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for "Power Users"

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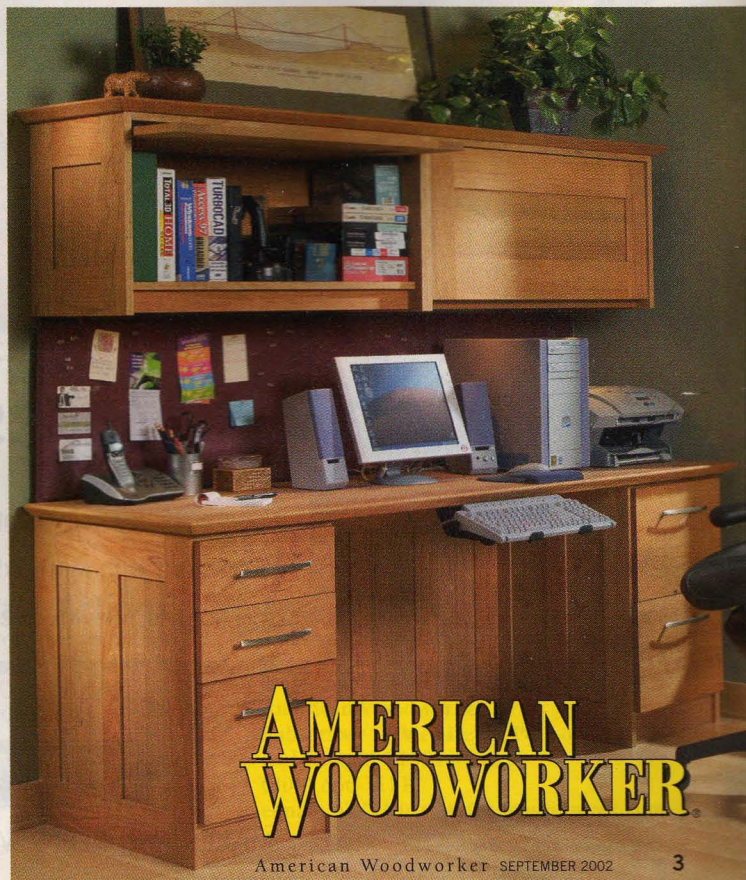
Contemporary Bookcase 76

You'll want one in every room! Fresh, clean lines and sturdy construction make this bookcase darn close to perfect.



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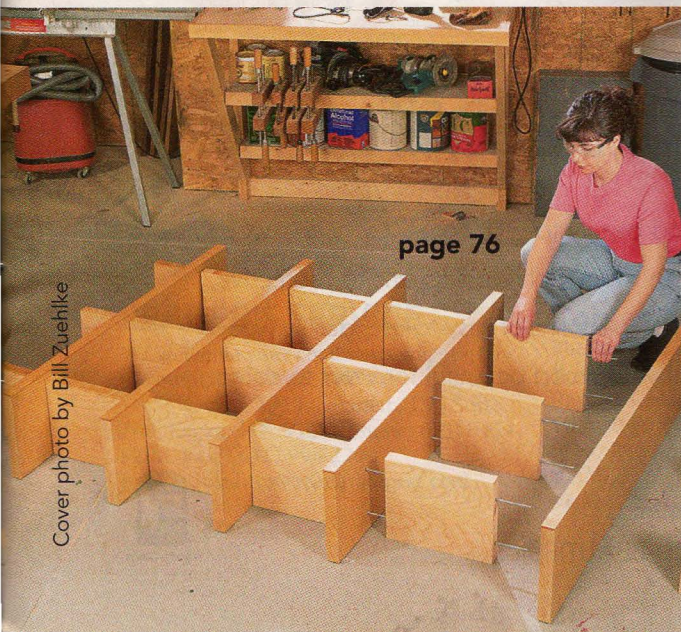
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Cover photo by Bill Zuehlke

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READER'S SERVICE

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Editor's Letter

Back In the Saddle

As you've probably noticed, a few issues back we changed the way American Woodworker is bound. We went back to the so-called "saddle-stitch" binding that the magazine had from its beginning until 1998.

There are a number of advantages to saddle stitching, but a big one for us is that it makes it easier to use the center of the magazine for special supplements, like the Frame and Panel Door poster we ran in the February '02 issue.

There's one disadvantage, however: the spine doesn't carry the issue number and date, so it's harder to file your back issues. We refer to our back issues constantly, so we've come up with some "Workshop Tips" to help us stay organized.

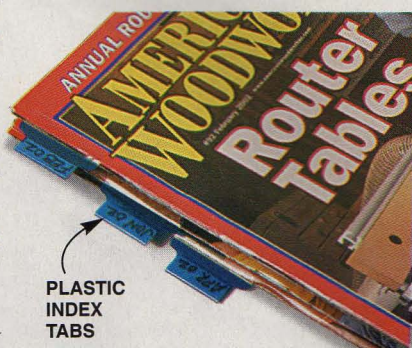
The first two are index tabs, made by Avery, the label folks. The ones on top (11 cents apiece) are heavy-duty gummed fabric, the second are the classic school notebook tabs (15 cents each). Both are color-coded for easier filing. The third one is simple: cut the metal strip from a hanging file folder and insert it in the middle of the magazine. This lets you easily file the issues in a file drawer, at a cost of only 10 cents each. The last approach is plastic inserts, available at office supply stores for around 30 cents each. These allow you to file the issues in 3-ring notebooks. Which one's best? We don't know yet. We're using all of them in an informal "Tool Test."

If you've got any other solutions I'd love to hear about them.

Ken

Ken Collier

aweditor@readersdigest.com



Question & Answer

Do Blade Stiffeners and Stabilizers Really Help?

Q. I'm trying to get a super-smooth cut on my contractor's saw. I've seen blade "stabilizers" for sale. Do they work?

Lucas Phiffer

A. Two devices can help both standard and thin-kerf blades make smoother cuts: a blade stiffener (at right) or a pair of blade stabilizers (below). Their names are often interchanged but they're actually very different accessories.

Stiffeners cost about \$15, while stabilizers cost about \$20 per pair (see Sources, page 108).

Before you buy either one, make sure your saw is properly set up. The blade and fence must be parallel to the miter slot. Upgrade your pulleys and belt (see AW #91, page 41). Use a high-quality blade and make sure it's clean and sharp.

(Stiffeners and

stabilizers improve average-quality blades more than high-quality ones.)

If your cut still isn't smooth enough, buy a stiffener or stabilizer. By virtue of their larger diameters and added mass, both reduce the amount of vibration the motor, pulleys and arbor pass on to the blade.

A stiffener is a precision-ground, flat disc. It's far easier to add than stabilizers. It goes right on top of the blade, behind the arbor washer. You may lose 1/4-in. depth of cut.

Stabilizers replace or supplement the arbor washers on either side of the blade. Most outer arbor washers are simply stamped steel, and may not run true, but stabilizers are machined flat. If your inner arbor washer is also stamped steel, slide it off and replace it with one of the stabilizers. If you can't remove it, place one stabilizer on top of it.



Blade stabilizers are used in pairs, one on either side of the blade. In effect, they're oversized, precision arbor washers.



The big downside to thick stabilizers is that the inner piece pushes the blade farther out on the arbor. You must adapt your saw to fit the new position of the blade. The spot in your saw's throat plate may not line up with the blade. If it doesn't, substitute a zero-clearance insert (see "Zero-Clearance Inserts," page 50). Shift the splitter on your blade guard so it lines up with the blade. In addition, realign the cursor and scale on your fence.

Question & Answer

How Tight Does My Blade Have to Be?

Q. I have a heck of a time loosening the arbor nut when I switch blades on my tablesaw. How hard do I really have to crank on that nut when I tighten it?

Henry Gilbertsen

A. Don't knock yourself out tightening that arbor nut! It only has to be snug.

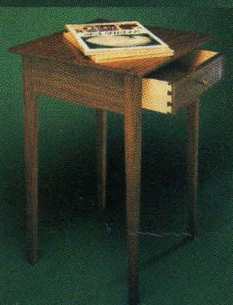
Every saw's arbor is threaded so the nut will self-tighten. The arbor on a right-tilt saw is a left-handed thread; on a left-tilt saw it's a right-handed thread, just like a standard screw or bolt.

For either saw, the force of the blade will tighten, not loosen, the nut as the blade is spinning. It's highly unlikely the nut will come loose from inadequate tightening, so there's no reason to crank down on it with a ton of force.



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What Does "Made in USA" Really Mean?

Q. I don't know if woodworking machines made in the United States are any better than those made overseas, but given the choice, I'd like to support American factory workers. How can I be sure that a machine is actually made here at home?

Billy Tesch

A. Look for a label with these exact words: "Made in USA." Manufacturers must follow very strict guidelines established by the Federal Trade Commission (FTC) in order to legally use this label.

According to the FTC, "Made in USA" means that "all or virtually all" of the product, including all significant parts, processing and labor, must be made in the United States.

Watch for variations in the wording. "Made in USA" cannot be applied to a machine that was merely assembled

in the United States, according to the FTC. However, the label on that machine could be qualified to read "Assembled in

USA." A machine labeled "Made in America" or "Built in USA" must meet the "Made in USA" standard.

Pay attention to what part of a machine a "Made in USA" label is attached. The label may be printed on an accessory that actually is made here (such as a tablesaw fence) when the machine itself is made overseas.

The FTC does not pre-approve "Made in USA" advertising or labeling claims. They rely on the integrity of each company, the

watchful eye of consumers and a formal complaint process to make sure these claims are honest and truthful. If you have a complaint, call the FTC at (877) FTC-HELP or go to www.ftc.gov.



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Question & Answer

Should I Run My Tablesaw on 120 or 240 Volts?

Q. My contractor's saw pops a breaker every once in a while, and that's driving me crazy. I noticed that its motor can be wired for either 120 or 240 volts. I don't have a 240 circuit in my shop yet. Do I have to install one or is there something else I should try first?

Lawrence Bennet



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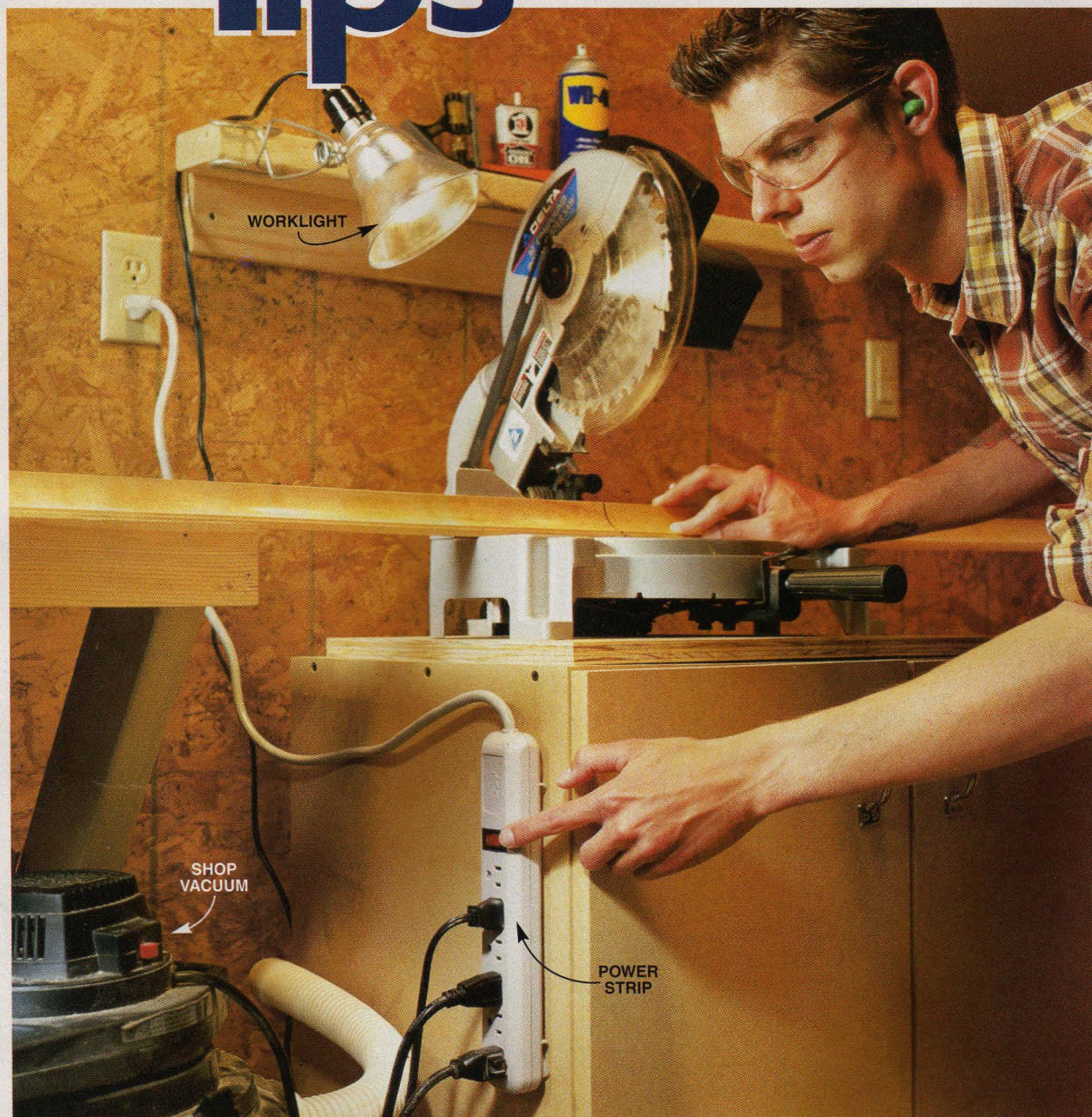
A. Rewiring your motor and upgrading the circuit to 240 volts will solve your breaker problem, improve the motor's performance and extend its working life. However, it won't increase the horsepower of your motor.

Before you rewire your motor and shop make sure your saw is getting as much power as it can. Don't run any other machines or lights on the same circuit as the saw. If your saw must be connected to an extension cord, replace the cord with one that's shorter and made with heavier gauge wire.

Finally, see if the amp draw of your motor exceeds the capacity of your 120-volt circuit. A sound rule of thumb is that the full-load amps (FLA) of your motor should be equal to or less than 80 percent of your circuit breaker rating, or 12 amps for a 15-amp circuit and 16 amps for a 20-amp circuit. (A motor's FLA is written on its nameplate in a box marked Amps. FLA is generally two numbers, such as 12/6. The first number is the amp draw at 120 volts, the second at 240 volts.)

If your motor exceeds this guideline, and popping your breaker is still a problem, your best bet is to rewire the motor to 240 volts. It may only involve switching a few wires inside the motor and replacing the plug. Then consult a licensed electrician about adding a 240-volt circuit to your shop. **AW**

Workshop Tips

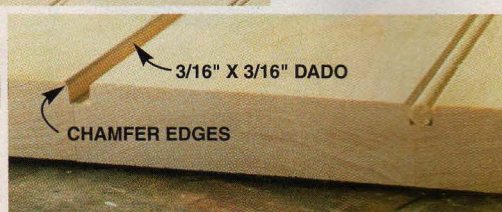
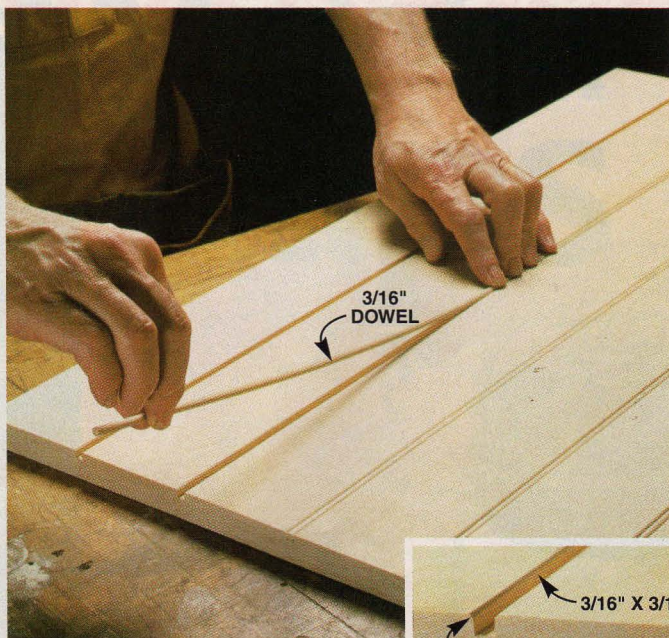


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One-Switch Chop Saw Station

I decked out my chop saw station with a shop vacuum for dust collection and a shop light so I can see where I'm cutting. It worked great except for one thing: I had to flip two switches just to make one cut. The solution was simple. I bought a power strip, with keyholes for mounting, for about \$6 at the hardware store and plugged everything into that. Now when I want to make a cut, I flip a single switch on the power strip and my chop saw station springs to life. No more fumbling around.

Ken Collier



A Bead in any Board

I wanted an antique beadboard look for my cabinet doors, but stock beadboard didn't work out with my door size. Here's what I came up with: I glued up a solid door and cut 3/16-in. x 3/16-in. dados at each glue joint. Then I chamfered the edges with a sanding block (or you could use a plane). Finally, I ran a thin bead of glue in the bottom of the dados and laid in 3/16-in. dowels. Could it be any simpler? Now I can have any width beadboard I need and I'm not limited to the wood species available at the lumberyard. I have a few more ideas to try; like using rope instead of dowels.

Robert Holzer Jr.

Sources See Page 108

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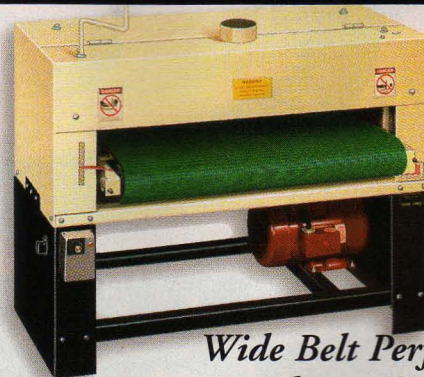


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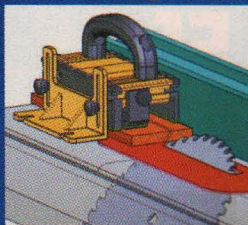
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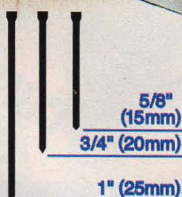
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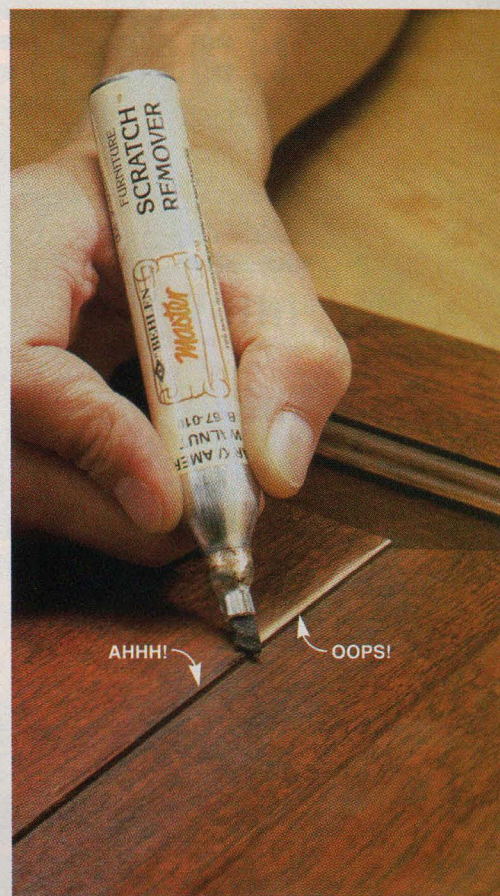
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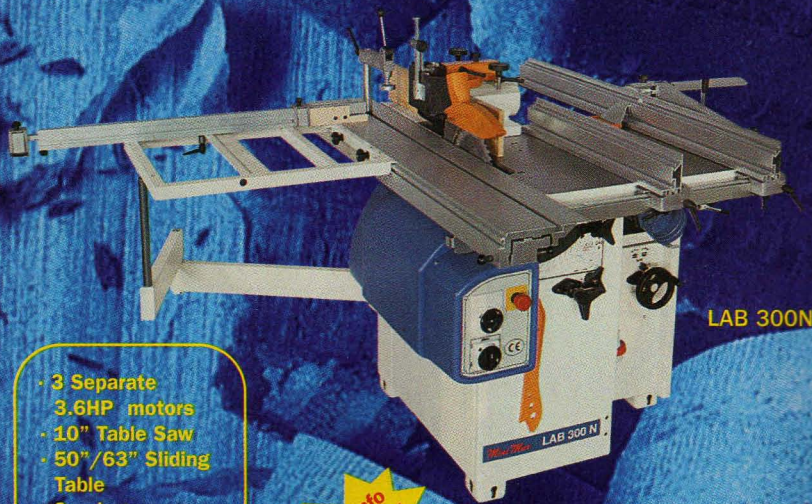
Aaaargh! It's so easy to sand through the finish on an edge and it always seems to happen when I'm ready for the last coat of varnish. Here's a quick and easy fix. Grab a touch-up marker and run it along the sand through. It'll make your mistake virtually invisible. The marker dries instantly so you can put that final coat on right away. Available in a wide variety of shades and colors, these markers are designed to blend scratches and minor sand throughs into the finish.

David Radtke

Sources See Page 108

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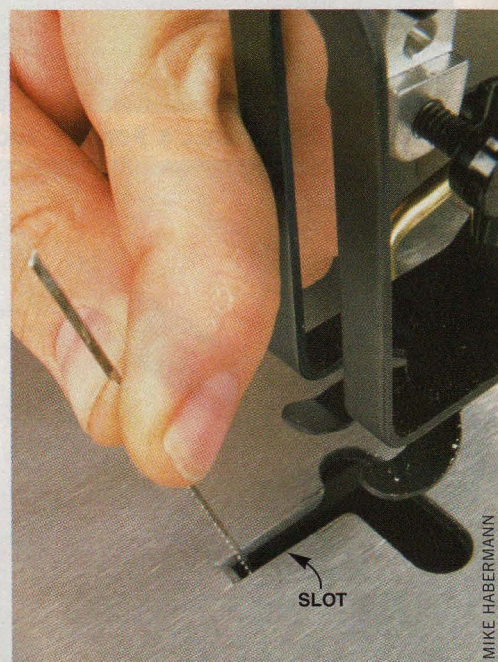
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Workshop Tips



SLOT

MIKE HABERMANN

Cut a Slot for Easy Blade Threading

I made blade threading on my scrollsaw a whole lot easier by cutting a slot in the table with a hacksaw. Use a hacksaw blade holder that leaves one end of the blade free. You can buy one at a home center or hardware store for about \$7.

Scrollsaw patterns often call for a shape to be cut out from the middle of a pattern, like the hole in a doughnut. To accomplish this you must remove the blade from the saw, thread it through a small hole drilled through the pattern, and reattach the blade. If you have a lot of cutouts to do, this can be a real pain. A slot cut in the table allows the blade to tip forward for easy threading. Now, instead of completely removing the blade, I only have to detach the blade from the top holder.

Pat Spielmann

AW

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For all but the most demanding operations, a top-quality combination blade is the best choice for everyday use in your table saw. It'll rip and crosscut solid wood, plywood, particleboard and MDF almost as well as separate, dedicated blades.

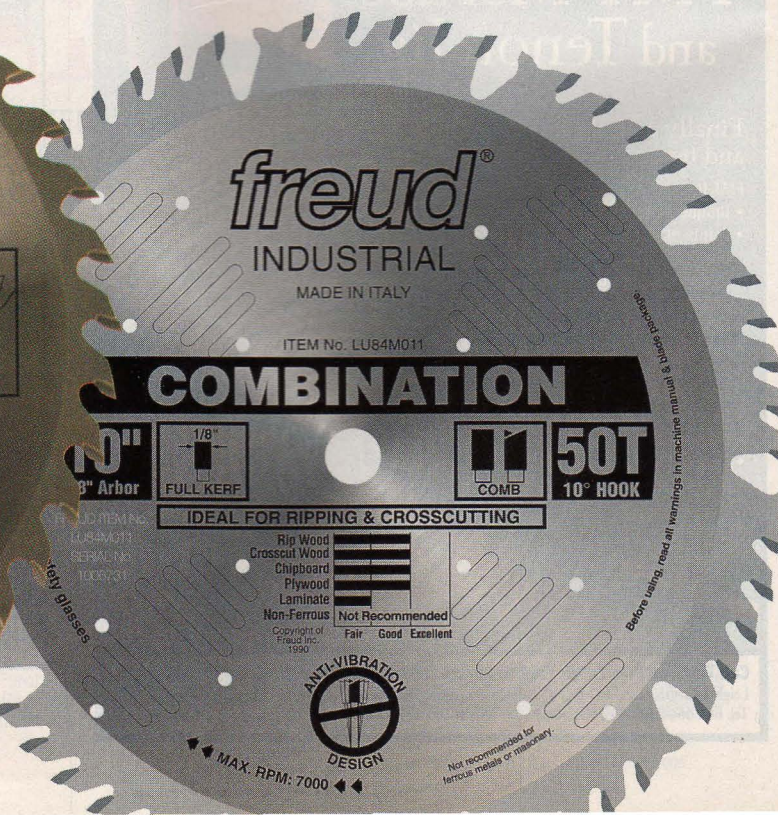
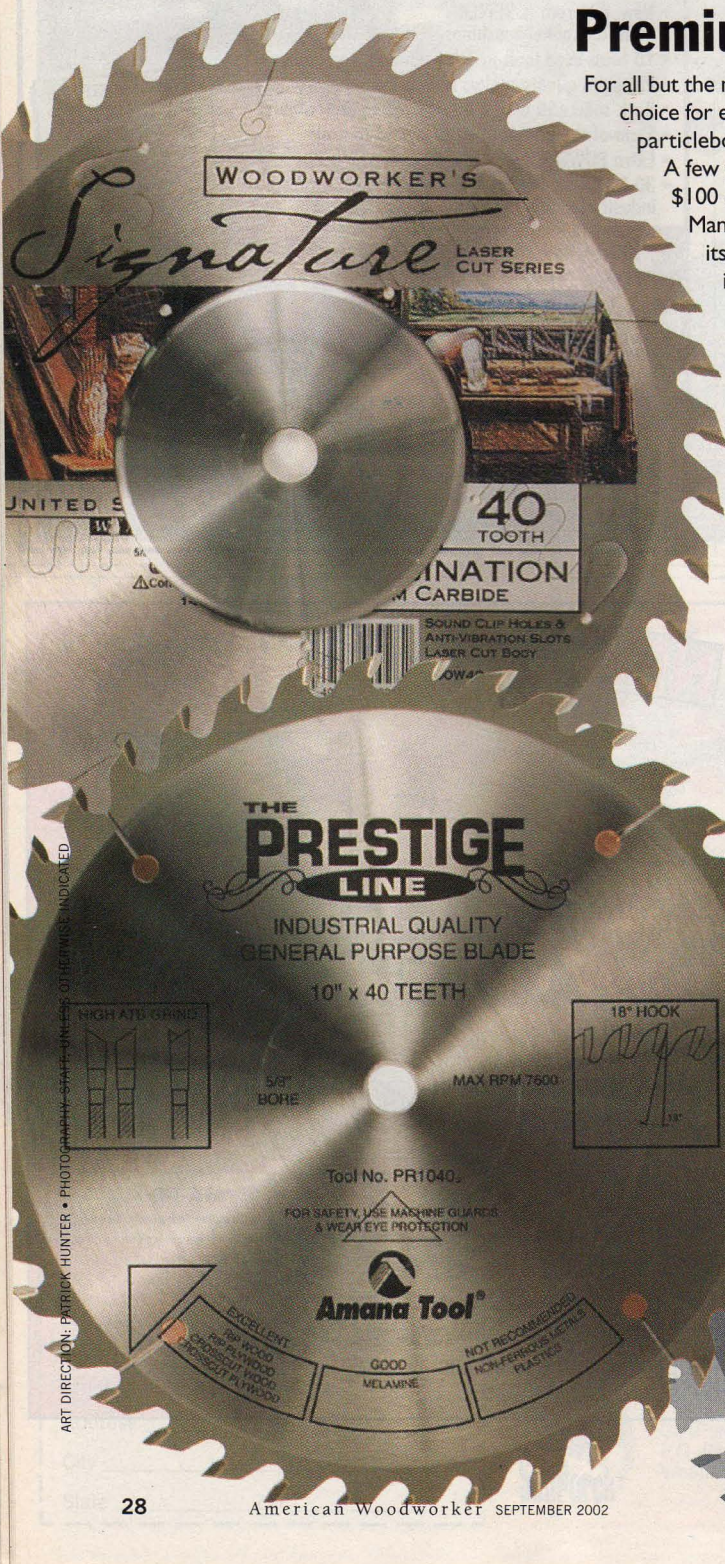
A few years ago, premium combination blades came with premium prices of \$100 or more. But prices are going down, and the blades keep getting better. Manufacturers are pulling out all the stops to get your business. Amana says its new Prestige blade is a state-of-the-art, industrial-quality offering, but it's priced at a very attractive \$50.

Freud's LU84M combination blade has been a consistently popular blade because Freud keeps making improvements while holding the line on price. In its newest iteration, the \$65 LU84M includes laser-cut anti-vibration reeds.

Oldham offers a package deal. Priced at \$80, their new Signature laser-cut series blade comes with a blade silencer and a coupon for one free resharpening, about \$25 of added value.

According to blade manufacturers, dedicated blades for different operations and materials are still superior. But, when teamed with a zero-clearance insert, these premium combination blades perform so well that one will probably find a permanent home in your saw.

Sources for all products See page 108



oped Shop

by Tim Johnson and
George Vondriska

A Better Throat Insert for Your Tablesaw

If you appreciate the benefits of using zero-clearance inserts in your tablesaw, but don't want to make your own, here's an alternative. This machined throat insert is better than any stock throat insert, because it makes zero-clearance possible for every kind of saw cut. Versions are available for many popular tablesaws. In the long run, this \$99 upgrade can pay for itself, especially because it's easy to make replacement inserts from scrap stock.



Board Feet at Your Fingertips



Stop hurting your brain! The Woodworker's Tape/Rule takes the pain out of figuring board/foot (bd. ft.) calculations. The back of the tape is marked with a four-line lumber rule (the measuring system found on a lumber inspector's grading stick) for calculating bd. ft.

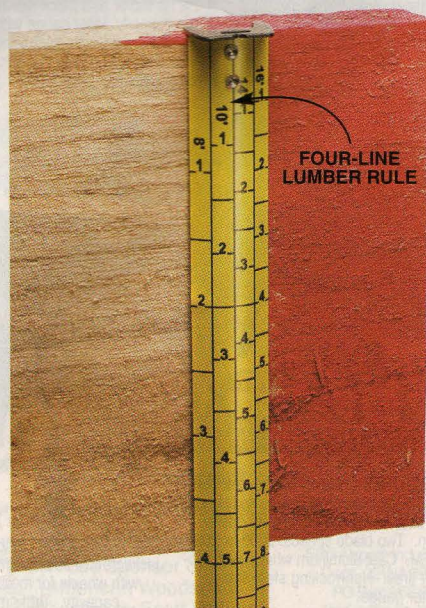
The four-line rule measures the surface area of any 1-in.-thick (4/4) hardwood board up to 16-ft. long. Simply draw the tape across the board's width and read its bd.-ft. measurement from the proper board-length line on the rule. That's it! For boards of non-standard lengths, or thick stock, you'll still have to do some simple math.

Compact Drills are Just Right

DeWalt's Compact-series drills (12 volt, 14.4 volt and 18 volt) are great choices for the home shop.

Compared with the top-of-the-line XRP models, which are designed for continuous rough use, compact-series drills are smaller and much lighter. The 3.9-lb, 12-volt 927 weighs over a pound less than the XRP 12 volt. These drills are well-balanced and comfortable to hold.

Compact-series drills have two ranges of variable speed, numerous clutch settings and develop plenty of torque. They're equipped with 3/8-in. ratcheting chucks, so bits won't come loose. In fact, they've got many of the features found in our six Editors' Choices (Cordless Drill Tool Test, AW # 91, Dec., 2001). And at \$140, including two NiCd batteries and a one-hour charger, the DW 927 costs less than any of them.





THE SENCO AIRFREE 25 BRAD NAILER is completely battery powered—no air hose at all! It's about twice the size and weight of a conventional pneumatic brad nailer.

Battery-Powered Brad Nailer

No air hose! No compressor! Senco's revolutionary new AirFree 25 brad nailer (18 gauge, 5/8 in., 2-1/8-in. capacity) is completely battery-powered.

Here's how it works: Pulling the trigger energizes a belt-driven flywheel. There's a split-second lag as the flywheel gets up to speed, and then a clutch drops to fire the driver and sink the brad. Wrrzzt-WHAM!

You can adjust the drive force to match the brad's length and/or the material's hardness. We found the AF-25 has enough guts to sink 1-5/8-in. brads flush in solid white oak, and countersinking longer brads in softer wood is no problem. That should be plenty of punch for fastening moldings or face frames.

Senco promises 1,000 drives on a single battery charge. Your arm will probably wear out before the battery. Even though the AF-25 is nicely balanced, it weighs 5.8 lb., about twice as much as a conventional pneumatic nailer.

The AF-25 costs over \$300, more than most brad nailer/compressor packages. But Senco is betting go-anywhere convenience is high on everybody's wish list. Larger 15- and 16-gauge AirFree nailers are also available.

Sources See page 108



Quality is more affordable than you think!
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TSC-10CL 10" Table Saw

the perfect table saw for contractors or smaller shops.

FEATURES: Left-tilting arbor reduces chance of kickback. 1-1/2 hp motor with quick release connection plug. 10" dia. blade capacity. Miter gauge with T-slot. Large cast iron table with a solid extension wing. Beveled front table edge for smooth miter gauge operation. 4" dust collection hookup.



**BW-15BS
15" Bandsaw**

don't let its low price fool you, this amazing bandsaw is designed and built to provide trouble free operation cut after cut.

FEATURES: Heavily ribbed cast iron frame. 3/4 hp motor is mounted directly to cast iron frame for smooth operation. Two blade speeds: 2000 or 2600 SFM. Cast aluminum wheels with rubber tires. Non-rocking steel stand. Miter gauge.



TSC-10CL shown with standard Align-a-Rip® 30" capacity rip fence.

New!
enclosed base with wheels

BW-15P 15" Planer

economically priced yet built like larger professional planers.

FEATURES: 3 hp, 3 knife cutterhead. Jackscrew knife adjustment. Enclosed base with wheels for mobility. 15" x 6" planing capacity. Table moves up and down—cutterhead stationary for smoother cuts. Three stock support rollers front and back. 2 speed feed rate. Magnetic switch.

BW-6R 6" Jointer

Acclaimed a "best buy" among 6" jointers by a professional woodworking publication

FEATURES: 1 hp motor. 3 knife cutterhead. Jackscrew knife adjustment. Enclosed base with 4" chip collection hookup. Precision ground 6" x 45" cast iron tables. Rabbeting table and ledge. Cast iron fence tilts in both directions to 45° with positive stops at 45° and 90°. Cast iron handwheels.



**BW-002A
Dust Collector**

portable, compact unit can solve your dust collection problems at a very low cost

FEATURES: 2 hp motor. 1059 CFM. 1 Micron filter bag. 43.5 gallon collection bag. Bags attached with quick release metal straps. Metal impeller (not plastic).

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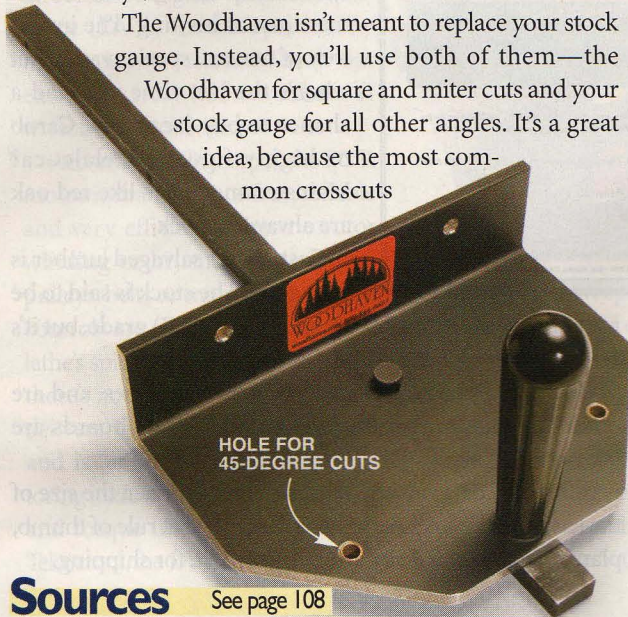
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Precision Miter Gauge at a Great Price

Unlike aftermarket miter gauges with stops at every angle (and prices well over \$100), Woodhaven's new miter gauge has only two stops—at 90 degrees and at 45 degrees left and right. But it's machined to cut all three angles perfectly, and it costs only \$60.

The Woodhaven isn't meant to replace your stock gauge. Instead, you'll use both of them—the Woodhaven for square and miter cuts and your stock gauge for all other angles. It's a great idea, because the most common crosscuts



you'll make on your saw are going to be square or mitered.

The Woodhaven miter gauge is better than your stock gauge because its head has no stops to get bent or adjustment nuts to work loose. Holes in the machined face make it easy to fasten subfences. The Woodhaven's bar won't wiggle in the miter slot, because it's fitted with setscrews and phenolic inserts, for adjustment.



MAKE A LOW-TECH CROSSCUT SLED for cutting wide pieces by using both gauges. Fasten the subfence to the Woodhaven miter gauge first. Don't lock your stock gauge until after you've fastened the subfence, so the Woodhaven sets the angle.

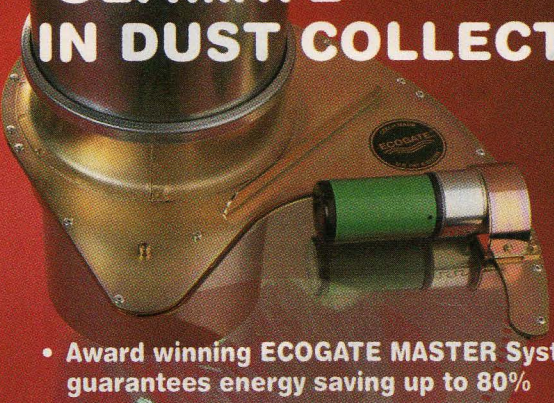
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American Woodworker SEPTEMBER 2002

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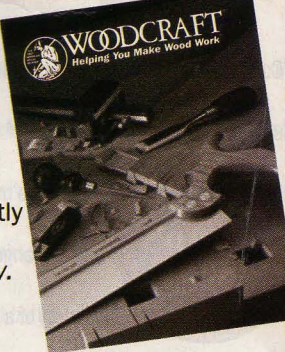


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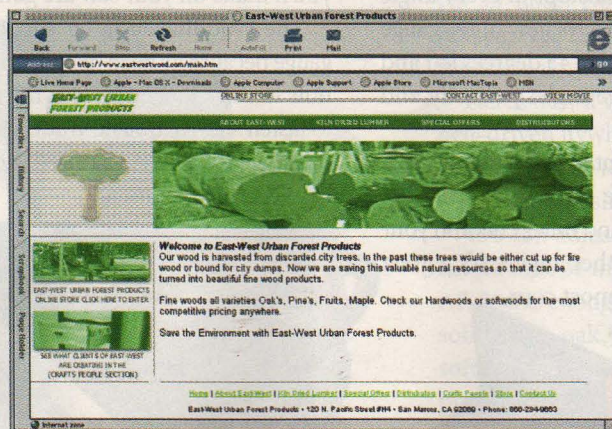


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Bountiful Harvest from the Urban Forest

Here's a win-win story—a lumber operation that's good for cities, good for landfills and forests, and especially good for woodworkers. East-West Urban Forest Products, of San Marcos, California, salvages city trees once destined for the dump and transforms them into high-quality, kiln-dried lumber.



A large-scale operation operating under certification of the SmartWood Rediscovered Wood Program, East-West receives logs from numerous tree-salvage companies that have contracts with hundreds of California municipalities. This salvaged lumber is now available to woodworkers nationwide, over the internet, at www.eastwestwood.com.

You'll find an unusual variety of species (both hardwood and softwood), for a couple reasons. First, the southern

California climate accommodates a very wide range of native hard- and softwoods. Second, exotic specimen plantings find the climate just as inviting. The inventory of unusual species varies, but when's the last time you had a chance to buy Jacaranda, Carob or highly figured Melaleuca? Mainstream species like red oak are always in stock.

East-West's salvaged lumber is ungraded. The stock is said to be roughly equivalent to Selects and Better (S/B) grade, but it's sold at prices closer to No. 1 Common.

Boards are sawn in 1-in. and 2-in. thicknesses, and are offered in random widths and lengths. Wide boards are often available.

Shipping costs vary, depending on the carrier, the size of the load and the final destination. As a general rule of thumb, plan to add between 50¢ and \$2 per bd. ft. for shipping.

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

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

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

(519-836-2840 in Canada).



Techno-Whiz Motor Powers Nova Lathe

Space-age technology has landed in the headstock of Teknatool's Nova DVR 3000 lathe. Its new direct-drive digital variable reluctance (DVR) motor operates by magnetic attraction. (Check out exactly how it works at www.teknatool.com.)

According to Teknatool, the DVR motor is maintenance free, reliable and very efficient. It has no rotor winding or brushes, there are no pulleys, belts or motor mounts, and the controls are electronic. Aside from the lathe's spindle bearings, Teknatool says, there's nothing to wear out. The DVR delivers 1-3/4 hp on a 15-amp circuit and is "smart"—continuously monitoring itself to maintain consistent speed and torque under load. According to Teknatool, the DVR delivers much more



torque at slow speed than conventional direct-drive AC or DC motors.

We took a 10-in. white oak bowl blank (green, wet and heavy) for a spin on the DVR, to test its torque. The new motor is a big improvement over the DC motor it replaces. It's very smooth and quiet, and generates plenty of torque above 500 rpm. However, below

this speed, the torque diminishes, just as it does on other motors. At 250 rpm, the DVR's slowest speed, torque appears to be no better than that generated by other comparably priced, belt-driven machines.

The DVR 3000 has a 16-in. swing and a 24-in. spindle capacity. The head is indexed and swivels for outboard turning. The tailstock has been beefed up, and is much better than earlier versions of the Nova 3000.

Exclusively available at Woodcraft, the Nova DVR 3000 is priced at \$1,700. If you want to turn dining table legs, you'll have to add a bed extension (21 in., \$150) and get a longer base (\$200). **AW**

Sources See page 108

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of both, using exclusive **TPS Technology™** (Twin Power Source System).

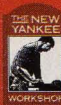
It's pneumatic, courtesy of a 1/4" valve that allows you to use it with traditional

compressors. It's also cordless, thanks to a mini-compressor powered by our

rechargeable, interchangeable 12-volt battery. To get one of your own, visit your

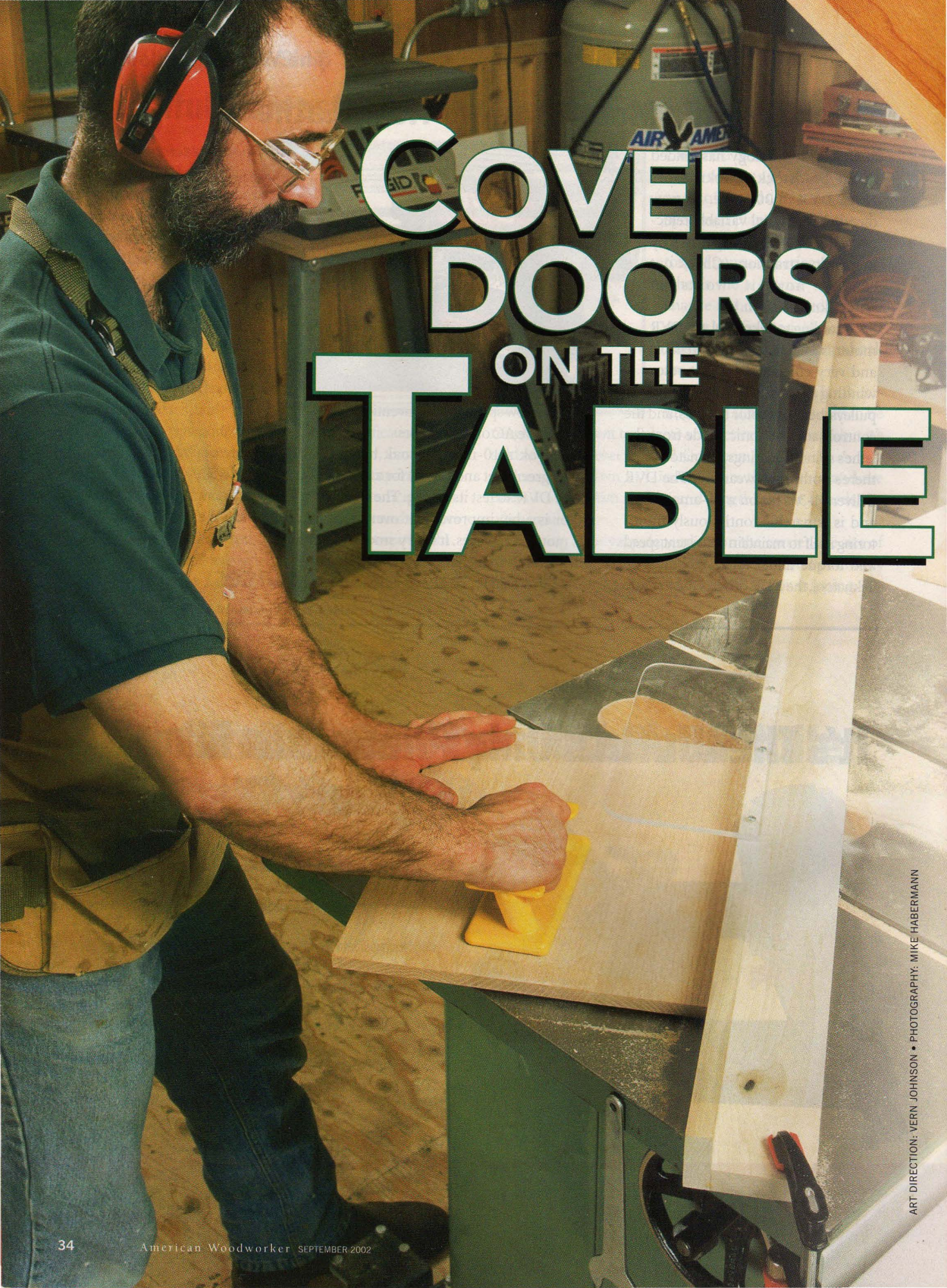
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A man with a beard and safety glasses, wearing large red earmuffs, is working in a workshop. He is using a yellow push block to guide a piece of wood through a table saw. The workshop is filled with various tools and equipment, including a large air tank in the background.

COVERED DOORS ON THE TABLE

ART DIRECTION: VERN JOHNSON • PHOTOGRAPHY: MIKE HABERMANN



SAW

By George Vondriska

Make beautiful raised panels without a router table and expensive bits.

The tool of choice for most small-shop woodworkers who want to make raised panels is the router: A large one, generally 3 hp, hung in a router table, plus a set of specialized bits. The whole setup will cost \$350 to \$800 and is money well spent if you're going to make a whole kitchen-full of doors.

But what if you just want to make one or two raised-panel doors, say for a bathroom vanity, a small cabinet, or a jewelry box? With our technique you can make raised panels with the traditional scooped-out profile using just your tablesaw. This process is based on the traditional method for cutting coved moldings on the tablesaw, but we've adapted it for making raised panels. You clamp an auxiliary fence at an angle to your blade, and feed the panel over the blade repeatedly, taking off only a little at a time until you get the profile you want. Cutting coves on the tablesaw can require a fair amount of trial and error, but we've eliminated that by developing a simple recipe that steers you through the

process and gives you perfect results, even the first time.

For large doors, cutting coved panels on the tablesaw is actually a *better* technique than using a router. The tablesaw allows you to cut a very wide profile; wider than you could cut with a router bit. On large raised panels, like those found on entertainment centers and armoires, the narrow profile produced by router bits can look out of scale. The best way to cut these wider raised panels is with a shaper, but again, if you're only making a couple panels, this tablesaw method will give you excellent results.

For many doors, you may still need a router and a rail-and-stile router bit set to make the door frames. But these are smaller, less-expensive bits, and don't require a 3-hp router. For more information on making the frames to go with these panels, see "Stile and Rail Joinery," AW #78, February 2000, page 72 and "Raised-Panel Doors," AW #86, April 2001, page 32.

The Bad News

One downside of this tablesaw technique is that the panel requires a fair amount of sanding. We've developed a solution to simplify the sanding and make it go faster, but if you had to sand more than three or four doors at a time, it'll get old. However, for one or two doors, the sanding is not a big deal.

The other drawback to this technique, although it's minor, is that the panel edge is not automatically cut to the right thickness. Because this is the part that fits into the groove in the frame, it has to fit precisely. It's important to make accurate measurements as you go (Photo 7).

What You Need

Any tablesaw, from benchtop to cabinet saw, can handle this work, as long as you have a sharp, carbide-tipped blade to make the cuts. A blade with a high tooth count (60 or more) will produce a smoother cut than a blade with fewer teeth. And a smoother cut means less time spent sanding.

You'll need to build a simple auxiliary fence for your tablesaw and a fresh zero-clearance throat plate (see page 50 for how to make one). An inexpensive dial caliper (\$15) is handy but not essential for measuring the thickness of your panel edges.

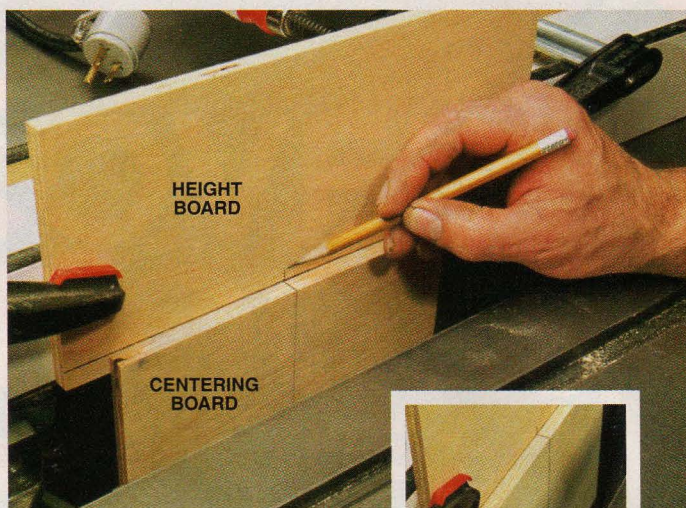
Planning Your Doors

With this method, the panels are cut to fit the frame, so it's essential to make the frame parts first. You can use a spare rail or stile to test the thickness of the panel edge when it's near completion.

Glue up your panels, if required, and plane them all to the same thickness. This is important for cutting the tongue of each panel to the correct thickness.

By varying the angle of the fence and the size of the blade you use, you can get an infinite variety of profiles (see page 40). We suggest starting off with a profile that has a small cove on the back of the panel and a larger one on the front. For most door frames, this will make the outside surface of the panel slightly below or flush with the frame, which will make sanding the doors much easier.

For our doors, we planed the panels to 13/16-in. thick, and cut a profile that had a 1/4-in. tongue, a 1/8-in. cove on the back and a 7/16-in. cove on the front. Our maximum depth of cut was 7/16 in.



- 1** **Locate the center of your saw arbor.** Mount the centering board on the arbor as if it was the saw blade, and clamp the height board to the rip fence, with the bottom edge at the level of the saw table. Raise the arbor of your saw until the top of the centering board is at the line on the height board. Mark where the arbor line meets the height line.

Fig. A The Centering Board

This is a piece of plywood, approximately 8 in. x 8 in., with a pencil line square to one edge and a 5/8-in. hole exactly centered on the line, 5 in. from the edge.

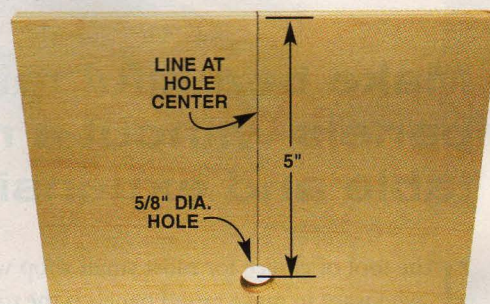
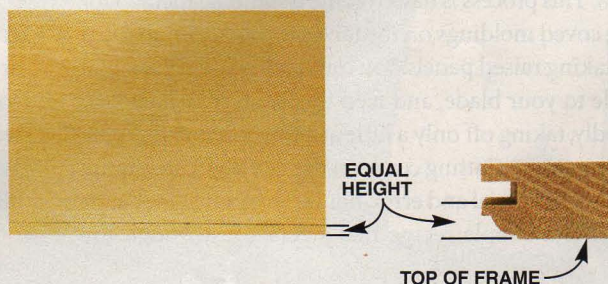


Fig. B The Height Board

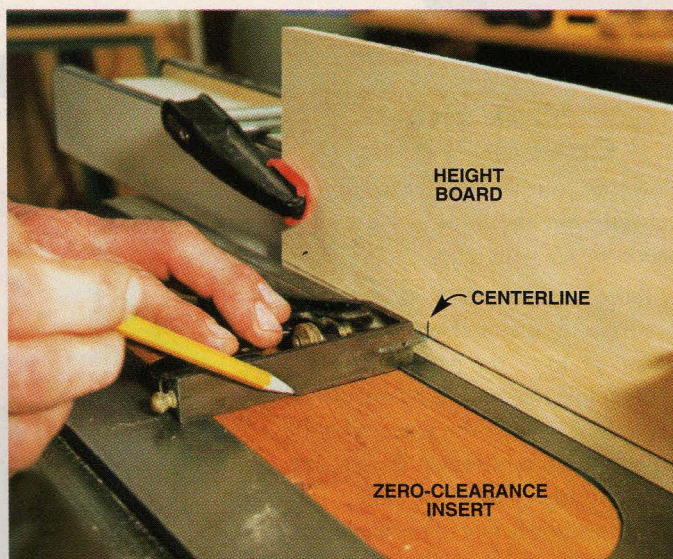
This is simply a scrap of plywood about 8 in. x 12 in., with a pencil line along one edge to mark the maximum height to which you will raise the blade. This height is the depth of the coved profile. For a panel that will be flush with the top of the door frame (the common arrangement), you simply measure from the top of the frame to the groove.



First, Set Up Your Saw

The actual cutting of the panels is fairly straightforward; you clamp a fence at an angle to the saw blade and pass the panels over the blade, taking shallow cuts. But to get perfect results, you need to set up the fence accurately. We've developed a guaranteed system:

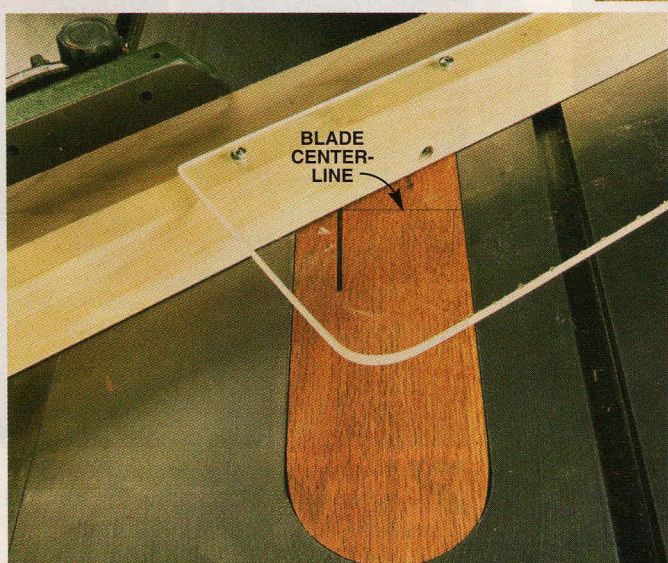
1. First, build the auxiliary fence (Photo 3) and make the centering and height boards (opposite page) that you'll use to set the location of the fence.
2. Find top-dead-center of the blade using the centering board and height board (Photo 1). It's important that the fence be located over top-dead-center so the tongue of the panel is properly shaped to fit the groove in your frames (see Oops!, page 40). This is difficult on many tablesaws because the blade actually swings forward as it is raised. You need to find top-dead-center at the maximum height to which you will be raising the blade, because that height will give you the profile you want.
3. Transfer the location of top-dead-center to your zero-clearance insert (Photo 2). Raise your blade through the zero-clearance insert if you haven't already.
4. Position the fence on the tablesaw so it covers the front half of the blade, where the teeth point down toward the table (Photo 3). The blade must be down. Use your miter gauge to set the fence at 35 degrees. The edge of the fence must be directly over the intersection of the blade kerf and the top-dead-center line on the insert (below). Clamp the fence securely to the saw, and you're ready to make a panel.



- 2** Transfer the centerline from the height board to the zero-clearance throat plate. Then raise the blade to the maximum height you will be using, while the zero-clearance throat plate is clamped down.



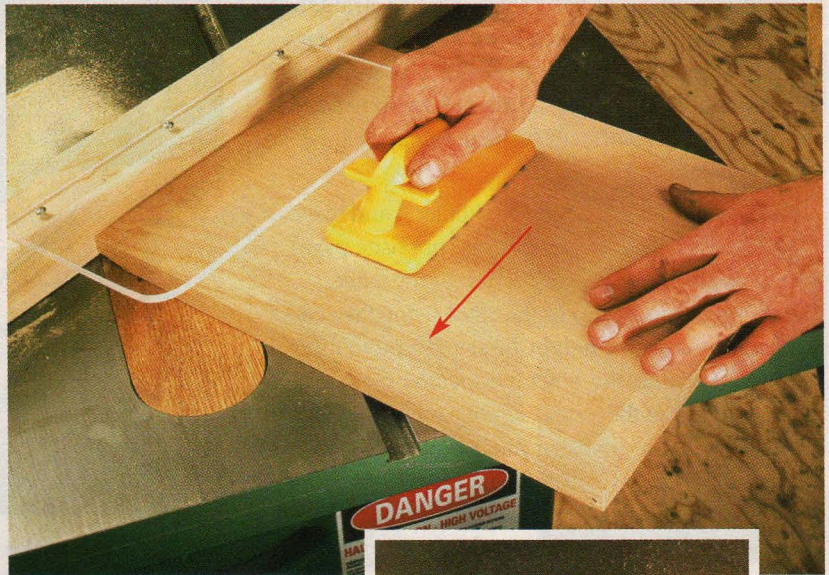
- 3** Clamp a shop-made fence to your saw using the miter gauge to set its angle to 35 degrees. (See page 40 for other options.) The fence edge should be directly over the intersection of the centerline on the insert and the blade kerf (at left).



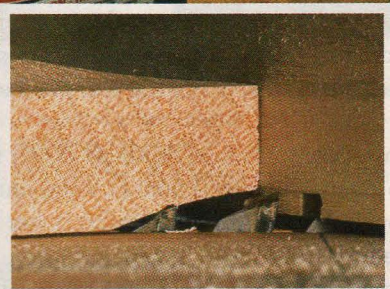
Cut the Coved Profile

Now that your fence is set, it's time to actually cut the panels. Here's the process:

1. Raise the blade 1/16-in. above the surface of the tablesaw and cut the end-grain of the panel (Photo 4). Note that the panel is being pushed "uphill" against the fence. Cut the long grain and repeat the process on the other side of the panel.
2. Increase the height of the blade 1/16 in. and make another pass on all four edges of both faces, end grain first. Now the back of the panel is complete (Photo 5).
3. Finish the front of the panel by continuing to raise the blade 1/16 in. per pass. Use test cuts on the scrap piece to monitor your progress. It will take about six passes to complete the profile on the front.
4. Measure the thickness of the panel tongue (Photo 7). Leave it 1/32-in. thicker than the groove in the frame to allow for sanding. Dial calipers are an accurate and convenient way to take this measurement.

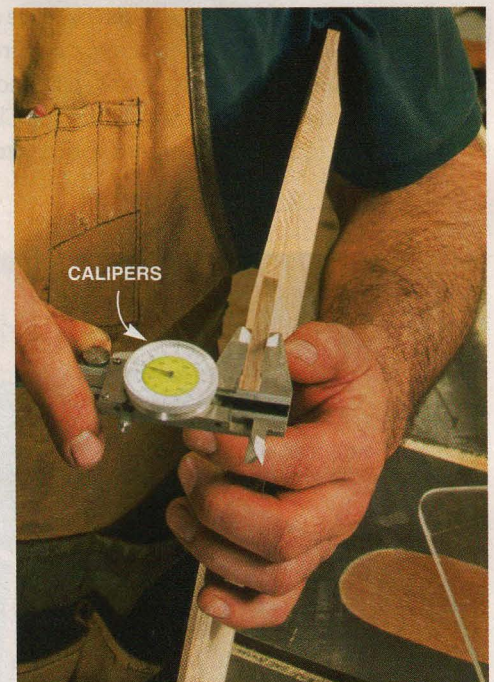


4 Always machine the end grain first, using a push block to hold the panel. The blade should only protrude 1/16-in. above the table. Cut all four edges of both sides of the panel twice, taking off no more than 1/16 in. at a time.



5 This is how the edge should look after two passes front and back. At this point the coved profile on the back of the panel is complete, so mark which sides of the panels you want to be the front and back.

6 It will take approximately six passes in all on the front of the panel to achieve the final shape. Stop cutting when the edge of the panel (the tongue) is the correct thickness (Photo 7).



7 Measure the edge of the panel carefully. To allow for sanding, it should be 1/32-in. thicker than the groove in the frame.

Sand the Profile

To sand the saw scratches out of the profile without spoiling its shape and crisp edges, you need a sanding block that's made to fit the profile. An easy way to do this is with Bondo-type auto-body filler (Photo 8).

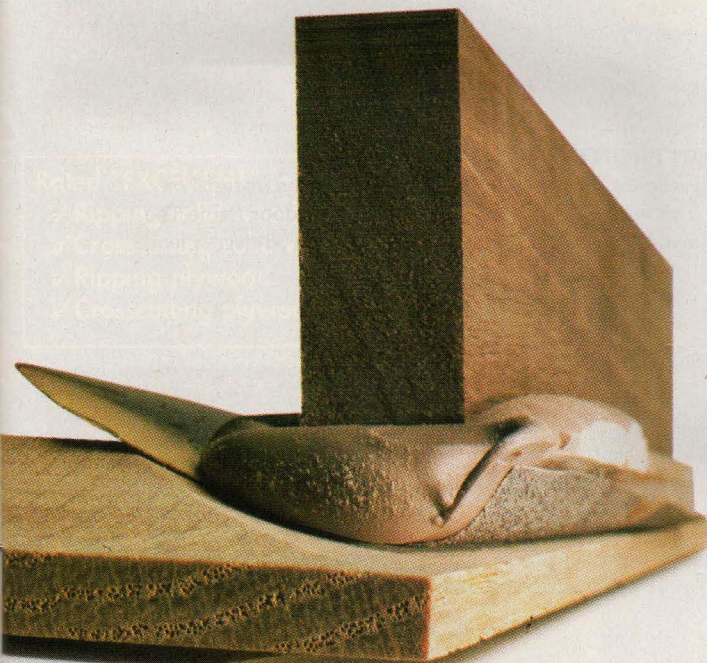
When you sand the profile, start with 80-grit sandpaper and move up to 220 grit. When the panel is fully sanded, it should easily slip into the door frame without rattling around inside it.



- 8** Make a sanding block that's the exact shape of your coved profile. Mix auto-body filler and pack it into the cove, with a layer of wax paper over the wood to prevent it from sticking. A piece of scrap creates a dam to hold the filler in place.



- 9** Add a handle to the sanding block while the filler is wet. This makes it a lot easier to hold the block when you're sanding. When dry, the filler creates a sanding block perfectly formed to the cove.



- 10** Attach sandpaper to the sanding block. Self-adhesive sheets are the easiest, but you can also use self-adhesive discs, cut in half.



- 11** Sand the cove, starting with 80-grit sandpaper and moving up to 220 grit. Every so often, check the fit of the panel, to be sure you're not making the tongue too thin.

Tips

For Great Coved Panels

- ✓ Raise the blade in small increments; 1/16 in. at a time. Light passes make these cuts easier on your saw and provide the smoothest surface.
- ✓ Have on hand an extra panel, of the same dimensions and thickness as your good ones. Use this for test cuts as you machine the panel.

Oops!



We learned the hard way that setting up the fence carefully is essential. If the auxiliary fence is located behind the center of the blade, you'll get a profile that gets thicker right at the edge. This won't fit into the groove worth a darn. Use the setup procedure we show, and you'll be sure you've set the fence at the top-dead-center of the blade.

Imagine the Possibilities

Now that you understand the technique, the possibilities are limitless. The look of the cove changes with every change of blade diameter and fence angle.



10-IN. BLADE AT 35 DEGREES

This is the profile we show in the step-by-step photos. It's a particularly useful profile for 3/4-in.-thick panels in standard cabinet door frames.



10-IN. BLADE AT 90 DEGREES

This gives you a wider profile that's appropriate for large doors. It has the same profile on the back of the panel as the panel shown above.



COVE ON FRONT ONLY

Instead of relieving the panel back, you can take all the material off the front. This will leave the panel face proud of the door frame. The profile shown here was made by a 10-in. blade and a 35-degree fence.



8-IN. BLADE AT 35 DEGREES

This gives you a smaller profile, appropriate for small doors and boxes. This cut was made using an 8-in. blade from a dado set. **AW**

Sources See Page 108

Special thanks to the folks at Amana and Freud for their assistance with this story.

What's New in Tablesaws

NINE things we bet you don't know about today's tablesaws.

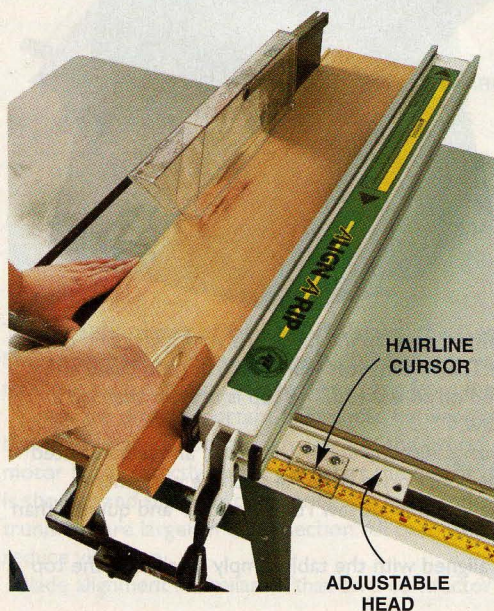
Imagine a workshop filled with 19 different, brand-new tablesaws. What an eye opener! That's what the AW shop looked like after we ordered almost every 120-volt portable and stationary tablesaw on the market.

We were amazed at how much saws have improved during the past

10 years. It's a whole new world, and it's still changing.

In our next issue, we'll report on our tests of the stationary saws, model by model. Now, read on about all of the general improvements manufacturers have made on both kinds of saws.

ONE Stock Fences are More Accurate and Reliable



Whatever brand of contractor's saw you buy, chances are you'll get a decent fence. Gone are the days when you had to measure from the blade to the fence and bang the fence into alignment for every cut. Good riddance!

Most contractor's saws now come with accurate and reliable fences. This is terrific news! Great fences such as the Biesemeyer, Vega and Unifence have been around for a while, but they were only available on expensive cabinet saws or as aftermarket accessories. Now the

best features of these pioneers have been incorporated into the stock fences of most contractor's saws.

These new fences are quick to adjust and easy to use. The scale is generally as legible as a good tape measure. Reading through a hairline cursor, you'll always be accurate to within 1/32 in. or better, time after time. Best of all, you can rely on the fence to remain parallel to the blade every time you move it. There's no need to double check. You're always good to go, right away.

The revolution in tablesaw fences has finally reached the average contractor's saw. Most manufacturers offer, as standard equipment, a fence that always stays square.

TWO Hybrids are a New Class of Tablesaw



The DeWalt DW746X looks like a contractor's saw, but its motor is tucked inside, like a cabinet saw.

There's a new kid on the block: the hybrid tablesaw. These saws are called hybrids because they're a cross between two different kinds of tablesaws. From the outside, hybrids look like cabinet saws. From the inside, they have more in common with contractor's saws.

There are three models on the market: the DeWalt DW746X (\$900), the General International 50-200 (\$1,100) and the Jet JWCS-10A (\$1,000).

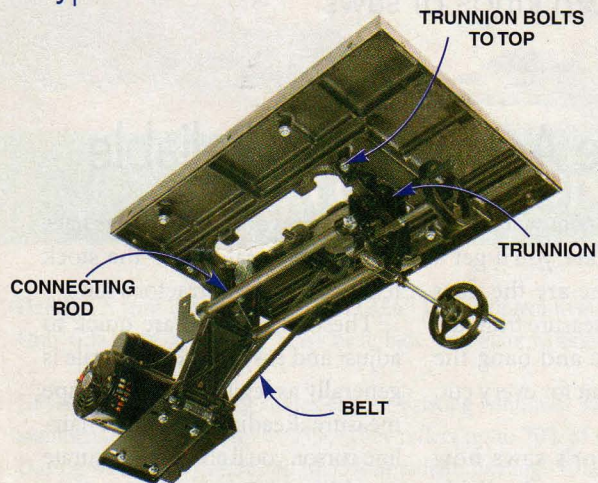
Hybrid saws offer us a new choice. Until they came along, home woodworkers had to choose between saws originally designed for construction sites (contractor's saws) or saws designed for production shops (cabinet saws). Neither type of saw is ideal for a home woodworker.

Hybrid saws combine the best features of contractor's and cabinet saws:

■ **Voltage and Power.** Like contractor's saws, hybrids run on 120-volt power. Their motors are 1-3/4 hp or 2-hp, ostensibly more powerful than the standard 1-1/2-hp motors on contractor's saws. (Cabinet saws are 3 hp, 240 volt.)

■ **Price.** Hybrid saws don't cost two arms and a leg. An average price

Typical Contractor's Saw

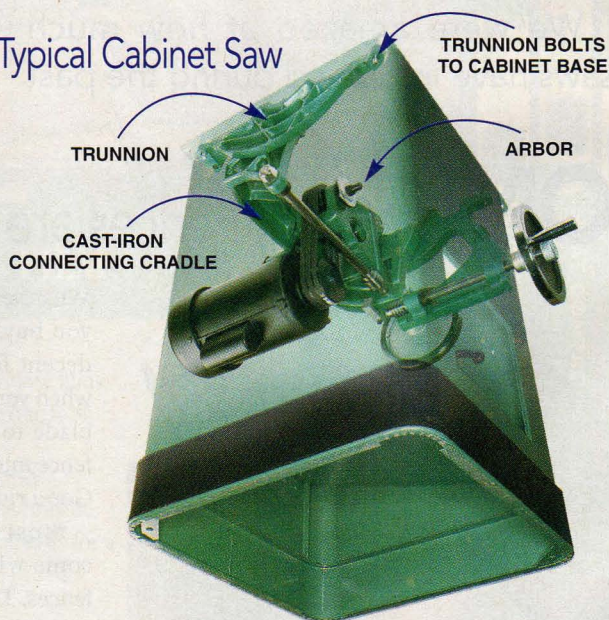


Under a contractor's saw, all of the parts are relatively lightweight and hang from the top.

The motor is cantilevered on the end of two connecting rods to make it easy to dismount. The motor drives the arbor with a long belt. (Longer drive belts produce more vibration than shorter belts.) Vibration from the saw's arbor and motor is passed directly to the table.

The blade is aligned with the table by loosening the trunnions from the top and shifting them side to side.

Typical Cabinet Saw



Under a cabinet saw, all the parts are very heavy and hang from the base. That means less vibration from the blade and motor is passed on to the top. The top is heavier than on a contractor's saw.

The motor hangs directly under the arbor and is connected to it with three short drive belts. All of these elements combine to make a cabinet saw run smoother and quieter than a contractor's saw.

The blade is aligned with the table simply by shifting the top on the base.

in Tablesaws

of around \$1,000 is positioned right in between contractor's saws (\$500 to \$800) and traditional cabinet saws (around \$1,500).

■ **Floor Space.** Hybrid saws are more compact than contractor's saws. Like cabinet saws, their motors are tucked away under the table, so the saw takes up almost a foot less space front to back than a contractor's saw.

■ **Dust Collection.** Like cabinet saws, hybrid saws are better at capturing dust than contractor's saws. The Jet and General International have fully enclosed bases that trap most of the sawdust, plus 4-in. dust ports. The DeWalt has a shroud around the blade to direct dust to a 3-in. port.

■ **Fence.** Hybrid saws have fences similar to contractor's saws. They're not as beefy as the fences on some cabinet saws, but just as accurate.

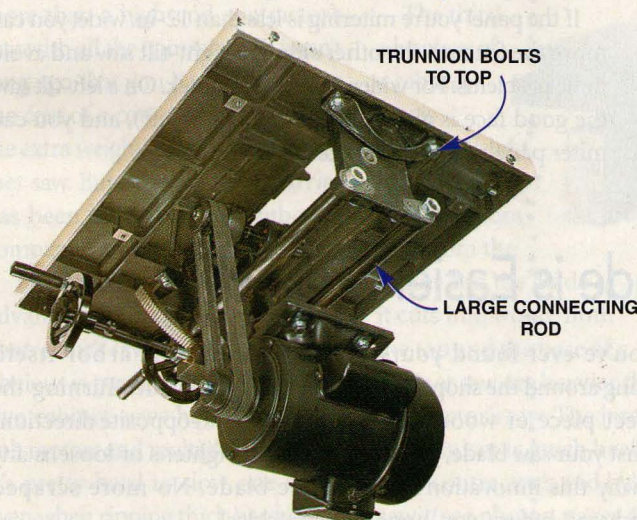
■ **Alignment.** Underneath, hybrid saws are basically built like contractor's saws (see four photos below). Aligning the blade is not as easy as on a cabinet saw.

■ **Vibration.** Hybrid saws are built to run smoother than contractor's saws but are not as vibration-free as the much heavier cabinet saws.



The Jet JWCS-10A looks like a cabinet saw, but the mechanism under the table more closely resembles a contractor's saw. The General International 50-200 is similar in design.

Jet and General International Hybrid Saws

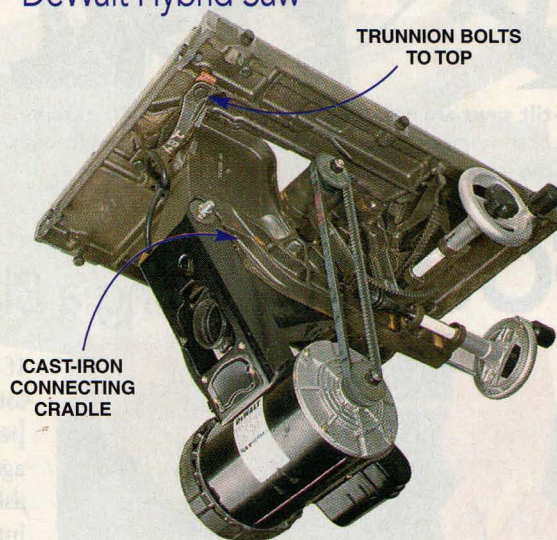


The mechanisms of two hybrid saws, the General International 50-200 and the Jet JWCS-10A, are very similar to those on a contractor's saw. They hang from the top.

There are three important differences between these hybrid saws and a contractor's saw. On the hybrid, the motor hangs directly under the arbor; the motor drive belt is shorter and the rods connecting the front and rear trunnions are larger in cross section. All of these factors reduce vibration.

Blade alignment is similar to that on a contractor's saw.

DeWalt Hybrid Saw



The mechanism of the DeWalt 746X also hangs directly from the top, like a contractor's saw. But the trunnions are connected by a cast-iron cradle, similar to a cabinet saw.

This robust design further reduces vibration and improves the ability of the blade to remain accurately aligned with the top of the saw.

Blade alignment is similar to that on a contractor's saw.

THREE Left-Tilt Saws are Becoming More Common

A left-tilt contractor's saw used to be as rare as a woodworker with enough tools. Not any more.

Left-tilt saws are simply easier and safer to use (whether you happen to be right- or left-handed). All things being equal, if you had to choose between a right-tilt and a left-tilt saw, it would be a no-brainer. Go with the left-tilt. The mechanism under the table of a left-tilt saw is nearly identical to that of a right-tilt saw; a few parts are simply left-handed rather than right-handed.

Left-tilt models priced under \$1,000 include the Bridge-wood TSC-10CL (\$600), the DeWalt DW746X hybrid saw

(\$900), the General International 50-185 LM1 (\$840), the Grizzly G1023 SL cabinet saw (\$900), the Powermatic 64 A (\$850), and the Ridgid TS3612 (\$600).

Left-tilt saws handily solve three problems common to cutting bevels on right-tilt saws. These problems aren't insurmountable, they're simply annoying.

First, you can chew up the fence of a right-tilt saw when you tilt the blade. The solution is to use a sub-fence or simply move the fence to the other side of the blade. However, a sub-fence can be a pain to attach, and moving the fence to the other side puts your hands in unfamiliar positions. This problem is eliminated on a left-tilt saw.

Second, you must be alert for a serious kickback hazard on a right-tilt saw. Have you ever seen an offcut come flying out of a saw after it's trapped between the blade, the table and the fence? This danger can easily be avoided by moving the fence to the other side of the blade. The offcut isn't trapped on a left-tilt saw, so there's one less safety issue to worry about.

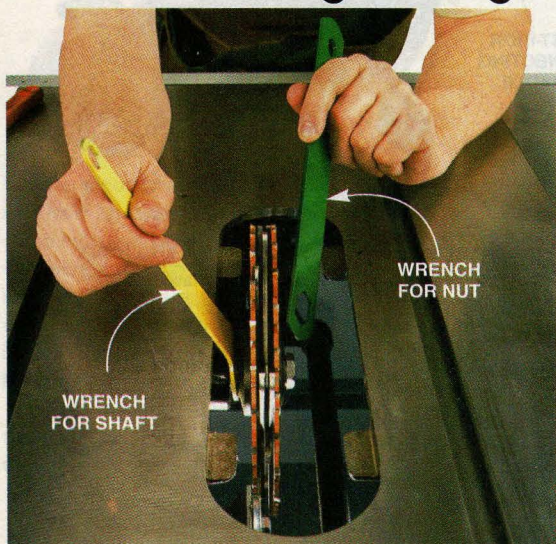
Third, it's hard to make clean miter cuts along the length of a panel on a right-tilt saw. If you keep the fence on the right side of the blade, the panel has to face down on the saw. That increases the chance of tear-out on the good side. In addition, the miter is trapped between the blade and table, increasing the chance of burning an edge.

If the panel you're mitering is less than 12-in. wide, you can move the fence to the other side of a right-tilt saw and avoid these problems. For wider work, you're stuck. On a left-tilt saw, the good face is always up (see photo at left), and you can miter panels as wide as your rip fence will go.



Left-tilt saws are now available from many manufacturers. They cost no more than right-tilt models. The blade tilts away from the fence on a left-tilt saw.

FOUR Tightening a Blade is Easier Than Ever



If you've ever found yourself looking around the shop for that perfect piece of wood to jam against your saw blade, you may ask why this innovation wasn't introduced before you bought your saw.

Many new saws come with *two* wrenches for tightening blades. One wrench fits over the arbor nut, as usual, but the other

fits around the arbor itself, behind the blade. Turning the wrenches in opposite directions handily tightens or loosens any size blade. No more scraped knuckles!

Hang both wrenches on the side of the saw, and you'll always have the proper equipment on hand for changing blades.

One wrench holds the arbor while the other wrench tightens the arbor nut. This new design may become standard on all saw arbors. Shown is the Delta 36-431 contractor's saw.

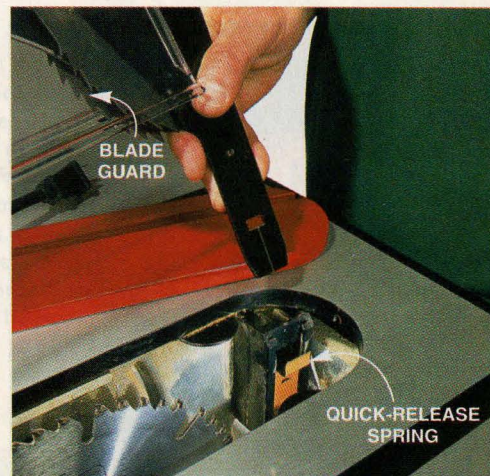
FIVE The Best Blade Guard Yet

At last, somebody made a blade guard that's just as easy to put back on as it is to take off. The guard on the new Porter-Cable 3812 benchtop saw doesn't require any tools to mount or dismount. It's ironic that benchtop saws should push the frontiers of innovation. Isn't it about time a feature this useful appears on *all* saws?

It's no secret that most woodworkers routinely discard their tablesaw guard, even though many accidents are prevented by using

one. Chances are your guard is gathering dust somewhere simply because it's so annoying to constantly mount and re-mount the darn thing.

When a manufacturer comes up with a guard that's actually easy to remove, we're impressed. Woodworking should be safe, so our hats are off to the folks at Porter-Cable. The engineers at Ridgid deserve kudos as well. Their TS2400 benchtop saw also features a tool-free guard.



Woodworkers, do you know where your blade guard is tonight? This new pop-in guard on the Porter-Cable 3812 benchtop saw is so user-friendly, chances are it won't ever get lost.

SIX You Can Buy a Cabinet Saw for \$900 to \$1,100

Some cabinet saws now cost little more than a high-end contractor's saw with all the trimmings. It wasn't long ago that you had to pay twice the cost of a contractor's saw to get the extra weight and power of a cabinet saw. But now the price barrier has been broken by a number of companies (see Sources, page 108).

There are three significant advantages of a cabinet saw over a contractor's saw. The first and most obvious is power. These less-expensive cabinet saws have 3-hp, 240-volt motors and multiple drive belts. It's pretty hard to slow one down even when ripping thick hardwood. On a contractor's saw, you often have to adjust your feed rate to match the power of the motor. On a cabinet saw, you just push.

The second advantage of a cabinet saw is better dust collection. Most contractor's saws spew dust out the back side, where the motor hangs. Cabinet saws contain the

dust in an enclosed space.

The third advantage of a cabinet saw is weight. Weight helps to dampen vibration from the motor and the blade as it cuts into wood. Both the top and the base of a cabinet saw are heavier than a contractor's saw. The internal mechanism is much beefier than contractor's and hybrid saws (see photos, pages 44 and 45).

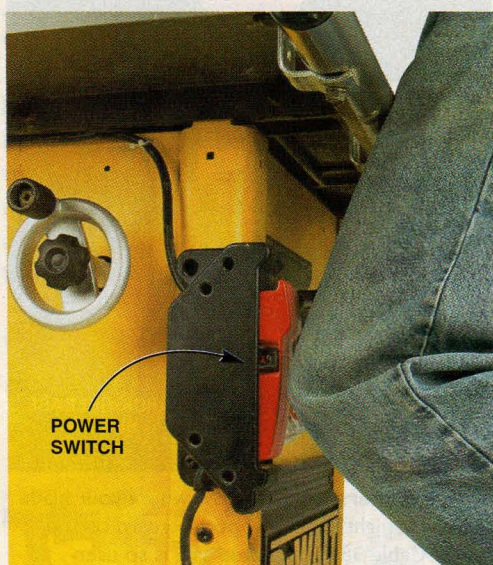
Extra weight also anchors a cabinet saw to the floor, so it won't shimmy or shake when you plop a large timber or full sheet of plywood on it. The closed base on a cabinet saw is more rigid than the open base of a contractor's saw.



Grizzly 1023SL; \$900

Cabinet saws are now available in a new lower price range. Like their more expensive cousins, these saws have more power, more weight, and better dust collection than contractor's saws.

SEVEN You Can Turn Off This Saw With Your Knee



Have you ever had to turn off your saw in the middle of a cut? What a pain! Typically, you've got to take one hand off the workpiece and fumble around under the saw to find the switch.

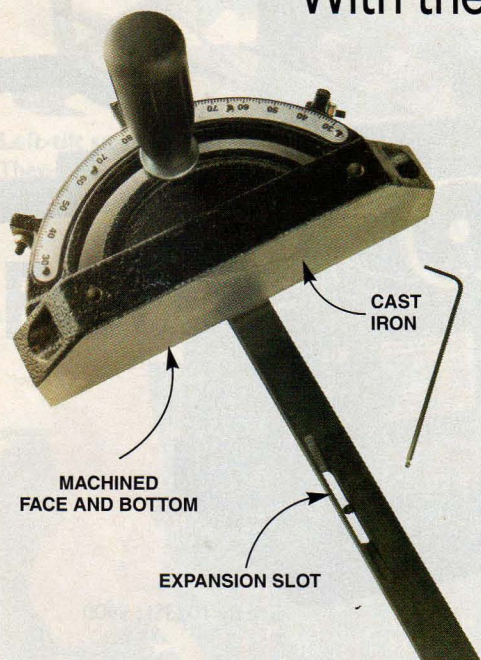
A lot of clever woodworkers modify their switches to make them easier to turn off. You can cobble together a homemade wooden paddle to fit over the

switch. Thwack the paddle with your knee and the saw shuts down.

Manufacturers are catching on to this simple improvement. The switch on the DeWalt DW746X is among the best. It's large and strategically placed. You can leave your hands and eyes on the workpiece at all times and simply kick the switch if things aren't going right.

In a bind? Shut down this saw by simply bumping your knee against the switch. The oversized switch on the DeWalt DW746X, shown here, is a well-engineered safety feature that woodworkers used to make for themselves.

EIGHT This Improved Miter Gauge Actually Comes With the Saw



Grizzly Industrial's improved miter gauge is standard equipment on its new line of contractor's and cabinet saws.

While tablesaw fences have steadily advanced over the last few years, miter gauges have been stuck in a rut. The miter gauge that came with a saw 20 years ago usually wiggled around in its slot just enough to throw off the angle of a critical cut. You had to pound the miter gauge bar with a ball peen hammer to widen it and make it fit tighter.

Accurate miter gauges are just as important as accurate fences. Why can't manufacturers include a good miter gauge with a new saw? The design problems of making a better miter gauge have been worked out, after all. There are plenty of good miter gauges available, but they're aftermarket accessories that cost a fair amount of dough (\$60 to \$300).

Grizzly Industrial has taken the lead and upgraded the miter gauge

that comes with many of their saws. The bar has two expansion slots. You can fine-tune the fit of the bar to your saw's miter slots simply by turning a screw in each slot. The screw pushes against the side of the slot, widening the bar.

The cast-iron head of this miter gauge is also machined flat and square to the table. When you hold a squared piece of wood up against the miter gauge, it won't rock.

As good as the Grizzly gauge is, there are no holes for attaching a subfence, but you can drill your own. It's also missing one important feature that the aftermarket gauges have: precision, indexed angle settings. We'd all be happier if this were standard equipment, too!

NINE The New Benchtop Saws are Packed With Excellent Features

Benchtop saws have come a long way. Many of the features that woodworkers have enjoyed on contractor's and cabinet saws have been built into improved smaller saws, too. High-end benchtop saws now have

- accurate and reliable fences
- left-tilting arbors (see page 46)
- 24 in. of rip capacity
- 10-in. blades
- arbors long enough for a 3/4-in. dado set
- standard-size slots that accept an aftermarket precision miter gauge
- enough power to cut 2-in.-thick hardwoods.

Benchtop saws with these features include the Bosch 4000 (\$500), the DeWalt DW744 (\$500), the Porter-Cable 3812 (\$400) and the Ridgid TS2400LS (\$500).

These saws are ideal for shops with very limited space. The saws are very small, but you can pull the fence rails out an additional foot or so to handle wide material. Each saw fits in a cubbyhole about 20-in. high, 32-in. wide and 24-in. deep. (By contrast, you need open floor space that's about 4-ft. deep and 5-ft. wide to store a contractor's saw.) Benchtop saws weigh about 60 lb., so it's not too difficult to lift one by yourself and stow it away on a shelf.

There are three problems with using any benchtop saw to build cabinets and furniture. But each problem has a practical solution.

First, the tabletop is short from front to back, which makes it hard to crosscut wide pieces. There's about one-third less distance from the front of the table to the blade than on a contractor's saw. Building a crosscut sled solves this problem (see AW #75, page 38, for plans).

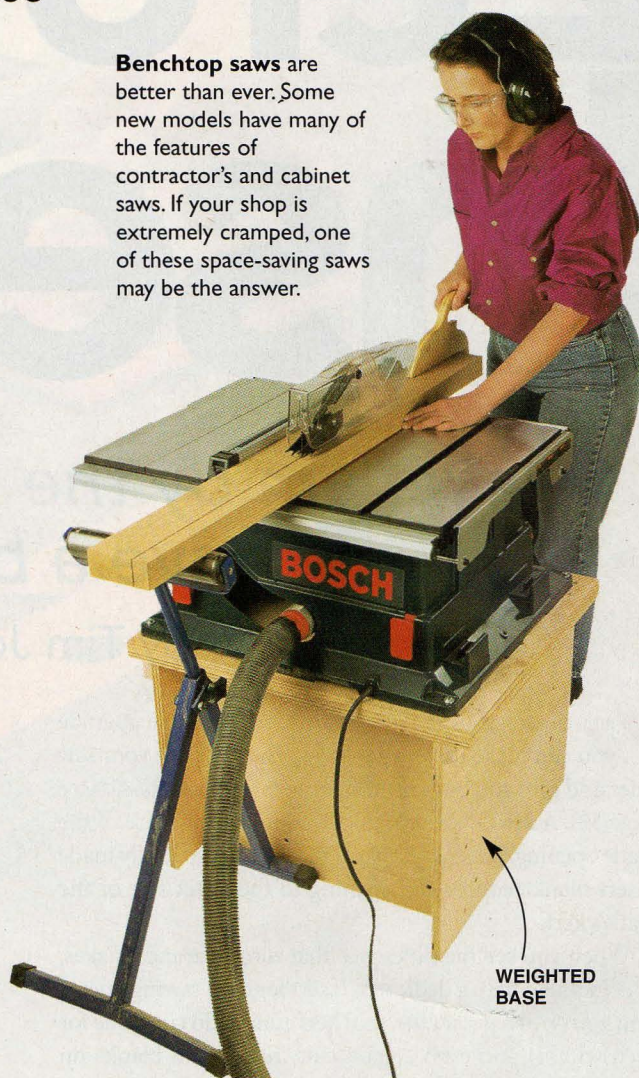
Second, a benchtop saw doesn't produce as smooth a rip cut as a contractor's saw does. A benchtop saw's arbor flexes much more readily under load than the arbor of a contractor's saw. The result is that the blade scores the edge of the wood along the full length of a rip cut. It scores even deeper when you change hand positions and hesitate while feeding a board.

Flex in the arbor affects crosscuts, too. A standard combination blade slightly wanders on a demanding cut, such as mitering thick hardwood.

To fight these problems, you can slow down the rate at which you feed a board and avoid hesitations. You can improve the surface of a cut by adding a blade stiffener (see Q&A, page 10). You can also make better crosscuts by switching from a combination blade to a high-quality crosscut blade.

The third problem with a benchtop saw is stability. It must be fastened to a secure base so the saw doesn't tip over or wiggle

Benchtop saws are better than ever. Some new models have many of the features of contractor's and cabinet saws. If your shop is extremely cramped, one of these space-saving saws may be the answer.



around. You can buy a lightweight folding stand as an accessory, but the saw still won't be as rigid as a heavier contractor's saw. Once again, though, the answer is simple. Build your own stand. A plywood box with a sandbag or two inside makes your benchtop saw as solid as a rock. **AW**

Are You an Inventor?

Many of the improvements in tablesaws came from ideas first born in ordinary home shops. If you've got an idea, share it with us. We'll pay you \$100 and publish your brain child in a special story. Send your tips to:

A Better Tablesaw
American Woodworker Magazine
2915 Commers Dr., Suite 700
Eagan, MN 55121
aweditor@readersdigest.com

Zero-Clearance Inserts

Make 'em by the bunch and you'll save a bundle.

By Tim Johnson

Zero-clearance throat inserts are the best simple upgrade you can make to your tablesaw. They'll make your saw safer and give you better cutting results with less hassle (see page 52). A zero-clearance insert minimizes the size of the blade opening. Raising the blade through the specially made insert blank reduces the opening to the exact size of the blade's kerf.

When you see the difference that zero clearance makes, you'll want to have a dedicated insert for each sawing operation you do—regular cuts, thin kerf cuts, dado cuts (one for each width!) and even angled cuts. Keep extra blanks on hand, and you're always ready to replace a worn-out insert. (With repeated use, the zero-clearance slots get wider and less effective).

Don't let the low cost fool you. These \$5 inserts are stable and flat, with dense cores and durable surfaces. Like the \$20 commercial versions, they can be leveled and adjusted for a perfect fit. They include retaining pins to keep them in place and finger holes so they're easy to remove.

Our inserts for ripping and crosscutting are designed to be used with your saw's splitter and blade guard. Store-bought blanks lack this important safety feature. A \$50 investment buys enough material to make nine blanks—enough to last you a long time.

Zero Clearance All the Time

We've tailored these inserts for three different sawing opera-

tions. Inserts for ripping and crosscutting have dadoes underneath to accommodate 10-in.-diameter blades. They also have slots for the splitter and blade guard assembly. Inserts for bevel cuts have even wider dadoes underneath. Inserts for dadoes have no alterations and are the easiest to make.

These 3-3/4-in.-wide inserts fit the throat openings in most contractor's and cabinet saws, but are too thick to use with benchtop saws. Measure your saw before you begin, to make sure the width is correct.

Besides your tablesaw, the only other tools you'll need are a drill press, an edge-guide-equipped router and a hand-held drill.

Better than Store-Bought

Aftermarket insert blanks are available for about \$20 apiece. If you make them yourself, they'll cost less than \$5 each. The trick is to make a bunch of them at once.

At a full-service lumberyard, buy one 25-in. x 48-in. sheet of plastic laminate and one 4x8 sheet of tempered hardboard. You'll only need a 2x4 section of tempered hardboard, but most lumberyards only sell it as full sheets. Tempered hardboard is more dense and much stiffer than regular hardboard, so it makes better core material for the inserts. You'll also need carpenter's wood glue, a box of 1/2-in. 6-32 flat-head (Phillips) machine screws and a couple of 8-in. x 16-in. concrete blocks.

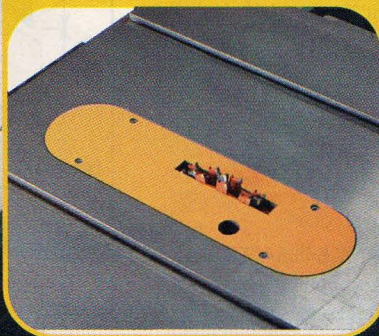
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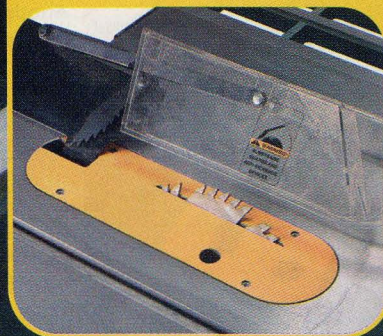
Regular



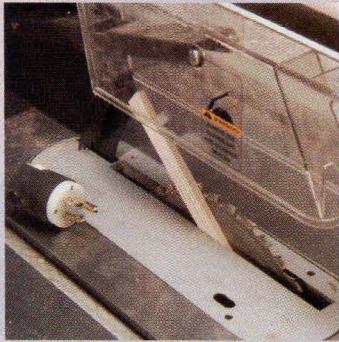
Dadoes



Bevels

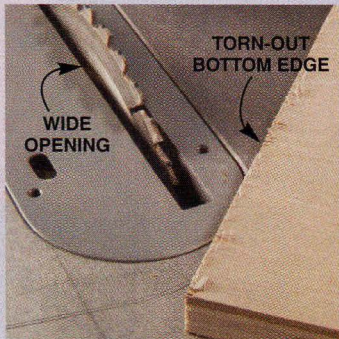


Throat-Plate Woes

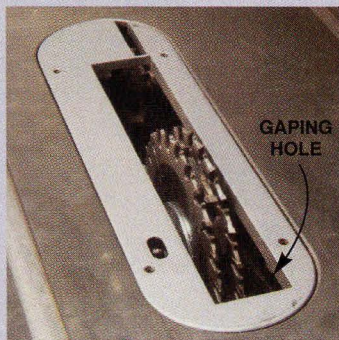


The throat plate, or insert, that came with your saw is fine for general work, but it does create some problems.

THIN OFFCUTS GET STUCK, forcing you to stop everything to remove them. The stock throat plate has a wide opening because it's designed for both angled and vertical cuts.

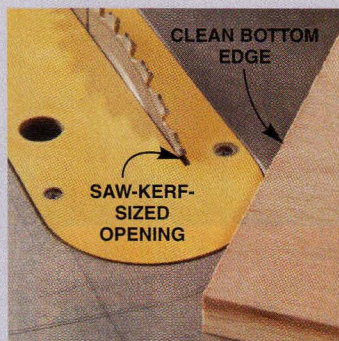


THE BOTTOM EDGE TEARS OUT, especially when you crosscut plywood, because the stock throat plate's wide slot leaves it unsupported.



KICKBACK POTENTIAL. Stock one-size-fits-all throat plates for cutting dados have enormous openings that make it impossible to process short or narrow pieces.

Zero-Clearance Solutions



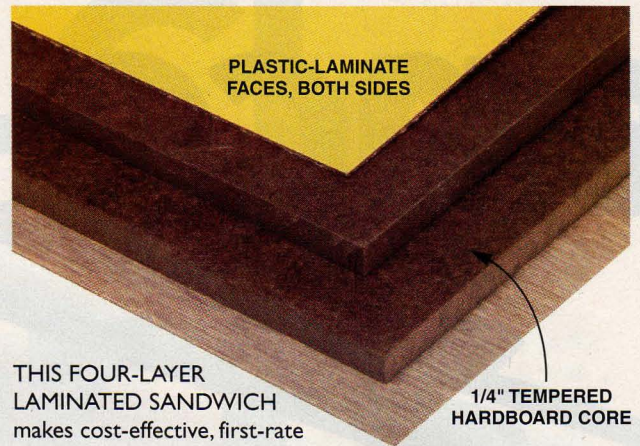
Zero-clearance inserts improve cut quality and make your saw safer to use.

ZERO-CLEARANCE SLOTS are no wider than the blade, so off-cuts can't get stuck and tear-out is dramatically reduced. Another benefit: You can use the saw kerf to line up your cuts.



ZERO-CLEARANCE IS SAFER. A perfectly sized opening won't allow the workpiece to sag, catch and kick back.

Make the Blanks



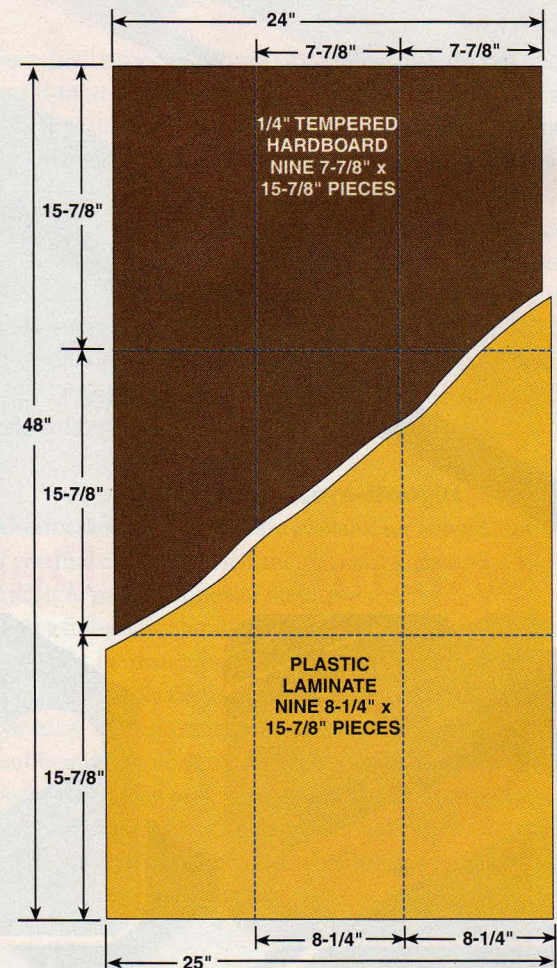
THIS FOUR-LAYER LAMINATED SANDWICH makes cost-effective, first-rate blanks.

Four-Ply Construction

Cut both the hardboard and plastic laminate into nine pieces, all 15-7/8-in. long. Keep the hardboard pieces as wide as possible at 7-7/8 in. Cut the plastic laminate pieces 8-1/4-in. wide (Fig. A).

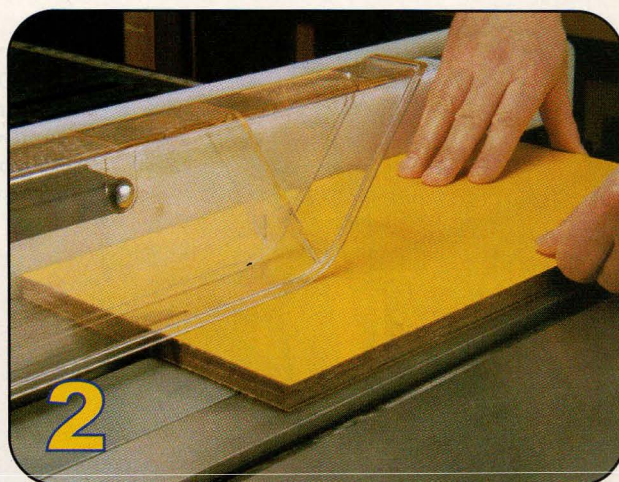
Stack the pieces in four four-layer sandwiches (photo

FIG. A Cutting Diagram for Laminated Blank Stock (makes 9 inserts)





1 LAMINATE THE BLANKS on the flattest surface in your shop. After scuff-sanding the hardboard, carefully stack the four pieces, spreading glue on all the interior surfaces as you go. Press the stack under cement blocks, making sure the pieces stay aligned.



2 SAW THE BLANKS IN HALF. Then trim each half-sized blank to the same width as your saw's stock throat plate.

above, left). You'll have single leftover pieces of hardboard and plastic laminate. Cut these two pieces in half, lengthwise, and stack the four pieces to make a single "half-sandwich."

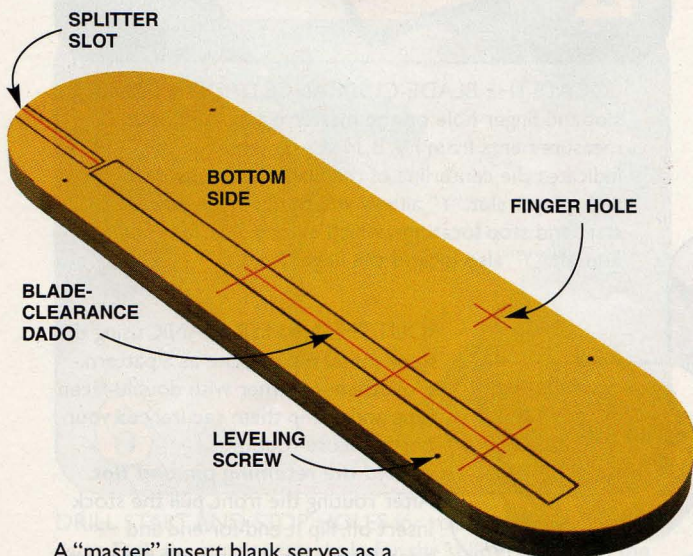
Before gluing, scuff-sand both faces of the hardboard pieces. This quick sanding flattens any ridges and dulls the shiny surfaces so the glue will adhere.

While gluing each four-layer sandwiched blank, keep the hardboard cores centered inside the edges of the plastic lam-

inate. Use cauls and concrete blocks as clamps (Photo 1).

After gluing, cut each blank in half to yield two blanks that are the same width as your saw's stock metal throat plate (Photo 2). The plastic-laminate faces are wide enough to give you a little cushion, but you won't have much left over, because most throat plates are 3-3/4-in. wide. Trim the single half-sandwich blank to the same width. Square the ends of all nine blanks, leaving them slightly long.

Make a Master



A "master" insert blank serves as a setup tool and routing template for making a pile of inserts all at once.

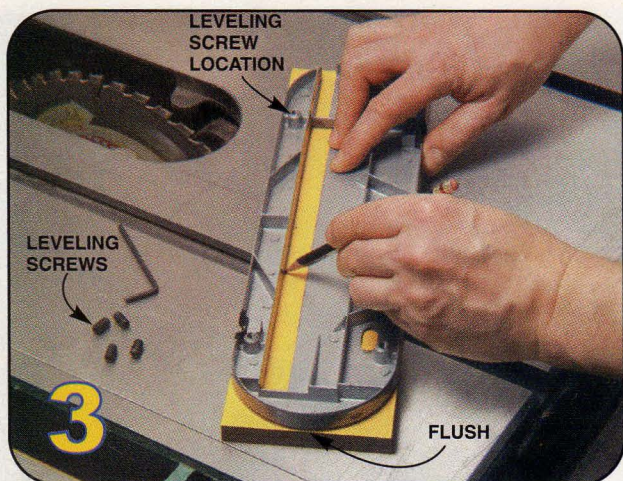
These are the best upgrades you can make to your tablesaw.

Always Keep a Master Insert

Dedicate one insert as a template for routing your blanks to size (photo at left.) Use the same blank as a setup tool, by recording layout marks on it (Photos 3 and 4 and Fig. B). Every insert has four holes for the leveling screws and a finger hole. Inserts for use with a 10-in. blade require clearance dados and splitter slots.

Once you've routed both ends of the master insert (Photo 5 and inset), test-fit it in your saw. It should drop in easily, with just a bit of front-to-back and side-to-side play.

Make a Master continued



TRACE THE STOCK THROAT PLATE'S PROFILE, including the blade and splitter slots, while holding it centered on a blank and flush at the front. Then mark the locations of the leveling screws.

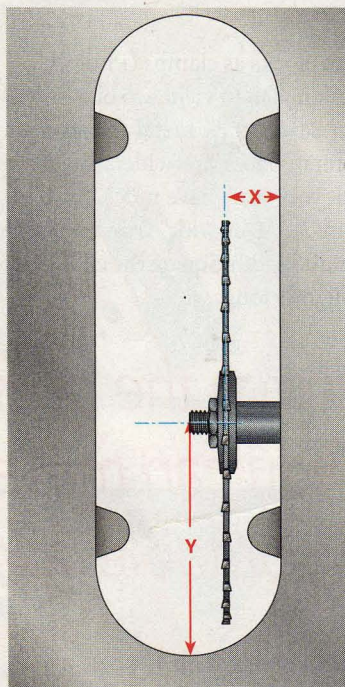
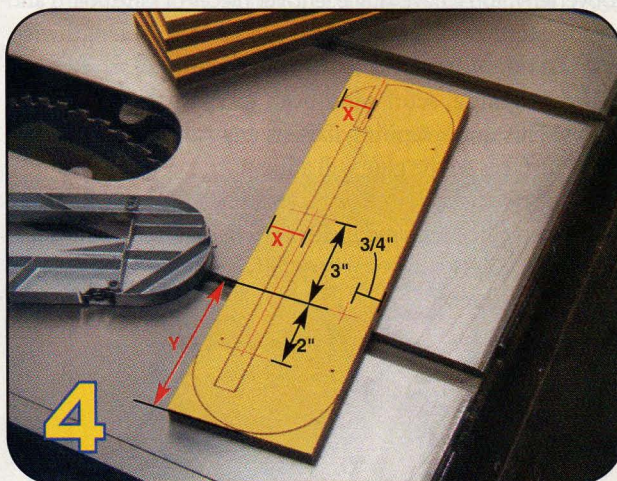
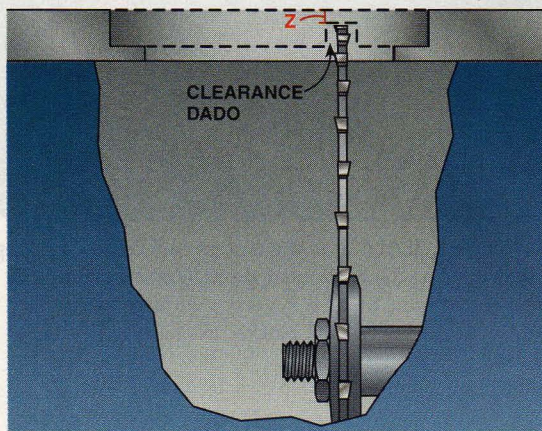


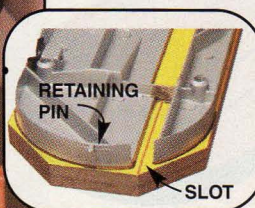
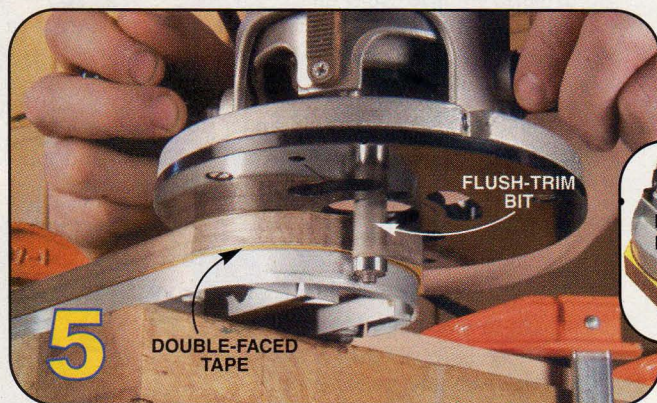
FIG. B MEASURE

THE BLADE LOCATION
Measure from the edge of the throat opening to the center of the blade (X). Then measure from the center of the saw arbor to the front of the opening (Y).

FIG. C INSERTS REQUIRE A CLEARANCE DADO underneath because a 10-in. blade only barely retracts below the table. Measure the distance "Z," and use it when cutting the clearance dado in the bottom of the insert.



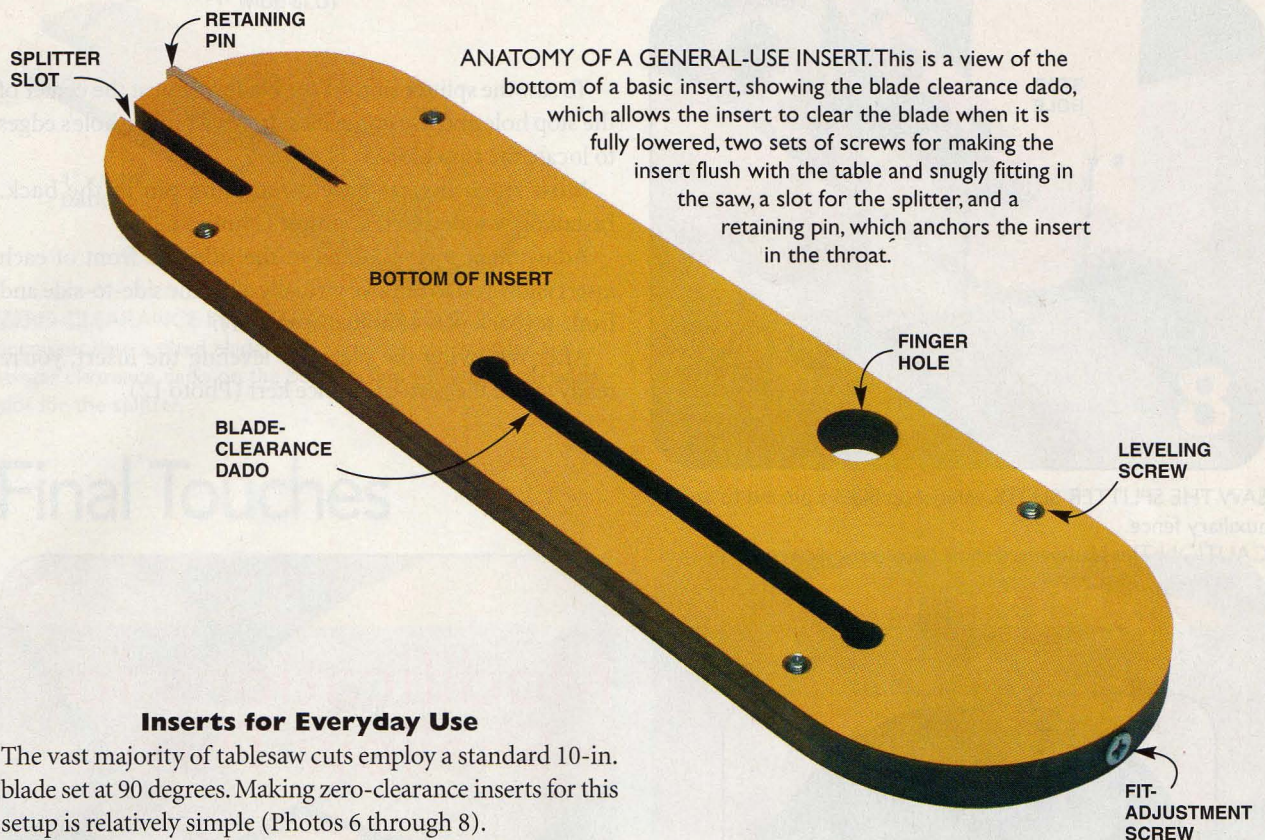
LOCATE THE BLADE-CLEARANCE DADO, splitter slot and finger hole on the master blank, using your measurements from Fig. B. Measurement "X" indicates the centerline of the blade-clearance dado and splitter slot. "Y" allows you to mark the dado's start and stop locations, which extend 2-in. fore and 3-in. aft. "Y" also locates the finger hole.



ROUT THE MASTER BLANK, using the stock metal throat plate as a pattern. Hold them together with double-faced tape and clamp them securely to your bench before routing.

Avoid the retaining pin and slot. After routing the front, pull the stock insert off, flip it end-for-end and remount it. **Use the smooth front end of the stock insert to rout both ends of your master blank.**

Insert for Rips and Crosscuts



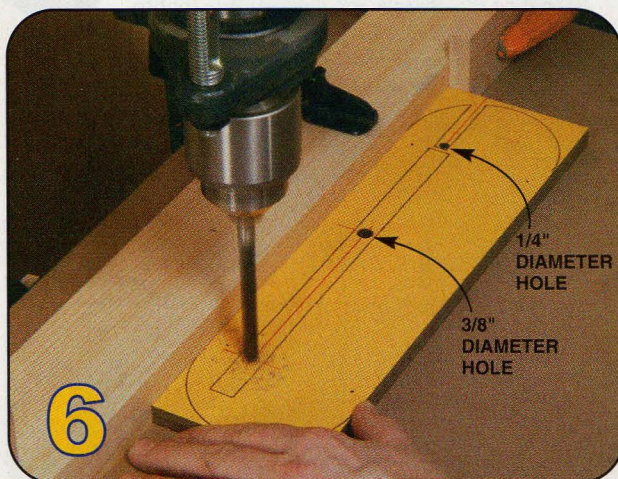
Inserts for Everyday Use

The vast majority of tablesaw cuts employ a standard 10-in. blade set at 90 degrees. Making zero-clearance inserts for this setup is relatively simple (Photos 6 through 8).

All marks are made on the bottom side of the blank. Mark all your blanks, so you don't get confused and drill or rout on the wrong side. Drilling a bunch of blanks is easier if you equip your drill press with a fence and stop blocks. If you have a plunge router, you don't have to drill start and stop holes for the clearance dado (Photo 6). Countersink the 3/32-in.-diameter holes for the leveling screws a bit at the bottom and

halfway through from the top. Drill the 3/4-in.-diameter finger hole from both sides, too, to keep it from blowing out.

Rout the clearance dado (Photo 7). The start hole is oversized, so you can turn the router on after it's in place.



DRILL START AND STOP HOLES for routing the clearance dado. Drill the smaller stop hole for the splitter slot from the same fence setting, and go all the way through.



ROUT CLEARANCE DADOES using an edge guide. Center the bit on the guideline.

For Rips and Crosscuts continued



SAW THE SPLITTER SLOTS, using stop blocks pinned to an auxiliary fence.

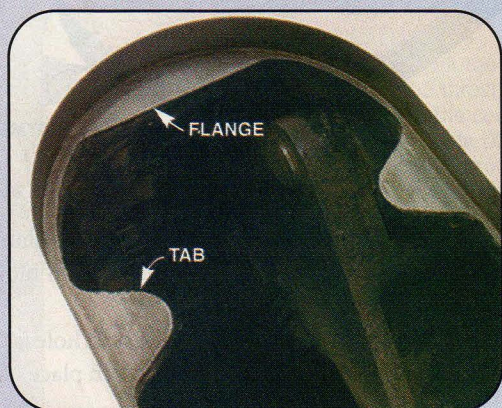
CAUTION: The blade guard must be removed to make this cut.

To saw the splitter slot, set the blade height at the center of the stop hole and use guidelines drawn from the hole's edges to locate the stop blocks (Photo 8).

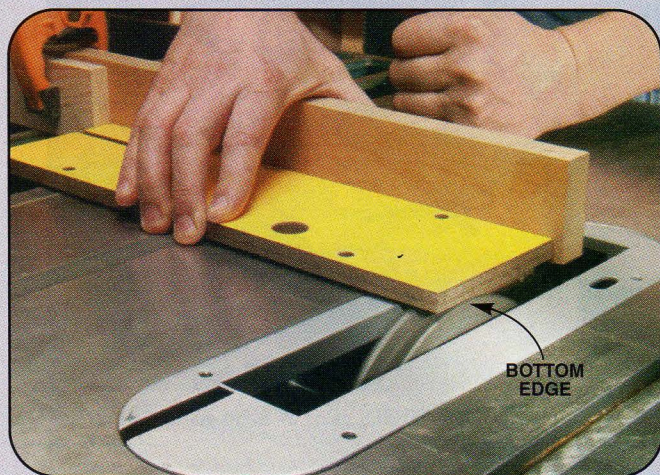
Most stock inserts have a retaining pin in the back. Installing wooden pins is simple (Photo 9).

Adjustment screws added to the side and front of each insert allow you to remove virtually all of the side-to-side and front-to-back play (Photos 10 and 11).

After removing the play and leveling the insert, you're ready to cut the zero-clearance kerf (Photo 12).



FLANGES ALL AROUND THE THROAT mean you'll have to rabbet all four sides of your insert.



RABBET THE EDGES to make the inserts thinner.

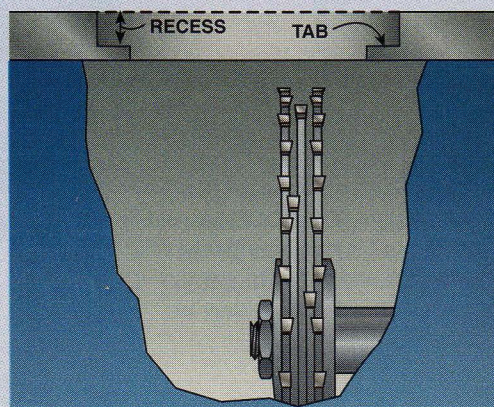
Modifications for a Shallow Throat

Some tablesaws have thin throat plates, which require simple modifications to the inserts we show. To tell if your saw requires shallow inserts, measure its throat recess (Fig. D). If the depth is less than 1/2 in., you'll have to make your inserts thinner.

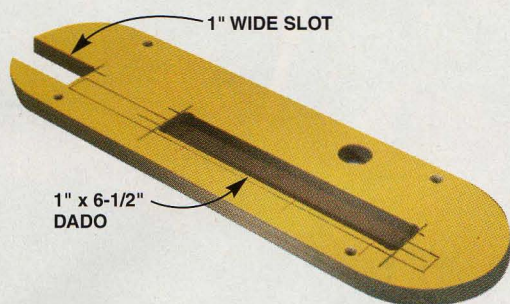
Rabbeting the edges is the quickest way (photo below left), although you could also drill recesses for the tabs with a Forstner bit. Make the rabbets slightly wider than the length of the tabs. You may have to use shorter adjustment screws, depending on the depth of the throat recess.



FIG. D
DETERMINE THE THROAT'S RECESS BY MEASURING FROM THE TABS.

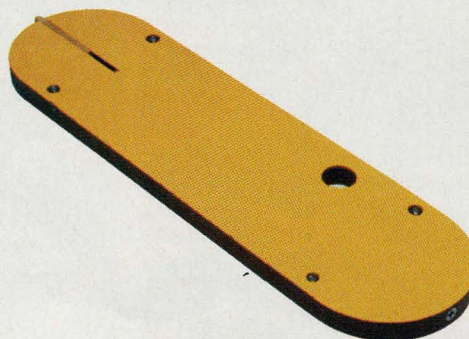


For Bevels



ZERO-CLEARANCE INSERTS FOR ANGLED CUTS have to accommodate a tilted blade. They require a much wider and longer clearance dado on the bottom side and an equally wide slot for the splitter.

For Dadoes



ZERO-CLEARANCE INSERTS FOR DADO CUTS have no splitter slot because you can't cut dadoes with the splitter installed. There's no clearance dado on the bottom either, because dado sets are never more than 8-in. in diameter.

Final Touches



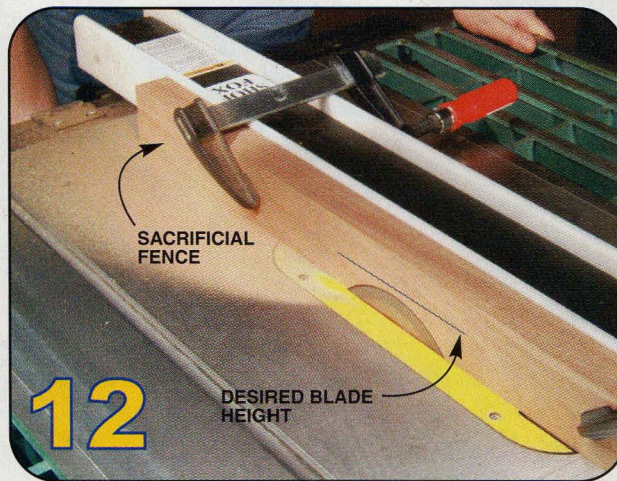
INSTALL RETAINING PINS to keep the inserts from lifting out of the throat. Glue a piece of maple into a saw kerf, using the pin on your stock insert for location. Plane or sand it flush.



CLAMP THE EDGE while drilling holes for the adjustment screws, or you may split the hardboard core.



GET A PERFECT FIT from side-to-side and front-to-back with edge-mounted adjustment screws, two on the side and one at the front. Countersunk leveling screws keep the insert flush to the table surface.



HOLD THE INSERT IN PLACE when you raise the blade. Clamp a board to the fence, flush to the insert and positioned so only the blade's outer face is exposed. Lock the fence, start the saw and raise the blade to the desired height. **AW**



ART DIRECTION: VERN JOHNSON • LEAD SPREAD PHOTOS: BILL ZUEHLKE, ALL OTHERS, MIKE HABERMANN, UNLESS OTHERWISE INDICATED • TECHNICAL ART: FRANK ROHRBACH

By George Vondrisk and Ken Collier

Home Office Cabinets

A flexible design for today's totally wired family

Has your computer become the nerve center of your home? Are you finding that your family spends more and more time at the computer, both for work and play? If so, this set of home office cabinets is for you.

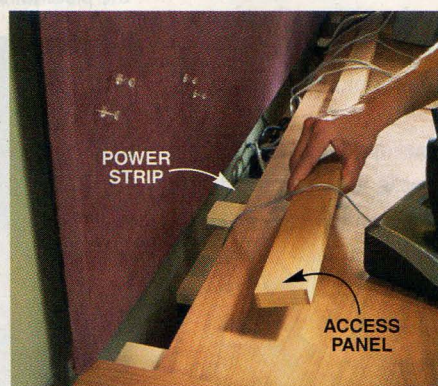
It's not a cute little "let's hide the computer when we're not using it" design. It's a woodworker's version of a well-tested line of metal office furniture, with tons of capacity, convenience and flexibility. If you need space for a phone and a fax, a printer and a scanner, in addition to your computer, this unit can hold them all. Plus, it's got storage for all the paper, CDs, reference material and miscellaneous clutter that an office always generates.

A "Power User" Design

The dark side of having lots of electronic gear is the mess of cords. We've devised a unique solution that not only keeps them hidden, but makes it simple to plug and unplug devices (see top photo, above right).

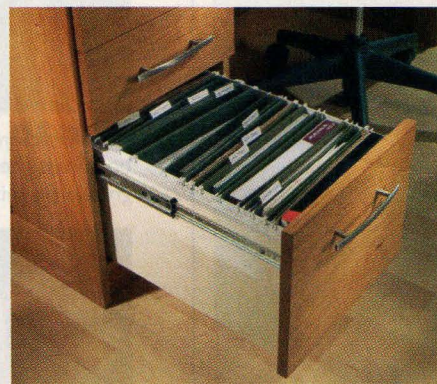
Another problem with work areas is lighting; we've designed the upper cabinets with halogen lights underneath. And if you're taking care of taxes, investments or business out of your home, you need plenty of space for files. We've included three spacious file drawers.

We've avoided a separate compartment for the computer. Computers are getting smaller every

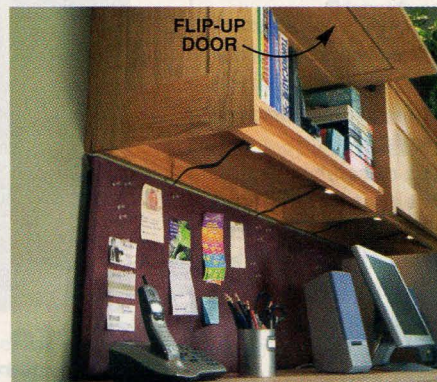


MANAGE THOSE *\$%# CORDS!

A loose panel at the back hides all the mess. It gives access to power strips on narrow shelves behind the desk, making it easy to connect and disconnect equipment.



THREE FILE DRAWERS that accept hanging files give you the capacity for serious home office work. They operate on heavy-duty ball bearing slides.



STORE PAPER SUPPLIES and reference materials behind flip-up doors. Cords for the under-cabinet lighting are concealed behind the bulletin board.

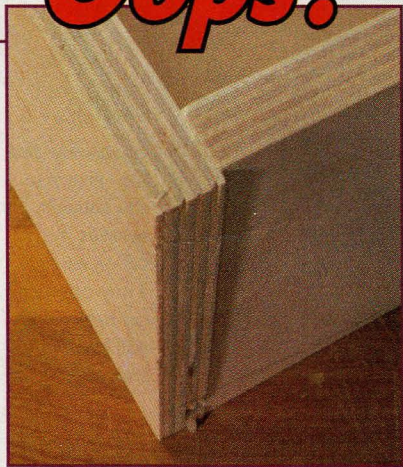
year, and our guess is that it won't be long before a separate computer compartment goes the way of fold-out typewriter tables.

This design is modular, so it gives you a lot of options. You could build just the lower unit or just the upper. You could build the desk with two of the left-hand drawer units instead of one. And if you've got the space, it would be simple to add base units and top units to make the system longer.

A distinctive feature of these cabinets is the web frames used for the desk sides, the upper cabinet doors, and all the other "show" surfaces. We used a new adjustable matched tongue-and-groove router bit set (see Sources, page 108) to make the frames on the router table, but however you make them, they're probably the simplest, fastest way to turn simple boxes into fine-looking furniture (see page 75).

The overall dimensions of the cabinets shown in these photos, when installed, are 76-in. wide by 66-in. high.

Oops!



The bane of biscuit joinery is this alignment problem, which we faced with some of our prototype drawers. It occurs when you register the base or fence of the machine against the wrong surface.

The first rule to remember is this: **mark the surfaces that have to end up perfectly positioned, and register the machine against those surfaces.** The second rule is: **always dry-assemble.** That way you'll spot the problem before it's unfixable.



Photo 1 CUT BISCUIT SLOTS for drawers, using a piece of scrap as a support/layout board. With it, you can transfer slot locations to each part of each drawer accurately. Clamped to the drawer side, it also helps support the fence of the plate joiner.



Photo 2 MEASURE GROOVE TO GROOVE to ensure the drawer bottom is the right size. Mark a convenient distance from the bottom of one groove (in this case, 10 in.), then measure from the other groove to your mark.

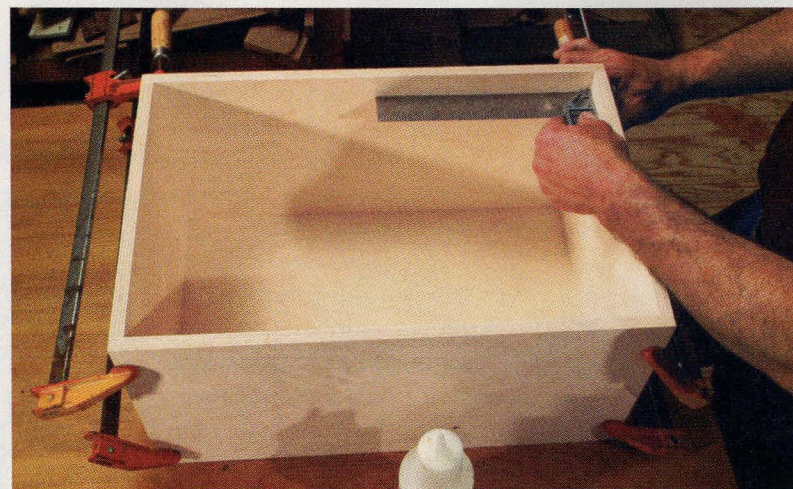


Photo 3 ASSEMBLE THE DRAWERS with biscuits, making sure they're flat and square. The bottom is glued into the drawer box for extra strength.



Photo 4 GLUE EDGE BANDING to the plywood pieces while they are oversize. Leave the banding slightly shy of the plywood and the pieces will be easier to handle. Cut the plywood to size after the banding is sanded, and you'll have clean, flush ends.



Photo 5 CUT RAILS AND STILES from solid wood, keeping the grain as straight as possible. Cut the center stiles to length later, after marking them against the partially assembled frame.

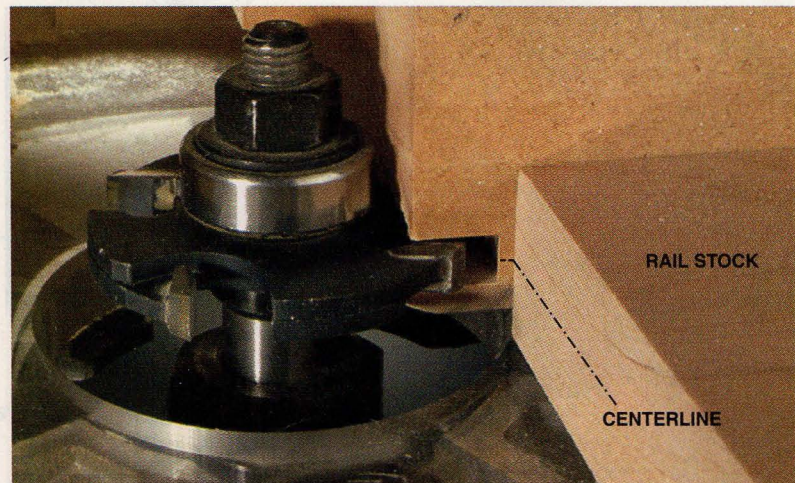


Photo 6 SET UP A GROOVE CUTTER on the router table, with the width of the groove equal to the thickness of your plywood, and the bit centered on your rail stock, and the bearing flush with the fence.

Tools and Materials

These cabinets are built using a plate joiner for almost all the case joints. You'll find that it makes the pieces come together quickly and easily. Besides the plate joiner, you'll need a tablesaw (with dado blade), a jointer and thickness planer, and a router table. A miter saw and tablesaw sled are handy, but not essential. A 35mm bit is useful for mounting the flip-up door hardware, but you could also use a 1-3/8-in. Forstner bit.

We chose cherry for these cabinets, with drawers of Baltic birch. In our area, the materials for both the desk and two upper cabinets, including the hardware and lights, cost \$1,100. You could also make the cabinets out of birch, which would bring the cost down to around \$800.

Measure in Place, or Use the Cutting List?

It's great to have a Cutting List, so you can simply cut and assemble. However, for cabinets like this, it's better not to follow the Cutting List slavishly. There are some parts that must be cut exactly; for those, the Cutting List is fine. For other parts, the safest procedure is to mark or measure from the partially completed assembly. That way, small differences due to sanding, the accumulation of small cutting errors, or plywood that's less than 3/4-in., will not throw you off. In the step-by-step instructions, we've indicated when to cut to the Cutting List dimensions, and when to measure from other parts.

Now let's get started!

Start with the Drawers

Begin with the drawers, because they have to be a precise width to hold the hanging files properly. You can then work outward from the drawers, making the cabinets fit the drawers perfectly.

1. Rip two sheets of Baltic birch plywood as shown in Fig. K, page 73. Crosscut the drawer parts (D1 through D5) from these pieces. Save the scrap pieces for testing your joinery setup later.

2. Cut the groove in the drawer sides (D2 and D5). We used the groove cutter from the adjustable tongue-and-groove set, in a router table. Use a featherboard and make test cuts to fine-tune the setup. Cut grooves in all the drawer parts, and don't move the router table fence when you're done.

3. Make a support/layout board for cutting the biscuit slots (Photo 1). Cut biscuit slots in the drawer sides first, then in the drawer fronts and backs. Use the support/layout board to lay out biscuit locations.

4. Measure the width of the drawer bottoms (D3). Dry-assemble one drawer and measure from the inside of one groove to the inside of the other. Subtract 1/16 in. for clearance (Photo 2). Trim the drawer bottoms to size if necessary.

5. Cut rabbets in the drawer bottoms, using the slot cutter in the router table. If the fence is in the same position, the width of the rabbet will be correct. Adjust the height of the cutter to produce the correct rabbet thickness. Dry-fit the drawers to test.

6. Assemble the drawers. First, sand all the drawer interiors. Then assemble the drawers (Photo 3), using #0 biscuits and white glue (for extra working time). Check drawers for square by measuring from corner to corner.

Cut and Edge-Band the Plywood

Now is a good time to cut and edge the 3/4-in.-plywood parts. Notice that two of the desk parts (C1 and C2) are of birch for the sake of economy, because only the front edge shows, and that is edged with cherry. The other parts are cut from cherry plywood. Choose the better of your two cherry sheets for the desktop (T1).

The general approach we suggest for making the plywood parts is to rip the plywood to width, but only roughly cut them to length. Glue on the edge banding, sand it flush, and cut the pieces to length (Photo 4). This ensures that the banding is cut cleanly at the ends.

7. Rip the birch plywood as shown in Fig. K, to the widths required for the desk top



Photo 7 CUT GROOVES in the rails and stiles to house the plywood panels. The center stile (shown) gets grooves on both sides, the others on just the inside edge. Keep the good (outside) face down, and use featherboards and a push stick.

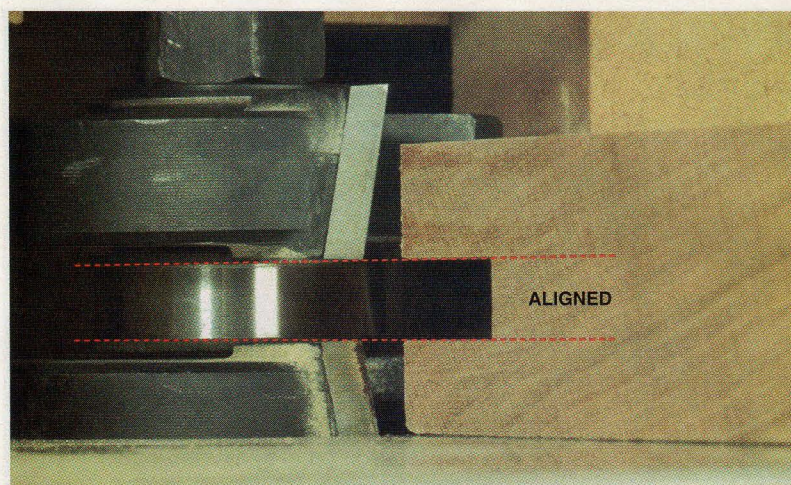


Photo 8 SET UP A TONGUE CUTTER so the tongue is a snug fit in the groove, and the joint is flush. With a matched tongue-and-groove set, the fit is guaranteed.

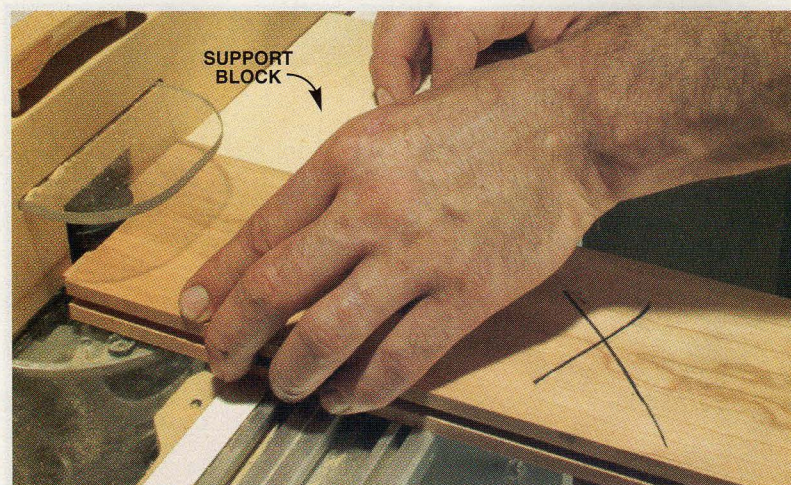


Photo 9 CUT THE TONGUES, using a support block behind the stock. Be sure the good side is down while you cut, and use a zero-clearance fence to minimize blowout.

Desk Pedestals and Kneehole Panel



Fig. B Desk Top

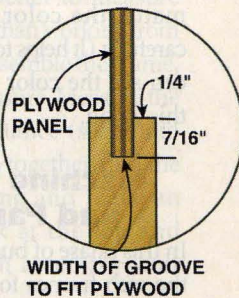
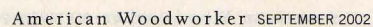


Fig. C



and bottom (C1) and the dividers (C2).
8. Rip the less-good sheet of cherry plywood into four strips, as shown in Fig. K, to give you material for parts U2, U3 and U4. Save the remainder for other parts. Cut a 36-in.-long piece from each strip to make them easier to handle.

9. Prepare the 1/8-in. edge banding. You'll need around 45 ft. of it, but make plenty, because it's a drag to run out. Plane your cherry to the thickness of your plywood plus 1/16 in. Rip 3/16-in.-thick strips, then plane these to 1/8 in.

10. Glue edge banding to the plywood (Photo 4). Because these pieces will be trimmed later, you can leave the banding slightly short of the ends of the plywood. Note that parts U4 require no edge banding, and parts U1 require banding on two adjacent edges. Mark the U1 parts so you can orient them with the good side facing the inside of the cabinet (Fig. E). When the glue is dry, sand all banding flush with the plywood and crosscut all the parts to final length.

Choose the Best Boards for Drawer Fronts

The best way to get a good grain and color match among the drawer fronts is to cut them all from one board. It'll have to be clear enough to get eight pieces, 6-in. x 15-in. Each file drawer front (F2) will be glued up from two of these pieces. If you can't get them all from one board, match the color and grain pattern carefully. (It helps to wet the wood so you can see the color better.) Set aside all this wood.

Machine the Frame and Panel Parts

In this phase of building, you will make the web frames for the desk sides, the knee-hole panel (between the pedestals), the ends of the upper cabinets and the upper cabinet doors. All are made the same way, and differ only in dimensions.

11. Cut the rails (P2, P6, P7, UP2, and DR2) and stiles (P1, P3, UP1 and DR1) for the frames (Photo 5). Try to get all the parts that make up one frame from a

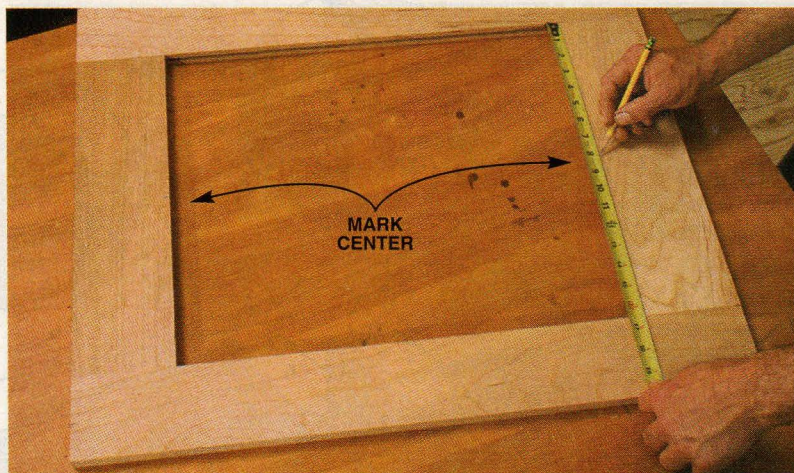


Photo 10 DRY-FIT THE FRAME and measure the center stile length from the bottom of one groove to the bottom of the other groove. Cut the center stile, and mark the centerline of the frame and the stile on both ends.

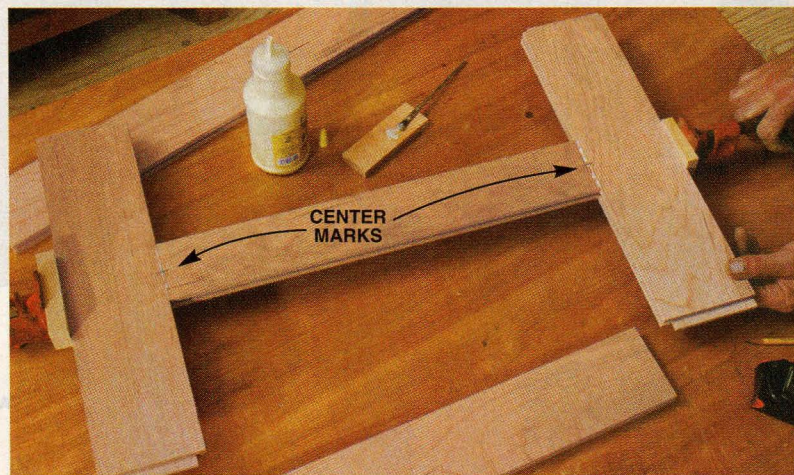


Photo 11 GLUE THE FRAME IN STAGES, starting with the center stile. Make sure it's flat and square, and centered in the frame. A little bit of glue on the plywood panels will strengthen the web frame considerably.

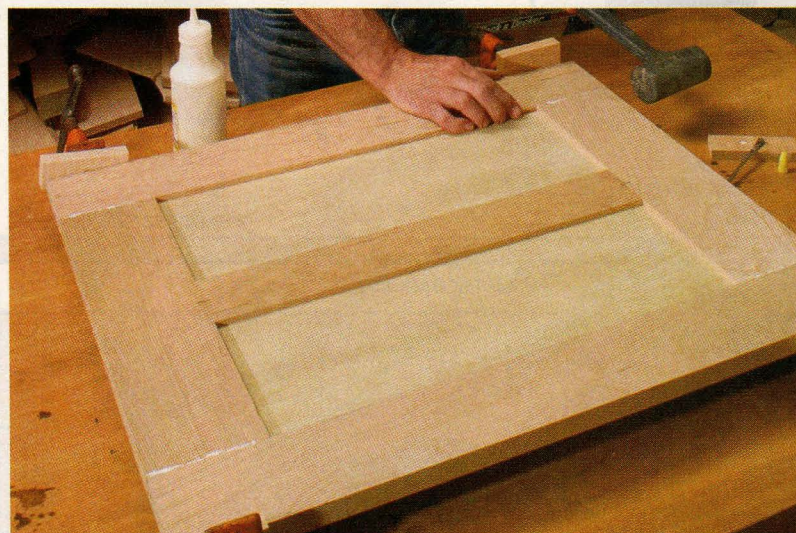


Photo 12 COMPLETE THE GLUE-UP, keeping one end of the frame flush. The other end can be trimmed slightly to make it flush after the glue dries.

Fig. D
Drawers

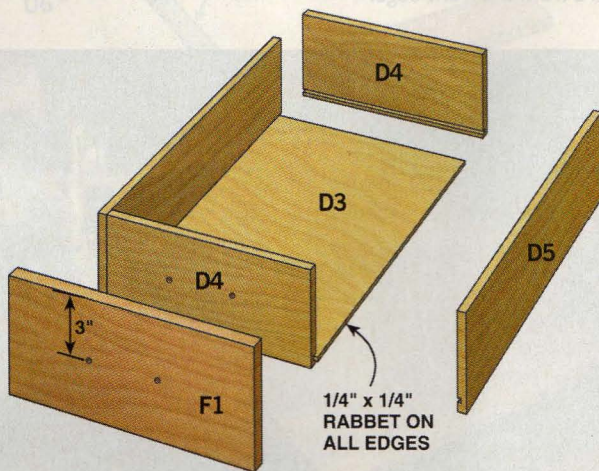
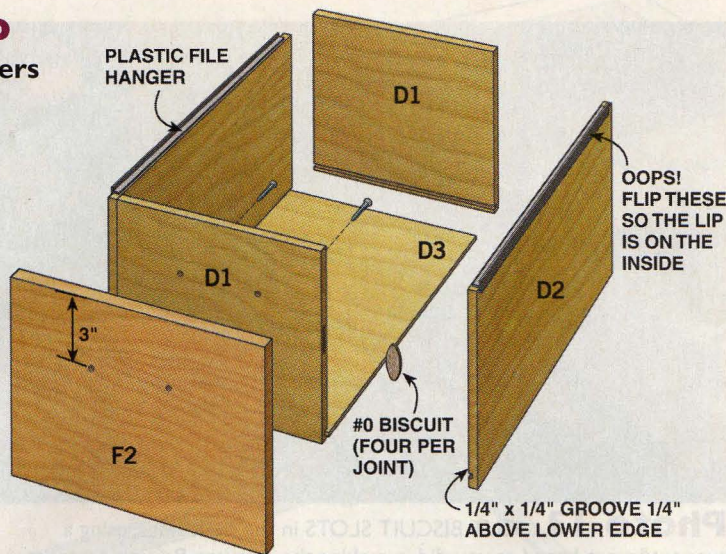
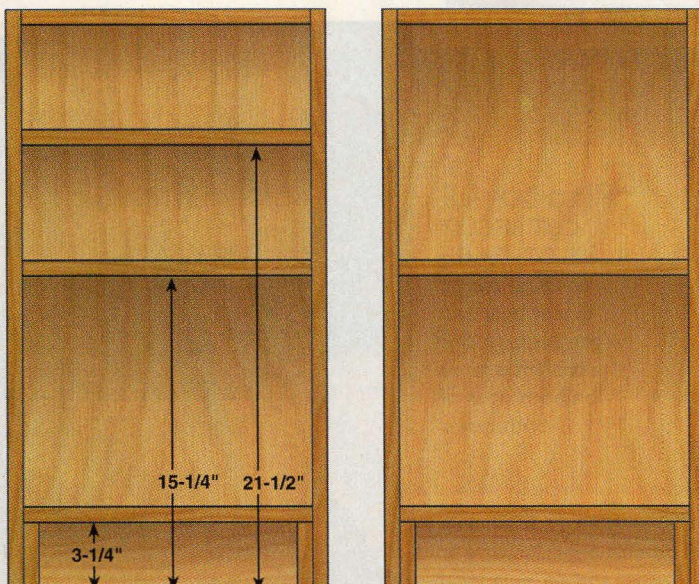


Fig. E
Position of Dividers



single board, or from boards with similar grain and color. Keep the grain as straight as possible in the parts, even if you need to cut them at an angle to the edge of the board. Make a few extra and save the less-good parts for setup and insurance. Mark all parts to indicate the good (outside) face and which frame-and-panel unit they belong to. Use a stop block to ensure that matching rails and stiles are crosscut to the same length. Note: Do not cut the center stiles (P3) to length yet.

12. Set up your router table to cut the grooves in the rails and stiles (Photo 6). All parts will be machined good face down on the router table. Plow the groove into all the frame pieces (Photo 7). Note that the center stile gets grooves on both edges.

13. Set up the tongue cutter in the router table. Set the height of the tongue cutter by aligning it with the groove you just machined. Position the fence so it's flush to the router bit bearing. Make test cuts in scrap to check the bit height. When the tongue height is correct, the sample piece should fit in the groove so the good faces are perfectly flush. Fuss with the height of the tongue cutter until it's dead on.

14. Cut the tongue in the end of each rail. Support the edge of the rail with a square piece of scrap (Photo 9). The good face should again be face down.

15. Determine the length of the center stile (P3). This is an example of a situation where it's better to measure from the work, rather than working from a Cutting List. Dry-assemble the frame, using light clamp pressure. Measure the groove-to-groove distance (see Photo 2). While the frame is together, find the center of the opening and make an accurate hash mark at the top and bottom to help with assembly later (Photo 11).

16. Cut the center stiles (P3) to length, then cut a tongue on both ends. Mark the center of the width of the center stiles, and dry-assemble the frame using light clamp pressure. Align the center mark on each end of the center stile with the center marks on the frame.

17. Measure and cut the plywood panels

(P3, P4, P5, P8, UP3 and DR3). Measure groove to groove, as you have before, and cut the plywood panels 1/16 in. undersize. Keep the panel parts organized so the grain is in the correct orientation and the panels that go into one frame all come from the same part of the plywood sheet, so the grain matches. Lay out the panels on the plywood so the grain is well situated on the panels. This may require shifting the cuts, either horizontally or vertically (see Fig. K).

18. This is a convenient time to cut the beveled cleats (U5 and K1) that are used to hang the upper cabinets. Angle the blade of your tablesaw to 45 degrees and rip the parts out of scraps of plywood or solid wood.

Assemble the Web Frames in Stages

It's much safer to assemble the frame-and-panel units in stages, so you have plenty of time to make corrections and remove glue squeeze-out. Before you get out the glue bottle, though, sand all the inner edges of the frames and the show side of the plywood panels.

19. Glue the center stile (P3) into each frame (Photo 11). Make sure the upper and lower rails are square to the center stile, and the center rail is centered on the hash marks you made earlier. When the center stile/rail sub-assembly is clamped, insert the plywood panels and glue on the stiles. You can glue in the plywood panels for strength, but use only a little glue to minimize squeeze-out mess. Clamp, check for square and be sure the frames are flat.

20. Run the five frame-and-panel assemblies for the desk through the tablesaw to trim them to a uniform length. Then do the same for the two sets of web frames that go into the upper cabinets. Sand the rail/stile joints to feather out any unevenness. Rip 1/2 in. from the top of the kneehole panel, so there is a little gap for wires when it is assembled.

21. Cut grooves and rabbets in the web-frame desk sides, to house the plywood backs (C4). Mark the frames to indicate

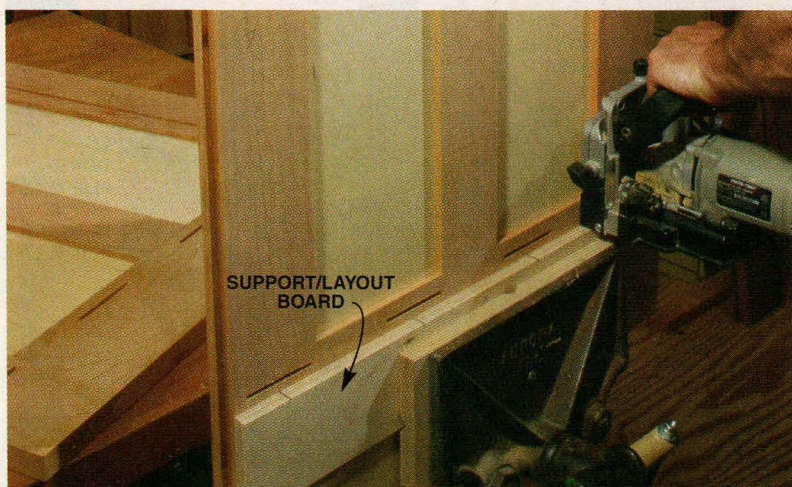


Photo 13 CUT BISCUIT SLOTS in the desk sides, using a support/layout board as you did in making the drawers. Be sure to register your layout board from the front edge.

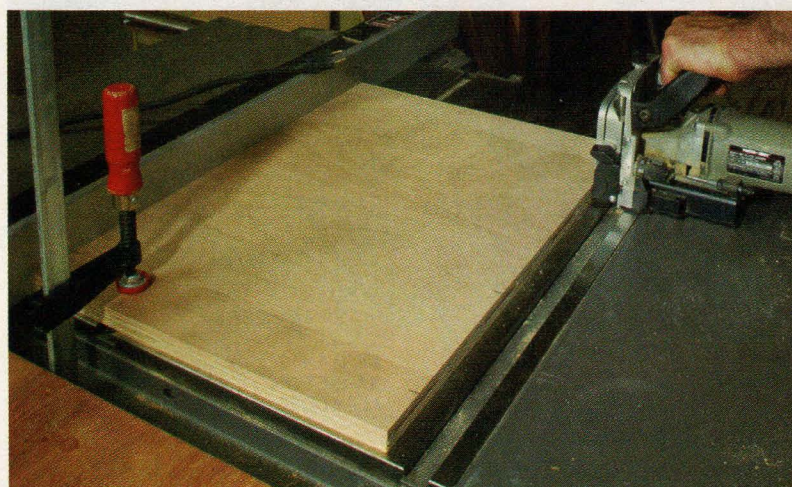


Photo 14 CUT BISCUIT SLOTS in the cabinet bottoms, using the support/layout board to transfer the locations.

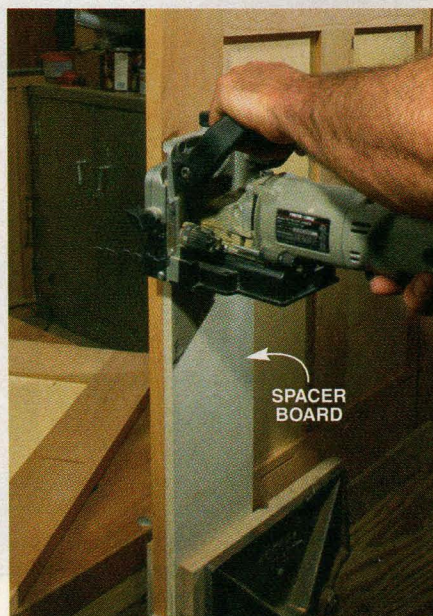


Photo 15

CUT BISCUIT SLOTS for the dividers, using a spacer board to get the locations exactly the same on both sides of both cases.

Fig. F
Upper Cabinets

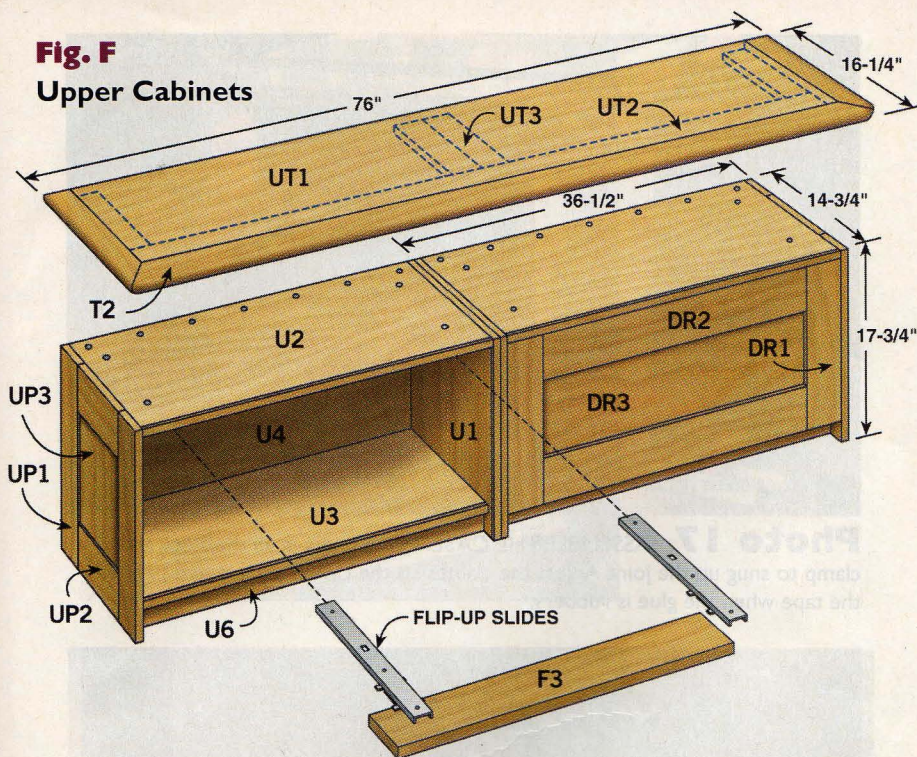


Fig. H
Bulletin Board

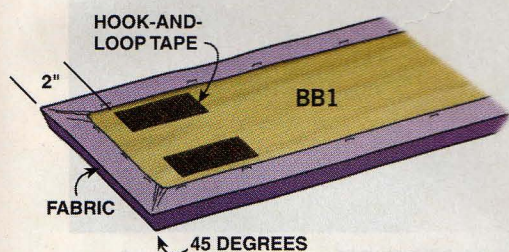
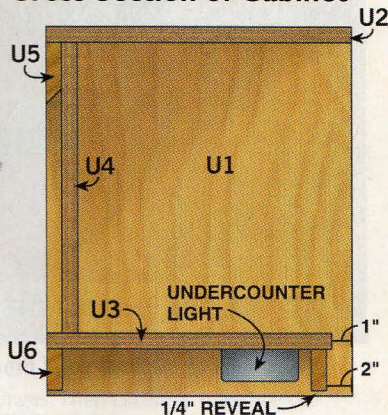


Fig. G
Cross Section of Cabinet



their orientation in the finished desk: outside left, inside left, inside right, outside right. Label the top and back of each panel. Set up a dado head in your tablesaw to cut the groove shown in Fig. A. The plywood you're using for the back should fit snugly in the groove. Cut the grooves in the outside web frames, and the rabbets on the inside web frames.

Assemble the Desk Pedestals with Biscuits

22. To lay out the biscuit slots for the desk, make a support/layout board as you did for the drawer boxes (Photo 13). Make it 3-1/4 in. x 20-7/8 in. Lay out biscuit locations on the board, 1-3/4 in. and 7-1/2 in. from each end.

23. While the rip fence is set at 3-1/4 in. for the support/layout board, rip two toe boards (C5) from leftover cherry plywood.

24. Cut biscuits slots in the frame-and-panel sides and the plywood tops and bottoms (Photos 13 and 14).

25. Cut biscuit slots for the drawer dividers (Photo 15). Use two support/layout boards, cut at 15-1/4 in. and 21-3/8 in. The shorter board is used on both units to locate the slots for the lower dividers. The longer board is used only on the left unit to locate the upper divider. Cut slots in the dividers themselves while they are flat on the tablesaw, as you did with the case bottoms.

26. Prepare for assembly. Sand the inside faces of all parts to 220 grit. Attach masking tape to the faces of the cabinet top, bottom and dividers, immediately adjacent to the biscuit-slotted edges. This tape prevents glue squeeze-out from getting on these parts. Dry-assemble the cabinet. Attach masking tape to the inside faces of the panels where they meet the top, bottom and dividers. Disassemble the cabinet.

27. Assemble the pedestal units. Lay one frame-and-panel side on a pad, with the good (outside) face down and the front edge toward you. Brush white glue in the slots and insert biscuits. Brush glue into the slots of the cabinet top, and set it over the biscuits. Make certain the front



Photo 16 APPLY GLUE in the biscuit slots. White glue gives you slightly more working time, which is convenient for a complicated glue-up like this. The tape makes it easier to remove squeezed-out glue. It's not really necessary on the lower cabinets, but it's useful on the uppers.

edges are flush. Continue with the dividers and the cabinet bottom. Brush glue and place biscuits into the exposed slots on the cabinet components. Brush glue onto all of the biscuit halves now projecting up from the cabinet components. Carefully lay the mating frame-and-panel side over the glued biscuits. Align the parts carefully to avoid getting glue from the biscuits all over the interior of the panel. It's a good idea to get an extra pair of hands to help.

28. Clamp-up the desk pedestals (Photo 17). Clamp across the cabinet top and bottom, using a caul at each joint and clamps front and back. Make sure the front edges are flush. Clamp across the divider in front. Check the cabinet for square. After the glue gets rubbery, in about 10 to 15 minutes, peel off the masking tape.

Complete the Desk

Once the two pedestals are glued up, you can get the entire lower part of the desk ready for finishing.

29. Attach skids (C3) to the underside of the pedestals and glue and nail on the toekick boards (C5).

30. Drill holes for mounting the desk top (Fig. A) and install the plywood backs on the two desk pedestals. Cut, drill and attach the mounting cleats (C6) for the kneehole panel.

31. Install the drawer slides in the desk first, using a spacer board to ensure that they are perpendicular to the front of the case (Photo 18). Separate the slides and install the drawer slide half on the drawer boxes, keeping it parallel to the drawer edge. Install the drawer boxes in the desk.

32. Cut the drawer fronts (F1 and F2). Rip them to the dimensions given in the Cutting List, page 74. Finish-sand, and attach them temporarily to the drawer boxes (Photo 19). When they're perfectly aligned, screw them to the drawer boxes from the inside.

Cut Biscuit Slots in the Upper Cabinets

33. Mark the ends of the upper cabinet for biscuits. There should be two web

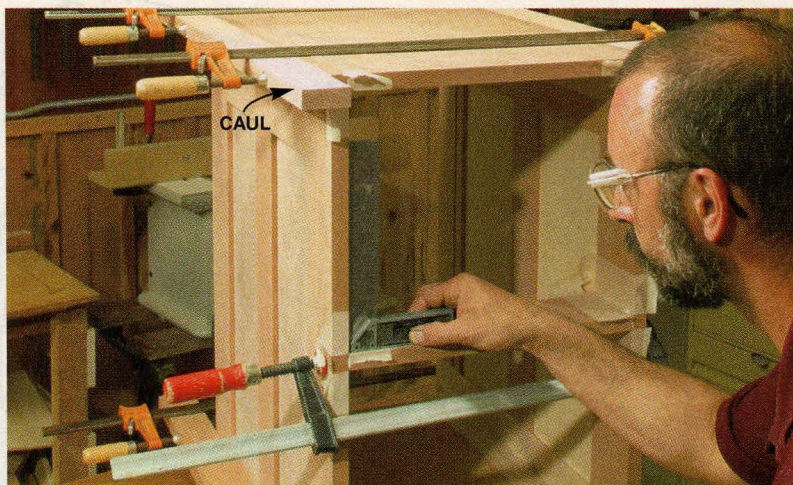


Photo 17 ASSEMBLE THE CASE with biscuits in all the slots, and clamp to snug up the joint. Adjust the clamps so the case is square, and peel off the tape when the glue is rubbery.

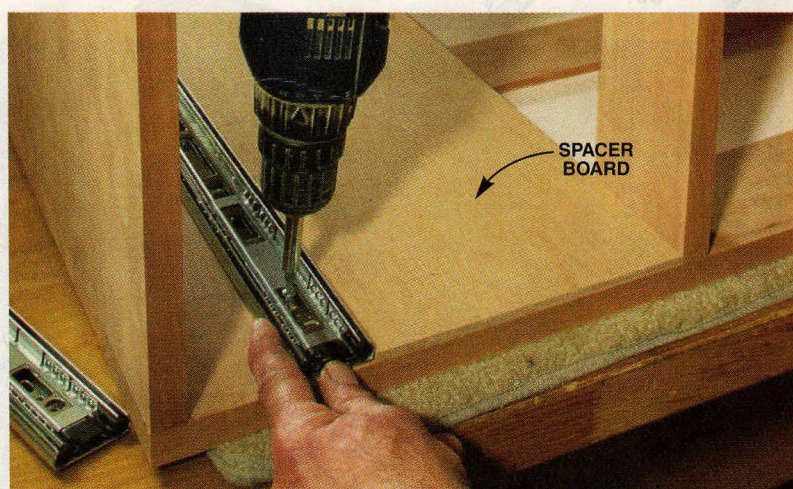


Photo 18 MOUNT THE DRAWER SLIDES to the cabinet sides first, using a spacer board. Then attach the other half of the slide on the drawer box so it is parallel to the bottom of the drawer.

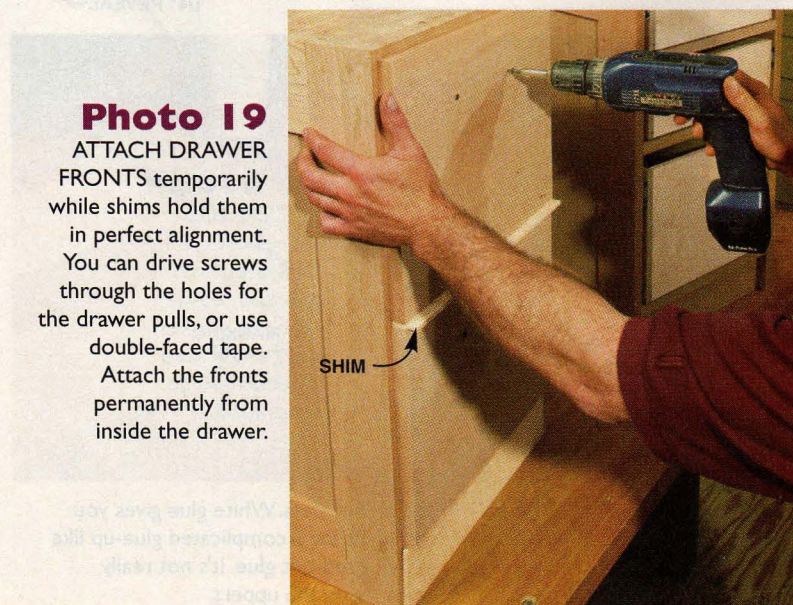


Photo 19 ATTACH DRAWER FRONTS temporarily while shims hold them in perfect alignment. You can drive screws through the holes for the drawer pulls, or use double-faced tape. Attach the fronts permanently from inside the drawer.

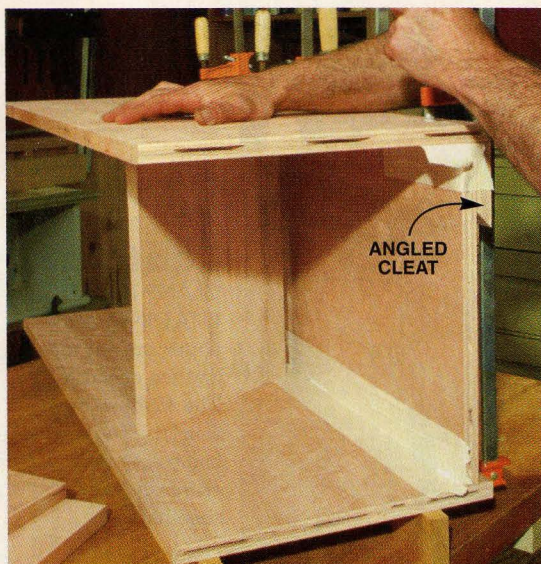


Photo 20

ASSEMBLE THE UPPER CABINETS in the same fashion as the lower units, with frame-and-panel sides and banded plywood for the remainder of the case. An angled cleat built into the back makes installation much easier.



Photo 21 MOUNT FLIP-UP DOOR HARDWARE in the upper cabinets by boring the door to accept cup hinges. Then carefully measure the required setbacks for the slides and screw them in place.

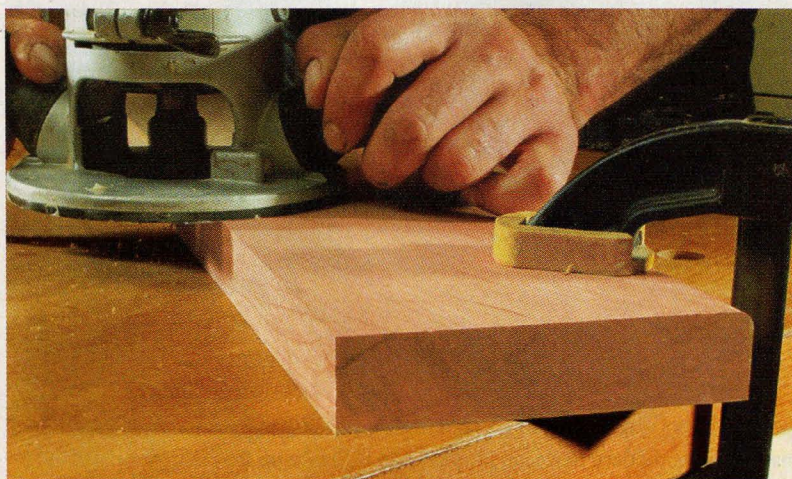


Photo 22 ROUT EDGE MOLDING for the desktop and upper cabinet top, using stock that is at least twice as wide as needed. This gives you more stability while machining, and you can rip the finished molding in half afterwards.

frames for the ends and two plywood parts (U1) that face each other between the two cabinets (Fig. F). Make sure you are laying out both lefts and rights.

34. Cut biscuit slots to join the back (U4) and the bottom (U3). Start by laying out slot locations in the bottom edge of the backs (U4). Center the slots 1-3/4 in., 9-3/4 in. and 17-1/2 in. in from each end. Use the hanger cleat (U5) as a spacer to rest the biscuit joiner fence on as you cut the slots. Set the fence to place the slot in the center of the plywood, and use the back face of the material as a reference. Cut mating biscuit slots in the back edge of the bottom (U3).

35. Cut biscuit slots to join the ends (U1 and frame-and-panel units) to the tops and bottoms (U2 and U3). Rip a support/layout board 2-1/4-in. wide, and crosscut it to the width of the bottom (U3). Lay out biscuit locations at 1-3/4 in. and 6-7/8 in. from each end. Using the support/layout board, cut biscuit slots on the inside face of the ends. Transfer layout lines to the ends of the bottom (U3), then cut those slots. Do the same for the tops (U2).

36. Cut biscuit slots to join the ends to the back (U4). Lay out the biscuit locations on the ends of the back (U4) where it will join the ends, 1-3/4 in. and 7 in. from the end. Cut the slots.

37. Dry-assemble the cabinets to make sure all biscuit slots are in the proper locations.

Assemble the Upper Cabinets

38. First, it's time to take care of a few odds and ends. Screw and glue the hanger cleat (U5) to the cabinet back (U4). Drill and countersink the holes in the top (U2) that will later be used for mounting the finished top (UT1). (Make sure you're countersinking the *inside* surface.) Cut the four rails (U6), sand them, and glue two under the front edge of the bottom (U3), 1-in. back from the edge. Clamp the other rails to the back bottom edge of U3, and attach with screws. Then remove the screws and the rail. It'll be easier to clamp the case without the rails there, and it's hard to

drill the holes after the case is assembled. Dry-assemble the case and mask-off around the biscuit joints.

39. Assemble the upper cabinets in stages. You'll need about 28 #20 biscuits. First, glue and screw the top (U2) to the back (U4) and hanger cleat. Hold the assembly upright by using a 14-in. spacer under the top. Keep the ends flush, and use a square to check that the top and back are square. Glue, biscuit and clamp the bottom (U3) to the back (U4). Use the 14-in. spacer to help hold the assembly upright, and be sure the back and bottom are perpendicular (Photo 20). Allow this assembly to dry.

40. Glue and screw the rear rails (U6) in place. Glue and clamp the front rails in place, keeping the ends flush.

41. Glue, biscuit and clamp the end panels (U1 and frame-and-panel assemblies) to the partially complete assembly. Check for square, and remove the masking tape.

42. Install the doors. First, trim the doors so they fit the cabinets with an even 1/8-in. gap on both ends. Then install the hardware (Photo 21). For the slides we specify (see Sources, page 108), the included instructions are clear. (Other brands may have slightly different installation procedures.) Begin by drilling holes in the doors, centered 2 in. from the edge, to receive the cup hinges. Follow the hardware directions to determine the filler-strip dimensions, cut them, and install the slides.

Build the Tops

43. Rip your better sheet of cherry plywood to size for the tops (T1 and UT1). Rip strips of Baltic birch for buildup strips (T4, T3, UT2 and UT3) on the underside of the tops, and crosscut them to length. Note that the buildup strips for the desktop extend 2-in. beyond the top at the back and they hold up the loose access strip (T5). Also, you'll have to piece together parts T3 and UT2 to get the necessary length. Glue cherry edge banding to all four sides of the access strip (T5) and the back edge of the top (T1).

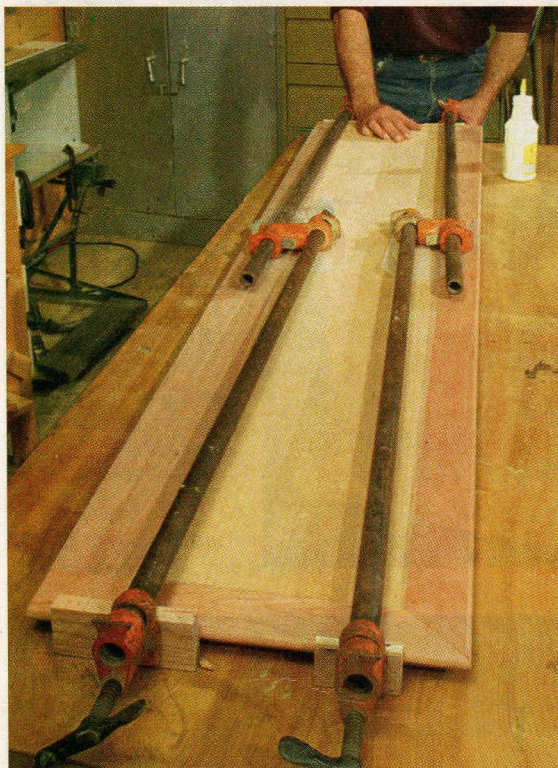


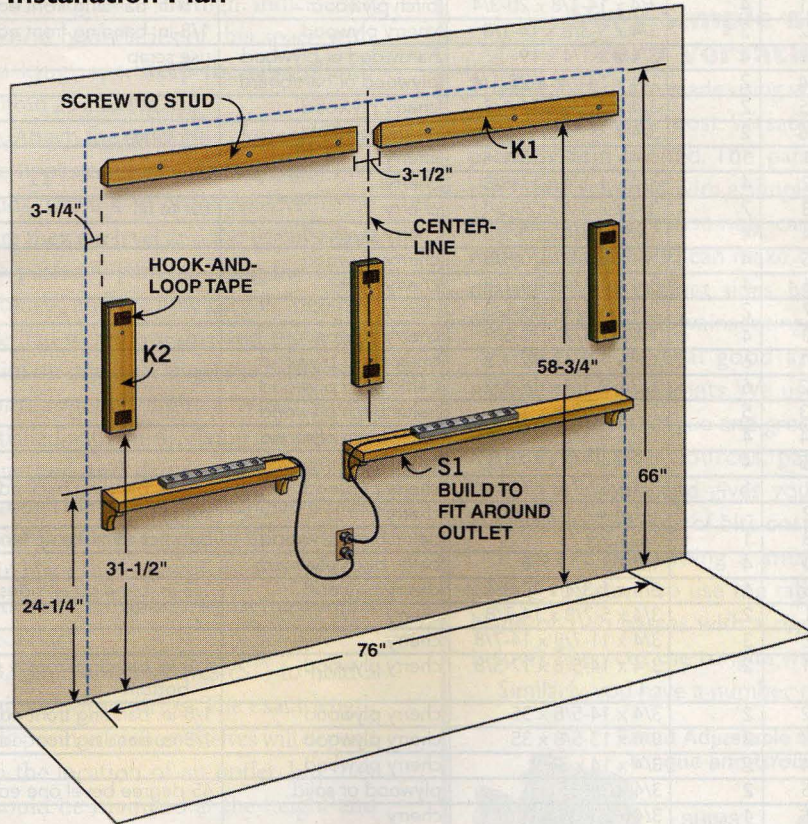
Photo 23 CLAMP THE EDGE MOLDING to the upper cabinet top and the desktop. The tops are over 6-ft. long, so we had to use two clamps hooked together.



Photo 24 INSTALL THE CABINETS by laying out two strips of masking tape that are perfectly plumb. Then measure up from the floor and in from the tape to locate the hanging strips for the upper cabinets, the mounting boards for the bulletin board, and the narrow shelf that holds the power strips.

BILL ZUEHLKE

Fig. J

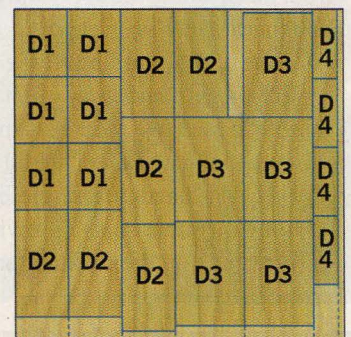
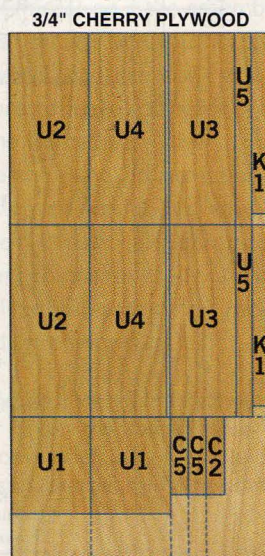
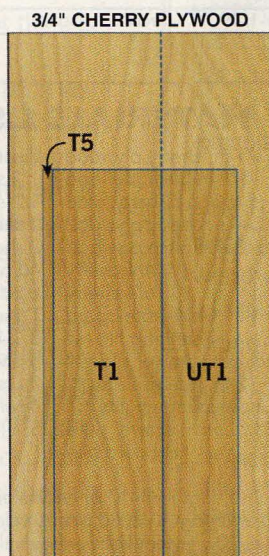
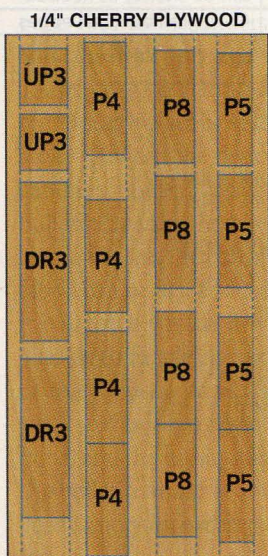
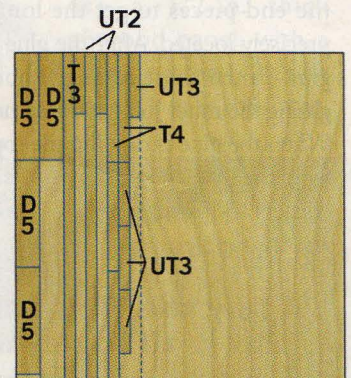
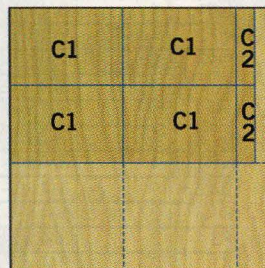


44. Glue and screw the buildup strips to the underside of the plywood, long edge first. On the desktop, place two buildup strips 15 in. from each outside edge so they rest over the edges of the pedestals. For the upper cabinet top, there are buildup strips on either side of the centerline.

45. Mill the edge-molding stock, T2 (Photo 22). Saw and plane pieces of 6/4 cherry so they're 5-1/2-in. wide and 1-1/4-in. thick, or to match the thickness of your top. This piece will be ripped in half to produce your molding. Run the pieces through your planer to clean off the saw marks from the edges. Rout a 1/4-in. roundover on both top edges. Angle your tablesaw to 45 degrees, and rip the angled edges. Keep the wide side of the material, the side with rounded corners, resting on the saw top as you cut. Feed slowly, because you'll be cutting with the show side down. Rip the molding to 2-9/16 in., with the beveled

Fig. K

Lay out rip- and cross-cuts to yield the best grain pattern in the parts.



side facing up. Then joint the sawn edges. Be especially careful and use push blocks, because these are narrow pieces. Sand off saw marks on the beveled surfaces after the molding is glued to the plywood.

46. Cut miters on the molding. For each top, cut the miters on the short end pieces first, but do not cut them to final length. Instead, keep them 1/4-in. long. (Notice that the short molding for the desktop is longer than the top, T1, Fig. B.) Now cut the long front molding piece. Try to get the end pieces and front piece from one length of molding to keep the grain continuous. Clamp the long front molding piece in position and use the short end pieces to test the miters. Adjust if necessary. Trim the short end pieces to final length.

47. Lay out and cut biscuit slots in the top and molding. Use the fence of your plate joiner and register it from the top edge of the plywood and the molding for all the slots. There are two biscuits at each location; one in the 3/4-in. plywood, one in the 1/2-in. plywood.

48. Glue and clamp the edging to the plywood. Attach the long edge first, using the end pieces to get the long edge precisely located. After the glue is dry, glue on the short edging (Photo 23), gluing the miter joint at the same time. When the glue is dry, flip the top over. Sand the beveled edge smooth, ease the corners and finish sand both the edging and the top.

CUTTING LIST

Part	Quantity	Size	Material	Notes
C1	4	3/4 x 14-1/8 x 20-3/4	birch plywood	1/8-in. banding front edge
C2	3	3/4 x 3-3/8 x 14-1/8	cherry plywood	1/8-in. banding front edge
C3	4	3/4 x 3-1/4 x 19	hardwood or plywood	use scrap
C4	2	1/4 x 14-7/8 x 28-1/4	plywood or hardboard	
C5	2	3/4 x 3-1/4 x 14-1/8	cherry plywood	
C6	2	3/4 x 3/4 x 27	hardwood	use scrap
P1	10	3/4 x 3-1/2 x 28-1/4	cherry	
P2	4	3/4 x 4-1/4 x 17-3/8	cherry	
P3	7	3/4 x 2-3/4 x (20-5/8)	cherry	cut to fit
P4	4	1/4 x 7-3/4 x 20-5/8	cherry plywood	
P5	4	1/4 x 6-1/2 x 20-5/8	cherry plywood	
P6	4	3/4 x 4-1/4 x 14-7/8	cherry	
P7	2	3/4 x 4-1/4 x 35-5/8	cherry	
P8	4	1/4 x 7-1/2 x 20-5/8	cherry plywood	
D1	6	1/2 x 9-3/4 x 12-1/8	baltic birch plywood	
D2	6	1/2 x 9-3/4 x 19-1/2	baltic birch plywood	
D3	5	1/2 x 12-5/8 x 19	baltic birch plywood	
D4	4	1/2 x 4-1/2 x 12-1/8	baltic birch plywood	
D5	4	1/2 x 4-1/2 x 19-1/2	baltic birch plywood	
T1	1	3/4 x 19-7/8 x 71	cherry plywood	1/8-in. banding back edge
T2	-	1-1/4 x 2-1/2 x 235	cherry	cut to fit
T3	1	1/2 x 2 x 71	baltic birch plywood	butt pcs to make up length
T4	4	1/2 x 2 x 19-7/8	baltic birch plywood	
T5	1	3/4 x 1-3/4 x 70-3/4	cherry plywood	1/8-in. banding all sides
F1	2	3/4 x 5-7/8 x 14-7/8	cherry	
F2	3	3/4 x 11-7/8 x 14-7/8	cherry	
U1	2	3/4 x 14-5/8 x 17-5/8	cherry plywood	1/8-in. banding front & bottom
U2	2	3/4 x 14-5/8 x 35	cherry plywood	1/8-in. banding front edge
U3	2	3/4 x 13-5/8 x 35	cherry plywood	1/8-in. banding front edge
U4	2	3/4 x 14 x 35	cherry plywood	
U5	2	3/4 x 3 x 35	plywood or solid	45-degree bevel one edge
U6	4	3/4 x 2 x 35	cherry	
UP1	4	3/4 x 3-1/2 x 17-3/4	cherry	
UP2	4	3/4 x 4-1/4 x 8-5/8	cherry	
UP3	2	1/4 x 8-5/8 x 10-1/8	cherry plywood	
UT1	1	3/4 x 13-3/4 x 71	cherry plywood	
UT2	1	1/2 x 2 x 71	baltic birch plywood	butt pcs to make up length
UT3	4	1/2 x 2 x 11-5/8	baltic birch plywood	
DR1	4	3/4 x 3-1/2 x 15-7/8	cherry	
DR2	4	3/4 x 4-1/4 x 28-7/8	cherry	
DR3	2	1/4 x 8-1/4 x 28-7/8	cherry plywood	
F3	2	3/4 x 3 x 29-1/4	cherry	filler strips for flipper door hdw
K1	2	3/4 x 3 x 33	plywood or solid	45-degree bevel one edge
K2	3	3/4 x 3-1/2 x 15	solid wood or plywood	paint edges black
S1	-	3/4 x 2-1/4 x 69		can be shorter as needed
BB1	1	1/2 x 17 x 74-1/4	acoustic board	45-degree bevel all edges

Apply the Finish and Put it all Together

49. Remove the drawer fronts from the drawers, the drawer boxes and slides from the desk, and the doors and flip-up door hardware from the upper cabinets.

50. Give a final sanding to the entire project, vacuum, and apply your favorite finish. We used two coats of Danish oil for everything and after the oil had a few days to harden completely, an additional couple coats of a wipe-on polyurethane on the desktop for extra protection.

MATERIALS LIST

3/4-in. cherry plywood	2 sheets
3/4-in. birch plywood	1/2 sheet (48" x 48")
1/4-in. plywood or hardboard	1/2 sheet (48" x 48")
1/4-in. cherry plywood	1 sheet
1/2-in. Baltic birch plywood	2 sheets (60" x 60")
4/4 cherry	40 bd. ft.
6/4 cherry	8 bd. ft.
3/4-in. Homosote board	1 sheet
hanging file rail	6 (24")
20-in. med. duty drawer slides *	5 prs.
12-in. flip-up slides **	2 prs.
halogen undercounter lights ***	4 (with switch)
drawer pulls	5
keyboard tray	1

* Knapp and Vogt KV8417 or equivalent

** Knapp and Vogt KV8080 or equivalent

*** Westek 20w accent light or equivalent.

Install the Cabinets

51. Locate a space on your wall that's 76-in. wide by 67-in. high. Indicate the vertical boundaries of this space with masking tape. Keep the tape plumb (Photo 24 and Fig. J).

52. Attach the mounting cleats (K1) for the upper cabinet, screwing them into studs. Use a 4-ft. or longer level to be sure they are level and the upper edges are perfectly parallel. Hang the upper cabinets, and see how they fit together. We had to remove one and put a thin shim on one cleat to get the cabinets to come together tightly. When you're satisfied with the fit, clamp the cabinets together, and drive a couple screws through the back of each cabinet into the mounting cleats. Clamp on the top, screw it in place, then reinstall the flip-up door slides and the doors. Adjust the doors if necessary.

53. Build small shelves (S1) to hold a pair of power strips. The exact length and position of these shelves will depend on the location of an outlet, but they should be mounted at the height and distances from the masking tape shown in Fig. J. Install the halogen lights on the upper cabinets, and the light switch wherever it is most convenient.

54. Assemble the desk pedestals and the knee-hole panel a couple feet away from the wall. Attach the top to the pedestals, reinstall the drawers and drawer fronts, and attach the drawer pulls. Screw on a commercial keyboard tray (see Sources, page 108) to the underside of the top. Slide the desk up to the wall.

55. Make the bulletin board (BB1) and the mounting strips (K2). Measure the space between the desk and the upper cabinets, and adjust the width of the bulletin board if necessary; the tighter the fit the less the cords will show. The fabric can be just about anything, but if it has some stretch it will be easier to work with. Staple and glue it to the back of the acoustic panel. Glue and staple pieces of hook-and-loop tape to the panel and the mounting boards. Attach the bulletin board so it covers the light cords, and you're ready to move in! **AW**

Sources See Page 108

WEB FRAME PANELS

Very Simple and Very Versatile

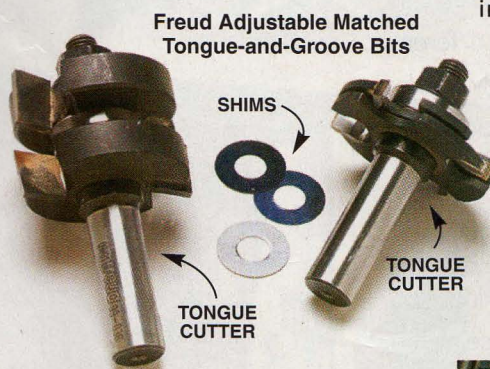
These cabinets are made using what is perhaps the simplest and most versatile frame-and-panel system around. The panel is flat, and the frame is joined with a simple tongue-and-groove joint. This assembly can be used for many purposes; you can make cabinet doors, drawer fronts, cabinet sides, backs for large furniture, and even wainscoting.

There are several good approaches to making the frame joints. We used a matched set of adjustable tongue-and-groove router bits from Freud (see Sources, page 108). This system is simple and gives you a perfect fit every time. The pair of bits costs \$80.

If you're only doing a small number of panels, you can also use the tablesaw to cut the joints. Use either a dado blade or two passes with a regular blade to cut the grooves (see photo below). Then cut the tongue with the dado head.

Similarly, you have a number of options for the panels. If they're small, as in these cabinets, 1/4-in.

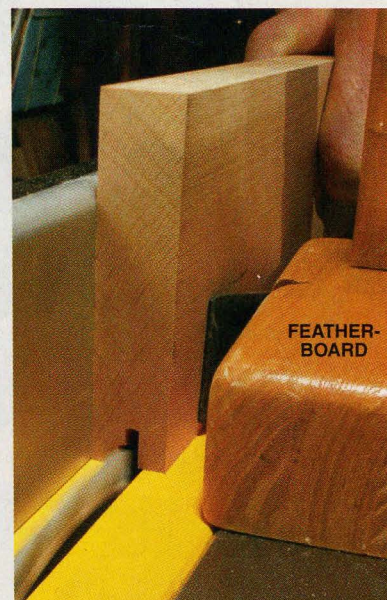
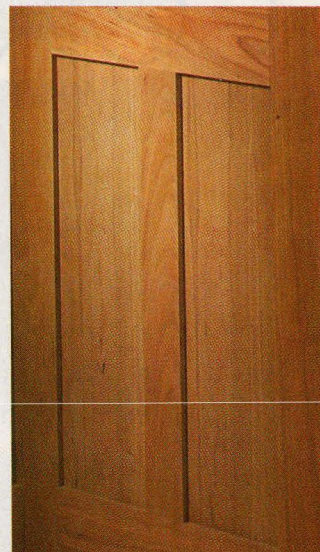
plywood is an easy and economical choice. If you glue the panel in place, it strengthens the assembly considerably. You can also use a 1/2-in. thick plywood panel, with a rabbet on the back side to allow it to fit the frame.



This is a good approach if the panel is larger (for stiffness) or if the assembly has to be flush on one side. You can also use a solid-wood panel, but don't glue it in and be sure to leave room for it to expand in the frame.

Flat frame-and-panel construction is worth getting to know. It's simple enough for less experienced woodworkers to master easily, and it's a fast and flexible system for more experienced woodworkers.

CUT GROOVES for web frames either on the tablesaw or on the router table. To center the groove when using the tablesaw, make two passes, alternating the face that's against the fence.



CONTEMPORARY BOOKCASE

The credo of many great 20th-century architects was "Form Follows Function." And for this bookcase, it certainly does. The strong shelves are supported in a straightforward fashion by equally strong uprights. No decoration, no superfluous details, not even a back to mar its perfect geometry.

For you, the woodworker, this bookcase has beauty of a different kind. The joinery is amazingly simple: Long threaded rods are concealed inside the pieces and tie the whole bookcase together. There are no angles to cut, no mortises, no traditional joinery of any kind. And finishing is a breeze because all the parts are finished separately before they're put together. You can buy all of the wood and hardware at a home center for less than \$200.

For tools you'll need a tablesaw, dado blade, jigsaw, sliding miter saw, planer, jointer, drill press, hand drill, router and router table. If you don't have a sliding miter saw for the wide crosscuts (Photo 11) use a tablesaw sled instead. See AWW #75, page 38 for information on building a tablesaw sled.

Fresh, clean lines, simple, strong construction, and a design you can modify to fit any room.



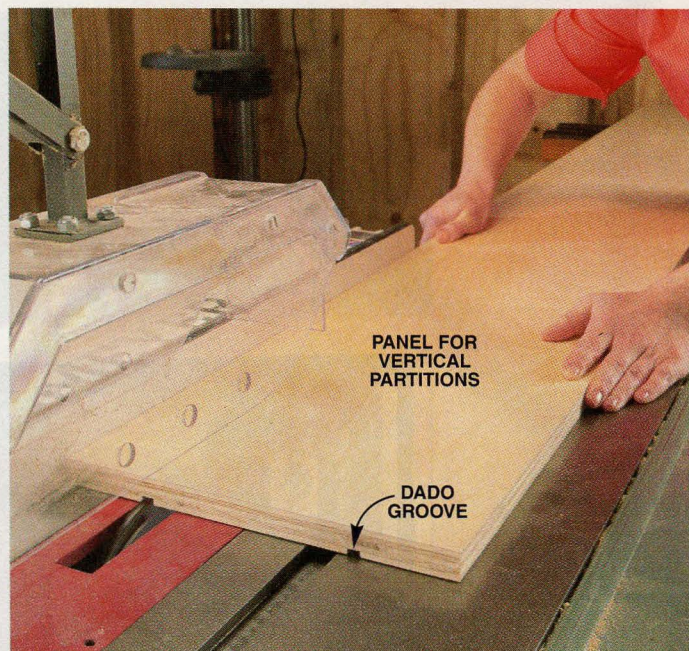
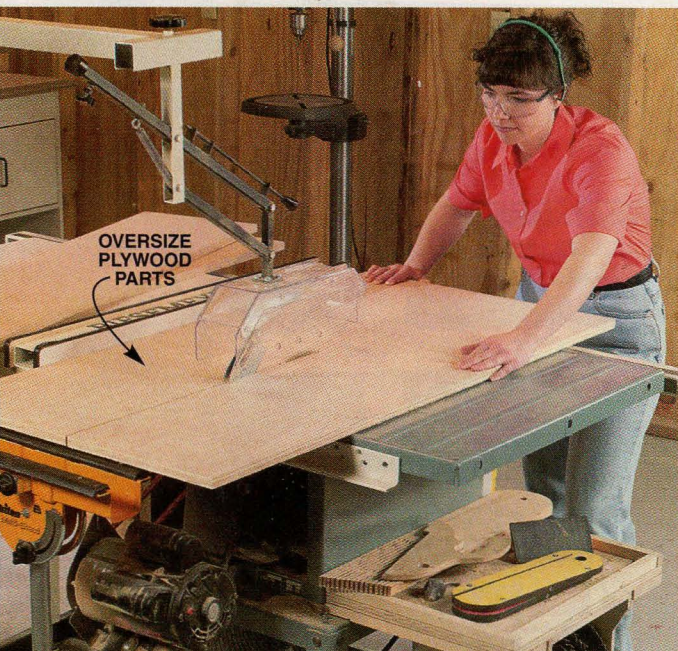
Follow the photos for construction details.

By RANDY JOHNSON



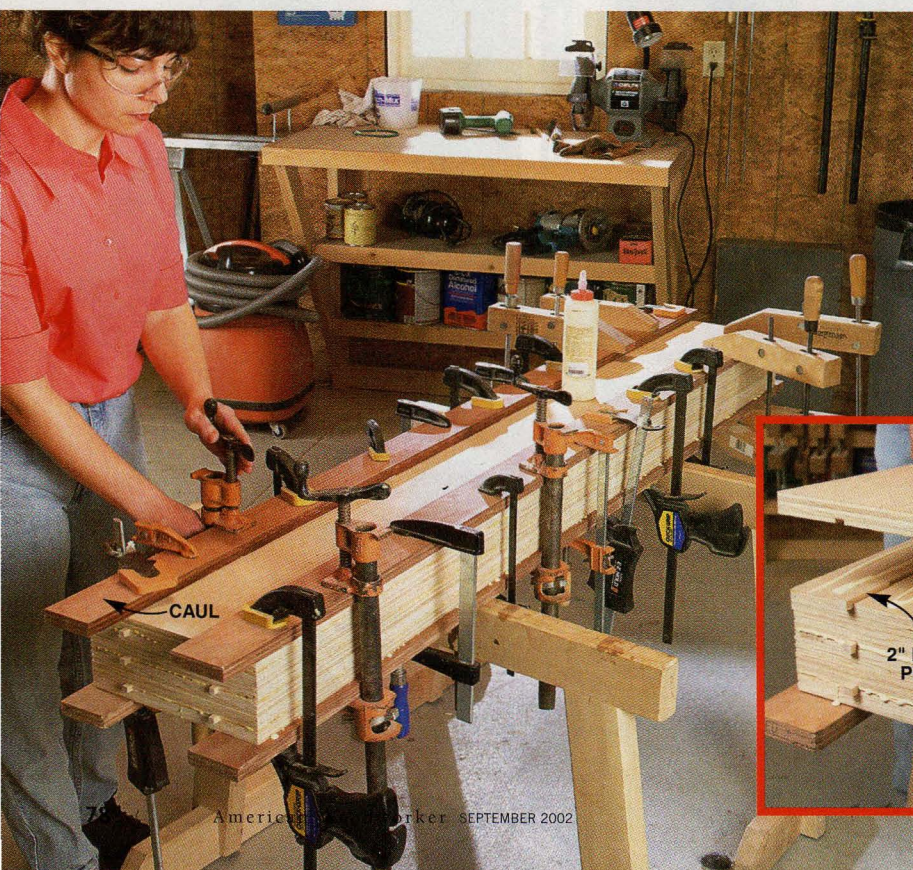
LAMINATE THE PLYWOOD

The backbone of this bookcase is the laminated plywood parts. They make it strong and stiff and give it the look of solid wood. The laminations also provide an easy hiding place for the threaded rods that hold the parts together.



1 Cut all the plywood parts oversize. Leave the plywood for the vertical partitions (parts L, M and R) as long panels. The individual vertical partitions are cut to final width and length later. Add 1/2 in. to the width and length of the shelves (parts A) which are also cut to final size later.

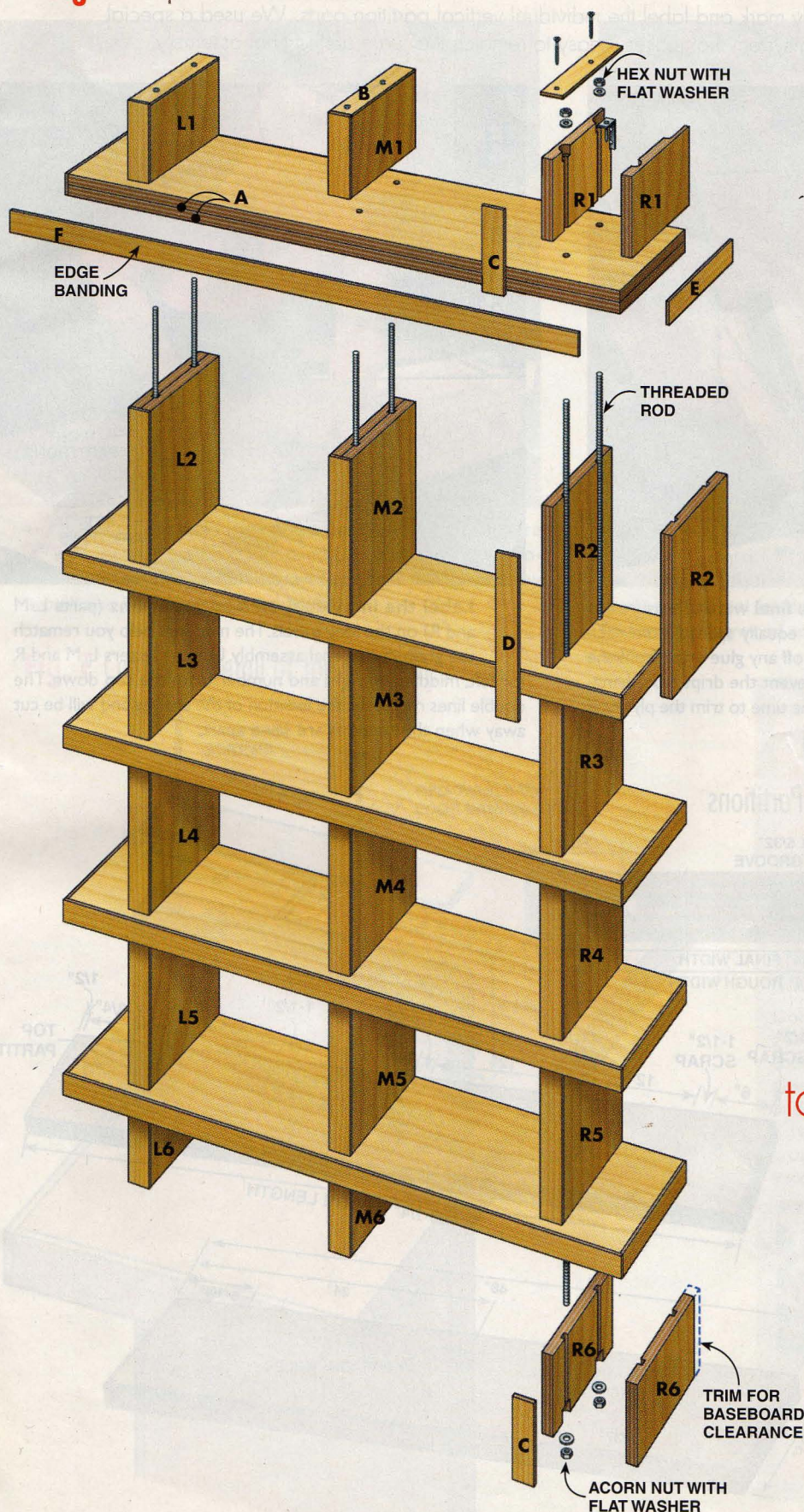
2 Make room for the threaded rods that hold the parts together by dadoing grooves into the backside of the vertical partition panels (parts L, M and R). See Fig. B for the placement of these grooves. When the panels are sandwiched together, these grooves create the holes for the threaded rods.



3 Glue together the panel halves for the vertical partitions (parts L, M and R). We glued up all three pairs at once to help keep them flat. This is a big glue up, so use a slow-drying glue (see Sources, page 108). Use 5/16-in.-square wood pegs at both ends to keep the panels aligned. The pegs get drilled out later. Use clamping cauls to protect your plywood. If you don't have enough clamps, you can precut your panels in half and glue them up as shorter sections. (Use square alignment pegs in both ends of these shorter panels, too.) This is also the time to glue and clamp the plywood for the shelves (parts A).



Fig. A Exploded View of Bookcase



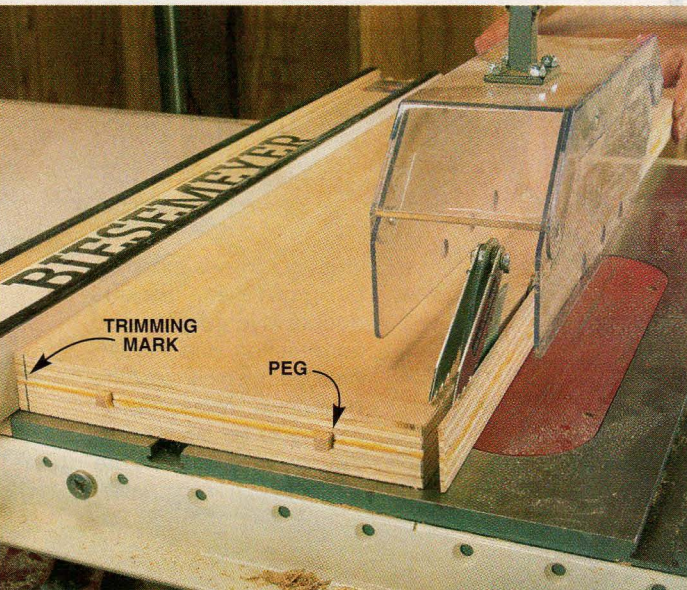
A STRONG, SIMPLE DESIGN WITH LOTS OF POSSIBILITIES

This bookcase is extremely strong and sturdy, thanks to double-layered plywood construction and hidden threaded assembly rods. This knockdown, modular design can easily be modified so you can make a bookcase to fit any room in your house.

Individual labels on all the parts make it easy to rematch the wood grain during final assembly.

MARK AND CUT THE PARTS

Carefully mark and label the individual vertical partition parts. We used a special labeling system that makes it easy to rematch the grain during final assembly.



4 Trim the glued-up panels to final width. Measure and cut carefully so the holes are equally spaced from each trimmed edge (Fig. B). Scrape off any glue drips from the plywood edges before cutting to prevent the drips from hanging-up on the saw fence. Also, this is the time to trim the plywood shelves to final width.



5 Label the individual vertical partitions (parts L, M and R) on the long panels. The markings help you rematch the grain during final assembly. Use the letters L, M and R for left, middle and right and number from the top down. The double lines represent the location of the shelves and will be cut away when the sections are sawn apart.

Fig. B End View of Vertical Partitions

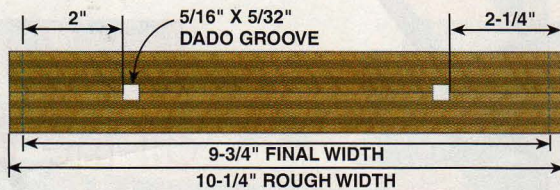


Fig. C Layout for Vertical Partition Panels

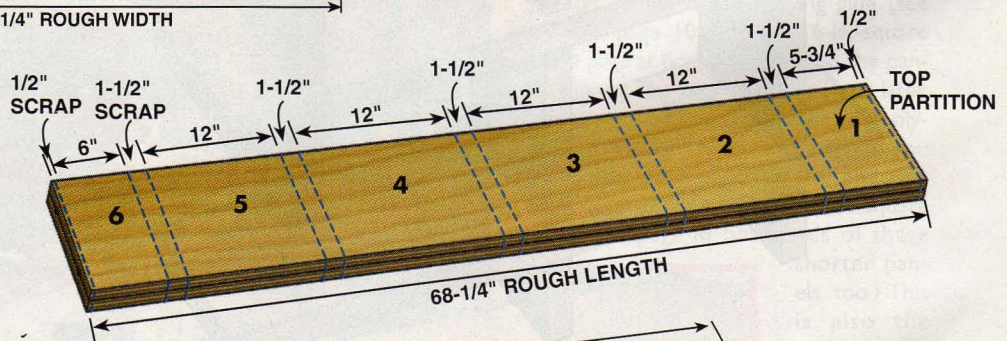
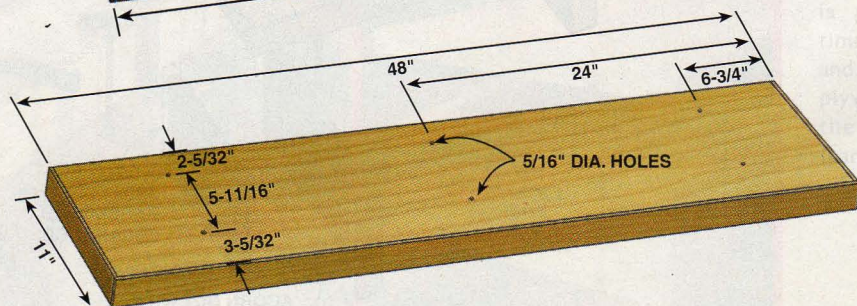
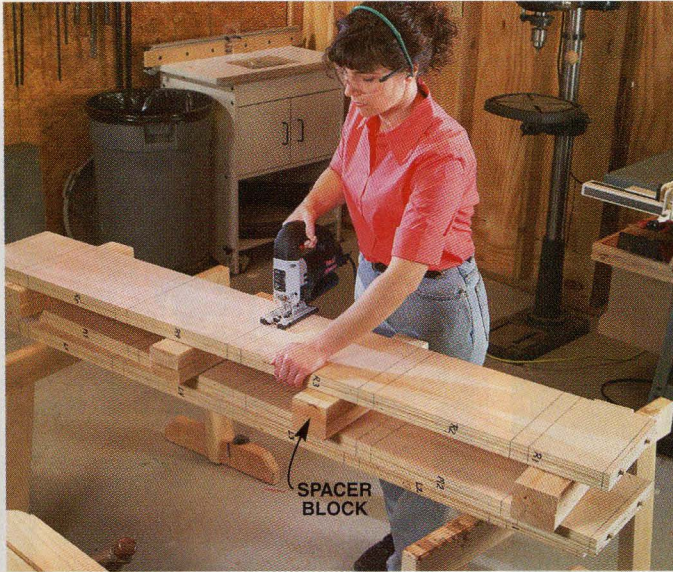
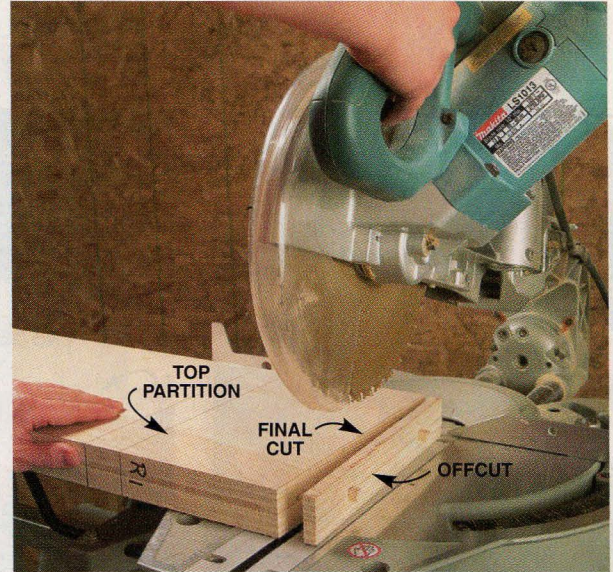


Fig. D Drilling Layout for Shelves



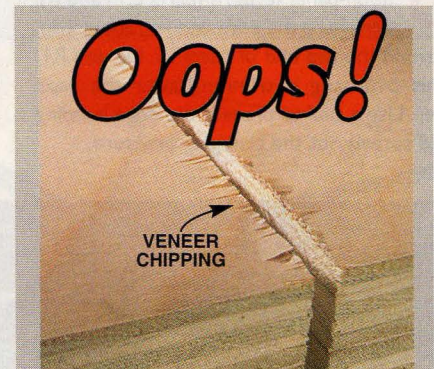
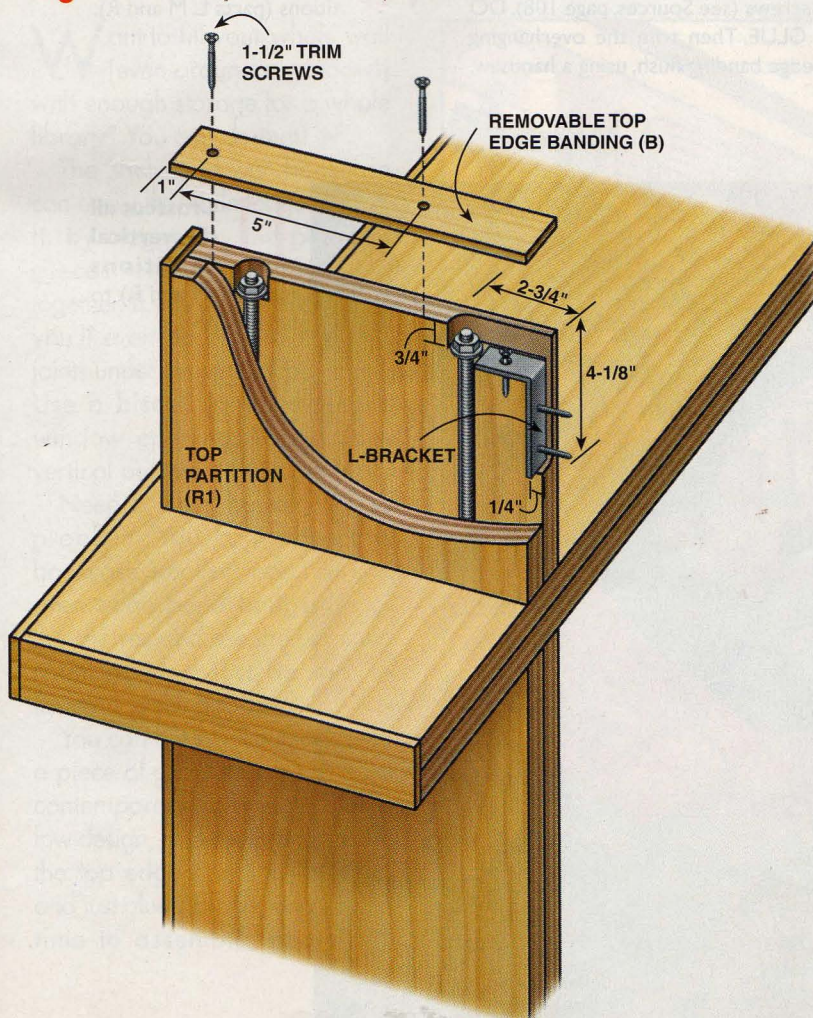


6 Rough cut the long panels into two parts so they're easier to handle and edge band. Use spacer blocks to provide clearance for your jigsaw blade. Your sliding miter saw would also work for this rough cutting.

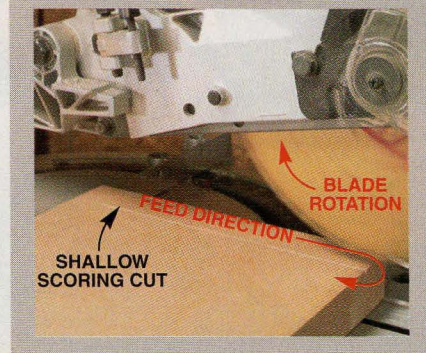


7 Trim the top end of the vertical partitions to final length (parts LI, MI and RI). Cut the glued-up shelf panels (parts A) to final length at this time also. A sliding miter saw is a great tool for this job because it's quick and accurate. Prescore the plywood to reduce veneer chipping (see Oops!, below).

Fig. E Cut-Away Detail of Top Partition

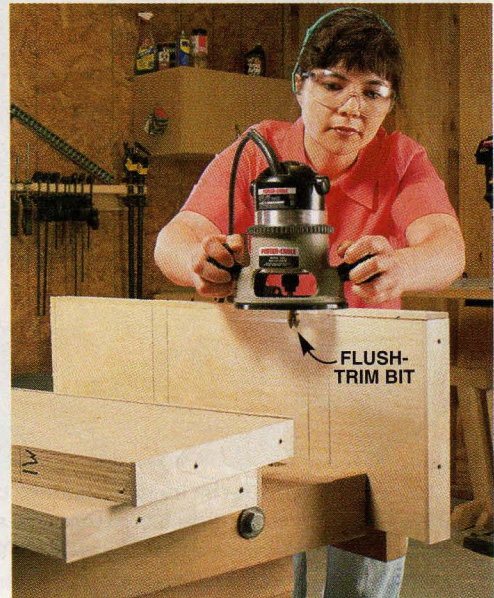
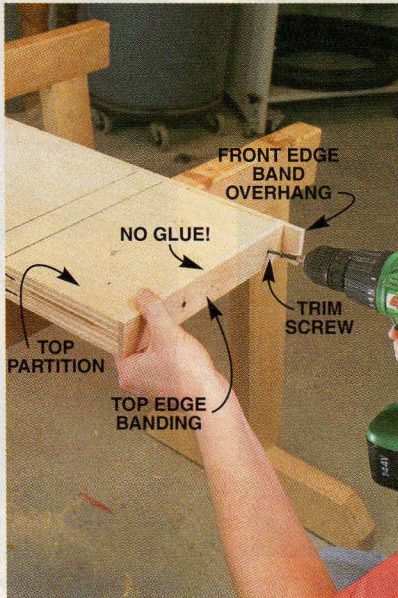
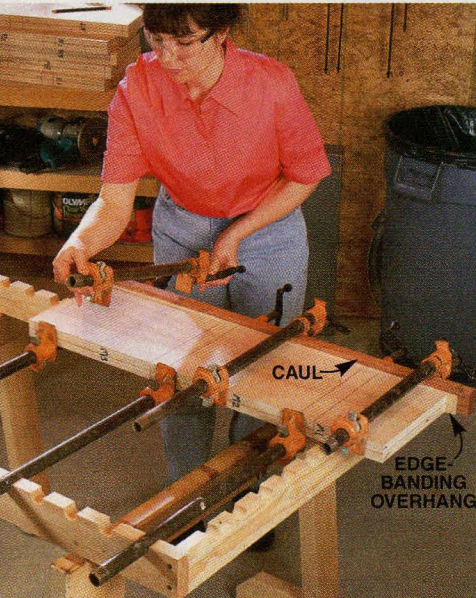


Don't let chipped plywood veneer ruin a good day in the shop. Take preemptive action by prescoring the top side of your plywood. Make the scoring cut about 1/8-in. deep on the pull stroke and then, with a return push stroke, complete the crosscut. This reduces or eliminates most veneer chipping.



EDGE BAND THE PLYWOOD

Edge banding covers the edges of plywood and makes the panels look almost like solid-wood planks. Make the 1/4-in.-thick edge banding by resawing 3/4-in. thick by 1-3/4-in.-wide lumber in half. Remove the saw marks and reduce the stock to 1/4-in. thickness with a planer.



8 Edge band the fronts of all the partition-panel sections (parts L, M and R). Overhang the edge banding about 1-in. beyond the top end of parts LI, MI and RI. This overhang is trimmed after the next step. Use a caul to protect the edge banding and spread out the clamping pressure.

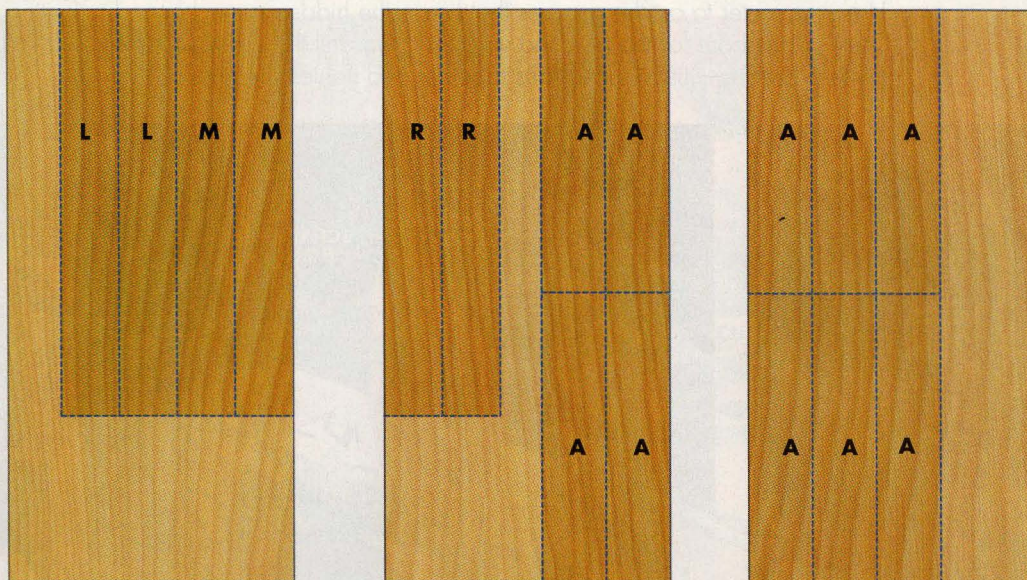
9 Attach the top edge banding (part B, Fig. E) with two small trim screws (see Sources, page 108). DO NOT GLUE. Then trim the overhanging front edge banding flush, using a handsaw.

10 Flush trim the front and top edge banding on the vertical partitions (parts L, M and R).



11 Crosscut all the vertical partitions (parts L, M and R) to final length.

Fig. F Plywood Layout



Make it Big or make it Small

Want to fill your whole wall (even around a window!) with enough storage for a whole library? You can do that!

The shelves of our bookcase can easily be made longer than 8 ft. by staggering the plywood pieces when you glue them together. If you measure carefully you'll even be able to hide the joints under the vertical partitions. Use a biscuit joint below the window openings to keep the vertical partitions lined up.

Need a small bookcase? No problem. You can make this bookcase smaller, too. You can even edge band both sides of the shelves and use the unit as a room divider. Just be sure to fasten it to the floor.

You can also make it low, with a piece of glass on the top for a contemporary sofa table. For a low design, skip the trim screws in the top edge banding (parts B) and just glue it on. When it comes time to assemble, epoxy the



threaded rods into the square holes in the bottom of the top partitions. Then assemble and fasten the parts together,

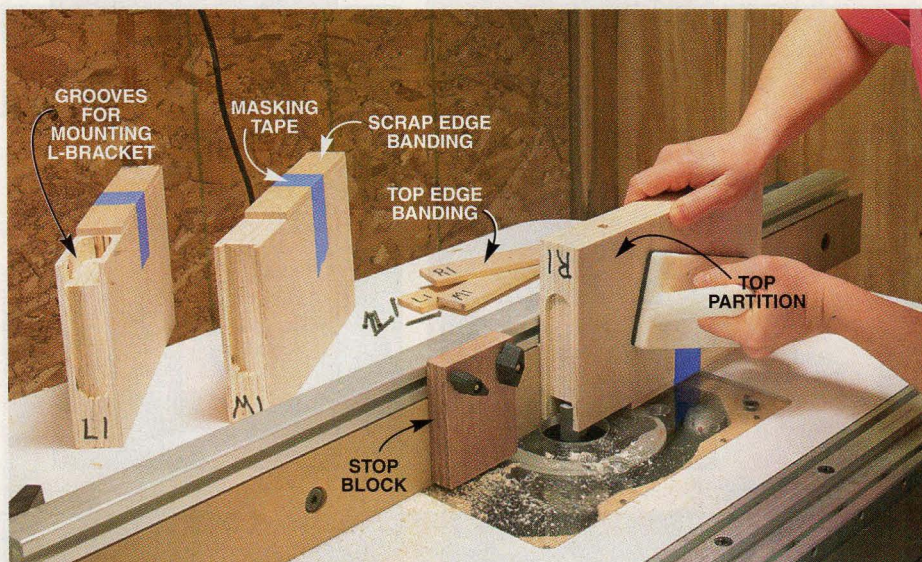
from the bottom, with regular hex nuts.

ROUT, DRILL AND ASSEMBLE

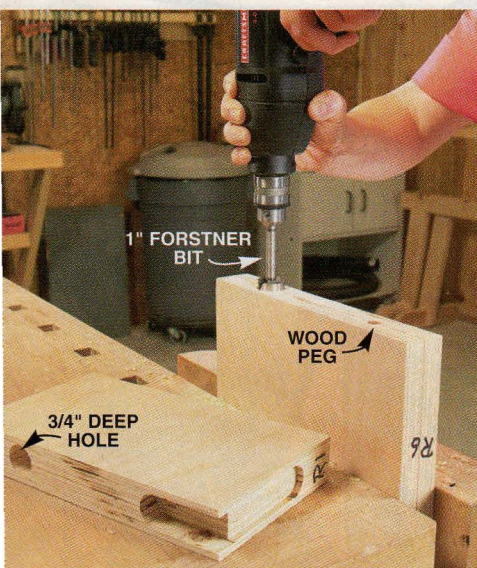
Use your router to cut the grooves that house the hidden assembly and mounting hardware. Then counterbore for the nuts and washers, and drill the shelves for threaded rods. Assembly is a breeze—just slip the parts together and tighten the nuts.



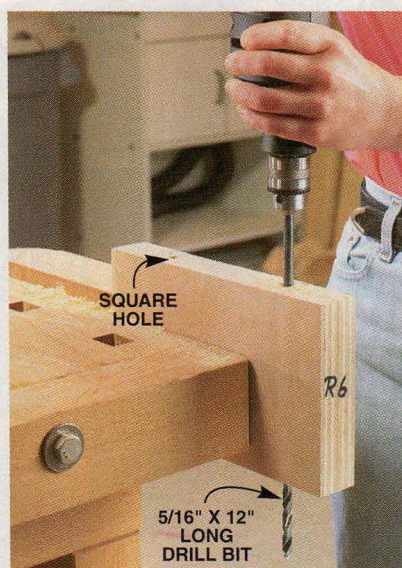
12 Trim off 3/4 in. of the back edge of the bottom partitions (parts L6, M6 and R6). This provides clearance for your wall's baseboard so the bookcase stands flush against the wall. Make sure to re-label the backs of the bottom partitions (L6, M6 and R6) with their location markings.



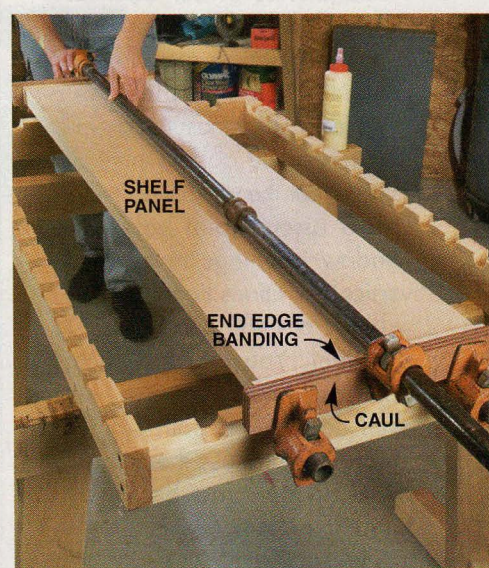
13 Rout the grooves for the wall-mounting brackets into the top partitions (parts L1, M1 and R1, see Fig. E for details). First remove the top edge banding strips (parts B) and replace them with short pieces of scrap edge banding. These temporary pieces are needed as spacers because the front edge banding overhangs the top edge. They are left short so they don't interfere when routing the groove. Use a 1-in.-diameter straight bit for the routing. Cut the deeper top groove in two or three passes.



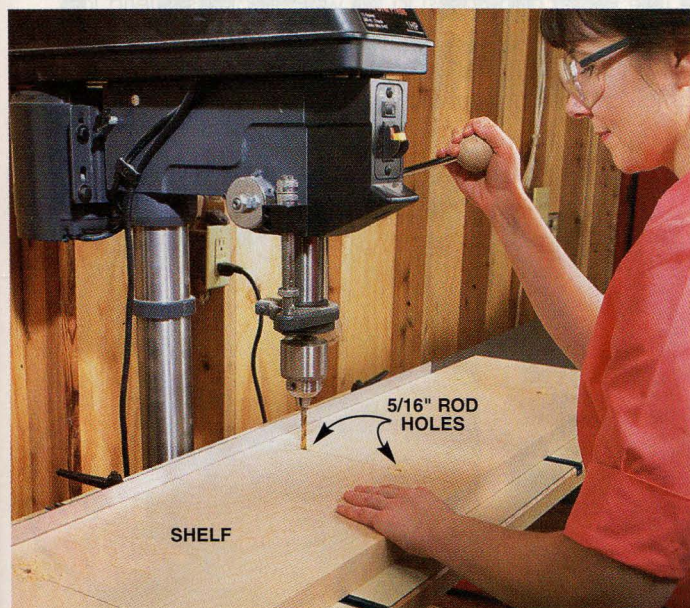
14 Drill holes for the assembly nuts and washers. Drill into the center of the square wood pegs that are glued into the panels. Only the top and bottom partitions (parts L, M and R) receive these large holes.



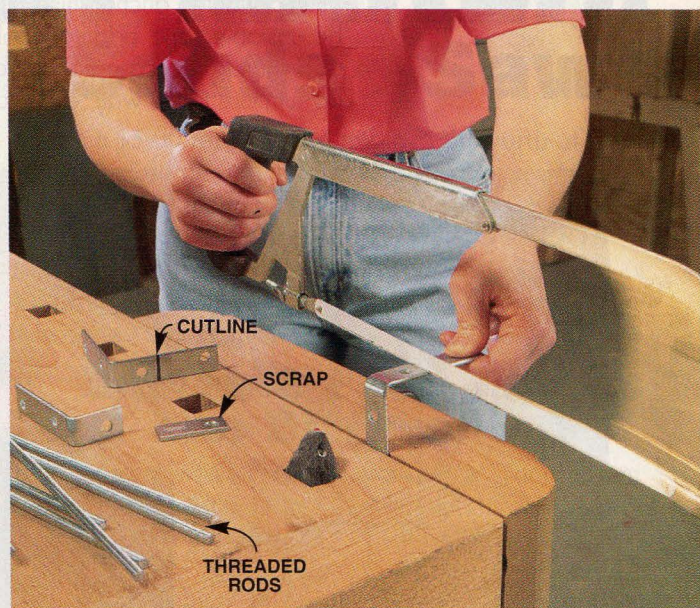
15 Ream out the square holes in all of the vertical partitions (parts L, M and R) with a long drill bit (see Sources, page 108). This removes any dried glue, wood splinters and remaining wood pegs.



16 Edge band the shelves (parts A). Start with the ends (parts E) and then add the front edge banding (parts F). Trim any overhanging edge banding with a handsaw and flush trim the long edges with a flush-trim bit in your router.



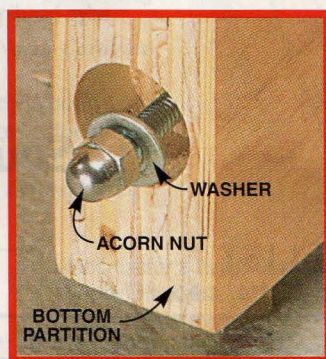
17 **Drill holes for the threaded rods in the shelves.** Lay out these holes carefully and use a drill press to ensure that the holes go straight through the shelves. See Fig. D for the layout dimensions. After all the parts for the bookcase are fabricated, do a final sanding. Then apply a clear finish of your choice. Finishing prior to final assembly is a lot easier than brushing or spraying all those inside corners once the bookcase is put together.



18 **Saw the mounting L-bracket and threaded rods to length.** The length of the short leg on the mounting angle is not critical, just cut it off about 1/4-in. beyond the first hole.

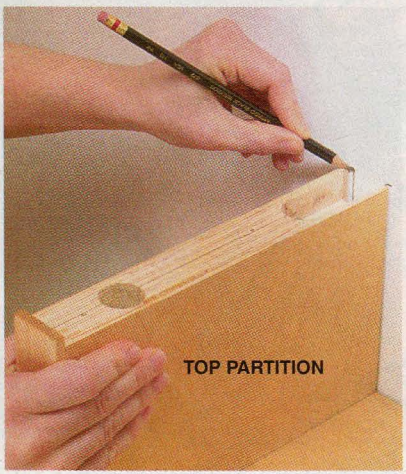
19 Assemble the prefinished bookcase on the floor.

Lay the parts on their backs and slide them onto the threaded rods. Start with the bottom partitions and shelves and work your way to the top. The acorn nut at the bottom acts as a bolt head and makes tightening a lot easier. After sliding all the parts together, put a regular hex nut and washer on the top end. Lightly tighten the parts using a socket wrench at each end. The vertical partitions should self-align, but if you notice one that's slightly out of alignment, give it a little bump until it's lined up. When everything is perfectly aligned, do a final tightening.

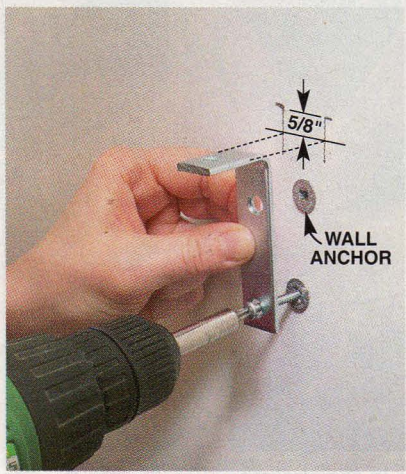


ANCHOR IT TO THE WALL

It's important to anchor this bookcase (like all tall bookcases) to the wall. Bookcases tend to be unstable, and adding books and such can make the situation even worse. Once an unanchored bookcase starts to fall, there's little stopping it. Always anchor bookcases and other tall furniture to the wall, especially if small children are around.



20 Mark the inside of the groove on the wall after standing the bookcase against it.



21 Attach the L-brackets to the wall with screws and wall anchors (see Sources, page 108). Align the top of the L-bracket 5/8-in. down from the top of the pencil marks.



22 Screw the L-bracket to the bookcase. If you're setting your bookcase on carpet you should leave the screw head sticking up about 1/4-in. above the L-bracket. This allows the bookcase to settle into the carpet. Once you've secured the L-brackets to the bookcase you can screw the top edge banding strips (parts B) back in place.
AW

Brackets hold the bookcase to the wall and are totally hidden.

Sources See Page 108

CUTTING LIST

Overall dimension 48" wide x 67-1/4" tall x 11" deep

Part	Name	Qty.	Dimensions TxWxL	Material
A	Shelf parts	10	3/4 x 10-3/4 x 47-1/2	Birch Plywood
B	Top edge banding for top partitions	3	1/4 x 1-1/2 x 9-3/4	Birch
C	Front edge banding for top and bottom partitions	6	1/4 x 1-1/2 x 6	Birch
D	Front edge banding for center partitions	12	1/4 x 1-1/2 x 12	Birch
E	End edge banding for shelves	10	1/4 x 1-1/2 x 10-3/4	Birch
F	Front edge banding for shelves	5	1/4 x 1-1/2 x 48	Birch
L1,M1,R1	Top partition parts	6	3/4 x 9-3/4 x 5-3/4	Birch Plywood
L,M,R, 2-5	Center partition parts	12	3/4 x 9-3/4 x 12	Birch Plywood
L6,M6,R6	Bottom partition parts	6	3/4 x 9 x 6	Birch Plywood
Hardware	1/4 -20 threaded rod	6	66-1/4 long	
	Hex nuts	6	1/4-20	
	Cap nuts	6	1/4-20	
	Flat washers	12	For 1/4" rod	
	Metal angles	3	3/4 x 3	
	Wall anchors	6		

Small Shop Tips



Double-Duty Planer Stand

I love two-for-one deals. Even my shop is a twofer; it doubles as a garage (sometimes) when I'm not woodworking. My recent purchase of a benchtop planer inspired me to create another two-for-one deal. I built a mobile outfeed table for my tablesaw that doubles as a stand for my planer.

The cart is designed so the outfeed table on the planer equals the height of my tablesaw. This gives me a beautiful, long outfeed extension for the planer. Never one to leave well enough alone, I built up the sides so the top of a pair of 22-in. rollers equals the height of my saw. Now, my planer stand acts as an extension table for my saw and my tablesaw acts as an outfeed extension for my planer. There's lots of room under the cart to store the planer and the saw is perfect for stacking wood while planing.

George Vondriska

Sources See Page 108

Behind the Stairs Storage

In my basement shop every square inch counts! Out of necessity I found a wealth of unused space tucked right under my nose, or should I say feet. That awkward space under the basement steps can easily be turned into a set of deep shelves perfect for storing everything from tools to shop vacuums, and of course, lumber. Help your small shop seem a lot bigger by using this highly underutilized space.

Travis Larson



POCKET HOLE SYSTEMS

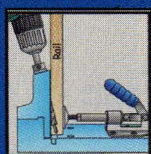
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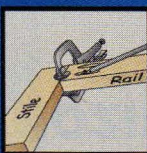


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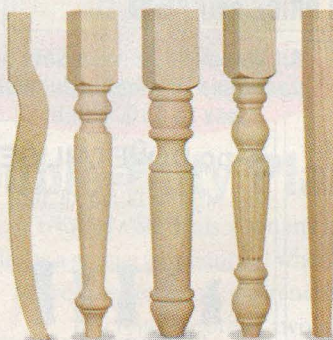


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Small Shop Tips



At-Hand Tool Storage

I hate fumbling around in drawers or digging into cabinets for tools. That's why I love perf-board. It displays my hand tools out in the open where I can grab them the instant I need them. But, rather than having one big piece of perf-board in one location, I cut the stuff up and hang it wherever I need it. On my workbench, for example, I found the perfect spot to hang some perf-board for my bench tools between the legs on the face-vice end. Now my bench tools are within easy reach and right where I'm most likely to use 'em.

Bob Ungar

AW

If you have an original Small Shop Tip, send it to us with a sketch or photo. We pay \$100 for each one we print. Send to: **Small Shop Tips, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121, or e-mail to smallshoptips@readersdigest.com.** Submissions can't be returned and become our property upon acceptance and payment. We may edit submissions, and use them in all print and electronic media.

Great Wood!



EIGHT-DRAWER DRESSER BY JEFF LIND
PHOTO BY DAN GARR

Curly Red Oak

We all know red oak. After all, it's the most commonly used hardwood in North America. But hidden in the abundant supply of this species is a rare variation: spectacular curly figure. Curly red oak can't be seen in the log. It's only discovered when the log is cut into boards. Traditionally, curly red oak was culled as a defect. Now when that wavy figure reveals itself to the sawyer, the boards are still culled, but put in the premium-priced pile.

Curly figure's wave-like contortions reflect light differently off the surface of the board and create the characteristic undulating, liquid appearance. Red oak is well known for its natural contrast between the open, coarse-grained early wood and the denser late wood. That contrast, when combined with the curly figure, has a strong visual impact that lifts red oak out of the ordinary and into the extraordinary.

The usual precautions are in order when machining curly red oak. Feeding the board through your planer at an angle or skewing your jointer's fence produces a shearing cut that helps reduce the tear-out that plagues all curly figured woods. Wetting the surface of the board before planing also works wonders.

We got our curly red oak from Groff & Groff Hardwoods in Pennsylvania. The sawmills they buy from set aside any curly red oak they come across. Even though supply is spotty, they almost always have some 4/4 curly red oak in stock; 8/4 is occasionally available. You can expect the curly figure to be present throughout the entire board. Prices range from \$4.50 to \$8 a bd. ft., plus shipping, depending on the intensity of the figure and the width of the board. There is no minimum order. **AW**

Curly figure weaves its way throughout the natural coarse-grain texture of red oak to create a stunning appearance.

PHOTO BY MIKE HABERMANN

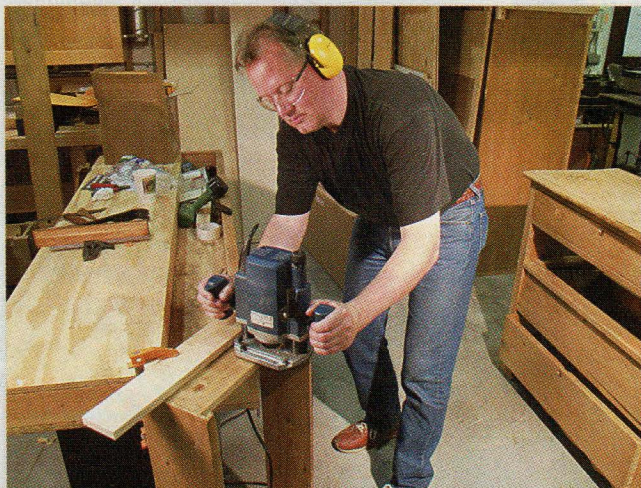
Sources See page 108

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

ART DIRECTION: PATRICK HUNTER

What's Coming Up

in AW #96, October 2002



Restore a Chest of Drawers

Before he joined American Woodworker, Tim Johnson was a professional furniture restorer. He's seen plenty of beautiful chests of drawers selling for a pittance because the drawers didn't work. He's restoring a charming pine chest, and in the process, he'll show you how to make some of the most common drawer repairs.



Tablesaw Test

There are some great new tablesaws—even some cabinet saws—for the woodworker who doesn't have 240-volt power in their shop. Tom Caspar and our crew of consumer testers are giving them all a once-over for our next AW Tool Test.



Photo Frames by the Dozen

Randy Johnson's working on a photo frame design that everyone in the shop is excited about. It's a design that can work for just about any size photo, plus he'll show you how to gear up for making a dozen or more at a time. Your gift-giving problems are solved!

PLUS

Build a Countertop

Applying plastic laminate is a fundamental skill for the modern woodworker, and Dave Munkittrick is going to show you both the basics and some more advanced techniques, as he builds a new kitchen countertop.

Rolling Tool Cabinet

Most tool cabinets were designed for the old days, when journeyman cabinetmakers used hand tools and travelled from one shop to another. George Vondrisk and Dave Munkittrick are designing a tool cabinet for the way woodworkers work today. (Hint, they're thinking routers and cordless drills.)

Oops!

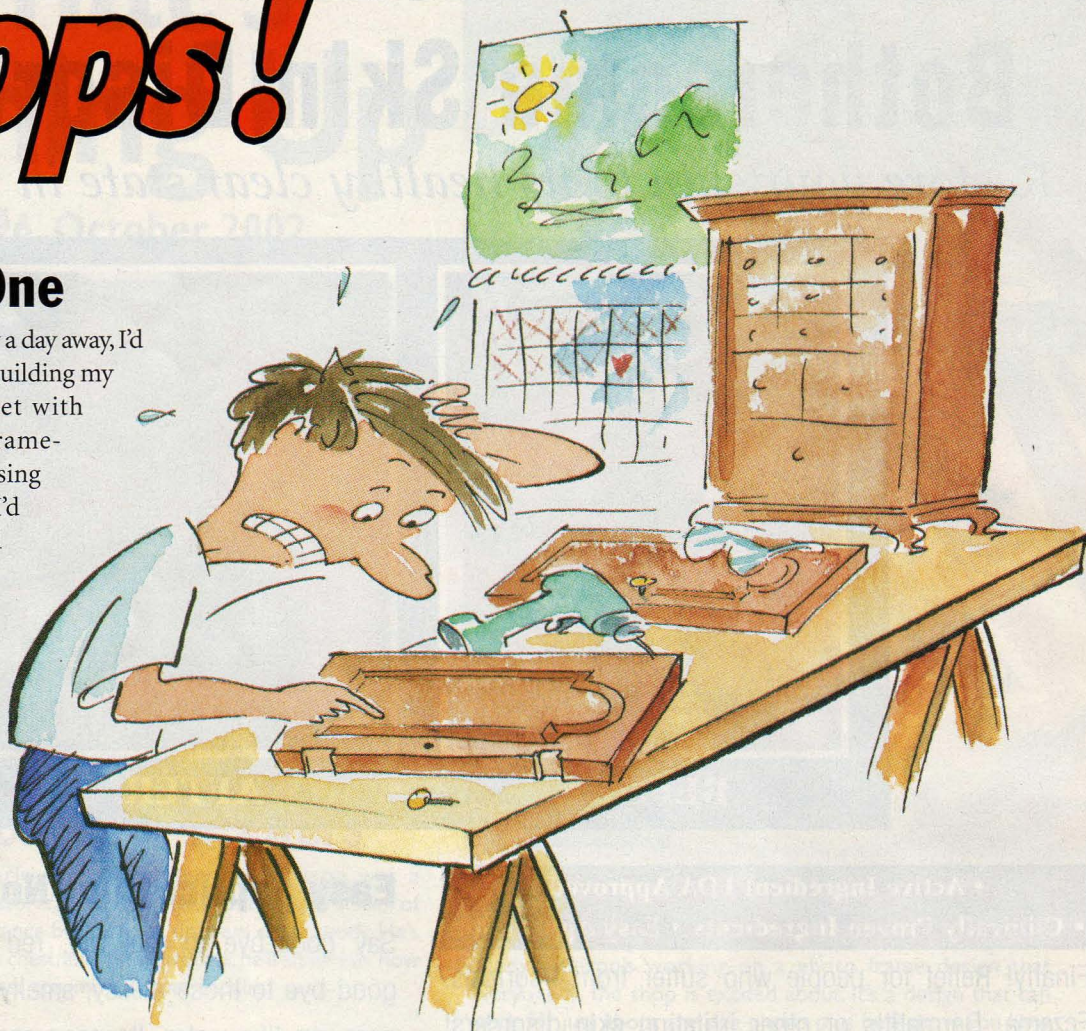
Hole in One

With our anniversary a day away, I'd just about finished building my wife a spice cabinet with tombstone-style frame-and-panel doors, using two special boards I'd been saving. All I had to do was to mount the door pulls. But when I drilled the holes, one of them somehow ended up on the wrong stile (the one with the hinge mortises). I was devastated. I didn't have enough time or leftover wood to make another door.

I tried gluing in a plug, but it stood out like a sore thumb. I was just about at my wit's end when I realized that, like a magician, I could pull a "rabbet" out of my hat. I cut a full-length, 1/8-in.-deep rabbet in the outside edge of the damaged stile, just wide enough to include the hole. In my scraps, I found a suitable replacement strip with matching grain. I glued it into the rabbet and voilà!: No more hole! Sanded and finished, my repair is virtually invisible. I hope my wife doesn't read this because I never told her.

Jim Culler

Sorry, Jim, your secret's out. Mrs. Culler, it takes a really good woodworker to pull off a great repair like this one. TJ



Baby's Got Smelly Drawers

I built a dresser/changing table for my newborn daughter. To make sure she wouldn't get any splinters, I finished it with several coats of varnish. I varnished the insides of all the drawers too, so her clothes wouldn't smell like sawdust. Little did I know that the smell of varnish would never go away. My daughter is now six months old and we still haven't put her clothes in her dresser.

Josh Sinowitz

Josh, that lingering smell means the varnish inside the drawers hasn't fully cured. Take the drawers out of the cabinet and remove the bottoms, if you can, so air can circulate around them freely. Set the drawers outside in the warm sun and breezes to speed the drying process. Next time, finish the inside of the drawers with a coat of shellac. TJ **AW**

If you have a woodworking blunder you're willing to share, send it to us. We pay \$100 for each one we print. Send to: **AW Oops!, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121, or e-mail to oops@readersdigest.com.** Submissions can't be returned and become our property upon acceptance and payment. We may edit submissions, and use them in all print and electronic media.

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