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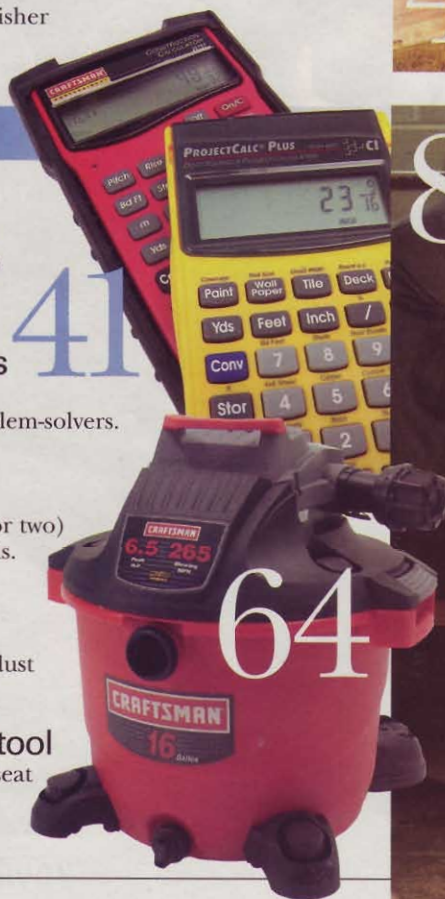
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(800) 666-3111, e-mail AWWservice@rd.com

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A complete index is available online at
www.americanwoodworker.com

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the Reprint Center at the address above.

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2915 Commers Dr., Suite 700, Eagan, MN
55121, (651) 454-9200, fax (651) 994-2250,
e-mail aweditor@readersdigest.com

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ADVERTISING SALES

260 Madison Ave., New York, NY 10016; (212) 850-7226
CHICAGO **Carl Benson** (312) 540-4802,
Brian Condron (312) 540-4805
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Classified Advertising, The McNeill Group, Inc.
Classified Manager, **Don Serfass**, (215) 321-9662, ext. 30

PUBLISHED BY HOME SERVICE PUBLICATIONS, INC.,
A SUBSIDIARY OF THE
READER'S DIGEST ASSOCIATION, INC.

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President, Consumer
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Issue #117, American Woodworker®, ISSN 1074-9152,
USPS 738-710 Published bimonthly, except monthly
October and November by Home Service Publications, Inc.,
260 Madison Avenue, 5th Floor, New York, NY 10016.
Periodicals postage paid at New York, NY and additional
mailing offices. Postmaster: Send change of address notice
to American Woodworker®, P.O. Box 8148, Red Oak, IA
51591-1148. Subscription rates: U.S. one-year, \$24.98. Single
copy, \$5.99. Canada one-year, \$29.98 (U.S. Funds); GST #
R122988611. Foreign surface one-year, \$29.98 (U.S. Funds).
U.S. newsstand distribution by Hearst Distribution Group,
New York, NY 10019. In Canada: Postage paid at Gateway,
Mississauga, Ontario; CPM# 1447866. Send returns and
address changes to American Woodworker®, P.O. Box 8148,
Red Oak, IA, USA 51591-1148. Printed in USA. © 2005
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With the Carey Brothers



Tips of the Month

We are proud to be associated with the premier woodworking magazine, and we are pleased to offer the following tips:

USING A JIG

We have been building and assembling stuff out of wood since we were kids. Our great grandfather was a plumber, so construction isn't new to our family. We giggle when, after all of these years and generations, we get to learn something new and interesting about our trade. For example, if you have ever installed door and drawer hardware on a house full of cabinets you know how valuable a drilling jig can be for getting the holes properly placed every time. Better yet, with a jig you can forget the measuring mistakes that are a certainty when a jig isn't used. Did you know that you can take advantage of a jig for building the face frame of a cabinet as well? Generally speaking the topmost drawers in a given set of cabinets are always the same height. Use a block of wood to space the drawer opening height instead of a measuring tape. Every opening will be identical and you won't make a measuring mistake.

NAIL FREE CABINET FRONTS

Putting furniture and cabinet parts together with biscuits or dowels can add hours to your assembly time. If you have access to an angle boring machine or if you outfit your shop to pre-drill panels and parts then you can glue as always and assemble with screws instead. Here are the tricks:

- You should devise a way to make the exact same countersink bore every time. Both depth and angle.
- Your depth should leave the installed screw about an eighth short of going all the way through the piece that you will be attaching to.
- Use two screws every six to nine inches whether the run is long or short.
- Use square or lox head screws for assembly.
- Pre-glue like crazy.

The neat thing about this process is that it is far more forgiving than dowels or biscuits. Alignment can be adjusted on the fly and the long wait for clamps disappears. Depending on the project you may not be able to use this technique because the construction may not hide the bores, but if you can you will save time and heartache.

Ask the Carey Brothers a woodworking, home improvement or remodeling question on their live radio broadcast every Saturday from 9:00 a.m. to 1:00 p.m. Eastern Time. Call toll-free at 1-800-737-2474 to ask your question. Visit their website at www.onthouse.com for recaps of the show and other helpful info.

QUESTION & ANSWER

by Dave Munkittrick
and Bruce Kieffer

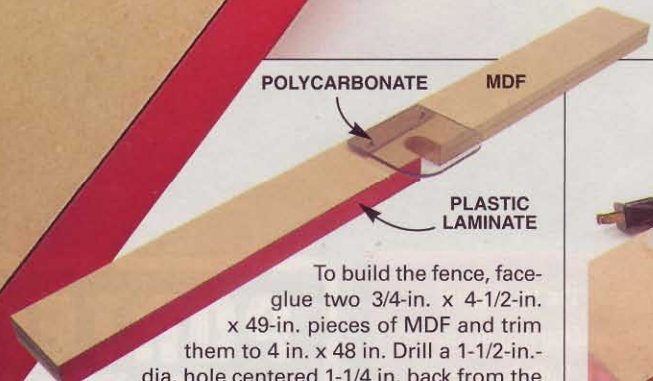
ROUTER-TABLE EDGE JOINTING

Q I don't own a jointer. I've heard about using a router table as a jointer. How is this done?

A All that's required is a simple shop-made fence and a flush-trim router bit. The fence has an offset created by adding a strip of plastic laminate to the fence's outfeed face (see photo, bottom left). The offset equals the amount of stock removed for each pass (see inset photo).

To use the fence, set up your router table with a flush-trim bit. The fence must be set so the outfeed side is dead-on flush with the router bit's cutting arc (see photo, bottom right). Make a few test cuts. If you get some snipe at the end of the cut, the fence needs to move forward. If the stock bangs into the laminate edge, the fence needs to be moved back a touch. The easiest way to fine-tune the fence is by loosening one clamp and tapping the fence in or out.

Source MLCS,
(800) 533-9298,
www.mlcswoodworking.com
3/4-in.-dia., two-flute,
carbide-tipped, flush-
trim bit, #7808, \$15.



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MDF
PLASTIC LAMINATE

To build the fence, face-glue two 3/4-in. x 4-1/2-in. x 49-in. pieces of MDF and trim them to 4 in. x 48 in. Drill a 1-1/2-in.-dia. hole centered 1-1/4 in. back from the front edge. Finish the U-shaped bit channel with a jigsaw. Glue a plastic-laminate strip on the fence's outfeed edge. Finally, add a polycarbonate guard for safety.



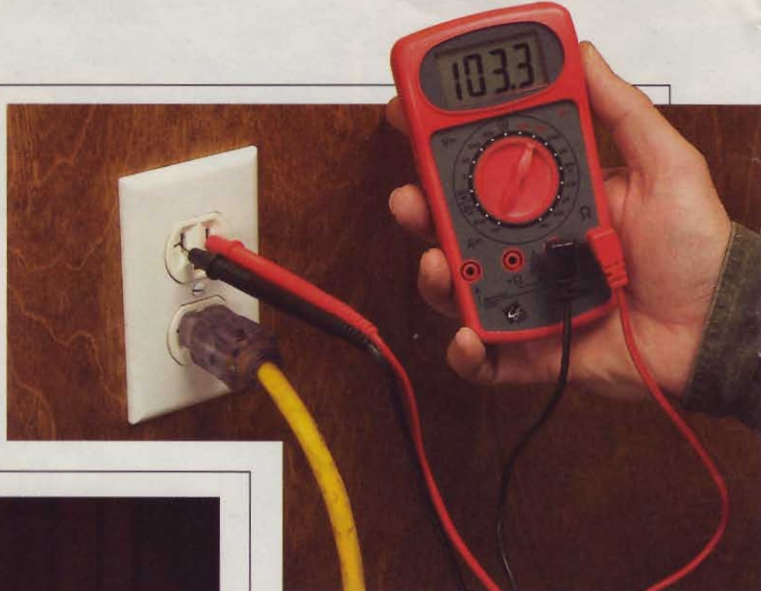
Set the fence flush with the router bit bearing by holding a straightedge against the outfeed side. Position the fence so the straightedge contacts the router bit bearing and clamp the fence down.

EDITOR: DAVE MUNKITTRICK • ART DIRECTION: RYAN NELSON • PHOTOGRAPHY: VERN JOHNSON

BREAKER-POPPING TABLESAW

Q I keep popping a circuit breaker with my contractor's saw, and it's driving me nuts. Would changing to a 240-volt circuit solve the problem?

A In a perfect world, a 120-volt circuit should handle the 1-1/2-hp motor on your contractor's saw without tripping the breaker. In reality, your



circuit may not be delivering the full 120 volts to your saw. This is commonly referred to as voltage drop. Your saw's motor is rated for 120 volts. If it's getting less than that, it will pull more current to make up the difference and that will cause the breaker to trip.

Here's what you can do: First make sure there is no other electrical draw on the circuit. Then, look at how far the outlet is from the service panel. If your panel is in the garage and your shop is on the opposite side of the house in the basement, you're essentially running your saw on a very long "extension cord." The longer the distance, the greater the voltage drop.

To measure the actual voltage being delivered to your saw, have a friend cut some wood on your saw while you take a reading with a voltmeter (available at hardware stores for around \$20). A voltage drop in excess of 5 percent can lead to breaker trips. Running the saw on 240 volts would solve this problem. That's because a 240-volt circuit will have one-quarter the voltage drop over a given distance than a 120-volt circuit will have. (This difference is what leads people to swear they get more power from 240 volts than 120 volts.) Instead of about a 16-volt drop (13 percent) shown on the voltmeter in the photo, you would have a 4-volt (2 percent) drop in a 240-volt circuit.

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QUESTION & ANSWER

KEEP YOUR BATTERIES WARM

Q I leave my shop unheated when I'm not using it. At times it gets well below freezing. Will this shorten the life of my rechargeable battery packs?



A Rechargeable batteries should be treated like pets. Give them a warm place to stay in the winter and cool shelter in the hot summer months.

Nickel cadmium (NiCad) and nickel metal hydride (NiMH) batteries do not like extremes in temperature. Near-freezing temperatures can shorten the life of rechargeable batteries. If your shop is unheated, it's best to keep the batteries warm inside your house when you're not in the shop.

Excessive heat can also damage your batteries. Storing batteries for extended periods of time in temperatures higher than 95 degrees can actually break down the chemicals and insulation used in rechargeable batteries. If your shop runs hot in the summer months, try to find a cool place to store the batteries, for instance, a lower cabinet near the floor. And never leave a rechargeable battery in a car or truck, where interior temperatures can exceed 100 degrees.

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

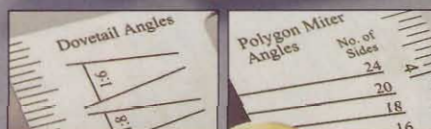
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WORKSHOP TIPS SPECIAL WORKING

Solitary Strategies for Three-Handed Tasks

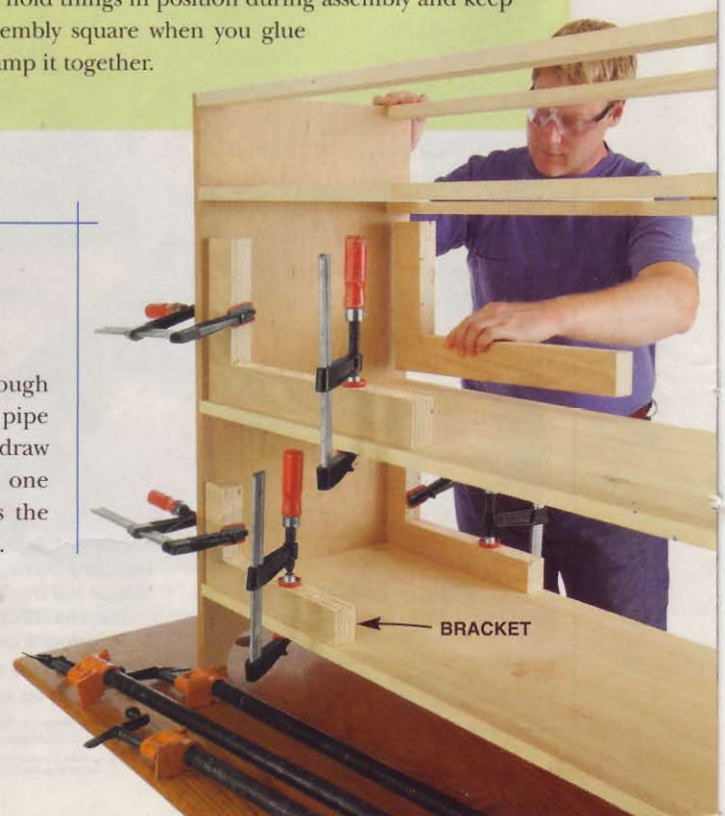
One of woodworking's major attractions is being able to say, "I built that myself." On the surface, this statement is about mastering skills and techniques. But on another level, it's about independence—the satisfaction that comes from discovering methods that allow working successfully by oneself. Woodworking is loaded with situations, large and small, in which a little ingenuity can replace a call for help. So put down the phone and read on!

KEEP IT TOGETHER WITH BRACKETS

Keeping large or complex assemblies square during glue-up can be a real headache. Heck, when you're alone, just assembling all the pieces can be a pain in the neck. You won't need aspirin or an assistant if you use 90-degree brackets. They'll hold things in position during assembly and keep the assembly square when you glue and clamp it together.

SUPPORT UNWIELDY CLAMPS

Without help, it's tough to hold a long, heavy pipe clamp level while you draw it tight. By supporting one end, a spring clamp eliminates the need for help from extra hands.



ALONE

by Tim Johnson

HIT THE SKIDS

Managing the space in your shop can be a real chore during a kitchen cabinet project. Nailing skids on the bottoms makes cabinets easy to move and also keeps their veneered plywood sides from chipping out.



GLUE COMPLEX ASSEMBLIES IN STAGES

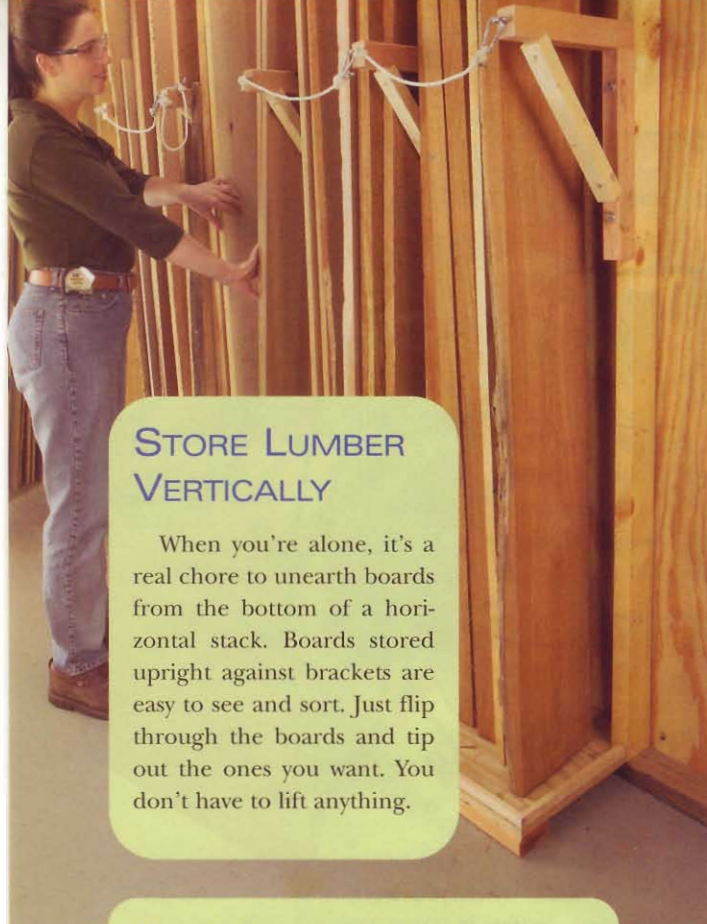
There's no rule that says you have to glue together a tabletop or a cabinet all in one shot. When you work alone, it's easier—and a lot smarter—to glue in stages, tackling only as many joints as you can safely manage. (Here, for example, the left side joints are being glued first.) Then you won't risk having the glue dry before you can assemble and clamp the joints. To ensure everything stays square and properly aligned when you use this method, always clamp the entire assembly together, even though you're only gluing a portion of it.

TURN YOUR BACK ON SHEET STOCK

I've tried all kinds of carriers and lifting strategies to move heavy sheet stock, like MDF, but this method is my all-time favorite. Stand the sheet on edge, grab the sides, lean forward and go. Ninety pounds never felt lighter. Of course, this method is incompatible with low ceilings inside and windy days outside, unless you enjoy MDF sailing.



ART DIRECTION: RICK DUPRE • PHOTOGRAPHY: MIKE KRIVIT



STORE LUMBER VERTICALLY

When you're alone, it's a real chore to unearth boards from the bottom of a horizontal stack. Boards stored upright against brackets are easy to see and sort. Just flip through the boards and tip out the ones you want. You don't have to lift anything.

GO MOBILE

Nothing helps a solo woodworker move materials and machinery like a good set of wheels. Size matters: Buy casters that can handle heavy loads, at a minimum, a 125-lb. capacity per caster. Large wheels, at least 3 in. in diameter, provide clearance on uneven floors and are less likely to stall on cracks or power cords. Rubber tires ride more smoothly and quietly than solid plastic wheels. They're also more skid-resistant when the casters are locked.

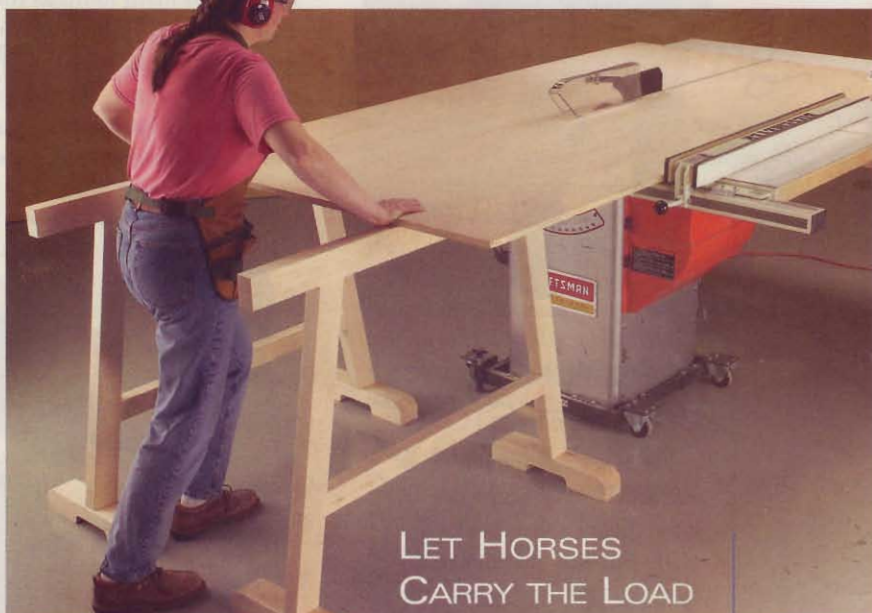
Four swivel casters provide the best maneuverability; pairs of swivel and fixed casters make a cart easier to steer. Ball bearings and wheel locks are essential. Swivel casters should have dual-action locks, so they won't roll or swivel.

Source Highland Hardware, (800) 241-6748, www.tools-for-woodworking.com 3-in. locking swivel caster with plate, 150-lb. capacity, #084050, \$8 ea.; 3-in. fixed caster with plate, 150-lb. capacity, #184050, \$4 ea.



USE A BRAD NAILER

By simultaneously holding brads and driving them, this air-powered hammer allows you to perform a two-handed job with one hand. That means you won't need a third hand to hold the workpiece. A brad nailer is great for securing mitered corners, tacking drawer fronts in position or fastening delicate moldings. Face frames secured with a couple brads won't slide out of place when you apply clamps during glue-up. The tiny nail holes are easy to disguise. You can buy a brad nailer and a small compressor for as little as \$200.



LET HORSES CARRY THE LOAD

Trying to rip sheet stock single-handedly while standing 8 ft. behind the saw is no picnic. A pair of horses the same height as your saw table carry the load and leave a path so you can easily guide the sheet from start to finish. Used beside the saw, saw-height horses provide the same stabilizing support for crosscutting sheet stock.

REDUCE FRICTION

Like helping hands, slippery surfaces make heavy stock slide easily and seem lighter. Reduce drag on your steel machine tables by coating them with paste wax or a dry-lubricant spray. Use melamine, which is MDF with resin-impregnated paper faces, for support tables. In addition to reducing muscle strain, melamine brightens your shop, is easy to keep clean and costs only one-third more than plain MDF.



MELAMINE BOARD



SLOW-SETTING GLUE

END GLUING TIME TRIALS

Yellow wood glues typically have about five minutes of open time—that's how long you have to assemble the joint after you've applied glue. Five minutes is sufficient for simple glue-ups, but this short window puts a real squeeze on a solo woodworker facing an assembly with numerous joints.

One way to beat the clock is to buy wood glue with a longer open time, from a couple extra minutes to half an hour, depending on the formulation. The only trade-off is longer clamp time, because these slow-setting formulations take longer to dry.

Another clock-beating method is to spread glue with a trim roller. It's amazingly fast and the roller leaves a nice even layer of glue. Trim rollers, packaged in a small plastic tray, cost about \$4 in a home center's paint department. The rollers are reusable; just rinse them out. Short-nap rollers produce the best results.

Sources Rockler Woodworking, (800) 279-4441, www.rockler.com
Titebond Extend wood glue with 7- to 8-minute open time, #24623, \$6.50 a pint. • Garrett Wade, (800) 221-2942, www.garrettwade.com Slo-Set Glue with 30-minute open time, #62J04.01, \$7 a pint.

SHORT OF HANDS? USE FEET

To hold a workpiece on its edge for mounting hinges, gluing on edge banding and similar tasks, simply clamp handscrews to the bottom.



THE WELL-EQUIPPED SHOP

by George Vondriska



BENCH-MOUNT CLAMP

The new Versa Clamp, \$35, from TS Tool Co., is a quick-acting clamp that doubles as a holding device on your workbench. It comes with two mounting brackets that you can permanently mount to your bench. The clamp easily slips in and out of the brackets. The Versa Clamp has one sliding jaw and one fixed jaw to provide a 20-in. maximum capacity. Both jaws are padded. The clamp tightens with a cam action on the fixed jaw. Simply slide the loose jaw against your work and pivot the handle on the fixed jaw to apply pressure and lock everything in place.

Compared with many other quick-acting clamps, the Versa Clamp exerts quite a bit more pressure but is more expensive and doesn't act as a spreader. In practice, I found the Versa Clamp very handy. It has enough grab to act like a vise on a bench and, when used like a conventional clamp, it can pull unwieldy joints closed. Versa Clamp is available directly from the manufacturer.

Source TS Tool Co., (812) 933-5421, www.tsstoolco.com Versa Clamp, \$35.



EDITOR: RANDY JOHNSON • ART DIRECTION: RICK DUPRE • PHOTOGRAPHY: PATRICK HUNTER



GLOWING GLUE

Oh, it's a sneaky devil. That little bit of squeeze-out that was left behind when you glued up your project. It hides, unseen until you get the first coat of finish on. There, glaring at you, is a spot that won't take finish. You can shed some light on this problem—black light, that is—by using Titebond Fluorescent Glue, \$9 a quart, to assemble your projects. The glue glows under a black light, showing you any smears left on your project, so you can remove the residue before you apply a finish.

Titebond Fluorescent is the same formula as Titebond Original, so it has the same working characteristics, plus the fluorescent additive, for about \$2 more a quart. The fluorescent glue glows under black light whether the glue is wet or dry, but it's easiest to do your cleanup while the glue is still wet. Black-light bulbs are available at home centers for about \$10 each. Titebond Fluorescent is available in 1-quart and 5-gallon buckets.

Source Franklin International, (800) 877-4583, www.titebond.com
Titebond Fluorescent, \$9 a quart.

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DeWALT



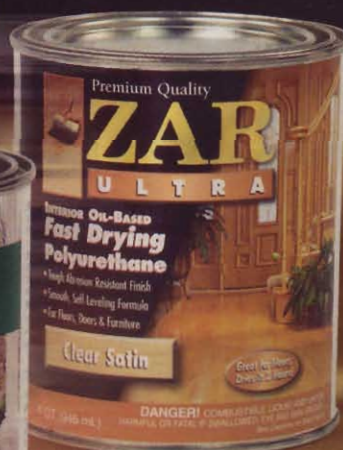
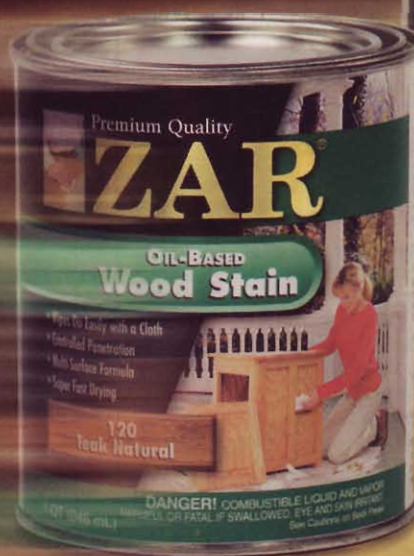
KEEP CORDS CONNECTED

Have you ever been merrily driving your router along when suddenly you run out of power? The extension cord gets hung up on something, and suddenly you're disconnected. I know, the time-tested solution is to tie a knot in the cord that captures the plug and extension cord. (What is the right Scout knot for cords?) For a mere \$5 you could try a Cord Snake instead, and never again worry about getting disconnected, or tying the right knot.

The Cord Snake is a simple device that acts like a bridge between the extension cord and tool. It works on cords from 10 to 18 gauge. It's easy to leave it permanently looped on the end of an extension cord so it's available to grab the cord of any power tool you're using.

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www.cordsnake.com
Cord Snake, \$5.

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QUICK-RELEASE NUT

INEXPENSIVE BENCH HOLD-DOWN

The last thing I want to do is chase my material around the workbench so I can work on it. Hold-down clamps excel when you need pressure in the middle of a bench where other clamps can't reach. The Jorgensen Hold-Down Clamp for workbenches, \$15 for two, is like getting two extra hands at a price that's hard to beat. The clamp is easy to mount in your bench, and it's got plenty of grab.

The hold-downs have a 4-1/2-in. capacity, minus the thickness of your workbench. They require a 3/4-in. hole. A large nut with a quick release grabs the hold-down under the bench. The quick release lets you make rapid adjustments without screwing or unscrewing the nut. A cam lever locks the clamp onto your material. The Jorgensen Hold-Downs have soft jaws, so you don't need any clamp pads.

Source Adjustable Clamp Co., (312) 666-0640, www.adjustableclamp.com Hold-down clamp for workbenches, #1652, \$15 for two.



BEFORE

9 Ways to Untangle the Mess

Electric spaghetti. That's what most of us have lurking behind our computer desks and entertainment centers. Every time you want to add or take out a component, unsnarling that mess can be a real nightmare.

There's a term for the solution: wire management. The best new cabinets and desks have built-in wire-management features, such as raceways and concealing panels, to route wires. Other much simpler ways exist to manage wires, however; they're especially useful to retrofit less-sophisticated furniture, old or new. Here are nine of our favorite methods.

AFTER



GROMMETS

Cords draped over the back of a desk are an unsightly mess and make cleaning a real chore. It's much neater to run them as bundle through a grommet. Grommets come in many sizes and generally snap into a standard-size hole. The best tool for drilling these oversize holes is a hole saw.

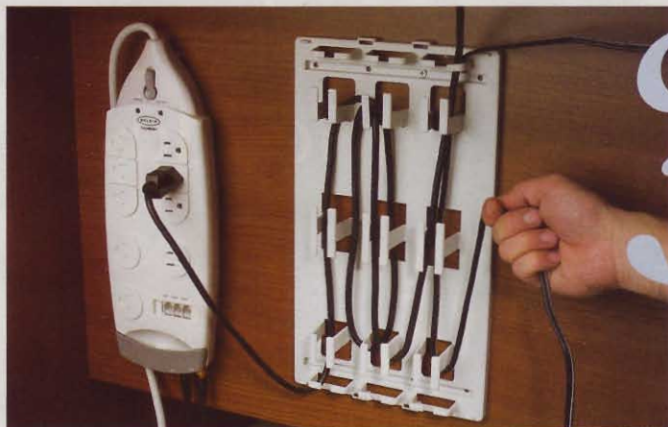
Source Cable Organizer.com Inc., (877) 547-4580, www.cableorganizer.com Grommet, #GR-2375, \$4.50 ea.



MOUSE TRAP

One cord in particular always seems to tangle: the tail of a computer's mouse. Two wire clips are the answer. Mount one at the back of your keyboard tray, the other at the back of the desk. The mouse won't slide off the tray, and the cord won't wrap around your legs.

Source Wire clips are available at home centers and hardware stores.



WIREMATE

Here's a slick way to organize and conceal extra wire. The WireMate has three sets of cleats for separating and looping slack wire. Each cleat is split in the middle, which makes it even easier to wrap up just the right amount of wire. A cover snaps on to hide the stuff inside.

Source WireMate.com, (212) 867-6020, www.wiremate.com The WireMate, #WMG (gray), #WMB (black), #WMW (white), \$30 ea.



SPIRAL WRAP

This simple, inexpensive product binds wires together. You can pull them in or let them out anywhere along the length of the bundle. Spiral Wrap is simply a tube cut in a helical pattern. To install it, pull your wires in a taut line and wind the wrap around them. It only takes a few minutes. Spiral Wrap comes in various diameters to accommodate as many wires as you have.

Source M.M. Newman Corp., (800) 777-6309, www.mmnewman.com Spiral Wrap, #HT3/4C, \$17 for 25 ft.

visit.



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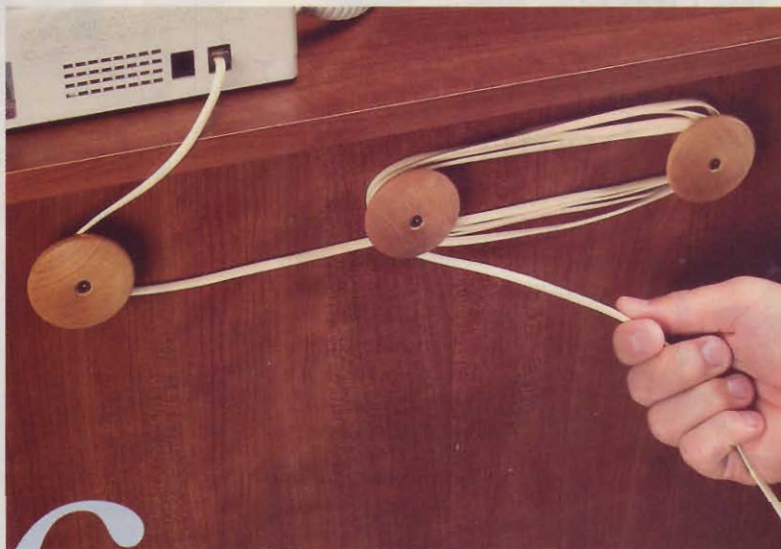
MODERN CABINETMAKER



VERTEBRAE

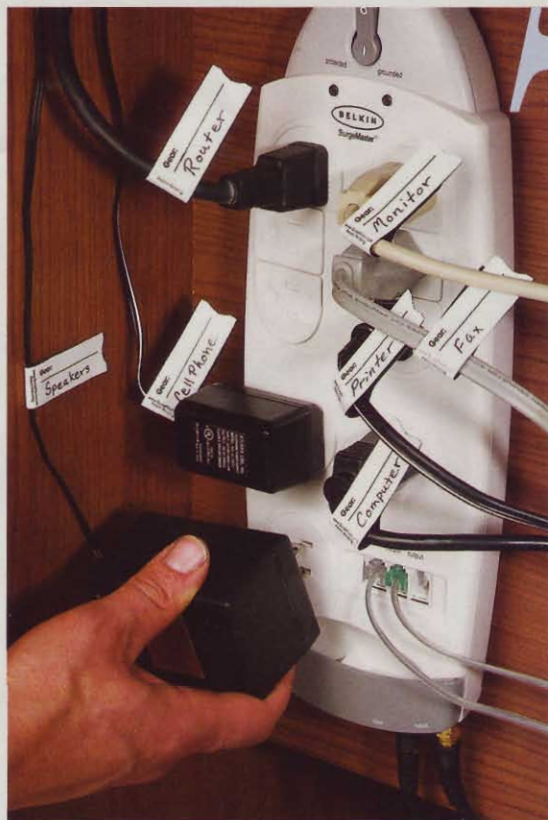
No, it's not a set of bones; it's a series of plastic clips in a plastic channel. But it resembles a spine so much that it's dubbed The Vertebrae. You can run wires in and out as needed between each clip. That's perfect for a stacked set of components, but you can position it horizontally, too. Run a couple of screws through the plastic channel to fasten it in place wherever you need it. As you organize and loop your wires, just snap each vertebra shut. There's plenty of room inside for lots of slack.

Source Doug Mockett & Co. Inc., (800) 523-1269, www.mockett.com
The Vertebrae, #WM15A, \$13.



HOMEMADE CLEATS

This cord-wrapping device is just a set of wooden knobs bought at the hardware store. Drill a screw hole through the center of each knob to make mounting easier. Mount them as far apart as you want to minimize the number of loops. Then use hook-and-loop wire wraps to secure the wires (see page 38). Coat hooks and clothesline cleats also work well. No doubt there's something in your junk drawer that'll do the job, too.



CENTRALIZE THE POWER SOURCE

Plug all your gear into a single power center and label each component. Mount the power center on the back of your desk or cabinet, out of sight. After you've taken the slack out of your wires, direct all of them to this central hub.

If you're hooking up computer equipment, buy a power center that has a surge protector with receptacles for both the computer's power cord and the telephone line for its modem. This model even has coaxial cable connections. When shopping for a surge protector, keep a few basics in mind. It should have a UL rating and be listed as a transient voltage surge suppressor. The voltage at which it kicks in should be low, 330 volts or less. It should have an indicator light to let you know that it is not just functioning as an extension cord. It should have high energy absorption, at least 200 to 400 joules, and a response time of less than 1 nanosecond.

The labels we used have hook-and-loop fasteners, so all you need to do is pinch them in place. They're just as easy to remove and reuse.

Sources CableOrganizer.com Inc., (877) 547-4580, www.cableorganizer.com Quick Pinch labels, QP001-4, \$6 for eight.
• Power centers with surge suppressors are available at electronics stores and home centers.

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www.epiloglaser.com/american_woodworker.htm

WIRE WRAPS

Hook-and-loop wire wraps are so easy to use that you can tie up your slack in seconds. Of course, they're also very inexpensive. Wraps are available in many sizes to handle any situation.

Source CableOrganizer.com Inc., (877) 547-4580, www.cableorganizer.com Wire wraps, #VWOW-PK, \$2.50 for five.



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Who thinks of this clever stuff? Here's a split hollow ball with a spool inside for wrapping small-diameter wire. Pop open the Cable Turtle to turn both halves inside out, wrap your wire around the middle and snap the halves shut. Easy! It's ideal for speaker and telephone wire and it looks cool enough to sit on your desktop.

Source CableOrganizer.com Inc., (877) 547-4580, www.cableorganizer.com Cable Turtle, #CT-LG, \$8.



by Dave Munkittrick

FRACTIONAL CALCULATORS

THESE CALCULATORS MAKE
WOODWORKING MATH CHILD'S PLAY.

I've been woodworking for more than 20 years without a fractional calculator. After a few minutes with one, I became acutely aware of what an opportunity I'd been missing. Checking cutting lists and figuring face-frame openings, chair-back spindle spacing and board-foot calculations—all these tasks are at your fingertips with a fractional calculator. And luckily, the least-expensive models are all most woodworkers need. The high-end models have features professional builders use to lay out stairs, figure angles on complex roof framing or estimate cubic yards of concrete.

I found most of the calculators to be very user-friendly. They work like the common calculators we're all used to, with the ability to handle fractions thrown in. There's no need to find common denominators; the calculator does that for you. Just enter the numbers as they come, for example, $23\text{--}5/8" + 3\text{--}3/32"$ and the calculator will indicate the sum $26\text{--}23/32"$.

FEATURES

Basic math keys include +, −, ×, ÷, x^2 , π , $\sqrt{}$, %, $\frac{1}{x}$, $\pm$, are found on most of the calculators.

Preset fraction keys, $/2$, $/4$, $/8$, $/16$, $/32$, and $/64$, help reduce the number of keystrokes required to enter a problem—and fewer keystrokes mean fewer chances for error. To enter a fraction, just punch in the numerator and then the appropriate denominator key.

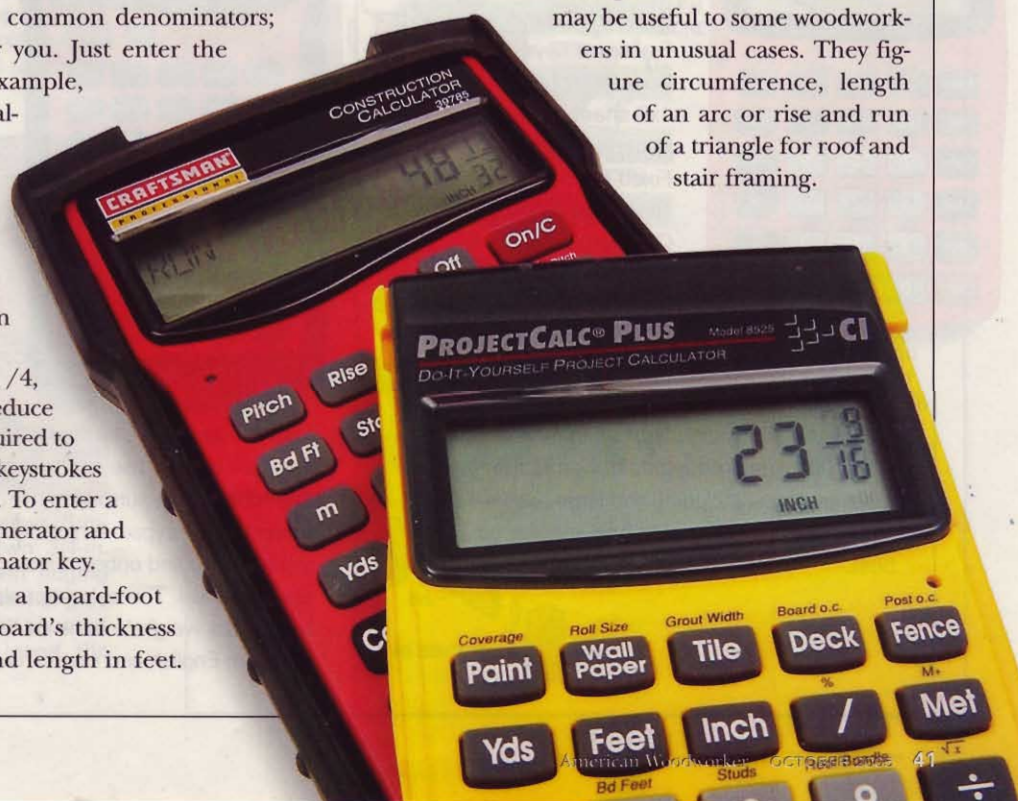
A **board-foot key** yields a board-foot measurement based on a board's thickness in inches, width in inches and length in feet.

A **4x8 sheet stock calculator** simply divides the total square feet of sheet stock your project requires by 32 sq. ft. to calculate how many 4x8 sheets you need. It doesn't take grain direction into account, so it's only useful for nonveneered stock, such as MDF or melamine.

A function called **paperless tape** lets you review your entries for an equation, but doesn't allow you to change them. If you find a mistake, you will have to start over from the beginning.

The **fixed fraction** allows you to set the degree of accuracy for fractions from $1/2$ in. to $1/64$ in. All your answers are rounded to the accuracy you choose. So, if you don't want to mess with $1/64$ -in. units, you can set this function to round off to $1/32$ -in. units.

Triangle and circle functions may be useful to some woodworkers in unusual cases. They figure circumference, length of an arc or rise and run of a triangle for roof and stair framing.



Calculated Industries

PROJECTCALC PLUS, \$20

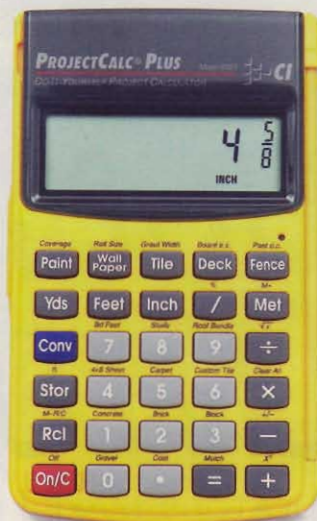
FEATURES

- Basic math keys ✓*
- Fractional keys
- Board-foot key ✓
- 4x8 sheet stock key ✓
- Paperless tape
- Fixed-fraction mode
- Triangle keys
- Circle/arc keys

* does not have $\frac{1}{x}$ function

Source Calculated Industries, (800) 854-8075, www.calculated.com, #8525

This calculator has all a woodworker really needs at a very affordable price. The hard plastic case has a protective cover with a quick-reference user's guide printed on the inside. It also has preprogrammed do-it-yourself homeowner keys designed to estimate everything from roof shingles to garden mulch. The ProjectCalc is easy to use and its large keys are hard to miss.



Calculated Industries

MEASURE MASTER CLASSIC, \$44

FEATURES

- Basic math keys ✓
- Fractional keys
- Board-foot key
- 4x8 sheet stock key
- Paperless tape ✓
- Fixed-fraction mode ✓
- Triangle keys
- Circle/arc keys ✓

Source Woodworker's Supply, (800) 645-9292, www.woodworker.com, #104-642

The Measure Master Classic can figure arc lengths, circle circumference, plus weight and volume. It can also convert fractions to decimal equivalents or to metric measurements. These are extra features that typical woodworkers won't use. The vinyl case uses a magnet to hold the calculator. It includes a pocket for keeping the thoroughly written manual with the calculator at all times.



Craftsman

PROJECT CALCULATOR, \$20

FEATURES

- Basic math keys ✓*
- Fractional keys
- Board-foot key ✓
- 4x8 sheet stock key ✓
- Paperless tape
- Fixed-fraction mode
- Triangle keys
- Circle/arc keys

* does not have $\frac{1}{x}$ function

Source Sears, (800) 377-7414, www.craftsman.com, #39749

This is the same calculator as the ProjectCalc from Calculated Industries. It has all the same great features, including the large, easy-to-use keys. Pick the color, price and supplier you like best.



Craftsman

CONSTRUCTION CALCULATOR, \$50

FEATURES

- Basic math keys ✓
- Fractional keys
- Board-foot key ✓
- 4x8 sheet stock key
- Paperless tape ✓
- Fixed-fraction mode
- Triangle keys ✓
- Circle/arc keys ✓

Source Sears, (800) 377-7414, www.craftsman.com, #39785

I like the large keys of the Craftsman Construction Calculator. They are easy to use and less prone to inadvertent entries. The rubber case surrounds the calculator and a hard plastic lid protects the keypad. It has a quick-reference guide printed inside the lid and onboard storage for the thoroughly written user's manual. This calculator also has stair and rafter solution keys and a weight/volume calculation key. Plus, it can convert between English and metric measurements.

Sonin

INCHMATE+, \$22

FEATURES

- Basic math keys ✓*
- Fractional keys ✓**
- Board-foot key
- 4x8 sheet stock key
- Paperless tape
- Fixed-fraction mode
- Triangle keys ✓
- Circle/arc keys

* does not have $\frac{1}{x}$, % or $\pm$ functions** does not have $\sqrt{32}$ or $\sqrt{64}$

Source Woodworker's Supply,
(800) 645-9292,
www.woodworker.com, #949-811



The InchMate+ automatically displays feet and inch units on the screen. I found this feature more hassle than help. Woodworkers typically work in inches, not feet and inches. To use inches only requires you to enter 0 feet or select the inches-fraction mode with the second-function key. The preset fractions are limited to 1/16-in. accuracy. That's OK for most situations, but I prefer to work to 1/32-in. accuracy and, on rare occasions, I may want 1/64 in. You can't do that with this calculator.

Sonin

INCHMATE PRO, \$23

FEATURES

- Basic math keys ✓
- Fractional keys ✓
- Board-foot key ✓
- 4x8 sheet stock key ✓
- Paperless tape ✓
- Fixed-fraction mode ✓
- Triangle keys ✓
- Circle/arc keys ✓

Source Lee Valley and
Veritas, (800) 871-8158,
www.leevalley.com, #86K78.07



The InchMate Pro has the most features for the money. Unlike its cousin, the InchMate+, with the InchMate Pro, it's easy to work in inches. The hard plastic case features a permanent white pad on back for pencil notes, but there's no onboard storage, so good luck finding your manual when you need it. I also wish it had bigger keys.



Sonin

INCHMATE 2000,
\$40

FEATURES

- Basic math keys ✓
- Fractional keys ✓
- Board-foot key ✓
- 4x8 sheet stock key
- Paperless tape ✓
- Fixed-fraction mode ✓
- Triangle keys ✓
- Circle/arc keys ✓

Source Lee Valley and
Veritas, (800) 871-8158,
www.leevalley.com, #86K78.10

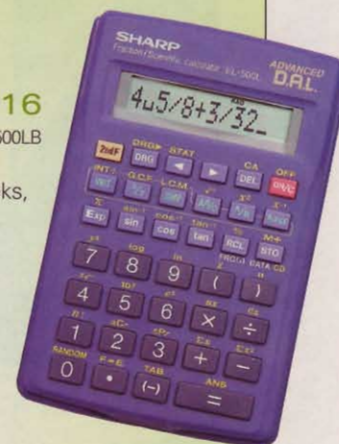
This is the calculator for frequent-flyer woodworkers who visit Europe or Canada a lot. Not only will it convert Fahrenheit to Celsius temperatures at the push of a button, but it can also convert miles to kilometers so you won't get a speeding ticket. It also has stair-building functions, liquid measure and volume measure. The tiny function keys are easy to miss.

scroll-edit function

Sharp

EL-500LB SCIENTIFIC
FRACTION CALCULATOR, \$16

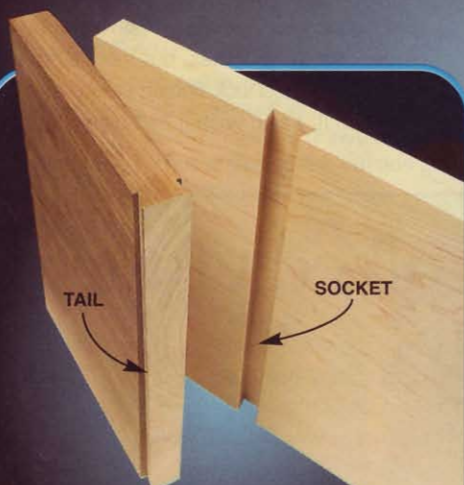
Source Amazon.com, www.amazon.com, #EL-500LB



This calculator is designed for math geeks, but it does have one really cool feature: the ability to scroll through and change numbers in a problem. Typical calculators only show the number you are entering. With the Sharp EL-500LB, every number and math function is displayed, just like word processing on a computer. It can handle up to 159 characters. You are free to scroll through the problem at any time and change, add or delete a number or a function. I wish I could recommend this calculator for woodworking, but I can't. It does a beautiful job of adding and subtracting fractions and maybe even calculating a rocket trajectory to Mars, but when it multiplies or divides with fractions, it doesn't round them to the nearest woodworker-friendly 1/16 in. or 1/32 in. Instead, you can end up with weird numbers, like 5-5/23 in. Try finding that on your tape measure. Still, I wish all the woodworking calculators had this scroll-edit function.

Tapered Sliding Dovetails

Two jigs make a complicated joint ever so easy.



A sliding dovetail joint has two mating parts: a tail and a socket. It's much easier to assemble when both parts are tapered. As the tail slides into the socket, the joint gradually locks into place until it's rock solid.

The tapered sliding dovetail joint is one of the hallmarks of fine craftsmanship. But making it has made many craftsmen pull out their hair! I've made it simple, using a jig with a micro-adjust feature for dialing in a perfect fit.

This exceptionally strong joint was traditionally used to bind solid shelves and dividers to the sides of a carcase. A standard sliding dovetail must overcome a lot of friction to go home, but a tapered sliding dovetail is a cinch to assemble. My bookcase on page 70 makes full use of it, additionally joining the top to the sides. The jigs I built are sized to fit the bookcase, but it's easy to tailor them to another project.

To reduce setup time, I used two routers to make the joint, but that's not absolutely necessary. You'll need a 1/2-in. top-bearing dovetail bit (\$34), a 1/2-in. top-bearing flush-trim bit (\$29), a 3/8-in. straight bit (\$23) and a 5/8-in.-dia. template guide.



BUILD THE TAIL JIG

1. Make a taper template for routing the tails. First, draw a rectangle (shown in red in Photo 1) the same size as the end of the board that receives the tail. Next, draw two lines (shown in black) inside the rectangle indicating the amount the dovetail will taper (Fig. A, page 50). Each side of this taper has a 1/8-in. rise over the joint's 11-in. length, or run. A 1/8-in. rise works equally well if the joint is a few inches shorter or longer. Rough-cut the template 1/16 in. outside the black lines with your band-saw.

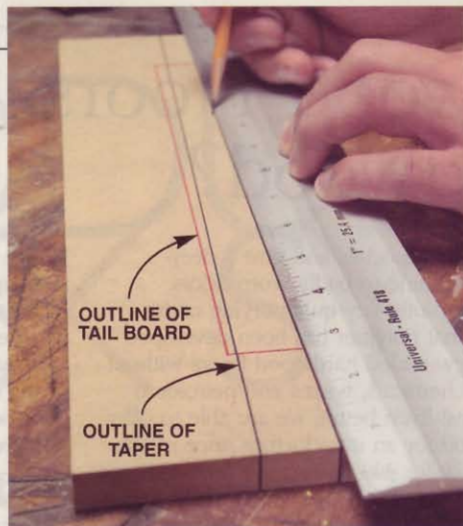
2. Cut to the black lines on the router table (Photo 2), using a top-bearing straight bit (see Source, page 50). Fasten the template to the guide board with screws so the template doesn't flex.

3. Screw the template to a test board (Photo 3). Align the red lines with the board's edges. Position the template so it's exactly centered from side to side, clamp it in place and drive in the screws.

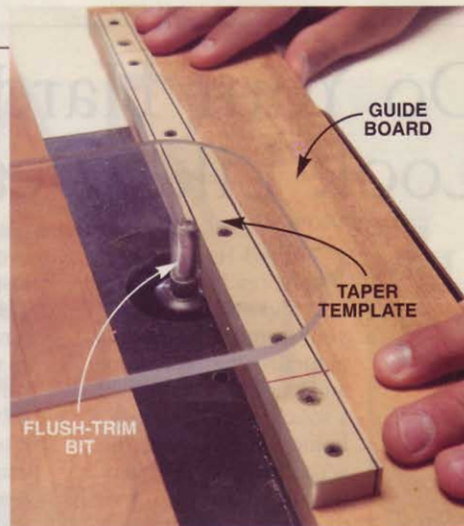
4. Assemble the rest of the jig on the test board so it fits tightly (Photo 4). Clamp the braces (C) in place first; then add the ends (B, Fig. B, page 50).

5. Add two outriggers (D, Photo 5). Stand the jig on a flat surface to ensure these boards are level with the template.

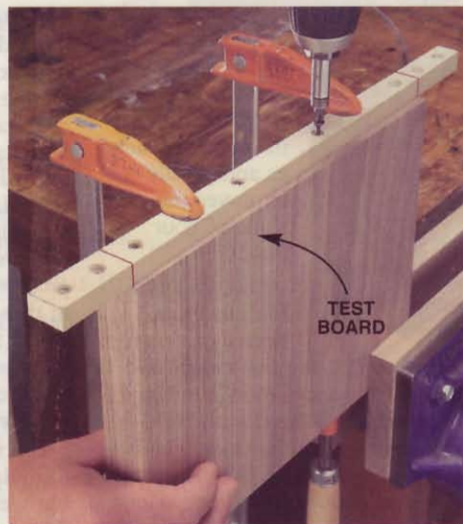
6. Rout a test dovetail with a bearing-guided router bit (Photo 6; see Source). Lower the bit so it cuts 1/2 in. into the test piece. Unscrew the template and remove the jig.



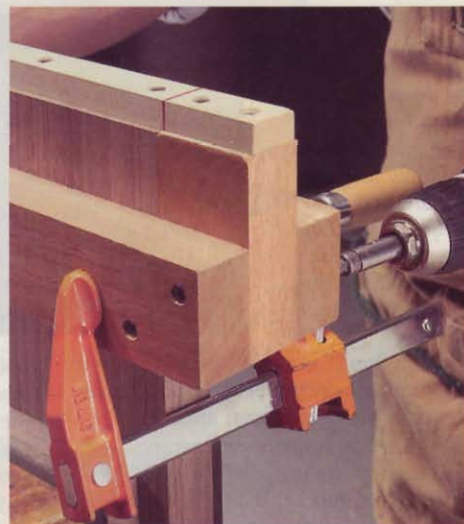
1 Draw an end view of the tail's taper. Rough cut this piece just outside the black lines, to make a taper template.



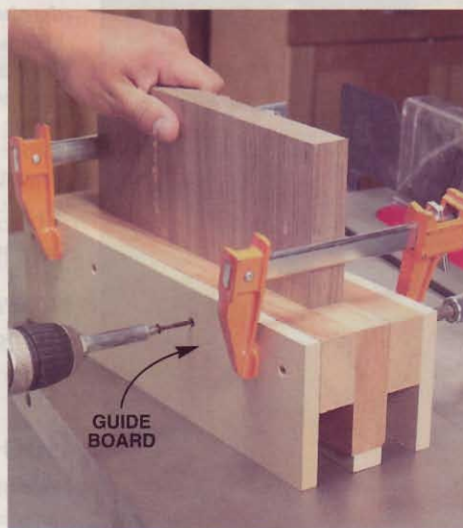
2 Rout the taper template using a board as a guide. This guarantees the template will have absolutely straight edges.



3 Fasten the taper template to the end of a short test board.



4 Build a jig for routing the tails. Assemble it on the test board, with the taper template, to fit tightly.



5 Add two outrigger guide boards to the jig. These pieces will help you balance a router on the taper template.



6 Rout the dovetail. Follow the taper template with a dovetail bit that has a bearing above the cutter (see inset).

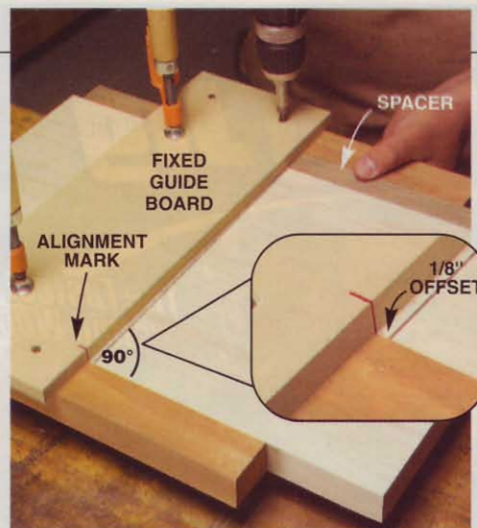
BUILD THE SOCKET JIG

7. Build this jig around a second test board (Photo 7). To position the fixed guide board, use the same 1/8-in. taper you used to make the tail jig. Draw an alignment mark (shown in red) on the guide board perpendicular to the test board's edge. Lay the fixed guide board exactly on the line at one end and offset it by 1/8 in. at the other end. Fasten the guide board to the braces (G). The spacer enables this jig to fit the 12-in. top of the "Dovetailed Bookcase" project (see page 70).

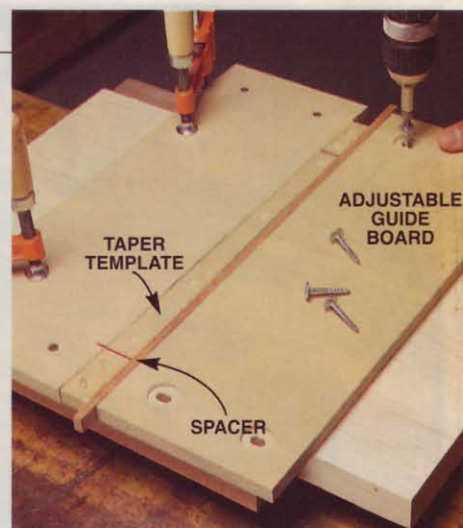
8. Add the adjustable guide board (Photo 8). Butt it tight to the taper template and a spacer. The spacer makes up for the difference in diameter between the bearing and the dovetail cutter 1/2 in. up from the bottom (the depth of the tail and socket). Align the template's red line with the alignment mark on the fixed guide board.

9. Rout a test socket (Photo 9). Remove most of the waste with a second router so you don't have to alter the dovetail bit's depth setting or prematurely dull this special bit. Use a 5/8-in.-dia. template guide and 3/8-in. straight bit. File the template guide to 7/16 in. long, so it's shorter than the thickness of the template material. Make the cut 7/16 in. deep, which is 1/16 in. shy of the socket's final depth.

10. Rout the socket with the bearing-guided dovetail



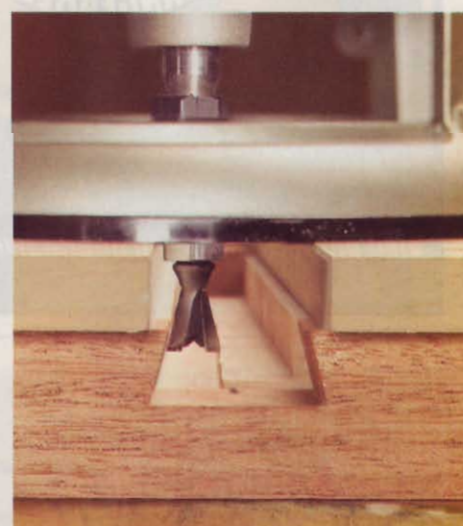
7 Build the socket jig. Offset a fixed guide board by 1/8 in., the same amount as each side of the template is tapered (see inset).



8 Add a second, adjustable guide board. Use the taper template and a spacer to position this board. Align the red marks.



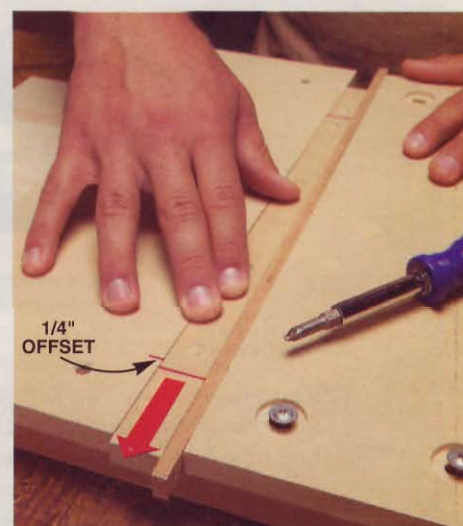
9 Rout a test socket. Remove most of the waste with a straight bit (see inset), using a second router with a template guide.



10 Finish the socket with the bearing-guided dovetail bit.



11 Assemble the joint. It will be very loose until you get near the end, because both parts are tapered. You may have to adjust the width of the socket to make it flush and tight with the tail.

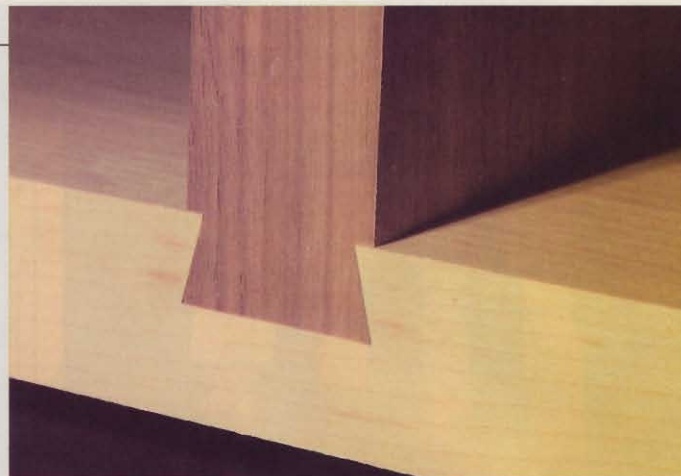


12 Adjust the socket's width by altering the gap in the jig. Slide the taper template 1/4 in. in or out to micro-adjust the gap's width. Rout a new socket and try the joint again.

bit (Photo 10). The socket will be 1/2-in. deep—exactly the same depth as the tail. Remove the jig from the test piece.

TEST THE FIT

11. Test the joint's fit (Photo 11). If the tail won't go home or slides too far, adjust the socket jig (Photo 12). Using the red lines as a reference, shift the template 1/4 in. and rout another test socket. Slide the template in for a looser joint and out for a tighter joint. You may have to cut a couple of test sockets to get the right fit, but once you do, replace the template in the tail jig and you're all set to cut the real tails and sockets (Photo 13).



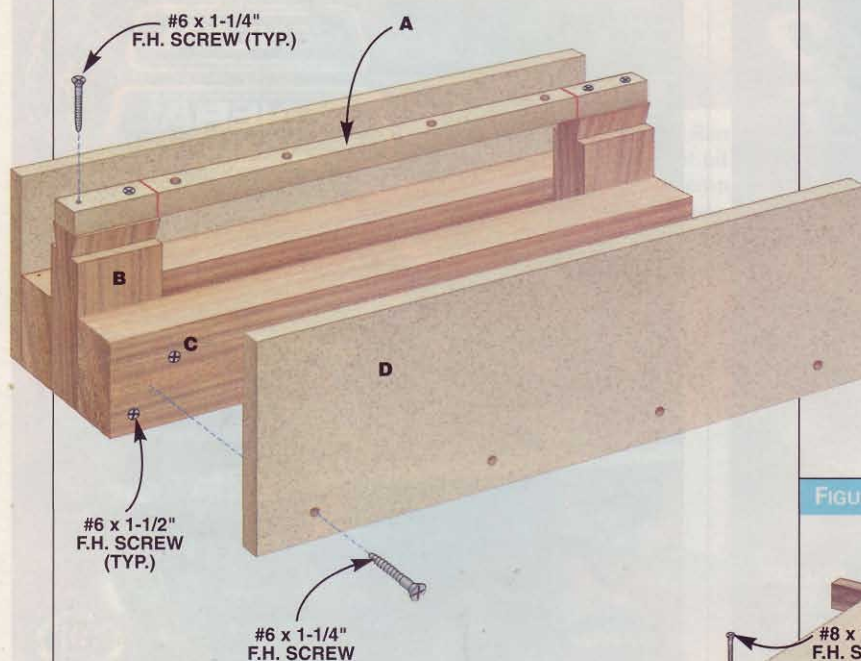
13 A perfect fit should only require a few light taps to assemble. The joint should be tight when its two parts are flush.

CUTTING LIST

Part	Name	Qty.	Materials	Dimensions
Tail jig				
A	Template	1	MDF	1/2" x 7/8" x 15"
B	End	2	Hardwood	1-1/8" x 2" x 3-1/2"
C	Brace	2	Hardwood	1-1/8" x 2" x 15"
D	Outrigger	2	MDF	1/2" x 4" x 15"
Socket jig				
E	Fixed side	1	MDF	1/2" x 5-1/2" x 16"
F	Adjustable side	1	MDF	1/2" x 5-1/2" x 16"
G	Brace	2	Hardwood	1-1/8" x 1-1/2" x 12"
H	Spacer 1	1	Hardwood	1/2" x 7/32" x 17"
J	Spacer 2	1	Hardwood	1" x 1-1/4" x 16"

* Pieces tapers 1/4" total over 11" length, 1/8" on each side

FIGURE B TAIL JIG



Source Amana Tool, (800) 445-0077, www.amanatool.com
 1/2-in. top-bearing dovetail bit, #45850, \$34. 1/2-in. top-bearing flush-trim bit, #45460, \$29. 3/8-in. straight bit, #45414, \$23.

FIGURE A TAPER TEMPLATE

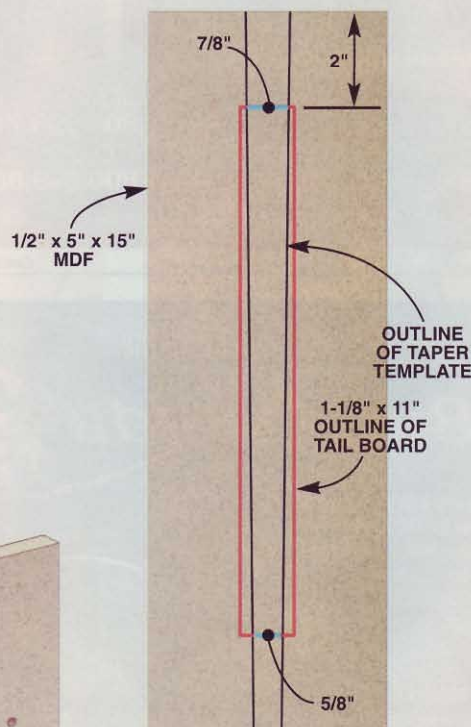
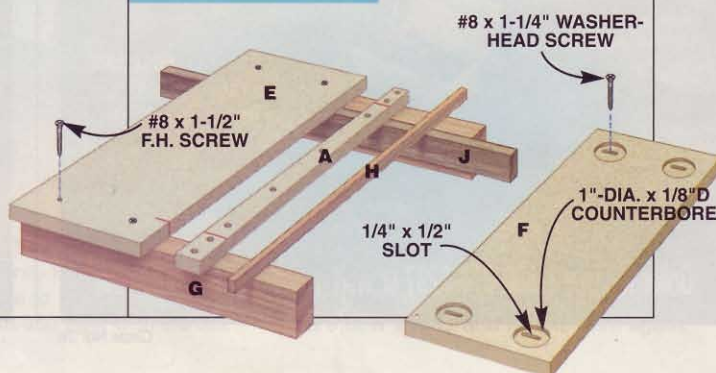


FIGURE C SOCKET JIG



MODULAR DESK SYSTEM

by Bruce Kieffer

Mix-and-match components make a desk that fits your needs.

This computer-desk system has more going for it than great looks. The system is based on modular components that can be assembled in a variety of ways to make the “perfect” desk, whether small, giant-size, or somewhere in between. Making the components is as easy as it gets—no complex joinery, just screws and biscuits.

I designed two different drawer configurations. The two-drawer unit has one drawer sized to accept hanging files and the other sized for CDs (see inset photo, page 53). The four-drawer unit features two pencil drawers, a letter drawer and a CD drawer. The drawers are built around a European undermount slide system that greatly simplifies drawer construction.

An easy-access wire track neatly takes care of wire management. The channel also supports the top and provides an attachment point for the modesty panels.

PLAN YOUR DESK

Decide which configuration you want to build. Every configuration requires a different amount of material, so you’ll need to figure the sizes and quantities of wood, sheet stock and laminate needed to build your desk.



Giant Corner



Standard Corner



Executive



Student



Credenza



YOU'LL LOVE THESE DRAWERS!



The slides have 1-in. overtravel, meaning they pull out all the way—and then an inch more. Add plastic drawer accessories to hold CDs and to make a hanging-file drawer.

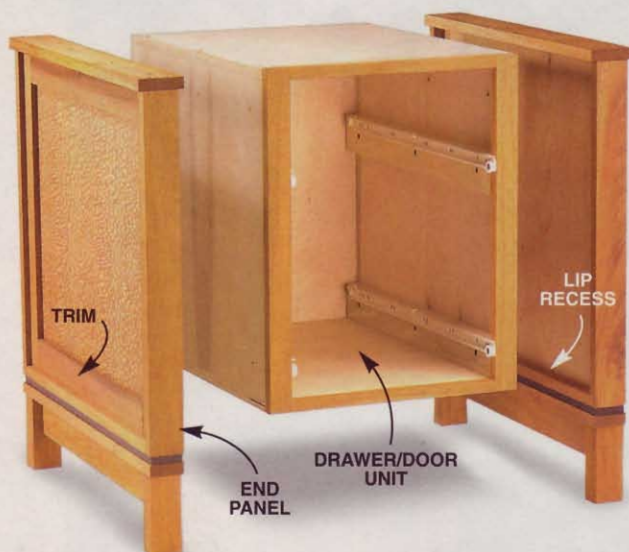
SIMPLE MODULAR CONSTRUCTION

Mix-and-match components create a desk that fills your needs and fits your space. This giant corner desk uses every component except a door unit.



Basic Components Make a Module

End panels are the main components of the desk system. They're built so a lip is created all around the veneered end panel. This lip is where the drawer/door unit and modesty panel rest. Trim is added to the outside end panels to give them a finished look.



PROJECT REQUIREMENTS AT A GLANCE

Materials: Sizes and quantities are based on your configuration; see "Simple Modular Construction," above, and the Cutting List, page 60.

4/4, 5/4 and 8/4 mahogany
4/4 poplar
3/4-in.-thick lacewood-veneered panels (one-sided or two-sided, depending upon location)
3/4-in.-thick shop-grade birch plywood
3/4-in.-thick MDF
1/2-in.-thick MDF
1/2-in. x 5-ft. x 5-ft. Baltic birch plywood
7/8-in.-wide mahogany edge banding
Plastic laminate
Contact cement
No. 0 and No. 20 biscuits
Danish oil finish

Tools: Biscuit joiner, cordless drill/driver, edge-banding tools, tablesaw with dado blade, router, drill press, laminate trimmer, flush-trim bit, finish sander, 18-gauge Brad nailer, bar and pipe clamps, 2-3/8-in.-dia. hole saw, No. 2 x 6-in. square-drive screwdriver bit and magnetic holder

Hardware: Drawer slides, drawer handles, 35-mm concealed hinges, wire grommets, CD storage track, hanging file rails, pull-out keyboard tray (optional), assorted screws

Estimated Cost:

Lacewood student desk, \$700 (\$400, if all birch),
Lacewood giant corner desk, \$1,400 (\$800, if all birch).

CUSTOM LACEWOOD PANELS

I used lacewood-veneer panels trimmed with mahogany and dark laminate accents to build the components. If you're wondering how I made the lacewood panels, well, I didn't! I ordered them custom-made (see Sources, page 61). Buying custom panels is expensive, but much simpler than veneering your own. To order custom panels, list the

panel sizes you need and whether they are one-sided or two-sided; then call for a quote, including shipping costs. For desks that get placed against walls, there's no need to use expensive veneer on the back of the drawer/door units and modesty panels, unless you think that someday the desk may be placed in the middle of a room.

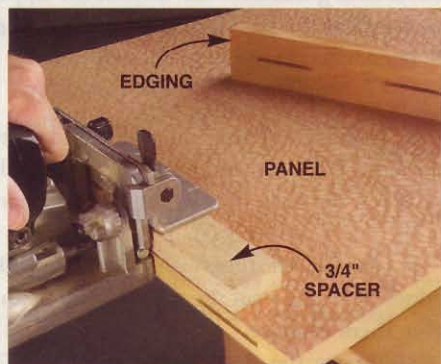
BUILD END PANELS

1. Cut the pieces A1 through A11 to size. Be precise when you cut these pieces. They all have to fit together well when the end panel is assembled (Fig. A, right).

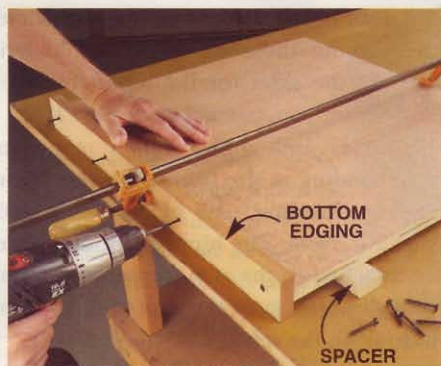
2. Drill the screw holes in the panel top and bottom edging (A3, A6) and the base cap (A5, Fig. L, page 61).

3. Cut biscuit slots for attaching the front and back edging (A7, Photo 1). Cut biscuit slots in the feet (A2) and rail (A4). Use a 5/8-in.-thick spacer to center the rail on the feet.

4. Glue and screw the bottom edging (A6) to the panel (A1, Photo 2). Glue and biscuit the front and back edging (A7) to the panel. Center the top edging on the panel; then glue and screw it in place.

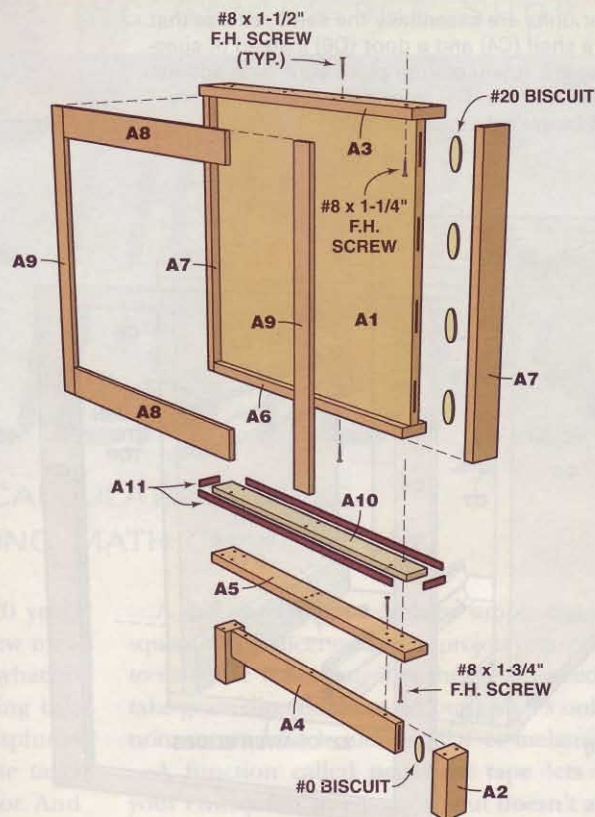


1 Align the panel's front and back edging with biscuits. To center the edging, place a 3/4-in. spacer on top of the panel and adjust your biscuit jointer's fence to center the grooves on the panel. Then cut the biscuit slots in the edging without using the spacer.



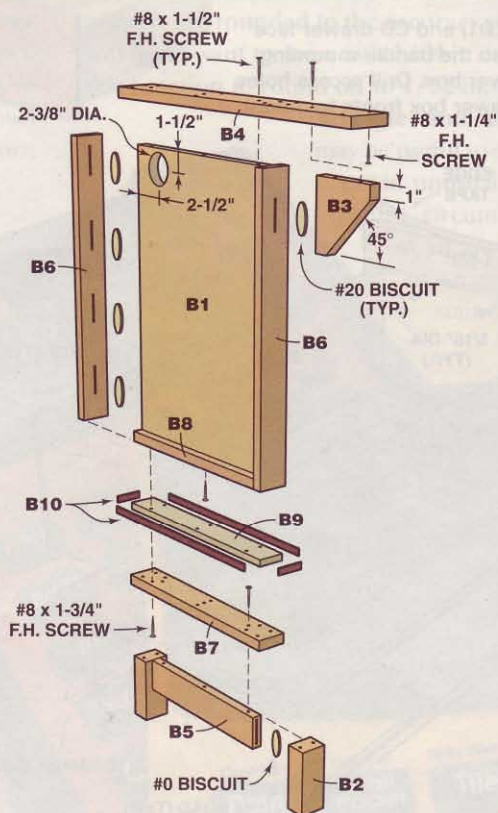
2 Fasten the top edging with screws. Support the panel on top of two 3/4-in. spacers. That centers the bottom edging with the panel. Use a small amount of glue so squeeze-out is minimal. Pre-drill counter-sunk pilot holes before you insert the screws (Fig. L, page 61).

FIGURE A END PANEL



End panels used for drawer/door units have lacewood veneer on the outside only. End panels that are used by themselves (see student desk) have lacewood veneer on both sides. Trim is only added to end panels that face outward.

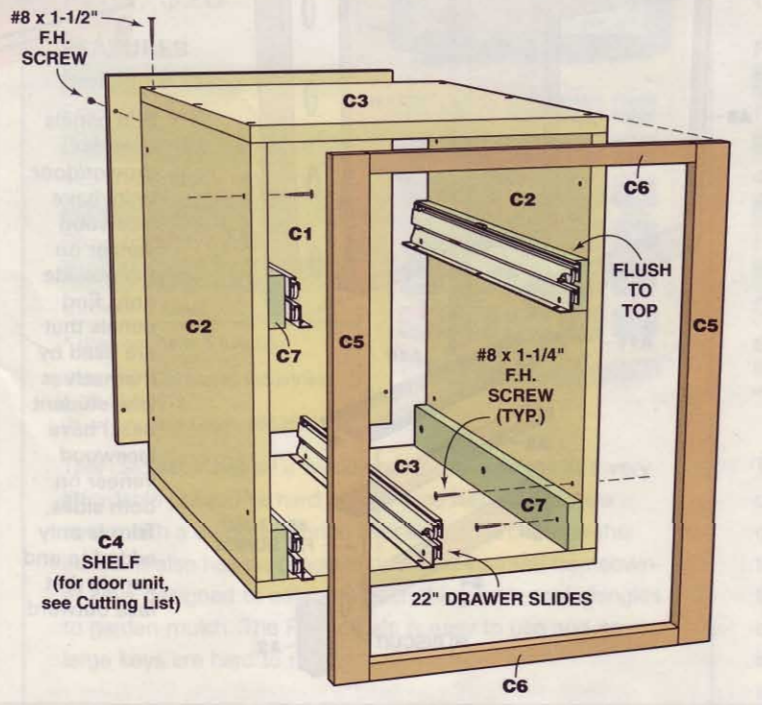
FIGURE B MID PANEL



Mid panels are used as supports under joined tops. They are narrower than end panels and allow a chair to move unobstructed around the desk opening.

FIGURE C DRAWER/DOOR UNIT

Drawer and door units are essentially the same, except that a door unit has a shelf (C4) and a door (D6) instead of spacers (C7) and drawers. If you plan to place your desk against a wall, then make the back (C1) from shop-grade birch plywood instead of lacewood-veneered MDF.



5. Glue and biscuit the feet to the rail and screw on the base cap to create the base assembly.

6. Glue the laminate edging (A11) to the spacer (A10) using contact cement (see "Working with Plastic Laminate," AW #102, Sept. 2003, page 43). Apply two coats of Danish oil finish to the panel and base assembly.

7. Use a nail gun to tack the laminate-edged spacer to the base cap. Then drill holes through the spacer using the predrilled holes in the base cap as guides. Screw the base assembly to the panel. Add the panel trim (A8, A9) to any end panels that face out on the assembled desk.

BUILD MID PANELS

Mid panels are built just like end panels. Attach the brace (B3) after the top edging (B4). Drill a 2-3/8-in.-dia. hole at the upper back end of the panel for passing wires (Fig. B, page 55).

BUILD A DRAWER UNIT

8. To make a drawer unit, glue and screw the sides (C2), top and bottom (C3) together. Screw the back (C1) to the box to square it up (Fig. C, above left).

9. Glue on the stiles flush with the outside edges (C5); then cut the rails (C6) to fit and glue them in place.

10. Screw the drawer-slide spacers (C7) in the box (Fig. M, page 61). Mount the drawer slides flush with the top of the spacers.

11. Drill holes through the box sides for attaching the box to the end panels.

BUILD A DOOR UNIT

A door unit is made the same as a drawer unit without the slide spacers (C7). Drill holes in the sides for the adjustable shelf pins before you assemble the box. Make a shelf (C4) and apply iron-on mahogany edge banding to the front edge (see "Iron-on Edge Banding," AW #113, March 2005, page 26). **Note:** The hinge-mounting plates are attached to the stile, centered 3 in. up from the bottom of the unit and 3-3/8 in. down from the top.

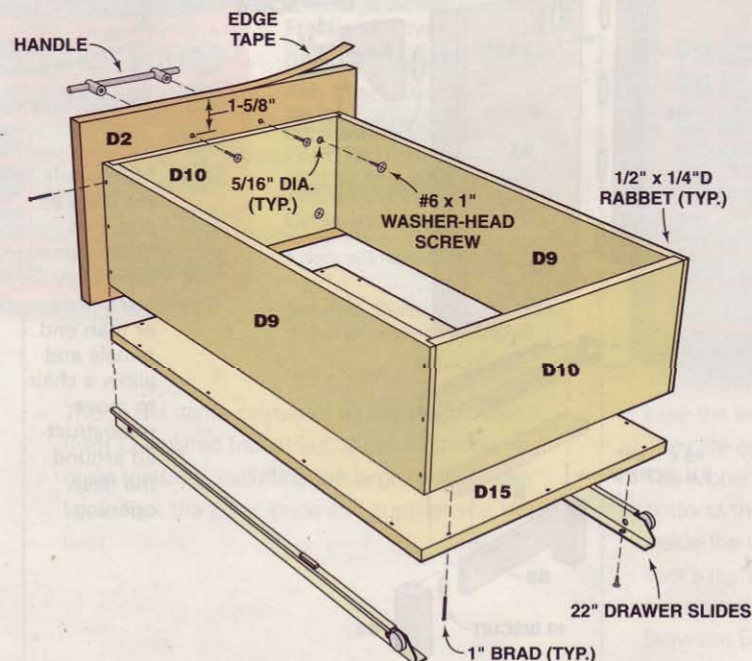
BUILD DRAWERS AND DOORS

12. Cut the drawer parts (D1 through D15) and rabbet the ends of the drawer sides (D7, D9, D11, D13) (Fig. D, left). Glue and nail the drawer box together.

13. Use mahogany edge banding to cover the edges of the drawer faces.

FIGURE D DRAWER BOX

The file drawer face (D1) and CD drawer face (D2) are tall enough so the handle-mounting screws clear the drawer box. Drill access holes through the other drawer box fronts to mount the handles.



14. Drill holes for the drawer handles in the drawer faces (D1 through D5). Drill oversized holes through the drawer fronts (D8, D10, D12, D14) to fine-tune the drawer faces' position and attach them.

15. To make a door (D6), cover the edges of the door with mahogany edge banding. Drill holes for the door handles and the hinge cup holes (Fig. E, center right).

MAKE THE DESK TOPS

Building the straight desk tops is fairly easy (Fig. F, lower right), but the corner unit offers some challenges, so, that's the focus here.

16. Cut the shape of the corner unit top (E10, Fig. G, below). Drill the wire grommet hole, or holes, using a 2-3/8-in.-dia. hole saw. You want to drill these holes now, because the laminate would ruin a hole saw.

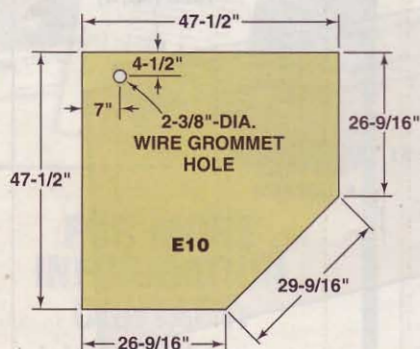
17. Adhere the decorative laminate and cabinet liner (E15, E20) with contact cement. Trim away the overhanging laminate edges using a flush-trim bit.

18. Locate the center of the wire grommet hole under the laminate by tapping the surface until you hear a hollow sound. Drill a hole through the laminate that is large enough to fit your flush-trim bit, and trim the laminate.

19. Cut and fit the corner unit side edging pieces (E3, Fig. H, page 58). One end of each edging piece is 45 degrees and the other is 90 degrees. Make sure their lengths are perfect.

FIGURE G CORNER UNIT TOP LAYOUT

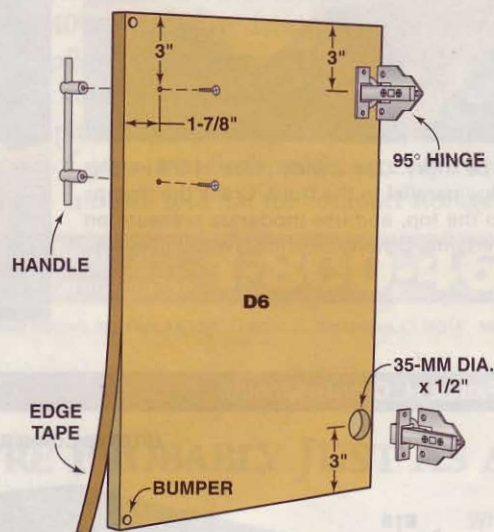
The two 26-9/16-in. edges must be cut accurately for the corner unit to match up perfectly with the square ends of the standard desk top. The wire grommet hole is positioned over the wire channel under the top.



UNDERMOUNT SLIDES

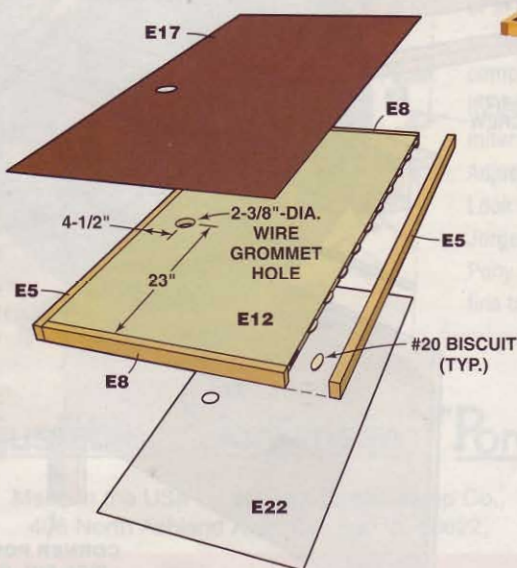
Undermount drawer slides make drawer construction a cakewalk, because they wrap around the bottom edge of the drawer box. This allows you to apply the drawer bottom rather than build it into grooves in the drawer parts. The drawer slides cover the 1/2-in. plywood edge for a good-looking drawer that's as strong as it is easy to build.

FIGURE E DOOR



Concealed hinges with face-frame hinge-mounting plates are simple to adjust. Cam-action screws allow you to move the door in or out, up or down, and side to side without locking and unlocking screws.

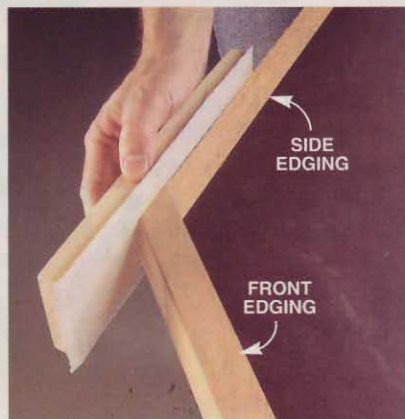
FIGURE F LAMINATE TOP



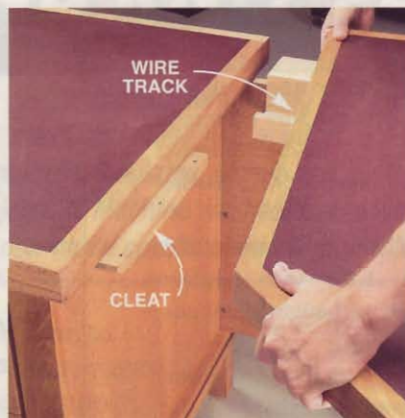
Tops are 3/4-in. MDF sandwiched between a decorative laminate on top and a cabinet-liner backer laminate on the underside. Don't skip applying the backer. Without it, the top will not be as strong and will have a greater tendency to sag over time.



3 Angled glue-ups can be tricky. Use a wide piece of 3/4-in. plywood to create an edge parallel to the front. Crank the clamps that hold the plywood to the top, and use moderate pressure on the clamps that hold the edging. Otherwise, the plywood may slip.



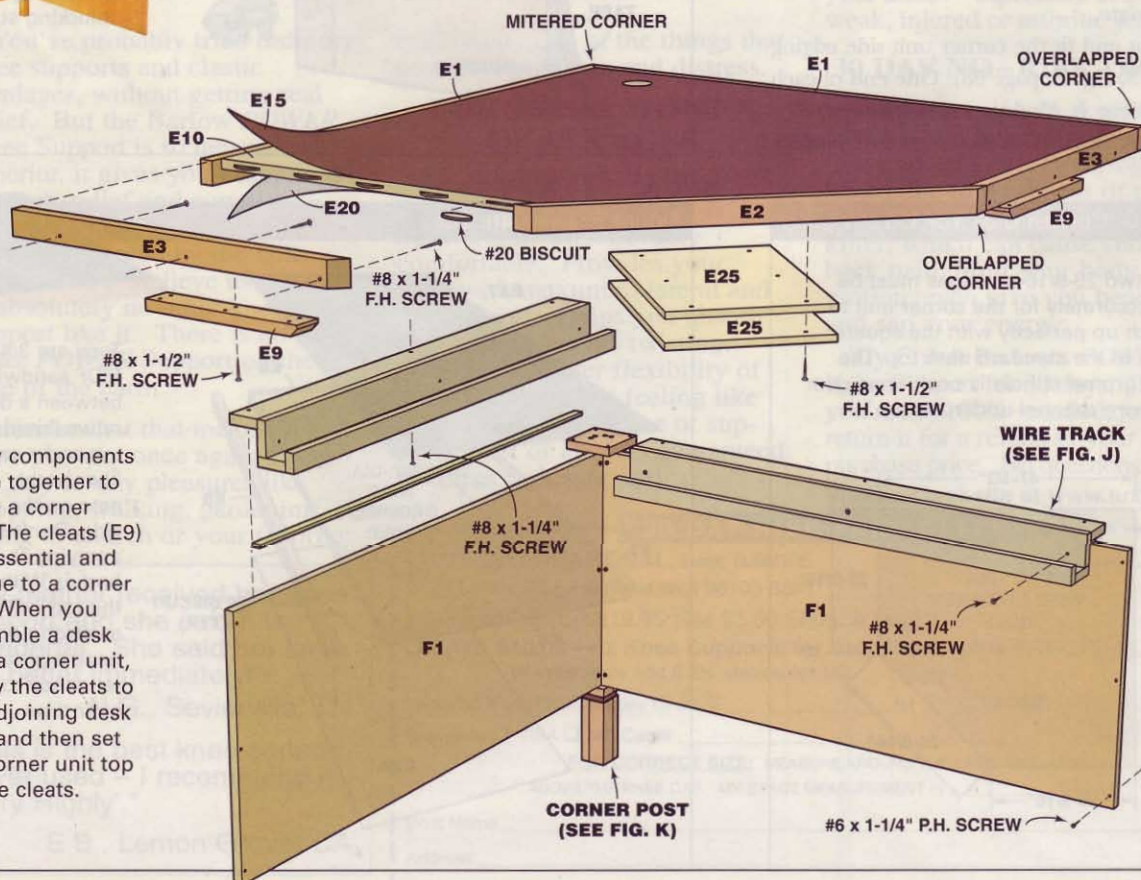
4 Sand the front edging flush with the side edging using a long sanding block. PSA sandpaper and an 8- to 10-in. block of MDF work great. The long block is guided by the side edging to ensure a perfectly flush joint.



5 Assembling the corner unit is a two-person job, because the unit is large and heavy. The wire track and cleats support the corner unit top. **Note:** The wire track is screwed to the modesty panel first.



FIGURE H CORNER MODULE



Many components come together to make a corner unit. The cleats (E9) are essential and unique to a corner unit. When you assemble a desk with a corner unit, screw the cleats to the adjoining desk tops and then set the corner unit top on the cleats.

You don't want to have to trim them anymore after they're glued on.

20. Cut biscuit slots to join the top and edging pieces (see "Wood Edging on Laminated Tops," page 62). Glue and clamp the side edging pieces (E3) to the top.

21. Attach the corner unit's front edging piece (E2, Photo 3) and the back two edging pieces (E1). **Note:** The rear corner edging joint is mitered.

22. When the glue is dry, sand the edging joints flush (Photo 4).

BUILD MODESTY PANELS, WIRE TRACKS

23. Cut the modesty panels to size (F1, F2) and drill three holes (no countersink) on each side (Fig. H, left) for the pan-head screws that attach the panel to a component.

24. To make wire tracks, drill countersunk holes in the channel pieces (G1, G3) for the screws that attach the wire tracks to the modesty panels and the tops. Assemble the wire tracks as shown in Fig. J, above right.

25. Don't glue the fill strips (G5, G6) onto the wire tracks yet. You may need to tweak their thicknesses slightly during the desk assembly so the tops of the wire tracks are flush with the tops of the end panels and corner post.

26. If you want a wire grommet hole closer to the front of the corner unit desk top, then make a short section of wire track to carry wires from that hole to the wire tracks in back.

BUILD A CORNER POST

27. Miter one edge of each leg blank (H3, Fig. K, right). Glue the mitered edges together. Wrap masking tape tightly around the pieces to hold them together as the glue dries.

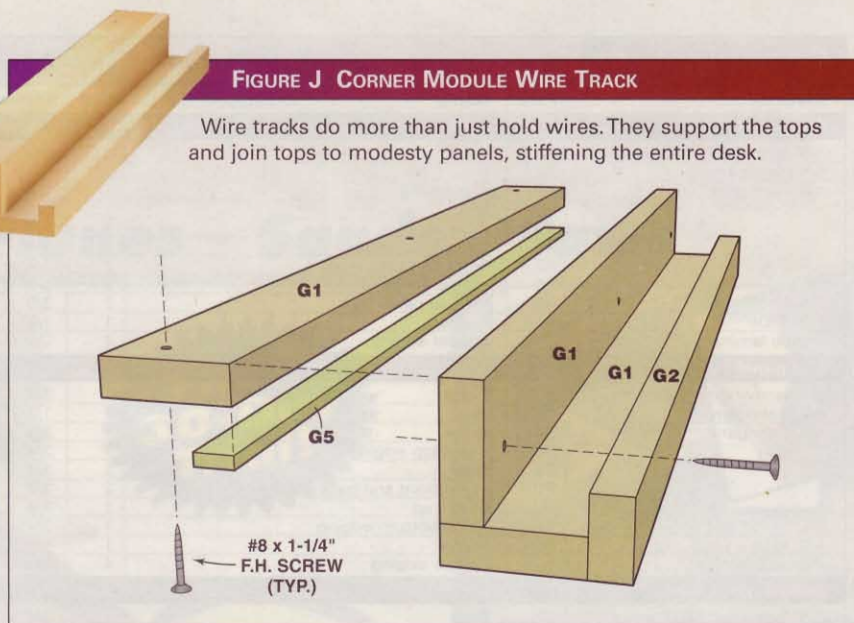
28. Glue and clamp the foot and corner block (H1, H4) in place.

29. Use a tablesaw with a dado blade to cut 1/8-in.-deep grooves in the legs and foot for the laminate (H5).

30. Attach the cap (H2), glue the dado laminate pieces in the grooves and finish the corner post with Danish oil.

FIGURE J CORNER MODULE WIRE TRACK

Wire tracks do more than just hold wires. They support the tops and join tops to modesty panels, stiffening the entire desk.



ASSEMBLE A STANDARD CORNER DESK

31. Apply Danish oil to any unfinished parts. Screw the drawer units to the end panels. They rest on the end-panel lower lips and are set tight to the rear lips. A slight gap between the front-panel edging and the front of the drawer box is OK.

32. Attach handles to the drawer faces, and then the drawer faces to the drawers. The oversize holes allow you to fine-tune the drawer front position for even margins.

33. Attach the drawer module tops. Align the tops so they're tight to the front of the panel top edging pieces.

34. Screw the left modesty panel to the corner post and the end panel of the left drawer unit. Attach the right modesty panel the same way.

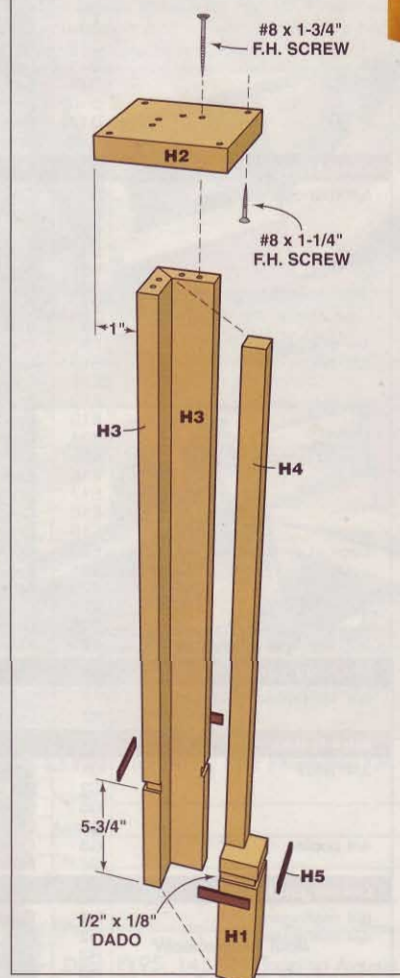
35. Screw the cleats (E9) to the undersides of the drawer unit tops (Fig. H) and screw the wire tracks to the modesty panels. Attach the corner module top (Photo 5).

36. Screw the corner module top edges to the drawer unit top edges (Fig. H). Then screw the cleats to the underside of the corner unit top edging and the wire tracks to the top.

37. Add the file drawer hanging file rails, the CD drawer storage tracks, computer and peripherals. Now you're ready to get some real work done—right.

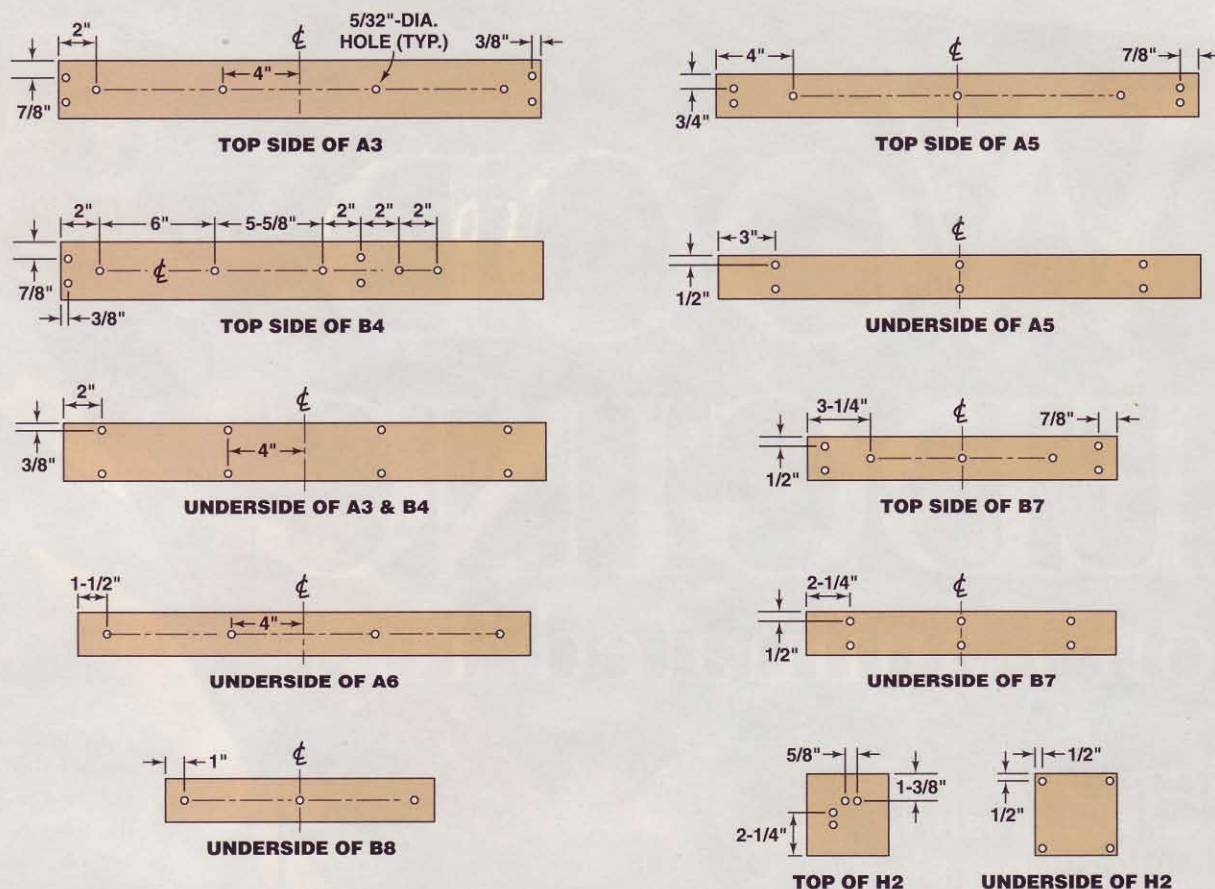
FIGURE K CORNER POST

The corner post has two 3/4-in.-deep lip recesses at 90 degrees to each other. The recesses provide attachment points for the modesty panels. Laminate strips set in the foot mimic the spacers on the panels.



CUTTING LIST		DIMENSIONS: Giant Corner Desk: 28"W x 106-1/2"L x 30"H + 28"W x 72-1/4"L x 30"H			OTHER CONFIGURATION DIMENSIONS:
Material	Part	Name	Qty.	Dimensions	
End panel					Standard Corner Desk:
3/4" lacewood MDF panel	A1	Panel	1	3/4" x 23-1/2" x 21-1/2"	28"W x 72-1/4"L x 30"H
8/4 mahogany	A2	Feet	2	1-1/2" x 2" x 5"	each wing
4/4 mahogany	A3	Top edging	1	3/4" x 3" x 25"	Executive Desk:
	A4	Rail	1	3/4" x 2-1/2" x 21-3/4"	28"W x 74-3/4"L x 30"H;
	A5	Base cap	1	3/4" x 2-1/4" x 25"	Student Desk:
	A6	Bottom edging	1	3/4" x 2-1/4" x 23-1/2"	28"W x 57"L x 30"H
	A7	Front and back edging	2	3/4" x 2-1/4" x 22-1/4"	
	A8	Horizontal panel trim	2	3/8" x 2-1/8" x 20-1/2"	Credenza:
	A9	Vertical panel trim	2	3/8" x 1-1/2" x 21-1/2"	28"W x 40-1/2"L x 30"H
1/2" MDF	A10	Spacer	1	1/2" x 2" x 24-3/4"	
Plastic laminate	A11	Spacer edging	4	Cut oversize, apply and trim.	
Mid panel					
3/4" lacewood MDF panel	B1	Panel	1	3/4" x 14-1/2" x 21-1/2"	
8/4 mahogany	B2	Feet	2	1-1/2" x 2" x 5"	
4/4 mahogany	B3	Brace	1	3/4" x 5" x 5"	
	B4	Panel top edging	1	3/4" x 3" x 25"	
	B5	Rail	1	3/4" x 2-1/2" x 12-3/4"	
	B6	Panel front and back edging	2	3/4" x 2-1/4" x 22-1/4"	
	B7	Base cap	1	3/4" x 2-1/4" x 16"	
	B8	Panel bottom edging	1	3/4" x 2-1/4" x 14-1/2"	
	1/2" MDF	B9	Spacer	1	1/2" x 2" x 15-3/4"
Plastic laminate	B10	Spacer edging	4	Cut oversize, apply and trim.	
Drawer/door unit					
3/4" lacewood MDF panel	C1	Back	1	3/4" x 17" x 21-3/8"	
3/4" birch plywood	C2	Sides	2	3/4" x 21-15/16" x 19-7/8"	
	C3	Top and bottom	2	3/4" x 21-15/16" x 17"	
	C4	Shelf (per door unit)	1	3/4" x 21-7/8" x 15-7/16"	
4/4 mahogany	C5	Stiles	2	3/4" x 1-1/2" x 21-3/8"	
	C6	Rails	2	3/4" x 3/4" x 14"	
4/4 poplar	C7	Spacers (per drawer)	2	3/4" x 2-3/8" x 21-3/4"	
Drawers and doors					
3/4" lacewood MDF panel	D1	File drawer face	1	3/4" x 14-15/16" x 12-5/16"	
	D2	CD drawer face (two-drawer configuration)	1	3/4" x 14-15/16" x 8-7/16"	
	D3	CD drawer face (four-drawer configuration)	1	3/4" x 14-15/16" x 7-15/16"	
	D4	Letter drawer face	1	3/4" x 14-15/16" x 5-5/16"	
	D5	Pencil drawer face	1	3/4" x 14-15/16" x 3-9/16"	
	D6	Door (per door unit)	1	3/4" x 14-15/16" x 20-15/16"	
1/2" Baltic birch plywood	D7	File drawer sides	2	1/2" x 8-7/8" x 22"	
	D8	File drawer front and back	2	1/2" x 8-7/8" x 12-1/2"	
	D9	CD drawer sides	2	1/2" x 5-3/4" x 22"	
	D10	CD drawer front and back	2	1/2" x 5-3/4" x 12-1/2"	
	D11	Letter drawer sides	2	1/2" x 4-3/8" x 22"	
	D12	Letter drawer front and back	2	1/2" x 4-3/8" x 12-1/2"	
	D13	Pencil drawer sides	2	1/2" x 2-1/4" x 12-1/2"	
	D14	Pencil drawer front and back	2	1/2" x 2-1/4" x 22"	
	D15	Bottom (per drawer)	1	1/2" x 13" x 22"	
Desk tops					
5/4 mahogany	E1	Corner module back edging	2	1" x 1-3/4" x 49-1/2"	
	E2	Corner module front edging	1	1" x 1-3/4" x 32-3/8"	
	E3	Corner module side edging	2	1" x 1-3/4" x 26-9/16"	
	E4	Executive desk front edging	2	1" x 1-3/4" x 74-3/4"	
	E5	Student desk front edging	2	1" x 1-3/4" x 57"	
	E6	Credenza front edging	2	1" x 1-3/4" x 40-1/2"	
	E7	Drawer/door module front edging	2	1" x 1-3/4" x 22-3/4"	
	E8	End edging (per top)	2	1" x 1-3/4" x 26"	
4/4 mahogany	E9	Cleats	2	3/4" x 2" x 12"	
3/4" MDF	E10	Corner module top	1	3/4" x 47-1/2" x 47-1/2"	
	E11	Executive desk top	1	3/4" x 26" x 72-3/4"	
	E12	Student desk top	1	3/4" x 26" x 55"	
	E13	Credenza top	1	3/4" x 26" x 38-1/2"	
Plastic laminate	E14	Drawer module top	1	3/4" x 26" x 20-3/4"	
	E15	Corner module top	1	48-1/2" x 48-1/2"	
	E16	Executive desk top	1	27" x 73-3/4"	
	E17	Student desk top	1	27" x 56"	
Cabinet liner plastic laminate	E18	Credenza top	1	27" x 39-1/2"	
	E19	Drawer module top	1	27" x 21-3/4"	
	E20	Corner module top underside	1	48-1/2" x 48-1/2"	
	E21	Executive desk top underside	1	27" x 73-3/4"	
1/2" Baltic birch plywood	E22	Student desk top underside	1	27" x 56"	
	E23	Credenza top underside	1	27" x 39-1/2"	
	E24	Drawer module top underside	1	27" x 21-3/4"	
	E25	Keyboard mounting plate (optional)	2	1/2" x 12" x 18"	
Modesty panels					
3/4" lacewood MDF panel	F1	Corner module	2	3/4" x 48-1/8" x 21-1/4"	
	F2	Desk (per opening)	1	3/4" x 33-1/2" x 21-1/4"	
Wire tracks					
3/4" MDF	G1	Channel (corner module)	6	3/4" x 2-1/2" x 41-1/2"	
	G2	Lip (corner module)	2	3/4" x 1-1/2" x 41-1/2"	
	G3	Channel (per desk opening)	3	3/4" x 2-1/2" x 31"	
	G4	Lip (per desk opening)	1	3/4" x 1-1/2" x 31"	
4/4 poplar	G5	Fill strip (corner module)	2	1/4" x 3/4" x 41-1/2"	
	G6	Fill strip (per desk opening)	1	1/4" x 3/4" x 31"	
Corner post					
8/4 mahogany	H1	Foot	1	1-1/2" x 1-1/2" x 7"	
4/4 mahogany	H2	Cap	1	3/4" x 4-1/4" x 4-1/4"	
	H3	Leg blank	2	3/4" x 2-1/4" x 28-1/2"	
	H4	Corner block	1	3/4" x 3/4" x 21-1/2"	
	Plastic laminate	H5	Laminate	4	Cut to fit.

FIGURE L SCREW-HOLE LAYOUTS

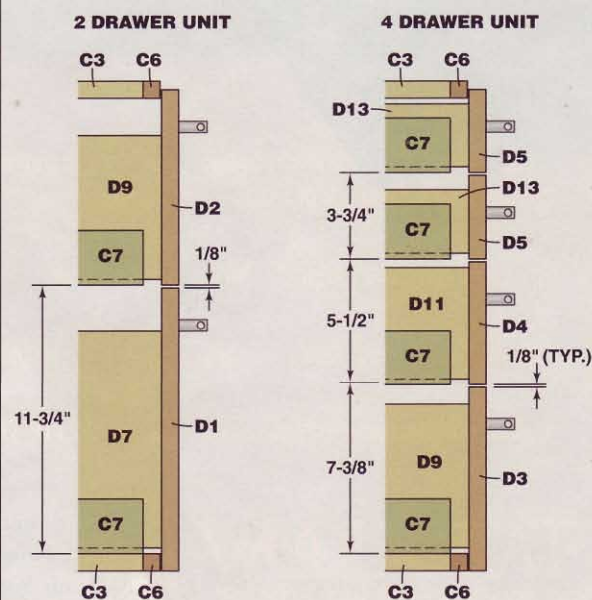


Note: Predrill and countersink all the holes on the drill press.

Sources Wood River Veneer, (800) 875-7084, www.woodriverveneer.com Lacewood-veneered MDF panels, custom-made, check current price.

• Woodworker's Hardware, (800) 383-0130, www.wwhardware.com Blum cream-colored 22-in. full-extension drawer slides, #B430E 22CM, \$23 ea. Blum 95-degree self-closing clip hinges, #B071T9580, \$4 ea. Blum 3-mm cam-adjust face-frame hinge-mounting plates, #B175H6030, \$1 ea. Clear polyurethane bumpers, 1/16-in. x 5/16-in. dia., #3MSJ5302, \$6 for a card of 144. Brass spoon shelf supports, 1/4-in. dia., #HB21C25, \$2 for a bag of 20. Fastbond green 30-NF water-based contact adhesive, 3M21185, \$17 a quart. Fine-thread square-drive pan-head screws, No. 6 x 1-1/4 in., #KTSPS F125, \$3 for 100. Deep-thread square-drive flat-head screws, No. 8 x 1-1/4 in., #SCS8X114F, \$4 for 100. Deep-thread square-drive flat-head screws, No. 8 x 1-1/2 in., #SCS8X112F, \$5 for 100. Deep-thread square-drive flat-head screws, No. 8 x 1-3/4 in., #SCS8X134F, \$5 for 100. CD storage track, 11-5/16 in. x 2-9/16 in., T4238 LA, \$2 ea. Black cable grommet, 2-3/8 in. dia., #CPF 2600, \$3 ea. Hole saw, 2-3/8 in. dia., P47227, \$11. Hole saw arbor for a 3/8-in. chuck, P45319, \$8. PVC hanging file rail for 1/2 in. drawers, #CPF 32500 2-ft., \$1 ea. Keyboard arm and mouse tray package (optional), 10-1/2 in. x 21-in., #VWK5930, \$91. • Lee Valley and Veritas, (800) 871-8158, www.leevalley.com 96-mm stainless-steel bar handles, 01W76.10, \$5 ea. • Woodworker's Source, (800) 423-2450, www.woodworkerssource.net Iron-on mahogany edge tape, 7/8-in. x 25-ft., 20012030, \$8 a roll. • Nevamar, (800) 638-4380, www.nevamar.com Plastic laminate, 4-ft. x 8-ft. sheet, #AL2004, \$80 ea. Cabinet liner/backer for top undersides, 4-ft. x 8-ft. sheet, \$40 ea. • McFeely's, (800) 443-7937, www.McFeelys.com Magzilla magnetic bit holder, #MH-9900, \$8. Square-drive bit, No. 2 x 6 in., #HX-0265, \$1. • Local lumberyard Shop-grade birch plywood, 3/4 in. x 4 ft. x 8 ft., \$35 a sheet. Baltic birch plywood, 1/2 in. x 5 ft. x 5 ft., \$23 a sheet. MDF, 3/4 in. x 49 in. x 97 in., \$30 a sheet. MDF, 1/2 in. x 49 in. x 97 in., \$25 a sheet. Mahogany, 4/4, \$5 a bd. ft. Mahogany, 5/4, \$6 a bd. ft. Mahogany, 8/4, \$7 a bd. ft. Poplar, 4/4, \$3 a bd. ft. • Local paint store, Natural-colored Danish oil finish, \$10 a quart.

FIGURE M DRAWER-SLIDE SPACER HEIGHTS



WOOD EDGING

on Laminated Tops

by Bruce Kieffer

5 steps to align
and finish wood
edging on a plastic-
laminated surface

Most woodworkers cringe at the thought of applying wood edging to a plastic-laminated top. Unlike wood veneer surfaces, you can't sand this edging flush without scratching the laminate. Over the years, I've discovered a few tricks of the trade that will help you avoid messy glue-ups and misaligned edging.

Even after you've successfully applied the trim, you still face a woodworking conundrum: applying finish to the wood edge but not the laminate. I found a special automotive masking tape that works better than I could imagine. Applying any type of finish is now fast and clean. Just follow these easy steps for a clean-looking, hassle-free top.

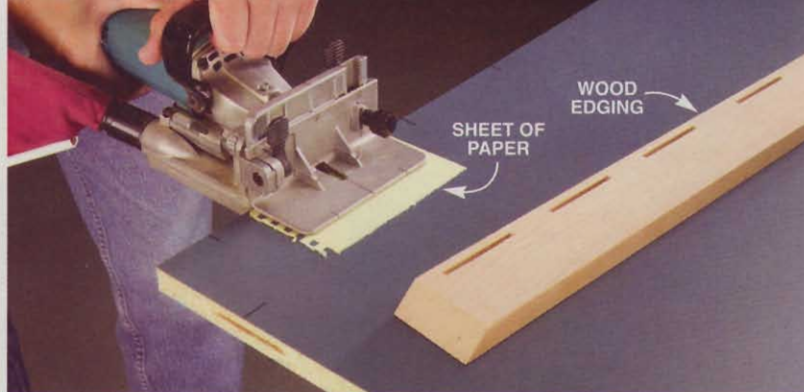
CUTTING THE MITERS

The first hurdle is to cut your edging pieces' mitered corners to fit exactly—you can't get away with being a hair short or long. Start with the two long trim pieces. Use a short piece of edging with a mitered end to test-fit the long pieces. Leave the end pieces about 1/16 in. long; they'll be trimmed to fit later. Finish-sand the top edges of the edging pieces before you glue them on. You don't want to sand the top of the trim after it's applied and risk scratching the laminate. After the long runs are glued in place, you can cut and fit the end pieces for airtight miters.

Source Hillas Packaging Inc., (800) 952-7424, www.hillas.com 3M Scotch Fine Line Tape #218 Green, 3/4-in. x 60-yd. roll, #3M 218 3/4 X 60, \$7 a roll.

EDITOR: DAVE MUNKITTRICK • ART DIRECTION: VERN JOHNSON • PHOTOGRAPHY: MIKE KRIVIT

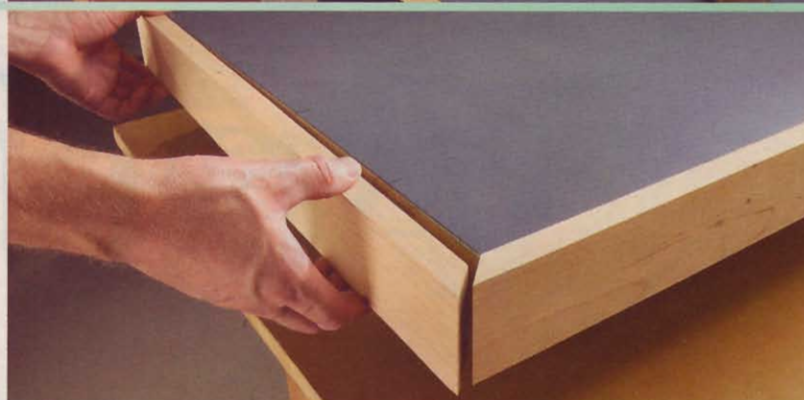
1 Use biscuits to avoid alignment nightmares. You'll never have a wood edge dip below the laminate surface if you cut the slots so the wood edge sets just a smidgen above the laminated top. To do this, cut the slots in the wood edging first. Then use the same setting with a sheet of paper under the fence to cut the slots in the laminated top. Use No. 20 biscuits and set the slots 4 in. to 6 in. apart.



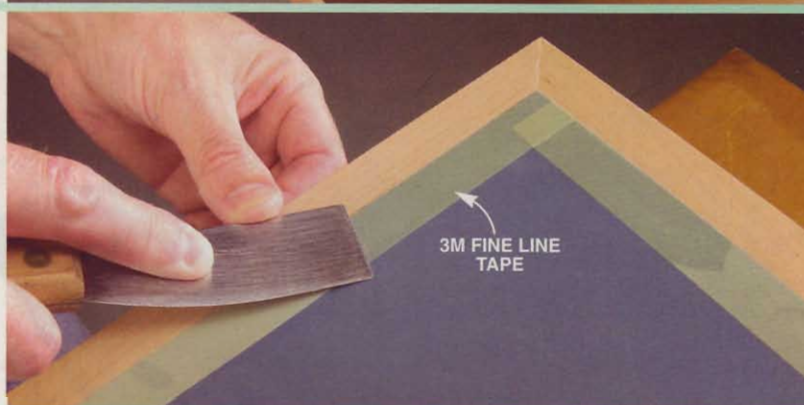
2 Glue on one piece of edging at a time. Glue-up disasters often result from attempts to glue everything at once. Start with the long edging pieces. After they're set, trim the mitered end pieces for an exact fit (see Photo 3). To eliminate squeeze-out on the laminate surface, apply glue only to the inside of the biscuit slots and a bead along the edge below the biscuits.



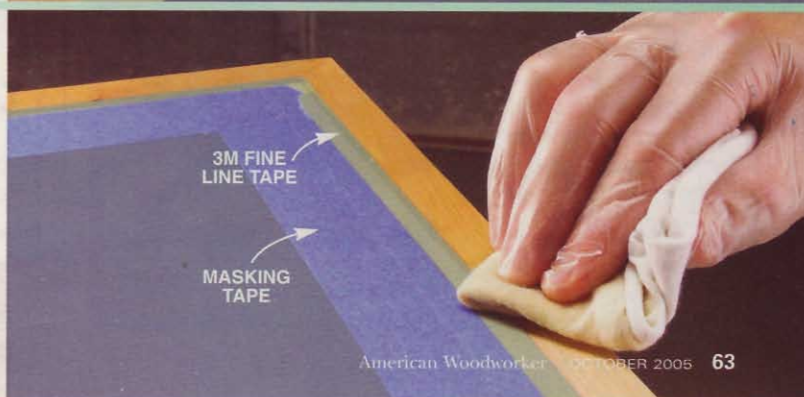
3 The end pieces are cut slightly oversize and then trimmed to create a tight joint. To trim off a whisker, try this: With the miter saw off, drop the blade down and push the mitered end of the edging up against the teeth with enough pressure to ever so slightly deflect the blade. With a tight hold on the edging, raise the blade back up. Turn the saw on and slowly make the cut. This will take the lightest shaving off the end and allow you to work your way to the perfect fit.

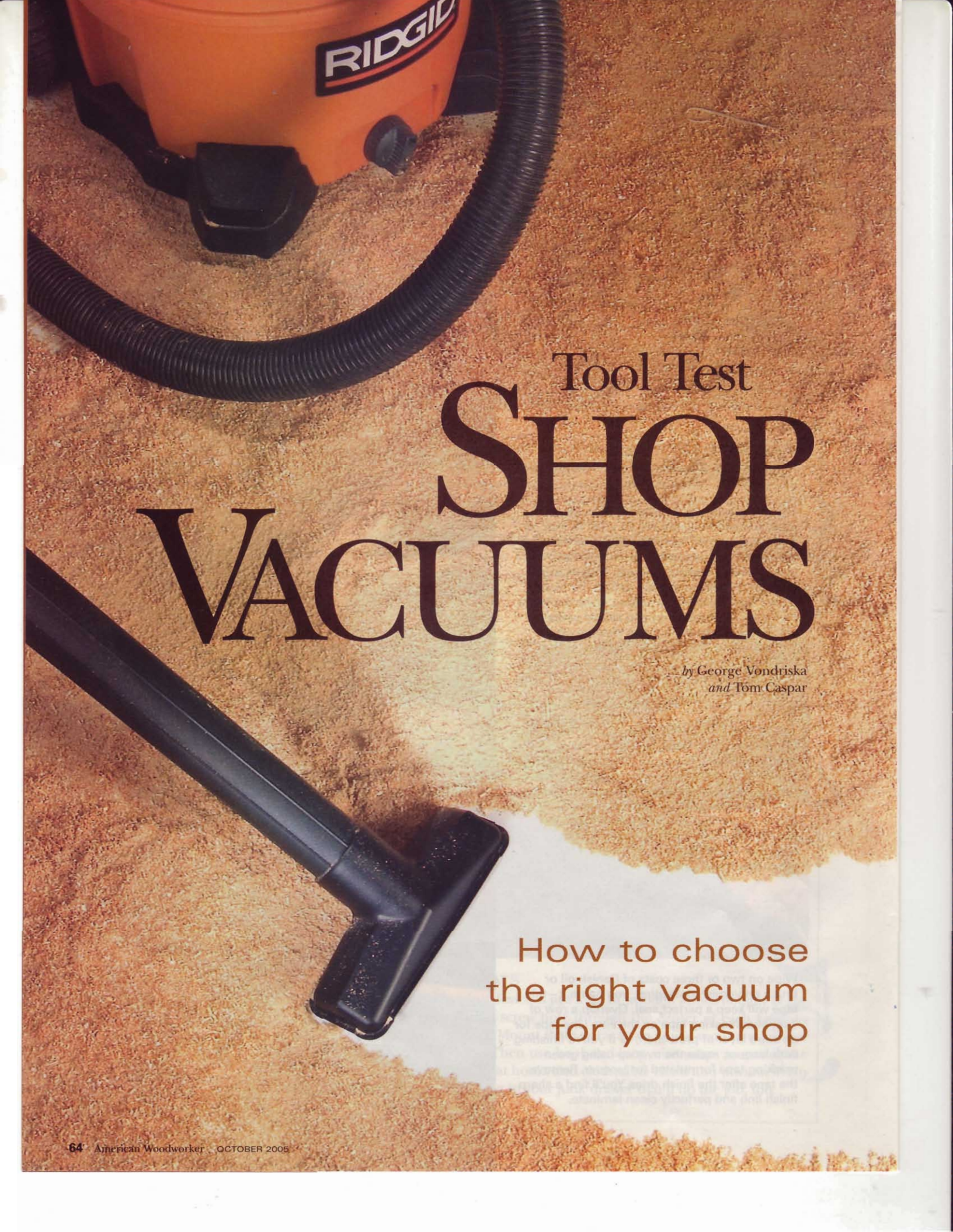


4 Get a clean crisp finish line using 3M's Scotch Fine Line Tape (see Source, page 62). This is truly a "magic" masking tape! Originally designed for auto bodywork, it makes an airtight seal that no finish can sneak under. Apply the tape to the laminate with your fingers first. Then, to make a tight seal, use a putty knife to slowly, gently press down the tape.



5 Wipe on two or three coats of Danish oil or brush on varnish or lacquer, you name it—this tape will keep a perfect seal. Overlap a row of 2-in. blue masking tape on the Fine Line tape for an extra layer of protection, or if you're finishing with lacquer, make the overlap using green masking tape formulated for lacquer. Remove the tape after the finish dries. You'll find a sharp finish line and perfectly clean laminate.





Tool Test

SHOP VACUUMS

by George Vondriska
and Tom Caspar

How to choose
the right vacuum
for your shop

If you haven't test-driven a shop vacuum in a while, get ready to be impressed. These aren't Grandpa's machines. Their filtration is better, their motors are quieter and their power is outstanding.

Choosing the right vacuum for your shop is not easy, though. There are so many models! We'll cover some broad categories of vacuums so you'll get an idea of what your budget will buy. We'll also take a closer look at a few selected vacuums that you may find useful in your shop.

NOT JUST FOR CLEANUP

These days, workshop vacuums have two main uses: general cleanup and dust collection from small tools. The latest sanders, routers, plate joiners and router tables have dust ports for hooking up to a vacuum. Teamed with a dust collector for your tablesaw, planer and jointer, a good vacuum should capture most of the small, unhealthy dust particles these tools make before the dust becomes airborne.

Both uses impose different requirements on a vacuum. For cleanup (or for a router table), you need lots of air flow for gobbling up a large pile of wood chips and lots of suction for picking up heavy chunks of wood and other debris, like nails and screws. A large, 2-1/4-in. hose is ideal. For dust collection from a portable power tool, you don't need as much air flow or suction, but you do need a smaller diameter, flexible hose and a switch that automatically turns on the vacuum when you turn on the tool. Most vacuums are better at one job than another, so when you look over the field, ask yourself whether you want a vacuum just for cleanup, just for tools or for both.

Which vacuum is the most powerful? This is a complicated question. Vacuuming power is a combination of two forces: suction and air flow. We conducted a real-world test on the vacuums profiled here by measuring their ability to pick up roofing nails and sawdust. The more nails a vacuum could pick up in a given amount of time, the better its suction power. The more sawdust it could pick up, the higher its air flow.

Hook up a shop vacuum to a portable power tool and you may never have to breathe dust again. Some vacuums have hoses and switches specifically designed for this setup, but even an ordinary vacuum can be outfitted with the right equipment to collect virtually all the dust from a sander, plate joiner or router.

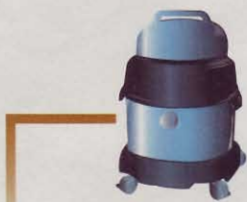


TYPES OF SHOP VACUUMS

General-Purpose Vacuums

These vacuums are fantastic for cleaning up the shop, but their large, stiff hoses are much too unwieldy for connecting to portable power tools. General-purpose vacuums typically come with a kit that includes a floor wand and other cleaning tools. Spend another \$70 for a tool-actuated switch and a small hose, though, and you've got a machine that could both clean the floor and hook up to a tool (see "Soup Up Your Shop Vacuum," page 74).

General-purpose vacuums come in a wide range of sizes. Increased horsepower and capacity usually go hand in hand. We've somewhat arbitrarily divided them into three groups:



Small Vacuums

1 to 2 peak hp, 6 to 8 amps,
2 gallons, \$30 to \$70

These machines are short and lightweight. You can easily tuck one under a bench or carry it outside to clean the car. They're inexpensive, so you can afford to dedicate one to a specific tool that creates small amounts of dust, like a miter saw. These are the least effective general-purpose machines for cleaning a very messy shop, however. They don't have the high air flow of their larger cousins, and the small tub fills quickly. Unfortunately, most of them are louder than other vacuums in our test and easier to tip over.



Midsize Vacuums

3 to 5 peak hp, 8 to 10 amps,
7 to 9 gallons, \$75 to \$100

Midsize vacuums are just fine for collecting the small volume of dust a portable power tool makes. They've got plenty of power for this job. For general cleanup, they'll hold much more sawdust and debris than a small vacuum, so you don't have to empty as often. However, as with a small vacuum, the midsize machine's filter hangs inside a relatively small tub and can quickly become surrounded by debris. The filter usually clogs up faster than one would in a large machine.



Large Vacuums

6 to 6.5 peak hp, 10 to 12 amps,
10 to 18 gallons, \$120 to \$180

If you've got the space to store it, and you're only going to own one, look for a vacuum in this class. These vacuums have lots of power and capacity for tackling even the largest piles of wood shavings and cut-offs. No other vacuum is as versatile. Equipped with an additional small hose and a tool-actuated switch, these vacuums can easily handle portable power tools, a disc sander and most operations on a router table.



9 to 12 amps,
9 to 15 gallons,
\$300 to \$400

Tool-Actuated Vacuums

These vacuums are generally more expensive than general-purpose machines, but they're a real pleasure to use. They have plenty of air flow for picking up dust from a portable power tool. When attached to your sander or router, the vacuum automatically starts up when you turn on the tool and shuts down a few seconds after you switch off the tool. Sweet! There's one limitation, though. The combined amperage of the vacuum and tool must be within the wall outlet's amperage limit.

Tool-actuated vacuums have more great features, too. They're much quieter than general-purpose vacuums. They typically come with a long, super-flexible, small-diameter hose, perfect for connecting to portable power tools. Some come with a static-discharge hose, which prevents you from getting a nasty static shock. Some models have built-in mechanisms for shaking dust off the filter, so you don't have to remove the filter as often for cleaning. All models have a two-stage motor with an air bypass that helps extend a motor's life (see "Air Bypass," page 67). Most models accept paperbag prefilters.

If your woodworking habits leave you with big piles of debris in the shop, you'll find that tool-actuated vacuums aren't as effective at shop cleanup as the largest general-purpose vacuums are, unless you sweep first. The tool-actuated models have less suction power for picking up chunks of wood. In addition, their small hoses can plug with small pieces of wood (though some vacuums have optional large hoses). Tool-actuated vacuums usually don't come with floor-cleaning accessories, such as a sweep or brush. A typical accessory kit costs about \$60.

FEATURES

POWER

Amperage represents the amount of electrical current used by a vacuum's motor. It's a rough indication of a vacuum's ability to pick up dust and debris. Vacuums with 8-amp motors or greater are more than adequate for collecting dust from a sander; 11- to 12-amp vacuums perform much better at collecting dust from a router table or gulping big piles of sawdust from the floor.

CAPACITY

The bigger the tub, the less often you'll have the unpleasant chore of emptying it. A big tub also helps keep your filter clean. That's important, because a clogged filter leads to a loss in vacuuming power. Most filters hang inside the tub, right under the motor. If the tub is small, the filter can quickly become surrounded by and packed with dust and debris. If the tub is large, the filter stays out of the dust longer.

FILTRATION

The vacuum you choose should have, at minimum, a pleated HEPA-rated filter (photo, top). HEPA stands for high-efficiency particulate air. A HEPA filter should remove 99.97 percent of the particles 0.3 microns and larger, but few if any filters are independently certified to meet this standard. Nevertheless, it's the best filter for your vacuum and lungs, because the smallest dust particles are the most hazardous to your health.

We like a vacuum that can accept a paper bag prefilter (photo, center). The paper bag fits inside the tub. Once full, the entire bag is discarded. With a paper bag prefilter, you won't be banging your filter and releasing giant clouds of dust every time you empty the vacuum.

EASY-TO-EMPTY TUB

It's easy to dump debris out of a tub that has a smooth wall (photo, below). It's harder with a tub that has a lip at the top, because you must tilt the tub much higher.

SWIVELING CASTERS

Admit it. You know you're going to use the hose like a leash to tug the vacuum around your shop's obstacle course. We prefer four casters that can roll in any direction rather than two fixed wheels and two swiveling casters.

AIR BYPASS

The greatest enemy to a motor's life is excessive heat. The air that passes through a vacuum's fan also cools the motor. If the hose gets clogged, air doesn't move and the motor heats up. Some vacuums have a bypass air inlet that allows air to flow over the motor no matter what. If a vacuum has a two-stage motor (meaning, it has two in-line fans) it usually has this bypass, also.

Pleated paper filters are standard on most vacuums. Pleating adds surface area, which increases the filter's effectiveness. You've got to keep the filter clean, though, or the vacuum will lose power.



A paper bag prefilter inside your shop vacuum keeps your regular filter from filling up in a hurry. It also makes emptying the tub a lot easier. Bags are an option on many vacuums. Some have caps to cover the opening after you remove the bag.



Emptying a vacuum is a lot easier when its tub has a smooth rim. Some vacuums are more difficult to empty because their rims are stepped inward, like a pickle jar. To empty a stepped-rim vacuum, you must turn the tub completely over and shake it.



1-800-425-2567

LARGE GENERAL-PURPOSE VACUUMS



RAMON MORENO

Craftsman 17066

\$120, 6.5 hp, 12 amps, 16 gallons

This one has power, in spades. Of the three large vacuums we tested, this machine performed the best at picking up heavy debris. It accepts a dust pre-filter. This vacuum is one of the easiest models to empty, because there's no lip on the tub. It also has multidirectional casters, making it easy to pull anywhere around the shop. It's the loudest large vacuum we tested, at about 78 dBA. The head of this machine can be detached and used as a leaf blower.

Sears, (800) 349-4358, www.sears.com



MANUFACTURER

Ridgid 1850

\$150, 6.5 hp, 12 amps, 16 gallons

This machine did a great job gobbling dust and debris. It's the only vacuum with a filter performance sensor, which shows you when the filter is clogged without requiring you to open the tub. Paper bag prefilters are available. A lip on the tub makes completely emptying the tub difficult. It's a moderately loud machine, coming in at about 74 dBA.

Ridgid, (800) 474-3443, www.ridgid.com



MANUFACTURER

Shop Vac 9621900

\$160, 6.5 hp, 12 amps, 18 gallons

This vacuum has lots of power, particularly in picking up heavy debris. But it has less power than the Craftsman 17066 and Ridgid 1850 models. With the largest tub of the three, this vacuum can hold lots of trash. A lip on the tub makes completely emptying difficult, however. This vacuum accepts paper bag prefilters. It's moderately loud at about 74 dBA.

Shop Vac, (570) 326-3557, www.shopvac.com

General-Purpose or Tool-Actuated?

We like both types of machine, but for different reasons. Here's how they stack up:

- **Price.** Large general-purpose vacuums cost about half as much as tool-actuated vacuums. The equation stays the same when you add helpful accessories to both types: \$70 for a small hose and tool-switch for a general-purpose machine, \$60 for a floor-cleaning kit for a tool-actuated machine.
- **Versatility.** Large general-purpose vacuums do a bang-up job cleaning a messy floor that is full of wood chips and debris. But you must purchase an accessory kit for use with portable power tools. With a tool-actuated machine, you should sweep up big chips and cut-offs before vacuuming; however, the vacuum is always ready to go with a portable power tool.
- **Noise.** Tool-actuated vacuums are noticeably quieter than large general-purpose machines.
- **Filtration.** Large general-purpose vacuums have filters that can easily clog because they hang down in the tub. You must bang the filter to clean it. Some filters on tool-actuated vacuums sit above the tub and can be cleaned without opening the tub. And some models have a built-in filter shaker.

A Note on Noise Testing: To test these vacuums' noise levels, we measured sound-pressure levels in decibels on the A scale of a sound level meter. This scale measures only the frequencies generally heard by the human ear. Levels obtained using this scale denote decibels (dB) as dBA units, which is how you'll see them listed in most shop vacuum specs.

TOOL-ACTUATED VACUUMS



Bosch 3931

\$400, 11.1 amps, 13 gallons

This vacuum has slightly more suction and greater air flow than the Fein Turbo III or Porter-Cable 7814, but not nearly as much as the 6.5-hp general-purpose vacuums. Turning on its Pulse-Clean switch automatically shakes the dust out of the filter. The filter is mounted horizontally inside the head above the dust in the tub. The filter can be removed, cleaned and replaced without opening the tub. This vacuum comes with a static-discharge hose and has optional dust pre-filters. The tool-actuated plug maxes out at 7.2 amps, an amperage rating lower than that of most routers. This machine is relatively quiet at 69 dBA.

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



The Bosch 3931 is the only vacuum with a power filter shaker. A flick of this red switch knocks most of the dust from the filter.



Fein Turbo III

\$350, 10 amps, 14.5 gallons

Lots of woodworkers love their Fein vacuums because they're exceptionally quiet—about 58 dBA. Fein offers two tool-actuated models: the Turbo III (shown), and the Turbo II (9.5 amps, 9 gal., \$300). Both have 19-amp ratings on their tool-actuated switches, the highest in the field. Both have multi-directional casters for maximum mobility. The Turbo III comes standard with a large-diameter, nonstatic discharge hose. You'll need a small-diameter hose (\$52) for connecting to portable power tools. The Turbo II comes with the small-diameter hose only.

Fein, (800) 441-9878, www.feinus.com



Fein's basket-shaped 5-micron cloth filter is very easy to remove and clean. You may upgrade to a 3-micron pleated filter (\$28) or a HEPA filter (\$95).



Porter-Cable 7814

\$340, 9 amps, 15 gallons

This compact vacuum has a manual filter shaker. The filter is housed horizontally in the head and can be removed, cleaned and replaced without opening the tub. The maximum amperage rating for the tool-actuated switch is 6 amps, which is quite small. At about 70 dBA, this vacuum is a bit louder than the Bosch and Fein, but still very quiet. Porter-Cable also makes a smaller, 10-gallon version of this vacuum (#7812, 9 amps, \$270) with the same features. It's short enough to tuck under a low workbench.

Porter-Cable, (800) 321-9443, www.porter-cable.com



Porter-Cable's vacuum has a built-in filter cleaner. Pulling the external handle rakes a series of small fingers across the filter's bottom.

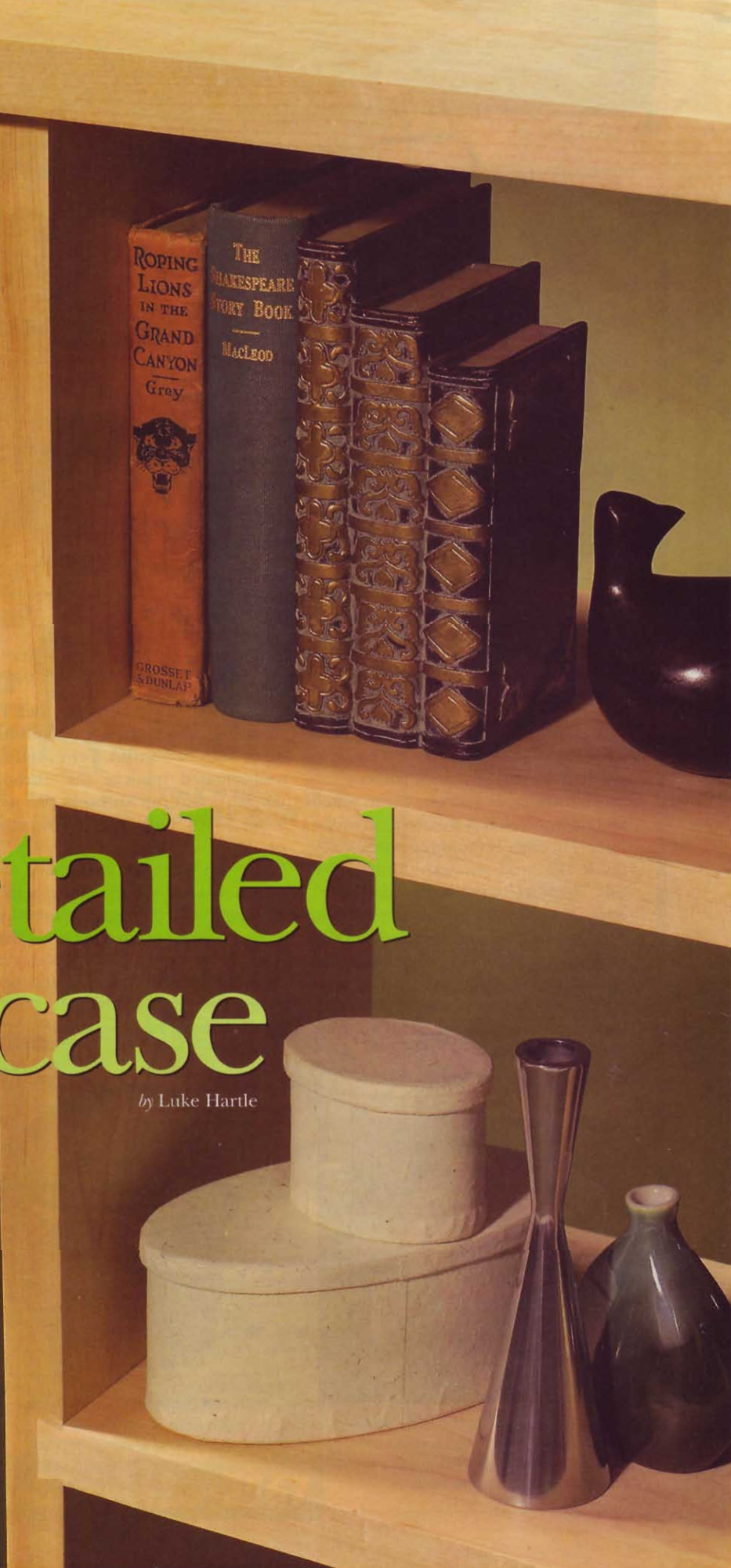
Simple, beautiful, strong. This bookcase is just six boards held together using one elegant joint: the tapered sliding dovetail. Dovetails join the shelves to the sides and the sides to the top. This joint has a well-deserved reputation for being fussy to cut and fit, but I've devised two jigs so easy to use that you can't go wrong.

I used 1-1/8-in.-thick wood for this bookcase because it makes the piece look strong and substantial. However, using my jigs, you can make the bookcase from 7/8-in. boards. I built my bookcase from hard maple. It doesn't have a dominant grain pattern, like red oak, so the exposed dovetails are easy to see. They look terrific!

Dovetailed Bookcase

No screws,
no nails—
tapered
sliding
dovetails
hold it all
together.

by Luke Hartle





PREPARE THE STOCK

Glue up and mill the shelves (A), sides (B) and top (C) to final width and length (Fig. A, Photo 1). All the pieces are equal to or less than 12 in. wide, so you can run them through a planer to even up the joints. To succeed with the dovetail joinery, it's essential that all these parts are dead flat. Use a crosscut sled to ensure the ends are square (see "A Simple Crosscut Sled," AW #87, June 2001, page 43).

ROUT THE TAILS

Use my shop-made dovetail jig to make perfectly tapered dovetails on the shelves and sides (Photo 2; Fig. B, page 72). You'll find complete information on how to build and use my jigs in "Tapered Sliding Dovetails," page 44. Note that a joint's wide end goes on the *front* of a shelf but on the *back* of the side (Fig. A, page 72). The shelves slide in from the front, so the exposed dovetails are the wide end. The top slides in from the front because the joint is stopped. Rout both ends of each shelf and the top end of each side.

ROUT THE SIDE SOCKETS

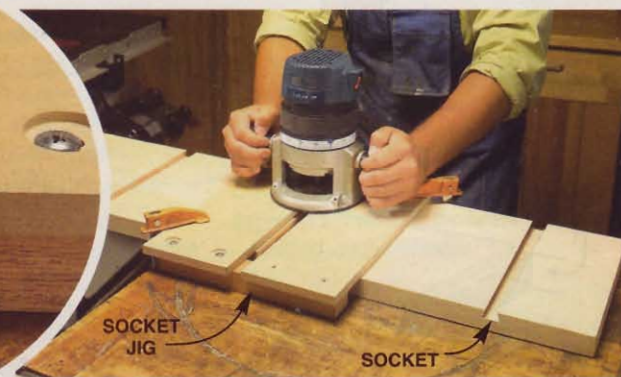
Lay the two sides together, like an open book, and mark the centerlines of the shelf sockets (Fig. A). Align the socket jig with these marks and rout all six sockets using my shop-made tail jig (Photo 3).



1 Cut the shelves, sides and top to length using a crosscut sled. The ends must be absolutely straight and square to make tight-fitting dovetail joints. Clamp a long stop arm to the sled to ensure similar pieces are cut to the same length.



2 Rout tapered dovetails on the ends of the shelves and sides. I've devised a shop-made jig that makes this complicated joint virtually foolproof (see "Tapered Sliding Dovetails," page 44).



3 Rout sockets in the sides. This jig has a tapered opening that exactly mirrors the dovetail's taper. Line up the jig's alignment mark with each shelf's centerline (see inset).

PROJECT REQUIREMENTS AT A GLANCE

Materials:

30 bd. ft. of 5/4 (1-1/4-in.)
hard maple

Tools:

Planer, tablesaw, jointer, router

Cost: \$160

CUTTING LIST

OVERALL DIMENSIONS: 42"H x 42"W x 12"D

Part	Name	Qty.	Dimensions (Th x W x L)
A	Shelf	3	1-1/8" x 11" x 34-3/4"
B	Side	2	1-1/8" x 11" x 41-3/8"
C	Top	1	1-1/8" x 12" x 42"

FIGURE A EXPLODED VIEW

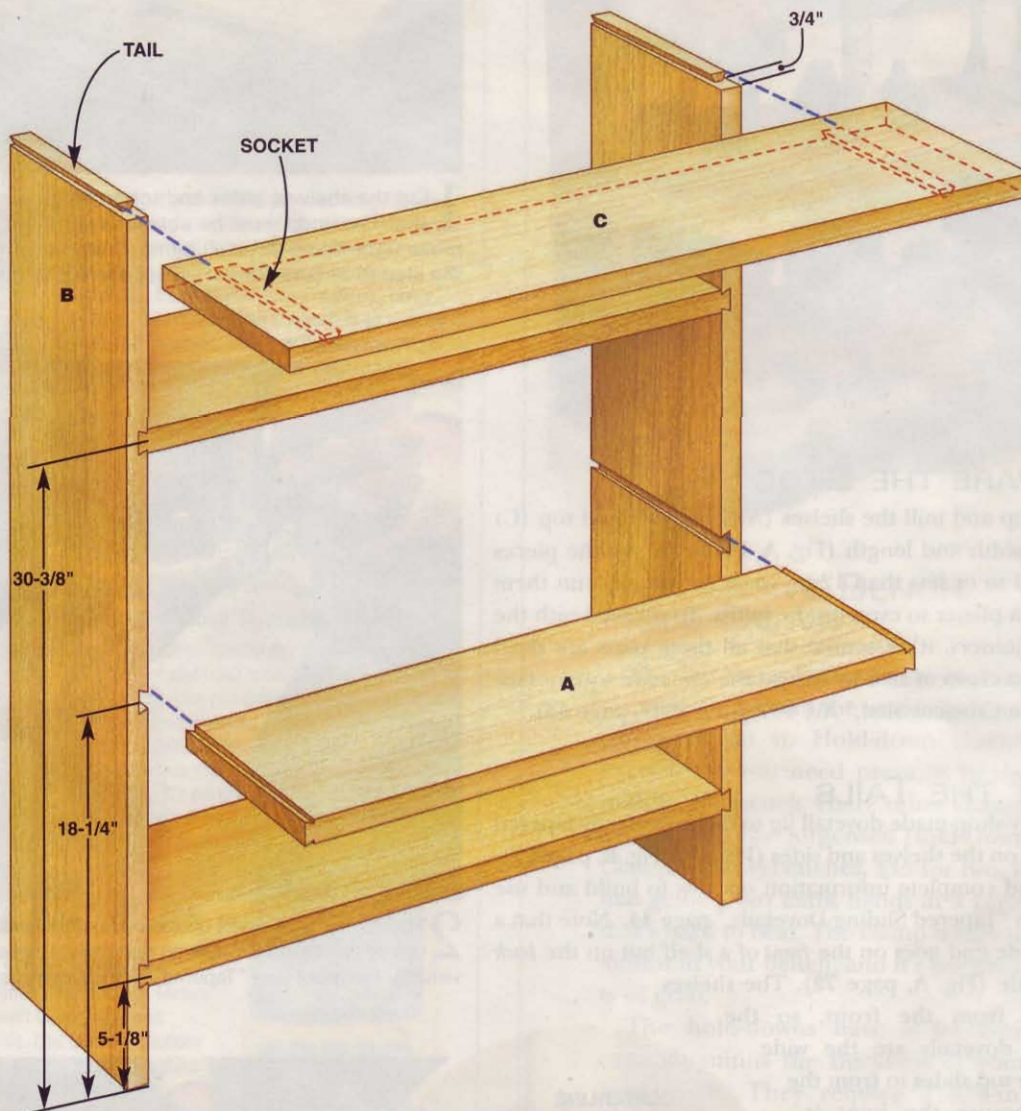


FIGURE B SHELF DOVETAIL

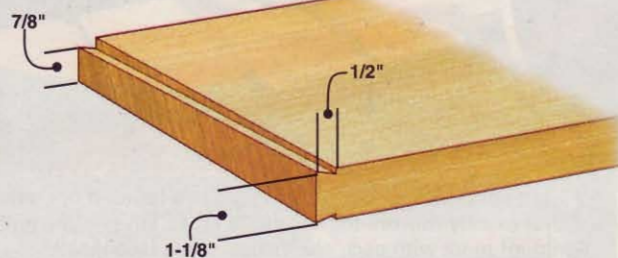
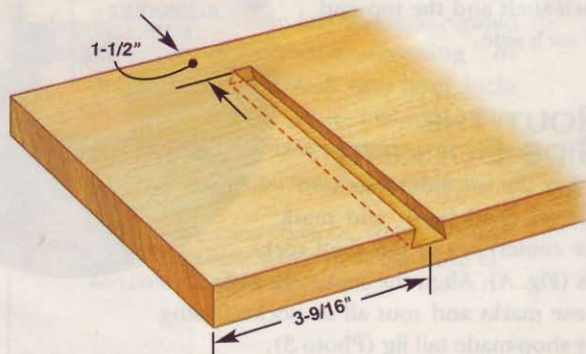
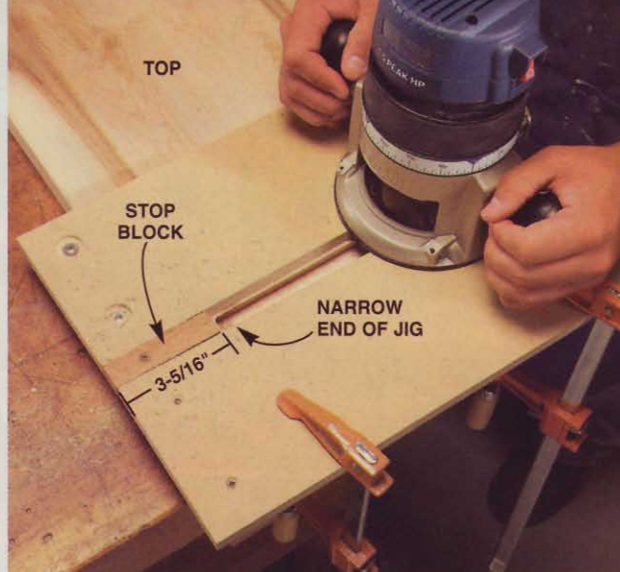


FIGURE C UNDERSIDE OF TOP

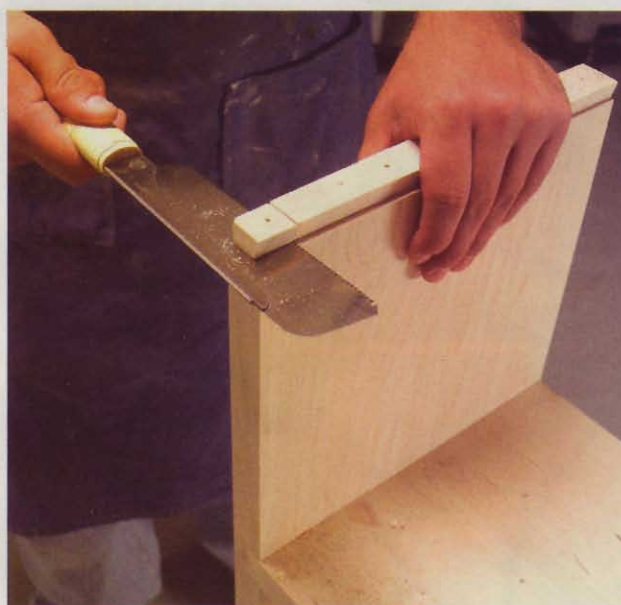




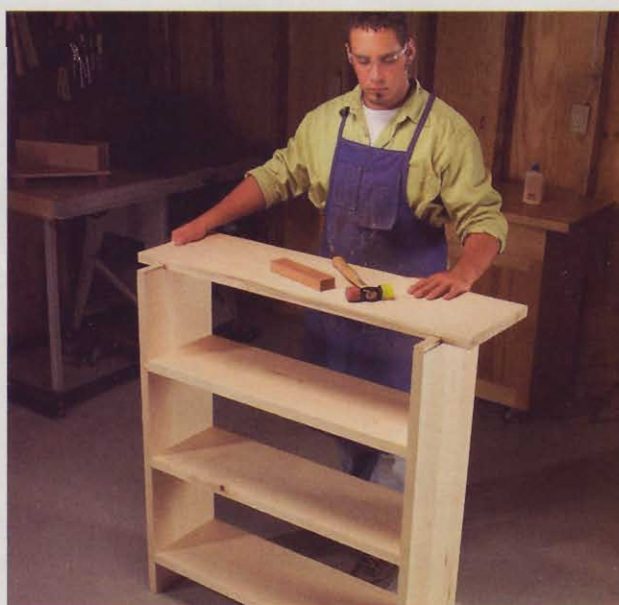
4 Assemble the shelves and sides. Glue all three shelves to one side; then add the other side before the glue sets. Tapered sliding dovetails don't become tight until they're almost home, so you can work at a comfortable pace.



5 Rout stopped sockets in the top. Place a block in the jig to stop the cut. These sockets don't go all the way across, because the top's front overhangs the sides. Here, the dovetail joint is "blind," or hidden.



6 Trim the front end of each side's dovetail. This is much easier to do with a handsaw than by machine. The shoulder you create will sit under the uncut portion of the top's socket.



7 Slide the top into place. Dovetail joinery makes this bookcase extremely rigid, even without a back panel. You can load it with heavy books and never worry about it sagging or falling apart.

ASSEMBLE THE CASE

Sand the shelves and sides; then glue them together (Photo 4). Apply a thin layer of glue to either the socket or the dovetail—it's not necessary to spread glue on both parts. It's easy to slide the joint most of the way home by hand, but keep a mallet or pipe clamp handy for the final push.

ROUT THE TOP SOCKETS

Be fussy when laying out the sockets in the top, because there's little or no room for error. Mark the center of the top

dovetails on the sides. Turn the glued case upside down and place it on the top. Transfer the centerlines of the dovetails to the top (Fig. C, page 72). Line up the socket jig on these marks (Photo 5). Note that the jig's narrow side faces the top's front.

ADD THE TOP

Trim the side's dovetails (Photo 6, Fig. A). Sand the top and glue it on (Photo 7). Round over all the edges of the top, sides and shelves with sandpaper.

Soup Up Your

Had enough dust? Hook up to any portable power tool with this set of accessories.

Most shop vacuums are big and powerful, like SUVs. These vacuums have tons of suction power for cleaning the mess on your floor, but their standard hoses and fittings are way too big to use with portable power tools. There's no way you're going to attach a stiff, heavy, 2-1/4-in. hose to a random-orbit sander! You need accessories that are small, lightweight and nimble, like a sports car. With this set of options, you can hook up nearly any workshop vacuum to any portable power tool. What a difference! No more choking sawdust—it's definitely the way to go.

VERSATILE HOSE

Super-flexible, long, lightweight and small in diameter—that's what you're looking for in a hose. This 1-1/4-in. hose from Shop Vac weighs less than 2 lbs., runs 18 ft. long and bends easily. The end that fits into your vacuum's tub is a standard 2-1/4-in. straight sleeve.

Source Shop Vac, (570) 326-3557, www.shopvac.com 1-1/4-in. x 18-ft. hose, #903-24-00, \$51.

TOOL-ACTUATED SWITCH

This convenient gadget will really turn you on. Actually, it's your vacuum that automatically turns on whenever you fire up a power tool. Plug the Craftsman Automatic Power Switch into an outlet; then plug the tool and vacuum into the switch. It works just like the tool-actuated switch on a high-end vacuum. The vacuum starts up with the tool and runs an additional 2 to 3 seconds to clear the hose after you've turned off the tool.

The switch is rated to handle a total of 15 amps for the vacuum plus a tool.

Source Sears, (800) 349-4358, www.sears.com Craftsman Automatic Power Switch, #24031, \$20.



Shop Vacuum

by George Vondriska



FINER FILTER

The smallest dust particles are the largest health hazard. To best capture sanding dust, switch from a standard filter to a high-efficiency particulate air (HEPA) filter. This CleanStream HEPA-grade fabric filter doesn't clog as easily as a paper HEPA filter and can be cleaned with water. These filters are machine-specific, so you'll need to buy one that fits your vacuum's make and model.

Source CleanStream, (800) 758-6755, www.cleanstream.com CleanStream Filters, about \$30, but price depends on your vacuum's size.

HOSE ADAPTERS

Chances are every power tool in your shop has a different size of dust port, right? It's time to buy a set of hose adapters. These two from Fein should be good for most situations.

- Cut the step adapter to custom-fit the inside or outside diameter of a dust port. The large end fits on the hose; the small end has a 7/8-in. inside diameter and 1-1/16-in. outside diameter at the taper's end.
- The flexible rubber sleeve connects to a dust port that has approximately the same outside diameter as the end of the hose—about 1-1/4 in.

Source Fein, (800) 441-9878, www.feinus.com Step Adapter, #921072K13, \$3.70. Rubber sleeve, #921069A13, \$1.50.

HOSE CLIPS

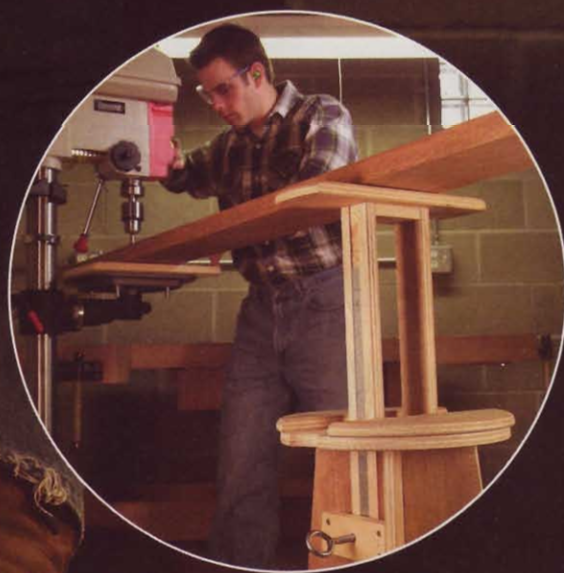
These handy clips from Fein bind together your tool's power cord and a 1-1/4-in. vacuum hose. Five clips are usually enough for an 18-ft. hose.

Source Fein, (800) 441-9878, www.feinus.com Hose/cord clips, #921063K13, \$1 ea.

Double-Duty Shop Stool

by Eric Smith

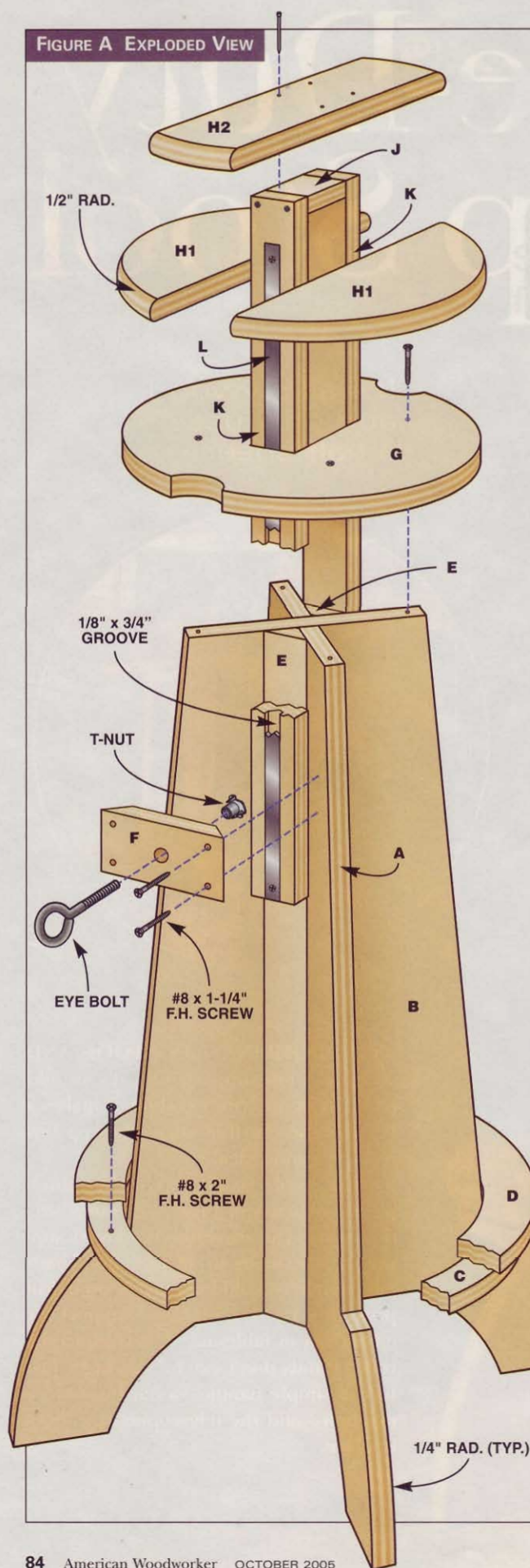
It's all plywood, and only uses a half sheet.



A COMBINATION STOOL AND work support? OK, it's an odd pair, but in my crowded shop, it makes a lot of sense. Anything that takes up less room is a good idea!

The stool's seat is divided into three pieces. When you raise the center section, you get an absolutely rigid work support that extends to 48 in. high. That's tall enough to hold long pieces on a drill press or serve as an outfeed support for a bandsaw or tablesaw. Most commercial roller stands don't extend this high. Just turn a simple handle—a hardware-store eye bolt—and the telescoping top locks in place.

FIGURE A EXPLODED VIEW



PROJECT REQUIREMENTS AT A GLANCE

Materials:

1/2 sheet of 3/4-in.
birch plywood

Tools:

Tablesaw
Circular saw
Jigsaw
Cordless drill
Router
Brad nailer (optional)
1/4-in.- and 1/2-in.-rad.
router bits
Dado set or 3/4-in.
straight router bit

Hardware:

Two 24 x 3/4 x 1/8-in.
steel flats
Two 3/8-in. x 7/16-in.
T-nuts
Two 3/8-in. x 4-in.
eye bolts
1-1/4-in. screws
2-in. screws

Cost: \$35

CUTTING LIST

OVERALL DIMENSIONS:
22"DIA. x 30"H, RAISES TO 48"H

Part	Name	Qty.	Dimensions (W x L)
A	Base (top notch)	1	22" x 28-1/2"
B	Base (bottom notch)	1	22" x 28-1/2"
C	Bottom footrest	1	16-1/2" dia.
D	Top footrest	1	17" dia.
E	Inside corner brace	2	2-1/4" x 24-3/4"
F	Clamping block	2	2-1/4" x 5-1/2"
G	Subseat	1	13" dia.
H	Top seat	1	13-1/2" dia.
J	Work support subbase	1	2-1/4" x 3-5/16"
K	Work support leg	2	2-1/4" x 25-1/2"
L	Flat steel bar	2	3/4" x 22" x 1/8" thick



Shine a light wherever you need it. Your shop stool doubles as a lamp stand.

FIGURE B PLYWOOD CUTTING DIAGRAM

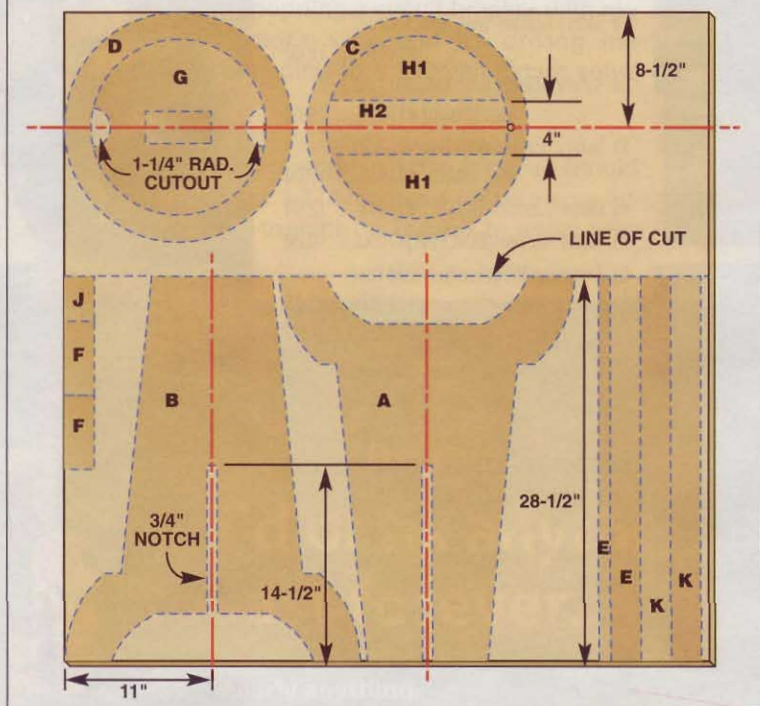


FIGURE C DETAIL OF BASE

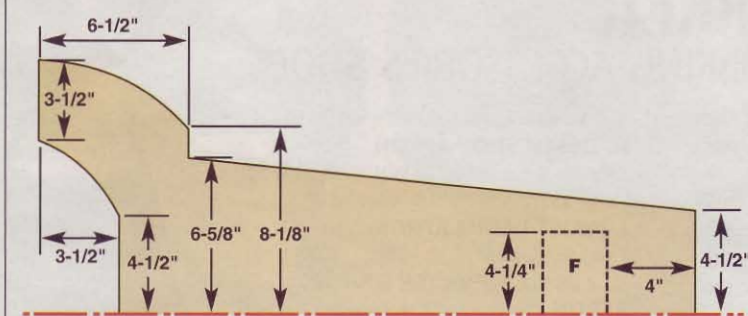
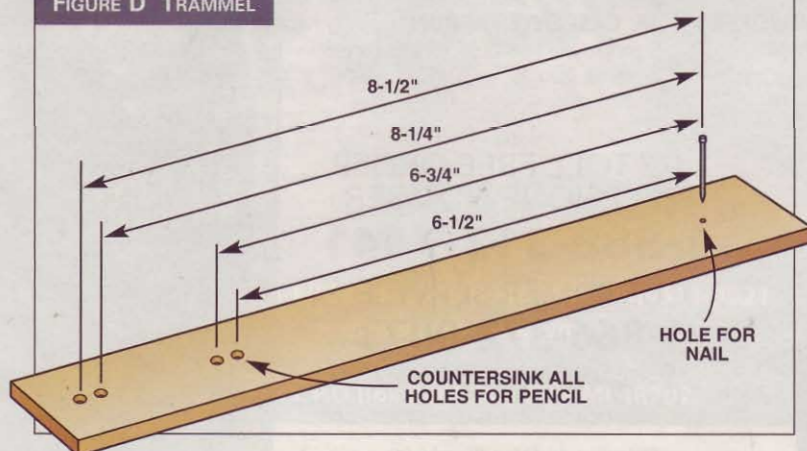


FIGURE D TRAMMEL



This telescoping stool is the perfect companion for your bandsaw or drill press.

MATERIALS AND TOOLS

Cut all the parts of the stool from one half-sheet (4 ft. x 4 ft.) of 3/4-in. birch plywood (about \$25). Birch plywood makes the best-looking stool for the least amount of money. Its faces are free of ugly knots and its edges are virtually free of voids. But you're free to choose any kind of 3/4-in. plywood without voids, such as Baltic birch, marine-grade plywood or AB fir plywood. Use plywood-cutting blades in your circular saw and jigsaw to avoid splintering.

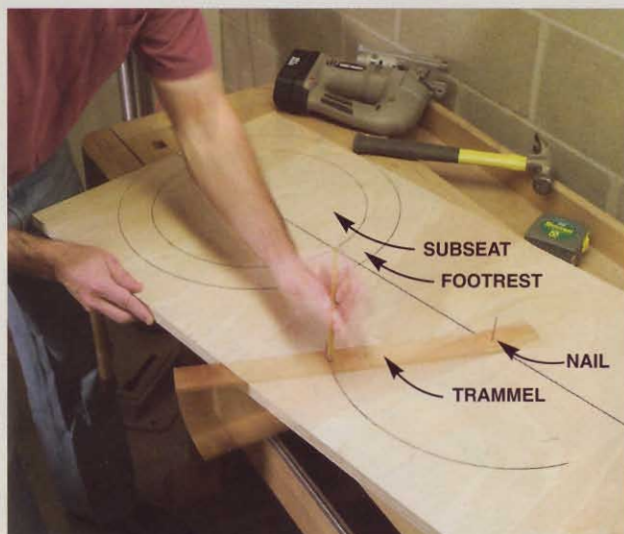
LAY OUT THE PARTS

1. Cut the plywood into two large rectangular pieces (Fig. B, above). Draw a centerline on the smaller piece for laying out two sets of nesting circles. Use a trammel (Fig. D, below) to draw two footrests (C, D) and two top pieces (G, H, Photo 1). Drill start holes to fit your jigsaw blade. Cut all the circles using a jigsaw.

2. Lay out the two base pieces (A, B, Fig. C, center). Use the outside edge of the smaller footrest (C) to draw the curved sections of the legs—it's simpler than setting up the trammel. Leave a 1/2-in. separation between the two base pieces. Cut the center notches and the sides of the bases using a circular saw (Photo 2). The accuracy of these cuts isn't critical, so you don't need a guide. Cut the legs and inside corners of the notches using the jigsaw.

ASSEMBLE THE BASE

3. Test-fit the two base pieces (Photo 3). Trim the notches as needed so the parts fit easily.



1 Draw two pairs of circles on a sheet of plywood. The outer circles are parts of the footrest; the inner circles are parts of the seat. For drawing circles this large, use a shop-made trammel—a thin strip of wood with a nail for a center-point. Cut the circles using a jigsaw.



2 Cut out both base pieces using a circular saw and jigsaw. Support the pieces on sacrificial 2x4s. Lower the blade of the circular saw 1/4 in. below the plywood and cut right through the top of the 2x4s.

4. Sand the edges of the seat and base pieces. Round the corners with a 1/4-in.-radius router bit.

5. Slide the two base pieces together. Place the smaller footrest on the base. Predrill and countersink screw holes through the footrest and into the base (Fig. A, page 84). Screw and glue the bottom footrest to the base.

6. Check the fit of the top footrest

(D) on the base. It will be tight—trim as needed. Position the top footrest so its face grain runs the opposite way from the grain of the footrest below. Glue and clamp the top footrest to the bottom footrest (Photo 4).

7. Rip the corner braces (E, Photo 5). Flip the plywood sheet over for each succeeding 45-degree cut (Fig. E, page 90). Cut the corner



3 Slide the base pieces together. Don't worry—the fit doesn't have to be precise. Additional parts of the stool will lock these two pieces into one solid unit.

braces to length. Glue the corner braces on opposite sides of the base (Fig. A). Fasten these pieces using a brad nailer, or predrill and countersink holes for 1-1/4-in. screws.

8. Cut and miter two clamping blocks (F). Drill a 7/16-in. hole in the center of each block and hammer in a T-nut on the inside. Mark the location of the ends of the clamping blocks on the base pieces (Fig.



4 Attach the footrests in three steps. First, adjust the base pieces so they're square to each other. Second, attach the bottom ring with screws. Third, glue and clamp the top ring.



5 Rip two beveled corner braces on the tablesaw. To avoid kickbacks, tilt the blade away from the fence. On a right-tilt saw, shown here, that means placing the fence on the *left* side of the blade, opposite of where it normally goes.

C). Then glue and screw the clamping blocks to the base (Photo 6).

INSTALL THE TELESCOPING SUPPORT

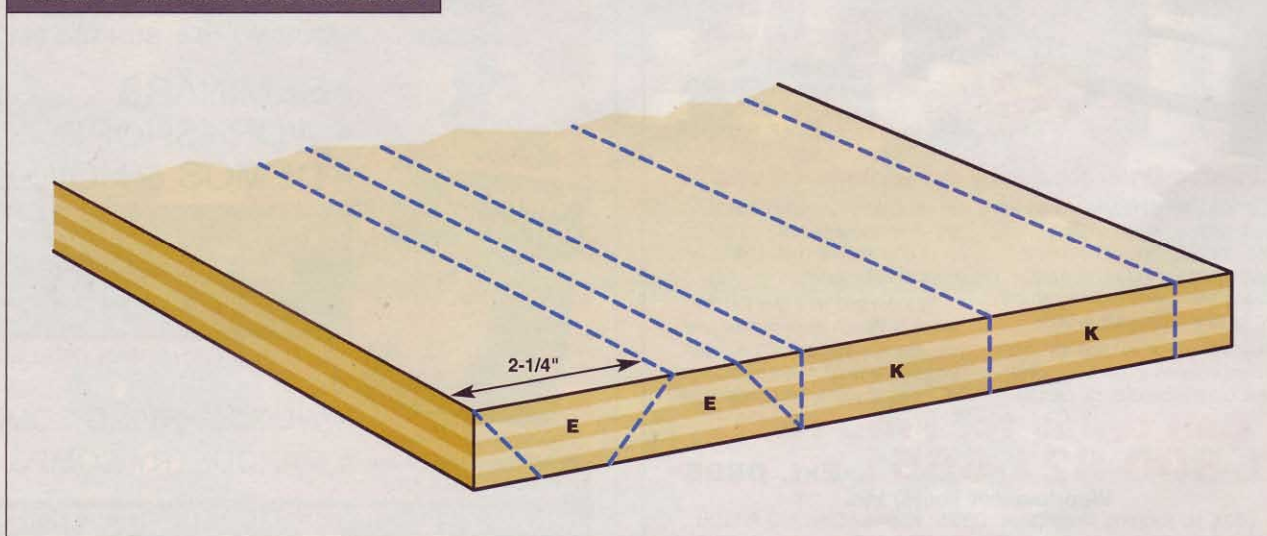
9. Rip the work support legs (K). Cut them to length and sand their edges. Cut a groove down the center of each leg (Fig. A). Use a dado set on the tablesaw or a 3/4-in.

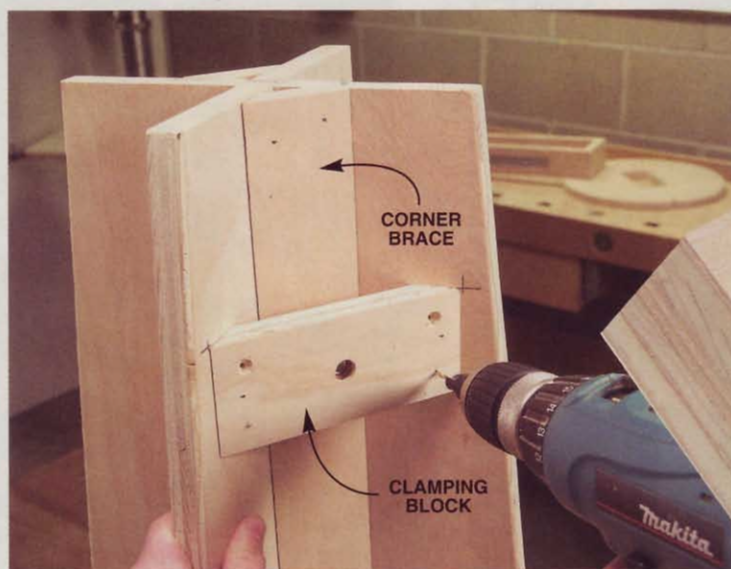
straight bit in your router.

10. Drill and countersink screw holes at the top and bottom of two pieces of 1/8-in. x 3/4-in. flat mild steel. Fasten the steel (L) to the work support legs. (You don't need screws if you use epoxy or polyurethane glue.) The eye bolts that clamp the work support bear against this steel. Without the steel, the bolts will dig into the wood.

11. Cut the work support subbase (J). Assemble the work support column by gluing and nailing the legs to the subbase. When you glue, be sure the legs are square to the subbase. Cut a rectangle in the middle of the subbase (G) using a jigsaw (Fig B). Test the fit of the work support column in this opening. Slide the work support down the base and leave it in position.

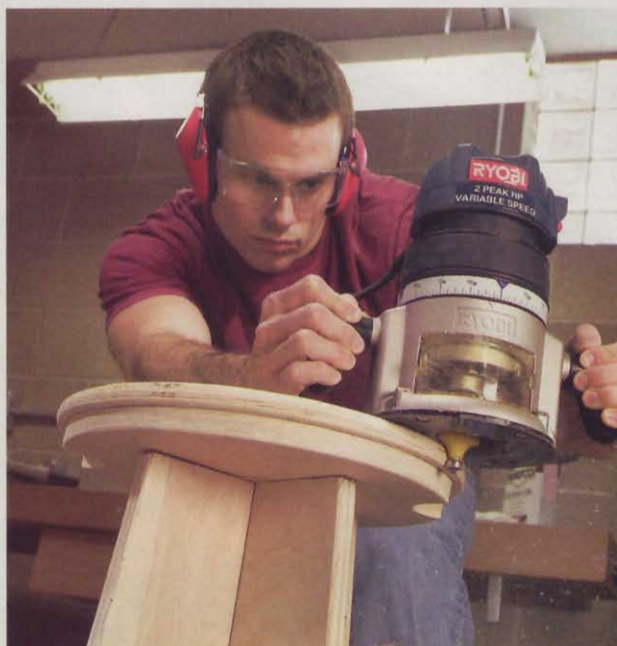
FIGURE E TABLESAW CUTS FOR BRACES





One twist of
an eye bolt
locks the
work support.

6 Install a clamping block with a T-nut opposite each corner brace. Temporarily tack the blocks in place using brads; then predrill pilot holes for screws. The screws go in square to the blocks.



7 Glue and nail the subseat to the base. After the subseat is tacked in place, reinforce the joint with screws. A rectangular hole in the subseat guides the adjustable work support column.

8 Round the edge of the top after it's glued and nailed in place. A large radius makes the seat quite comfortable.

ADD THE SEAT

12. Cut two semicircles in the subseat (G, Fig. B). These cutouts make it easier to grip and raise the seat. Flip the subseat upside down and place it on the base. Trace the outline of the base on the subseat. Turn the subseat right-side up and place it on the base. Make sure the

work support slides freely up and down. Fasten the subseat to the base (Photo 7). Use the tracing marks as a guide for the nails and screws.

13. Cut the seat (H) into three pieces using a jigsaw (Fig. B). Center the middle piece on the work support column and glue and

nail it with brads. Place the outer pieces in position, leaving 1/8-in. gaps next to the center piece. Glue and nail the outer pieces to the subseat.

14. Round the seat's edge (Photo 8). Fill all exposed nail holes and sand off the pencil marks. Apply any finish you want, or none at all.

Tablesawn

Saw round tabletops with a simple shop-made jig

It's easy to cut perfectly round tabletops of almost any size on your tablesaw. All it takes is a simple jig (Fig. A., page 95) and careful setup. With this method, you can safely cut diameters from 12 in. to within an inch of your saw's rip-fence capacity.

Why use a tablesaw? It's better than bandsawing or routing, especially for large-diameter circles. Unlike bandsawing, when you're working on the tablesaw, the blank is fully supported, so it's easy to control. Unlike routing, you stay in one place while making the cut and you don't have to deal with a tangle-prone cord. Tablesawn results are better, too. The circular blade leaves a cleaner edge than a bandsaw blade does and it won't tear out the end grain, the way a router bit can.

This tablesaw technique is similar to the approach used for cutting circles on a bandsaw. Using a clamped-on jig with a center pin, you make the cut by rotating the blank into the

blade. Unlike the bandsaw method, however, you must start with a blank that's already roughsawn. Cutting the circle to final size takes several steps. Like turning a rough blank into a round on a lathe, you gradually cut down the high spots until the blank is perfectly round. Here's how to do it:

1. Draw the circle on the bottom of the blank, using a compass or trammel.

2. Use a jigsaw to rough-saw the blank 1/4 in. to 1/2 in. larger than the final diameter. Starting on the bottom face, draw a diameter line that continues all the way around the blank.

3. Enlarge the center hole that remains from drawing the circle to fit the jig's center pin. Mount the blank (Photo 1). Then install the retainers.

4. Before you position the jig, unplug your saw and install an alternate tooth bevel (ATB) blade with at least 40 teeth. Raise the blade fully. Set the rip fence so there's just enough room for the jig and blank to slide past the blade. Align the blank's centerline with the reference line you've drawn on the clamp rail (Fig. A).

5. Hold the jig against the fence, slide it forward into position and clamp it securely (Photo 2).

6. Lower the blade fully to locate the jig for the first cut. Spin the roughsawn blank to find its widest spot. Then reset the fence so the blade will remove about 1/16 in. from



Circles

by Tim Johnson

this point. A more aggressive cut wouldn't work; it would cause binding between the blank and the blade.

7. Start the cut by raising the blade (Photo 3). Then rotate the blank clockwise (Photo 4). Shut off the saw and lower the blade.

8. Reset the fence and repeat the cutting process, as needed, removing about 1/16 in. from the edge of the blank each time. Removing 1/16 in. reduces the blank's overall diameter by 1/8 in. Your last fence adjustment, to dial in the final diameter, will probably be less than 1/16 in.

9. Remove saw marks on the edge by sanding or by routing a profile.

This technique was developed from a tip supplied by Paul Lee.

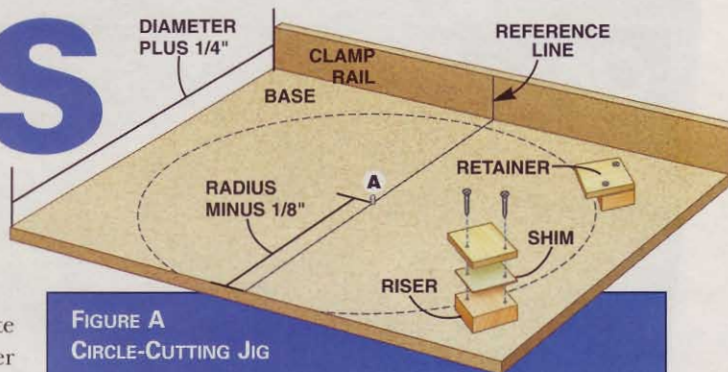
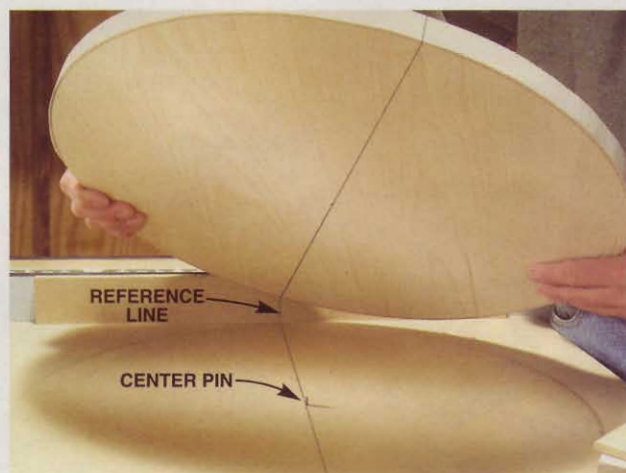
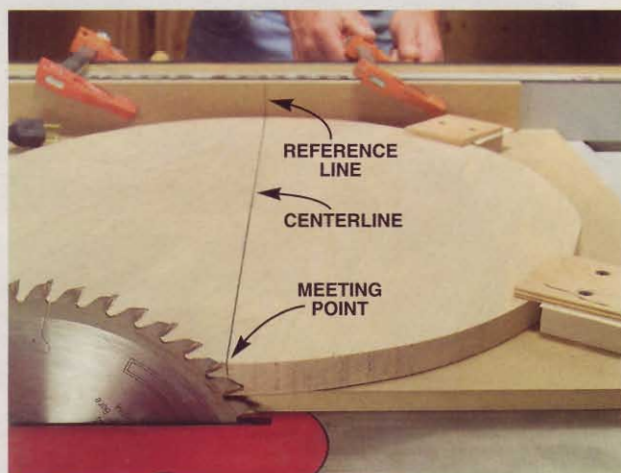


FIGURE A
CIRCLE-CUTTING JIG

The jig's base is slightly wider than the diameter of the circle you plan to cut and deep enough to fully support the blank. The 1/8-in.-dia. steel center pin (A) protrudes at least 1/4 in. It's located on a line perpendicular to the edge and centered front to back. This reference line continues onto the clamp rail. Position the pin so the blank slightly overhangs the base. The retainer risers are the same thickness as the blank. Heavy paper shims provide clearance under the risers' tops so the blank can rotate.



1 Mount the roughsawn blank on the jig. It rotates on the center pin. Align the blank's centerline with the reference line on the jig's rail.



2 Clamp the jig to the rip fence at the point where the tip of the fully raised blade, the top edge of the blank and the centerline meet. Lower the blade completely. Then position the blank for the first cut by adjusting the fence.



3 Start the cut by raising the blade into the blank after setting the fence to remove only 1/16 in. from the edge. Hold the blank firmly, so it can't move. Turn on the saw and slowly raise the blade to full height.



4 Complete the cut by rotating the blank clockwise. After one full rotation, shut off the saw and lower the blade completely. Reset the fence about 1/16 in. closer to the blade for the next pass. Repeat the cutting process until the blank reaches its final diameter.

edited by Tim Johnson

FIRE EXTINGUISHER FOLLIES

While maneuvering a large board in my small shop, I inadvertently whacked my old fire extinguisher and knocked it off its bracket. The heavy, dry-chemical extinguisher pinwheeled to the concrete floor and crashed top-side down. The impact broke the plastic valve assembly, causing a major, unstoppable eruption of fire suppressant. Almost instantly, my shop disappeared in a billowing yellow cloud. Holding my breath, I dropped the board and headed for the door. The excitement lasted less than a minute, but cleaning up took days. After the blast, everything in my shop was covered with a layer of powdery residue—almost like yellow volcanic ash.

Bruce Kieffer



If you have a woodworking blunder that you're willing to share, send it to us. You'll receive \$100 for each one we print. Send it 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.

INLAY EATER

My husband was working quietly in his basement shop when I heard a muffled "ugh!" followed by sounds of gagging and footsteps racing up the stairs. I ran to the kitchen, where I found him rinsing his mouth under the gushing faucet.

After allowing a minute for him to towel off and regain his composure, I asked what had happened. He opened his mouth and pointed to the back of his throat, where I saw a small puncture wound.

Sheepishly, he croaked out the story. While cutting long, slender inlay pieces for a box, he'd put one of them in his mouth like a straw, so he could use both hands to adjust the rip fence on his tablesaw. Unfortunately, when he leaned forward to eyeball the scale, he forgot about the piece in his mouth, which hit the saw table and then speared his throat. Luckily the injury was more embarrassing than serious. I bet he'll never do *that* again!

Jennifer Raftery