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WOOD

THE WORLD'S LEADING WOODWORKING MAGAZINE

ISSUE 119 DECEMBER 1999

Cordless Drills

See which
12-volt models
passed our
punishing
tests

Project Bonanza

- Shaker quilt stand
- Mobile mitersaw center
- Scrollsawn bird puzzles
- Shaker wall mirror
- Dust-collection hoods
- Whimsical alarm clock
- Tablesaw featherboard

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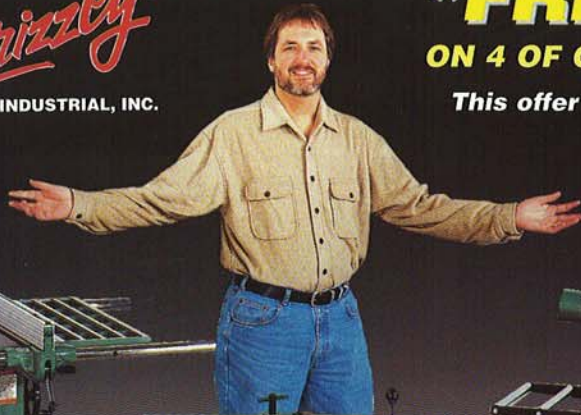


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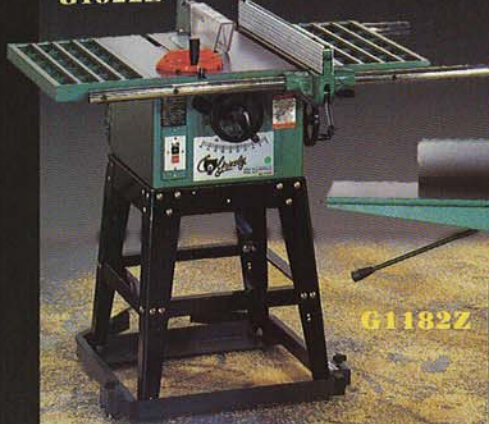
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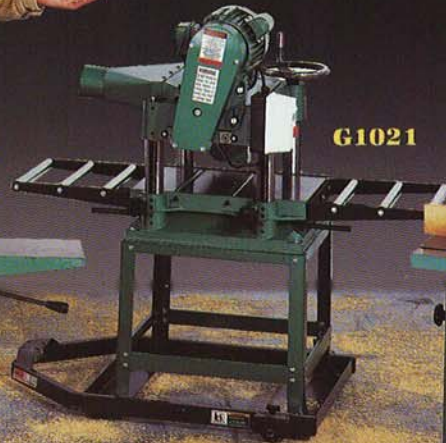
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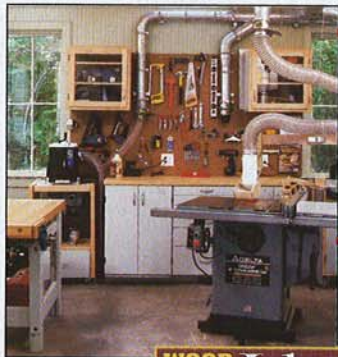


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THE WORLD'S LEADING WOODWORKING MAGAZINE

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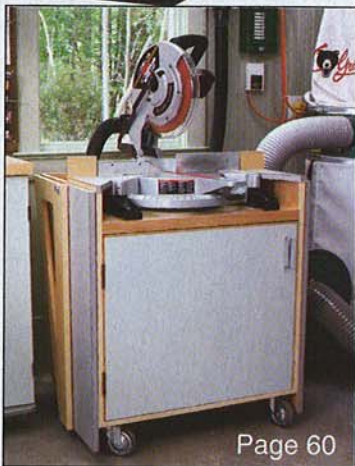
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Think about it. If you were asked to sign your name (*without hiding behind an inspection number*) saying the product you were about to ship is nothing short of great, you'd want to make sure it was just that. Well, that's what the people at RIDGID do every day. Right on the box.

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Enter Our "IT'S ABOUT TIME" CLOCK CONTEST And Win Great Prizes!

I've got to admit that clocks always have held a certain fascination for me. And they must for others as well. Sure, they serve a functional purpose in this time-conscious world of ours—and they always have.

But there's an aesthetic side to clocks, too. Throughout the ages, clockmakers have lavished great care in their making of clocks, and that tradition continues today.

I'm always amazed at how many terrific-looking clocks of all descriptions I run across in my travels. And recently, I've turned my admiration for these timekeepers into a small collection at home. My only regret is that I didn't start collecting sooner.

In announcing this new contest, which Titebond glues & adhesives has graciously agreed to sponsor, I'm betting that a fair number of you share my passion for clocks. And I'm

In addition to \$15,000 in prize money from Titebond glues & adhesives, we will be awarding Certificates of Accomplishment to the 25 runner-up clocks.



Just a few of the many clock designs I've run across over the years. And I'm hoping you can show me some more.

hoping that we have some amateur or professional clockmakers among the readership who want to 1) receive some recognition in *WOOD*® magazine and 2) win some nice prizes. (The five best clocks will share \$15,000 in prize money.) We may even make an arrangement with you to run the plans for your clock in the magazine so other readers can have fun building it, too.

Entering the "It's About Time" Clock Contest is as easy as 1-2-3:

1. Design and build up to three clocks. Each clock must fit into a box no larger than 2x2x2'. Limited to one prize per person.
2. All entries must be received by April 3, 2000.
3. Cross your fingers and hope that you are one of the lucky winners.

Note: Please see page 85 for complete contest rules.

OK, there it is. I've layed down the gauntlet; the rest is up to you. The best of luck to you all. ♣

Larry Clayton

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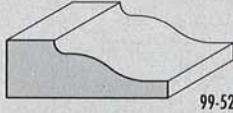
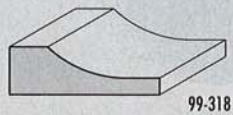
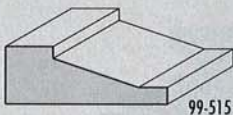
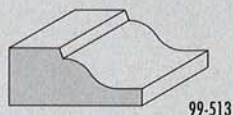
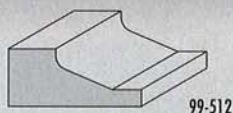


Freud has always been first in cutting tools technology. **First** with anti-kickback design. **First** with Teflon® coatings. **First** with Super micrograin carbide. Now, in their never ending quest for superior cutting tools, Freud engineers have designed another "**first for the industry**". A four-wing raised panel cutter that will revolutionize the way you make raised panel doors. Freud's patented 2+2 Raised Panel Router Bits produce glass-smooth cuts, even on cross grain! This new design has an ingenious configuration of both positive and negative sheer angles that eliminates the fuzz on the top edge of the profile. Available individually and in sets. Once you've tried Freud's 2+2's, you'll see all others are second class.

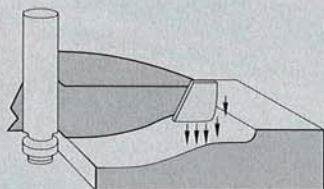
- **Anti-Kickback Design*** chip limitators restrict tooth bit reducing the effects of kickback.
- **Freud's Super Micrograin Carbide** for durable, long lasting cutters that really hold an edge.
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- **Shear Angle** Lets the bit slice through the wood, producing a superior finish on all materials.
- **Computer Balancing** eliminates vibration and chatter resulting in clean, smooth profiles.
- **Advanced Tri-Metal Brazing** creates a stronger, more impact resistant bond between the carbide and the bit.

Patented Design

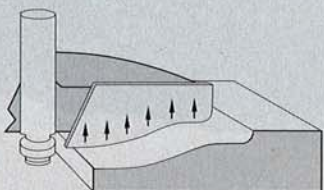
U.S. Patent No. 5,899,252



Other profiles available.



The small wings cut downward on the wood fibers to shear the top edge off for a perfect splinter free edge.



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Information courtesy of DuPont® Industrial Coatings
*Not all Freud products feature anti-kickback design.

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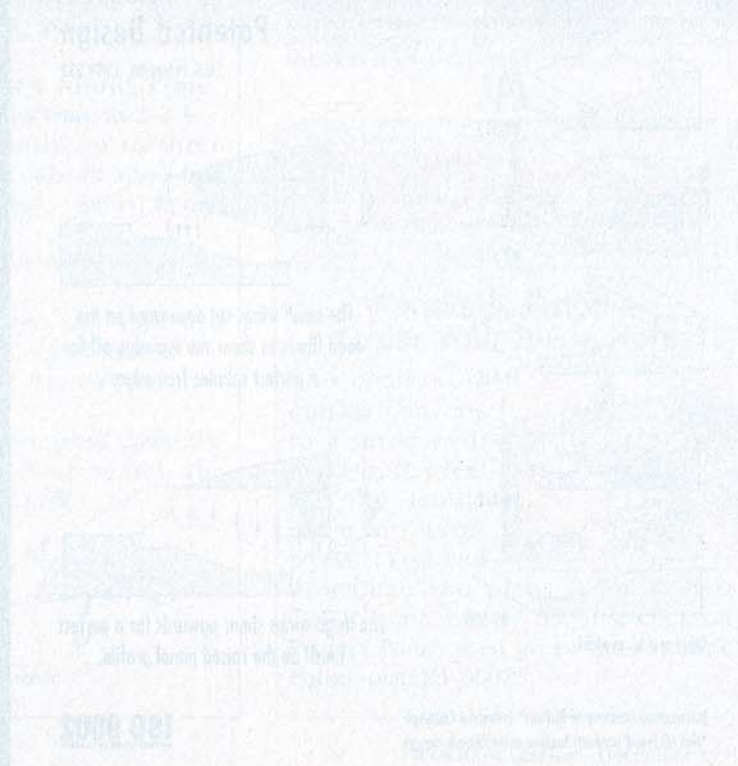
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Two more stains to consider

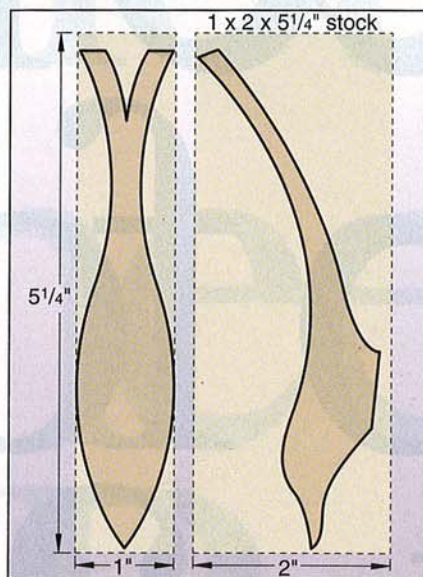
When we reported on stains in issue #114, two Olympic products were not available locally at the time of testing. But, we recently had a chance to review samples of Olympic Interior/Exterior Oil Based Gel Stain and Olympic Interior One-Step Stain & Polyurethane In 1.

The gel stain earned "excellent" ratings in the three tested areas of performance: ease of application, evenness of color, and grain-raising. It has a syrup-like consistency that makes it more likely to run on vertical surfaces, but easier to clean out of crevices than thicker gel stains. We recommend this product.

Although we don't recommend one-step stain/protective-coat products as a group, the Olympic one-step formula performed well and earned "excellent" ratings in evenness of color and grain-raising and a "good" rating in ease of application.

Oops, here's the pattern

Inadvertently, the full-size pattern for the stylized bird carving shown on page 55 in issue #117 was left out of the *WOOD PATTERNS*® insert. So look for it among the other patterns in the center of this issue.



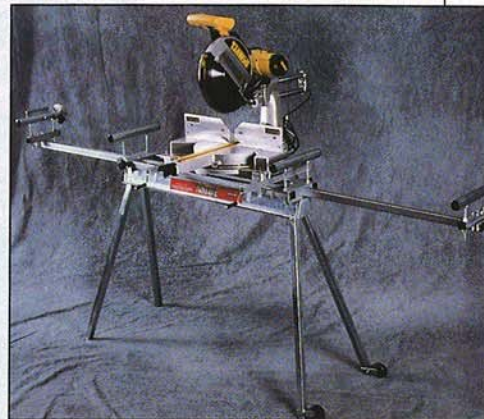
Two miter saw stands too-new for review

Just as our last issue, #118, went to press, we learned of upgrades to two of the miter saw stands reviewed on pages 66-71. First, Delta's Universal Miter Saw Stand 50-155 looks much like the Kickstand 50-175 it replaces, while adding a few features.

Besides the original wooden mounting plate that crowded a 12" saw, the new stand comes with a pair of mounting rails that Delta officials say will fit any size, style, or brand of miter saw. Also new are height-adjustable legs with stabilizers to steady the stand with a big saw mounted. The Universal Miter Saw Stand sells for about \$200.

And the latest addition to the Stablemate line is the XWC-36, right. The new model addresses one of our complaints about the RWC-36 we tested, by adding a flip stop and back stop to the stand.

In addition, the manufacturer has added a second pair of stock supports that extend to 106", and a pair of wheels to make the stand room-to-room mobile without tearing it down. The new model should retail for around \$160, and will be available after January 1, 2000.



We would like to hear from you

We welcome your comments, criticisms, suggestions, and yes, even compliments. We'll publish letters of the greatest benefit to our readers. Write to: Talking Back, *WOOD* Magazine, 1716 Locust St., GA310, Des Moines, IA 50309-3023

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SUGAR PINE California's Gold Rush Tree

When James Marshall discovered gold at Sutter's Mill on the American River in 1848, the California Gold Rush began. So did the mass harvest of the sugar pine, the largest North American pine.

John Sutter had set up his mill at Coloma to saw sugar pine. The tree's tremendous size—200' heights and diameters of 18' have been recorded—meant lots of quality boards from a tree. And the wood was lighter and easier to work than other pines.

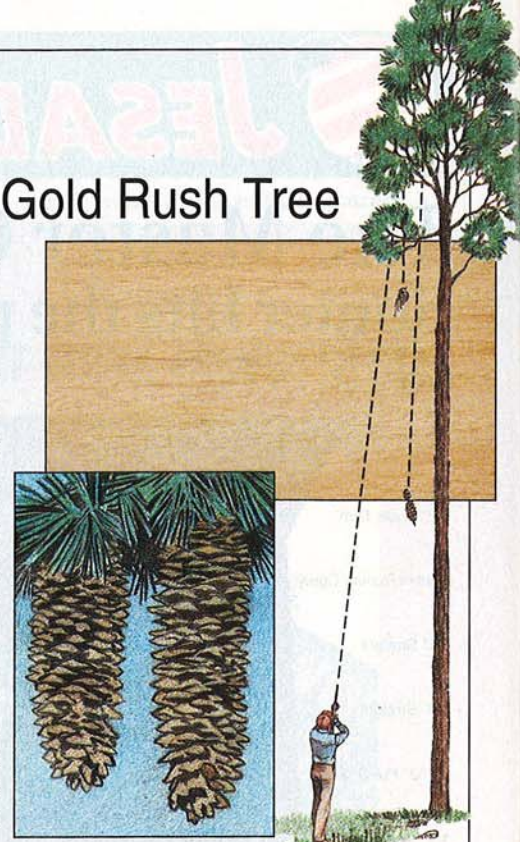
Little did Sutter suspect how his lumber business would boom with the coming of the prospecting Forty-niners. They quickly created demand for boards to build mining shacks, sluice boxes, and flumes to extract the gold from river banks and stream beds. It became shoring for mines and bridges to cross the waterways.

Sugar pine was used for homes, stores, and roof shingles.

After the Gold Rush, settlers began farming and ranching in the valleys. And just as before, the sugar pine yielded wood for their barns and fences, even though the remaining trees were 100 miles away.

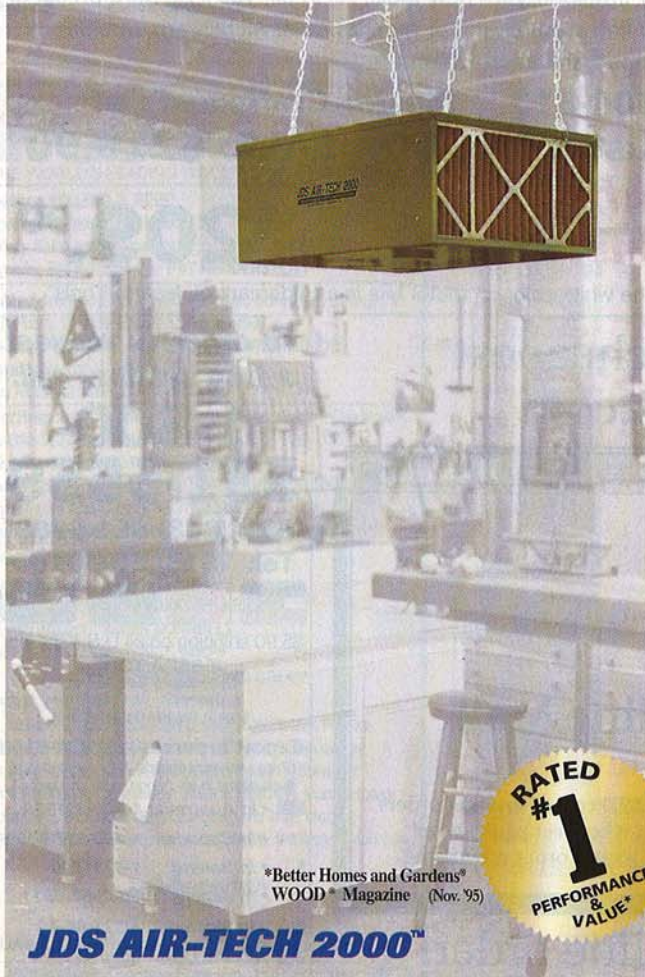
As California's fruit-growing industry developed, growers turned to the sugar pine for boxes and crates because it imparted no taste to the fruit. It was also good-looking.

Even after 150 years of harvesting, sugar pine still grows in commercial amounts in California and Oregon. But to ensure future trees, forest managers have been known to hire sharpshooters to drop the large (10-20" long), otherwise uncollectible, unopened cones from the towering treetops!



Sugar pine's height poses a problem for collecting seeds from unopened cones. Marksmen sometimes shoot them down.

Illustration: Jim Stevenson



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If you've got a tough question, especially one you think would interest other readers, we would like to hear from you. Write to: Ask WOOD®, 1716 Locust St., GA310, Des Moines, IA 50309-3023. If you want to enlist quick help from other woodworkers, try posting it on one of our 10 internet discussion groups at: www.woodmagazine.com

How do I know if pulley sizes make for unsafe jointer speed?

I have a 6" jointer with a 3/4-hp, 1,725-rpm motor. I'd like to replace this motor with a new 1-hp motor I have, but this larger motor runs at 3,450 rpm. Is it okay to use the same pulley setup? I have a 7"-diameter pulley on the existing motor, and a 2 3/4" pulley on the cutterhead.

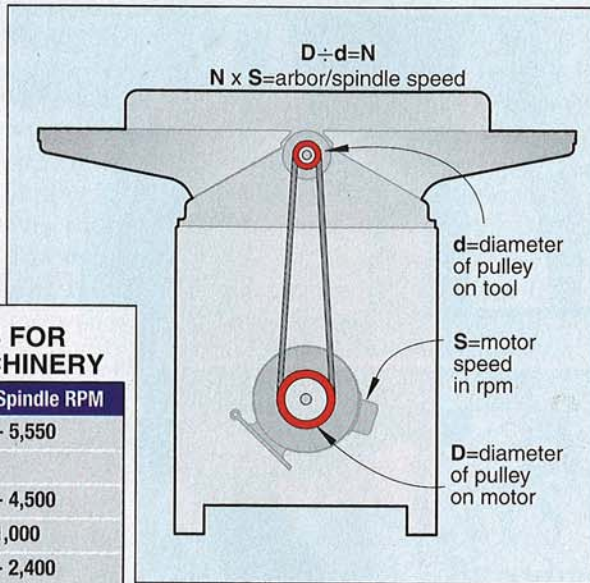
Elmer Aretz, Brackenridge, Pa.

The new motor will improve your jointer's performance, Elmer, but when we checked with Sam Kuykendall, a senior engineer at

Powermatic, he warned that the pulley arrangement you're currently using will spell trouble. Right now, the cutterhead speed translates to about 4,400 rpm (divide the drive pulley diameter by the diameter of the cutterhead pulley, then multiply the result by the motor speed). This is a bit slower than the 5,000-5,500 rpm most jointers run, so bumping the speed a little would be fine. But doubling the motor speed would push the cutterhead to almost 8,800 rpm, which is too high.

Kuykendall explained that Powermatic balances its jointer cutterheads at 7,000 rpm, which he said is typical for the industry. Run a machine faster than that and you're likely to have bearing problems from increased vibration. The higher speed also increases the centrifugal force, raising safety concerns about the knives being ejected from the cutterhead, a serious risk on some machines.

You can leave the cutterhead pulley alone, but you'll need to reduce the motor pulley size. A 5"-diameter pulley would get you about 6,270 rpm, acceptable but still a little fast. A 4" pulley will put you in a safer range of about 5,000 rpm, and you'll still get a good-quality surface—if you keep your knives sharp. (See illustration to demonstrate relationship of pulley sizes and motor speed.)



COMMON SPEEDS FOR WOODWORKING MACHINERY

Machine	Motor RPM	Blade/Spindle RPM
Jointer	3,450	5,000 - 5,550
Planer	3,450	6,000
Tablesaw	3,450	4,000 - 4,500
Bandsaw	1,725	300 - 1,000
Sander	1,725	1,800 - 2,400

A cure for a worn-out finish?

Nearly 50 years ago, my wife and I bought what was called "blond oak" furniture—a dining room set, a chest of drawers, dresser, and so on. After surviving the wear from children and grandchildren, the finish is in bad shape, down to bare wood on the table top and some other pieces. Construction is 1/16" veneer (red oak?) over solid wood. How do I handle the refinishing? I would like to keep the blond color if I can.

W. C. Geppert, Lake City, Minn.

W.C., you've got a lot of variables involved here, and without seeing the furniture we can give you only general suggestions. First, use a chemical stripper to remove all of the old finish, and clean any residue from the stripper with lacquer thinner or a similar solvent. Then sand the surfaces smooth.

White oak veneer, not red, would have been more common for blond furniture because it already has the color cast desired. The pink tint in red oak often interferes with the whitish-yellow color characteristic of blond furniture. If it is red oak, odds are the manufacturer applied a "toned" finish (pigment mixed with lacquer, probably) to overpower the pink cast. Duplicating that effect successfully exceeds the equipment and skills of most home-shop woodworkers.

A waterborne polyurethane or nitrocellulose lacquer will retain the wood's original color better than an oil-based varnish or a shellac finish, with less darkening. Find an inconspicuous area and test the results before working on an entire piece. If you don't get the result you want, ask a professional finisher to examine the set and offer a recommendation.

Continued on page 14

"Compared to the other machines in the test, the Delta produced the cleanest surface and the least amount of snipe. The other planers in the test also gave us excellent surface finishing, but the Delta stood out as just a bit better."

Woodworker's Journal, January/February 1998

"...quick-change knives that we found easy and accurate to install. We found that with the quick-change systems we aligned the knives within .001!" And, we could install both knives in about five minutes." "Editors' Choice Top Tool™"

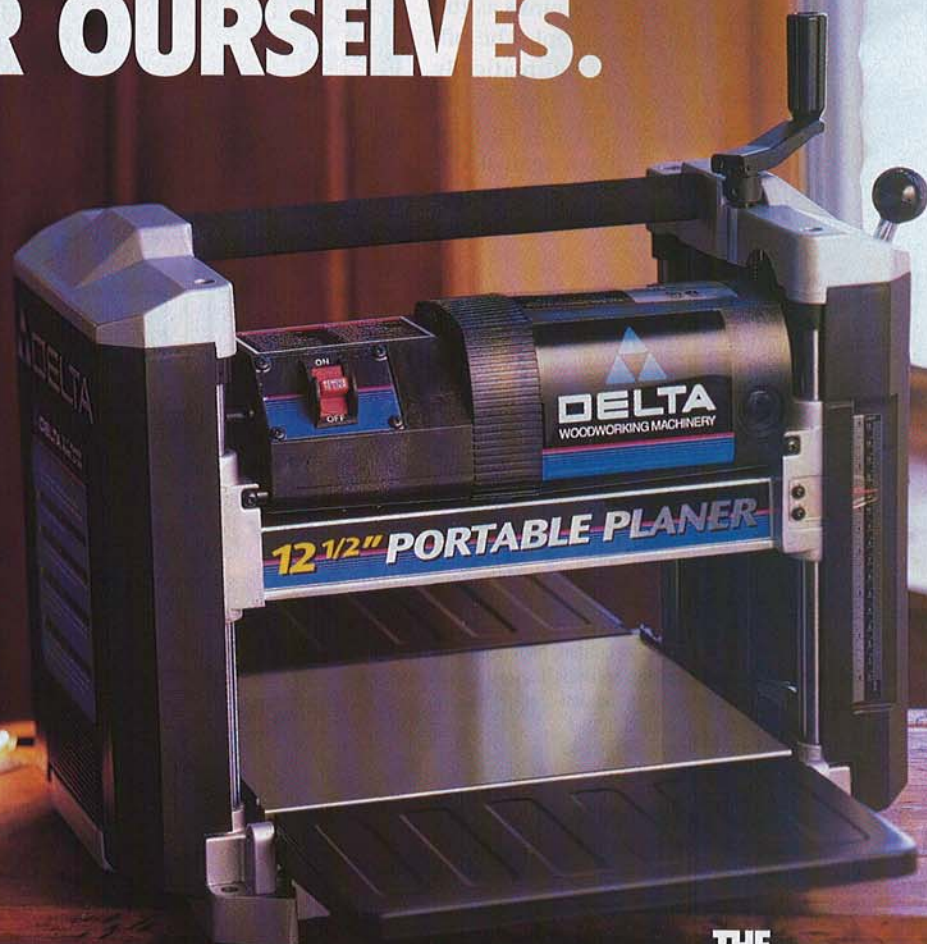
Better Homes & Gardens Wood, November 1996

"The Delta got great marks for quality of cut and portability, and for its innovative cutterhead assembly lock." "Editors' Choice"

American Woodworker,™ December 1996

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ASK WOOD

Continued from page 12

Marking gauge mystery—how do I use it?

The marking gauge shown on pages 64-65 of your June 1999 issue is a beautiful tool. You did a fine job with the project instructions, but skimped on selling the idea. How is it used? I'd like to know what benefits there are, aside from pride of construction and ownership, if I should decide to make one.

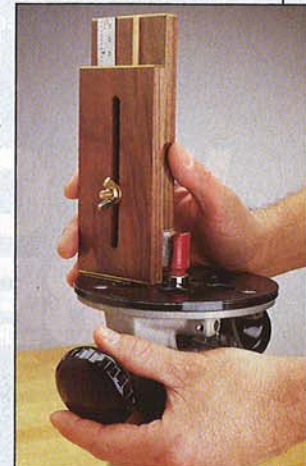
David Baker, Halfway, Ore.

Guilty as charged, David. Sometimes we focus so hard on getting the instructions right, we take a project's virtues for granted. But this tool is as useful as it is beautiful, so we'll welcome the chance to sing its praises.

Marking joinery layout ranks as the primary purpose of the tool. The offset of the sliding top automatically registers on the steel rule inlaid in the base. This feature lets you set the gauge, position the base against the edge or end of a board, and lay out

the location of a mortise (photo below left), a tenon shoulder, or the depth of a dovetail. The wide body allows you to mark most joinery details without moving the tool, and if you have to move it, the brass plate keeps it sliding smoothly along the edge of the workpiece.

The tool also doubles as a depth-of-cut gauge for setting router bits (photo below right), and quickly registers a board's thickness if you're planing stock to a custom dimension. These are the basics, but you can certainly experiment. Let us know if you find other uses! 🌲



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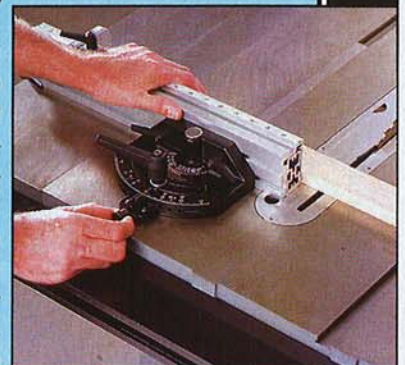
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Figure Dust-Collection Needs

By the Numbers

Is it finally time to tackle the dust problem in your shop? Don't gamble by guessing on duct sizes and airflow. These basic calculations will tell you what flow capacity you need, what size ductwork that calls for, and how much static pressure loss your dust collector must overcome to work effectively.

Worksheet 1 DUST-COLLECTOR REQUIREMENTS

You'll determine these two values and write them in as you work through the article. Then when you shop for a dust collector, compare these figures with manufacturers's specifications to find a machine that meets your needs.

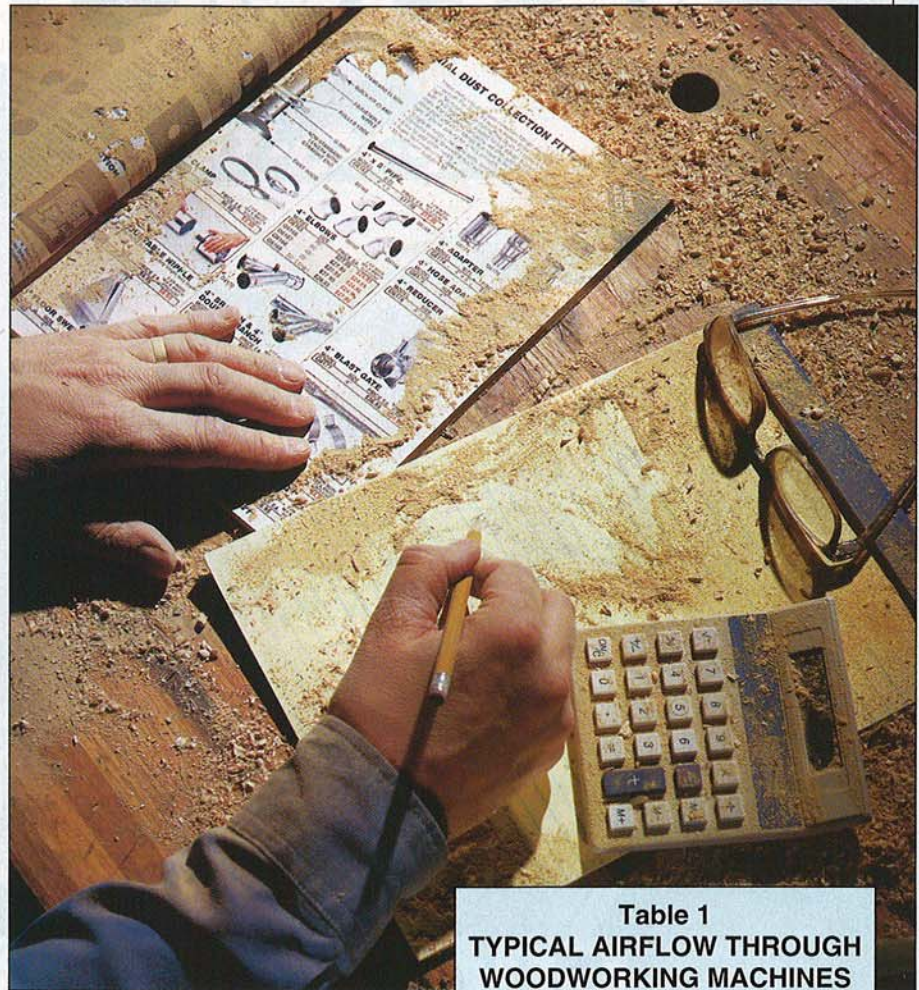
CFM: _____
Static Pressure Loss: _____

You'll need to know the amount of air flowing in your system

Start by determining what the maximum airflow through the system will be. To do this, list the tools that you'll connect to the system. Beside each one, jot down the dust-collection airflow it requires in cubic feet per minute (CFM). You can come up with this figure several ways:

- Look it up in the tool manual. (Not all manuals specify it.)
- Use the typical airflow values shown in *Table 1*.
- Figure the flow based on the size (thus, the flow capacity) of the tool's built-in dust-collection port. You can do this using one of these methods:

- For a round port, measure the diameter. Then, select the corresponding CFM value from *Table 2*.



- For a rectangular port, calculate the area (multiply length times width, in inches). Then, multiply that area times 28 to find the approximate flow in CFM @ 4,000 feet per minute (FPM).

The single largest CFM figure on your list represents the maximum airflow your dust-collection system will have to support. (This assumes that airflow from each machine can be shut off with a blast gate. If you will have more than one machine operating at once or if a single blast gate serves more than one machine, add together the figures for those machines to find the maximum flow.) Enter this CFM figure on *Worksheet 1*.

Continued on page 18

**Table 1
TYPICAL AIRFLOW THROUGH
WOODWORKING MACHINES**

<u>Machine</u>	<u>CFM</u>
Circular saw	350
Includes tablesaw, radial-arm saw, and mitersaw	
Bandsaw	350
Belt sander, up to 6"	440
Belt sander, 7-9"	550
Disc sander, up to 12"	350
Disc sander, 13-18"	440
Drum sander	
Up to 200 square inches of sanding surface	350
201-400 square inches of sanding surface	550
Jointer, up to 6"	350
Jointer, 7-12"	440
Thickness planer, up to 13"	400
Thickness planer, 14-20"	785
Router, table-mounted	195
Shaper	350
Lathe	350

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Continued from page 16



Figure Dust-Collection Needs

Next, find the diameter for your system's main and branch ducts

The speed of air movement through a dust-collection system is critical. For systems carrying woodshop dust and chips, engineers recommend *minimum air velocity of 4,000 FPM in branch lines (that's about a 45 mph breeze) and 3,500 FPM in the main duct.* The speed of the air moving in the system may exceed these figures, but shouldn't fall below them. Maintaining the velocity at or above the minimum value ensures that dust and chips will remain in suspension as the air flows through the system.

Velocity of an airflow depends on duct size. Here's how to find the right main duct diameter for your system:

① Find the value on *Table 2* under CFM @ 4,000 FPM that's nearest to—but less than—your system's maximum flow, which is the CFM figure you entered on *Worksheet 1*. (We're using 4,000 FPM for main and branch ducts for simplicity.)

② Read to the left on the table to find the duct diameter that corresponds to that flow.

Say, for example, your largest airflow is 440 CFM for an 8" jointer. The nearest lower figure, in the CFM @ 4,000 FPM column of the chart is 350, which indicates a 4" duct.

Resist the temptation to step up to a larger duct in hopes of improving flow. At the same flow, a larger duct will reduce air velocity, perhaps enough to diminish performance.

For example, 440 CFM of air flows through a 4" duct at around 5,000 FPM. In a 5" pipe, velocity for the same flow is only 3,200 FPM—lower than recommended. If the velocity drops low enough, the result will be a system that won't transport dust and chips at all.

Determine duct diameters for the system's branch lines in the same way. Treat each one separately.

duct/port size	FPM
2"	90
2½"	140
3"	195
4"	350
5"	550
6"	785

Determine the static pressure loss in the system's ductwork

The final step in setting up your system is to calculate static pressure loss (SP loss). This figure represents the friction between the duct wall and air moving in the ductwork, friction that the blower must overcome to make air move through the system.

Figure each branch separately. Start by measuring the length of the branch duct in feet. Count the number of 90° and 45° bends in it. Where a branch enters the main duct through a 45° wye, count the wye as a 45° bend for the branch.

Then, prepare a *Duct SP Loss worksheet* like the one shown *below* for each branch. Find values for the equivalent length of bends in *Table 3*.

rigid duct length (ft.)	_____
+	
flex hose length (ft.) × 3	_____
+	
number of 45° bends	_____
×	
equivalent length each =	_____
+	
number of 90° bends	_____
×	
equivalent length each =	_____
=	
Total effective length	_____
×	
SP Loss per foot (from Table 3)	_____
=	
SP loss for duct	_____

Now, taking each branch duct separately, figure the static pressure loss for the portion of the *main* duct that runs from the point where that branch enters it to the dust collector, using the *Worksheet 2* format. Add this figure to the branch duct's SP loss to find the total SP loss from the tool to the dust collector, as *below*.

SP loss for branch duct	_____
+	
SP loss for main duct, from branch entry to dust collector	_____
=	
Total SP loss	_____

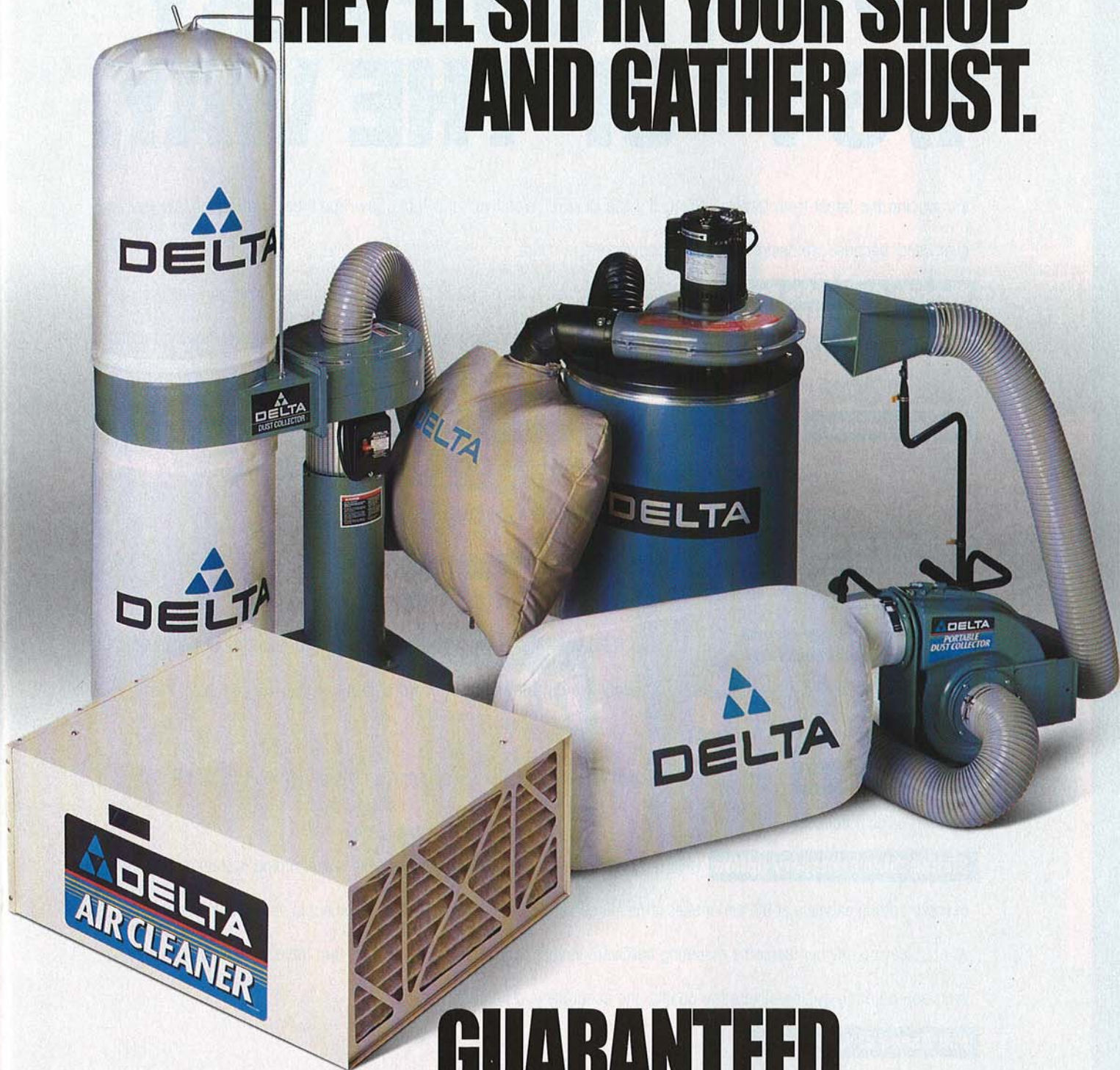
The *largest* value you calculate for your system then represents the static pressure loss your dust collector must be able to overcome. Enter this figure on *Worksheet 1*.

Worksheet 1 now shows the maximum CFM flow and static pressure loss for your system. To power your system, you'll need a dust collector that meets or exceeds both figures. ♣

Dia.	Equivalent length of bends		SP loss per foot
	45°	90°	
2"	1.5'	3'	.15
2½"	2'	4'	.11
3"	2.5'	5'	.10
4"	3'	6'	.07
5"	4.5'	9'	.055
6"	6'	12'	.045

Photograph: Hetherington Photography

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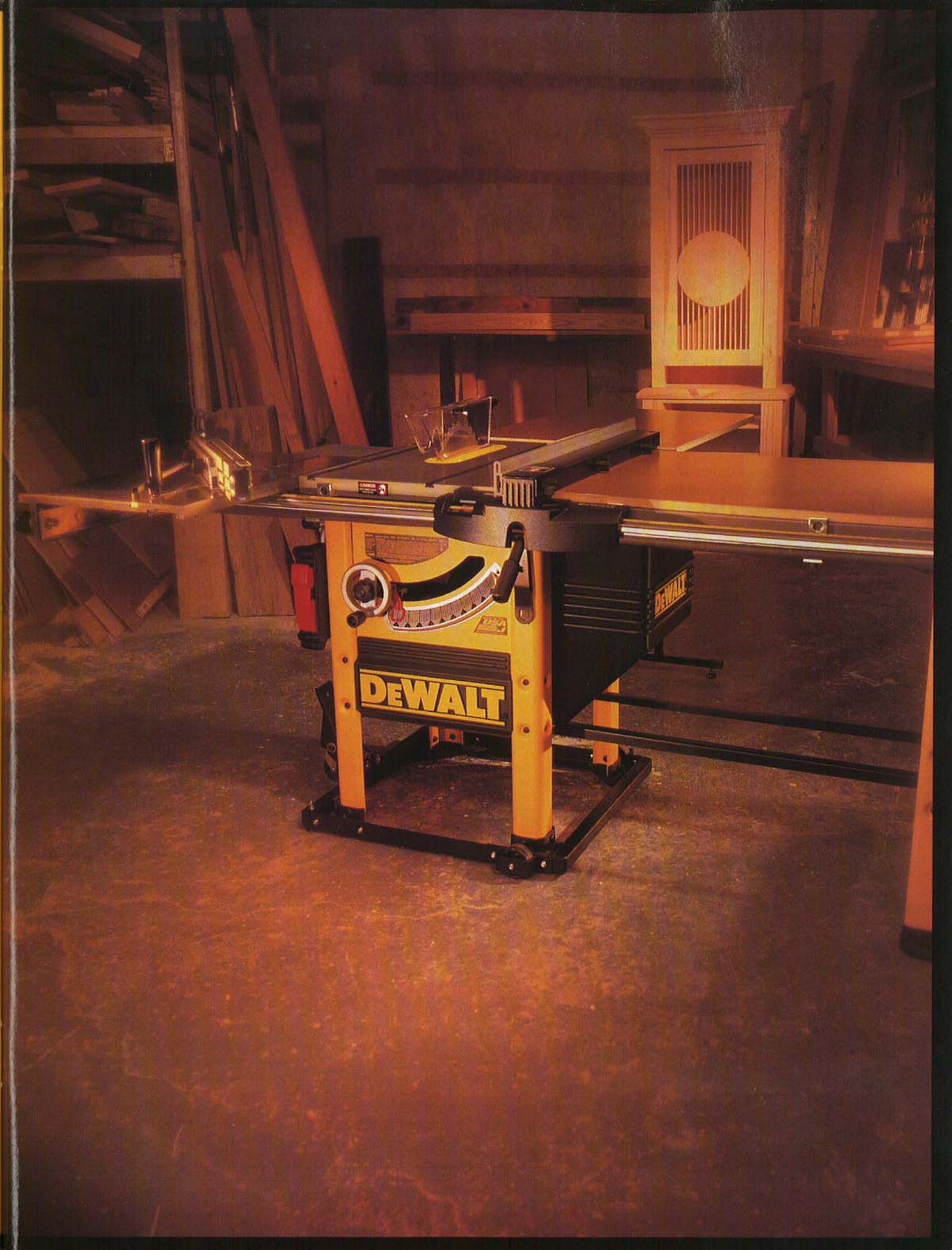
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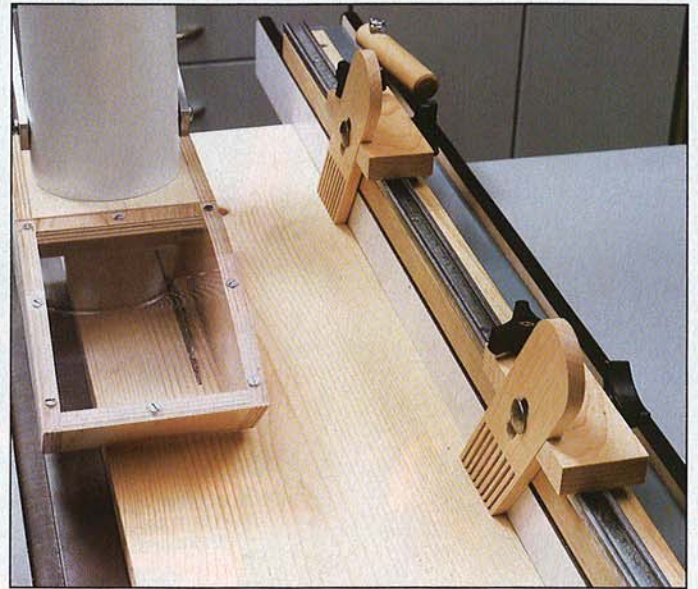
TABLESAW HOLD-DOWNS

Boards of feather work wonders together

When we designed the table saw dust-collection hood (page 66) for Idea Shop™ 2000, we knew we also had to replace the saw's anti-kickback pawls built into the original blade guard. Whether you build our hood or leave your saw's guard intact, you'll appreciate the additional stock control and safety provided by this feather board system.

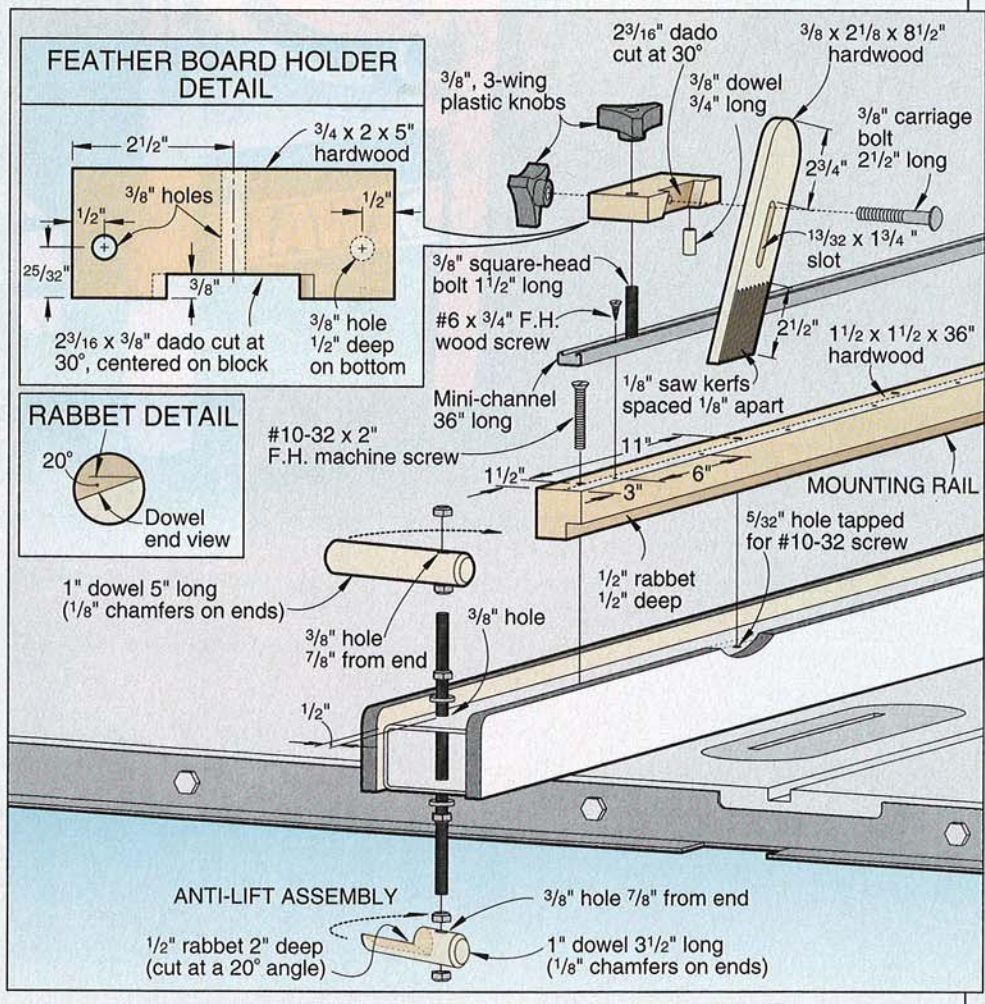
Build a pair of feather board assemblies using the drawing below right as a guide, and attach the mini-channel to the mounting rail (which you may need to modify slightly to suit your fence). Align the mounting rail flush with your fence's face, drill pilot holes in the rail where shown, and mark their locations on the top of the fence. Drill and tap a hole to accept a #10-32 machine screw at each mark, then attach the rail assembly to the fence.

If your fence locks down at the back of the table, you won't need to add the anti-lift assembly shown in the drawings. However, a fence that locks only at the front will raise at the rear without this mechanism. To cut the 20° rabbet, rip the dowel 2" down its center. Lay the dowel on your drill press table, oriented as shown in the Rabbet Detail drawing, and bore the 3/8" hole to accept the threaded rod.



Buying guide.

Hardware. Knobs, square-head channel-bolts, and mini-channel for a pair of feather boards. Kit no. TS-FB, \$15.95 ppd. in U.S. (add \$2.85 for three additional knobs to fit the dust-collection hood). Schlabaugh and Sons Woodworking, 720 14th St., Kalona, IA 52247. Call 800/346-9663 to order.



Project Design: James R. Downing,
Charles I. Hedlund
Illustrations: Roxanne LeMoine
Photograph: Steve Uzzell



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Fumes, Fires, Sawdust, and Kickback

A potpourri of sound safety advice for common concerns

Many woodworkers share their garage workshop with an automobile, a power mower, chainsaw, and possibly other internal-combustion tools and equipment. That means there's gasoline around—and the danger of fire.

The Consumer Products Safety Commission estimates that 25,000 to 30,000 fires are caused each year by flammable vapors, such as from gasoline. But just because you share a shop with gasoline doesn't automatically make you a probable statistic.

The problem with gasoline

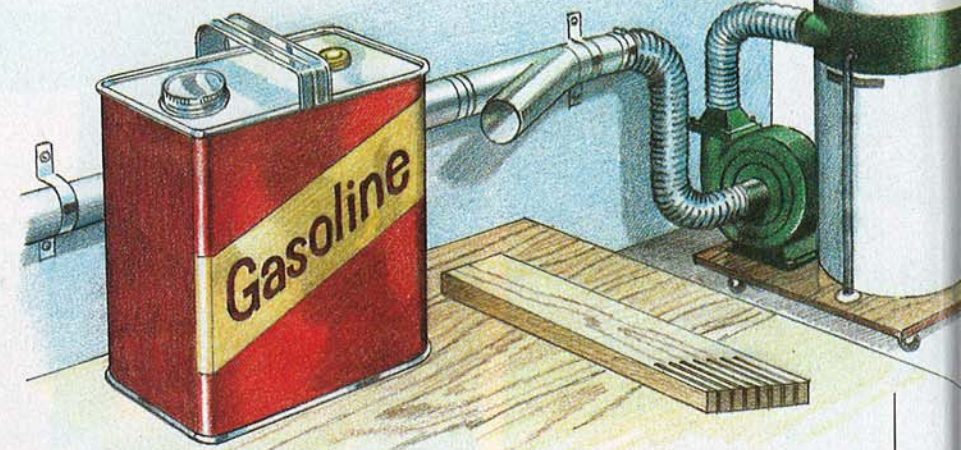
Sure, gasoline fumes smell strong. They're also highly flammable as well as invisible. But did you know that fumes from gasoline are heavier than air? Because of that weight, they sink through the air to the floor like water running downhill.

Fumes don't always stay low, though. You can stir them up just by walking into a room. And the fumes can rise all the way to the ceiling before they settle again. Either on the floor or in an unsettled state in the air, it's possible they'll ignite from a glowing ember, high heat, open flame, or spark.

Of course, you can avoid catastrophe. First of all, *always* store gasoline in a sealable container intended for that use. It doesn't matter if it's metal or plastic (never glass), just so you can keep it tightly sealed. Then, place that container away from a heat source or flame, such as a furnace, electric heater, or gas water heater. This advice also applies to gasoline-powered tools and equipment. Keep their gas tanks fully closed and store them properly.

Scared by static discharge

A recent posting to the internet discussion group at WOOD ONLINE® (www.woodmagazine.com) brought up what was to me an all-new safety



concern. The internet contributor was corresponding about the discharge of static electricity from an ungrounded dust-collection system. Although basically harmless, according to this cyber woodworker, a static discharge could startle you enough to result in injury from the power tool you might be using. And that's a point well taken.

With dust collectors of the type used in home shops, an explosion caused by static discharge shouldn't be something you spend sleepless nights worrying about. If you do, ground your system. After all, safety should make you comfortable and confident in your shop.

On this same subject, WOOD® magazine reader Scott Graham of Devon, Pennsylvania, put a new spin on the sawdust-collection question in a letter. He wanted to know how to hook up his metal grinder to his dust collector yet keep sparks from getting into the sawdust.

Frankly, there isn't a foolproof way to do it. And those metal particles fresh off the grinder would be hot enough to cause ignition. So don't even think about it. Glowing

embers belong in the fireplace, not in your sawdust!

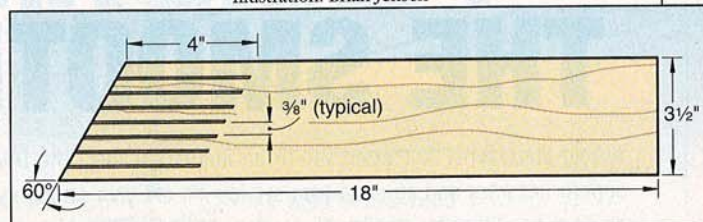
Feather boards fight kickback

Whenever woodworkers gather, the subject of kickback always seems to come up. A recent discussion I tuned in on was about using feather boards. I discussed their kickback-detering use in issue #104, March 1998. Then, though, I didn't tell how to make them, so here goes:

To make a feather board, start with clear, straight-grained, 3/4"-thick wood (yellow poplar or pine work fine). Particleboard, plywood, or warped wood won't do.

The width and length of a feather board can vary according to your needs, but I've found that a general-purpose size measures 3 1/2" wide by 18" long. Use the drawing below for a pattern. Cut the kerfs on your bandsaw or scrollsaw. ♣

Drawing: Lorna Johnson
Illustration: Brian Jensen



"Where Safety Begins" is written by Mike Gilliland, a safety consultant and lifelong woodworker. If you have a safety-related question, send it with an SASE to: The Safety Man, WOOD Magazine, 1716 Locust St., GA310, Des Moines, IA 50309-3023. Not all questions asked will be published, but all will receive a personal reply.

THE BEST TOOL IN THE JOINT.

DEWALT DW682K HEAVY-DUTY PLATE JOINER



Precision

Dual rack-and-pinion fence ensures blade and fence are always parallel

Fast and Accurate Settings

Integral one piece fence is adjustable and tilts 0° to 90°

Quick Outside Registration Setting

45° locating notch in fence allows indexing off the outside surface of a mitered joint

Rapid Biscuit Size Setting

Preset depth stops for all common biscuit sizes

Accurate Cuts

Retractable anti-slip pins help hold work in place

Power

6.5 amp motor with 10,000 rpm

Only the DeWalt DW682K Heavy-Duty Plate Joiner makes it easy to construct a variety of accurate joints. The dual rack-and-pinion fence control guarantees precise vertical adjustments and precise fence alignments. And, for making cuts at any angle, the integral, adjustable fence tilts from 0° to 90°, then locks in place for unparalleled accuracy. Flush cuts can be made at 0° without removing the fence. Together, these

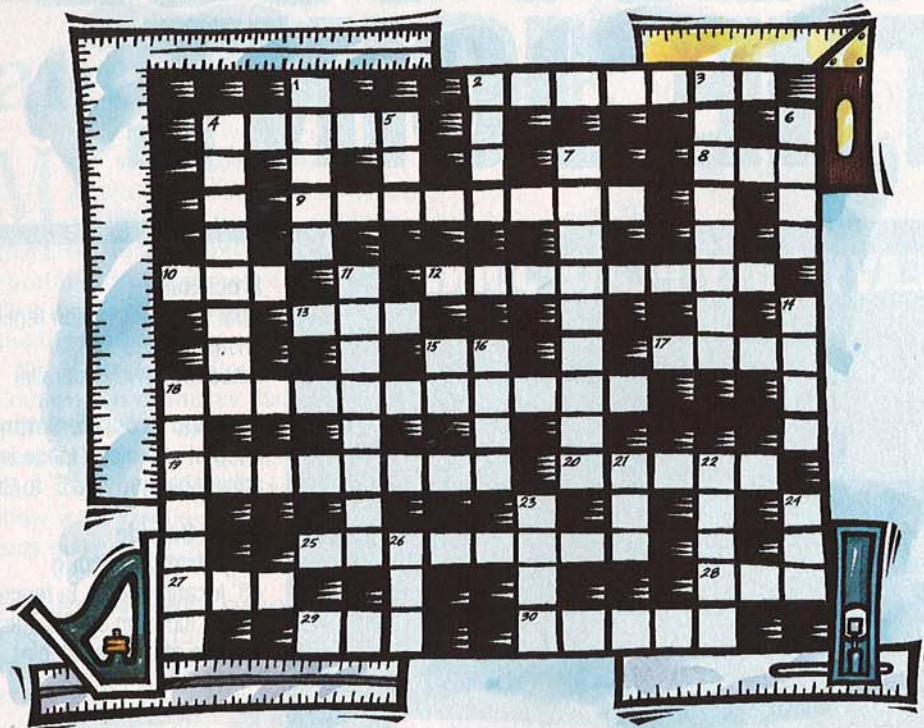
features ensure accurate joints every time. The DeWalt plate joiner is also easy to use and control, thanks in part to the ergonomically designed barrel grip and the extra-wide paddle switch. Because it's so versatile, it can be positioned on the inside or the outside face of a mitered joint. For precision that can't be beat, choose DeWalt. It's built into every one of our plate joiners. Guaranteed Tough.™

For more information, call 1-800-4 DEWALT
or visit our web site at www.dewalt.com.

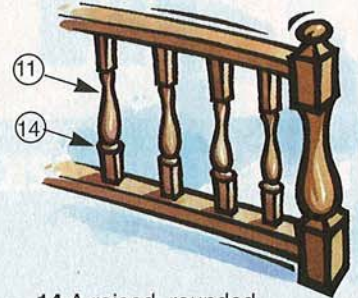
DEWALT
High Performance Industrial Tools

WORKSHOP PUZZLER

Here's a fair, square test of your woodworking vocabulary



11 A vertical pillar, sometimes turned, that supports a handrail.



14 A raised, rounded decorative feature.

15 To be effective, a finish for outdoor projects must protect against these rays.

16 A square fillet to separate molding features, or the paper reminder you take when shopping for supplies.

18 A durable, fast-curing finish, clear or pigmented, that came into widespread use during the 1920s.

21 The timber of Old Ironsides and Arts and Crafts furniture.

22 The widest part of an annual growth ring is sometimes called _____ wood.

23 Hollow part of a molding.

24 Send a good one to WOOD® magazine, and you can earn \$75 or more.

26 Tough grain to work. 🌲

Across

2 This may never touch wood, but it belongs in a woodshop—unless you like working with dull tools.

4 Redwood suitable for many outdoor projects bears this grade mark.

8 Belly up to this kind of clamp for wide glue-ups.

9 Having to do with trees.

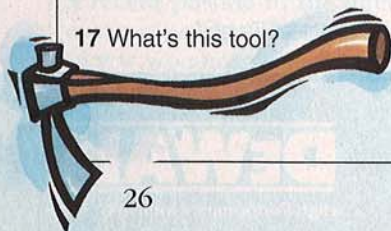
10 The square at the top right corner of the puzzle.

12 A term for battery-powered tools.

13 Shallow carvings are said to be in _____ relief.

15 These two letters ordinarily appear in a circle on a power-tool nameplate.

17 What's this tool?



18 This hardest and heaviest of woods self-lubricates when used as a bearing.

19 The village smithy once stood under one of these mighty trees. Then, early in this century, a fungus all but wiped out the genus (*Castanea*) in America.

20 A solid, cylindrical reinforcement for a joint.

25 Intricately cut-out pieces.

27 The state tree of Massachusetts and North Dakota, genus *Ulmus*.

28 One part lays over another in this type of joint.

29 A software program for drawing up project plans on the computer.

30 The black heartwood from any of several hundred species of the genus *Diospyros* goes by this name.

Down

1 From around the Adriatic Sea comes this favored material for pipe bowls.

2 A toothed wheel that transmits power.

3 This kind of molding resembles a carved piece, but isn't.

4 Yankee Doodle could have named this carving tool, identifiable by its three outside-beveled edges.

5 The middle of a disc, where an axle attaches or passes through.

6 A slender nail with a small head, often used to attach moldings or stops.

7 Sheet goods made from pressed wood fiber, sometimes perforated.



ANSWERS:
ACROSS
2 GRINDER
4 MERCH
8 BAR
9 ARBOREAL
10 TRY
12 CONDLESS
13 BAS
15 UL
16 BEAD
17 ADZE
18 LIGNUM-VITAE
19 CHESTNUT
20 DOWEL
21 CHESTNUT
22 EARLY
23 FRETWORK
25 ELM
26 END
27 LAP
28 TIP
29 CAD
30 EBONY

DOWN:
1 BRIAR
2 GEAR
3 EMBOSSED
4 MACARONI
5 HUB
6 BRAD
7 HARDBOARD
11 BALUSTER
14 BEAD
15 UV
16 LIST
18 LACQUER
21 OAK (white)
22 EARLY
23 FRETWORK
25 FRETWORK
27 ELM
28 TIP
29 CAD
30 EBONY

THE PERFECT EDGE.

DEWALT HEAVY-DUTY ROUTERS



DW625

Heavy-Duty 3 HP
VS Electronic Plunge Router



DW610

Heavy-Duty 1-1/2 HP Router



DW621

Heavy-Duty 2 HP
Electronic Plunge Router

DW621

95% Dust Collection

Exclusive, built-in, dust extraction column attaches to standard shop vacuum

Quality Finish

Electronic Variable Speed (8,000 - 24,000 rpm) for constant speed under load

Fast and Accurate

Depth Setting

Rack and Pinion microfine depth adjustment starting at 1/256"

Versatility

Converts from fixed base to plunge with the lock-down knob

Control

Rubber-coated knobs have built-in plunge-lock and on/off switch

Durability

100% Ball Bearing Construction

Power

2 Horsepower Motor

Capacity

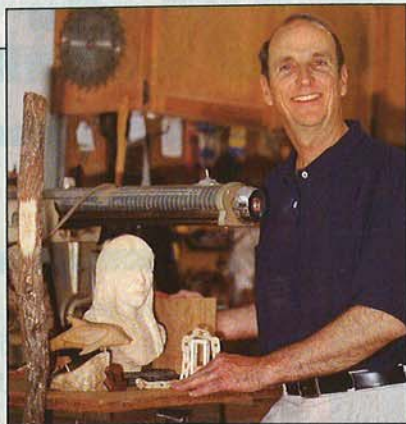
Accepts 1/4" and 1/2" collets

The DeWALT Heavy Duty Routers deliver accuracy, durability, power and the most innovative features available. For example, the DW621 includes the industry's first built-in dust collection system. It can also convert from a fixed base to a plunge router with the twist of the left knob. The DeWALT line includes the DW625, which boasts 15 amps and a 3 horsepower motor.

Additionally, it contains phosphorous bronze guide bushings for a smooth and even plunge. Our fixed-base router, the DW610, won the 1998 Wood Magazine Editors' Choice Award and our Plunge Router, the DW621 won the American Woodworker's Editors' Choice Award for 1998. So get the best of all worlds, and get a DeWALT heavy-duty router. Guaranteed Tough™

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or visit our web site at www.dewalt.com.

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Top Shop Tip winner Wayne Allison proudly displays some of his favorite wood carvings.

Earlier in life, Wayne Allison was an engineer and a probation officer. But these days, he raises chickens near Long Branch, Texas, with help from wife Charlotte (an accomplished spinner and weaver) and Stonewall Jackson, their 30-year-old mule.

After the chores are done, Wayne likes to retreat to his shop for a little woodcarving. "It's the perfect hobby for me: I like working with wood, it doesn't require a lot of materials, and I heal fast," he deadpans. Although Wayne's world recently moved into a spacious new 25x30' shop, his formerly cramped quarters inspired this issue's Top Shop Tip *at right*.

Big ideas come from small places, and if you have a space-saving (or time- or money-saving) tip your fellow woodworkers might benefit from, send it to us. We pay \$75 for each one we print, and the person who sends in the best tip also wins a tool worth over \$250. Send your idea, along with a drawing or photo and your daytime phone number, to:

Tips From Your Shop (And Ours)
WOOD® Magazine
 1716 Locust St., GA-310
 Des Moines, IA 50309-3023

Sorry, but we can't send back your submission. And, because we try to publish only original tips, please send your suggestions only to us. Thanks!

Dave Campbell
 GENERAL-INTEREST EDITOR

Stock-support blocks prevent a bench-clearing brawl

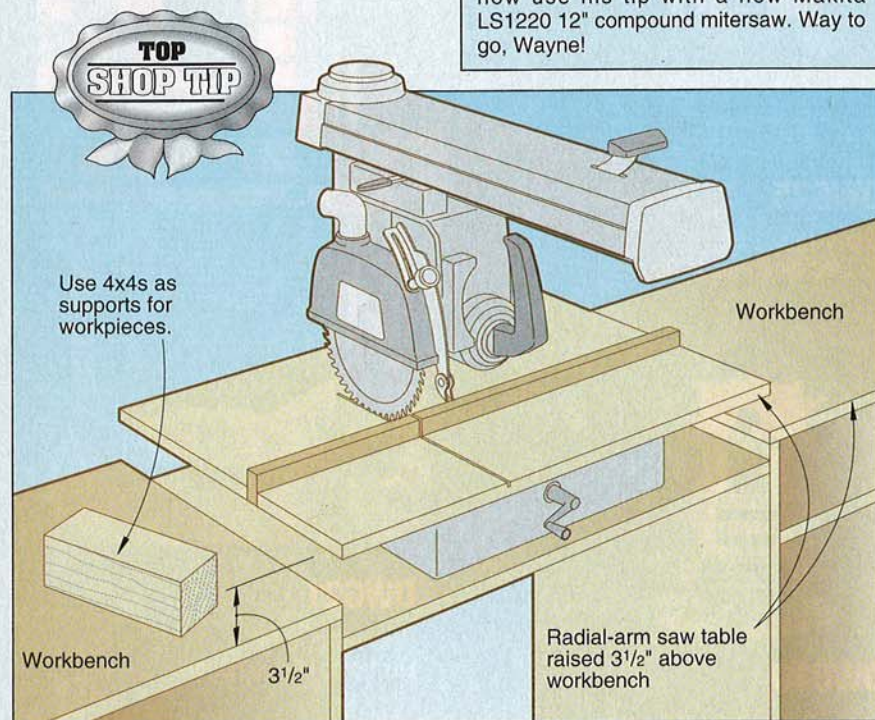
Long support tables for a radial-arm saw or mitersaw make cutting lengthy stock a breeze, but I couldn't dedicate one whole wall of my tiny shop to one tool. Forcing my workbench into double duty seemed to be the best idea, but I didn't want to move all the stuff off the bench every time I wanted to make a cut.

So, instead of setting the saw base flush with the benchtop, I raised it 3½" higher. At that height, I can slip a short length of 4x4 under each end of my workpiece and not have to clear the entire bench.

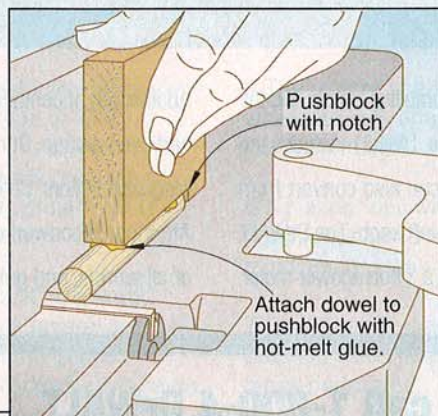
—Wayne Allison, Long Branch, Texas



Top Shop Tip winner Wayne Allison can now use his tip with a new Makita LS1220 12" compound mitersaw. Way to go, Wayne!



Yet another way to make round things flat



When making doll furniture, I occasionally need to flatten one side of a dowel (to make a decorative beading, for example). Rather than trying to split it on my bandsaw, I hot-glue the dowel to an L-shaped pushblock made from ¾" stock, as shown *at left*. I then run both pieces through my jointer, keeping the face of the pushblock against the fence. I end up with a nice flat face with virtually no tearout.

—Bud Hadford, Atascadero, Calif.
 Continued on page 30

THE FASTEST FINEST FINISH.

DEWALT HEAVY-DUTY SANDERS



DW411

Heavy-Duty 1/4 Sheet
Palm Grip Sander



DW423

Heavy-Duty 5" Random Orbit Sander
With Electronic Variable Speed



DW431

Heavy-Duty 3" X 21" Electronic
Variable Speed Belt Sander



DW421

Heavy-Duty 5" Random Orbit Sander

DW421

Finest Finish

Patented, Controlled Finishing System maintains pad speed on or off of the material

3/32 orbit diameter provides tight orbital patterns

Reduce Vibration

Dual-Plane Counterbalance for more comfortable use

Fastest Finish 2.0-Amp

2.0-Amp motor with 12,000 orbits per minute

95% Dust Collection

Built-in dust extraction adapter attaches to standard shop vacuums

Durability

Dust sealed switch and 100% Sealed Ball Bearing Construction prevents dust contamination

The DeWALT Heavy-Duty Sanders were designed to produce the fastest, finest finishes possible on all kinds of materials. Take the DW421 Heavy-Duty 5" Random Orbit Sander, which features the patented DeWALT Controlled Finishing System to maintain pad speed and virtually eliminate gouging. Its 2.0-Amp motor provides maximum sanding speed while being extremely comfortable to use. And, features like the dust-sealed switch, contribute to longer tool life. If greater control

is needed, there's the DW423 Electronic Variable Speed sander (7,000 to 12,000 opm). The electronic variable speed keeps the sander running at a constant speed under load. For fine finishes, the DW411 palm grip sander has a 2.0-Amp motor with 13,500 opm. And for faster removal, the DW431 Belt Sander provides a compact and lightweight unit for sanding vertical surfaces or tight spaces. So choose the best sander for the job. Choose DeWALT. Guaranteed Tough.™

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Continued from page 28

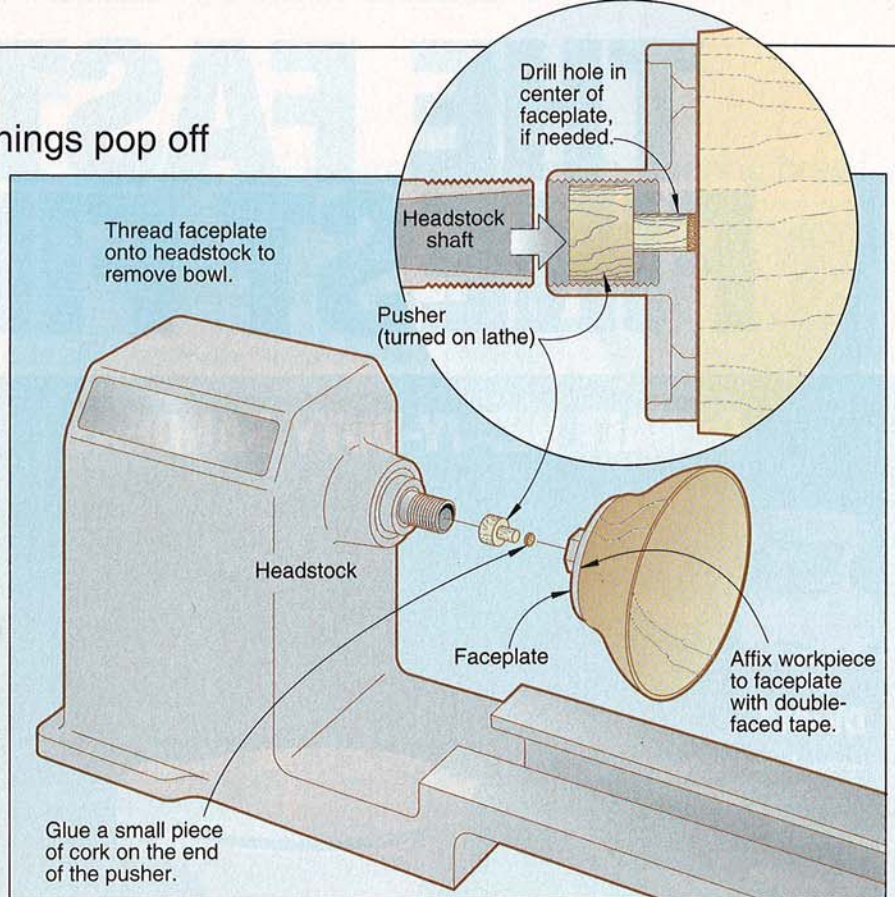
Pusher makes taped-on turnings pop off

Many woodturners use double-faced tape to attach a workpiece to the lathe's faceplate. But sometimes the adhesive works a little too well, and efforts to separate the two result in a damaged workpiece. Before you turn your next project, fashion a "pusher" that fits just between the threads of the faceplate on one end and inside a hole drilled in the center of your faceplate on the other, as shown *at right*.

To remove a well-adhered workpiece, remove the faceplate from your lathe. Insert the pusher in the plate hole and remount the plate, threading it slowly. For an unfinished piece with a thin bottom, you can drizzle a little lacquer thinner in the joint to weaken the tape's hold.

If you allow a few seconds between each small turn, you'll hear the tape letting go as the dowel forces the workpiece off. To prevent scarring the turning, I put a piece of cork on the business end.

—Wally Dickerman, Green Valley, Ariz.



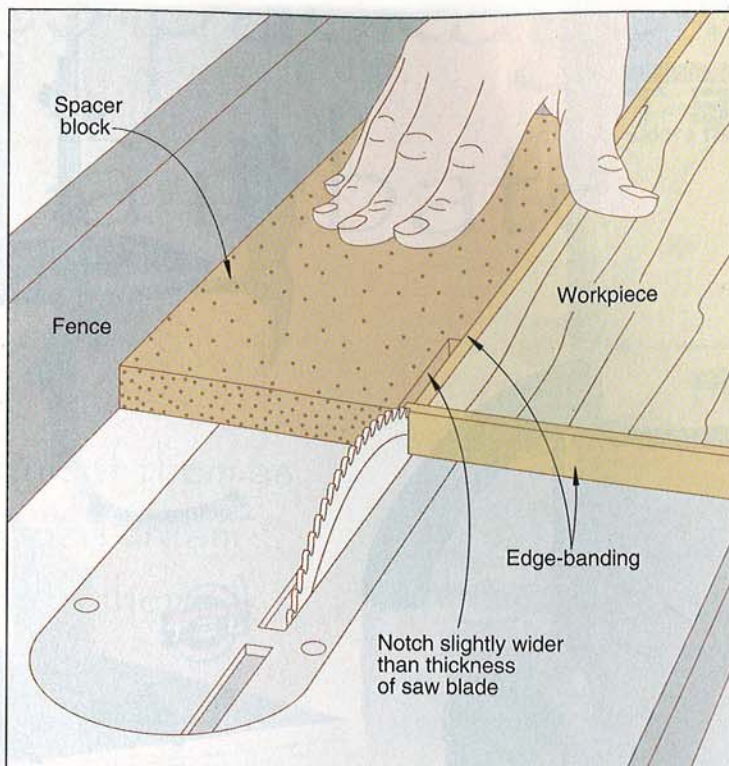
Clean up edge banding using your tablesaw

When edge-banding plywood with solid stock, completing the corner joints can be a nuisance. Cutting off the jutting excess banding with a hand-saw can leave scars, and sanding seems to take forever. Here's a way to quickly clean up that excess with a minimum of elbow grease and scarring.

Make the opposite edges of a scrapwood spacer block parallel to each other. (The exact width of the piece doesn't matter, but a few inches is all you'll need.) Now, set up your tablesaw fence to remove just a whisker more than the blade's width from the end of one edge, so it looks like the block shown in the drawing *at right*.

Without moving the fence, lay your spacer block against the fence and a piece of scrap against the spacer block, and push both a couple of inches into the blade. If the scrap makes contact with the blade, move the fence a tiny bit closer to the blade. Finally, set aside your test scrap, replace it with your edge-banded workpiece, and run the banding through the saw as shown. Touch up the end of the joint with a sanding block.

—*Chuck Hedlund, WOOD® magazine shop manager*



Continued on page 34

Pike Noyes
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Both left- and right-tilt
XACTA SAW™ with table and legs.
Now \$1,299* after \$100 mfr. rebate
Total Package Savings*
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*Manufacturer's suggested retail price after mail-in rebate. "Total Package Savings" reflects savings on accessories after manufacturer's mail-in rebate.

accessories package ... and a rebate?

(Think of them as
whipped cream ...
and a cherry.)



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For a limited time, we're packaging
our best-selling woodworking tools
with the accessories you want,
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at savings of up to 71 percent!

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Now \$1,099* after \$100 mfr. rebate

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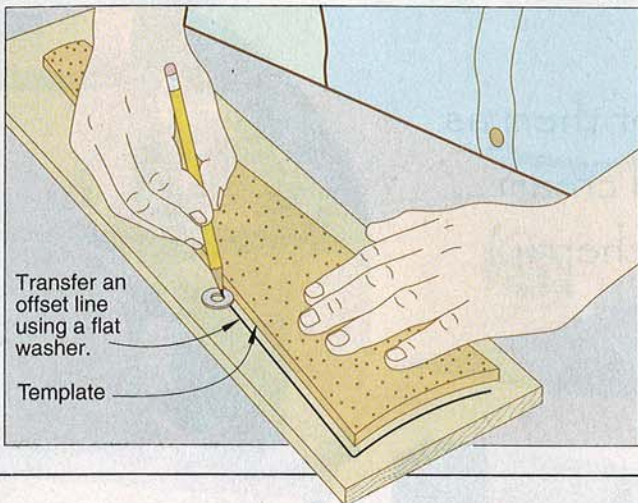
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 31

Template and washer team up and draw a blank

When cutting blanks for template routing, I like to cut them about $\frac{1}{8}$ " larger all the way around, then trim them to exact size with a pattern bit. Instead of tracing directly around the template and trying to cut outside the line, I "enlarge" the template slightly while I trace it, as shown *below*. Then, after bandsawing all the rough pieces, I stack them and stick them together with cloth-backed double-faced tape, tape the template on top, and rout them all to finished size.

—Chuck Hedlund, WOOD® magazine shop manager



Stop banging on finish lids!

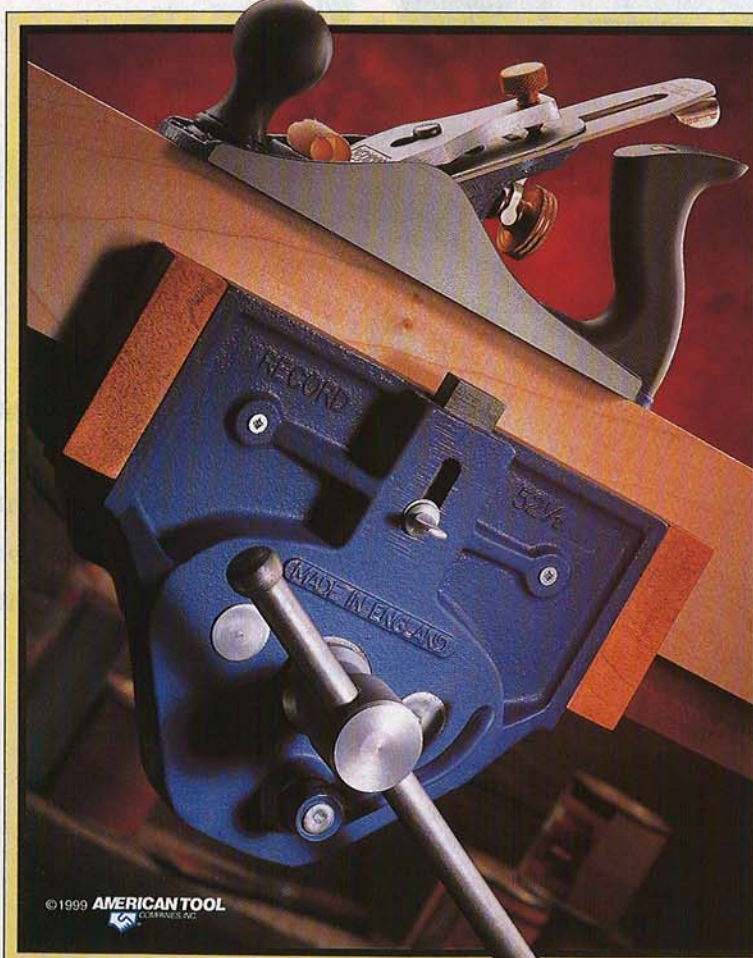
Putting the lid back on a can of stain or finish with a hammer not only makes the container harder to open next time, it also knocks debris down into the can, contaminating the finish. Instead of reaching for the mallet, grab a scrap of wood and a bar clamp. Position the can, clamp, and scrap as shown, then tighten the clamp until the lid seals.

—Jim Downing, WOOD® magazine senior design editor



A FEW MORE TIPS FROM OUR WOODWORKING PROS

- You can make dowels to match your project, even in tricky-to-turn, highly figured woods. Learn how we did it for the quilt rack project on *page 52*.
- The wheel-raising mechanism in our mitersaw center can be adapted for just about any mobile base or cabinet. You'll find building instructions in the article starting on *page 60*.
- To drill a centered hole straight into a ball, try a trick we used in building the alarm clock on *page 80*. You'll find it in *Step 5* at the bottom right of that page. 🌲



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Five-dollar flocker puts on a fast, fuzzy finish

On occasion, I like to finish the inside of a wooden box with a nice flocked finish. But I don't do it often enough to justify spending \$50 or more for a specialized spray gun. Woodcraft's Mini Flocker performs well for about one tenth that price.

At first glance, this product looks like a kid's telescope with one cardboard tube fitting snugly inside another. To use it, pull out the inner tube, fill it about halfway with flocking fibers, then slip it back inside the outer tube. After applying color-matched undercoat adhesive to your project, it's just a matter of pointing the Mini Flocker and pumping out the fine flocking. The flocking fibers and adhesive will set you back another \$16 or so, but will cover about 15 square feet.

I had to keep the applicator pretty level with my bench to get good results—when held nose-down, it



clogged quickly. I also found that shaking or turning the Mini Flocker from time to time helped prevent the flocking from clumping up inside. All in all, the process is easy and results in a professional-looking job.

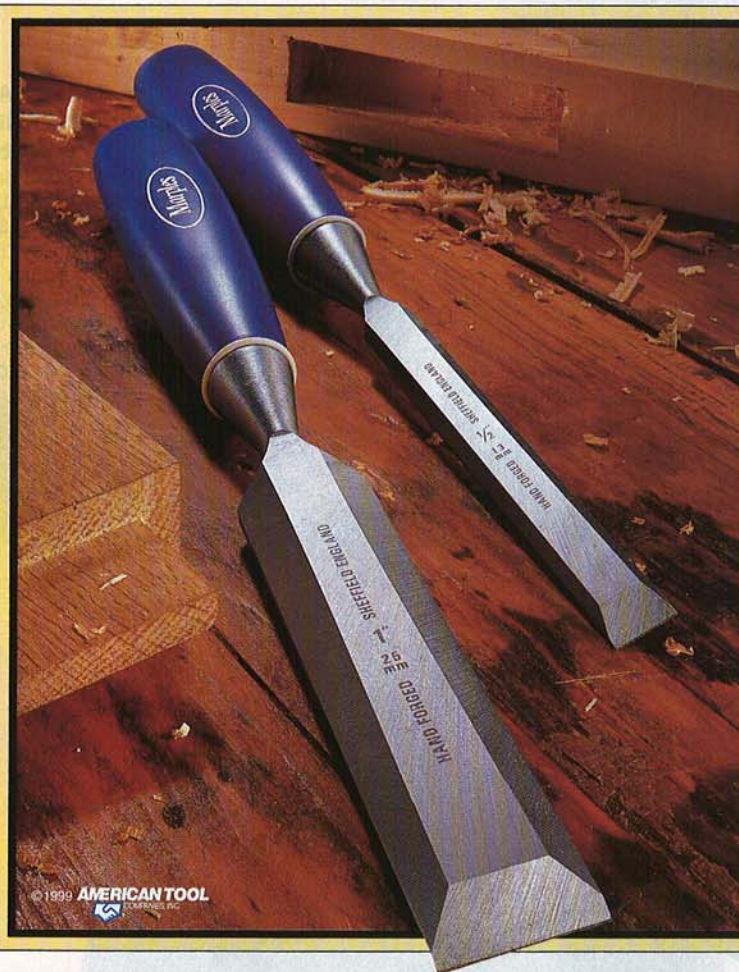
—Tested by Larry Johnston

PRODUCT SCORECARD

Mini Flocker (product no. 127115)

Performance	★ ★ ★ ★ ☆
Price	Flocker, \$5; adhesive, \$8 for 8 oz.; fibers, \$8 for 3 oz.
Value	★ ★ ★ ★ ★
Available from Woodcraft Supply, 800/225-1153, or order online at www.woodcraft.com .	

Continued on page 38



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Craftsman power management in the workshop

The Craftsman Automatic Power switch is a 3-outlet power source that allows you to operate a power tool and two accessories such as a wet/dry vac & worklight at the same time. Plug a power tool into the top outlet and accessories into the two bottom outlets. When the power tool is turned on, it simultaneously activates the accessories. It's rated at 110 volts and can be plugged into any standard household outlet.



STEP OVER TO A ROUTER TABLE RIGHT ON YOUR TABLE SAW!

Craftsman router table extension attaches right on your table saw, saving you time and footsteps. Make a cut on the saw then switch over to route the edge, all in one location. Ideal for trim work & molding, plus, it adds versatility to your saw.

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The Good Life at a Great Price. Guaranteed.

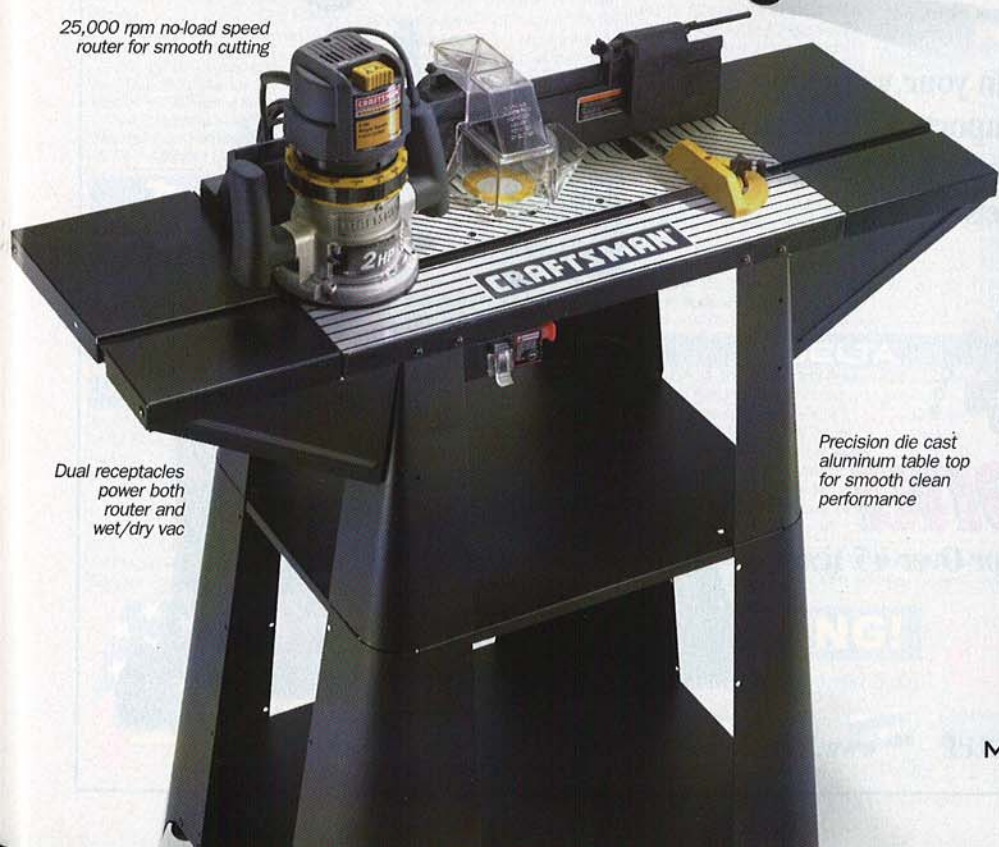


Solid cast-iron body with solid cast-iron extension wings provide a large supporting workspace

ROOM TO GROW!
Our largest capacity 10-in. table saw has a 30-in. right and 24-in. left self-aligning rip fence. Controls are easier to reach and adjust. Expect accurate rips every time.

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Craftsman router table with extensions provides over 570 sq. in. of smooth surface that won't scratch your work. A multi-functional fence has a clear guard and special jointer fence for cutting straight edges.

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Continued from page 35

Tough tape measure stops just short of bulletproof

To improve on the old standby tape measure, you have to go to some effort. Left-reading? Been there. Digital? Done that. Fine improvements all, but what I really want is a tape that takes a licking and comes back for more. The Ultralife tape may well be the one.

I tortured the tape in my tests, tying the blade in knots, bending and straightening it, even sanding right on the numbers with 120-grit paper. And, though you'd never mistake it for brand new, the Ultralife survived admirably.

So what makes this tape so tough? Rather than just paint on a steel tape, U.S. Tape has jacketed the blade in a clear nylon extrusion that protects it. I tried the sandpaper test on an ordinary blade in my shop, and in less than a minute, I saw shiny steel; it took several minutes of sanding on the Ultralife before I finally got down to the paint.



PRODUCT SCORECARD

Ultralife measuring tape

Performance ★ ★ ★ ★ ☆

Price \$10-13 for a 25' tape

Value ★ ★ ★ ★ ★

Call U.S. Tape at 800/472-8273.

Although I did break the blade when I folded it back on itself and pinched the crease, it took lesser bends in stride, leaving only a small ripple in each edge when straightened. Also adding to the Ultralife's durability is a rubber blade-wiper that

sweeps debris off the blade before it retreats into the case.

You'll find the Ultralife in hardware stores and home centers. U.S. Tape also makes them for Home Depot, sold under the Husky brand name. ♣

—Tested by Dave Henderson

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RYB ZRWDS1600 Factory Reconditioned 16/32" Drum Sander ... \$429.00
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NEW! 920001N 5/8 - 2" Brad Nailer w/case ... \$134.50
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PC0701 A9 Palm Nailer ... \$159.00

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7800P Drywall Sander ... \$358.00
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SALE PRICE ... \$119.90

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DRILL DOCTOR
Sharpen drills almost as easily you sharpen pencils.
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FLG-622-322 HVLP Suction Gun \$159.95
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ADJUSTABLE CLAMP COMPANY

"Jorgensen" "Pony"
#ACC 50 Pony Clamp Fixture Style 50 ... \$8.85
STYLE "J" JORGENSEN ADJUSTABLE HANDSCREW

Item#	Jaw Length Overall	Max Opening	Reach, middle	Spindle to Jaw	SALE
#ACC 3/0	6"	3"	3"	3"	\$9.75
#ACC 2/0	7"	3-1/2"	3-1/2"	3-1/2"	\$10.45
#ACC 0	8"	4-1/2"	4"	4"	\$11.65
#ACC 1	10"	6"	5"	5"	\$13.35
#ACC 2	12"	8-1/2"	6"	6"	\$15.30
#ACC 3	14"	10"	7"	7"	\$19.35

STYLE 7200 JORGENSEN STEEL "I" BAR CLAMPS

Item#	Max. Opening	Normal Load Limit	SALE
#ACC 7224	24"	7000 lbs.	\$20.45
#ACC 7236	30"	7000 lbs.	\$21.95
#ACC 7248	48"	7000 lbs.	\$24.10
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How Powerful Should Your Cordless Drill Be? Consider This.

We readily admit that a 9.6-volt drill will handily perform nearly all wood-working tasks. But, because of higher run times, torque, and speeds, 12-volt models have pushed 9.6-volters out of the marketplace limelight. That's why we elected to test 12-volters in the article starting on *page 72*.

Of course, you pay a little more for each step up in voltage, and you add some weight, too. In the case of the Makita 9.6-, 12-, 14.4-, and 18-volt models shown at *right*, the respective weights are: 4, 4.3, 4.5, and 5.7 pounds. As you can see, the size of the drills—except for the battery packs—doesn't change until you get to the 18-volt model, which features heavy-duty construction. Price-wise, these drills (outfitted with 2.0-Ah batteries) come in at about \$140, \$170, \$210, and \$260.

So why spend the extra money and put up with the added weight of the



Drills become more powerful, but also heavier, with every move up in voltage.

14.4- and 18-volt models? If you frequently make large holes with spade bits and hole saws, or drive lag screws, one of these big boys may make sense for you. A 12-volt drill can perform these tough tasks, but its motor and battery will heat up excessively, shortening their lives. Also, if

you think you'll ever need a cordless circular saw or reciprocating saw, such tools work best with the highest-voltage batteries. It makes sense to buy cordless tools of only one voltage and brand because you'll need just one charger for batteries that interchange between tools. ♣

When you buy a machine you also buy the company selling the machine. Torben Helshoj, President of Laguna Tools understands the American Woodworker, because he is one. Torben knows firsthand the hard work that goes into every piece of furniture. Having the best tools makes a difference.

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Free Demonstration Video Available



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reinforced by durable die cast construction, it's so tough we back it with a lifetime warranty against material and manufacturing defects.

Ah, but it has more than just brawn. Like our exclusive Repeat-A-Cut™ fence to save time and aggravation on multiple same length cuts. Or the patented Bevel Stop Bypass, to ease set-ups when corners and walls aren't perfect 45°s and 90°s (aren't they all!). And the high visibility miter/bevel indicators and Sof-Touch™ handles to help you zero in precisely and comfortably on your workpiece target. Make sure the RIDGID Miter Saw is in your arsenal. Anything less will leave you, well, unprotected.



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Make your own Raised Panel Cabinet Doors



with your 1/4" or 1/2" Router, or your 1/2" or 3/4" Shaper.

Plus make many other types of doors and projects:

- Flat Panel Doors • Kitchen Cabinet Doors
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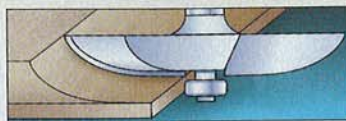
It's simple, inexpensive, and easy with professional production quality MLCS carbide tipped door sets! Sets include Combination Rail and Stile bit, Raised Panel bit plus instructions, professional tips and techniques.

Raised Panel Door Sets *Ball bearing included

SET#	BIT STYLE	LRG. DIA.	SET PRICE
#1301	1/4" Shank Router	*2"	\$69.95
#1302	1/2" Shank Router	* 3-1/2"	\$79.95
#1303	1/2" & 3/4" Shaper	4-5/8"	\$99.95

Raised Panel Door Instructional Video

#1438 Special Sale Price\$9.95



*Raised Panel Router Bit



*Combination Rail & Stile Bit

The NEW Merle Clamp now features pivoting jaws that adjust to any angle!

The new flexible jaw inserts are made of non-marring high impact ABS plastic and are easily removed. The NEW dual pivot feature allows the Merle to clamp virtually any size or shape securely! 23 ft. of steel banding included.

WOOD Product Scorecard	
Merle Clamp, Editors Choice, Winter '97	
Performance	★★★★
Value	★★★★

- Clamp circles, ovals, rectangles, and with additional corners (see below*) 5, 6, 7, 8 or more sides.
- Ideal for clamping drawers, doors, picture frames, boxes, cabinets, etc. Holds firmly in square.
- Adjustable, uniform clamping pressure on all sides
- Durable cast aluminum and steel construction
- Clamps as small as 2-5/8" x 2-5/8" to 69" x 69", or 23' around, but can be extended to any length by using standard 3/8" steel banding or strapping.

Merle Clamp and 23 ft. of steel banding
#1439 REG. \$39.95SALE \$26⁹⁵

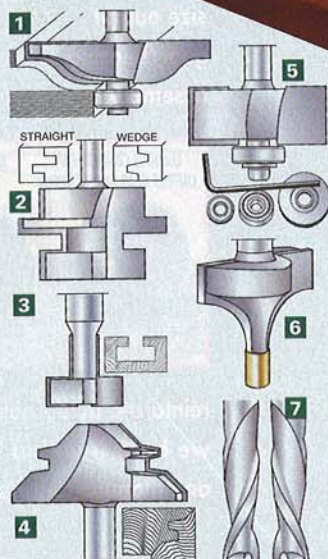
*4 Additional Aluminum Corners and Jaw Inserts
#1440 Set of 4SALE \$14⁹⁵



1/4" Shank Carbide Tipped Router Bits

Professional Production Quality!

- OGEE RAISED PANEL**
#1423 2" Large Diameter\$29.95
- TONGUE AND GROOVE**
#1333 Straight\$29.00
#1335 Wedge.....\$29.00
- T-SLOT CUTTER**
#1305 3/4" lrg. dia, 3/8" sm. dia. ..\$17.00
- LOCK MITRE BIT**
#1433 2" Dia., For 1/2"-3/4" Stock ..\$37.50
- RABBETING KIT**
4 depth of cuts: 3/8", 7/16", 5/16", 1/4". Set: 1/4" shank rabbeting bit, 4 bearings & hex key.
#1425 1-1/4" Large Diameter.....\$25.00
- BRASS PILOTTED BIT SET**
Rout into tight spaces and sharp corners. These bits have Brass Pilots, measuring only 5/32" in dia., instead of usual 1/2" bearing.
#1441 1/8", 1/4", 3/8" Round Over ..\$44.95
- SOLID CARBIDE UPCUT AND DOWNCUT SET**
Upcut spiral ideal for mortise and tenon joints. Downcut will plunge cut and plane edges.
#1437 1/4" dia., 3/4" cutting length
Special Set Price\$19.95



Solid Brass Router Inlay Kit

Follow template of almost any shape to make the recess. Fits Porter Cable, Black & Decker or any router with Porter Cable bushings adapter. Includes 1/8" solid carbide downcut spiral bit, brass bushing, brass template guide, brass retainer nut & instructions.



ITEM #1426 REG. \$35.95.....SALE \$21⁹⁵

16 pc. Forstner Bit Set

High Quality Steel for heavy use

- Sizes: 1/4", 3/8", 1/2", 5/8", 3/4", 7/8", 1", 1-1/8", 1-1/4", 1-3/8", 1-1/2", 1-5/8", 1-3/4", 1-7/8", 2", 2-1/8".



ITEM #1418 REG. \$141.20.....SALE \$43⁹⁵

Round Over-Beading Bit Set

1/4" shank, Carbide Tipped, 4 Round Over Bits with 1/2" OD bearing: (1/8", 1/4", 3/8", 1/2"), plus 3/8"OD bearing and allen wrench.



ITEM #1434 \$72 IndividuallySALE \$39⁹⁵

Biscuit Joining Set

5/32" Slot Cutter-1/4" Shank and 250 #20 Biscuits



Instruction sheet included.

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Wood on the Move

Even the driest wood can change shape due to moisture, no matter what you do to it. But you can learn what to expect.

Where you'll find the water

Wood remains dimensionally stable if its moisture content is above the *fiber saturation point* (FSP). The FSP is the condition where the wood's cell walls are completely wet, but the cavities within the cell walls are dry. If the wood loses moisture from the cell walls, it shrinks. If the cell walls gain moisture, the wood swells.

What shrinkage does to wood

Woodworkers call the change in shape of a piece of wood *warp*. And it takes several common forms, all of which distort the wood.

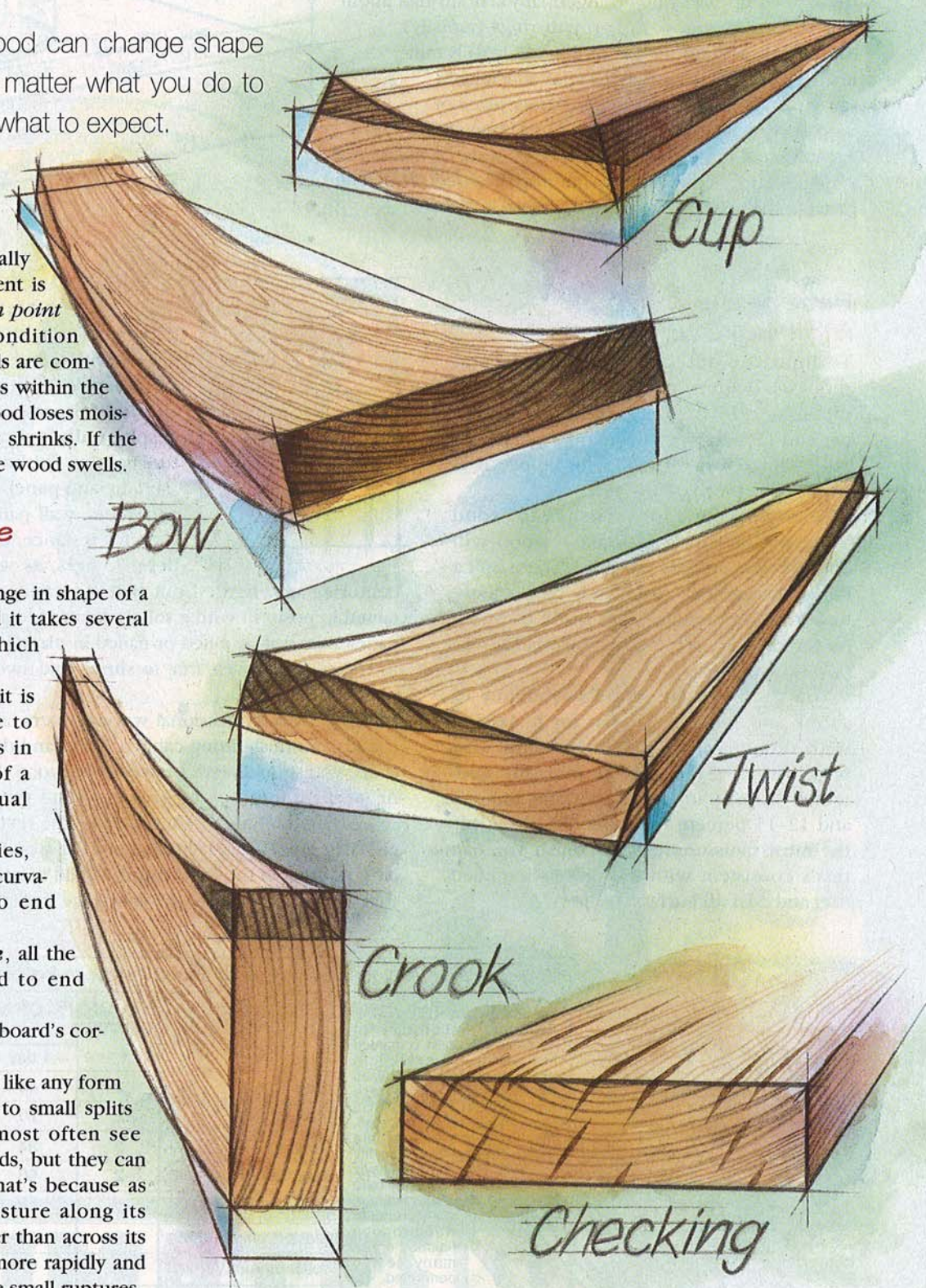
A board has **cup** when it is no longer flat from edge to edge. Cup always occurs in the opposite direction of a flatsawn board's annual growth rings.

Bow, as its name implies, describes the lengthwise curvature of a board—end to end along its face.

When a board has **crook**, all the curvature runs from end to end along its edge.

Twist means that all of a board's corners won't lie equally flat.

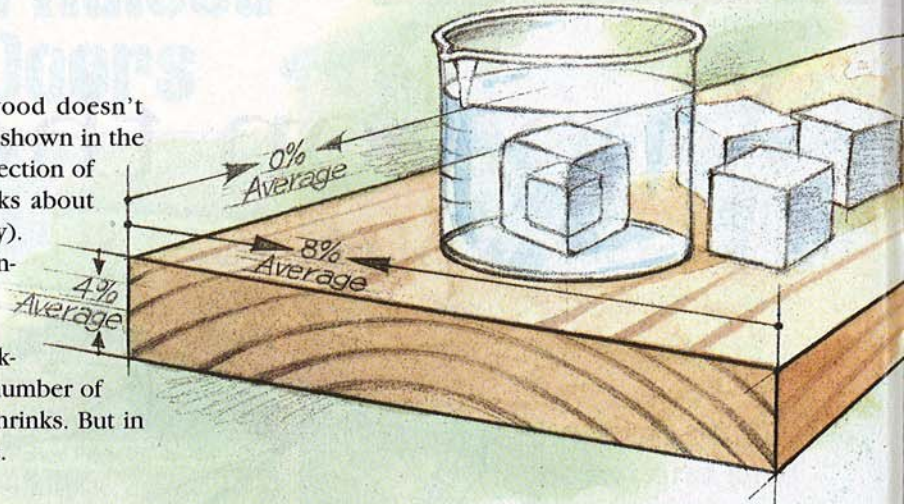
Although not a distortion like any form of warp, **checking** refers to small splits along the grain. You'll most often see checks in the ends of boards, but they can occur on surfaces, too. That's because as wood dries, it loses moisture along its length about 10 times faster than across its width. So end grain dries more rapidly and shrinks faster, causing these small ruptures.



Continued

How wood shrinks

Unlike a dissolving sugar cube, a block of wood doesn't behave the same in all directions as it shrinks. As shown in the illustration at right, wood shrinks most in the direction of the annual growth rings (tangentially). It shrinks about half that much across the growth rings (radially). And shrinkage with the grain (longitudinal) is minimal. The result: Combined radial and tangential shrinkage distorts the shape of any piece of wood because of the difference in the two shrinkage rates and the way the annual rings curve. A number of variables affect how and to what degree wood shrinks. But in general, the denser the wood, the more it shrinks.

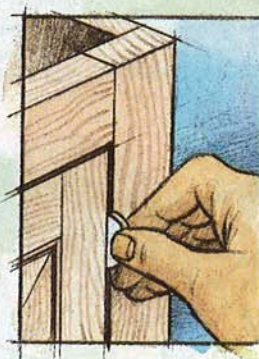


Finishes slow moisture absorption

To limit the defects caused by natural shrinkage of green wood, lumber producers preshrink it by carefully supervised seasoning and kiln-drying. They, and you, would rather have the wood shrink before it is made into a piece of furniture.

Woodworkers apply finishes to wood because—despite the drying—wood will both take on and lose moisture. There isn't a finish, though, that completely blocks moisture from re-entering things made of wood. As you can see in the chart, below, finishes only slow the process.

You can't change wood's tendency to shrink and swell; only plan for it. Design with dimensional change in mind. Use wood dried to the average moisture content it will see in use—8 percent indoors and 12-15 percent outdoors. Finally, apply the most moisture-resistant finish you can that's consistent with the piece's intended use, and coat all surfaces.

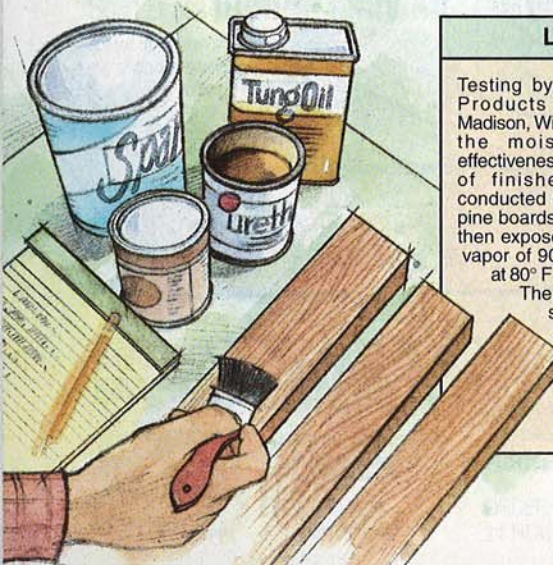


Take wood movement into account

Experience taught woodworkers of old how to deal with wood's dimensional changes due to moisture. The answer was joinery that allowed for seasonal wood movement. And despite today's super-strong glues and moisture-fighting finishes, that's still the answer.

Frame-and-panel construction for cabinet and doors, wall panels, and sections of furniture, for instance, didn't come about by accident. Joiners, as woodworkers were called centuries ago, figured out that a rectangular panel could be maintained in position with a solidly secured frame of wood. However, the panel must not be glued or nailed in place in the frame. Instead, it has to "float" in grooves, free to shrink and swell with changes in atmospheric moisture.

Today, some professional woodworkers talk about "nickel and dime reveals" on flush-fitting cabinet doors and drawers. These refer to the space you should leave between the wood that you expect will shrink or swell—the doors or drawers—and the carcass or frame of the piece. "If you build in winter, make the reveal the thickness of a nickel," they say. That leaves room for the wood to swell when the humidity goes up. On the other hand, "Build in summer, use a dime," means that you're allowing for the shrinkage that will come in winter.



Laboratory tests show finish effectiveness in keeping moisture out

Testing by the U.S. Forest Products Laboratory in Madison, Wisconsin, compared the moisture-excluding effectiveness of different types of finishes. Tests were conducted on dry Ponderosa pine boards that were coated, then exposed to the moisture vapor of 90 percent humidity at 80° F for from 1-14 days. The results listed here show how only the most common woodworking finishes of the many tested performed.

FINISH TYPE	NO. OF COATS	% OF MOISTURE-EXCLUDING EFFECTIVENESS		
		1 day	7 days	14 days
Tung Oil	2	46	2	0
Lacquer	2	70	22	8
Shellac	2	84	43	20
Spar Varnish	2	80	36	15
Urethane Varnish	2	83	43	23
Gloss Enamel Paint	2	91	64	43
Polyurethane Varnish	2	90	66	46
Two-Part Epoxy	2	98	93	88

Illustrations: Brian Jensen

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Ideal for the finish carpenter on the move
Meters 47° left and 57° right; Bevels 0-45° left
Cuts 90 pieces of 6" crown molding on one charge
Weighs only 23.8 lbs. for easy job-site transport
High quality 40 tooth carbide-tipped blade

Ni-MH
30% Longer Run Time
Nickel-Metal Hydride



Externally accessible brushes allow job-site serviceability



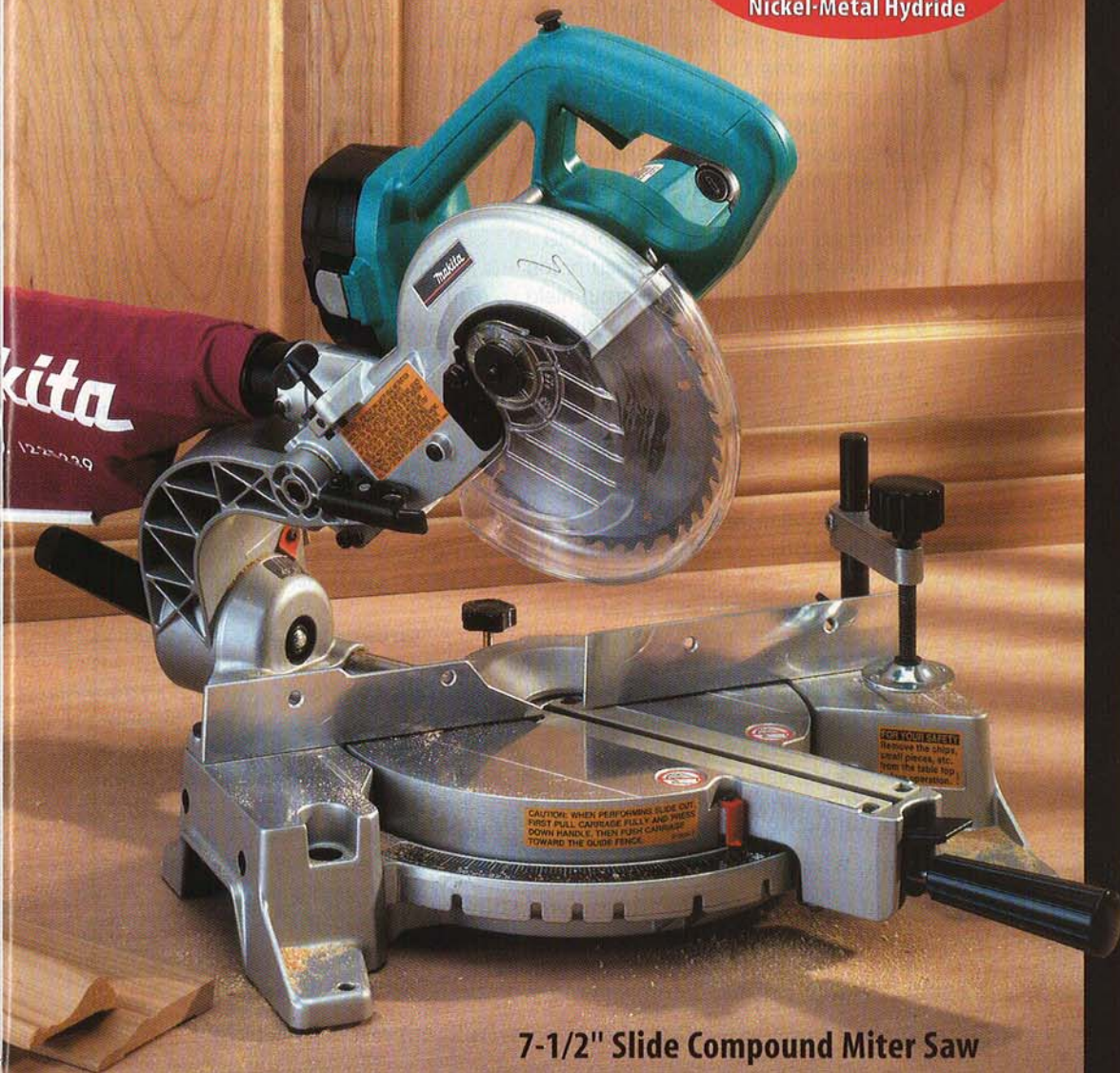
Linear ball bearings on each rail provide a smooth sliding action



Dual rail system for sturdy and precise performance



3" Base height allows user to set job-site extensions



7-1/2" Slide Compound Miter Saw

Circle No. 61

Bevel	Miter	0°	45°
0°		2" x 7-1/8"	2" x 5"
45°		1-3/8" x 7-1/8"	1-3/8" x 5"

Cutting Capacity

Model
LS711DWBEK

Kit includes (2) Ni-MH Batteries,
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What it takes to be Shaker

The first Shakers came to America from England in 1774. Following strict religious beliefs that separated them from the outside world, they recruited members to live and work in self-sufficient, communal settlements. By the early 1800s there were 18 Shaker communities in seven states.

Native wood from the forest

Shakers used local trees. Ash, basswood, birch, butternut, cherry, white pine, and sugar maple (especially figured) were common in New England settlements. Beech, chestnut, yellow poplar, and walnut were added in Kentucky and Ohio. Fruitwood (apple, pear, etc.) was used widely for pulls.

Finishes varied with the stock

Because several woods went into chests of drawers, cabinets, and tables, these types of furniture were painted. In the early 19th century the paint was opaque. Later, it was a wash through which the grain was visible with varnish as a top coat. Chairs and rockers made of only one kind of wood were varnished or shellacked after staining. Darker hardwoods, such as cherry, were finished with linseed oil.

Joinery that stayed together

The Shakers invented the tongue-and-groove cutting machine, so they employed it to edge-join boards. Splined grooves, butt joints, lap joints, through tenons (wedged and keyed), and dadoes for shelving were favorite joinery methods. Dovetails are the most observable construction feature. They were used for their strength and durability rather than for appearance.

Shakers became known in the world outside their settlements for excellence in whatever they grew or made, especially their furniture. In keeping with the Shakers' unadorned lifestyle, they built purely functional pieces devoid of ornamentation. Yet their furniture displayed delicately con-

structed, graceful lines, and sensitivity to proportion reminiscent of Danish modern or Scandinavian-style furniture of the 20th century.

The 1830s marked Shaker furniture's Golden Age. But they continued producing it, even commercially, into the early 20th century.

Details didn't decorate.

Shaker case goods featured drawers, usually combined with larger storage spaces covered by frame-and-panel doors. Except for a restrained top-edge molding in cove, quarter-round, or bull-nose shape, case goods were simple. They sat directly on the floor, had cut feet, or applied legs.

Side chairs, hung on wall pegs when not in use, were light and graceful with plain turned stiles, legs, and stretchers. Finials at the top of the stiles were intended as handles to lift the chair, not as decoration. The bottom of the back legs usually had turned tilters (early Shaker) that protected the floors. Later, tilters were commonly made of brass.

Rocking chairs had finials atop their stiles, too, or a plain crossbar on which to hang a pillow. On the top of the front arms were mushroom-shaped, wooden tenon covers. Chair and rocker seats featured woven wood splints, rush, leather, cane, and, after 1830, colorful cloth tape made on special looms.

Trestle tables were known for gracefully arched feet (on small tables, too). A raised stretcher beneath the top added leg room for seating comfort.

Illustrations: Brian Jensen



Shaker Reflections

Cherry classic with splined miter joints



Talk about luck! When I was researching the article on furnituremaker Thomas Moser for the August 1998 issue, I casually mentioned to him that we're always looking for great project designs. To my surprise, an hour or so later, he handed me shop drawings for this and several other beautifully designed Shaker pieces. We'll feature more of them in future issues.

Larry Clayton
Editor-In-Chief

Start with the basic mirror frame

1 From 1/2" stock (we used cherry), cut the mirror-frame stiles (A) and rails (B) to the sizes listed in the Bill of Materials plus 1" in length.

2 Fit your table-mounted router with a 1/8" round-over bit, and rout a round over along what will be the inside front edge of each stile and rail.

3 Fit your tablesaw with a dado blade, and cut a 5/8" rabbet 1/4" deep along what will be the back inside edge of each stile and rail.

4 Miter-cut the stiles (A) and rails (B) to finished length.

5 Glue and clamp the frame pieces (A, B) together, checking for tight miters and square corners.

Construct the jig and cut the splines

1 Construct the jig shown on the Spline-Cutting Jig drawing on the next page. Use glue to adhere the hardboard support to the 1 1/2" base piece. Do not use metal fasteners.

2 Fit your tablesaw with a 1/8" blade, and raise the blade 1 3/16" above the surface of the saw table.

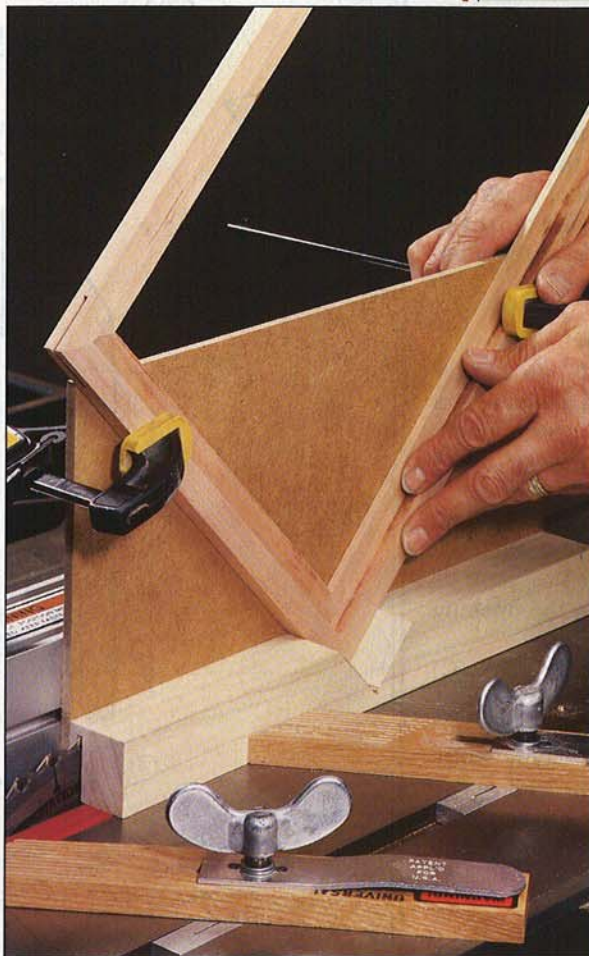
3 Position the jig on tablesaw, and locate the fence so the blade cuts into the base 3/16" from the inside face of the support. Place a piece of 1/2" stock in the notch in the jig and make a test cut. The kerf needs to be centered in the stock. Now, as shown in the photo at right, clamp the mirror frame to the jig support, and cut a kerf in a corner of the mirror frame. Repeat for each corner of the frame.

4 Cut spline material from cherry stock to the same thickness as your tablesaw blade (1/8" in our case). Cut four splines measuring 1x2 1/4" each. Glue and clamp the splines into the

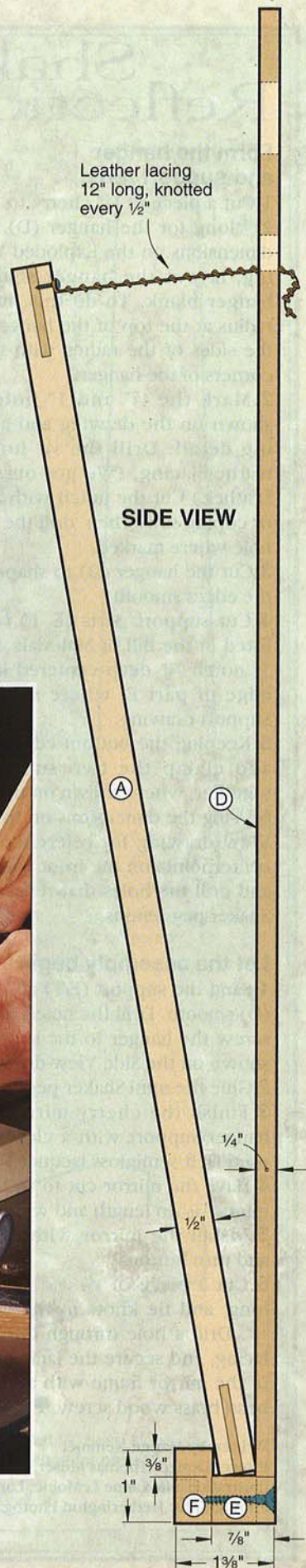
kerfs in the mirror frame. Tap the splines lightly so there's not a gap between the inside edge of the spline and the bottom of the angled kerf. Later, trim the splines flush with the edges of the mirror frame and sand the mirror frame smooth.

5 Cut the mirror back (C) to the size of the rabbeted opening minus 1/16" in length and width.

Continued



When kerfing the corners of the mirror frame, we used featherboards to hold the jig firmly against the rip fence.



Shaker Reflections

Form the hanger and support next

1 Cut a piece of $\frac{1}{4}$ " cherry to 5" wide by 21" long for the hanger (D). Using the dimensions on the Exploded View drawing, layout the hanger shape on the hanger blank. To do this, mark a $1\frac{1}{2}$ " radius at the top of the hanger. Connect the sides of the radius with the bottom corners of the hanger.

2 Mark the $\frac{1}{4}$ " and 1" holes, where shown on the drawing and accompanying detail. Drill the $\frac{1}{4}$ " hole for the leather lacing. (We got ours at Tandy Leather.) Cut the notch with a scrollsaw or coping saw. Then, drill the 1" hanging hole where marked.

3 Cut the hanger (D) to shape, and sand the edges smooth.

4 Cut support parts (E, F) to the sizes listed in the Bill of Materials. Then cut a 5" notch $\frac{1}{4}$ " deep centered in the back edge of part E, where shown on the Support drawing.

5 Keeping the bottom edges flush, glue and clamp the two support pieces together, where shown on the drawings.

6 Using the dimensions on the Exploded View drawing for reference, mark the centerpoints on the front edge of part F, and drill the holes that receive the mini-Shaker peg tenons.

Let the assembly begin

1 Sand the support (E/F) and the hanger (D) smooth. Drill the holes, and glue and screw the hanger to the support, where shown on the Side View drawing.

2 Glue the mini-Shaker pegs in place.

3 Finish the cherry mirror frame and hanger/support with a clear finish. (We used Deft semigloss lacquer.)

4 Have the mirror cut to fit the opening minus $\frac{1}{16}$ " in length and width.

5 Install the mirror with the back (C) and turn buttons.

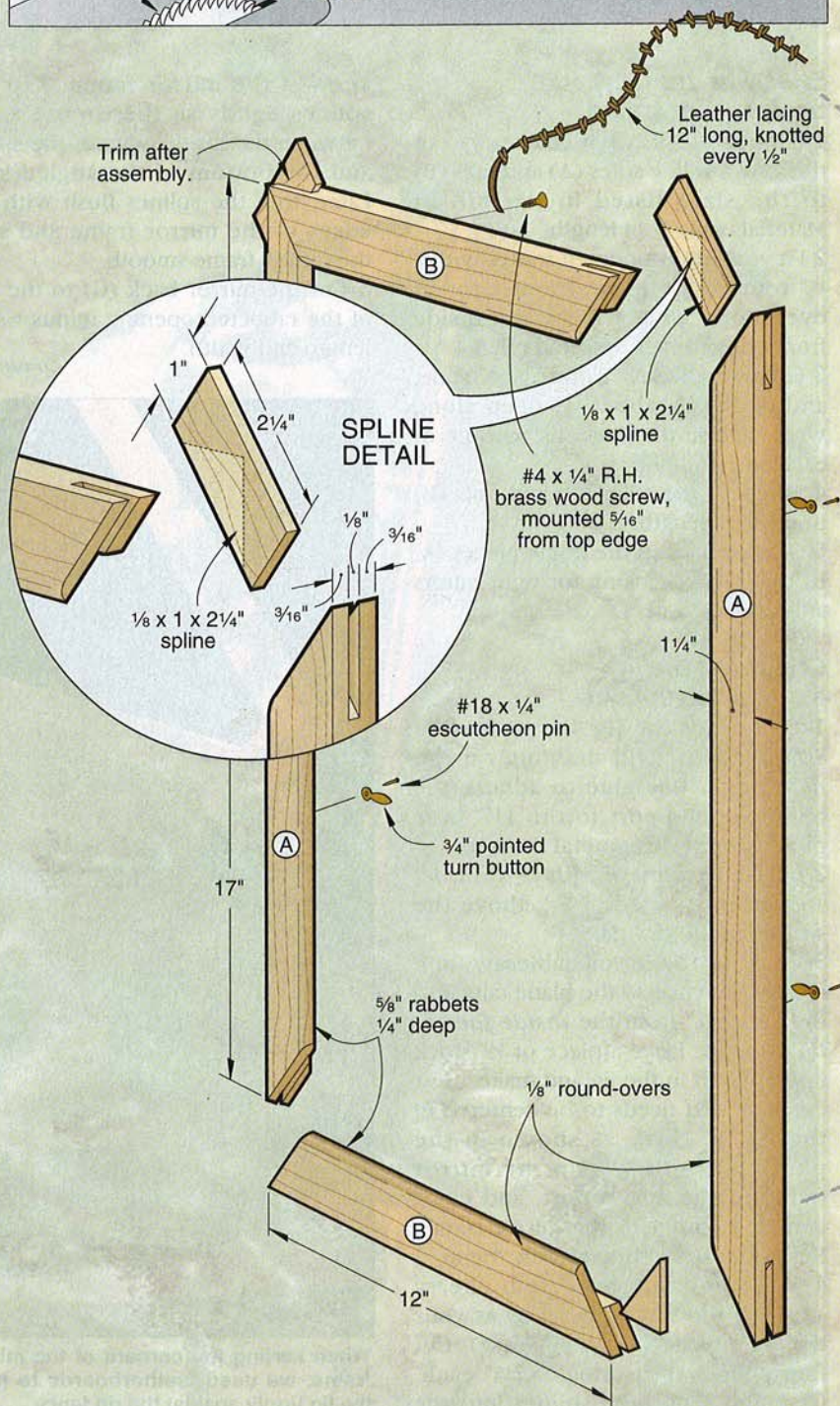
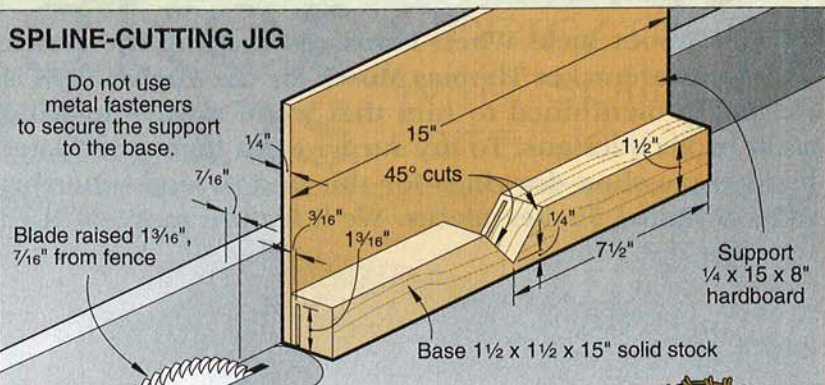
6 Cut a piece of $\frac{1}{32} \times \frac{3}{16}$ " leather to 12" long, and tie knots in the lacing every $\frac{1}{2}$ ". Drill a hole through one end of the lacing, and secure the lacing to the back of the mirror frame with a #4 x $\frac{1}{4}$ " round-head brass wood screw.

Written by Marlen Kemmet

Project Design: Thomas Moser

Illustrations: Roxanne LeMoine; Lorna Johnson

Photographs: Hetherington Photography



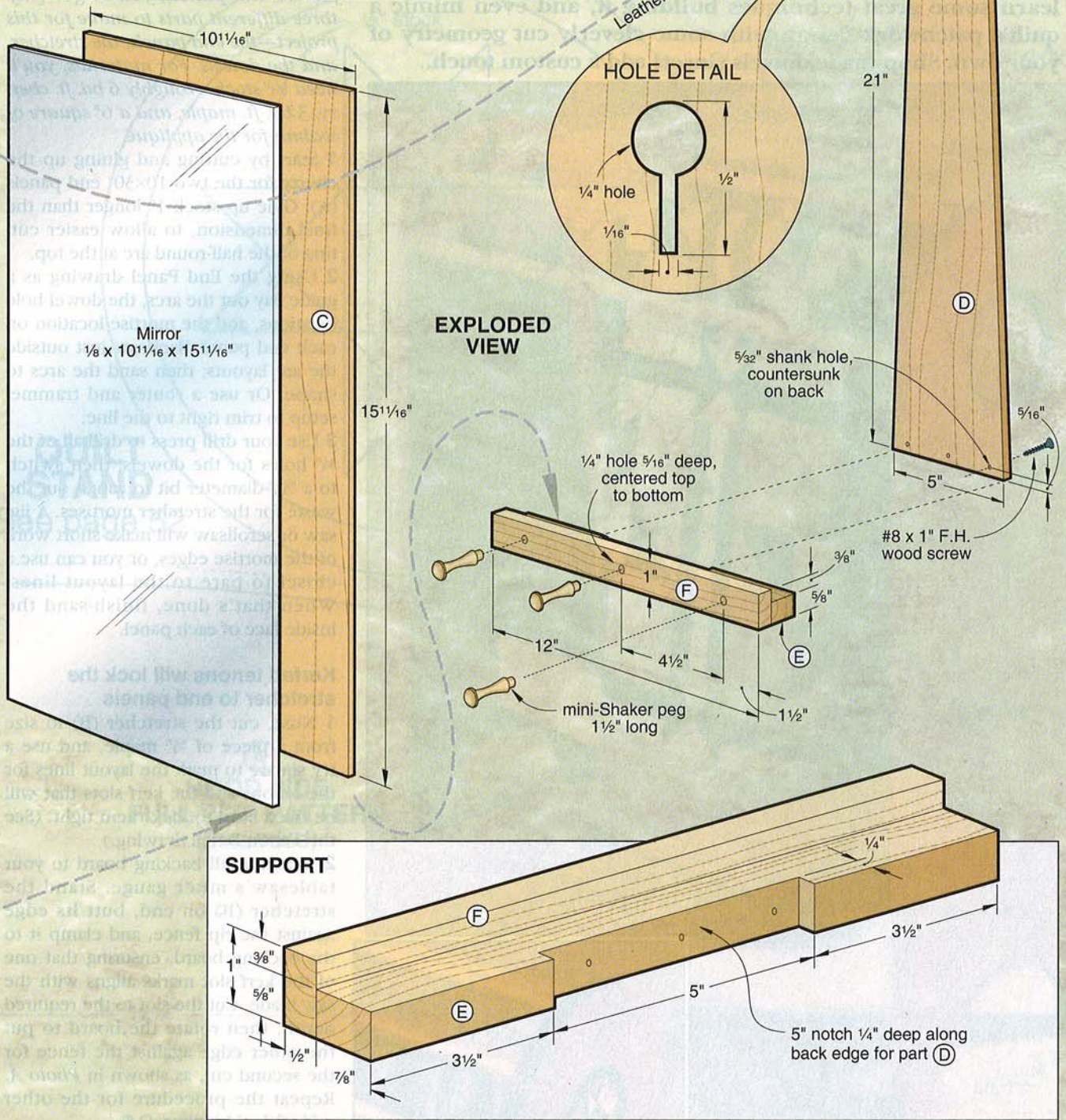
Bill of Materials

Part	Finished Size			Mati.	Qty.
	T	W	L		
A* stiles	1/2"	1 1/4"	17"	C	2
B* rails	1/2"	1 1/4"	12"	C	2
C back	1/8"	10 1/16"	15 1/16"	P	1
D hanger	1/4"	5"	21"	C	1
E support	5/8"	7/8"	12"	C	1
F support	1/2"	1"	12"	C	1

*Cut parts marked with an * oversized. Trim to finished size according to the how-to instructions.

Materials Key: C—cherry, P—plywood or hardboard

Supplies: 3—#8x1" flathead wood screws, 1/8" mirror, 4—3/4" pointed turn buttons held in place with 18x1/4" escutcheon pins, 3—mini-Shaker pegs 1 1/2" long (1 3/4" including tenon), 1—#4x1/4" roundhead brass wood screw, 12" leather lacing, clear finish.



Q A Shaker-Inspired QUILT STAND

With A Patchwork Appliqué Twist

If you've got a friend or family member skilled at quilting, let them show off their work with this handsome display stand, or make one to display a quilt you bought. You can learn some great techniques building it, and even mimic a quilt's patchwork design with some cleverly cut geometry of your own. Shop-made dowels (inset) add a custom touch.

Start with a pair of sturdy end panels

Note: Except for the appliqué pieces for the end panels, you've got only three different parts to make for this project—the end panels, the stretcher, and the dowels. For materials, you'll need 3/4" stock—roughly 6 bd. ft. cherry, 3 bd. ft. maple, and a 6" square of walnut for the appliqué.

1 Start by cutting and gluing up the cherry for the two 10x30" end panels (A). Glue up stock 1" longer than the final dimension, to allow easier cutting of the half-round arc at the top.

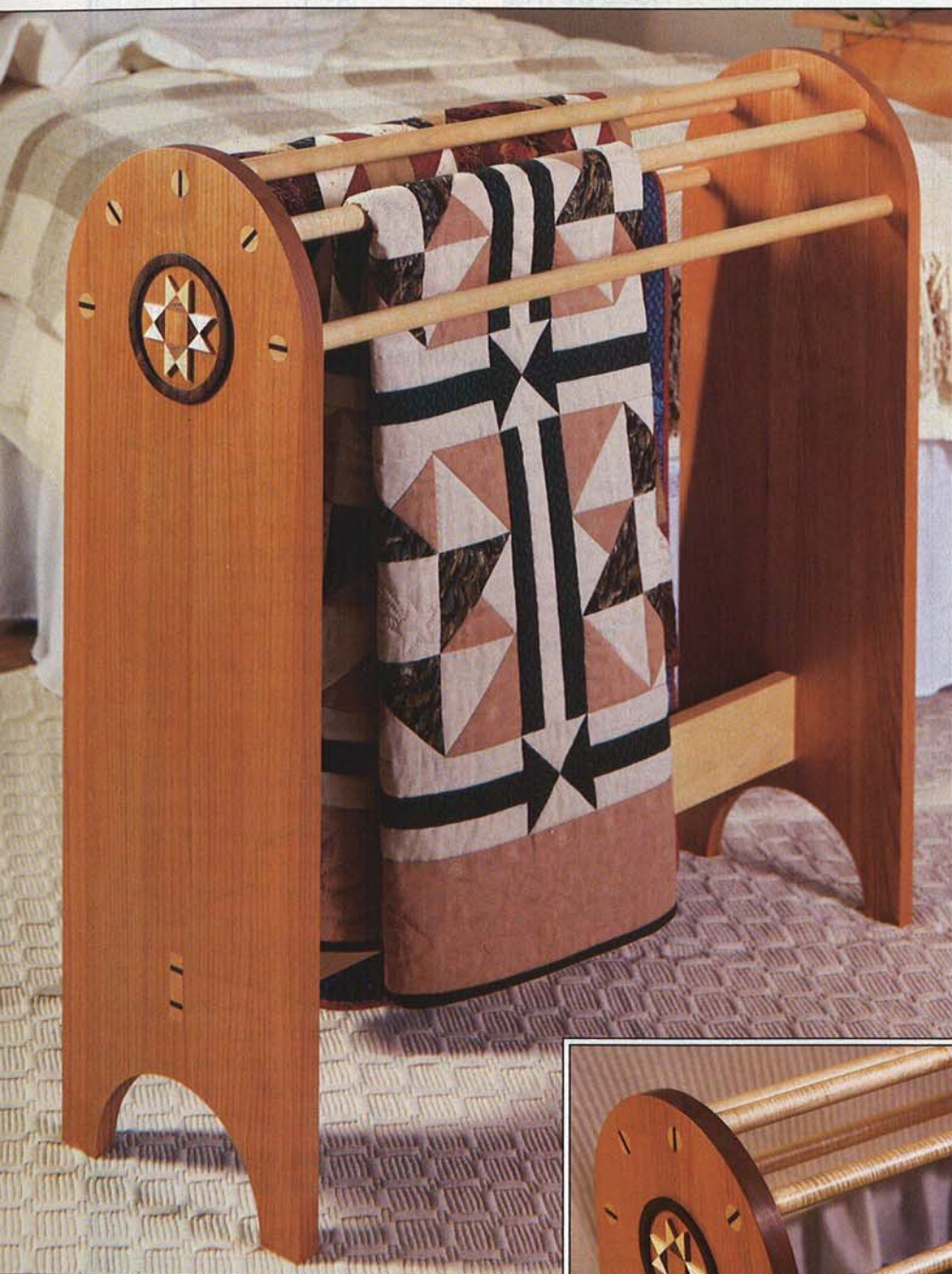
2 Using the End Panel drawing as a guide, lay out the arcs, the dowel hole locations, and the mortise location on each end panel. Bandsaw just outside the arc layouts; then sand the arcs to shape. Or use a router and trammel setup to trim right to the line.

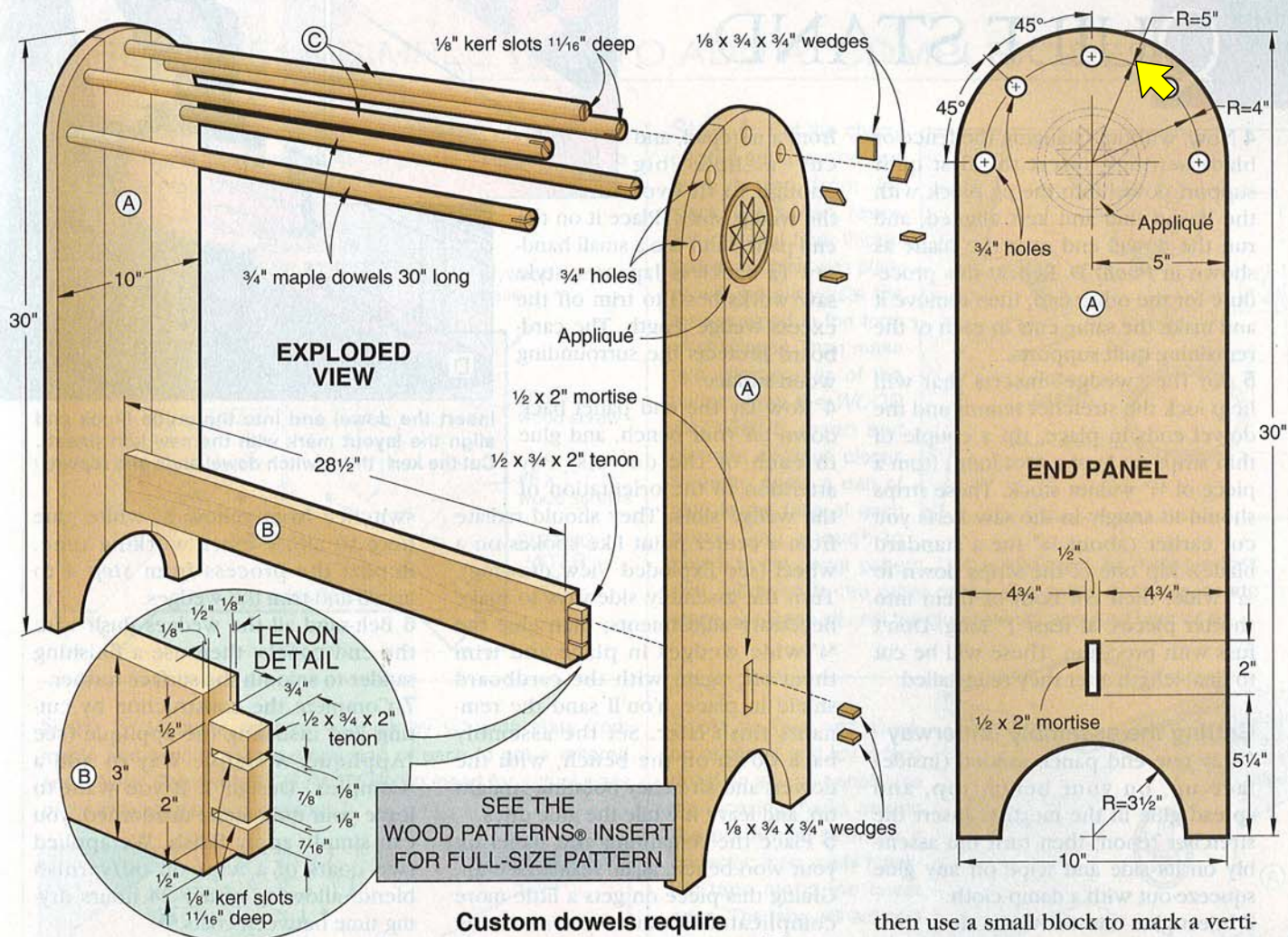
3 Use your drill press to drill all of the 3/4" holes for the dowels; then switch to a 7/16"-diameter bit to rough out the waste for the stretcher mortises. A jig-saw or scrollsaw will make short work of the mortise edges, or you can use a chisel to pare to the layout lines. When that's done, finish-sand the inside face of each panel.

Kerfed tenons will lock the stretcher to end panels

1 Next, cut the stretcher (B) to size from a piece of 3/4" maple, and use a try square to mark the layout lines for the tenons and the kerf slots that will be filled later to lock them tight. (See the Tenon Detail drawing.)

2 Attach a tall backing board to your tablesaw's miter gauge. Stand the stretcher (B) on end, butt its edge against the rip fence, and clamp it to the backing board, ensuring that one of the kerf slot marks aligns with the saw blade. Cut the slot to the required depth; then rotate the board to put the other edge against the fence for the second cut, as shown in *Photo A*. Repeat the procedure for the other end of the stretcher.





3 Now install a $\frac{3}{16}$ " dado blade in your tablesaw and attach a "sacrificial" or auxiliary wood fence to the rip fence. Set the fence so the dado makes just a shallow cut in the face of the sacrificial board, leaving $\frac{3}{4}$ " of the blade width exposed. Set the blade height at $\frac{1}{8}$ " for the wide tenon cheeks, and use the miter gauge to guide the cut. (Test-cut on scrap first.) Then raise the blade to $\frac{1}{2}$ " to cut away the edge cheeks (Photo B).

Custom dowels require simple tricks to make, modify

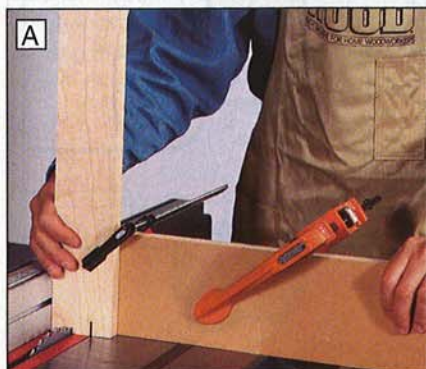
Note: You can use store-bought dowels for this project, but they tend to be bland. We wanted eye-catching figure, so we made our own quilt supports (C) from the same curly maple stock as the stretcher. To learn how we did it, see "Router-Made Dowels, in Minutes!" on page 54.

- 1 Rout and sand five dowels for the quilt supports. Cut them 30" long.
- 2 Clamp the dowels one at a time to your workbench so they can't roll;

then use a small block to mark a vertical layout line across each end of the dowel (Photo C). These lines will help you cut the kerf slots for the wedges.

3 For a cutting jig, you'll need a hardwood block at least 1" thick, 2" wide, and about 12" long. Using a drill press, bore a $\frac{3}{4}$ " hole through the center of the block, about 3" from one end. Then cut a saw kerf $\frac{1}{16}$ " deep into one face, centered and about half the length of the jig block so it intersects the $\frac{3}{4}$ " hole.

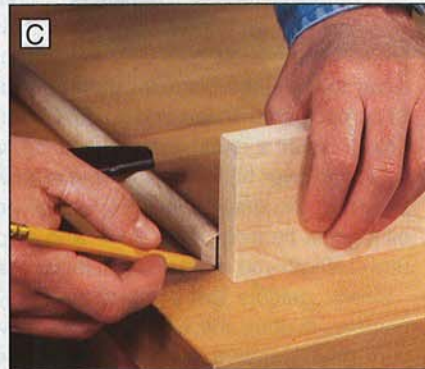
Continued



Using the miter gauge to guide the stock, cut end kerfs in the stretcher.



Switch to a dado blade to cut the tenons. Adjust the blade height as required.



Clamp the dowels to your bench top, and mark a vertical line on each end.

QUILT STAND

4 Now, without changing the fence or blade settings, insert the first quilt support dowel into the jig block with the layout line and kerf aligned, and run the dowel end over the blade as shown in *Photo D*. Repeat this procedure for the other end; then remove it and make the same cuts in each of the remaining quilt supports.

5 For the "wedge" inserts that will help lock the stretcher tenons and the dowel ends in place, rip a couple of thin strips (at least a foot long) from a piece of $\frac{3}{4}$ " walnut stock. These strips should fit snugly in the saw kerfs you cut earlier (about $\frac{1}{8}$ " for a standard blade). Rip one of the strips down to $\frac{1}{2}$ " wide; then cut both of them into shorter pieces, at least 1" long. Don't fuss with precision. These will be cut to final length after they're installed.

Getting the assembly underway

1 Lay one end panel, sanded (inside) face up, on your bench top, and spread glue in the mortise. Insert the stretcher tenon; then turn the assembly on its side and wipe off any glue squeeze-out with a damp cloth.

2 Inject glue into the tenon slots, then insert a $\frac{1}{2}$ "-wide wedge into each slot, tapping it home with a hammer.

3 Next, take the thin cardboard back

from a notepad, and cut a hole big enough to fit over the wedge stubs. Place it on the end panel, and use a small hand-saw (a backless Japanese-style saw works best) to trim off the excess wedge length. The cardboard protects the surrounding wood surface.

4 Now lay the end panel back down on your bench, and glue in each of the dowels. Pay attention to the orientation of the wedge slots. They should radiate from a center point like spokes on a wheel (see Exploded View drawing). Turn the assembly sideways to make necessary adjustments; then glue the $\frac{3}{4}$ "-wide wedges in place and trim them off, again with the cardboard shield in place. You'll sand the remnants flush later. Set the assembly back down on the bench, with the dowels and stretcher pointing straight up, and leave it while the glue dries.

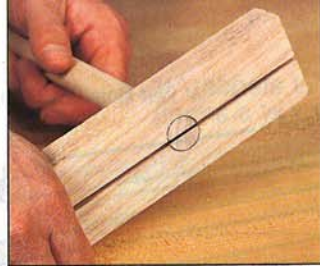
5 Place the remaining end panel on your workbench, again inside face up. Gluing this piece on gets a little more complicated because the assembly work you've already done requires you to insert all the dowels and the stretcher tenon simultaneously. We

switched from yellow to white glue here to allow extra working time. Repeat the process from *Step 4* to install and trim the wedges.

6 Belt-sand all the wedges flush with the end panels; then use a finishing sander to smooth the surface further.

7 Complete the construction by cutting and installing the appliqué (see "Appliqué: A Simple Way to Add a 'Complex' Design"). If you want to leave your quilt stand unadorned, you can simply apply finish. We applied two coats of a wipe-on oil/varnish blend, allowing nearly 24 hours drying time between coats. ♣

Written by Bill LaHay
Illustrations: Kim Downing; Lorna Johnson
Photographs: Hetherington Photography



Insert the dowel end into the guide block and align the layout mark with the saw kerf (inset). Cut the kerf; then switch dowel ends and repeat.



ROUTER-MADE DOWELS, IN MINUTES!

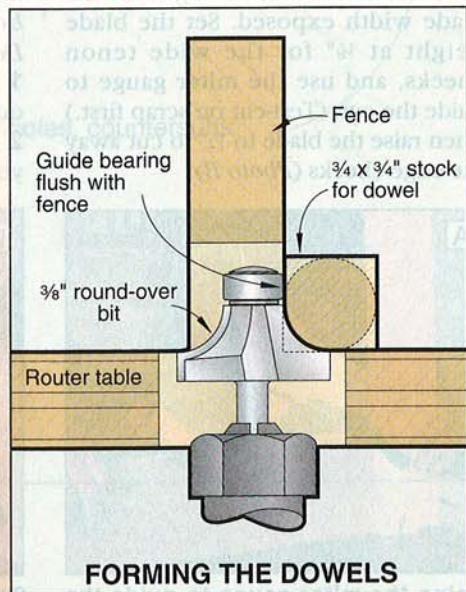
Having custom-made dowels for your project doesn't require a lathe or a special milling machine. Chuck Hedlund, our project builder, created them with an ordinary router table and a round-over bit. By doing the same, you can use wood with exactly the figure or character you want.

This simple technique involves just three basic steps. First, cut square strips of wood,

sized to equal the diameter of the dowel(s) you want. For length, allow an extra 3" on each end. These end portions should stay square as you rout the dowel.

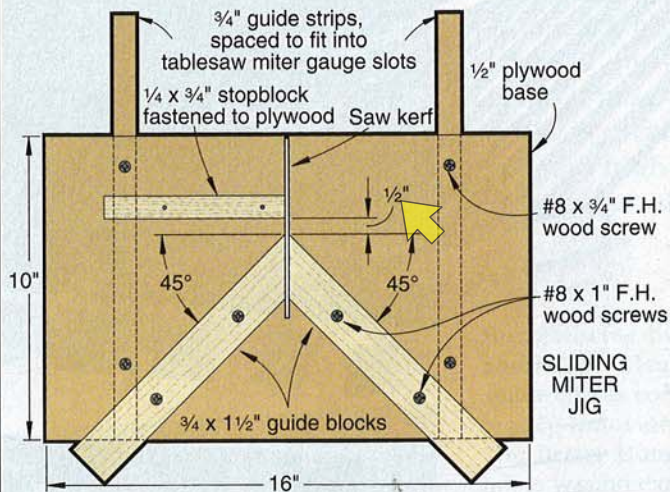
Next, install a round-over bit with the same radius as the dowel (for example, a $\frac{3}{8}$ " round-over bit for a $\frac{3}{4}$ "-diameter dowel). Set the bit up in the router table as shown in the illustration *at right*, and adjust the fence position to align with the bit's guide bearing. Mark start- and stop-lines on the fence so you can rout the dowel length you need and still leave the ends square.

Finally, guide a test piece of squared stock along the fence to round over the corners, rotating the blank until the dowel is round. You may have to sand off very slight ridges to get the dowel perfectly smooth. Large ridges mean the bit height and/or the fence position needs adjustment.

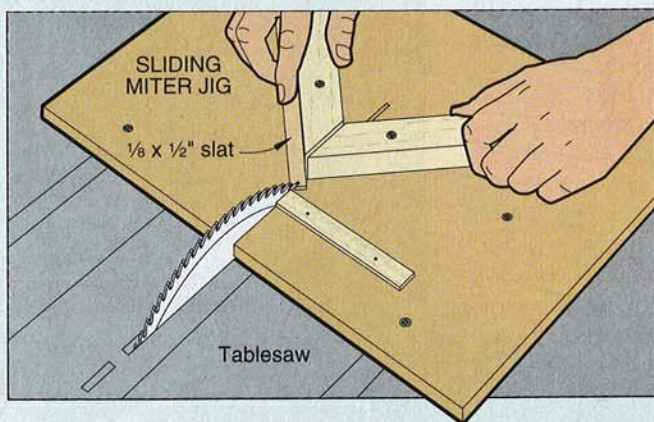


APPLIQUÉ: A SIMPLE WAY TO ADD A "COMPLEX" DESIGN

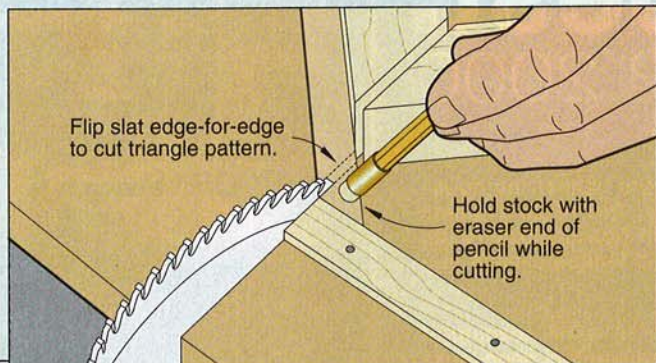
Step 1: Construct a simple sliding-miter jig for your table saw, with guide blocks positioned at 45° angles to the blade (90° to each other), and a cleat for a stopblock.



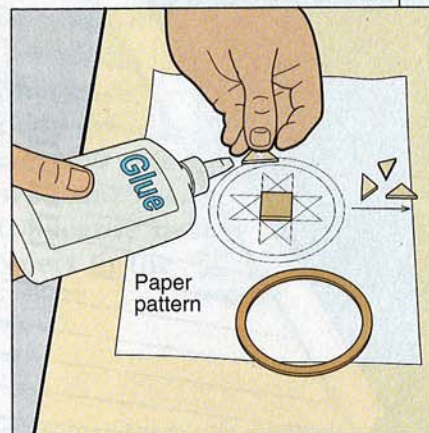
Step 2: Machine several 1/8"-thick by 1/2"-wide slats from maple and walnut; then cut one end of each to get a mitered end. (Note: See the WOOD PATTERNS® insert for actual sizes of the individual appliqué pieces.)



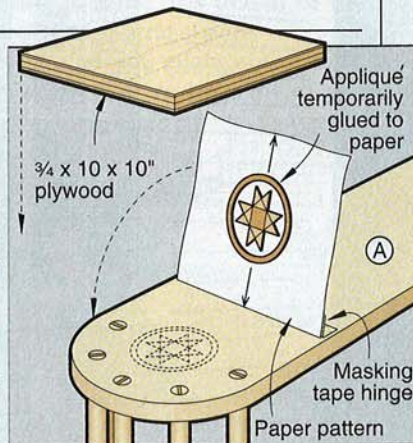
Step 3: Flip the slats edge-for-edge to produce triangle-shaped cutoffs. Repeat the steps until you have 16 triangles in maple and 8 in walnut. Use the eraser end of a pencil as a hold-down to keep the small triangles from being thrown by the saw blade.



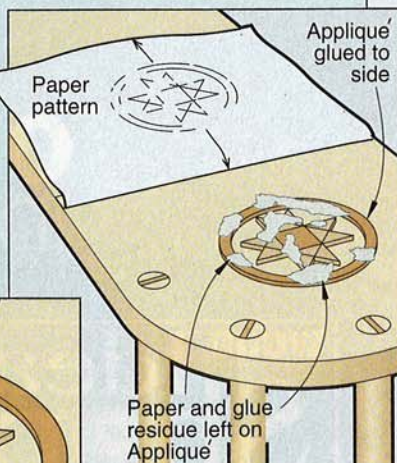
Step 4: Cut the cherry center square and the walnut ring from 1/8" stock. (If you can, resaw this material from thicker boards. A thickness planer will merely waste the excess wood in the form of shavings.) Then make two photocopies of the pattern from the WOOD PATTERNS insert and glue the appliqué pieces to them. Apply a dab of glue to the face of each piece, just enough to hold it to the paper pattern. Use a little more on mating edges that will bond to the other parts, and press each piece into place. Let these sit until the glue sets up, about an hour or so.



Step 5: Take one glued-up appliqué and lay it face down on an end panel. Use the indexing marks around the pattern to position it correctly; then apply masking tape along the lower edge. The tape will act as a hinge, allowing you to fold the pattern back and expose the unglued face of the appliqué. Apply a thin layer of glue to each part in the appliqué, fold the pattern back onto the end panel, and tape the top end so it can't shift. Place a 10"-square piece of 3/4" plywood on top of the appliqué, and clamp it evenly to the end panel. Let the assembly set for at least an hour. Then repeat the procedure for the other appliqué, and clamp it in place.



Step 6: Peel away the paper pattern to reveal the appliqué, now glued solidly to the end panel. Remove as much paper residue as possible by hand; then use a finishing sander and a mat (X-acto) knife to clean up the rest.



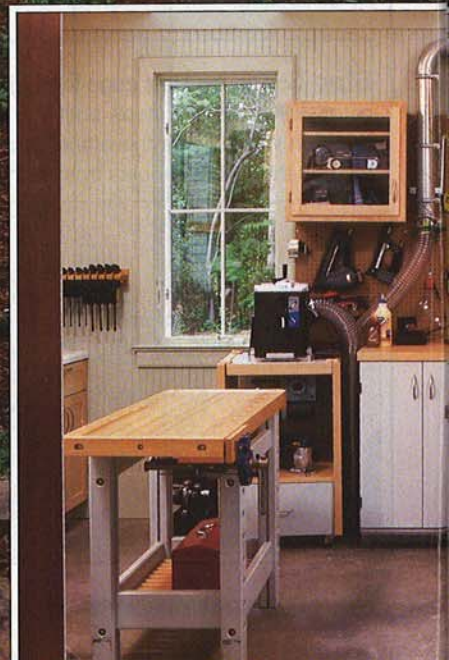


The best of the best: IDEA SHOP[®] 2000



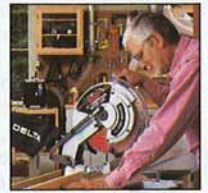
Above: IDEA SHOP 2000 sits behind the house and adjacent to the garage. The 12x20' building affords views of trees and flower gardens. Its back-of-the-lot location also limits possible nuisance noise.

Right: Viewed through the 72"-wide opening of the French doors, the 240-square-foot shop looks spacious and inviting. Skylights and windows feed in natural light. Mobile bases and tuck-away tools add flexibility and save space.



When Better Homes & Gardens® magazine editors began planning to build their Blueprint 2000 model home in Chapel Hill, North Carolina, they wanted a woodworking shop to go with it. And WOOD® magazine was glad to help out. Here's the shop we came up with. We call it IDEA SHOP® 2000 because it has the high-tech features you'd expect in the new millennium.

Peter J. Stephano
Features Editor



Features Editor Pete Stephano uses the miter saw and stand on page 60.

Homes being built in Chapel Hill's Southern Village boast lots of Old South charm combined with contemporary innovation and technology. The Better Homes & Gardens show home was no exception. So we didn't think a woodworking shop should have any less.

Our IDEA SHOP 2000 occupies a 12x20' building connected to the garage by a covered portico. The shop's 9' ceiling has three powered, venting skylights, each operated electronically. Those, plus four windows, French doors, and a pastel color scheme add natural light and a sense of spaciousness in what otherwise might feel like tight quarters.

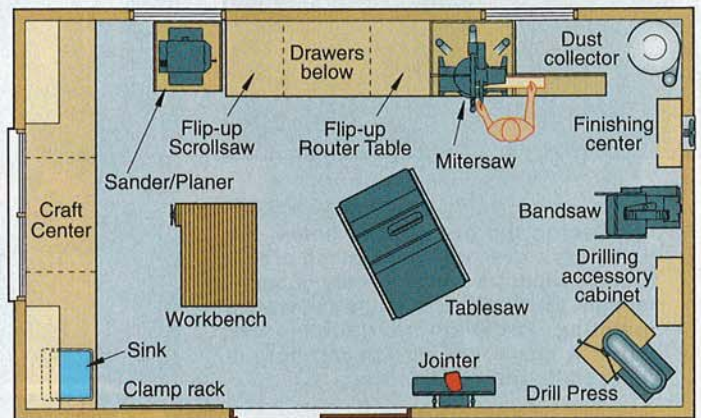
In addition to all the standard stationary woodworking machines, cabinets, and a workbench, there's a crafts area with a wet sink. That makes the shop perfect for the couple with complementary hobbies.

IDEA SHOP 2000 also was outfitted with a dust-collection system that includes a high-tech blast-gate control that automatically turns on the dust collector and opens the gate as each machine starts up. When the machine gets switched off, the control shuts down the gate and the dust collector. Then, too, the shop has a particulate filter for fine airborne dust as well as a vented finishing area.

On the following pages you'll see other innovations that make space

work harder. There's an emphasis on mobility, too, with mobile bases on every stationary machine. When it's time to shut down, state-of-the-art security takes over. And in this new-millennium home, it's tied-in to the sophisticated central system.

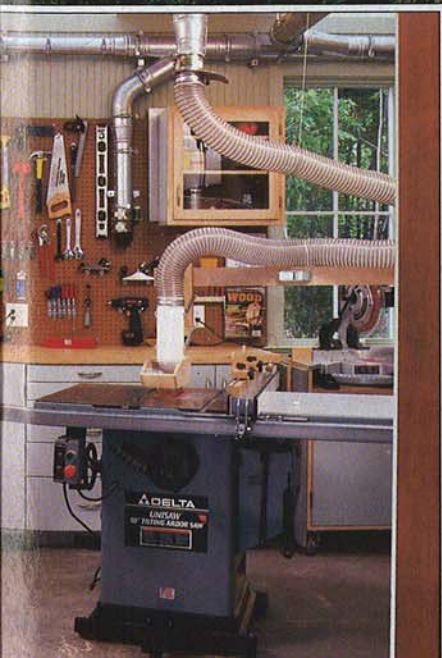
On your tour you might notice some projects that we've brought to you



before, such as the lift-up router table and lift-up scroll saw (issue #103, February 1998), the modular wall cabinets (issue #100, November 1997), the swivel-topped cabinet (issue #104, March 1998), the finishing center (issue #68, February 1994), and the drill-press accessory cabinet (issue #54, September 1992). These came from the first three IDEA SHOPS, and because they seemed to fit IDEA SHOP 2000, we put them in.

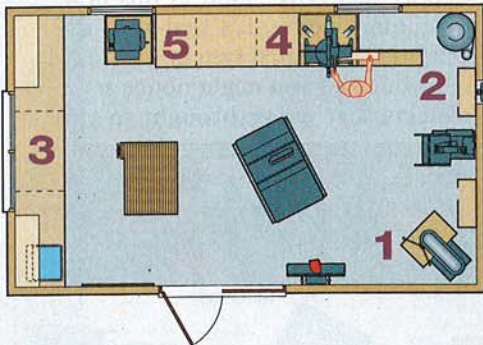
You'll find some new ideas, too. There's the shop's mobile miter saw stand on page 60. On page 66, you'll learn how to make the tablesaw dust-collection hood and rip-fence hold-downs, and on page 70, the drill press dust-collection collar. Now, enjoy your tour.

Continued



1 A drill press, complete with a shop-built dust-collection collar and auxiliary table (issue #86, February 1996) stands in the corner. A cabinet holding bits and other accessories hangs nearby. Close by, too, is a hanging clamp rack, one of several in varying sizes throughout the shop. The jointer, on its mobile base, stands ready for use. Above it, a particulate filter removes fine dust from the air.

2 This corner of the shop works hard. It's the home of the dust collector and the electronic blast-gate control (the green box in the photo); a fold-up finishing center with exhaust; and the band-saw, with the heat/air-conditioning pump above it. The miter saw can be used tucked against the wall as shown. Or, it can be wheeled outdoors and the extensions raised to crosscut long stock.



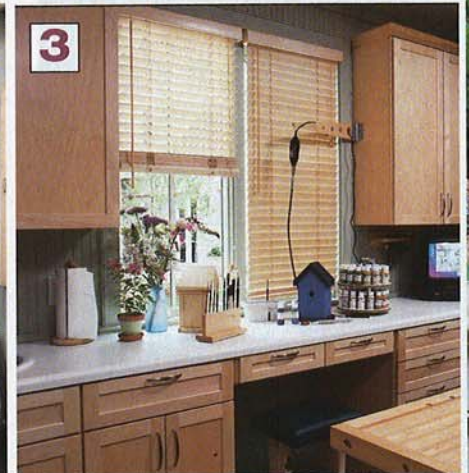
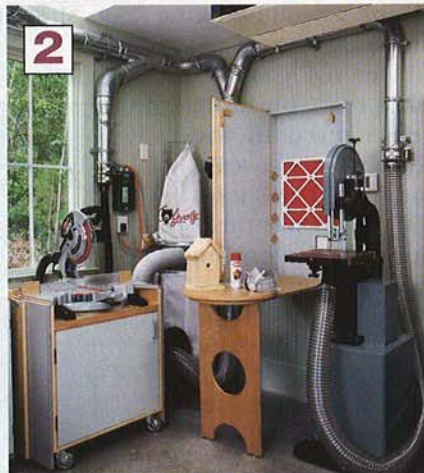
3 Facing the back of the home, the shop's east wall focuses on crafts. Double windows provide plenty of natural light for hobbies, such as decorative painting. For clean-up, there's a wet sink. A moveable workbench serves both crafts and woodworking.

4 The flip-up router table and its shop-built cabinet become the center of attention in this portion of the south wall. Tools hang on screw-mounted Pegboard hooks and holders that won't pop loose and drop.

5 The shop's south wall accommodates a mobile, swivel-topped cabinet housing a small planer and belt/disc sander. Next to it, there's a lift-up scroll-saw stand and cabinet. The wall cabinets, featuring a hanging system of mating beveled strips, easily relocate if needed. Flexible hose connects the sander and/or the planer to the main dust-collection system.

For a complete listing of tools, equipment, and other materials in IDEA SHOP® 2000, see page 84.

Shop layout and design: James R. Downing
Interior design: Joseph Boehm
Photographs: Steve Uzzell
Illustrations: Kim Downing



5



Want to see more of the show home and the crafts area? Here's where to look.

Better Homes & Gardens® magazine unveiled its Blueprint 2000 home in the November 1999 issue, available at newsstands (or send your name, address, and a check for \$1.50 to BH&G Nov. 99, LS 305, 1716 Locust St., Des Moines, IA 50309-3023. Offer expires Feb. 25, 2000.) Also see their web site, www.bhglive.com.

For detailed coverage of the crafts' area, see the December 1999 issue of Decorative Woodcrafts® magazine, now on sale at newsstands. (You can order a copy by calling 800/572-9350.)

To get a good look at IDEA SHOP® 1, 2, and 3, visit WOOD ONLINE® at www.woodmagazine.com.

Mobile Fold-down

Finally, the ultimate mitersaw center has arrived. This sturdy plywood unit rolls around and locks in place where needed. Fold-down table extensions let you manage long pieces for crosscutting. And there's more, including built-in waste disposal for cutoffs and sawdust, and a unique leveling system for parking the unit securely on an uneven floor.

Let's whip up a sturdy carcass

1 Cut the cabinet sides (A), bottom (B), and back (C) to the dimensions found in the Bill of Materials.

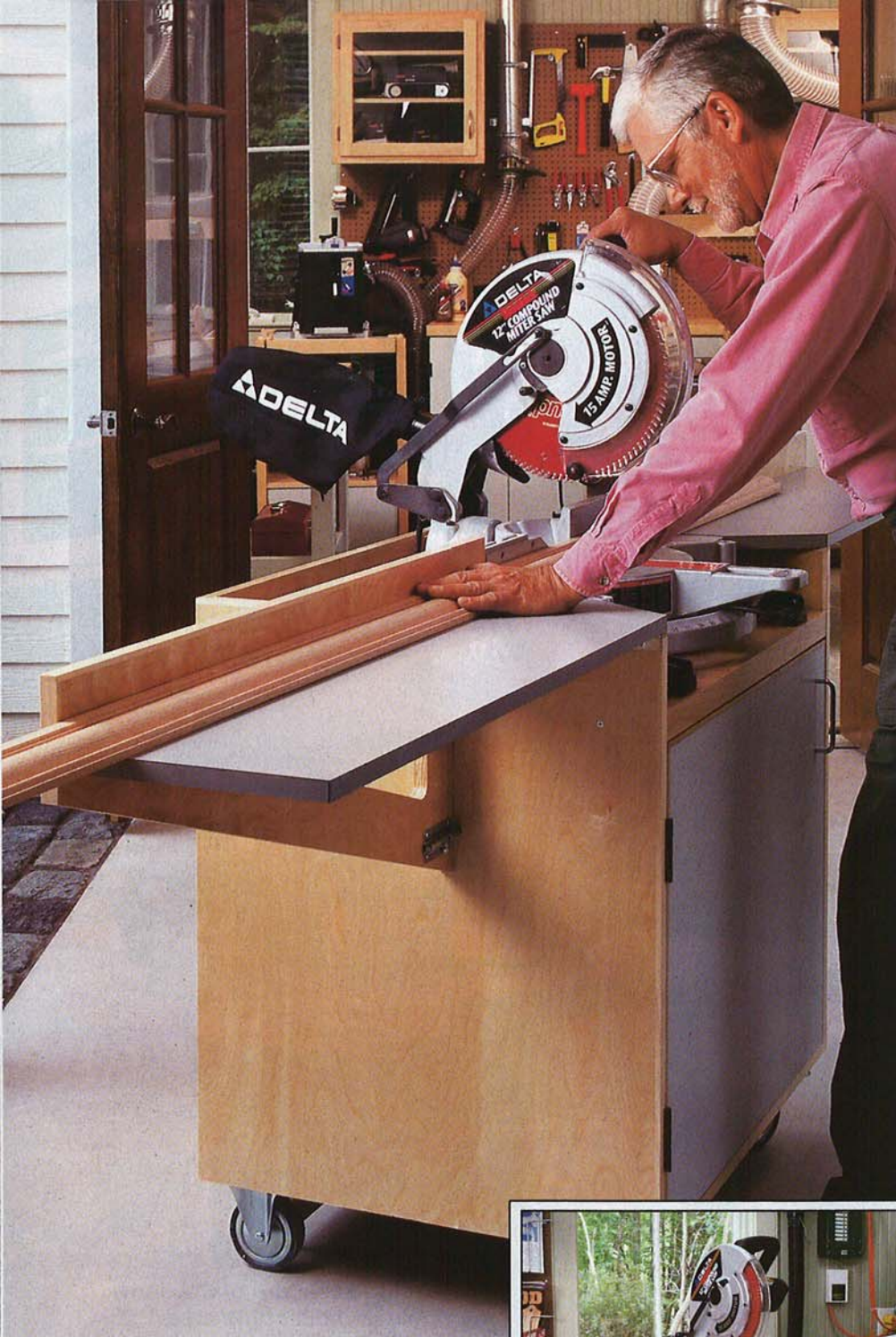
Note: We used birch plywood for this and other shop projects for several good reasons: Compared to fir plywood, it's flatter, contains fewer voids and patches, and paints and finishes better.

2 From solid stock (we used birch), cut enough $\frac{1}{4} \times \frac{3}{4}$ " material for the sides' top and front edge banding pieces (D, E), the bottom's front edge banding (F), and the back edge banding (F). (See the Carcass drawing for reference. Then cut the parts to length.)

3 Glue and clamp the side top edge bandings (D) on the sides first; then follow with the remaining bandings. Sand these applied pieces flush.

4 Cut the rabbets on parts A and C where shown.

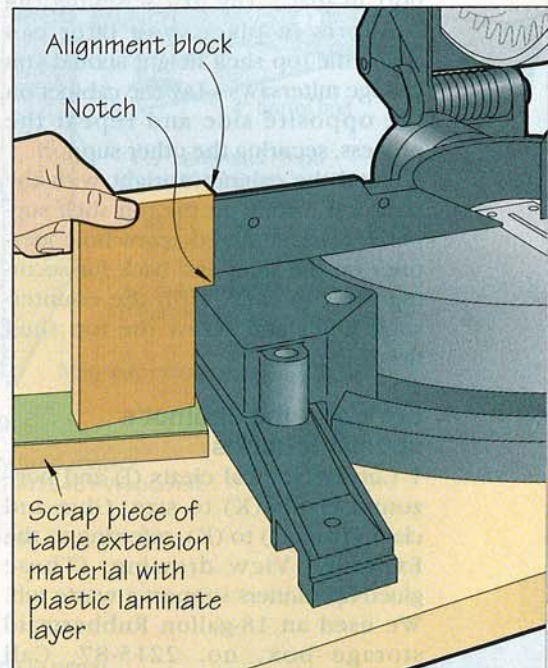
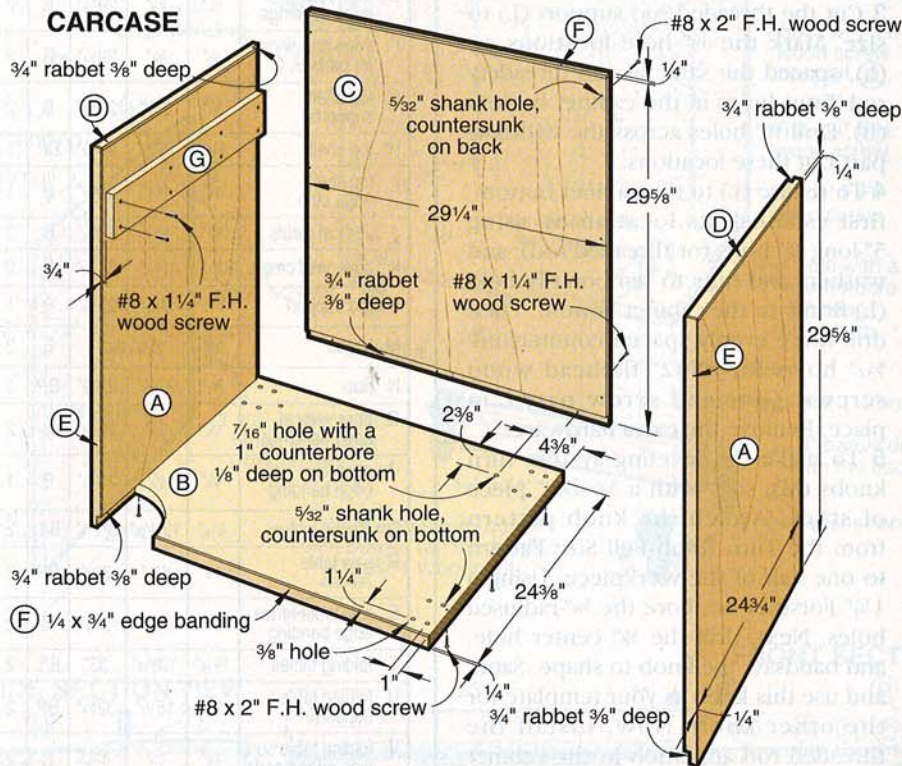
5 Referring to the Exploded View and Carcass drawings, drill the $\frac{7}{16}$ " counterbored holes for the threaded rod and the $\frac{3}{8}$ " holes for the casters in the bottom (B). (We used the casters as hole guides.) Now hammer $\frac{3}{8}$ " T-nuts in the



With the folding tables down, our mitersaw cabinet stores easily against a shop wall, right.

Mitersaw Center

tables make it easy to store



Working off laminated scrap and the height of your miter saw table, mark the notch location in the alignment blocks needed to fix the top shelf height.

holes for the threaded rods in the bottom side of the carcass bottom.

6 Glue and assemble parts A, B, and C. Then, drill the countersunk holes in the bottom and back, and secure the joining parts with screws.

Build and install a heavy-duty top shelf

Note: The top shelf height shown is for a Delta 12" miter saw, model no. 36-235. Depending on the miter saw model you use, some dimensions and part sizes will change. These we've indicated in the Saw Table And Fence drawing.

1 Cut the top shelf supports (G) to size and drill the countersunk holes. We'll install these later.

2 Cut two pieces of 3/4" birch plywood to 24x29" for the top shelf (H). Glue and clamp these pieces together,

keeping the edges and ends flush. Then cut the lamination to size. See the Top Shelf drawing.

3 From 3/4" stock, cut the top shelf edge strip (I) to size. Determine the width by measuring the thickness of the top shelf. (Ours measured 1 1/2".)

4 Glue and clamp the top shelf edge strip (I) to the front edge of the shelf top (H). Sand smooth.

5 Place the top shelf face down and lay out the opening on the bottom surface. Also, mark the locations of the 3/8" holes for the all-thread rod and the 5/32" holes that are countersunk on the bottom. (See the Top Shelf drawing on page 65.)

Next, drill blade start holes in the four corners of the layout. Jigsaw out the opening, cutting just inside the line. Sand to the line using a drum sander or oscillating spindle sander.

6 To locate the shelf top at the exact

height for your miter saw, you'll need to cut two alignment blocks first. To make these, place your miter saw on a flat surface. Then, take a 6" piece of 3/4" birch plywood and glue a piece of scrap plastic laminate to it. This should be a scrap piece of the same plastic laminate you will later glue to the saw table surfaces.

Next, cut two pieces of scrap (ours measured 3/4x4x6") and place one on top of the laminated scrap and alongside your miter saw. Mark the precise location of the saw's table surface on the scrap and cut a 3/4" notch at this location. Now, hold this "alignment block" against the saw as shown in the illustration above to test the fit. Once satisfied, cut the second alignment block the same way.

7 Lay the cabinet carcass down on its side; then gather the top shelf sup-

Continued

Mobile Miter Saw Center

ports (G), top shelf (H), and the alignment blocks as shown in the illustration below, on the inside of the cabinet. Clamp these in place. With the shelf support flush to the cabinet back, screw (don't glue) the top shelf support in place. (By just screwing the supports in place, you later can adjust the top shelf height should you change miter saws.) Lay the cabinet on the opposite side and repeat the process, securing the other support.

8 Stand the cabinet upright with the shelf top resting on the top shelf supports. Mark centered screw-hole locations on the sides and back for securing the top shelf. Drill the countersunk holes and screw the top shelf firmly in place.

Let's add the cabinet's special touches

1 Cut the vertical cleats (J) and horizontal cleats (K) to size. Glue and clamp parts (J) to (K), referring to the Exploded View drawing. (These glued-up runners support a waste tub. We used an 18-gallon Rubbermaid storage box, no. 2215-87. Call 800/362-1000 for more information.)

Once dry, drill three countersunk holes through each runner. Turn the cabinet upside down and fasten the runners to the bottom of the top shelf

(see the Front Section View) and factoring in the waste tub dimensions.

2 With the cabinet still upside down, install the casters, using the $\frac{3}{8}$ " holes drilled earlier. Note that the braking swivel casters mount at the front and the fixed casters at the back.

3 Cut the threaded rod support (L) to size. Mark the $\frac{3}{8}$ " hole locations on (L), spaced the same as the threaded-rod T-nut holes in the cabinet bottom (B). Drill $\frac{3}{8}$ " holes across the width of part L at these locations.

4 To secure (L) to the cabinet bottom, first establish its location by using 5"-long $\frac{3}{8}$ " bolts (or threaded rod), and washers and nuts to temporarily hold (L) firmly to the cabinet bottom. Then drill three evenly spaced countersunk $\frac{5}{32}$ " holes for #8x2" flathead wood screws. Glue and screw part L in place. Remove the extra hardware.

5 To make the leveling system turn knobs (M), start with a $\frac{3}{4}$ x4x8" piece of stock. Attach the knob pattern to one half of the workpiece. Using a $1\frac{1}{4}$ " Forstner bit, bore the $\frac{3}{8}$ "-radiused holes. Next, drill the $\frac{3}{8}$ " center hole, and bandsaw the knob to shape. Sand, and use this knob as your template for the other knob. Now, install the threaded rod and knob in the cabinet using washers and nuts. See the Side Section View and Exploded View drawings for reference.

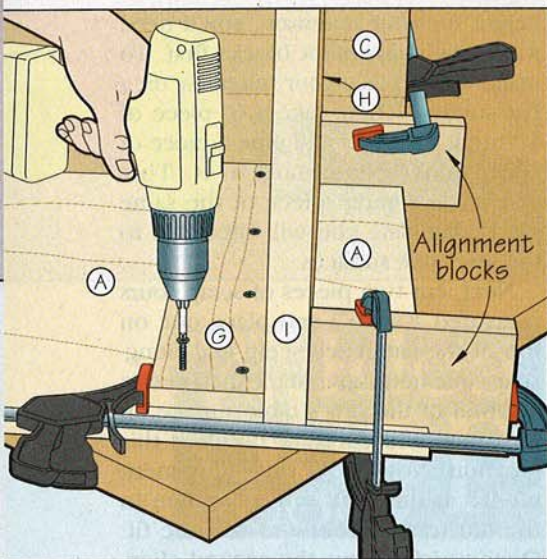
Give your cabinet a door

1 From $\frac{3}{4}$ " birch plywood, cut the door (N) to size. Cut the vertical edge-bandings (O) for the door and glue and clamp these in place. Now, cut and apply edge banding (P) for the door's top edge. Sand the parts flush and smooth.

2 Lay out the locations of the non-mortise hinges where shown on the Exploded View drawing. Drill the screw holes and attach the hinges to the door. Allowing for a $\frac{1}{8}$ " reveal, attach the door to the cabinet.

3 Locate and install the wire pull on the door. Next, screw on the magnetic catch and magnetic catch plates on the cabinet side and door back. See the Buying Guide for our source for the hinges, catches, and wire pull.

Continued



Using the alignment blocks, establish the locations of the top shelf (H) and top shelf support (G), as shown, and screw the support in place.

Align the cabinet doors easily against the miter saws. The doors will stay in place.

Bill of Materials

Part	Finished Size			Mater.	Qty.
	T	W	L		
A cabinet sides	$\frac{3}{4}$ "	24 $\frac{3}{4}$ "	29 $\frac{5}{8}$ "	BP	2
B cabinet bottom	$\frac{3}{4}$ "	24 $\frac{3}{8}$ "	29 $\frac{1}{4}$ "	BP	1
C cabinet back	$\frac{3}{4}$ "	29 $\frac{1}{4}$ "	29 $\frac{5}{8}$ "	BP	1
D side top edge bandings	$\frac{1}{4}$ "	$\frac{3}{4}$ "	24 $\frac{3}{4}$ "	B	2
E side front edge bandings	$\frac{1}{4}$ "	$\frac{3}{4}$ "	29 $\frac{5}{8}$ "	B	2
F edge bandings for parts B, C	$\frac{1}{4}$ "	$\frac{3}{4}$ "	29 $\frac{1}{4}$ "	B	2
G top shelf supports	$\frac{3}{4}$ "	3 $\frac{1}{2}$ "	23 $\frac{1}{2}$ "	B	2
H* top shelf	1 $\frac{1}{2}$ "	23 $\frac{1}{2}$ "	28 $\frac{1}{2}$ "	BP	1
I top shelf edge strip	$\frac{3}{4}$ "	1 $\frac{1}{2}$ "	28 $\frac{1}{2}$ "	B	1
J vertical cleats	$\frac{3}{4}$ "	1 $\frac{1}{4}$ "	23 $\frac{1}{2}$ "	B	2
K horizontal cleats	$\frac{3}{4}$ "	1 $\frac{1}{4}$ "	23 $\frac{1}{2}$ "	B	2
L rod support	1 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	22 $\frac{1}{4}$ "	P	1
M knobs	$\frac{3}{4}$ "	2 $\frac{1}{2}$ "-dia.		B	2
N door	$\frac{3}{4}$ "	27 $\frac{3}{4}$ "	23 $\frac{1}{2}$ "	BP	1
O door vertical edge bandings	$\frac{1}{4}$ "	$\frac{3}{4}$ "	23 $\frac{1}{2}$ "	B	2
P door top edge banding	$\frac{1}{4}$ "	$\frac{3}{4}$ "	28 $\frac{1}{4}$ "	B	1
Q** saw tables	$\frac{3}{4}$ "	10 $\frac{1}{16}$ "	31 $\frac{3}{16}$ "	B/L	2
R** saw table fences	$\frac{3}{4}$ "	6 $\frac{7}{8}$ "	3 $\frac{7}{8}$ "	BP	2
S saw table fence edge banding	$\frac{1}{4}$ "	$\frac{3}{4}$ "	3 $\frac{7}{8}$ "	B	2
T folding tables	1 $\frac{9}{16}$ "	10 $\frac{9}{16}$ "	33"	B/L	2
U folding table supports	$\frac{3}{4}$ "	15 $\frac{1}{2}$ "	32 $\frac{3}{4}$ "	BP	2
V folding table sup. side edge bands	$\frac{1}{4}$ "	$\frac{3}{4}$ "	4 $\frac{3}{8}$ "	B	2
W folding table sup. top edge bands	$\frac{1}{4}$ "	$\frac{3}{4}$ "	33"	B	2

* Cut parts marked with an * oversized. Trim to finished size according to the how-to instructions.

** Parts are cut slightly undersized and reach finished size when plastic laminate is applied.

** Part dimensions subject to change due to miter-saw model used. See Saw Table And Fence drawing.

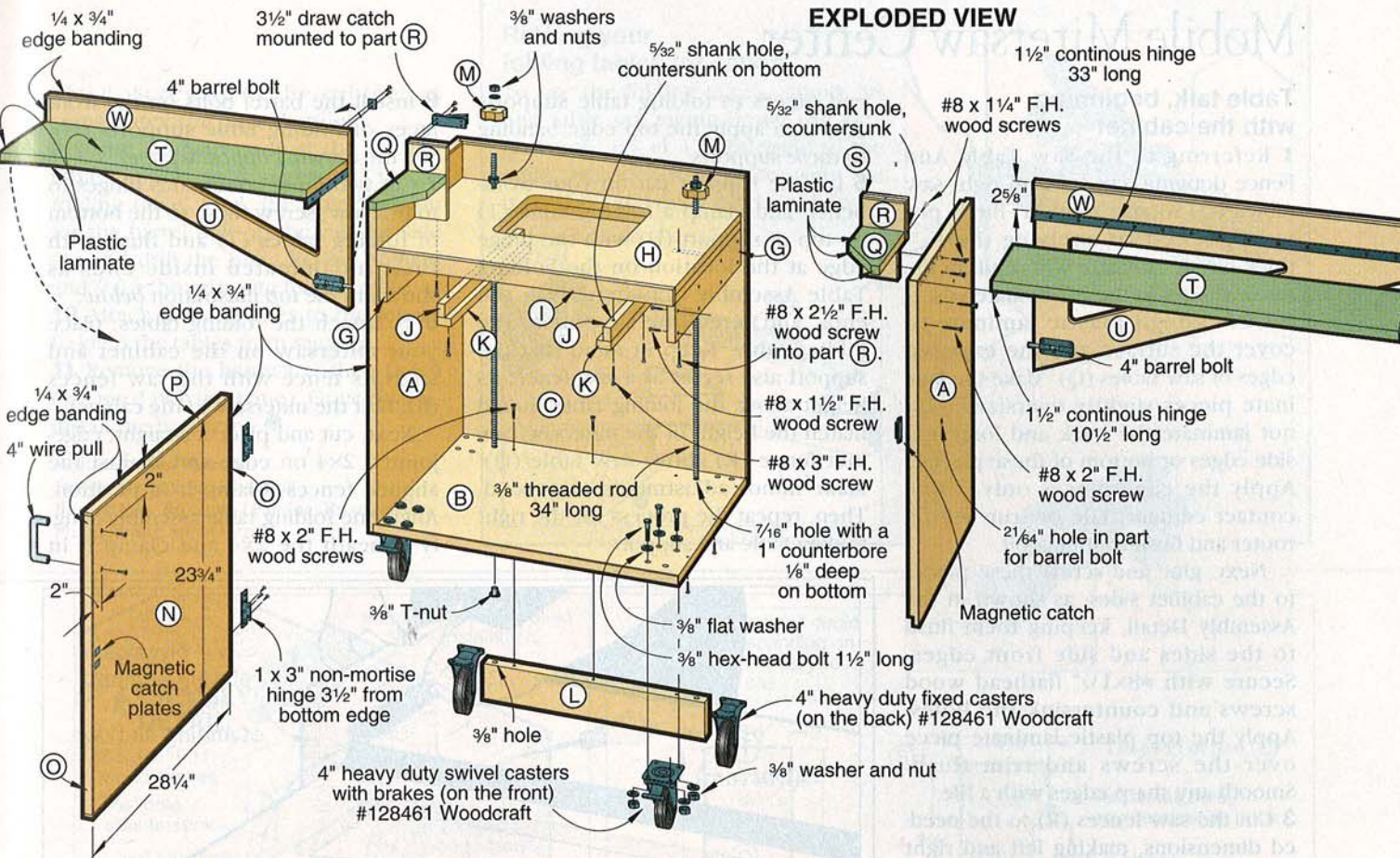
Materials Key: BP—Baltic birch plywood, B—birch, P—pine or fir, B/L—Baltic birch plywood with plastic laminate

Supplies: 2 $\frac{3}{8}$ " T-nuts; 2 lengths of $\frac{3}{8}$ " threaded rod, 34" long; #8x1 $\frac{1}{4}$ " flathead wood screws; #8x2" flathead wood screws; #8x2 $\frac{1}{2}$ " flathead wood screws; #8x3" flathead wood screws; 1 $\frac{1}{2}$ " continuous hinge, 33" long (2); 1 $\frac{1}{2}$ " continuous hinge, 10 $\frac{1}{2}$ " long (2); $\frac{3}{8}$ x1 $\frac{1}{2}$ " hex-head bolts; $\frac{3}{8}$ " washers and nuts; 4" barrel bolts (2); 3 $\frac{1}{2}$ " draw catches (2); 1 pr. 1x3" non-mortise hinges; 4" wire pull; magnetic catch and catch plates; 18-gal. Rubbermaid storage box; clear finish.

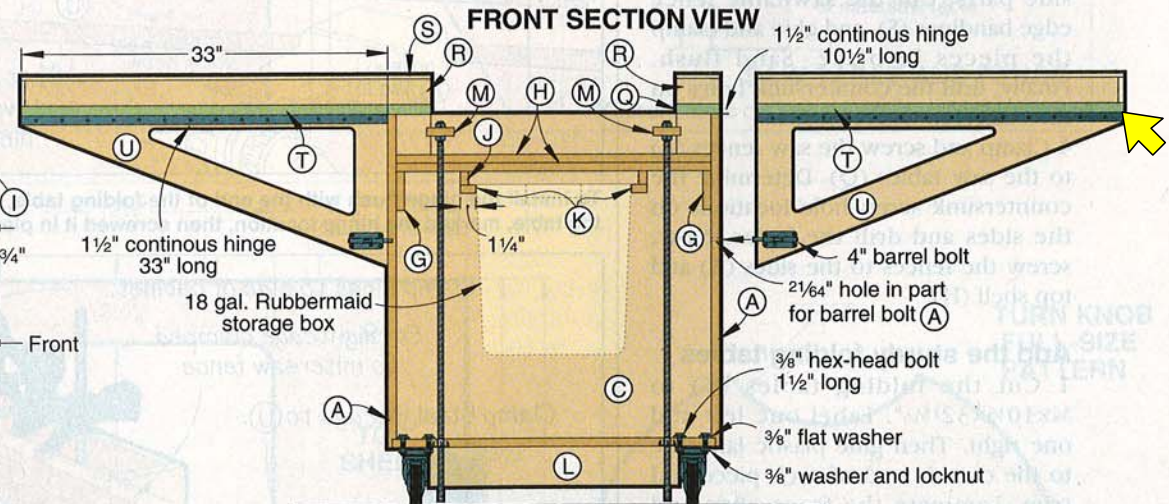
Buying Guide

Hardware. 2 HD fixed casters and 2 HD double-locking (braking) swivel casters, 4", sold as set, #128461, \$34.99; 1 pr. 1x3" door hinges, #27G14, \$2.50; 4" wire pull, #130308, \$1.50; magnetic catch and strike, #27H04, \$1.50. Woodcraft, 210 Wood Country Industrial Park, P.O. Box 1686, Parkersburg, WV 26102-1686 or order by calling 800/225-1153.

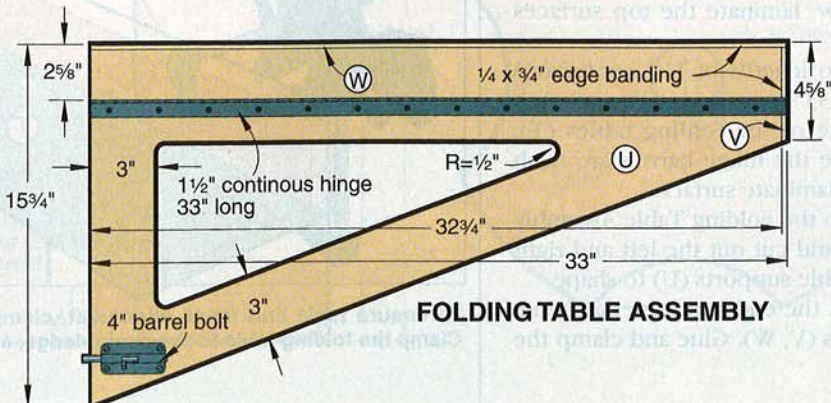
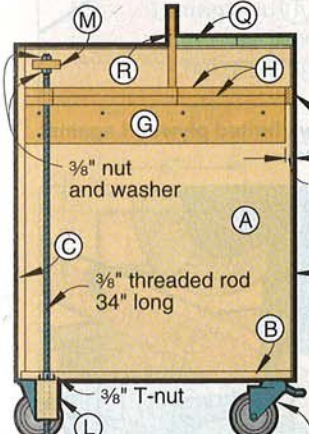
EXPLODED VIEW



FRONT SECTION VIEW



SIDE SECTION VIEW



Mobile Miter Saw Center

Table talk, beginning with the cabinet

1 Referring to the Saw Table And Fence drawing, cut left and right saw tables (Q) to size from $\frac{3}{4}$ " birch plywood. Note that applying the $\frac{1}{16}$ "-thick plastic laminate will result in the finished sizes in the Bill of Materials.

2 Cut enough plastic laminate to cover the surface and the exposed edges of saw tables (Q). Make the laminate pieces slightly oversized. (Do not laminate the back and long outside edges or bottom of these pieces.) Apply the edge pieces only, using contact cement. File or trim with a router and flush-trimming bit.

Next, glue and screw these pieces to the cabinet sides, as shown in the Assembly Detail, keeping them flush to the sides and side front edges. Secure with #8 \times 1 $\frac{1}{2}$ " flathead wood screws and countersink the holes. Apply the top plastic laminate piece over the screws and trim flush. Smooth any sharp edges with a file.

3 Cut the saw fences (R) to the needed dimensions, making left and right side parts. Cut the saw-table fence edge bandings (S), and glue and clamp the pieces in place. Sand flush. Finally, drill the countersunk holes on the back side where shown.

4 Clamp and screw the saw fences (R) to the saw tables (Q). Determine the countersunk screw-hole locations on the sides and drill the holes. Now, screw the fences to the sides (A) and top shelf (H).

Add the sturdy folding tables

1 Cut the folding tables (T) to $\frac{3}{4}\times 10\frac{1}{2}\times 32\frac{1}{16}$ ". Label one left and one right. Then glue plastic laminate to the outside end of each piece and trim. Laminate the front edge and trim. Now, laminate the top surfaces and trim.

2 Cut two lengths of 1 $\frac{1}{2}$ " continuous hinge to 33" long. Screw one to each back edge of the folding tables (T). Make sure the hinge barrels are flush with the laminate surface.

3 Refer to the Folding Table Assembly drawing and cut out the left and right folding table supports (U) to shape.

4 Cut out the end and top edge banding pieces (V, W). Glue and clamp the

end pieces to folding table supports (U); then apply the top edge banding to these supports.

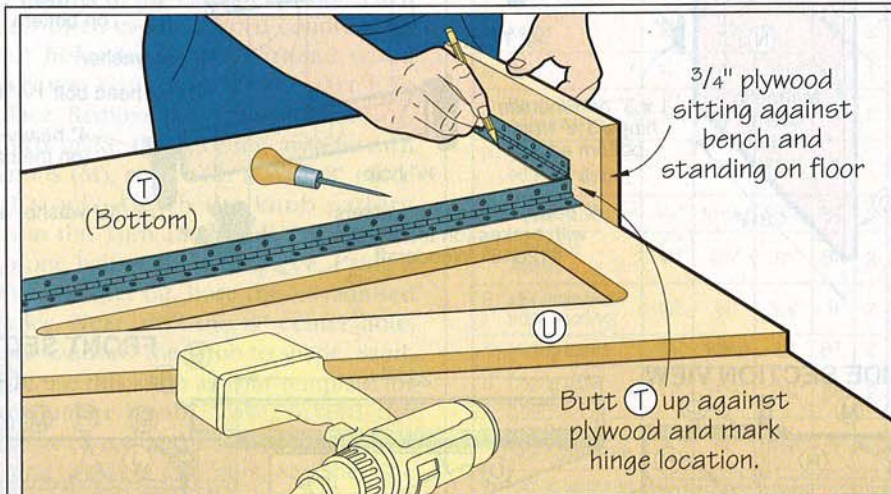
5 Lay the support flat on your workbench and clamp a folding table (T) on top of support (U) with the hinge edge at the location on the Folding Table Assembly drawing. Flush the ends, and screw the support to the folding table. Keep in mind that the support also serves as a saw fence; its height above the folding table should match the height of the miter saw cabinet fence (R) above saw table (Q). Make minor adjustments as needed. Then, repeat the process for the right folding table and support.

6 Install the barrel bolts on the front faces of folding table supports (U). See the drawing *opposite page*.

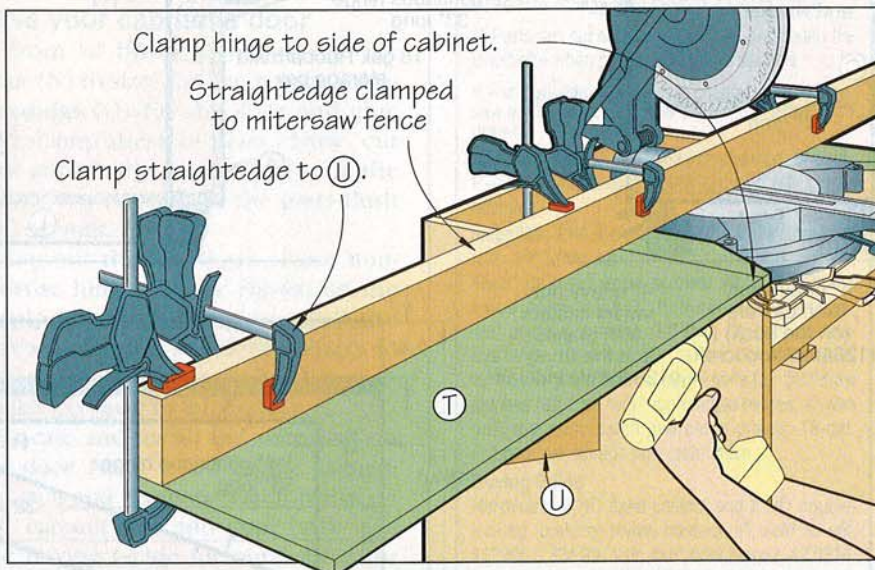
7 Cut two more continuous hinges to fit. Now, screw these to the bottom of folding tables (T) and flush with their unlaminated inside ends as shown in the *top illustration below*.

8 To attach the folding tables, place your miter saw on the cabinet and align its fence with the saw fences (R). Bolt the miter saw to the cabinet.

Next, cut and place a straight, edge-jointed 2 \times 4 on edge and against the aligned fences. Clamp it in position. Align one folding table assembly snugly beneath the 2 \times 4 and clamp it in



To install the hinge flush with the end of the folding table, we butted plywood against the table, marked the hinge location, then screwed it in place.



To ensure table and fence alignment, clamp a straightedge to the cabinet fences. Clamp the folding table to the straightedge, and secure it to the cabinet.

place. Screw it to the cabinet as shown *opposite page, bottom*.

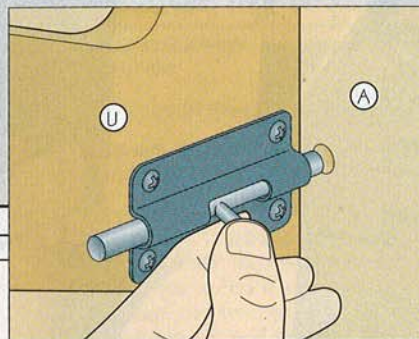
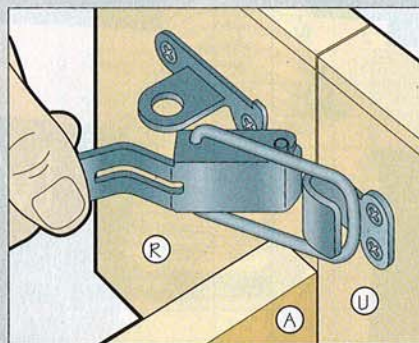
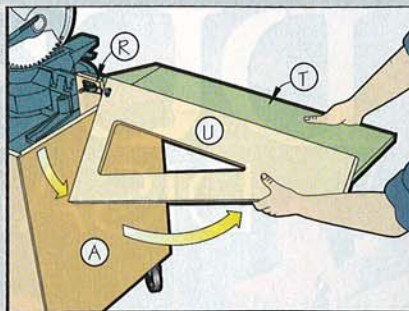
9 Using a square, adjust the folding table support so it angles 90° to the folding table. Mark the hole location for the barrel bolt on the cabinet side (A) and drill the hole. Repeat Steps 8 and 9 for the opposite folding table.

10 Attach draw catches to the fences to keep the tables from sagging.

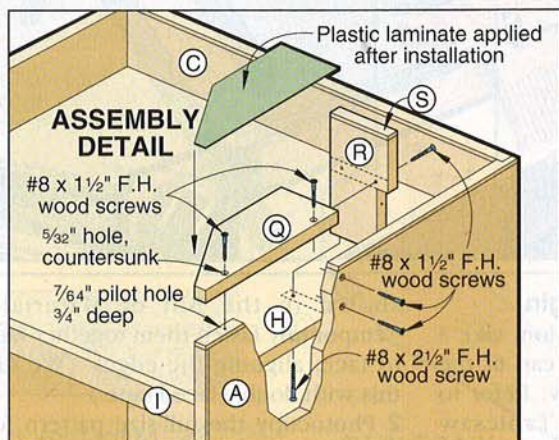
11 Remove the hardware, then finish (we used polyurethane). Once dry, re-install the hardware. 🍷

Raising your folding tables for action

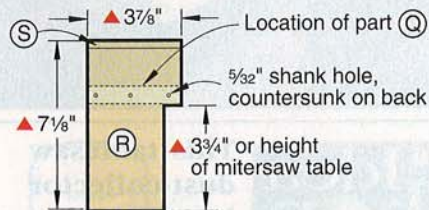
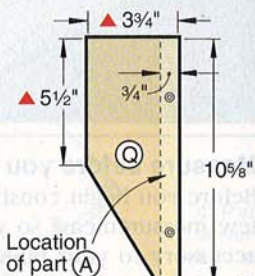
To use the folding tables, simply lift one table up, swing down the support until it's at a right angle to the table, and lock it in place using the barrel bolt and draw catch as shown.



Written by Jim Harrold
Project Design: Jim Downing
Illustrations: Roxanne LeMoine; Brian Jensen
Photographs: Steve Uzzell

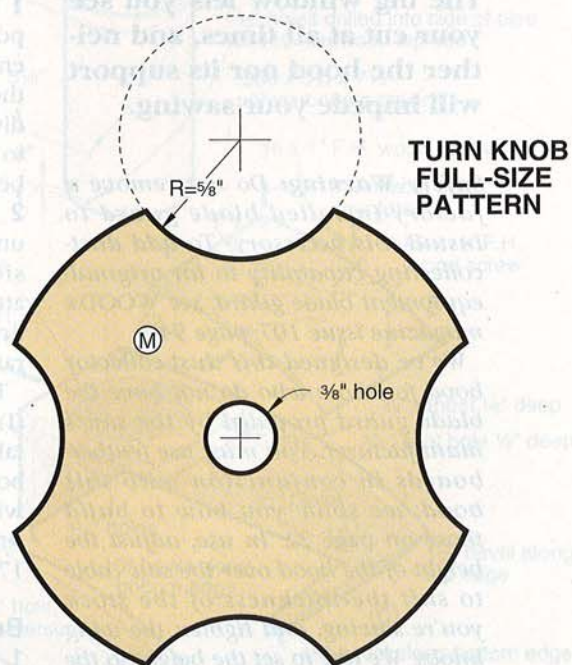
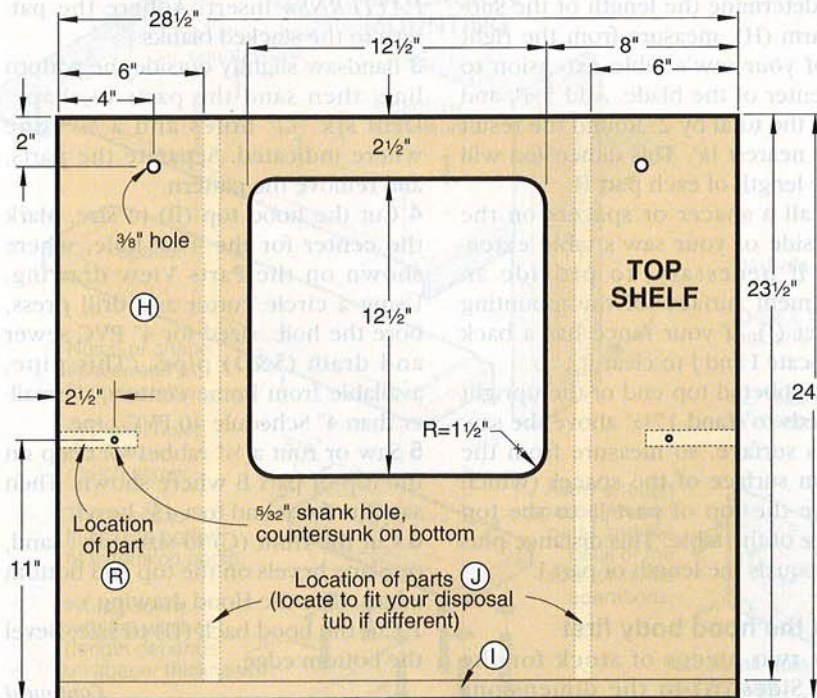


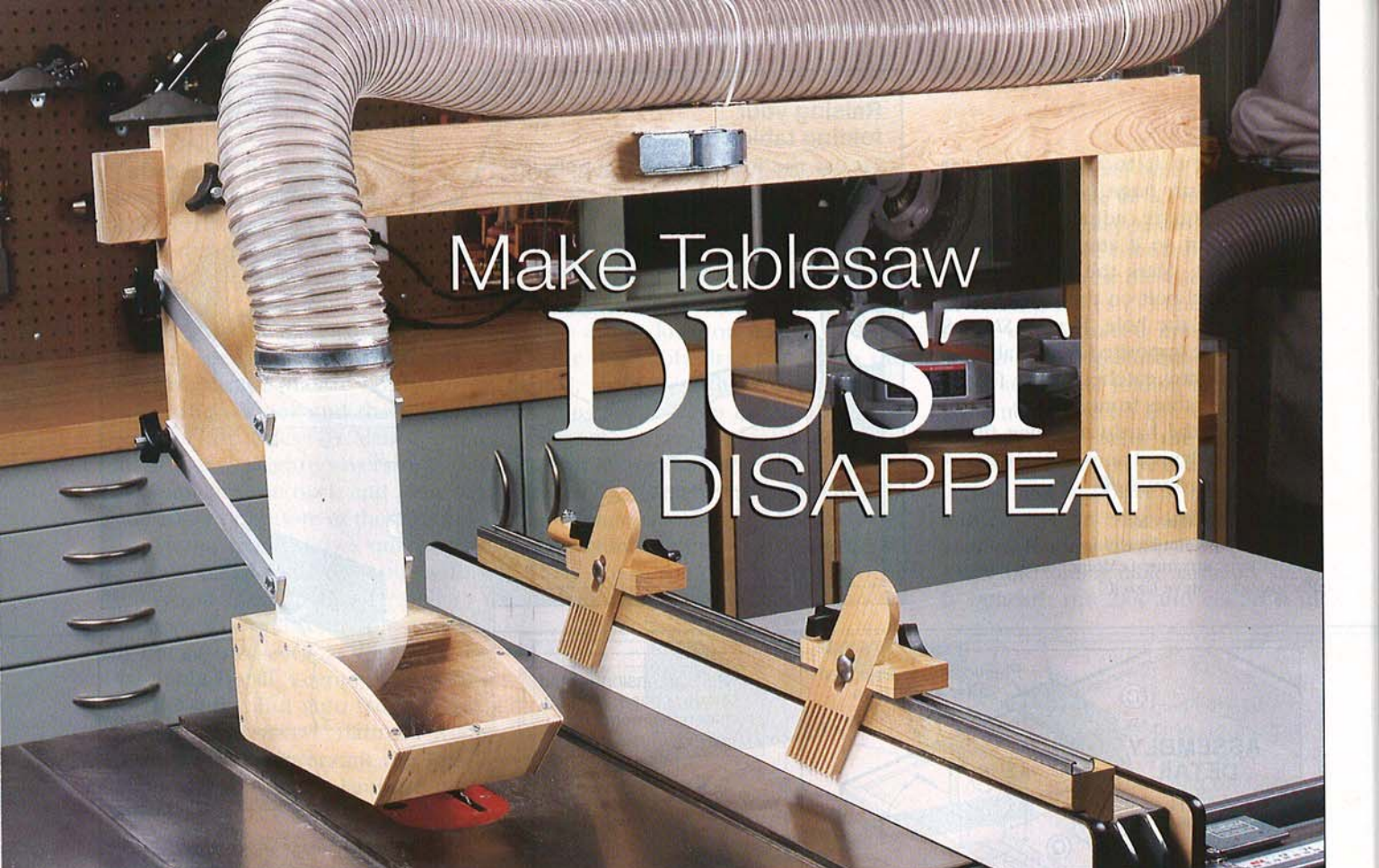
▲ Part dimensions could change depending on miter saw model you intend to use.



SAW TABLE AND FENCE

*Measurements of Q do not include plastic laminate.





Make Tablesaw DUST DISAPPEAR



This tablesaw dust-collector hood is effective as well as convenient.

The big window lets you see your cut at all times, and neither the hood nor its support will impede your sawing.

Safety Warning: Do not remove a factory-installed blade guard to install this accessory. To add dust-collecting capability to an original-equipment blade guard, see WOOD® magazine issue 107, page 94.

We've designed this dust-collector hood for those who do not have the blade guard provided by the saw's manufacturer. You must use featherboards in conjunction with this hood; we show you how to build those on page 22. In use, adjust the height of the hood over the saw table to suit the thickness of the stock you're sawing, and tighten the wing knobs. We like to set the height to the thickness of the material plus 1/4".

Measure before you begin

Before you begin construction, take a few measurements so you can fit the accessory to your tablesaw. Refer to the Exploded View and Tablesaw Extension Mounting drawings.

1 To determine the length of the support arm (H), measure from the right end of your saw's table extension to the center of the blade. Add 5 1/2", and divide the total by 2. Round the result to the nearest 1/8". This dimension will be the length of each part H.

2 Install a spacer or spacers on the underside of your saw's table extension, if necessary, to provide an attachment surface for the mounting bracket (J). If your fence has a back rail, locate I and J to clear it.

The rabbeted top end of the upright (I) needs to stand 17 1/2" above the saw table's surface, so measure from the bottom surface of the spacer (which will be the top of part J) to the top surface of the table. This distance plus 17 1/2" equals the length of part I.

Build the hood body first

1 Cut two pieces of stock for the Hood Sides (A) to the dimensions

shown in the Bill of Materials. Temporarily fasten them together face to face, aligning the edges. (We did this with double-faced tape.)

2 Photocopy the full-size pattern for the hood side, found in the WOOD PATTERNS® insert. Adhere the pattern to the stacked blanks.

3 Bandsaw slightly outside the pattern line; then sand the parts to shape. Drill six 9/64" holes and a 3/16" one where indicated. Separate the parts, and remove the pattern.

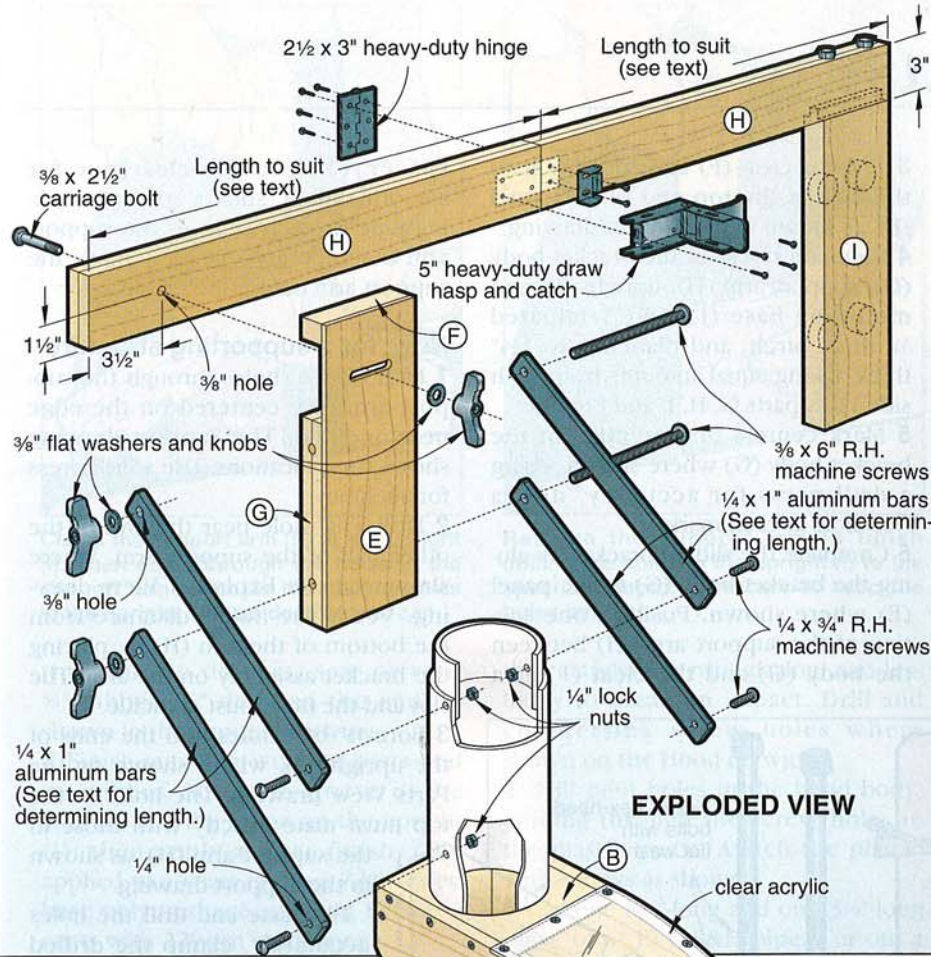
4 Cut the hood top (B) to size. Mark the center for the 4 3/16" hole, where shown on the Parts View drawing. Using a circle cutter and drill press, bore the hole, sized for 4" PVC sewer and drain (S&D) pipe. (This pipe, available from home centers, is smaller than 4" Schedule 40 PVC pipe.)

5 Saw or rout a 3/4" rabbet 1/8" deep on the top of part B where shown. Then saw the front end to a 45° bevel.

6 Cut the front (C) to size. Saw, sand, or plane bevels on the top and bottom edges. (See the Hood drawing.)

7 Cut the hood back (D) to size. Bevel the bottom edge.

Continued



Bill of Materials					
Part	Finished Size			Matl.	Qty.
	T	W	L		
A hood side	½"	4"	12¾"	BP	2
B hood top	½"	4½"	6¼"	BP	1
C hood front	½"	3½"	4½"	BP	1
D hood back	½"	3½"	4½"	BP	1
E bracket panel	¼"	4¼"	11¾"	BP	1
F bracket cleat	¾"	1¼"	4¼"	B	1
G bracket body	1¼"	4¼"	8"	LB	1
H support arm	1¼"	3"	*	LB	2
I upright	1¼"	5½"	*	LB	1
J mounting base	1¼"	5½"	12" **	LB	1

*To determine length, see *Measure before you begin* in text.
**Length can be altered to fit your saw.

Materials Key: BP—Baltic birch plywood; LB—laminated birch; B—birch

Supplies: 6x½", 1", and ¼" flathead wood screws; 10-24x1" self-tapping flathead machine screws; ¼-20x¾" roundhead machine screws and lock nuts; ¾-16x2½" carriage bolt; ¾-16x6" roundhead machine screws; ¾" flat washers; plastic knobs with ¾-16 thread; ½-13x5" and 8" hexhead bolts with nuts; ½" flat washers; .080"-thick polycarbonate glazing; 4" PVC sewer and drain pipe; ¼x1" aluminum bar stock; 2½x3" heavy-duty hinge with screws; 5" heavy-duty draw catch with screws.

SEE THE WOOD PATTERNS, INSERT FOR FULL-SIZE PATTERN AND PARTS VIEW DRAWING

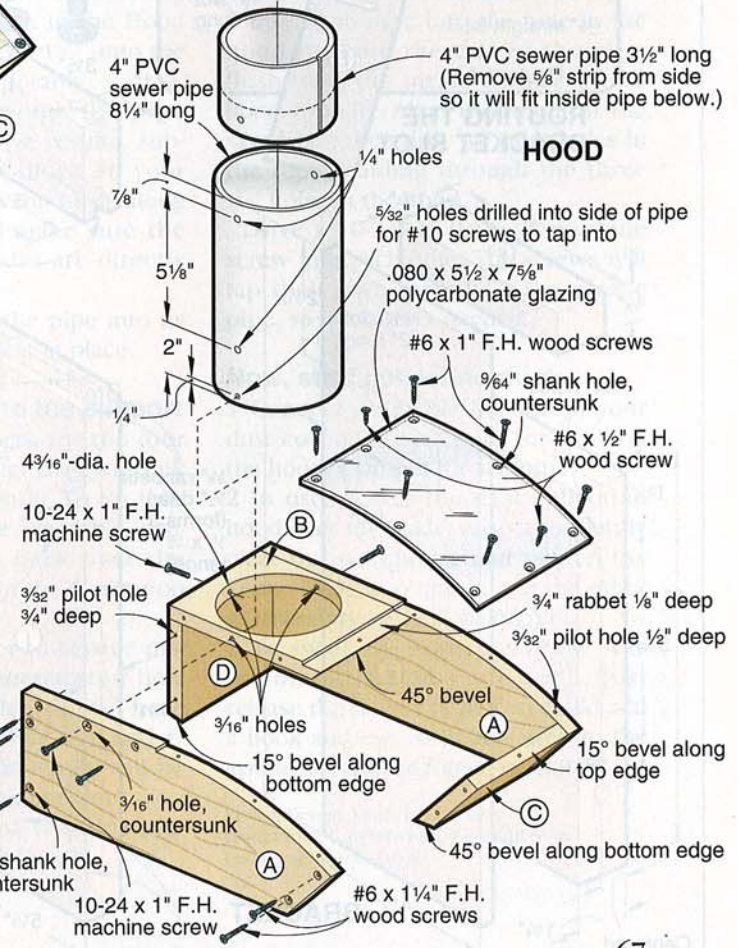
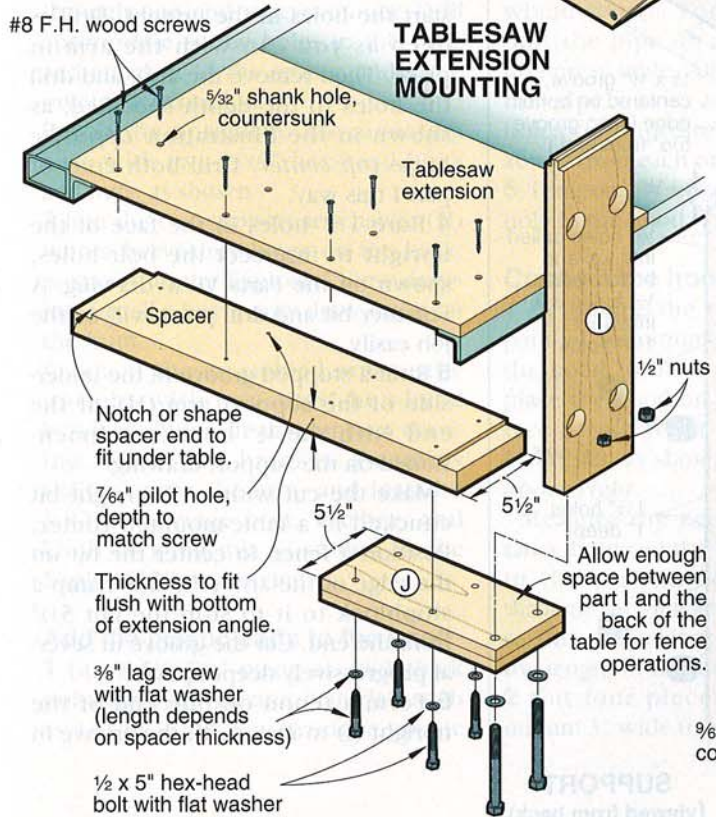


Table Saw Dust

8 Clamp parts A, B, C, and D together. Then, guiding through the holes in the sides (A), drill pilot holes for #6x1¼" flathead wood screws. Drill and countersink the ⅜" hole through the back (D), and countersink the screw holes in the sides (A). Unclamp the hood body assembly, apply woodworker's glue to the joints, and drive in the wood screws.

Build the adjustable bracket

1 Cut the bracket panel (E) to size.
2 Form a ⅜" slot where shown. To do this easily, install a fence on your table-mounted router and set stops on it, as shown in the Routing the Bracket Slot drawing below.

3 Cut the cleat (F) to size. Glue it to the face at the top end of the panel (E), as shown in the Bracket drawing.

4 Laminate stock for the bracket body (G), support arm (H), upright (I), and mounting base (J). (We laminated ¾"-thick birch, and planed it to 1¼" thick, taking equal amounts from each side.) Cut parts G, H, I, and J to size.

5 Mark centers on one edge of the bracket body (G) where shown. Using a drill press for accuracy, drill a ⅜" hole at each mark.

6 Complete the sliding bracket by gluing the bracket body (G) to the panel (E) where shown. Position one section of the support arm (H) between the body (G) and the cleat (F) as a

spacer. (To provide clearance for smooth sliding, stick a strip of masking tape to each edge of the support arm as temporary shims.) Remove the support arm before the glue dries.

Now, for a supporting structure

1 Drill two ½" holes through the support arm (H), centered on the edge near one end. The Support drawing shows their locations. Use a drill press for accuracy.

2 Drill a ⅜" hole near the end of the other half of the support arm, where shown on the Exploded View drawing. Verify the hole's distance from the bottom of the arm (H) by placing the bracket assembly on the arm. The slot and the hole must coincide.

3 Bore ½" bolt holes into the ends of the upright (I), where shown on the Parts View drawing. The holes in the top must mate exactly with those in the support arm (H), as shown in the Support drawing.

To locate and drill the holes accurately, clamp the drilled arm to the upright, as shown in the illustration

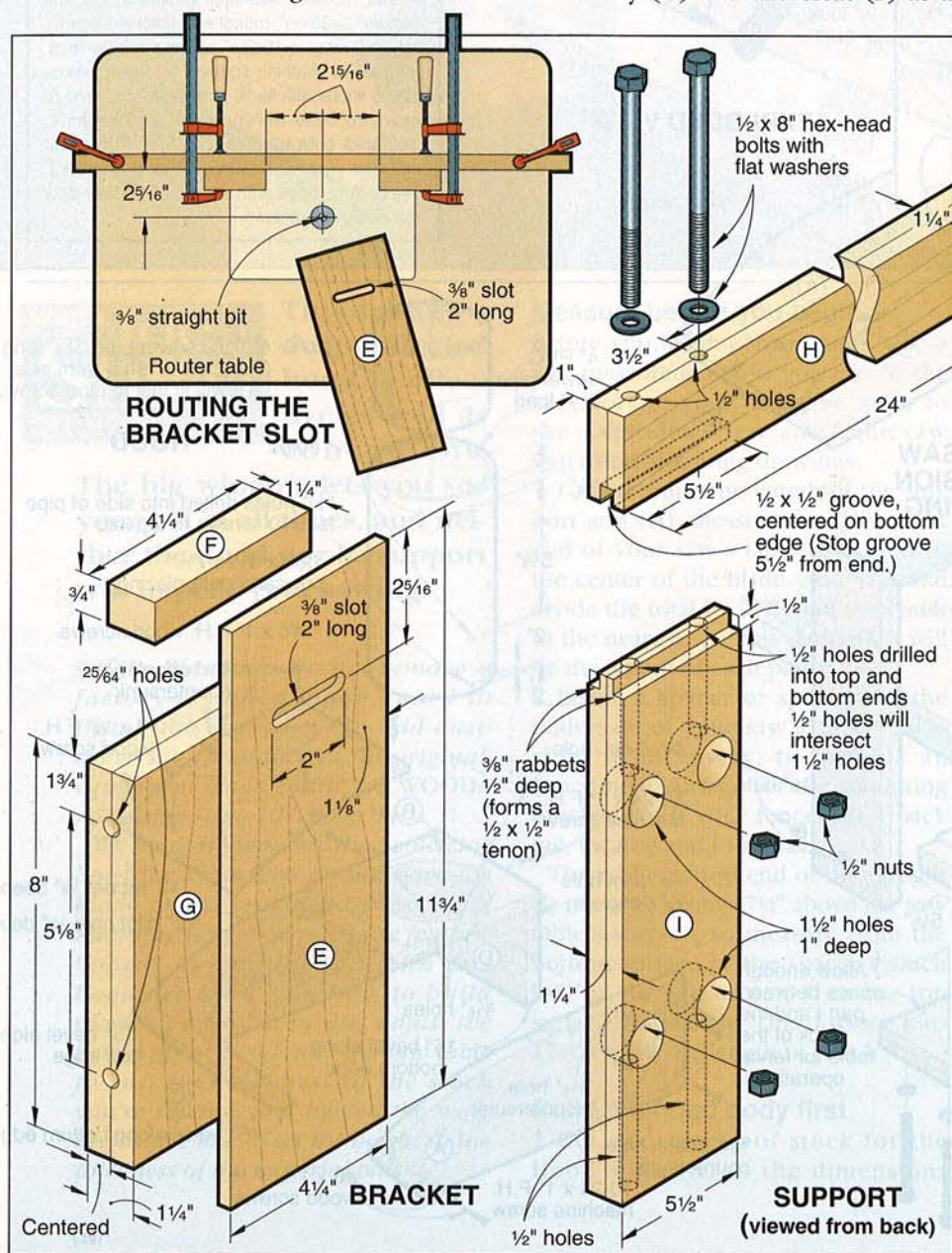
opposite page, top left. With a ½" bit chucked in a portable drill, guide through the holes in the arm to start the holes in the upright. Drill as deep as you can with the arm in place. Then remove the arm, and drill the holes to the depth specified, as shown in the illustration *opposite page, top center.* Drill both ends of part I this way.

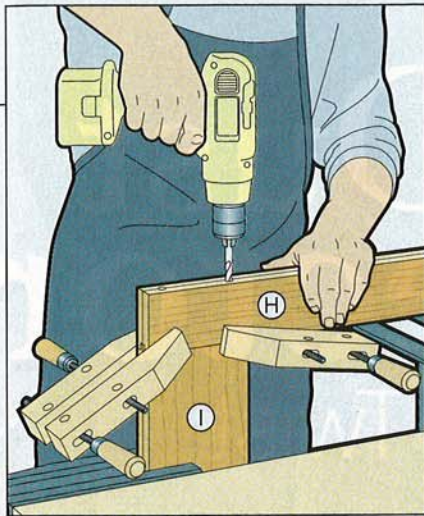
4 Bore 1½" holes in the face of the upright to intersect the bolt holes, shown on the Parts View drawing. A Forstner bit and drill press will do the job easily.

5 Rout a stopped groove in the underside of the support arm (H), at the end with the ½" holes, as dimensioned on the Support drawing.

Make the cut with a ½" straight bit chucked in a table-mounted router. Position a fence to center the bit on the edge of the arm (H), and clamp a stopblock to it to stop the cut 5½" from the end. Cut the groove in several progressively deeper passes.

6 Form a tenon on one end of the upright (I) to mate with the groove in

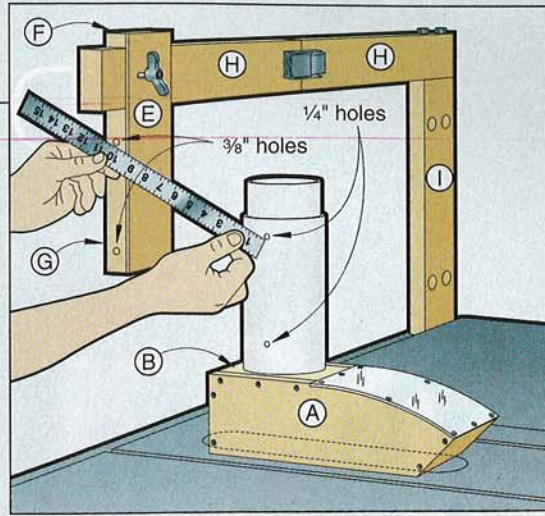




Clamp the support arm (H) to the upright (I). Then guide through the holes in the support arm to locate the mating holes in the upright. Drill as deep as you can.



Remove the support arm to finish drilling the holes in the upright (I) to the specified depth. Take care to keep the holes straight.



Center the hood assembly over the blade slot and center the bracket assembly behind the outlet pipe when measuring the length of the aluminum arms.

the arm. To do that, saw or rout $\frac{3}{8}$ " rabbets $\frac{1}{2}$ " deep on the end, as shown in the Support drawing.

7 Finish-sand the wooden parts and assemblies. Mask the groove in the arm (H) and the tenon on the upright (I); then apply a clear finish. (We applied two coats of Aqua ZAR water-base polyurethane, sanding between coats with 220-grit sandpaper.)

Attach the support to your saw

1 Cut the mounting base (J) to size. Using the drilled support arm as a template, drill two $\frac{1}{2}$ " bolt holes through one end where shown. Drill appropriate screw holes in the part, and attach it to the spacer under the saw table extension.

2 Bolt the upright to the mounting base with two $\frac{1}{2} \times 5$ " hex-head bolts and nuts, as shown.

3 Join the two support arm halves (H) with a heavy-duty hinge on the back, as shown in the Exploded View drawing. Install a heavy-duty draw catch on the front.

4 Attach the assembled arm to the upright with two $\frac{1}{2} \times 8$ " hex-head bolts, as shown in the Support drawing. Slide the bracket assembly (E/F/G) onto the arm, and install a $\frac{3}{8} \times 2\frac{1}{2}$ " carriage bolt, washer, and knob or wing nut as shown in the Exploded View drawing.

Add the plastic parts to the hood

1 Cut a $5\frac{1}{2} \times 7\frac{3}{8}$ " piece of .080"-thick polycarbonate glazing material, such as Lexan. This is a stronger plastic

than standard acrylic glazing, and less likely to break on impact. Drill and countersink screw holes where shown on the Hood drawing.

2 Drill pilot holes in the hood body, guiding through the screw holes in the plastic piece. Attach the plastic with screws as shown.

3 Cut one $8\frac{1}{4}$ "-long and one $3\frac{1}{2}$ "-long piece of 4" PVC S&D pipe. Cut out a $\frac{3}{8}$ "-wide strip along the axis of the shorter piece, as shown in the Hood drawing. Slide this piece $1\frac{3}{4}$ " into the other, and tape it temporarily.

4 Drill $\frac{1}{4}$ " holes through the pipe where shown. For best results, support the pipe on a V-block on your drill-press table. Align the holes along the pipe's axis, and make sure the holes on opposite sides are directly across from each other.

5 Temporarily insert the pipe into its hole in the hood. Tape it in place.

Connect the hood to the support

1 Determine the length for the four parallel aluminum bars that will link the hood to the support. To do this, place the hood on the saw table, centered from front to back over the blade slot, as shown in the illustration *above right*.

Measure the center-to-center distance between the uppermost $\frac{1}{4}$ " hole in the pipe and the top $\frac{3}{8}$ " hole through the bracket body (G). Add 1" to this dimension; the result will be the length of the aluminum arms.

2 Cut four pieces of $\frac{1}{4}$ "-thick aluminum 1" wide to that length.

3 Drill bolt holes in the arms. To do this, stack the arms, and tape them together. On the top piece, center-punch a mark $\frac{1}{2}$ " from each end and centered. Then, with a drill press, drill a $\frac{1}{4}$ " hole at one end and a $\frac{3}{8}$ " hole at the other. Separate the parts.

4 Bolt the ends with the $\frac{1}{4}$ " holes to the pipe assembly, as shown in the Exploded View drawing. Attach the other ends to the bracket, as shown.

5 Insert the pipe into the hole in the hood, making the end of the pipe flush with the inside surface of the hood top (B). Align the hood on the saw table; then drill $\frac{5}{32}$ " pilot holes in the pipe, guiding through the three $\frac{3}{16}$ " holes in the hood.

Drive a 10-24 \times 1" flathead machine screw into each hole. The screws will tap their own threads in the plastic pipe, so nuts aren't needed.

Now, start collecting dust

1 Connect a flexible hose from your dust collection system to the pipe on the hood. Clamp it for security.

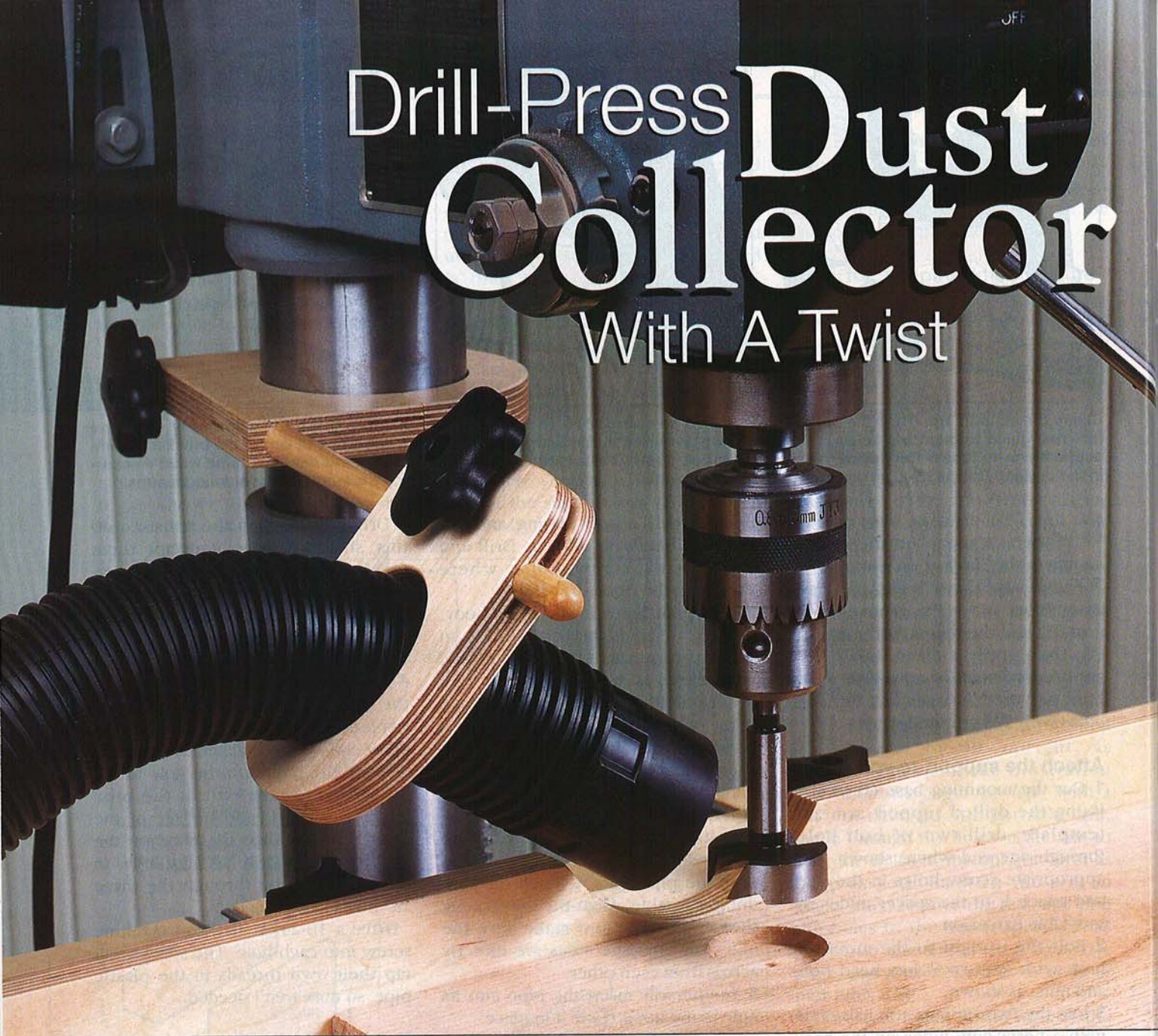
2 In use, center the dust collection hood over the blade, raise it to slightly clear the workpiece, and tighten the knobs. Slide it to one side or the other as necessary for best vision.

3 To swing the hood out of the way for blade changes and such, just release the draw catch. You could add a hook and eye or bullet catch to the arm to secure the folded section. 🌿

Project Design: James R. Downing
Illustrations: Kim Downing; Lorna Johnson
Photograph: Steve Uzzell

Drill-Press Dust Collector

With A Twist



In the never-ending battle with lung-damaging dust, you can't have too many weapons. Add this handy rig to your arsenal and you'll not only breathe easier, but you'll also speed shop clean-up.



(Note: We designed the column-mount of our dust-collection jig to fit a Delta stationary drill press with a 3/8"-diameter column. If the column on your drill press is a different size, change the dimensions of the column mount accordingly.)

(Note: We designed the column-mount of our dust-collection jig to fit a

First things first: Fashion the column mount

1 Begin by cutting the column mount (A) to the size shown in the Bill of Materials. (We used 3/4" Baltic birch plywood for its stability, but you also could use good quality fir or birch plywood.) Lay out the shape and mark the locations of all of the holes, as shown in the Parts View drawing. Drill the column hole.

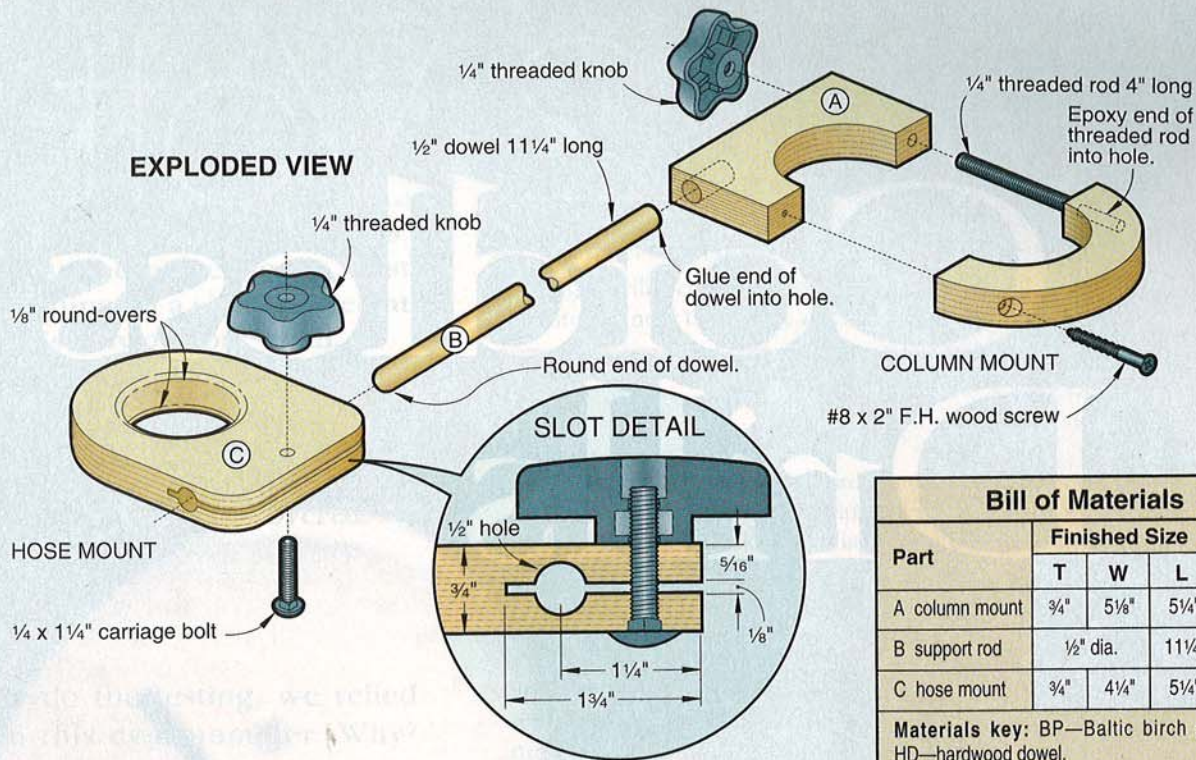
2 Set up your drill-press fence to center holes in the edge of the plywood, and clamp a stopblock 1/2" from the center of the drill bit. Drill the 1/2", 3/32", and 1 1/32" holes where shown. In the center of the 1 1/32" hole, bore a

3/32" hole that extends just past the center cutline. Don't move the fence or the stopblock; you'll use the same settings for the next step.

3 Cut the column mount to shape, then sand. Set up your bandsaw fence and cut the workpiece into two pieces through the column hole. Now bore the 3/64" pilot hole using your drill press and existing stopblock.

4 Cut 1/4" threaded rod to length, and epoxy it into place, where shown in Exploded View drawing.

5 Cut the support rod (B) to length. Sand one end round and glue the other end into the column mount where shown.



Bill of Materials					
Part	Finished Size			Mati.	Qty.
	T	W	L		
A column mount	3/4"	5 1/8"	5 1/4"	BP	1
B support rod	1/2" dia.		11 1/4"	HD	1
C hose mount	3/4"	4 1/4"	5 1/4"	BP	1

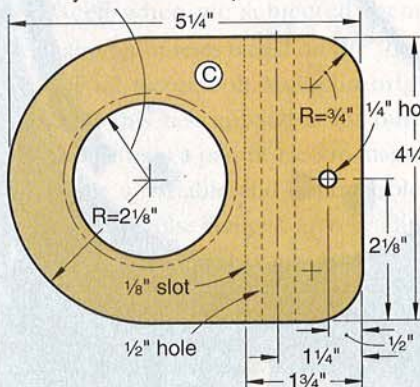
Materials key: BP—Baltic birch plywood; HD—hardwood dowl.

Supplies: 1/4" threaded rod, 4" long; 1/4x1 1/4" carriage bolt; 1/4" threaded knobs (2); #8x2" flathead wood screw.

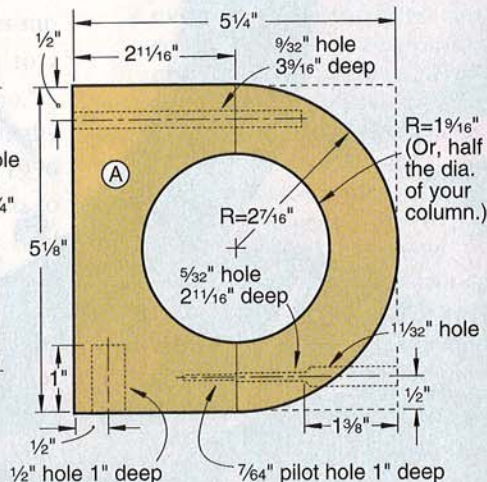
PARTS VIEW

HOSE MOUNT

R=1 1/4" (Or, half the outside dia. of your hose + 1/16".)



COLUMN MOUNT



Next, make the handy hose mount

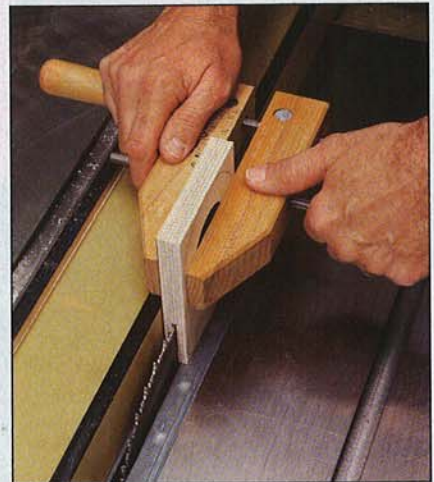
- 1 Cut the hose mount (C) to size.
- 2 Lay out the shape and mark locations for holes, where shown on the Parts View drawing. Our vacuum hose has a 2 1/4" outside diameter (OD) at the end, but the hose itself measures 2 3/8" OD, so we marked a 2 1/2" hole for a loose-fitting hose.
- 3 Drill the 1/4", 1/2", and hose holes where shown.
- 4 Insert the carriage bolt in the 1/4" hole, tap the head with a hammer to seat it, then remove it.
- 5 Set your tablesaw fence so the blade is centered on the edge of the ply-

wood. Raise the blade to 1 3/4" and cut the slot. Keep your fingers a safe distance from the blade by clamping a handscrew to the workpiece before guiding it through the cut, as shown in the photo at right.

- 6 Using your bandsaw, cut the hose mount to shape, sand it, and rout a 1/8" round-over on the hose hole.

Finally, finish and assemble

- 1 Finish-sand and soften the sharp edges; then finish with several coats of your favorite finish. (We used polyurethane.)
- 2 Slip the rounded end of the dowel into the 1/2" hole of the hose mount.



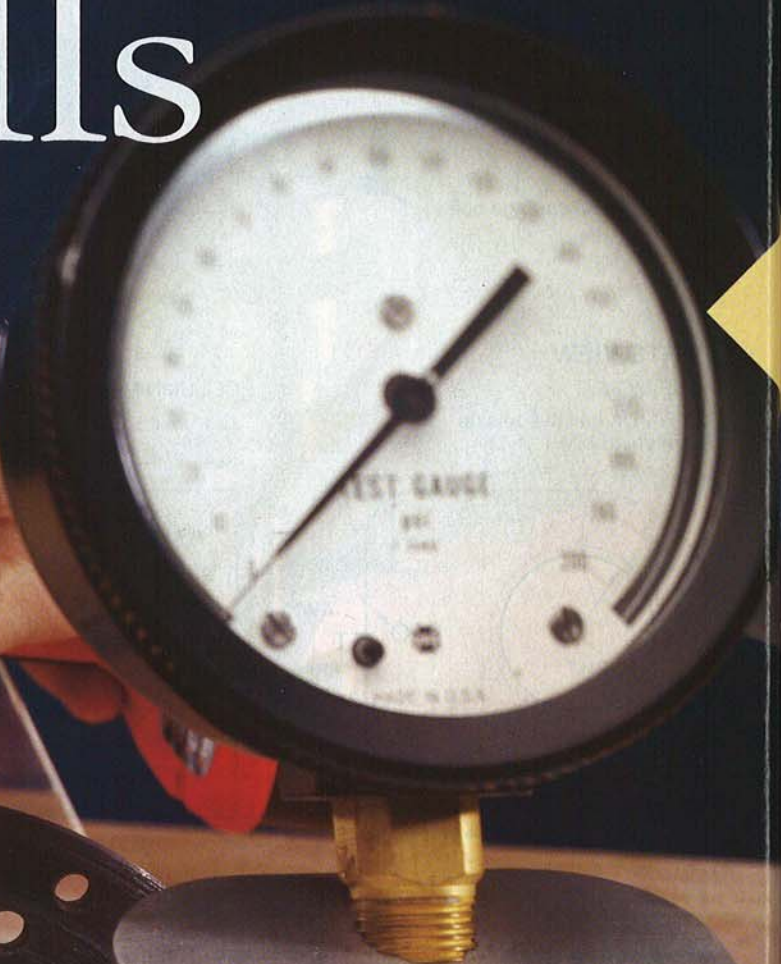
A handscrew on the hose mount rides the saw fence to guide it through the cut.

Reinsert the carriage bolt and attach the 1/4" threaded knob as shown in the Slot Detail drawing.

- 3 Now attach the column mount to your drill press above the rack gear, securing it with a 2" flathead wood screw and a 1/4" threaded knob as shown in the Exploded View drawing.

Written by Dave Campbell
Project Design: James R. Downing
Illustrations: Kim Downing; Lorna Johnson
Photographs: Steve Uzzell; Doug Hetherington

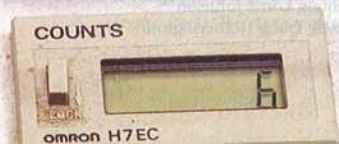
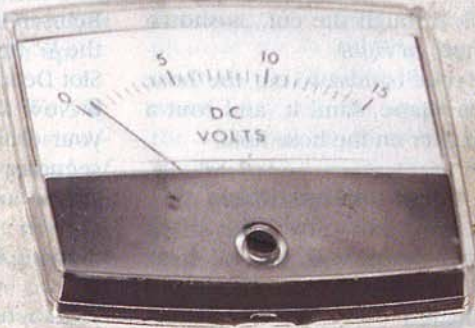
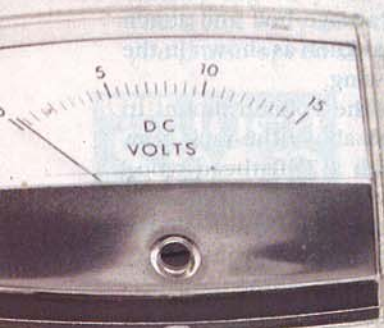
12-Volt Cordless Drills



Don't try this at home.

We ran each of the tested drills through torturous testing on this dynamometer.

To measure maximum torque, we had to completely stall the drills—something that's sure to make any motor smoke as shown here.



Although 14.4- and 18-volt cordless drills seem all the rage these days, we think a 12-volt model better fits the needs of most woodworkers. It has the power to do most anything, in a size and weight that's easy on your hand.

So which 12-volt drill is best for you? For the answer, we put 14 popular models through rigorous testing. Here's what we discovered.

To do the testing, we relied on this dynamometer. Why? Upon first inspection, these drills seemed to share many of the same features. But performance differences surfaced when we subjected them to a gauntlet of tests based on the "dyno."

Tool tester Bob McFarlin originally built this test apparatus for our 1996 test. It uses a pair of electro-magnets to apply a variable and controllable load to the drills. Gauges give readings of the applied load (torque), revolutions per minute (rpm), total revolutions per charge, and chuck speed.

Of course, we wanted to take this year's test several steps beyond what we did in '96, so we added to the dyno a gauge capable of reading up to 300 inch pounds of torque. And, we developed several new tests that we think reveal a lot about what you can expect from these drills in real-world use. In the sections that follow, we take a look at five critical tests of drill performance, and chronicle in bar graphs the performance of each drill.

Before conducting these tests, we charged and completely discharged all of the battery packs six times to bring the batteries up to full capacity. Then, we conducted each of the tests six times, and averaged the results.

Fast Facts

- Because of the intense competition among drill manufacturers, it's hard to find a major-brand cordless drill that's *not* a good value.
- More power is not necessarily better. Carefully consider how the weight and size of a cordless drill will affect its usability and comfort.
- No single drill performed best in all of our tests. A few, however, were consistently near the top in all categories.

When we last reviewed cordless drills in our August 1996 issue, we favored models with two battery packs, T-style handles, electric brakes, keyless chucks, self-diagnostic chargers, and high amp. hour (Ah) ratings. Models with those features had a good shot at earning our Editor's Choice Award.

Well guess what? All of the 12-volt drills in this year's test come with two battery packs, so you'll never be left with a powerless drill. All have T-style handles for better balance in your hand, and even the lowest-priced models come with electric brakes. Keyless chucks have become standard, and all but one of the tested drills (the low-cost Black & Decker) has a self-diagnostic charger to help prolong battery life. And Ah ratings have crept up, giving the drills more energy capacity.

So what new features stood out this time? Just two. First, the Makita 6213DWBE comes with nickel-metal hydride (NiMH) batteries with higher Ah ratings than the nickel-cadmium (NiCd or Ni-Cad) cells found in the other tested drills. For more on this subject, see "What's with these new nickel-metal hydride batteries?" on page 88.

Also, Craftsman has come out with a marvel of engineering called the Redi Drill, model 27491 (shown below). It's the only drill with an internal magazine that holds up to five drill or driver bits. We found it a snap to dial up the right bit with one knob on the side of the drill, and slide the bit into and out of the chuck with another knob that slides along the top and end of the drill.



After dialing up one of five drill or driver bits stored in a rotating magazine, you slide a knob forward to push the bit into the chuck. You replace the bits in the magazine by sliding them through the chuck.



As you can read on this Porter-Cable unit, self-diagnostic chargers tell you plenty about the status of a battery and the charging process.

That feature can prove handy for jobs that require frequent bit changing. And the drill performed reasonably well in our tests. Still, we found the drill bulky and hard to balance, making it uncomfortable for extended use. In place of a clutch, this drill has a "torque" dial switch that we found inconsistent for driving fasteners.

12-Volt Cordless Drills

The maximum-torque test and what it means to you

In addition to low-gear torque readings, this year we added maximum torque readings with the drills in high gear, as shown in the graph below. Why? With today's powerful drills you can use high gear to quickly drive fasteners.

Now keep in mind that these are *maximum* readings—at these high levels the motors on the drills begin to smoke and self-destruct. We consider the *safe maximum* torque output of these drills to be about 80 percent of the maximums shown.

Note: Because of differences in testing procedures, our test results may vary from advertised ratings. But, because all of the drills were tested identically, you can use these ratings to accurately compare drills within the test group. Do not compare this information against advertised ratings for models not covered here.

The DeWalt and Black & Decker models were the only machines that pushed beyond 300 inch pounds of torque in low gear. These drills were tops also in high-gear torque with 78

inch pounds. However, you cannot consider torque readings without looking at chuck speed. For example, the B&D model produces high torque readings because it is geared lower than the other tested drills (its top speed in low gear is 250 rpm); other drills run at up to 400 rpm in low gear. So the B&D model has plenty of torque, but its slower chuck speed requires patience on your part.

When chuck speed is entered into the torque equation, the Makita and Panasonic drills impressed us the most, with the DeWalt close behind. All of these drills had high torque outputs combined with relatively high speeds in both gears.

At this point you may be wondering, "Just how much torque do I need?" To put the torque ratings into perspective, we tested how much torque it actually takes to perform certain drilling and driving tasks. You'll find those results in the chart at right.

As you can see, 12-volt drills handle all of the tasks we attempted, with the possible exception of boring with

a 2½" holesaw. Nevertheless, if you feel you could benefit from owning a drill with even higher torque output, see the information headed "How Powerful Should Your Cordless Drill Be? Consider this." on page 40.



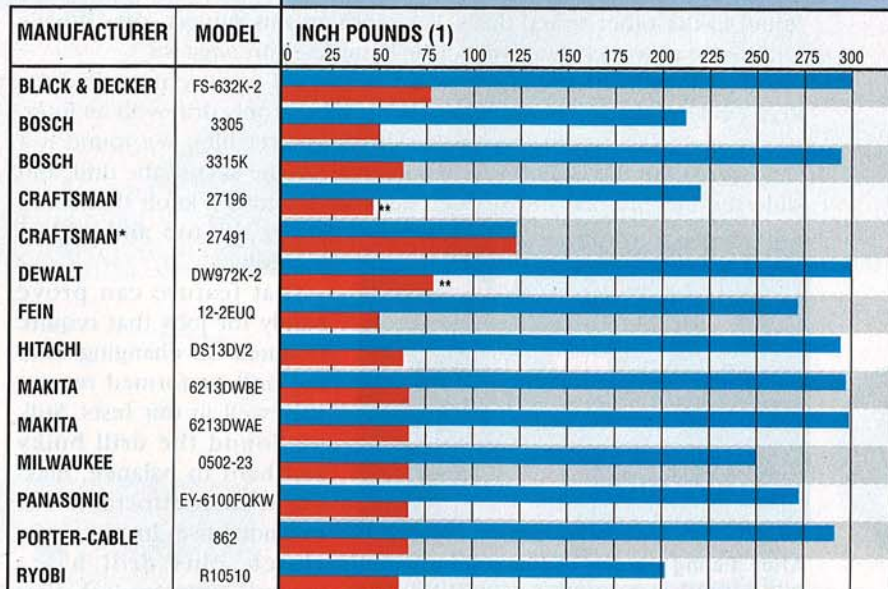
TORQUE REQUIREMENTS OF SOME TYPICAL TASKS

FASTENER OR BORING ACCESSORY	INCH POUNDS OF TORQUE REQUIRED TO DRIVE OR BORE*
2"-Long #6 Screw	10 to 35
3"-Long #8 Screw	50 to 75
¼" Twist Drill Bit	30 to 50
⅜" Twist Drill Bit	50 to 75
⅝" Twist Drill Bit	100 to 130
½" Spade Bit	75 to 100
¾" Spade Bit	100 to 150
1" Spade Bit	130 to 200
¼" x 1½" Lag Screw No Pilot Hole	150 to 200
¼" x 1½" Lag Screw With Pilot Hole	80 to 110
⅝" x 1½" Lag Screw No Pilot Hole	175 to 250
⅝" x 1½" Lag Screw With Pilot Hole	100 to 130
1⅛" Holesaw	100 to 150
1¾" Holesaw	150 to 250
2½" Holesaw	225 to 350

*Red oak and pine were used for tests. Torque range is due to difference in hardness between these materials.

MAXIMUM TORQUE

HOW MUCH MUSCLE THESE DRILLS DELIVER FOR TOUGH DRIVING AND DRILLING TASKS



NOTES:

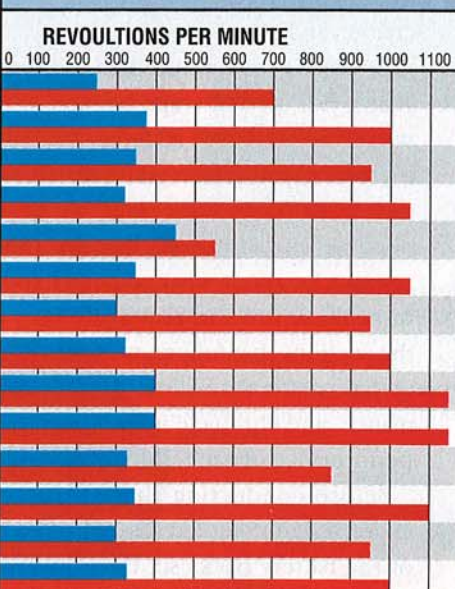
*Single-speed drill

**Machine shut itself off via electronic overload switch

(1) These are maximum torque ratings. Pushing a drill to its maximum torque may damage motor. The safe maximum torque is about 80 percent of maximum ratings shown in chart.

CHUCK SPEED

HOW FAST BITS SPIN IN HIGH AND LOW GEAR UNDER LOAD



NOTES:

In low gear with 35 inch pounds of applied load

In high gear with 10 inch pounds of applied load

Chuck speed affects the quality and speed of your work



The faster a cordless drill turns in high gear, the cleaner it will drill holes, and one that cranks along quickly in low gear will help you drive fasteners with greater speed. With that in mind we applied 35 inch pounds of load to the drills in low gear, and 10 inch pounds in high gear, then measured their speed in rpm. As the "chuck speed" graph shows, the Makita and Panasonic drills edged out several close contenders.

Speed consistency gives you control

As we discovered in the test described *above*, some drills bog down under increased load more than others. Why? Better drills have electronic feedback circuitry that senses added load and sends more electrical energy to the motor to keep the speed consistent.

As shown in the "speed consistency" graph, we ran all of the drills at 200 rpm with no load initially, then increased the load to 50 inch pounds. Only the Hitachi and Panasonic drills had no rpm drop as we increased the load. The DeWalt was next best with a drop of only 25 rpms.



Battery capacity means less work interruption



Drills with higher Ah ratings have batteries that store more energy. That means you can drill more holes, or drive more screws, on every charge. In the chart on the *next page* we list the Ah ratings for each drill. To test for battery capacity for ourselves, we measured the number of revolutions each of them produced, under load, per charge.

As you can see in the "battery capacity" graph, the Porter-Cable drill led the charge in this category, with the Makita 6213DWBE close on its heels. (Makita makes two versions of the 6213; the DWBE version comes with a 2.2 Ah, NiMH battery, and the 6213DWAE comes with a 2.0 Ah, Ni-Cad pack.)

A chuck that's sure grippin', saves you from bits a slippin'

Few things in woodworking match the frustration of a bit that slips in a drill chuck. With the help of the dyno, we compared the gripping strength of each of the chucks as shown in the "chuck grip" graph.



Only a handful of the drills kept a grip at torque levels of 240-or-more inch pounds—a level that's necessary when using big bits with round shanks. The Panasonic won this contest easily because it has a unique self-ratcheting chuck that actually grips the bit tighter as torque increases. However, this chuck will grip the bit so tightly that sometimes you can't release the chuck without using a steel pin that's provided with the drill. That's easy enough to do, but we wish the drill came with a storage spot for the pin. In workshop use we had a hard time keeping track of it.

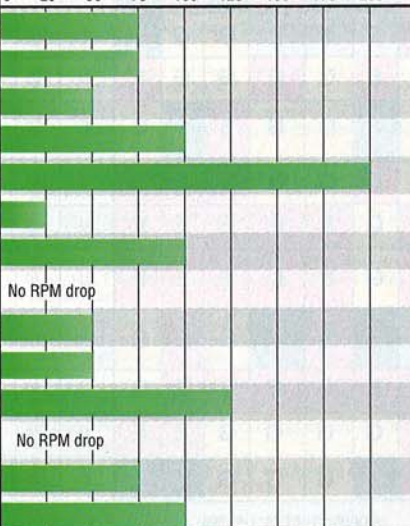
Continued

SPEED CONSISTENCY

HOW WELL A DRILL MAINTAINS CONSTANT SPEED UNDER VARYING LOAD

RPM LOST WITH INCREASED LOAD

0 25 50 75 100 125 150 175 200



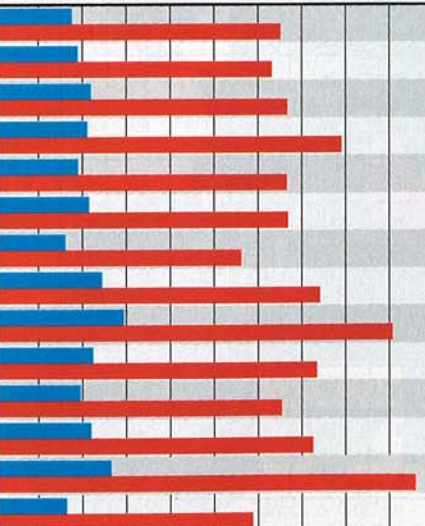
NOTE: Measurement is in revolutions per minute lost when load was increased. Drills were run in low gear at 200 rpm and zero load initially. Then load was increased to 50 inch pounds, and RPM drop was measured.

BATTERY CAPACITY

HOW MANY REVOLUTIONS YOU CAN EXPECT PER CHARGE

REVOLUTIONS UNDER LOAD PER CHARGE

0 1000 2000 3000 4000 5000 6000 7000 8000 9000



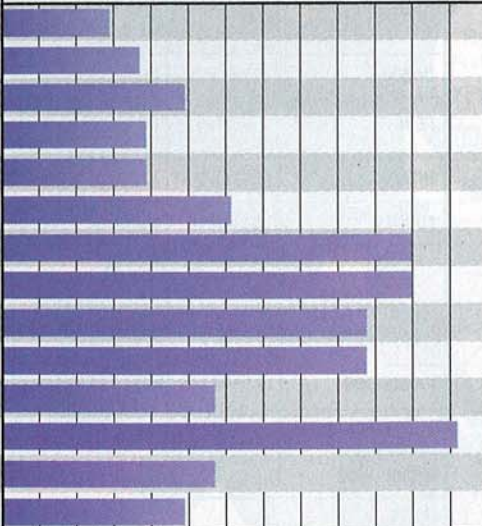
NOTES:
In low gear with 35 inch pounds of applied load
In high gear with 10 inch pounds of applied load

CHUCK GRIP

HOW WELL A CHUCK HOLDS BITS DURING STRENUOUS USE

INCH LBS OF TORQUE REQUIRED FOR SLIPPAGE

0 25 50 75 100 125 150 175 200 225 250 275 300

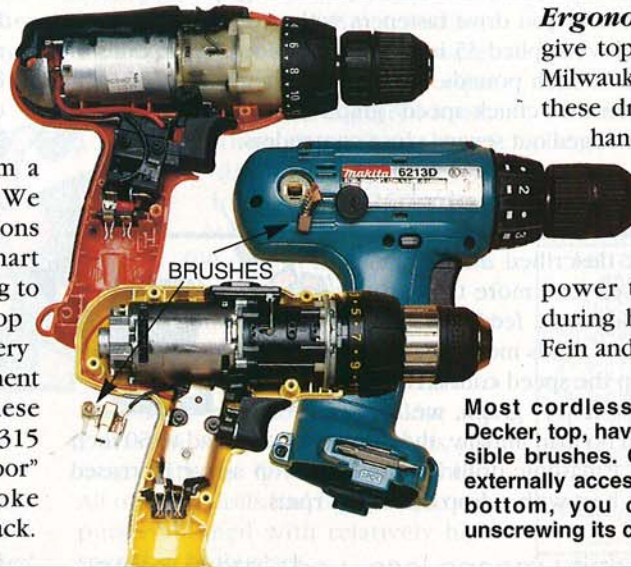


NOTE: All chucks were hand tightened. A round steel shaft of 30 Rc (the approximate hardness of a drill-bit shank) was chucked into each drill. Torque was gradually increased until the shaft slipped.

12-Volt Cordless Drills

More pertinent points to consider

Durability. Sooner or later, you're going to drop a cordless drill if you use it often. To simulate how each of the tested drills would survive such an accident, we dropped each of them from a height of 4' onto a rubber mat. We oriented the drills in three positions before dropping them. In the chart below we give an "excellent" rating to those drills that withstood the drop intact. On some models the battery pack popped off (with no permanent damage to the drill), earning these drills a "good" rating. The Bosch 3315 and Milwaukee drills received "poor" ratings because their cases broke where they attach to the battery pack.



Ergonomics. In this department we give top marks to the Bosch, Makita, Milwaukee, and Panasonic drills. All of these drills feel well-balanced in our hands, and are relatively compact in size and light in weight.

Electronic overload circuits. This feature protects a motor by cutting off power to it before it is overloaded during high-torque applications. The Fein and Sears drills have it.

Most cordless drills, such as the Black & Decker, top, have Johnson motors with inaccessible brushes. Only the Makitas, middle, have externally accessible brushes. With the DeWalt, bottom, you can access the brushes by unscrewing its clamshell case.

AT-A-GLANCE REVIEW OF 14 OF TODAY'S POPULAR 12-VOLT CORDLESS DRILLS

MANUFACTURER	MODEL	TYPE (1)	BATTERY PACK		CHUCK CAPACITY (INCHES)	REPLACEABLE BRUSHES (Y) YES, (N) NO	NO. OF CLUTCH SETTINGS (IN ADDITION TO THE "DRILL" SETTING)	SIZE			DRIVER-BIT STORAGE (Y) YES, (N) NO	PERFORMANCE EVALUATION (2)						COUNTRY OF ASSEMBLY (3)	SELLING PRICE (4)		
			AMP.	HOUR (Ah) RATING				CHARGE TIME (MINUTES)	LENGTH FROM TRIGGER TO CHUCK TIP (INCHES)	OVERALL LENGTH (INCHES)		OVERALL HEIGHT (INCHES)	WEIGHT (POUNDS)	DROP TEST DURABILITY	SPEED CONSISTENCY*	HANDLING EASE	CHUCK SPEED UNDER LOAD*			CHUCK GRIP*	BATTERY CAPACITY*
BLACK & DECKER	FS-632K-2	NiCd	1.3	180	3/8	N	23	4 3/4	9 1/2	9 1/8	3.8	N	E	G	G	P	F	G	E	C	\$100
BOSCH	3305	NiCd	1.4	60	3/8	N	5	4	8 1/4	10	3.6	Y	G	G	E	G	F	F	F	M	140
CRAFTSMAN	3315K	NiCd	1.7	60	3/8	N	15	4	8 3/4	9 7/8	4	Y	P	G	E	G	G	G	E	M	160
	27196	NiCd	1.7	60	3/8	N	23	5 1/4	10	9 7/8	4.3	Y	E	F	F	E	F	E	F	C	155
	27491	NiCd	1.7	60	3/8	N	Electronic Variable	4 7/8	10 3/4	10 1/2	5.1	Y	E	P	P	P	G	G	F	C	150
DeWALT	DW972K-2	NiCd	1.7	60	3/8	Y	14	5	9 1/4	9 1/8	4.5	Y	G	E	G	E	G	G	E	U	185
FEIN	12-2EUQ	NiCd	1.3	60	1/2	N	14	5 1/2	10 7/8	9 3/4	4.3	N	G	F	G	G	E	F	G	G	250
HITACHI	DS13DV2	NiCd	2.0	60	1/2	N	22	4 5/8	8 7/8	9 3/4	4.2	N	G	E	G	G	E	E	E	J	140
MAKITA	6213DWBE	NiMH	2.2	60	3/8	Y	17	4 1/8	9 1/8	9 3/8	4.3	Y	E	G	E	E	E	E	E	U	180
	6213DWAE	NiCd	2.0	60	3/8	Y	17	4 1/8	9 1/8	9 3/8	4.3	Y	E	G	E	E	E	E	E	U	170
MILWAUKEE	0502-23	NiCd	2.0	60	3/8	N	21	3 1/2	9 1/8	9 3/8	3.9	N	P	F	E	F	G	E	G	G	170
PANASONIC	EY-6100FQKW	NiCd	2.0	15	3/8	N	21	4	8 1/2	8 3/8	3.9	N	E	E	E	E	E	E	G	U	180
PORTER-CABLE	862	NiCd	2.0	60	3/8	N	20	4 1/4	9 1/2	9 1/4	4.1	N	E	G	G	G	G	E	E	U	150
RYOBI	R10510	NiCd	1.5	60	3/8	N	23	5	9 3/4	9 3/4	4.3	Y	E	F	G	G	G	F	F	C	130

NOTES:

1. (NiCd) Nickel-Cadmium
(NiMH) Nickel-metal hydride

2. **E** Excellent **G** Good
F Fair **P** Poor

(*) See other charts throughout article for specific performance.

3. (C) China
(G) Germany
(J) Japan
(M) Mexico
(U) United States

4. Based on advertised prices at time of article's production.

MANUFACTURERS' LISTING:

Black & Decker 800/544-6986
Bosch 877/267-2499
Craftsman Call or visit your local Sears store.
DeWalt 800/433-9258
Fein 800/441-9878

So what drill do you buy? Here's our recommendation

Motors and replaceable brushes.

Although most of the drills have similar motors manufactured in China by Johnson, DeWalt and Makita make their own motors in the U.S. and Japan, respectively. And not coincidentally, only the DeWalt and Makita motors have replaceable brushes. That's important to know because the brushes in a cordless motor will wear out after a few years of regular use.

As shown *left*, with the DeWalt you need to split its housing to access the motor and brushes. The Makita makes this task much easier because it has brushes that you can inspect or replace by removing two button-like covers on either side of the housing.

The DeWalt and Makita drills rank atop our tests, and choosing between them comes down to cost. We found the Makita 6213DWAE priced about \$15 less at the time of this article's production, making it our first choice among drills costing \$170 or more. We also liked the feel and handling of its "nose-up" design.

The similar Makita 6213DWBE comes with higher-capacity Ni-MH batteries that produced about 20 percent more revolutions per charge in our tests. At the time we wrote this,

the DWBE was promotion-priced at only \$10 more than the DWAE.

If you don't want to spend quite that much, the Hitachi tops the drills in the \$140-170 range. The only drill in our test priced between \$110 and \$140 is the Ryobi. It doesn't quite match the performance of the already-mentioned drills, but it's a good value at \$130 or so.

You won't be happy with the Black & Decker if you're used to top-notch tools, but for \$100 it affordably meets the needs of the occasional user. Its relatively slow chuck speeds and three-hour charger won't make you a speed demon around the shop.



COMMENTS

Has lots of torque but relatively low chuck speeds. A low-cost drill with a three-hour, nondiagnostic charger and lower-quality chuck. A good value for the occasional user.

If you're primarily interested in a light and compact drill, give this one a hard look. Its battery capacity does not match that found in most models in its price range.

A competent, but not outstanding, performer in most areas. Proved comfortable to hold and well balanced.

Has no serious flaws, but doesn't match the performance of some similarly priced drills. Overload switch prevents motor damage but limits maximum torque output.

A unique drill that holds multiple bits for quick changes. Large and bulky.

Produces high torque and chuck speed. This drill and both Makitas were tops in our tests.

Well-built but pricey considering its middle-of-the-road performance. Overload switch prevents motor damage but limits maximum torque output.

A solid performer that's comfortable in your hand. Has outstanding electronic speed control. A good value.

The only drill in the test with NiMH batteries. Otherwise, similar to Makita 6213DWAE.

This drill, the similar Makita 6213DWBE, and DeWalt were tops in our test. Externally accessible brushes a big plus for the frequent user.

A good performer, but falls just short of some similarly priced drills. Short length from trigger to chuck gives outstanding control when driving fasteners.

A small and compact drill with an outstanding chuck. Excellent speed control. Its 15-minute charger comes in handy at times.

Produced the most revolutions per charge, but chuck speeds were average. A good value.

An average performer in this test of mostly more-expensive drills. A good value in light of its price.

Hitachi 800/706-7337	Milwaukee 800/243-0870	Porter-Cable 800/487-8665
Makita 800/462-5482	Panasonic 800-338-0552	Ryobi 800/525-2579

For specifications on other types of tools, click on "Tool Comparisons" at www.woodmall.com

Written by Bill Krier Product testing: Bob McFarlin
Photographs: Marty Baldwin Illustrations: Brian Jensen

Brilliant Birds

These colorful cutouts
will put a feather in your cap

Russell Greenslade's puzzles aren't just playthings; many people buy the colorful, artistic pieces to display. And here's something else you'll appreciate—the designs are great fun to scrollsaw. Here are two of Russell's originals, presented for your workshop enjoyment.

1 Decide which bird you want to make if you don't want to make both. Cut a $\frac{3}{4} \times 5\frac{1}{4} \times 18"$ blank for the scarlet macaw puzzle; one that measures $\frac{3}{4} \times 4\frac{1}{2} \times 7"$ for the pelican. Maple, basswood, or clear pine would be suitable stock for the puzzles.

2 Photocopy the full-size pattern for the puzzle you're making. Patterns for both the macaw and pelican are in the *WOOD PATTERNS*® insert.

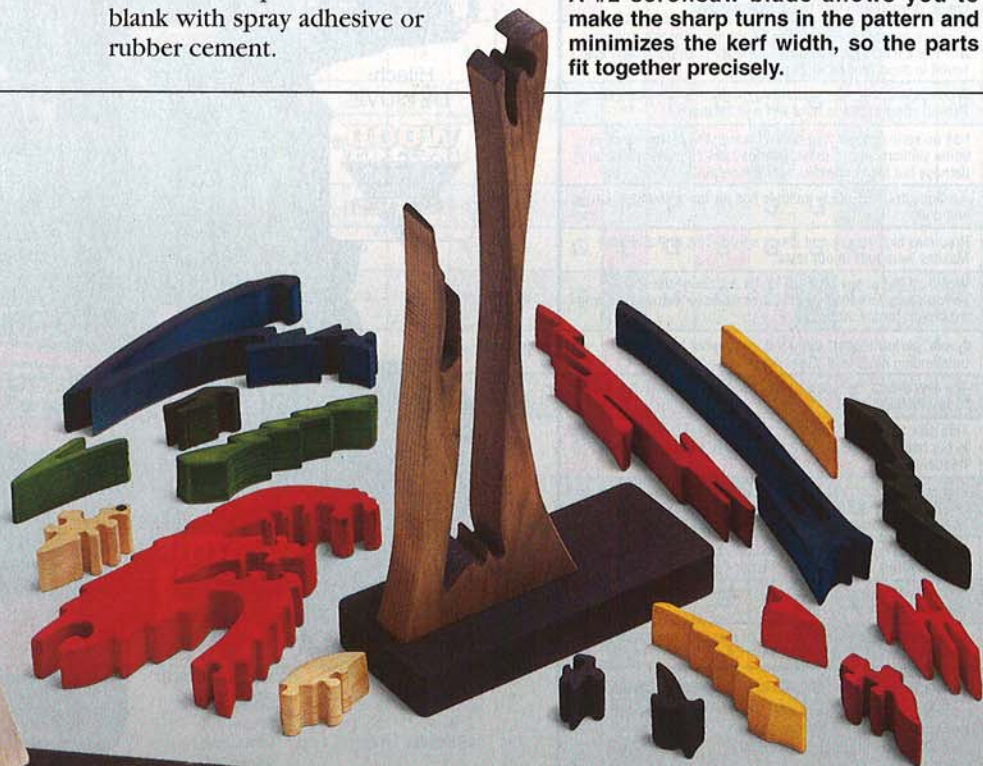
Adhere the pattern to the blank with spray adhesive or rubber cement.

3 Install a #2 blade (.028x.012", 20-23 teeth per inch) in your scrollsaw.

4 Cut around the outside pattern line on the puzzle. (We cut out and completed the sunset pelican first.)

5 Cut the puzzle into parts, working from the top down. Cut each part as you come to it. On the pelican puzzle, for instance, start by sawing into the puzzle along the line that separates

A #2 scrollsaw blade allows you to make the sharp turns in the pattern and minimizes the kerf width, so the parts fit together precisely.





Square cuts enable the parts to slide together smoothly. To keep your cuts square, make sure your blade is sharp and properly tensioned, push the work straight into the blade, and don't force it in an attempt to saw faster.

the setting sun from the water. Continue up around the bird, and saw your way out along the remaining water/sun separation line. Slide the sun off.

Next, cut out the top part of the bird's head (the yellow piece in the photo). Move on to the middle of the head, as shown in the photo *below center*. Carry on this way, cutting out each part individually, until you finally cut the bird's body free from the water along the bottom.

(For the scarlet macaw, you can start by cutting out the beak. Then make the other cuts on the head, and work your way down.)

6 Remove the patterns and any traces of adhesive. Sand the surfaces smooth, and sand a slight round-over along all edges.

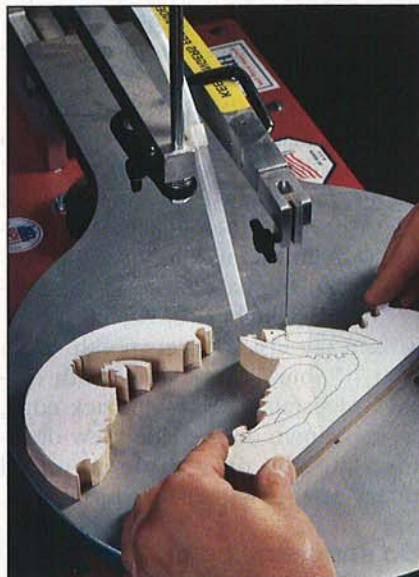
7 Designer Russell Greenslade colors his puzzles with water-soluble aniline dyes. His color choices, listed in the Buying Guide, are keyed to the patterns by the list numbers. All-purpose dyes sold in drug and variety stores for fabric coloring will work, too.

Mix the dyes according to package instructions. For these puzzles, Russell slightly reduces the green peacock blue and medium yellow maple by adding water to the mixed dye.

You could paint the parts with watercolors, although the hues might not be as bright. Acrylic paints—even washes—might prove too thick for the parts to slide together easily.

8 After the dyes dry, lightly sand the parts with 400-grit sandpaper to smooth the grain, which will have been raised by the water-base dye. Dye the parts again. Allow the dye to dry; then paint on the eyes where shown. A small dab of black acrylic craft paint will do the trick.

SEE THE
WOOD PATTERNS® INSERT
FOR FULL-SIZE PATTERNS



Work methodically around the puzzle, cutting off the small parts. This keeps the workpiece as large as possible for easier handling.

9 Cut a $\frac{3}{4} \times 2\frac{3}{4} \times 6\frac{1}{4}$ " base for the scarlet macaw puzzle. Drill and countersink two screw holes, centered side-to-side on the bottom where shown. Dye or paint the base black. Allow it to dry; then, guiding through the screw holes, drill pilot holes into the bottom of the puzzle. Attach the base with two screws.

10 Apply a clear oil finish to all parts. Allow the oil to cure before you assemble the parts of the puzzle. ♣

Buying Guide

Aniline dyes. Woodworker's Supply company's catalog numbers for the colors used are shown in parentheses after each color. Each dye costs about \$5–6 for one ounce, which makes one quart of stain. Call 800/645-9292 to order

Aniline dye colors

- 1** American walnut (W1595)
- 2** Medium yellow maple (W1510)
- 3** Silver gray (W1620)
- 4** Nigrosine black (W1660)
- 5** Bright green (W1670)
- 6** Dark forest green (W1690)
- 7** Green peacock blue (W1720)
- 8** Brilliant scarlet (W1790)
- 9** Ruby (W1800)
- 10** Orange red (W1830)
- 11** Lemon yellow (W1850)

Wake.



Add some mirth to morning wake-up with this colorful, cartoony alarm clock. It's easy to build, so you won't have to stay up late and miss a lot of sleep getting it done.

First thing, make a ring

1 Find the center on one face of a $1\frac{3}{8} \times 5 \times 5$ " blank. (We used ash; any light-colored stock would work.) You could laminate two $\frac{3}{4}$ "-thick pieces, and plane the lamination to thickness.

2 Draw a centerline across the blank, perpendicular to the grain. Lay out a line on each side of the centerline at a 25° angle to it. Lay out two more lines, these at a 35° angle to the centerline, running the opposite way.

3 Cut a $3\frac{3}{4}$ " disc from the blank. You can bandsaw or scrollsaw it, or cut it with a circle cutter. With a circle cutter, you may have to drill the pilot-bit hole through, then flip the thick workpiece over to finish the job.

4 Sand the edge of the disc smooth.

5 Draw lines straight across the edge of the disc from the points where the lines on the face intersect the edge. These lines will locate the feet, "bells," and "striker," as shown in the Exploded View drawing.

6 Now, bore a $2\frac{3}{8}$ " hole through the center to make the disc into a ring. To do this, adjust a circle cutter to a $1\frac{3}{16}$ " radius, measuring from the center of the pilot bit to the outside of the cutter. Line up the pilot bit over the center, clamp the workpiece to the drill-press table, and bore the hole.

7 Sand the inside edge smooth. Then rout $\frac{1}{8}$ " round-overs along both outside edges and the inside back edge, where shown on the Side View drawing. Do this on a table-mounted router, using a jointer-style pushblock.

Do some drilling on the ring

1 Build the jig shown in the Drilling Jig drawing to drill the compound-angle holes for the legs easily. With the front leg removed, the jig also

serves when drilling the holes for the "bells" and "ringer."

2 Draw a centerline on the jig, extending it from the V-block to the bottom edge of the front leg, as shown in the photo on the *opposite page*. Draw a centerline on your drill-press table, too. To do this, chuck a bit in the drill press, and mark the point where the bit hits the table. Extend a line through that point to the approximate center of the column. (We drew ours on a strip of masking tape, as shown in the photo.)

3 Drill the compound-angle holes for the legs by placing the ring on the jig with the 35° lines upward. Align one 35° line on the face with the jig's centerline. Clamp the ring to the jig.

Place the jig and ring on the drill-press table. Position it with the $\frac{1}{8}$ " twist drill on the line across the edge of the ring, $\frac{1}{4}$ " from the face. Clamp a fence to the table behind the jig, perpendicular to the table centerline. The jig centerline should meet the table centerline, as shown. Hold the fence in place with stopblocks.

Then drill the $\frac{1}{8}$ " hole $\frac{1}{2}$ " deep. Leaving the jig in place, unclamp the ring and rotate it to bring the other 35° line under the bit. Drill that hole.

Without moving the jig, flip the ring over so the other side faces out. Drill the other two leg holes.

4 Drill the "bell" and "ringer" holes. To do this, remove the front leg from the jig. Place the ring on the jig with one of the 25° lines facing up. Place the fence on the drill-press table, centering the line on the ring's edge under the bit.

Drill the first hole; then rotate the ring to drill the second 25° hole. Change to a $\frac{3}{32}$ " twist drill, and drill the "ringer" hole at the centerline.

5 Drill a $\frac{1}{8}$ " hole $\frac{1}{4}$ " deep in each foot ball. To do this easily, clamp a piece of scrapwood to the drill-press table. With a $\frac{1}{2}$ " bit, bore about $\frac{3}{8}$ " deep into the piece. Without moving the piece, switch to a $\frac{1}{8}$ " twist drill. Then place a ball in the hole in the scrapwood to drill a centered hole.

up Call

An alarmingly easy project

The time has come to finish up

1 Finish-sand the ring. For an amusing look, dye the ring a bright color. (We used bright green water-soluble aniline dye, and sprayed clear gloss lacquer over the dyed wood.) You also could paint the clock.

2 Paint or dye the balls for the feet.

3 Referring to the Exploded View drawing, assemble the feet. First, put a small dab of epoxy glue on one end of a $\frac{1}{8}$ " x 1" roll pin, and press it into the foot hole. Next slide on a $\frac{1}{8}$ " anodized washer and a $\frac{5}{64}$ " O-ring. Then epoxy the foot into the ring. Level the feet as you install them so the clock won't wobble as it warbles.

4 Install the "ringer" and "bells." For the ringer, slide an O-ring, an anodized spring, and another O-ring onto a #10 x $1\frac{1}{2}$ " anodized rod. Epoxy-glue a wooden bead to the top. Make the "bells" from $\frac{1}{8}$ " x 1" aluminum rivets and half-balls. Epoxy-glue the parts together. Press each assembly into the appropriate hole in the ring, with a dab of epoxy on the end to hold it.

5 Finally, press the clock insert into the front of the ring. The back remains open for setting the clock and alarm, and so you can better hear the progressively louder signal that proclaims it's time to rise and shine. 🌞

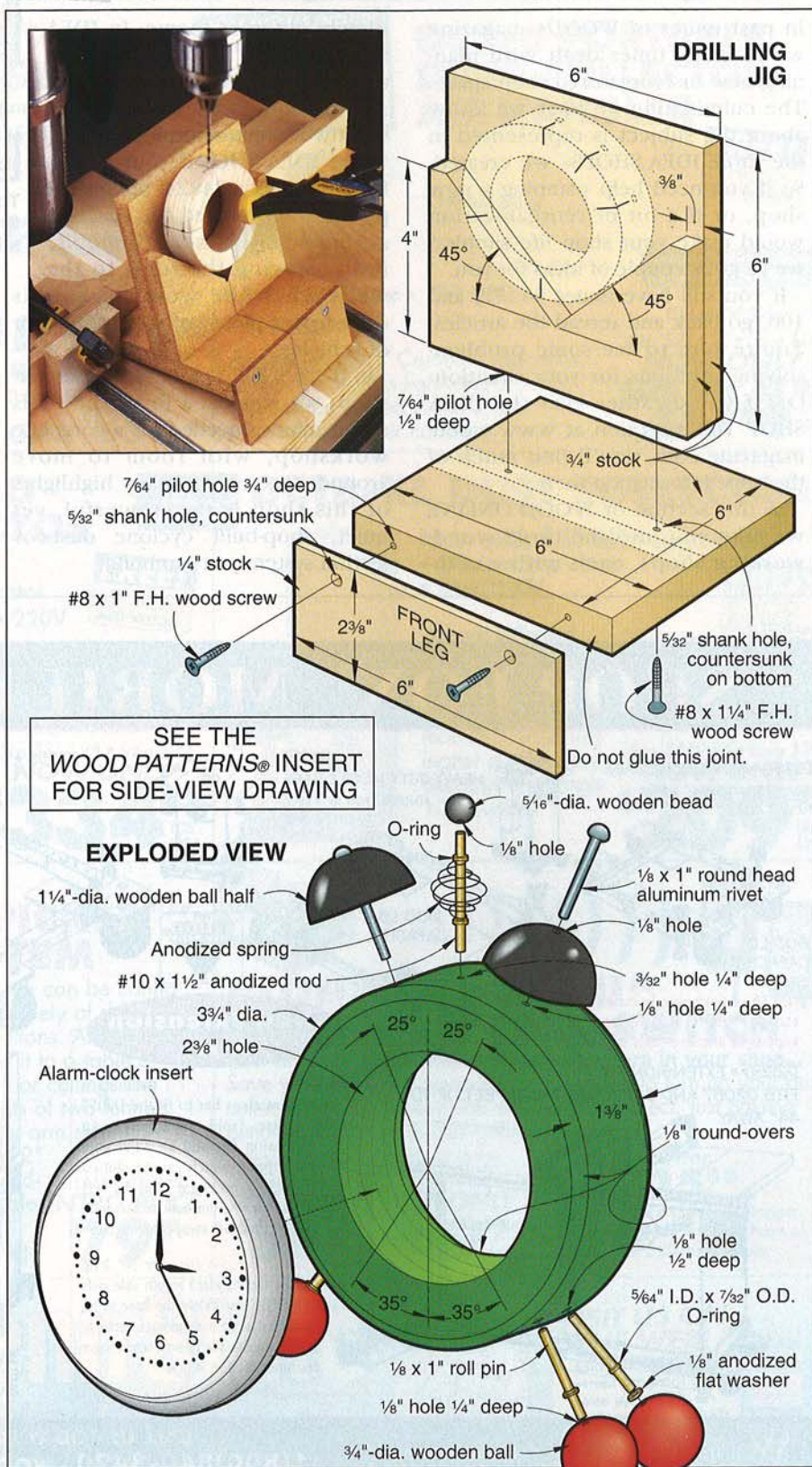
Buying Guide

Clock. Quartz clock insert with alarm, item 200995A, \$9.95.

Small parts. Kit includes all small parts for one clock: Anodized aluminum washers, spring, and rod (assorted colors); O-rings; aluminum rivets; roll pins; four $\frac{3}{4}$ " balls for feet; drilled bead for "ringer" top; and two drilled, black-lacquered half-balls for "bells." Kit 300AR, \$5.95.

Add \$3.95 for shipping and handling via Priority U.S. Mail. Order from Schlaubaugh and Sons Woodworking, 720 14th St., Kalona, Iowa 52247. Call 800/346-9663 for credit card orders.

Project Design: Schlaubaugh and Sons
 Illustrations: Roxanne LeMoine; Lorna Johnson
 Photographs: Baldwin Photography;
 Hetherington Photography



Three Virtual Shop Tours

Await you at www.woodmagazine.com

In past issues of *WOOD*® magazine we've many times dealt with planning new or reorganized shop space. The culmination of what we know about the subject is represented in the three IDEA SHOPS® we created. So if you need help planning a new shop, or if a bit of reorganization would make your shop life simpler, we've got a couple of ideas for you.

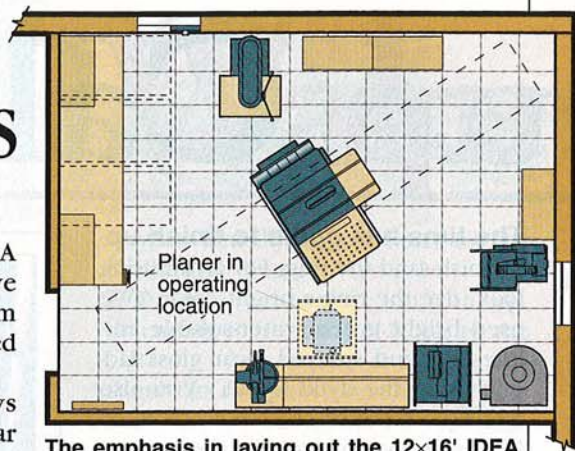
If you still have issues 54, 72, and 100, go back and reread the articles. You're sure to see some problem-solving solutions for your situation. Or, if you'd rather visit the IDEA SHOP Tours section at www.woodmagazine.com, you'll find much of the same information there.

In this section of WOOD ONLINE we take you into the three woodworking shops, each with a com-

pletely different theme. In IDEA SHOP 1 you'll discover how we took a 14x28' bare-bones room and turned it into a featured-filled woodworking masterpiece.

The IDEA SHOP 2 tour shows how we took a 24x24' double-car garage and designed the space to accommodate a host of mobile tools. Moving the tools to the walls when the woodworking is done leaves plenty of room for a pair of vehicles.

In IDEA SHOP 3, a 12x16' basement shop, we squeezed in all the tools and machines needed for a complete workshop, with room to move around. One of the many highlights of this shop is the powerful, yet quiet, shop-built cyclone dust-collection system you can build.



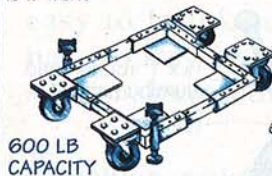
The emphasis in laying out the 12x16' IDEA SHOP 3 was to create a full workshop and still provide room to move around.

But you don't have to replicate our shops to learn from the tours. Each tour includes a floor layout, detailed photography, and description of when the individual projects appeared in *WOOD* magazine. If you don't have the back issues, don't worry. We've added many of the plans to our downloadable plans section at WOOD ONLINE.♣

Written by Marlen Kemmet

SHOP FOX® MOBILE BASES

D2260 • MINI-MOBILE BASE
ADJUSTS FROM 10 1/2" X 14 1/2" TO 17" X 21 1/2"



600 LB CAPACITY

D2057 HEAVY-DUTY MOBILE BASE
ADJUSTS FROM 19" X 20 1/2" TO 29 1/2" X 29 1/2"

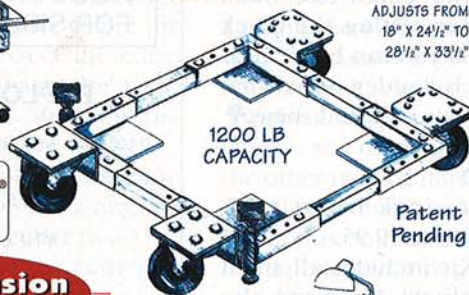


600 LB CAPACITY

D2057



D2058 • SUPER HEAVY-DUTY MOBILE BASE
ADJUSTS FROM 18" X 24 1/2" TO 28 1/2" X 33 1/2"



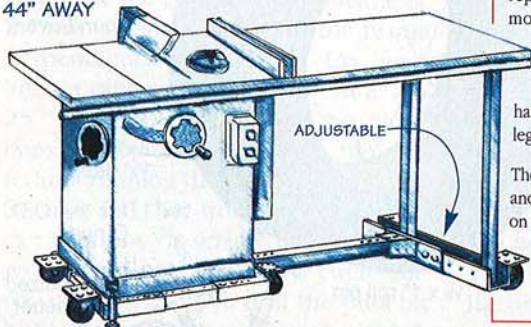
1200 LB CAPACITY

Patent Pending



Our Shop Fox® mobile bases are extremely strong, very stable, have outrigger supports and are fully adjustable!

D2259 • EXTENSION KIT
FITS D2057 AND SUPPORTS TABLE FEET UP TO 44" AWAY

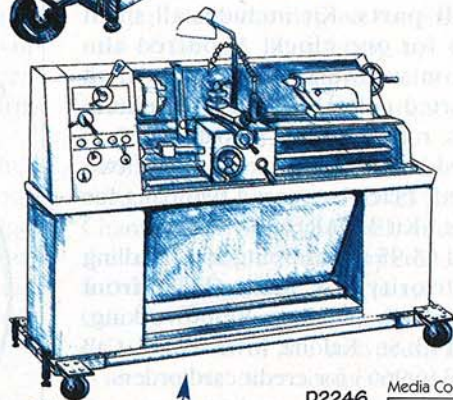


ADJUSTABLE

New Extension Kits!

The D2259 Extension Kit includes a replacement cross bar to fit the D2057 mobile base (sold separately), an extension bar and an adjustable leg support which can be shifted forward or backward. This kit will handle tablesaw extension tables with legs that are up to 44" away from the base.

The D2246 Extension Bars are 36" long and replace the standard length side rails on the D2058. This allows the base to be assembled with a maximum capacity of 44", suitable for heavier and longer machines such as lathes.



36" EXTENSION BARS

D2246 EXTENSION BARS
FIT D2058

Media Code
WA138
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- 2-1/2hp, 220V, 1350 CFM blower
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The most efficient dust collection system available. Captures over 99% of dust into the container—the filter bag stays nearly dust free. System includes motor blower, cyclone, drum connection and filter bag.

With 5 Micron Super High Filtration Bag!

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Optional Stand "TEMPSTAND"
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Captures the finest sawdust, six times better filtration than the bags sold with our competitor's collectors.

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Penn State Industries

FREE!
8' HOSE
\$12 Value

Includes 5 Micron Super High Filtration Bag!

- 1-1/2 hp motor • 750 CFM
- 110/220V

Award Winner!* Compact, powerful, and portable, this lightweight 50 lb. unit can be moved to the job or mounted as an air handler!

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Was \$214.95 • Save \$10
NOW ONLY \$204⁹⁵ UPS \$21

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- Powerful 2-1/2 hp motor
- 1350 CFM capacity • 220V

Award Winner!* Our most powerful system is perfect for multiple machine and long runs. It's great for any home or commercial shop!

Includes 5 Micron Super High Filtration "Vu-thru" Bags!

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NOW ONLY \$334⁹⁵ FOB PHILA.

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50' HOSE
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DC1B-XL DUST COLLECTOR

Now with 850 CFM capacity

- Efficient 1hp motor
- 110/220V

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Our most popular system connects to almost any machine! Improved higher air capacity because of a larger 10" impeller.

FREE!
8' HOSE
\$12 Value

Includes 5 Micron Super High Filtration "Vu-thru" Bags!

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Turn on your dust collector from anywhere in your shop... Save yourself the inconvenience of walking to turn on your dust collector when you're in the middle of a project. Just press a button to switch your dust collector on or off.

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YEAR 2000

It's About Time

CLOCK BUILDING CONTEST

Contest Rules

1. No purchase necessary to enter or win.
2. To enter, construct a working clock. All entries must fit into a box no larger than 2'X2'X2'. The primary material of the clock case must be wood, but you may incorporate other materials.
3. Entries must be received by April 3, 2000. All entries must be postpaid; collect entries will be refused. Attach a 3-1/2"X5" card with your name and address to each entry. You may submit up to 3 entries. Winners limited to one prize. Send all entries to: "It's About Time" Clock Contest, 1716 Locust Street (GA 310), Des Moines, IA 50309-3023.
4. Entries become property of WOOD Magazine and will not be returned. All entries will be offered at auction under the supervision of Meredith Corporation; and all proceeds from the auction will be donated to the U.S. Marine Corps Reserve Toys for Tots program.
5. The entry must be your own original design and not made from previously published patterns. A different approach to an existing clock case could qualify.
6. The sponsors are not responsible for illegible, lost, late, misdirected, damaged, delayed or stolen entries. All decisions of the judges are final. Entry constitutes permission to use winner's

name, hometown, and photograph for promotional purposes, unless prohibited by law. Employees and immediate family members of Meredith Corporation and Titebond® Glues & Adhesives and their affiliates and subsidiaries are ineligible. Open to U.S. and Canadian residents, except Quebec. Subject to all U.S. federal, state and local laws and regulations. Void where prohibited.

7. Winners will be selected and notified by mail on or about May 15, 2000. A panel of representatives from the U.S. Marine Corps Reserve, Meredith Corporation and woodworking experts will judge all entries on or about May 1, 2000 on design excellence, creativity and craftsmanship.

8. Grand Prize - \$5,000; First Prize - \$4,000; Second Prize - \$3,000; Third Prize - \$2,000; Fourth Prize - \$1,000; 25 honorable mentions

9. Winners are responsible for applicable taxes. Winners will be required to complete an Affidavit of Eligibility, Ownership and Liability Release within 14 days of notification, or an alternate winner may be selected.

10. Winners will be published in the December 2000 issue of WOOD. For a list of winners, send a separate self-addressed stamped envelope after June 1, 2000 to: "It's About Time" Clock Contest, 1716 Locust Street (GA 310), Des Moines, IA 50309-3023.

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It's About Time

CLOCK BUILDING CONTEST

What time is it? It's that time to enter the Better Homes and Gardens® WOOD® Magazine and Titebond® Glues & Adhesives' Year 2000 "It's About Time" clock-building contest.

Woodworkers of all skill levels can enter this contest!

\$15,000 in cash prizes will be awarded to five woodworkers, whose original clocks display design excellence, creativity and craftsmanship. These special timepieces will be auctioned, and all proceeds from the auction will benefit the U.S. Marine Corps Toys for Tots program. Not only will you have a chance to win, but you'll make a difference in the lives of less fortunate children who will win too!

See the contest rules on the next page and start thinking about your clock entry. Time flies when you're woodworking, so remember to send in your clock by April 3, 2000 before time runs out.



GRAND PRIZE!

\$5,000

- First Prize - \$4,000
- Second Prize - \$3,000
- Third Prize - \$2,000
- Fourth Prize - \$1,000
- 25 Honorable Mentions



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- Front mounted controls
- Multi-directional dust blower
- Table bevels 45° left and right
- Factory reconditioned, factory perfect

~~\$299⁹⁹~~ **\$279⁹⁹**

ITEM 51734-1KFA

CONTROLLED PRESSURE, NON-MARRING HARDWOOD CLAMPS



SAVE UP TO 50%

These handscrews will clamp without scratching or marring your workpiece. Hardwood jaws distribute pressure evenly, and can easily be adjusted for non-parallel surfaces and odd shapes.

JAW LENGTH	JAW CAPACITY	ITEM	PRICE
6"	3"	06986-4KFA	\$1⁹⁹
7"	4-1/2"	06987-3KFA	\$3⁹⁹
8"	4-3/4"	04852-4KFA	\$4⁹⁹
10"	6"	04853-3KFA	\$5⁹⁹
12"	8-1/2"	04854-4KFA	\$7⁹⁹

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3/8", 16.8 VOLT CORDLESS DRILL KIT



WITH KEYLESS CHUCK

- Variable speed, reversible, 0 to 900 RPM
- Includes 6 pc. drill bit set and 6 pc. screwdriver bit set
- Maximum torque: 200 in. lbs.
- 6 torque settings

~~\$69⁹⁹~~ **\$49⁹⁹**

ITEM 36387-6KFA

29 PC. HIGH SPEED STEEL DRILL BIT SET



~~\$12⁹⁹~~ **\$8⁹⁹**

ITEM 02642-2KFA

16.8V REPLACEMENT BATTERY

\$39⁹⁹

ITEM 36390-0KFA

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HEAVY DUTY 16 GAUGE BRAD TACKER

This unit packs extra punch to cleanly drive extra long brads every time. Use for cabinetry and carpentry jobs, also paneling, casings, and other construction applications. Features solid aluminum magazine with sliding cover.

- 60 to 100 PSI
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- 3/4" to 2" brad length; 16 gauge
- 100 brad capacity
- 4-1/2 lbs. tool wt.

~~\$89⁹⁹~~ **\$69⁹⁹**

ITEM 31317-6KFA

16 GAUGE BRADS

LENGTH	ITEM	PACK OF 2500
1"	34122-0KFA	\$4⁹⁹
1-1/4"	34123-1KFA	\$5⁹⁹
1-1/2"	34124-0KFA	\$6⁹⁹
1-3/4"	34125-2KFA	\$7⁹⁹

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- Two 24T 8" outerblades
- Five, 2T chipper blades - one is 1/16"
- Includes brass shimstock

~~\$39⁹⁹~~ **\$29⁹⁹**

ITEM 40745-2KFA

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4" PLATE JOINER



- Fence adjusts to a maximum depth of up to 1-1/8"
- Maximum angle of up to 45°
- Preset depth stops: 0, 10, and 20 gauge
- Includes 4" carbide tipped blade, dust bag, high impact base and fence, carbon brush set, 4mm hex wrench, arbor wrench, glue bottle, assorted biscuits (10 each of 0, 10, and 20 gauge)
- 4" blade diameter
- Tool weight: 6-1/2 lbs.
- 115V, 6.4 amps, 10,000 RPM, 60 Hz, single phase

~~\$59⁹⁹~~ **\$49⁹⁹**

ITEM 38437-2KFA

CARBIDE TIP PLATE JOINER REPLACEMENT BLADE

- Blade teeth: 6 carbide tip teeth
- Blade diameter: 4"
- Maximum RPM: 12,000

\$7⁹⁹

ITEM 38840-0KFA

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Electric Power Tools

FLEXIBLE SHAFT GRINDER & CARVER



Tackle detail work in wood, metal, and plastics. This heavy duty tool grinds, deburrs, drills, polishes, buffs and sands. Motor hanger lets you mount it on any vertical surface. Ball bearing motor, 1/4 HP motor, 38" flexible shaft, handpiece, 4 mm (5/32") key-type chuck, variable speed foot control for hands-free operation, 1 phase, 60 Hz, 115V, Speed: 15,000 RPM; Shipping weight: 5-3/4 lbs.

~~\$64⁹⁹~~ **\$49⁹⁹**

ITEM 40432-1KFA

DEWALT

DeWalt DW708R

LIMITED QUANTITIES

HEAVY DUTY 12" DOUBLE BEVEL SLIDING COMPOUND MITER SAW



- 12" crosscut capacity at 90°
- Precision miters 0-50° left & 0-60° right
- 13.0 amps, 4000 RPM
- Includes 60 tooth carbide blade & blade wrench
- 0-48° bevel capacity
- Factory reconditioned, factory perfect

\$459⁹⁹

ITEM 51737-2KFA

SAVE \$40

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Electric Power Tools



18 VOLT CORDLESS, 5-3/8" CIRCULAR SAW KIT

Cut up to 85 ft. of plywood on a single charge. Kit includes: 1 hour quick charger, 18 volt battery, saw and hex key. 2400 RPM; 1.3 amps; 10mm arbor; 50° bevel capacity; maximum depth of cut @ 90°: 1-1/2" and @ 45°: 1-1/4"; weighs 7-1/2 lbs. Blade and rip fence sold separately.

~~\$109⁹⁹~~ **\$59⁹⁹**

ITEM 37412-1KFA

18 VOLT REPLACEMENT BATTERY

\$37⁹⁹

ITEM 37145-4KFA

5-3/8" TUNGSTEN CARBIDE TIP BLADE

Teeth: 24, C2 carbide steel, 10mm arbor, max. RPM: 7000

\$7⁹⁹

ITEM 37413-0KFA

RIP FENCE

\$3⁹⁹

ITEM 37449-1KFA

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QUANTITIES



20" INDUSTRIAL SCROLL SAW

Turn work 360° in less than 1/32". 19-1/2" throat; 10" x 10" table lifts up to 20". Capacities: 2" wood; Depth of cut: 3/8" soft metals, 1/4" hard metals; Length of stroke: 3/4"; Speed: 1100 SPM; Motor: 1/7 HP, 110/220 volt, 1.7 amp, 1130 RPM; Dimensions: 26-1/2" x 10" x 19"; Weight: 57 lbs.

~~\$199⁹⁹~~ **\$139⁹⁹**
ITEM
02062-4KFA

CENTRAL MACHINERY



DOVETAIL MACHINE

Create strong, fine looking dovetail joints. Just place stock and pull cam handles to positively lock material in place. Fixture holds both workpieces at the same time - both male and female dovetail cuts are made at the same time. Allows cutting tails, pins, half blind, and standard dovetails. Accepts stock up to 12" wide and 1-1/4" thick. Includes 1/2" template.

~~\$48⁹⁹~~ **\$39⁹⁹**
ITEM
34102-8KFA

CENTRAL MACHINERY

DRILL 1/4", 3/8", &
1/2" SQUARE HOLES

MORTISING MACHINE

Make a square hole in the fraction of the time it takes by hand! Easier layout for professional mortise and tenon joints in furniture, cabinets, and restoration projects. Fence with hold down clamp keeps workpieces from lifting off the table. Large capacity - up to 5" maximum height. Includes fence, workpiece clamp, and 1/4", 3/8", and 1/2" mortising chisels and bits. 5" max. workpiece height; 5" throat; Accepts 745° chisel shanks, 1/2 HP, 110V, 2.3 amps, 3580 RPM spindle speed; 13-3/8" x 6" table; 10-7/8" x 7-3/4" base; 60 lbs. shipping weight

~~\$169⁹⁹~~ **\$129⁹⁹**
ITEM
35570-6KFA

CENTRAL MACHINERY

16 SPEED FLOOR DRILL PRESS

16-1/2" swing, a No. 2 Morse taper female spindle socket and an adjustable stop and gauge. A heavy duty, 1 HP, 110/220 volt, 12/6 amp, all ball bearing motor drives this versatile press at spindle speeds ranging from 170 to 3800 RPM. • Free oiler included Height: 63"; Base size: 20" x 13-3/4"; Spindle stroke: 3-1/8"; 5/8" capacity chuck. Table size: 14" diameter, Column diameter: 3-3/16"; Shipping weight: 148 lbs.

~~\$284⁹⁹~~ **\$234⁹⁹**
ITEM
00583-5KFA

CHICAGO Electric Power Tools



VARIABLE SPEED RECIPROCATING SAW

Gear driven, variable speed durable saw. All ball bearing for longer life. • 300 SPM to 2400 SPM • 1-1/4" stroke • 600 Watts • 110V, 3.6 amps, 60 Hz, single phase • Tool weight: 7-1/4 lbs. • Overall length: 17"

~~\$59⁹⁹~~ **\$39⁹⁹**
ITEM
36595-6KFA

RECIPROCATING SAW BLADES

• 5 metal cutting 24 TPI, 5 wood cutting 7 TPI, 5 wood cutting 10 TPI **PK. OF 15** • Universal 1/2" shank

~~\$3⁹⁹~~ **\$3⁹⁹**
ITEM 40986-1KFA

9/16" DOVETAIL TEMPLATE

ITEM 38808-OKFA **\$9⁹⁹**

7/16" DOVETAIL TEMPLATE

ITEM 38809-OKFA **\$9⁹⁹**

1/2" DOVETAIL TEMPLATE

ITEM 38810-OKFA **\$9⁹⁹**

CENTRAL MACHINERY



10" PLANER

• 2 HP, 110V, 1 phase, 11 amp, 8000 RPM • 2-blade cutter head • 19" x 16-5/8" x 16" overall dimensions • 5-1/8" working distance • 10-1/8" x 9-1/8" feed table • 10-1/8" blade size • 61 lbs. shipping weight • Stand sold separately

~~\$239⁹⁹~~ **\$199⁹⁹**
ITEM
32377-3KFA

PLANER STAND

• 20" x 10" x 27" • Shipping weight: 20 lbs.

~~\$32⁹⁹~~ **\$32⁹⁹**
ITEM
32969-2KFA

2 PC. HIGH SPEED STEEL REPLACEMENT BLADE SET

ITEM 36068-1KFA **\$29⁹⁹**

2 PC. REPLACEMENT BLADE SET

ITEM 38265-OKFA **\$15⁹⁹**

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Multiple clutch plates permit instant adjustment. Simply depress plates to slide handle against workpiece. Includes heat-treated steel bars with cast iron jaws, plated steel screws, and hardwood handles.

• All clamps have 3/4" pads and throat depth of 2-3/4"

LENGTH	ITEM	PRICE
6"	34387-4KFA	\$1⁹⁹
12"	05975-OKFA	\$3⁹⁹
18"	31264-OKFA	\$4⁹⁹
24"	05976-2KFA	\$5⁹⁹
30"	34389-4KFA	\$6⁹⁹
36"	34388-3KFA	\$7⁹⁹

CHICAGO Electric Power Tools INDUSTRIAL



SUPER HEAVY DUTY INDUSTRIAL 1/2" REVERSIBLE DRILL

• Ball and needle bearing construction • 115V, 6 amps • D-handle rotates 360° • 550 RPM no load speed

~~\$55⁹⁹~~ **\$45⁹⁹**
ITEM
07426-5KFA

29 PC. HIGH SPEED STEEL DRILL BIT SET

• 1/16" through 1/2" by 64ths • M2 high speed steel • Includes metal index

~~\$11⁹⁹~~ **\$9⁹⁹**
ITEM
00986-2KFA

CHICAGO Electric Power Tools



HEAVY DUTY 4-1/2" DISC GRINDER

• 5/8"-11 spindle with 7/8" arbor adapter • Motor: 3/4 HP, 115V, 5.18 amps • Spindle lock • 11-7/8" long • High powered 10,000 RPM

~~\$39⁹⁹~~ **\$18⁹⁹**
ITEM
31135-OKFA

4-1/2" x 1/4" GRINDING WHEELS

FOR	ITEM	10 PACK
Metal	06674-OKFA	\$8⁹⁹
Masonry	07422-2KFA	\$8⁹⁹

CENTRAL MACHINERY

EVEN TURNS BOWLS



14" x 40" WOOD LATHE

Create beautifully turned pieces of furniture with this four speed lathe. Comes with chuck plate. Mount on your workbench. Motor: 1/2 HP, 110V, 60 Hz, 5 amps Swing over bed: 14" Speed: 3010 RPM Distance between center: 40" Drive: V-belt Overall size: 56-1/2" x 8-1/4" x 12-3/4" Tool weight: 88 lbs.

~~\$129⁹⁹~~ **\$99⁹⁹**
ITEM 38515-1KFA

CENTRAL MACHINERY



6" INDUSTRIAL RABBETING JOINTER

Cast iron infeed/outfeed tables. Rack and pinion hand controls; Cast iron fence lifts 45° left/right with 45° and 90° positive stops. Includes stand. Motor: 1 HP, 110V, 4 amp; Cutter head speed: 4900 to 5900 RPM; Infeed table size: 22-1/2"; Rabbet cut: 3/8"; Outfeed table size: 19-1/2"; Cutter head size: 3"; Knives: 3; Rabbeting ledge: 2-7/8"; Weight: 160 lbs.; Dimensions: 37-1/2" x 16" x 26-3/4"

~~\$279⁹⁹~~ **\$199⁹⁹**
ITEM
30289-4KFA

REPLACEMENT BLADE SET

ITEM 38268-OKFA **\$9⁹⁹**

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Circle No. 78

What's With These New Nickel-Metal Hydride Batteries?

Ever since the 1950s, nickel cadmium (Ni-Cad) cells have been the battery of choice for portable rechargeable applications. And over the years, Ni-Cad cells of the "sub C" size used in power tools have improved to the point where they can store about 2.0 amp. hours (Ah) of energy. But only small, incremental improvements will come in the future. Because of this energy-storage limitation, as well as environmental concerns about cadmium, battery makers developed nickel-metal hydride (NiMH) cells about 10 years ago. These batteries can theoretically hold about 40 percent more energy than Ni-Cads, according to our sources at Energizer Power Systems, a U.S.-based manufacturer of NiMH batteries.

Our cordless-drill test starting on *page 72* includes just one drill with a NiMH battery pack—the Makita 6213DWBE with 2.2-Ah of energy capacity. But you will see more NiMH batteries in the future. Several companies have hinted at having 3.0-Ah batteries soon.

So why haven't all manufacturers switched completely to NiMH? In a word, cost. NiMH batteries cost more than Ni-Cads, and manufacturers tell us their research shows that consumers may not be willing to pay significantly more for something as intangible as additional run time. As you can see in the chart on *page 76*, Makita charges about \$10 more for a drill with a 2.2-Ah, NiMH battery than it does for a nearly identical drill with a 2.0-Ah, Ni-Cad pack. But that's because of promotional pricing—most manufacturers tell us that they would probably increase prices proportional to increases in run time. In other words, the same drill with a 2.0-Ah battery costing \$200 would sell for \$300 with a 3.0-Ah battery.

Of course, with the proliferation of NiMH batteries, prices for them should come down. For example, cellular phones and laptop computers used to be powered by Ni-Cads, but now nearly all of them run on NiMH or lithium-ion batteries. (Don't expect lithium-ion batteries in cordless power tools any time soon; they store lots of energy, but dispense it in doses too small for power tools.)



Industry experts tell us you can expect to see nickel-metal hydride batteries replace nickel cadmium ones during the coming years.

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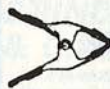
Belts are resin bond cloth with a bi-directional splice, specify grits.

1X30	\$.81 ea	3X24	\$.93 ea
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1X44	.81 ea	4X21 3/4	1.06 ea
2 1/2X16	.85 ea	4X24	1.10 ea
3X18	.86 ea	4X36	1.35 ea
3X21	.90 ea	6X48	3.50 ea
3X23 3/4	.93 ea	6x89	6.24 ea

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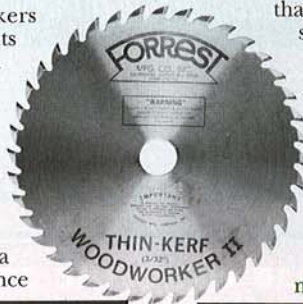
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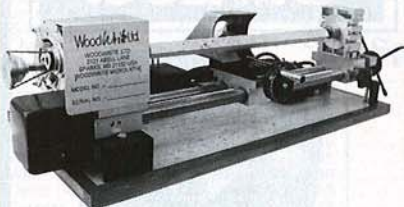
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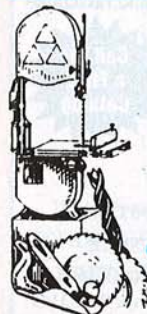


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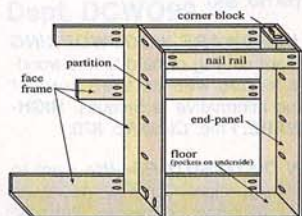


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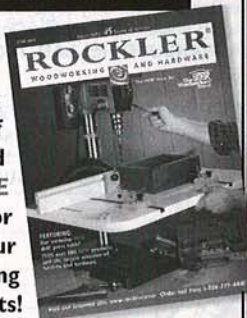
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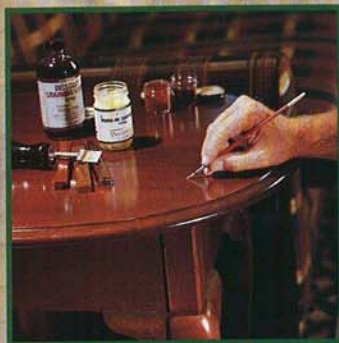
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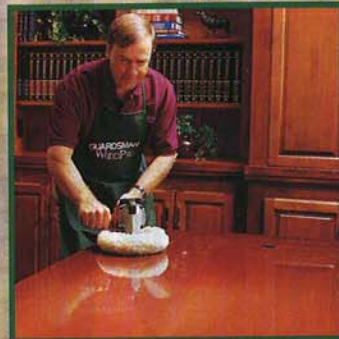
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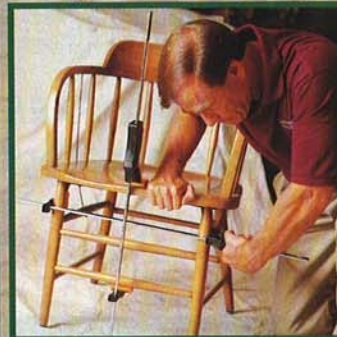
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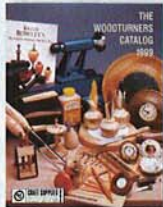
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22-675	DC380 15" Planer.....Sale 1175
28-275	14" Band Saw 3/4 HP.....Sale 595
28-280	14" Band Saw 1 HP motor with enclosed stand.....Sale 739
28-255	14" Platinum Edition Band Saw - 1 HP w/ mobile base, 18" rip fence, & 3/8" blade.....Sale 849
31-280	Sanding Center w/ stand.....Sale 789
37-190	6" Deluxe Jointer.....603 445
37-195	6" Professional Jointer.....625 539

MILWAUKEE TOOLS	
Model	Description.....List Sale
652-67	Sawzall with case.....343 169
653-226527	w/quick lok blade change224 179
0407-22112	Drill w/keys chuck&2 batt380 179
0224-1	3/8" Drill 4.5 amp magnum.....236 136
0236-6	1/2" Drill 4.5A mag 0-850 rpm255 134
0235-6	1/2" Drill w/keyless chuck.....255 139
0244-1	1/2" Drill 4.5A mag 0-600 rpm255 139
0222-1	3/8" Drill 3.5 amp 0-1000 rpm213 128
0228-6	3/8" Drill 3.5 amp 0-1000 rpm207 124
0375-6	3/8" close quarter Drill.....255 148
0379-1	1/2" close quarter Drill.....288 168
6546-6	Screwdriver 200 & 400 rpm.....150 89
6547-6	6546-6 w/bits, 1/4" case & cs185 112
6599	1/2" D-hdle Hammer Drill Kit356 225
5397-6	3.8" v/ spd Hammer Drill Kit 275 145
5371-6	1/2" v/ spd Hammer Drill Kit 360 194
6145	4-1/2" Grinder 10,000 rpm.....179 105
6494-6	10" Compound Miter Saw.....585 279
6286-6	Top Handle Jig Saw.....315 159

FREED HANDE TIPPED SAW BLADES	
Item	Description.....Teeth List Sale
LU72M010	Gen Pur. A.T.B.10" 40 69 42
LU82M010	Cut-off 10" 60 93 32
LU84M011	Comb 10" 50 78 45
LU85R010	Super Cut-off10" 80 114 68
LM72M010	Ripping 10" 24 69 39
LU73M010	Cut off 10" 60 84 49
LU87R010	Thin Kerf 10" 24 72 48
LU88R010	Thin Kerf 10" 60 88 55
LU98R010	Ultimate 10" 80 128 78
LN91M010	Compnd Mitr 10" 60 88 54
F410	Quiet Blade 10" 40 95 54
SD308	8" Dado - Carbide.....230 119
SD508	8" carbide w/case & shims 344 172
FB100	16 piece Forstner Bit Set 338 194
94-100	5 pc. Router Bit Door System320 169
FT2000E	Plunge Router.....Sale 185

HITACHI TOOLS	
Model	Description.....List Sale
C8FB2	8-1/2" Slide Compound Saw1169 449
C10FS	10" Slide Compound Saw.....1627 579
C15F	15" Mitr Saw.....1346 645
C10FCD	NEW 10" dual bevel Compound Mitr Saw.....550 265
NV45AB	Coil Roofing Nailer.....935 379
NT50AE	NEW Pinner 3/4" - 2".....Sale 119

MAKITA TOOLS	
Model	Description.....List Sale
5090DW	3-3/8" Saw Kit 9.6 volt.....280 139
DA391D	3/8" angle Drill Kit 9.6V.....166 85
DA391DW	3/8" angle Drill Kit 9.6V.....341 139

NEW 18 VOLT MAKITA TOOLS	
Model	Description.....List Sale
6343DWAE	1/2" Drill Kit.....Sale 255
5620DWA	6-1/2" Circular Saw Kit.....Sale 255
DK1016	1/2" Drill & 6-1/2" Saw combo kit.....Sale 369

CORDLESS DRILLS	
WITH 2.0 AMP HIGH CAPACITY BATTERIES	
Model	Description.....List Sale
6213DWA	12V 3/8" Drill Kit.....325 169
6233DWA	14.4V 3/8" Drill Kit.....358 205

9900B	3"x21" Belt Sander w/bag.....347 165
9924DB	3"x24" Belt Sander w/bag.....360 169
N1900B	3-1/4" Planer with case.....263 142
1912B	4-3/8" Planer.....352 205
N9514B	4" Disc Grinder 4.6 amp.....118 65
DA3000R3/8"	Angle Grinder.....355 185
2708W	8-1/4" Table Saw.....637 295
6405	3/8" Drill Rev. 0-2100 rpm.....115 65
6013BR	1/2" Drill Rev. 6 amp.....270 149
9401	4" x 24" Belt Sander w/bag458 219
LS007NBK-1/4"	Circ Saw w/ case.....250 125
510711	10" Slide Compound Saw.....995 429
LS1211	12" Slide Compound Saw1620 695
3901	Plate Joiner Kit.....376 159
3612C	3 HP Plunge Router.....492 265
LS1040	10" Compound Miter Saw.....460 259
LS1013	10" Dual Compound Side Mitr Saw.....1088 599
BO5010	5" Random Orbit Sander.....142 69
LS1220	12" Compound Mitr Saw Sale 379
9227C	7/9" Polisher.....350 195
SAJ401	16" Bench Scroll Saw.....300 175
2702	8-1/4" Table Saw.....Sale 299
2703	10" Table Saw.....Sale 309

SENCO AIR NAILERS	
Model	Description.....List Sale
SFN30	NEW Finishing Nailer w/ cse459 229
SN45	Stapler 7/16" crown, 1" - 2".....540 365
SLP20	Pinner w/cs 5/8 - 1-5/8".....422 179
SKS	Stapler 5/8 - 1-1/2".....390 239
SN70	Framing - Clip Hd 2 - 3-1/2".....725 449
SN65	Framing - Full Hd 2 - 3-1/2".....709 375
SN60	NEW Framing 2 - 3-1/2".....695 379
SFN40	Finish Nailer 1-1/4 - 2-1/2".....569 349

BOSTITCH AIR NAILERS	
Model	Description.....List Sale
NR05-1	Stick Nailer.....Sale 299
RN45	Coil Roof Nailer 3/4 - 1-3/4 845 339
N60FN-2K	Finishing Nailer w/ case.....557 269
BT35-2K	Brad Tacker 5/8" - 1-3/8" w/ case, oil, & brads.....279 125
MH1FS	Flooring Stapler 15 gauge.....902 539
S325X-1K	Finish Stapler-1/2" - 1-3/8" w/ case & oil.....269 135

JORGENSEN ADJUSTABLE HANDSCREWS	
Item#	Jaw Length Capacity List Sale of 6
#1	8" 4-1/2" 20.35 12.50 69.95
#1	10" 6" 23.30 13.95 78.95
#2	12" 8-1/2" 26.75 15.75 86.95
#3	14" 10" 33.85 19.95 114.95

PONY CLAMP FIXTURES	
Model	Description.....List Sale of 12
50	3/4" Black Pipe 15.45 8.50 94.00
52	1/2" Black Pipe 12.65 6.95 79.00

PANASONIC CORDLESS	
Model	Description.....List Sale
EY6431NQKW	NEW 1/2" 15.6V drill kit with two 3 amp-hr Ni-Mh batteries, 45 minute charger, & case.....369 205
EY6431FOKW	NEW 1/2" 15.6V drill kit with two 2 amp-hr Ni-Cad batteries, 30 minute charger, & case.....339 189
EY6407NQKW	NEW 1/2" 12V drill kit with two 3 amp-hr Ni-Mh batteries, 45 minute charger, & case.....339 189
EY6406FOKW	NEW 3/8" 12V drill kit with two 2 amp-hr Ni-Cad batteries, 30 minute charger, & case.....305 169
EY3503FOKW	5-3/8" 12V Wood Cutting Circular Saw Kit.....500 259

BISEMEYER FENCES	
Model	Description.....List Sale
B-50	50' Commer. Saw.....443 325
T-SQUARE 52	52" Homeshop.....360 275
T-SQUARE 40	40" Homeshop.....335 255
T-SQUARE 28	28" Homeshop.....325 245

AIRY AIR NAILERS	
Model	Description.....List Sale
0241SK	Brad Nailer 3/8" - 1-9/16".....180 88
0626SK	1/4" Crown Stapler 3/8" - 1"190 88

STABILA LEVELS	
Model	Description.....List Sale
25010	10" die cast Torpedo Level Sale21.95
24640	24" Level w/ hand holes.....Sale47.95
24670	48" Level w/ hand holes.....Sale 59
24632	NEW 'Jambor Set' designed for setting door jams. Includes 78" level and 32" level.....Sale 129

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DEWALT TOOLS	
Model	Description.....List Sale
DW124K	1/2" right angle Drill.....590 329
DW321K	Top Handle Jigsaw Kit.....300 164
DW364	7-1/4" Circ. Saw w/bags.....294 155
DW610	1-1/2 HP 2 handle Router.....266 149
DW411K	1/4 sheet Palm Sander w/ cse88 169
DW682	Biscuit Joiner with case.....448 169
DW705	12" Compound Mitr Saw.....734 339
DW621	2 HP Plunge Router.....400 199
DW677K	3-1/4" Planer with case.....268 155
DW431	3 x 21 v/spd Belt Sander.....338 188
DW421	5" Palm Ran. Orb Sander.....144 75
DW423	Palmrip Random Orbit Sander - variable speed.....170 92
DW421 & DW423	come with Free DW4317 case!
DW272	Drywall Gun, 0-4000, 6.3 amp160 95
DW276	Drywall Gun, 0-2500, 6.5 amp160 99

DEWALT CORDLESS DRILLS	
Model	Description.....List Sale
DW972K-2	3/8" variable speed w/ two 12V XR batteries.....362 184
DW991K-2	3/8" variable speed w/ two 14.4V XR batteries.....415 209

Above drill kits come w/ charger & steel case!

DW991K3-2	DW991K drill, DW935 trim saw, 2 XR batteries & case.....Sale 345
DW911	NEW Jobsite Radio & Charger.....Sale 149

DEWALT 18 VOLT CORDLESS TOOLS	
Model	Description.....List Sale
DW933K	Jigsaw Kit.....468 275
DW938K	Recipro Saw Kit.....520 269
DW995K-2	1/2" Drill Kit w/ 2 batt.....Sale 259
DW997K-2	1/2" Drill/Hammer Drill Kit454 249
DW936K	5-3/8" Saw Kit.....458 249
DW935K-2	DW995K Drill, DW936 Saw and case.....Sale 399
DW995K-2	DW995K 18V drill kit, DW938 18V reciprocating saw, & case.....399

DEWALT BENCH TOP TOOLS	
Model	Description.....List Sale
DW708	12" Slide Mitr Saw.....Sale 649
DW788	20" Scroll Saw.....Sale 469
DW733	12" Planer w/ extra bladesSale 369
DW744	10" Portable Table Saw.....Sale 499
DW756	6" Bench Grinder.....164 75
DW758	8" Bench Grinder.....184 115

DAVID WHITE INSTRUMENTS	
Model	Description.....List Sale
LP6-20A	Sight Level package-20x.....329 239
LP6-20XLA	LP6-20A with 9056 tripod and 7620 rod.....409 279
LT8-300	Level Transit - 26x.....739 359
LT8-300P	above Level with optical plumb.....869 629
LT6-900	Level Transit - 20x.....419 299
LTPE-900	Above Level with tripod and rod.....185 395
ALTE-900	Automatic Level - Transit - 18x.....666 479
ALTP6-900	above Level with tripod & rod.....799 549
ALB-225	Automatic Level - 22x.....583 289
ALP-22	Above level with tripod & rod.....Sale 349
ALB-265	Automatic Level - 26x.....854 325
ALP-26	Above level with tripod & rod.....Sale 369

BOSCH	
Model	Description.....List Sale
1587VS	Top Handle "CLIC" Jig Saw.....292 139

1587AVSC	1587VS Saw Kit with case and New Progressor blades.....Sale 155
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1584VS	Barrel"CLIC" Jig Saw.....288 155
Bosch Metal Case	for above Jig Saws.....24
Bosch 30 blade assortment	for Jig Saws 29.99

1584VS or 1587VS with steel case and 30 Bosch blades Sale 175	
1295DH	5" Random Orb Palm Sndr.....145 89
1274DVS	3"x21" v/spd Belt Sander.....301 175
1278VSK1	1-1/2"x12" Belt Sander.....218 129
1275DVS	3"x24" v/s Belt Sndr.....379 219
1274SDK	4"x24" v/s Belt Sndr.....408 229
1196VSR	1/2" v/ spd Drill w/ case.....300 159
1613EVS	2HP v/s Plunge Router.....369 199
1634VSK	Recip Saw 10.5 amp.....335 185
3315SK	12V T-handle Drill Kit.....345 159
3615K	14.4V Drill.....354 174
3107DVS	5" Random Orbit Sander.....165 98
3107DVK	3107DVS with case.....195 118
3725DVS	5" Random Orbit Sander.....256 145
3727DVS	6" Random Orbit Sander.....266 149
3915	10" Slide Compound Saw.....1050 499
3912	NEW 12" Cmpnd Mitr Saw.....638 329
11224VSR	7/8" SDS Rotary Drill.....404 229
1703AEVS	5" Grinder - 8.5 amp.....245 145
1347AK	4-1/2" Grinder with case.....159 92
1638K	Drywall Cut-out Unit.....165 105
1617	1-3/4 HP Router - 2 handleSale 159
1617EVS2	HP Router w/ variable speed - 2 handle.....Sale 189

1618	1-3/4 HP Router - "D" handle.....Sale 179
1618EVS	1618 router w/ var/spd.....Sale 360 215
1640VS	NEW Power Tenon Saw.....200 129
1640VSK	NEW Power Tenon Saw Kit3170 209
3850K	1

FINISHING TOUCHES

Knock on wood for luck

In his book *A Reverence for Wood*, Eric Sloane (now deceased) explains where the expression “knock on wood” originated. His research indicates that New England farmers of the early 1800s used to knock on their barn doors for luck after closing them at night.

Timber to bank on

Southern Lumberman magazine reports that a newly created Virginia organization now accepts “deposits” of logging rights from private landowners, just as a bank would take money and pay interest. Developed with the help of The Nature Conservancy and \$500,000 in funding from the Tennessee Valley Authority, the Clinch Valley Forest Bank encourages landowners in southwest Virginia and eastern Tennessee to delay logging their lands until a sustainable-harvest forest management plan can be put into effect.



The logging rights earn an annual interest equal to a percentage of the estimated value of the timber if harvested. While their “deposits” remain in the forest bank, landowners retain title to and can use their property for any purpose other than logging. The Nature Conservancy hopes the concept catches on across the nation to better control forest resources for the future.

Photographs: Chris-Craft courtesy of the Mariners' Museum, Newport News, Virginia; Marty Baldwin
Illustration: Jim Stevenson

Woodworking helps the autistic

A neurological disorder that hinders information gathering and processing, autism occurs in roughly 15 of every 10,000 human births. Although the disorder isn't curable, supportive training in a structured environment can reduce its effects and help those with autism better cope with their family, friends, and community.

At The Homestead, a non-profit living and learning center for the autistic in Runnells, Iowa, woodworking is becoming another avenue of help. “The required focus that woodworking demands, such as sawing, fitting, and sanding, provides needed structure to the life of the autistic,” says Steven Muller, executive director. To that end, The Homestead has inaugurated a woodworking program through which their people can produce—under professional supervision—wooden craft items, such as bird houses, planter boxes, and garden benches. The items then are sold in The Homestead's Country Store



At The Homestead, people with autism craft garden furniture and other projects as part of a supervised woodworking program they hope to see grow.

along with seasonal produce and products from its organic orchards and gardens.

For the unfunded program to grow, however, more tools and equipment are needed. From portable electric power tools to clamps, workbenches, and instructional videos, all contributions (new and used) are welcome. Through *WOOD* magazine, Grizzly Industrial kicked off the expansion effort by donating a drill press. For details on how you can help, contact Steven Muller at 888/228-8476 (e-mail, Homestead@itgrp.com). Of course, first check with your local social services agency to see if there's a similar need where you live.

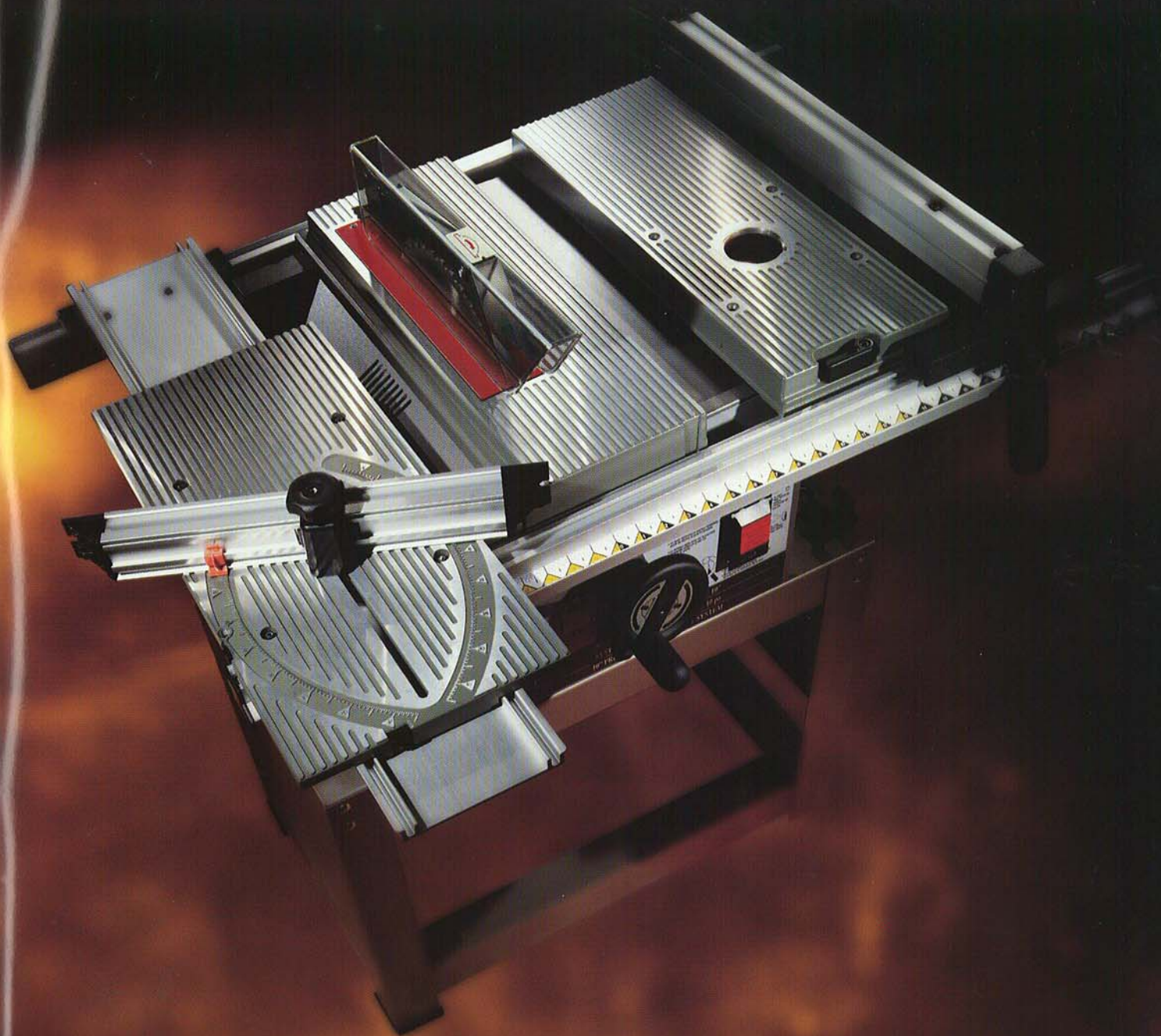
Oldies but goodies: Chris-Craft at the Mariners' Museum

Through December 31, you can trace America's love affair with wooden Chris-Craft runabouts in an exhibit at the Mariners' Museum in Newport News, Virginia. “Chris-Craft: The Affordable Dream” revisits the 1920s and 1930s and the rise of the American middle class that made Chris-Craft so successful. If you

enjoyed the historical article “The Boats of Chris-Craft,” issue #115, June 1999, you'll be fascinated by this exhibit that features nostalgic artifacts of the period, including four restored Chris-Craft runabouts from the era. For more exhibit information, call 800/581-7245. Or visit the website, www.mariner.org. 🌲

Miss Belle Isle, built of mahogany in 1923 as a 26', 10-passenger runabout, ranks as one of the oldest existing Chris-Crafts and highlights an exhibit at the Mariners' Museum in Newport News, Virginia.





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SHAPER

New Poly-V Drive System, New Micro-Adjust extra large fence with dust connector and hold downs, 2 cast iron table extension wings.

\$100 REBATE

BAND SAW

Mobile base, 18" rip fence, Platinum Pro premium blade.

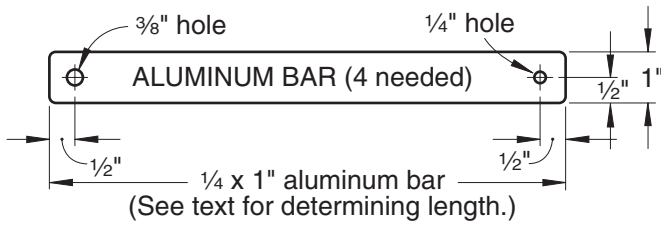
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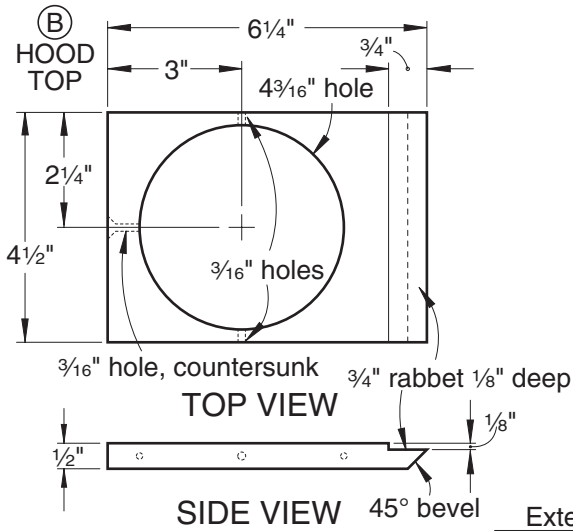
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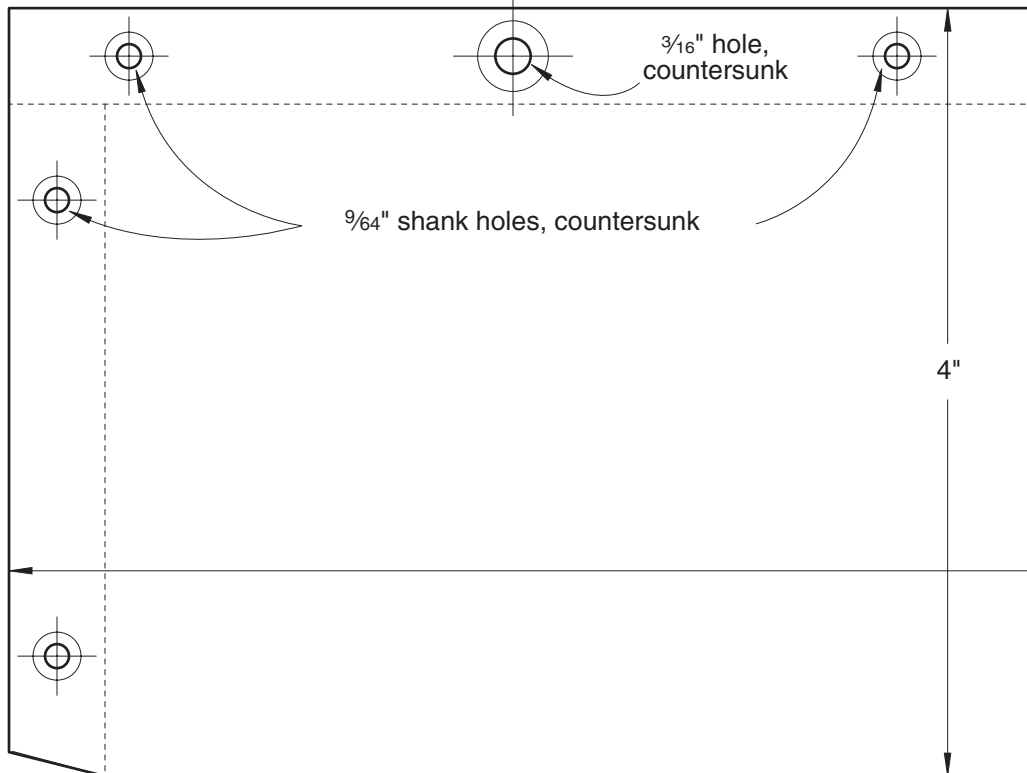
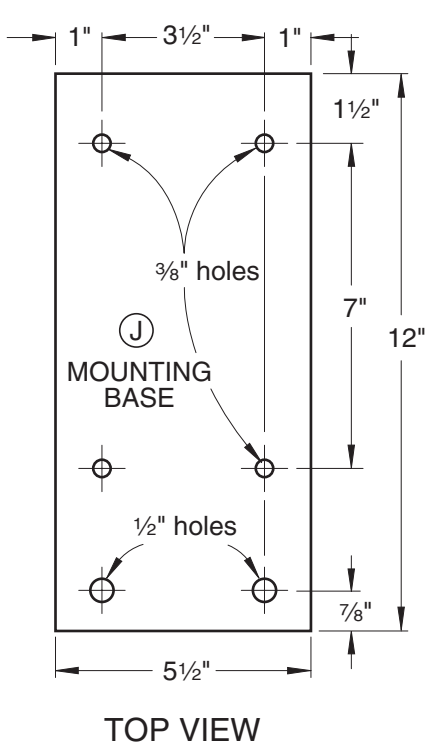
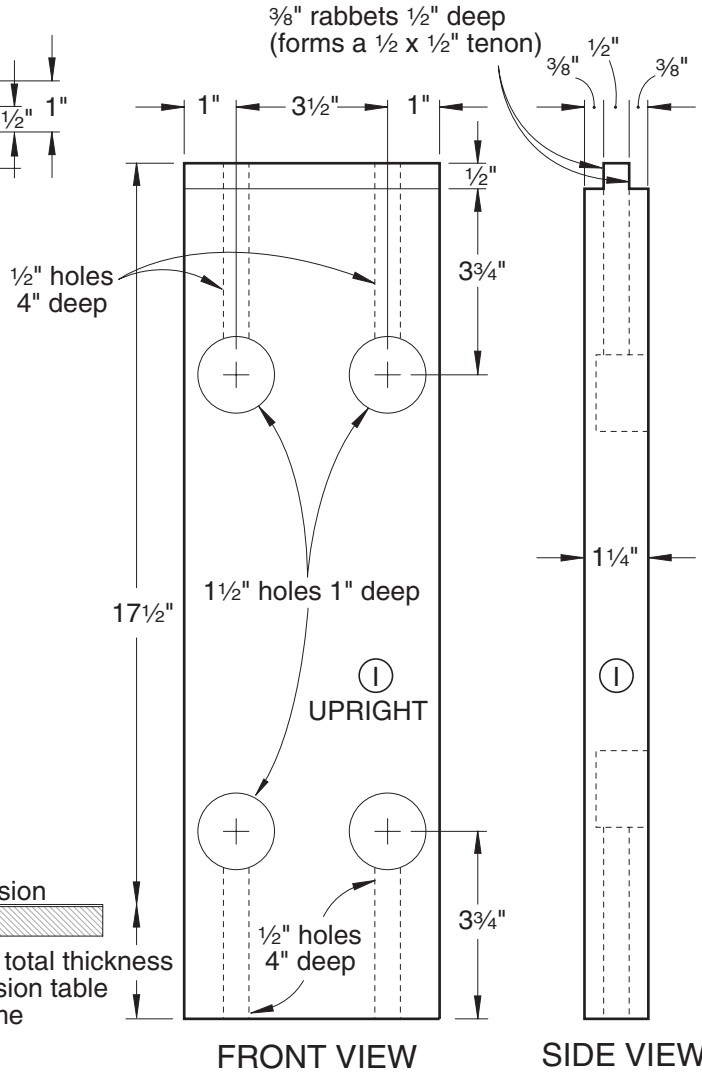
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PARTS VIEW

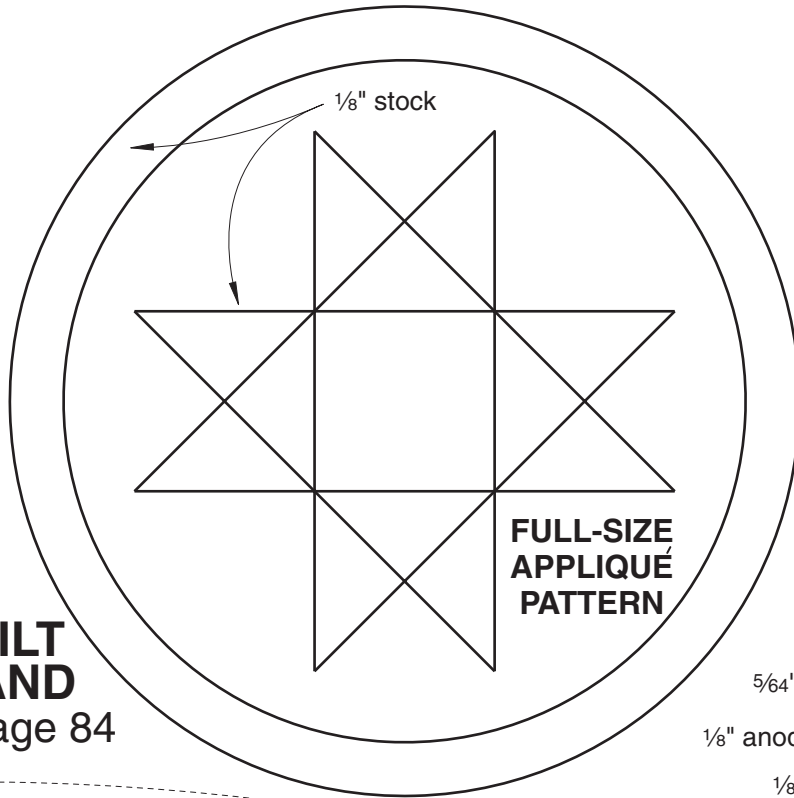


TABLESAW DUST COLLECTOR
See page 68



Brilliant Bird Puzzles • Alarm Clock

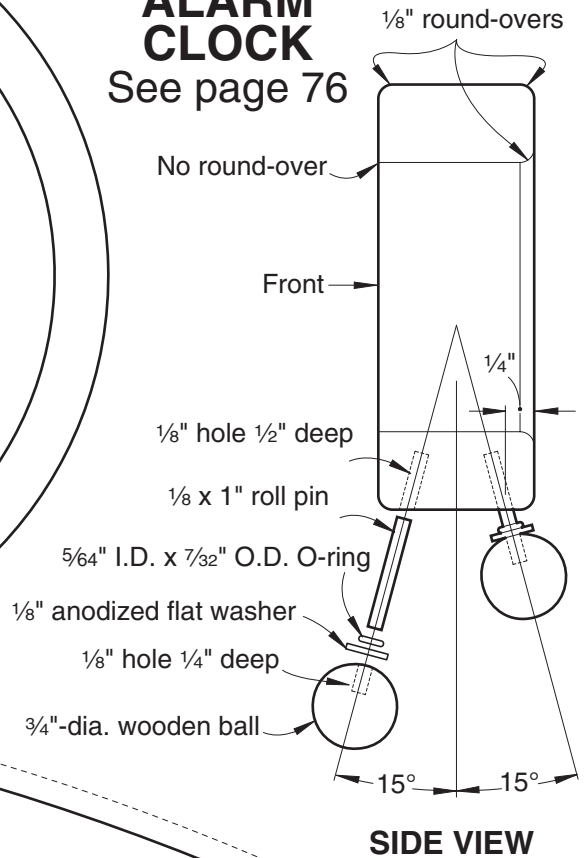
Quilt Stand • Carved Bird • Dust Hood Collector



QUILT STAND
See page 84

ALARM CLOCK

See page 76



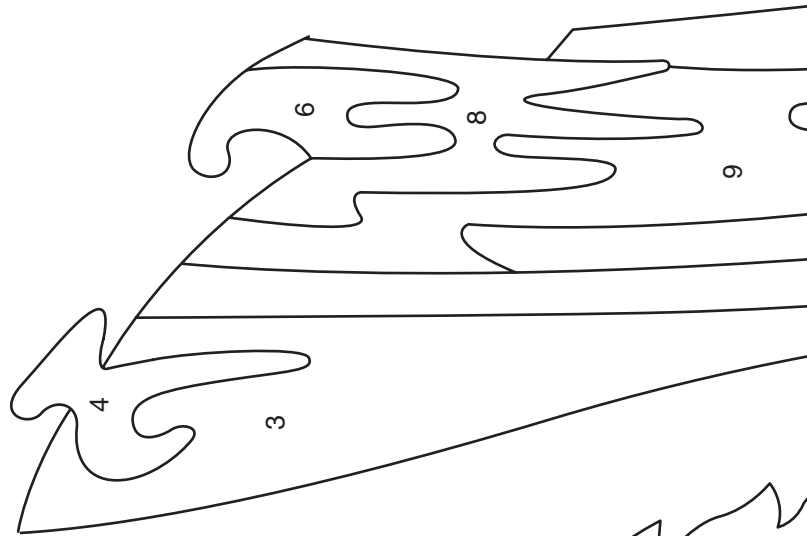
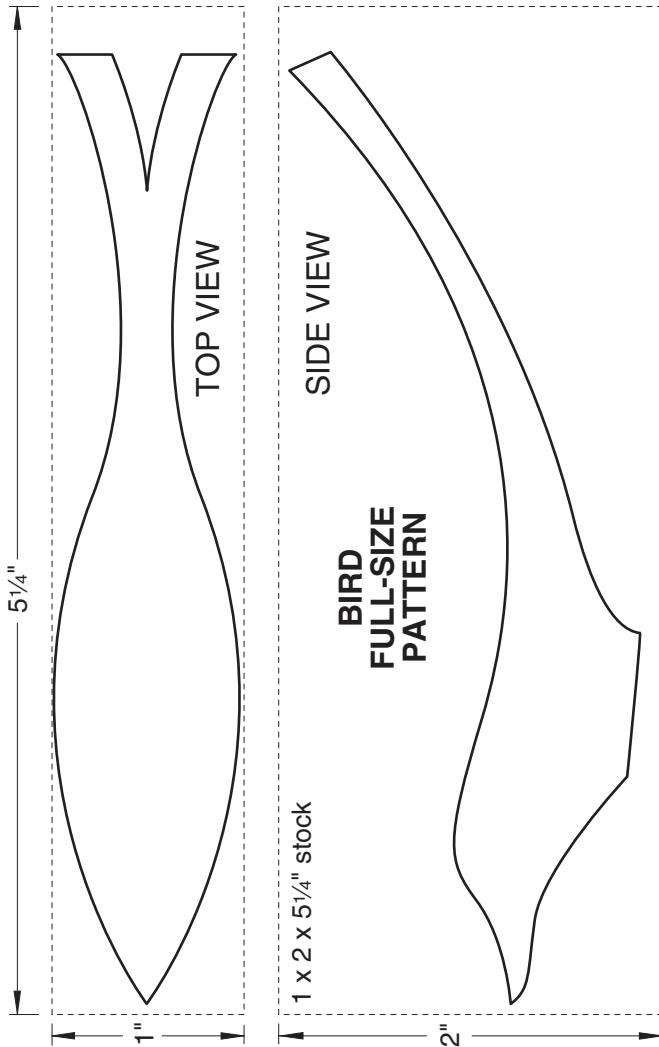
(A)
HOOD SIDE
FULL-SIZE PATTERN
(2 needed)

12 3/4"

9/64" shank holes, countersunk

CARVED BIRD

See page 8



Note: Numbers refer to colors; see key.
Unmarked parts are natural color.

Aniline dye colors

- 1 American walnut (W1595)
- 2 Medium yellow maple (W1510)
- 3 Silver gray (W1620)
- 4 Nigrosine black (W 1660)
- 5 Bright green (W1670)
- 6 Dark forest green (W1690)
- 7 Green peacock blue (W1720)
- 8 Brilliant scarlet (W1790)
- 9 Ruby (W1800)
- 10 Orange red (W1830)
- 11 Lemon yellow (W1850)

**BRILLIANT
BIRD PUZZLES**
See page 74

