primarily with metal parts, this jig is built to withstand the rigors of a busy professional woodworking shop. The basic unit cuts fixed-space half-blind dovetails the same way its less-expensive Porter-Cable brother does (see page 70). However, you can buy an Omnijig accessory template (\$130) for cutting variable-spaced through dovetails as well. You have to reposition the edge stops when shifting from pins to tails when cutting through dovetails—a minor inconvenience. The jig comes with a template guide and carbide bit for making 1/2-in. half-blind dovetails. There's a wide range of other accessory templates (see page 73).

Pro: The Omnijig is built like a tank.

Con: The combination package is pricey (\$450, plus bits).

(See Chart, page 73 for specs.)

ONE OUTSTANDING FEATURE



Quick-action board clamps let you move lumber through this jig at a rapid rate. The clamps are as stout as the rest of the jig, which looks like it can take years of hard use.



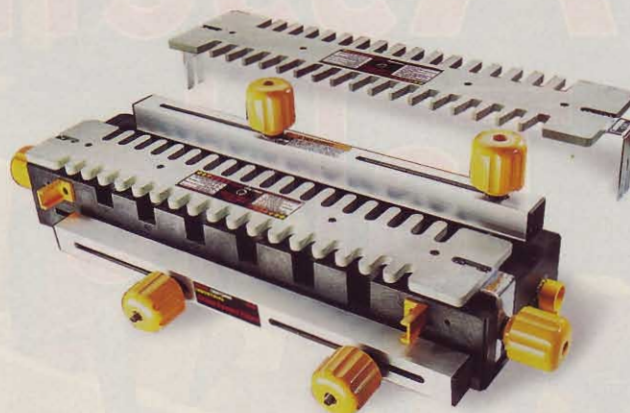
Combination Dovetail Jigs

SEARS CRAFTSMAN INDUSTRIAL DOVETAIL FIXTURE \$140

This is a relatively inexpensive jig for cutting both half-blind and through dovetails. The spacing and size of both kinds of dovetails is fixed. Two important features of this jig are the template adjustment knob (see below) and the adjustable board clamps. Most of the parts of the jig are plastic. The templates are somewhat flexible (we prefer more rigid ones) and must be set up with care. Craftsman template guides are included, but not the bits (\$30 for the set).

Pro: The Craftsman is less than half the cost of other combination jigs.

Con: Both kinds of dovetails are fixed-space. (See Chart, below for specs.) **AW**



ONE OUTSTANDING FEATURE



Fine-tune the template setting with a simple turn of a knob. You can easily adjust the template for different thicknesses of lips on rabbeted drawers.

ACCESSORIES KEY

A=Katie Jig: 3 sizes of box-joint guide forks, router table handles, and more.

B=Keller: Router bits for 1/8" to 3/8" thick stock, and a bit for making box joints.

C=Leigh: Templates for rounded and square finger joints, six variations of dovetails, a multiple mortise and tenon attachment, and more.

D=Porter-Cable Omnijig: Templates for 1/2" "hand dovetails," 1/4" half-blind dovetails, 1/2" sliding tapered dovetails, 1/2" and 3/4" adjustable through dovetails, and 1/2" box joints.

E=Sears Craftsman: Templates for two sizes of box joints.

Through and Combination Dovetail Jigs

Model	Price	Width	Pin Width	Pin Spacing	Thickness of Wood	Pin Width	Pin Spacing	Thickness of Wood	Accessories	Source
			THROUGH			HALF-BLIND				
Katie Jig 5/8"	\$270	12"	5/8"	1-3/4" min.	1/2" to 1"				A	Hampton House Inc. (317) 881-8601
Katie Jig 7/16"	\$250	12"	7/16"	1-3/8"	1/4" to 3/4"					
Keller 1500	\$150	15"	7/16"	1-1/8"	3/8" to 3/4"				B	Keller and Co. (707) 763-9336
Keller 1601	\$250	16"	7/16"	1-1/8"	3/8" to 3/4"					
Keller 2401	\$340	24"	5/8"	1-3/4"	5/8" to 1"					
Keller 3600	\$440	36"	1"	3"	5/8" to 1-1/4"					
Leigh D4-24	\$370	24"	1/2" min.	1" min.	3/16" to 1-1/4"	11/16"	1"	1/2" to 1-1/2"	C	Leigh Industries (800) 663-8932
Porter-Cable 5116	\$320	16"	1/2"	1-3/4"	1/2" to 1"	1/2"	7/8"	5/16" to 1"	D	Delta Int'l Machinery (800) 438-2486
Porter-Cable 7116	\$360	24"	1/2"	1-3/4"	1/2" to 1"	1/2"	7/8"	5/16" to 1"		
Sears Craftsman Industrial Dovetail Fixture Part #171.25450	\$140	16"	9/16"	1"	3/8" to 1"	9/16"	1"	3/8" to 1"	E	Sears (800) 377-7414

A man in a yellow shirt is working on a wooden assembly table in a workshop. The table is made of light-colored wood and is supported by several wooden legs. The man is using a tool to work on the table. The workshop has wooden shelves in the background.

Building an Assembly Table

Make it low,
Make it flat,
Make it renewable,
Jazz it up!

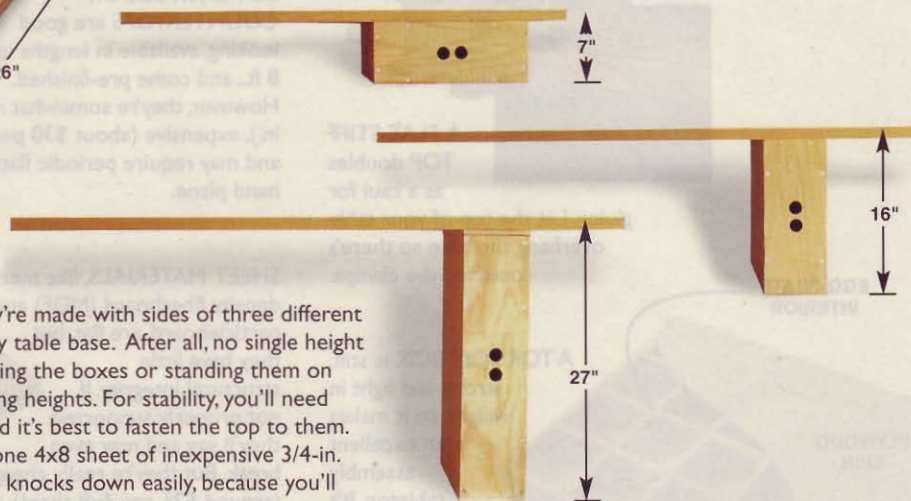
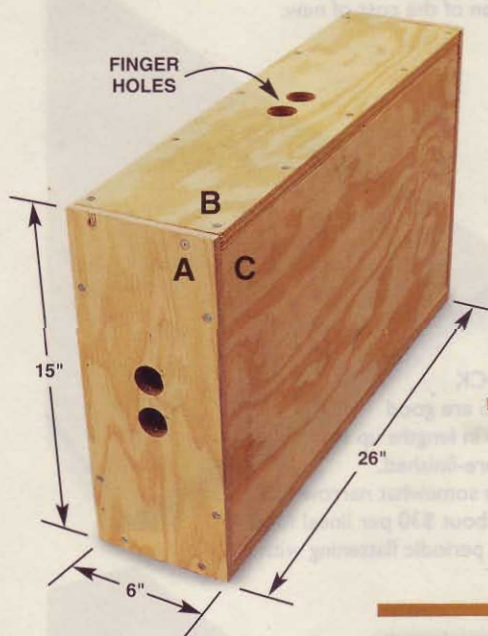
by Bruce Wiebe

You can build it small or massive, temporary or permanent, humble or majestic. As long as this essential piece of shop furniture has a flat surface at a comfortable working height, it will serve you well. Use these tips as inspiration for building an effective assembly table for your shop.

EDITOR: TIM JOHNSON • ART DIRECTION: PATRICK HUNTER AND VERN JOHNSON • PHOTOGRAPHY: BILL ZUEHLKE AND RAMON MORENO

Make it **Low**

ASSEMBLING PARTS is easiest when you can work comfortably. To custom-fit your assembly table, let your arm hang straight down, measure the distance from your fingers to the floor and build the table to that height. It'll be about 27 in.; considerably lower than your workbench.



ABC BOXES, so called because they're made with sides of three different dimensions, make a flexible assembly table base. After all, no single height will be right for everything. By rotating the boxes or standing them on end, you'll get three different working heights. For stability, you'll need three boxes (photo, above right), and it's best to fasten the top to them. All three boxes can be made from one 4x8 sheet of inexpensive 3/4-in. plywood. It's a good thing this setup knocks down easily, because you'll find ABC boxes useful for lots of other shop tasks as well.



Electrify It

You can mount power strips or raceways to the top or to a support apron underneath your table.

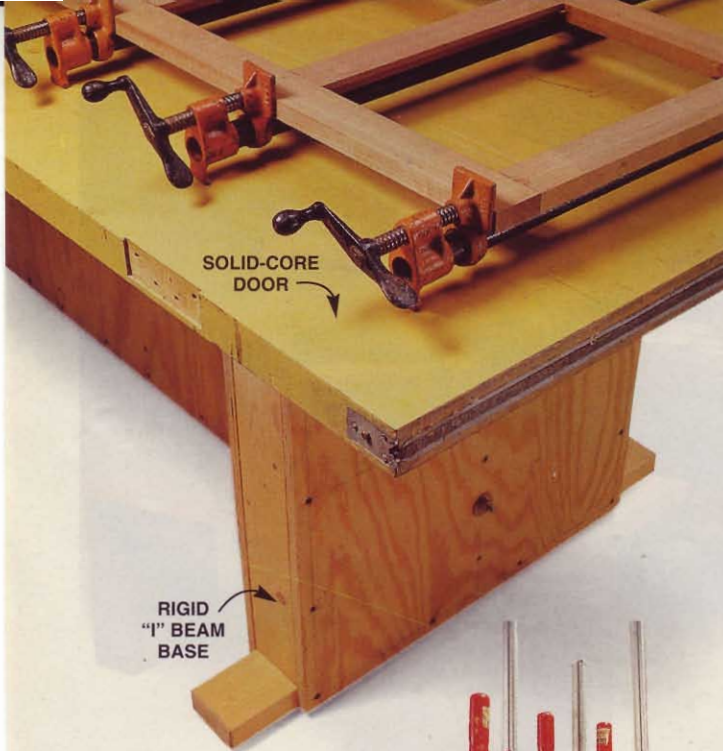
With a little planning, a metal-covered wiring method (housing 15-amp receptacles and 12-gauge insulated wire inside junction boxes and pipe, flexible conduit or metal-sheathed, manufactured cable) allows you to locate outlets wherever they're needed. Supply power with a 12/3 SJ cord set with the female end removed. Install a strain-relief cord connector (\$4, available at home centers and electrical suppliers) between this cord and the junction box. It keeps the connection secure despite inadvertent tugs on the power cord.

AW #82, October 2000, page 48 contains complete instructions, including wiring, for building this "ultimate" tool stand.



Make it Flat

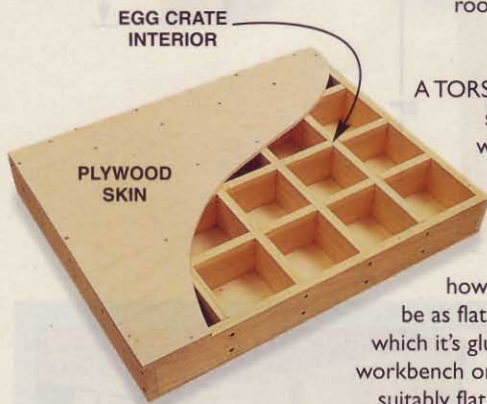
A FLAT SURFACE keeps glue ups from twisting and cabinets from racking. You can buy flatness ready-made. Solid-core doors, for example, are stiff and stable, but heavy and awkward to handle. They're available from any home center (\$45). This laminate-covered one came from a salvage yard for a fraction of the cost of new.



RIGID
"I" BEAM
BASE



A FLAT, STIFF TOP doubles as a caul for gluing. Let the top of your table overhang the base so there's room for the clamps.



EGG CRATE
INTERIOR

PLYWOOD
SKIN

A TORSION BOX is stiff, strong and light in weight, so it makes an excellent assembly tabletop. It's tedious to make, however, and will only be as flat as the surface on which it's glued together. Your workbench or tablesaw may be suitably flat for this assembly.

THIS HALF-LAPPED BASE supports any top, sets up or breaks down in a minute and keeps sheet materials flat. Simply notch sawhorses and straightened 2x4s so they fit together with the top edges level. Lay on the top and shim the sawhorses to compensate for an uneven floor.



BUTCHER-BLOCK COUNTERTOPS are good looking, available in lengths up to 8 ft., and come pre-finished. However, they're somewhat narrow (25 in.), expensive (about \$30 per lineal foot) and may require periodic flattening with a hand plane.

SHEET MATERIALS, like medium density fiberboard (MDF) and particleboard, are flat, but they have little structural integrity. If not properly supported, they'll sag and may even break. But they're really cheap (around \$25 per 4x8 sheet), available up to 1-1/8-in. thick and remain flat, with adequate support.

Make it Renewable

ASSEMBLY TABLES GET ABUSED. Every shop needs a work surface that can get battered. Here are some ways to extend its life:



SEAL THE SURFACE. Not only does this add protection and make it easier to clean, it's a great way to use up leftover finish. Just pour it on and roll it out.



FOUR TOPS IN ONE. When the original top gets ratty, flip it over. When that side gets wrecked, switch the top with the lower shelf and you've got two fresh surfaces to ruin.



USE A SACRIFICIAL TOP of thin hardboard to protect the primary table surface.



CLAD THE TOP with plastic laminate. It's easy to do. After coating both surfaces with contact cement (\$6 to \$8 per quart), position the oversized piece of laminate (about \$2 per sq. ft) above the substrate, using strips of scrap wood as spacers. Then, press the laminate to the MDF, starting at one end and working to the other, removing the strips as you go. Trim the edges flush with a router and laminate trimming bit. Be sure to laminate both the top and bottom. If you don't, your top won't stay flat. You'll have two work surfaces when you do.



Jazz it up

THESE USER-FRIENDLY ADDITIONS, like the electrical outlets shown on page 75, increase your efficiency and make your assembly table more versatile.



USE THE SPACE underneath the top for storage. It's a great place for pipe clamps, shop drawings or a sacrificial top. There's still room for lots of other stuff on the bottom shelf.

Sources

MDF, solid-core doors, power strips, raceways, plastic laminate adhesive: Available at home centers.
Butcher-block countertops: Available at hardwood lumberyards.
Toggle clamps: MLCS, item #9058, \$8 each, (800) 533-9298.
Two-way locking casters: Woodcraft Supply, item #140639, four for \$58, (800) 225-1153.



TOGGLE CLAMPS mounted on blocks offer pressure right where you need it. Just screw them in place and remove them when the job is done.



CASTERS make the table mobile. Our favorites lock both the rotation of the wheel and the swivel of the caster. You won't find them at hardware stores, but you can order them through the mail (\$14.50 each, see Sources, at left).

AW

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W0200_100900_H00222

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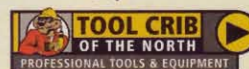


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Shaker Sewing

You can find a place for every conceivable sewing notion in this Shaker-inspired chest of drawers. Mix 'n match modular trays fit perfectly in the middle drawers. Store patterns or magazines in the large lower drawer. There's enough compartments for a complete sewing kit.

You'll make the most out of your router and half-blind dovetail jig when you build this cabinet. Not only are the drawers dovetailed, but the case is as well! All the joints are modern variations of the dovetails made by Shaker cabinet-makers 150 years ago.

Machine-cut add a

Cabinet of a hundred uses



We designed the drawers so modular plastic trays found at most sewing centers (left) fit perfectly with no rattling around. Plus the bottom drawer is just the right size for file folders to keep patterns organized. Office supplies (right), fly-tying gear; you name it—this cabinet can organize tons of stuff.



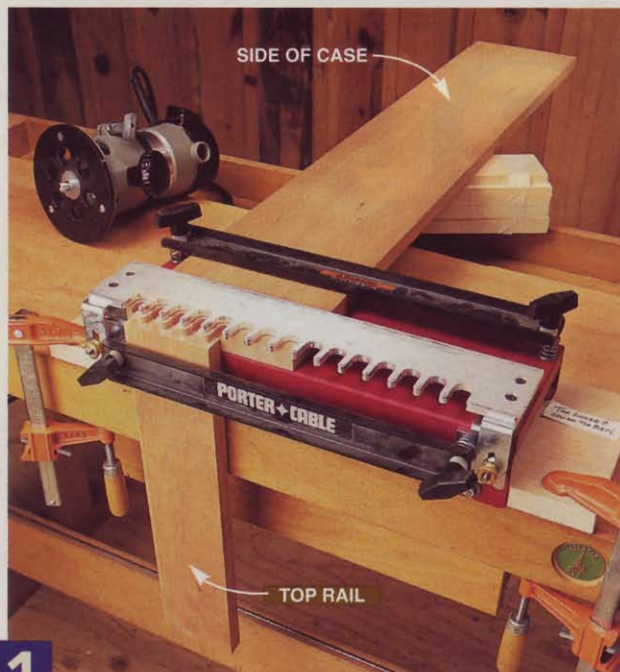
Cabinet

By Tom Caspar

*dovetails
new twist.*

ART DIRECTION: DAVID FARR • PHOTOGRAPHY: MIKE HABERMANN • ILLUSTRATION: FRANK ROHRBACH • PROJECT DESIGNER: NINA CHILDS JOHNSON

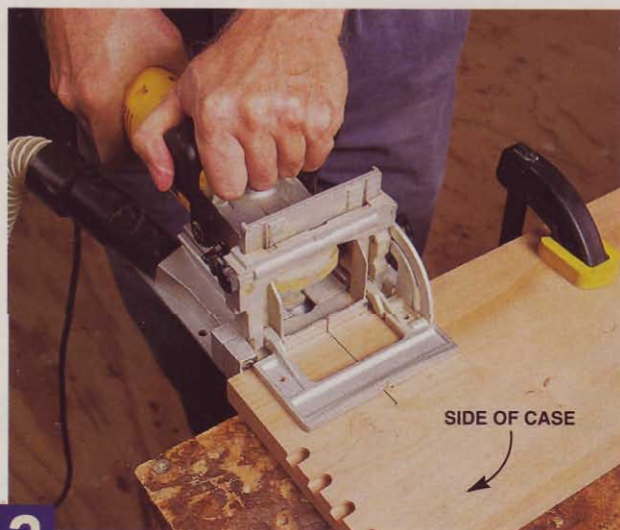
Shaker Sewing Cabinet



1 Cut dovetails in the sides and top rails. Each side of the cabinet is composed of two pieces that are glued together *after* the dovetails are cut because the complete side is too wide to fit in a basic dovetail jig.

Tools and Materials

In addition to a standard set of power tools, you'll need a half-blind dovetail jig and a biscuit joiner. Any brand of jig will do (see the Tool Test, page 66). We've based the dimensions of this case on the dovetails made by a Porter-Cable jig. You'll have to slightly alter the Cutting List, page 81 if your jig cuts wider or longer dovetails (see Changing Dimensions to Suit Your Jig, page 80). A router table makes cutting the casework dovetails a lot easier and safer.



2 Cut biscuit slots in each half of one side. Use biscuits or splines to align the two halves when you glue them together.

The chest requires about 25 bd. ft. of 4/4 primary wood and 25 bd. ft. of 4/4 secondary wood. We used \$150 of cherry and \$75 of yellow poplar. The modular trays for each drawer are made by Rubbermaid and are available at sewing centers nationwide. They sell for about \$2 apiece. We bought our drawer pulls from a company that specializes in Shaker reproductions (see Sources, page 81). A set costs \$9.

The Sides

Be a stickler for flatness throughout this project, particularly when you mill and glue up the sides. You'll go nuts trying to fit dovetails in cupped or warped boards.

Begin by making the case; then build the drawers to fit. (Here's a woodworking truism: "Always make the holes first, and then the parts that go into them!") Start building the case by milling and routing the sides. They're split in half because they're too wide to fit into a standard dovetail jig.

Mill the wood for sides B1 and B2. Cut them to width and length, and mark the front and top. Avoid sapwood on the front edge.

Next, mill the top rails C, dividers D and supports E. They're all the same thickness. (Make a few extra supports E as test



3 Glue the side together. Align the ends with a clamp placed lengthwise. With biscuits in the glue joint, you'll need the force of a clamp to shift the boards.

Once the ends are aligned, remove the long clamp and check the side for flatness. Flat sides are necessary for the next step to succeed!

Detail 1
End View of
Back Boards

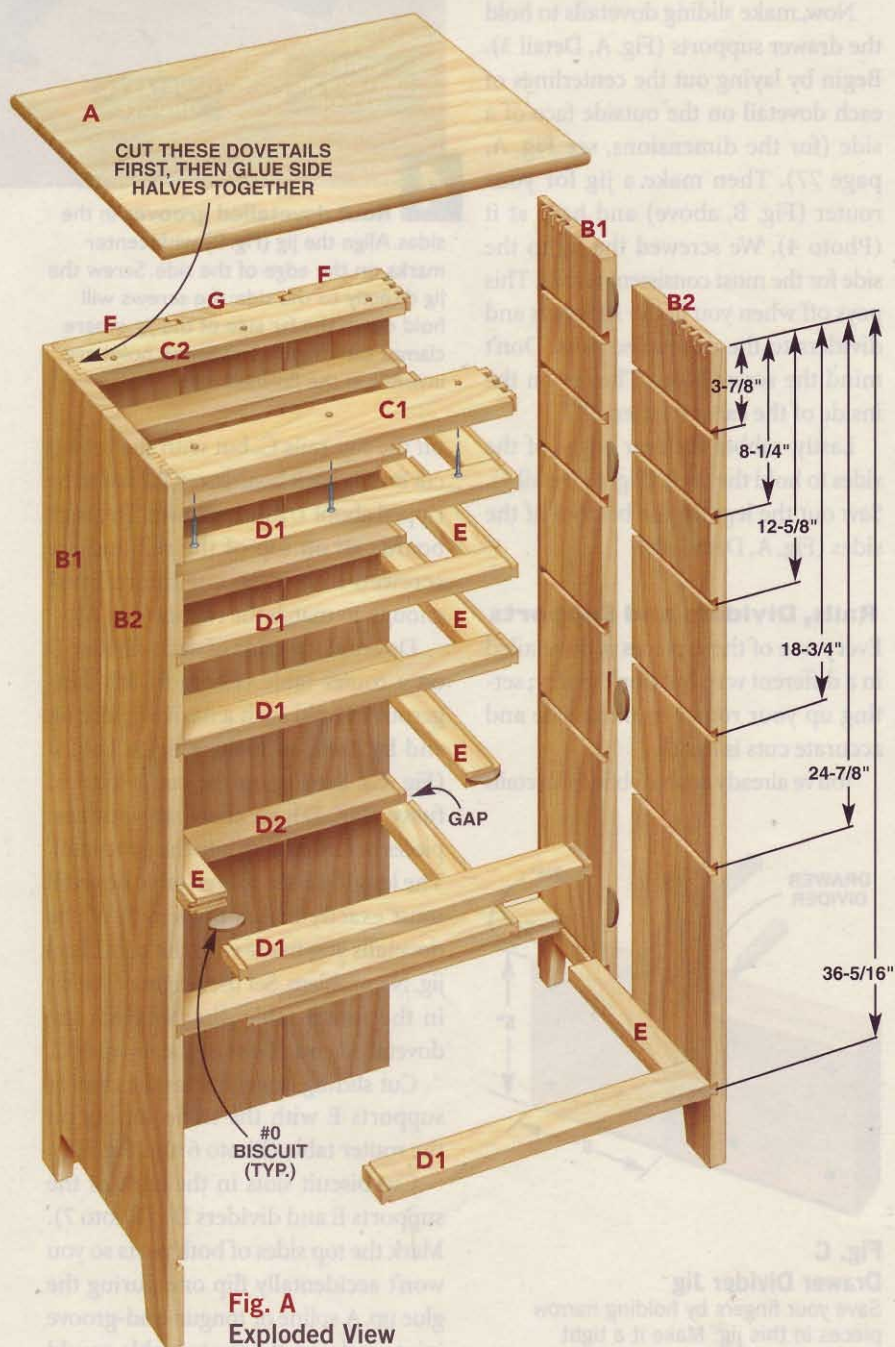
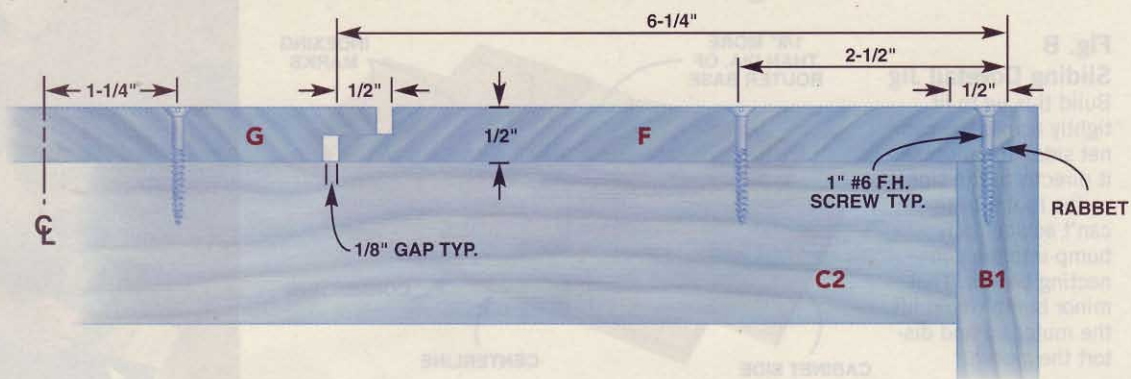
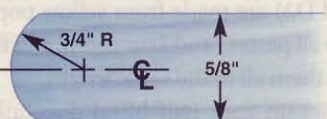
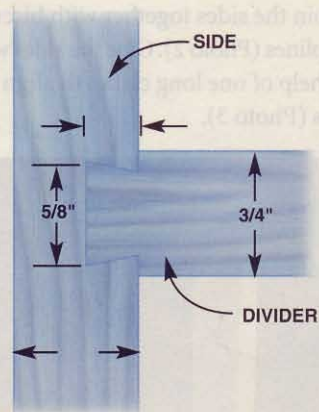


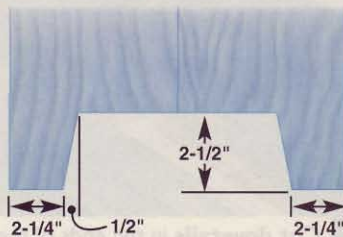
Fig. A
Exploded View



Detail 2
Profile of Top



Detail 3
Drawer Divider Dovetail

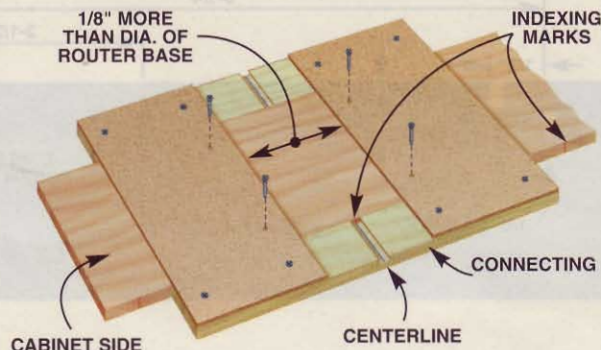


Detail 4
Side View of Legs

Shaker Sewing Cabinet

Fig. B
Sliding Dovetail Jig

Build this jig to fit tightly across the cabinet side. Then, screw it directly to the side so the router base can't accidentally bump into the connecting boards. That minor bump would lift the router up and distort the groove.



pieces.) The parts that show in the front of the case (C1 and D1) are made from cherry, while those that don't show (C2 and D2) are made from yellow poplar. Rip all parts C and D to width, and then cut them all to the same length.

Set up your half-blind dovetail jig and cut dovetails in the sides and top rails (Photo 1). The two pieces aren't the same width, so chances are you'll cut an extra socket in the side. No big deal. It won't show.

Join the sides together with biscuits or splines (Photo 2). Glue the sides with the help of one long clamp to align the ends (Photo 3).

Now, make sliding dovetails to hold the drawer supports (Fig. A, Detail 3). Begin by laying out the centerlines of each dovetail on the outside face of a side (for the dimensions, see Fig. A, page 77). Then make a jig for your router (Fig. B, above) and have at it (Photo 4). We screwed the jig to the side for the most consistent results. This pays off when you fit the supports and dividers to the dovetailed slots. Don't mind the screw holes. They're on the inside of the cabinet, after all.

Lastly, rabbet the rear edges of the sides to hold the back (Fig. A, Detail 1). Saw out the legs on the bottom of the sides (Fig. A, Detail 4).

Rails, Dividers and Supports

Every one of these pieces is dovetailed in a different way, but don't worry; setting up your router to make safe and accurate cuts is easy.

You've already cut half-blind dovetails

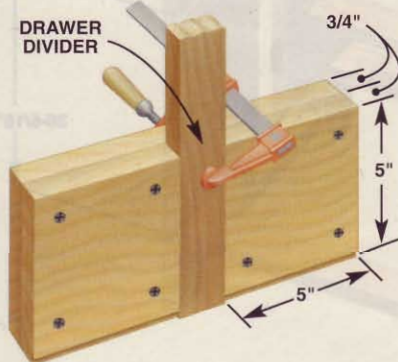
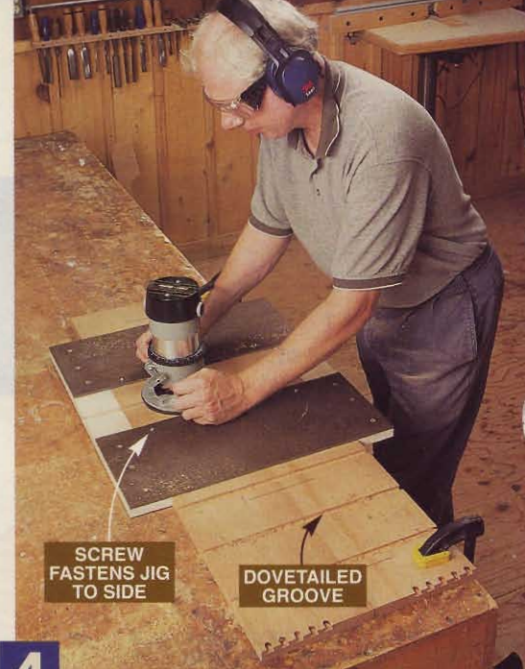


Fig. C
Drawer Divider Jig

Save your fingers by holding narrow pieces in this jig. Make it a tight fit. Shim with paper if one divider fits in loosely.



4 **Route dovetailed grooves in the sides.** Align the jig (Fig. B) with center marks on the edge of the side. Screw the jig directly to the side; the screws will hold down the far side of the jig, where clamps can't reach. The screw holes are invisible in the finished case.

on the top rails C, but with the rabbet cut for the back boards, rail C2 has to be ripped about 1/2 in. narrower. The back boards sit on top of the rail and are screwed into it, so cut the rail just enough to match the rabbet (Fig. A).

Dovetail the ends of each divider D on a router table (Photo 5). It's dangerous to hold such a narrow piece on end by itself, so make a jig to hold it (Fig. C). Setting up the cut is kind of fussy (Fig. D), so chew up your test pieces before cutting into the good stuff. The length of the router-table dovetail must exactly match the length of the dovetails you made with the half-blind jig. No problem. Set the height of the bit in the router table directly from the dovetailed end of one of the top rails C.

Cut sliding dovetails on the drawer supports E with the same setting on the router table (Photo 6 and Fig. E).

Cut biscuit slots in the ends of the supports E and dividers D1 (Photo 7). Mark the top sides of both parts so you won't accidentally flip one during the glue up. A spline or tongue-and-groove joint made on the router table would also work here.



5 **Cut dovetails in the ends of the dividers.** Rout equally from both sides of the divider so the dovetail is centered. Clamp the narrow workpiece to the jig so it doesn't slip down into the opening of the router table.

The Proper Fit

Finding the right tolerance between two pieces can drive you crazy. Too tight a fit may mean that glue up is a nightmare. Too loose a fit can look like sloppy craftsmanship. Here are some pointers on fitting three critical areas:



Fig. D

A Tight Fit: The Drawer Divider

Here's a short, sliding dovetail that should be fairly tight. A loose fit would be unsightly and weak. The test is whether you can push the joint home by hand, without glue. Taper the back of the dovetail with a file so it slides easier. Tap the joint home with a mallet during glue up.



Fig. E

A Sliding Fit: The Drawer Support

Long, sliding dovetails are very fussy to fit. Invariably they're either too tight or too loose, no matter how careful you are. Too tight is a disaster at assembly time.

Fit and mark these pieces individually. Tweak the fence setting on your router table to take a little more off this long piece than you did when cutting the short dividers. If the support still won't fit, make an angled sanding block and lightly sand the sides of the dovetail.

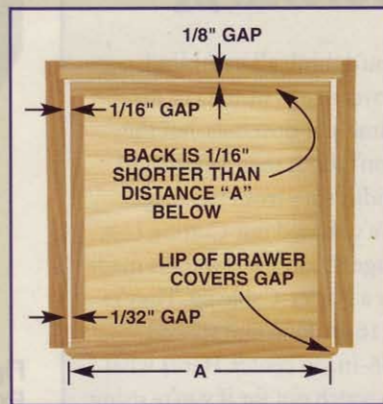


Fig. F

A Tapered Fit: The Drawer Itself

It's difficult to fine-tune the fit of a lipped drawer after it's glued together. You can't run a plane or belt sander down the side because the lip gets in the way. The answer is to taper the sides of the drawer, so the back is slightly narrower than the front. That's easily accomplished by closely fitting the front first and then cutting the back so it's a bit shorter than the distance between the front's rabbets.

Assembly

Gluing up the case is quite easy because you only add one divider at a time. Plus, you won't need dozens of clamps! The divider's dovetailed ends hold themselves in place.

Begin by inserting (without glue) a few of the dividers D1 and D2 to square up the case. Then, glue the top rails C1 and

C2. Glue each of the front dividers D1, starting at the top (Photo 8).

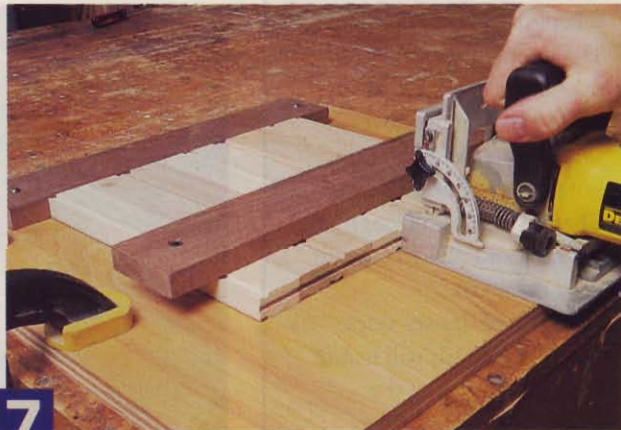
Leave the lowest rear divider D2 in place and remove the others. Now you have room to glue supports E to the front dividers D1 (Photo 9). Clamp the supports to the divider.

Finally, glue all the rear dividers D2. Make sure their outer



6

Dovetail the drawer supports. It's basically the same setting as in Photo 5. You may have to move the fence to cut a fraction deeper, because the fit over a longer distance needs to be looser (Fig. E).



7

Cut slots in the ends of the drawer supports for #0 biscuits. Line up all the supports and make, in effect, one continuous slot. Biscuits align all the pieces that support the drawer so the drawer will slide smoothly, without hitting any uneven edges.

Changing Dimensions to Suit Your Dovetail Jig

You'd think all half-blind dovetail jigs would cut the same size dovetails, but they don't. Both their length and width vary from jig to jig. We've based our Cutting List, page 81, on the dovetails made by a Porter-Cable jig. They're 5/16-in. long and spaced 7/8-in. on center. Here's what to watch out for if you're using a different dovetail jig:

- **Drawer thickness.** Longer dovetails require a 13/16-in.-thick front so they don't cut into the drawer lips. Make the rabbets 7/16-in. deep.
- **Drawer sides.** The upper half-pin may not work out (see Lipped Drawers, page 94, Fig. B). Change the width of the drawer parts to get a balanced look.

Our case and drawers are dimensioned to fit Rubbermaid modular trays. If you want to use these trays, but cut your parts on a different jig, pay attention to these details:

- **Length of rails and dividers.** The width of the drawer opening is fixed. So the distance between the dovetail shoulders is fixed, too (it's noted in the Cutting List). Change the overall length of the rails and dividers to suit your dovetails.
- **Length of drawer sides.** Longer dovetails will *reduce* the inside depth of the drawer. Compensate by adding length to the drawer sides.

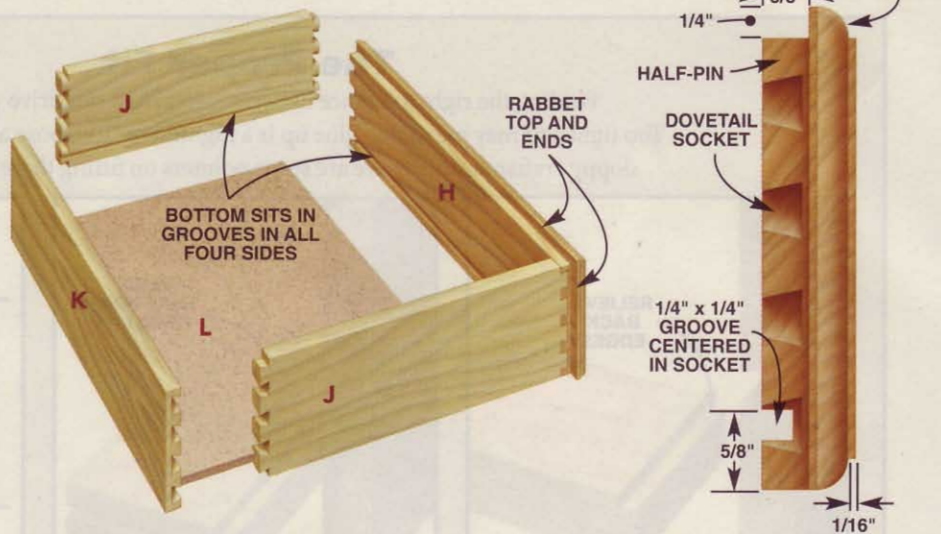


Fig. G
Exploded View of Typical Drawer

Detail 5
End View of Typical Drawer Front

edge is flush with the bottom of the back board rabbet. There's a gap between the back of support E and each divider D2 to allow for wood movement of the case sides (Fig. A).

Drawers, Back and Top

Fit the drawers to the case. There should be 1/16-in. clearance between the tops of a drawer side and the divider above it (1/8-in. for the big drawer). See Lipped Drawers, page 91 for the complete how-to.

The drawers have trapped bottoms (Fig. G). We used tempered hardboard for the bottoms because it's inexpensive and doesn't show once the drawer is full. You could use hardwood plywood instead. We've dimensioned the drawers so there's a half-pin showing at the top and bottom (Detail 5, above). Note in the Cutting List, page 81 that the back of each drawer is 1/16-in. narrower than the distance between the rabbets in the front (Fig. F). This kind of tapered fit helps drawers slide smoothly, in any project.

Drill holes in the center of each drawer front for pulls. You could turn your own, but we found some high-quality mail-order pulls that look terrific (see Sources, page 81).

Drill holes through the top rail C1 for the screws that hold the top (Photo 10). Make the top and shape its edges (Fig. A, Detail 2) by taking two passes with a 3/4-in.



8

Assemble the case one piece at a time. That's the beauty of dovetails! You don't have to clamp a dozen pieces at once.



9

Glue the drawer supports to the front dividers. The drawer supports are only glued at the front, not in the groove, so the case side is free to expand and contract.



10

Drill screw holes for the top from *inside* the case. That way you know the holes will be accessible when you install the top.

round-over bit (see Sources, at right) or one pass with a half-radius bullnose bit on the router table. Fasten the top to the case.

Make the backs and screw the boards to the case, rails and dividers (Fig. A, Detail 1). They're not glued together.

Apply a wipe-on varnish or brush on an oil-based varnish. We used Minwax Antique Oil on our lightly figured cherry, and it looks great. Give the cabinet some sun and it'll slowly darken to a beautiful color. **AW**

Sources

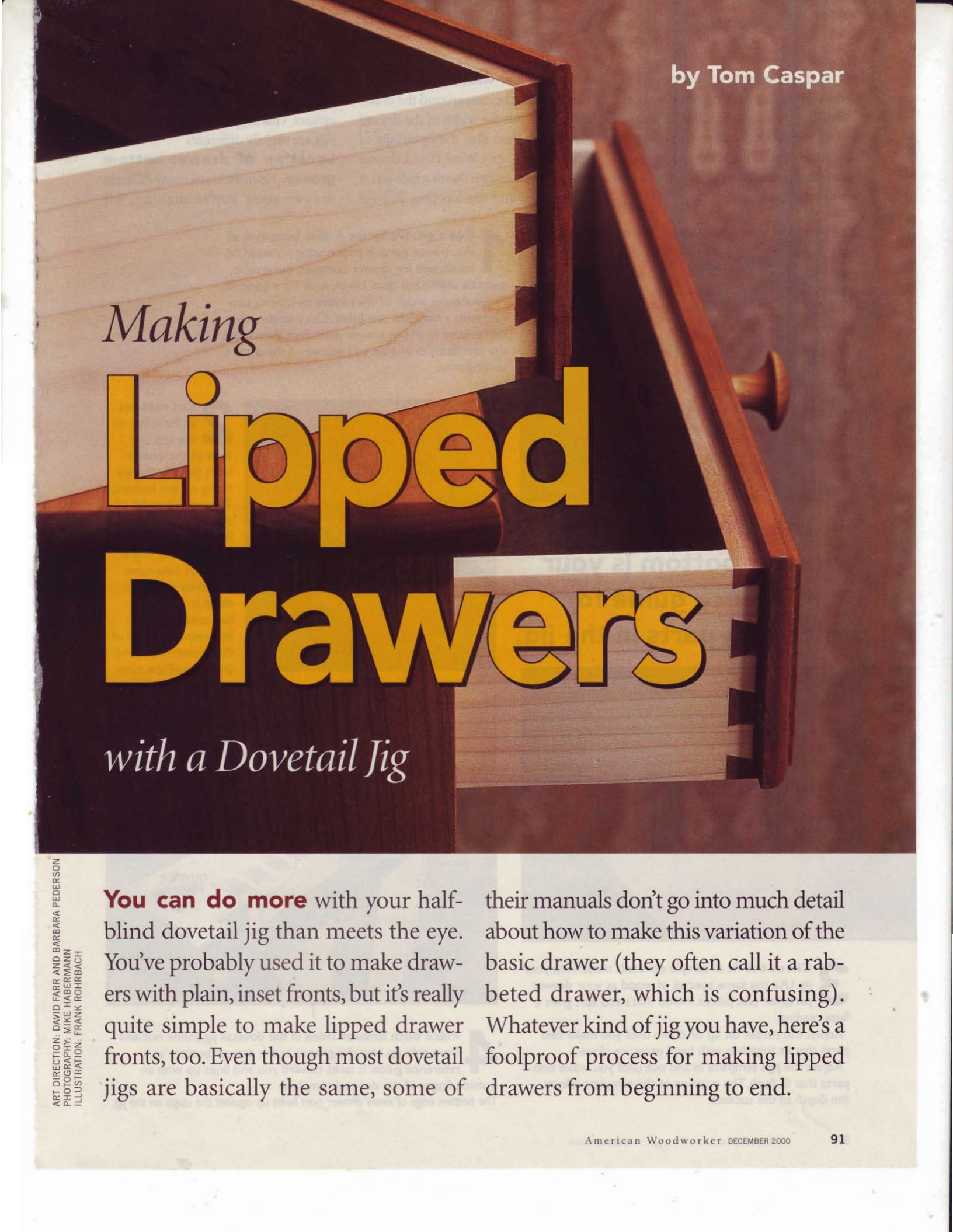
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Cutting List for Shaker Sewing Cabinet

Overall Dimensions: 41" H x 18-13/16" W x 14-3/8" D

Part	Qty	Name	Material	Thick	Width	Length	Comments
Sides & Top							
(all measurements in inches)							
A	1	Top	4/4 Cherry	5/8	14-3/8	18-13/16	1/2" Overhang Front and Sides
B1, B2	4	1/2 of Side	4/4 Cherry	3/4	6-15/16	40-1/4	13-7/8" Total Width of Side
Rails							
C1	1	Top Rail	4/4 Cherry	3/4	3-1/2	16-15/16	16-5/16" Between Dovetail Shoulders After dovetailing, rip to about 3"
C2	1	Top Rail	4/4 Poplar	3/4	3-1/2	16-15/16	
D1	6	Drawer Dividers	4/4 Cherry	3/4	1-1/2	16-15/16	
D2	6	Drawer Dividers	4/4 Poplar	3/4	1-1/2	16-15/16	
E	12	Drawer Supports	4/4 Poplar	3/4	1-1/2	10	
Back							
F	2	Outer	4/4 Poplar	1/2	6-1/4	40-1/4	
G	1	Inner	4/4 Poplar	1/2	5-5/8	40-1/4	
Drawers							
							Inside 15-1/4" W x 12-1/4" D
H1	1	Front	4/4 Cherry	3/4	2-15/16	16-3/4	
H2	2	Front	4/4 Cherry	3/4	3-13/16	16-3/4	
H3	2	Front	4/4 Cherry	3/4	5-9/16	16-3/4	
H4	1	Front	4/4 Cherry	3/4	10-13/16	16-3/4	
J1	2	Sides	4/4 Poplar	1/2	2-11/16	12-7/8	
J2	4	Sides	4/4 Poplar	1/2	3-9/16	12-7/8	
J3	4	Sides	4/4 Poplar	1/2	5-5/16	12-7/8	
J4	2	Sides	4/4 Poplar	1/2	10-9/16	12-7/8	
K1	1	Back	4/4 Poplar	1/2	2-11/16	16-3/16	
K2	2	Back	4/4 Poplar	1/2	3-9/16	16-3/16	
K3	2	Back	4/4 Poplar	1/2	5-5/16	16-3/16	
K4	1	Back	4/4 Poplar	1/2	10-9/16	16-3/16	
L	6	Bottoms	1/4" Hardboard	1/4	12-3/4	15-11/16	1/16" smaller than opening



by Tom Caspar

Making

Lipped Drawers

with a Dovetail Jig

ART DIRECTION: DAVID FARR AND BARBARA PEDERSON
PHOTOGRAPHY: MIKE HABERMANN
ILLUSTRATION: FRANK ROHRBACH

You can do more with your half-blind dovetail jig than meets the eye. You've probably used it to make drawers with plain, inset fronts, but it's really quite simple to make lipped drawer fronts, too. Even though most dovetail jigs are basically the same, some of

their manuals don't go into much detail about how to make this variation of the basic drawer (they often call it a rabbeted drawer, which is confusing). Whatever kind of jig you have, here's a foolproof process for making lipped drawers from beginning to end.

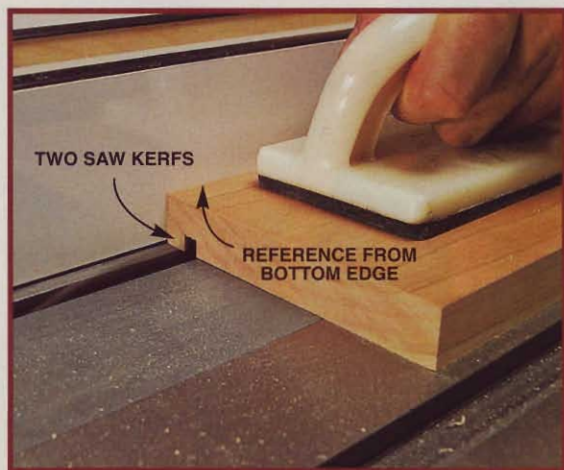
Lipped Drawers

If this is your first time out with a dovetail jig, try making some standard half-blind joints to familiarize yourself with the process and to fine-tune the settings of your jig. Make a sample corner and use it to work out these two important design details:

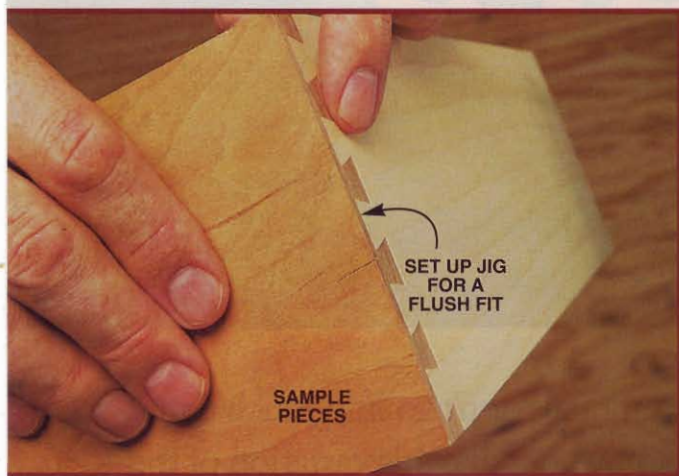
Ideal drawer widths. Here's a basic rule: Design the case around the drawers. Figure out the width of the drawer sides first, then size the openings of your case on paper. Why? I think drawer sides look best when there's a half-pin at the bottom and the top (Fig. B, page

94). Their ideal widths are multiples of one number: the distance between pin centers. That's typically 7/8 in., but some jigs are slightly different.

Location of drawer-bottom groove. No matter how many different drawer sizes you're making, for



The groove for the drawer bottom is your reference guide for positioning parts in the jig.

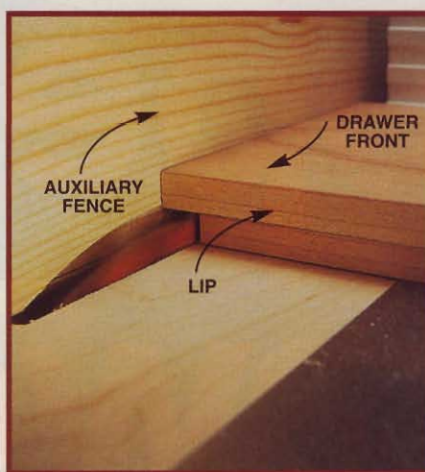


3 Check the fit of sample dovetails made with your jig. Use the same species of wood as your drawer parts for test pieces. Wood that's too soft gives a false reading.

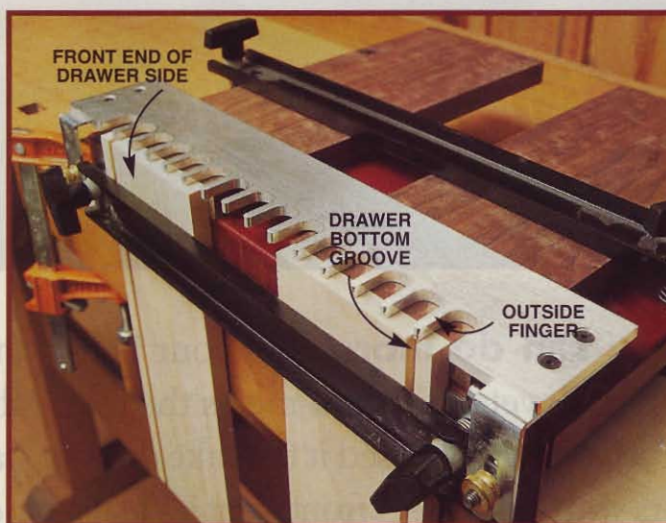
Adjust the router bit up or down until you make two parts that fit together with hand pressure alone.

Adjust the jig's template in and out until you make two parts that fit flush. The position of the template affects the depth of the sockets.

1 Cut a groove for the drawer bottom in all the drawer parts. If you're using plywood or hardboard for drawer bottoms, the groove must be *slightly less than 1/4-in.* wide for a good fit. Fine-tune the width of the groove by making two cuts with a standard saw blade. Cut a single saw-kerf groove in all the drawer parts first, then move the saw fence over a bit and groove all the parts a second time.



2 Cut rabbets to form lips on the top and ends of the drawer front (usually there's no lip on the bottom). The precise width of the rabbets affects the fit of the drawer front in its opening (Fig. F, page 79). Fine-tune the fence setting so there is 1/16 in. or less total side play between the inside of the drawer front and the sides of the case.



4 Place both drawer sides in the dovetail jig, inside out and front side up. Use the groove in the drawer bottom as a reference guide. It faces toward you and lines up with an outside finger of the dovetail template. The bottom edge of every drawer part butts up against the stops on the jig.



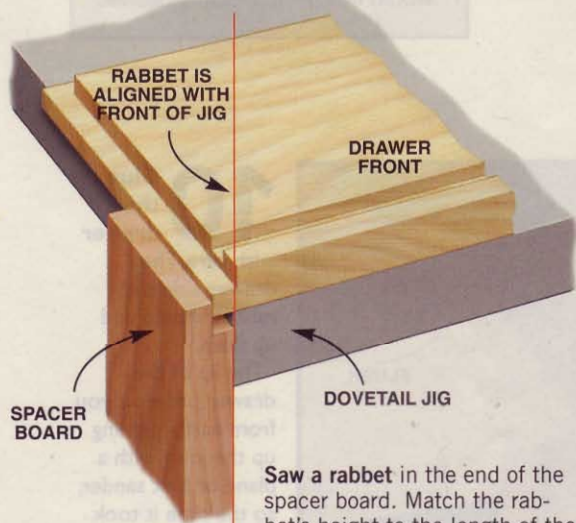
workshop efficiency it's best to have this groove in the same location for every drawer. Center the groove on the lowest socket of the drawer front. (A socket is the concave hole that each tail fits into, see Photo 9.) On your sample corner,

mark the edges that you placed against the jig's stops. Measure the distance from that edge to the center of the first socket.

Once you've worked out the details, build the case. Then cut all your drawer parts to fit the actual box (rather than

A rabbeted spacer board makes setup a breeze.

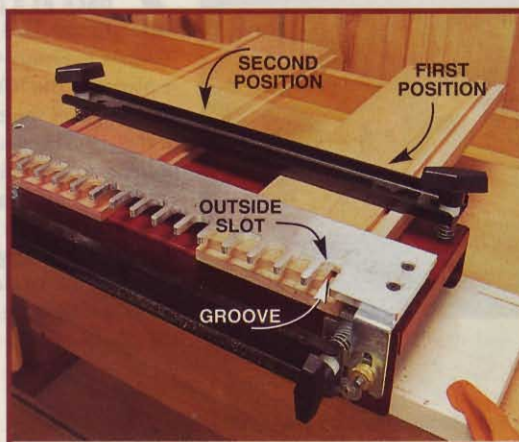
Fig. A
Rabbeted Spacer Board



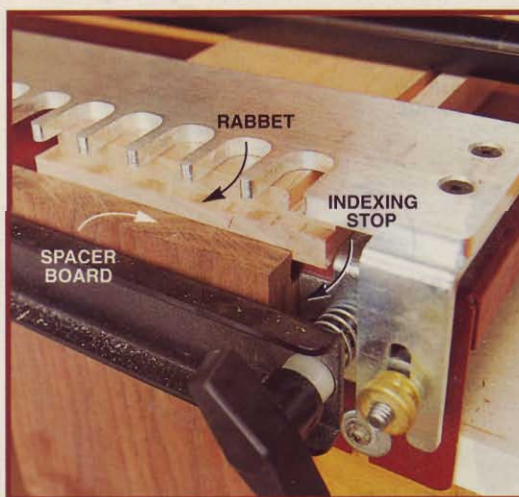
Saw a rabbet in the end of the spacer board. Match the rabbet's height to the length of the lip on the drawer front. The width of the rabbet isn't critical, but it should be about as wide as the lip is thick.



5 Rout dovetails in the drawer sides. Move the router from left to right for best results. Use backer boards behind the drawer sides to prevent the backs of the tails from chipping out.



6 Place the drawer front in the jig. One end of the board is cut on the right side of the jig. The other end is cut on the left side. Again, use the groove as a reference guide. This time it lines up with the outside slot of the template.

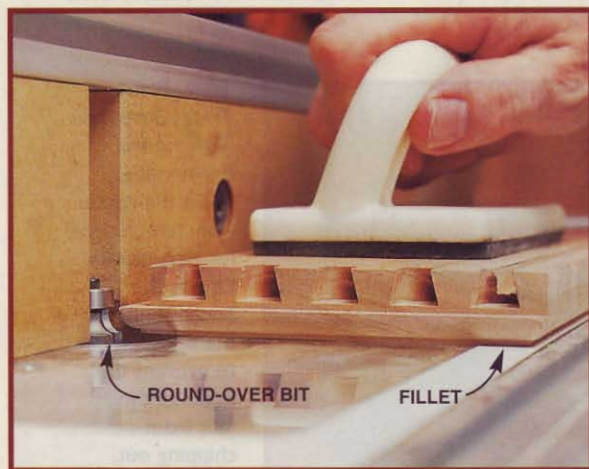


7 Align the drawer front using a shop-made spacer board (Fig. A, at left). The end grain of the rabbet must be exactly in line with the front edge of the jig so the dovetail is cut to the correct depth. Cut dovetails in both ends of the drawer front.

Lipped Drawers

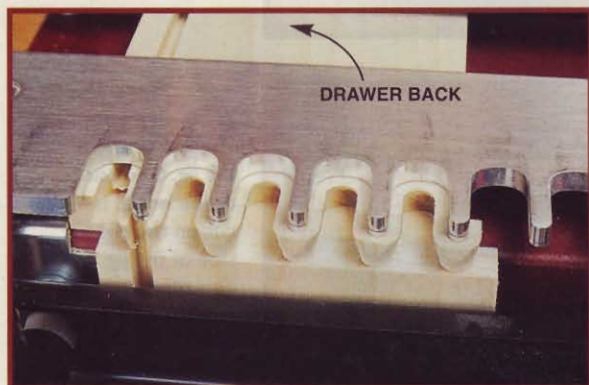
cut them to fit the case you planned on paper!). Make the sides and back the same width. The drawer fronts are wider than the sides by the height of the lip, generally about 1/4 in. (see page 80

for an example). The fronts are longer than the backs by the width of *two* lips. Finally, set up your tablesaw to cut a 1/4-in.-deep drawer-bottom groove and follow Photos 1 through 10. **AW**



8 **Route a profile** on all four sides of the drawer front. A 1/4-in. round-over is typical. Raising the bit up a little to create a fillet adds an attractive shadow line.

You really can't rout this profile before cutting the dovetails because you need square edges (not round ones!) on the sides of the drawer front. These sides bump up against thin indexing stops on most dovetail jigs (see Photo 7).



9 **Dovetail one drawer side and back as a pair**, making a standard half-blind joint. As in Photo 4, one pair is placed in the left-hand side of the jig and the other pair in the right-hand side. You won't get parts mixed up if you remember that the grooves always go nearest the stops of the jig.

Sand all the inside faces of the drawer before gluing.

Lipped vs. Standard Drawers

The idea of putting a lip around a drawer probably dates from the early 1800s. While there's no record of why cabinetmakers went to the considerable trouble of adding lips to drawers, here are our guesses. All of these reasons are as valid now as they were 200 years ago.

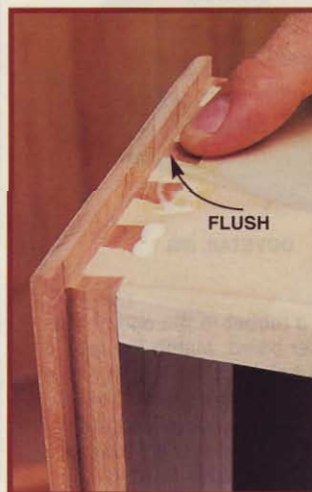
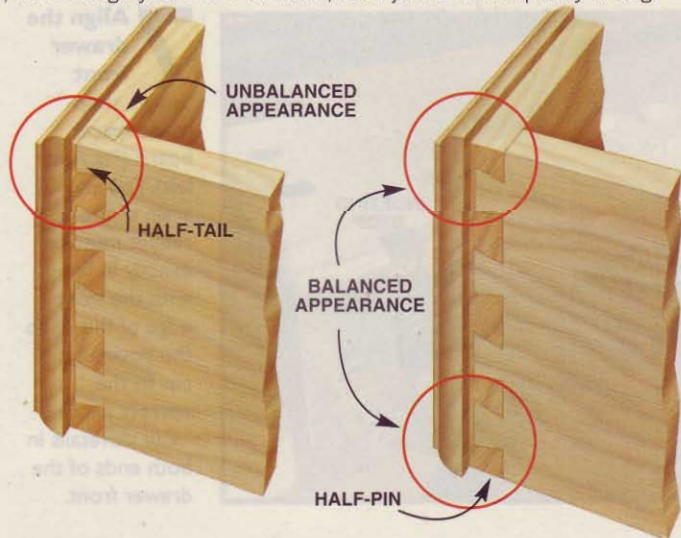
Lips make fitting easier. Standard drawers require careful measurement and individual fitting to minimize the clearance gaps around their sides and tops. Lipped drawers always appear to fit well, no matter how large the clearance gaps.

Lips are drawer stoppers. They prevent the drawer from going too far back into the case. Stoppers for standard drawers can be awkward to make and install. Not so for lipped drawers. Thin, fragile lips, however, may break off if a heavy drawer is slammed too hard.

Lips seal out smoke, dust and vermin. Homemakers of 200 years ago must have appreciated a new design feature that would help keep clothes cleaner.

Fig. B Sizing Drawer Sides

A half-tail at the top of a drawer looks awkward and unbalanced. To avoid an unbalanced look, check out the dovetail spacing of your jig first, then design your case. However, both joints will be plenty strong.



10 Glue up the drawer

with care. The drawer side and rabbet should end up flush.

The lip of the drawer prevents you from easily evening up the joint with a plane or belt sander, so the time it took to set up a perfect joint in the beginning pays off now!



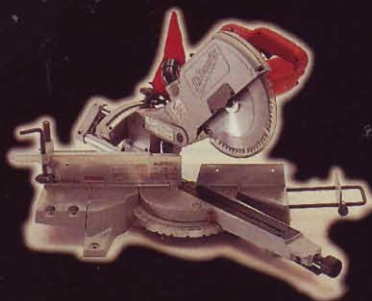
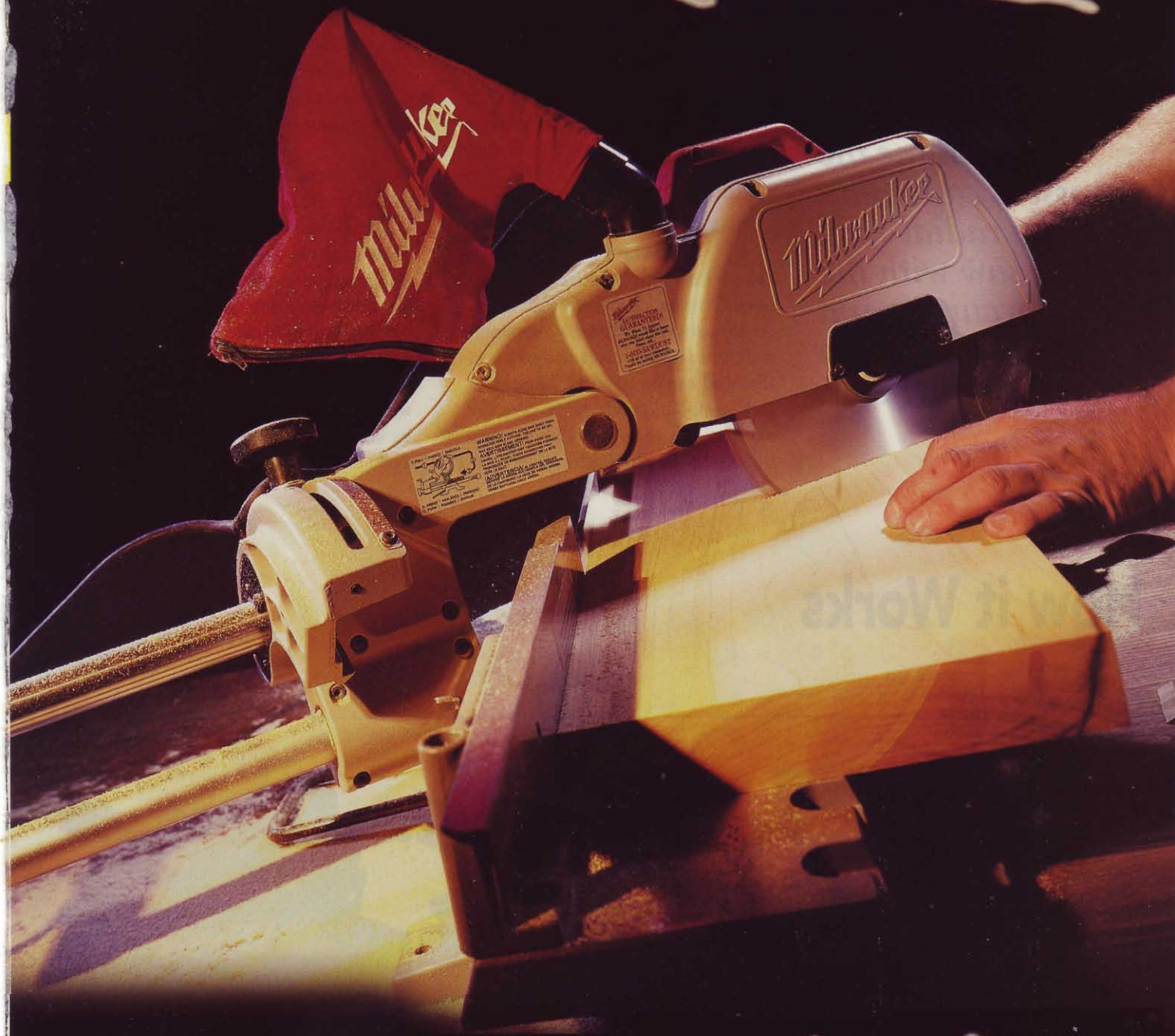
By George Vondriska

TOOL TEST

Compound SLIDE Miter Saws

In the shop or on the jobsite, these saws offer portability, large capacity and accurate cuts.





These saws combine the crosscut capability of a radial-arm saw with the accuracy and portability of a miter saw.

Compound slide miter saws are versatile machines. They combine the cutting capacity of a radial-arm saw with the accuracy of a miter saw. But, what matters most to you is how they perform in a woodshop, and that's what we looked at in this test.

What's a compound slide miter saw?

Take a compound-miter saw and mount it on a slide to increase its cross-cut capacity and you have a compound slide miter saw. Like a radial-arm saw, the head can be tilted for bevel cuts. But, compound slide miter saws are safer to use than radial-arm saws because you're not climb cutting (cut-

ting in the direction of the blade rotation, see "How it Works," below). Unlike a radial-arm, however, you can't rip or dado on these machines. But, that's a job best done on a tablesaw anyway.

Who needs one?

At two to three times the price of a miter saw, why pop the extra cash? Three reasons: Capacity, compound-angle capability and portability. These features have made compound slide miter saws the saw of choice for carpenters. For the same reasons, they are becoming popular with woodworkers who want an accurate saw that can also be used to trim the house or build a deck.

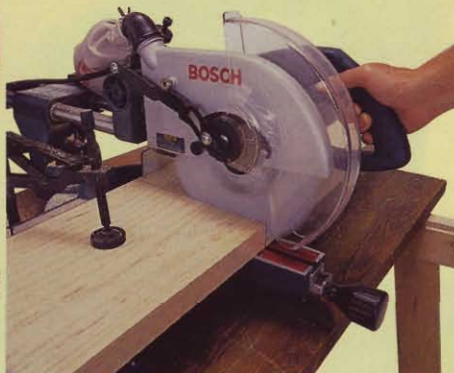
text continued on page 102

How it Works

On Wide Stock



1 Pull the head all the way toward you with the blade above your work and the motor off.



2 Squeeze the trigger and ease the blade down into the material.



3 Push the saw head away from you to cut through the piece.

On Narrow Stock

1. Lock the slide (all of these saws have slide locks), squeeze the trigger and ease the blade down into your work, just like a miter saw.

2. Release the trigger and wait for the blade to stop before allowing the head to come back up. This prevents the blade from grabbing small offcuts and flinging them around your shop or back at you!

Features

Here are some things we found important when comparing machines. Pick the group of features that best suits your needs. See the chart, pages 108 and 109, for details.

Blades

These saws come in four blade sizes. The larger the blade, the thicker the stock it can cut. We felt the 10-in. saws offered the best value. A top-dollar blade for your 10-in. compound

slide miter saw can also be used in your tablesaw. That beats having to buy odd-sized blades that fit only one machine. The 12-in. blades give you an extra 1/2-in. of thickness-cutting capacity, but they're more expensive to buy and sharpen.

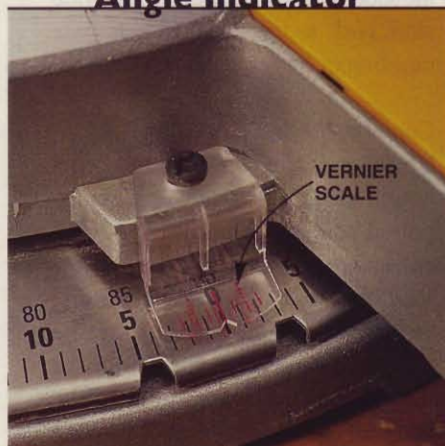
Speaking of blades, pay attention to the blade that comes with the saw. A 40-tooth, 10-in. blade is fine for framing walls, but not so good for framing granny's photo. Plan on spending an additional \$50 if your saw doesn't come with a high tooth-count blade (see the chart, pages 108 and 109).

Positive Angle Stops



Distinct positive angle stops where the pin firmly engages into a recess, such as on this Bosch saw, are best. As you're swinging the saw to the angle setting, the spring-loaded pin firmly drops into the recess. There's no question about whether or not you're in the right spot.

Angle Indicator



An easy-to-read angle indicator makes setting the saw quick and accurate. The DeWalt hairline cursor indicator shown here also has a vernier scale, allowing you to readily set to 1/4- and 1/2-degree increments.

Beveling



Setting the bevel is much easier with an easy-to-read scale. Go for a saw that bevels both left and right. This makes it much easier to do compound cutting.

Fence Height



A tall fence allows you to cut 3-1/4-in. crown molding the traditional way. While it's nice if the saw comes with a tall fence, this one's easy to work around by adding a wooden subfence, if needed.

Handle Style



Horizontal or vertical handles are your two choices on these saws. We recommend trying both to see what's comfortable for you. Our testing panel preferred the horizontal style and the Hitachi and DeWalt were voted the most "left-hand friendly."

Hold-Downs



Quick acting hold-downs are found only on the Bosch and Porter-Cable saws. They work like toggle clamps and are great for cutting lots of wood. All the other machines have hold-downs that must be screwed down.

Tool Test: Compound Slide Miter Saws

Is this tool for you?

If you can say yes to these questions (especially the last one) consider yourself in the market.

- ☐ I need more capacity than a miter saw offers.
- ☐ I need to bevel cut wide material.
- ☐ I want portability.
- ☐ I need to do compound cuts.
- ☐ I'm ready to spend some money.

text continued from page 100

Capacity:

All but two of the saws we tested could crosscut 11-1/2-in. or wider stock. Miter saws, even with 12-in. blades, max out at about 8 in. That means you can use compound slide miter saws to crosscut narrow carcasses, like bookcases. Marry the tilting head to the slide, and you can bevel some wide stuff, such as the ends of wide base molding or box corners.

Compound-Angle Capability:

Don't forget the compound in compound slide miter saws. Cutting compound angles means cutting a bevel and an angle at the same time. Simply set the bevel cut by leaning the cutting head to the desired angle, then set the miter angle on the table. A number of these saws allow you to bevel the head left and right, something no

tablesaw or radial-arm saw can do. This means you won't have to cut one board on its face and the other on its back in order to complete a mitered corner.

Portability:

This is an important feature. You can crosscut some big stuff on a tablesaw if you use a sled (AW #75, October 1999, page 38) or a well-tuned miter gauge. But you may not be able to use your tablesaw if you need to do accurate crosscutting outside the shop, when putting up trim around the house or working on a deck, for example. While they can be cumbersome to haul around, they're far more portable than tablesaws or radial-arm saws.

Features

Bevels Both Left and Right



It's a great feature to be able to bevel both to the left and to the right. Angle-mounted motors and belt drives keep the motor out of the way when leaning the blade over to the motor side.



Rear Blade Guard



A unique feature of the Hitachi C10FS is this guard that supports the cut. It provides a line-of-cut indicator, making it easy to align and cut to pencil marks. Also, small offcuts can't get caught by the spinning blade and tossed around the shop.

A number of these saws allow you to bevel the head left and right, something no tablesaw or radial-arm saw offers.

Why wouldn't I want one?

- They're expensive (but you get a lot of saw for your buck). See chart, page 108, for prices.
- They take up a lot of space (see the chart). It's not just the width of the machine, it's also the depth. You need a 30- to 36-in.-deep bench to accommodate the slide mechanism. Even with that, the handle on the front of the saw projects past the front of the bench.
- They're cumbersome beasts to handle. While portability is an advantage, their size and weight (see chart) make them awkward to carry.

Are They Accurate?

In order to make a definitive statement about the accuracy of one make of saw over another, we would have to test a hundred saws of each make and model.

What we do know from our tests is:

- All the saws made perfect 90-degree cuts once the blade and fence were aligned according to the manual.
- Most of the saws had some inaccurate preset angle stops. If need be, you can release the preset and tweak the angle position to get the precise cut you need.
- All the saws can produce accurate cuts, but the preset angle stops may be off.

Contact the manufacturer if you get a saw that isn't performing up to snuff (like we did). In general, you'll find these saws highly accurate for most shop work.

Cordless Saws



Battery-driven tools are everywhere, including the world of compound slide miter saws.

Makita's 18-volt model is an expensive tool at \$480. The relatively low rpm of the motor results in a fairly poor surface finish. Stick with a thin-kerf blade to save battery power.

If I were still in construction, I might buy this tool. Extreme portability is its greatest asset. Up on a scaffold cutting siding, it'd be great. But it hasn't earned a place in the average woodworking shop yet.

Editor's Note: Makita has just introduced a new 24-volt version of this saw; the BLS712SE. The bigger battery yields more cuts/charge as well as a 15-percent increase in rpm over the 18-volt model. Expect to see it in the stores by December.

Tool Test: Compound Slide Miter Saws

Top 5 Saws

Here are the finalists from our tool test. All five are excellent saws. The Editors' Choice went to the Makita LS1013 because it has the most features for the buck, especially the left and right bevel feature. In fact, the price is so competitive we didn't pick a separate Best Buy.



Makita LS1013
\$520



A nearly perfect saw with great features. The only thing we'd add is the preset override like the Bosch and Milwaukee. Great features at a great price.

Pros

- ✓ Bevels left and right
- ✓ Very good blade
- ✓ Firm positive stops
- ✓ Nice fence
- ✓ Smallest footprint of the top five

Cons

- ✓ Short table



Bosch B3915
\$500

A good value for the price, the Bosch was our runner-up. This saw has very distinct preset angles and can angle up to 60 degrees. The large table simplifies supporting your material.

Pros

- ✓ Angles up to 60 degrees
- ✓ Good blade
- ✓ Tall fence
- ✓ Long table

Cons

- ✓ Bevels only one way
- ✓ Preset angle-release trigger a possible pinch point



DeWalt DW708
\$600

Lots of capacity for even the largest stock. Both the bevel and angle indicators are very easy to read. The high fence simplifies supporting crown molding.

Pros

- ✓ Cuts a 60-degree angle
- ✓ Tall fence
- ✓ Good angle and bevel indicators
- ✓ Bevels left and right

Cons

- ✓ Heaviest saw
- ✓ Dust bag and hold-downs cost extra



Hitachi C10FS
\$550

One of only two 10-in. saws that bevels left and right. The adjustable guard behind the blade offers excellent support, provides a line-of-cut indicator and prevents small offcuts from being flung by the spinning blade.

Pros

- ✓ Bevels left and right
- ✓ Great soft-start and brake
- ✓ Rear blade guard for supporting work and providing line-of-cut support

Cons

- ✓ Spongy positive stops
- ✓ Hard-to-read angle scale



Makita LS1212
\$700

This saw comes with a very good blade. It angles up to 60 degrees and has one of the highest-amp motors in the group.

Pros

- ✓ Great blade
- ✓ Positive stops firmly engage
- ✓ Nice fence
- ✓ High-amp motor
- ✓ Bevels left and right

Cons

- ✓ No angle presets for compound cuts

Tool Test: Compound Slide Miter Saws

Manufacturer and Model #	Cost	Blade Size/ Tooth Count	Left and Right Tilt	Distinct Positive Stops	Angle Pointer	Bevel Pointer	Fence Height*	Handle Style†	Quick Release Hold-Downs	Footprint=	Max Width of Cut, in inches
Bosch B3915	\$500	10"/60 tooth	N	Y	G	G	Y	V	Y	41-1/4 x 26-1/2	12
Craftsman 21292	\$580	12"/40 tooth	N	N	G	G	Y	H	N	45-1/2 x 23	12-5/8
Delta 36-240	\$430	10"/40 tooth	N	N	E	G	Y	H	N	34-1/2 x 27-1/4	11-1/2
DeWalt DW708	\$600	12"/60 tooth	Y	Y	E	E	Y	H	N	44-1/2 x 23-1/2	12
Hitachi C8FB-2	\$450	8 1/2"/24 tooth	N	N	F	F	N	V	N	39 x 21-1/4	12
Hitachi C10FS	\$550	10"/40 tooth	Y	N	F	F	N	V	N	43 x 21-1/2	12-1/4
Makita LS711DWBK	\$500	7-1/2"/40 tooth	N	Y	G	F	N	V	N	30-1/2 x 17	7-1/8
Makita LS0711	\$415	7-1/2"/40 tooth	N	Y	G	F	N	V	N	30-1/2 x 17	7-1/8
Makita LS1011	\$420	10"/64 tooth	N	N	F	F	N	V	N	31 x 20-1/2	12
Makita LS1013	\$520	10"/64 tooth	Y	Y	G	G	Y	V	N	39 x 21	12
Makita LS1212	\$700	12"/96 tooth	Y	Y	G	G	Y	V	N	39 x 23-1/2	12-1/4
Milwaukee 6496-6K	\$550	10"/40 tooth	N	Y	F	G	Y	V	N	37 x 25	12-3/8
Milwaukee 6497-6K	\$600	10"/80 tooth	N	Y	F	G	Y	V	N	37 x 25	12-3/8
Porter-Cable 3807	\$500	10"/40 tooth	N	Y	G	G	N	H	Y	36 x 22	11-1/2
Tradesman 8336	\$370	8-1/2"/40 tooth	N	Y	G	G	Y	V	N	49 x 21-1/2	12

* Fence height is adequate for cutting 3-1/4-in. crown ** volt battery E=Excellent; G=Good; F=Fair †V=Vertical, H=Horizontal ‡Depth needed to accommodate rail travel

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10" x 80 T (1/8" or 3/32" K)	\$169	\$143	\$135
12" x 80 T (3/8" or 1" hole, 1/8" K)	181	163	154
14" x 80 T (1" hole)	187	177	168
14" x 100 T (1" hole)	326	203	192
16" x 100 T (1" hole)	243	219	206

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Buy any sawblade or dado in this ad and save 10% off the sale prices. Buy additional sawblade(s) or dado(s) and save even more—15%! Sale good through December 31, 2000.

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Special 10% Discount! Take 15% off second blade of your choice.

EDITOR'S CHOICE AND TOP RATING OVER 18 COMPETING SAW BLADES.

The 10" x 40T earned the Editor's Choice Award for the best performance regardless of the price. See American Woodworker magazine, April 1998, pp. 68-69.

	Sale Price	10% Off 1st Blade	15% Off 2nd Blade
14" x 40 T x 1"	\$148	\$134	\$127
14" x 30 T x 1"	138	125	118
12" x 40 T x 1"	128	116	110
12" x 30 T x 1"	118	107	101
10" x 40 T x 1/2" or 3/4"	118	107	101
10" x 30 T x 1/2" or 3/4"	98	89	84
9" x 40 T	108	98	93
9" x 30 T	98	89	84
8 1/4" x 40 T x 1/2"	98	89	84
8" x 40 T x 1/2"	98	89	84
8" x 30 T x 1/2"	88	80	78
7 1/4" x 30 T x 1/2"	68	62	59
**6" x 40 T x 1/2"	88	80	78
***5 1/4" x 40 T x 10mm	88	80	78

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	Sale Price	10% Off 1st Blade	15% Off 2nd Blade
6 1/2" x 40 T Delta, Sidekick, & Others	\$98	\$89	\$84
8 1/4" x 60 T Sears, Delta, Ryobi	108	98	93
8 1/2" x 60 T Hitachi, Dewalt, Ryobi, FreudTR125	118	107	101
9" x 80 T Delta & Others	128	116	110
10" x 80 T Delta, Bosch, Mitachi, Makita, Ryobi, AEG, & All	138	125	118
12" x 80 T Dewalt, Hitachi, Makita, B-D, Sears, & All	148	134	127
14" x 100 T Makita, Ryobi	188	170	161
15" x 100 T Hitachi, Ryobi	198	179	169

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Designed for radial arm or tablesaws—fine crosscut.

	Sale Price	10% Off 1st Blade	15% Off 2nd Blade
8", 8 1/4", 7 1/4" x 60T	\$108	\$98	\$87
10" x 60 T (3/8" hole)	128	116	103
12" x 60 T (3/8" or 1")	138	125	111

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8" Set	299	260	245
10" Set	349	314	297
12" Set	449	404	382

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"EASY-FEED" STANDARD DADO
For solid hard and soft woods only! (No plys, no melamine!) 8" D. with positive hook 24 tooth blades & 2 tooth chippers and shims. Cuts 1/8" to 29/32" wide.
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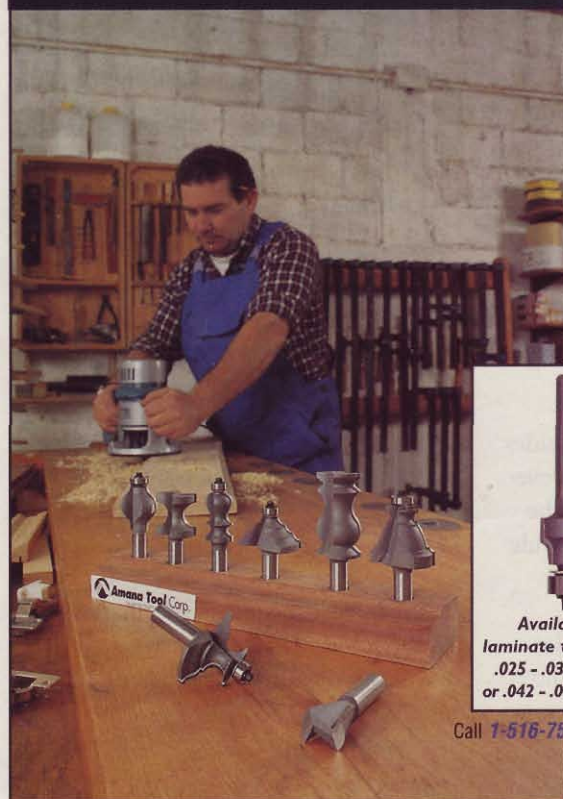
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4	8-3/4	15	53	Saw jumps noticeably on start-up and shut-down.	Sears retailers
3-5/8	8	15	55	Longest table in group. Angle scale tends to get covered with sawdust.	(800) 438-2486
4-3/4	8-1/2	13	61	Tall fence on both sides. Add \$15 for a dust bag. Angle scale tends to get covered with sawdust.	(800) 433-9258
2-9/16	8-5/8	9.5	45	Awkward bevel lock.	(800) 706-7337
3-3/8	8-11/16	12	50	Awkward bevel lock.	(800) 706-7337
2	5	18**	26	Not comparable in performance to electric saws.	(800) 462-5482
2	5	10	35	Good value, crosscut capacity is small.	(800) 462-5482
2-15/16	8-7/16	12	41	Lots of preset angles. Hard to change blade.	(800) 462-5482
3-5/8	8-1/2	13	55	Very good blade.	(800) 462-5482
3-7/8	8-1/2	15	55	Excellent blade.	(800) 462-5482
3-5/8	8-3/4	15	55	Positive stop override. Hold-down on left only.	(262) 781-3600
3-5/8	8-3/4	15	55	Same as 6496-6K with dust bag and better blade.	(262) 781-3600
3-5/8	8	15	54	Easy blade change. Narrow table awkward for wide stock.	(800) 487-8665
2-9/16	8-1/2	10	50	Economical tool. Locks are close together and hard to handle.	(800) 243-5114

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Hollow Turning Steady Rest

If you've conquered turning spindles, legs and bowls and are looking for a new challenge, Dan Henry's jumbo lathe steady rest will help expand your horizons. It allows you to shape tall, hollowed-out pieces

like vases by using non-marring inline skate wheels to steady the unchucked end of the piece while you hollow it out. Unlike normal steady rests, it's not designed for supporting very thin spindles.

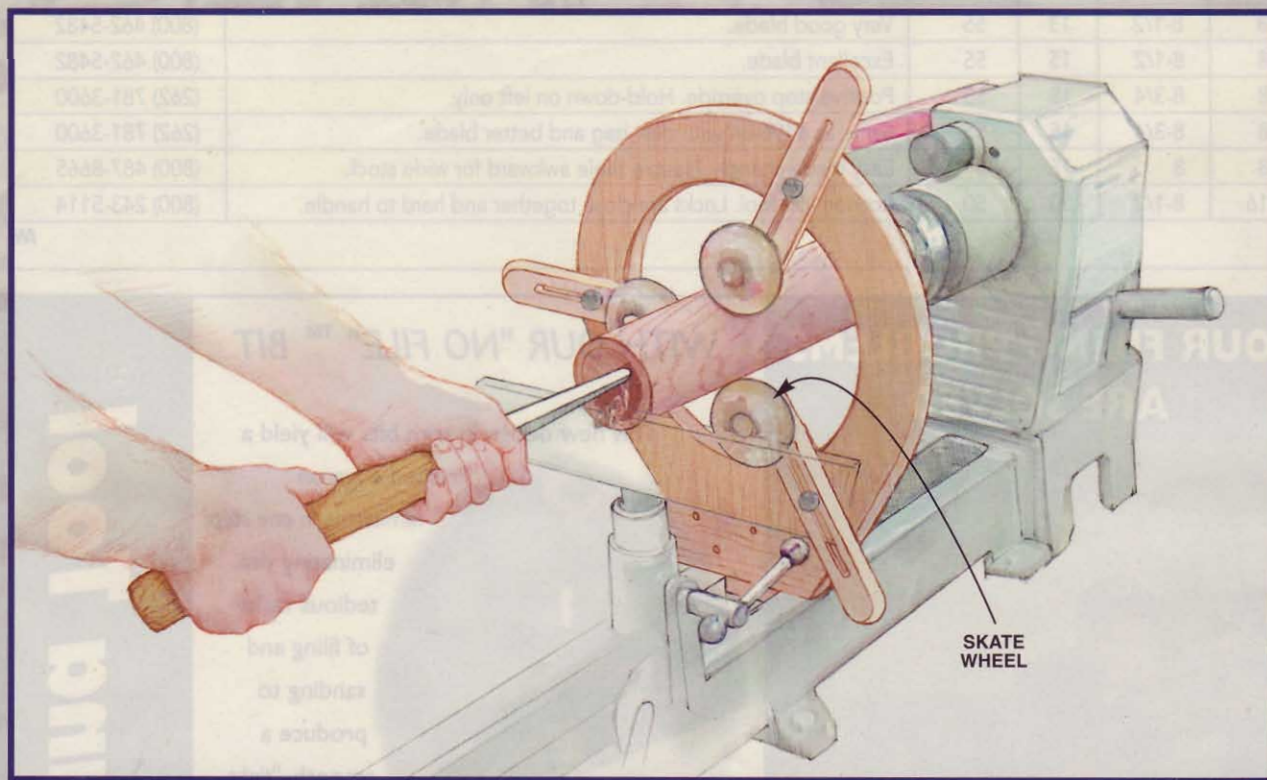


FIG.A Steady Rest for Hollow Turnings

STEP 1 Laminate two pieces of 3/4 in. x 15 in. x 15-1/2-in. MDF together for the main ring of the jig. The outer shape of the ring is a 15-in. circle. The tapered base is formed by 40-degree angles coming from the 6-7/8-in. flat base. Cut the outer shape and the inner 11-in. circle with a bandsaw.

STEP 2 Ease the edges on both sides of the ring with a 1/4-in. round-over router bit. Then, on one side of the ring, cut 1/8-in. dia. x 1-1/4-in. wide guide slots for the roller arms.

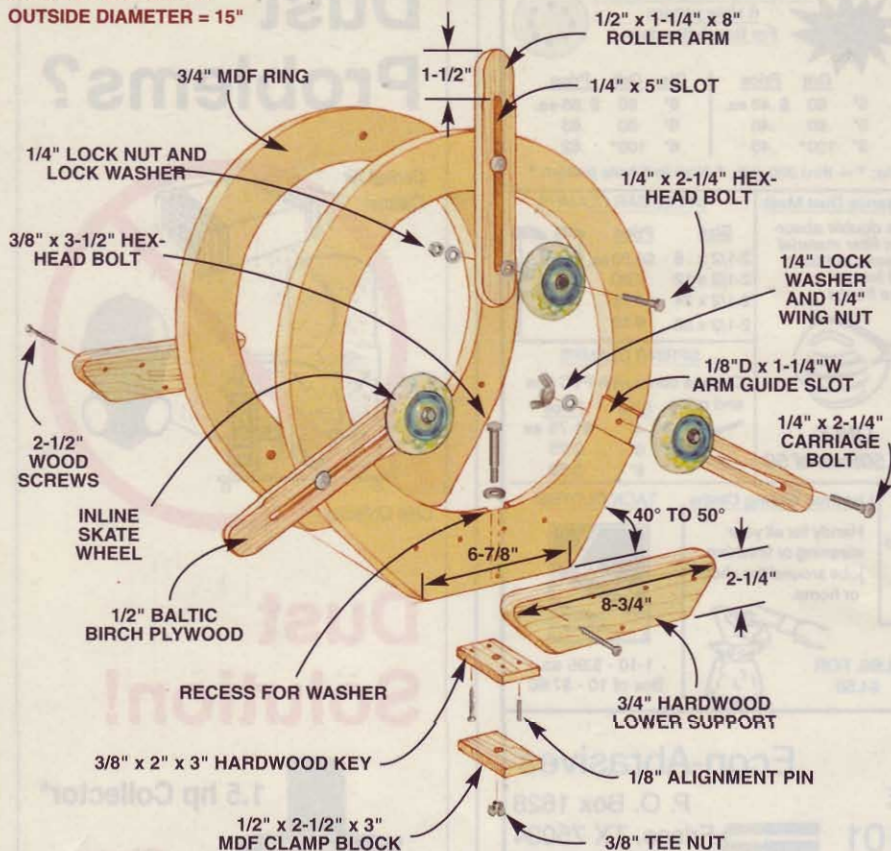
STEP 3 Cut 1-1/4 in. x 8-in. roller arms from 1/2-in. Baltic birch and rout a 1/4 in. x 5-in. slot in the center

of each. Make each slot a bit oversized to let it slip easily on the 1/4-in. bolt. Round the ends of each arm and drill a 1/4-in. hole for the roller bolt.

STEP 4 Place the roller arms in their slots and drill 1/4-in. holes in the ring for the carriage bolts that hold the arms in place.

PROJECT IDEA: DAN HENRY • ART DIRECTION: DAVID FARR • ILLUSTRATION: MELANIE POWELL • PHOTOGRAPHY: SEAN MCCOY

INSIDE DIAMETER = 11"
OUTSIDE DIAMETER = 15"



Blue Highway Tips

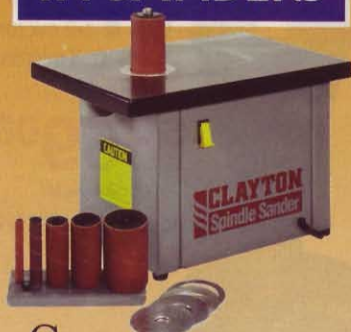
STEP 5 Shape the 3/4 in. x 2-1/4 in. x 8-3/4-in. hardwood lower supports. Attach each support with five 2-1/2-in. flat-head wood screws.

STEP 6 Install the 3/8 in. x 2 in. x 3-in. hardwood key (sized to fit your lathe) in the center on the bottom of the base. Drill a 3/8-in. hole through the center of the base for the 3-1/2-in. hex-head bolt that clamps the jig to your lathe.

STEP 7 Make the 1/2 in. x 2-1/2 in. x 3-in. clamping block (sized to fit your lathe) and install the 3/8-in. tee nut. Secure an alignment pin (a wood screw with the head cut off works) in the key and drill a companion hole in the clamping block.

FIG. B
Steady Rest Dimensions

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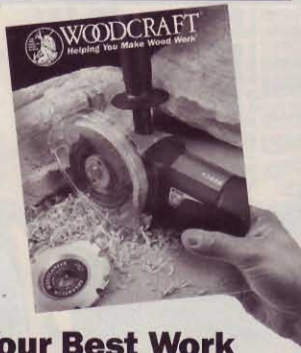
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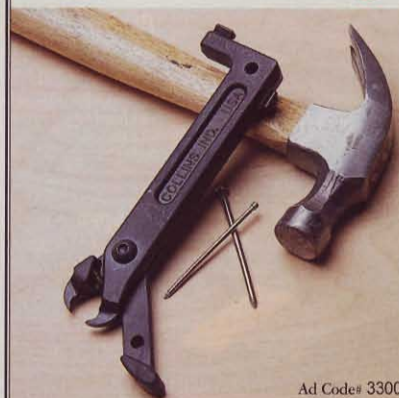
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STEP 8 Attach the rollers to the roller arms with the 1/4 in. x 2-1/4-in. hex-head bolts and use a flat washer on both sides of the arm. Attach the roller arms to the ring with carriage bolts and wing nuts. **AW**

Materials List

- A 16 x 30-in. piece of 3/4-in. MDF (medium density fiberboard)
- B Three 1-1/4 in. x 8-in. pieces of 3/4-in. Baltic birch plywood
- C Two 2-1/4 in. x 8-3/4-in. pieces of 3/4-in. hardwood
- D 3/8 in. x 2 in. x 3-in. piece of hardwood
- E Three inline skate wheels
- F One 3/8-in. tee nut
- G Three 1/4 in. x 2-1/4-in. carriage bolts
- H Three 1/4 in. x 2-1/4-in. hex-head bolts
- J Ten 2-1/4-in. flat-head wood screws
- K One 3/8 in. x 3-1/2-in. hex-head bolt
- L One 3/8-in. flat washer
- M Six 1/4-in. flat washers
- N Three 1/4-in. locking washers
- P Three 1/4-in. locking nuts
- Q Three 1/4-in. wing nuts

Travel Log

When American Woodworker hit the road earlier this year to visit one on one with woodworkers, we confirmed a suspicion we often entertain: woodworkers are anything but selfish! In city after city and shop after shop, every woodworker we met enthusiastically shared their best ideas with us and each other. The best example of this occurred in Dallas at a meeting of the North Texas Woodworkers Association. At this meeting, about 50 woodworkers spent over two hours sharing their latest shop lessons and inventions. It's also where we found Dan Henry and the lathe steady rest you see here. Clearly, it pays to get involved in your local woodworking club. So, if you're not a part of one already and want to grow your shop skills, get on the Internet or ask folks at local woodworking stores for contact information.



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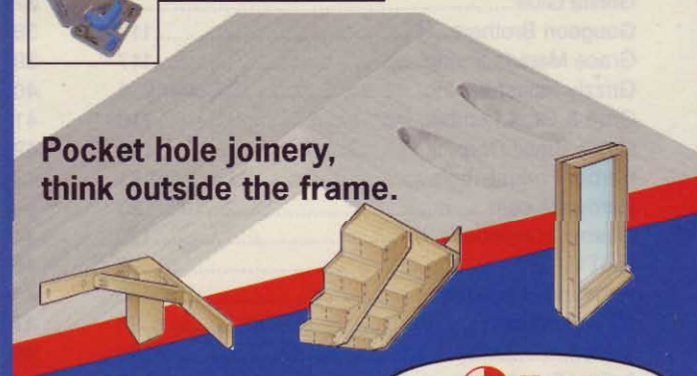
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Jig for Tapered Legs

Like most things in woodworking, tapered square legs can be made several ways. You can cut them on the tablesaw, but the sawn surfaces then need to be cleaned up. You can taper them on the jointer, but it can be difficult to get all four legs to match. Or you can use the planer, which I find the fastest and easiest.

To taper legs on the planer, put all four legs on this easy-to-make sled. One end of the legs is elevated by riser strips (see photo). First the legs are run through with one riser strip in place. Then, the legs are rotated 90 degrees and another face is cut. The legs are rotated another 90 degrees, but because the bottom side is now tapered, the second riser strip must be added. The third side is planed down, the legs rotated one last time, and finally the fourth side is planed down.

The only tricky part is figuring out the dimensions of the riser strips. The best way is shown in the illustration, below right. Cut the legs to their final length and draw the two tapered cuts on one side of one leg. Then shim up the end of the leg so the taper line you've drawn is parallel to the sled surface. After you've cut one taper, go through the same process to determine the thickness of the second riser strip.

AW

Jean Bartholome, Summit, NJ

If you have an original Shop Solution, send it to us with a sketch or photo. We pay \$200 for each one we print. Send to: Shop Solutions, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121. Submissions can't be returned and become our property upon acceptance and payment.

