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#109 September 2004

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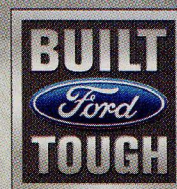
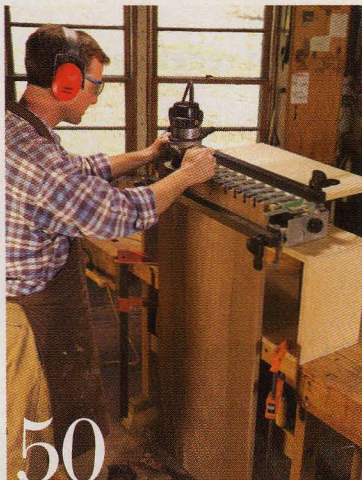


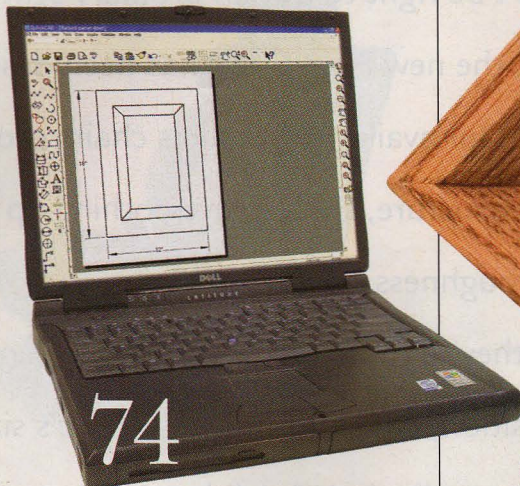
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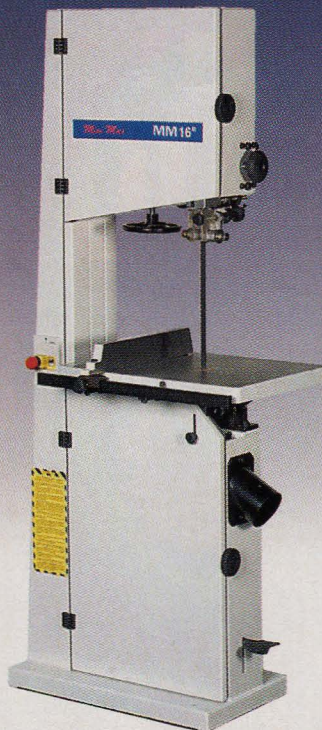
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Circle No. 24

AMERICAN WOODWORKER

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QUESTION & ANSWER

by Dave Munkittrick

SHARPENING CURVED SCRAPERS

Q I'm struggling to get a good cutting edge on my concave card scraper. Any tips?

A Here's the inside scoop on those inside curves. It's a lot easier to get good results if you concentrate on creating a hook on one side only.

Here's how it works: Start by creating a slight bevel on the edge (Photo 1). Then remove the wire edge (Photo 2). Finally, use your burnisher to roll the cutting hook (Photo 3).

For more details on sharpening a scraper, see "Foolproof Scraper Sharpening," AW #102, September 2003, page 63.

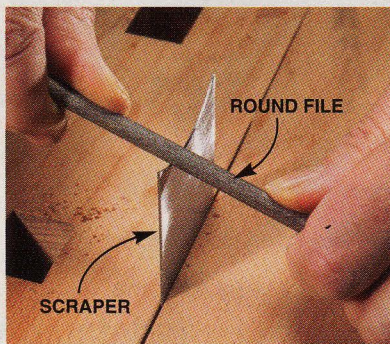
Sources

Woodcraft
(800) 225-1153,
www.woodcraft.com
Crown Round Scraper Burnisher,
#14256, \$19
Diamond Honing Stick,
#O8S15, \$6.

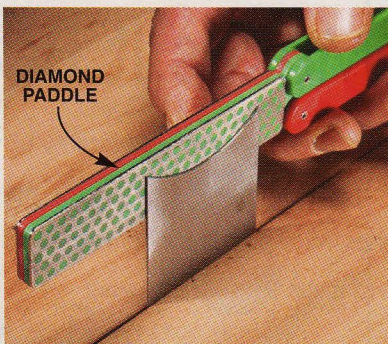
Hardware store
Chainsaw file, \$3.



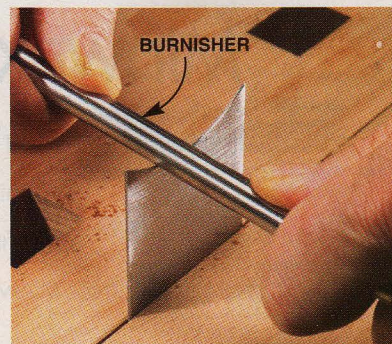
RAMON MORENO



1 File a slight bevel on the curve. With the scraper held in a vise, push a chainsaw file at a slight angle until you feel a continuous wire edge on the high side of the bevel.



2 Remove the wire edge with a super-fine diamond paddle. Because you have created a beveled edge, the wire edge will only form on the high side of the bevel.



3 Use a burnisher to roll the edge and create the cutting hook. Hold the burnisher almost flat and use firm pressure to form the cutting hook. A drop or two of light machine oil helps.

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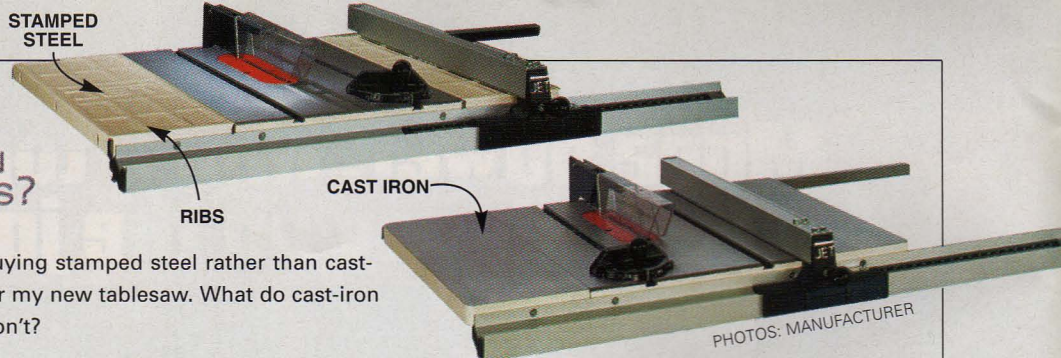
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QUESTION & ANSWER

SHOULD I SPEND MORE MONEY ON CAST-IRON WINGS?

Q I can save money by buying stamped steel rather than cast-iron extension wings for my new tablesaw. What do cast-iron wings offer that steel wings don't?



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DeWALT

A. Over the long haul, you'll find that cast-iron wings have at least four valuable benefits that are worth the extra money.

First, a cast-iron wing is much more rugged and is more likely to remain flat after years of use. You can inadvertently bend a steel wing by grabbing it when you move your saw or by dropping something heavy on it, such as a full sheet of plywood.

Second, a cast-iron wing adds about 25 lb. to the top of your saw table. That additional mass helps soak up vibration. Two wings are even better.

Third, a cast-iron wing provides a dead-flat surface that's useful even when the saw isn't running. An unplugged tablesaw makes a great assembly table, and a single cast-iron wing adds almost 50 percent more flat surface area to the main table. The ribbed surface on a stamped steel wing is anything but flat.

Fourth, believe it or not, a cast-iron wing is a convenient surface for sharpening tools. Simply attach some sandpaper with low-tack spray adhesive. The wing is flat, rock solid and more accessible than the main table—perfect for lapping the backside of chisels and plane irons.

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

Circle No. 9

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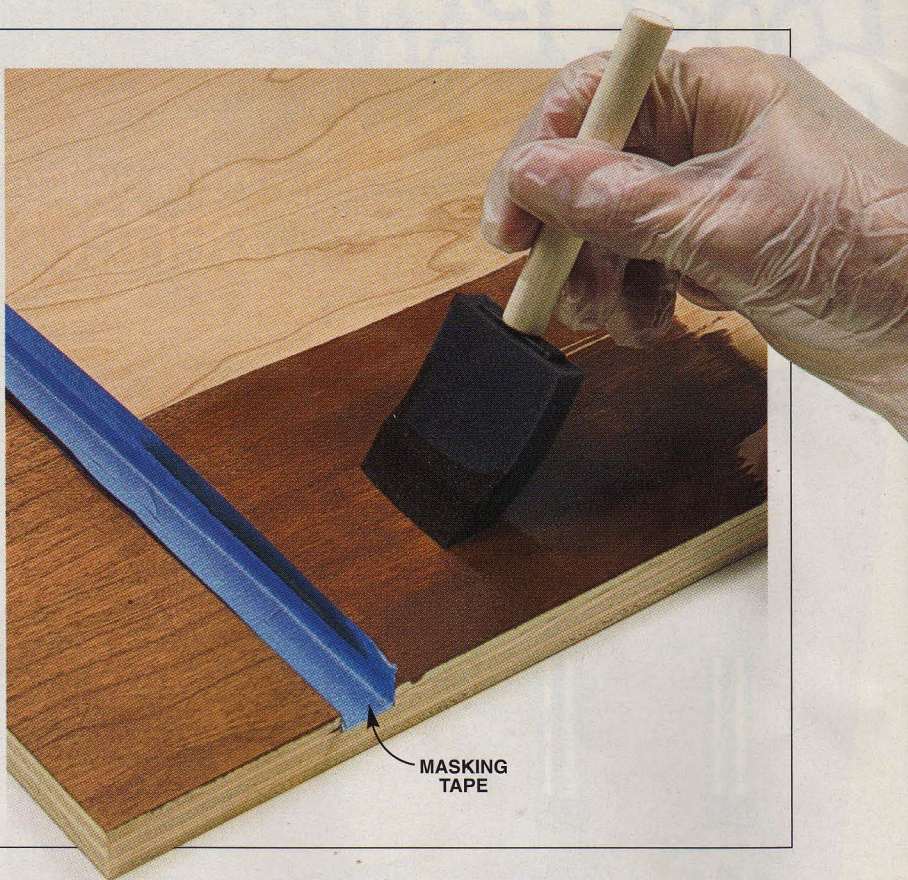
Circle No. 2

A LITTLE TAPE IS ALL YA NEED

Q Finishing cabinet parts before assembly makes a lot of sense to me. Will stain in the joints cause problems with glue adhesion?

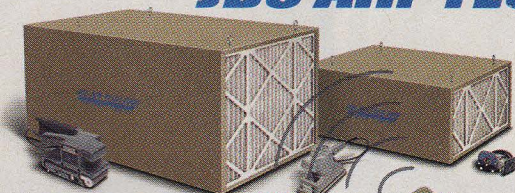
A. Yes, it will. Stain seals the wood and prevents the glue from penetrating. Wood glue must penetrate the wood fibers to create a strong bond. Prestaining is still a great idea though, if you protect the glue joints from contamination.

Simply push masking tape into the bottom of the dados and rabbets. Then wrap the last 1/4 in. of each shelf that gets housed in a 3/8-in.-deep dado. Blue painter's tape is a good choice because it can be left on for long periods of time and still be easily removed. **AW**



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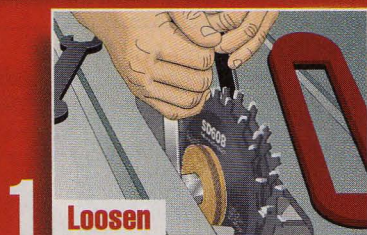
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Freud's innovative adjustable-hub design not only eliminates the need for shims, but allows you to fine tune the width of the dado without ever removing the dado cutter from your table saw. No more wasted time making adjustments and re-adjustments. A simple click of the dial ensures accuracy the first time.

Flawless Finish

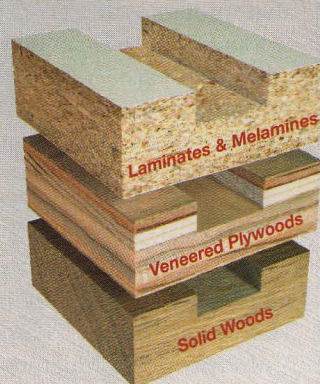
The SD608 features the same premium materials and quality as all of Freud products. The blade bodies are laser cut for extreme accuracy, and the precision-ground arbor holes ensure precise blade alignment on any table saw. The MicroGrain carbide is manufactured specifically by Freud for splinter-free, flat-bottom grooves in all materials—including problem materials like veneered plywood or melamine.

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THE WELL-EQUIPPED

CUTTING-EDGE SLIDING MITER SAW

Have you seen the light yet? Laser light, that is. Lasers make miter saws safer and more accurate. They've been appearing on miter saws for some time, but getting one on a sliding miter saw is news. The C10FSH 10-in. dual-bevel sliding compound miter saw from Hitachi, \$500, is one of the latest entries into laser-guided cutting.

On this saw, the laser line can be cast down the blade's left or right side, it's very easy to fine-tune for accuracy and it works no matter what angle or bevel you're cutting. The line is narrow and crisp, making it easy to align with your pencil mark. The laser has its own switch so it can be turned on or off as needed. This allows you to use the laser to set up the cut without running the blade, which some other saws require.

This saw is an improved version of the tried-and-true C10FS. Its dust collection is excellent. The angle scale is easier to read and locks in place with a solid click. The fence is taller, so it's easier to handle crown molding. Dual-bevel means the head tilts either left or right. Boy, does that simplify cutting compound angles! A good hold-down clamp is included with the saw.

The C10FSH has a 12-amp motor with soft start and electronic speed control. Soft start gently ramps up the motor to full speed so it doesn't feel as though the handle is being ripped from your hand. Electronic speed control helps the blade maintain rpms under a cutting load.

This machine is comparably priced with other dual-bevel sliding compound miter saws, even those without lasers.

Source

Hitachi, (800) 829-4752, www.hitachi-powertools.com
C10FSH Sliding Compound Miter Saw, \$500.

LAGUNA ANNOUNCES WINNERS

Hats off to Laguna Tools, which marked its 20th anniversary by recognizing and rewarding 10 schools that promote the craft of woodworking. The competition had two categories: excellence in woodworking projects and greatest need for woodworking tools. Winning schools received prizes of Laguna tools valued from \$2,500 to \$29,500.

In the category for excellence in woodworking projects, the first-place winner is Cedar Ridge High School, Hillsborough, N.C. The second-place winners are the University of Washington-College of Architecture and Urban Planning, Seattle, and Central Valley High School, Shasta, Calif. And placing third are Marshfield High School, Marshfield, Mass., and Maine College of Art, Portland, Maine.



First-place winner for excellence in woodworking projects, Cedar Ridge High School, Hillsborough, N.C.

Winners in the greatest-need category are Perryton High School, Perryton, Texas; Peshtigo Middle/High School, Peshtigo, Wis.; East High School, Denver; Kellogg High School, Kellogg, Idaho; and Freehold Township High School, Freehold, N.J.

Congratulations to the teachers and students in each of these programs.

PHOTO: MANUFACTURER

by George Vondriska

WOODEN NAILS

What do you get if you add the ease of a screw to the strength of a dowel? The Miller Dowel. The system is inexpensive and easy to use. Just drill a hole, glue and drive a peg, and cut or sand it flush.

The Miller Dowel is a highly engineered peg that does more than simply dowel the joint together. It acts like a nail or screw, drawing the parts together as you tap the Miller Dowel into place. Steps are the key: The dowels are stepped, and the TruFit bit used for predrilling is stepped to match.

What makes the Miller Dowel work so well is the relationship between the steps on the drill and those on the dowels. The parts are machined so the shoulder on the top will bottom out before the rest of the steps do. As you tap the head with a mallet, seating the dowel, you are actually drawing the parts together, just as the head of a nail or screw would. The dowel's ribs provide some bite into the joint and also expose end grain on the dowel. The end grain absorbs moisture from the glue, causing the dowel to swell inside the hole. The bottom portion of the predrilled hole automatically ends up deeper than the dowel is long, creating a pocket for excess glue. The steps also allow the dowel to be pushed far into the hole before making contact. This prevents glue from being squeezed off the dowel and onto the face of your work. Finally, the steps make it very easy to drive a long dowel into a perfectly fitted hole—something that's very difficult to do with straight dowels.

The most cumbersome aspect of using this system is clamping all the parts together for drilling, but you would run into the same problem using screws. The Miller Dowel is designed for butt or lap joints where you might otherwise use screws and plugs. It's great that the holes are automatically plugged, but unlike custom-cut plugs placed over screws, the Miller Dowel leaves end grain exposed instead of face grain, which will finish differently than the surrounding wood. Predrilling can be done using a hand drill. In fact, holes drilled at a slight angle, a common side affect of hand-

held drilling, create a toenailed effect that helps hold the parts together.

Miller Dowels are available in three sizes, the Mini-X designed for 1/2-in. material, 1X for 3/4-in. material and 2X for 3/4- to 1-3/4-in. material. Each size requires its own drill bit. The dowels can be purchased in a variety of species, including birch, cherry, walnut, oak, ipe and teak. Ipe and teak are excellent choices for an outdoor project. Prices vary depending on the dowel species.

Source

Miller Dowel Co., (866) Wood-Peg, www.millerdowel.com

Miller dowels:

Mini-X dowels, birch, 100 for \$14

1X dowels, birch, 40 for \$9

2X dowels, birch, 40 for \$11

Mini-X TruFit bit, \$10

1X TruFit bit, \$17

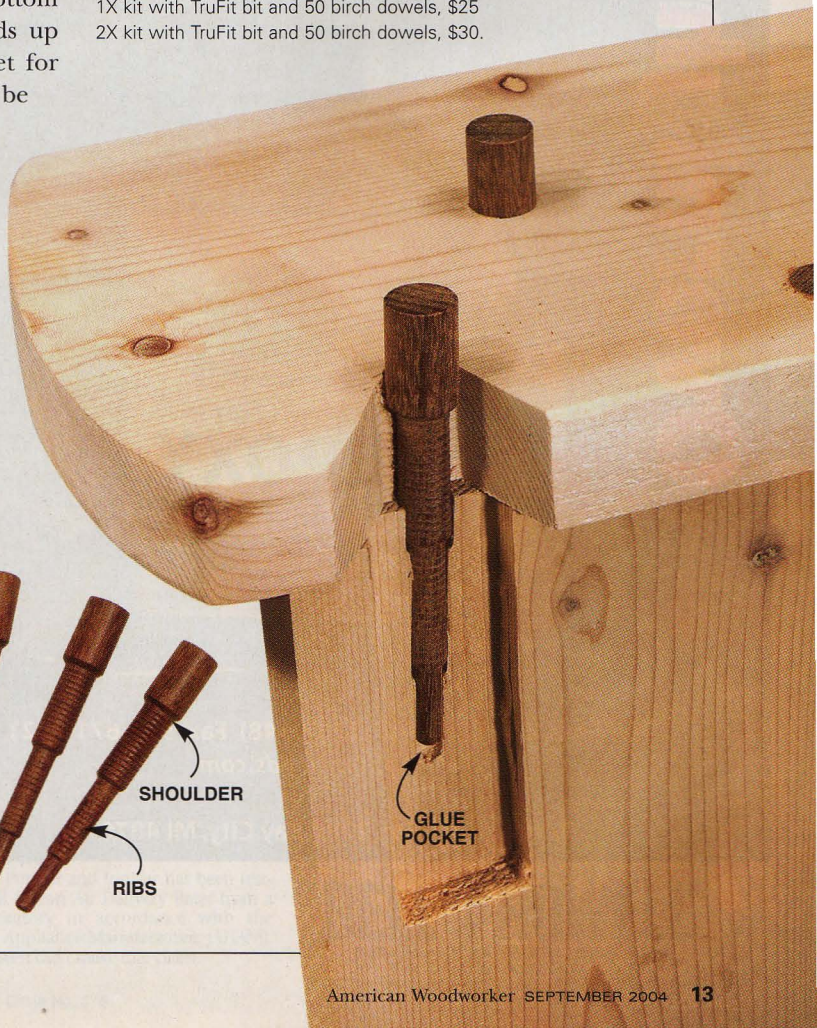
2X TruFit bit, \$18

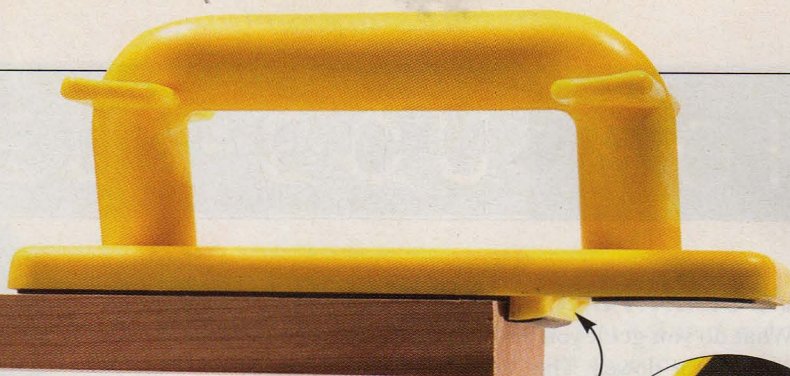
Kits:

Mini-X kit with TruFit bit and 100 birch dowels, \$23

1X kit with TruFit bit and 50 birch dowels, \$25

2X kit with TruFit bit and 50 birch dowels, \$30.



RETRACTABLE
FOOT

VERSATILE PUSH BLOCK

One of my woodworking rules is start with 10 fingers and quit with 10. So I'm big on push blocks. They protect you from putting your pinkies somewhere you shouldn't. Sometimes you need a flat push block that can be plunked down in the middle of a board for downward pressure, for instance, when you're cutting dados. Sometimes you want a push block with a foot on the back that will capture the end of the material, like when you're face-jointing. Now you can get both uses out of one tool with the Joy Block from Woodworker's Supply, \$13.

The foot in the Joy Block pad is spring loaded. When the block is used in the middle of a board, downward pressure on the handle compresses the spring so the foot recesses into the pad. When pressure is released the foot springs out, where it can engage the edge of a board. Four thumb supports are molded into the handle, so no matter how you're holding the block, there's a place to rest your thumb, providing greater control of the material.

Source

Woodworker's Supply
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Joy Block, \$13.

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Never buy replacement filters again

The Bell+Howell® Air Purifier and Ionizer uses a permanent filter, which is easy to clean and never has to be replaced. Air cleaners that don't use filters can create their own pollution. Interior parts that collect the dust have to be removed and scrubbed, and some of that gunk winds up on your walls and furniture!

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The Bell+Howell® Air Purifier and Ionizer uses only 14-24 watts, less electricity than a 60-watt bulb! So why pay hundreds of dollars for an ionizer when you can get a combination ionizer & filtration air cleaner for so much less?

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Source

Dynapaq, (312) 924-3499, www.dynapaq.com
Safetypaq, \$40.

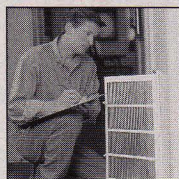
A NEW CASE FOR SAFETY

You can't use your safety glasses and earplugs if you can't find them. The new Safetypaq, \$40, includes earplugs, work gloves and *two pairs* of safety glasses in a convenient case that keeps your safety gear dust free.

The ANSI-approved safety glasses are a comfortable face-fitting style. One pair of glasses is clear for indoor work; the other is tinted for working outside. They even look cool, designed with one-piece wrap-around lenses. The earplugs come in their own case and include a neck cord. The finger-fitting, high-dexterity gloves are more like a second skin than a pair of work gloves. You shouldn't wear them when working on power tools, but they're handy for staying splinter-free when unloading lumber.

The Safetypaq case is divided inside, so there's a compartment for each piece of gear. It also has a carrying handle, a hole for hanging the case on a hook and magnets on the back so you can stick the case to a metal cabinet, like the side of your table saw. If you can't keep your safety gear close by with all those storage options, you just aren't trying. **AW**

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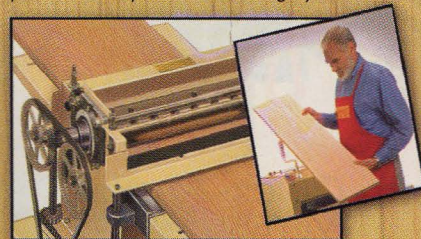
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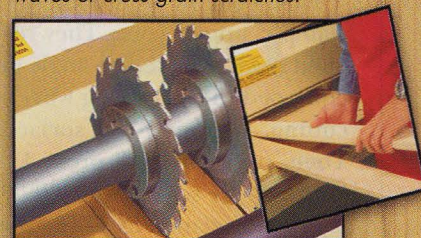
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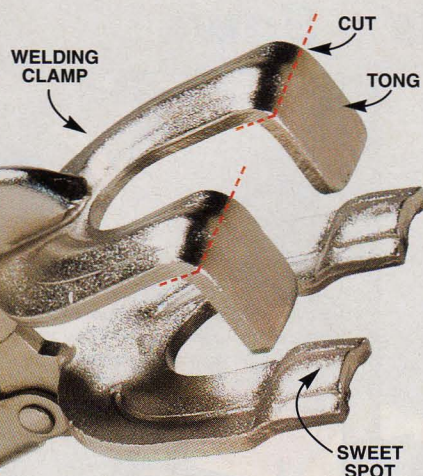


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edited by David Olson



QUICK-ACTION MITER SAW STOP

I got tired of clamping a block to my miter saw fence every time I wanted to make a stop cut, so I made this adjustable quick-action stop. Unlike a spring clamp, once this baby's clamped to the saw fence, it stays put!

My stop is based on a locking welding clamp I found at the hardware store for about \$24; imported knock-offs cost a lot less (see Source, below). This weird-looking clamp has adjustable jaws and locks just like vise-grip pliers do.

First, I cut the front tongs from the clamp's upper jaws. They're hardened steel, so I used an angle grinder equipped with a cutting wheel. After cutting, I ground the surfaces flat. Then, using my drill press, I drilled holes for the screws.

For the clamp to work, the stop board must be $\frac{3}{8}$ in. taller than the fence, because the clamp's lower jaws have an offset "sweet spot." Before mounting the clamp, I notched the stop board's bottom corners to prevent sawdust buildup.

Dave Youngren

Source

Northern Tool & Equipment,
(800) 221-0516, www.northerntool.com
Welding clamp set, #15014, \$15.



SCRAPER WALLET

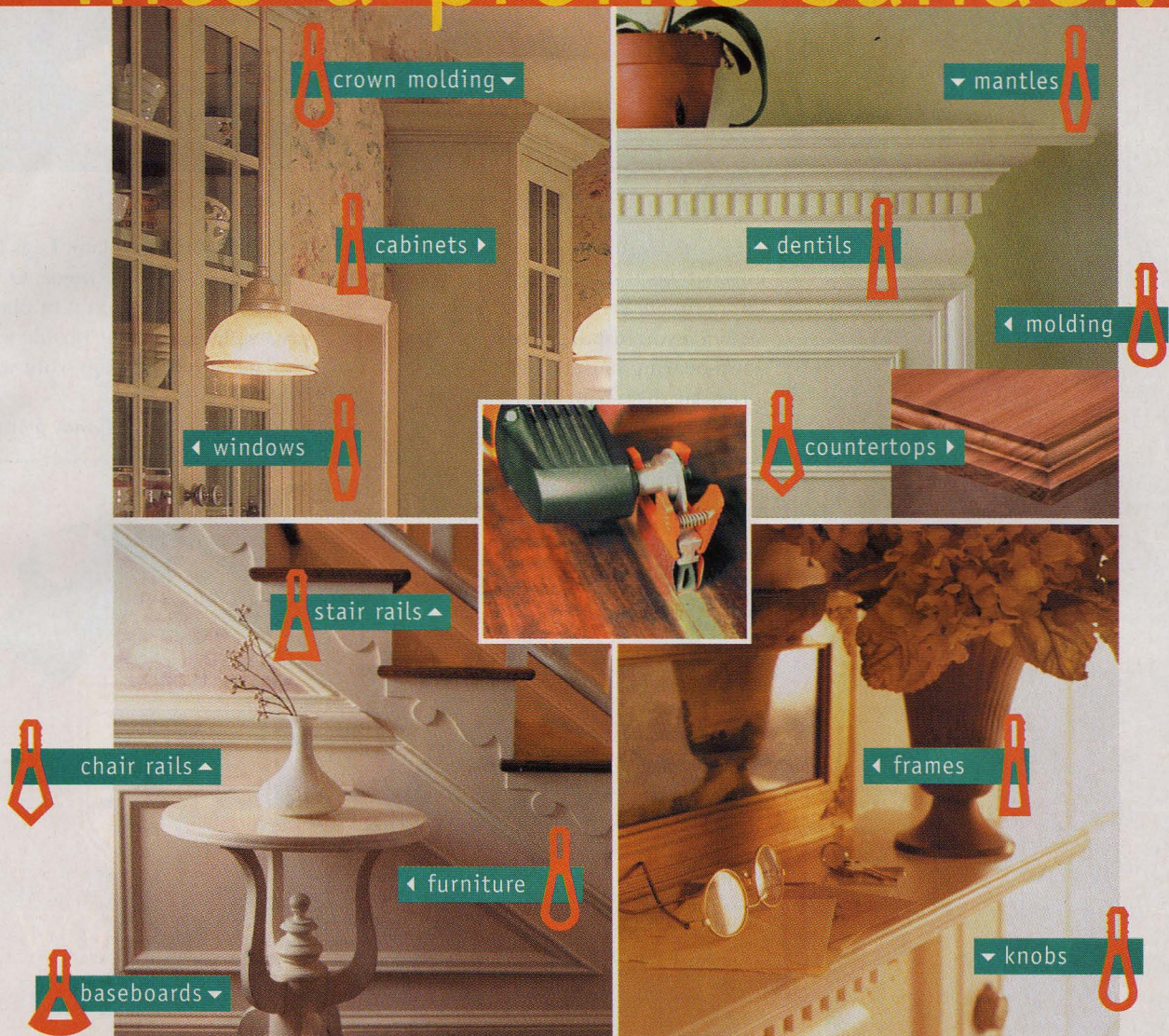
I love to use card scrapers for removing chatter marks, tear-out and any other smoothing that requires a delicate touch. Trouble is, they get dinged up in my toolbox.

When my wife bought herself a new leather wallet, I immediately snatched her old one. The leather compartments are perfect for storing and protecting my scrapers.

Gary L. Curry



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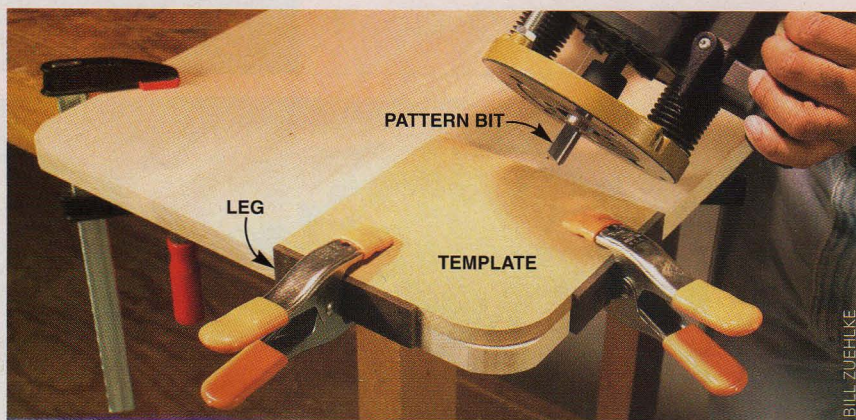
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WORKSHOP TIPS

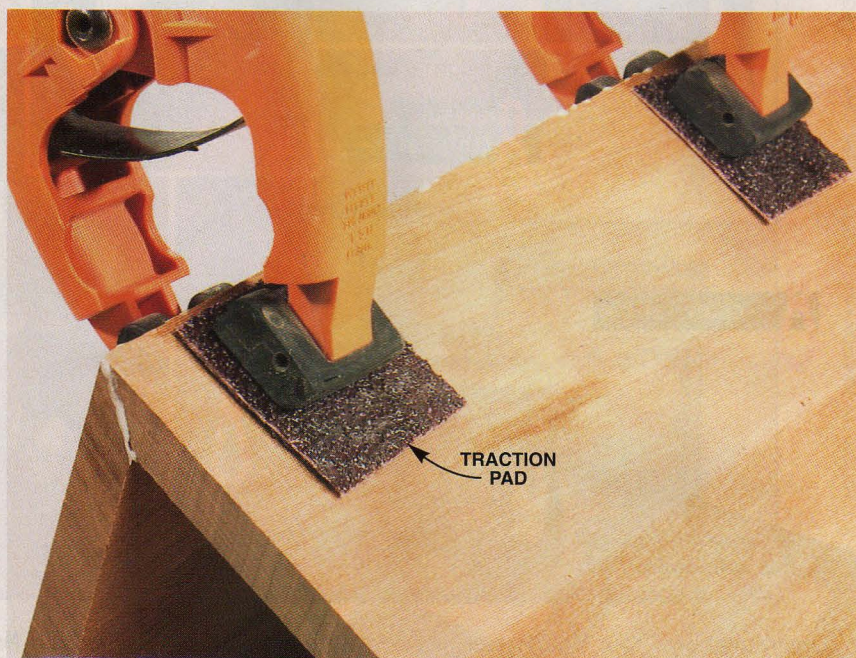


ROUNDED CORNERS IN A JIFFY

Getting rounded corners that match is a cinch with this template. Legs fastened to both sides automatically center the template on the workpiece. Once the template is in position, only spring clamps are needed to hold it in place.

When you install the template on top of the workpiece, rout the profile with a top-bearing pattern bit. If you install the template on the bottom, rout with a regular flush-trim bit.

Randy Johnson



CLAMP TRACTION PADS

My spring clamps wouldn't work on an acute-angle joint I needed to clamp. Even though their jaws had swiveling pads, the clamps just slipped off.

Nothing worked to hold the clamps in place until I made my own traction pads by gluing strips of coarse abrasive together back to back. When the glue was dry, I cut the strips into squares and stuck them between the clamp pads and the wood.

Jay McClellan



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Bob Newman



RUBBER BAND



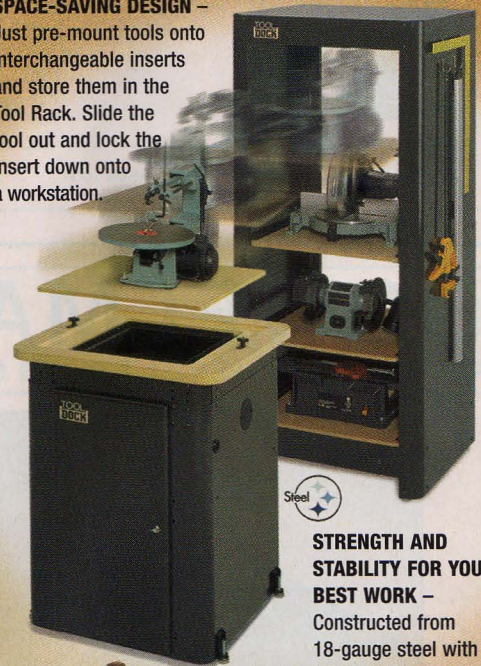
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ROUT NARROW STOCK WITH EASE

Since I don't have a router table, routing narrow stock is doubly tough. First, it's hard to hold the stock in position. Second, it's virtually impossible to balance the router as I rout.

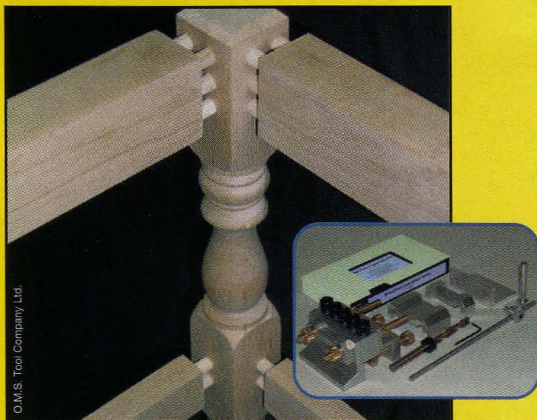
My system solves both problems. I use a notched board to hold the narrow stock and an outrigger to stabilize the router. Routing presses the stock securely against the notched board, which is clamped to the bench. The outrigger is simply an offcut of the narrow stock, screwed to the router base. I just replace one of the base's mounting screws with a longer one.

I make sure the surface the outrigger will ride on is smooth and clear of debris and I stop routing about 1 in. away from the notch.

Jim Vasi

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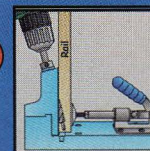
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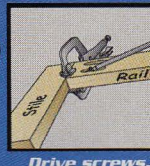


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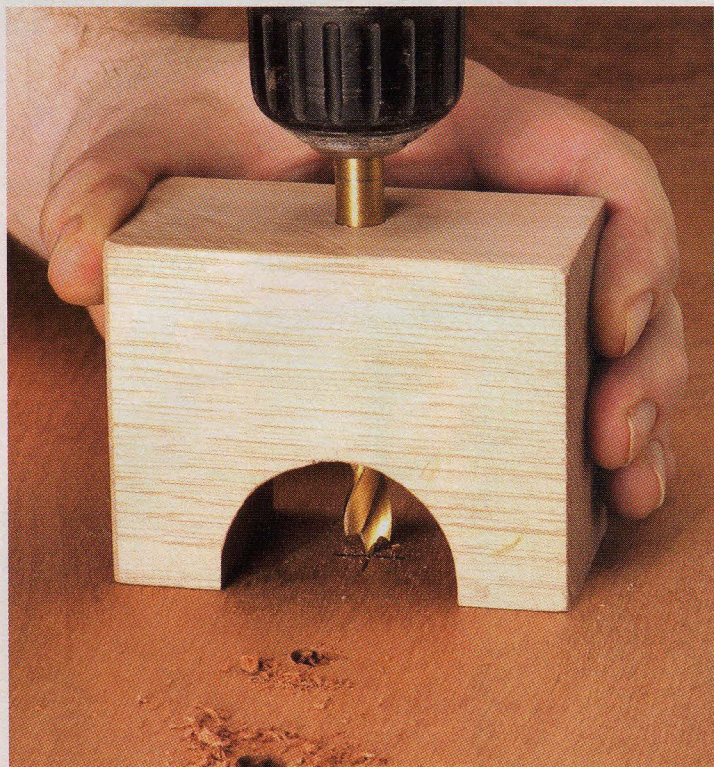
"...the unit's performance is exceeding my wildest expectations. It was significantly quieter than my old 16 gal. shop vac. Pick up performance is tremendous. There is no doubt in my mind that I made the right decision in choosing Oneida over the other cyclone systems currently on the market. I couldn't be happier with it's performance. It is obvious that the Oneida piping design provides optimum performance."

B. Wilson - Pennsylvania



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GO-ANYWHERE DRILL GUIDE

When I need holes drilled too far from the edge of a board to use my drill press, I reach for this handy drilling guide. It allows me to position the bit exactly and assures that I'll drill a perpendicular hole, as long as I hold the guide firmly on the workpiece. I can also drill to an accurate depth by chucking the drill bit so it protrudes beyond the guide by the depth of the hole I want to drill. Unlike stop collars that mount on the drill bit, this stop never mars the workpiece's surface.

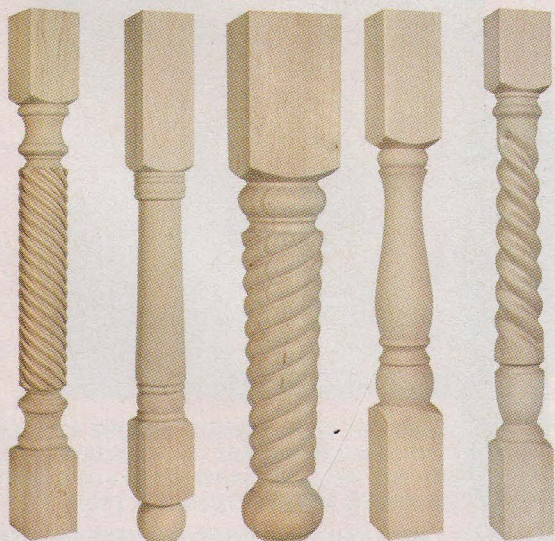
These guides are so handy, I've made them for many of my bits. First, using my drill press, I drill a perpendicular hole through the block. Then I cut the arch on my bandsaw.

Nathan Dixon

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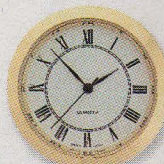
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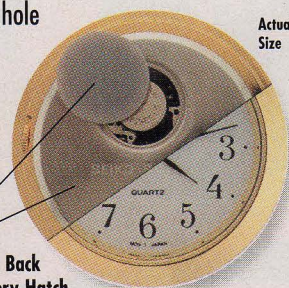
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COMPACT TURNING CENTER

I made turning on my lathe much more enjoyable by trimming out the metal stand that it came with. Now all my turning tools are right at my fingertips, thanks to the built-in tool storage rack. The tool tray keeps calipers and other measuring tools close at hand. Large accessories are stowed in the drawer. The screwed-on panels stiffen the metal frame and dampen it, so my lathe is less noisy. Adding weight (a bag of sand) makes my lathe more stable.

BUILDING STEPS

1. Remove the lathe from the stand (a two-person job).
2. Determine the width of the drawer front. Measure from the floor to your

stand's horizontal strut and subtract 5-1/2-in. for the toe space and front rail (see Exploded View and photos, pages 30 and 31).

3. Cut the plywood back, lower sides and front rail and screw them to the frame.

4. Install the L-shaped (two-piece) drawer supports and the spreader.

5. Cut and assemble the drawer box. The ends of the box sides are angled to match the base.

6. Install the drawer guides. First, center the drawer box in the opening, making sure it recesses at least 3/4-in. from the front of the frame, so there's room for the drawer front. The drawer guides also act as drawer stops.

7. Make and

attach the drawer front and drawer knobs.

8. Cut and install the shelf for the sandbag.

9. Make and install the upper sides.

10. Build the tool storage rack. First cut its plywood bottom to fit your stand. Locate the cleats while resting the plywood bottom on the back edge of the sandbag shelf. Fasten the cleats to the side panels. Then fasten the plywood bottom to the cleats.

11. Cut 2-1/4-in.-dia. holes on a length of 4-1/8-in.-wide plywood. Rip this stock in half and fasten the two pieces to the bottom so one piece cradles the tools and the other stops them.

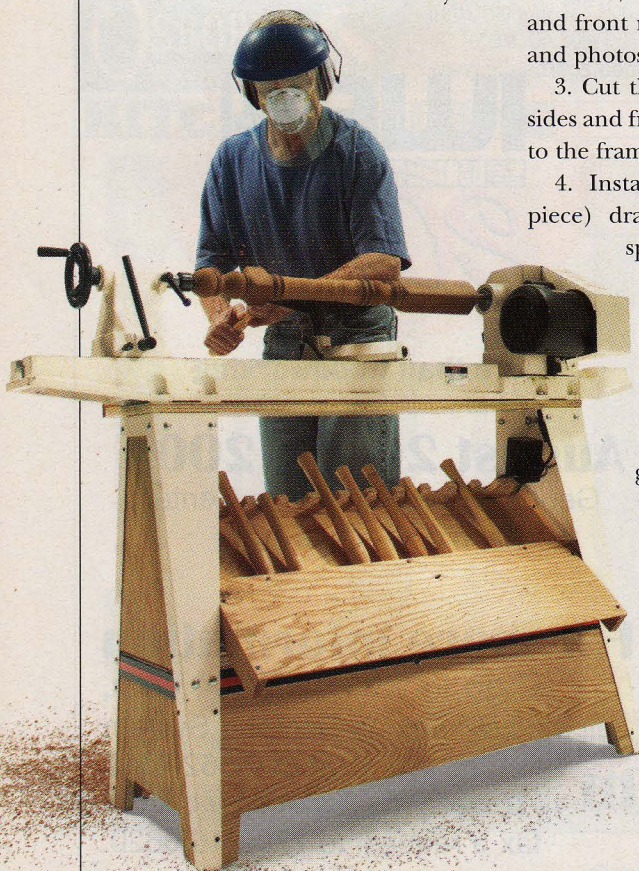
12. Cover the exposed tool edges with a 1/4-in. plywood top.

13. Make and install the tool tray. It should extend no more than 2-1/2-in. in front of the lathe, so it doesn't interfere with turning operations. Transfer the bolt holes (and

Continued on page 31



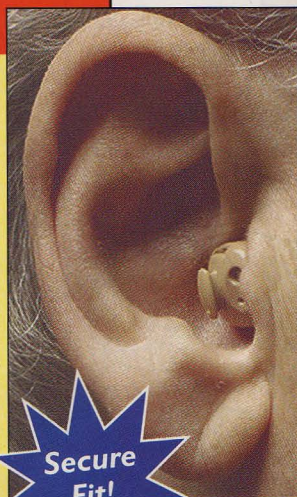
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"It is simple and very easy to use in either ear."

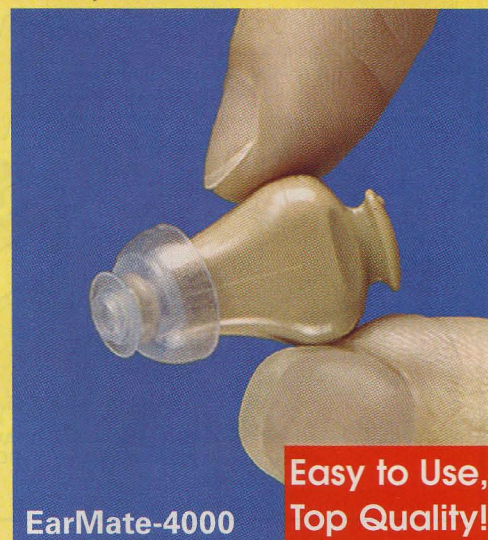
M.R. - Kellogg, ID

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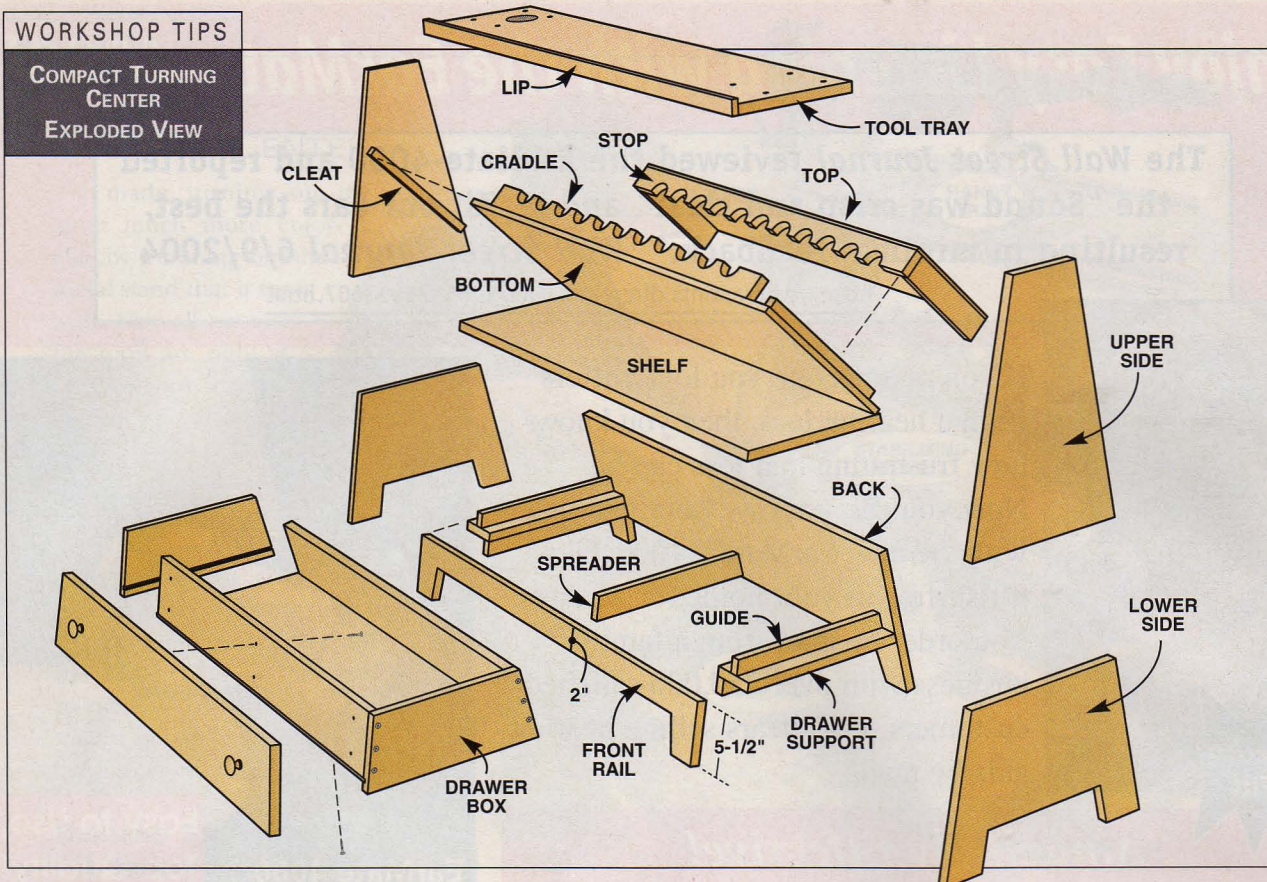
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30 American Woodworker SEPTEMBER 2004

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Continued from page 28

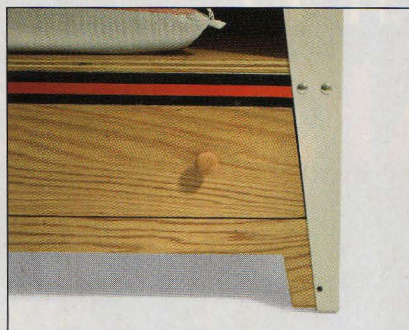
one for the power cord, if necessary) from the metal frame to the plywood tray. Drill these holes oversize to allow wiggle room.

14. Sandwich the tray between the frame and the lathe, and bolt them together (you'll need longer bolts and someone to help lift).

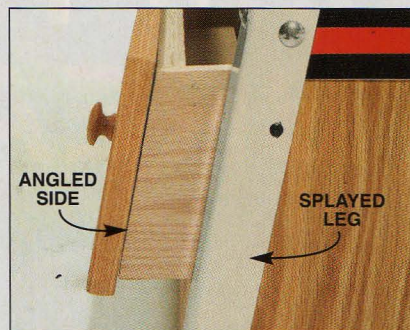
15. Attach a lip to the tray to keep things from falling off. Leave the ends open, so the tray is easy to brush clean. **AW**

Jim Williar

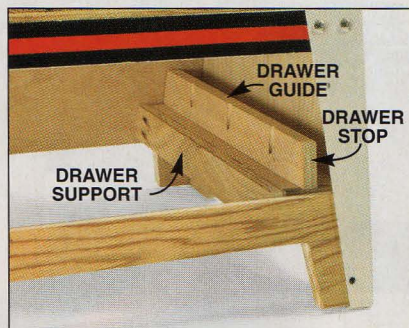
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The drawer front is shaped to fit.



The angled drawer is parallel to the splayed legs so it closes flush.



The drawer guides double as stops.



Tools nest in the storage rack.

ALL PHOTOS THIS PAGE: BILL ZUEHLKE



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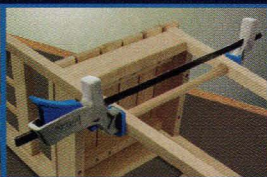
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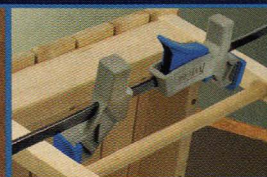
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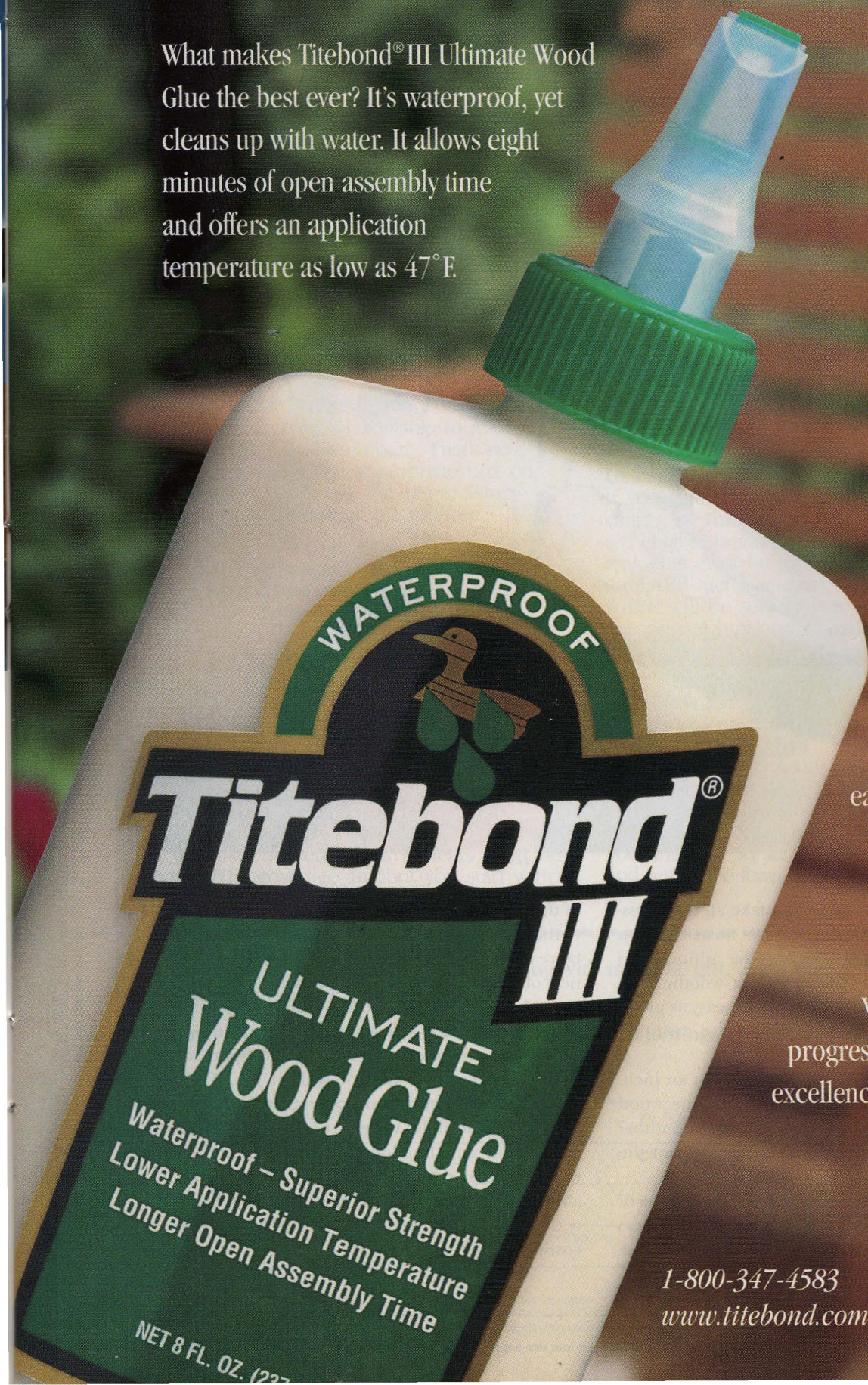
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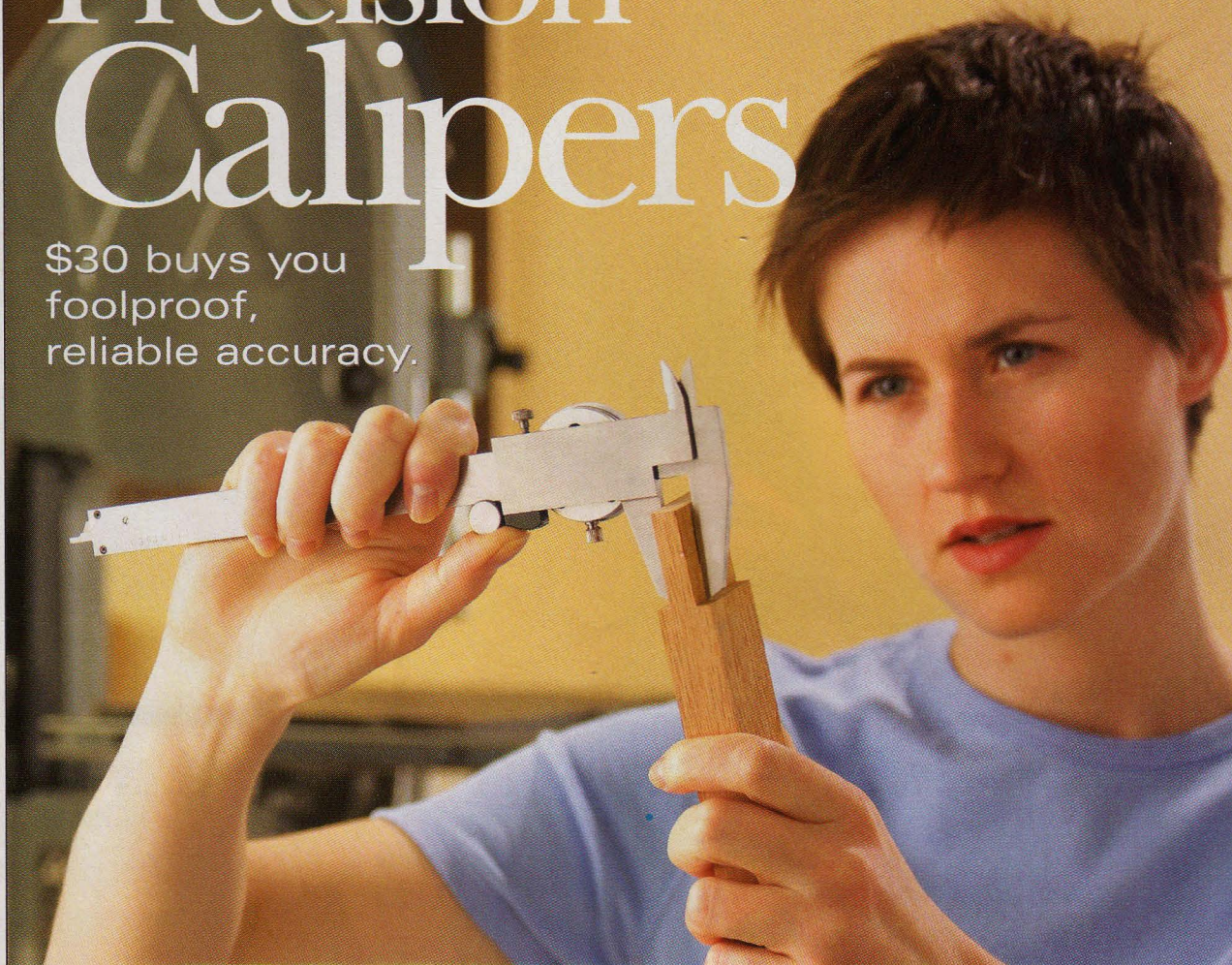
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by Tom Caspar

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One tool can take all the guesswork out of measuring: a caliper. It's the ultimate in accuracy—for a woodworker, anyway—and it's easy as pie to use. A caliper reads out one precise measurement, clear and simple.

Most calipers read in thousandths of an inch. They're designed for machine shops, not wood shops. Who measures wood in thousandths? Musical instrument makers, maybe, but not the rest of us.

Fractions are what we want. A new generation of \$30 to \$50 calipers designed for woodworkers replaces thousandths with sixty-fourths. With one

of these gems, you can easily make a measurement to the nearest 1/64 in. And you can go smaller yet, by reading between the lines, to about the thickness of a heavy sheet of paper. That's plenty good enough for wood, which can expand or contract that much each day with a change in humidity.

Let's take a look at all the jobs a caliper can do, no matter what kind of scale it has. Then we'll weigh the pros and cons of five kinds of calipers—basic slide, vernier, decimal dial, decimal digital and fractional dial—you'll find in woodworking catalogs. Finally, we'll tell you about the clear winner (see page 39), a \$30 beauty that will pay for itself the first time you avoid a costly mistake.

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Benefits Won't Decrease after the Limited Benefit Period

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There's No Physical Exam. No Health Questions.

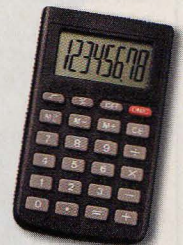
Not only is no medical exam required, there are also no health questions to answer.

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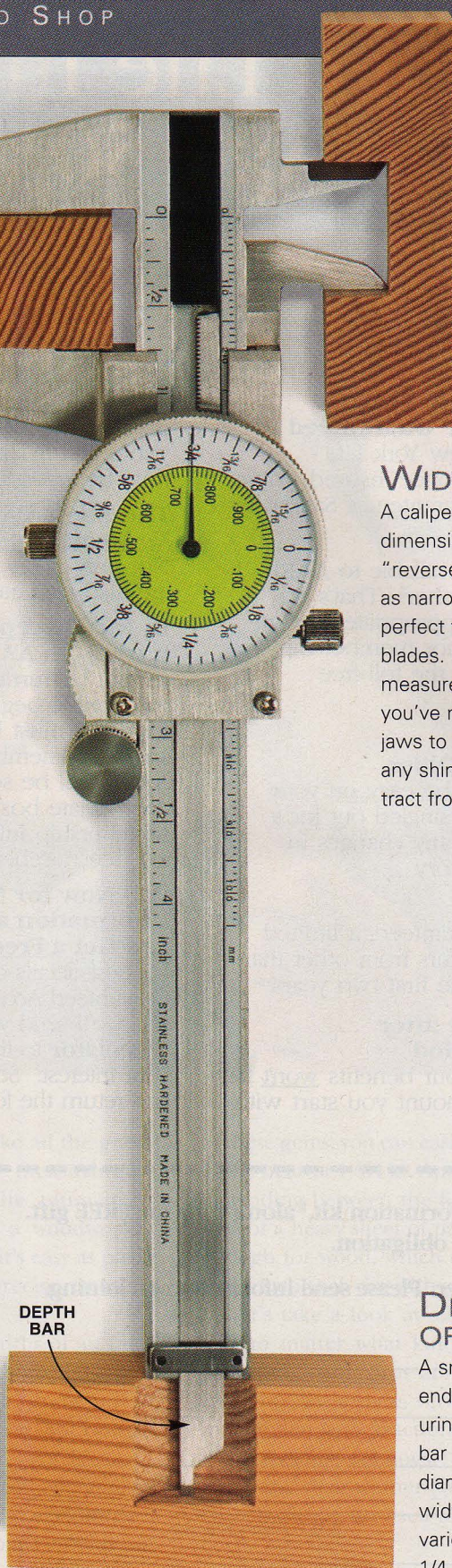
THICKNESS

The most common use for a caliper is to measure an outside dimension, such as the thickness of your stock as it comes out of the planer. A caliper is a lot easier to read than a ruler for this everyday job. You can also measure the precise width of a board you've cut in order to adjust the rip-fence scale on your tablesaw.



DEPTH OF A RABBET

Many folks are surprised to learn the back of a caliper can measure the width and depth of a rabbet or dado. In addition, whenever you use a zero-clearance throat plate on your tablesaw, you can measure the height of your blade or dado set with the back of the caliper. This is much easier than standing a ruler on end.



WIDTH OF A DADO

A caliper measures an inside dimension, too, with small "reverse" jaws that can span a gap as narrow as 1/16 in. A caliper is a perfect tool for setting up dado blades. Using the reverse jaws, measure the width of a dado you've made; then use the other jaws to measure the thickness of any shims you must add to or subtract from the dado blades.

DEPTH OF A HOLE

A small bar extends from the end of every caliper for measuring the depth of a hole. This bar may not fit in very small-diameter holes, however. The width of different calipers' bars varies from 1/8 in. to just over 1/4 in.

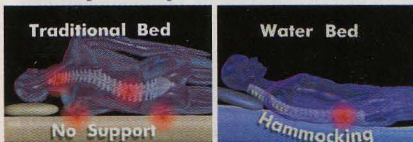
You look better...and you feel better... when you Sleep Better™

The Memory Foam Ultra mattress topper is cut into a grid pattern combining six different zones for variable support and a better night's sleep.

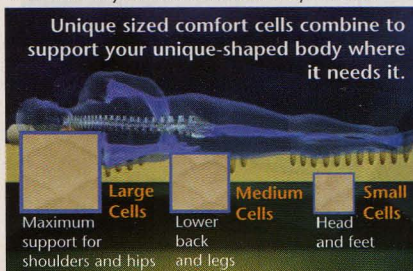
It's 3 a.m. You have exactly two hours until you have to get up for work, and you still can't seem to fall asleep. At this point, the phrase "tossing and turning" begins to take on a whole new meaning for people whose mattresses simply aren't giving proper support anymore. Your mattress may dictate your quality of sleep. Even if you merely suspect that your mattress may be outdated, that's when you need to take action. Some mattresses fail to support your spine properly, which can result in increased pressure on certain parts of your body. Other mattresses, sporting certain degrees of visco-elastic foam, can sometimes cost you well over \$1000. Now, one of the world's leading manufacturers of foam products has developed an incredibly affordable mattress topper that can actually change the way you sleep. Introducing the future of a better night's sleep: The Memory Foam Ultra mattress topper.

Sleep Better™...Wake up to a better morning. The Memory Foam Ultra mattress topper is designed to give you a better sleep surface. Not only does it support each region of your body, but it's also temperature sensitive. With its various-sized "comfort cells," the 2-inch thick Memory Foam Ultra mattress topper combines six zones to support specific

What could be wrong with your present bed?



The ideal position is a neutral body posture in which the different parts of the human body are supported individually and evenly. This is the secret behind Memory Foam Ultra, the mattress topper that turns any bed into the ideal sleep surface.



body area weight, which promotes a better night's sleep. The largest cells support your lower back and mid-section, while the medium-sized cells support the shoulders, lower back and legs. The smallest cells support your head and feet. Combined, these zones provide variable support from head to toe. By using visco-elastic foam, the Memory Foam Ultra mattress topper also molds to your body contours to help prevent tossing and turning during the night. When you lie down on this amazing material, the heat and pressure sensitive foam reacts to your body's weight and temperature, so that it molds to your exact body shape. This means that whether you sleep on your back, stomach or side, your weight is evenly distributed and your spine remains in a neutral position. Other surfaces support your body at the shoulders, hips and legs only. This causes your spine to sag in other areas, which can often result in discomfort, and even back pain. You'll wake up rested, relaxed and ready to take on the day. Anyone who suffers from insomnia and back pain due to mattress discomfort can benefit from this technology.

FREE heavyweight mattress pad included.

Included with the Memory Foam Ultra mattress topper is a fitted mattress pad. It's heavyweight and quilted, and made of 200-count 100% cotton with a 14-inch deep stretchable skirt to fit a mattress up to 21 inches thick. The size



The 2-inch thick temperature-smart foam adjusts to your shape.



of the mattress pad is determined by the size mattress topper you order.

Try it for yourself today! The

Memory Foam Ultra mattress topper can change the way you sleep. Promote proper spine positioning, while enjoying relief from insomnia and back pain with this full-body support. It comes with a 5-year manufacturer's limited warranty and firstSTREET's exclusive in-home trial. If you are not completely satisfied, simply return it within 90 days for the product purchase price.

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TYPES OF CALIPERS

**BASIC SLIDE**

- Reads in fractions
- Smallest division is 1/16 in.
- Costs \$5 to \$12

PROS

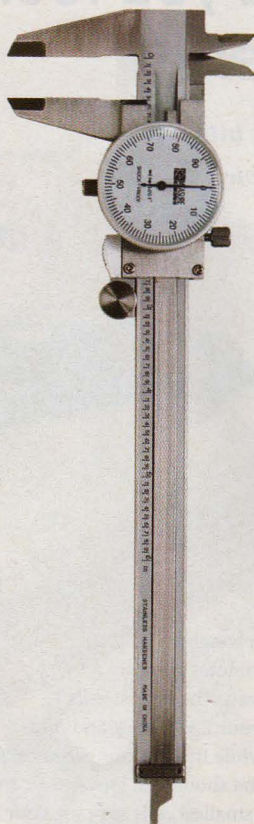
A slide caliper is inexpensive and small enough to easily slip into a pocket. It doesn't have any spiky points to catch on fabric. Most models read in both inches and millimeters.

CONS

A slide caliper cannot read the depth of a rabbet or a hole. It cannot be zeroed out to make comparison measurements (see page 41). Its markings are often hard to read. Some models have dimension lines cut in brass or steel, rather than inked-in lines.

OUR FAVORITE MODEL

Hartville Tool
(800) 345-2396, www.hartvilletool.com
4-in. brass caliper, #85879, \$8.

**DECIMAL DIAL**

- Reads in thousandths
- Smallest division is 0.001 in.
- Costs \$16 to \$30

PROS

A decimal dial caliper is very precise (0.001 in. is one-third the thickness of a dollar bill). By comparison, a basic slide's smallest division of 1/64 in. is about 0.016 in., or 16 divisions on a decimal dial caliper. Roughly speaking, a decimal caliper is 16 times more accurate than a basic slide caliper.

CONS

Few woodworking situations call for this level of accuracy. When you're making two pieces that must fit together, such as a mortise and tenon, the feel of the fit is more reliable than measuring in thousandths.

OUR FAVORITE MODEL

Woodcraft Supply
(800) 225-1153, www.woodcraft.com
6-in. dial caliper, #01R62, \$30.

**VERNIER**

- Reads in fractions
- Smallest division is 1/128 in.
- Costs \$13 to \$20

PROS

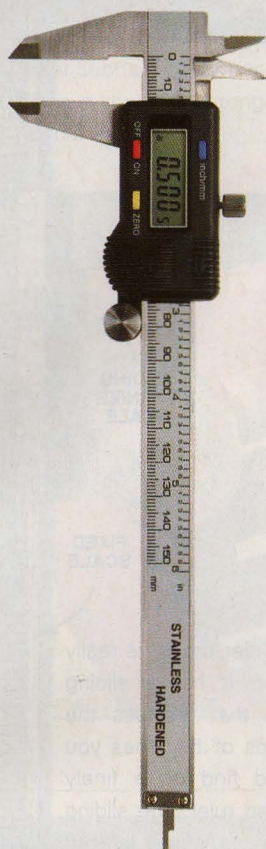
With a vernier caliper, you get plenty of accuracy for the least amount of money. A vernier caliper is named after a two-part scale that reads both coarse and fine measurements (see "How To Read a Vernier," page 40). A vernier caliper's simple slide mechanism is virtually indestructible, unlike a dial or digital device.

CONS

A vernier scale is not intuitive. You have to learn how to read it and remember how it works each time you use it. A vernier caliper cannot make comparison measurements. Most vernier calipers read in thousandths of an inch, not in fractions.

OUR FAVORITE MODEL

Lee Valley
(800) 871-8158, www.leevalley.com
6-in. fractional vernier caliper, #88N70.01, \$17.



ELECTRONIC DIGITAL

- Reads in thousandths
- Smallest division is 0.001 in.
- Costs \$35 and up

PROS

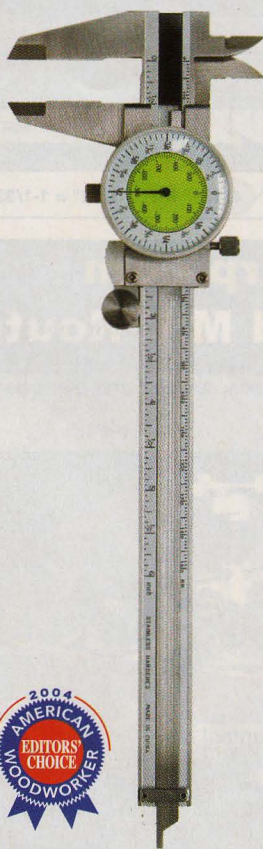
A digital caliper is foolproof and very accurate. It displays one clear number. There's no need for counting lines or mentally adding numbers together, as with a decimal dial caliper. For comparison measurements, you simply push a button to zero the caliper. A short 4-in. model is amazingly compact and lightweight.

CONS

Nobody makes an electronic caliper that reads in fractions—yet. All of them read in thousandths, and going from decimals to fractions can really be awkward. You need a conversion chart or an engineer's head for remembering decimal equivalents.

OUR FAVORITE MODEL

Lee Valley
(800) 871-8158, www.leevalley.com
Electronic caliper: 6-in., #88N62.56, \$35
4-in., #88N62.54, \$33.



FRACTIONAL DIAL

- Reads in sixteenths and hundredths
- Smallest divisions are 1/64 in. and 1/100 in.
- Costs \$30 to \$50

PROS

A fractional dial is clearly the best type of caliper for woodworking. Fractions are our language! This model is our hands-down favorite because it's so easy to read. We prefer the smaller 4-in. version shown here because it fits right into an apron pocket.

CONS

Of the many types of fractional dial faces, some are easier to read than others (see "Types of Fractional Dials," at right).

EDITORS' CHOICE

Highland Hardware, (800) 241-6748, www.highlandhardware.com
4-in. caliper, #168077, \$30
6-in., #065008, \$37.

TYPES OF FRACTIONAL DIALS

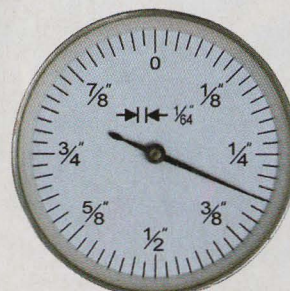
A lot of companies have jumped on the fractional caliper bandwagon, but not all their tools are easy to read. Our favorite type, the top dial, has every commonly used fraction up to an inch clearly marked on the outside of the dial. Each unmarked line is 1/64 in.

The dial below our favorite isn't as user-friendly. You must count lines in between the major markings to find, for example, the 5/16-in. mark. The bottom dial is only marked in 1/64-in. increments, and they're on the inner ring of the dial. Which one is 5/16 in. here? You can go cross-eyed, or make a major mistake, trying to figure out both these dials.

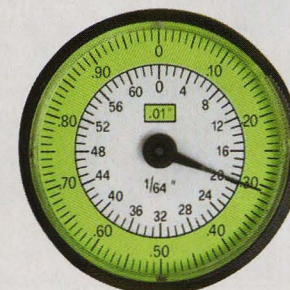
The key to quickly reading any dial is to treat it like the face of a clock. One revolution is 1 in.; a quarter of the way is 1/4 in. Each major division is 1/16 in.



BEST: 1/16-IN. FRACTIONS



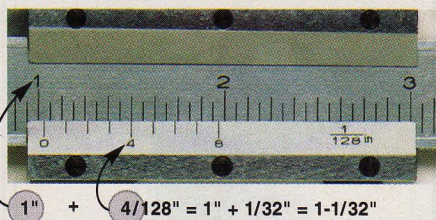
LESS GOOD: 1/8-IN. FRACTIONS



LESS GOOD: 1/64-IN. FRACTIONS

HOW TO READ A VERNIER SCALE

Read a vernier scale by using the zero to measure whole inches and sixteenths. Then find where two lines meet. This is the number of smaller fractional units to add, in this case, 1/128-in. units.

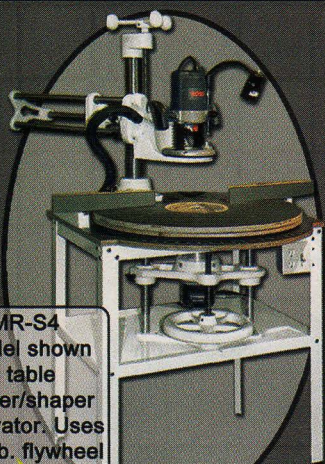


$$1" + 4/128" = 1" + 1/32" = 1-1/32"$$

www.tenfingerscorp.com

Radial Arm Shaper and Mill Router

- Easily makes Dados, Tenons, Louvers, Sliding Dovetails, Arches, and Eyebrows.
- Performs Pin Routing, Pattern Copying, and Molding
- Much safer and cleaner than handholding your router!



RAMR-S4 model shown with table router/shaper elevator. Uses 14 lb. flywheel to raise and lower motor.

Patents Pending

Two routers mounted!

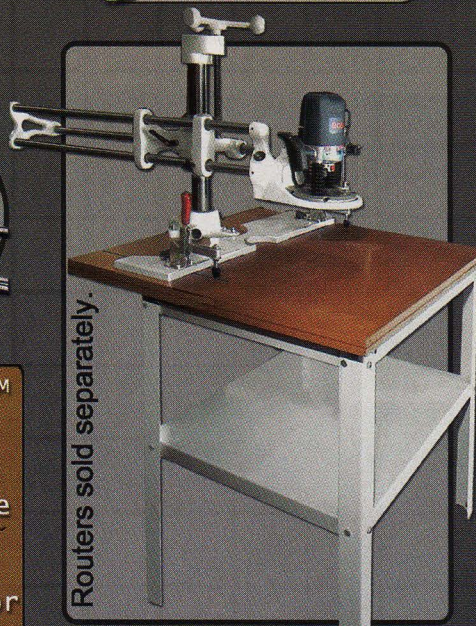


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Three models available!



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New RAMR-DADO. The new Dado model is available now. Also makes eyebrows, arches, and louvers fast.

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Call for a brochure to be mailed or FAXed.

See our web site

www.tenfingerscorp.com for technical updates, sales, and application notes.

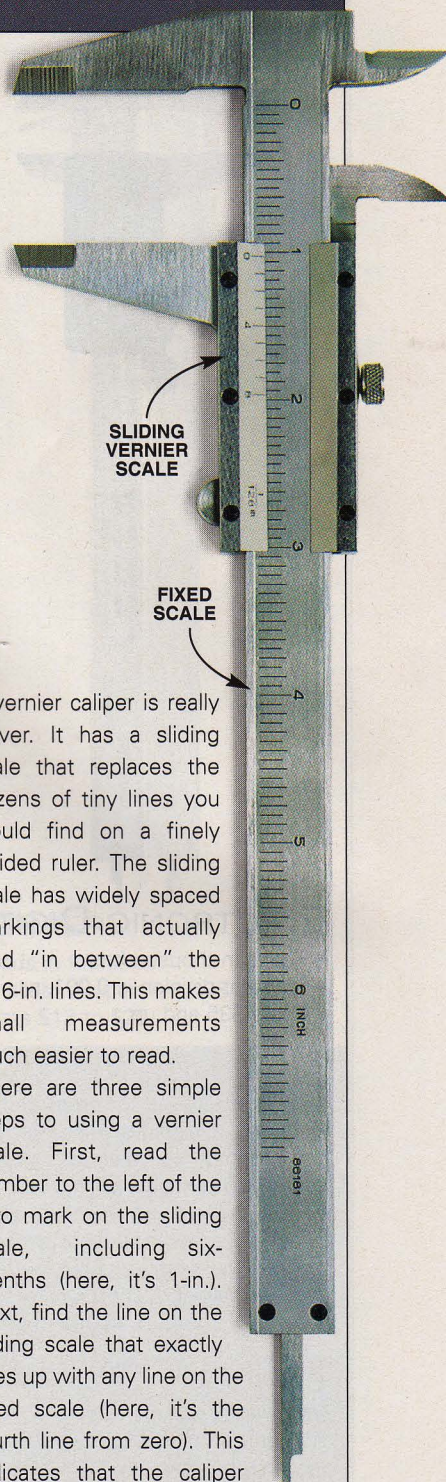
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We proudly sell **BOSCH** routers.

Circle No. 184



SLIDING
VERNIER
SCALE

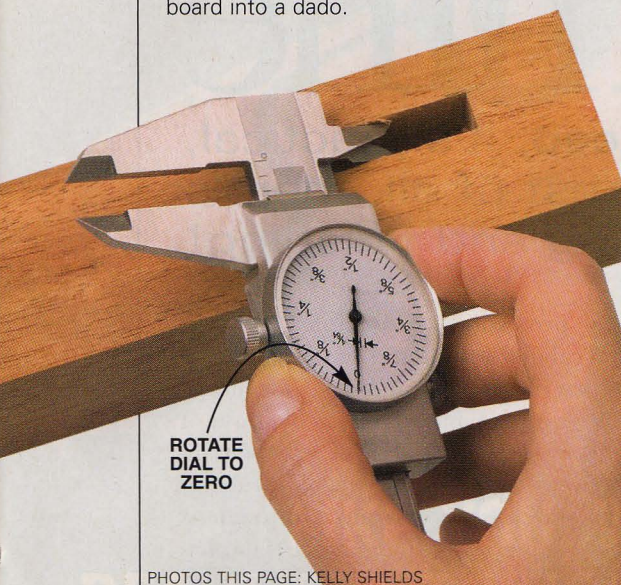
FIXED
SCALE

A vernier caliper is really clever. It has a sliding scale that replaces the dozens of tiny lines you would find on a finely divided ruler. The sliding scale has widely spaced markings that actually read "in between" the 1/16-in. lines. This makes small measurements much easier to read.

Here are three simple steps to using a vernier scale. First, read the number to the left of the zero mark on the sliding scale, including sixteenths (here, it's 1-in.). Next, find the line on the sliding scale that exactly lines up with any line on the fixed scale (here, it's the fourth line from zero). This indicates that the caliper reads 4/128 (or 1/32) past the 1-in. mark. If the fifth mark on the sliding scale lined up better with a different line on the fixed scale, the reading would be 5/128 past the 1 in. mark. The last step is to add the whole numbers, sixteenths and 1/128-in. measurements.

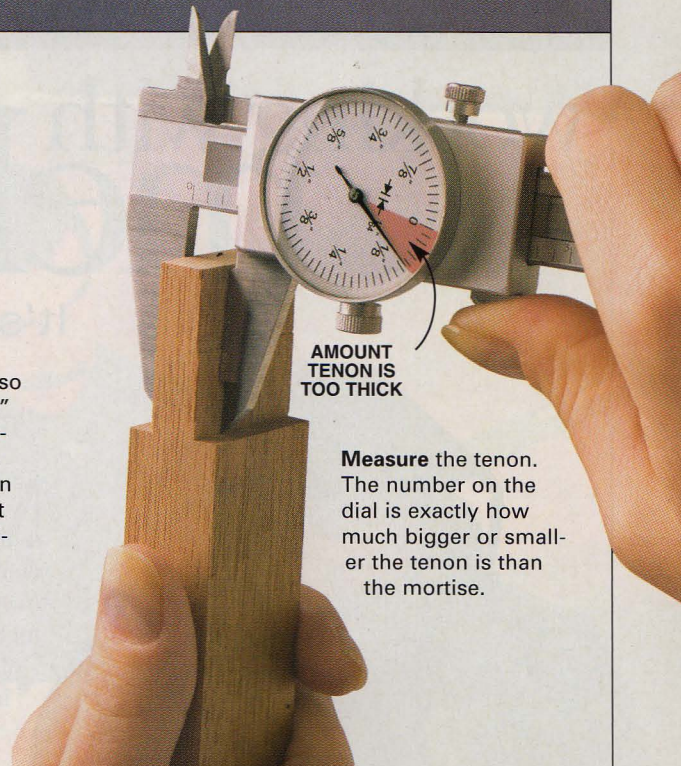
MATH-FREE COMPARISONS

A caliper can easily tell you the exact difference in thickness or width between two pieces of wood, without requiring that you add or subtract nasty fractions. This is a great way to fit a tenon into a mortise, a tongue into a groove or a plywood board into a dado.



ROTATE
DIAL TO
ZERO

Turn the dial so it reads "zero" when measuring a mortise. All calipers can be zeroed out at any position.



AMOUNT
TENON IS
TOO THICK

Measure the tenon. The number on the dial is exactly how much bigger or smaller the tenon is than the mortise.

PHOTOS THIS PAGE: KELLY SHIELDS

American Woodworker SEPTEMBER 2004 41



SK-250TS-L series YOU DESERVE MORE ...

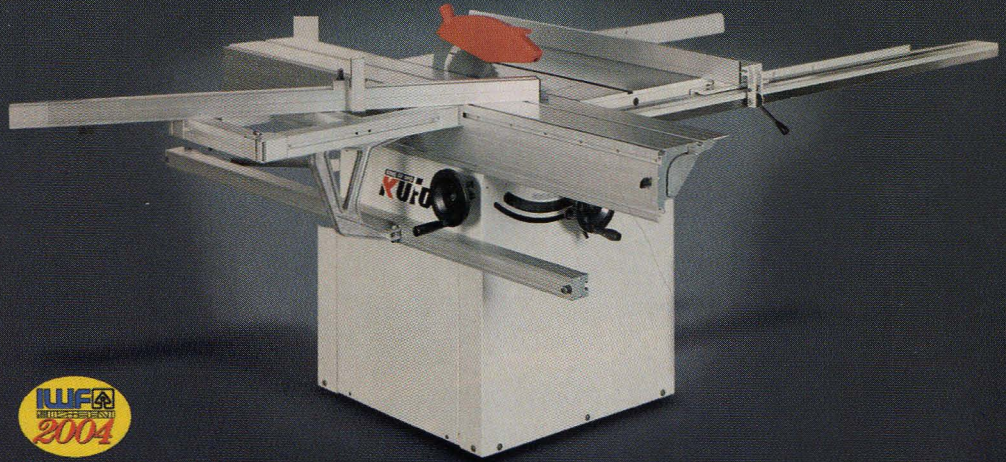
KUFO table saw model SK-250TS-L comes with professional features built-in.



10" tilting arbor blade and 3-1/2" scoring sawblade keep tearout to a minimum.

52" Precision rip fence system standard, cross cuts up to 48" available. Precision auxiliary fences stop with lens magnifier is easy to adjust.

Powerfull 3HP motor with built-in blade brake helps eliminate the dangers of kick back.



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working with melamine

It's dirt cheap, it's practical, and best of all, there's no sanding and finishing!

Melamine is the professional cabinetmaker's best friend. Build a cabinet with it and you have a complete, durable interior that requires no sanding (yes!) and no finishing (oh, yeah!). Pros often build whole kitchens out of melamine and then dress the boxes with plywood end panels and solid-wood fronts. The bright melamine cabinet interiors are easy to search, stain resistant and tough as nails. Entertainment centers and home office, laundry-room or mudroom cabinets are also made with melamine. Most home centers carry melamine shelving with the edge banding already on. Just buy or make shelf supports and you're in business.

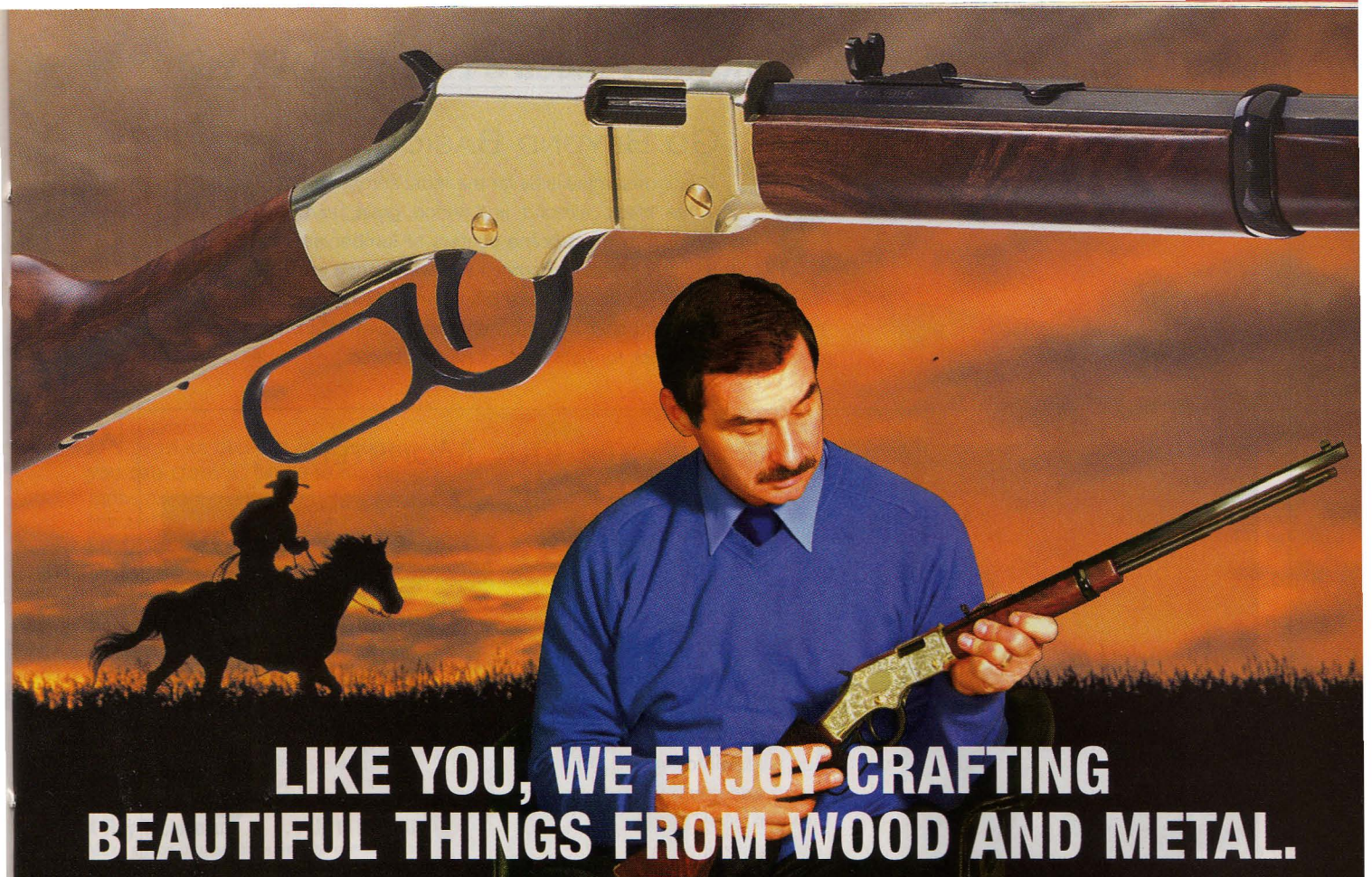
Melamine has found a home in many a woodshop. The durable, slick surface is perfect for jigs, fences, out-feed tables and router tables. I use it in my shop as an assembly table cover. Glue drips pop right off and the slick surface makes it easy to slide around heavy assemblies. It's not as durable as plastic laminate for high-wear surfaces such as countertop and desktops, but it's plenty tough for shop use.

Still not sold on melamine? How about saving money? It's about half the cost of birch plywood. Not only that, but you get better yield from a sheet of melamine than from veneer sheet stock. That's because you don't have to worry about grain direction.

Better yield at a lower cost—you save both ways.

Here are some tips on how to make this staple material of the modern cabinetmaker work perfectly for you!





LIKE YOU, WE ENJOY CRAFTING BEAUTIFUL THINGS FROM WOOD AND METAL.

Even the most skilled craftsmen who love working with tools need a break from the workshop. When it's time to get outdoors and have some fun, thousands of you are heading down to their local gun shops and asking to check out the rifles from Henry Repeating Arms.

Our traditional American rifles perform beautifully, are built with the smoothest actions and come with the historically famous Henry name.

Our Henry Lever Action is available in .22 LR, .22 Magnum, and .17 HMR. You'll find each reliable, robust, and great fun to shoot.

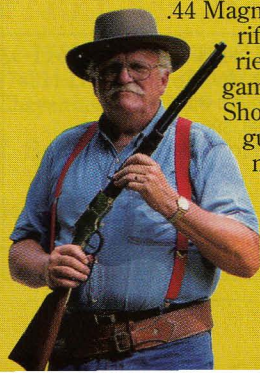
The award-winning Golden Boy is styled after the original Henry of 1862. A golden gleaming receiver and massive octagon barrel will be loved at first sight and handed down from generation to generation.

The Henry Pump Action .22 is the gun made for fun. You'll relive the grand old days of the American shooting gallery.

And Henry didn't forget the young shooters who'll grow to keep our great shooting sports traditions alive. The Mini Bolt .22 is the perfect way to start a youngster on the path to mastering the use of firearms in a safe and responsible manner.

We listen to the suggestions that pour in from Henry fans, and we heard you loud and clear. The Henry Big Boy .44 Magnum is the result. It's a centerfire rifle with a solid brass receiver married to a heavy octagon barrel. Big game hunters and Cowboy Action Shooters are adding Big Boys to their gun collections as fast as we can make them.

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Name _____

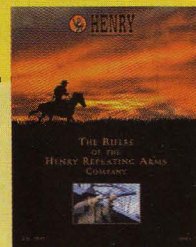
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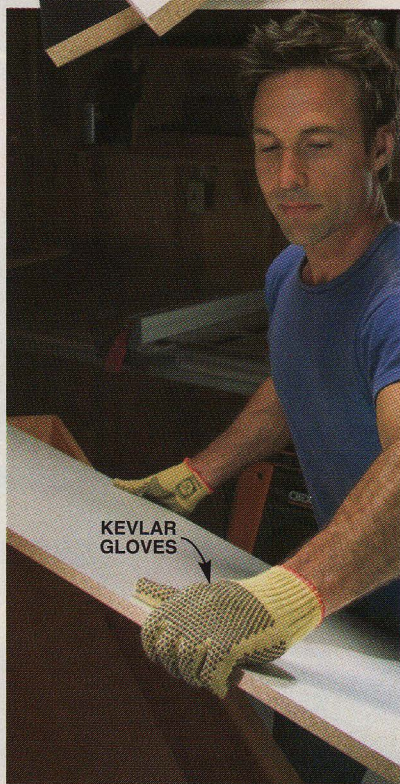
Henry Repeating Arms Company 110 8th Street, Brooklyn, NY 11215
Tel: (718) 499-5600 Fax: (718) 768-8056 www.henry-guns.com



GO BEYOND BASIC WHITE

White melamine is by far the most common, but basic colors, like black, almond and wood grain, can be special-ordered from most home centers or lumberyards that carry the white. Melamine comes in a wide range of thicknesses.

Home centers not only carry 3/4-in. and 5/8-in. sheets for cabinet construction and shelving, but they often have 1/2-in. for drawer parts and 1/4-in. stock for backs and drawer bottoms.



KEVLAR GLOVES

WEAR GLOVES!

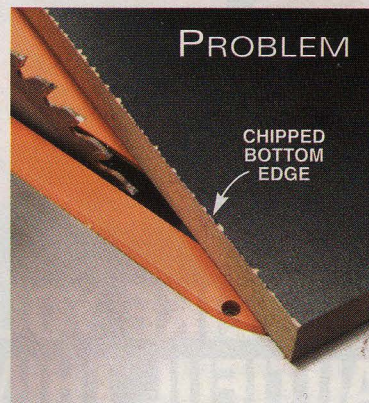
Gloves are a must when handling large sheets of melamine. We recommend a pair of Kevlar® gloves. Kevlar is designed to protect the user from slicing cuts. Surprisingly, they're inexpensive (\$5) and the rubber dots or stripes help you get a grip on the slippery melamine surface.



Source
All Safety
Equipment
& Supplies,
(888) 739-1080,
www.AllSafetySupplies.com
Kevlar gloves, #SS-GLK600PD2, \$5.

STOP THE CHIP-OUT MONSTER

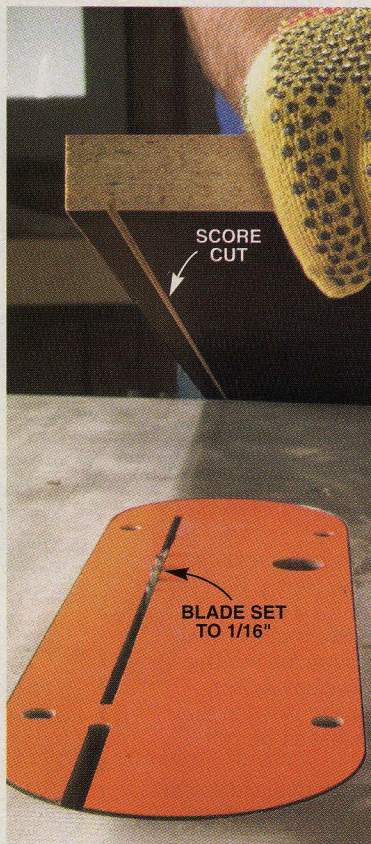
Chip-out on the bottom edge is a common problem when you use a general-purpose blade to cut melamine. Sometimes one rough edge doesn't matter, but when you need a perfectly clean edge on both sides, you have a couple options. The first is to make a 1/16-in.-deep scoring cut on the bottom of the piece (see photo, below). Turn the saw off and crank up the blade to finish the cut. The result is a perfectly clean cut on both surfaces.



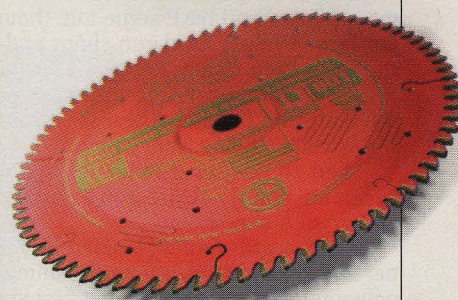
PROBLEM

CHIPPED
BOTTOM
EDGE

SOLUTION 1



SOLUTION 2



The second solution is a laminate-cutting blade (above), which gives you perfectly clean edges on both sides, without a scoring cut. If you cut a lot of melamine, these blades are well worth the investment.

Source
Woodworker's Supply, (800) 645-9292,
www.woodworker.com
Freud LU97 double-sided laminate
blade, #117-386, \$90.

Get **FREE FACTS** about training at home for a new career!

Choose from 22 Moneymaking Career Opportunities*

Now in as little as four months you can train at home to make more money. Take your first step toward a career in healthcare, business, law, hospitality or the building & trade industries. Even start your own work-at-home business! **No previous experience necessary.**

Electrician Up to \$41,000

Train to make good money connecting, installing, testing and maintaining electrical systems. Work for construction or maintenance companies in this in-demand field that's projected to grow at a faster than average rate.

X-Ray Technician Up to \$39,000

Make a good income managing the overall X-ray imaging process in a doctor's office, clinic or hospital. Prepare patients for X-ray imaging, develop film and more. Field is projected to grow faster than average through 2012.

Desktop Publishing Up to \$32,000

Take the first step to entering this creative and fun career. You train to design and create brochures, advertising and all kinds of printed items.

Accounting Services Up to \$40,000

Learn computerized Bookkeeping, Payroll and Tax Preparation. More and more small businesses are outsourcing their accounting needs. Offer all these services from home.

Medical Transcription Up to \$40,000

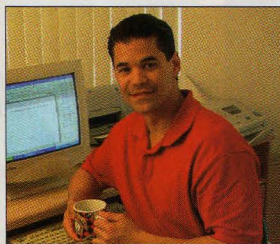
If you want to work at home this is the career for you! We train you to transcribe doctors' recorded dictation and reports. Enjoy a good income and a flexible schedule, too.

Asst. to Court Reporters Up to \$40,000

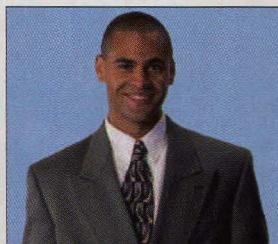
Be a court reporter's transcriptionist. Work at home full or part-time. Learn to read and transcribe legal notes of court testimony.

Pharmacy Tech Up to \$30,000

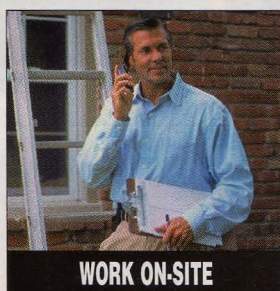
Demand for Pharmacy Technicians is growing **MUCH FASTER** than most other careers! Train to assist the pharmacist, measure, weigh and sort drugs, as well as helping customers.



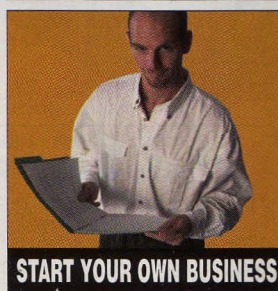
WORK AT HOME



WORK FOR A CORPORATION



WORK ON-SITE



START YOUR OWN BUSINESS

Culinary Arts Up to \$34,000

If you enjoy cooking and inventing recipes, then this is the career for you! Train to be a chef, caterer or dietitian. Work for yourself or in exciting places like restaurants, resorts, hotels, spas and cruise lines.

Landscaping Up to \$30,000

Learn everything you need to know to design, install and maintain landscaped areas in residential neighborhoods and commercial property. Excellent faster-than-average growth potential. Work for yourself and be your own boss or work for a landscaping firm.

Paralegal Up to \$40,000

Be a vital part of the legal team! You'll learn to do almost everything a lawyer does, except appear at trials. Exciting work...at home or in a law office.

Animal Care Specialist Up to \$30,000

Train for a rewarding career in veterinary offices, boarding kennels, pet stores and zoos. Even start your own grooming service!

Computer Literacy Up to \$30,000

Learn to use a computer the easy way, with our step-by-step training and toll-free hotline support. PC skills are essential in today's world. Get with it...and get a better job, too!

Convention & Event Planner Up to \$35,000

Work from home much of the time and yet get out to where the action is, too! Learn to organize events of all kinds including trade shows, fundraisers, conventions, weddings and more.

Home Inspector Up to \$41,000

Housing sales are up—and the career of home inspection is projected to grow at a phenomenal 16% rate through 2010. We train you to be ready to earn great money and be your own boss!

HVAC Mechanic/Installer Up to \$35,000

Train to repair heating, central air conditioning, and refrigeration systems. This is an in-demand career projected to grow faster than average through 2010.

Gunsmith/Firearms Repair Up to \$28,000

260 million guns are owned in the U.S. yet there are only 11,450 licensed gunsmiths to repair them! We train you to fulfill this increasing demand. Work for yourself or for a firearms dealer or repair business.

Bookkeeping Up to \$35,000

Skilled bookkeepers are needed in every business, from coast to coast. Easy to learn. Work in an office or work at home.

Massage Therapy Up to \$40, \$50, \$60 per massage

Today's fastest growing alternative health career. Earn \$40, \$50, up to \$60 per massage! Work at home or in clinics, hospitals, even glamorous places like resorts, spas, cruise lines and more.

Medical Billing Up to \$40,000

Healthcare is one of the fastest growing fields in the country. Work at home or in a doctor's office, hospital or clinic processing medical billing and claims full or part-time.

Child Day Care Up to \$35,000

If you love children, make them your career! Work for day care centers or schools...or start your own business caring for children in your own home!

Medical Coding Up to \$45,000

Proper coding can increase doctors' incomes by 10% to 15% and more. That's why experienced coders make up to \$50,000 a year and more.

Real Estate Appraiser Up to \$43,000

Make great money as a part of the fast-growing residential real estate industry. Get paid for inspecting property for homebuyers, lenders and insurance providers. Work for yourself or others.

*Income and growth information is based on graduate earnings and figures from the U.S. Dept. of Labor. Individual earnings may vary due to experience, hours worked and location.

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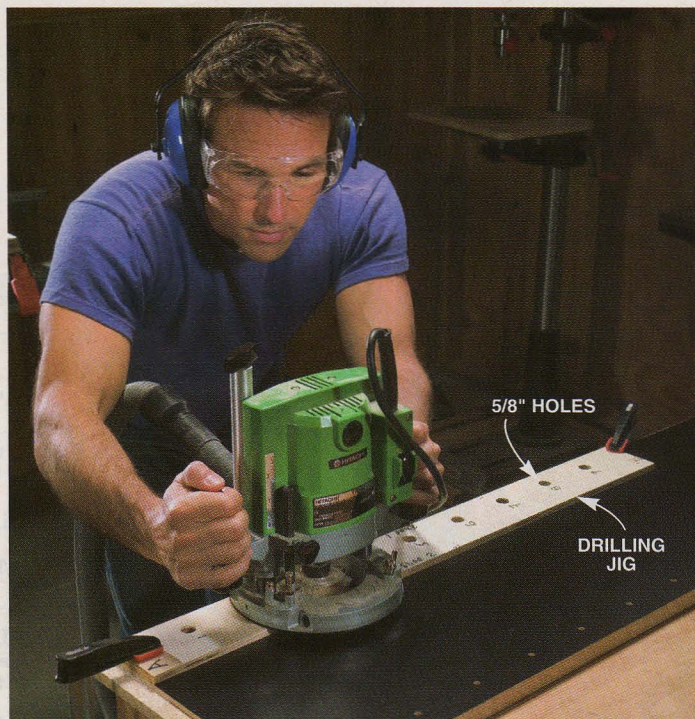
At-Home Professions, Dept. AMWA74
1740H Dell Range Blvd., #510
Cheyenne, WY 82009

Write one course selection here:
(Only one course, please)

Yes! Send me free information without obligation on training at home for the career I've selected.

Name _____ Age _____
Address _____ Apt _____
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XX004



USE YOUR ROUTER TO DRILL HOLES

Drilling for adjustable shelves can be a problem in melamine. A sharp brad-point bit will make a clean hole, but the melamine is hard on the cutting edges and a typical bit will quickly dull. Production shops use special carbide-tipped bits that are expensive and hard to find.

For the weekend builder, the best way to drill holes in melamine is to use a router. A simple jig and a plunge router with a 5/8-in. guide bushing is the way to go. Use a 1/4-in. carbide down-spiral bit for flawless holes.

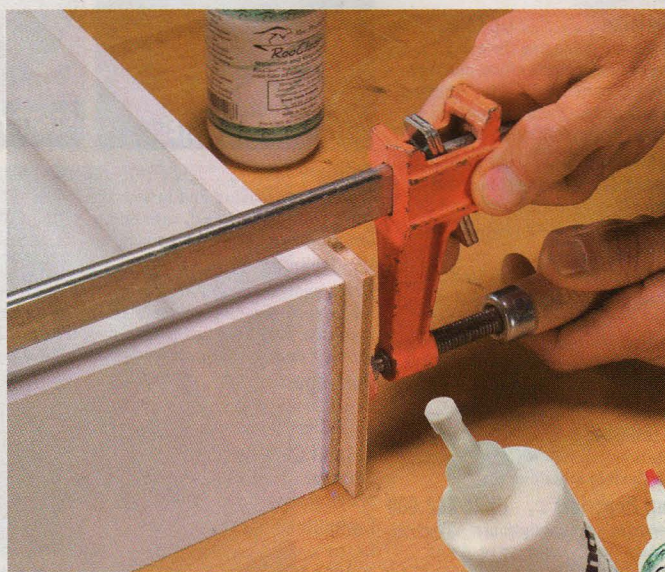
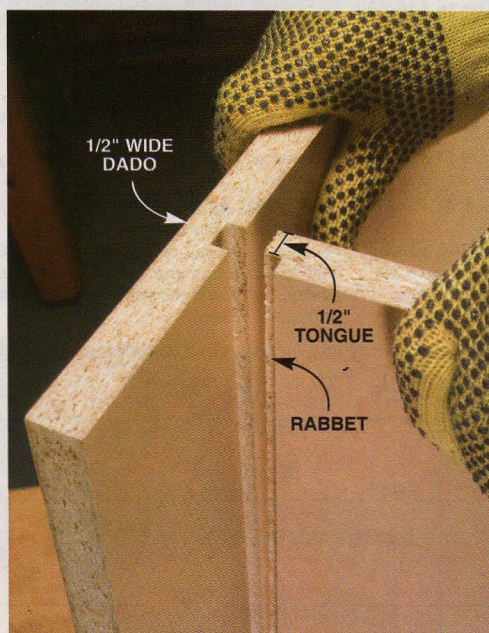
The jig is simply a piece of 1/2-in. plywood with a series of 5/8-in. holes spaced at 2-in. intervals. Clamp the jig flush with the case side, set the bushing in the first hole and plunge. Repeat the process until all the holes are drilled.

Source

MLCS, (800) 533-9298, www.mlcswoodworking.com
1/4-in. spiral down-cut bit, # 5177, \$14.

A TONGUE MAKES DADO JOINTS EASIER

Routers are great for cutting dados in melamine, because it assures a chip-free cut. Unfortunately, melamine is about 1/128-in. over 3/4-in. As a result, if you try to use a 3/4-in. router bit to cut a dado, it'll be slightly undersized—not a pretty picture come assembly time. You can get around this by making a 1/2-in. dado and creating a 1/2-in. tongue on the ends of the shelf with a rabbeting bit.



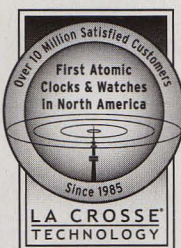
REINFORCE JOINTS WITH MELAMINE GLUE

Typical wood glue won't bond at all to melamine's slick surface. That leaves you with a weakened glue joint where melamine meets particleboard. Fortunately, you can buy specialized glue that will bond melamine to a porous surface like particleboard. This is especially critical on more delicate joints, for instance, those used to construct a drawer.

Source

Woodworker's Hardware, (800) 383-0130, www.wwhardware.com
8 oz. RooClear melamine glue, #R8012, \$4
16 oz. Titebond Melamine Glue, #F4014, \$7.

For the best time of your life



Technology creates greatest advancement in time keeping since the quartz movement...

and lets everyone benefit from United States Government innovation. With the Atomic Digital Watch by La Crosse Technology, all of us have the opportunity to take advantage of our tax dollars at work, in a way that will positively impact our daily lives.

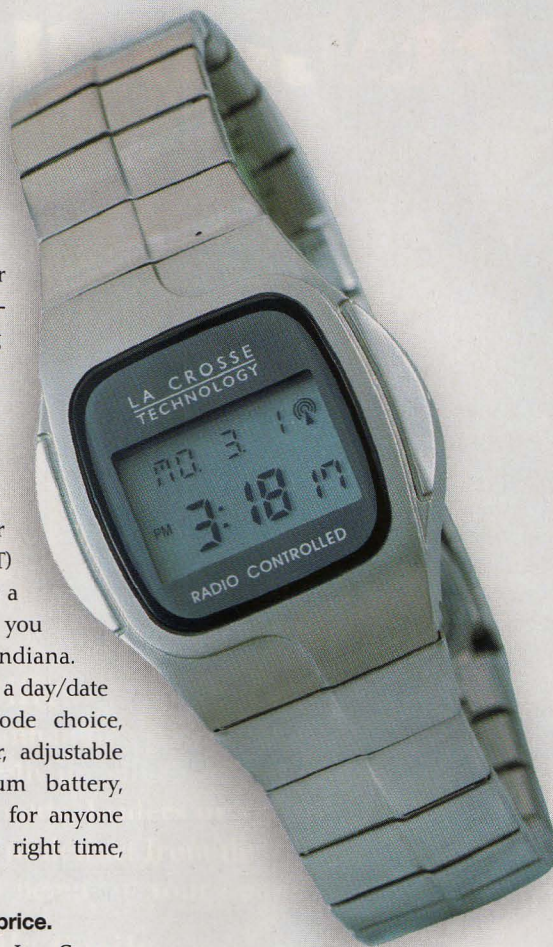
How can a watch possibly create such an opportunity? The U.S. Government National Institute of Standards and Technology (NIST) Time and Frequency Division, a division of the U.S. Department of Commerce, maintains the cesium Atomic Clock, a clock that is accurate to within one second in a million years, to monitor and maintain the official U.S. time standard. In Colorado our Government relies on the cesium Atomic Clock to create a national time standard to provide the most precise and accurate measure of time. The cesium clock drives a low frequency radio signal, known as the WWVB signal, which is transmitted at 60 kHz to your location at the speed of light.

The Atomic Digital Watch has a built-in receiver that automatically tunes in to the WWVB signal transmitted to the

NIST stations on a daily basis, so that you can have the most accurate time in the world on your wrist! Imagine never having to worry about setting the time on your watch. Turn the watch on, select your time zone and the watch will set itself overnight. This watch will also automatically adjust for Daylight Saving Time (DST) and leap year. There is also a DST disabling feature if you live in Arizona or Indiana. With features that include a day/date calendar, 12/24 hour mode choice, signal reception indicator, adjustable band and 3-volt lithium battery, this watch is a great gift for anyone who needs to know the right time, all the time.

An unbelievably new low price.

The Atomic watch by La Crosse Technology is now available at a new low price. Originally \$69.95, one of the most technologically advanced watches in the world is now available for the unbelievably low price of \$39.95! Innovative Home Products home trial allows you to try the Atomic Digital Watch for 30 days risk-free. If you are not completely satisfied, simply return it for a full refund of the purchase price.



CALL NOW TO TAKE ADVANTAGE OF THIS INCREDIBLE OFFER!

Atomic Digital Watch

~~\$69.95~~ **\$39.95** + S&H

Atomic Digital Alarm Clock

~~\$29.95~~ **FREE** + S&H

A \$99 value for only \$39.95!!

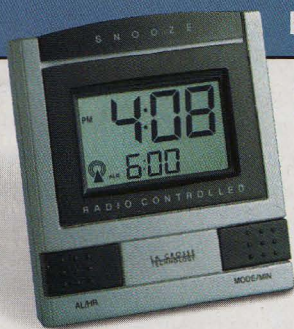
Promotional Code ADW-Z028

Please mention this when you call.

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To order by mail, please call for details.

FREE WITH PURCHASE!



Order today and receive, **FREE OF CHARGE**, La Crosse Technology's Atomic Digital Alarm Clock with a retail value of \$29.95!

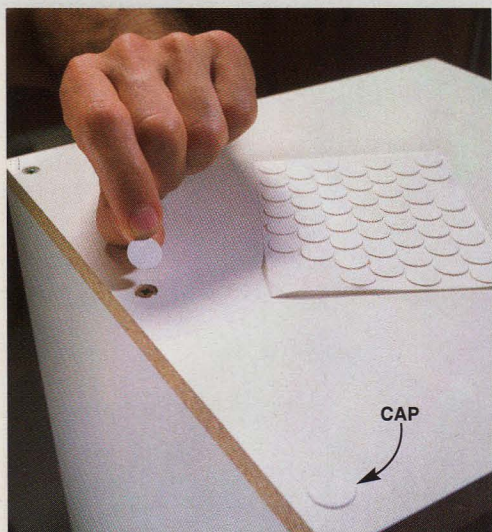
- Atomic radio-controlled time
- Automatically sets time
- Time alarm with snooze
- Backlight for easy viewing

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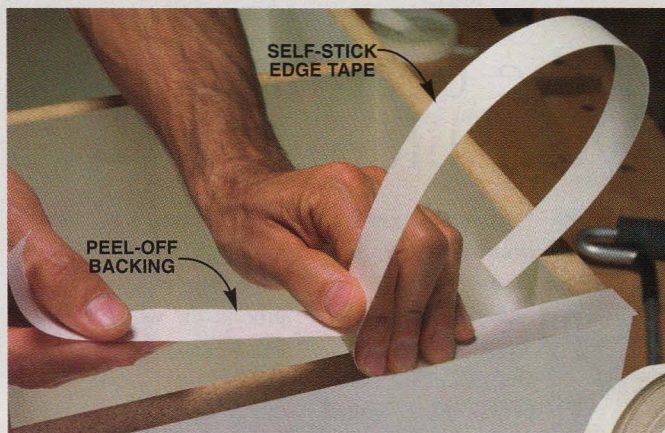


COVER UNSIGHTLY HOLES

The easiest way to cover exposed screw heads is with Fast Cap self-stick caps. These discs come in typical melamine colors and they're a cinch to apply—just peel and stick.

Source

McFeely's (800) 443-7937, www.mcfeelys.com
52 white PVC peel and stick caps, #FCS-6100 \$2.

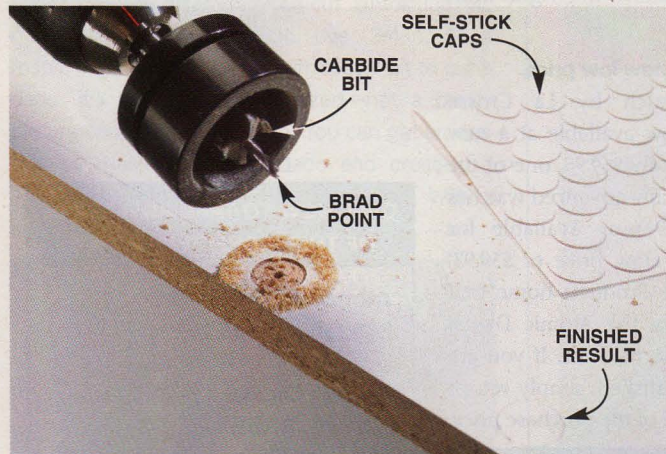


THROW AWAY YOUR IRON

Melamine needs to be edged for a finished look. You can use iron-on edging, but self-stick edging is faster, easier and incredibly strong. Just peel, stick and give it a pass with a wood block or roller to push the adhesive into the particleboard. Maximum strength is obtained in a week. One swipe with a double-sided edge trimmer cuts the tape flush.

Source

Woodworker's Hardware, (800) 383-0130, www.wwhardware.com
50-ft. roll of white 15/16-in. self-stick tape, #FCFESP 1516 50WH, \$14
Double-sided hand edge trimmer, #VIAU 93, \$13.

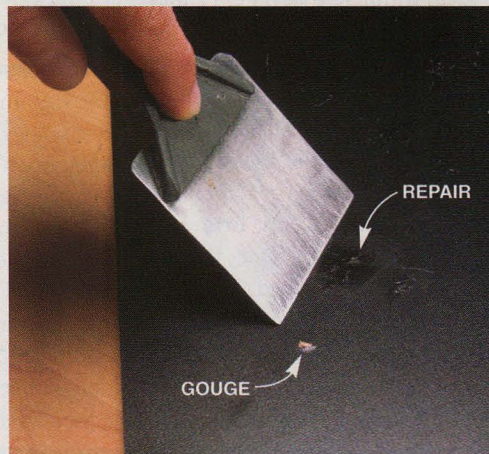


FLUSH-FIT CAPS APPEAR INVISIBLE

A flush-fit screw cap looks a whole lot better than the surface-applied caps. Plus, they are less prone to getting knocked off. The FlushMount carbide drill bit cuts a shallow 9/16-in.-dia. countersink for the self-stick cap. An adjustable brad-point bit protruding through the center of the carbide bit drills the pilot hole. Both bits can be adjusted for depth of cut. Just drill, screw and cover. The caps are almost invisible. The same system can be used on wood-veneered sheet stock.

Source

McFeely's (800) 443-7937, www.mcfeelys.com
FlushMount carbide drill bit, #FCS-6050, \$40
52 white PVC peel and stick caps, #FCS-6100 \$2.



REPAIR, DON'T DESPAIR

Small nicks and gouges are easy to fix using SeamFil. It works just like wood filler but it's designed for plastic. Just work a little into the wound and scrape it flush using a putty knife. After the filler dries, use a utility razor to remove any excess. It makes a quick, easy repair that's only noticeable at close range. **AW**

Source

Woodworker's Hardware, (800) 383-0130, www.wwhardware.com
SeamFil, 1-oz. squeeze tube:
white #K901, black #K914,
almond #K941, \$4 ea.



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The Rainhandler system is practically invisible. No gutters, downspouts, leaders or splash blocks to detract from the natural beauty of your home.

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Each 5-foot section comes with 3 brackets & 6 screws. Do your entire home in 3 or 4 hours.

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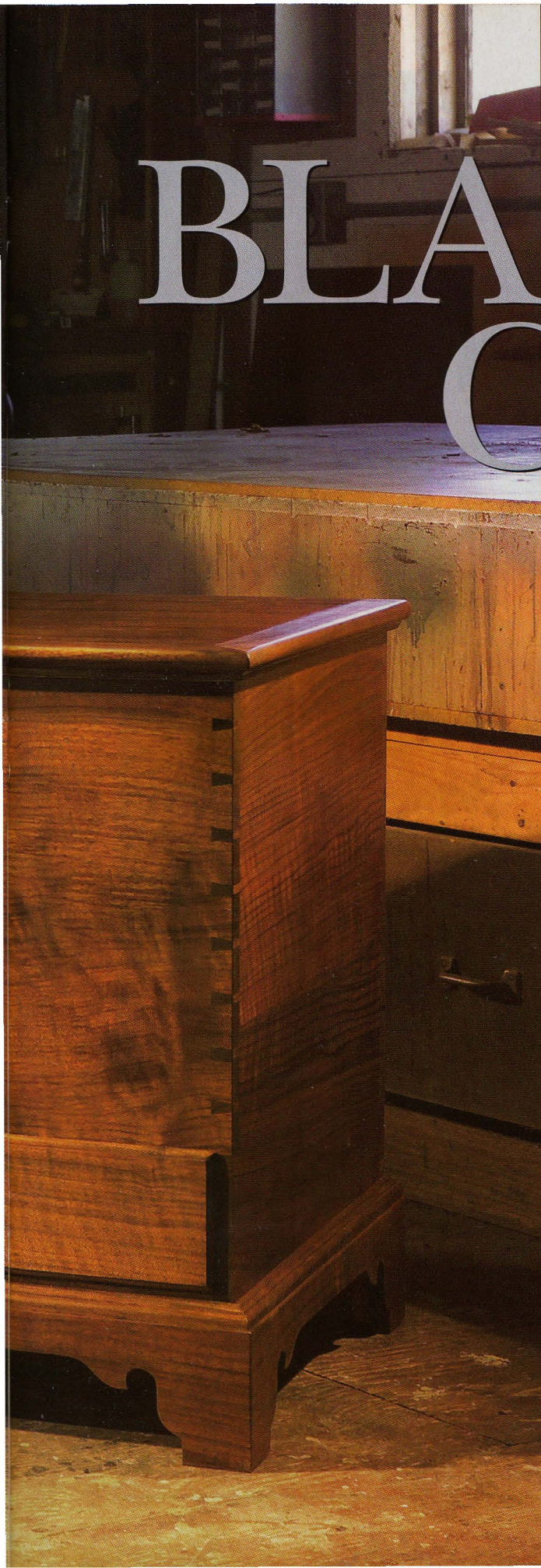
Address

City State

Zip Email

www.rainhandler.com/fh



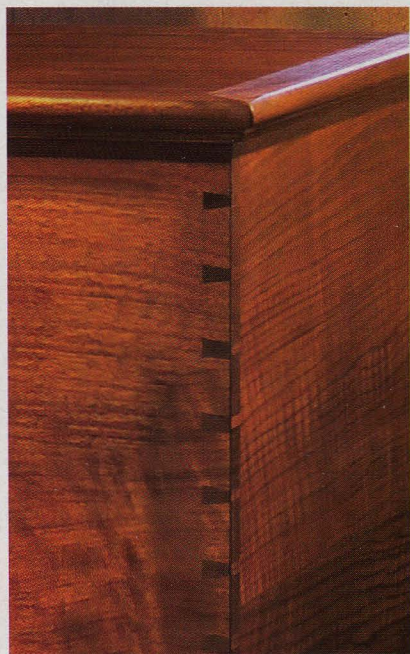
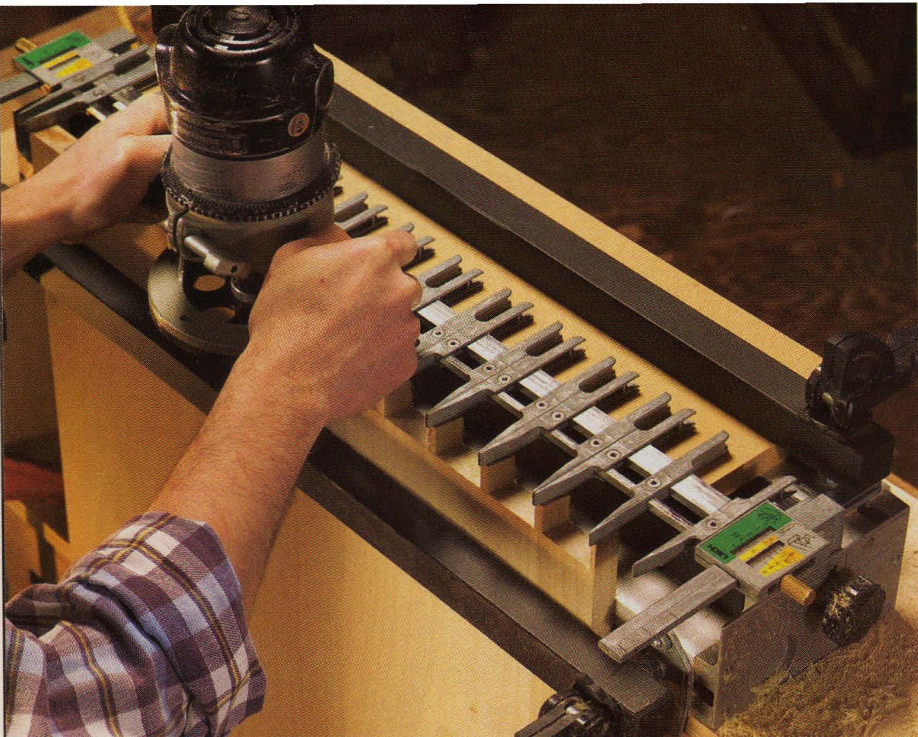


Pennsylvania BLANKET CHEST

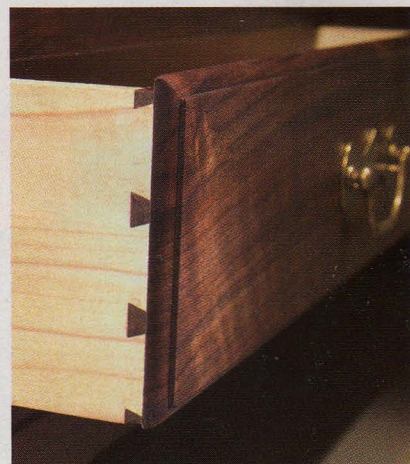
The Beauty of
Hand-Cut Dovetails
Without the Toil

I've always admired old Pennsylvania blanket chests. The detailing is fantastic, from the molded tops to the scalloped bases. But for me, it's the hand-cut dovetails that really make the old chests special. As much as I admire the look, there's no way I have the time to develop the skill to hand-cut large-panel dovetails. Fortunately, I've discovered the Leigh dovetail jig. It's given me the ability I've always longed for. Now I can create a timeless hand-crafted beauty, like this blanket chest, with relative ease.

by Jon Stumbras



Through dovetails



Half-blind dovetails

The Leigh D4-24 jig is well suited for this project. Adjustable fingers allow you to customize the size and spacing of your dovetails for a hand-cut look. It has capacity for boards up to 24 in. wide and more than 3/4 in. thick, which is necessary for a large project like this. Plus, it will cut both through dovetails for the case and half-blind dovetails for the drawers.

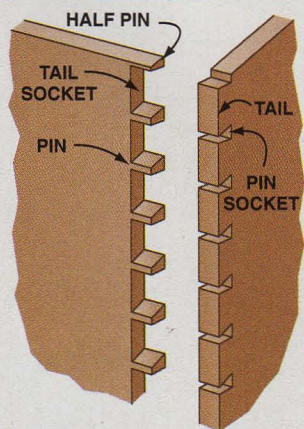
THE LEIGH JIG

If you like dovetails, you'll love the Leigh jig. I used the Leigh D4-24 jig because it has all the features this project demands:

- capacity for stock up to 24 in. wide and more than 3/4 in. thick (photo, above).
- variable dovetail size and spacing for a hand-cut look (photo, above right).
- ability to cut through dovetails on the chest and half-blind dovetails on the drawers (photo at right and Fig. A, below).

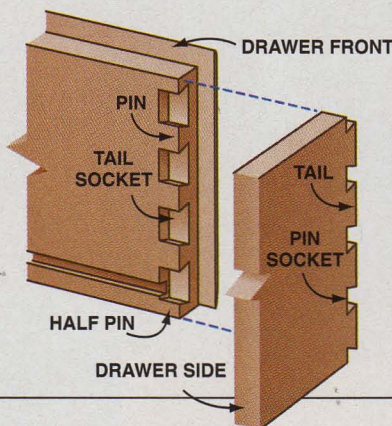
The Leigh jig, on the market for more than 20 years, has a proven track record of dependability and accuracy. A fully featured jig like this will seem a bit complicated at first. Fortunately, the Leigh comes with an excellent manual. With a little practice, you'll be able to add dovetails to your list of skills. If you take your time with each setup, label your pieces and use test pieces, you'll have no trouble building this wonderful chest.

FIG. A THROUGH AND HALF-BLIND DOVETAILS



Through dovetails have pins and tails that go completely through each other.

A dovetail joint consists of two interlocking parts called pins and tails. The pins on one board fit into pin sockets on the other board. Tails and tail sockets have the same relationship.



Half-blind dovetails are typically used for drawer construction. That's because the tail sockets do not go all the way through, which leaves a clean-looking drawer front.

PROJECT REQUIREMENTS AT A GLANCE

Materials

50 bd. ft. of figured 4/4 Oregon walnut
2-ft. x 4-ft. x 3/4-in. birch plywood
2-ft. x 4-ft. x 1/4-in. birch plywood
10 bd. ft. of 4/4 poplar

Hardware

Plate handles
Eschutchen
Hinges
Lid supports

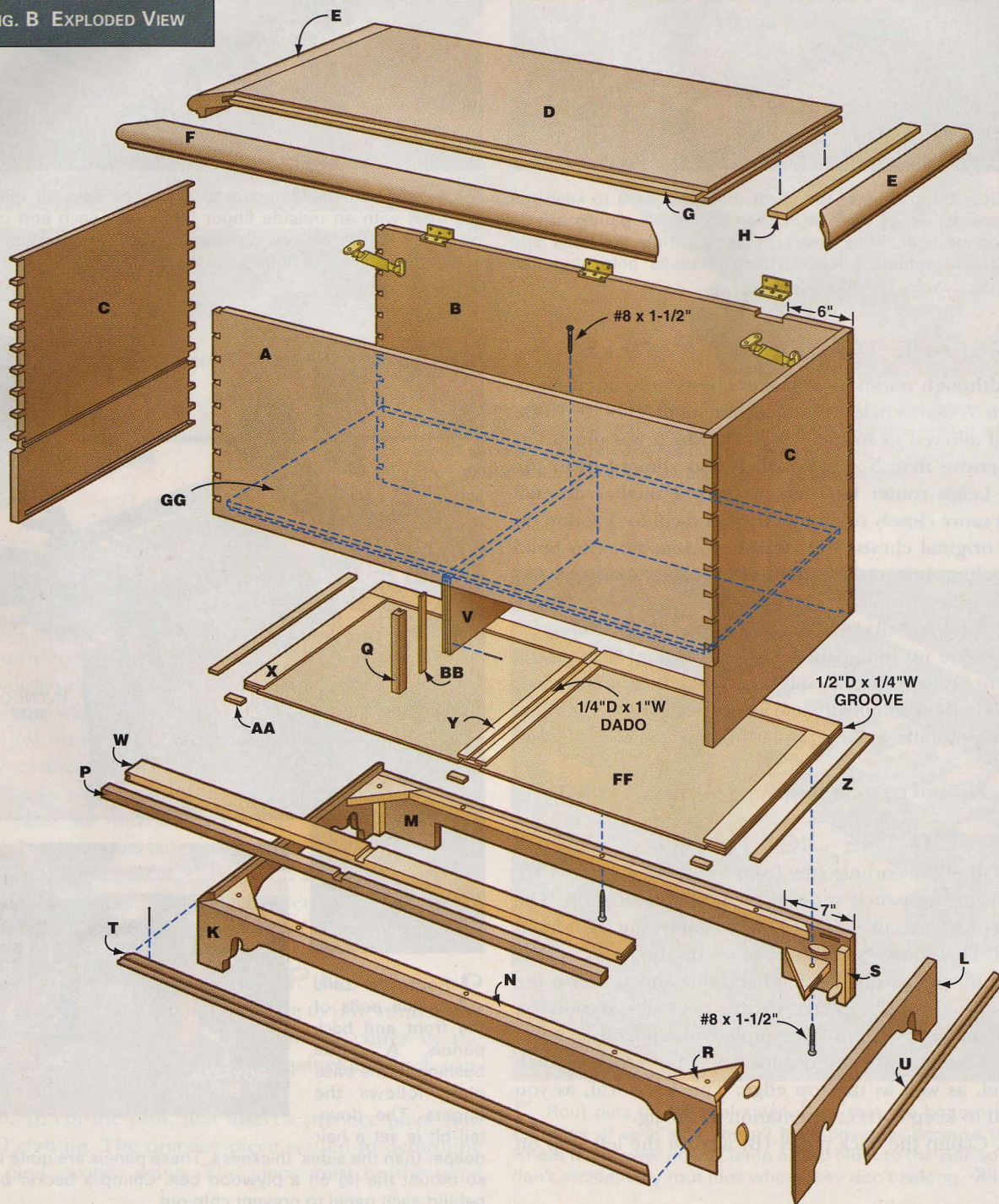
Tools

Leigh D4-24 dovetail jig
Leigh No. 128-A dovetail bit
Rabbit bit
Slot-cutting bit
Classic ogee bit
3/8-in. round-over bit
Bottom-bearing flush-trim bit
1/4-in. straight bit
3/8-in. straight bit

5/16-in. round-over bit
Porter Cable 7/16-in. guide bushing
Tablesaw
Biscuit joiner
Jointer
Planer
Router table

Materials and hardware costs \$800

FIG. B EXPLODED VIEW





1 Glue the panels of the chest first. Take care to keep the boards' edges flush with each other. Flat panels are an important goal. They result in better-fitting dovetails and require a whole lot less sanding. Biscuits help align the boards.

PREPARE THE CHEST PANELS

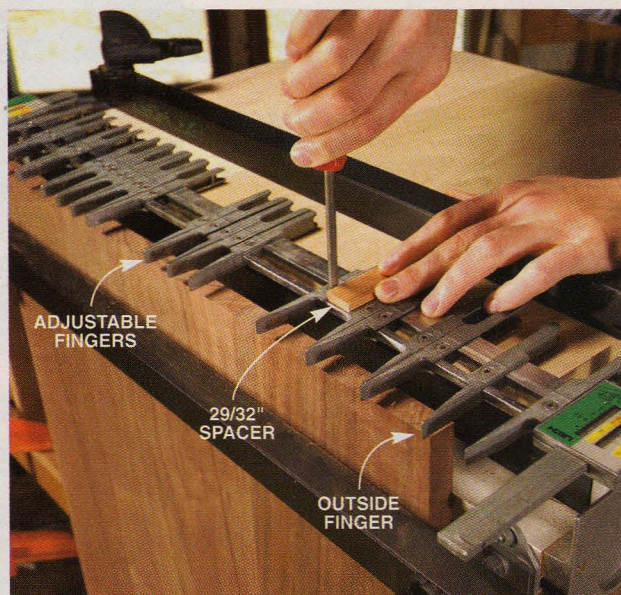
Although traditional blanket chests were often made from 7/8-in. stock, we milled our lumber to 13/16 in. That allowed us to use 4/4 stock, which was much less expensive than 5/4 material. It also allowed us to use the Leigh router bits that produce a smaller dovetail that more closely resembles the hand-cut look found on the original chests. You can use 3/4-in. stock to build this chest, but you'll have to modify the dimensions on a few parts.

1. Joint and plane all the solid wood to 13/16 in.
2. Glue up four panels (A, B, C in Fig. B, page 53; Photo 1). Keep the biscuits far enough in from the ends to allow for trimming to final length and for the 13/16-in.-deep dovetails. Make a poplar practice panel to be used later.
3. Rip and crosscut the panels to final dimension.

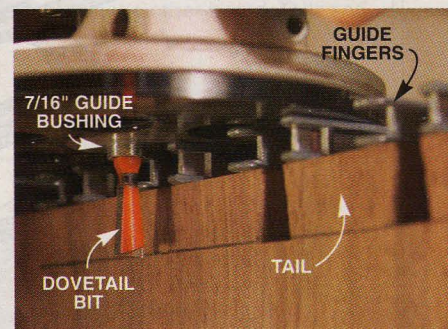
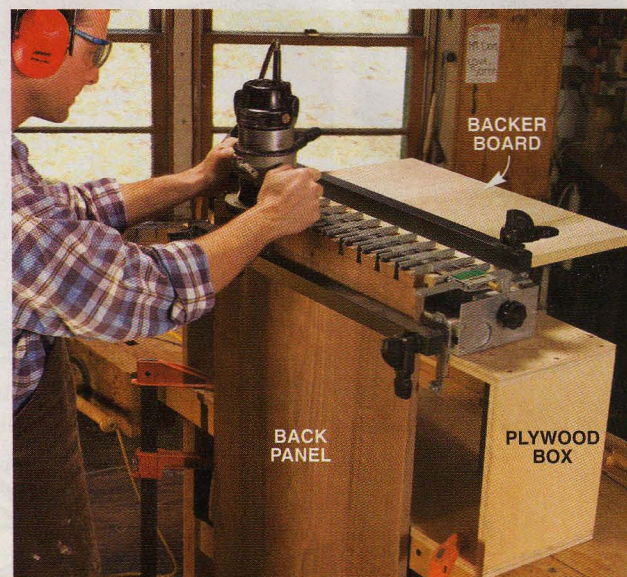
SET UP THE JIG

Half of the corners (the front left and back right) are cut with the panels set against the left-hand stop. The other half are cut with the panels against the right-hand stop. That means you'll have to set up the fingers twice, once for the cuts on the left-hand side and again for the cuts on the right. Refer to the manual's section on Asymmetric Dovetails for complete instructions.

4. Clearly mark the outside and inside face of each panel, as well as the top edge. This is critical, as you need to keep correct orientation in the jig.
5. Clamp the back panel (B) against the left stop on the jig.



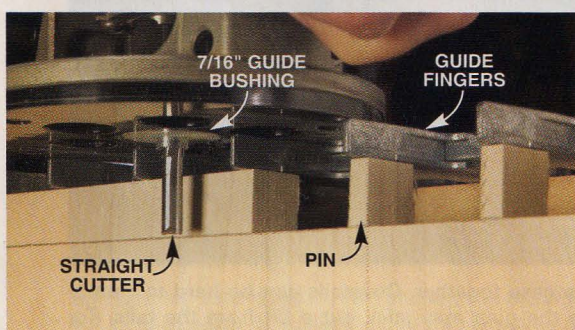
2 Set the adjustable fingers to create the dovetail spacing. Start with an outside finger just inside each end of the panel. A 29/32-in.-wide spacer creates the perfect gap between each pair of fingers for this project.



3 Rout the tails on the ends of the front and back panels. A guide bushing in the base plate follows the fingers. The dovetail bit is set a hair deeper than the sides' thickness. These panels are quite long, so mount the jig on a plywood box. Clamp a backer board behind each panel to prevent chip-out.



4 Rout pins in a test piece first. Test the fit. The finger assembly can be adjusted in or out until the dovetail joints go together with a gentle tap of a mallet. The pins are cut using a straight bit and a guide bushing. The pointed ends of the fingers are used to make the pins.



6. Even though the tails are cut first using the Leigh jig (putting an end to that age-old debate), make sure the fingers are in the pin-cutting mode (pointed end out) when you create the dovetail spacing. The adjustable fingers determine the desired dovetail size and spacing. To set the spacing for this chest, first place the outside fingers just inside each end. Then, pair up the remaining fingers using a 29/32-in. spacer (Photo 2).

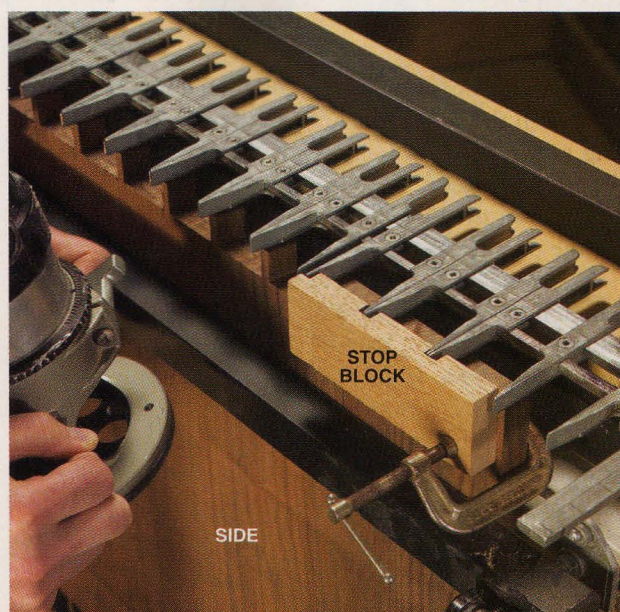
7. Make sure all the fingers are tightened securely.

8. After the dovetail spacing is set, flip the finger assembly over to its tail-cutting mode. Now the rounded guide fingers are facing toward you and you're ready to cut the tails in the right-hand corner of the back panel and in the left-hand corner of the of the front panel.

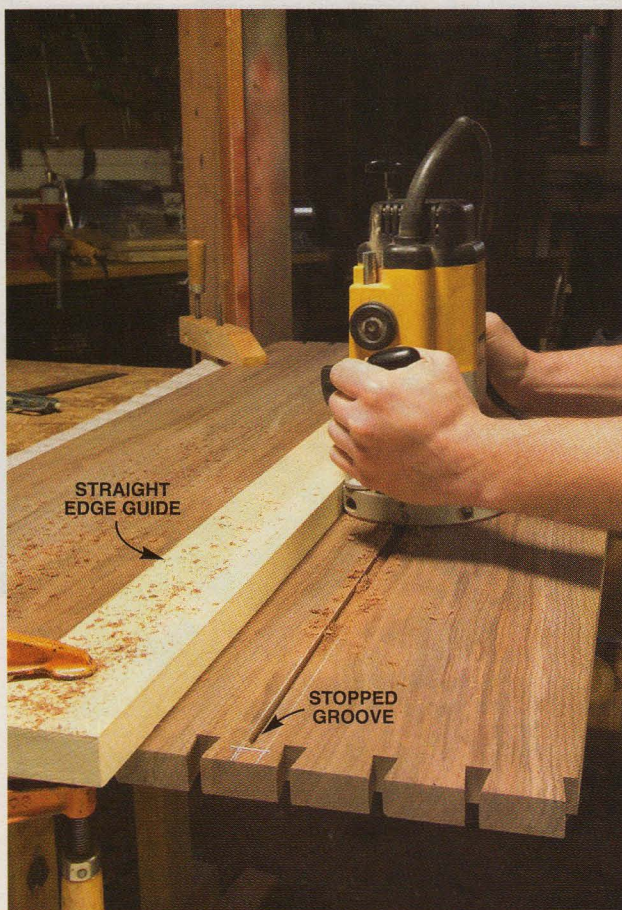
CUT THE TAILS AND PINS

9. Attach a 7/16-in. guide bushing to your router base and chuck the Leigh No. 80 dovetail cutter in the router. Rout the tails on the front panel and back panels (Photo 3).

10. To cut the pins, first insert a practice piece into the Leigh jig. The practice piece is used to determine the pins' proper sizing. The piece must be the same



5 Rout pins on the real sides. Note that the bottom front edge of each side doesn't have dovetails because that's where the drawer goes. Clamp a stop block to the side so you don't accidentally rout pins where they don't belong.



6 Rout grooves in the front, back and sides to receive the plywood bottom. Use a straightedge to guide the router. Take care to stop the cuts on the ends of the front and back panels or the grooves will be visible after the case is assembled. The grooves in the sides can be routed through.

thickness as your side panels, but it need not be as wide.

11. Flip the finger assembly back over to the pin-cutting mode. Insert a Leigh No. 140 straight cutter into the router with the 7/16-in. guide bushing.

12. Reset the depth of the cutter and make test cuts for the pins (Photo 4).

13. Remove the board to test the fit with the back panel. If the joint is too tight, move the finger assembly away from you just a hair. If it's too loose, move the fingers towards you. It only takes a tiny adjustment of the finger assembly to change the fit.

14. Use a stop block to prevent routing into the drawer opening on the bottom portion at the front of each side panel (Photo 5).

15. Repeat steps 5 through 14 for the cuts made on the right-hand side of the jig.

16. After all the dovetail joints are cut, mark the location of the square shoulder on the side panels just above the drawer opening. (Fig. C, page 57). Square off the shoulder using a chisel.



7 Glue the case together. Dovetails can be hard to clamp because the pins may stick out a bit from the tails. To apply clamping pressure on each tail, attach 1/8-in.-thick clamping pads to the tails using double-faced tape. A hardwood caul over the pads applies even clamping pressure and forces the tails home.

FIT THE TWO BOTTOM PANELS

17. Rout a groove along the inside of all the panels to accept the 3/4-in. plywood bottom (GG) (Fig. C and Photo 6).

18. Rout the 3/8-in. deep groove for the web frame splines (Z) with a 1/4-in straight cutter (Fig. C). These grooves are cut in the sides only. The web frame is butt-joined with glue to the back of the chest.

19. Dry-fit the case assembly with the bottom installed to make sure everything goes together correctly.

GLUE UP THE CHEST

Gluing a dovetailed case can make your knees go weak, but we'll show you a few simple tricks to take care of the nerves.

20. Using double-stick tape, fasten clamping pads to the tails prior to glue-up (Photo 7).

21. Use hide glue to assemble the chest. You'll really appreciate its long open time.

22. Fit the plywood bottom into the two sides. Then glue on the front and back panels and clamp.

23. Check the diagonal measurement across the top to make sure the case is square.



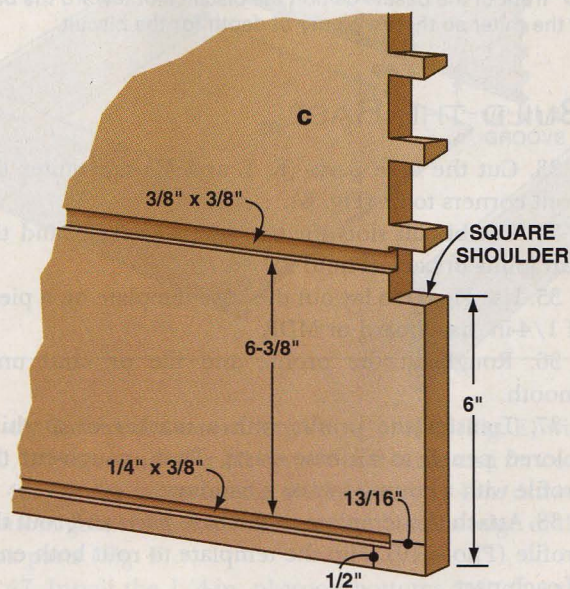
8 Turn the case upside down and slide in the web frame. It's held in place by splines glued into grooves on the chest sides. Glue and clamp the back edge to the back. Make sure the walnut face is flush with the side.

BUILD THE WEB FRAME

24. Cut the web frame members (W, X and Y) to length.
25. Cut the 1/2-in.-deep grooves for the dust panels (FF) and splines (AA, Z) with a slot cutter in the router table.
26. Glue and clamp the web frame together.
27. Glue the 1-in.-wide walnut face (P) to the front of the web frame.
28. On the tablesaw, run a dado through the web frame for the center divider (V).
29. Glue the splines (Z) into the case sides.
30. Glue and clamp the web frame into place (Photo 8).
31. Cut the grooves for the spline (BB) on the front edge of the center divider and walnut edging (Q). Fasten the edging to the divider with glue and brads. Keep the glue on the top third of the divider only. Fasten the rest of the edge with brads. They have enough give to allow the center divider to expand and contract a bit.
32. Glue the center divider into the web frame and fasten using screws through the bottom.

FIG. C GROOVE AND SHOULDER

Pare down the square shoulder to fit the front panel.





9 Cut a biscuit slot to reinforce the mitered corners at the front of the base. Position the biscuit slot toward the back of the miter so there's plenty of depth for the biscuit.

BUILD THE BASE

33. Cut the base parts (K, L and M) and miter the front corners to fit (Fig. B).

34. Cut biscuit slots for the miters in front and the butt joints in back (Photo 9).

35. Use Fig. D to lay out the base template on a piece of 1/4-in. hardboard or MDF.

36. Rough-cut the profile and file or sand until smooth.

37. Transfer the profile with a marker or a white-colored pencil to all base parts. Then, rough-cut the profile with a coping saw or a bandsaw.

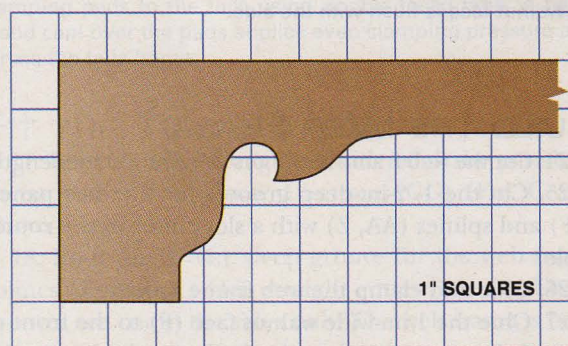
38. Attach the template to the base parts and rout the profile (Photo 10). Flip the template to rout both ends of each part.

39. Glue the base parts together; then biscuit in corner support (R).



10 Use a template to rout the base profile on the router table. Secure the pattern to the rough-cut base part with double-faced tape.

FIG. D BRACKET FOOT DETAIL

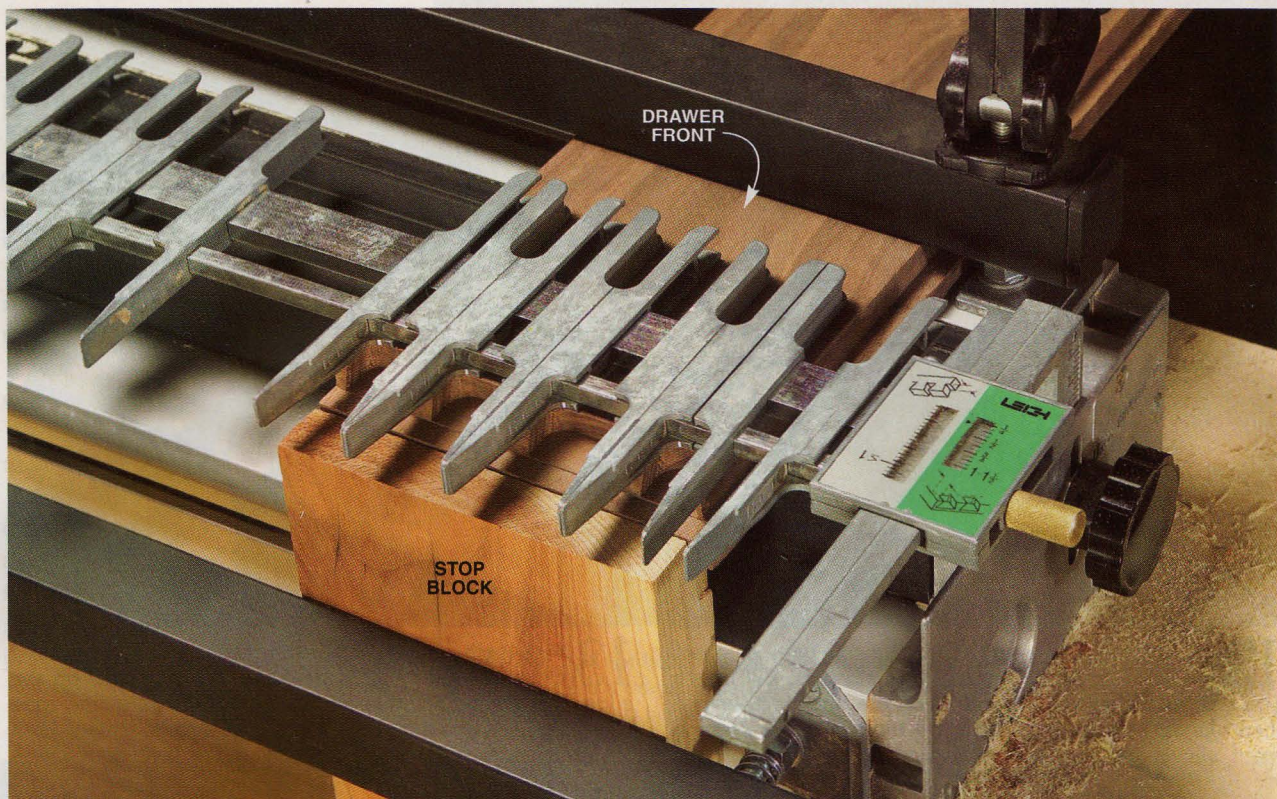


Transfer the cutout onto your template. The template should be about 28 in. long so it reaches past the halfway point of the front molding. That way you'll be able to rout the flat stretch between the two front feet.

40. Glue in screw flanges (N) and glue blocks (S) to the base.

41. Attach the case to the base with screws through the corner blocks and the screw flanges (see Fig. B).

42. Rout the base molding (T, U) using a classic ogee profile bit. Miter the ends to fit, and glue and nail to the base (not the chest!).



11 Rout the half-blind dovetails in the drawer front. The drawer fronts are clamped horizontally on the Leigh jig

for this operation. Butt the drawer front up against a scrapwood stop block to correctly position the drawer front in the jig.

FIG. E DRAWER FRONT DETAIL

Rout the profile on all four sides of the drawer front with a 5/16-in. round-over bit. Then rabbet both sides and the top. Do not rabbet the bottom edge.

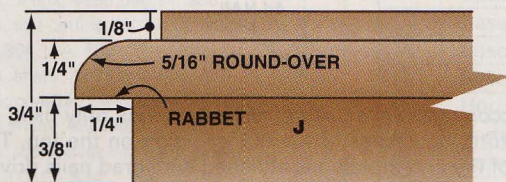
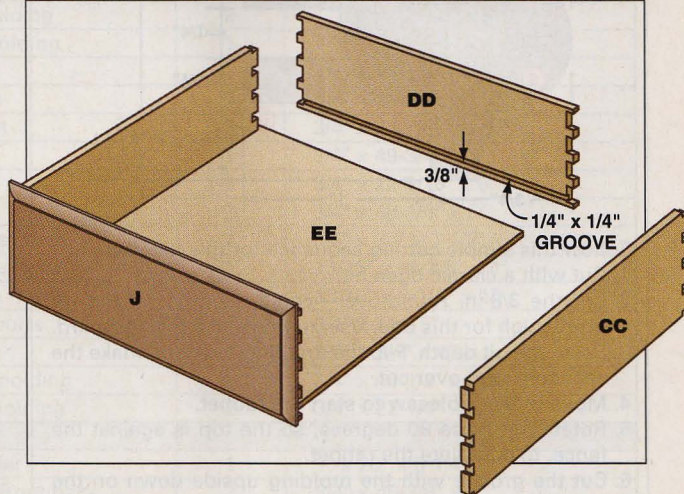


FIG. F DRAWER



MAKE THE DRAWERS

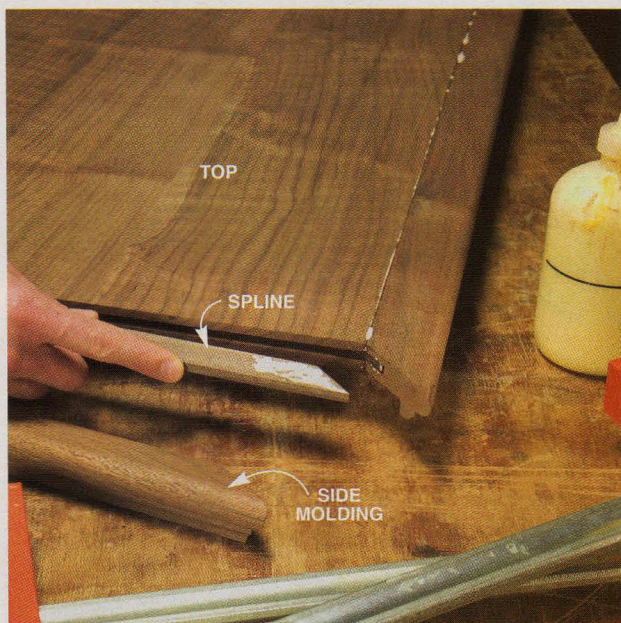
43. Cut all the drawer parts. Rout the drawer-front rabbet (Fig. E) on a router table. **Note:** The drawer fronts are rabbeted on the top and sides only.

44. Rout the dovetails for the drawer (Photo 11). We used half-blind dovetails in front and through dovetails for the back of the drawer (Fig. F).

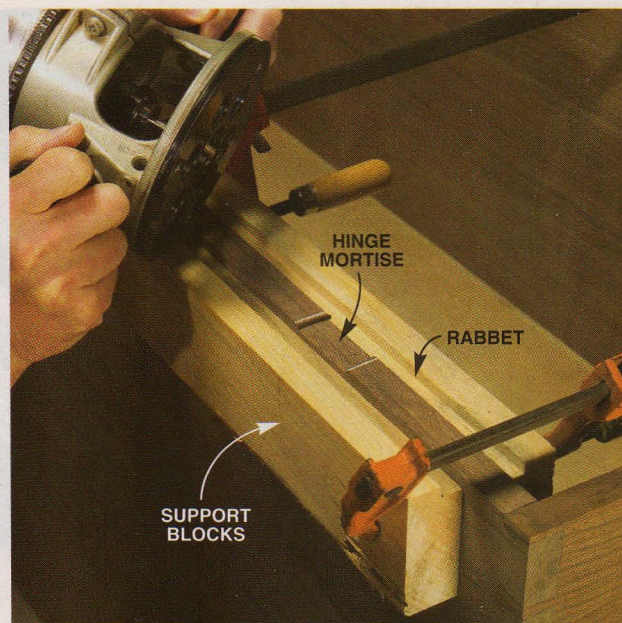
45. Cut the drawer-front molding profile (Fig. E) with a 5/16-in. round-over bit on a router table and fence.

46. On the tablesaw, cut the 1/4-in. x 1/4-in. drawer-bottom grooves 3/8 in. up from the bottom edge of the box parts (Fig. F).

47. Install the 1/4-in. plywood bottoms and glue the drawer together.

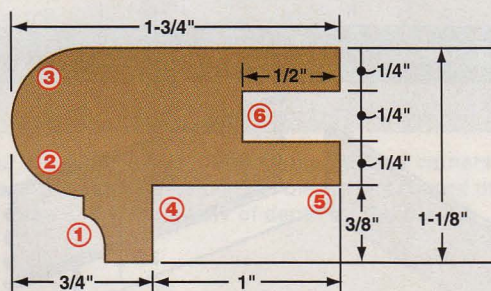


12 Attach the edge molding to the top with glue and splines. Glue the front molding along its full length. The side moldings are only glued on the front inch or two, then pinned with brad nails toward the back. This arrangement allows for seasonal expansion and contraction that would otherwise crack the top.



13 Free-hand rout the hinge mortises in the back of the chest. Support blocks help steady the router on the edge of the back. Rabbets on the blocks create a free zone where you can position, start and stop the router safely. Rout close to the layout lines; then clean up the shoulders with a chisel.

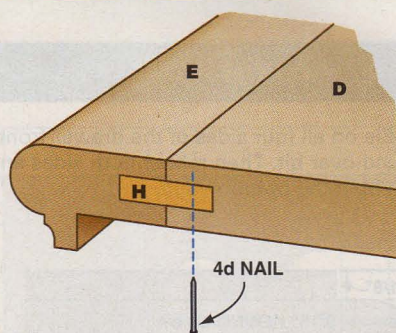
FIG. G TOP MOLDING PROFILE



Follow this simple cutting sequence for this molding:

1. Cut with a classic ogee bit.
2. Cut the 3/8-in. round-over—you'll need to set the bit pretty high for this one. Use guards and a featherboard.
3. Reset the bit depth. Flip the molding over and make the second round-over cut.
4. Move to the tablesaw to start the rabbet.
5. Rotate the piece 90 degrees, so the top is against the fence, to complete the rabbet.
6. Cut the groove with the molding upside down on the router table. Use a 1/4-in. slot cutter.

FIG. H TOP END MOLDING



To accommodate wood movement, glue is only used on the front few inches of the end molding on the top. The rest of the end molding is attached with brad nails driven up through the underside of the top into the spline.

MAKE THE TOP

48. Thickness-plane the boards for the top to 3/4-in. Use biscuits to help maintain a flat glue-up.

49. Sand out any irregularities. Then rip and crosscut the top to its final dimensions.

50. Make the top molding (Fig G) using the same ogee-bit you used for the base molding. Cut the spline slot last.

51. Before you rout the spline slot in the glued-up top, make test cuts on a piece of scrap until you get a flush fit with the molding.

Tip: If you have a removable router mounting plate, simply lift the router and the plate out of the router table. You won't need to reset the bit depth from routing the groove in your molding.

52. Mill the splines (G, H).

53. Cut and fit the moldings. Glue the front molding in place using the spline.

54. Glue the splines into the side moldings and attach to the top (Photo 12). Nail the remaining portion of the side molding using brads (Fig. H).

FINISHING TOUCHES

55. Cut the mortise to the full depth of the hinge knuckle (Photo 13). That way no mortise is necessary in the top.

56. Screw the hinges in the mortises; locate the hinge on the top and attach.

57. Attach a pair of safety lid supports (Photo 14).

58. Attach the drawer pulls to the drawers.

59. We used a Danish oil finish on the walnut. Sand to 220 grit and apply three to four coats of finish. A couple coats of satin varnish will provide added luster and protection. **AW**



14 Last, but not least, install safety lid supports on the blanket chest. Lid supports are a crucial safety feature that prevents the top from crashing down on an unsuspecting person's fingers.

SOURCES

Woodcraft

(800) 225-1153, www.woodcraft.com

Leigh D4-24 dovetail jig with standard bits included, \$370

Porter Cable guide bushing, 7/16-in., #04C34, \$8

Lid safety support left, #04431, \$5

Lid safety support right, #04415, \$5

Watco oil, #123977, \$12 per quart.

CMT, (888) CMT-BITS, www.cmtusa.com

Leigh No. 128 dovetail bit, #818.132.11, \$23

Rabbit bit, 1/4-in. shank, #835.350.11, \$32

1/2-in. shank, #835.850.11, \$35

1/4-in. slot-cutting bit, 1/4-in. shank, #822.364.11A, \$29

1/2-in. shank, #822.364.11B, \$29

Classic ogee bit, 1/4-in. shank, #844.350.11, \$46

1/2-in. shank, #844.850.11, \$46

3/8-in. round-over bit, 1/4-in. shank, #838.317.11, \$34

1/2-in. shank, #838.817.11, \$35

5/16-in. round-over bit, #838.285.11, \$33

3/8-in. straight bit, #811.095.11, \$18

1/4-in. straight bit, #811.064.11, \$16.

Goby Walnut

(514) 926-1079, www.gobywalnut.com

50 bd. ft. 4/4 quarter-figured walnut, \$12 per bd. ft.

Local lumberyard

2 x 4-ft. sheet of 3/4-in. birch plywood, \$18

2 x 4-ft. sheet of 1/4-in. birch plywood, \$7

4/4 poplar, 10 bd. ft., \$20.

Lee Valley and Veritas Hardware

(800) 871-8158, www.leevalley.com

Two plate handles, 96mm, # 01A56.10, \$4 ea.

One escutcheon, # 01A19.51, \$1

Two brass hinges, 2-in. x 1-1/2-in.,

#01B02.07, \$32 per pair.

CUTTING LIST Overall dimensions: 50-1/2" x 22-3/8" x 28-3/4"

Part	Name	Qty.	Dimension
Walnut			
A	Front panel	1	13/16" x 48" x 17"
B	Back panel	1	13/16" x 48" x 23"
C	Side panels	2	13/16" x 21-1/2" x 23"
D	Top	1	3/4" x 46-1/4" x 20-5/8"
E	Top side molding	2	1-1/8" x 22-3/8" x 1-3/4"
F	Top front molding	1	1-1/8" x 49-3/4" x 1-3/4"
G	Front spline	1	1/4" x 49-1/2" x 7/8"
H	Side splines	2	1/4" x 22" x 7/8"
J	Drawer front	2	3/4" x 23-1/8" x 5-1/8"
K	Base front	1	3/4" x 49-3/4" x 5"
L	Base side	2	3/4" x 22-5/16" x 5"
M	Base back	1	3/4" x 48-1/4" x 5"
N	Base flanges	2	3/4" x 38" x 1-1/2"
P	Horizontal face frame	1	13/16" x 46-3/8" x 1"
Q	Vertical face frame	1	13/16" x 5-1/4" x 1"
R	Corner supports	4	3/4" x 5" x 5"
S	Glue blocks	4	3/4" x 3/4" x 4"
T	Base front molding	1	3/4" x 49-1/2" x 3/4"
U	Base side molding	2	3/4" x 22-1/4" x 3/4"
Poplar			
V	Center divider	1	1" x 20" x 5-1/4"
W	Web frame front/back	2	3/4" x 46-3/8" x 2"
X	Web frame sides	2	3/4" x 15-7/8" x 2"
Y	Web frame center	1	3/4" x 15-7/8" x 3-1/2"
Z	Web frame splines	2	1/4" x 19-1/2" x 7/8"
AA	Web frame tenons	6	1/4" x 7/8" x 7/8"
BB	Vertical face frame spline	1	1/4" x 5" x 7/8"
CC	Drawer sides	4	1/2" x 20-1/2" x 4-7/8"
DD	Drawer backs	2	1/2" x 22-5/8" x 4-7/8"
1/4" Birch Plywood			
EE	Drawer bottoms	2	1/4" x 22" x 20"
FF	Dust panels	2	1/4" x 20-3/16" x 16-5/8"
3/4" Birch Plywood			
GG	Case bottom	1	3/4" x 47" x 20-1/2"



A Free Car with Every Watch?...Keep Reading

I love classic watches. They are finely tuned miniature mechanical marvels that are both beautiful and functional. But many Swiss models cost more than my new car. So we at Stauer decided to replicate the movement of a magnificent \$26,000 Swiss Automatic watch but sell it to you for only \$198. So you end up with \$25,802 in change. That's enough to buy a brand new sedan or SUV.

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You can tell the quality by the smooth sweeping motion of the second hand. It doesn't click like a mass produced quartz movement. Plus, the crocodile embossed leather band doesn't pinch like many metal bands but comes with a butterfly-locking clasp that is easier to operate than other buckles.

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Speaker Stand

with Hidden Storage

Don't you love hearing great sound with your movies at home? A pair of these oak stands puts today's small speakers at the ideal height—3 ft. above the floor. We've built cabinets under the speakers that hold a total of 60 DVDs behind secret doors. And we've tucked the the speaker wires out of sight—they run inside the stands.

by Gary Wentz



PROJECT REQUIREMENTS AT A GLANCE

Tools

Tablesaw
Biscuit joiner
Router
Drill

Materials

(to make two stands)

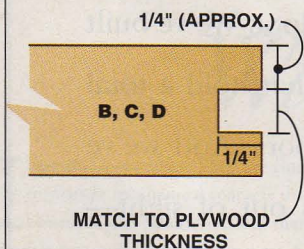
15 bd. ft. of oak
1/2 sheet of 1/4-in. oak plywood
10 6 x 6-in. pieces of 3/4-in. plywood
1-1/4-in. and 2-in. No. 8 flat head screws

Cost

\$100 for two stands

DETAIL 1

GROOVES IN RAILS AND STILES



DETAIL 2

SIDE VIEW OF TOP

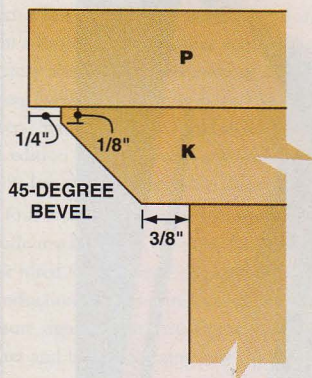
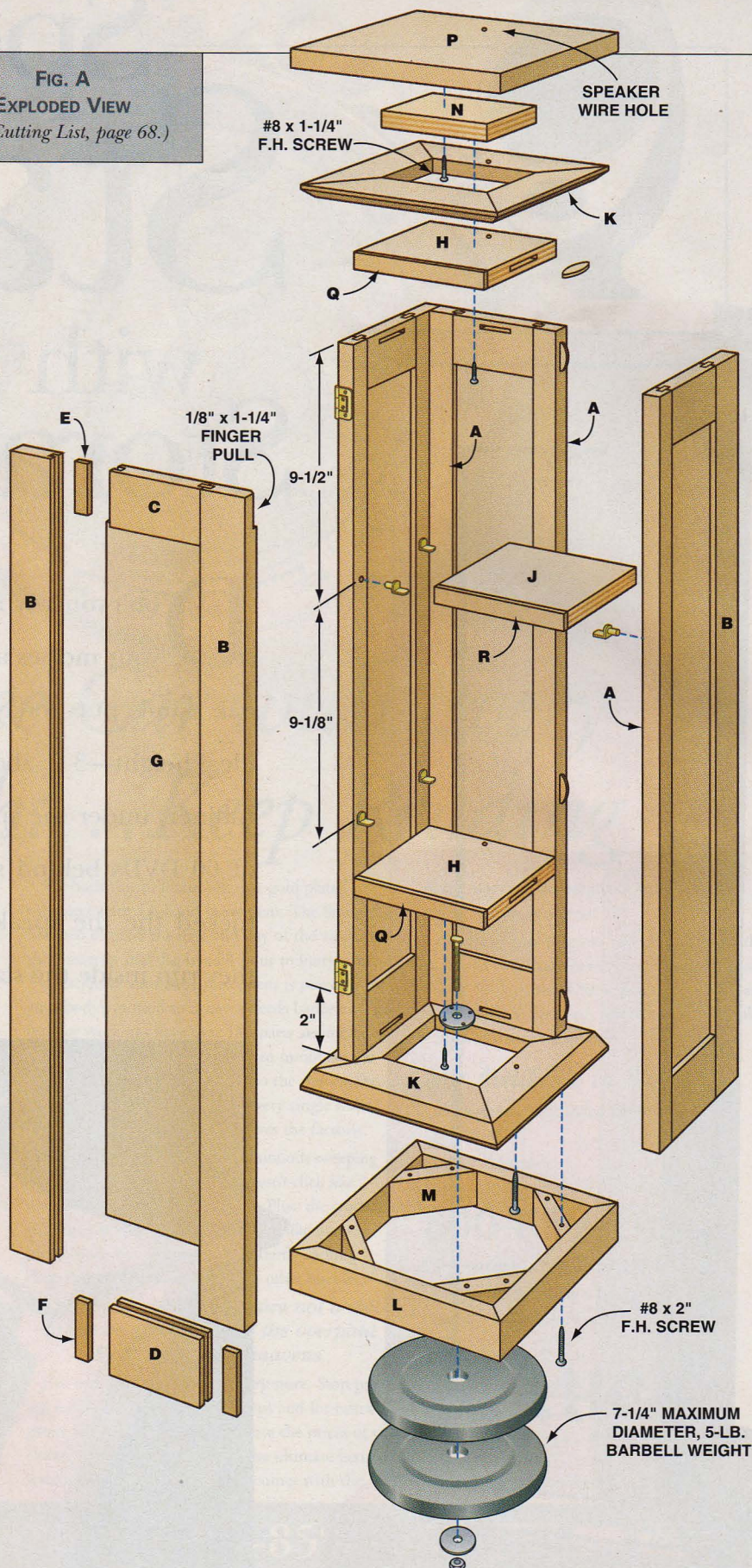
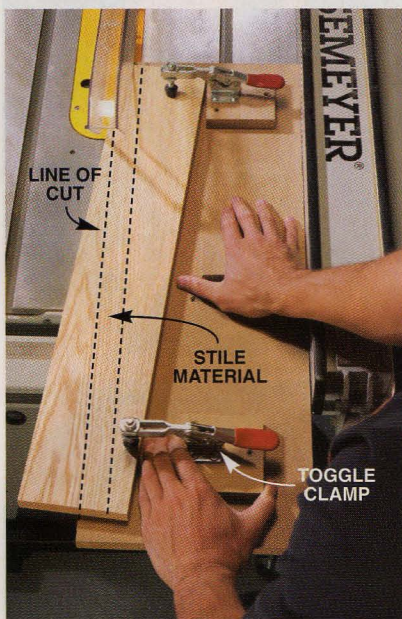
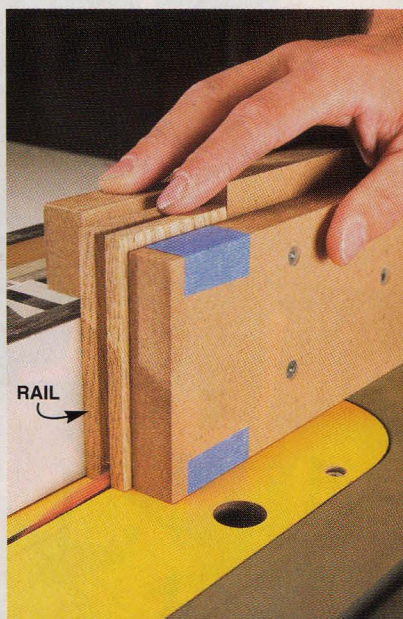


FIG. A
EXPLODED VIEW
(See Cutting List, page 68.)

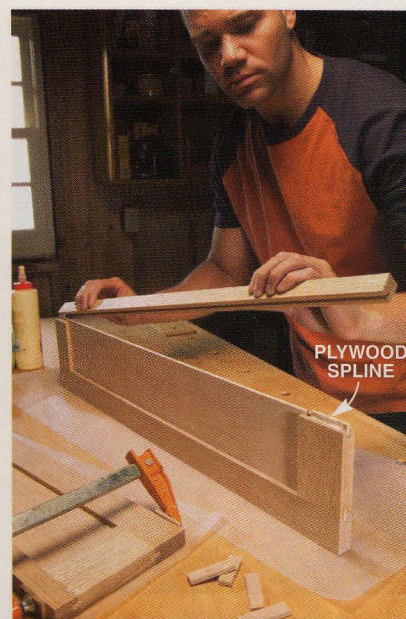




1 Straight-grained wood complements the simple lines of this project. This simple jig with toggle clamps lets you rip straight-grained pieces from ordinary boards.



2 Cut grooves in the rails and stiles to hold plywood panels and splines. The rails are very short and unsafe to hold by themselves, so push them with a shop-made jig (Fig. B).



3 Glue each side of the cabinet using 1/4-in. plywood splines. The back and the door are built exactly the same way, although the back is narrower.

START WITH STRAIGHT-GRAINED WOOD

Wood selection makes all the difference in this project. Straight-grained pieces emphasize the stand's simple lines. Wild or angled grain is distracting, but often it's the norm in oak. No problem. If you don't mind wasting some wood, you can make your own great-looking straight-grained boards.

Begin by selecting boards for the stiles and rails. You don't need many. It doesn't matter what angle the grain runs at in these pieces, as long as some of it is straight. Save the parts of these boards with really wild grain for the frames (K) and top (P) since their faces don't show. Rip the boards at an angle that follows the grain (Photo 1). Use the new edge to cut your stiles and rails.

RAILS, STILES AND PANELS

The storage cabinet is basically four frame-and-panel assemblies with similar stiles and rails. They are grooved to hold plywood panels (G) and splines (E, F). The splines

join each assembly. We'll use a standard blade to cut the grooves, rather than a dado blade, because 1/4-in. plywood is usually undersized.

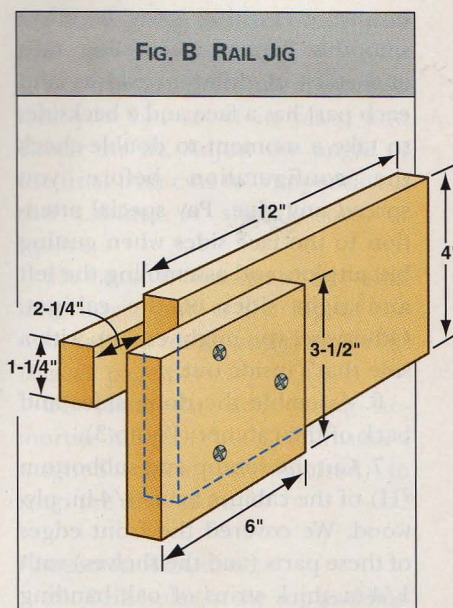
1. Rip and crosscut the stiles (A, B) and rails (C, D). Hang on to your offcuts to use as trial pieces when making the grooves. Note that the stiles are two different widths. The back has two narrow stiles; the door has two wide ones. The sides have a narrow stile in front, a wide stile in back.

2. Cut the plywood panels (G) and use leftover scraps to make splines.

3. To make assembly easier, use sandpaper to slightly round the edges of the panels.

4. Select and mark the best-looking side of each rail and stile as its face. Place the face against the fence each time you cut a groove. That way, any slight variations in wood thickness will create uneven joints on the inside rather than the outside of the speaker stand.

5. Set your blade to 1/4-in. cutting depth and set your fence 1/4 in. from the blade. Cut one kerf in



some trial pieces and every stile and rail (Photo 2; Fig. A, Detail 1, left). Move the fence and make a second pass in one of the trial pieces. Use a spline to check the fit of the groove. The spline should slip in easily, allowing room for glue. Adjust the fence if necessary and finish grooving all the pieces.



4 Cut biscuit slots; then drill holes in the sides for shelf supports. This jig indexes the holes and acts as a depth stop. The chuck of the drill hits the jig before the bit goes too deep.

ASSEMBLE THE CABINET

Make a dry-run assembly to ensure everything goes together smoothly. You're assembling rails and stiles of different widths and each part has a face and a backside, so take a moment to double-check the configuration before you spread any glue. Pay special attention to the face sides when cutting biscuit slots and assembling the left and right sides of the cabinet. Otherwise, you might end up with a side that's inside out.

6. Assemble the door, sides and back of the cabinet (Photo 3).

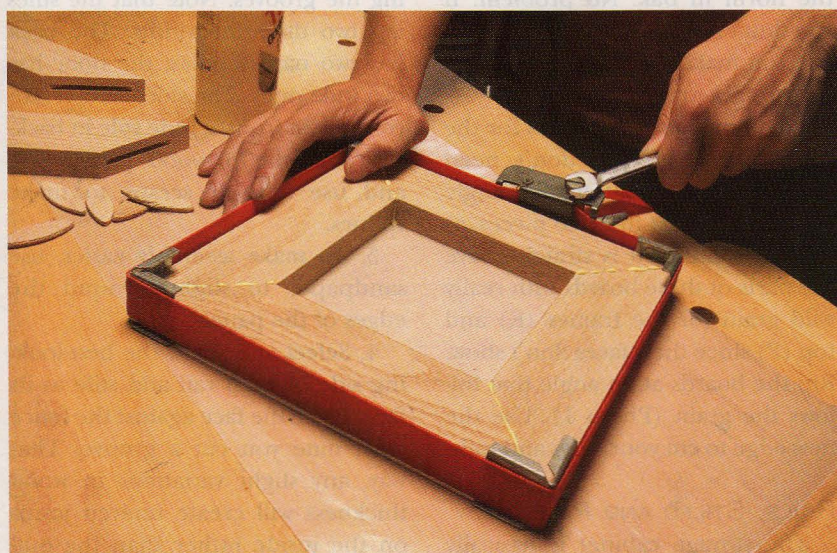
7. Cut the subtop and subbottom (H) of the cabinet from 3/4-in. plywood. We covered the front edges of these parts (and the shelves) with 1/4-in.-thick strips of oak banding (Q, R).

8. Cut slots for No. 0 biscuits. Biscuits aren't vital to the strength of the cabinet, but they hold the parts in alignment and make assembly much easier.

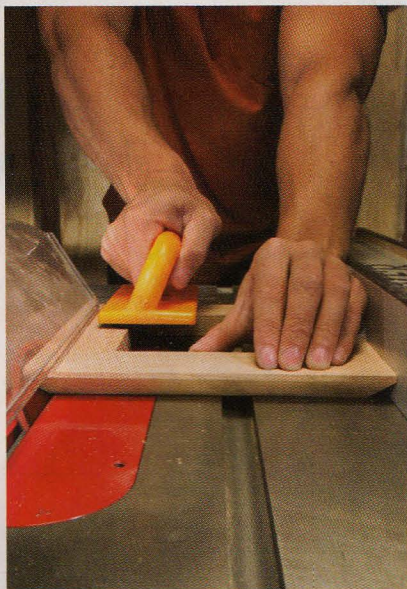
9. Drill the holes for shelf pins before assembly (Photo 4).



5 Assemble the cabinet using the subtop and subbottom to square the sides to the back. Place spacers between the stiles so they don't flex under clamping pressure. Biscuits make aligning the parts a no-brainer for this critical step.



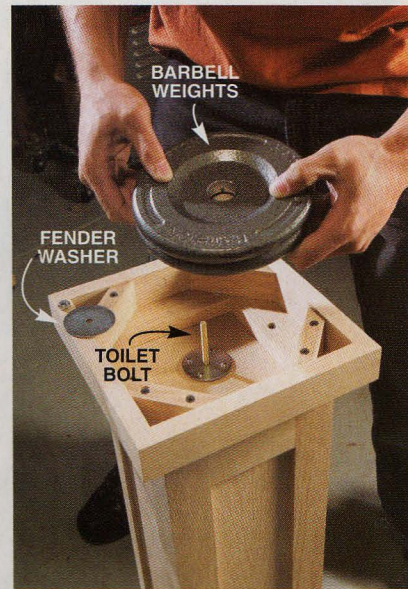
6 Glue the mitered frames that go on the top and bottom of the cabinet. This awkward glue-up is a cinch with a band clamp.



7 Bevel the mitered frames with the blade tilted away from the fence. It's safer to run your workpiece over a tilted blade rather than under the blade. Plus, this leaves a cleaner cut.



8 Attach the mitered frame to the base with double-sided tape. Drive a couple of screws and check the alignment. Back out the screws, remove the tape and reassemble using screws and glue.



9 Mount two 5-lb. barbell weights inside the base so the stand is more stable. Make a sturdy post for the weights from a toilet bolt and a fender washer with four holes drilled in it for screws.

10. Glue up the cabinet in two stages. First, glue and clamp the back to one of the sides. Immediately add the subtop and subbottom to square the assembly (Photo 5). When the glue has set, add the other side.

THE TOP AND BASE

The top and base are attached to identical mitered frames that are beveled to 45 degrees.

11. Miter the frame sides (K) and cut slots for No. 0 biscuits.

12. Glue up the frames (Photo 6).

13. Bevel the frames by running them over—not under—the tilted blade (Photo 7; Fig. A, Detail 2, page 64). If you have a right-tilt saw, move the fence to the blade's left side. If there isn't enough room, cut the bevels using a 45-degree chamfer bit in your router.

14. Cut the sides (L) and corner blocks (M) for the base.

15. Assemble the base sides and glue in the corner blocks.

16. Stick the frame and base together with double-sided carpet tape. Screw and glue them together (Photo 8).

17. Use the same tape-screw-glue method to fasten the beveled frame to the cabinet.

18. Make the top (P) by gluing three boards together. A single, wide board is less likely to stay flat.

19. Attach the beveled frame to the top using screws, but no glue. Drill oversize clearance holes in the frame so the top can move freely with changes in humidity.

20. Screw a scrap of 3/4-in. plywood (N) to the top, inside the frame, so you can screw the top to the cabinet.

21. Fasten weights to the base to stabilize the stand (Photo 9).

HANG THE DOOR

At this point, the door is the same height as the cabinet. The top and bottom ends need to be trimmed to leave 1/8-in. gaps above and below

the door. Make the trim cuts with a miter saw or tablesaw sled.

22. Trim the door just enough so that you can set it in place and check the fit. Adjust the angle of the final trim cuts to compensate if the cabinet is slightly out of square.

23. Cut a 1/8-in.-deep, 1-1/4-in.-long finger pull at the top of the door using a router and chamfer bit (Fig. A, page 64).

24. Hang the door using no-mortise hinges (Photo 10). Install a magnetic catch (not pictured) to keep the door shut.

FINISHING TOUCHES

25. Drill holes in the top and bottom for speaker wire. Set a speaker on the stand to determine the best hole position.

26. Finish the speaker stand with golden oak stain followed by three coats of spray-on polyurethane.

27. Stick adhesive-backed felt pads to the underside of the base.



10 Attach the door to the cabinet. First screw the hinges to the cabinet. Stick double-sided tape to the loose side of the hinges. Set the door in place and gently swing it open. Support the door with stands as you screw the hinges to the door. **AW**



Sources

Lee Valley, (800) 871-8158,
www.leevalley.com

No-mortise hinge, 1-1/2 x 5/8-in.,
bronze finish, #00H51.21, \$1 ea.
Band clamp, includes 90-degree
corners, #17F10.13, \$9.50
Adhesive-backed felt pads, 3/4-in.-dia.,
#93K86.03, \$2.50 per pack of 24.

Woodcraft, (800) 225-1153,
www.woodcraft.com
Bracket-style shelf support, 1/4-in.
shank, #27114, \$4.50 per bag of 25
Toggle clamp, 6-1/2 x 1-3/4-in.,
#143993, \$10 ea.

Minwax Co.
(800) 523-9299 (for dealer locations),
www.minwax.com
Golden oak stain, #210B, \$8 per quart
Satin polyurethane, \$5 per
11.5-oz. spray can.

CUTTING LIST Overall dimensions: 9-1/2" x 9-1/2" x 31-3/4"

All materials are 3/4"-thick solid wood, unless otherwise noted. Quantities are for one stand.

Part	Name	Qty.	W	L	Notes
A	Narrow stile	4	1"	28"	Groove one side.
B	Wide stile	4	1-3/4"	28"	Groove one side.
C	Upper rail	4	2"	3-3/4"	Groove three sides.
D	Lower rail	4	2-3/8"	3-3/4"	Groove three sides.
E	Upper spline	8	7/16"	1-3/4"	1/4" plywood
F	Lower spline	8	7/16"	2"	1/4" plywood
G	Panel	4	4-1/8"	24"	1/4" plywood
H	Subtop and subbottom	2	5-1/2"	5-3/4"	3/4" plywood
J	Shelf	2	5-3/8"	5-5/8"	3/4" plywood
K	Frame side	8	2"	9"	Miter ends. Cut slots for No. 0 biscuits.
L	Base side	4	1-1/2"	9-1/2"	Miter ends.
M	Corner block	4	1-1/2"	3-7/8"	Miter ends.
N	Screw block	1	4-7/8"	4-7/8"	3/4" plywood
P	Top	1	9-1/2"	9-1/2"	Make from edge-glued boards.
Q	Subtop and subbottom banding	2	3/4"	5-3/4"	Make from 1/4"-thick solid wood.
R	Shelf banding	2	3/4"	5-5/8"	Make from 1/4"-thick solid wood.



• tablesaw picture frame

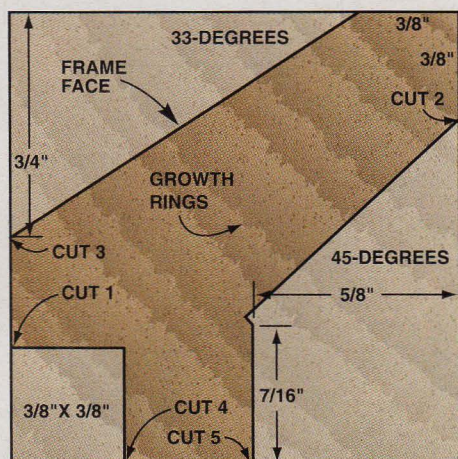
Safely make shaper-quality molding
on your tablesaw without fancy jigs.

by Eric Smith and Richard Tendick

This how-to story has a picture-perfect ending. In fact, you might want to round up some spectators for applause in the final steps. Richard Tendick has developed a safe, simple technique to help you make narrow, complex picture-frame stock using nothing more than a tablesaw. That's right, there are no routers or specialized jigs and sleds to make, either. With Richard's system, you actually glue the frame before the final cut. The fun comes when the frame is cut loose from the square stock.

Richard's molding also simplifies assembly. Mitering and gluing odd-shaped picture frame molding can be a struggle. With this technique, the frame is mitered and glued when the stock still has its square profile. That makes building a picture frame much easier.

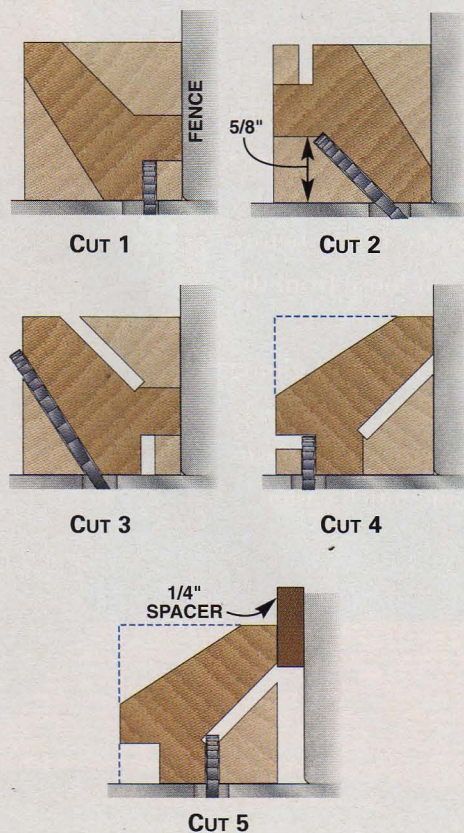
FIG. A
PICTURE FRAME PROFILE CUTS



Five rip cuts create the picture frame profile. The first four cuts are made with most of the 1-1/2-in. square piece still intact. That means plenty of wood is riding against the tablesaw bed and fence—no rocking or pinching to worry about as you push the stock through.

When you plan your cuts, make sure the face of the frame is cut roughly perpendicular to the growth rings. This yields straight grain that flows smoothly from miter to miter.

Note: All profiles are shown from the outfeed end of the saw. For this project, we used a right-tilt tablesaw with the fence moved to the left of the blade. Reverse all diagrams for a left-tilt saw.



PROJECT REQUIREMENTS AT A GLANCE

Materials

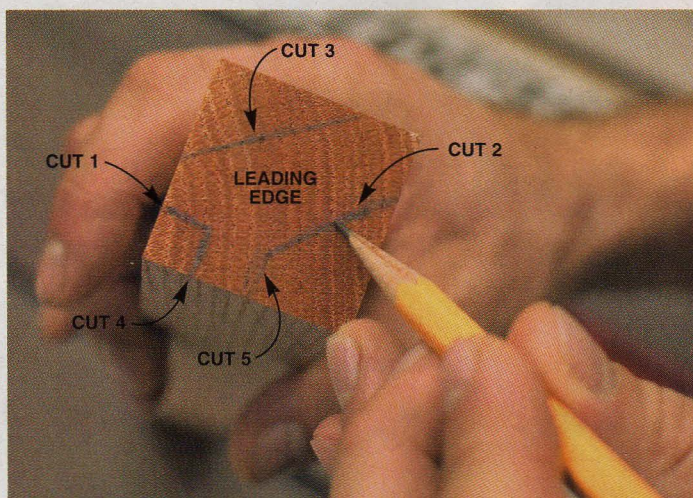
1-1/2-in. square oak
stair balusters, \$2.50 per ft.
Band clamp, \$10.

Tools

Tablesaw
Stock miter gauge
Drill
Sander

GRAIN AND COLOR ARE IMPORTANT

This technique requires 1-1/2-in. square stock. For a frame to look good, the grain must flow smoothly around all four pieces (see “Oops,” below) and the color must be consistent. Choose clear, straight-grained wood for your frame stock. It’s best if you can cut the frame stock from a single length of wood. Buy extra wood for test cuts. We found 1-1/2-in. square oak stair balusters sold at home centers to be an excellent source for frame stock.



1 Sketch the saw cuts on the leading end (the end that goes into the saw blade first) of the frame stock before you start cutting.

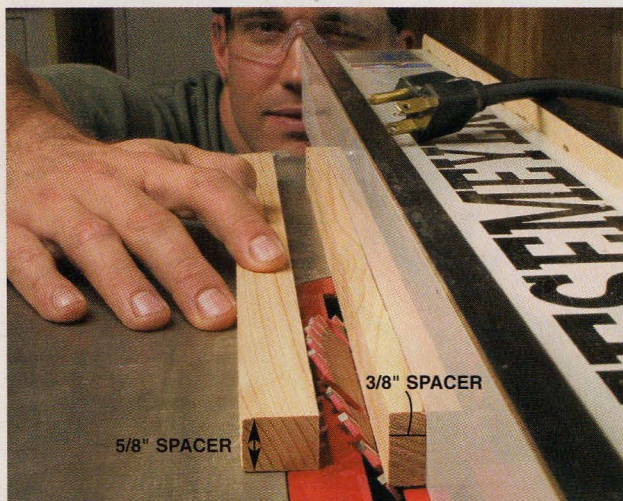
SET UP FOR THE CUTS

1. Rough-cut the frame stock to a few inches over the finished dimensions for cutting on the tablesaw.
2. Sketch the cuts on the end of each piece for orientation (Photo 1; Fig. A). All cuts start at the same end, so if you find yourself reversing the piece, something is wrong. Pay attention to grain direction! (See Fig. A and “Oops.”)
3. Cut spacer strips 3/8, 5/8 and 3/4 in. wide by 18 in. long. You’ll use these for setting the fence and saw blade height for some of the cuts.

Oops!

At first we didn’t pay attention to grain orientation. The result was mismatched grain and a bad-looking corner. Make sure the face of your frame is positioned so the growth rings run perpendicular to it. This will give you a straight-grained face, which will make the corners match better.

STRAIGHT
GRAIN FACE



2 Use spacer sticks to set the fence and blade height for Cut 2. With the blade at 45 degrees, use the 3/8-in. spacer to set the fence. When the teeth center on the 5/8-in. spacer's upper corner, you've reached the blade height.



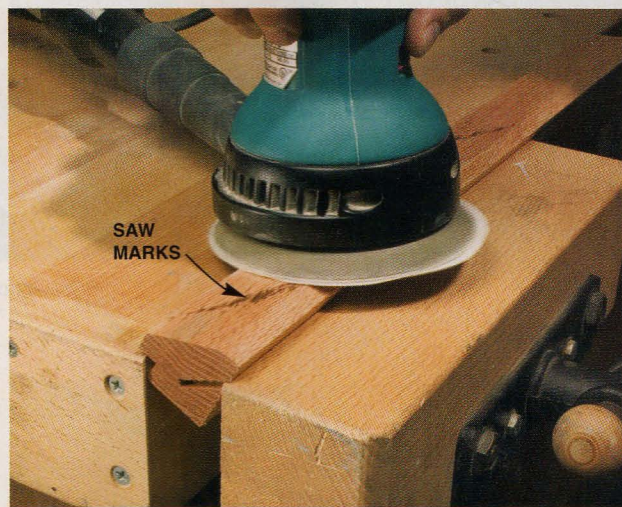
Caution: The guard is removed for this operation.

3 Tilt the blade 33 degrees to make Cut 3. Use a 3/4-in. spacer to set the fence. A featherboard and a rubber-tipped push stick make the cut smooth and safe.



Caution: The guard is removed for this operation.

4 Make Cut 4 on the side of the blade away from the fence to prevent kickback. This also allows the stock's large sides to bear against the fence and table for greater stability.



SAW MARKS

5 Sand off saw marks on the frame's face. The molding can be pinched in a vise to hold it steady.

MAKING THE SAW CUTS

4. Set the blade to make a 3/8-in.-deep cut and make Cut 1 (Fig. A, page 70).

5. Set the blade and fence for Cut 2 (Photo 2) and make the cut.

6. Make Cut 3 with the blade tilted to 33 degrees. Set the blade just high enough to poke through the wood about 1/4 in. (Photo 3).

7. Make Cut 4 to create the rabbet that holds your picture, matte and glass (Photo 4). Set the fence and blade height using Cut 1 as a reference.

SANDING, MITERING AND GLUING

8. Sand the frame before cutting the miters (Photo 5). It's a lot easier than sanding into the corners of an assembled frame.

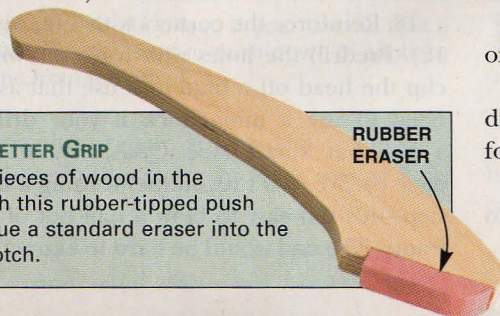
9. Before you cut the miters, take a 1/2-in.-thick slice off your stock. Save the slice for setting up the last cut.

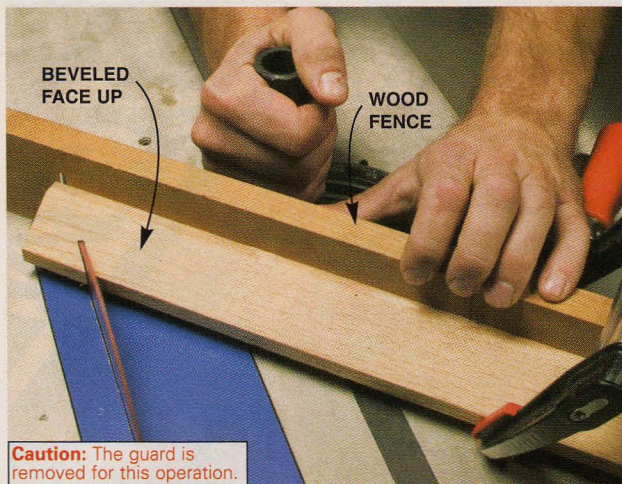
10. Attach a long subfence to the miter gauge. Use a drafting square to set the gauge at 45 degrees. (see "Tips for Perfect Miters," AW #108, July 2004, page 62).

TIP: GET A BETTER GRIP

Hold small pieces of wood in the tablesaw with this rubber-tipped push stick. Just glue a standard eraser into the push stick notch.

RUBBER ERASER

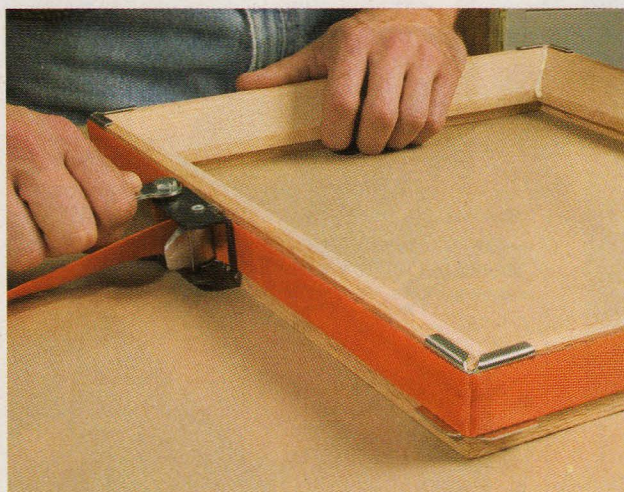




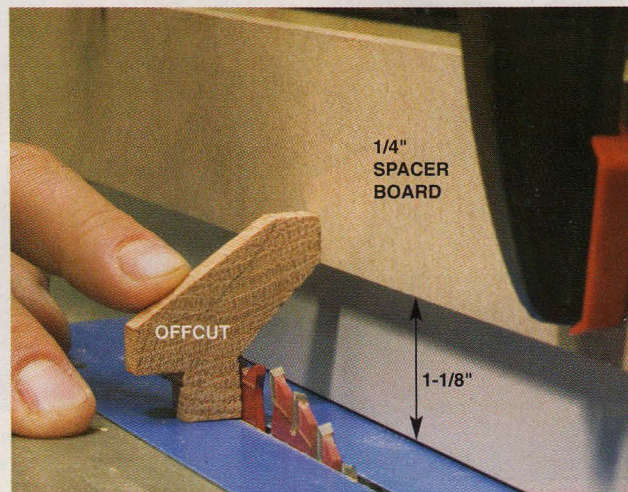
6 Make the first miter cuts to the left of the blade. Clamp the stock face up to a wooden fence attached to the gauge. The end being cut should angle toward you. Make this cut on all four pieces.



7 Make the second miter cut on the right side of the blade. Clamp a stop block to the fence so the frame's parallel sides will be exactly the same length.



8 Glue and clamp the mitered frame together. A band clamp is perfect for the job. The clamp's metal plates hang on each corner of the frame to help position the band and protect the wood.



9 Set up your tablesaw for the final cut using a cross section of the frame stock as a guide. Clamp a 1/4-in. spacer to the fence just above the offcut to create a gap between the offcut and the fence to prevent kickback.

11. Cut the miters (Photos 6 and 7). (If you make a lot of picture frames, you may want to build our simple miter sled found in AW #96, October 2002, page 84.)

12. Test-fit the frame with a band clamp before gluing to check for tight-fitting joints.

13. Glue the frame together, spreading a heavy coat of glue over the entire miter (Photo 8). Yes, that includes the part that will eventually be cut off. Wipe off excess glue with a damp rag.

THE FINAL CUT (THE FUN PART!)

14. Set up the tablesaw for Cut 5 (Photo 9).

15. Make the final cut on all four sides of the frame (Photo 10).

16. Lift the frame from its four-sided offcut (Photo 11). (You may want an audience for this step.)

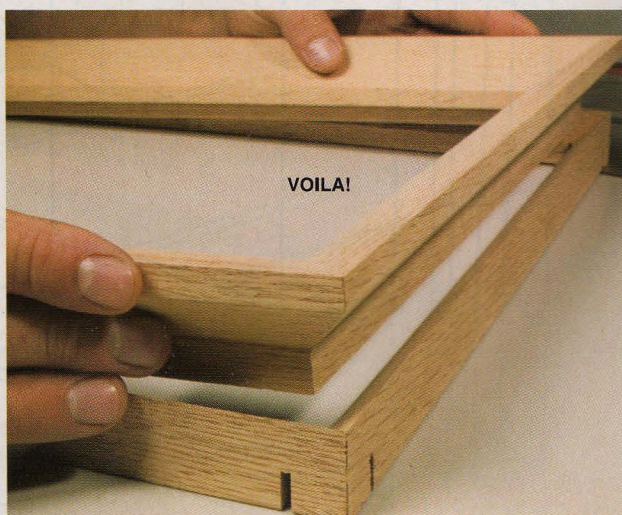
17. If the inner frame doesn't fall away from the offcut immediately, don't panic. Ours didn't (and of course, we panicked). It turned out that despite our best efforts, the blade was set a hair too shallow. All we had to do was push down gently on the frame to break that sliver of wood and release the offcut.

FINISHING TOUCHES

18. Reinforce the corners with 1-in. wire brads (Photo 12). Predrill the holes with a No. 60 wire gauge bit or clip the head off a brad and use that as a bit. You may need to use a mini-chuck if your drill doesn't hold a bit that small (see Q&A, AW #107, May 2004, page 8). We don't recommend using a nail gun for this step—it's too easy to blow a nail out of the face of the frame. The nail would be hard to extract, and the result-

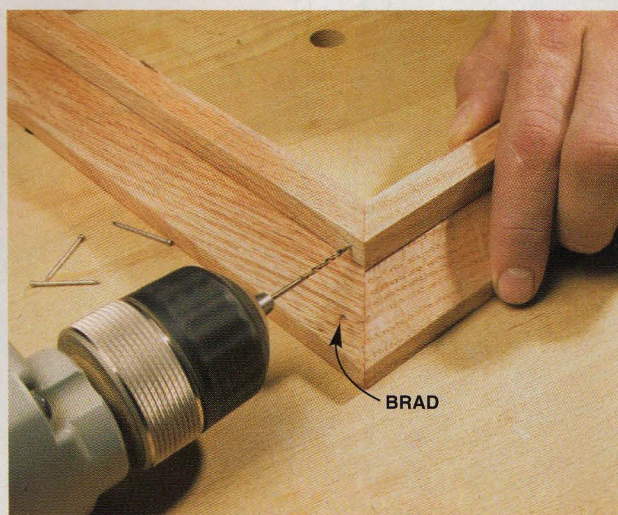


- 10** Make Cut 5 on all four sides of the frame. The offcut won't release from the frame until all the cuts are complete.



- 11** Lift the frame out of the offcut. If your last cut was a bit shallow, you may need to push down in spots to separate the frame from the offcut.

ing damage, difficult to repair. With a drill, if you accidentally drill a hole in the wrong spot, it's easy to hide with filler.



- 12** Drill pilot holes for a couple of 1-in. brads to reinforce each miter joint. Keep the brads on the back of the frame where they won't be seen.

19. Sand the outside of the frame and fill the nail holes. Stain as desired and finish with at least two coats of varnish or polyurethane. **AW**

TOOL TEST

SOFTWARE TESTING ASSISTANT: RON CORRADIN • ART DIRECTION: SARAH KOEHLER AND PATRICK HUNTER • PHOTOGRAPHY: STAFF, UNLESS OTHERWISE INDICATED

CAD for



Two programs (one is only \$50!) stand
out from the pack for ease of use.

Woodworkers

by Randy Johnson

You don't have to spend much money to get a good computer-aided drafting (CAD) program for drawing woodworking projects. Fifty bucks will buy you a starter program that's easy to learn and use. For \$150, you can get one with all the drawing power you're likely to ever need. A CAD program may not be on the top of your "tools to buy" list, but using CAD does provide some big benefits if you like to design your own projects or build projects that have lots of curves and angles in them.

Dozens of CAD programs are on the market, ranging in price from a few dozen to thousands of dollars. It's a dizzying array. Some are made specifically for architects or engineers and are more specialized or advanced than most woodworkers need. Others are more general in nature and make a better choice for us. Thanks to the Internet, you can try before you buy. Most CAD programs are available as free trial downloads. Trial programs have some limitations but are complete enough to let you take the software for a good test drive.

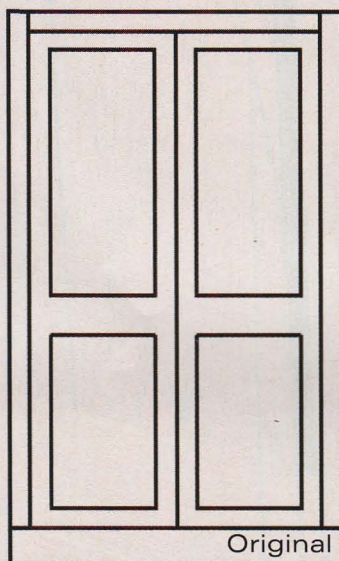
Our primary goal for this test was to find a CAD program that's easy to learn and use, yet powerful enough to create precise woodworking project drawings. In the end, all 15 programs we tested were capable of making precise drawings, but some were considerably easier to learn and use than others.

THE BENEFITS OF CAD

Beyond producing
detailed shop
drawings, CAD
does three things
particularly well.

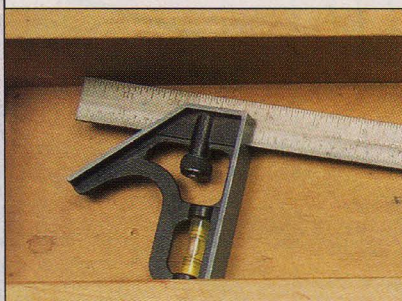
PRECISE DIMENSIONING

Measuring the parts of your project is fast and accurate because the computer does the math for you. With CAD, even arcs and angles are easy to measure. This is a huge advantage when you need to measure an unusual angle or the radius of an arc.



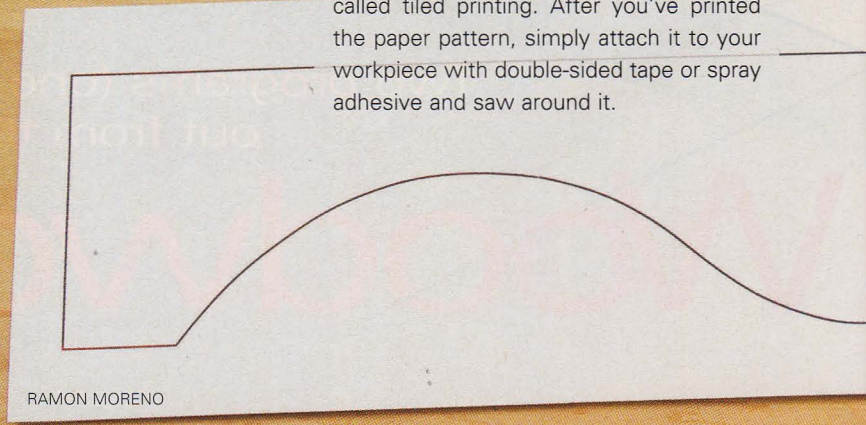
DESIGN DEVELOPMENT

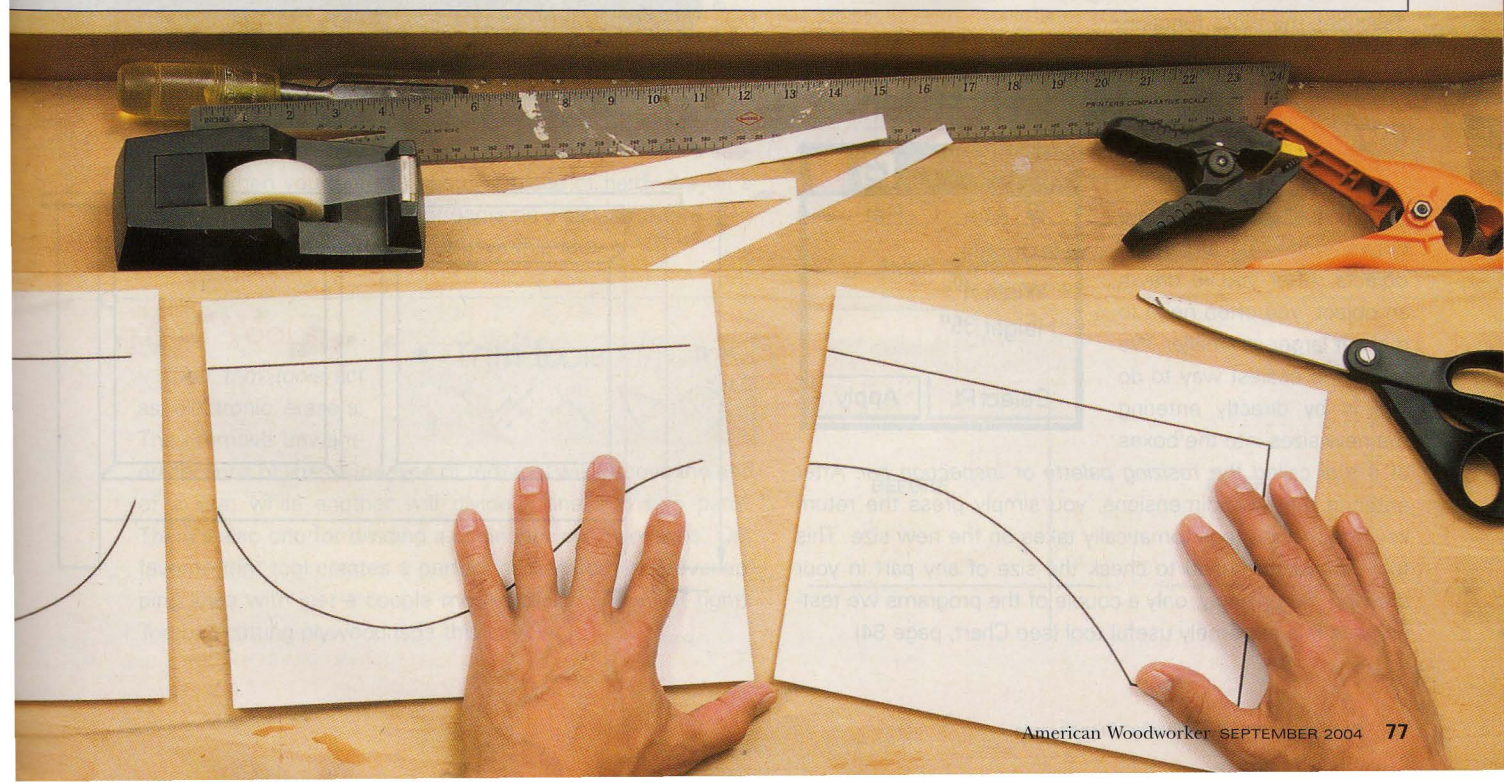
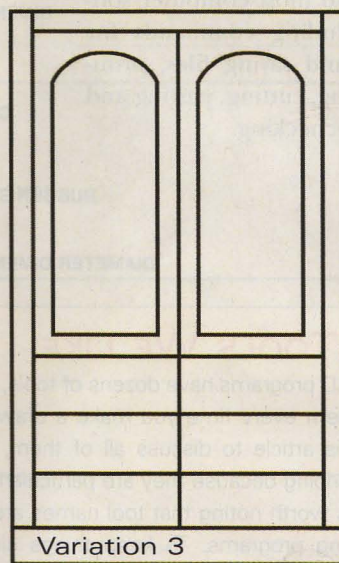
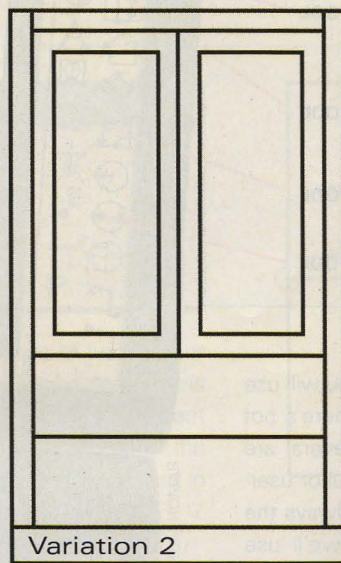
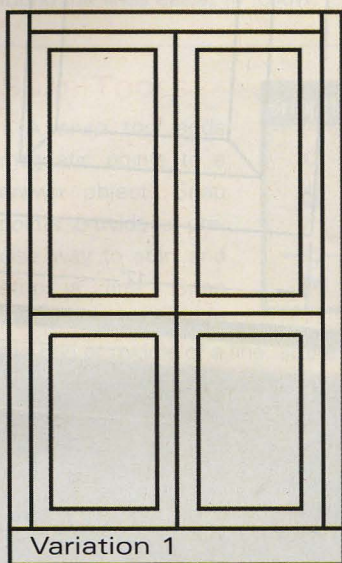
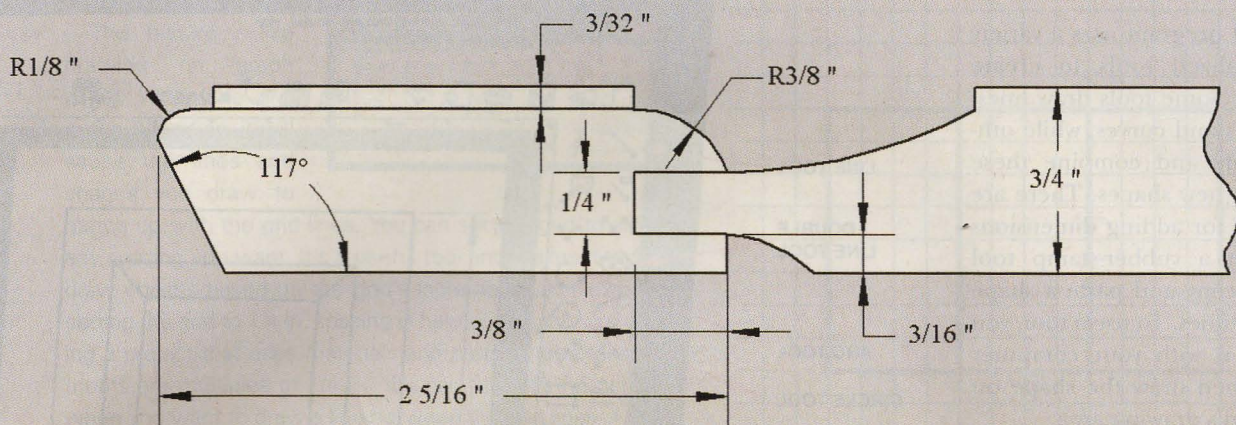
CAD is great for exploring design options and proportions. The first design may take you just as long to draw with CAD as with pencil and paper, but once you have a drawing, you can copy it as many times as you like in a matter of seconds. You can make changes to the copies much more quickly than you could using pencil and paper. And you'll never have to worry about wearing a hole in your paper with your eraser.



FULL-SIZE PAPER PATTERNS

Full-size patterns are particularly helpful when your project has a large or complex shape. You don't need a special printer to make full-size patterns, because CAD programs can split a large drawing across several sheets of letter-size paper. This is called tiled printing. After you've printed the paper pattern, simply attach it to your workpiece with double-sided tape or spray adhesive and saw around it.



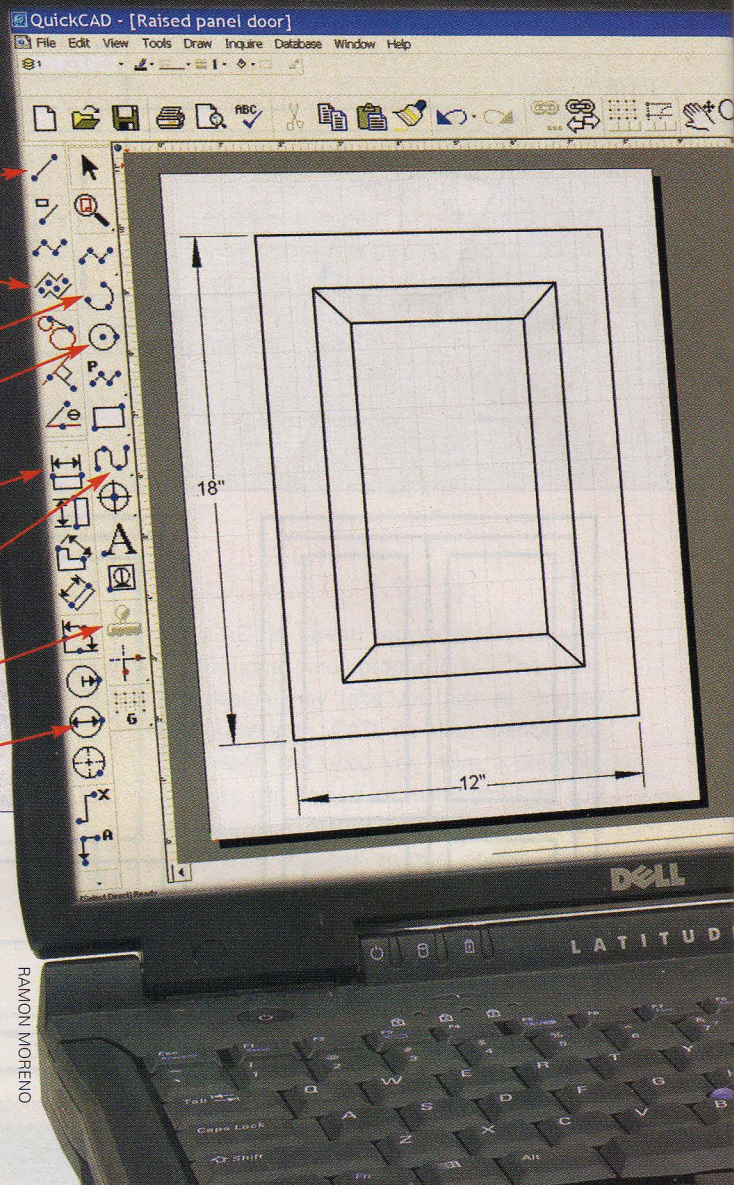


DRAWING WITH CAD

A CAD program uses a variety of specialized tools to create drawings. Some tools draw lines, rectangles and curves, while others modify and combine these lines into new shapes. There are also tools for adding dimensions and even a rubber-stamp tool that will copy and paste a shape multiple times. To use a tool, you click on it with your computer mouse, then draw the shape on the screen's drawing area.

CAD programs also have tools common to most computer software, including commands for opening and saving files, printing, copying, cutting, pasting and even spell-checking.

LINE TOOL
DOUBLE
LINE TOOL
ARC TOOL
CIRCLE TOOL
DIMENSION TOOL
CURVE TOOL
RUBBER STAMP TOOL
DIAMETER DIMENSION TOOL



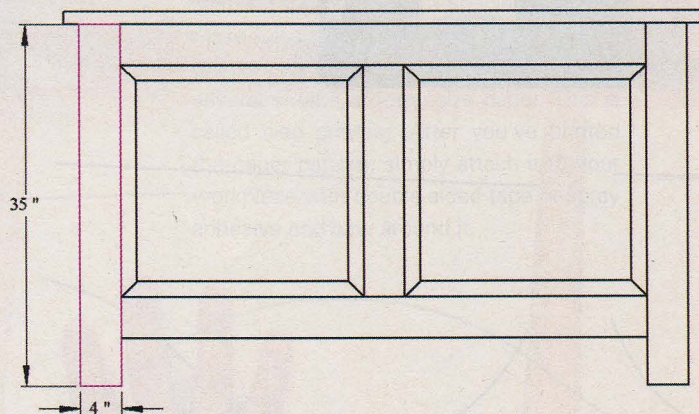
RAMON MORENO

CAD TOOLS WE LIKE

Most CAD programs have dozens of tools, and you will use many of them every time you make a drawing. There's not room in this article to discuss all of them, but several are worth describing because they are particularly useful or user-friendly. It's worth noting that tool names are not always the same among programs. To keep things simple, we'll use either the most commonly used name or one that best describes the tool's function.

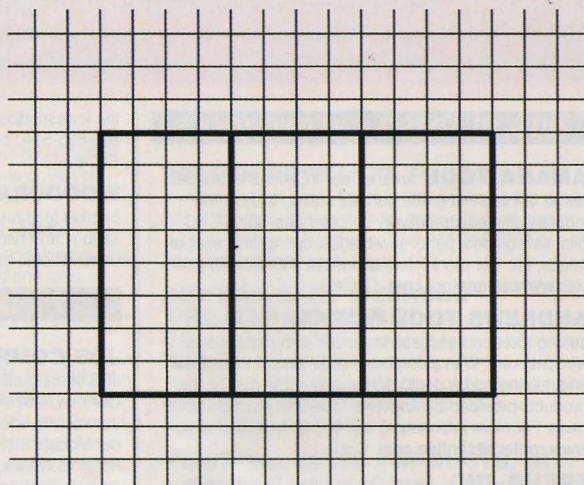
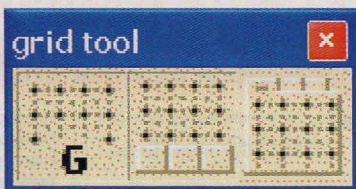
EASY-TO-USE RESIZING TOOL

Individual shapes that are drawn with CAD are called *objects*. After you've drawn an object, you often need to make it larger or smaller. We found the easiest way to do this is by directly entering the new sizes into the boxes of a tool called the *resizing palette* or *inspection bar*. After entering the new dimensions, you simply press the return key and the shape automatically takes on the new size. This tool can also be used to check the size of any part in your drawing. Surprisingly, only a couple of the programs we tested have this extremely useful tool (see Chart, page 84).



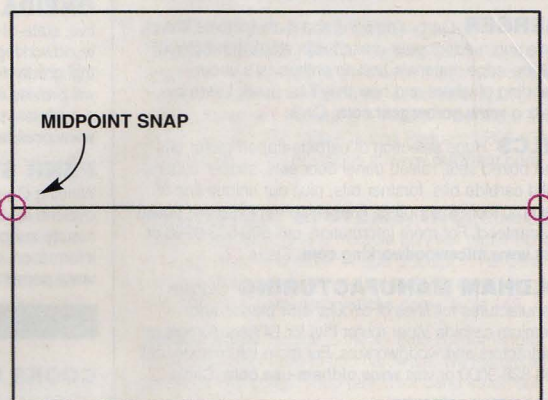
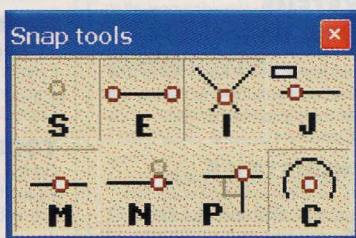
GRID TOOL

This feature is like drawing on graph paper. When the *grid tool* is turned on, it will cause the lines and shapes you draw to match up with the grid lines. You can set the grid to almost any spacing you want. It's a useful tool and makes it easy to draw objects based on the grid's increments. For example, setting the grid to 1/4-in. spacing is helpful when you're drawing a project that uses materials and parts whose measurements are multiples of 1/4 in. You can turn off the grid tool when you want to draw a line between the grid lines. All programs have this tool, but some use dots rather than lines. We found the lines easier to follow.



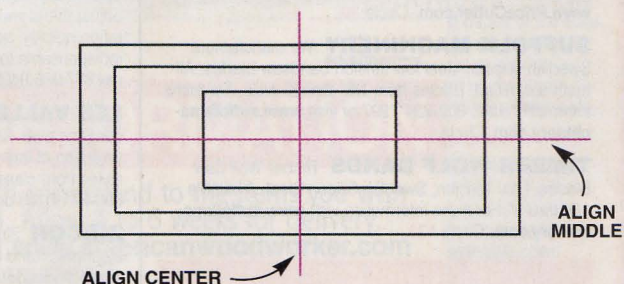
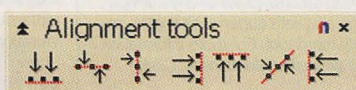
SNAP TOOLS

A *snap tool* adds magnetic points to a drawn object. Snap points provide a precise way to start and stop a line. Snap points can be added to the end or middle of a line, at the intersection of two lines or at the center of an arc or circle. The beauty of a snap tool is that you only need to get close to the point where you want to start or end the line; the program will pull the end of the line to the point and lock it there. Snap tools are standard in most CAD programs and you will come to love them.



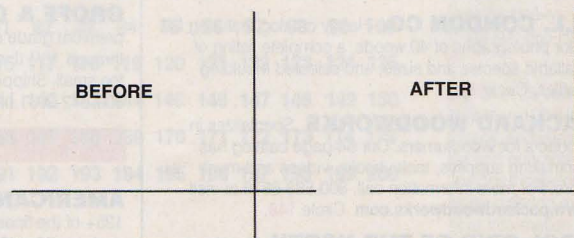
ALIGNMENT TOOLS

The *alignment tool* allows you to align objects along their bottoms, tops, sides or middles. It's a useful tool when you want to center a piece of hardware on a drawer front or line up a set of doors on a cabinet. More than half of the programs we tested have this tool.



TRIM TOOLS

CAD *trim tools* act as electronic erasers. They remove unwanted sections of lines. One type of trim tool will remove the end of a line, while another will divide a line into two parts. There's also one for dividing a circle into even sections. Our favorite trim tool creates a perfect corner from two overlapping lines with just a couple mouse clicks (shown at right). Too bad cutting plywood isn't this simple.



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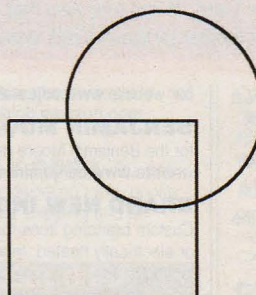
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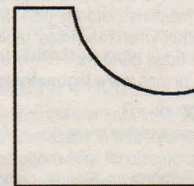
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BOOLEAN TOOLS

These are a special kind of trim tool. The term *Boolean* comes from the world of algebra, but simply put, a *Boolean tool* adds or subtracts one object from another. It's a very powerful and fun tool to use. There are three basic types of Boolean tools: One joins two shapes together; the second subtracts one shape from another (shown at right); the third type subtracts everything except the space where shapes overlap.



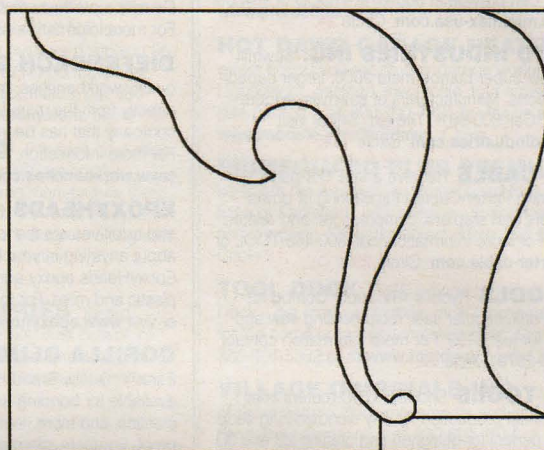
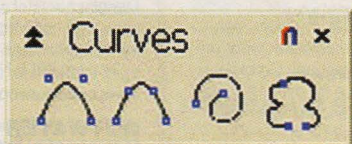
BEFORE



AFTER

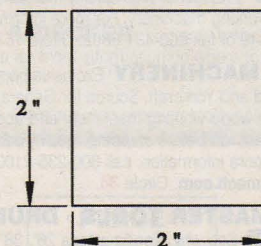
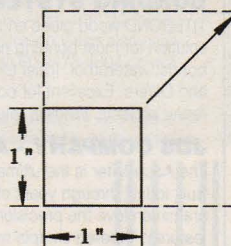
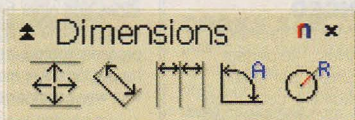
EASY-TO-MODIFY CURVES

All programs have *curve-drawing tools*. The one we liked best is called a *spline curve*. We like it because it is the easiest to modify in most programs. This is important, because let's face it, if there's one shape that requires finessing after it's drawn, it's a curve. It takes a little practice to master the spline curve tool, but when you learn how to use it, you'll be able to quickly produce smooth, flowing curves.



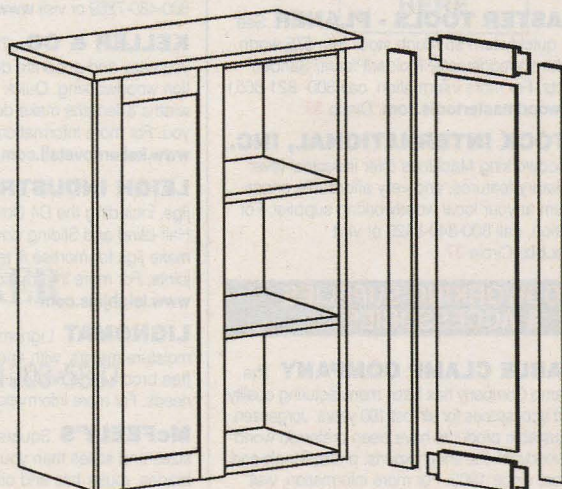
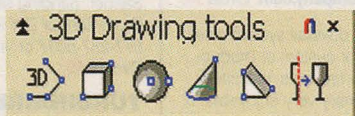
ASSOCIATIVE DIMENSIONING

Associative dimensioning is a feature that links the dimension to the object. If you resize the object, the dimension will change with it, and the new size will automatically display (shown at right). Only a few programs have this useful feature.



3D DRAWING TOOLS

You can do a lot of useful drafting with only 2D tools, but *3D drafting tools* are pretty amazing. With them you can build your project complete with joints that can be taken apart. The 3D tools also let you rotate your project and view it from any angle. You can even open the doors and look inside if you want. Using 3D tools has a lot in common with real building, because the 3D shapes can be cut, mitered or dadoed using Boolean tools. Several of the more expensive programs in our test include 3D drawing tools. You don't have to use them, but they are there if you want to try them.



TOOLS THAT STAY SELECTED

To use a CAD tool, you click on it, just as you do with most computer program tools. For example, clicking on the *rectangular drawing tool* allows you to draw a rectangle. It's particularly helpful if the drawing tool stays selected, allowing you to continue using it, eliminating the need to click on it every time you want to draw another rectangular or similar shape. Snap, trim and dimensioning tools are also more convenient to use if they stay selected.

TIPS FOR LEARNING CAD

1. Use the tutorial. This is the best way to get started with a CAD program because the tutorial will guide you through a couple practice projects and help you master CAD basics. Not all CAD programs come with tutorials, but they should.

2. Use the online help file. An online help file (shown below) is included with many of the CAD programs we tested. Most online help files are a gold mine of information and provide a quick source of help-yourself assistance. The file allows you to look for help in three ways: by a table of contents, topic index or key-word search.

3. Click on the help tool.

This tool is great! It adds a question mark to the on-screen cursor's arrow. When you click on an unfamiliar tool or menu item, you get an instant explanation of its function.

4. Read the manual.

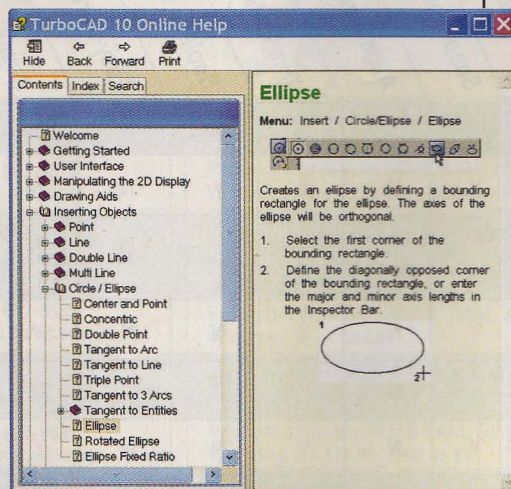
Some programs include printed or PDF-file manuals. These manuals include explanations

of how to use the various CAD tools. Manuals are a good reference but are not generally as user-friendly as an online help file.

5. Other help options. Some companies provide free phone support for the first 30 days or more; others charge for it. Phone support is a great way to get questions answered when you're stumped and can't find help through the manual or online file.

Most companies also provide e-mail support. It may take a day or two to get a response, but it's an easy way to get an answer to a specific question.

After you've gained some experience with CAD, you may want to check out some of the Internet-based CAD discussion groups. They are moderated by other CAD users and can provide a wealth of tips and hints on using CAD.



IS CAD RIGHT FOR YOU?

You should consider several things before you jump into CAD, because to take full advantage of it, you need drafting skills, computer skills, computer power and a commitment to go through the learning curve.

CAD programs will *aid* you in your drafting, but you still need to know how to do basic drafting. If you remember your drafting lessons from junior high school, you know enough to get started in CAD. If not, check out a basic drafting book from your library or buy one and study up. Understanding the principles of drafting enables you to arrange your drawings in a way that communicates the information about your project in a standard and clear method.

Don't expect the manual that comes with your CAD program to teach you drafting. It will help you learn how to use the program, but not how to draft a woodworking project.

To use CAD, you don't need to be a computer genius, but you should be comfortable around computers and familiar with how they operate. If you know how to use Microsoft Word or similar programs that have pull-down menus and tool bars, you probably have enough computer skills to begin learning a CAD program. A CAD program will present you with many new tools, but such functions as saving files and printing pages are very similar to those in other commonly used computer programs.

It's also important that your computer have enough memory and disk space before you load a CAD program. Many are quite power-hungry. Without sufficient power, the program will operate very slowly and may even stall your computer. Power requirements vary among programs (see Chart, page 84), but most require a Pentium processor with a Windows 98 or newer operating system or a Macintosh G3 or later model running OS X.

Working through the learning curve is the biggest barrier for most people, and there's no simple way around it. You may spend 10 to 30 hours to learn a CAD program's basics and up to twice that long to reach a high level of comfort with them. The good news is that the help files and tutorial training that come with many programs do a great job in helping you learn the program.

RECOMMENDATIONS

If you have some computer experience and a newer Pentium-powered computer, either our Best Buy or Editors' Choice will work for you. If you have limited computer experience or an older computer with less power, DeltaCAD is a good choice. It lacks a few of the features we like, but it's an easy program to learn

and requires very little computer power to run. If you own a Macintosh, you don't have many choices. Of the two programs we tested, MacDraft PE (\$130) was easier to learn and use. It lacks a few features we like and it's only 2D, but it does have a very easy-to-use resizing palette.

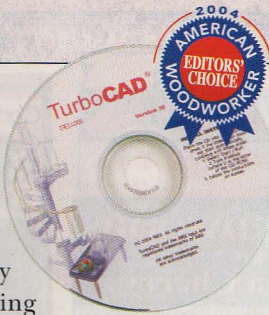
PROGRAMS AT A GLANCE

Program	Price	Resizing tool	Lined grid tool	Snap tools	Alignment tools	Trim tools	Boolean trim tool	Easy-to-revise compound curves	Associative dimensioning	3D tools	Important tools that stay selected
QuickCAD 8	\$50	N	Y	Y	Y	Y	Y	N	N	N	DR, T, S, DM**
AutoSketch 8	\$100	N	Y	Y	Y	Y	Y	N	N	N*	DR, T, S, DM
CADopia IntelliCAD 4 Standard	\$150	N	Y	Y	Y	Y	Y	N	N	Y	DR, T, S
DataCad LT11	\$150	N	N	Y	N	Y	N	N	Y	Y	DR, S, DM
DeltaCAD Professional 5.0	\$40	Y	N	Y	N	Y	N	Y	N	N	DR, T, DM
PowerCAD LT+ 5.2	\$100	N	Y	Y	N	Y	N	N	Y	Y	DR, T, DM
TurboCad Deluxe v10	\$150	Y	Y	Y	Y	Y	Y	Y	Y	Y	DR, T, S, DM
CAD6 Economy	\$150	N	Y	Y	Y	Y	N	N	N	N	DR, T, DM
Instant Woodworking Design	\$30	N	Y	Y	N	Y	Y	N	N	N	DR, T, S, DM
DesignCAD Express 14	\$45	N	Y	Y	Y	Y	N	N	N	N*	DR, T, S, DM
DesignCAD 3D Max 14	\$90	N	Y	Y	Y	Y	Y	N	N	Y	DR, T, S, DM
Instant Shed & Shop	\$30	N	Y	Y	N	Y	Y	N	N	Y	DR, T, S, DM
PC Draft PE	\$60	Y	N	Y	Y	Y	N	Y	Y	N	DR, T, S, DM
CADintosh 5.0	\$33	Y	Y	N	N	Y	N	N	N	N	DR, T, DM
MacDraft PE	\$130	Y	N	Y	Y	Y	N	Y	Y	N	DR, T, S, DM

* Extrude tool creates nonrotatable 3D objects. ** DR=draw T=trim S=snap DM=dimensioning

IMSI TurboCAD DELUXE v10, \$150

TurboCAD Deluxe is an amazingly powerful program for the money. It has many user-friendly features and tools including associative dimensioning and an inspection bar for resizing objects. The 3D drawing tools that come with this program are a real bonus. TurboCAD takes longer to learn than QuickCAD because TurboCAD has more tools. IMSI offers training CDs for sale (\$50), which are very thorough.



RAMON MORENO

AUTODESK QuickCAD 8, \$50

QuickCAD was one of the easiest programs to learn, because it can be run at three different levels: beginner, intermediate or expert. The beginner level has the fewest drawing tools, but that makes it simpler to master. It also has many of the user-friendly features we like. It lacks a resizing palette, but the snap and grid tools work very well. QuickCAD is only a 2D program, but for 50 bucks it's hard to beat. **AW**



RAMON MORENO

Online help file included	Tutorials	Phone support	Contact information	Recommended system requirements	Comments
Y	Y	Y	(800) 247-4671 www.autodesk.com	Pentium II or newer, 64MB RAM, 100MB disk space Windows NT 4.0, 98, Me, 2000 or XP	Phone support is free for first 60 days if you buy online.
Y	Y	Y	(800) 247-4671 www.autodesk.com	Pentium II or newer, 64MB RAM, 100 MB disk space Windows NT 4.0, 98, Me, 2000 or XP	Phone support is free for first 60 days.
Y	N	N	support@cadopia.com www.cadopia.com	Pentium or newer, 64MB RAM, 100MB disk space Windows NT 4.0, 2000 or XP	
N	Y	Y	(860) 677-8689 www.datacad.com	Pentium II or newer, 256MB RAM, 300MB disk space Windows 95 or newer	Phone support is free for first 30 days.
Y	Y	N	fax (206) 361 0796 www.deltacad.com	386 or newer, 4MB RAM, 5MB disk space Windows 3.1, 95, 98, NT 4.0, 2000, Me or XP	Excellent tutorial
Y	Y	Y	(888) 977-6937 www.givemepower.com	Pentium or newer, 64MB RAM, 60MB disk space Windows NT 4.0, 98, 2000 or XP	
Y	N	Y	(415) 878-4000 www.turbocad.com	Pentium (1.6+GHz), 256MB RAM, 220MB disk space Windows 98, NT 4.0, Me, 2000 or XP	Excellent online help file
Y	Y	N	post@malz-kassner.com www.malz-kassner.com	Pentium III or newer, 64MB RAM Windows 95, 98, NT 4.0, 2000 or XP	Very good online help file and tutorial
Y	Y	Y	(800) 233-3223 www.upperspace.com	Pentium, 16MB RAM, 18MB disk space Windows 95, 98, NT 4.0, Me, 2000, XP	
Y	Y	Y	(800) 233-3223 www.upperspace.com	Pentium or newer, 64MB RAM, 30MB disk space Windows 95, 98, NT 4.0, Me, 2000, XP	
Y	Y	Y	(800) 233-3223 www.upperspace.com	Pentium or newer, 64MB RAM, 30MB disk space Windows 95, 98, NT 4.0, Me, 2000, XP	
Y	Y	Y	(800) 233-3223 www.upperspace.com	Pentium, 16MB RAM, 18MB disk space Windows 95, 98, Me, 2000, XP or NT 4.0	
N	N	Y	(800) 622-7568 www.microspot.com	Pentium or newer, 6MB RAM, 10MB disk space Windows 95 or newer	
N	Y	N	lemkesoft@aol.com www.lemkesoft.com/	Mac PowerPC 68020 or newer, 32MB RAM Mac OS X	The 5.1 upgrade has an online help file.
N	N	Y	(800) 622-7568 www.microspot.com	Mac G3 or newer, 8MB RAM, 20MB disk space Mac OS X (10.2 recommended)	

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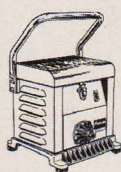


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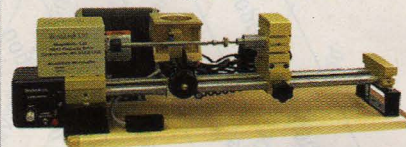
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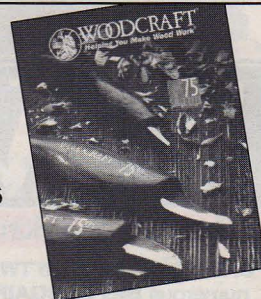
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Its 27-watt compact bulb is the equivalent to a 150-watt ordinary light bulb. This makes it perfect for activities such as reading, writing, sewing, needlepoint, and especially for aging eyes.

SAVE \$51 in energy cost over the life of one Balanced Spectrum™ bulb!

A 150 watt incandescent bulb uses \$0.013 per kilowatt hour in energy cost. The Balanced Spectrum bulb uses an average of **70% less energy** which saves you \$0.009/kWh. Based on 5,000 hours bulb life, the Balanced Spectrum bulb will save **\$46** in energy cost. Plus, because the Balanced Spectrum bulb last 10 times longer than an incandescent bulb priced at an average of \$0.50, an additional **\$5** savings is realized.

*Source: "Lighting the Way to Energy Savings"; 1999

What's the difference with Balanced Spectrum®?

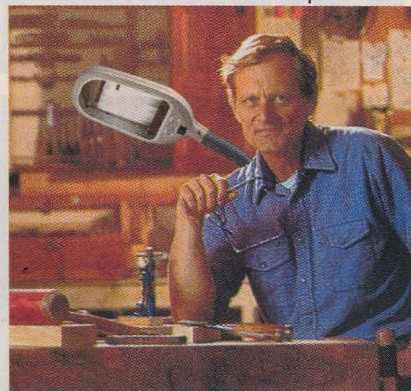
The value of a light source is measured by how well it renders all colors of the visible spectrum without bias. The Color Rendering Index (CRI) is measured on a scale of 1-100. The bulb used in the Balanced Spectrum® lamp is an exceptional light source with a CRI of 84. This will provide better vision and energy savings through a full spectrum of light with a brighter bluish tint versus the same area lit by lighting with more of an orange or reddish tint.

Height as shown: 50"

We've looked at lots of lights, but this one offered the benefit of dual light levels of 27 and 18 watts of power equivalent to 150 and 100-watt incandescent bulbs. This lamp has a flexible gooseneck design for maximum efficiency, with an "Instant On" switch that is flicker-free. The high-tech electronics, user-friendly design, and bulb that lasts five times longer than an ordinary bulb make this product a must-have.

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This light can change the way you live and work

As a commercial photographer, I probably give more attention to lighting than most people and therefore was impressed with the smooth, soft daylight quality of your lamp.

Dennis M.
Richmond, VA

I sit in my comfortable chair after my husband has gone to bed, and I turn that lamp on. It makes it so nice because it's like daylight over my chair...I don't get sore eyes like I used to.

Grace A.
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SMALL SHOP TIPS

HOLD IT! ROLL IT!
HANG IT! STORE IT!

edited by Tim Johnson

CLAMP TABLE

I don't have room in my garage shop for a permanent clamp table, so I made this folding version from a leftover 2-ft.-wide sheet of 3/4-in.-thick plywood. Folded, it's less than 2 in. thick, so it stores neatly in a narrow space.

First, I crosscut the sheet to 60 in. in length. Then I made a rip cut to create the 16-in.-wide base.

Next, I drilled 1-1/8-in.-dia. holes at 4-in. intervals down the middle of the remaining 8-in.-wide piece. Ripping this piece down the middle created two racks with half-round cradles for pipe clamps. I attached these racks to the base with screen hinges, which are flat on the outside, so they can be surface-mounted (I bought four 3-in. screen hinges for less than \$4 at my local home center). I mounted the hinges on the inside of the racks, so the racks sit on the base when they're open.

Friction-fit spreaders lock the racks in position during use. I made the spreaders 3 in. wide so they sit below the half-round clamp cradles. When the table folds for storage, wing nuts hold the spreaders on the base.

Rod Maxson



COMBO CART

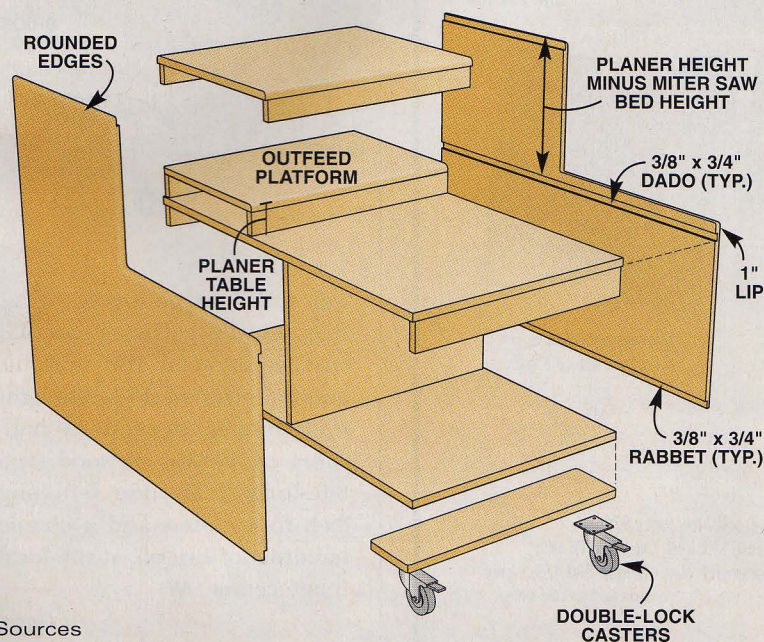
Hauling my benchtop planer or miter saw out every time I needed to use one or the other was hard on my back until I devised this mobile base. It makes both of them readily accessible and stores neatly in the corner when I don't need it.

I positioned the tools so the planer provides out-board support for the saw. I made sure the planer blades and dust hood were accessible, and I extended the planer's outfeed capacity. I store a bunch of my portable power tools in the cabinet below.

The cabinet costs about \$100 to build. It takes about 1-1/2 sheets of 3/4-in. plywood and four double-locking swivel casters (see Sources, below). You'll have to adjust the dimensions of your cabinet to suit your work habits and tools.

I built my cabinet so the bed of the miter saw sits 42 in. from the floor, a comfortable working height for me. To locate the planer shelf, I subtracted the planer's height from the height of the miter saw's bed. To make the outfeed extension, I measured the height of the planer's outfeed table and built a platform to match. I slid it into the cabinet and screwed it in place.

Jim Ramsey



Sources

Highland Hardware, (800) 241-6748, www.highlandhardware.com
Locking swivel caster with plate, #084050, \$8 ea. (4 required).

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MOBILE WALL

My shop has limited storage space, so my tablesaw accessories used to cram its tuck-under drawer and cover the extension table. My new accessory storage wall makes everything accessible and

keeps my saw table clear and ready for action.

The wall was easy to make. The frame is grooved for the plywood and everything is just glued and screwed. To make the box at the bot-



tom wide enough for the bricks that provide ballast, I inserted spacers between the uprights and the plywood sides. I bought everything I needed (a half-sheet of 1/2-in. plywood, two 8-ft.-long 2x2s, one 6-ft.-long 2x4, four casters and a couple handfuls of bricks) at my local home center. **AW**

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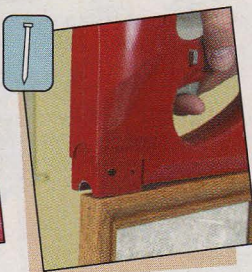
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Tips of the Month

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

Driving Your Point Home

Even the most sophisticated woodworkers will always have a need for the good old hammer and nail, and here are three simple tips to help make "driving that point home" a lot easier:

1. Prepare the face of your finish hammer so that it won't slip off the nail head. Do this by rubbing the face of the hammer on concrete. The concrete will scratch the face of your finish hammer just enough to help grip your finish nail as you smack it home.
2. The tip of the nail should be dulled. A sharp nail may split hardwood. By dulling the tip the nail will tear rather than split the wood. Place the top of the nail head on a hard surface and give the pointed tip of the nail a very light tap with your hammer. You'll notice just a slight bend in the tip - that's enough to do the trick.
3. Last but not least, apply a little lubrication. Wipe your finger across your forehead, or along side of your nose, and then wipe the nail with the same finger. A tiny amount of lubricating oil will be transferred to the nail and make for easy driving.

A Shortcut To Fine Finish Work

Sometimes getting miter joints on trim to fit tightly can be frustrating. Even if you cut the pieces perfectly, when you nail them on the joint they can open up. One trick is to "back bevel" the joint. To make the back bevel, remove some of the wood on the back of the joint, where it won't be seen, using a file, a block plane, or by cutting the joint at a slightly different angle. This makes it so that the only place the two trim pieces meet is right at the visible part of the joint. Doing this allows for a little play in the connection making it easier to fit. Naturally, structural connections should be solid and don't fall into this category. But, when it comes to most trim applications where appearance is what's important, beveling the hidden portion of the joint works. The result is a connection that appears to be tightly fitted everywhere. Purist or not, back-beveling trim joints makes sense and saves time.

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

The Woodworker's Corner

A note from the Publisher of American Woodworker, Jim Schiekofer

American Woodworker works hard to provide its readers with the best, newest, and most complete information on tools and techniques, and we're proud of our leadership position in the woodworking category. In fact, recent research has shown that we deliver more tool buying advice, more visual how-to editorial and more new product information than any other woodworking magazine*. We are always on the lookout for the latest and most exciting woodworking news, and to make sure we—and you—don't miss a beat, we'll be down at the International Woodworking Fair in Atlanta from August 26-29. It's the largest woodworking trade show in the country, and many tool and equipment companies unveil their latest products here. We'll be searching and evaluating all the new product launches and we'll bring you our analysis in upcoming issues. So rest assured that we'll never stop working to make our readers the most informed and educated woodworkers in the country. If you happen to be one of the more than 40,000 attendees at the Fair, stop by our booth and say hello. We'd love to hear your feedback, opinions, and suggestions.

*Source: Hall's Study 2004

edited by Tim Johnson

POLY'D POOCH

I was about to apply the finish to my latest project when the phone rang. I set the open can of polyurethane on my tablesaw with a rag underneath.

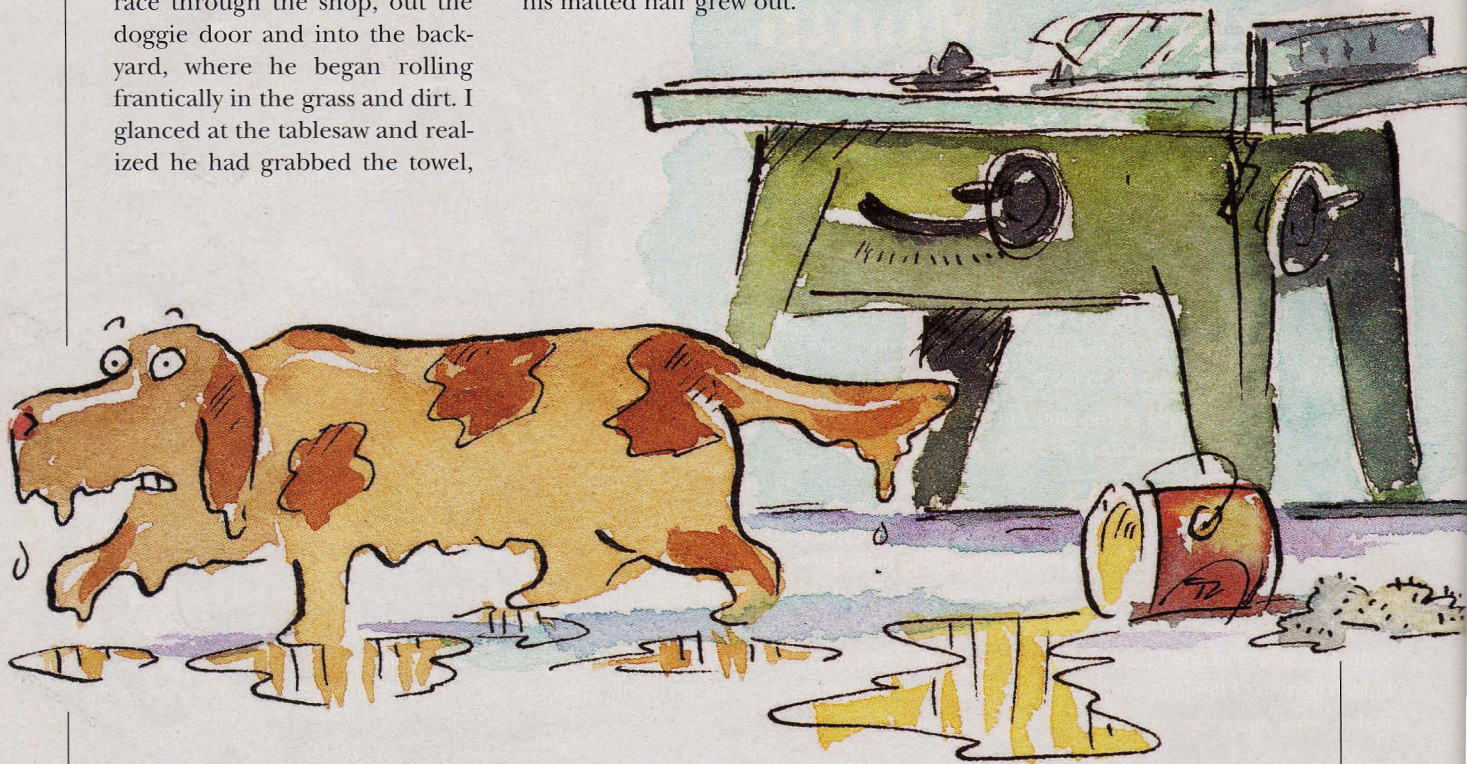
While on the phone, I heard a crash and a yelp. I looked up to see our basset hound puppy race through the shop, out the doggie door and into the backyard, where he began rolling frantically in the grass and dirt. I glanced at the tablesaw and realized he had grabbed the towel,

dumped the can and given himself a polyurethane bath.

Fearing he might suffocate, I rushed our sticky, muddy puppy to the vet, who gave him a thorough cleaning and told me I'd have to put up with a punk-rock-er canine for a month or so until his matted hair grew out.

Woody is now 14 years old and still sports a little Mohawk-like spike of hair on top of his head, a reminder of my "Oops!"

Dan Wood



SLIP-KNOT DISASTER

I decided to hang the drop leaves of the table I had just built so I could finish both sides at once. After installing eye screws in the hinge-mounting holes, I used twine to hang the leaves from the ceiling joists. The finish went on great, and I went upstairs feeling very proud of myself.

Later that evening, I was startled by a sickening crash. I crept down to the basement and forced

myself to survey the damage. Four empty strands of twine hung limply from the ceiling; both leaves lay mangled on the floor. One had nosedived into the concrete; the other had smashed into the tabletop on its way down. All three pieces were ruined. I was so lousy at tying knots that my old Boy Scout advisor would surely have given me a "demerit" badge.

Tim Johnson

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*Source: Preference Test of the Varathane Line versus the Minwax Line of Interior Wood Stains, May 2003



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