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AUGUST HOME
MAGAZINE

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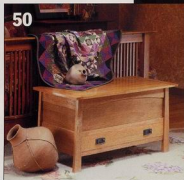
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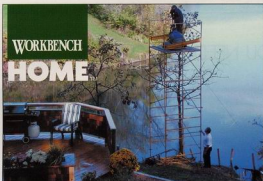


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EDITOR'S NOTES

There was just a bit of reluctance as our art director and photographer climbed the tall scaffold shown above. (Actually, the scaffold didn't sway that much.) But sometimes we have to go to great lengths — or heights — to photograph projects that appear in *Workbench*.

As you can see, this lofty perch provided a bird's-eye view of the Rustic Retreat featured in this issue (page 21). It's a two-level deck with built-in benches, a cedar-clad planter and railings, and a fireplace. In short, it's a great getaway that can be used all year round.

Of course, you don't need a beautiful lakeside setting for this deck. It can easily be built as a separate, free-standing structure in your backyard. Or, you can attach it to your house.

But the best thing about this deck is how easily you can customize it to suit your needs. For example, the post and beam support system can be laid out to fit any size or shape of deck. As for the benches, planter, and fireplace, each one is a separate, self-contained

project. That means you can incorporate as many of them as you want. And even if you don't build this deck, you may want to add one of these projects to your existing deck.

WORKBENCH HOME. As you can tell, I'm excited about this project. But it's only the beginning. The deck is the first in a series of special projects we've been planning that will appear in a new section of the magazine called *Workbench Home*.

So what is *Workbench Home* anyway? The best way to describe it is to think back to the last time you walked into a great looking house and said, "I'd like my home to look just like this."

The goal of *Workbench Home* is simple — to provide the plans, practical know-how, and inspiration to make your home look, well, just like that.

Tim

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Questions & Answers

Avoiding Chipout When Planing



▲ This board was planed without special preparation. Notice how it chipped out in some spots.

▲ Then the same board was planed again after being dampened. The chipout has virtually disappeared.

Q I'm having chipout problems using my portable thickness planer. Any suggestions?

Cindy Maxwell
Cambridge, MA

A If the knives of your planer are sharp, you might be running the board through the planer against the grain. This almost always causes a board to chip out. To check, take a look at the edge of the board to see which direction the grain is running. For more

about determining grain direction, see the *Reading Grain Direction* sidebar below).

Once you've determined the direction of the grain, set the depth of cut to take an extremely light cut (about $1/32$ "). Then make a pass, feeding the board through the planer at a slight angle (Fig. 1). This makes more of a shearing cut, providing a smooth surface.

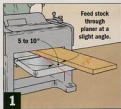
Another trick is to wipe the surface of the board with a damp cloth. Then let the board sit for a few minutes before planing it. The moisture softens the wood fibers just enough to make them pliable and less likely to chip out.

Don't worry about the board warping from the moisture. Planing the board removes the damp wood fibers before the moisture has a chance to affect it.

READING GRAIN DIRECTION

To determine grain direction, look at the edge of the board. When planing, the idea is to feed a board so that the blades in the cutterhead smooth the wood fibers with the grain. Think of it as stroking the fur on a

cat so it lies flat. Problems usually occur when the grain runs in different directions in the same board. What happens is that the blades hit against the grain in some spots, which lifts and tears the fibers.



SHARE YOUR QUESTIONS!

If you have a question about woodworking or home improvement, write it down and mail it to WORKBENCH Q&A, 2200 Grand Ave., Des Moines, IA 50312. Please include your name, address and daytime phone number (in case we need to contact you).

You can also reach us via Fax at (515) 283-2003 or by email at editor@workbenchmag.com.

If we publish your question, we'll send you a handsome and fashionable Workbench cap like shown here.



"Liquid Eraser" to the Rescue



Q How can I remove layout marks on veneer plywood without sanding through the thin veneer?

Sandy Atchison
Cleveland, OH

A One of the easiest ways I've found for removing pencil marks is with a soft cloth dampened with denatured alcohol. The alcohol removes the mark without raising the grain of the wood, so sanding isn't necessary.

Edge Jointing on a Router Table

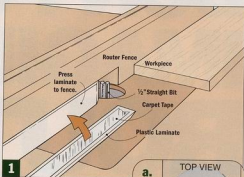
Q I need to edge glue several narrow boards together to make a wide panel of solid wood. But I don't have a jointer to make the edges straight and square. Is there another way to go about this?

Jack Wiggins
Rock Island, IL

A You can do a top-notch jointing job with a router table, a piece of plastic laminate and a straight bit. The trick is to use your router table like you would a jointer, as shown in Figure 1.

A jointer has a separate infeed and outfeed table, each one set at a different height. This allows you to adjust how much material you want to remove from a board. The outfeed table, which is slightly higher than the infeed table, provides support for the board after the cut is made.

You can create a similar offset on a router table by attaching the plastic laminate to the outfeed side of the router table fence. A slight bevel on one end of the laminate will allow the workpiece to pass



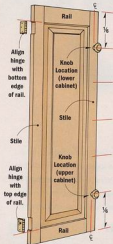
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over the laminate without catching the leading edge. The laminate strip is attached to the fence with carpet tape so that the beveled end aligns with the cutting edge of the bit, as shown in Figure 1a.

To joint the edge of a board, mount a $1/2$ " straight bit in the router. Next, adjust the fence so that the face of the laminate aligns with the cutting edge of the bit, as seen in Figure 1a.



Now turn on the router and pass the workpiece over the bit from right to left in a smooth, continuous movement. The router bit will shave a straight edge like the knives of a jointer, while the laminate supports the newly cut edge.



Where to Locate Knobs and Hinges

Q Are there any standards for locating knobs and hinges on kitchen cabinets?

Tim Anderson
Seattle, WA

A There aren't any set standards, but knobs should be easy to reach and visually appealing. Here's a good rule of thumb to follow: Locate knobs $1/6$ of a door's total length from either the top of the door (for a lower cabinet) or the bottom (upper cabinet), as shown at left. I also like to center knobs on the width of the door's stile. On frame-and-panel doors, align the hinges with the edge of the rails.

Loosening a Sanding Sleeve

Q I have a stubborn sanding sleeve that's stuck on my drum sander. What can I do to remove it without damaging the rubber drum?

Smart Move
via the Internet

A Try putting the drum in the freezer overnight. The cold should shrink the rubber just enough so you can slip the sleeve off easily. Another simple trick you can use to help avoid stubborn sleeve problems in the future is to apply talcum powder or cornstarch to the drum.

This makes it easy to slide the sleeve on and off.



Tips & Techniques

FEATURED TIP



Masking Tape "Clamp"

Recently, I was building the Craftsman-style clock that was featured in the November 1999 issue of *Workbench*. The long edges on the front and sides of this clock are mitered. So, the trick was trying to clamp up the clock without having the tips of the miters slip out of alignment.

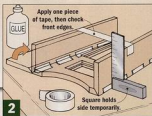
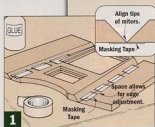
To prevent the pieces from sliding, I "clamped" the clock together with masking tape. (The tape also lets you adjust the fit of the miter joints.)

Start with the front and sides of the clock face up on your workbench. After you've carefully

aligned the tips of the miters, tape the pieces together, leaving a space between each piece of tape. The space will allow you to see whether the tips of the miters are aligned during glue-up (Fig. 1a).

After flipping the pieces over face down, put glue in the valley of the miters (Fig. 1). Then flip up one side and use a small square to hold it in place (Fig. 2). Now stand the second side up and tape across the two sides (see photo at left). To adjust the fit of the joint, loosen or tighten the tape.

Hide Garoto
Marietta, GA



This Featured Tip was submitted by Wade Garoto of Marietta, GA. He earns \$250 worth of tools from THE STANLEY WORKS

STANLEY

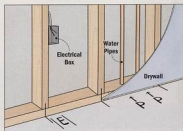
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Seeing Through Walls

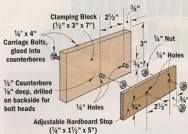
Locating wall studs or electrical outlets can be tricky once a wall is covered with sheetrock. So here's a tip that will help you "see through" walls and save you lots of headaches when remodeling.

Before you close up your framing, use a dark colored lumber crayon to mark the locations of the studs, plumbing and electrical boxes. Black or blue crayons hold up better through the sheetrock finishing stage. I use marking symbols that are easy for me to remember (see art at right).

Ralph C. Craig
Tipp City, OH



Dado Setup Jig Revisited



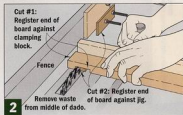
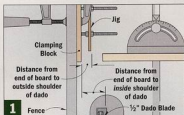
I liked the basic idea of the Dado Setup Jig featured in the November/December issue of *Workbench* (page 64). Being able to cut both shoulders of a dado without having to reset the rip fence is a big plus — especially when cutting dados in multiple pieces.

But instead of making the setup jig exactly as it was shown, I decided to modify it slightly by using a longer clamping block. I made the clamping block 7" long

instead of 4" as in the original jig (see art at left, and Fig. 1).

Now, when making the first shoulder cut, I register the end of the board against the clamping block instead of the fence, as shown in Figure 2. This way the work piece is supported by the miter gauge only — not the fence and the miter gauge as in the original jig.

Mike Suddes
Plainville, MA



Two Clamping Helpers

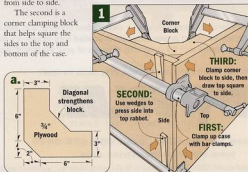
To reduce the number of clamps needed for gluing up large case projects, and to help square up the case, I use two shop-made helpers.

The first is a simple wedge that fits between the case and bar clamp. It holds the sides of the case tight to the top and bottom pieces. This also removes the need for clamps from side to side.

The second is a corner clamping block that helps square the sides to the top and bottom of the case.

The corner clamping block is made out of an 8" square piece of 3/4" plywood (Fig. 1a). Cutting the block to create two "ears" provides the reach needed for my clamps. Also, notching the inside corner allows for glue squeeze-out.

Jerry Peterson
Macon, Ga



SHARE YOUR TIPS, JIGS, AND IDEAS

Do you have a unique way of doing something? Just write down your tip and mail it to: *Workbench* Tips & Techniques, 2200 Grand Ave., Des Moines, IA 50312.

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Customize Your Kitchen Cabinets with

Divided Glass Panels

Work wonders this weekend in your kitchen. Turn ordinary cabinets into elegant display doors. Best part — it's easier than you think.

Sometimes even a simple project can completely transform the look of an entire room. The divided glass doors in the

kitchen cabinets shown above are a perfect example.

Believe it or not, these attractive glass doors were fairly ordinary looking when the cabinets were first installed (see *Before* photo at left). But a few narrow strips of wood and a piece of glass turned them into the elegant display doors you see here.

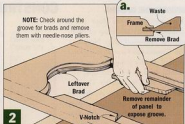
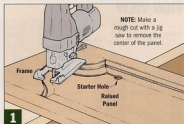
Okay, adding dividers and a glass panel makes for a great-looking door. But why not just buy glass-front doors and install them? Simple. They're expensive. Making your own, on the other hand, is fast and inexpensive. Each of our large

doors cost about \$11 for a piece of clear glass and the dividers (not including the stain). And you'll save about \$20 or more by installing the glass yourself.

Another advantage to making your own glass doors is that it lets you customize exactly how you want your kitchen to look. For this kitchen, we chose to put glass in the two large end cabinets and the two smaller ones above the microwave (see inset photo above).

Even making a few display doors opens up the entire kitchen and gives it a whole new feel. Everybody's kitchen is different,





though. So we've provided three more display door options for you to consider at the end of this article (see page 41).

Regardless of the style you choose, making a display door is easier than it appears. You simply remove the solid wood (or plywood) panel from an existing door and rout out one of the lips of the groove that held the panel in place. This creates a rabbet to hold a piece of glass. Then a number of notches are cut in the door frame to hold the dividers.

REMOVING THE WOOD PANEL

The first step in this project is to remove the wood panel from the frame that surrounds it.

The biggest part of the wood panel can be removed with a jig saw. Begin by drilling a starter hole large enough so you can stick the jig saw blade down through the panel. Then cut all the way around

the panel, staying about an inch away from the frame of the door (Fig. 1). This leaves a narrow strip of waste around the inside edge of the frame. It may take some coaxing to pull this strip loose. So try cutting a few V-shaped notches around the edges. This makes the waste sections a bit more manageable as you wiggle them free (Fig. 2).

Now is also a good time to remove any brads that might have been used to hold the original panel in place (Fig. 2a). You don't want to accidentally hit one of these brads when you're routing the back of the door. The brads pull out easily with a pair of needle-nose pliers.

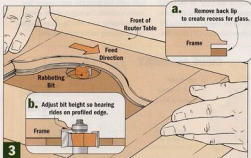
PREPARING THE OPENING

Removing the waste exposes the groove around the inside edge of the door frame that held the panel. In order to create a recess where the glass will sit, the back lip of this groove has to be removed (Fig. 3a).

This forms a rabbet in the back inside edge of the door frame. The thing to keep in mind here is the *width* of the rabbet. The idea is to rout it wide enough so that it matches the depth of the groove.

A table-mounted router and a rabbeting bit are all that's needed here (Fig. 3). You'll need to use a bit that's sized to match the width of the rabbet. Or, you may want to consider purchasing an adjustable rabbeting bit (see the sidebar below). Either way, be sure to feed the frame as shown in Figure 3.

One thing you'll notice is that the rabbeting bit leaves a rounded corner, so you'll need to square up the bottom corners with a chisel. As for the top corners, they can be left rounded.



ADJUSTABLE RABBETING BIT

Interchangeable bearings on this bit let you adjust the width of a rabbet with a single cutter. Use smaller bearings for wider rabbets (see left drawing below) and larger bearings for narrow rabbets (right drawing). See page 74 for sources.

<p>Smaller Bearing, Wider Rabbet</p>	<p>Larger Bearing, Narrower Rabbet</p>
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DIVIDING THE OPENING

The opening in the door has a gridwork that's made up of three narrow hardwood strips. Notice in the *Construction View* there's a long vertical divider joined to two horizontal dividers with half laps.

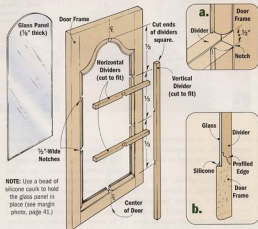
CUT THE NOTCHES. The first step in making the gridwork is to lay out the location of the notches on the profiled edge of the door frame. An easy way to do this is to center the vertical divider on the width of the opening. Then position the horizontal dividers so they divide the opening into thirds (see *Construction View*).

Note: If you have fixed shelving, position the horizontal dividers so they align with the front edges of the shelves.

To ensure the dividers fit tightly, it's important to cut the notches straight and to a consistent width (*Detail a*). To accomplish this, I used a simple jig and a fine-tooth backsaw to cut the notches. (For more on how the jig works, see *Shop-Made Cutting Guide* below).

ADD THE DIVIDERS. Now it's time to start work on the narrow vertical and horizontal dividers. Cutting and fitting the dividers

CONSTRUCTION VIEW



NOTE: All three dividers are 1/2" wide and cut to fit. The thickness equals the profiled edge of the door frame.

takes a bit of patience, so don't get in a hurry. Start by planing an extra-long blank to final thickness. The idea here is to plane the blank so that the thickness matches the profiled edge of the door frame (see *Detail b* above).

Next, rip a *test* piece to match the width of the notches. Once you're satisfied with the test fit, cut a vertical divider a hair longer than the distance between the notches. To fit the divider into place, flex it a bit and then "spring" the ends

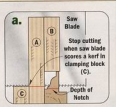
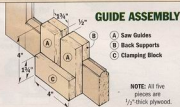
SHOP-MADE CUTTING GUIDE

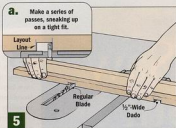
When cutting the notches for the dividers, this shop-made cutting guide provides a quick and easy way to make straight, accurate cuts. It's made from five plywood blocks glued together. These blocks form a saddle that fits over the frame of the door at each notch location (see *Guide Assembly*).

The key when gluing up the blocks is to make sure the opening between the two pairs of saw guides (A) and back supports (B) matches the width of notch you want to cut (1/2" in my case).

Another important element is the position of the clamping block (C). It should be slightly higher (about 1/16") than the

final depth of the notch (*Detail a*). That way, once the saw scores a kerf in the clamping block, it's a signal to stop and remove the guide. Then complete the cuts with the backsaw and remove the waste between the edges of the notch with a coping saw. Finally, carefully pare the remaining waste with a chisel.





SHOP TIP

To set the blade height for half laps, make two cuts in a test piece, flipping it over between each cut, until there's a thin silver left. Then raise the blade to barely remove the silver.



into the notches. You may have to sand the edges of the divider at the top and bottom ends to get it to fit.

Now cut several horizontal dividers from the blank. It's nice to have a couple of extra strips in case you break one. That way you won't have to stop and cut a new one.

HALF-LAP JOINERY. There's one more step to complete before installing the dividers permanently. That's to lay out and cut dados to form the half-lap joints.

To mark the dado locations, start by pushing the vertical divider below the face of the door frame (Fig. 4). Then position the horizontal dividers, overlapping the vertical one, and mark the dados.

Since the half-lap joints are exposed, it's important that the dividers fit snugly. To accomplish this, it pays to make trial cuts in a test piece to set up the height of the blade (see Shop Tip above). Just be sure that the test piece matches the thickness of the workpiece.

Once you have the blade height set, you're done with the test piece. Now grab the dividers and make a series of passes, trimming to the layout lines until you get a perfect fit (Figs. 5 and 5a).

PUTTING IT ALL TOGETHER

All that's left is to install the dividers in the door. Start by brushing a thin coat of glue on each half-lap joint

and also in the notches. To avoid finishing problems, don't get carried away and use too much glue. Next, fit the dividers into the notches in the door and apply clamping pressure over each half-lap joint.

There's still one small problem. The dividers don't match the color of the door. There's an easy way to solve this. Take a door to a local paint store and have them prepare a stain that matches the color of the door. Then stain the dividers and the rabbet in the back of the door. (The rabbet is noticeable when the door is open.)

Finally, it's time to add the glass (see at right), rehang the door, and enjoy your "new" kitchen.



▲ To hold the glass in place and prevent it from rattling, apply a bead of clear-drying silicone caulk all the way around.

CREATE A STYLE TO MATCH YOUR DOORS

You can easily create a variety of elegant display doors by changing the gridwork for the dividers or using different types of glass. Here are three different examples of what can be done.

CRAFTSMAN-STYLE. A small gridwork of maple dividers at the top of this door gives a nod to the Craftsman style. The frosted glass partially conceals what's behind it.

LEADED PANELS. Adhesive-backed metal strips make it easy to craft clear glass to look like old-fashioned leaded panels. The metal strips are adhesive-backed for easy application.

CONTEMPORARY. A ribbed glass panel in this door complements the white-washed maple frame. Together they create a stylish, contemporary-looking display door.

CRAFTSMAN-STYLE



LEADED PANELS



CONTEMPORARY





Band Saw Blowout

*Six band saws
compete for top honors.
Find out which saws
make the cut.*

Band saws rank high on many woodworkers' wish lists. And with good reason. From resawing to cutting curves, ripping to crosscutting, cutting circles and even intricate scroll patterns, there is no other woodworking machine that can match the versatility of a band saw.

Unfortunately, choosing which band saw isn't nearly as easy as deciding that you need one. That's because there's such a wide range of band saws to choose from.

WHERE TO START

I'd suggest looking at 14" band saws. There's just no question that a 14" band saw is the right size for most home woodworking shops. The combination of power, features and price that these saws offer make them an easy choice.

So with that as our starting point, we gathered up six of the most popular 14" band saws on the market and put them to the test.

What we wanted to know is what qualities made one band saw better than another.

HOW WE TESTED

Because band saws are so varied, even within the 14" size range, we needed a variety of opinions to best evaluate these tools. So we rounded up five experienced woodworkers to grade the saws in 12 different categories.

Before the saws were turned on, we graded them on things such as ease of assembly, the clarity of the owner's manual, and their overall fit and finish.

Then we pushed each saw to its limit, making curved cuts and resawing thick stock (see *Test Cut*).

As we made our cuts, comparing power and precision, we also paid close attention to some of the finer details that helped us rank the saws.

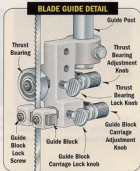
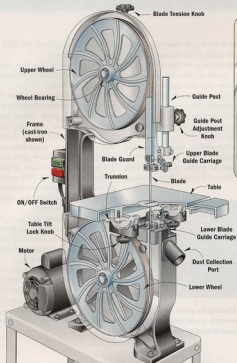
Several of those are featured in *Details That Make a Difference* on pages 44 and 45.

TEST RESULTS

For a complete list of the categories we graded and the average grade each saw received, turn to the *Band Saw Report Card* on page 49.

In addition to the final rankings and the details that make a difference, we'll also tell you our overall impressions of each saw, along with the important facts and figures about each. Finally, we'll tell you which saws we'd choose for our own shop and why.

ANATOMY OF A BAND SAW



TEST CUTS

Band saws are largely measured by their ability to cut clean, accurate curves and to resaw thick boards into thinner pieces with power and accuracy.

To compare the curve-cutting abilities of the saws in this test, we cut elaborate patterns out of $\frac{3}{4}$ "-thick red oak using identical $\frac{1}{4}$ " carbon-steel blades (Fig. 1).

For our resawing evaluation, we mounted a $\frac{1}{2}$ " carbon-steel blade on each machine. Then we resawed 2"-thick oak boards at the maximum capacity of each saw (Fig. 2).



CUTTING CURVES

▲ Effective guides, a clear sight line, and little or no vibration are essential to making crisp, curved cuts.



RESAW CAPACITY

▲ Resawing requires a well-tensioned blade, good guides, and plenty of power.

Details That Make A Difference

BLADE GUIDE SYSTEMS

All band saws have blade guides above and below the table. The guides support the blade and limit side-to-side and backward movement of the blade during cuts.

To keep the blade from moving side-to-side, there are two support members in each guide. These are either block type guides (*Photo B*), or bearing guides (*Photo C*).

Behind the blade is a thrust bearing. This bearing keeps the blade from being pushed backward off the wheel. The thrust bearing can be

seen at the top of *Photo C* or in the *Blade Guide Detail* on page 43.

In our test, we found that all of the guides on the saws we looked at were able to support the blade through a variety of cuts. What differentiated these guides from one saw to the next was how difficult it was to set them up and then keep them set up.

Remember, every time you change a blade, you'll need to adjust the guides. If that's difficult to do, you'll be less likely to change

blades, which will limit the effectiveness of your saw.

Our favorite guides were the ones that required few or no tools to change the setup.

The guides shown in *Photo B* are the best example of easy setup. And this same guide system has another feature we really like. The guide block carriage and the thrust bearing are both positioned by turning a knurled knob (you can just see one of the knobs at the right edge of *Photo B*). This makes positioning the guides much more precise than the type that slide back and forth by hand.

You'll also want to take a look at the guidepost on a band saw (*Photo A*). The post can be moved up and down to accommodate different widths or thicknesses of stock.

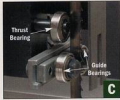
Because the upper guides are mounted on this post, it's critical that the post remain parallel to the blade as it moves. Otherwise, you'll have to reset the guides each time you change the height of the post.



▲ General's tensioned guidepost operates smoothly.



▲ Thumbscrews on Ridgid's guide system make it completely tool-less. A knurled knob positions the guides.



▲ Adjusting the guides on the Powermatic proved to be a nuisance because it requires wrenches.

WHEEL COVERS AND CABINET ACCESS



▲ Threaded knobs like those on the Powermatic make it inconvenient to open the wheel covers.



◀ The cam-lock knobs on the General lock the covers firmly, but still provide easy access.

Opening up the wheel guards or other cabinet compartments on your band saw isn't something you'll do everyday. But when you do need to get inside the machine for service, cleaning or blade changing, it should be as easy as possible.

Wheel covers that are held closed with threaded knobs make getting to the inside of the saw inconvenient (*Photo D*). The cam-style closures in *Photo E*, on the other hand, allow quick, easy access to the wheels and still hold the doors closed securely.

We also liked the large knobs and spring clips that were typical on the wheel covers of the saws we tested.

Among these saws, only the Jet has hinged doors on all of the compartments (*Photo F*). Other saws require screwdrivers or nut drivers to remove cabinet covers to get to the motor or pulley compartments.

Jet also used a nifty snap-out latch on the motor cabinet door for a professional touch.

▶ The Jet makes it easy to service the entire saw by hinging every cabinet door.



FRAME & WHEELS

The saws we tested have two types of frames: two-piece cast iron (*Photo G*) and welded-steel (*Photo H*).

Quite honestly, we weren't able to find any performance differences that we could directly relate to the frame type. There are, however, some important differences that you'll want to consider when you select your band saw.

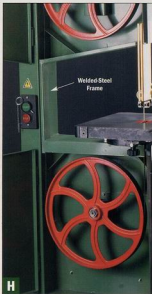
The most important difference in the frame types is really resaw capacity. As a rule, welded-frame band saws have more resaw capacity right out of the box. Most two-piece cast-iron frames, however, have the option of adding a riser block that can add as much as double the saw's resaw capacity. Welded-frame saws cannot be expanded.

Another important structural element of a band saw is its wheels. A nine-spoke wheel, such as the one in *Photo G*, is heavier than the six-spoke wheel in *Photo H*.

The extra weight means the wheel will produce more centrifugal force, and thus more cutting force. Heavier wheels also absorb more vibration.



▲ Cast-iron frames have less resaw capacity out of the box, but can be expanded. The heavier nine-spoke wheels help dampen vibration.



▲ Welded frames start with greater resaw capacity, but are not expandable. The lighter six-spoke wheels absorb less vibration.

BLADE TENSION ADJUSTMENT

Band saw blades require a great deal of tension in order to resist flexing. If a blade tensioning knob is too small, poorly positioned, or uncomfortable to use, you may not be able to apply the necessary force to tension the blade.

Large rubberized knobs (*Photo I*) or the lever-style tensioner in *Photo J* ranked high among our testers.



◀ Ridgid's large rubberized knobs make tuning the saw painless.



▶ General's quick-release blade tensioner is a pleasure to use.

SIGHT LINES

If you can't see the line, you can't follow the line. It's as simple as that.

Some saws offered a clear view of the blade and cut line while still allowing the guides to come very close to the workpiece (*Photo K*).

On other saws, the blade guard interfered with the line of sight (*Photo L*). This blade guard also held the guides much further above from the workpiece, which makes the blade more likely to flex.



▲ The Delta's guidepost provides a clear sight line — even with the guides very close to the workpiece.



▲ The Powermatic guidepost has a blade guard that greatly obstructs the view of the blade and cut line.

JET JWBS-14CS



The Jet impressed us right out of the box with its clear, thorough assembly instructions and illustrations.

Once it was put together, the Jet's performance was second to none. It powered through every cut with ease. And even during the most aggressive cuts, it was one of the quietest, smoothest-running machines we tested.

The Jet also has one of the best blade guide systems of the bunch. It's completely tool-less, and fine tuning the guides is incredibly easy.

The guide block carriages and thrust bearings are adjusted with knurled knobs and then locked with thumbscrews. The guide

blocks themselves are also locked with thumbscrews.

The fit and finish of this machine also earned high marks. It has a flat, well-polished table that tilts smoothly. And every adjustment on this saw is made with large comfortable knobs. It was also the only cabinet that didn't require tools to get to at least some part of the machine. Everything about the Jet band saw shows incredible attention to detail.

Amazingly, this is also one of the most affordable saws of the group. Hard to believe they could deliver this kind of quality for under \$600, but they did it.

So, if you're looking for high performance at a moderate cost, this is your saw.

At a Glance:

Price:	\$599
Motor:	1 HP, 115V/10 Amp or 230V/5 Amp
Resaw Capacity:	6"
Rip Capacity:	13 $\frac{1}{2}$ "
Blade Range:	$\frac{1}{4}$ " - $\frac{3}{4}$ "
Blade Speed:	3,000 SFPM
Weight:	185 lbs.
Dim:	19"D x 26"W x 68"H
Warranty:	2 years

Virtues: Powerful, quiet-running motor; Tool-less blade guide adjustments; Superior quality cabinet; Large, comfortable adjustment knobs; Large table; Great price.

Vices: Lightweight

Verdict: This is a superior-quality band saw from top-to-bottom at an unbeatable price.

Jet ... 800-274-6848
www.JetTools.com

DELTA 28-280



Delta has long made some of the best 14" band saws on the market. This tool continues Delta's fine tradition, though it does come at a price.

This saw met or exceeded every one of our expectations in terms of performance. And overall, many of the testers felt it was the best-built saw of the group.

The table had the nicest grind and polish among this group of saws. And the heavy, nine-spoke wheels — which help dampen vibration and increase cutting power — was another feature we all liked. As was the resilient-mount motor, which also minimizes vibration and is further evidence of solid construction.

The blade guide system, while requiring an Allen wrench to loosen the blocks, also impressed us. In terms of positioning the guide block carriages and the thrust bearings, the large, knurled knobs on the Delta were the easiest to reach and use.

Where this saw lost a few points was with things like a thumbscrew to adjust the upper wheel tracking — it's undersized and uncomfortable to use. We all preferred the large plastic knobs common on the other machines.

The dust port on this tool was also an issue; it just always seemed to be in the way.

But even with a few quirks, you'd never regret buying this first-class, solidly-built band saw — no matter what the price.

At a Glance:

Price:	\$799
Motor:	1 HP, 115V/9.6 Amp or 230V/4.8 Amp
Resaw Capacity:	6 $\frac{1}{4}$ "
Rip Capacity:	13 $\frac{3}{4}$ "
Blade Range:	$\frac{1}{4}$ " - $\frac{3}{4}$ "
Blade Speed:	3,000 SFPM
Weight:	224 lbs.
Dim:	18"D x 25"W x 66"H
Warranty:	2 years

Virtues: Heavy-duty construction; Excellent guide adjustment; Best overall fit & finish.

Vices: Mild vibration; Tools are required to adjust guide blocks and to access the cabinet.

Verdict: This is an outstanding saw that has long set the standard for what band saws should be. Worth the higher price.

Delta ... 800-438-2486
www.DeltaWoodworking.com



GENERAL INTERNATIONAL 90-100

At a Glance:

Price:	\$650
Motor:	1 HP, 115v/11amp or 230v/5.5amp
Resaw Capacity:	7"
Rip Capacity:	13 ³ / ₄ "
Blade Range:	1/8" - 3/4"
Blade Speed:	2,300/3,250 SFPM
Weight:	210 lbs.
Dim:	25"D x 16"W x 67"H
Warranty:	2 years

Virtues: Two speeds; Powerful; Quiet & smooth running; Large resaw capacity; Quick-release tension lever; Easy cabinet access.

Vices: Crude guide adjustments; No tension gauge; Guidepost did not stay parallel;

Verdict: A good saw with some disappointing flaws.

General Int. . . . 514-326-1161
www.General.ca

The General band saw has several unique and worthwhile features that earned it third-place in our test.

First, it has two speed settings. The slower speed is for dense hardwoods. The faster speed is well-suited to softer material. This is a nice feature that will appeal to many woodworkers.

Another feature we liked was the blade tensioning lever. The lever flips up to instantly release the tension for blade changes or when the saw is not in use. Oddly enough, this band saw did not have a tension gauge on it. Which puts an unfortunate black eye on an otherwise well thought-out tensioning system.

On a positive note, the cabinet doors of this band

saw are secured with cam-lock knobs that make opening up the machine a snap.

The solid cabinet construction was another plus.

Finally, a smooth operating guidepost, which is tensioned to keep it from slamming down on the table, also won high praise.

Unfortunately, the guidepost didn't move exactly parallel to the blade.

Another place the General suffered was in its crude guide system. An Allen wrench is needed for most adjustments, and the lower guides are difficult to reach.

Overall, the saw performed well, had some great features, and a reasonable price. With a few refinements, it could definitely contend for a higher spot.



CRAFTSMAN PROFESSIONAL

At a Glance:

Price:	\$499
Motor:	1 ¹ / ₂ HP*, 120V/10 Amp
Resaw Capacity:	6"
Rip Capacity:	13 ³ / ₄ "
Blade Range:	1/8" - 1/2"
Blade Speed:	2,700 SFPM
Weight:	194 lbs.
Dim:	33"D x 21"W x 64"H
Warranty:	1 year

Virtues: Solidly built; Nice guide adjustment; Heavy castings; Sturdy open base; Great price.

Vices: Loud; Poor belt guard design; Table adjustment knobs are too close to the table.

Verdict: Not a fancy saw but performed very well. Top Value at under \$500.

Craftsman . . . 800-549-4505
www.Craftsman.com

*Craftsman claims 2 1/2 "maximum developed HP which means the motor only reaches this output under extreme loads.

The Craftsman delivered performance that we all felt was well beyond its reasonable price.

Despite being powered by what is essentially a 3/4 horsepower motor (Craftsman claims 1 1/2 "maximum developed" horsepower, which is a bit deceiving when rating induction motors), this saw handled even our most demanding cuts. It stalled only when our feed rates outpaced our good sense.

Additionally, the Craftsman has a blade guide adjustment system very similar to the much higher-priced machines.

The overall construction of the machine also impressed us. The castings were sturdy, and the large table was nicely polished.

What cost the Craftsman a higher ranking were things such as a poorly designed guard for its drive belt, which actually shook

off at one point. That also speaks poorly of the excessive vibration we experienced when making heavy cuts.

Having to remove the blade guard to change blades and the noisy operation of the saw were our other big complaints.

Overall, the Craftsman is not a particularly fancy saw, but certainly an effective one. Based on that, and a price tag under \$500, we awarded it Top Value honors.



POWERMATIC 044



The Powermatic is best described as equal parts good, and equal parts bad.

On the good side, this saw was far-and-away the quietest, smoothest-running saw we used. That's a huge advantage when you're cutting intricate curves.

In fact, this saw ran so smoothly that the minimal vibration in some of the other saws in the test seemed downright annoying by comparison.

Also in the Powermatic's favor was its enormous resaw capacity — nearly 2" more than the next largest saw.

The tension spring in this saw was easily the strongest. That gives the saw greater ability to tension wide blades.

Unfortunately, this saw was plagued by a few too many problems to be ranked any higher in the test.

For instance, the blade guide system was absolutely maddening to adjust. And the knobs for blade tensioning and tracking were almost painful to use. Also, threaded lock knobs made getting into the cabinet inconvenient. And finally, the guidepost intruded into the sight line so badly that it made us all feel cross-eyed (see *Details That Make A Difference*, page 44).

Just the same, this saw has a lot of potential.

If you want a powerful machine that's solidly built, this is a good choice. And if you can justify the cost of an after-market guide system and friendlier knobs, this saw could be as good as any we tested.



RIGID BS-1400



Except for a smaller motor and an open stand, the Ridgid is almost a clone of the Jet.

Most notably, the Ridgid boasts a nearly identical guide system to the Jet. Interestingly enough, Ridgid went one step further and rubberized all the thumbscrews. In fact, every knob on this saw is rubberized and extremely comfortable to manipulate. These are small touches, but good ones.

Another plus for Ridgid is a lifetime warranty compared to the one- or two-year warranties on all the other saws in this test.

Unfortunately, some members of our team found the 3/4 hp motor to be inadequate for aggressive cutting.

During the resaw testing, the Ridgid stalled easier than we would have liked.

The saw also had an excessive amount of vibration. That may be due to its open stand, which seemed too lightweight to supporting a tool of this size.

Those things alone were enough to knock the Ridgid into the bottom spot.

And yet, despite its poor placement in this test, everyone agreed that the saw would work well for occasional, light-duty use.

We can't recommend the Ridgid for resawing. But, with the money you save on the price of this saw, you could buy plenty of high-quality blades that would maximize the saw's performance in all other situations.



At a Glance:

Price:	\$669
Motor:	1 HP, 115V/7 Amp or 230V/3.5 Amp
Resaw Capacity:	9"
Rip Capacity:	14"
Blade Range:	1/4" - 3/4"
Blade Speed:	3,000 SFPM
Weight:	212 lbs.
Dim:	27"D x 23"W x 71"H
Warranty:	1 year

Virtues: Smoothest-running motor; Large resaw capacity; Large table; Strong tension spring.
Vices: Difficult assembly; Poor manual; Threaded knobs are inconvenient; Tensioning knob is uncomfortable; Guides are hard to adjust.
Verdict: Some really good things here, but overall, it's hard to recommend this saw at this price.

Powermatic . . . 800-274-6848
www.Powermatic.com

At a Glance:

Price:	\$499
Motor:	3/4 HP, 120V 10 Amp
Resaw Capacity:	6"
Rip Capacity:	13 3/8"
Blade Range:	1/8" - 3/4"
Blade Speed:	2,800 SFPM
Weight:	178 lbs.
Dim:	32"D x 17"W x 68"H
Warranty:	Lifetime

Virtues: Guides are tool-less and easy to adjust; All knobs and thumbscrews are large and rubberized; Good fit and finish; Great price; Lifetime warranty.
Vices: Heavy vibration; Excessive noise; Lightweight stand; Underpowered for heavy resawing.
Verdict: At this price, it's a reasonable saw for light-duty use.

Ridgid . . . 800-474-3443
www.RidgidWoodsworking.com

BAND SAW REPORT CARD

	Jet	Delta	General	Craftsman	Powermatic	Ridgid
Assembly/Set Up	B+	B+	B	C-	B	C
Owner's Manual	C+	C+	C	C+	F	C
Fit & Finish	B+	A-	B	B	B	B+
Table Tilt	A-	A-	B	B+	B-	B+
Dust Port	B	C+	B	C+	C-	C+
Blade Guides	A	B+	C	C+	D+	A
Blade Changing	B	B	B	B-	C	C+
Blade Tensioning	B	B	A-	B	C+	B
Noise Level	B	B	B-	C+	B+	C+
Vibration	B	B	B-	B	B+	C
Resawing	B+	A-	B+	B-	B-	C-
Curve Cutting	B+	B+	B-	B-	B-	C
Overall Grade	B	B	B-	C+	C	C

Final Recommendations

EDITOR'S CHOICE

Forgive me for riding the fence. There's just no other way.

The Jet is a great saw. The Delta is a great saw. I searched for a reason to give one of them sole claim to the *Editor's Choice* award. But no matter how I came at it, I just couldn't rationalize making either one of them the "bridesmaid."

Unfortunately, my test group was no help in solving the stalemate. They liked them both, giving them identical final grades.

So, is the Jet the automatic winner because it is priced significantly lower? For some people, yes. For others, the American workmanship and the heritage of Delta tools justifies the additional \$200.

In reality, either of these saws should last you a lifetime. Both will handle the vast majority of cuts you can demand of them. The blade guides on both saws are effective and easy to use. The overall construction of both machines is nearly flawless.

So rest assured, whether you choose the Jet or the Delta, either saw is worth every dime.

TOP VALUE

If you want to spend as little as possible to equip your shop with a capable band saw, then the Craftsman is easily the *Top Value*.

Admittedly, this saw isn't as heavy-duty as the pricier models we tested. And its motor, which Craftsman markets as a 1½ maximum-developed hp, actually produces ¾ continuous hp.

Despite that, and a few other small quirks that we discovered during our testing, this saw impressed us. We especially liked the way it handled fast feed rates when resawing. It also cut curves smoothly with little effort.

Overall, we felt that whatever limitations the Craftsman band saw may have, they are more than offset by its relatively low price.

JET JWBS-14CS



DELTA 28-298



CRAFTSMAN PROFESSIONAL





Craftsman-Style Blanket Chest

Sturdy construction and classic Craftsman style — two reasons why this blanket chest is sure to be a family heirloom.

I always enjoy hearing people's initial reaction to a project. For this blanket chest, the legs attracted the most attention. If you look at the photo above, it's easy to see why. The thick, tapered legs made of solid, straight-grained oak really set this chest apart.

Well, talking about the legs naturally brought up a few questions. Like what's the best way to cut the long, gradual tapers? And what about the joinery? Doesn't it require making tricky, angled cuts?

For starters, all it takes to make the tapers are a table saw and a shop-made jig. Now don't worry, this isn't a complicated jig that takes longer than the project to put together. In fact, you can knock it out in about 10 minutes. The result? Identical tapers on each leg.

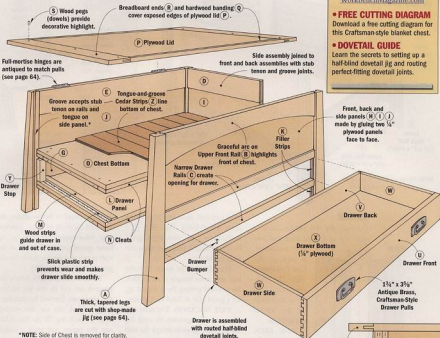
As for the joinery, there aren't any tricky, angled cuts. That's because each leg is tapered on the outside edge only. Although it might not look like it at first glance, the inside edges of each leg are actually straight.

This design simplifies the joinery considerably. To assemble the case, I used stub tenon and groove joints — a strong, fast method of connecting the legs, rails and plywood panels. (We've included a separate article on stub tenon and groove joinery on page 58.)

Of course, there's more to this chest than sturdy construction. Making an arched front rail and a dove-tailed drawer, along with "aging" hardware all present some interesting challenges. Plus, they create a classic looking chest that will definitely stand the test of time.

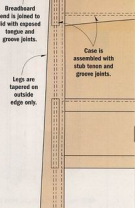
BLANKET CHEST CONSTRUCTION DETAILS

Overall Dimensions: 42"W x 20³/₈"D x 22"H



Front, back and side panels (H, I, J) made by gluing two 1/4\"/>

Drawer Bottom (1/4\"/>



Breadboard end is joined to lid with exposed tongue and groove joints.

Legs are tapered on outside edge only.

Case is assembled with stub tenon and groove joints.

MATERIALS & HARDWARE LIST

CASE

A (4) Legs (oak)	1 1/2" x 2 1/2" x 21 1/2"
B (1) Upper Front Rail (oak)	3 1/2" x 3 3/8" x 34 1/2"
C (2) Drawer Rails (oak)	3 1/2" x 3 1/2" x 34 1/2"
D (2) Upper Side Rails (oak)	1 1/2" x 3 3/8" x 16 1/2"
E (1) Upper Back Rail (oak)	3 1/2" x 3 3/8" x 34 1/2"
F (2) Lower Side Rails (oak)	3 1/2" x 7" x 16 1/2"
G (1) Lower Back Rail (oak)	3 1/2" x 7" x 34 1/2"
H (1) Front Panel (plywood)	1 1/2" x 8 1/2" x 34 1/2"
I (2) Side Panels (plywood)	1 1/2" x 6 1/8" x 16 1/2"
J (1) Back Panel (plywood)	1 1/2" x 6 1/8" x 34 1/2"
K (1) Filler Strips (oak)	1 1/2" x 3/32" x 30" rgh.
L (1) Drawer Panel (plywood)	3 1/2" x 16 1/2" x 35"
M (2) Drawer Guides (oak)	1 1/2" x 1" x 16 1/2"
N (1) Cleats (oak)	1 1/2" x 1 1/2" x 18 kn. fl.
O (1) Chest Bottom (plywood)	3 1/2" x 16 1/2" x 35"

CHEST LID

P (1) Top (plywood)	3 1/2" x 20 3/8" x 39"
Q (2) Edgebanding (oak)	3 1/2" x 1/2" x 39"
R (2) Breadboard Ends (oak)	3 1/2" x 2 1/2" x 20 3/8"
S (6) Pegs (oak)	1 1/2" x 1/2" dowels
T (1) Support Strip (oak)	3/8" x 1" x 34 1/2"

DRAWER

U (1) Drawer Front (oak)	3 1/2" x 4 1/8" x 34 1/2"
V (1) Drawer Back (oak)	1 1/2" x 4 1/8" x 34 1/2"
W (2) Drawer Sides (oak)	1 1/2" x 4 1/8" x 15 1/2"
X (1) Drawer Bottom (plywood)	1/4" x 15 1/2" x 33 3/8"
Y (1) Drawer Stops (oak)	3 1/2" x 1" x 4 1/4"
Z (10) Cedar Strips	1 1/2" x 3 3/8" x 16 1/2"

HARDWARE

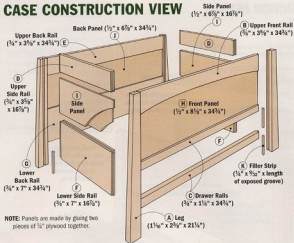
- (28) #8 x 1 1/4" Fh Woodscrews
- (28) #8 x 2" Fh Woodscrews
- (12) #6 x 3/4" Fh Woodscrews
- (2) 3/4" x 2 1/2" Butt Hinges
- (2) 1 3/4" x 3 3/8" Drawer Pulls
- (1) 15 1/2"-long Black Chain
- (2) UHMW Drawer Bumpers
- (2) 1 1/2" x 16" UHMW Drawer Glide Strips

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• **FREE CUTTING DIAGRAM**
Download a free cutting diagram for this Craftsman-style blanket chest.

• **DOVETAIL GUIDE**
Learn the secrets to setting up a half-blind dovetail jig and routing perfect-fitting dovetail joints.

CASE CONSTRUCTION VIEW



NOTE: Panels are made by gluing two pieces of 1/2" plywood together.

THE CASE

The case for this blanket chest is made up of a front, back and two side assemblies, as seen in the *Case Construction View*. The "cornerstones" of these assemblies are the sets of tapered legs.

THE LEGS.
To give the chest its solid

look and feel, each leg (A) is made from 1 1/2"-thick oak (Fig. 1). I looked for the straightest grain lumber I could find and then cut four leg blanks.

One thing to be aware of is the legs are mirror images of each other. So to avoid getting them mixed up, it's a good idea to label each piece.

CUT GROOVES. The next step is to cut two grooves in each leg blank. These grooves accept the stub tenons on the rails and also the tongues on the plywood panels of

the case. Detail 'u' below shows the size and location of these grooves. (For information on how to cut these grooves, as well as all of the stub tenon and groove joints for this project, refer to page 58.)

TIME FOR TAPERS. Once the grooves are cut in the leg blanks, the tapers are formed by making a long, angled cut on the outside edge of each leg. To do this, I laid out the tapers and used a simple sled on a table saw to "carry" the legs through the blade. (See page 64 for more on this sled.)

By the way, after making the angled cuts, hold onto the wedge-shaped waste pieces. They'll come in handy when gluing up the front and back assemblies for the case.

READY FOR THE RAILS. At this point, you can set the legs aside and concentrate on the rails. Before you get started, take a close look at the rails on the front of the chest in the *Case Construction View*.

Notice the graceful arc on the upper front rail (B) that helps give the chest its distinctive look. The two narrow rails (C) underneath form an opening for the drawer. Unlike the front of the chest, there are only two rails on the side and



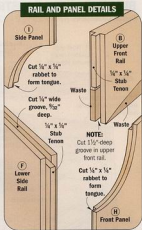
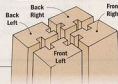
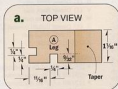
NOTE: Legs are mirror images. Make two of each.

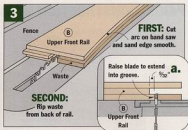
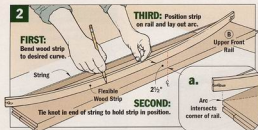
LEG CONSTRUCTION VIEW

STEP 1:
Cut four leg blanks to size.

STEP 2:
Cut grooves for rails and panels.

STEP 3:
Cut tapers in legs (page 64).





back assemblies. The narrow upper rails (D, E) and wide lower rails (F, G) "sandwich" the side and back panels between them.

All the rails have a short (stub) tenon on each end that fits into the grooves in the legs (*Rail and Panel Details*). To hold the plywood panels, you'll also need to cut a groove in one edge of each rail with one exception. There isn't a groove in the lower drawer rail.

One thing to be aware of is the depth of the groove in the upper front (arched) rail. It's $1\frac{1}{2}$ " deep (instead of $\frac{3}{32}$ " like the others). This way, it will be deep enough to hold the panel after the arc is cut.

It only takes a minute to lay out the arc on this rail. A thin, flexible strip of wood that's bowed with a string makes it an easy, one-person job (Figs. 2 and 2a).

There's just one thing left to do to complete the upper front rail. That's to make a rip cut on the back face of the rail (Figs. 3 and 3a). This creates a groove that's the same depth as the one in the other rails ($\frac{3}{32}$ "). And it leaves the arc on the front of the rail intact.

PLYWOOD PANELS

Once the rails are completed, it's just a matter of making the plywood panels that fit between them.

The front (H), sides (I) and back panels (J) are $\frac{1}{2}$ "-thick plywood panels. I wanted to use rift-sawn (straight-grained) oak plywood to match the legs and rails. But I couldn't find $\frac{1}{2}$ " plywood with two "good" sides. So instead, I glued two

pieces of $\frac{1}{4}$ " plywood together with contact cement. Since contact cement creates an instant bond, it will "grab" as soon as the pieces touch. So it can be tricky to get the edges of the pieces perfectly aligned.

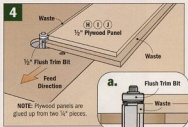
The solution is to start by cutting one piece to exact size. Then glue on a second piece that's about $\frac{1}{4}$ " larger all around. This creates an overhanging edge, which is easily trimmed flush with a router and flush trim bit (Fig. 4 and 4a).

Now all that's needed to complete each panel is to cut a rabbet in all four edges. This forms a tongue all the way around that fits into the grooves in the legs and rails. (Again, refer to the article on page 58.)

CASE ASSEMBLY

Since the case is fairly large, it's easiest to assemble it in several stages.

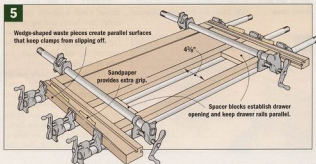
I started by gluing up the front assembly. To ensure a flat, square assembly, I used the wedge-shaped waste sections from the legs and two



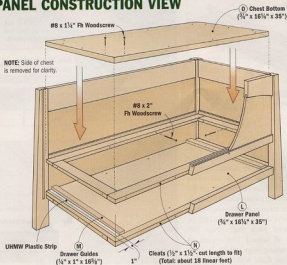
spacers, as shown in Figure 5. As for the back assembly, the process is basically the same. Only here, you won't need the drawer spacers.

Finally, after gluing up each side unit, glue and clamp the case together, checking it for square.

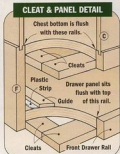
FILLER STRIPS. There's just one thing left to do for the case. That's to glue small wood filler strips (K) in the exposed grooves at the bottom of the legs and in the drawer opening (see the *Case Construction View*).



PANEL CONSTRUCTION VIEW



NOTE: Side of chest is removed for clarity.



▲ For a smooth-sliding drawer, peel the backing off a self-adhesive strip of UHMW plastic and press it into place.

ADD A PAIR OF PANELS

The inside of the chest is divided by two large $\frac{3}{4}$ " plywood panels that are supported by wood cleats (Panel Construction View, above). The lower panel supports the drawer, and the upper panel serves as the bottom of the blanket chest.

DRAWER PANEL. The first step is to make the drawer panel (L). To get it to fit down into the case, the panel is sized to allow for an $\frac{1}{8}$ " gap all around.

After cutting the drawer panel to size, I added two drawer guides (M). These are thin strips of wood

that are glued to the top surface of the panel. In use, two notches in the back of the drawer straddle the guides, which prevents the drawer from racking.

To make the drawer slide smoothly (and to reduce wear), I attached two strips of an extremely slick plastic material next to the guides. As you can see in the photo at left, this Ultra-High Molecular Weight plastic (UHMW for short) is easy to install. Note: For sources of UHMW, refer to page 74.

CLEATS. At this point, the drawer panel is almost ready to install. But there's nothing to support it yet. That's the job of four $\frac{1}{2}$ "-thick hardwood cleats (N) attached to the front, back and sides of the chest.

Note: There are actually *two* sets of cleats, one to hold the drawer panel and the other for the bottom of the chest. But the second set can't be installed until after you fit the drawer panel down into the chest.

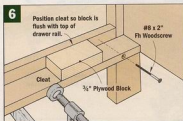
With that in mind, it's time to install the lower set of cleats. The

goal is to position the cleats so the drawer panel ends up flush with the top edge of the lower drawer rail (Clear and Panel Detail). This way, the drawer won't catch on the panel when it's slid in and out.

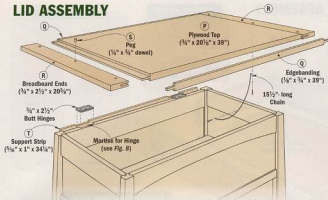
To accomplish that, I used a $\frac{3}{4}$ " plywood block as a thickness gauge (Fig. 6). Just set the block on the cleat that will be attached to the lower drawer rail. Then clamp the cleat in place so the block is flush with the rail and screw it in place.

Once the front cleat is installed, use it to establish the height of the other cleats. Then lower the drawer panel into the case and fasten it with screws (Mounting Detail).

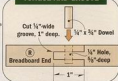
CHEST BOTTOM. Next, turn your attention to the plywood panel that serves as the bottom (O) of the chest. It's the same size as the drawer panel, and it's also supported by four cleats. Only here, locate the cleats so the panel ends up flush with the *upper* drawer rail and the *lower* rails on the sides and back. As before, screw the cleats and chest bottom in place.



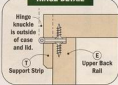
LID ASSEMBLY



TONGUE AND GROOVE



HINGE DETAIL



THE LID — AN OPEN & SHUT CASE

This blanket chest is enclosed with a large, overhanging lid that highlights two distinct features: exposed tongue and groove joinery and decorative wood pegs (*Lid Assembly*).

To simplify construction, the lid starts out as a large plywood panel. It's banded with thin strips of solid wood in front and back. Wide "breadboard" ends cover the sides.

The panel for the top (P) of the lid is cut from $\frac{3}{4}$ " plywood. Then, to cover the front and back edges, to rip the $\frac{1}{8}$ "-thick hardwood strips for the edgebanding (Q) and glue them in place. Since the edgebanding is quite thin, the joint line virtually "disappears."

BREADBOARD ENDS. After carefully sanding the edgebanding flush with the top, it's time to add the breadboard ends (R). These are $\frac{3}{4}$ " thick boards assembled to the

lid with tongue and groove joints (see *Tongue and Groove* detail above).

There's a $\frac{1}{4}$ "-wide groove centered on the thickness of each breadboard end. As with the rails, you can use the same two-pass method to cut this groove (see page 58). Only here, the groove is 1" deep to hold a tongue of the same length. This provides a large glue surface, which makes for a strong joint.

With the grooves complete, the tongues can be cut to fit. To do this, I set up a dado blade in the table saw and rabbeted both sides of the lid (Figs. 7 and 7a). Here's a tip — to prevent chipout, carpet-tape a scrap block to the back edge where the blade exits the cut.

PEGS. After gluing on the breadboard ends and sanding them flush, I added three decorative wood pegs (S) on each side. These are $\frac{3}{4}$ " dowels that are glued into holes

drilled through the tongue. Then they're trimmed flush with a chisel.

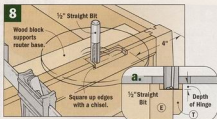
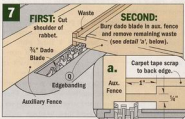
HINGE THE LID. The next step is to hinge the lid to the chest. I used butt hinges that are mortised into the back of the chest (*Hinge Detail*). To open the lid without having it bind against the legs, I had to increase the thickness of the back by adding a hardwood support strip (T). It's chamfered on the bottom edge to create a smooth transition to the chest, and then glued in place.

Now it's just a matter of routing the mortises for the hinges (Figs. 8 and 8a). To keep the router from tipping, it's a good idea to clamp a block to the chest. After freehand routing the bulk of the waste, square up the corners with a chisel.

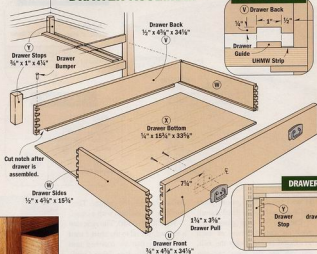
To finish up, attach the hinges with screws. Then install a chain to keep the lid from opening too far (see photo at right).



▲ The hinges for the lid are "aged" to look like antique bronze (page 62). A chain prevents the lid from being opened too far.



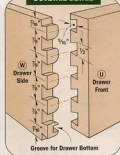
DRAWER ASSEMBLY



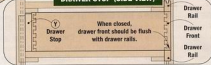
DRAWER NOTCH



DOVETAIL DETAIL



DRAWER STOP (SIDE VIEW)



▲ The half-blind dovetail joints used to assemble the drawer are both strong and attractive.

DOVETAILED DRAWER

The opening near the bottom of the chest holds a large drawer that's assembled with half-blind dovetail joints — a strong joint that won't loosen with use (*Drawer Assembly*).

To match the chest, I used solid, straight-grained oak for all the drawer parts except the bottom: $3/4$ \"-thick stock for the front and $1/2$ \" material for the sides and back.

After planing stock to thickness, cut the front (U), back (V) and sides (W) to size. The dimensions shown above take the joinery into account, a $1/16$ \" gap around the sides and top of the drawer, and two wood stops.

ROUT DOVETAILED. Now you can concentrate on the half-blind dovetail joints (*Dovetail Detail*). I used a router and a half-blind dovetail jig to rout the pins and tails.

Editor's Note: There's information about this type of jig and step-by-step instructions for routing dovetails in the May/June 2001 issue of *Workbench*. Or, visit us at www.workbenchmag.com

DRAWER BOTTOM. With the joinery complete, it's time to add the drawer bottom (X). It's a piece of $3/8$ \" oak plywood that fits into a groove near the bottom edge of each drawer piece. You'll want to center this groove on the lowest 'tail' on the side pieces (Figs. 9 and 9a). This way, the groove won't be visible after the drawer is assembled.

Before gluing up the drawer, it's best to pre-drill holes for the mounting screws on the drawer pulls. Then glue and clamp the drawer, checking it for square.

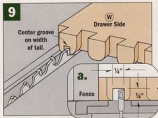
NOTCH DRAWER. The next step is to cut two notches in the bottom edge of the drawer back (*Notch Detail*). These notches fit

over the wood guides, which prevent the drawer from racking when you slide it in and out. A hand saw and chisel are all that's needed to cut the notches.

DRAWER STOPS. For the final fitting of the drawer, I added two wood stops (Y) to the back of the chest (*Drawer Assembly and Stop Detail*). The idea here is simple. When the back of the drawer contacts the stops, the front should be perfectly flush with the drawer rails. The best way to accomplish this is to use a trial-and-error process.

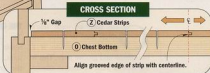
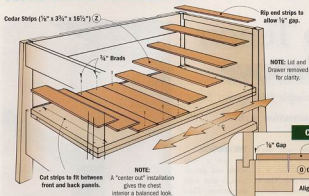
Start by cutting the stops slightly *thicker* than needed. (I made mine a "fat" $3/4$ \" thick.) Then set them in place and slide in the drawer. The drawer front is probably just a bit proud at this point. But that's okay.

To get a perfect fit, take out the stops and use a hand plane to remove a small amount of material. Then put the stops back in and check the fit of the drawer. If necessary, repeat the process until you're satisfied with the fit. Then glue in the stops, using hand pressure to hold them in place.



CEDAR LINING INSTALLATION

Cedar Strips ($\frac{1}{2}$ " x $3\frac{1}{4}$ " x $16\frac{1}{2}$ ") (Z)



STAIN & FINISH

There's still some work to do on the blanket chest. (I planned to install cedar lining.) But since the aromatic cedar is best left unfinished, it's a good time to apply stain and to finish the chest.

I used a gel stain, as shown in the sidebar below. Once it dried, I wiped on two coats of tung oil.

CEDAR LINING

To avoid having keepsake blankets damaged by moths, the bottom of the chest is covered with $3\frac{1}{4}$ "-wide cedar strips that have pre-cut tongue and groove joints (*Cedar Lining Installation*).

Since the joinery is already done, installing the strips should go quickly. They're simply cut to length and fit together piece by piece, starting near the center and working toward both ends.

Start by aligning the *grooved* edge of the first strip with a centerline marked on the bottom of the chest (*Cross Section*). Then attach it with nails installed in the face of the strip, as shown at right. To allow for wood movement, center the nails on the width of the strip.

Next, fit the two adjoining strips into place and nail them, as well. Then just repeat the process. When you get to each end of the

chest, the last strip won't be a full-width piece. You'll have to rip one edge. The idea is to leave at least $\frac{1}{8}$ " gap between the strip and the side of the chest (*Cross Section*). This allows the entire cedar panel to expand and contract with changes in humidity. You'll also need to notch the two end strips to fit around the legs (*Corner Notch Detail*).

Now just fill the nail holes. If you use a matching color of wood filler, the holes virtually disappear.

Well, this blanket chest is finally finished. And if it's anything like mine, it's bound to become a family heirloom — just like the treasures it holds. **▼**



▲ A pneumatic nailer makes quick work of tacking the cedar strips in the chest.

GEL STAIN GIVES GREAT RESULTS

When staining a large project like the blanket chest, it's sometimes hard to get consistent results. So to ensure a nice, even color, a gel stain is just the ticket. (I used a stain manufactured by Minwax called antique oak.)

Like its name implies, a gel stain has a much thicker consistency than a liquid stain. Because of this, the color pigment stays suspended in the can instead of settling in a sludge at the bottom. This means the color is the same from top to bottom — without having to keep stirring the stain.

All that's needed to apply a gel stain is a foam brush. Don't be dainty here. Just load up the brush. As you brush the stain around, the gel flows across the workpiece. Stop brushing, and it changes back to its gel consistency.

To avoid lap marks, be sure to keep a "wet" edge. Once the surface is covered, use a clean rag to wipe off the excess stain. To prevent streaking, wipe in the direction of the grain until the workpiece is almost "dry."



Stub Tenon & Groove

This strong, simple joint makes frame and panel construction a cinch.

One type of joint that's often used in frame and panel construction is a stub tenon and groove joint. This is the type of joint we used to assemble the blanket chest on page 50.

There are two reasons for using stub tenon and groove joinery: First, it provides a quick, easy way to join the solid wood legs and rails of the chest to the plywood panels. Second, it creates an extremely strong joint.

To see how the stub tenon and groove joints fit together, take a look at the photo above. Notice that there are two grooves in the leg and a single groove in the bottom edge of the rail. These grooves hold a stub (short) tenon on the end of the rail and a tongue that's formed on the plywood panel.

So what makes a stub tenon and groove joint so strong? The plywood panel is *glued* into the grooves, so the panel itself actually becomes part of the joint. This increases the glue surface, making the entire unit very strong.

THE GROOVES

To cut a stub tenon and groove joint, I start with the grooves. Then the tenons (and tongues) can be cut to fit.

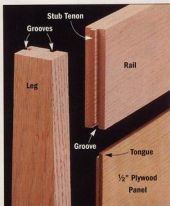
The width of the grooves is sized to match the thickness of the stub tenons and tongues ($1/4$ " wide in my case). As for depth, it's best to cut the grooves slightly deeper ($1/32$ " than the length of the tenons and tongues ($9/32$ " deep). This provides room for glue at the bottom of the groove.

LEG GROOVES. With that in mind, the first step is to set up the table saw to cut grooves in the legs. Start by mounting a $1/4$ " dado blade and adjusting its height to make a $9/32$ "-deep cut (Fig. 1a). Then lock the rip fence, attach a featherboard to hold the workpiece against the fence, and make a single pass to cut each groove (Fig. 1).

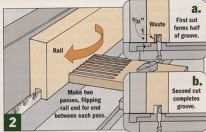
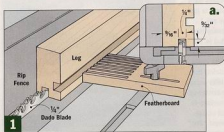
RAIL GROOVES. The setup for cutting grooves in the rails is different. That's because these grooves are centered on the thickness of the rails. To make it easy to cut a centered groove, I use a single saw blade (see margin photo) and make two passes.

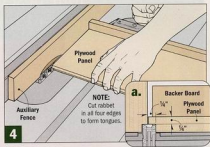
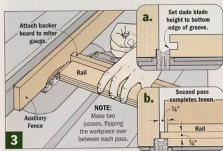
Start by positioning the rip fence so the blade is roughly centered on the thickness of the rail, and make a pass (Figs. 2 and 2a). Then without moving the rip fence, flip the piece end for end and take a second pass (Fig. 2b).

If necessary, nudge the fence away from the blade and make two more passes until you end up with a $1/4$ "-wide groove.



▲ The raker teeth on most dado blades are ground flat, so using a single outer blade of a stacked dado set produces a flat-bottomed groove.





▲ To make it easy to fit the panel into the groove, sand a chamfer on the edges of the tongue.

STUB TENONS & TONGUES

After the grooves are cut, the next step is to cut the stub tenons and the tongues to fit.

STUB TENONS. The stub tenons serve two purposes. First, they keep the rails aligned so they won't twist in relation to the legs. Second, they fill the ends of the grooves in the legs.

SETUP. Here again, I use a dado blade to cut the stub tenons. As you can see in Figs. 3 and 3a, an auxiliary fence acts as a stop that determines the length of the tenon. Set the auxiliary fence $1/4$ " from the blade. This will produce a tenon that's slightly shorter than the depth of the groove. As a result, the tenon won't "bottom out" in the groove, and you'll get a tight-fitting joint.

To accurately set the height of the blade, use one of the grooved pieces (Fig. 3a). This determines the thickness of the tenon. With the blade height set, the idea is to make two passes, flipping the workpiece over between each pass (Fig. 3b).

The last step in the setup process is to check the miter gauge with a try square. It must be 90° to the rip fence. If it's not, the tenon's shoulders won't be perpendicular to the edge of the workpiece, and the assembly won't be square.

TRIAL CUTS. Before cutting the actual workpiece, it pays to make a trial cut in a test piece. Just be sure that the test piece matches the thickness of the workpiece.

To make a trial cut, butt the end of the test piece against the fence

and use the miter gauge to guide it through the blade. This creates one cheek of the tenon. Then flip the test piece over and repeat the process to cut the other cheek.

TEST FIT. Now check to see if the test stub tenon fits the groove in the leg. The goal is a friction fit — snug, not tight. Also, the shoulders of the tenon should fit tightly against the leg. Once you're satisfied with the fit, go ahead and cut the tenons on both ends of each rail.

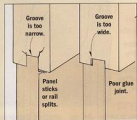
TONGUES. At this point, you can concentrate on the tongues that wrap around all four edges of the plywood panel. They're formed by cutting a rabbet in each edge.

To cut the rabbets, partially "bury" a dado blade in an auxiliary fence (Figs. 4 and 4a). Here again, an auxiliary fence attached to the rip fence serves as a stop to establish the length of the tongue. As for the blade height, adjust it so the rabbet that's cut forms a $1/4$ "-thick tongue. As before, make trial cuts in a test piece to ensure a snug fit.

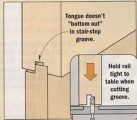
DRY ASSEMBLY & GLUE. It pays to dry assemble all the pieces to make sure they fit together as a unit before gluing them up. Be sure to check for tight joints and square corners.

To glue up the assembly, spread glue on each tenon and also into the grooves. Keep in mind that it's the large glue surface that gives a stub tenon and groove joint its strength. So it's important to brush on a continuous film of glue. This ensures a strong, long-lasting joint. ■

TIPS FOR TROUBLESHOOTING



▲ The tenon can cause the rail to split if the groove is too narrow. If the groove is too wide, it results in a poor glue joint.



▲ A "stair-step" groove can prevent the panel from seating, so hold the rail down tightly against the table saw during the cut.

Around The House

Repairing Window Sills and Brickmolds

Rotting window casings are a common problem that homeowners face. Here's a way to avoid more costly repairs. It involves using a special hardener to stop the rot and a two-part filler to patch the damaged areas.

First, remove the rotten wood. You can do this with a chisel or wire brush, as shown in Figure 1.

Second, you'll need to stop the rot from going any further. This is where the hardener comes in. The hardener penetrates into the wood, creating a solid reinforced base. (It also seals out moisture, which causes rot.) I use a bristle brush and paint the hardener on the damaged area (Fig. 1a). Apply several coats until you get a nice sheen and let this cure for a few hours.

Next, you'll need to fill in the areas where the wood has been removed and prepped. A two-part wood filler is just the ticket to get this done. This consists of a putty and a catalyst. When the two are

mixed, the filler immediately begins to harden. (You can mix this right in the plastic lid that comes with the wood filler.)

Activating the wood filler requires mixing the putty and the right amount of catalyst together (see box at right). Once the two are thoroughly mixed, start laying it in right away, as you only have 5-15 minutes working time.

When the repairs are deeper than $\frac{1}{8}$ ", build up the filler in layers. And, if the area you're filling is an edge, you can create a dam with a piece of tape to prevent the filler from oozing out (Fig. 2).

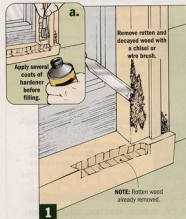
You'll need to overbuild the filler since it tends to shrink a little as it sets. The nice thing about this filler is its ability to be carved after it has hardened slightly, so don't worry too much about the amount of overbuild.

After about 20 minutes, the filler will be hard enough to carve the overbuilt areas closer to the final surface (Fig. 3). But don't walk away while you're waiting for this stage. Temperature (especially heat) greatly affects the setting time of the filler. It can get so hard that carving will chip it and even cause it to break out in chunks.

After you're done carving, let the filler stand another 10-15



▲ The hardener (tall can) reinforces the wood and prevents further decay, while the filler (short can) fills in the prepared areas. These products from Minwax are sold separately.



Mixing Tips



When working with two-part wood fillers, make sure the wood surface is already prepared. Once you mix the putty and catalyst, there's no time to be looking for tools or doing any more prep work.

The two parts must also be mixed thoroughly. Even when all the white colored catalyst disappears, stir the batch a little more. This helps prevent any dead spots in the filler.

The manufacturer suggests a "golf ball"-size scoop of putty and a $\frac{3}{4}$ " line of catalyst. To be safe, start by trying a batch half this size.

minutes before you give it a final sanding. Then once all the surfaces have been sanded, it's time to repaint. Even though the hardener and filler are moisture resistant, prime the repaired areas as well as casing and sills. This will remove any uneven sheen in the top coat.



In the Shop

Table Saw Taper Jig

One of the distinctive features of the blanket chest (page 50) is its thick, tapered legs. Cutting the outer edge at an angle creates a leg that's narrow at the top and wider at the bottom. To make this long, angled cut quickly and accurately, I used a simple taper jig. The jig makes it easy to position the leg at the correct angle and hold it in place during the cut (see photo).

There's nothing complicated about this taper jig. A plywood base with two support blocks acts like a "sled" that carries the leg through the saw blade. A couple of hold-downs attached to the long support block prevent the leg from shifting.

To build the jig, rip a $7\frac{1}{2}$ "-wide piece of $\frac{1}{4}$ "-thick plywood for the base. The ripped edge serves as a *reference* that indicates the path



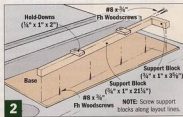
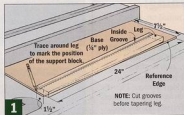
of the saw blade. This reference edge is used to align the leg on the base, which will help locate the support blocks.

To position the support blocks, lay out the width of the leg ($1\frac{1}{2}$ ") at the top end, then align this mark with the reference edge. Next, position the bottom outside corner of the leg flush with the reference edge and trace the outline of the

leg onto the base (Fig. 1). Then screw down the support blocks along the layout lines and add the hold-downs (Fig. 2).

To use the jig, push it through the saw blade along the reference edge to cut a taper on each leg.

Note: To make mirror images of the legs, two are cut with the inside groove facing up. The other two are cut with the groove facing down.



"Aging" Hinges Without the Wait

► To create an antique look, this solution causes a chemical reaction that changes the bright finish on the hinges to black.



I couldn't find hinges in the size I needed that had an antique finish for the Craftsman-style blanket chest (page 50). So I "aged" some hinges that had a bright zinc finish with a special *Brax Darkening Solution* (see page 74 for sources).

Before the solution will work, you'll need to remove the protective film on the hinge. To do that, simply rough up the surface with

steel wool. Then wipe it clean. Next soak the hinge for 10-15 minutes in a glass jar partially filled with solution (see photo).

A second dip may be needed to change the degree of darkness. After removing the hinge from the solution, rinse it with water to stop the "aging" process. If you want a protective coating, you can spray the hinge with a lacquer finish.

Drilling Pocket Holes in Thick Stock

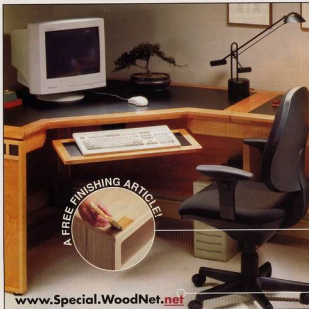
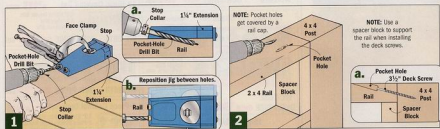
The rails on the rustic retreat (page 21) are connected to the posts with deck screws drilled into pocket holes. (We used a pocket hole jig from the Kreg Tool Company. See page 74 for sources of this jig.)

The jig clamps to the rail and serves as a guide for accurately drilling angled screw holes (Fig. 1).

Notice in *Figure 1a* that a special bit (included with the jig) is used to drill the deep counterbored pocket and the shank hole for the screw. Note: The shank hole doesn't go through the end of the board.

To make a solid connection, it's best to drill a pocket hole near each edge of the rail. This means you'll need to reposition the jig (Fig. 1b).

When working with the 2x4 rails, you'll also need to attach an extension (also included) to the jig (Fig. 1a). The extension moves the entry point of the bit farther back from the end of the rail. So when you drive in the screw, the tip will exit at a point that's centered on the thickness of the rail, as shown in *Figures 2 and 2a*.



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Sources & Resources



► A slick plastic material used in this self-adhesive tape and bumper glides makes the drawer slide smoothly.



Home Depot 770-433-8211
www.homedepot.com
Lee Valley 800-871-8158
www.leevalley.com
Rockler 800-279-4441
www.rockler.com

Blanket Chest — page 50

This elegant Craftsman-style blanket chest is accented with antique-looking hardware. It also features a simple guide system for the drawer.

ANTIQUE HARDWARE. In keeping with the Craftsman style, we used $3\frac{1}{2}$ " x $1\frac{1}{2}$ " Die-Cast Drawer Pulls with a hammered finish. They're available for \$6.40 each from Lee Valley (Item No. 0G6011). Most hardware stores and home centers carry the chain and zinc hinges.

DARKENING SOLUTION. To "age" the hinges, we used a solution that turns them black (available at most woodworking supply stores).

SLICK PLASTIC. We used Ultra-High Molecular Weight (UHMW) plastic tape and bumper glides to help the drawer slide smoothly in and out. This self-adhesive and self-lubricating Nylo-Tape is available from Rockler for \$5.99 (Item No. 70615). The Stem Bumper Glides (Item No. 28373) cost \$1.99 (10 per pack).



▲ This special darkening solution "ages" hardware in minutes.

Woodworker's Supply . . . 800-645-9292
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Woodsmith Store 800-835-5084

FEEDBACK AND FOLLOW-UP

Sorry, Wrong Number

In our review of "10 Tools for 2002" (the February 2002 issue of *Woodcraft*), the phone number listed for Bosch Power Tools (page 65) was incorrect. The correct number is 877-267-2499.

In that same issue, we reported that the Black & Decker Firestorm cordless drill came with a three-hour charger and one battery. In fact, the drill includes two batteries.

PRICE UPDATE. Finally, here's a follow-up on the price of the Milwaukee Body Grip Router, also included in that tool review. The list price of this router is \$312 w/case and \$285 w/out. The street price of this router is actually \$169 and \$159, respectively. This router is covered by a limited lifetime warranty.

Rabbeting Bit — page 39

In order to add glass panels to kitchen cabinet doors, you'll need to form a recess in the back of the door for the glass. To do this, we used an adjustable rabbeting bit. These bits are available by mail order and from woodworking supply stores.

CMT 888-268-2487
www.cmtusa.com

Woodworker's Supply . . . 800-645-9292
www.woodworker.com



Pocket Hole Jig — page 66

To drill pocket holes for the screws used to connect the rails and posts on the "Rustic Reira" (page 21), we used a Pocket Rocket Jig. The jig is manufactured by the Kreg Tool Company (sources below).

Kreg Tool Co. 800-447-8638
www.kregtool.com

Rockler . . . 800-279-4441
www.rockler.com



“Plane” & Fancy

Touted as “seven planes in one” when first introduced during the early 1880s, the popular Stanley No. 45 combination plane does it all.

Before electric routers, metal combination planes like this Stanley No. 45 could replace an entire shelf full of wooden molding planes. Many are still in use today.

This plow-type plane features a cast-iron body and rosewood handles, along with an adjustable fence and depth stop. It can be fitted with 18-23 interchangeable irons (depending on

vintage). These special “cutters” as Stanley called them let you plow rabbets and dadoes, and also perform fancier jobs such as cutting decorative beads and fillets.

No matter what type of cutter is used, the basic idea is the same. To produce a crisp, clean cut, make a series of light passes with the plane until the cutter reaches a preset depth.

