

WOODWORKER'S JOURNAL

August 2003

Volume 27, Number 4

6/19/03

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2 HP DUST COLLECTOR

- MOTOR SIZE: 2 HP, 220V, SINGLE-PHASE
- PORTABLE BASE SIZE: 21 1/2" x 33 1/2"
- STATIC PRESSURE: 12.3"
- AIR SUCTION CAPACITY: 1550 CFM
- STANDARD BAG FILTRATION: 30 MICRON
- MOTOR AMP DRAW: 12 AMPS (220V ONLY)
- APPROX. SHIPPING WEIGHT: 130 LBS.

**G1029 REG. \$249⁹⁵
SALE \$239⁹⁵**



1 1/2 HP SHAPER

- MOTOR: HEAVY-DUTY 1 1/2 HP, 110/220V
- 2 INTERCHANGEABLE SPINDLES: 1/2" AND 3/4"
- TWO SPINDLE SPEEDS: 7,000 AND 10,000 RPM
- SPINDLE TRAVEL: 3"
- SPINDLE OPENINGS: 1 1/4", 3 1/4", AND 5"
- TABLE SIZE: 20 1/4" x 18"
- FLOOR-TO-TABLE HEIGHT: 33 1/2"
- MAX. CUTTER DIAMETER: 5"
- APPROX. SHIPPING WEIGHT: 220 LBS.



**G1035
REG. \$425⁰⁰
SALE \$395⁰⁰
(SHOWN WITH
OPTIONAL WING)**

3 HP SHAPER

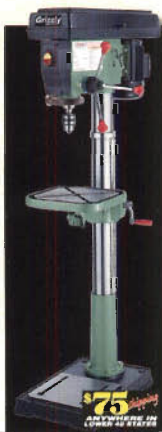
- HEAVY-DUTY 3 HP, SINGLE-PHASE, 220V MOTOR W/REVERSING SWITCH
- 3 INTERCHANGEABLE SPINDLES: 1/2", 3/4" AND 1"
- TWO SPINDLE SPEEDS: 7,000 AND 10,000 RPM
- 3" SPINDLE TRAVEL
- SPINDLE OPENINGS: 1 1/4", 2 1/4", 4", AND 5 1/2"
- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE WITH STANDARD WING ATTACHED: 30 1/2" x 28 1/2"
- FLOOR-TO-TABLE HEIGHT: 34"
- APPROX. SHIPPING WEIGHT: 353 LBS.



**G1026
REG. \$825⁰⁰
SALE \$775⁰⁰**

12 SPEED 17" FLOOR DRILL PRESS

- MOTOR: 1 HP, SINGLE-PHASE, 110V/220V
- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE: 13 3/8" SQUARE
- TABLE TILTS 90° IN BOTH DIRECTIONS
- SPINDLE TAPER: MT#3
- SPINDLE TRAVEL: 4 1/4"
- SWING: 17"
- DRILL CHUCK: 3/8"
- 12 SPEEDS: 210 - 3300 RPM
- DRILLING CAPACITY: 1" STEEL
- INCLUDES BUILT-IN LIGHT
- OVERALL HEIGHT: 64 1/2"
- APPROX. SHIPPING WEIGHT: 275 LBS.



**G7947
ONLY \$375⁰⁰**

10" HEAVY-DUTY TABLE SAW

- 1 1/2 HP, SINGLE-PHASE, 110/220V MOTOR
- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE (W/ WINGS ATTACHED): 27 1/2" x 40 1/4"
- CUTTING CAPACITY: 3 3/4" @ 90°, 2 1/2" @ 45°
- 3/4" x 1 1/4" ARBOR ACCEPTS DADO BLADES
- FRONT & REAR QUICK-LOCK FENCE IS MICRO-ADJUSTABLE
- MAXIMUM RIPPING CAPACITY: 24"
- APPROXIMATE SHIPPING WEIGHT: 220 LBS.



**G1022SM
REG. \$325⁰⁰
SALE \$310⁰⁰**



10" LEFT-TILTING SUPER HEAVY-DUTY TABLE SAW

- MOTOR: 3 HP, SINGLE-PHASE, 220V
- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE (W/ WINGS ATTACHED): 40 1/4" x 27"
- EXTRA-LARGE HANDWHEELS
- CUTTING CAPACITY: 8" L & 26" R OF BLADE
- MAXIMUM DEPTH OF CUT @ 90°: 3"
- MAXIMUM DEPTH OF CUT @ 45°: 2 1/2"
- 1/2" DIAMETER ARBOR ACCEPTS DADO BLADES UP TO 1 1/4"
- APPROX. SHIPPING WEIGHT: 467 LBS.



**MOTOR COVER & DUST HOOD INCLUDED
G1023SL
REG. \$895⁰⁰
SALE \$875⁰⁰**

THE ULTIMATE 14" BANDSAW

- MOTOR: 1 HP, TEFC, 110V / 220V SINGLE-PHASE
- PRECISION GROUND CAST IRON TABLE: 14" x 14"
- 2 SPEEDS: 1500 & 3200 FPM
- CUTTING CAPACITY/THROAT: 13 1/2"
- MAXIMUM CUTTING HEIGHT: 6"
- QUICK CHANGE BLADE RELEASE/TENSIONING
- TABLE TILT: 45° RIGHT, 10° LEFT
- FENCE: DELUXE EXTRUDED ALUMINUM
- FULLY BALANCED CAST ALUMINUM WHEELS WITH RUBBER TIRES
- BLADE SIZE: 92 1/2" (1/4" TO 3/4" WIDE)
- BALL BEARING BLADE GUIDES
- 4" DUST PORT
- INCLUDES ONE 3/8" BLADE
- APPROX. SHIPPING WEIGHT: 210 LBS.



**G0555 INTRODUCTORY PRICE
ONLY \$375⁰⁰**



17" HEAVY-DUTY BANDSAW

- MOTOR: 2 HP, SINGLE-PHASE, 110V/220V, TEFC
- PRECISION GROUND CAST IRON TABLE: 17" SQUARE
- CUTTING HEIGHT: 12"
- CUTTING CAPACITY LEFT OF BLADE: 16 1/4"
- FULLY-BALANCED CAST ALUMINUM WHEELS WITH RUBBER TIRES
- DELUXE EXTRUDED ALUMINUM RIP FENCE
- BLADE SIZE: 132" x 1/2" - 1" (STANDARD 1/2")
- 2 SPEEDS: 1600, 3300 FPM
- 4" DUST PORT x 2
- TABLE TILT 10° LEFT, 45° RIGHT
- QUICK CHANGE BLADE RELEASE/TENSIONING
- HEIGHT FROM FLOOR TO TABLE: 37 1/2"
- APPROX. SHIPPING WEIGHT: 321 LBS.



**G0513 INTRODUCTORY PRICE
ONLY \$750⁰⁰**



19" HEAVY-DUTY BANDSAW

- MOTOR: 2 HP, SINGLE-PHASE, 60 HZ, 110V/220V, TEFC
- PRECISION GROUND CAST IRON TABLE: 19" x 19" x 1 1/2" THICK
- CUTTING CAPACITY LEFT OF BLADE: 18 1/4"
- CUTTING CAPACITY HEIGHT: 12"
- 2 SPEEDS: 1700, 3600 FPM
- BLADE SIZE: 143" x 1/2" - 1"
- QUICK CHANGE BLADE RELEASE/TENSIONING
- WHEELS ARE FULLY-BALANCED CAST ALUMINUM WITH POLYURETHANE TIRES
- DELUXE EXTRUDED ALUMINUM RIP FENCE
- BLADE GUIDES: ROLLER DISC
- BLADE TENSION INDICATOR
- MICRO ADJUSTING GEAR TABLE
- 4" DUST PORT x 2
- TABLE TILT 10° LEFT, 45° RIGHT
- APPROX. SHIPPING WEIGHT: 383 LBS.



**G0514 REG. \$950⁰⁰
SALE \$895⁰⁰**



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6" X 47" JOINTER WITH HANDWHEELS

- 1 HP, 110/220V, SINGLE-PHASE MOTOR
- 6" x 47" PRECISION GROUND CAST IRON TABLE
- RABBETING CAPACITY: 1/2"
- MAX. DEPTH OF CUT: 1/2"
- 3-KNIFE BALL BEARING CUTTERHEAD
- SUPER HEAVY-DUTY, CENTER MOUNTED FENCE IS 4" x 29/4"
- INFEED & OUTFEED TABLES HAVE HANDWHEELS FOR CONVENIENT TABLE HEIGHT ADJUSTMENT



- POWDER COATED PAINT
- STEEL STAND HAS BUILT-IN CHIP CHUTE
- APPROX. SHIPPING WEIGHT: 215 LBS.

**FREE PAIR OF SAFETY
PUSH BLOCKS**

G1182HW

REG. \$325⁰⁰

SALE \$305⁰⁰



8" X 65" SUPER HEAVY-DUTY JOINTER WITH HANDWHEELS

- 1 1/2 HP, 220V, SINGLE-PHASE MOTOR
- SUPER HEAVY-DUTY PRECISION GROUND CAST IRON BED
- 3-KNIFE CUTTERHEAD IS 3" IN DIA. AND RUNS IN SHIELDED, PRE-LUBRICATED BALL BEARINGS
- MAX. DEPTH OF CUT: 1/2"
- INFEED TABLE HAS RABBETING LEDGE

- HEAVY-DUTY CENTER-MOUNTED FENCE
- APPROX. SHIPPING WEIGHT: 450 LBS.

**FREE PAIR OF SAFETY
PUSH BLOCKS**

G1018HW

REG. \$695⁰⁰

SALE \$675⁰⁰



8" X 75" JOINTER WITH 4 BLADE CUTTERHEAD



- 2 HP, 110V/220V, SINGLE-PHASE MOTOR
- 8" x 75" PRECISION GROUND CAST IRON TABLE
- 3" DIAMETER CUTTERHEAD RUNS IN SHIELDED, PRE-LUBRICATED BALL BEARINGS
- MAGNETIC SWITCH WITH THERMAL OVERLOAD PROTECTOR
- 4-HSS CUTTERHEAD KNIVES ARE 8" x 1/8" x 1"
- MAX. DEPTH OF CUT: 1/2"
- CUTTERHEAD SPEED: 5500 RPM
- CUTS PER MINUTE: 22,000

- APPROX. SHIPPING WEIGHT: 461 LBS.

G0500

INTRODUCTORY PRICE

ONLY

\$795⁰⁰



12 1/2" PORTABLE PLANER

- 2 HP, SINGLE-PHASE, 110V MOTOR
- MAX. CUTTING WIDTH: 12 1/2"
- MAX. CUTTING DEPTH: 1/8"
- 2 HSS KNIVES
- FEED RATE: 25 FPM
- ON/OFF TOGGLE SWITCH
- MAX. CUTTING HEIGHT: 6"
- MIN. BOARD THICKNESS: 3/8"
- CUTTERHEAD SPEED: 8,540 RPM
- 57 CUTS PER INCH
- APPROX. SHIPPING WEIGHT: 85 LBS.



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700 LB. CAPACITY STAND WITH PURCHASE OF G8794 PLANER

G8794
ONLY \$299⁹⁵

\$55

15" PLANER

- 2 HP, 220V, SINGLE-PHASE MOTOR
- PRECISION GROUND CAST IRON BED
- CUTTERHEAD SPEED: 5000 RPM
- RATE OF FEED: 16 FPM & 20 FPM
- MAX. CUTTING WIDTH: 14 1/2"
- MAX. CUTTING HEIGHT: 6 1/4"
- MAX. CUTTING DEPTH: 1/4"
- NUMBER OF KNIVES: 3 HSS
- ALL BALL BEARING CONSTRUCTION
- APPROX. SHIPPING WEIGHT: 440 LBS.



**INCLUDES
STAND!**



G1021

REG. \$795⁰⁰

SALE \$725⁰⁰

\$75

20" PLANER

- 3 HP, 220V, SINGLE-PHASE MOTOR
- 25 1/4" x 20" PRECISION GROUND CAST IRON TABLE
- CUTTERHEAD SPEED: 4833 RPM
- RATE OF FEED: 16 FPM & 20 FPM
- MAX. CUTTING WIDTH: 20"
- MAX. CUTTING HEIGHT: 8 1/2"
- MAX. CUTTING DEPTH: 1/4"
- NUMBER OF KNIVES: 4 HSS
- DUST EXHAUST HOOD HAS 5" DUST PORT
- APPROX. SHIPPING WEIGHT: 785 LBS.



**4 BLADE
CUTTERHEAD!**



G1033

REG. \$1285⁰⁰

SALE \$1195⁰⁰

\$150

OSCILLATING SPINDLE SANDER

- 1 HP, SINGLE-PHASE, 110/220V, TEFC MOTOR
- PRECISION GROUND CAST IRON 25" x 25" TABLE TILTS TO 45°
- STROKE LENGTH: 1 1/2"
- FLOOR-TO-TABLE HEIGHT: 35 1/4"
- SPINDLE SPEED: 1725 RPM
- SPINDLE OSCILLATES AT 72 SPM



- INCLUDES 100 GRIT SLEEVE FOR EACH SPINDLE & GROUND STEEL TABLE INSERTS
- 10 TAPERED & THREADED SPINDLE SIZES
- PERMANENTLY LUBRICATED BALL BEARINGS
- BUILT-IN 4" DUST PORT
- APPROX. SHIPPING WEIGHT: 300 LBS.

G1071

REG. \$525⁰⁰

SALE \$495⁰⁰



24" DRUM SANDER WITH VARIABLE SPEED

- 5 HP, 220V DRUM MOTOR DRIVES 2 ALUMINUM SANDING DRUMS
- 1/4 HP VARIABLE SPEED CONVEYOR MOTOR
- CONTROL PANEL WITH AMP LOAD METER
- HANDLES STOCK UP TO 23 1/2" WIDE AND 4 1/4" THICK
- HOOK AND LOOP SANDPAPER INSTALLS EASILY ONTO THE DRUMS
- INDUSTRIAL RUBBER CONVEYOR BELT
- 2 - 4" DIA. DUST PORTS
- APPROX. SHIPPING WEIGHT: 495 LBS.



G1066Z

REG. \$1595⁰⁰

SALE \$1550⁰⁰

\$75



15" WIDE-BELT SANDER (OPEN END)

- SANDING BELT MOTOR: 5 HP
- BELT FEED MOTOR: 1/4 HP
- REQUIRES SINGLE-PHASE, 220V ELECTRICAL AND 50-70 PSI AIR.
- CONVEYOR SPEED 13 & 16.4 FPM
- INCLUDES EXTENDED SUPPORT BAR FOR WIDE BOARDS.
- OVERALL DIMENSIONS: 61 1/4" H x 32 1/2" D x 35" W
- APPROX. SHIPPING WEIGHT: 922 LBS.

G9983

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SALE \$2750⁰⁰



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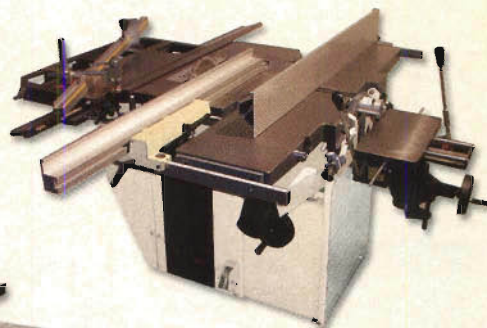
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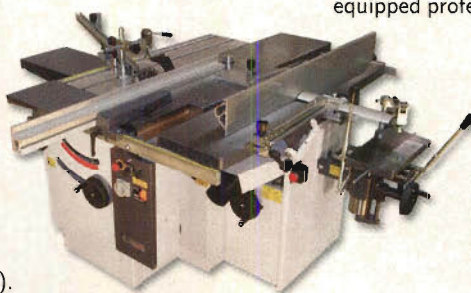


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Features

July/August 2003



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34 Arts & Crafts Wine Cabinet

By Chris Marshall

You won't need a wine cellar with the stupendous storage in this quartersawn white oak masterpiece.

43 Serving Table & Tray

By LiLi Jackson

A removable tray with mirrored bottom plus mahogany construction lend elegance to this easy-to-build piece.

48 Computer Desk

By Bill Hylton

If your workspace no longer computes, this ergonomic workstation has all the elements to adjust to your needs.



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Woodworker's Journal Departments

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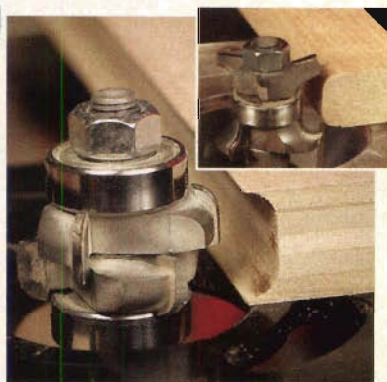
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FOR HOLES IN YOUR WALL,



NOT YOUR BUDGET.



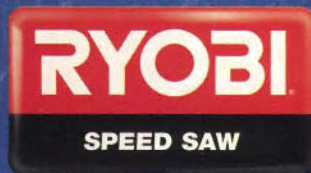
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White-knuckled Wrist Twisters

What? You thought they were all behind us? You thought cordless was a goal, not an approach? I've got news for you. It's gonna be a while before you can squeeze the kind of juice the local utility specializes in into a battery pack. There's something to be said for an unending stream of 120 volts driving your tools, and tool experts and regular contributors **Sandor Nagyszalanczy** and **Charles Self** are just the guys to say it. Check out their articles on pages 74 and 60, respectively, for the bottom line on corded advantages: Sometimes the job you're working on just calls out for one of these white-knuckled wrist twisters!



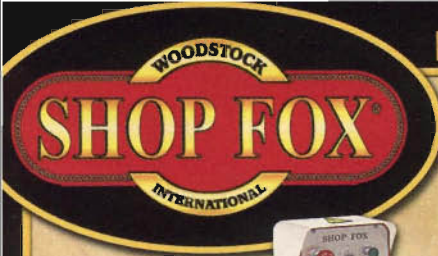
So, summertime is when woodworkers take it easy, right? Putter around the yard ... putz in the garden ... lounge on the beach. Sorry, but that's nothing but a bad rumor, and I've got the data to prove it. What I hear from you in our surveys is that summer is the perfect time to get started on big projects, to purchase and mill stock, sharpen tools, and maybe pick up a tool or two on discount. That's why this issue features not one but two significant projects: **Chris Marshall's** Wine Cabinet (see page 34) and **Bill Hylton's** Computer Desk (see page 48). Let's face it, if either of these projects (or your own customized variations thereof) appeal to you, now is the time to get started. And if you're looking for a slightly less challenging piece, check out **LiLi Jackson's** elegant serving tray on page 43. A long weekend should get you most of the way home on that one.



The other thing that the summer season always brings around is woodworking shows. This year's big event will take place in Anaheim, California, and you can bet editor **Rob Johnstone** and I will be there, checking out all the new offerings. In the coming months we'll be featuring them in our eZine (*go to www.woodworkersjournal.com to sign up ... it's free!*) and in the pages of the magazine. One way or another, we'll make sure no new woodworking tool or gizmo escapes our grasp ... or yours!



Larry N. Stoiaken



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- Silky-smooth handwheel table adjustment
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We designed this shaper for maximum performance. With 25% more power and 40% more weight than other shapers in its price range, you can use larger cutters or stack multiple cutters to save time. By stacking multiple cutters you simply raise or lower the spindle for the next profile, greatly reducing time for tooling changes. Combine this feature with the ones listed below and you have the best shaper value on the market!

3" SPINDLE TRAVEL!



- 2 HP, 110/220V, single-phase motor
- Large precision ground cast iron table
- All ball bearing construction
- Heavy-duty miter gauge
- 1/2" and 3/4" spindles included
- 3" spindle travel
- Cabinet stand with powder coated paint
- Approx. shipping weight: 270 lbs.

Shown with D2057 Adjustable Mobile Base (not included)



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Undersized Plywood Riles Readers



Don't Divide Your Digits

The article on cabinet saws in your *April 2003* issue reminded me of a suggestion I have made to many of my employees over the years when teaching them to use a table saw: touch the fence with every finger that isn't pushing a part. To not be touching something as you push your stock through a saw is to lose track of where that digit is when you get near the blade. Even when using a push stick, one should have something in contact with every single finger so that you do not lose track of a position while concentrating on the cut. I believe this hint has saved many a finger or fingertip through the years.

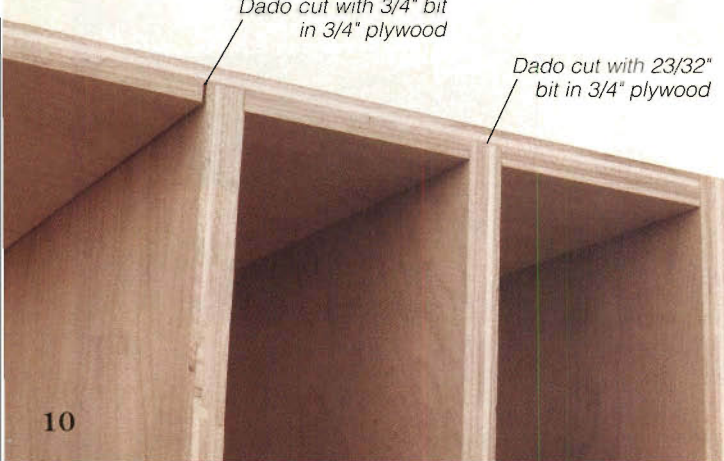
*Phil Cutting
Paola, Kansas*

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Dado cut with 3/4" bit in 3/4" plywood

Dado cut with 23/32" bit in 3/4" plywood



Shop Spring Cleaning

My April 2003 copy of *Woodworker's Journal* arrived just as I was completing a project. I read Sandor Nagyszalanczy's "Eight Steps to Shop Maintenance" and decided it was time for a full-blown field day in my shop.

I do sweep up regularly (a habit instilled by a fastidious shop teacher I had way back in 1956) and am scrupulous about maintaining my tools. On the other hand, taking time to move, vacuum, sort and "file" practically everything in my shop is something I don't do often (or care to do again any time soon). As you can see, the effort was not without benefit, and I do feel pretty proud of myself for my day-long demonstration of self-discipline (hence, this letter).

*Carl Tobin
Stanley, New York*



Carl really took Sandor's shop maintenance article to heart. In fact, you could probably perform heart surgery in his shop now!

A dado cut with a regular 3/4" bit (left cut) will be too big for your plywood shelf and look sloppy.

Striking a Plywood Nerve

In the *April 2003* issue, a reader asked why plywood that is manufactured to 23/32" cannot be made to 3/4" (*Questions & Answers*). Good question, but I found your answer to be bogus.

*Norm Buerklin
Maynard, Massachusetts*

A manufacturer producing millions of sheets a year has strict controls and produces sheets which are deliberately 23/32" thick, not 3/4". I still want to know why!

*Nigel Bond
Getzville, New York*

Seems like they could [produce 3/4"] with the same tolerances they use to produce the 23/32" stuff. Of course, they would be giving us more material and the cost would probably go up proportionally.

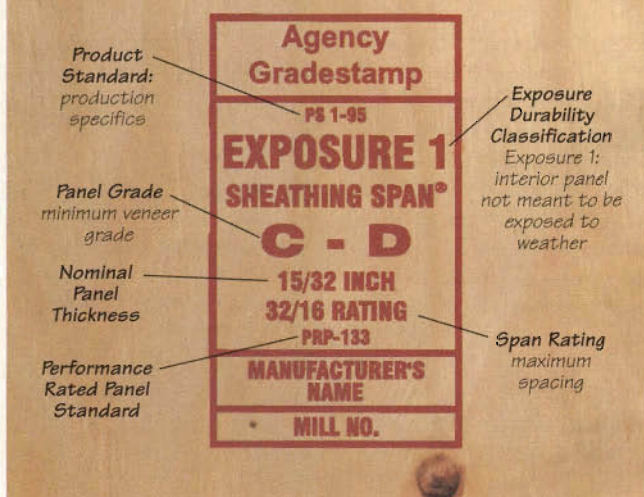
*Walt Schubert
Hobart, Oklahoma*

Back in the 1950s, 60s and 70s, you could get 3/4" plywood that was indeed 3/4" thick. Nowadays, there is no longer any respect for the width and length, let alone squareness.

Like a lot of other businesses today, the MBAs rule the roost. It costs too much to maintain the old standards. Turn out a cheaper product, and to hell with the customer. If the plywood producers of old could maintain the standards, with their technology, it would not be hard to do the same today!

*D.G. Towers
Ormond Beach, Florida*

Understanding Plywood Labels



Tips on "reading" plywood are available from industry testing company TECO (www.tecotested.com).

This is just another case of lumber mills "milking" the consumer to get more board feet from less material.

*Matt Ellsworth
Buffalo, Wyoming*

WJ Responds: We couldn't agree with you more: 3/4" ought to be 3/4". And at least one plywood rep has the courage to tell it like it is: "They cut it to save money," says Jeff Outten, a technical marketing manager with Southern Lumber and Plywood.

Of course, there are some fancier words for what happened in the 1980s, when plywood changed from "visually graded" to "performance rated" panels. (Officially, a panel that's smaller than it says it is, but

still strong enough to meet industry requirements, is called a "scant" panel.)

And all the manufacturers have now found a way to meet the strength requirements — "by modifying the process or changing the thickness slightly," Jeff says — whether their measurements are what they say they are or not. In fact, the rules allow a fudge factor for those measurements: a panel rated at 15/32" (.469), for example, is allowed to have an actual thickness ranging from .437 to .500 (1/2"). Somebody write (quick) if you find a panel that's actually 1/2"!

— The Editors

continues on page 12 ...

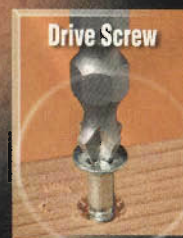
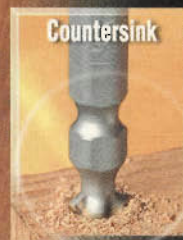
Safety First: Learning how to operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary guards have been removed from equipment shown in our magazine. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturers' instructions and safety precautions.

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Simulating Aged Cherry

The "Cabriole Leg Side Table" (*April 2003*) indicates the author, Paul Anthony, treated his cherry side table with potassium dichromate to simulate an aged look. Could you provide me with details of the process?

Frank O'Keefe
Medina, Minnesota

WJ Responds: I almost regret mentioning potassium dichromate as a stain because I don't recommend it for general use. This chemical stain, made from metal salts, does produce rich brown tones in high-tannin woods like cherry, but it is an acute toxin and a known carcinogen. Its application requires use of chemical-resistant gloves and safety glasses and an appropriately rated organic-vapor respirator. In retrospect, I'm not sure the finish is worth the risks.

There are alternatives, including dye stains and various gel stains. But perhaps one of the best techniques is simply to "sun tan" the wood.

There are safer alternatives than potassium dichromate, including dye stains like "antique cherry," to simulate that aged cherry look.

Cherry darkens remarkably quickly when exposed to light. Finishing expert Jeff Jewitt tells me that he sometimes coats a piece of cherry furniture with linseed oil, then places it in the sunlight a couple hours a day for a week or so, turning the piece occasionally to expose it evenly to the light.

— Paul Anthony

Slick On the Trigger

I enjoyed your article "Have Gun, Will Scour" (*Finishing Thoughts*, April 2003) very much, but using a petroleum base lube on my spray gun is a disaster just waiting to happen. For some people, if a little is good, a lot is better.

Gary Tatum
Blackfoot, Idaho

WJ Responds: Most gun companies make some sort of gun lubricant, and if you have some, use it. For those times when it is not handy, petroleum jelly will do just fine. It only goes onto the threads, so it never enters the fluid passageway. Because it is so thick, it does not atomize into airways either. Petroleum jelly is either compatible with or insoluble by most anything you are likely to spray, so trace amounts of it will not create finish anomalies. As always, if you are worried, choose something else.

— Michael Dresdner

Fire Hazard?

In your last *Finishing Thoughts* the author says "The first step after spraying is to pour out any remaining



Use safety precautions — gloves and a respirator — when you clean your spray gun; and always spray in a booth.

finish, then flush the gun by spraying a few ounces of the finish's solvent through it." What a perfect way to ensure that you have sprayed your last finish. Spraying a flammable solvent into a 21 percent oxygen atmosphere in a finely atomized mist is asking for a vapor-air explosion. The slightest spark will ignite the explosive mixture with disastrous results. As a retired fire marshal and certified fire investigator, I have seen this happen too many times.

Bruce E. Ryden, C.F.I.
Hendersonville, NC

WJ Responds: I hope no one else inferred that you should ever spray anything — solvent or finish — outside of a spray booth. To me, it goes without saying that all spraying is done in a booth. Since this was an article about cleaning guns, it was directed to those who already spray, and I took it for granted that if they spray, they know the safety rules.

If anything, I owe Bruce a hearty thank you for reminding me that you can't assume the rules are always being followed.

— Michael Dresdner

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Photo courtesy of the Great Smoky Mountains National Park Library and the American Chestnut Foundation.

Old Chestnuts and Twisted Blades

Towering American chestnut trees like this one photographed in Tennessee around 1920 died out because of blight — but they might be making a comeback.

Q I have some chestnut that was imported from Turkey. How does this compare to American chestnut?

*Scott Baryliski
Putnam, Connecticut*

A American chestnut (genus *Castanea*, species *dentata*; in the beech family) was a plentiful species providing 25 percent of the lumber in the Eastern hardwood forests until a fungal blight, introduced into North America in 1895, killed all the trees, except for a few sprouts, by 1930. The wood from this tall, straight tree was moderately high in strength and stiffness, glued and machined easily, and had high natural rot- and insect-resistance. Its grain and color looked like a combination of oak and ash, but without the ray fleck pattern.

In addition to American chestnut, there are 10 other species of chestnut in the world. These 10 include sweet or Spanish (*C. Vesca*),

Chinese (*C. Mollissima*), Japanese (*C. Crenata*), and Turkish (*C. Sativa*). These trees are small to medium sized; as a result, they cannot compete well in the natural forests and so have been unable to take the place of American chestnut. They do, however, seem to have moderate to good resistance to the blight. The wood, except for sweet chestnut, is lower in density, with coarser grain and lower strength, and is without much natural decay resistance. Sweet chestnut has been used in Europe since Roman times for structural members in buildings that are still standing today.

All do provide excellent wood, albeit a little soft at times, for furniture, cabinets and the like.

— *Dr. Gene Wengert*

Editor's Note: The American Chestnut Foundation has received awards for its work in restoring the American chestnut to eastern U.S. forests. They anticipate that cross-breeding with blight-resistant species will produce resistant nuts within five years. For more info, call 802-447-0110 or visit their web site at www.acf.org.

Q How does the electric brake work in my miter saw? It seems to have quit working.

*Ryan Vogt
Urish, Missouri*

RECALL NOTICE!

Recalls are in effect involving some Bosch, Craftsman, Hitachi and Milwaukee tools.

- The transformer can overheat inside 9.6-volt, 12-volt, 14.4-volt and 18-volt Skil® (Bosch) Warrior drill battery chargers.
- The switch can stick in the "on" position both on some Craftsman 17518 routers and on some 15 amp Milwaukee grinders with a 7" or 9" disc.
- The lower blade guards on some Hitachi 7 1/4" circular saws can stick in the open position.

For more information, visit: www.cpsc.gov or contact the manufacturers at their recall hotlines:

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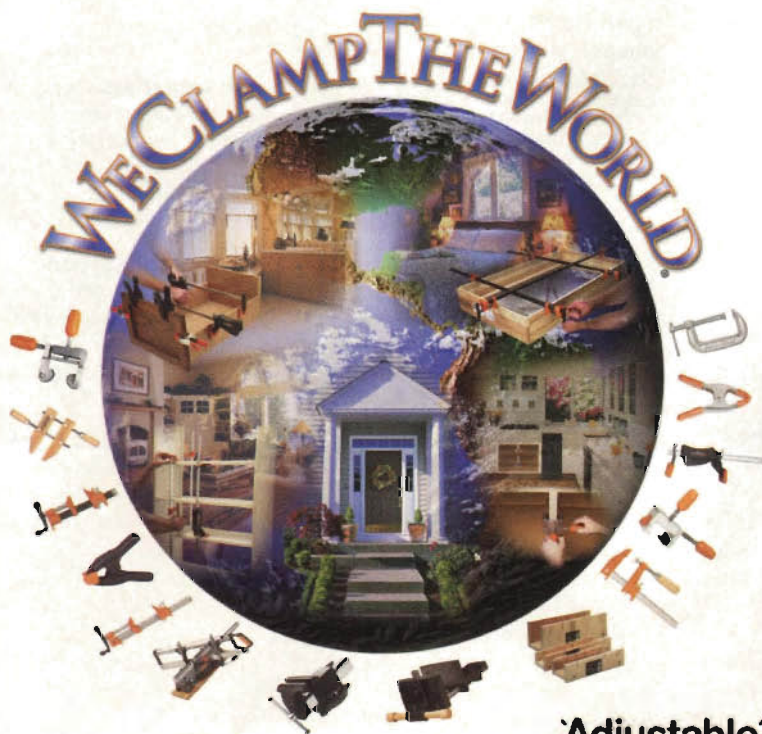
Contact us by writing to "Q&A", *Woodworker's Journal*, 4365 Willow Drive, Medina, MN 55340, by faxing us at (763) 478-8396 or by e-mailing us at: Q&A@woodworkersjournal.com. Please include your home address, phone number and e-mail address (if you have one) with your question.

A Most powered miter, compound-miter and sliding-compound miter saws have some kind of built-in automatic brake designed to stop the blade a few heartbeats after the tool is switched off. This minimizes the chance of disaster that could result from accidental contact with a spinning blade. The universal-type electric motors found on nearly all models consist of two parts: a rotating armature that spins inside

a fixed stator, both of which are wound with thin wire. When the tool is switched on, electricity flows through these wires, creating magnetic fields that cause the armature to rotate. Matt Smith, standards engineer at Porter-Cable power tools, says that most saw brakes work by actually using power from the coasting motor itself to stop the blade. When the saw is

continues on page 16 ...

A chop saw without its brake is a dangerous saw. If it can't be fixed, it should be replaced.



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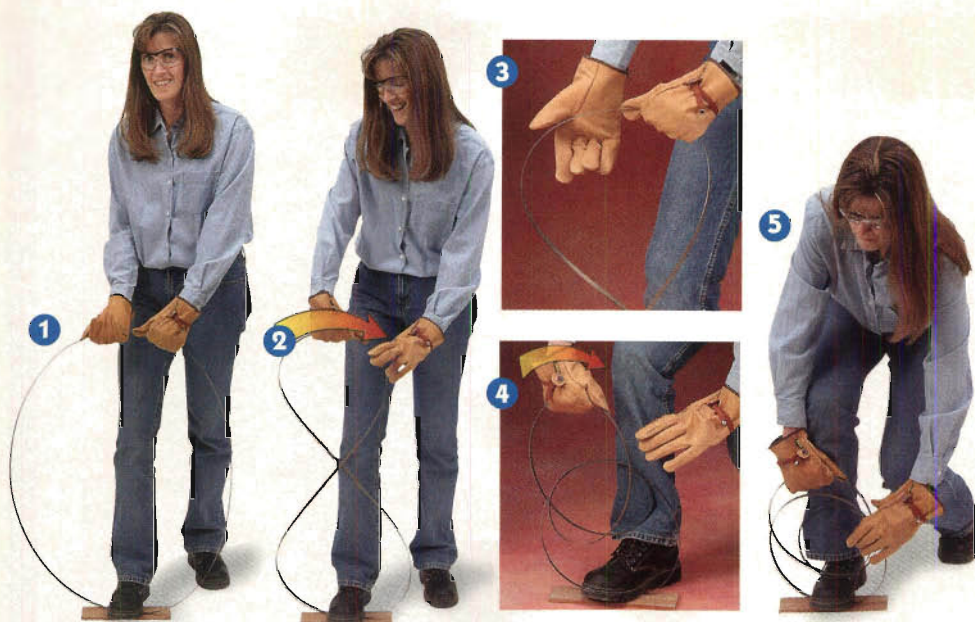
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There's more than one way to coil a band saw blade for storage: here WJ contributor Linda Haus demonstrates one of Mark Duginske's favorite techniques. 1. Use your foot to hold one end of the blade (note that Linda is wearing gloves and eye protection). 2. Twist the blade, forming a "figure eight." 3. Hold the blade with your free hand (left) and rotate your other hand (right) so that your palm is open toward the blade in preparation for another rotation. 4. Rotate your wrist one more time in the same direction as the last rotation and move your hand towards the floor, forming the third loop. 5. Capture all three loops with your other (left) hand.

turned off, contacts in the tool's switch reverse the electro-magnetic field in the motor's stator windings with respect to the armature. Since the armature still has a magnetic field in it (generated as it was running), a flow of electrons is induced in the stator winding. Because the stator's windings are reversed, its induced magnetic field now opposes the armature's field, which quickly stops the rotation of armature — and the saw blade.

Miter saws are fitted with a separate reverse-wound brake winding. Brake malfunctions often occur when connections to the brake winding come loose at the switch. Some saws use a power resistor to dissipate the energy generated when the two opposing electro-magnetic fields slam into each other. A faulty or burned-out power resistor can also cause the brake to stop working. Either way, an authorized service center

will be able to fix the problem. Although unlikely, brake failure may also be due to broken or shorted wires in the motor's brake windings. This problem isn't practical to repair, so if it occurs, you should replace the saw, rather than continue using it — a miter saw that lets its blade spin after power is switched off is hazardous to use.

— Sandor Nagyszalanczy

Q I recently purchased a new 14" band saw. After removing the blade, I realized that coiling up a band saw blade without turning it into a pretzel was more difficult than I thought. Is there an easy technique for coiling and storing unused blades?

Mark Dunne
Lake Zurich, Illinois

A Band saw blades made today will last a fair amount of time if they are not abused. Blades are often damaged by kinking

(bending or twisting the blade) during unfolding and folding. Poor folding and unfolding technique can put enough pressure on the weld to damage or even break the blade.

Large blades are best unfolded by gripping the back of the blade in a vice. Wear gloves and glasses or a face shield. After securing the blade, gently unfold it. If it seems to be getting away from you, simply let go of it as you back away quickly.

To fold the blade in three coils, use one foot as a third hand. Put a scrap block of wood on the floor as cushion. Place the blade on the block and step on it. Using both hands, rotate the blade 180 degrees, forming a figure 8. Reposition your hands and repeat, rotating the blade 180 degrees again as you press the blade down into the triple coils. Practice this technique with a dull blade so you don't kink a new one.

— Mark Duginske



WINNER! For simply sending in his question on band saw blade storage, Mark Dunne of Lake Zurich, Illinois wins a **Bosch 1295DVS random orbital sander**. Each issue we toss new questions into a hat and draw a winner.

THIS ISSUE'S EXPERTS

Dr. Gene Wengert is a professor emeritus of wood processing at the University of Wisconsin-Madison and president of the WoodDoctor's Rx, a consulting and education company.

Sandor Nagyszalanczy is a professional writer, photographer and author of seven books, including Woodshop Dust Control, from Taunton Press.

Mark Duginske is the author of Band Saw Bench Guide from Sterling Publishing Company.

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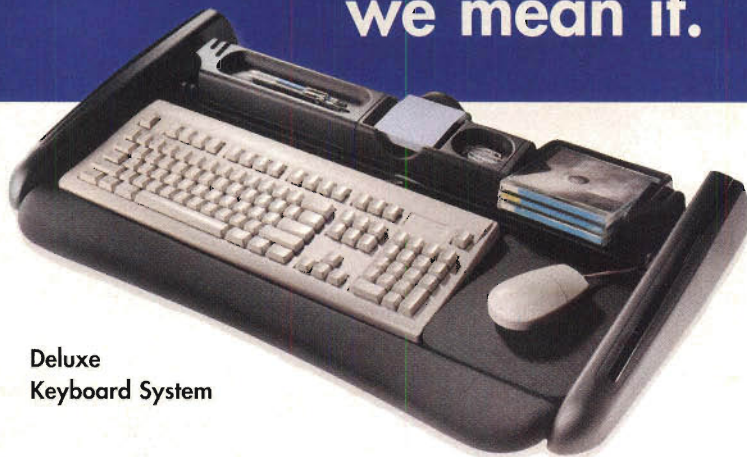
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Jointing operation shown

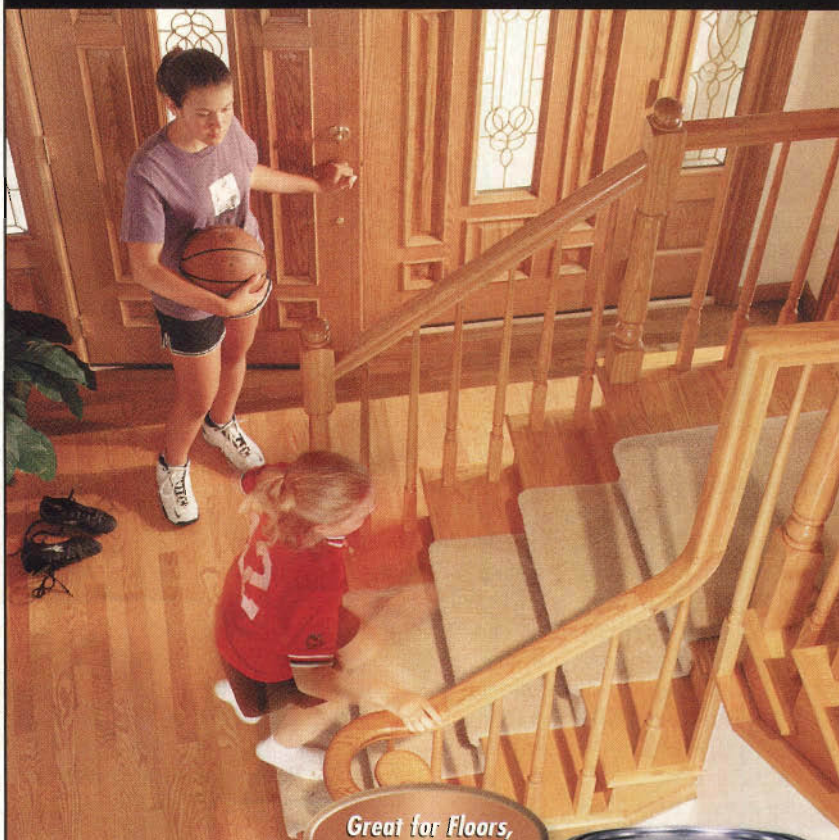
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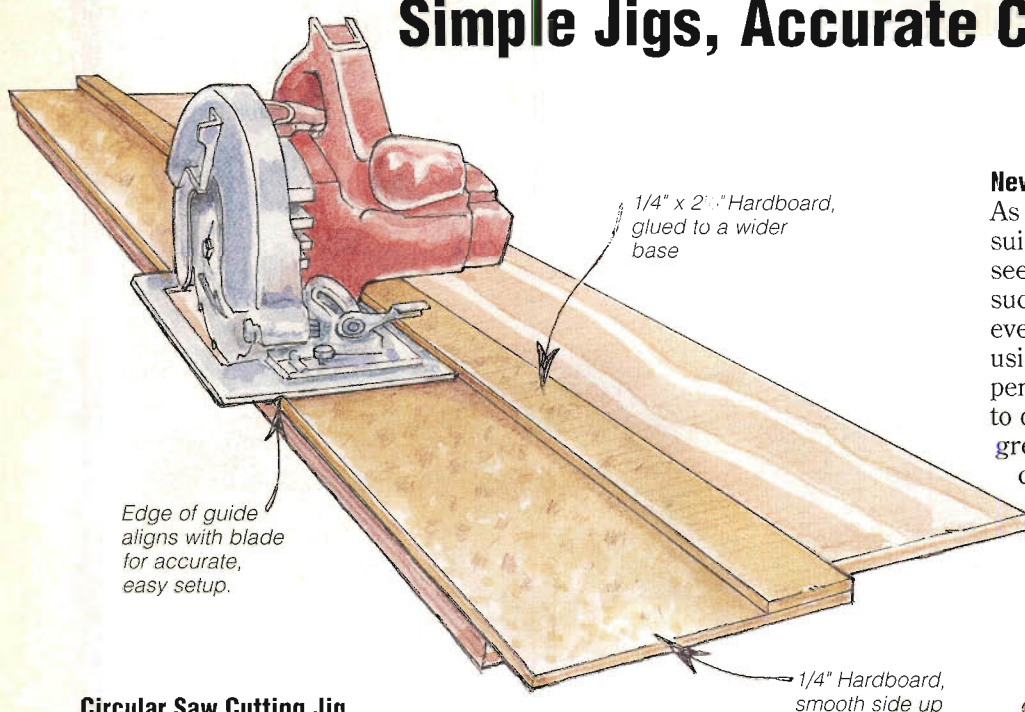


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I recently made a guide for my Skil saw, and I keep finding new uses for it. It's especially useful for making straight cuts in rough or twisted lumber and also handy when cutting 4 x 8 sheets of plywood, particle board or MDF.

To make the guide, I glued a 2 1/2" wide strip of 1/4" hardboard to a wider hardboard base, with the smooth sides face to face. I then put the base of my Skil saw against the guide and made one cut. The edge of the guide now marks the line of cut — no need to make allowance for width of blade or base plate.

Added bonuses are that the guide reduces splintering, protects a finished surface and eliminates the need for guide lines.

*Rick Carlson
Lewistown, Montana*

Replacing Sander Pads

As inevitably happens, sooner or later, my random orbit sander would not hang on to its sanding discs — it just kept throwing them off. Since I live in a small town, and ordering a new one would take over a month and cost around \$25, I decided there had to be a better way (and cheaper, too!).

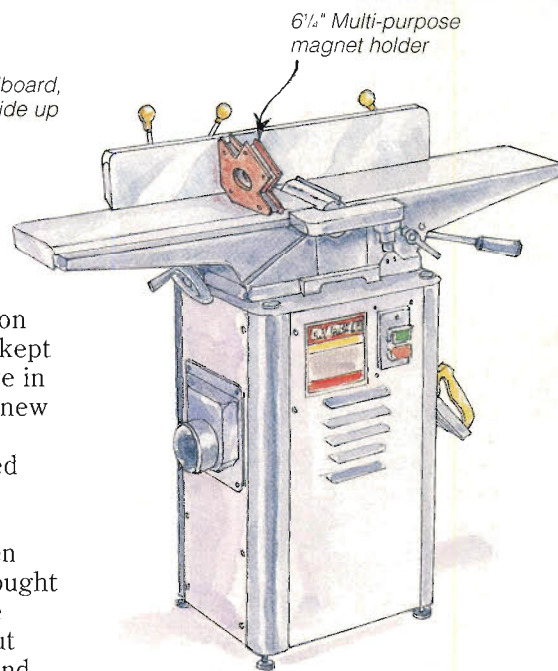
The answer came to me when I was in a local Wal-Mart®. I bought some heavy-duty, self-adhesive Velcro®, put that on the pad, cut out the dust collection holes, and it works great.

*Jerry Pruett
Blackfoot, Idaho*

New Lines for Older Eyes

As I get older and my eyes follow suit, I find it harder and harder to see pencil lines on darker woods such as walnut, mahogany and even some redwood. So I began using a sharp, white colored pencil, Primacolor, (#PC 938) to draw my layout lines. It works great: it allows for easier, accurate cutting; is highly visible; and sands off easily.

*Ron Madsen
Sacramento, California*



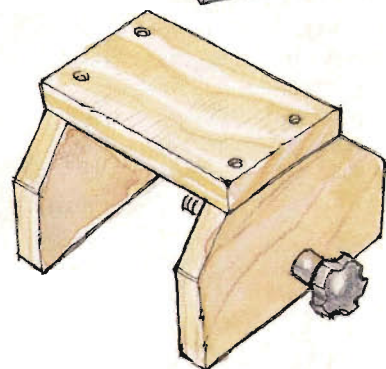
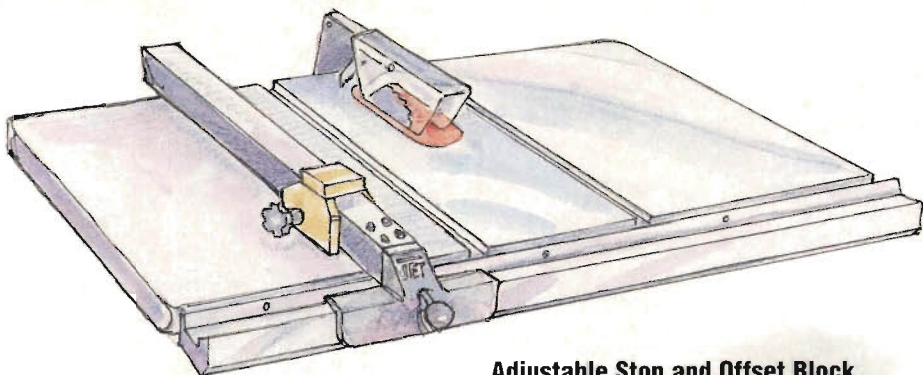
Squaring a Jointer Fence

I recently bought a 6" jointer from Sears. It works fine, but setting the fence to an accurate 90° required a third hand — with which I am not equipped. Then a friend loaned me a device called a "multi-purpose magnet holder" that holds anything made of steel at 45°, 90° or 135°. A welding supply store is bound to stock it, or you can order it from the web at www.weldingmart.com for \$6.99.

*Gene Andrews
Dothan, Alabama*

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Turn to page 21 for **details!**





Adjustable Stop and Offset Block

Rather than hassle with a block of wood and a clamp for a stop on my table saw fence, I used part of an old 5/16" screw clamp to make the little sliding jig shown in the sketch. I can now slip the jig over the fence, slide it into position and then lock it with a half turn of the plastic handle. It also works as an offset for crosscuts.

Alfred De Vries
El Cajon, California



WINNER!

In addition to our standard payment (below) John Hooper of Greer, South

Carolina, will also receive a **Drill Doctor 400PK 200** for being selected as the "Pick of the Tricks" winner. We pay from \$100 to \$200 for all tricks used. To join in the fun, send us your original, unpublished trick. Please include a photo or drawing if necessary. Submit your Tricks of the Trade to Woodworker's Journal, Dept. T/T, P.O. Box 261, Medina, MN 55340. Or send us an e-mail: tricks@woodworkersjournal.com

continues on page 22 ...

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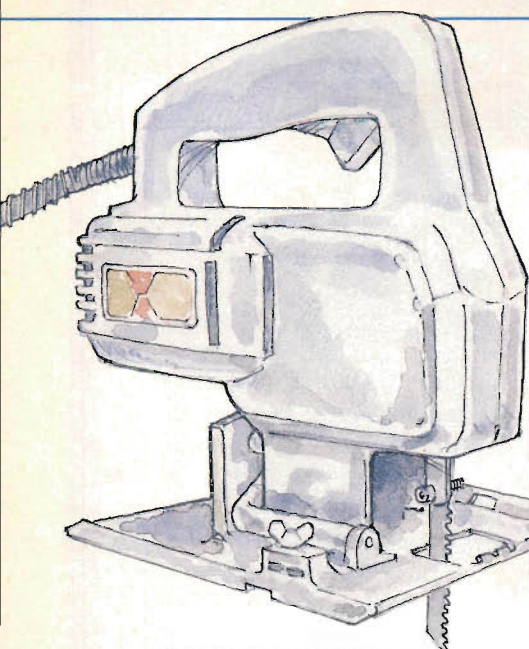


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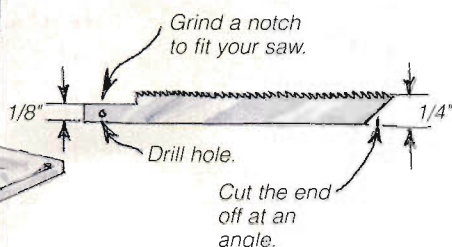
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Recycling Band Saw Blades

Broken band saw blades are usually kinked or otherwise damaged and not worth the cost of welding. Instead of throwing them away, I cut out the good sections and use them in my jigsaw. The 1/8" blades fit fine, but the 1/4" need grinding to the profile shown in the sketch.

*Ronald Bolton
Middlefield, Connecticut*



Pulling Nails

While helping to renovate a local church, I needed to remove some deeply set finish nails — with minimal damage to the wood.

After trying a few different approaches, the solution I landed on was to cut around each nail with a plug cutter chucked into my hand drill. I carefully avoided the nail and found that I could then break away the plug and pull the nail using a small pair of vise grips. The final step was to cut an oversize plug and glue it back in the hole.

*Ken Rosette
Cordova, Maryland*



Shop-made Flapper Sander

Sanding the slots on my lyre-backed dining chairs was tedious, so I came up with a miniature spindle or flapper sander. I split a 3" length of 1/4" dowel at one end with a coping saw. The sandpaper is double sided taped back to back and cut in strips. In less than half a minute, I can replace the sandpaper with a new piece.

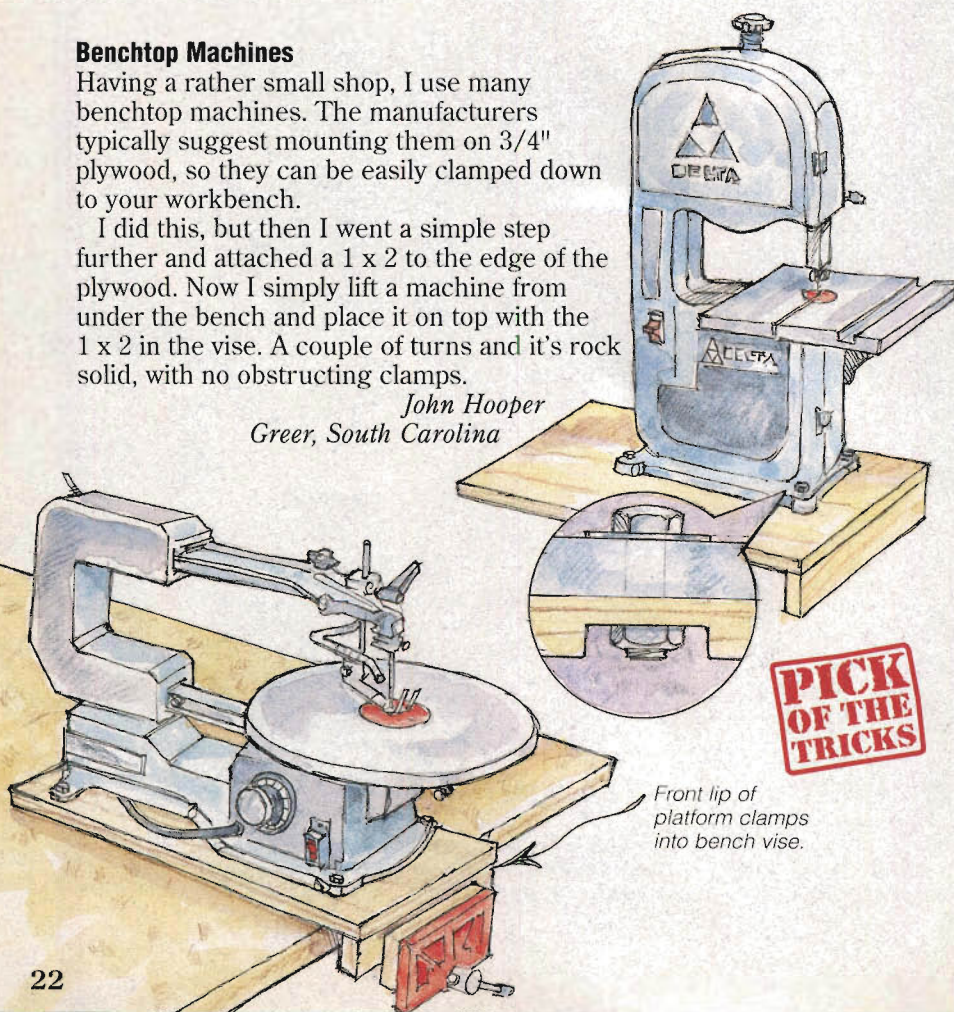
*Scott Ramoly
Conway, Arkansas*

Benchtop Machines

Having a rather small shop, I use many benchtop machines. The manufacturers typically suggest mounting them on 3/4" plywood, so they can be easily clamped down to your workbench.

I did this, but then I went a simple step further and attached a 1 x 2 to the edge of the plywood. Now I simply lift a machine from under the bench and place it on top with the 1 x 2 in the vise. A couple of turns and it's rock solid, with no obstructing clamps.

*John Hooper
Greer, South Carolina*



Front tip of platform clamps into bench vise.

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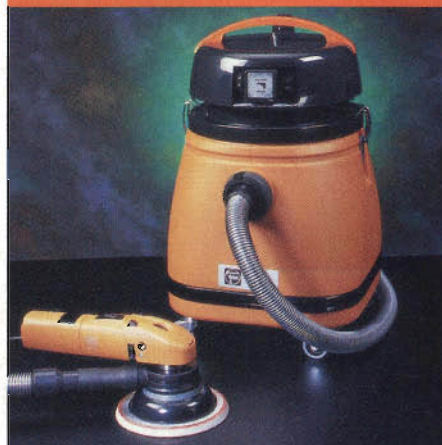
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What's This?



Who's number one? Well, this tool belonging to **Perry Gienger of Andover, Minnesota** is — at least that's what's stamped in the metal. **Know anything more about it — like what it's used for?** Send in your answer for a chance to win a prize!

If you have your own woodworking mystery tool (or the answer to this issue's entry), send it to Stumpers, c/o Woodworker's Journal, P.O. Box 261, Medina, Minnesota 55340. Or send us an e-mail: jtakes@woodworkersjournal.com

The Jig Is Up

Under the Tree

Your photos in the April issue of Stumpers brought back a flood of memories. In 1960, I was a young father, recovering from an emergency appendectomy, out of work, and my wife was taking care of two babies — in cloth diapers! We wanted to have something to put under the Christmas tree for our boy, so I borrowed one of the drill-powered jig saws, scavenged some scrap wood, and proceeded to build a rocking horse.

When this contraption was hooked up to a 1/4" drill, it made for clumsy sawing, but I persevered, and finished the job on Christmas Eve.

*Mike Foley
Kingwood, Texas*

A Long-lost Ancestor

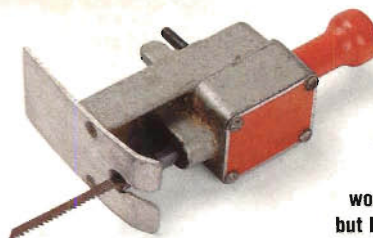
Mike, we're glad you have such fond memories of April's Stumpers tool — unearthed from WJ editor in chief Larry Stoiaken's shop. What the tool specifically is, "is a jig saw that operates with a drill motor," says **Kathy Riccobono** of Coconut Creek, Florida.

"Simply connect a power drill to the shaft protruding from the rear," said **Jerry Rose** of Gander, Newfoundland. "The drill is mounted upside down, pistol grip facing up," explained **Lawrence Tavernier** of Wyandotte, Michigan. "You had to hold the jig handle/knob and the drill's handle all the time," said **Joseph Rivera Jr.** of Citra, Florida. "If you didn't, the jig saw would rotate like a drill."

Perhaps that's why others' memories of the attachment are not so fond. "I'd like to say that it worked great, but I'm not that good a liar," **Howard Shrobe** of Jamaica Plain, Massachusetts, commented. "Talk about accuracy — that's all I could do, was talk about it," **Robert Kitchen** of Batavia, Ohio added.

Tom Dragovich of Waterloo, Iowa, tried to soften the blows, commenting, "It probably made some sense for the time, since fractional horsepower motors were relatively far more expensive than they are now."

"They made a lot of these type attachments: saws, sanders, drill presses, etc.," added **Stephen M. Myers**



"I'd like to say that it worked great, but I'm not that good a liar."

*Howard Shrobe
Jamaica Plain, Massachusetts*

of Nipomo, California. "Some were even used with a food mixer motor," commented **Ralph D. Asbridge** of Lakeside, Montana.

The price was right, too: when **Don Johnson** of Bloomington, Minnesota, bought his in the late 1950s, "the number of power tools available to me immediately doubled, and for under \$10!" **Donald Luther** of Sidney, Ohio, bought his for \$6.95 in 1962 or 63 "and sold it later for 50 cents at a garage sale."

What ever happened to such a jig saw attachment, said **Edward Jansen** of Norwalk, California, is that "it was snuffed out of the market when major tool makers began portable tool manufacturing." But **Lonnie H. Dickens Jr.** of Ravenna, Ohio, notes that it is properly considered "the long-lost ancestor of today's modular multi-tools, which allow you to switch from drilling to sawing or whatever by simply disconnecting the attachment on the handle and replacing it with another."

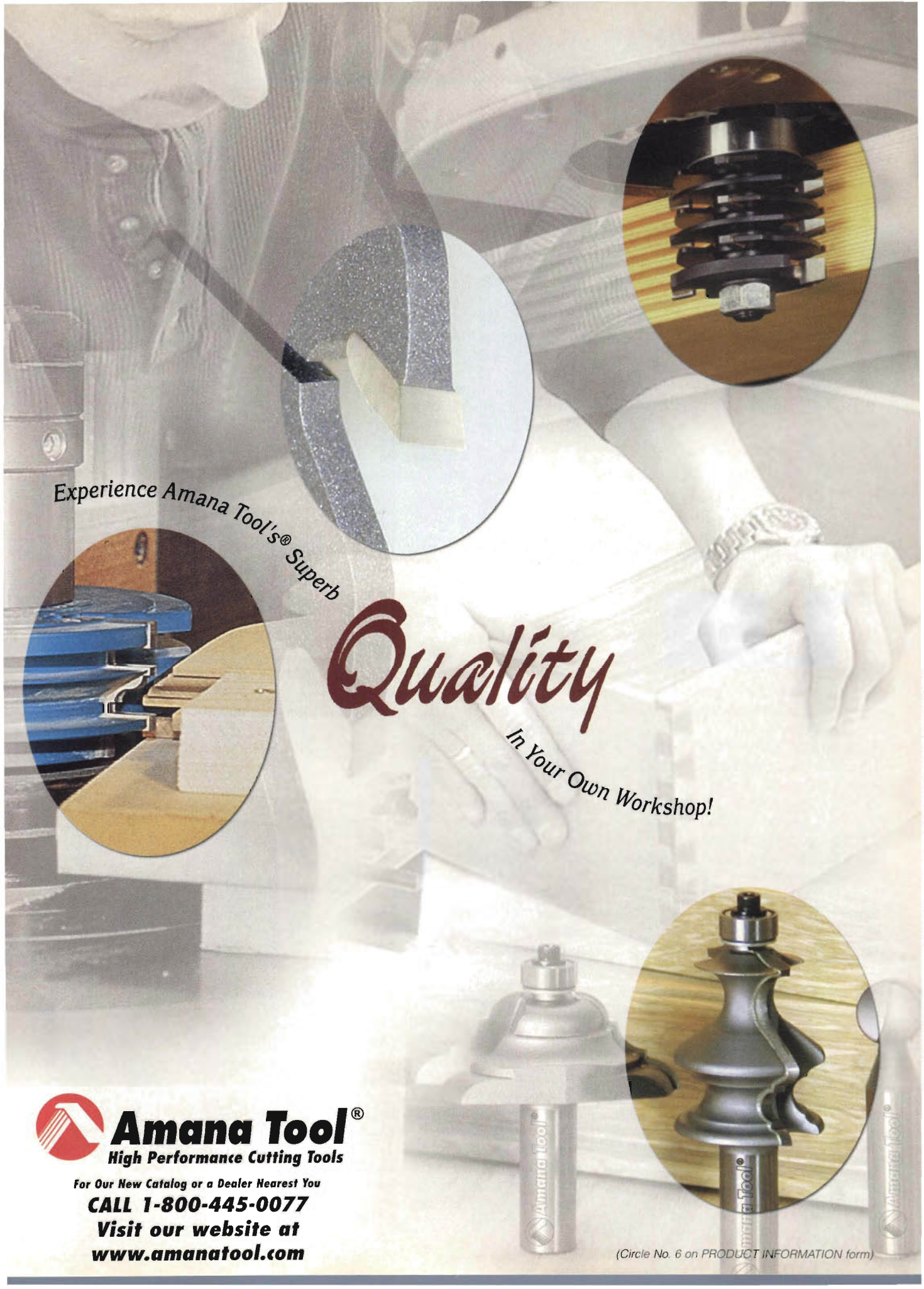
— *Joanna Werch Takes*



Dyno-Mite! That's what **Millers Falls Tools** called this version, owned by **Nadine and Richard Godfrey** of Chagrin Falls, Ohio. It cuts both metal and wood.



WINNER! **Herb Singleton** of Atlanta, Georgia wins a **Delta 36-255L 12" compound miter saw with laser**. We toss all the Stumpers letters into a hat to select a winner.



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Treasures of the Sierra Madre



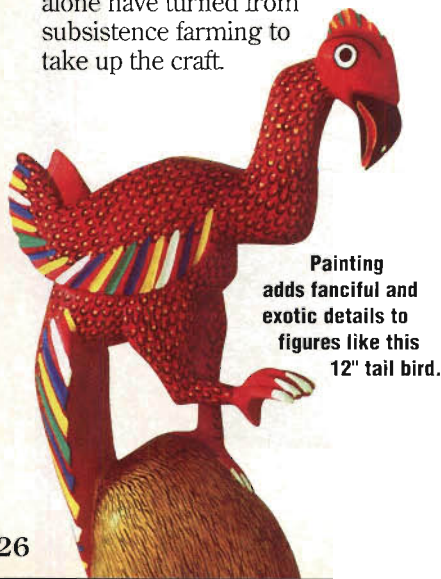
Women like Rocio Morales paint the Oaxacan carvings with brushes — or thorns from the mescal cactus.

Carving Out History

A 2,500 Year-old Tradition

Fire-breathing crocodiles and flying giraffes roam folk art museums and shops around the world. They are *alebrijes* — hand-carved wooden figures from the Mexican state of Oaxaca.

Zapotec and Mixtec Indians have been carving in the region for at least 2,500 years. Today, the best-known carvers work in Arrazola, San Martin Tilcajete, and La Union Tlaxiapan, villages a few dusty miles from the city of Oaxaca. In the last 30 years, almost 100 of the approximately 500 families in Arrazola alone have turned from subsistence farming to take up the craft.



Painting adds fanciful and exotic details to figures like this 12" tail bird.

Everyone has a role. Traditionally, the men carve while the women and older children sand and paint. The younger children recruit customers from tourists and collectors.

Subjects range from native creatures like armadillos, coyotes, and lizards to barnyard animals and birds. Customer requests have added animals never seen in Mexico, like polar bears and giraffes. Imaginary creatures — dragons, mermaids, space aliens, and more — complement the typical carver's repertoire. Many carvers produce both real and fanciful human figures as well.

Pieces range from 2-inch armadillos to 6-foot wooden skeletons. Styles can be elemental and rough or smooth, round, and flowing. Their appeal comes from both the carving and the painting, each accomplished using simple hand tools and finishes. The carver's "tool box" holds a machete, pocket knife, a few kitchen knives, and maybe a gouge or chisel.

Most of the wood comes from the copal tree, which once grew on the hillsides surrounding the villages. The local trees were victims of the



carving industry's success, though, and have mostly disappeared.

The few remaining trees are protected by environmental regulations and stiff fines are levied against poachers. Now copal is purchased from sellers who harvest it from the nearby Sierra Madre mountains.

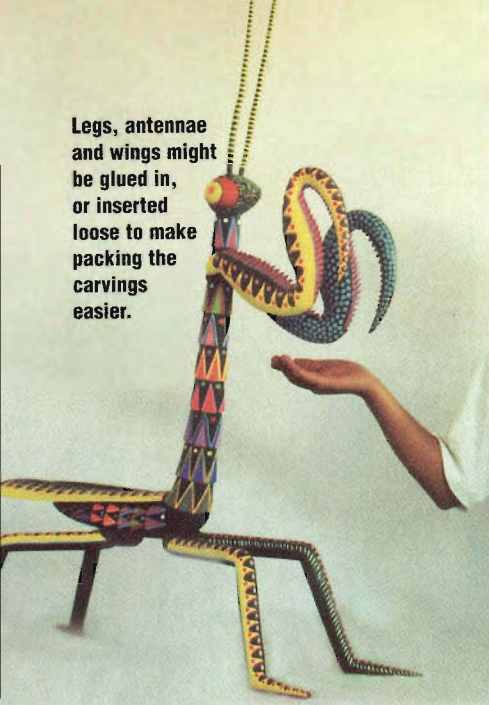
Copal resembles basswood in density, grain, and workability. The carver looks for curving, twisted branches to make pieces like spiral-tailed lizards and sinuous cats. Very little of the tree goes unused. The carver adds features using found materials like goat (or human) hair, cactus spines, splinters of wood, and fibers from maguey leaves.

The figures may be fanciful, but the carving is pretty straightforward. Once the carver visualizes the shape, he roughs it out with a machete. Final shaping and



For carvers such as Gerardo Ramirez Morales, the family workshop is often a shady tree in the backyard.

Legs, antennae and wings might be glued in, or inserted loose to make packing the carvings easier.



detailing are done by knife, and the piece is left to dry for a day or so in the sun. Next, the pieces are sanded and a base coat or sealer is applied. Then the painter adds the remarkable patterns that distinguish the genre.

— Dave Donelson

Government Dust Study Challenged

New Study Commissioned for 2004

Recent news from the U.S. government provides another good reason to install dust collection in your shop. A report has listed wood dust as a "known human carcinogen."

The National Toxicology Program said there is an association between wood dust exposure and nasal cancer, but didn't address risk magnitude.

The Association of Woodworking & Furnishings Suppliers® thinks the government relied too heavily on older, European studies that don't reflect current U.S. practices, and is helping sponsor a separate

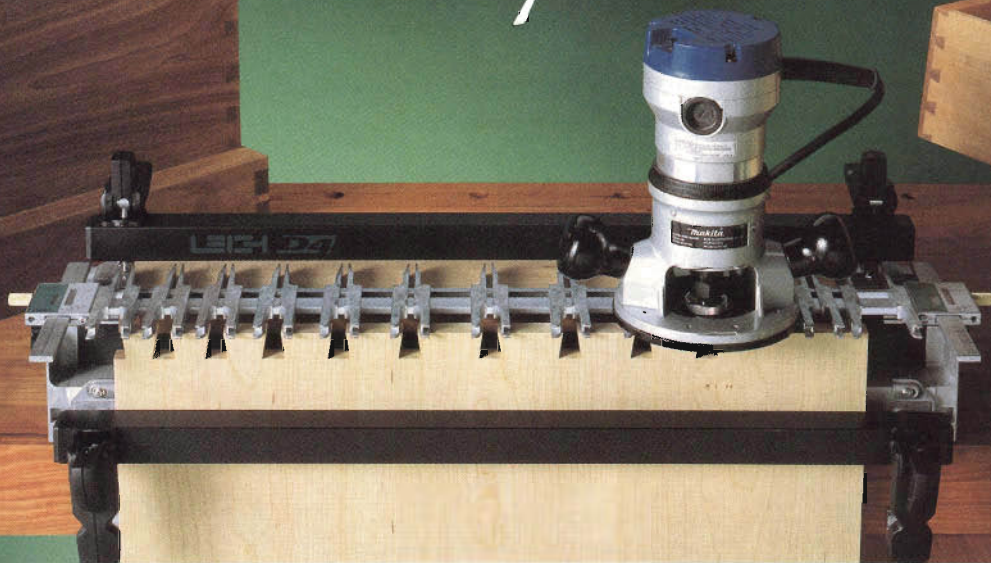
study on the health effects of wood dust. Results are expected in 2004.

The government's report did say that electrical orbital sanders and rotary sanders produce less respirable dust than electric belt sanders. It also includes recommendations on how long average dust exposure should be, with lower times assigned to hardwoods like beech and oak than to softwoods — except for Western red cedar.

You can find the government's report and more information online at <http://ntp-server.niehs.nih.gov> and information on the other study at www.nwpc.com/techtalk/WoodDustInitiative.htm

continues on page 28 ...

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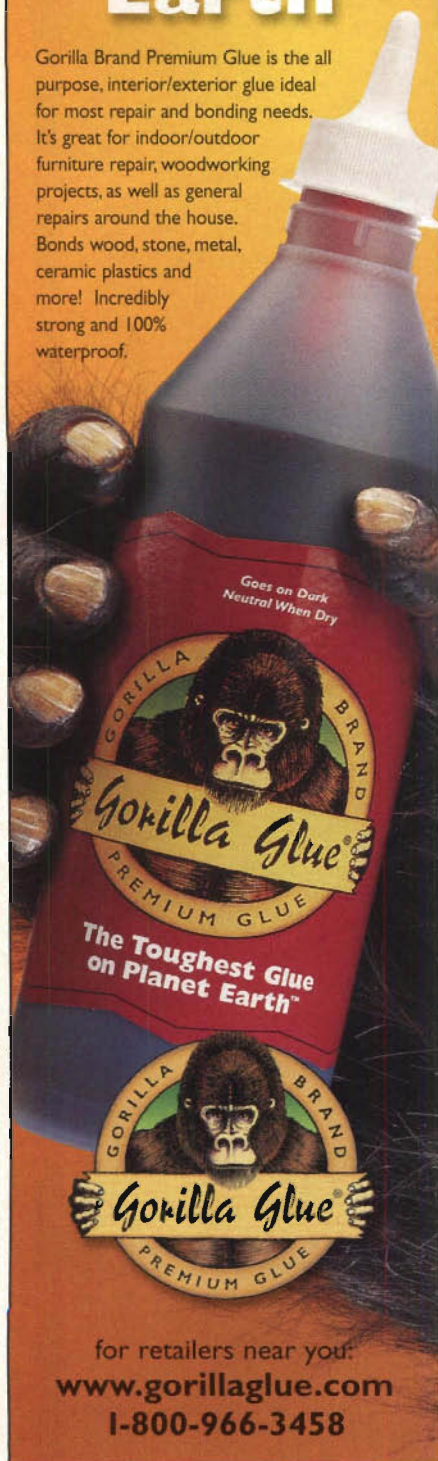
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The Happy Camper And His Wooden Trailer

Jim Smith's woody teardrop trailer is a love story. "It just totally consumed me," the Edmonds, Washington man says — and the idea came from his girlfriend. After sleeping in their truck following an exhausting climb of Mount St. Helens, she suggested a teardrop trailer would be nice.

Jim spent two years building one, mostly out of mahogany and oak, with some black walnut and maple. The boat on top took another four months. "I just keep thinking of new things that it needs," says Jim.

So far, the trailer has been on about 15 camping trips. People have occasionally asked if he built the trailer to sell, but Jim says he's having too much fun driving it around. "I've had it be all one color from the dust from going down a road — you just get out the lemon Pledge® and the rags, and it cleans right up."

— Joanna Werch Takes



Some stats on Jim Smith's trailer: eight storage compartments, sleeps two, intarsia eagle on one side and fisherman with bass on the other.



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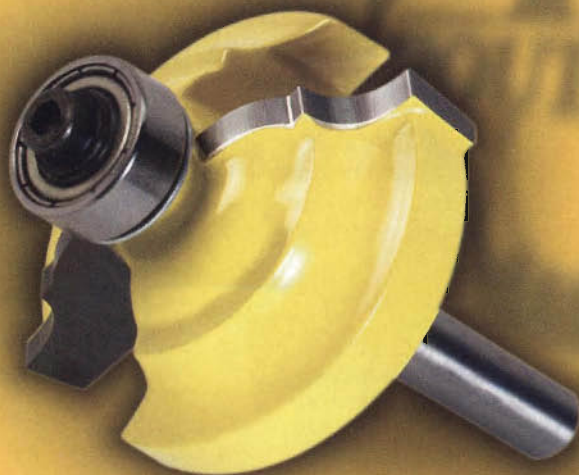
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Those Crazy Brits

Whimsical Wooden Sculptures

The British countryside plays host each summer to the Festival of Wood at Gloucestershire's Westonbirt Arboretum. (This year's show is August 25; visit the site www.forestry.gov.uk/forestry/hcou-4u4j74 for details.)

Friend Wood's car is licensed for the road, while a Westonbirt sculpture exists for itself.

Of particular interest is the sculpture competition, which reflects current fashion in Britain — there is an epidemic of giant wooden mushrooms in gardens across the country.

— Barrie Scott

Helpin' out in Grandma's Shop

Future Woodworkers

Barb Siddiqui started woodworking to build things for her kids. Now she has suggestions for getting kids involved in the shop.

Concentrate first on hand tool techniques, Barb says. Disconnect power tools, and have safety glasses, dust masks and hearing protection, sized to fit. Consider interests by age.

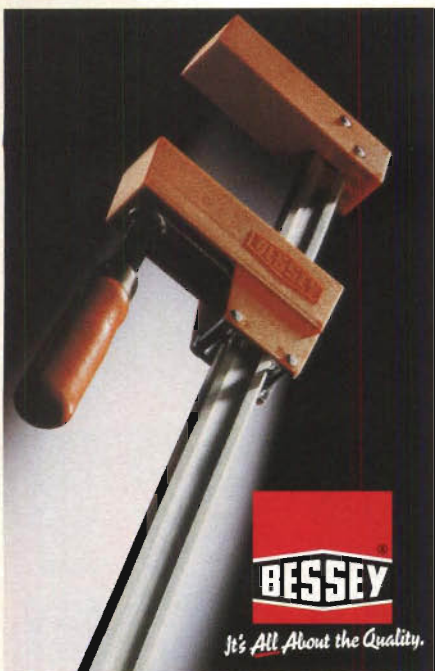
RandiAnn Thompson, 11, and brother Nathan, 6, learn woodworking techniques in grandma Barb Siddiqui's shop.

Three- to five-year-olds can tighten vise screws, anchor a workpiece between bench dogs, or stick brads to a bar magnet. They could sand the edges of cutoffs for building blocks; or use a tack hammer to pound nails into a board at 1" intervals.

Children ages five to eight need close supervision, but with a little help can build projects like a stepstool, a segmented box or a small picture frame.

At about age nine, you can launch into skateboard ramps; a CD cabinet; a large, narrow frame for a favorite poster; or a lidded, shoe-size box to organize personal photos.

"Introducing children to the workshop is a way to open their minds to the idea, 'You can make that,'" Barb says. "They will experience lessons in precision they receive nowhere else, and the time spent together is invaluable."



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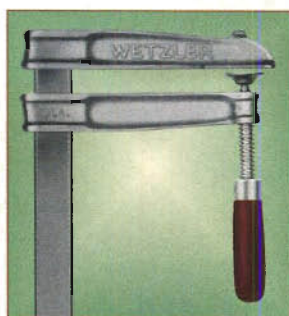
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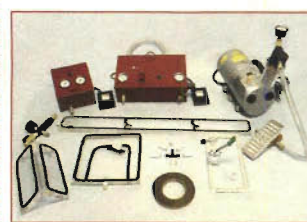
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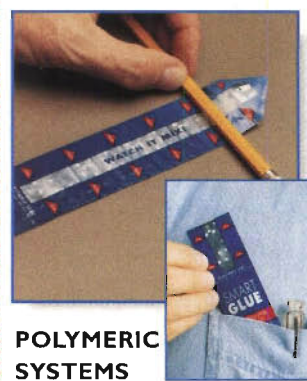
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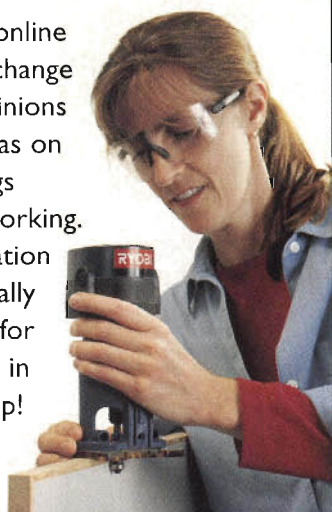
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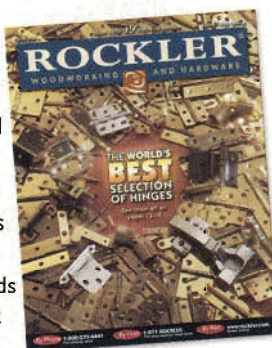
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Arts & Crafts Wine Cabinet

By Chris Marshall

An involved but straightforward exercise in casework construction that will also test your furniture building skills.

We'll never know if Gustav Stickley would approve of an Arts & Crafts wine cabinet, but the style doesn't compromise an ounce of function here. The base cabinet discreetly stows more than five dozen bottles of wine, while the divided glass doors above show off a full collection of stemware. I built this project to house my neighbor's budding wine collection, but it easily could be adapted into a traditional hutch simply by modifying the lower shelving.

If you've never worked with quartersawn white oak, here's a fitting opportunity. West Penn Hardwoods provided premium stock for this project, and the wide flakes show their true splendor. I also splurged for plywood laid up with quartersawn face veneer. If you can't find it, riftsawn veneer looks equally attractive.

Building the Upper Carcass

The upper cabinet has a pair of frame-and-panel ends made of solid wood, but the rest of the carcass is largely plywood. Start building the carcass by choosing the best plywood veneer for the back panel. As you can see in the *Exploded Drawing* on page 36, the cabinet back consists of three plywood panels (pieces 1 and 2) joined with biscuits. Here's why: In order to orient the plywood veneer so the grain pattern runs vertically — a visual necessity here — you'll need a panel nearly five feet wide and four feet long. I chose the most dazzling veneer for the center panel.

Cut the three back panels to size and mill #20 biscuit joints along the mating edges, then glue them up. Cut the rails (pieces 3) now, too. The rails stiffen the fragile biscuit

joints, and the bottom rail forms a finished edge where the two cabinets meet. The back panel and rails are joined with 1/4" x 1/2" tongue and groove joints. I used a piloted tongue and groove bit in my router to cut the long panel grooves. Stain and finish the completed panel now, while it's fully accessible.

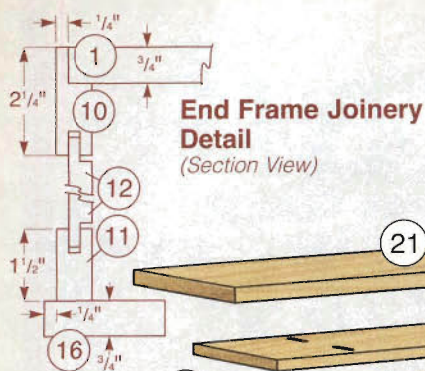
Follow the *Material List* dimensions to cut plywood parts for the subtop, horizontal divider, side panels and bottoms (pieces 4, 5, 6 and 7). Rout slotted holes through the subtop so the solid wood top can expand and contract with the seasons. Cut the side panel bottom rails (pieces 8), and join these to the sides the same way you did with the back panel rails. Complete the sides at this stage by cutting 3/8" x 3/4" dadoes across their inside faces for the horizontal divider.

Next, make the solid wood end frames (pieces 9, 10, 11 and 12). The rails and stiles are joined with more tongues and grooves (see *Elevation Drawings*, page 37). Cut a wide rabbet along the back edge of the

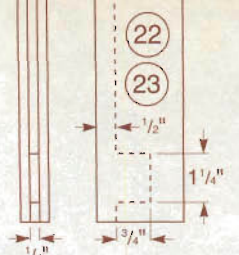
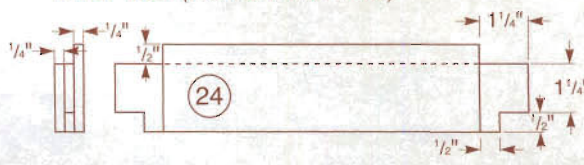
rear stiles to house the back panel. Carefully choose your stock for the panels that float inside these frames. Quartersawn flakes are hard to match up if you need to prepare the panels from more than one board. My stock was too thin to resaw, so I made each panel from two widths of single boards to help blend the random grain pattern.



Removable shelves in the base cabinet are outfitted with divider strips to keep the bottles stationary and evenly spaced. The shelves could be flipped over onto their flat faces for storing other items as well.

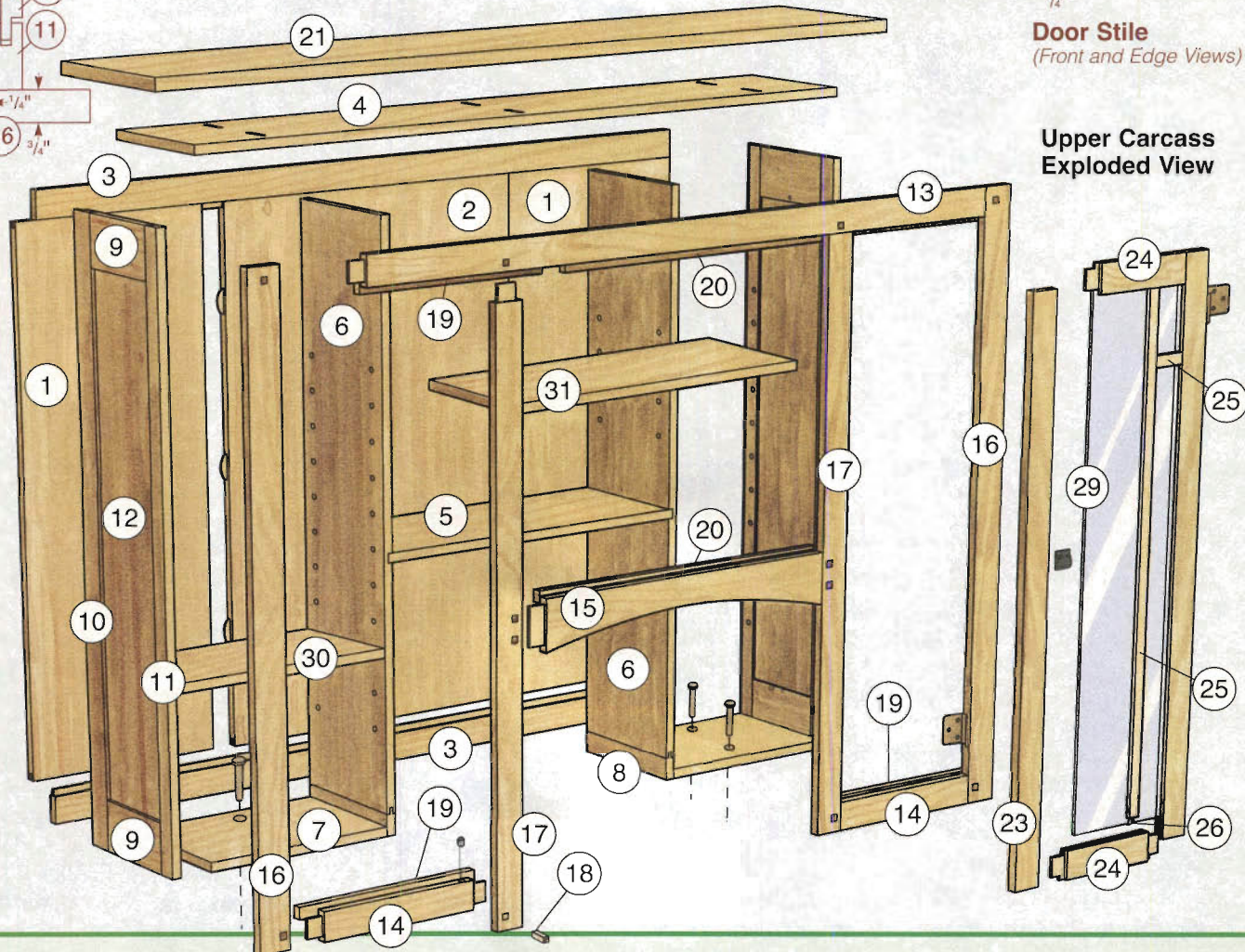


Door Rail (Front and End Views)



Door Stile
(Front and Edge Views)

Upper Carcass Exploded View

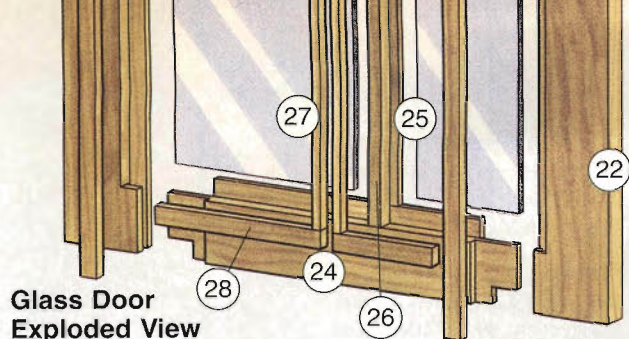


Material List Upper Carcass

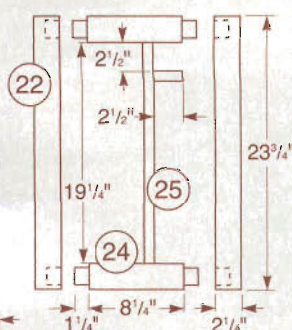
	T x W x L		T x W x L
1 Back End Panels (2)	3/4" x 16 3/8" x 44 1/2"	17 Inner Face Frame Stiles (2)	3/4" x 2 1/4" x 47"
2 Back Center Panel (1)	3/4" x 26 3/4" x 44 1/2"	18 Face Frame Pegs (12)	3/8" x 3/8" x 3/4"
3 Back Panel Rails (2)	3/4" x 2 1/4" x 59 1/2"	19 Large Door Stops (4)	1/2" x 1" x 15 1/2"
4 Subtop (1)	3/4" x 10 1/2" x 58 1/2"	20 Small Door Stops (2)	1/2" x 1" x 26"
5 Horizontal Divider (1)	3/4" x 10 1/2" x 26 3/4"	21 Top (1)	1" x 13" x 66"
6 Side Panels (2)	3/4" x 10 1/2" x 45 1/2"	22 Short Door Stiles (4)	3/4" x 2 1/4" x 23 3/4"
7 Bottoms (2)	3/4" x 10 1/2" x 15 1/2"	23 Tall Door Stiles (4)	3/4" x 2 1/4" x 43 1/2"
8 Side Panel Bottom Rails (2)	3/4" x 2 1/4" x 10 1/2"	24 Door Rails (8)	3/4" x 2 1/4" x 10 3/4"
9 End Frame Rails (4)	3/4" x 4" x 8 1/2"	25 Muntins (8)	1/4" x 7/8" x Varies
10 Rear End Frame Stiles (2)	3/4" x 2 1/4" x 48"	26 Muntin Backer Strips (8)	3/8" x 1/2" x Varies
11 Front End Frame Stiles (2)	3/4" x 1 1/2" x 48"	27 Small Glass Retainer Strips* (20)	1/4" x 3/8" x Varies
12 End Frame Panels (2)	1/2" x 8 1/4" x 41"	28 Large Glass Retainer Strips* (28)	3/8" x 1/2" x Varies
13 Face Frame Top Rail (1)	3/4" x 2 1/4" x 58"	29 Glass* (12)	1/8" x Varies
14 Face Frame Bottom Rails (2)	3/4" x 2 1/4" x 15 1/4"	30 Side Shelves (6)	3/4" x 10 3/8" x 15 1/4"
15 Face Frame Arched Rail (1)	3/4" x 4" x 28"	31 Center Shelf (1)	3/4" x 10 3/8" x 25 3/4"
16 Outer Face Frame Stiles (2)	3/4" x 2 1/2" x 48"		

*Measure and cut after doors are assembled.

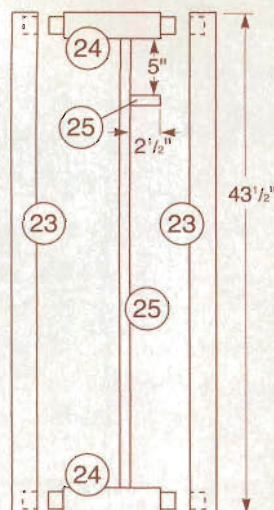
Glass Door Exploded View



Short Door (Front View)

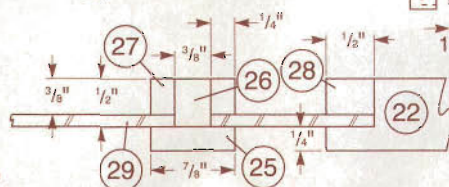
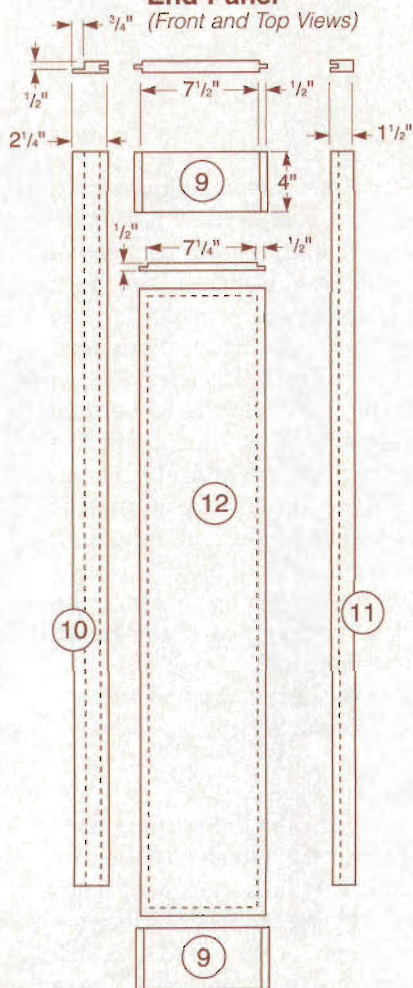


Long Door (Front View)



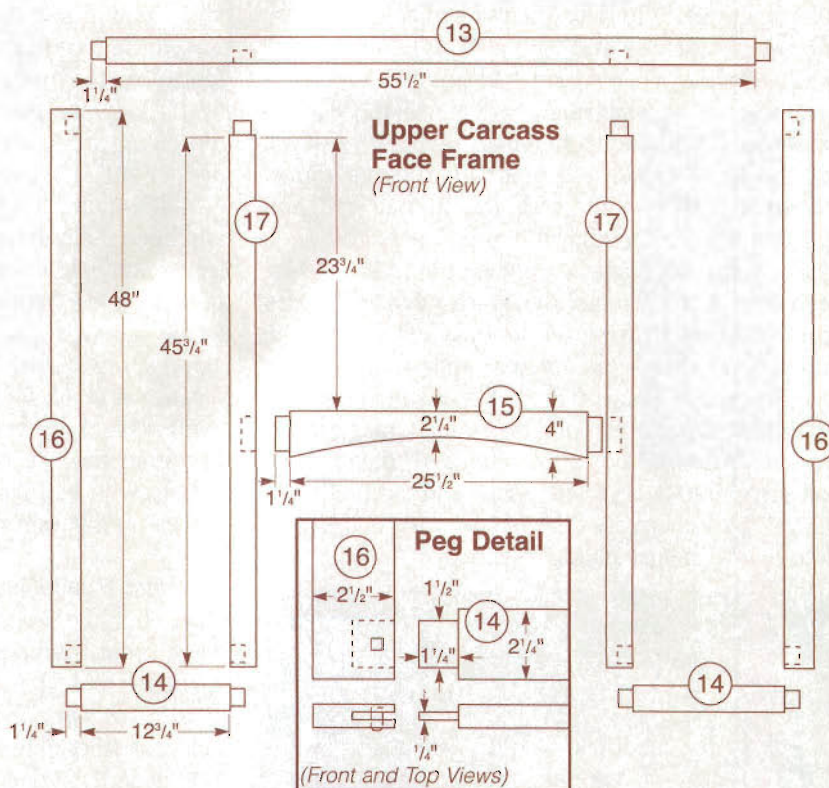
End Panel

(Front and Top Views)

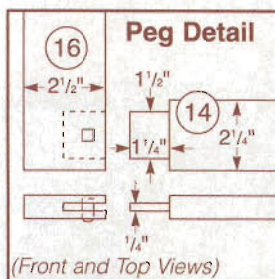


Muntin Assembly Detail (Top View)

Upper Carcass Face Frame (Front View)



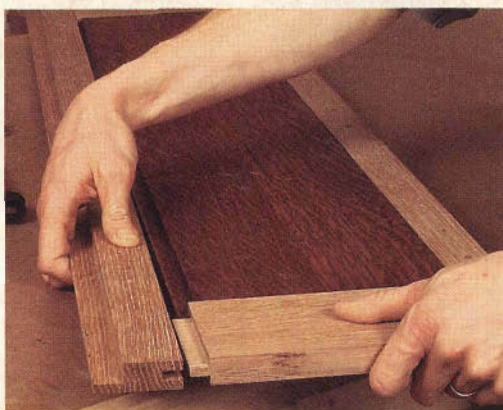
Peg Detail



Once you've got your panel blanks planed and trimmed to size, mill a rabbet around the inside faces (see *Elevation Drawings*, above). When you fit the frames and panels together, you'll notice that the panels are undersized 1/4" across their width to accommodate wood movement. You should prefinish the panels now, including the topcoat. This way, bare wood can't show if the panels shrink. Assemble the frames and panels with the panel rabbets facing inward, and lock the panels to the rails with a centered dowel, top and bottom. This keeps the rabbet reveals even.

Before you assemble the rest of the carcass, drill rows of shelf pin

holes in the side panels and end frame stiles. Remember that the side panels require shelf pin holes on both faces — two columns for shelving in the long cabinets and another set for the center cabinet shelves. Now, assemble the carcass by joining the end frames, side panels, subtop and bottoms with #20 biscuits and glue. Drive countersunk screws down through the subtop and into the side panels instead of using biscuits here — it's easier. Slip the horizontal divider into its dadoes and pin it in place with 18-gauge finish nails.



Tongue and groove joints connect the upper cabinet end frame parts. Finish the floating panels before assembling these frames.



Cut 5/8" deep square holes for the face frame pegs using a mortising machine. Support the face frame with blocking and line up the bit carefully. You may need to raise the mortiser's table with additional blocking (as I did) to get full throw of the lever arm on 3/4" thick stock.

Making the Face Frame

Following the *Material List*, cut all the face frame parts (pieces 13 through 17) to size. The rail and stile joints are straightforward mortises and tenons. The tenons are all 1/4" thick, 1 1/2" wide and 1 1/4" long, except for those on the arched rail (piece 15), which are 3" wide. Mill these joints using whatever machining techniques you prefer. Cut the curve in the arched rail, and glue up the face frame. Connect the parts, starting with the arched rail and working toward the outer stiles. Chamfer the edges.

To break up the flat plane of the face frame and doors, I locked the face frame joints with square oak pegs (pieces 18). If you've got a mortising machine, simply lay out the peg locations and chop square holes using a 3/8" hollow chisel bit. Otherwise, you could pull off this technique by drilling slightly undersized round holes and tapping in the square pegs. Once the holes are chopped, plane down some oak scrap into 3/8" x 3/8" strips and cut them into pegs (pieces 18). I chamfered the "show" ends of the pegs (see photo below) before gluing them in.



Make the face frame pegs from longer strips, chamfering each on a sander before cutting it to length. A simple angle jig helps maintain even chamfers. I pressed the pegs into their face frame holes with a C-clamp to avoid marring them.



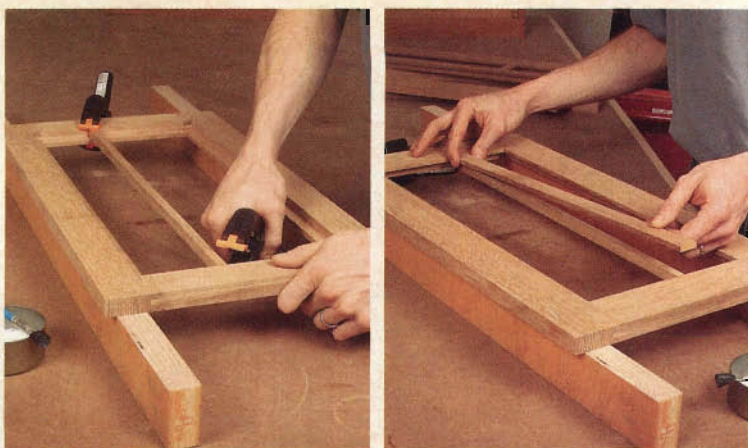
With the face frame and carcass construction behind you, apply finish to these parts before attaching them. I used the face frame to square up the carcass instead of following the usual convention of installing the back first. The face frame is oversized to provide 1/4" of overhang where it meets the end frames, horizontal divider and side panels. By installing the face frame first, I could square the carcass in relation to the face frame and keep the overhangs even all around. Nail on the face frame and, while the back is still off, cut and attach pairs of door stops (pieces 19 and 20) to the back of the face frame at each door opening with short countersunk wood screws. Then attach the back with more screws.

Make a blank for the top (piece 21). I glued mine up from several pieces of 5/4 stock planed to 1" thickness. Prefinish the top on all surfaces and attach it to the subtop with #10 panhead or washerhead wood screws, driven up through the subtop's slotted holes.

Doors and Muntin Assemblies

Now, on to the doors. Spend some extra time at the jointer when preparing your door frame stock to ensure the part surfaces are dead flat and square. Build all the door frames at once to economize your machining sequences. Once the rails and stiles (pieces 22, 23 and 24) are cut to size, mill 1/4" wide, 1/2" deep centered grooves along one edge of these parts. These grooves will house the glass, muntin assemblies (pieces 25 and 26) and retainer strips (pieces 27 and 28). Follow the *sidebar* on the next page to make the corner joints. Glue up the door frames and complete them by trimming off the back lip of the rail and stile grooves to form a 1/2" x 1/2" rabbet. I used a router and piloted rabbeting bit for this task, then squared up the rounded corners where the bit couldn't reach with a chisel.

Rather than employing a single large piece of glass in the doors and dividing it with faux muntins, these doors feature working muntins and individual panes of glass (pieces 29). Essentially, the muntins are "stick built" into the door frames. They're easy as pie, and you don't need cope-and-stick bits. To make the dividers, mill long strips of both backers and muntins. Follow the photos (above, right) to install the muntin parts. Slip the glass panes into



Cut, fit and glue the vertical backer pieces into the door frame rabbets first, locating the backers so they'll be centered behind the long muntins (left photo). Flip the doors, then cut and glue the long, vertical muntin strips to these backers (right photo). Flip again to install the short horizontal backer pieces, followed by the short muntin strips. With enough spring clamps, you'll be able to assemble the muntins for an entire door or two at once without waiting for glue to dry.

the rabbets formed by the muntins and backers, and then cut and fit four retainer strips around each glass pane. You can tack them to the door frames with hot melt glue or silicone caulk — no need for brads.

Now comes a moment of truth: hanging the doors. If you've sized the doors and face frame openings carefully, a couple passes over the jointer should shave the doors down just enough to fit in their openings. Aim for about $1/16$ " of clear space all around to allow room for the hinge leaf thickness and swing clearance. If you end up with a door that twists slightly or discover an out-of-square face frame opening, take a few shavings off the backs of the door frames or the edges and ends with a sharp low-angle block plane to improve the fit. The hinges you use may allow for some adjustment as well. You'll save yourself door hanging headaches and the effort of cutting all those hinge mortises if you use the attractive non-mortising hinges specified on page 42. Wrap up the assembly by making the side and center shelves (pieces 30 and 31).

Turning to the Base Carcass

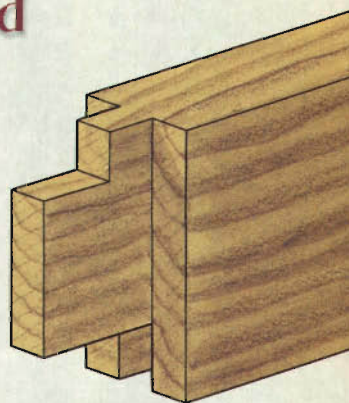
Except for a few design details (and a couple of drawers), building the base cabinet is similar to constructing the upper cabinet. I think it's even easier. Start by cutting and assembling pieces 32 through 36 to create your end frames. The joinery for the frames and floating panels is the same as for the end frames on the upper cabinet, but this time stop the grooves in the stiles $1\frac{1}{2}$ " from the bottom ends. This will position the bottom curved rails 1" up from the floor. Also, don't forget the rabbet along the back edge of the back stiles.

I tackled the glue-ups for the wide, thin floating panels in two stages. First, I glued up a couple of narrower blanks from thicker stock and milled them down to $1/2$ ", then joined these together to form the wide panels. It made the thin, wide stock easier to clamp, and I had far fewer "wet" joints to manage during final clamping. Apply finish to the wide panels before assembling and pegging the end frames. Attach short cleats (pieces 37) with screws and glue to the bottom arched rails.

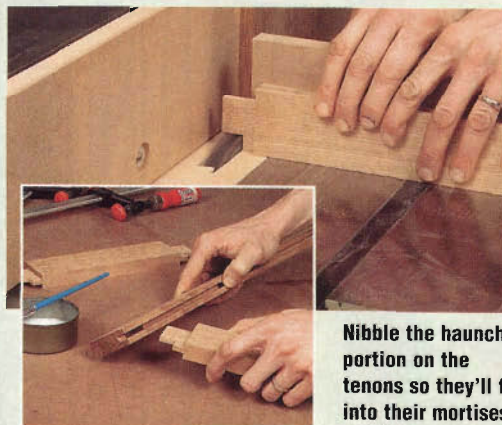
Make the bottom assembly, back panel assembly and dividers (pieces 38 through 42) and the support frame (pieces 43 and 44) next. You'll see in the *Exploded Drawing*, next page, that the

Haunched Tenons for Solid Corner Joints

Haunches on these door tenons add more glue surface area, which strengthens the joint. They also fill the ends of the full-length grooves in the stiles.



These door frames are joined by rock-solid haunched tenons and mortises. Cut the mortises in the stiles first with a plunge router, drill press or mortising machine. Start the $1\frac{1}{4}$ " long mortises a $1/2$ " in from the ends of the stiles, and cut them a bit deeper than necessary to allow extra room for glue to pool. Then set up your table saw and dado blade to cut $1\frac{3}{4}$ " wide, $1\frac{1}{4}$ " long tenons on the ends of the door rails.



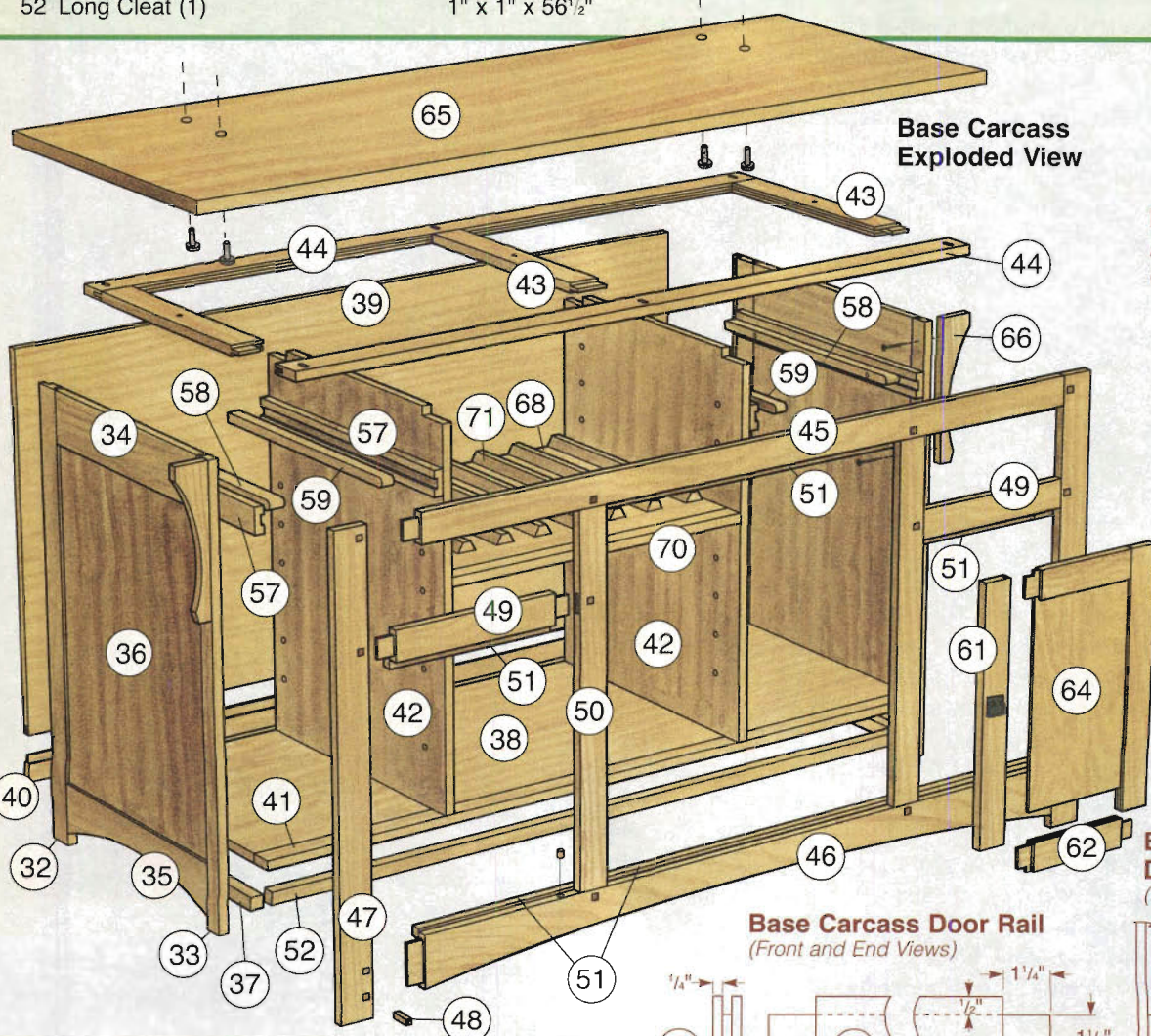
Nibble the haunched portion on the tenons so they'll fit into their mortises on the door stiles. A $1/2$ " thick spacer on the rip fence establishes the haunch length.

Trim the haunch from the outside edge of the tenons to complete them. I indexed the haunches off the ends of the tenons with a $1/2$ " thick stop block clamped to my rip fence. Once the joint parts are cut, refine their fit carefully with a hand plane and chisel. Keep trimming and test fitting until there's just a bit of friction between the mortises and tenons. I discovered the hard way that an overly tight joint can introduce a twist in an otherwise flat frame, which is the last thing you'll want when hanging these flush-fitting doors.

Material List Base Carcass

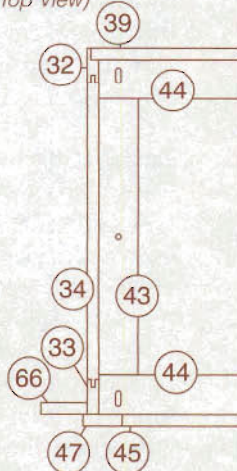
	T x W x L		T x W x L
32 Rear End Frame Stiles (2)	3/4" x 2 1/4" x 35"	53 Drawer Fronts (2)	3/4" x 5 3/8" x 12 5/8"
33 Front End Frame Stiles (2)	3/4" x 1 1/2" x 35"	54 Drawer Backs (2)	3/4" x 4 5/8" x 11 7/8"
34 Top End Frame Rails (2)	3/4" x 4" x 20 1/2"	55 Drawer Sides (4)	3/4" x 5 3/8" x 20"
35 Bottom End Frame Rails (2)	3/4" x 4" x 20 1/2"	56 Drawer Bottoms (2)	1/4" x 11 3/4" x 19 7/8"
36 End Frame Panels (2)	1/2" x 20 1/4" x 27"	57 Drawer Guides (4)	3/4" x 2" x 22 1/2"
37 Short Cleats (2)	1" x 1" x 22 1/2"	58 Wide Drawer Runners (2)	3/4" x 1 1/4" x 20 1/4"
38 Bottom (1)	3/4" x 20 3/4" x 58 1/2"	59 Narrow Drawer Runners (2)	3/4" x 1" x 20 1/4"
39 Back Panel (1)	3/4" x 30 1/4" x 59 1/2"	60 Tall Door Stiles (4)	3/4" x 2 1/4" x 27 3/4"
40 Back Panel Rail (1)	3/4" x 2 1/4" x 59 1/2"	61 Short Door Stiles (4)	3/4" x 2 1/4" x 20"
41 Bottom Rail (1)	3/4" x 2 1/4" x 58 1/2"	62 Door Rails (8)	3/4" x 2 1/4" x 10 3/4"
42 Dividers (2)	3/4" x 22 1/2" x 30 1/4"	63 Tall Door Panels (2)	1/2" x 9" x 24"
43 Support Frame Stiles (3)	3/4" x 2 1/2" x 19 1/2"	64 Short Door Panels (2)	1/2" x 9" x 16 1/4"
44 Support Frame Rails (2)	3/4" x 2 1/2" x 58 1/2"	65 Top (1)	1" x 25" x 68"
45 Face Frame Top Rail (1)	3/4" x 2 1/4" x 58"	66 Corbels (2)	1" x 3" x 12"
46 Face Frame Bottom Rail (1)	3/4" x 4" x 58"	67 Side Shelves (8)	3/4" x 15 1/4" x 21 1/4"
47 Outer Face Frame Stiles (2)	3/4" x 2 1/2" x 35"	68 Center Shelves (5)	3/4" x 21 1/4" x 25 3/4"
48 Face Frame Pegs (14)	3/8" x 3/8" x 3/4"	69 Shelf Edging (8)	3/4" x 1 1/2" x 15 1/4"
49 Face Frame Drawer Rails (2)	3/4" x 2 1/4" x 15 1/4"	70 Long Shelf Edging (5)	3/4" x 1 1/2" x 25 3/4"
50 Inner Face Frame Stiles (2)	3/4" x 2 1/4" x 30 1/4"	71 Bottle Divider Strips (80)	3/4" x 1 1/2" x 18"
51 Door Stops* (1)	1/2" x 1" x 120"		
52 Long Cleat (1)	1" x 1" x 56 1/2"		

*Cut to fit.

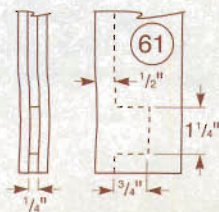


**Base Carcass
Exploded View**

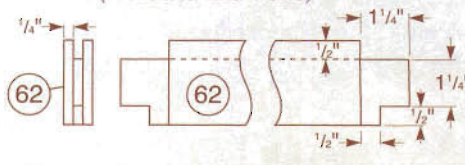
**Base Carcass
Assembly Detail
(Top View)**



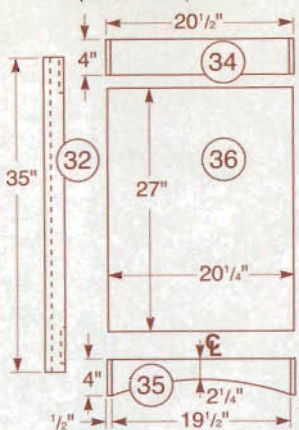
**Base Carcass
Door Stile
(Front and Edge Views)**



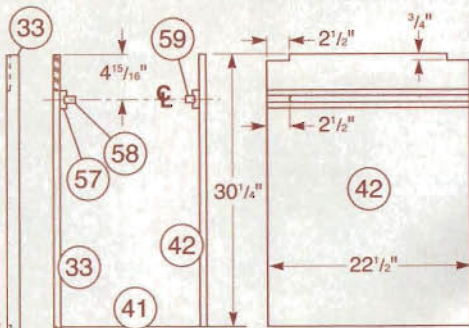
**Base Carcass Door Rail
(Front and End Views)**



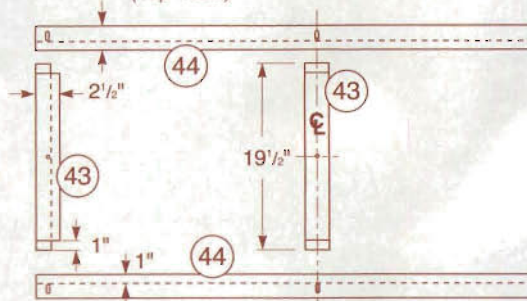
Base Carcass End Panel (Front View)



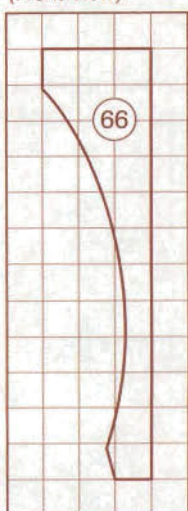
Base Carcass Drawer Guide Locations (Front and Side Views)



Base Carcass Support Frame (Top View)

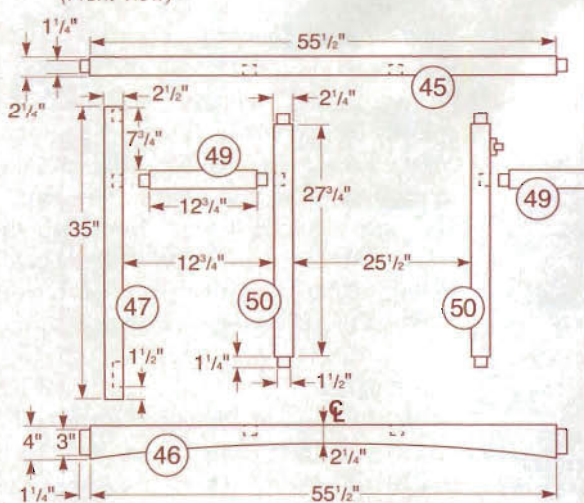


Corbel (Front View)

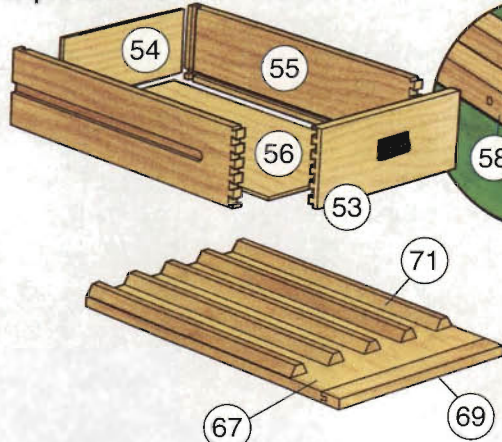


Each square equals 1"

Base Carcass Face Frame (Front View)



Drawer and Shelf Exploded View



Drawer Guide and Runner Detail



Side Shelf (Front View)



Drive 2" screws through the support frame stiles to attach this frame to the end frames. Mount the support frame just shy of flush with the upper end frame rails. The offset will enable the support frame to pull the cabinet top down flat and hold it under tension.

bottom and back panels have solid wood rails along one edge joined to the plywood with tongues and grooves. Notch the top corners of the dividers so they'll fit around the support frame rails. The support frame rails and stiles are joined by deeper 1/4" x 1" centered tongues and grooves. Cut three groups of round and slotted holes in this frame for attaching the cabinet top later.

Time for some assembly. Drive screws up through the end frame cleats to attach these frames to the cabinet bottom. Fasten the support frame to the end frames with screws (see *photo*, above). Slip the divider panels in place and fasten these with more screws. Drill all the shelf support holes at this point, taking into account where the drawers will hang when you lay out your hole locations — no need for shelf supports there.

Build the base cabinet face frame (pieces 45 through 50) with the same joinery you used for the upper face frame. This time, however, bore holes for the pegs that secure the drawer rails to the inner face frame stiles before you assemble the full face frame. Otherwise, your mortiser might not reach these locations once the face frame is glued up. Cut the large arch in the bottom face frame rail prior to assembling the face frame but after tenoning the ends. Screw the door stops (pieces 51) behind the face frame openings, and nail the face frame to the cabinet. As an added measure of support, I fastened a long cleat (piece 52) to the face frame and cabinet bottom with glue and screws.

Arts & Crafts Wine Cabinet Project Supplies

The following supplies are available from Woodworker's Journal.

Stickley Pendant Pull* #10877.....	\$18.99
Pendant Pull With Keyhole* #26823	\$22.99
Stickley Drawer Pull** #26740	\$32.99
Ball Tip Full-Wrap Hinges (Pair)*** #31313	\$5.99
Ball Tip Partial Wrap Hinges (Pair)* #31495.....	\$5.99
1/4" Shelf Supports (Pack)† #22765	\$2.06
Brass Ball Catch†† #28662	\$3.69

*Four required. **Two required. ***Five required. †Six required. ††Eight required.

To order your supplies, call 800-610-0883 and mention code W3083.

Making the Drawers, Doors & Top

Refer to the *Drawings* on page 41 to construct the drawers (pieces 53, 54, 55 and 56) and mill the stopped dadoes in the drawer sides. These grooves fit over drawer runner assemblies (pieces 58 and 59) and keep the drawers tracking straight. Make the drawer guides and runners, rounding the front corners of the runners to fit the curved ends of the drawer dadoes. Screw together two pairs of runners and drawer guides with the back ends of the parts held flush. Mount these inside the carcass to the end frames and dividers so they're centered on the drawer openings in the face frame (see photo below). The guides holding the wide runners fit against the end frames, and the narrow runners with their guides belong on the dividers (as shown in the *Exploded View*).

You're in the home stretch now. Build the four base cabinet doors (pieces 60 through 64), employing the same haunched tenon joinery as the upper glass doors and swapping wood panels for glass. Leave both lips of the tongue and groove joints intact this time. Hang the doors on their hinges. Apply finish to all the interior cabinet surfaces, drawers and doors before installing the back panel.



Slip the loose guide/runner assemblies into the drawer dadoes and slide the drawers and guides into their face frame openings to position them. Support the guides and drawers temporarily from below with clamps and scraps as you tack the guides in place. Test the drawer action, then fix the guides permanently with countersunk screws.

Dress this cabinet project with hammered copper Arts & Crafts door and drawer pulls.



Glue up 5/4 stock in several subassemblies to make the base cabinet top (piece 65), then apply finish to all its surfaces. Mill the corbels to shape (pieces 66) and mount them flush against the face frame overhangs on the end frame stiles with screws. Fasten the top to the support frame with #10 panhead or washerhead screws.

Time for More Shelving

Cut plywood blanks (pieces 67 and 68) according to the *Material List* dimensions, and attach solid wood edging (pieces 69 and 70) with tongue and groove joints to the front edges. I wrapped the other exposed edges and end of each shelf with iron-on veneer edge tape to give the shelving a finished look. Bevel rip the bottle divider (pieces 71) strips (yes, there are 80 in all!), and cut them to length. Nail five dividers to each side shelf and eight dividers to the center shelves.

Finishing Up

Apply the stain of your choice and follow up with three coats of Rockler's Polyurethane Gel. (I used six coats on top of the base.) Then rub some paste wax on the drawer runners. Install the door catches, drawer and door pull hardware. I took preventive measures against scratching the base cabinet top by covering the bottom of the upper cabinet with felt. To keep the upper cabinet safely upright on the base, run pairs of connector bolts and cap screws through the upper cabinet bottoms and the top of the base cabinet, or attach the cabinets with metal strapping and screws driven into the backs, if you prefer. Install shelf supports and slide in the shelving. Then take a well deserved rest with a bottle of your best vintage ... after all, this unit holds 67 of 'em!

Chris Marshall is a Woodworker's Journal contributing editor.

Serving Tray

A new woodworker turns to the distant past for a little design inspiration.

By LiLi Jackson

While today's woodworkers have plenty of 19th and 20th century motifs to look to for design inspiration, for this project I turned to the distant past. Curule chairs were popular during the medieval period, but actually can be traced even further back than that, to the dynasties of ancient Egypt. They're familiar enough, with their knuckle-jointed "X" shaped bases, but the design element doesn't seem to find a lot of application in today's furniture. I wasn't particularly interested in making a curule chair, but I did want to incorporate the "X" shape into a serving table I was making for my mother. With design in hand, I headed to contributing editor Rick White's shop, where Brad Becker, his trusty assistant, was waiting to help me through the construction stage.

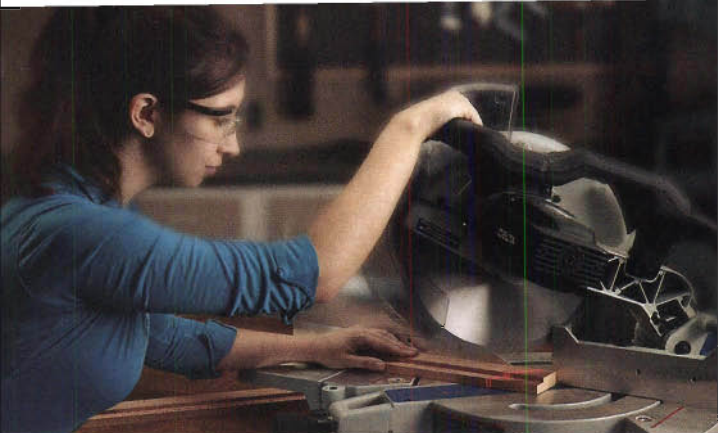
Brad and I settled on mahogany for this project — it's a great species for a beginner, essentially knot-free and easy to mill and finish.

Getting Started

I built my tray first, and then moved on to the base. An overriding concern of mine was that the legs must be true and at perfect right angles to the base and floor. A slight skew in or out would result in a spindly, awkward look. If I constructed the tray first, I reasoned, I could always adjust the base rails to push the legs out or pull them in.



This tray table's simple and elegant lines are a study in positive and negative space. The "X" shaped leg joinery's history is traceable to the ancient Egyptians.



After the tray stiles and rails are cut to width and rabbeted, they can be mitered to length.

The first thing to do is cut the tray's stiles and end rails (pieces 1 and 2) to width but a bit long. These pieces get a rabbet along their top edges, so use a straight bit in your router table or a dado blade in your table saw to form them, as shown in the *Elevation Drawings* at right. Once the rabbets are milled, miter the parts to length and lay out for the matching notches on the inside of each stile which will accept the two support rails (pieces 3). I cut them by hand ... setting up to make these cuts with a router seemed a waste of time, and I was looking for a little action with hand tools anyway. Now grab your biscuit joiner and cut slots to help beef up the miter joints. This table may be

handling a good amount of weight, so I wanted to ensure that the joinery would be as strong as possible. Dry fit the frame to make sure that you've got clean miters. At this point, you can go ahead and shape the support rails (see the *Elevations* at right) and form the tenons at their ends. When they're ready, dry assemble your tray again, for a final look. The tops of the support rails should be perfectly flush with the bottoms of the rabbets on the end rails and stiles. When everything matches up, go ahead and glue up these pieces and set them aside.

Handles and Rim

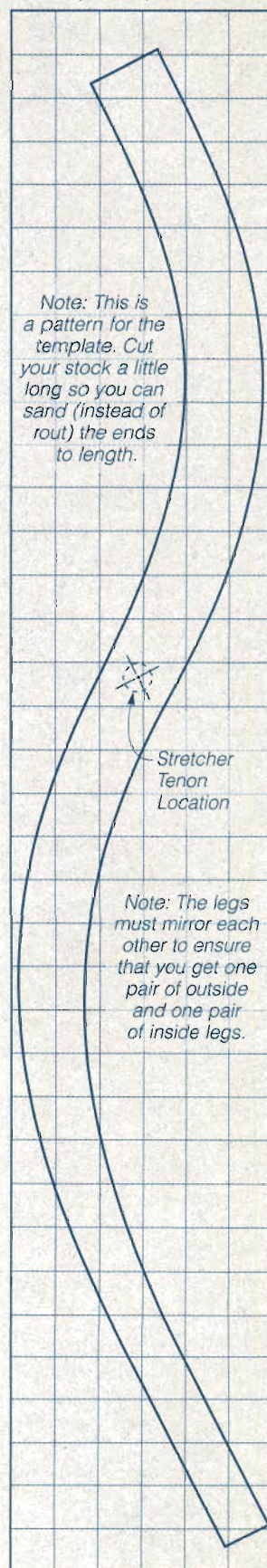
While the glue is drying, cut and shape the handles and form the miters on their ends, as well as on the ends of the back rim (pieces 4 and 5). These pieces all get a soft roundover



A biscuit or plate joiner is a great way to strengthen and align miter joints. The biscuits fit just under the tray's rabbet.



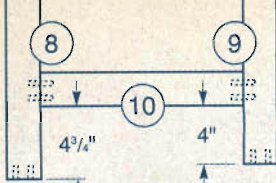
Each square equals one inch.



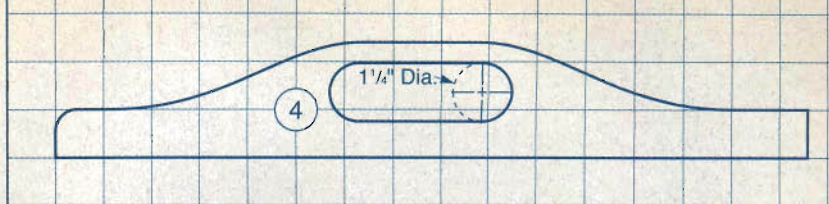
Note: This is a pattern for the template. Cut your stock a little long so you can sand (instead of rout) the ends to length.

Stretcher Tenon Location

Note: The legs must mirror each other to ensure that you get one pair of outside and one pair of inside legs.

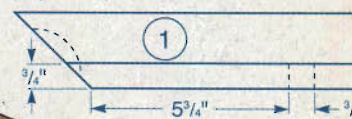


Base Subassembly
(Top View)

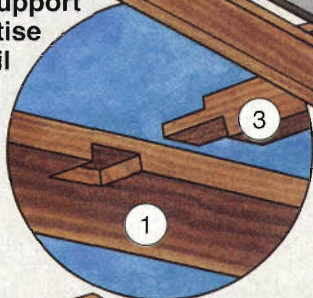


Each square equals one inch.

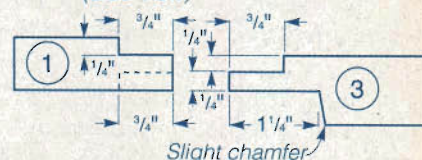
Tray Stile
(Top View)



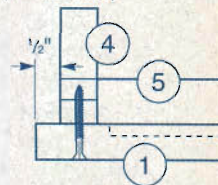
**Tray Support
Mortise
Detail**



Support Rail and Tray Stile
(Side View)



**Tray Handle
Location**
(Front View)



Stretcher
(Side View)



Exploded View

MATERIAL LIST

	T x W x L
1 Tray Stiles (2)	3/4" x 2 1/4" x 32"
2 Tray End Rails (2)	3/4" x 2 1/4" x 16"
3 Tray Support Rails (2)	3/4" x 1 1/4" x 13"
4 Tray Handles (2)	3/4" x 2 3/8" x 15 5/8"
5 Back Rim (1)	3/4" x 1" x 31"
6 Legs* (4)	3/4" x 6" x 35"
7 Stretcher (1)	1" x 1" x 30 1/2"
8 Long Base Stile (1)	3/4" x 1 3/4" x 29 1/2"
9 Short Base Stile (1)	3/4" x 1 3/4" x 28"
10 Base Rails (2)	3/4" x 1 3/4" x 10 1/2"
11 Mirror (1)	1/4" x 13" x 19"
12 Nylon Glides (4)	5/8" Diameter

*These dimensions represent the size of the leg blank.



Since there are only four mortises to chop, lay them out and cut them by hand. The support rail's top edge must align perfectly with the rabbet on the tray stiles and rails.

and plenty of time under the sandpaper, as they are the showiest part of the project and will be reflected by the mirrored top. When they're ready to install, pre-drill pilot holes from the bottom of the frame, three for each handle and five for the rim. Again, you don't want to short this piece on strength — you might be carrying some pretty precious cargo on it! Form the miters at the corners of the rim and handles and glue them up. Once the glue dries, you can screw the assembly in place on top of the frame — just be sure to keep the rim flush with the back and the handles 1/2" shy of each end.

Before moving on to assembling the base, I recommend creating a cardboard

template for your mirrored top. I used full 1/4" mirror for mine, and it's not cheap (and it doesn't sand or plane well, either!) Take the template to your glass shop and let them create the top from it, rather than from a set of measurements.

The X Factor

The legs (pieces 6) are created using a template. No method ensures uniformity better, and as I mentioned earlier, perfectly even and matching legs are a real key to the success of this project.

I spent a good deal of time refining my template, lightly sanding it until it was true and smooth all around. Then, as you can see in the sequence of photos below, it's a simple matter of transferring the shape to your stock, cutting the stock slightly oversized on the band saw and then applying your template.

I used one small screw at the middle (which I knew would later be hidden by the stretcher tenon) and turned to double-sided tape for the ends. One word of caution. Once you start the final pass with your flush cutting bit, stay away from the ends. End grain will fracture if you try to cut across it in this manner. Brad and I agreed that the best approach is to leave a little stock at each end and use a disk sander (while the template is still attached) to bring the stock flush to the template at each end. Sand your legs and lay them aside for now; you'll want all your base pieces ready to go before you assemble any of them.

Turning the Stretcher

I toyed around with using square stock for the stretcher (piece 7), but this idea never made it off the drawing board. Clearly, this tray calls for a round base stretcher — and anyway, this was a great chance to get an hour or two in on the lathe, one of my favorite tools in the shop!



Use the scaled drawing to help create a fair and true template of the tray leg. The next step (in preparation for template routing) is to transfer the shape to the hardwood leg blank.

The turned tenons on both ends of the stretcher need to be long enough to engage both legs, on each side of the table, as you assemble the project.



Start by locating the centers on the ends of your turning blank. Then machine your square stock into an octagonal profile by cutting off the corners on your table saw. Mount this blank between centers and use a gouge to rough out a cylindrical shape. I used a skew to bring the blank down to about 1" in diameter. Now find the center (from end to end) and from there lay out your tenon shoulders and relieve them down to 5/8" in diameter. (Note: It's critical that the length from shoulder to shoulder match exactly the length of the shorter stile (piece 9) above it, otherwise you'll end up with a pigeon-toed table.) The stretcher tenons will end up being 1 1/4" long, but when you're turning, you'll want to allow a little extra for paring off. Gradually create an arc that starts with the 1" diameter in the center of the piece and gracefully reduces to 3/4" at each shoulder. Sand the stretcher all the way through 320 grit (not the tenons!) while it's still on the lathe, and then trim the tenons to length.

Creating the Tray Support

The next step is to mill the stock for the tray support (pieces 8, 9 and 10). You'll notice that the stiles are different lengths, due to the offset created by the relative position of the legs. Cut these pieces to size, use the *Elevation Drawings* to locate your dowel holes, and glue this subassembly together, making sure to stay square as you do.

Bringing it Together

The first assembly step is to bring the sets of legs together. You'll be drilling right through two inner legs, but on the other two you'll limit your depth to 1/2". Remember, these legs mirror each other, so be sure to lay everything out before you start drilling. Next, locate and drill the dowel holes (I used a doweling jig and dowel-centers to make this task a bit easier) at the tops of the legs and pilot holes for the glides at their

bottoms. With the machining done, you can dry assemble the legs, the stretcher and the base subassembly. Check to ensure that all is square and proceed to your final glue-up.

Finishing Up

Test fit the mirror (piece 11) and tap the glides (piece 12) in place. After sanding everything down to 320 grit, I applied a custom stain I concocted by mixing (half and half) Zar's® Rosewood Stain with Carbon Black Woodburst®.

Next, I applied a coat of sanding sealer and two coats of lacquer, with a light 320 sanding between each coat. The final step is to drop (carefully!) the mirror into place.

LiLi Jackson is an apprentice woodworker in contributing editor Rick White's workshop. She worked closely with Brad Becker, Rick's shop assistant, on the construction of this project.



Take the leg blank to your hand saw and cut within 1/16" of the line you marked onto the blank. Don't cut into the line; you need to leave some material for the router bit to remove. This will ensure uniform legs.



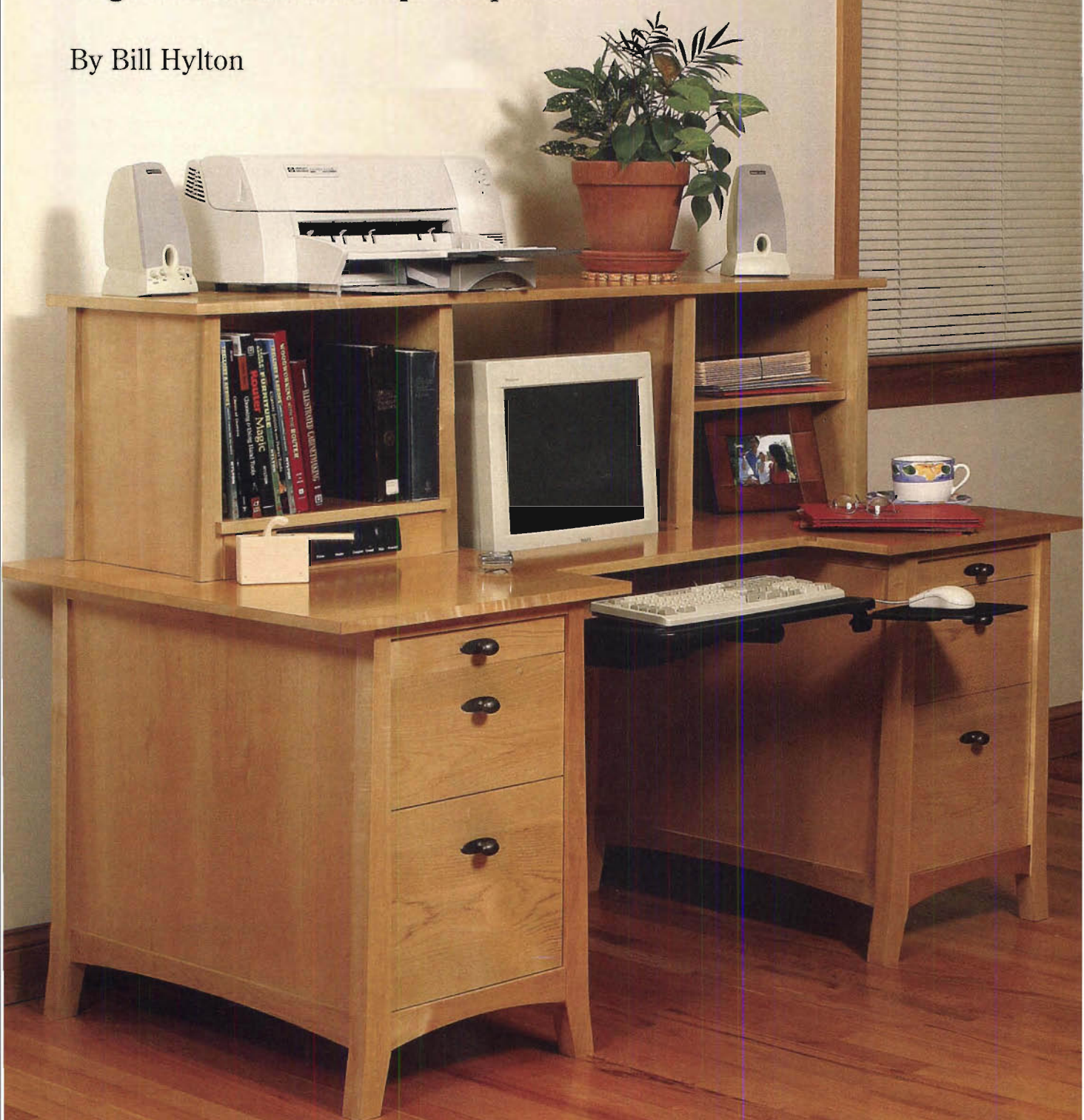
Use double-sided tape and one screw at the tenon mortise location to attach the template to a roughed out leg. A flush trimming bit shapes the legs. Note: Don't attempt to rout across the end grain on the legs. Use a disk sander to do the final shaping on the ends of the legs.



Computer Desk

Organize and clean up computer clutter

By Bill Hylton



Our author is keen to take routing to new heights in his shop. For this computer desk, as practical as it is elegant, he employed three unique router bits that offer woodworkers a slightly different approach to a casework project.

Until recently, my computer, monitor, keyboard, mousepad and power strip shared a 27" by 48" tabletop with pens and pencils, files and papers and an ever-changing assortment of stuff: oversized coffee cup, staplers, staple puller, loupe, tape measure, joint samples, loose paper clips, a Band-Aid® or two, a couple of brass screws ... well, you get the picture. (And yeah, it isn't pretty.)

For a long time, I've wanted to expand my computer table to provide more room for papers and reference materials. I also wanted to position things so I'd be more comfortable using the computer for long periods.

Having resolved to make a new desk, I looked on the web for ergonomic guidelines. As well, I searched for examples of other peoples' solutions. I considered stand-up desks, work-tables, and variations of traditional desks. What I settled on is an eclectic mix of features that suit me. You should easily be able to stretch and/or compress the basic layout to accommodate the computer system you use, your stature and your work habits.

The basic form is a traditional pedestal desk. I made it deep enough to accommodate the computer system I have, placing the monitor directly in front of the keyboard. The desktop is at traditional tabletop height (29½"), but the monitor sits on a platform several inches below that level, and it supports the keyboard via a sliding, tilting, pivoting tray. Hiding behind a door in the left pedestal is the CPU, standing on a

sliding platform. In the right pedestal I've got a filing drawer for my most important papers, a drawer for CDs and such and a pencil drawer (which matches one over the top of the CPU door).

I used soft maple and maple-veneered plywood for all the exposed components, Baltic birch plywood for the drawer boxes and odds and ends of MDF, particle-board, and plywood for shims, templates, and jigs. Necessary

hardware includes cross-dowels and connector bolts to join the monitor platform to the pedestals, Accuride® slides for the drawers, a pair of cup hinges for the door and pulls for the door and drawers.

Tooling Notes

I do a lot with routers. On this project, I did everything from some panel-sizing cuts, to mortising, to edge-banding using my routers. Several specialized router bits were particularly useful to me, and I want to highlight them.

Compression Bit: Cutting plywood in the home shop can be a challenge. The sheets are big, heavy and awkward to maneuver in tight quarters. Some of the desk's panels — like the desktop and the pedestal sides — exceeded the capacity of my biggest crosscut sled. In addition, the face veneers are fragile, and when you saw across their grain, they splinter and chip.

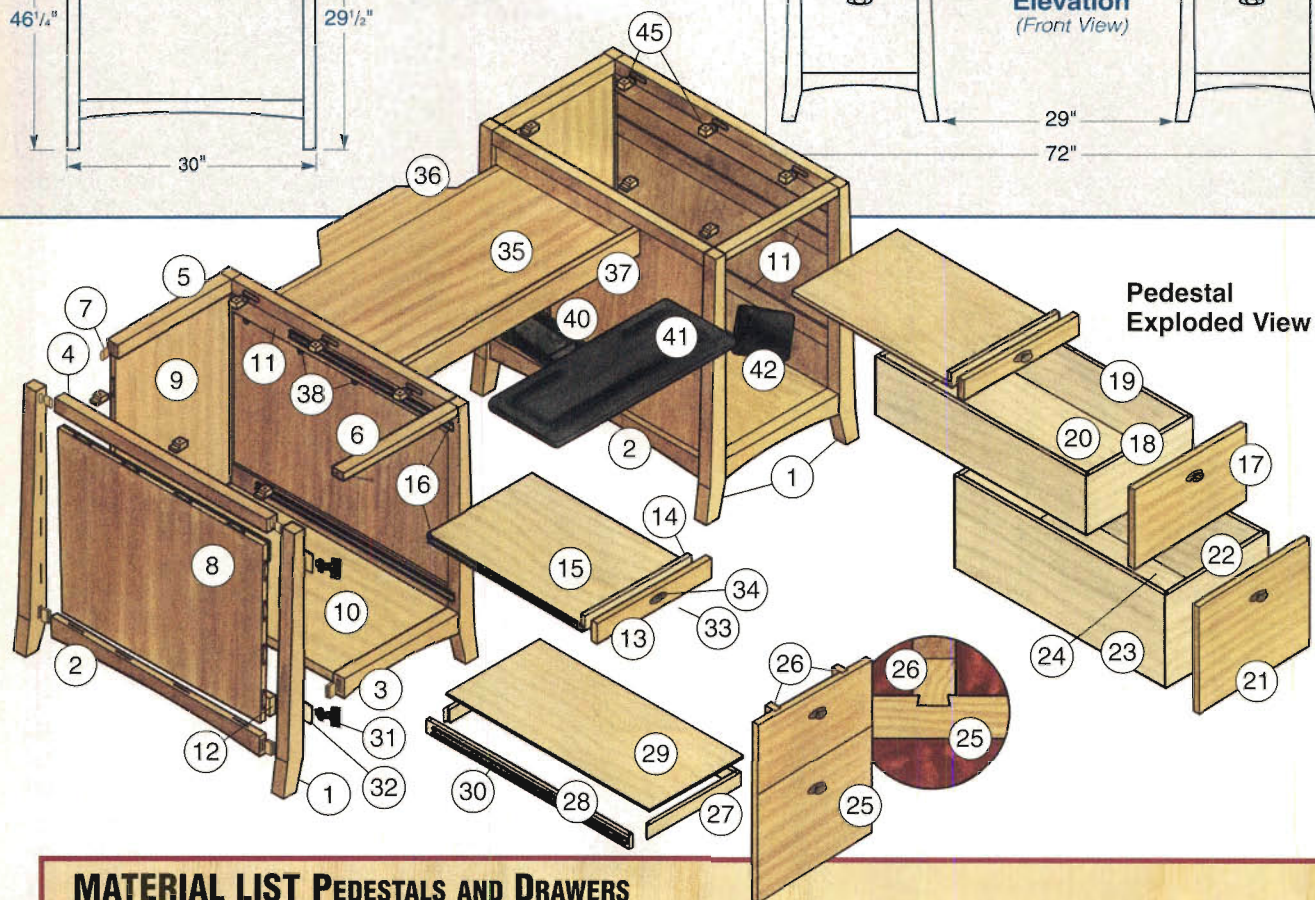
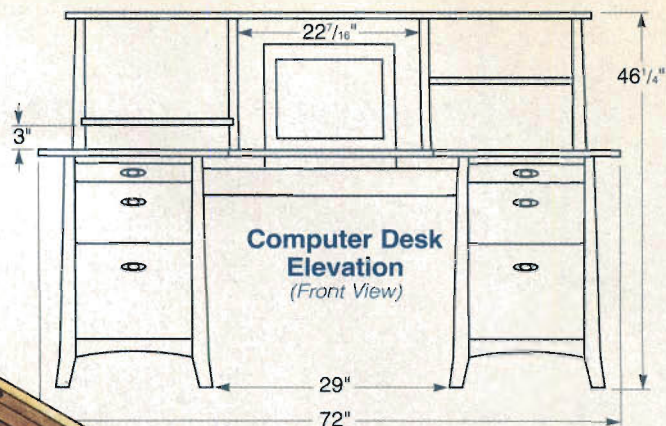
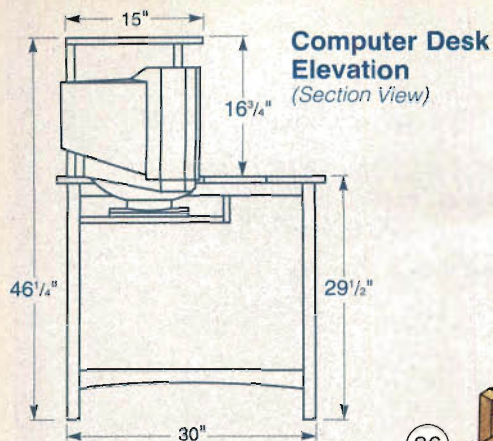
I dealt with these problems by using a router and compression bit to make critical cross-grain cuts. A compression bit has both up- and down-spiral cutting edges.

The patented Burgess Edge is created with these two, two-part router bits. Using this system to put hardwood edges onto veneered panels has several advantages.



A drawer lock bit (below) and compression bit are two of the three special cutters the author used for this project.

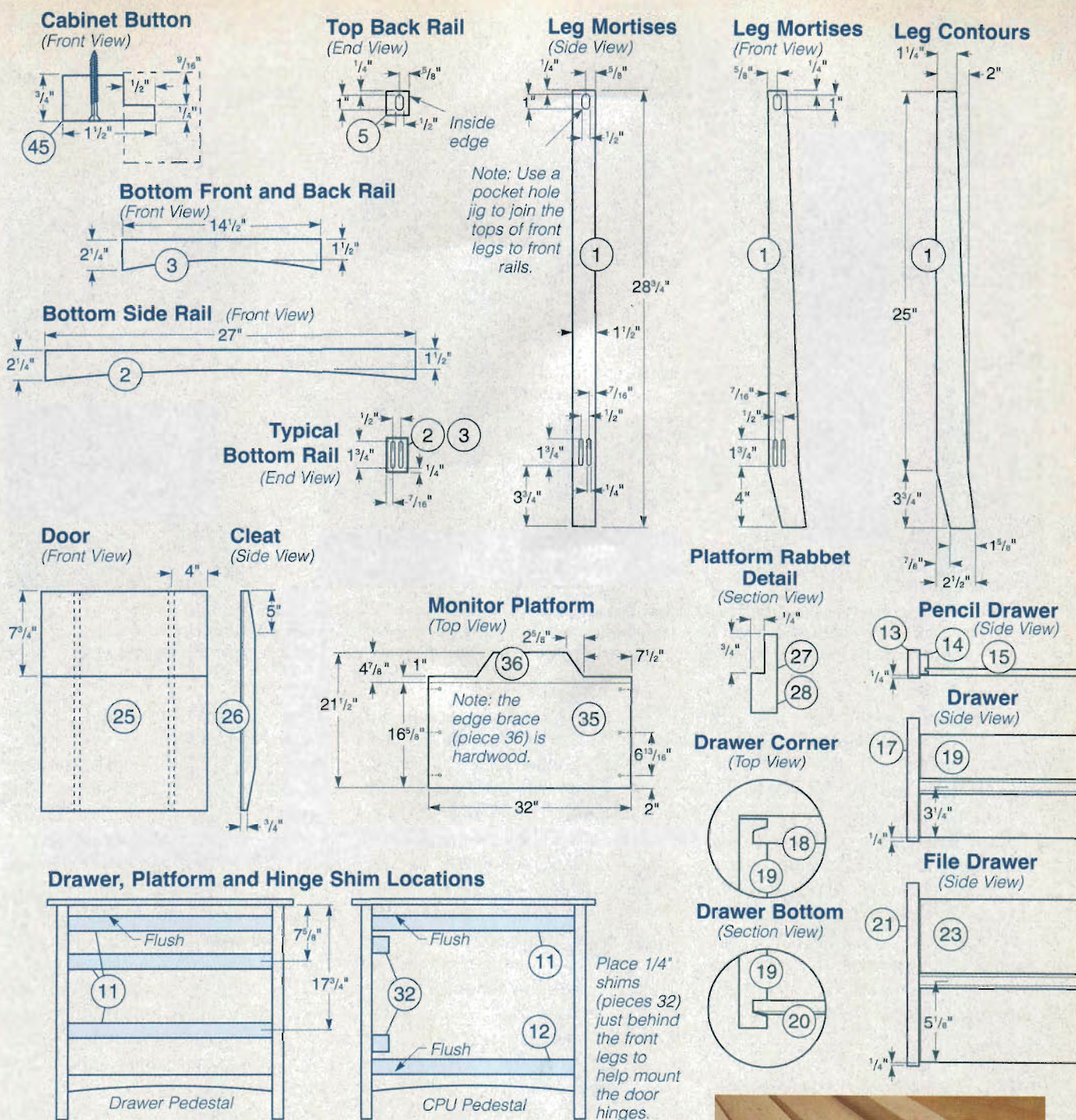




MATERIAL LIST PEDESTALS AND DRAWERS

	T x W x L
1 Legs (8)	1 1/2" x 2 1/2" x 28 3/4"
2 Bottom Side Rails (4)	1 3/8" x 2 1/4" x 27"
3 Bottom Front and Back Rails (4)	1 3/8" x 2 1/4" x 14 1/2"
4 Top Side Rails (4)	1 1/4" x 1 1/2" x 27"
5 Top Back Rails (2)	1 3/8" x 1 1/2" x 14 1/2"
6 Top Front Rails (2)	7/8" x 1 3/8" x 14 1/4"
7 Loose Tenons (44)	Hardwood
8 Side Panels (4)	3/4" x 27" x 21 1/4"
9 Back Panels (2)	3/4" x 14 1/2" x 21 1/4"
10 Bottom Panels (2)	3/4" x 14 1/2" x 27"
11 Drawer Slide Shims (9)	1/4" x 2" x 27"
12 CPU Slide Mount (1)	3/4" x 2" x 26"
13 Pencil Drawer Faces (2)	3/4" x 2 1/4" x 14 1/2"
14 Tray Fronts (2)	1/2" x 1 5/8" x 13 1/2"
15 Tray Bases (2)	1/2" x 13 1/2" x 20 5/16"
16 Pencil Drawer Units (2)	Slides, Plastic Trays
17 Drawer Face (1)	3/4" x 7 3/4" x 14 1/2"
18 Drawer Front and Back (2)	1/2" x 6 1/2" x 13 1/2"
19 Drawer Sides (2)	1/2" x 6 1/2" x 26 1/2"
20 Drawer Bottom (1)	1/4" x 13" x 26 3/8"

	T x W x L
21 File Drawer Face (1)	3/4" x 11 7/8" x 14 7/8"
22 File Drawer Front/back (2)	1/2" x 10 1/4" x 13 1/2"
23 File Drawer Sides (2)	1/2" x 10 1/4" x 26 1/2"
24 File Drawer Bottom (1)	1/4" x 13" x 26 3/8"
25 Door (1)	3/4" x 14 1/2" x 19 1/2"
26 Cleats (2)	3/4" x 1 1/4" x 19 3/8"
27 Platform Front/back (2)	1/2" x 1 1/2" x 12"
28 Platform Sides (2)	1/2" x 1 1/2" x 25 7/8"
29 Platform Base (1)	3/4" x 11 1/2" x 25 1/2"
30 Drawer Slides (3 pair)	Accuride, 26"
31 Cup Hinges (1 pair)	120° Self-closing
32 Hinge Shims (2)	1/4" x 2" x 3"
33 Pulls (6)	1 3/8" Oval bronze
34 Backplates (6)	3" x 7/8" Bronze
35 Monitor Platform (1)	3/4" x 16 5/8" x 32"
36 Edge Brace (1)	3/4" x 4 7/8" x 32"
37 Apron (1)	3/4" x 3 1/4" x 32"
38 Connector Bolts (6)	1/4"-20 x 3"
39 Cross-dowels (6)	1/4"-20 x 3/8" Dia. x 5/8"



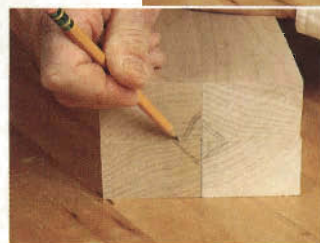
It doesn't lift the wood fibers from either face, so the plywood is left with crisp, chip-free edges, even on those cross-grain cuts. Spun with a 2 HP router, it plows through 3/4" thick plywood in a single pass.

To size the biggest panels, I set up a straightedge to guide the router, making sure it was absolutely square to the table-sawn reference edge. The routine isn't quick, but with patience and care, you can

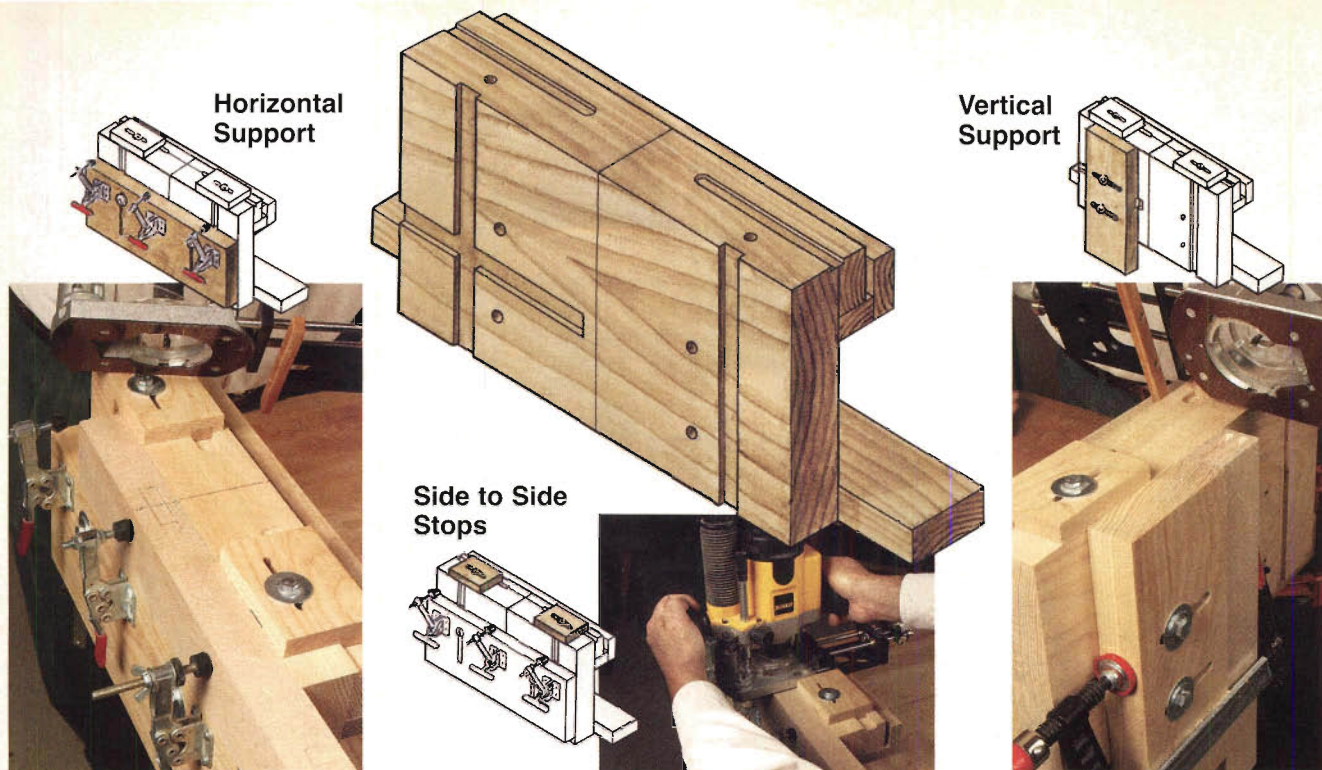
achieve excellent results. I also used the bit on a number of the primary template-guided cuts.

Even at \$90, a compression bit is a lot cheaper than a panel saw. And more space efficient, too.

Drawer Lock Bit: I made all the drawers and the printer platform frame using the drawer lock joint. While it lacks



Identify and orient the front and back legs. Mark locations for the top rail mortises (except where the top front rails join the legs). The author chose pocket joints for that task.



The mortising jig the author uses has toggle clamps to hold the workpiece, stops to limit the router's travel and a channel for the edge guide's wooden fence. The bit governs the mortise width, the plunge governs the mortise depth, and the edge guide positions the mortise on the workpiece. When routing the end of a piece, the author uses a separate clamp to secure the work.

the cachet of dovetails, it is effective and a lot easier to master. It works in plywood as well as solid wood. One bit is all you need. It even makes the groove to house the drawer bottom!

The Burgess Edge: Edge-banding panels cut from sheet goods — plywood, MDF, and the like — is pretty simple, but the results tend to vary. Tape is fast, but the adhesion, in my experience, can be iffy. Using 1/8" strips of hardwood often yields color and grain mismatches at the very margins of the panel's face.

The patented Burgess Edge is produced by a special pair of router bits. The doubled-bearing plywood bit follows the surface veneers as it excavates the inner plies of the plywood. The insert bit shapes a solid wood infill strip. Glue the insert in place, then trim it. Look at the edged panel, and you see the solid wood and just a knife-edge of the surface veneers.

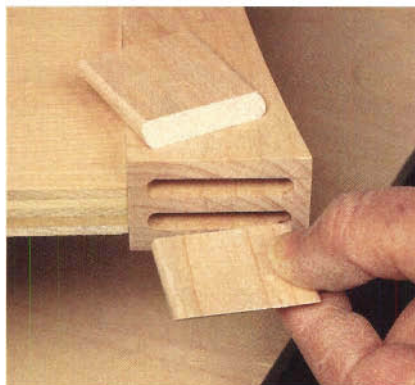
This was the first time I used this process, but I liked the results.

Build the Pedestals First

The construction of the pedestals (pieces 1 through 12, see *Material*

List on page 50) is post and rail. The legs and rails are joined with mortise and loose tenon joints. Plywood panels are joined to the legs and rails with biscuits. The first task is to construct these basic units. (For all of these construction details, see the *Drawings on pages 50 and 51.*)

Begin by laying out the legs in sets of four, as shown in the photos on the previous page. Don't be concerned with the contours now — focus on the mortises, which are cut before shaping the legs. Select and identify the front and back legs. You don't want to be cutting mortises or slots on the wrong sides.



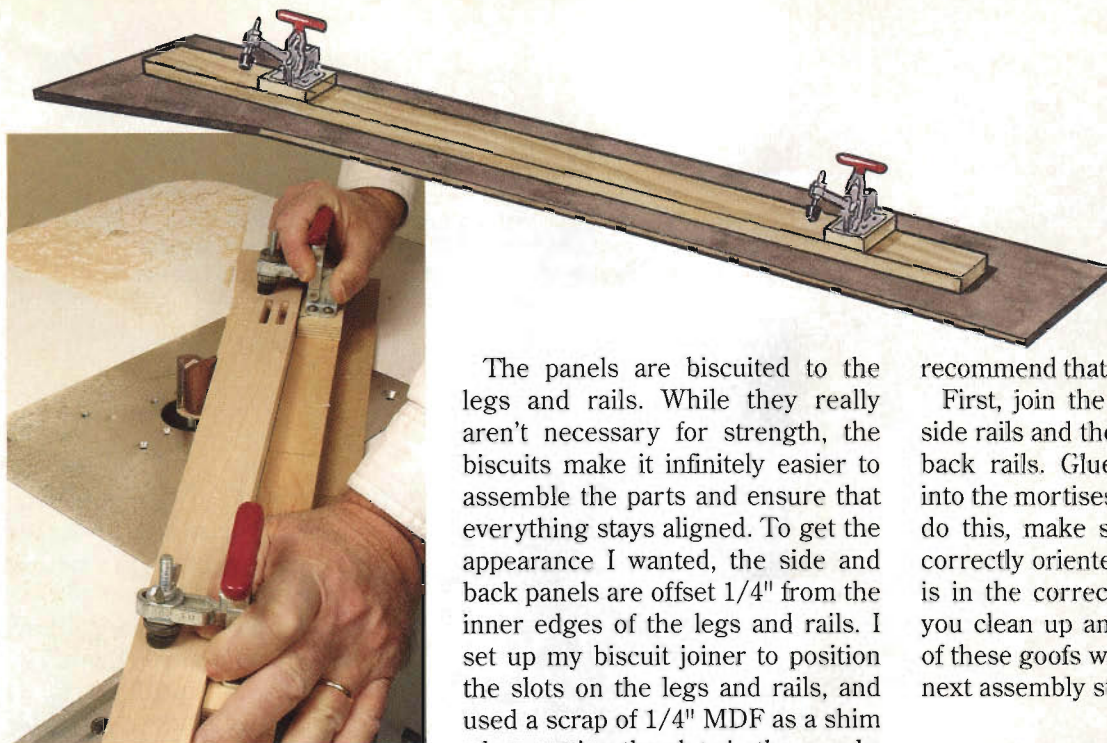
Before you begin the final pedestal glue-up, glue the loose tenons into the rail mortises. Be sure you orient the bevels properly.

Twin mortises are used for the bottom rails and a single mortise for the top ones. Because you mortise adjacent faces of the legs, the mortises do intersect. The "outer" mortise of the twins can be deeper than the "inner" one. When you make the loose tenons, you simply bevel one end of each.

Cut the mortises in both the legs and the rails. I used a plunge router with a good edge guide and a shop-made mortising jig for this operation (see photos and *Drawings* above), but use whatever approach you are most comfortable with.

Once the mortises are completed and the tenons made and fitted, shape the legs and rails. The rails have an arched bottom edge. The legs have a reverse taper from top to ankle, and the foot section cant outward from that point. In the assembled pedestal, the inner surface of the leg is plumb.

To shape the legs, I made a template and attached a fence and toggle clamps to it. This allowed me to band saw the majority of the waste from the parts, then rout the final contour (see photos, above right) on the router table.



Attach fences to the leg template, and mount a couple of toggle clamps on them to secure the leg blank. Band saw off the majority of the waste, then template rout the leg flush using a bearing-guided bit.

The foot's inner surface is the exception. On half the legs, the correct feed direction on the router table would require cutting against the grain, guaranteeing major tearout. To avoid this, I made a tapering jig and sawed this surface on the table saw (See photos, right).

Glue the rails to the panels and the loose tenons into the rails. When the clamps are off, glue the legs to the back rail and panel subassembly.

The panels are biscuited to the legs and rails. While they really aren't necessary for strength, the biscuits make it infinitely easier to assemble the parts and ensure that everything stays aligned. To get the appearance I wanted, the side and back panels are offset 1/4" from the inner edges of the legs and rails. I set up my biscuit joiner to position the slots on the legs and rails, and used a scrap of 1/4" MDF as a shim when cutting the slots in the panels. I also used the shim when cutting the slots in the rails for the bottom (so it would be flush).

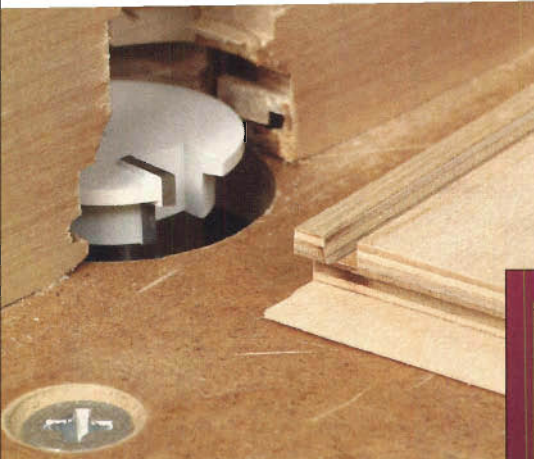
Now that I've glued-up this project, with lots of biscuits, loose tenons and parts, I know it can get hectic. To simplify things, I

recommend that you stage the work.

First, join the side panels to the side rails and the back panels to the back rails. Glue the loose tenons into the mortises in the rails. As you do this, make sure the bevels are correctly oriented, the longer tenon is in the correct mortise, and that you clean up any squeeze-out. Any of these goofs will thwart you in the next assembly stage.



Saw the inside foot taper to avoid major tearout problems. Attach a couple of fences to a scrap panel to make the jig quickly. Recycle the screws and panel after the legs are cut.



The drawer lock joint is a great way to join plywood drawer sides because it covers the plywood strata as shown in the drawing at left. The author also cut the groove for the drawer bottoms using the drawer lock bit.

In the second stage, join these subassemblies to the legs and bottom panel. The last little job, completing the basic pedestals, is to attach the 7/8" thick top front rail with glue and a pair of screws in pockets.

Make and Mount the Drawers

The desk has two standard drawers, two pencil drawer trays, and a sliding platform for the CPU (pieces 13 through 34). You'll find *Elevation Drawings* for the drawer construction on page 51. All but the CPU platform have maple "show" faces attached to the drawer's structural front with screws. The CPU platform is concealed behind a door. To clear the open door, this platform is narrower than the other drawers, and is mounted differently.

The boxes for the two regular drawers are 1/2" Baltic birch plywood, assembled with routed drawer lock joints. The bottoms are 1/4" birch plywood.

The pencil drawers originated with dandy molded drawer side

inserts packaged with a pair of slides. Since the inserts were not as wide as the pedestals, I made a Baltic birch plywood tray for each one, attached the slides to it, then fastened the insert to the tray.

These drawers are mounted in the pedestals with Accuride slides. I drilled mounting screw holes along the centerlines of 1/4" MDF shims (which bring the mounting surface flush with the legs), then screwed them to the side panels. The case members of the slides were screwed in place next. Then I screwed the slides' drawer members to the drawer sides and installed the drawers in the pedestals.

The CPU platform is a 1 1/2" high drawer frame (front, back and sides), with a 3/4" rabbet all the way around. The platform base drops into this rabbet.

Because it is narrower than the opening, a mounting point for a slide must be provided on the door-hinge side of the pedestal. This mount is simply a 2"-wide strip of plywood

that's screwed to the pedestal bottom. Cut it about 1/2" longer than the slide, then position it against the pedestal back.

With the drawers in place, I next fitted the "show" fronts to them. The front to the CPU platform is, of course, a door. I made it to mimic the appearance of the fronts on the two full drawers in the opposite pedestal. After fitting the 19 1/2"-wide panel to the opening, I kerfed it to represent the gap between the drawers. To keep it flat, I mounted two cleats on the back with sliding dovetail joints. Then I mounted it to the pedestal. You'll need a 1/4" shim to mount the hinge plates to, as with the slides. Complete the drawers by mounting the pulls.

The monitor sits on a platform mounted between the pedestals, several inches below the desktop. A keyboard slide and tray is screwed to its underside. When you pull it forward, the keyboard ends up in its cutout. The monitor platform (piece 35) is a plywood panel with hardwood brace (pieces 36) and an apron (piece

Burgess Bit



With its center bearing and a little fine adjustment, this bit forms perfectly sized hardwood edging with plenty of glue surface.



The Burgess Edge plywood bit has two stacked, adjustable cutters that scoop out the panel edge, leaving a knife-edge of hardwood veneer.



Use your master templates (the author used a good size Forstner bit to form the corners) to form the cutouts in the desktop (far left). The templates will guide a router fitted with a 3/4" template guide and 1/2" compression bit. Then, use the same templates to create secondary templates (left). For this step, clamp the master to your plywood and guide a router fitted with a 3/8" template guide and 1/4" straight bit along the edge.

37). Follow the *Drawings* on page 51 for its shape and construction details. I used connector bolts and cross-dowels to attach it to the pedestals (pieces 38 and 39). The bolts penetrate the pedestal sides and extend into the edge of the platform. A blind hole for the cross-dowel, drilled into the underside of the platform, intersects the bolt hole. You don't see the fasteners, but you can remove them to dismantle the desk. Mount the keyboard slide, platform and swivel mousepad later (pieces 40, 41 and 42).

Making the Desktop

The desktop (piece 43) is, of course, the main working surface. I made two U-shaped cutouts in it (see the *Elevation Drawings*), one for the monitor, and the other for the keyboard. The desktop is plywood with hardwood edging (pieces 44). There are a number of ways you can edge the plywood, so use the one that works for you. With the patented Burgess Edge system that I used, doing the cutouts was a bit involved. Making cutouts in the desktop for the monitor and keyboard isn't difficult. But cutting them so they can be edged with the Burgess system is. To pull it off, I used a pair of templates, a maple frame assembled with half-lap joints, the right combination of template guides and straight bits, and, of course, the Burgess-Edge bits. The first template of each pair is critical, since it is used for three steps: the second template, the initial cutout, and final

edge-trimming. To make this U-shaped template, I drilled out the inside corners with a Forstner bit, then cut from edge to hole, from hole to hole, and from hole to edge. Clamped to the desktop, this template guided my router as I made the actual cutout, as shown in the photo above.

To make the second template, I clamped the first to the blank, fitted my router with the appropriate template guide and straight bit, and routed along the edge of the first template. Then I screwed this template to the hardwood frame and routed around the outside, contouring the frame.

With this done, I routed the cutout with the Burgess plywood bit and the frame's edge with the insert bit. Now the frame fit perfectly into the desktop. Glue it in place and trim the excess with a jigsaw. Finally, use the original template to trim the cutout, leaving a clean, crisp edge on the desktop.

The desktop is secured to the pedestals with cabinetmaker's buttons (pieces 45). I used a 1/4" slot cutter to rout three slots in each top side rail for both pedestals. With the pedestals upended on the overturned desktop, I aligned them and joined them with the monitor platform. Then I fitted a button in each slot and screwed it to the desktop. (Later, when it was time to apply a finish and move the desk to its home location, I dismantled it, of course.)



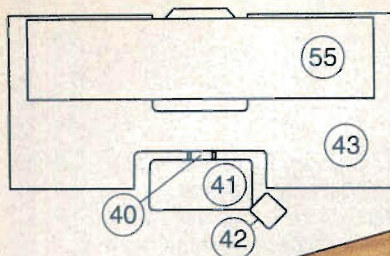
The secondary template the author is holding was used to shape the edges of the infill frame that was assembled with half-lap joints. The template was screwed in place with about 1/2" of the frame exposed on three sides. Then it was a simple matter of routing around the template to trim the frame to exact size.



Machine the desktop cutout with the Burgess Edge plywood bit and the newly shaped infill frame with the Burgess insert bit. Apply glue and slide the frame into the cutout.

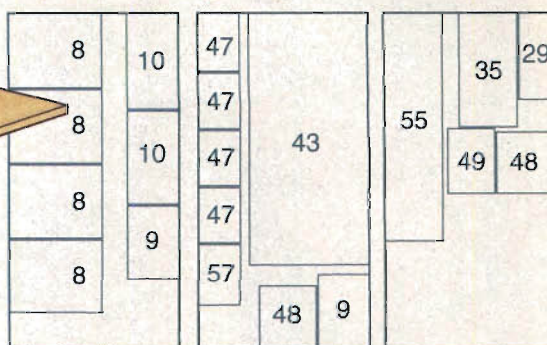


The final, trimmed edge (on the inside of the three-sided infill frame) is produced using the master template and the same router, guide and bit combination that made the initial cutout.

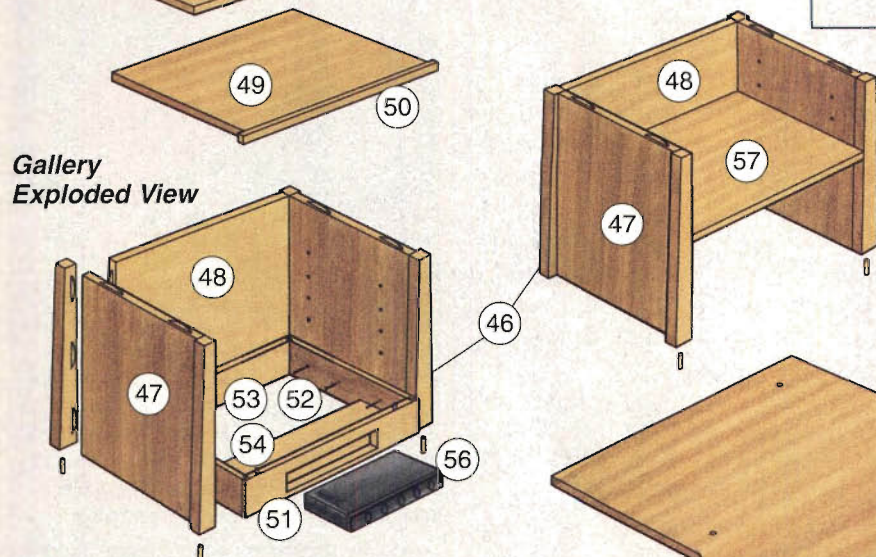


Computer Desk Elevation
(Top View)

Plywood Cutting Diagrams

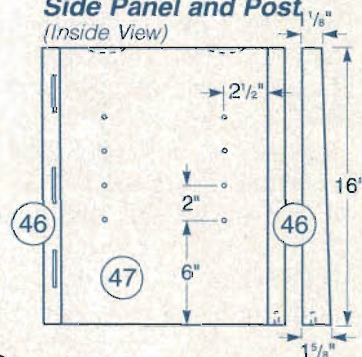


Gallery Exploded View

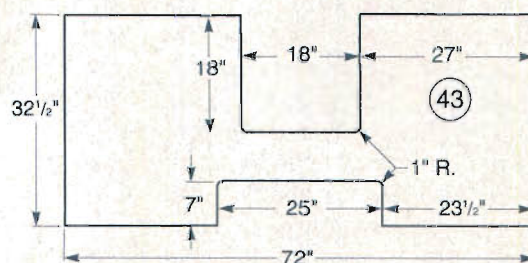


Power cord access hole

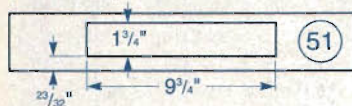
Side Panel and Post
(Inside View)



Desktop Panel
(Top View)



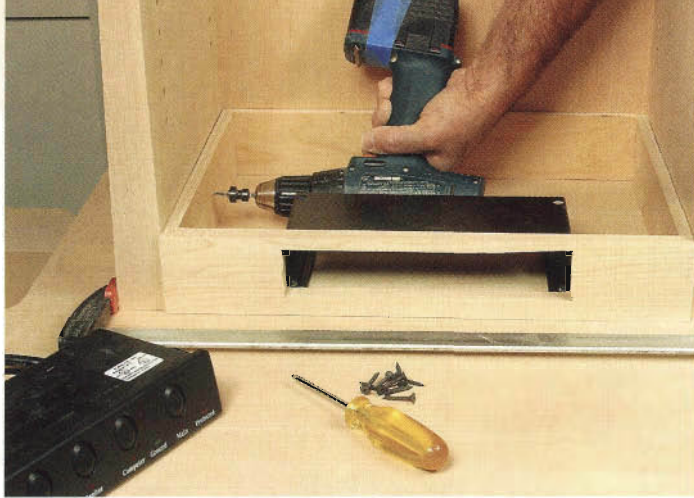
Power Strip Frame Front
(Front View)



MATERIAL LIST GALLERY

	T x W x L
40 Premium Keyboard Slide (1)	Adjustable
41 Keyboard Platform (1)	Black
42 Mouse Pad (1)	Black
43 Desktop Panel (1)	3/4" x 32 1/2" x 72"
44 Edge Banding (1)	3/4" x 1" x 300"
45 Cabinetmaker's Buttons (12)	3/4" x 1" x 1 1/2"
46 Posts (8)	1" x 1 5/8" x 16"
47 Side Panels (4)	3/4" x 12" x 16"
48 Back Panels (2)	3/4" x 17 3/4" x 16"

	T x W x L
49 Printer Platform (1)	3/4" x 12 7/8" x 17 3/4"
50 Edge Banding (1)	3/4" x 1/2" x 18 3/4"
51 Power Strip Frame Front (1)	3/4" x 3" x 17 3/4"
52 Power Strip Frame Sides (2)	1/2" x 3" x 13 1/2"
53 Power Strip Frame Back (1)	1/2" x 3" x 17 3/4"
54 Power Strip Frame Bottom (1)	1/2" x 4" x 16 3/4"
55 Gallery Top Panel (1)	3/4" x 15" x 65"
56 Power Manager (1)	Black
57 Adjustable Shelves (2)	3/4" x 12" x 17 3/4"



The Power Director (shown in photo) is mounted in a frame at the bottom of one of the gallery towers. The frame is screwed to the side of the tower and a port is cut in the desktop for cables. A removable shelf hides wire clutter.

Gallery Construction

Last to be constructed is the gallery (pieces 46 through 57). It features a long edge-banded plywood top, supported by two shelf units. One has a slightly elevated platform that could hold a small printer. Under it is a built-in power strip.

The shelf units consist of plywood panels and tapered posts (a taper that duplicates that of the pedestal legs; see the *Drawings* at left). The side panels are drilled for shelf support pins, so you have flexibility in the number and height of shelves. The posts and panels are joined with biscuits.

I assembled the units, then laid out and cut biscuit slots in their top edges. Then I positioned the units on the underside of the gallery top and trans-

ferred the slot locations to it. Then I slotted the top and glued up the subassembly.

The frame for the power strip is a drawer box with plywood sides and back and a hardwood front. I cut an opening in the front for the power strip. I incorporated a truncated bottom as a mounting point for the power strip bracket, but left most of the area open so I could cut a port in the desktop for cables. The gallery covers the hole, and a removable shelf covers the frame.

Rather than attach the gallery permanently to the desktop, I used gravity to hold it down and a half-dozen dowels to position it. I drilled holes for them in the bottom edges of the gallery, then used dowel points to transfer their locations to the desktop.

This done, I could lay out and cut the cable port in the desktop. I could also determine the best locations for other essential cabling ports — in the pedestal side for the power cords and monitor, keyboard, and mouse cables, in the gallery for the print cables and for the power strip cord.



One of the last tasks is to drill for the dowels that secure the gallery to the desktop. It must be done with considerable care.



With plenty of storage room and a place for your high-tech components, this computer desk cuts down on clutter and increases efficiency. And it looks great to boot!

Computer Desk Supplies

These supplies are available from the Journal.

Full Extension Drawer Slides**	#21361	\$19.79
Pencil Drawer Units*	#18095	\$37.99
Oval Knobs (1 $\frac{3}{8}$ " Bronze)***	#43089	\$6.49
Backplates (3" x 7/8" Bronze)***	#43098	\$5.89
Power Director #31892		\$59.99
Premium Keyboard Slide #21131		\$99.99
Keyboard Platform (black) #91463		\$29.99
Swivel Mouse Pad #18136		\$39.99
Pair of Blum Hinges #55809		\$10.99

*Two required. **Three required. *** Six required.

Call 800-610-0883; mention code W3086.

After completing all the parts and assembling the desk, I dismantled it to apply the finish. I used multiple coats of Waterlox on the desk, and a single coat of shellac on the drawers, pencil trays and CPU platform.

Then I set up the desk and my computer and had to go to work, writing this story! At least I had a slick new place to toil.

Bill Hylton writes regularly for Woodworker's Journal, covering tools and accessories and how to best use them.

Hybrid Table Saws

By Kelly Mehler



Until recently, home woodworkers could choose either a contractor's saw or a cabinet type saw, both of which posed limitations for the user. Then came the DeWalt 746, and three years later, in 2002, the JET Super Saw followed.

JET by the Numbers

JWSS-10SPFX Super Saw™
WMH Tool Group
Motor14/7 amp
Weight379 lbs.
Rip Capacity52"
Warranty2 years
Price\$1,259
More Info800-274-6848
www.wmhtoolgroup.com

Integrated Sliding Tables

These two saws look more like traditional cabinet saws, with their 120 volt motors housed inside a cabinet. JET's cabinet is enclosed; DeWalt's is open at the back (but the blade is shrouded). The JET has a wider stance than DeWalt's, which is tippy when the sliding table is added. (DeWalt adds stabilizing feet for the left legs to take care of this issue.)

In my opinion, it is the integrated sliding table option that makes these saws more usable for woodworking than any other U.S. table saw offered. Crosscutting at all angles and all sizes of work is a huge part of doing woodwork, and these sliding tables make this job easy. The sliding tables on both the JET and the DeWalt work on roller ball bearing assemblies and *move effortlessly*. DeWalt's sliding

table is 2" wider and has 3" more cutting capacity, at 30", than the JET. On the other hand, the JET table comes a bit closer to the blade, which is desirable. A problematic aspect I found in both these saws is that they're left-tilting. This causes difficulties for crosscutting bevels, when you want the blade tilting away from the workpiece.

Miters and Rip Fences

While both miter units have hold-downs, DeWalt's is beefier and can be used in the miter slots on the tabletop. JET's miter unit attaches and detaches to the sliding table with two threaded knobs and has some loose parts. It also has to be remounted to cut miters in the opposite direction. JET's miter fence attaches to the miter head at a wider stance, which makes it more rigid when crosscutting.

DeWalt by the Numbers

DW 746K
DeWalt Industrial Tool Co.
Motor15/7.5 amp
Weight365 lbs.
Rip Capacity50"
Warranty1 year
Price\$1,449
More Info800-433-9258
www.dewalt.com

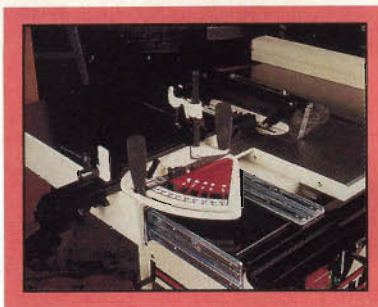


For a rip fence, both saws feature T-square units that always lock parallel, and measure out dead flat and straight. Those are the similarities; the designs and workability, however, are quite different.

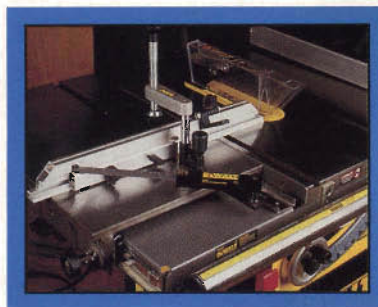
DeWalt's fence has a clear plastic window with a thin cursor close to the rule on the fence rail. Divisions on the rule are in 1/64ths of an inch, and there's also a rule to the left of the blade on the fence rail.

There's no deflection of the fence during any ripping task — an advantage when cutting larger panels. When it comes to ripping narrow strips, a low fence attachment is available for safer handling. The fence face does have to be removed and re-installed for use on the right side of the fence. A desirable aspect of DeWalt's fence is that the face is adjustable: you can make it into a half fence for working with reactive woods, or drop it down flush to the table for cutting thin stock.

The JET Super Saw's rip fence has four metric T-tracks for jigs milled



The Super Saw's sliding table (which moves effortlessly) and miter fence assembly is one of its many positive features. The JET saw's dust collection filters out very large pieces of debris. It is more effective with a large volume dust collector.



DeWalt's miter gauge assembly is very accurate, and the rip fence is quite strong. The dust-collecting blade shroud is a feature unique to the DeWalt 746 hybrid saw.

into the fence body: one on each side and two on top. These come in handy for jigs and auxiliary fences. Unlike on the DeWalt, both sides of the fence are usable, making it easy to move to the left side of the blade. Instead of a plastic window, the JET saw has a bubble magnifier to help you see the measuring gauge. But the magnifier sits more than 1/4" above the rule and increases the size of the 1/16" ruler divisions, making it more difficult to do precise measurements. The JET's fence also deflects a bit with lateral pressure.

Blade Guards and Trunnions

When you need to change the blade, you'll find the blade guard on the DeWalt minimal, but easy enough to remove and re-install. JET's blade cover, on the other hand, is easier and safer to work with because it has two independent sides, which move up and down for constant contact with the table on each side of the blade — which is nice when making bevel and narrow cuts. It requires loosening three bolts to remove the unit, but then it lifts up easily, and can be re-installed the same way.

JET has not changed the trunnion assembly for its new Super Saw, but uses the same contractor's style as of old: the two large metal bars bolted to two cast end plates cause a potential problem of misalignment of the parts to each other. DeWalt has developed a "one-piece" cast-iron trunnion, which provides a solid mounting for the arbor assembly.

Dust Collection

It is good to see that these two "hybrid" saws have made advances in the area of dust collection.

DeWalt enclosed the blade below the table and added a port to the back of the enclosure to promote efficient dust collection. The sawdust produced at the blade is actually "ejected" out of the dust port. Fitting this port to a shop vacuum with a typical 2 1/2" plastic connector is more than adequate, but you can use an adapter to connect to a full-size dust collector if you wish.

JET has totally enclosed the cabinet below the blade of its Super Saw, much like a cabinet saw, but has brought the floor much closer to the blade. Baffle holes in this metal floor allow sawdust to fall through but filter out the solid wood scraps. There's a sub-floor beneath this metal platform, as well as a dust collection chute with a 4" port for connection to a dust collector. A shop vacuum does not have sufficient capacity to work on the Super Saw, but with a dust collector attached, the Super Saw's dust collection system works much better than that of the typical cabinet saw.

Miscellaneous Details

Here's a few more details I noticed in comparing the 746 and the Super Saw. DeWalt's 45° and 90° stop adjustments

are easy to access on top of the saw in the miter slots. This saw, however, uses a cheaper stamped steel extension than the JET, which comes standard with a cast-iron extension wing and has convenient hangers on its cabinet for storing the

fence. The Super Saw also uses what is called a "timing belt" (like in your car) to connect the control wheel to the trunnion assembly that raises and lowers the blade — making another spare part you will want to keep around.

Both saws have large, easy-access on/off power switches. DeWalt's is fixed at the right height to the left of the blade to allow it to be turned off with your knee. JET's switch can be moved anywhere along the top rail and has a motor reset button and a green power indicator light next to the switch.

Conclusion

If I were in the market for a new table saw, as a home woodworker I would be delighted to have either of these saws, outfitted with a sliding table, rather than a contractor's saw or even a cabinet saw. Of the two hybrid options — I prefer the DeWalt because of the better fence, miter unit, dust collection and trunnion assembly. These features, in my opinion, outweigh the greater cost of the DeWalt.

Kelly Mehler is a table saw expert and author from Berea, Kentucky. His updated "The Table Saw Book" is available from Taunton Press and www.kellymehler.com.

Corded Hand Drills

By Charles Self



Want a drill that doesn't eat batteries and is more powerful than any cordless tool? Take a look at ten of the top corded hole borers!

Over the past few years, this most basic woodshop tool has changed for the better. While the new features aren't startling, and aren't even available on all models, there are a couple of surprises. One was the top amperage of the motors, with the Hitachi D10VG coming in at 9 amps, a really amazing figure for a supposedly lightweight tool. Another was the lack of drills with clutches. It's not that you can't buy a clutched 3/8" corded drill: there are several in this review, but for the most part, companies don't seem interested in manufacturing them.

While the two-finger trigger is not universal, it is popular. Most drills now have lock-on buttons, but, again, this feature is not universal. Many also have rubber or soft plastic padded grips: they're less likely to slip from a sweaty hand, and less tiring to use when boring a lot of holes. But aside from having trigger and grip styles in common, most of the drills in this test also have some very unique personalities.

Bosch 1032 VSR

The first impression when lifting this 7½ amp drill is heftiness, and the second is ease of handling. It has a two-finger trigger with a lock-on button for those heavy jobs. This is located down near the cord entry. Its one-hand keyless chuck closes easily and tightly, and holds

Bosch 1032 VSR

RPM : 0 - 1,100

Amps: 7½

Chuck: Keyless

Street Price: \$135

Phone: 877-267-2499

www.boschtools.com

A hefty heavyweight with great handling and a lot of speed, this contender is powerful enough to cause major wrist-twist if it hits a snag.



Porter-Cable 2610

Hitachi D10VG

Makita DP 3003

Metabo BE 560

DeWalt D21008

This tool's unique shape makes it exceptionally useful for woodworkers who hang or assemble a lot of cabinets. It can reach into spaces denied to most other drills.

Craftsman Mini-T™ 27996

RPM: 0 - 1,500
Amps: 3.2
Chuck: Keyed

Street price: \$139.99
Phone: 800-549-4505
www.sears.com/craftsman

Craftsman 27994

RPM: 0 - 400, 0 - 1,400
Amps: 5½
Chuck: Keyless

Street price: \$99.99
Phone: 800-549-4505
www.sears.com/craftsman

Low amperage didn't necessarily mean low power in this test. And although the 27994's trigger was a bit small, it offered options like the ability to store bits on board.



very well. The back of the handle is tapered and coated with rubber, which aids handling in hot weather (when hands might be slick), and on cold days, too.

The trigger is coated for non-slip use, and its reversing switch is a push-through type with a speed range of 0 - 1,100 rpm: this is great for producing lots of torque and getting it to the work. All in all, this is an excellent, almost overpowered example of what is available.

Bosch continues to save weight with magnesium, as in their routers. This can oxidize a bit: it stops quickly, but only after the matte gray has turned color.

An auxiliary side handle is included, which is needed when this powerhouse ramps up all its power. If the drill hits a snag, it can lead to a major wrist-twist if it's being used with only one hand.

The Bosch 1032 VSR handles nicely, and does everything that I requested of it. It drilled 1½" holes in oak and ran the 4" hole saw without even a thought of breathing hard. While I might prefer a little extra beef on the bottom of the handle, others are going to love it as it is. Everything that can be metal is metal. The motor bearings are ball type, and this is one of just two drills on my list which is made in the U.S.A. The bottom line: overall power, ease of handling and quality construction justify its price.

Craftsman 27994

Despite its low power (5½ amps), this keyless chuck model had more than sufficient guts for everything I tried. This included 5½" Forstner bit holes in scrap oak and pine. With the drill on straight



Ryobi D45C



Milwaukee 0202-20



Craftsman 27994



Craftsman Mini-T 27996



Bosch 1032 VSR

drive, those trials were very successful. The lock-on button is in the handle and works easily and quickly. It also drove a 4" hole saw without a problem, though it was possible to lean the body onto the drill and seriously slow it down, which wasn't the case with the 7 and 9 amp drills in my test.

The 27994 has a one-finger trigger which might be a fatigue factor during heavy-duty use, but it presented no problems with my workouts. There are two speed ranges, 0 - 400 rpm and 0 - 1,400 rpm, which are easily accessed through a slide switch on top of the drill. The clutch offers 24 positions, a fairly common figure.

The clutch worked in at least the four positions I tried. (There doesn't seem to be much of a step between positions on these multi-position clutches, so I tend to question the value of more than eight or nine different settings.) An auxiliary side

handle is included, and the back of the handle has rubber padding. The drill case holds two driver bits on top of the drill, near the speed range switch.

Craftsman Mini-T™ Drill 27996

This drill is included because I feel that it is exceptionally useful to woodworkers who need to hang cabinets, or assemble them. It's an angled head, lightweight drill, with a 3.2 amp motor, a single-finger trigger switch, a 0 - 1,500 rpm range, a push-through reversing switch, and a keyed chuck. There are brush access screws at the very bottom.

The entire handle, front and back, is coated, and the trigger has a soft touch yellow-orange coating. I never ran it with the big hole saw (because it's a specialty drill), but I did try numerous twist bits, some Forstner bits to 1½" (in cherry, though, not oak), and with a series of brad points up to 9/16". It performed well, and also did a good job of running a 2¼" hole saw through fir and yellow pine.

This is a likable little drill. Because of its shape and light weight, you might come, as I did, to treat it a bit like a pet, picking it up for jobs that previously were reserved for cordless drills. And it really handles well, letting the user stay comfortable driving screws or drilling holes.

Hitachi D10VG

RPM: 0 - 1,200
Amps: 9
Chuck: Keyed

Street price: \$110
Phone: 800-829-4752
www.hitachi.com/hpt/wood/index.html



Nine amps and a host of features made this remarkably well made drill a front runner in this line-up. A two-pin plug means that it is almost excessively well-insulated to pass today's tests.

DeWalt D21008

RPM: 2,500
Amps: 6
Chuck: Keyless

Street price: \$60
Phone: 800-433-9258
www.dewalt.com



The 3/8" keyless chuck is "one of the best made." However, a lack of padding on the switch and handle made this drill a little difficult to use on hot days.

DeWalt D21008

I received an early version of DeWalt's keyless 6 amp high-speed (2,500 rpm) drill. It's a sturdy tool which presents a bland face to the world. The handle has no grip padding, but the 3/8" chuck is one of the best made, though it's a two-hand type. There is no lock-on button, and the drill sent to me lacked an auxiliary handle, which is something I feel any drill over 4½ amps is going to need from time to time. The case is a sturdy blow-molded plastic, and the two-finger switch is easy to operate, as is the reversing switch. But the lack of any kind of rubber padding on switch or handle made this tool a little difficult to use on hot days. It worked well with the 1½" Forstner and the 4" hole saw, but speed control was a little twitchy because testing days were all in the high 80s to the mid-90s, so my hands were definitely slick with sweat.

The finger groove along the top edges of the drill aids handling, but the lack of coating doesn't. Reverse is a flick switch located above the front of the trigger. It's as easy to use as a slide-through switch, and probably just as sturdy.

Hitachi D10VG

The VG in this name could easily stand for "Very Good." This is a solid feeling drill with a 9 amp

motor and a host of other features. It doesn't have a keyless chuck, but the handle is nicely shaped and has padding to improve grip and comfort which extends even to the finger slots. The speed range is 0 - 1,200 rpm.

Hitachi provides a chuck key holder and lets you decide where it needs to go. The drill is listed as available with a keyless chuck, but in the interest of speed, I was sent the keyed version. With this much power available, I prefer a keyed chuck anyway. The auxiliary handle is a side screw-in model, unlike the rest, which are clamp-on types.

The Hitachi has one of the few two-prong plugs, which means the drill is almost excessively internally insulated to pass today's tests. There is a two-finger coated switch, with push-through reverse, and a lock-on button on the side of the handle.

Made in China, the D10VG ran the 4" hole drill and 1½" Forstner without faltering. In fact, I could barely slow this drill down by leaning on it while the test piece was on the floor. Note that the top listed hole saw size for this drill in this speed is 2¾". Hitachi, in my opinion, underrates it.

This is a remarkably well made drill, and the street price seems like a bargain. The D10VG is a toolbox critter which should stay with you for many years.

Makita DP3003

Here's another high-powered small drill with a 7 amp motor. The chuck is a two-handed keyless model which works easily, quickly and well. It's another sturdy-feeling drill from a company with a name for producing tools that last. The lock-on button is a slider located on the



Makita DP 3003

RPM: 0 - 1,200

Amps: 7

Chuck: Keyless

Street price: \$170

Phone: 800-462-5482

www.makita.com



A sturdy drill from a company with a name for producing tools that last, the DP 3003 is exceptionally comfortable, as well as the priciest tool reviewed.

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front of the grip: it's sort of an odd and cumbersome position, but unlikely to ever be locked on by accident. Speed range is 0 - 1,200 rpm.

Made in Japan, it handles exceptionally well with a comfort-coated back of the handle, coated two-finger grip, coated notch at the upper back of the drill case and a metal gearbox. Reverse is a flick-type, above and at the front of the switch. The case looks neat and clean. The two-prong plug again means heavy internal insulation.

The drill handles nicely, and shares the nose-heavy feeling of the others. It powered its way through my two major tests, and lots of handling tests, without a tremor. The side handle is a clamp-on type, and is needed in numerous situations.

This drill is a solid, if expensive (it's the price champ), contender.

Metabo BE 560

The Metabo supplied to me was just about feature-free compared to the rest of the drills. It has a two-finger trigger which is spoiled by the speed control centered on the lower part. The keyed chuck is driven by a 4½ amp motor, tied with Ryobi for the least amount of power.

The keyed chuck is excellent, and overall shape and handling of the drill is excellent to very good, though there seems to be a more extreme angle to the handle than with some models. The lock-on button is located on the side of the handle, and reverse is a flick type atop the front of the trigger switch. It is a two-prong plug model.

The drill holds its speed well, but stops easier than the others for two reasons: its very fast 2,800 rpm (which lowers the torque available), and its low amperage.



Metabo BE 560

RPM: 2,800

Amps: 4½

Chuck: Keyless

Street price: \$89.00

Phone: 800-638-2264

www.metabousa.com



Metabo tied with Ryobi for the least amount of power among the drills tested. Its overall shape and handling are excellent.

The key fits into a nicely designed holder on the cord, but tight up against the bottom of the handle.

With no coatings, the drill quickly started to slip around in my hand and stalled with some ease during the 4" hole saw test. There was no side handle supplied, but I doubt one would be needed. The Metabo is designed in Germany, but manufactured in China.

Milwaukee 0202-20

Milwaukee has a reputation for making tough, if uninspired, tools. But this drill caused a bit of a different reaction. Suffice to say, this time it was love at first spin! This 7 amp model with its keyless all metal chuck has a two-finger trigger, finger slots at the top of the body, a coated back and coated finger slots, a short shank flick switch above the trigger for easy directional changes, and trigger speed control. It also has a quick detach three-wire Quik-Lok®

grounded cord, and is immensely easy to handle.

The handle has a bit more angle than I like (similar to the Metabo). It's a bit nose heavy, but otherwise is powerful, fairly quiet and rumbles right along at any point in its 0 - 1,200 rpm speed range.

A clamp-on side handle is supplied, and is a great thing to have. I escaped injury with this handle when I hit three oak knots at one time and it whipped back on me.

The only lack I can find in this drill is the fact that the trigger is not coated. The detachable cord is a really nice touch, as it makes it easier to get the drill into its box.

This is a slick tool that is sleek in size, and well made for easy handling over a long period of time. The street price seems to be a bargain for this made in America drill.

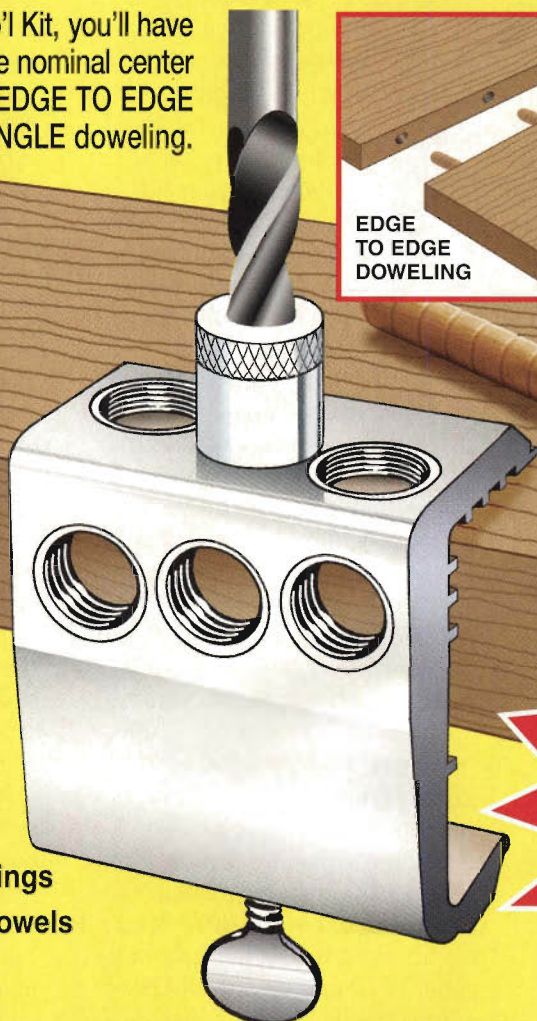
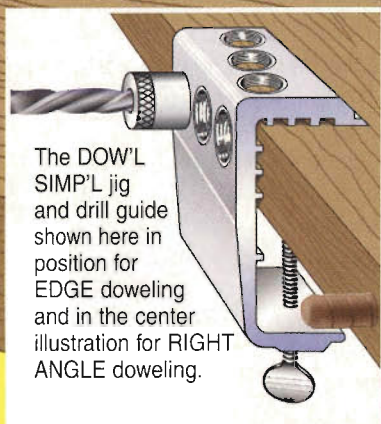
Porter-Cable 2610

A relative newcomer at the time of this review, this is a solid offering in the 7 amp sweepstakes. With a two-finger trigger, padded handle, flick switch for reversing, 0 - 2,500 rpm speed range, and a very reasonable street price, this one is going to be a winner. It's an excellent tool, well made and easy handling. For me, this handle was actually about the most comfortable of all. The motor

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is a great thing to have.
I escaped injury when
I hit three oak knots
at one time and it
whipped back on me.**

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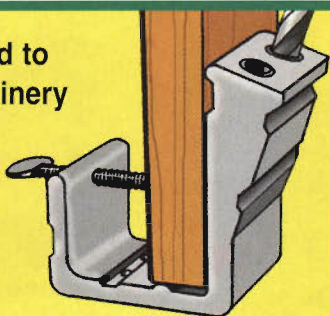
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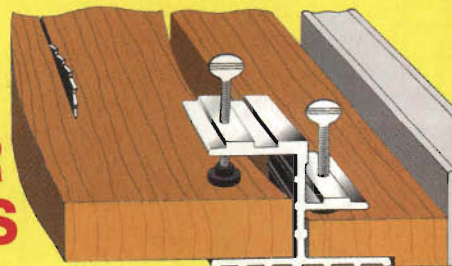
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Milwaukee 0202-20

RPM: 0 - 1,200

Amps: 7

Chuck: Keyless

Street price: \$128

Phone: 800-729-3878

www.milwaukeetools.com



Our reviewer "fell in love at first spin" when he tried this drill. He especially liked the detachable cord which allows for easier storage, and the solid street price which delivers great value.

provided plenty of power, though the higher speed does let it get slowed up more easily with the big 4" hole saw than do the 7 amp high torque tools.

Handling is nice, and the tool just misses being as sleek and slick as the Milwaukee. The higher speed range makes lower speeds harder to control, but a little practice solves that problem. There's a lot of magnesium in this one, as there is in the Bosch models, but it doesn't appear to oxidize as do the Bosch materials. This is another tool which is made in the U.S.A. For those who prefer the security of a keyed chuck, the P-C 2611 is exactly the same drill with a different chuck: street price for that is \$5 higher.

Ryobi D45C

The Ryobi is the sleeper of this test for the light- to medium-duty user. It uses a 4½ amp motor to spin up to 1,000 rpm, and has a keyless chuck and a 24-position clutch. The lock-on button is just behind the single-finger trigger on the handle, and the handle holds two driver bits at its base. Like the

Craftsman, it is a useful driver-drill, instead of just a drill.

This is a somewhat lighter duty drill than the others, but is well made. It should last nicely, though the chuck does appear more fragile than most. It bogged down slightly while cutting with the 4" hole saw, and had to be nursed through the 1½" Forstner bit use. There is no handle coating on the Ryobi, either.

With its low price, the Ryobi is a great bargain for the person setting up, or for the person who already has everything but a clutched 3/8" corded drill. It handles very nicely, appears well made (in China), and would be a great starter tool for anyone, or a great secondary tool for those who believe they need more than one.

What It's All About

I didn't do drive tests with these drills and 3" long screws, or big lag screws. Such tests are sensible with cordless drills, but are meaningless with corded drills, because every 3/8" corded drill made can drive 3" screws until the user's arm falls off. I did drive screws to see which had the most controllable triggers. The results weren't a major surprise, as the two-finger lower speed drills were easier to control. I quickly found it's easier to run in screws at 1,200 rpm than it is at 2,500 rpm — and especially so when the higher speed resulted in the bit slipping out of the screw head time after time. The two drills with clutches (Craftsman and Ryobi) did a decent job with screws, but the Ryobi came out behind, even though it is lighter and easier to handle. When the Craftsman 27994 got to be a problem in its high range (0 - 1,400 rpm), I could switch to the 0 - 400 rpm low range and keep on going.

Any of these corded drills should serve the woodworker well, and continue doing so for many years. Prices cover a wide range with a \$130 spread between top and bottom, so that will be a factor for many. For woodworkers on a budget who need decent power, good screw driving ability and the option to control the depth of drive,



Porter-Cable 2610

RPM: 0 - 2,500

Amps: 7

Chuck: Keyless

Street price: \$95

Phone: 800-487-8665

www.porter-cable.com

Our reviewer predicts that "this one is going to be a winner." The handle was the most comfortable of all the drills tested, and he liked the fact that it's made in the U.S.A.

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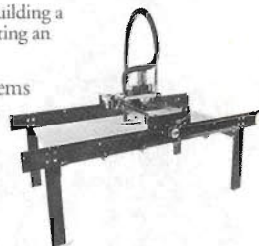
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nothing can beat the little Ryobi D45C. It will do general drill work for years to come.

For those with more money to spend, or more interest in a heavier duty tool, there is a wide choice from among the Bosch, Craftsman, Hitachi, Makita and Porter-Cable. My choice among those would be the Hitachi D10VG: even without a keyless chuck, its great power output (9 amps) and overall tough feel are combined with comfort. Bosch's 1032VSR might nose out the Hitachi except for a combination of slightly high price to go along with its superb feel and power, and that darn grip which narrows down toward the bottom.

The Makita drops a little further down the list, primarily because of price. It's an excellent drill, but the competition is stiff, and less

Ryobi D45C

RPM: 1,000
Amps: 4½
Chuck: Keyless

Street price: \$40
Phone: 800-525-2579
www.ryobitools.com



This drill is "the sleeper of the bunch." Even with its small (4½ amp) motor, it passed all the tests and, at its bargain price, it's an ideal entry level tool for new woodworkers.

expensive. Porter-Cable is a bit speedy at 2,500 rpm, but for those who prefer a high-speed drill, it is the way to go, especially for the money.

But my overall champ is the Milwaukee. This 7 amp drill has it all (OK, except a clutch), with superb quality, plenty of features, great ease and comfort in handling,

and legendary durability. Even the one-handed keyless chuck is all metal, and especially easy to use. At its price, it just can't be beaten.

Charles Self is an award-winning writer and woodworker. He regularly reviews tools and related items for Woodworker's Journal.

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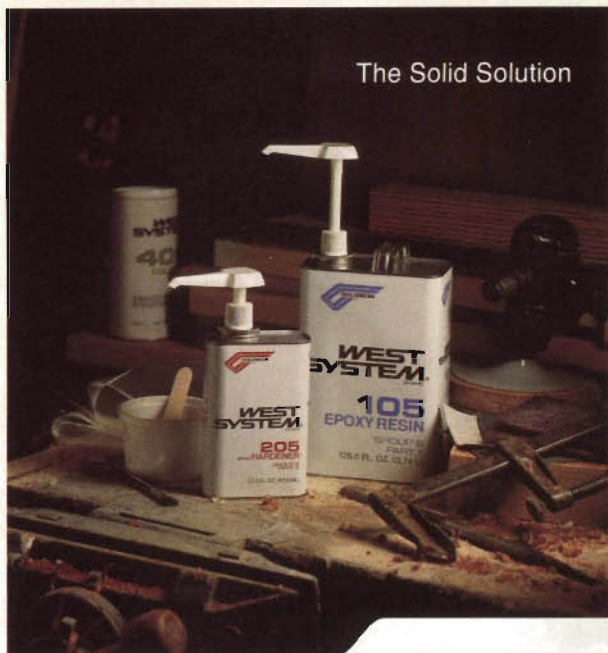
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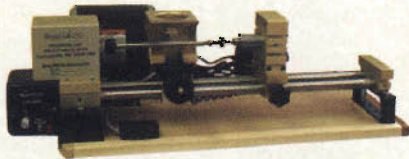
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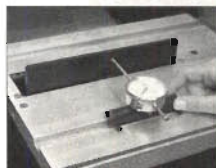
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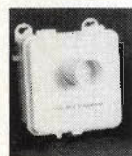
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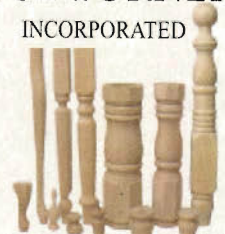
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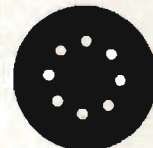
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Right-angle Sanders

By Sandor Nagyszalanczy

Why would anyone want a power sander that's big, heavy and takes two hands to operate?

One word: POWER.

With their large 6" sanding discs and strong motors, right-angle-style random orbit sanders pack enough power to level and smooth even the biggest, roughest wood surface swiftly, or remove the toughest old paint and finish with gusto. These big sanders are so good at what they do that they make working with smaller random orbit models feel more like you're massaging the wood, rather than abrading it.

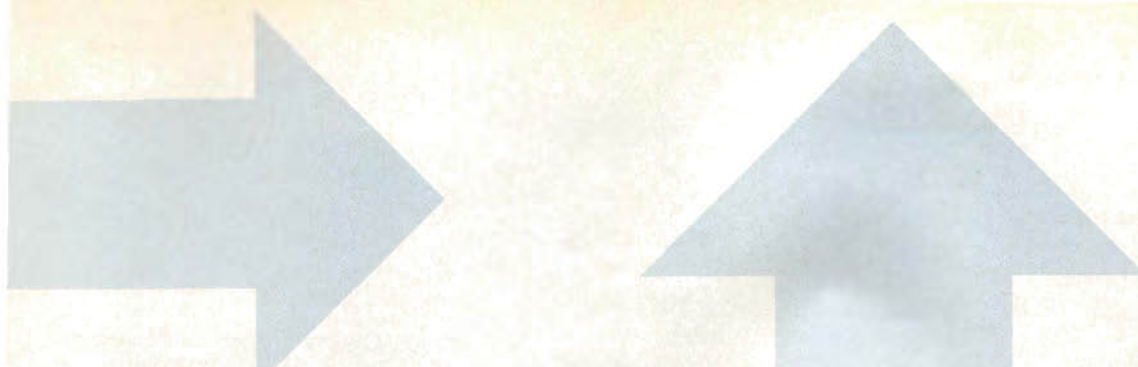
But are right-angle models worth their relatively high price tags and the effort it takes to heft them?

As Spiderman said in his recent action movie, "With great power, comes great responsibility." No amount of sanding power is worth the trouble if a tool is hard to control or difficult to use. I set out to address these concerns when I reviewed eight right-angle random orbit sanders currently on the market. The group included six 6" models by Bosch, DeWalt, Fein, Festool, Makita and Porter-Cable; one 5" model by Milwaukee which I tested with an optional 6" disc fitted; and a ringer: Fein's oversize 8" model. Although they're terrific for a variety of jobs, including non-woodworking jobs, like rubbing finishes and polishing plastics and metals using optional discs and bonnets, I concentrated on their ability to level rough wood surfaces and quickly sand them

smooth. After a few days of running the machines, I evaluated how effectively each model sanded soft- and hardwoods, how easy it was to control and how comfortable it was to operate.

All members of this group of heavy-duty sanders have several things in common: All use right-angle gearing to transfer power from the motor shaft to an arbor and eccentric drive mechanism that spins the backing pad. All require two-handed operation and accept a bicycle-grip-style second handle which screws into sockets on either side of the head, for right- or left-handed use. And all either come with dust collection standard or as an option. Variations





between models include: pad size and disc type (pressure sensitive adhesive (PSA) or hook and loop), motor power (rated in amperage), fixed or variable speed motor, orbits per minute or "OPM" (not motor RPM, but the number of times a minute the pad orbits); orbit diameter (the amount of the backing pad's eccentric motion), and the type of pad drive (how the backing pad's eccentric motion is driven). There's one more, irritating difference between 6" sanders: The number of dust extraction holes in their backing pads may be six-hole, one of two styles of eight-hole, or a combination thereof. All features and specifications are listed in the charts and discussed further in the sections for each model that follows.

Bosch 1370 DEVS

With solid ergonomic design, good motor power, and the highest orbit speed in this group (12,000 OPM), the 6" Bosch 1370 DEVS is a machine worthy of consideration. Its most unique feature is its pad drive system: Removing the tool's backing pad and flipping over a metal cog changes the drive to either free-spin or powered disc rotation. The free-spin drive lets the pad rotate freely as the motor powers its eccentric orbit. Powered disc drive makes the pad forcibly rotate as it goes through its eccentric orbits. Powered rotation creates a very aggressive sanding action, best for heavy leveling work on rough surfaces or finish removal with coarse grit discs. The free spinning action is much less aggressive, so it's best reserved for fine sanding and final smoothing (it's also less likely

to create swirl marks). Pad drive selection, via a more convenient-to-use knob, is also featured on the Festool and Makita sanders. Bosch does make cog-flipping very easy by including an Allen wrench that stores on board the sander. After a little practice, it took me only about 15 seconds to effect a changeover.

The first thing I noticed when I lifted Bosch is its side handle, which angles forward slightly, making the sander more comfortable to hold than other models with nearly-perpendicular side handles that force you to cant your wrist. In use, the Bosch removed material very aggressively in the forced rotation mode, but also generated its share of vibration, an unfortunately fatiguing characteristic shared by most other sanders.

Tool Review continues on page 76 ...



If it's power you're after, this collection of right-angle sanders will get the job done. Our author compares eight models, providing details on their strengths and weaknesses.

TOOL REVIEW

The sander's integral dust collection picked up dust well, even without an attached vacuum, depositing it in the included canvas dust bag. The tool's hook and loop backing pad has a unique set of dust-extraction holes (see photo), cleverly designed to accept either six- or eight-hole sanding discs — very convenient. At first I found it a little confusing to know which holes to line up when mounting discs, but I got used to it quickly. (NOTE: Bosch is planning to replace the 1370 DEVS with a new improved model some time later this year).

DeWalt DW443

This bright yellow machine by DeWalt has a nice, straightforward design with few lows — or highs —

in regard to features and performance. The DW443's pad drive is a non-selectable, free-spinning design which incorporates a pad brake to stop the whirling disc quickly after power is switched off. This prevents the disc from accidentally scratching up the work surface — or jumping around when set down. The DW443 comes with a 6" backing pad that accepts six-hole hook and loop type sandpaper

Bosch 1370 DEVS

Disc diameter: 6"
Pad/sanding disc: hook and loop/6- or 8-hole
Motor: 5 amps
Drive: free-spin with pad brake/forced rotation
Orbits per minute (OPM): 4,800 - 12,000
Orbit diameter: 11/64"
Dust collection: integrated port and dust bag
Weight: 5 lbs.
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Bosch 1370 DEVS



With Bosch's unique drive system, removing the backing pad and flipping over a metal cog changes the drive to either free-spin or powered disc rotation.

discs, which I prefer for general project sanding when you switch between different paper grits often. For production sanding, DeWalt offers the model DW444 that comes with a 6" PSA backing pad, which

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DeWalt DW443

uses sticky-backed discs that are cheaper to buy, but aren't reusable.

In use, the DeWalt DW443's performance was not a standout in terms of aggressiveness, and the tool produced an average amount of vibration. The gear case at the front of the body has a rubberized coating, providing a comfortable optional grip, should you decide to remove the side handle, perhaps to sand in a confined area. Like the Bosch, the DeWalt features built-in dust collection with a port and canvas dust bag, which is conveniently located below the body, where it's less obtrusive than the Bosch's bag.

Fein MSf636-1

Fein's 6" model is a compact machine that exhibits a very nice build quality. With a list price of \$656 (street price around \$530), the MSf636-1 is by far the most

expensive 6" right-angle random orbit around. Alas, if you're looking for features, you don't get many with this machine: there's no variable speed, rubber-coated gear housing or selectable pad drive. What you do get is a machine built to German industrial standards that comes with built-in dust collection, a firm 6" eight-hole hook and loop backing pad, and even wrenches for pad removal and a tube of bearing grease.

Even though the MSf636-1's 3.6 amp motor has the lowest power rating in the group, it must be



The DeWalt sander features built-in dust collection with a port and canvas dust bag. The bag's convenient location below the body is less obtrusive than some other brands.

DeWalt DW443

Disc diameter: 6"
Pad/sanding disc: hook and loop/6-hole
Motor: 4.3 amps
Pad: free-spin with pad brake
Orbits per minute (OPM): 4,300 - 6,800
Orbit diameter: 3/16"
Dust collection: integral port and dust bag
Weight: 5.7 lbs.
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Tool Review continues on page 78 ...

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Fein MSf636-1

a conservative rating, as the tool sands very aggressively, no doubt aided by its very large orbit diameter (5/16"). Equipped with a free-spinning pad with built-in pad brake, the Fein also generated its share of vibration. In fact, I found the tool unpleasant to use for any length of time when I wasn't wearing gel-filled anti-vibration gloves — not a bad idea for using any of these right-angle random orbits.

At 3.7 lbs., the 6" Fein is also the lightest and most compact sander of this group. Although the MSf636-1 is a high profile machine, its short-



The centrally placed, top-mounted, sliding on-off switch on Fein's 6" sander works equally well when operated with either hand.

length motor housing made maneuvering and controlling it a very pleasant affair. Its centrally placed sliding on-off switch works equally well when operated with either hand. The MSf636-1's dust collection was excellent (Fein claims it to be 98% effective; I won't dispute it). A shop vacuum with a built-in automatic switch provides the perfect compliment to this or any right-angle random orbit sander: the sander plugs into the vac, which turns on and off in concert with the tool.

Fein MOL1200E

If you're in the market for a right-angle random orbit sander because you need lots of power, for leveling really gnarly lumber, or for removing old, lumpy finishes, you'll really appreciate Fein's MOL1200E. If you thought a 6" backing pad was big, wait until you see this leviathan's massive 8" pad. With a 1,200 watt (10 amp) motor and an industrial strength build, this Fein model has all the muscle it needs to spin its huge pad. Dust collection is well integrated and features a backing

Fein MSf636-1

Disc diameter: 6"
Pad/sanding disc: hook and loop/8-hole
Motor: 3.6 amps
Drive: free-spin with pad brake
Orbits per minute (OPM): 7,500
Orbit diameter: 5/16"
Dust collection: integral dust port
Weight: 3.7 lbs.
Street price: \$450
Phone: 800-441-9878
www.feinus.com

pad with no less than 16 dust-extraction holes around its perimeter. The large dust port allows so much air flow, there's an air limiting control (lest you suck the big pad down to the work surface).

Recalling Spiderman's pledge of power and responsibility, you do pay for what you get with the MOL1200E. At a street price around \$550, it's prodigiously expensive, and the tool weighs more than twice as much as the Fein MSf636-1. While it sands large surfaces with alacrity, this 8" pad is too big to sand into corners or smooth smaller parts. It takes quite a bit of muscle to control this powerful tool, especially when fitted with a coarse-grit disc. One shortcoming of owning the biggest random orbit sander in town is that 8" hook and loop sanding discs are available from only a few sources — you can't run down to the neighborhood hardware store if you run out.

Festool RO 150 E-Plus

Although relatively expensive, the Festool (formerly Festo) RO 150 E-Plus is a classy German-made sander with a sleek, low-profile design and advanced features that include electronic variable speed control, advanced design dust collection and selectable pad drive. It comes in a sturdy, cleverly designed "systainer"



The large dust port on Fein's 8" model allows so much air flow, there's an air limiting control (lest you suck the big pad down to the work surface).

Fein MOL1200E

Fein MOL1200E

Disc diameter: 8"
Pad/sanding disc: hook and loop/16-hole
Motor: 10.9 amps
Drive: free-spin
Orbits per minute (OPM): 0 - 7,000
Orbit diameter: 5/16"
Dust collection: integral dust port
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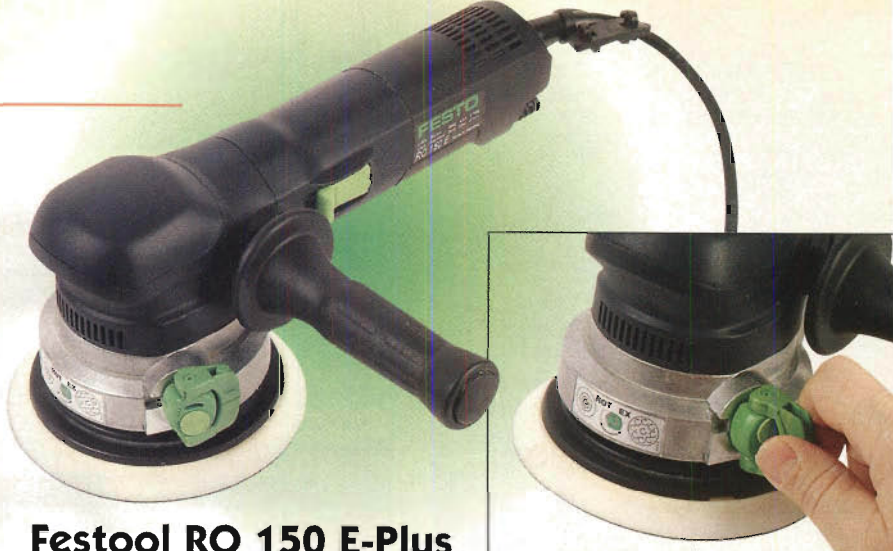
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carrying case which locks together with other systainers or to a Festool wheeled shop vacuum — very practical for storage or transport.

Like the Bosch, the RO 150 E-Plus has two drive modes for its 6" hook and loop pad, but is easier to switch over, thanks to its large (although somewhat stiff-turning) selector knob. In forced rotation mode, the Festool's sanding action was as aggressive as any other sander in the 6" group, somewhat surprising, considering that its orbit diameter is only 3/16". Unfortunately, at high sanding speeds, I found it took a bit of effort to keep the Festool's pad from juddering. The tool was very pleasant to use at lower speeds using the free-spin drive mode. Like the Bosch and Makita, the free-spin pad has a brake that slows it quickly upon power down. I liked the narrow profile of the motor housing, which is comfortable to grip, even by a small-handed user. However, I kept wanting to grip the sander's long body at the back end, which made operating its front/side mounted on/off switch awkward. I did like the Festool's variable speed control, which is located on a slanted section at the back of the motor housing, where it's easy to see and operate.

The RO 150 E-Plus features the unique and highly effective "JetStream" dust collection system, which uses an additional vent in the middle of the sanding disc to force dust toward the collection holes (Festool uses the same style of eight-hole discs as the Makita). The sander's dust port is located at the very rear of the motor housing, where the hose is much less likely to get in the way as compared to the front-mounted ports on the Bosch, Fein, and Makita sanders. If you connect the RO 150 E-Plus to one of Festool's shop vacuums, a metal



Festool RO 150 E-Plus

contact on the dust port grounds the tool via the wire-helix vac hose, to minimize annoying shocks from static discharge.

Makita BO 6040

A fairly recently introduced model, the 6" Makita BO 6040 has more features and refinements than older right-angle random orbit designs, like the Milwaukee and Porter-Cable. The BO 6040 uses a knob to select between aggressive sanding forced rotation or finer sanding free-spin pad drive modes, which I found easier to turn and set than the Festool's selector knob. The

Festool RO 150 E-Plus

Disc diameter: 6"
Pad/sanding disc: hook and loop/8-hole
Motor: 4.5 amps
Drive: free-spin with pad brake/forced rotation
Orbits per minute (OPM): 4,000 - 11,000
Orbit diameter: 3/16"
Dust collection: integral dust port
Weight: 5.06 lbs.
Street price: \$395
Phone: 888-337-8600
www.festool-usa.com

Festool offers a sleek, low-profile design with electronic variable speed control, built-in dust collection and selectable pad drive, shown above.

Makita's unique 6" backing pad has two sets of dust extraction holes that accept both six-hole and eight-hole hook and loop sandpaper discs. However, the eight-hole discs it uses are also unique to Makita and Festool and are different from more commonly available eight-hole discs used by other random orbit sanders. The Makita's built-in dust collection is nicely integrated into its head, but its small (5/8" diameter) dust port limited its effectiveness at sucking up its considerable dust output.

When it comes to performance, the Makita was hard to beat: at high speed, in forced rotation mode, it

Makita BO 6040

Disc diameter: 6"
Pad/sanding disc: hook and loop/6- or 8-hole
Motor: 6.6 amps
Drive: free-spin with pad brake/forced rotation
Orbits per minute (OPM): 1,600 - 5,800
Orbit diameter: 7/32"
Dust collection: integral dust port
Weight: 5.9 lbs.
Street price: \$320
Phone: 800-462-5482
www.makitatools.com

Makita's unique 6" backing pad has two sets of dust extraction holes that accept both six-hole and eight-hole hook and loop sandpaper discs.



Makita BO 6040

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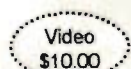
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sanded very aggressively, yet produced commendably little vibration and noise. Its free-spin mode sanded very smoothly but had one quirk: setting the variable speed control below half created a juddering

action that was hard to control. At 6.6 amps, the Makita is the most powerful 6" right-angle random orbit sander around, but it's also the heaviest sander among its 6" peers. But in this case, the tool's weight (and low profile) seem to be a good thing, serving to dampen vibration and help keep its pad flat on the work piece. Even though the Makita doesn't come standard with a side handle (it's an optional accessory), I found that I didn't miss it: Holding the tool by its rubberized gear case was very comfortable and afforded excellent control.

Porter-Cable 7336

Disc diameter: 6"
Pad/sanding disc: PSA*/no holes
Motor: 3.7 amps
Drive: free-spin
Orbits per minute (OPM): 2,500 - 6,000
Orbit diameter: 6"
Dust collection: optional dust hood
Weight: 5.75 lbs.
Street price: \$120
Phone: 800-487-8665
www.porter-cable.com

*Hook and loop conversion pad optionally available

Porter-Cable 7336



A dust collection kit with an easy mounting shroud and eight-hole backing pad is an added option for the Porter-Cable 7336.

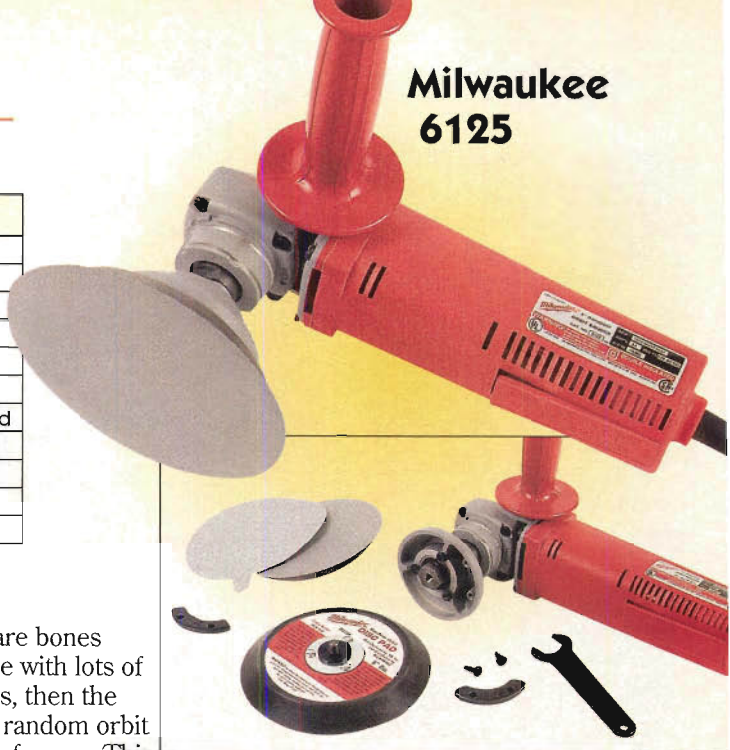
Milwaukee 6125

Disc diameter: 5"
Pad/sanding disc: PSA/no holes
Motor: 5.5 amps
Drive: free-spin
Orbits per minute (OPM): 10,000
Orbit diameter: 5/32"
Dust collection: optional dust hood
Weight: 5 lbs.
Street price: \$168
Phone: 800-729-3878
www.milwaukeetools.com

Milwaukee 6125

If you prefer a bare bones machine over one with lots of bells and whistles, then the Milwaukee 6125 random orbit sander is the one for you. This well-built American-made machine doesn't offer variable speed, built-in dust collection, or a selectable drive mode, and its freewheeling pad lacks a pad brake. Like the Porter-Cable, the Milwaukee comes with a PSA backing pad; great for production work, but not as convenient as a hook and loop pad when you need to change paper grits often. Dust control on the 6125 is optional, but requires you to buy not only a dust shroud, but an optional backing pad with dust extraction holes. On the plus side, the 5" Milwaukee easily converts to a 6" model, via an optional conversion kit that includes the larger backing pad and necessary counterweight. It also has a nice push-button arbor lock to make pad changes easier and a side handle that mounts in

Milwaukee 6125



The 5" Milwaukee easily converts to a 6" model, via an optional conversion kit that includes the larger backing pad and necessary counterweight.

three positions, rather than just right and left, as with the other right-angle models.

Thanks to its ample 5.5 amp motor, the Milwaukee dished out relatively good power and sanded with gusto when fitted with either coarse- or fine-grit discs; better than I expected, given its relatively small 5/32" diameter pad orbit. But the tool also generated quite a lot of vibration, especially with the pad lifted off the work, as commonly done when starting and stopping the tool. The 6125's high profile made controlling the sanding disc a bit more of a challenge than I would have liked.

And while I liked the position of the 6125's paddle-style on/off switch, located on the underside of the rear of the body, the switch's hard edges dug into my fingers. Further, it doesn't lock on like the switches on all the other models, which means you have to hold it the entire time you're sanding — pretty unacceptable in my book.

Porter-Cable 7336

Solidly built and pleasant to operate, the Porter-Cable 7336 is like the Milwaukee in terms of design and features:

It lacks built-in dust collection or selectable pad drive, and comes with a PSA-type backing pad (6") that lacks dust-extraction holes; a dust collection kit with an easy mounting shroud and eight-hole backing pad is an option. Unlike the Milwaukee, the 7336 does have variable speed control that lets you dial down the OPM to match the job. Porter-Cable also offers a few handy accessories for their sander, including a backing pad conversion kit that makes the PSA pad "hook and loop ready," and a polishing bonnet for rubbing out paint and clear finishes, or waxing your car.

In the workshop, the Porter-Cable exhibited middle-of-the-pack performance, but I found it easier to control and less vibration-prone than the Milwaukee or DeWalt. Like all the other variable speed sanders, setting the dial to one-third below the highest OPM made the tool sand less aggressively, but also made it more prone to juddering — a light touch is required.

These big sanders are
so good at what they
do that they make working
with smaller random orbit
models feel more like you're
massaging the wood, rather
than abrading it.

Conclusions

Now that the dust has settled, I can say that, despite the many differences between these eight sanders, most models could serve you reasonably well, depending on your budget and the kind of work you wish to do. If you're cash-constrained and need a basic right-angle random orbit for production work, or the occasional heavy sanding job, I'd choose the well-priced Porter-Cable 7336. Although it lacks features, it's still powerful and sturdy enough to get the job done. For a hobbyist or advanced amateur who intends to use a right-angle model as your only random

orbit sander, my choice would be the Makita BO 6040, which is the most comfortable performer of the bunch. For a professional who expects a tool to stand up to rigorous daily duty, I'd definitely consider spending the extra money and buying the impressive Festool RO 150 E-Plus. Or, if REALLY big jobs

are a common occurrence in your shop, (like smoothing and refinishing the brightwork on cabin cruisers), then I'd step up to the massive Fein MOL1200E. It's an industrial strength tool that packs the promise of years of dust-churning performance without fail. Regardless of which right-angle random orbit sander you choose, make sure to keep both hands on the machine at all times — you don't want all that power and ability to lead you astray.

Sandor Nagyszalanczy is the author of Power Tools: An Electrifying Celebration and Grounded Guide from Taunton Press.

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Originally, said Sears representative George Gibson, the fence was extruded aluminum: the new components make it much smoother and more rigid, contributing to its accuracy. Also contributing to the increased accuracy of the saw is a T-system fence where the 40" rip fence clamps only to the front rail. The 3 HP, 3,400 rpm saw features a "key lock" feature: "like a back door key to a house," George said. Using the key, it's possible to lock the saw's power and prevent it from reaching the switching system — thus preventing unauthorized use of the saw.

Weighing in at 717 pounds and running on 230 single phase volts, this saw is only available through Craftsman's catalog, not in its Sears stores, and sells for \$1,600. *For more information, call 800-377-7414 or visit their web site at www.sears.com/craftsman.*



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Besides the Vac-U-Clamp kit, which sells for \$150 through U.S. distributor Rockler Woodworking and Hardware (www.rockler.com), you can also buy additional modules, useful for larger pieces. These sell individually for \$40. For more information, call 888-342-8262 or visit www.vac-u-clamp.com.

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Take Note of Tiny Clamps

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The Vacuum-Base Spring Clamp is available in five colors: red, yellow, blue, green and black. *For more information, call 630-773-4777 ext. 240 or visit www.wolfcraft.com.*



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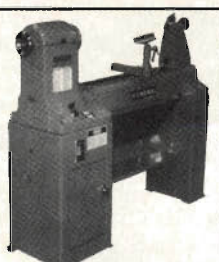


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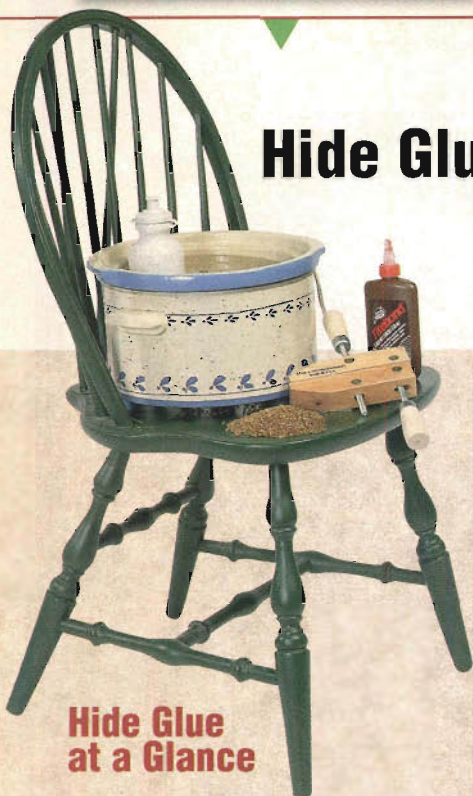


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Hide Glue: A High-tech Antique...

By Michael Dresdner



Hide Glue at a Glance

- **Extremely strong**
- **Fast-setting**
- **Gap-filling**
- **Glues end grain**
- **Transparent to solvent-based finishes**
- **Compatible under all finishes**
- **Takes dye stain**
- **Sticks to itself**
- **Reactivates with heat**
- **Easily reversible**
- **Hygroscopic, so it moves with the wood**
- **Natural, non-hazardous, biodegradable, organic**
- **Clampless joints possible**
- **Won't creep**
- **Squeeze-out can be cleaned off with water**
- **Washes out of clothes**
- **Doesn't clog sandpaper**

If you believe the test of time proves the value of a material, then put your trust in hide glue. Archeologists have found 8,000-year-old artifacts held together with this animal protein glue, and the earliest record explaining how to make and use hide glue appeared 4,000 years ago. It's been favored by furniture and violin makers throughout history, and for good reason. Hide glue is strong, versatile, reversible, convenient, and has oodles of qualities that make it ideal for woodworking in all eras.

What It Is and How It Works

As its name implies, hide glue is a protein-based adhesive made from the hides, or skins, of animals, along with other connective tissue, like tendons. It is not, as urban lore has it, made from horses' hooves. Rabbit, fish, horse and pig skin are all used, but most of our glue comes from cow hides, which are plentiful because we raise and eat so many cows. As such, it is a renewable resource that is non-hazardous, nontoxic, and biodegradable. You can toss leftover or unusable glue onto the compost pile. One friend of mine even lets his dog eat it.

Hide glue is rated in "gram strength," a measure of how quickly and solidly it forms a gel. This has little to do with joint strength: all glues are stronger than the wood they bond. Higher gram strength glues have a higher molecular weight, a higher viscosity, and set up or gel faster. Lower gram strengths offer longer working time, and a slight increase in flexibility. You can buy hide glue in gram strengths from 80 to 512, but woodworkers generally use 192

or 251. Milligan and Higgins (www.milligan1868.com), in business since 1868, is the only company in North America that makes hide glue, but many sources re-sell it. They also make a closely related product, edible gelatin, which is essentially highly refined hide glue.

Characteristics

Hide glue makes an incredibly strong, rigid, shear-resistant bond that will not creep or move over time. (A spindle or stretcher pulling out of a mortise is a good example of shear.) It bonds wood, fabric, paper, leather, pearl, tortoiseshell, and even metal. (To bond metal, clean its surface first with vinegar.) Glue spots usually don't show under clear finishes, and even dried glue can be colored with dye stain. It is gap-filling, making strong bonds on joints with up to .030" spaces, and works under all finishes. You can scrape, chisel, or sand off dried squeeze-out — it won't clog sandpaper — or scrub it off with a toothbrush and warm water. It even glues end grain, making it perfect for miter joints, and you can make a strong "rubbed" joint without clamping. (For secure end grain and miter joints, apply warm water to both faces of the joint immediately before applying hot hide glue.)

Hide glue is indefinitely reversible with heat, hot water, or steam, a handy trait if you must reposition and reglue a part. It's the only glue that sticks to itself and renews itself. If you reglue an old chair or drawer assembled with most adhesives, you must remove all glue residue to get a good bond. But if it was assembled with hide glue, you can reactivate the old glue with hot water, add

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An electric glue pot can be used to heat hot hide glue, and a bristle brush to apply it. Granules and water are mixed to create a gel.

extra fresh hot hide glue, which sticks to itself to form a secure bond, or "crack" the glue joint by injecting alcohol into it. Got a bubble in a veneer? Slice it open and iron it back down. Heat (160° F) will reactivate hide glue. Some woodworkers apply hide glue to both the veneer and the substrate, let it dry, then iron it on. As an added bonus, hide glue will wash out of your clothes if you soak them first for an hour in cold water. That's a tip-off to its one weakness: hide glue is not waterproof, so don't use it for exterior projects or kitchen cutting boards.

Hot Hide Glue vs. Liquid Hide Glue

What we call hot hide glue is typically sold in dry, granular form. You add water, let it sit until it turns into a gel, then heat it to create a syrupy liquid. It must be kept at 140° F while using it, creating the need for some sort of glue pot. Liquid hide glue is the same material with urea added so that it remains liquid at room temperature and does not need to be heated.

Both go through the same stages to form a bond. They start as a liquid, convert to a gel, then dry to a solid. The joint must be formed while the glue is in the liquid stage, before it gels. Hot hide glue gels in five minutes or less (depending on the temperature of the wood and the room), can be machined in four hours, and is fully cured in about 12 hours. Liquid hide glue gels in a half



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HEY! What's the difference?

I am a beginner woodworker with some big questions regarding finishing. Before I go much further down this finishing road, I need to find out the differences in the various clear coats available and get "clear" on their suggested uses and applications. On the few projects I've done, I've tried tung oil, wax and polyurethane. After the the clear coats are ready for use, I find that I really can't tell the difference.

Shannon Stineburg
Beale Air Force Base, California



The primary differences in finishes revolve around how easy they are to apply, how durable the film is, their color, and how they affect wood's appearance. For example, some finishes bring out depth and figure in wood more than others. What you need is a scorecard that shows common finishes along with their characteristics, and their solvents. The chart below should help.

— Michael Dresdner

	Ease of application	Durability	Color	Enhances Depth	Thinning/Cleaning Solvent
Wax	easy	poor	clear to amber	no	mineral spirits
Oils (Danish, tung, linseed)	easy	fair	amber	yes	mineral spirits
Shellac	moderate	good	light amber	yes	denatured alcohol
Lacquer	moderate	very good	light amber	somewhat	lacquer thinner
Catalyzed lacquer	difficult	excellent	light amber	somewhat	specialty thinner
Varnish	moderate	very good	amber	yes	mineral spirits
Oil-based polyurethane	moderate	excellent	amber	somewhat	mineral spirits
Waterbased polyurethane	moderate to difficult	very good	clear	no	none/ammonia in water

hour or longer, giving you much longer open time for complicated glue-ups. It can be machined after 12 hours, but does not reach full cure for several days. Like anything waterbased, cure time depends on temperature and humidity.

Mixing and Using It

Mix hot hide glue by adding a cup of glue granules to a cup of water, then let it sit for 30 minutes or longer. It will swell and turn into a gel. Heat it to 140° and it should be a syrupy liquid. Add more water if it's too thick or more glue granules if it's too thin — or simply heat it with the top off until some water evaporates. At the end of the day, refrigerate leftover glue to prevent mold growth. It can be reheated and reused for about a week.

Traditionally, woodworkers used glue pots to heat the glue, and bristle brushes to apply it. Electric glue pots cost about \$100 and must be cleaned regularly. Here's a cheaper method that includes a handy dispenser bottle. Mix glue and water (1/2 cup of each) in a plastic picnic ketchup dispenser or plastic squeeze bottle. Let it gel, then heat the dispenser in a slow cooker filled with water and set on "low." Use the dispenser as you would any glue bottle, but return it to the hot water after each use. Wear a leather glove on one hand — the bottle will be hot. Each night, turn off the slow cooker and store the glue bottle in the refrigerator.

Hide Glue: A Must-have

Hot hide glue can be modified with additives to change some of its traits, used to make a crackle finish or as a sealer on end grain to prevent excess stain absorption. As you might have guessed by now, in my opinion, no shop should be without it.

Contributing editor Michael Dresdner is a nationally known finishing expert and author. His latest book, *The New Wood Finishing Book*, is available from Taunton Press.

August 2003 Woodworker's Journal



Winner! For simply sending in the question on clear coats, Shannon Stineburg of Beale Air Force Base, California, wins a complete ZAR® Wood Finishing Kit shown at left. Each issue we toss new questions into a hat and draw a winner.

IT WILL DRILL THROUGH WOOD, CONCRETE AND TIME.

Scared to go into the basement? Is it only fit for habitation by cardboard boxes, cobwebs and the outdated washer and dryer? Obviously, you need to do something about it. If only there were time, right? Well, here's a way to find some. First off, you'll need materials:

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into harder substances. In other words, the walls will surrender long before your hand will. Speaking of giving up, you'll be a long way into screwing the drywall or wood paneling into the studs before the

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your pilot holes stay on the straight and narrow, too.) But anyone who has worked with concrete or stone foundations will tell you, it doesn't give up easy. No, far from it. But that's okay. The cushioned pistol grip dampens the vibration caused by drilling

going to do with all this time you just saved? Perhaps spend it in your now newly renovated basement, excuse us, family room, watching the game? The new line of Craftsman EX drills. Find them at Sears, Sears Hardware Stores, online at craftsman.com or call 800-437-9686. You'll find it well worth your time.

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