

# Woodsmith®

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Vol. 35 / No. 205

## ALL-IN-ONE CRAFT CABINET

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*Converts into  
stylish cabinet  
when not in use.*



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### Wall-Mounted Shelves . . . . . 16

Make a design statement with this elegant shelving system. The modular design of this wall-mounted unit makes it easy to customize.

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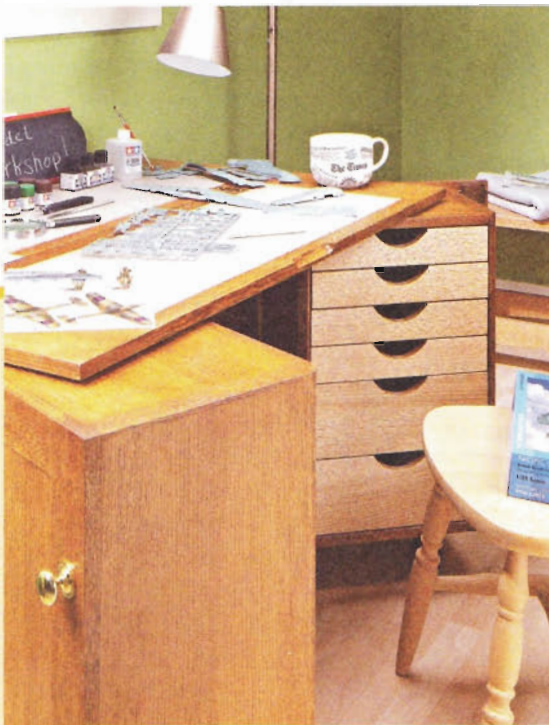
### Craft Cabinet. . . . . 20

Everyone should have a hobby. So we designed a great place to enjoy it. This expandable craft center provides a large work area and handy storage to suit a wide range of hobbies and crafts.

#### heirloom project

### Tall Case Clock . . . . . 34

This stylish tall clock has classic looks, simple construction, and a modern movement. It's sure to become a family heirloom.



**Craft Cabinet** page 20

**M**ost of us face the challenge of making the best use of the space we have, regardless of the size of our home. In this issue, you'll find two problem-solving projects to tackle any space issues you're facing in your own home.

**WALL-MOUNTED SHELVES.** For starters, there's the wall shelving shown on page 16. It's a low-cost, easy-to-build solution for your display and storage needs. Since it mounts to the wall, it won't take up any floor space. Plus, the design can be modified to create a system that works best for you.

**CRAFT CABINET.** When it comes to crafts and hobbies, it's amazing how much you can accumulate for even a single activity. Keeping everything organized and close at hand while you're working can stymie the best of us. That's where the craft center (page 20) can lend a hand. It's a perfect choice for any room because it looks like a fine piece of furniture. The two doors at the front are the key to the whole design. They swing out and open to provide easy access to handy storage, like open shelving and drawers for organizing all your materials. The doors also support a top that flips over to double the size of your work area, resolving another common problem. For sewing or fly tying, scrapbooking or model-making, it's a one-of-a-kind project.

**NEW WOODSMITH SHOP DVD.** There's one last thing I need to mention. The popularity of the *Woodsmith Shop* on public broadcasting continues with the completion of our sixth season. So just like before, season 6 is now available on DVD. All thirteen episodes are included on a pair of DVDs. A separate CD contains all the plans and articles mentioned on the show. You can find out more about ordering it (along with package options for the other five seasons) by turning to Sources on page 51. Be sure to check it out. We think it's our best season yet. And just in case you're wondering, season 7 is already in the works.

*Bryan*

from our readers

# Tips & Techniques



## Pull-Out Cabinet

If you have base cabinets, then you know this is where shop supplies often end up forgotten. I was tired of hurting my back and knees to get into one of these cabinets, so I decided to turn the whole cabinet into a pull-out shelving unit.

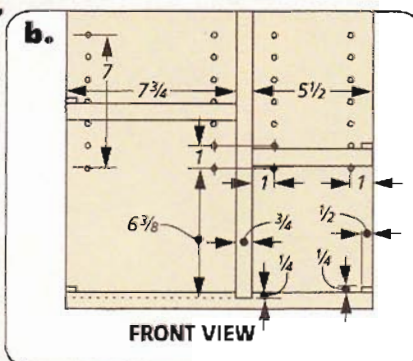
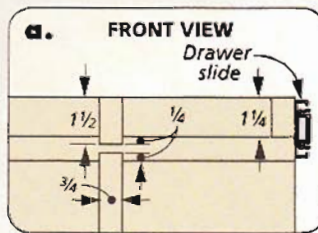
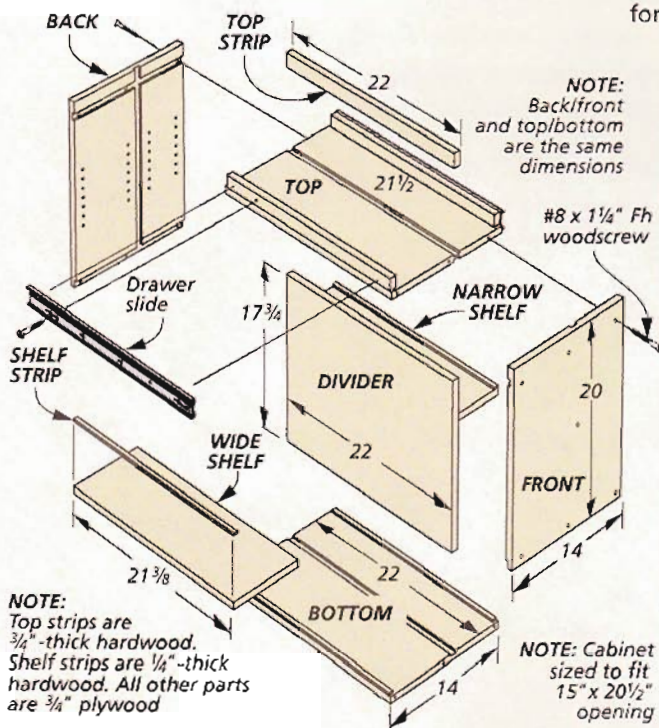
**OVERVIEW.** The cabinet isn't difficult to make, but it's proven extremely handy. It has front and back panels that each feature a dado, a rabbet, and a groove that accept top, bottom, and divider panels. The front and back also have a series of shelf pin holes for adjustable shelves on either

side of the divider. In addition, the top has three strips attached that turn it into a compartmentalized tray. Once it's assembled, the whole thing slides in and out of the cabinet on a pair of heavy-duty drawer slides.

**MAKING THE CABINET** The key to making this pull-out cabinet is to measure the cabinet opening first. That way, you can size the parts to fit properly. But after that, it's just a matter of cutting out the plywood parts, adding the joinery, and assembling the case with glue and screws.

Once you have it all put together, attach the drawer slides to the cabinet sides and the top strips, as shown in the photo above. Then, as a final touch, reattach the door to the front panel. That way, the cabinet will blend right in with the rest when the door is closed.

Bill Huber  
Haslet, Texas



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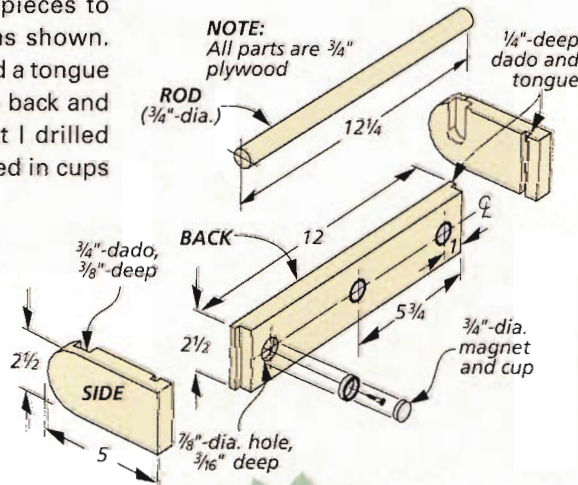
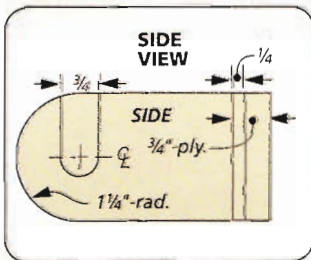
## Magnetic Paper Towel Holder

Paper towels often come in handy while working in the shop. To always have them close by, I made this magnetic paper towel holder out of a dowel and some plywood.

The holder isn't difficult to make. I just ripped a plywood blank to width and then cut it into three pieces to make the sides and back, as shown. Using the table saw, I created a tongue and dado joint between the back and sides to add strength. Next I drilled holes in the back and screwed in cups to accept magnets.

To complete the sides, I routed stopped slots to hold the dowel, and then I rounded the front edges at the band saw. After assembly, my new paper towel holder was ready for a roll.

Doug Broadhurst  
Holbrook, New York



## SUBMIT YOUR TIPS ONLINE

If you have an original shop tip, we would like to hear from you and consider publishing your tip in one or more of our publications. Go to:

**Woodsmith.com**

Click on the link,  
**"SUBMIT A TIP"**

You'll be able to tell us all about your tip and upload your photos and drawings. You can also mail your tips to "Woodsmith Tips" at the editorial address shown at right. We will pay up to \$200 if we publish your tip.

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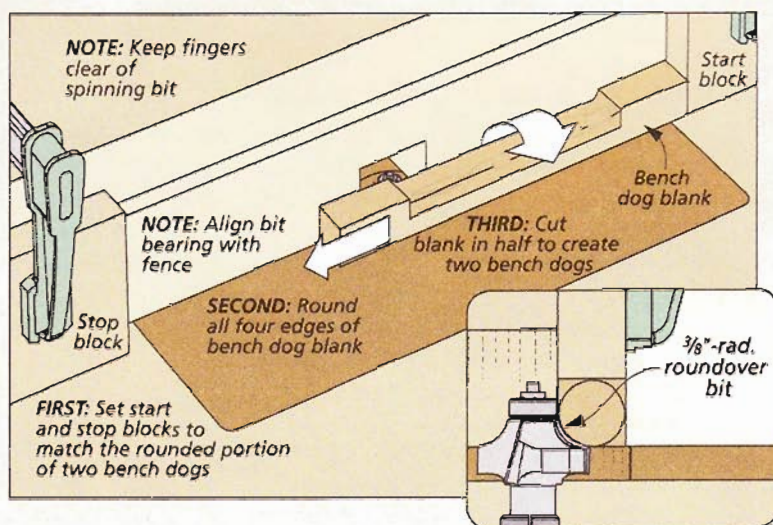
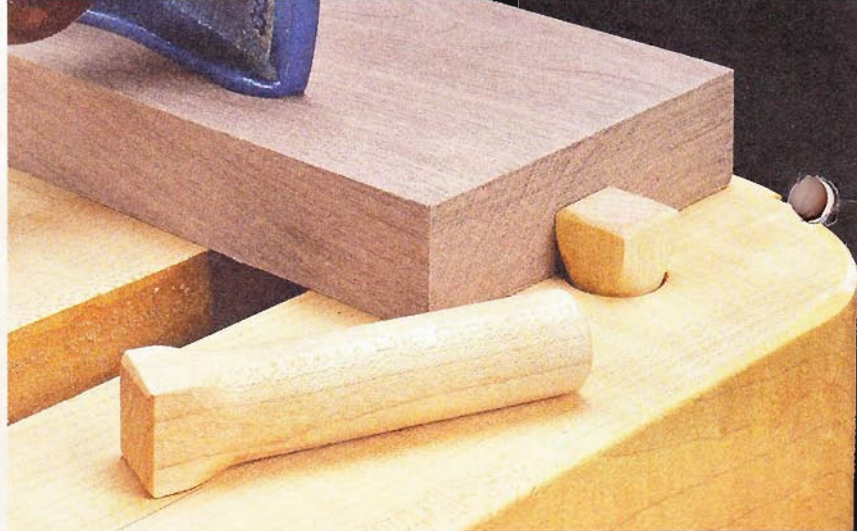
## Shop-Made Bench Dogs

Bench dogs are indispensable accessories for holding a board in place on a workbench. And wood dogs won't damage your tools if you accidentally strike them.

I figured out a simple way to make my own bench dogs in the shop. I just cut an extra-long workpiece to thickness and width to match the diameter of my workbench's dog holes ( $\frac{3}{4}$ " ). Then, I rounded over a portion of all four edges of the piece using the router table technique shown in the illustrations at right.

After that, it was a simple matter of trimming the flat, squared-off section at each end of the workpiece down to size. Then I just cut the piece in half to create two bench dogs. You can repeat the process to create as many bench dogs as you need.

Jim Moorehead  
Barrigada, Guam



## Simple Shop Mallet

A wood mallet should be part of everyone's tool arsenal. And making one doesn't have to be complicated.

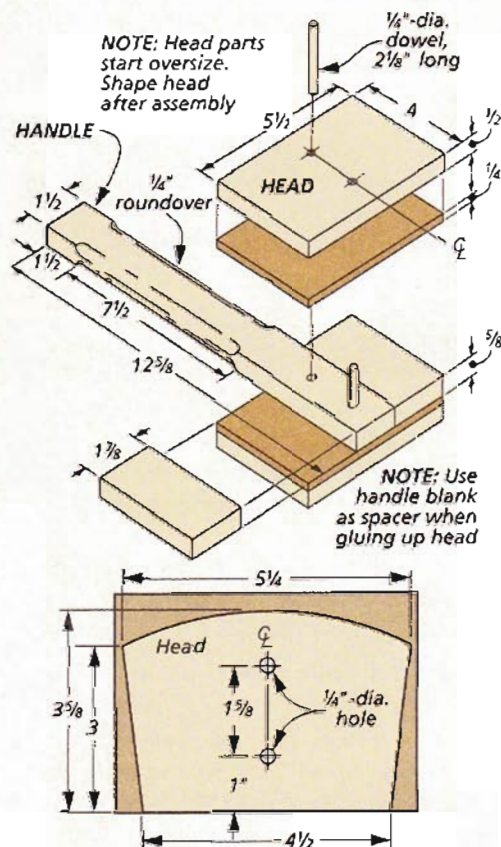
▼ Making a great-looking mallet like this is easier than you think.

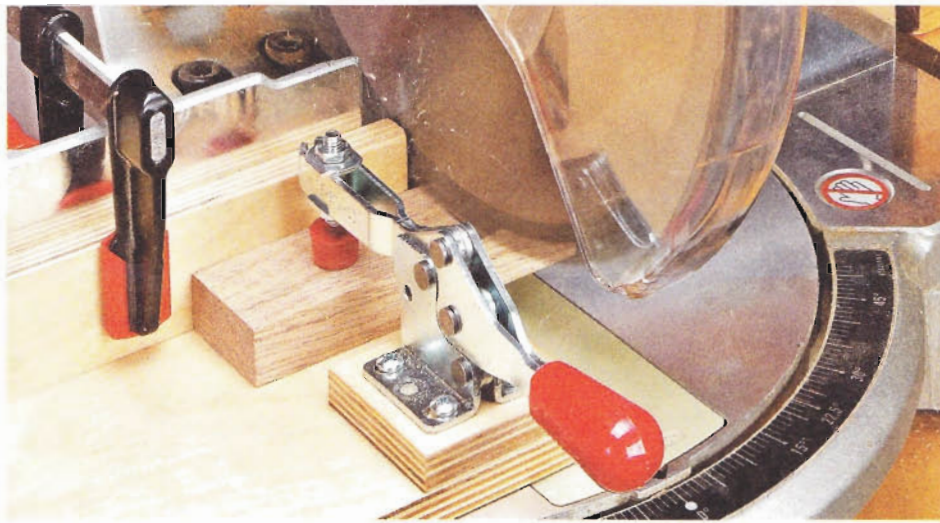


I made this mallet with a few scrap pieces and about an hour of shop time. The trick is to cut the handle to its finished dimensions, and then cut the other six parts of the mallet head slightly oversize. After that, I glued up all the pieces around the handle blank as you see at right, and I carefully slipped the handle out after adding clamps.

At this point, you can let the glue dry, and shape the mallet head at the band saw (below right). Now finish shaping the handle, and glue it back in place. Then drill holes and tap in dowels as a final touch, and give everything a nice sanding before applying finish.

Serge Duclos  
Delson, Quebec





## Small-Piece Miter Saw Jig

Cutting short pieces at the miter saw can be nerve-racking, not to mention dangerous. To keep my hands well out of harm's way when making cuts like this, I came up with the simple jig you see here.

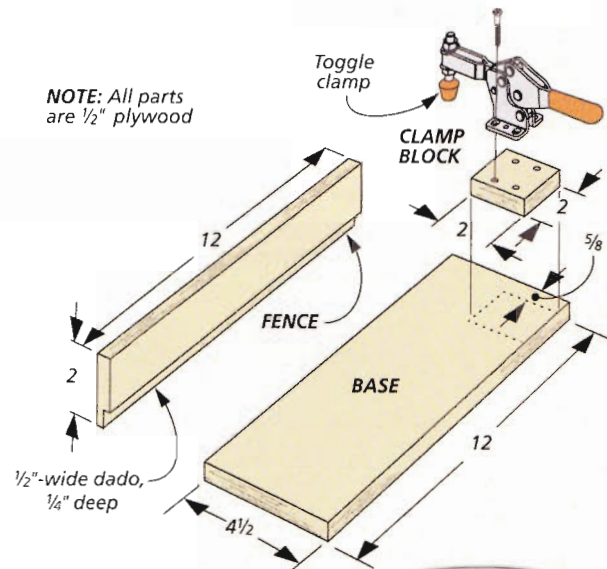
The jig is nothing more than a base and a fence made from plywood. A toggle clamp attached to the front of the base secures the workpiece. The clamp is adjustable, so the jig will accept workpieces of varying thicknesses and up to 2 1/4" wide.

To use the jig, I just scoot it up to the cut line on my miter saw, and clamp the jig to the fence. Then I secure the workpiece in the

jig with the toggle clamp. Finally, I place one hand on the jig, well away from the blade, and make the cut. The toggle clamp keeps the

workpiece secure, and my fingers live to woodworking another day.

*Gennadiy Dineralter  
New London, Connecticut*



## Quick Tips

### HOLE SAW FIXER

If you've ever drilled the wrong size hole with a hole saw, *Bill Wells* of Olympia, Washington, has the solution. Drill the correct size hole in a board and use that as a guide for making a new hole.



### IMPROVED PIPE CLAMPS

Pipe clamps can leave dents in wood from the jaws and stains on wood from the pipe. *Darrel Kalmes* of Dubuque, Iowa, fixed both issues with refrigerator magnets and a plastic wire chase.



## WIN THIS PORTER CABLE COMBO ROUTER

Simply send us your favorite shop tips. If your tip or technique is selected as the featured reader's tip, you'll win a *Porter Cable* combo router kit just like the one shown here. To submit your tip or technique, just go online to [Woodsmith.com](http://Woodsmith.com) and click on the link, "SUBMIT A TIP." You can submit your tip and upload your photos for consideration.



### The Winner!

Congratulations to *Doug Broadhurst*, the winner of this Porter Cable router. To find out how you can win this router kit, check out the information on the left.



natural

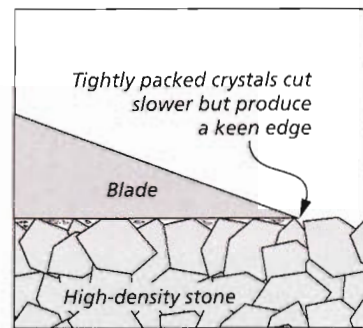
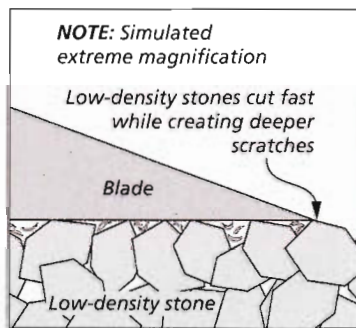
# Arkansas Stones

For generations, woodworkers have relied on these honing stones to put a keen edge on their tools. Learn why they work so well.

Arkansas stones come in a handful of grades that roughly correspond to different grits.

In this day when the latest and greatest, high-tech sharpening systems are all the rage, the old tried-and-true methods that served woodworkers well for countless years have largely been forgotten. Arkansas stones are a good case in point. These natural honing stones were once the standard for all tool sharpening. You may have a well-used Arkansas stone in your shop handed down from a father or grandfather.

But it's possible that you and many

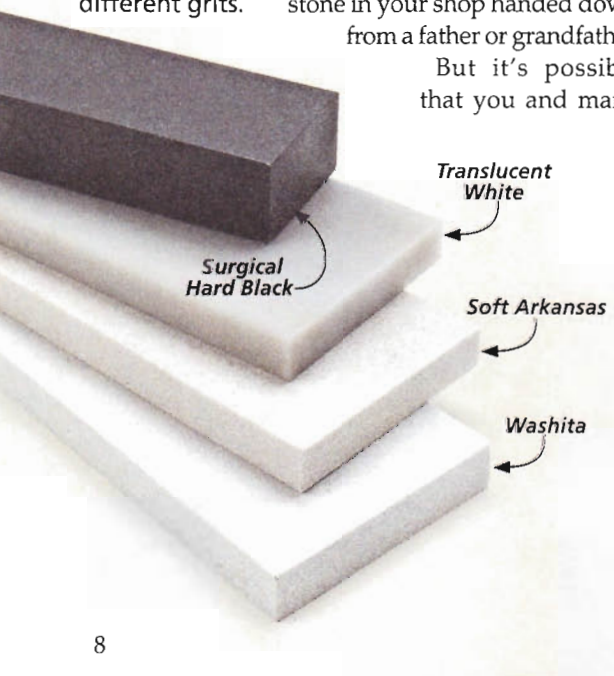


other woodworkers have only a vague and limited understanding of what an Arkansas stone is, what it can do, and how to use it. So I think that a basic course on Arkansas stones is in order. You might decide that "old-fashioned" Arkansas stones still deserve a place in the modern woodshop.

**WHAT ARE THEY MADE FROM?** Arkansas stones are milled from a naturally occurring rock named novaculite ("razor stone" in Latin) mined in the Ouachita mountains of Arkansas and Oklahoma. Novaculite is composed of very fine crystals of pure silica or quartz. (Think of a stone made up of tiny grains of sand.)

The individual crystals have a size in the neighborhood of 3 to 5 microns — comparable to 2000-grit sandpaper. This fine crystalline structure along with the hardness of the quartz are what give Arkansas stones their highly regarded sharpening prowess.

**CLASSIFICATION.** Although all Arkansas stones are composed of the same material and basic microcrystalline structure, there are distinctions drawn that separate novaculite into different grades. When used for sharpening, the various grades will give you very different results. This can be a point of confusion. You need to know what kind of



Arkansas stone will produce the edge you're looking for.

**IT'S THE DENSITY.** Unlike other abrasives, the grading of Arkansas stones is not based on grit size. It's all pretty much the same. Instead, the grades are based on the density of the stone (measured by specific gravity). To put it simply, the higher the density of the stone, the harder it is, and the finer the edge it will produce. Try to imagine that the tightly packed crystals in the more dense stones produce finer, closer-spaced metal shavings to create a keener edge. On the other hand, the less dense stones make larger "scratches" and cut much faster. The drawings on the opposite page illustrate this point.

Due to this classification system, a simple coarse/medium/fine type nomenclature isn't used. Rather, the stones are described by hardness and color. (Note that the correlation between color and hardness is not absolute. Stones of the same density and hardness can vary in color.) However, this general system is not used uniformly by all manufacturers.

**SOFT-TO-HARD.** At the bottom of the stack is the Washita stone. (This is a phonetic spelling of Ouachita.) These are the softest of the Arkansas stones and would correlate to a coarse stone. They're used for initial honing and, due to their soft composition, they wear quickly. Soft Arkansas is the next on the scale, followed by hard Arkansas. The hardest stones (most dense) are the translucent white and the hard black. The translucent white is considered an extra-fine stone while some say the hard black is even finer or ultra-fine. You'll sometimes find hard black stones marketed as surgical grade.

**WEAR.** The hardness of a stone relates to how fast it will cut and also how the stone wears. The softer stones cut fast but also dish out quicker. The translucent white and hard black cut very slowly but stay flat much longer.



▲ All it takes is a few drops of oil to lubricate the stone. The oil will float away the metal particles and keep the surface from becoming clogged.



▲ A white translucent stone will leave a mirror polish on a tool's edge.

**USING ARKANSAS STONES.** Arkansas stones are considered natural oil-stones, which simply means that oil is used as the lubricant when honing. Water can be used, but I think the more viscous oil works better. Once oil is used on the stone, you can't switch to water.

The oil serves two purposes. First, it lubricates the surface to make honing easier. Second, it floats away the metal particles and prevents them from clogging the surface. A very light oil such as mineral oil is the best choice. But I've heard of people using 3-in-1, WD-40, or even kerosene. Special honing oils are available at any good hardware store.

A new, freshly milled Arkansas stone needs to be conditioned. Basically this just means that it needs to be used for a while before it will produce the results you expect. As the stone begins to

wear, you'll see that it leaves a higher level of polish.

The honing process with Arkansas stones is the same as with any stone. As I mentioned, the finer stones cut slowly, so you want to work your way up through the grits. You should have a well-honed edge before you start working with a translucent white or hard black stone.

The oil will darken considerably as it picks up the metal shavings. You don't want to hone with a thick sludge. So wipe the stone clean and refresh the oil often. And when you're done honing, you should always wipe the stone clean (upper right photo). You can use fresh honing oil or a solvent such as mineral spirits. This will help keep your stones in tip-top shape for another generation. You'll find sources for Arkansas stones on page 51. **W**

▼ From Japan to Europe, all areas of the world can yield stones used for fine honing.

## Other Natural Stones

Two other naturally occurring honing stone options are shown in the photos at right.

The upper stone is a *Narutaki* waterstone. These stones have been mined in the Kyoto region of Japan for centuries and are preferred by sword polishers as well as woodworkers. The finer grades are rated equivalent to 10,000-grit or higher and produce a mirror polish. However, they wear moderately fast.

The lower stone is a Belgian coticule — sometimes called Belgian clay. Barbers have long used these stones for honing a hair-splitting edge on their straight razors. Although a coticule will produce a very fine edge, the soft stones wear rapidly.





top shelf

## Random Orbit Sanders

Sticker shock might make you question whether any sander could be worth so much money, but the performance leaves no doubt.

I have to admit that I hate sanding. It's tedious, time-consuming work that usually results in numb hands caused by the vibration of the sander. On top of that, sanding can fill up the air with clouds of dust. Even with a shop vacuum connected to my sander, a lot of dust still gets into the air.

With those concerns in mind, I decided it was time to take a look at a couple top-of-the-line random orbit sanders. In spite of the promises of better performance, I cringed at the idea of shelling out nearly \$500 for a sander. After all, there are big name-brand models for only \$80. The question I wanted

to answer was simple: "Can these sanders possibly be worth the price?" What I found was in keeping with everything else I've learned about tools over the years — you get what you pay for.

**THE LINEUP.** I chose a pair of 5" sanders: the *Mirka CEROS* (Compact Electronic Random Orbital Sander), and the *Festool Rotex 125*. They're shown in the photo at left. (Both sanders are available in a 6" model, as well.)

**WHAT'S THE DIFFERENCE?** These sanders both feature soft start, variable speed control, and improved dust collection. Both manufacturers offer a tool-activated dust extraction system as a separate item. On top of that, the shape of each offers a choice of design, giving you options that might suit your



tasks better. I'll point out a few things about each model.

### MIRKA

The first things you'll notice about the *Mirka CEROS* are the large, black power supply and the low-profile shape that resembles an air-powered sander. The box is a converter that sends power to the brushless, DC motor. The motor promises a long life for the sander.

I took an immediate liking to this tool. The paddle switch and the low-profile of the sander make it a breeze to control. Behind the paddle switch are the speed controls (right photo). You can select speeds from 4,000-10,000 RPM in 1,000 RPM increments. You can also choose to set the controls so the paddle switch controls the speed.

On top of the comfortable feel, you'll appreciate the significant noise reduction. This sander runs far more quietly than any other I've used (68 dB). Even when used with the companion dust extractor, you can easily carry on a conversation while you're sanding.

*Mirka's Abranet* open weave mesh sanding discs, with abrasives embedded in the fabric, are the perfect choice for the tool. They allow for near total dust collection. I sanded MDF, plywood, and hardwood with lights placed throughout the shop trying to detect specks of dust in the air. The air stayed clean with this sander and dust extractor.



▲ The speed controls on the *CEROS* are located just behind the paddle switch.

### FESTOOL

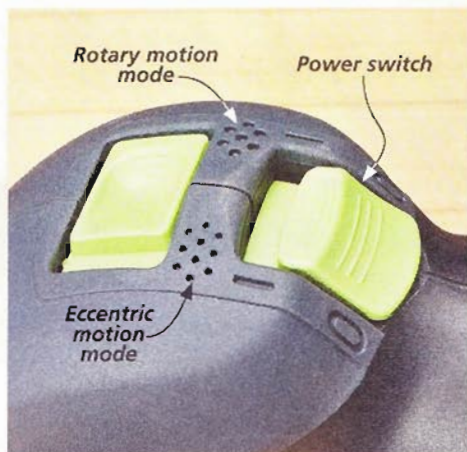
The *Festool Rotex* is a very different sander. After spending several hours using the sander, one word sums up the experience: Power. The *Rotex* has selectable motion mode for the final pass. In this mode, the sander was easy to control and performed beautifully. In the end, the *Rotex* proved it could replace my belt sander, but could do fine finish work, too.

I came away a big believer in both of these Sanders. The *Mirka* gets the nod for performance and comfort, but the *Festool Rotex* is unbeatable for the tougher jobs. Though both are commercial-grade tools, if you do a lot of sanding, either would be a great addition to your shop. **W**

with a realistic application for that much power. I found the perfect test to be my stained, gouged, and scratched benchtop.

I was able to completely strip and smooth my maple benchtop in no time. Even when I pushed down on the sander to apply force on the benchtop, the motor never slowed down. I finished up with 150-grit after switching to eccentric motion mode for the final pass. In this mode, the sander was easy to control and performed beautifully. In the end, the *Rotex* proved it could replace my belt sander, but could do fine finish work, too.

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▲ The mode switch is located just above the locking power switch on the top of the *Festool Rotex*.



▲ Rotary motion mode moves the disc in a large, circular orbit. This mode is perfect for aggressive stock removal and rough work.



▲ When switched to eccentric motion mode, the pad moves in very small, tight circles. This scratch pattern is better for finish work.



## accurate cuts with a **Circular Saw**

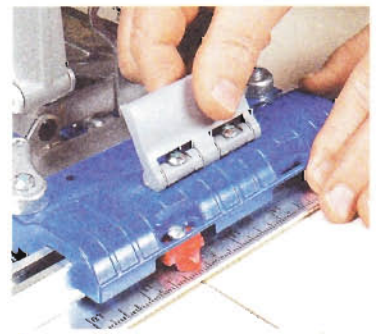
Turn your circular saw into a precision woodworking tool with one of these three easy-to-use accessories.

Most of us have a circular saw tucked away somewhere in the shop. But the saw usually only makes an appearance when there's a stack of 2x4s to be cut. Still, over the years, I have discovered some valuable woodworking uses for this tool. For example, when I need to cut down a sheet of plywood and there's nobody around to help me, it's invaluable.

**MORE PRECISE.** In recent years, manufacturers have created a few accessories

that transform the rough-cutting circular saw into a more precise and accurate cutting tool. The idea is that instead of guiding the tool by hand, you actually use the saw equipped with one of these accessories to cut project parts to final size. I decided to try them out with my saw to see how well they worked.

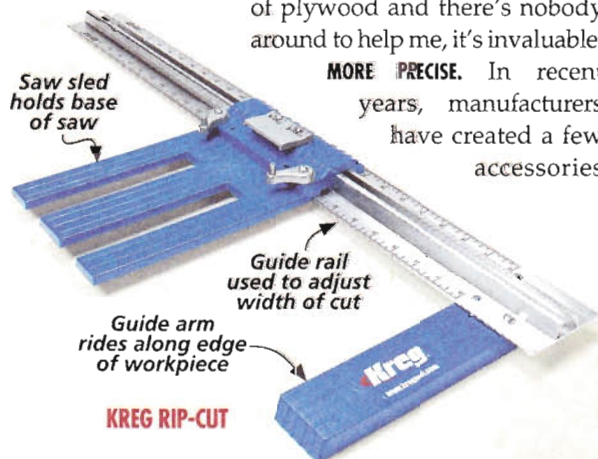
**KREG RIP-CUT.** The first accessory I looked at — and the most recent to hit the market — is the *Rip-Cut* from Kreg. As you can see in the photos above and at left, it's essentially a super-sized edge guide for a circular saw. It works by riding along the edge of a sheet of plywood or other material to guide the saw in a straight line. But this guide has a number of advantages over the typical circular saw edge guide that has



▲ Adjust the red pointer to the cut line, and lock the saw in place using the handle.

made it a go-to tool in my shop for cutting sheet goods.

First of all, the *Kreg Rip-Cut* has big-time capacity. It can cut a piece of plywood or MDF as wide as 24" with ease. This pretty well covers most of my case sides or other project parts that I make from plywood.



In addition, the *Rip-Cut* is very accurate. Once you clamp it to your saw, you just adjust the bright red "pointer" at the front to match your cut line (see the photo on the opposite page). After that, you can make repetitive cuts quickly and with precision. The guide is made with heavy-duty aluminum components, and the sled slides smoothly on the guide rail.

Overall, I was impressed with how well the *Rip-Cut* worked. It was easy to adjust between cuts and rode cleanly along the edge of both plywood and MDF.

**BORA TRACK & SAW GUIDE.** An old standby for guiding a circular saw in a straight line while ripping or crosscutting sheet goods is a clamp-on straightedge. This works pretty well all on its own for guiding a circular saw in a straight line. A company named *Bora* makes a number of high-quality clamp-on straightedges in lengths ranging from 24" to 100" (see Sources, page 51).

*Bora* has taken the idea of these straightedges one step further with its *Wide Track Saw Guide*. This plate simply clamps to the base of your circular saw as shown above. The guide is helpful for preventing

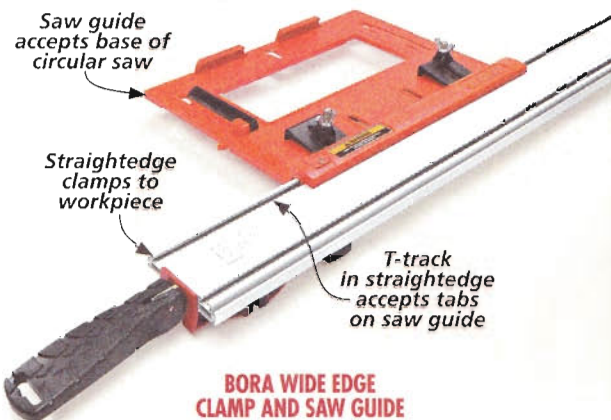


▲ The *Wide Track Saw Guide* from *Bora* attaches to the base of your circular saw. The guide rides along a T-track in the straightedge to produce straight, accurate cuts.

the saw from drifting away from the straightedge as you cut.

Like the *Rip-Cut*, the *Bora Wide Track Saw Guide* has a pointer that lets you align the blade of your saw with the cut line. But overall, I have to admit that I wasn't quite as impressed with this accessory. Don't get me wrong, it worked fine once it was in place on a sheet of plywood or MDF. But I had trouble getting the guide to fit well on the base of my saw. Frankly, I prefer using the straightedge alone for making circular saw cuts.

**A BETTER-CUTTING SAW.** Either one of these accessories, as well as the one shown in the box below, will help you get more accurate cuts with your circular saw. As a final



note, if you do plan to use these to cut plywood parts to final size, I'd recommend outfitting your circular saw with a 60-tooth finishing blade to achieve the smoothest cut possible. **W**

## Worth a Look: Bench Dog Pro-Cut



▲ Once the *Pro-Cut* is trimmed to size, all you do is line it up with the cut line on the board and hold it firmly as you begin cutting.

When crosscutting narrower boards with your circular saw, the *Pro-Cut* from *Bench Dog* helps make these cuts quicker and more accurate. It has a fence across the bottom that butts against the edge of the board, and a fence on top that guides the base of the saw.

What's different, however, is that the first time you use the *Pro-Cut*, you actually trim the plastic base of the guide to match your circular saw. After that, the edge of the *Pro-Cut* can be lined up with your layout line for quick, accurate cuts (photo, left). This also helps prevent tearout on the top face of the board when cutting.

▼ The right edge of the *Pro-Cut* is meant to be trimmed to match your circular saw.





craftsman-style

# Shop-Made Knobs

With just a little time at the router table and table saw, you can create spot-on knobs and pulls for your Craftsman-style projects.

When you think about the philosophy behind the Craftsman furniture style, what comes to mind? For me, it revolves around a hands-on approach to woodworking — simple, solid designs built while always keeping old-fashioned craftsmanship in mind.

So what could demonstrate this ideal better than style-perfect, shop-made knobs to complement all your Craftsman-style projects?

**A CLASSIC.** The pyramid-style knobs I'll show you how to make are a Craftsman classic (left margin photo). They're attractive

and versatile enough to be used on either cabinet doors or drawers. And despite all the detail, they're not hard to make.

The photo above gives away the secret. The trick is to make a pair of knobs on the end of a long, square blank. This allows you to make the cuts at the router table and table saw safely. Then you simply cut the knobs free.

**THE BLANK.** To get started, you'll need a square blank (or blanks). The key here is the orientation of the grain direction in the blank. In order for the top of the knob to show long grain, the blank has to be cut "crossgrain" from a wide piece of stock.

I started by planing a 6"-wide by 12"-long piece of stock down to 1¼" thick. Then I cut the piece in two and squared all four ends. This will provide enough stock to make multiple blanks and knobs.

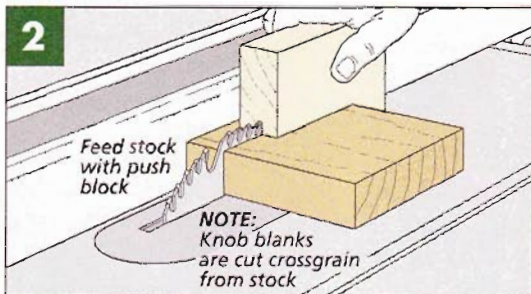
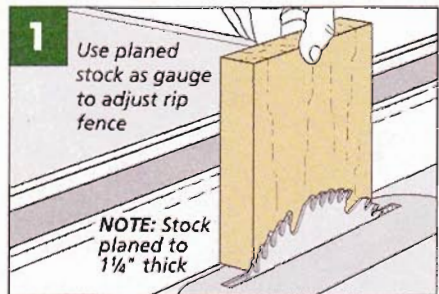
Figures 1 and 2 show how I cut the knob blanks to working size at the table saw. The goal is a blank that's perfectly square or very close to it. An easy way to achieve this is to use the thickness of the stock as a gauge when adjusting the rip fence, as shown.

Once the fence is set, I use a push block to crosscut a knob blank to final size. You can cut multiple blanks, depending on the number of knobs you need.

**ROUTER TABLE.** Now, you're ready to start shaping the knobs on the ends of the blanks. The initial work is done at the router table with a couple of common bits. You'll start by forming the hollowed waist section with a ½"-dia. core box bit.

**A GUIDE.** In order to make the cuts at the router table easily and

▼ This pyramid knob will look right at home on any Craftsman-style project.



accurately, you'll need a reliable way to guide the blank across the bit. My solution to this challenge was a 10" square piece of plywood with a short hardwood fence glued to one edge. The guide rides along the router table fence holding the blank square.

**THE WAIST.** The hollowed waist of the knob is formed with multiple passes (Figure 3). The router table fence serves to position the cuts. For the smoothest result, start with a cut across the end grain of the blank and then rotate it clockwise for the subsequent cuts.

Start with the bit set low and make a series of cuts on both ends of the blank or blanks. Raise the bit slightly and repeat until the waist measures  $\frac{5}{8}$ " across.

**THE BASE.** To give the knobs a more pleasing appearance, the base is trimmed to 1" square. The technique is identical to that used to create the waist of the knob. But here, you'll use a straight bit in place of the core box bit.

After installing a  $\frac{1}{2}$ " straight bit, you'll need to reposition the fence. You want to end up with a flat section about  $\frac{3}{8}$ " wide to the inside of the waist section.

Figure 4 shows the router table setup for this step. Even though the depth is shallow, I again made the cuts with multiple passes. This will produce the smoothest, chip-free faces and allow you to sneak up on the final dimension.

**BEVEL CUTS.** Your work at the router table is done. The next

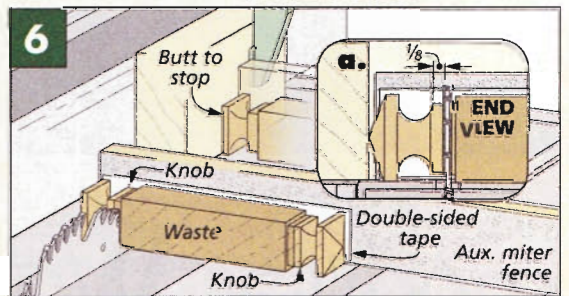
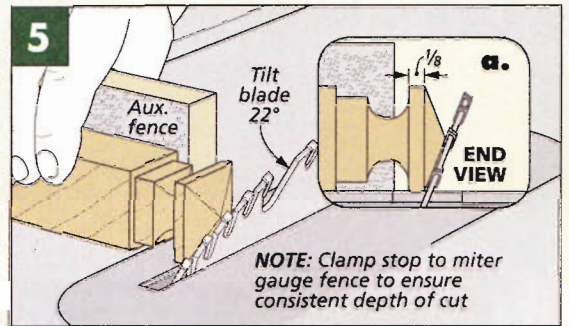
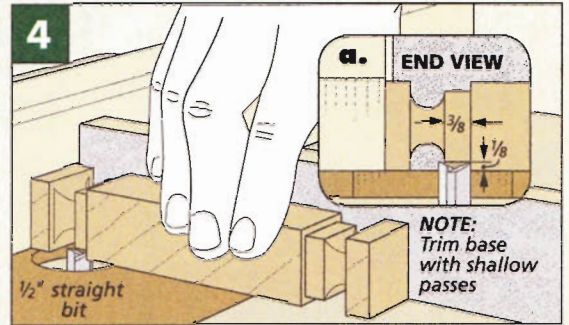
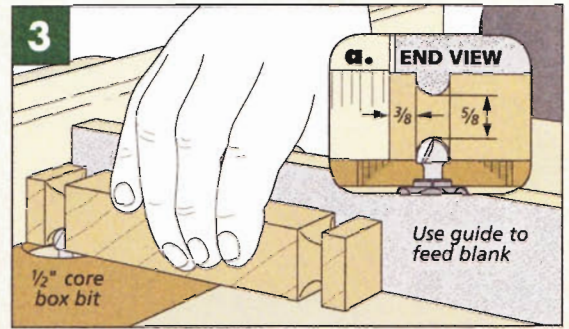
stop is the table saw where you'll make the bevel cuts that form the pyramid on top of the knob.

The goal here is to end up with four even facets. This is easy to accomplish by positioning a stop block on the miter gauge fence, as shown in the main photo on the opposite page and Figure 5.

Start by tilting the saw blade to  $22^\circ$ . Here again, you'll want to sneak up on the final profile. Position the blank along the auxiliary fence for a light cut across the end of a blank. Then clamp the stop block snug against the opposite end. Make four cuts around one end of the blank and take a look. Adjust the position of the stop block accordingly and give it another go. You want to end up with a  $\frac{1}{8}$ "-wide shoulder at the base of a crisp peak.

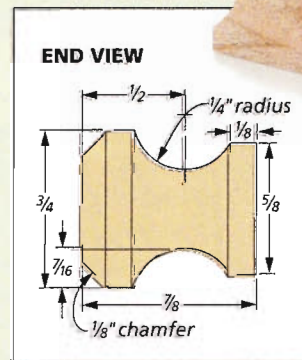
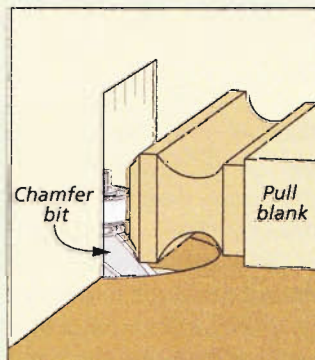
**FREE THE KNOBS.** Now all you have to do is cut the knobs free from the blank. Figure 6 shows a safe and accurate way to do this. A stop clamped to the rip fence in front of the blade gauges the knob's height while double-sided tape on the auxiliary miter gauge fence keeps the knob in place.

After a few minutes of sanding to remove any saw or milling marks and ease the sharp edges, your knobs are ready to go. And now I'll offer an option. If you think a pull with a similar design would better suit your needs, take a look at the box below. Either way you go, I'm sure Gustav Stickley would approve. **W**



## Craftsman-Style Pull

You can use a slightly modified version of the same technique to make pulls like the one shown at right. The pulls start as a  $2\frac{3}{4}$ " long crossgrain blank cut from  $\frac{3}{4}$ "-thick stock. The first two router table steps go the same. However, rather than bevel the top of the pull at the table saw, I routed a chamfer on the edges as shown in the drawing at right.



▲ This Craftsman-style pull is basically an elongated version of the pyramid knob.

# Weekend Project



## modular Wall Shelves

With its contrasting colors and unique design, this shelving unit is sure to attract attention. And you can make it in a day or two.

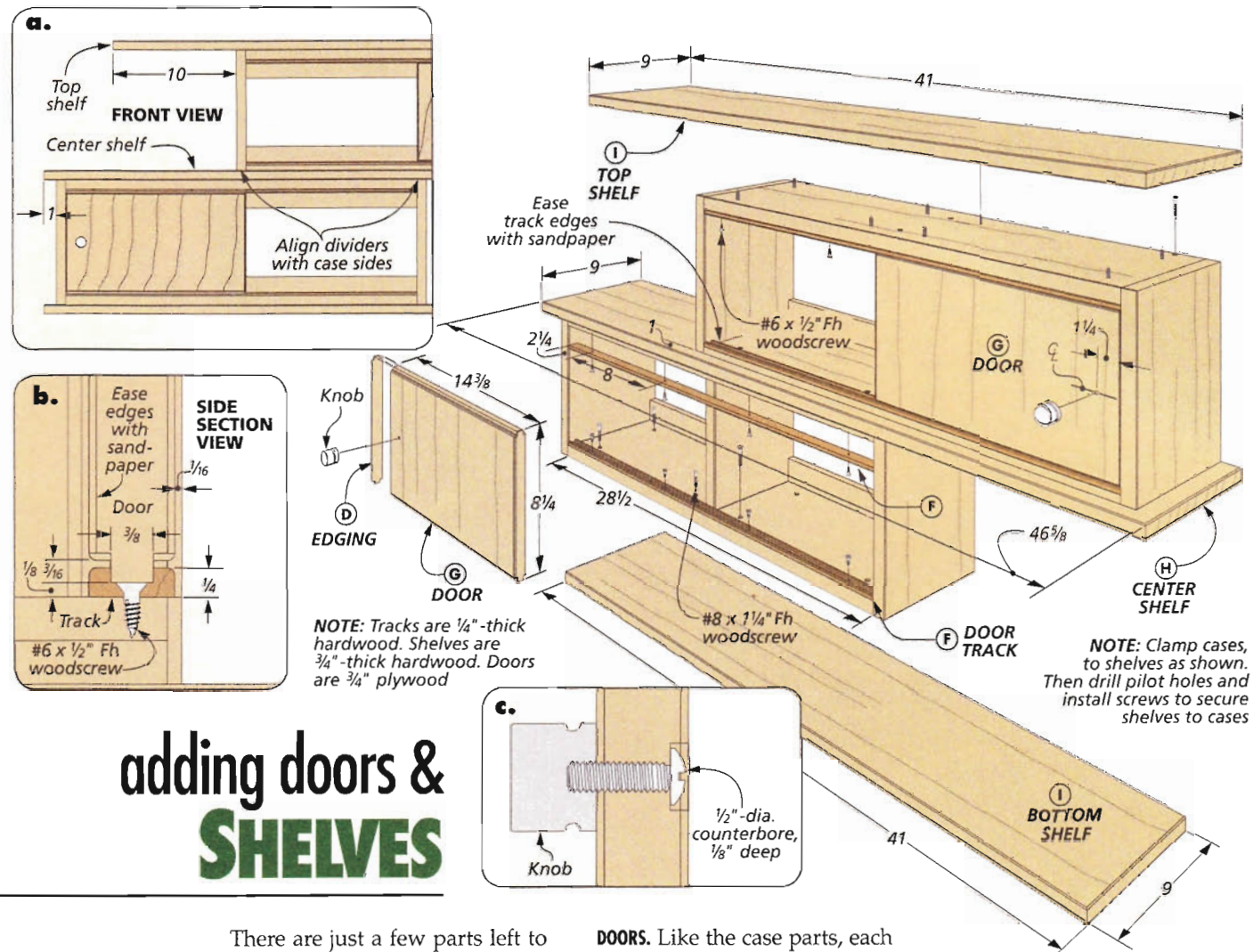
When it comes to creating simple, affordable display space in your home, it's tough to beat a wall shelf. But as far as woodworking challenges go, there usually isn't much to them. You just need a shelf, some trim pieces, and a method of mounting it to the wall.

**A UNIQUE SHELF.** This wall shelf is designed to be different, both in its appearance and in the fun you'll have in the shop making it. But the best part is, you can also customize the look for your home.

The heart of the project is a pair of plywood cases. Each has

hardwood edging and a single door that slides back and forth in a pair of hardwood tracks. But it's the dark-colored shelves that surround the cases that truly allow you to customize the design. By adjusting the length of the shelves — and changing where you





# adding doors & SHELVES

There are just a few parts left to add to the wall shelves. These include the doors, a pair of hardwood tracks to accept each door, and the hardwood shelves.

**TRACKS.** The first place to turn your attention is the tracks. Each is a strip of wood with a groove to accept a tongue on the door. The lower left and center drawings show how to make them.

**DOORS.** Like the case parts, each door is made from plywood. After cutting them to size, apply a strip of edging to each end.

On the top and bottom edges of the door are centered tongues meant to slide in the tracks. The tongues can be cut as shown in the lower right drawing.

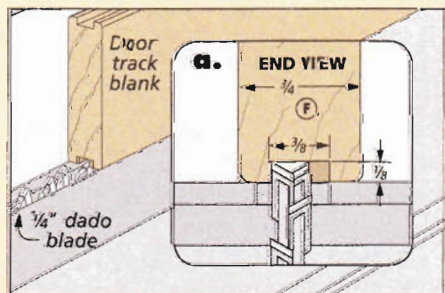
**FINISH.** Now is a good time to apply stain to the door tracks and

a couple of coats of finish to all the parts. Then add the knobs to the doors.

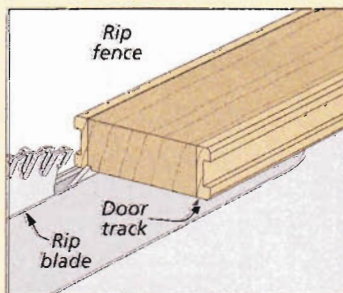
**ADD DOORS.** The tracks and doors have to be added to the cases at the same time, but I found a process that makes it simple. It's shown in the drawings on page 19.

**SHELVES.** All that's left now is to add the hardwood shelves.

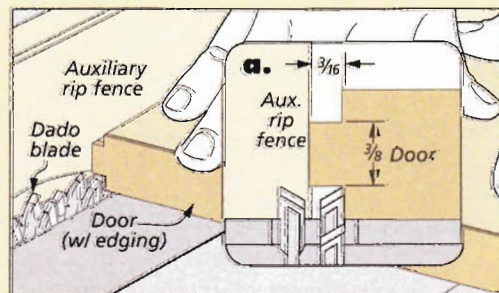
## How-To: Make Tracks & Doors



**Grooves.** Cut centered grooves on the edges of an extra-wide blank by flipping it end for end between each pass.



**Complete Tracks.** Now rip 1/4" strips free from the edges to make the door tracks.



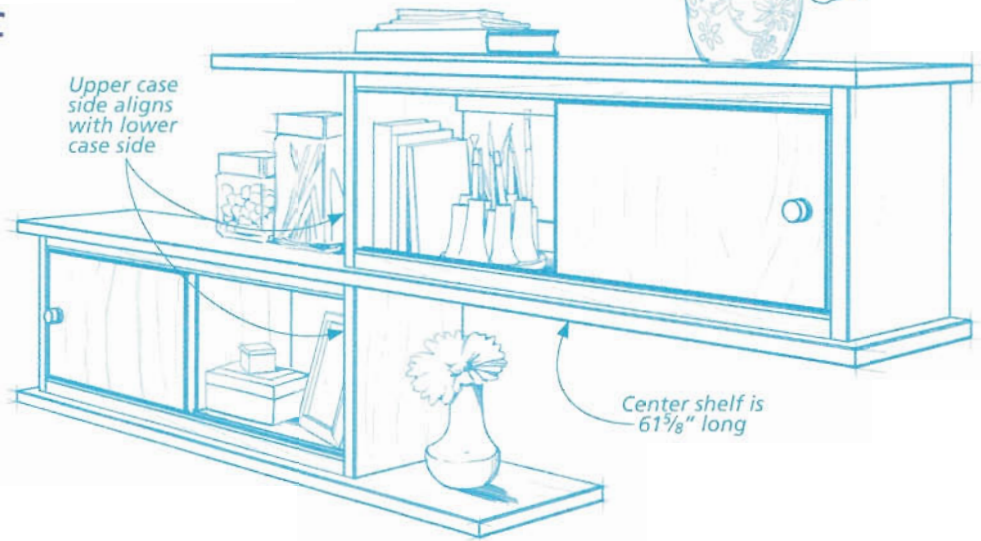
**Tongues.** Bury a dado blade in an auxiliary rip fence, and "sneak up" on the size of the tongue. Aim for a sliding fit in the track.

# DESIGNER'S NOTEBOOK



## Wide Shelf

Modifying this project is easy. The option at right, for example, has a longer center shelf, and the case ends align in the middle.



After cutting the shelves to size, sand them smooth and apply stain and finish.

Completing the shelving unit is a matter of getting everything positioned properly (detail 'a', opposite page). Clamps are helpful here to hold the shelves and cases in the right position.

Once it's all clamped together, drive screws through the case tops and bottoms to secure the shelves. To make quick work of this, I recommend investing in a right-angle drill attachment like the one shown below right.

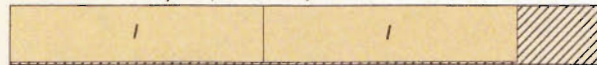
Your unique wall shelving unit is complete. Now it's just a matter of finding someone to help you attach it to the wall. Secure it with long screws driven through the cleats and into wall studs. Then comes the real fun — picking the best photos and other treasured items you want to display on your new wall shelves. **W**

### Materials, Supplies & Cutting Diagram

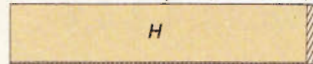
<b>A</b> Sides (4)	$\frac{3}{4}$ ply. - $7\frac{7}{8}$ x 10	<b>F</b> Door Tracks (4)	$\frac{3}{4}$ x $1\frac{1}{4}$ - $28\frac{1}{2}$
<b>B</b> Tops/Bottoms (4)	$\frac{3}{4}$ ply. - $7\frac{7}{8}$ x 29	<b>G</b> Doors (2)	$\frac{3}{4}$ ply. - $14\frac{3}{8}$ x $8\frac{1}{4}$
<b>C</b> Dividers (2)	$\frac{3}{4}$ ply. - $7$ x $8\frac{1}{2}$	<b>H</b> Center Shelf (1)	$\frac{3}{4}$ x $9$ - $46\frac{5}{8}$
<b>D</b> Edging (4)	$\frac{1}{8}$ x $\frac{3}{4}$ - 220 rgh.	<b>I</b> Top/Bottom Shelves (2)	$\frac{3}{4}$ x $9$ - 41
<b>E</b> Wall Cleats (4)	$\frac{1}{2}$ x $1\frac{1}{2}$ - $28\frac{1}{2}$		

- (8) #8 x 2" Fh Woodscrews
- (36) #8 x  $1\frac{1}{4}$ " Fh Woodscrews
- (8) #6 x  $1\frac{1}{2}$ " Fh Woodscrews
- (16) #6 x  $\frac{1}{2}$ " Fh Woodscrews
- (2)  $\frac{7}{8}$ " Aluminum Knobs w/ Screws
- (8) #8 x 3" Fh Woodscrews (for wall-mounting)

$\frac{3}{4}$ " x  $9\frac{1}{4}$ " - 96" Poplar (6.2 Bd. Ft.)



$\frac{3}{4}$ " x  $9\frac{1}{4}$ " - 48" Poplar (3.1 Bd. Ft.)

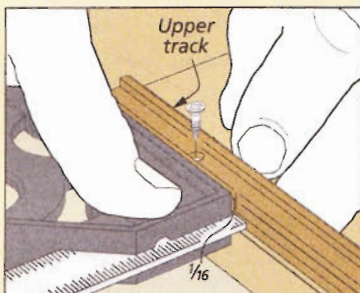


$\frac{3}{4}$ " x 5" - 96" Maple (3.3 Bd. Ft.)

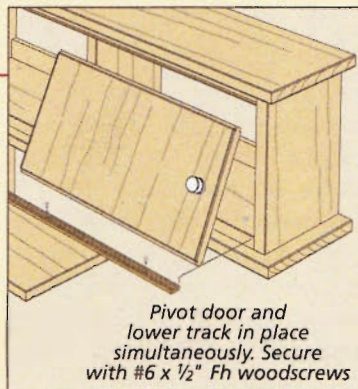


**ALSO NEEDED:** One 48" x 96" Sheet of  $\frac{3}{4}$ " Maple Plywood

## Adding Doors

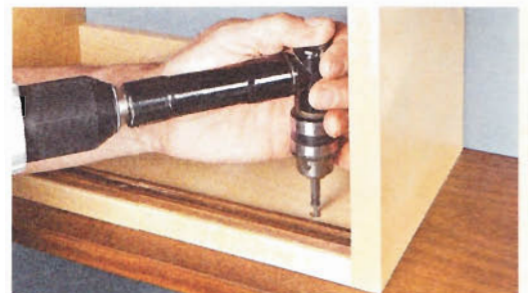


**Upper Track.** With the case upside down, use a combination square to position and install the upper track.



**Add Door.** Now pivot the door and lower track in place together. Screw the lower track in place.

## Shop Tip: Easy Install



▲ A right-angle attachment for a drill makes quick work of both drilling pilot holes and driving screws into the shelves.

# Designer Series Project



## all-in-one Craft Cabinet

Easy to set up and quick to put away, this mobile hobby center also includes a ton of storage and a large worksurface.

No matter what the hobby, you need a place to work and to store the tools and materials you use. For most of us, a dedicated room for a hobby is pretty hard to come by. Instead, sharing space in a dining room or family room is often the best you can hope for. So it helps to have a craft center like the one shown above, to provide a worksurface and hold supplies.

I designed this craft cabinet with sewing in mind, but it

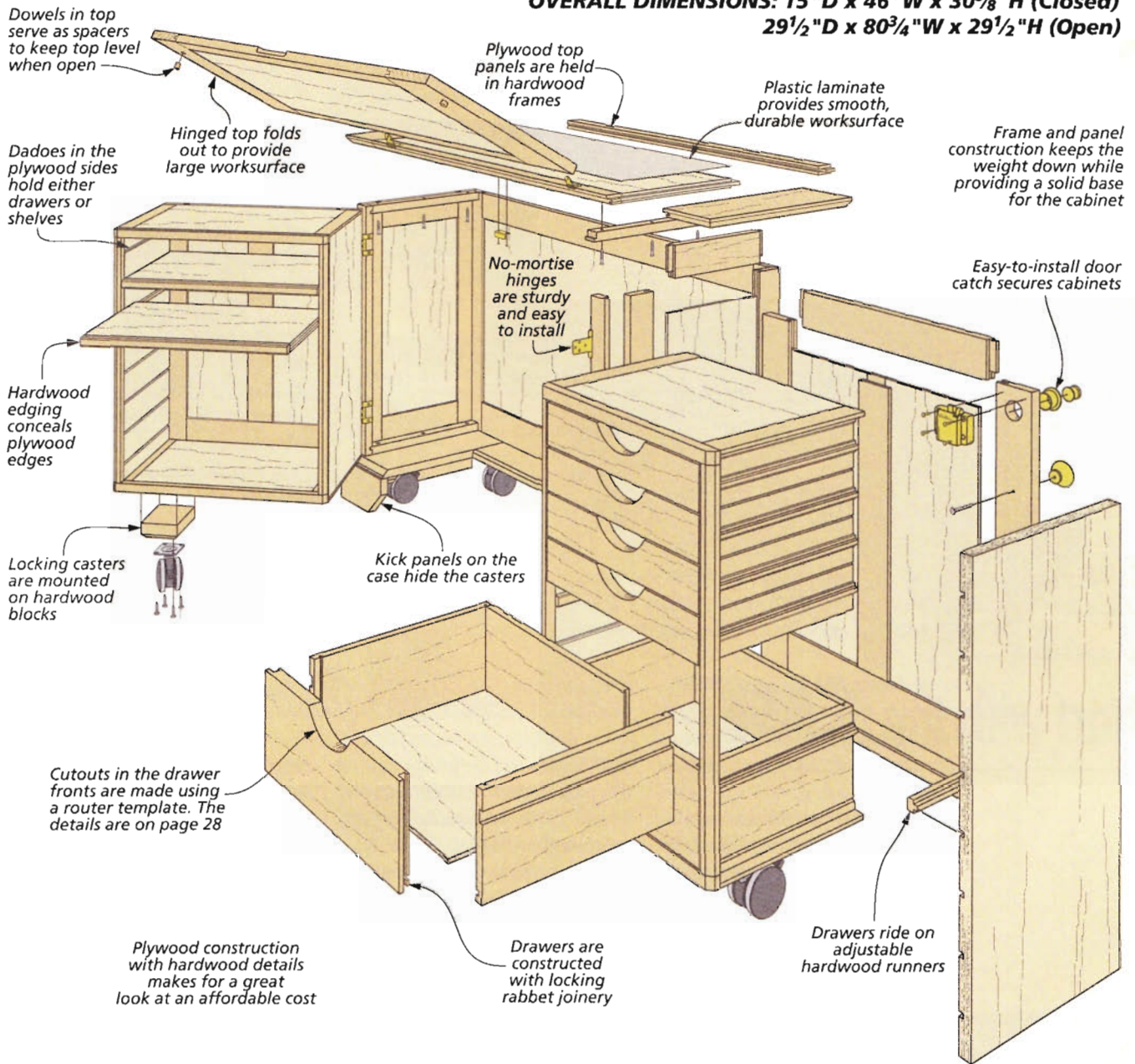
could easily be used or modified to accommodate just about any indoor hobby. (The back cover shows one more example.) The cabinet is full of drawers and adjustable shelves for storage of a variety of supplies. Best of all, it closes up into a fairly small unit that you can roll away into a corner when it's not in use.

As you can see in the main photo and the drawing on the opposite page, the cabinet has six

locking casters. The four main wheels are what you'd expect for a mobile cabinet. The other two allow you to open the doors and access the contents of the side storage cabinets. By locking the casters, you can keep the unit stationary while you work. And though it looks complicated, it's actually pretty straightforward to build. I've broken the big tasks into easy-to-follow segments, so you're sure to get a good result.

# CONSTRUCTION DETAILS

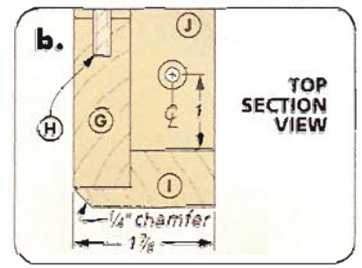
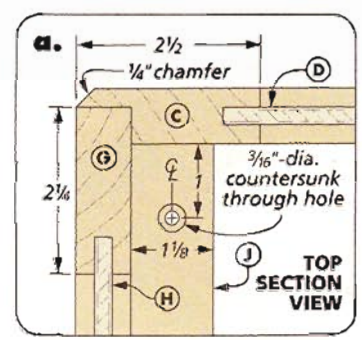
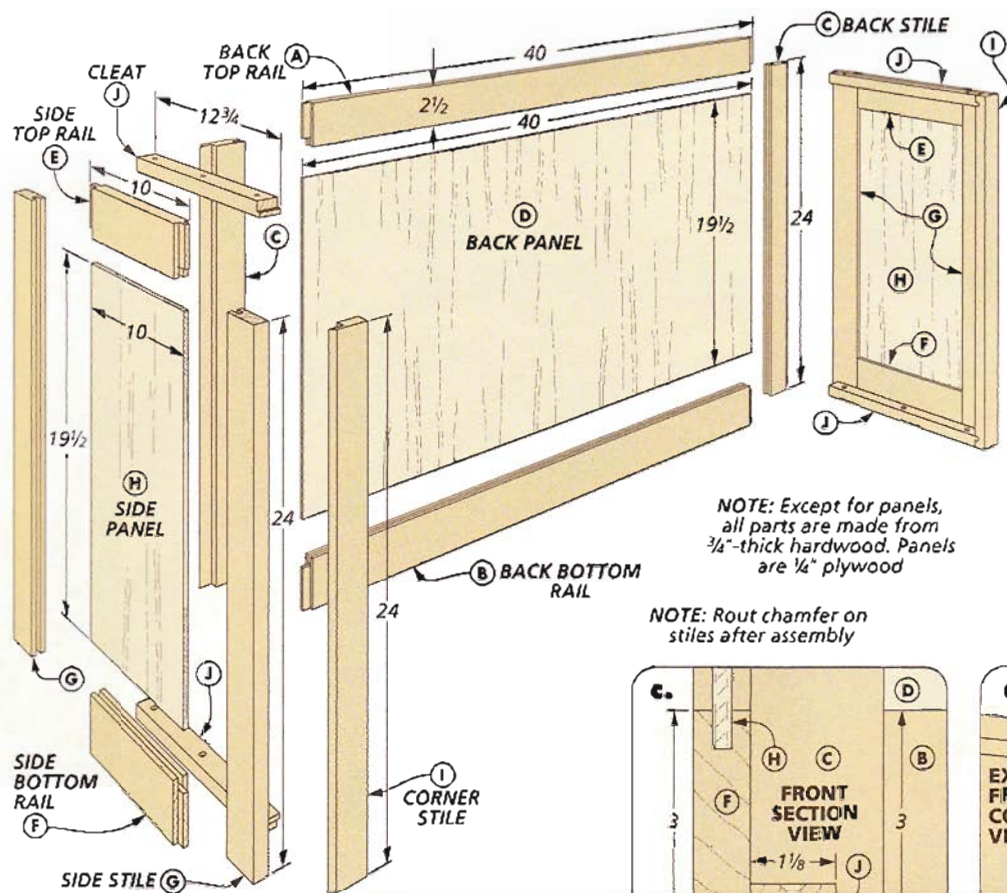
**OVERALL DIMENSIONS: 15"D x 46"W x 30<sup>5</sup>/<sub>8</sub>"H (Closed)  
29<sup>1</sup>/<sub>2</sub>"D x 80<sup>3</sup>/<sub>4</sub>"W x 29<sup>1</sup>/<sub>2</sub>"H (Open)**



▲ Adjustable shelves allow you to customize the space in the storage cabinets to suit your needs. Even large items can be stored neatly out of sight.

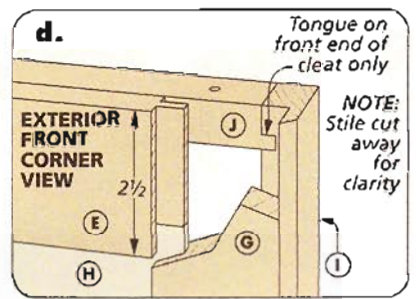
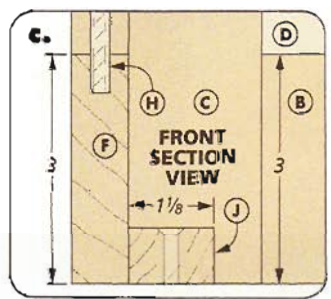


▲ When closed, the cabinet looks great and takes up very little floor space. This tiny footprint turns even the smallest room into a home for your hobby.



NOTE: Except for panels, all parts are made from 3/4"-thick hardwood. Panels are 1/4" plywood

NOTE: Rout chamfer on stiles after assembly



# start with the CASE

The basic case provides a foundation for the rest of the cabinet. Its frame and panel components are light but still very strong. The stub tenon and groove joinery makes it easy to build, as well. I started by making the back.

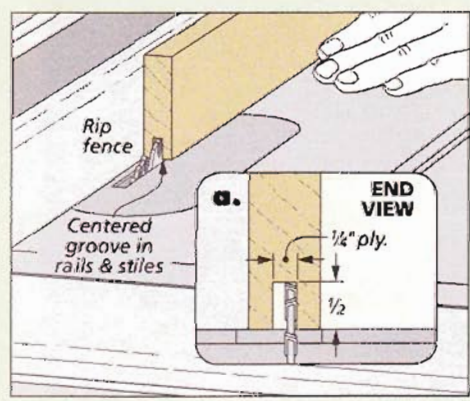
**BACK.** You can begin by cutting the rails and stiles to width and length. Note that the bottom rail is wider than the top.

Your next task is to cut the centered groove for the plywood panel in the rails and stiles (left drawing, below). Make the first cut slightly off-center. Then flip

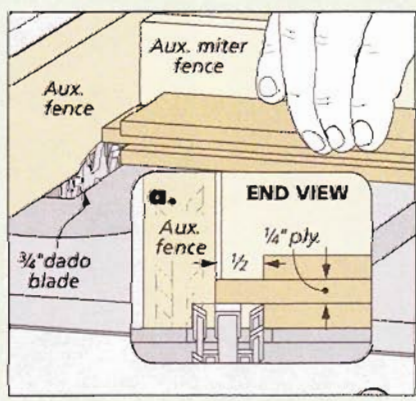
the workpiece end-for-end and repeat. Adjust the fence as necessary and repeat to sneak up on a good fit for the panels.

The center drawing shows how I used a dado blade and an auxiliary fence to cut the stub tenons on the rails. For the first

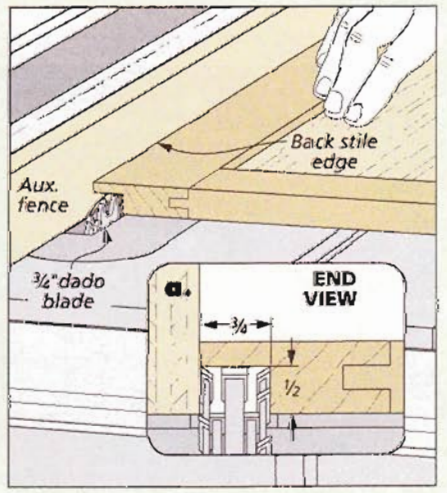
## How-To: Make the Joinery



**Centered Groove.** Cut the centered groove by making the first pass slightly off-center, then flip the workpiece for the second pass.



**Stub Tenon.** With the dado blade buried in an auxiliary rip fence, use the miter gauge to cut the tenons.



**Rabbet.** Now, just bump the fence out to expose the full width of the dado blade and cut the rabbet on the back stiles.

# Shop Tip: Assembling the Case

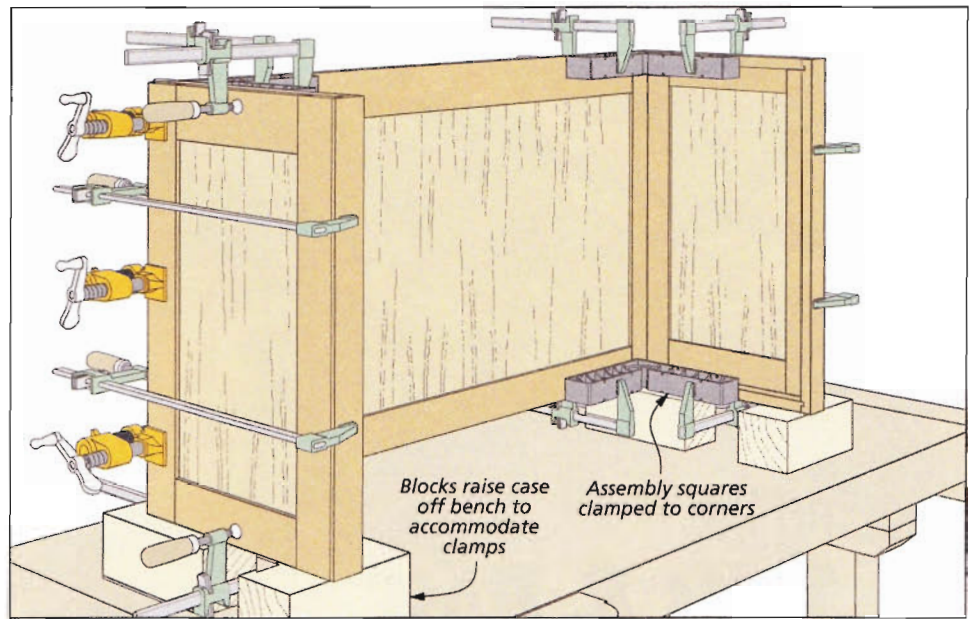
tenon, raise the dado blade slowly to find the perfect height for a snug-fitting tenon. Now you can cut the plywood panel to size and assemble the back with glue and a few clamps.

**RABBET THE BACK.** As you can see in detail 'a,' on the opposite page, the sides fit into a rabbet in the back stiles. I used a dado blade buried in an auxiliary rip fence to cut the wide rabbet (right drawing at the bottom of the facing page).

**SIDES.** Now you're ready to get started on the sides. Use the same methods as you did for the back to build these frame and panel pieces. Assemble them using the same technique, as well.

**CORNER STILES.** Next up are the corner stiles. Like the back stiles, these pieces are also rabbeted to hold the sides. With the exception of the groove for a panel, you can make them the same way you did the stiles earlier. They also have a narrow dado at each end to hold the cleat that you'll make next (left drawing, below). Just glue them in place on the sides.

**THE CLEATS.** As you can see in the main drawing, the cleats are glued to the inside of the sides and add support to the case. They'll also be used to connect the top and bottom later on. All you need to do is cut them to length and use the miter gauge to cut the rabbets on



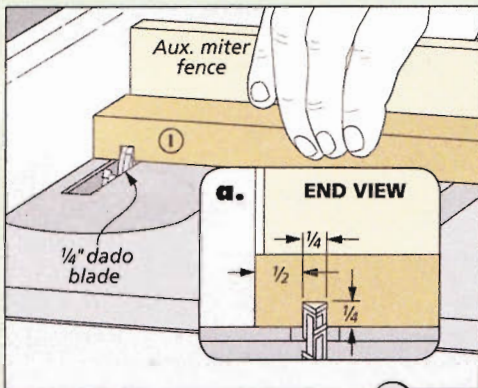
**Assembly Squares.** An otherwise tricky glueup is made easy by first attaching inexpensive, plastic assembly squares at the top and bottom of both corners. After that, conventional clamps spanning the joints are all you need for a successful assembly of the case.

the ends (middle drawing below). Then head to the drill press and drill the countersunk shank holes for the screws as shown in details 'a' and 'b.' Attach the cleats with glue and clamps.

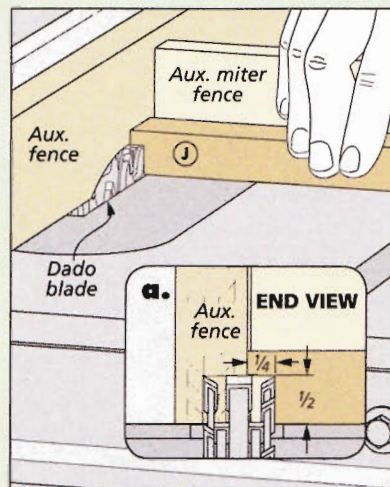
**ASSEMBLY.** The Shop Tip above shows how I used assembly squares clamped to the sides and back to keep everything aligned while adding the clamps. It's a sure way to keep things square.

**CHAMFER.** To give the look of a single, large post in the corners, I routed a small chamfer on the outside edges of the front and back. It's much easier to rout this accurately after assembly, as shown in the right drawing, below. The key to making the joint line nearly invisible is to make sure to set the bit height so the chamfer ends at the joint line, as shown in the detail box.

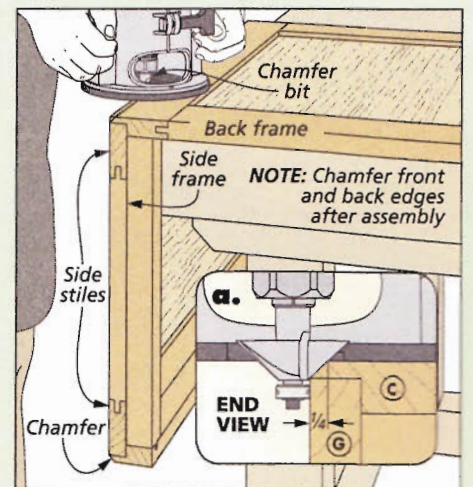
## Cleats & Chamfer



**Corner Stile.** Cut the dado on both ends of the front stiles using a dado blade and an auxiliary fence on the miter gauge.

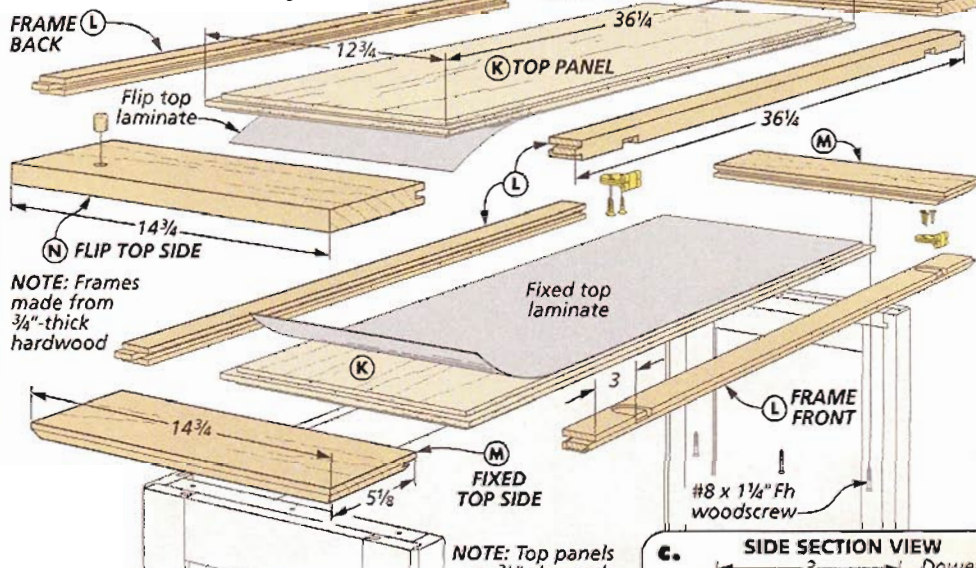


**Cleats.** To form the tongue on one end of the cleats, raise the dado blade and use the miter gauge.



**Routing the Chamfers.** After assembling the case, use a hand-held router to rout the chamfers on the corners.

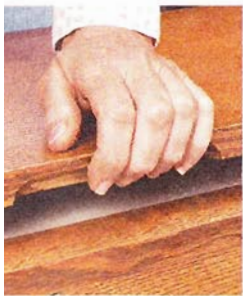
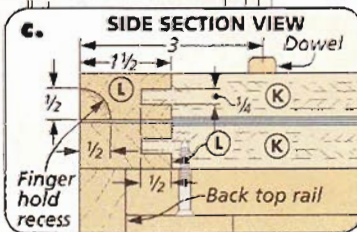
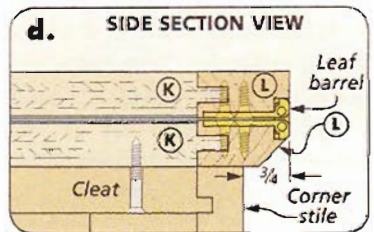
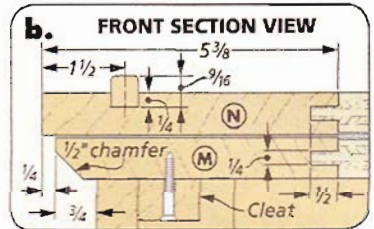
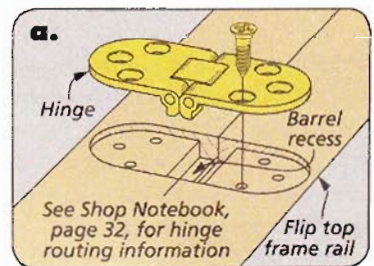
NOTE: Laminate applied to top panels before rabbeting



NOTE: Frames made from 3/4\"/>

NOTE: Top panels are 3/4\"/>

# adding the TOPS & BASE



With the case assembled, next up are the top and base. The folding top is simply another frame and panel assembly. And though the base looks like a conventional pedestal for a more typical cabinet, in fact it actually hides the wheels that make the cabinet mobile and allow the doors to open.

a large worksurface. The place to start is by attaching the laminate to the plywood panels.

I used contact cement to install the laminate. Use several narrow strips of wood to hold the laminate off the surface while you move it into position (left drawing, below). Then remove the middle ones and press the laminate down, squeezing out air bubbles as you continue to remove the wood strips. Trim the laminate with a flush-trim bit in a router (detail 'a').

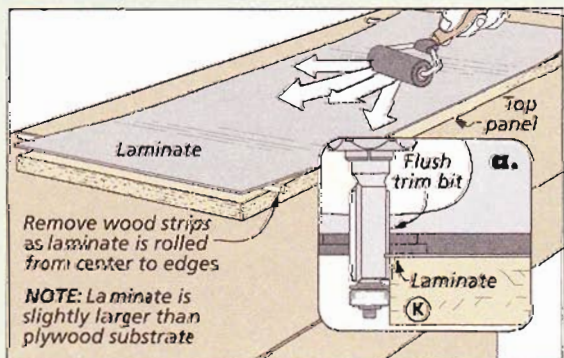
At this point, you can turn your attention to the frame pieces. Use the same techniques as before to make the frame. The front and back frame pieces are the same for both tops, so you can cut them first. Then cut the sides to final size. The center drawing below shows how to cut a centered tongue on the panels. Now you can assemble the panels.

**HINGES.** As you can see in detail 'a' above, the hinges I used to join the two tops have rounded leaves. I took a couple minutes to

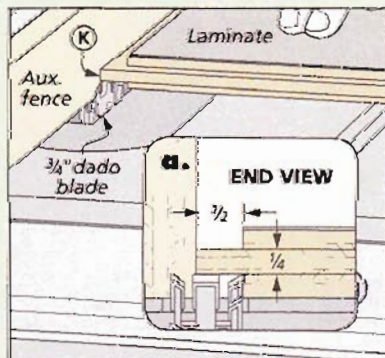
▲ See Shop Notebook on page 32 for an easy method of routing the finger pull.

**ADDING THE TOP.** The folding top is one of the highlights of the craft cabinet. When closed, the overall footprint remains small. But when you open the cabinet and fold out the top, it provides

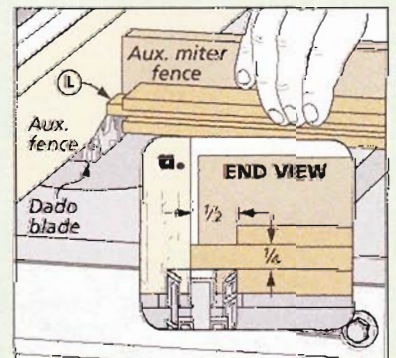
## How-To: Make the Top Panels



**Adding the Laminate.** After spreading contact cement on both surfaces, use wood spacers to keep the two separate until you have the placement correct.



**Tongue.** By rabbeting both sides of the edges, you form a centered tongue that fits into the frame pieces.



**Stub Tenon.** You can then use the same table saw setup to cut the stub tenons on the frame rails.

make a router template to make sure I got a perfect fit. Shop Notebook on page 32 has the details. You'll also need to rout a recess to make room for the barrel (detail 'd,' opposite page).

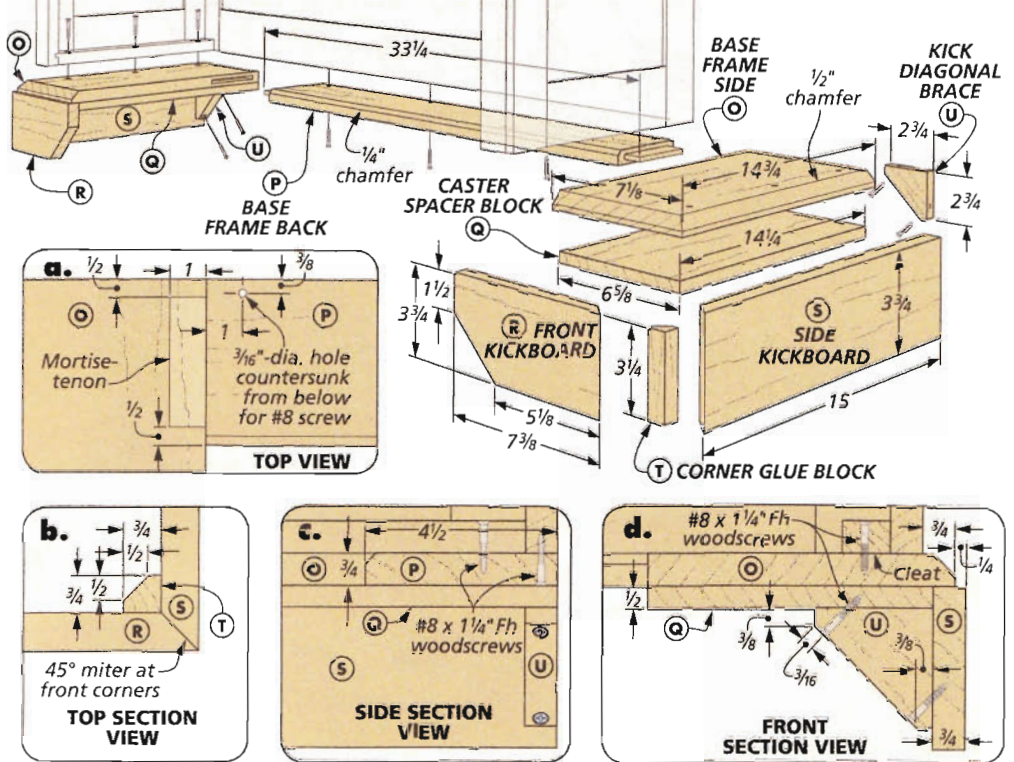
The folding top also needs a finger pull routed in the frame back. You can see how to do this in Shop Notebook on page 32.

Now rout a chamfer on the fixed top and install the dowel as shown in detail 'c' on the opposite page. Then set the top assembly aside while you work on the base.

**BASE.** The base assembly is shown in the main drawing, at right. I used mortise and tenon joints to connect these pieces to prevent racking. Start by cutting the pieces to final size, then cut the mortises on the sides as shown in the left drawing, below.

You can head back to the table saw to cut the tenons on the frame back. With a dado blade installed and an auxiliary fence on the miter gauge, cutting a snug-fitting tenon is a piece of cake (center drawing below). Then dry-fit the pieces.

Before assembling the frame, I routed the chamfers on the outside edges of the sides and the front edge of the back. Note the different depth of the chamfer on the back piece. Now drill the countersunk screw holes shown in detail 'a.' When you're done, glue the frame together.



**ADD THE SPACERS.** A pair of spacers under the frame puts the casters at the right height. Placement is very important. The spacers need to be inset to accommodate the kickboards. So I first drew a line to show the placement, then I glued them in place.

**KICKBOARDS.** Kickboards on the outside of the base partially hide the casters. I mitered them to fit around the base.

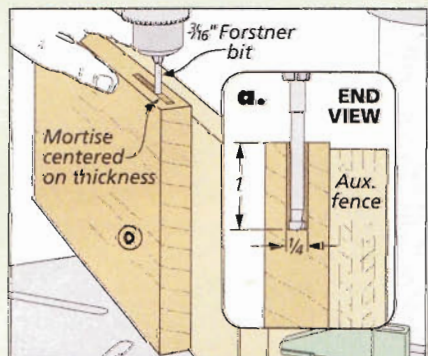
After cutting them to width, miter the front and side kickers to final length. Then you'll need to cut the decorative miters on the front boards using a miter gauge.

After that, install them both using glue, making sure to get a tight fit on the miter joints.

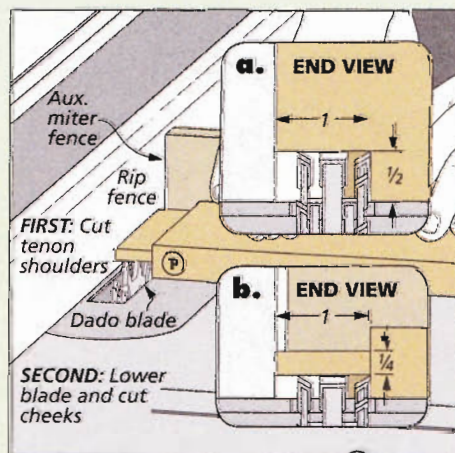
To reinforce the miter joint, I added glue blocks. Starting with an extra-wide blank, chamfer both edges at the router table (right drawing below). Then rip the blocks to width and glue them in place (detail 'b').

Finally, to add a little more support to the base, make a diagonal brace to attach to both side kickboards (detail 'd'). Then, attach the case to the base and the top to the case. I used screws to make these connections.

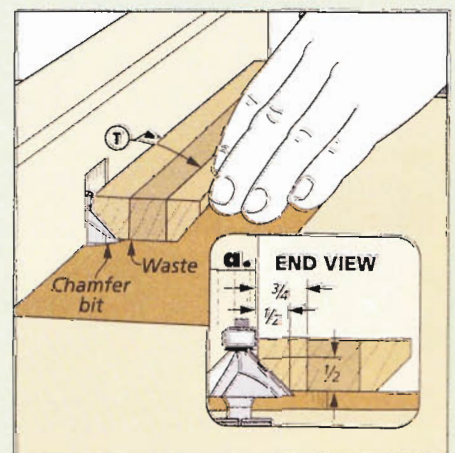
## The Base



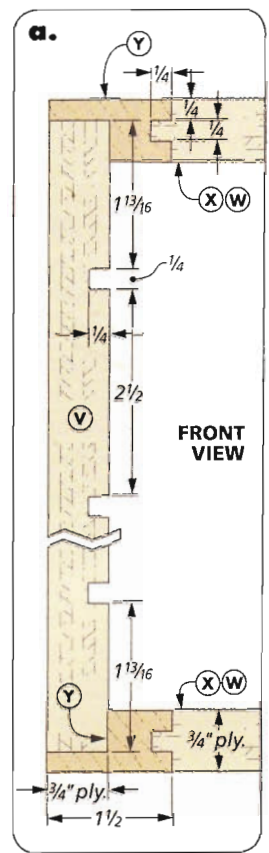
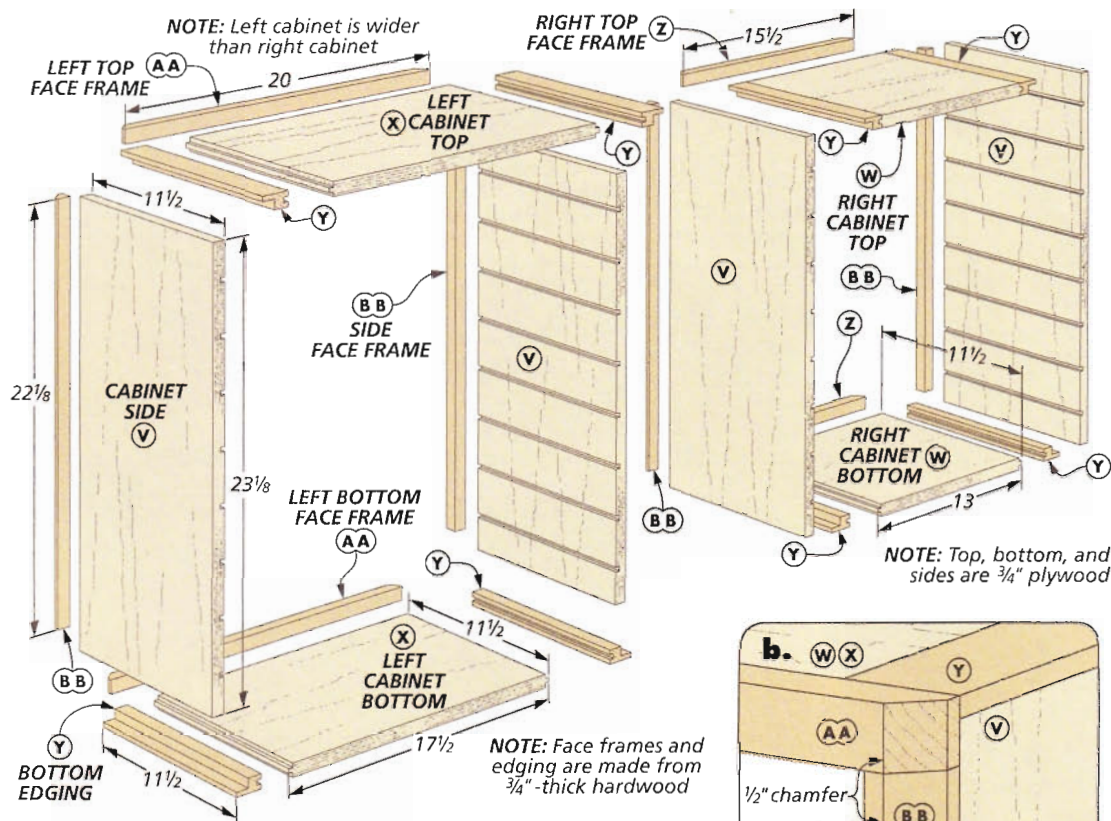
**Mortise.** For the mortises, start by drilling out most of the waste, then clean up the sides and square the corners with a chisel.



**Tenons.** Make a snug-fitting tenon by cutting the shoulders first. Then cut the cheeks at the table saw with a dado blade.



**Glue Blocks.** Start with an extra-wide blank to make the glue blocks. Then chamfer both edges and rip the blocks free.



# building the CABINETS

To complement the large fold-out top and work space, the cabinet also provides lots of storage in the form of drawers and shelves. The two swing-out cabinets can be configured in any combination you need for your hobby or craft.

**START WITH THE SIDES.** In spite of the difference in the widths of the two cabinets, the four cabinet sides are identical. And since they require

the same table saw setups, I made them all at the same time. After cutting them to final size, I cut the dados for the drawers and shelves (left drawing, below). Detail 'a,' above shows the spacing for cutting the dados.

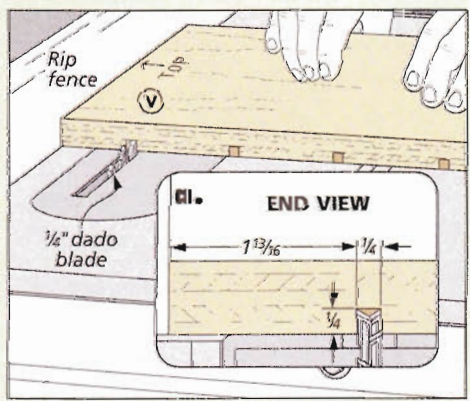
**TOPS & BOTTOMS.** The plywood tops and bottoms are different lengths, but you'll use the same techniques to make them all.

First, cut them to final size. Then form tongues on the ends using the same method as before.

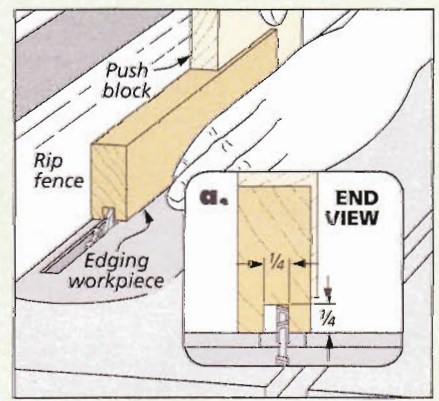
Each of the plywood panels needs a piece of edging on both ends. This edging also joins the sides (detail 'a'). The center and right drawings below show you how to make the edging.

After the glue dries, attach the top and bottom to the sides,

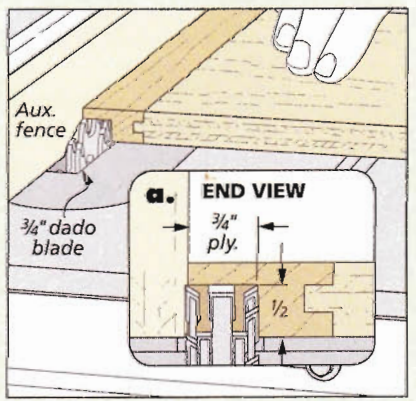
## How-To: Make the Cabinet Sides, Top & Bottom



**Sides.** Cutting the dados in the sides using the same saw setup guarantees uniform results. Move the fence after cutting all four.

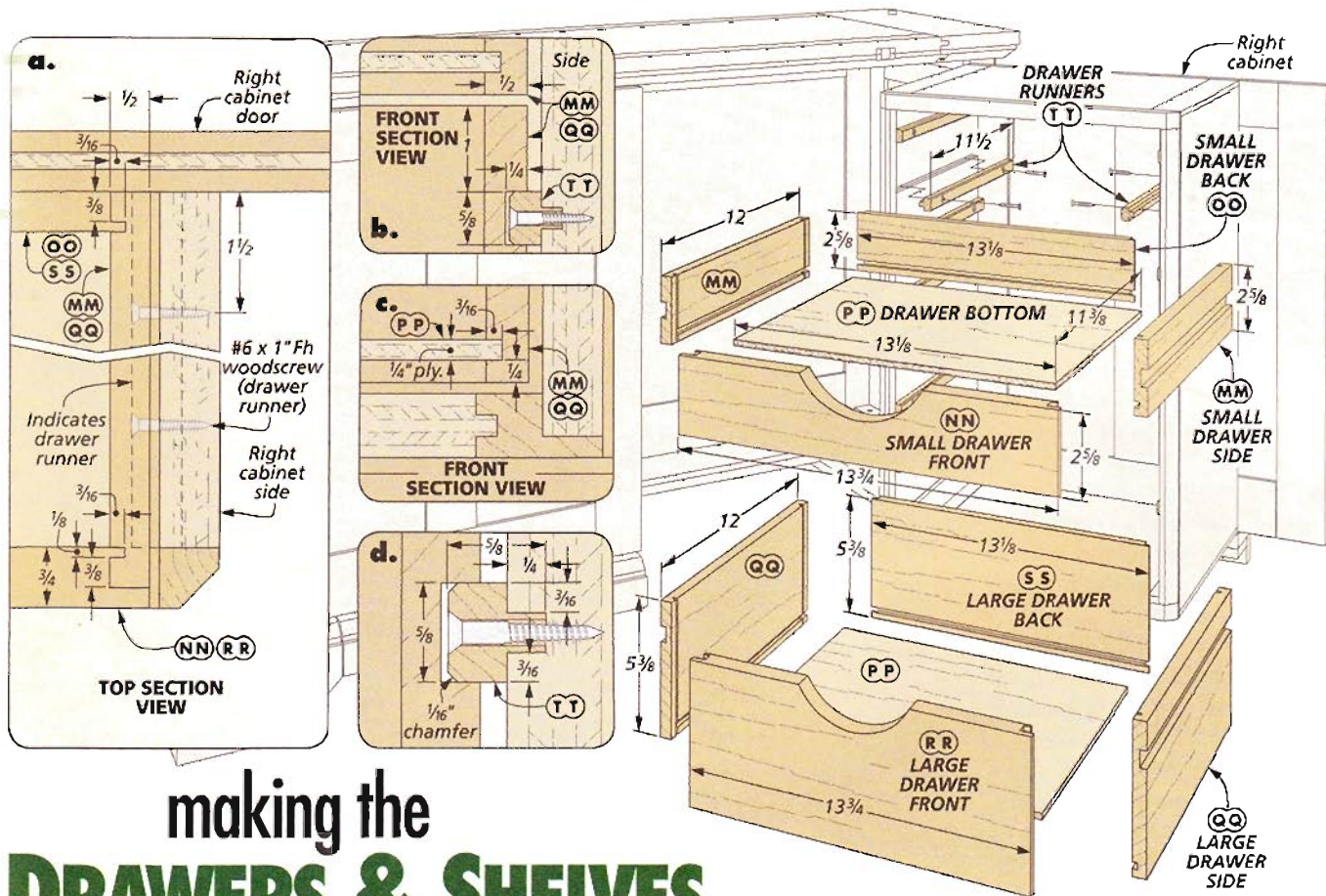


**Top & Bottom Edging.** The edging for the top and bottom begins with a centered groove to fit the plywood tongue.



**Rabbet.** Install the edging on the top and bottom, then head back to the table saw to cut the wide rabbet.





## making the DRAWERS & SHELVES

As I said earlier, it's the flexible storage that makes this cabinet such a versatile addition to your home. You can configure it with just about any combination of drawers and shelves to suit your needs. I chose to outfit the right side with a bank of drawers. On the left, I just added a couple of

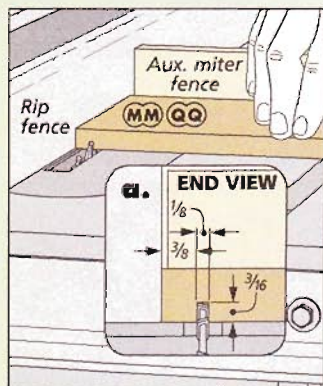
shelves and left a large space to hold a sewing machine. Choose the layout that's right for you.

**DRAWERS.** For drawer joinery, it's tough to beat the locking rabbet joint. It's strong and easy to build while still giving the drawer a nice look. I also made another design decision based mostly on

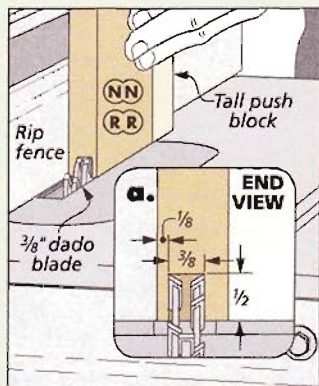
convenience — I used only two different sizes for the drawers.

When you're cutting the drawer parts, it's a good idea to make a couple extra pieces to use for saw setups. The locking rabbet joint often requires a little tweaking to get an accurate setup of the blade height and fence position.

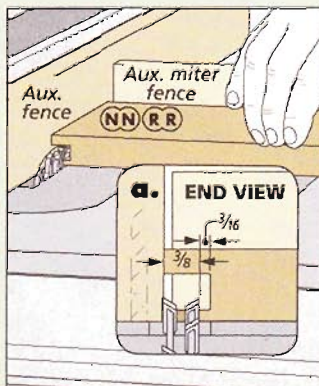
## How-To: Cut Drawer Joinery



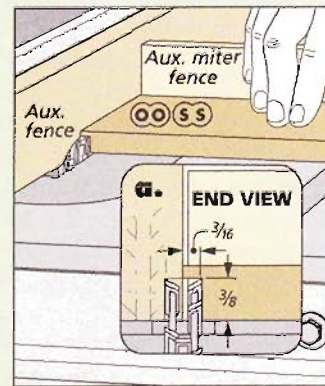
**Sides.** The first step in cutting locking-rabbet joints is to cut the kerf-wide dado in the sides.



**Front Groove.** Stand the front blanks on end to cut the deep groove in both ends.



**Tongue.** You don't need to change blades to cut the short tongue to length.



**Backs.** An auxiliary fence on the miter gauge supports the cut to form the tongue on the backs.

Start by ripping all the drawer parts to final width first. Then cut them all to final length. The boxes at the bottom of this and the opposite page walk you through the steps for cutting all the joinery.

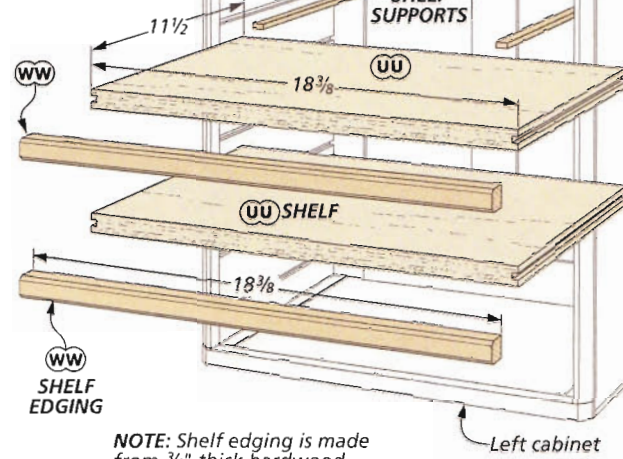
I used the miter gauge to cut the saw kerf dado in each end of the sides. For the fronts, stand the workpiece up with a push block and cut the groove with a dado blade. Then nibble off the thin tongue on the inside edge.

The drawer backs all need a rabbet to form the tongue. After that, cut the groove in all the pieces to hold the drawer bottom and cut the groove on the sides for the drawer runners.

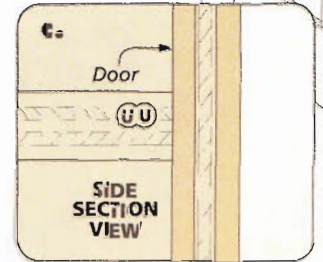
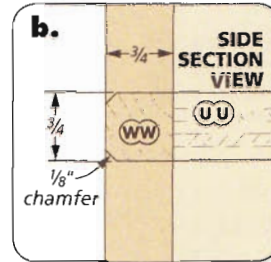
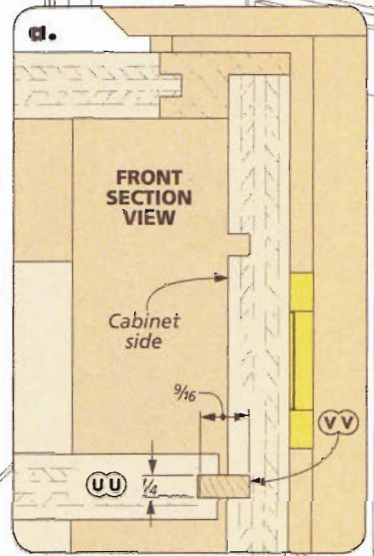
**DRAWER CUTOUTS.** I made a template for the cutout on the drawer fronts. After you cut out the arcs on the fronts at the band saw, you can also use the template and a flush-trim router bit to clean up the cuts and make sure each one is uniform (right drawings, below).

**RUNNERS.** Next up are the drawer runners. I designed the cabinet for easy reconfiguration, and the drawer runners are one of the key components to make that happen. They're just screwed into the grooves in the cabinet so you can remove them later. Detail 'd' on the opposite page shows the dimensions. First plane some stock to thickness ( $\frac{5}{8}$ " then cut the pieces to final size.

**NOTE:** Grooves in shelf ends cut before attaching edging



**NOTE:** Shelf edging is made from  $\frac{3}{4}$ "-thick hardwood. Shelves are  $\frac{3}{4}$ " plywood. Shelf supports are made from  $\frac{3}{4}$ "-thick hardwood planed down to  $\frac{9}{16}$ " thick



After that, I cut the rabbets on the runners that form the small tongue to fit into the groove in the sides. Complete the runners by heading to the router table and routing a chamfer on the edges.

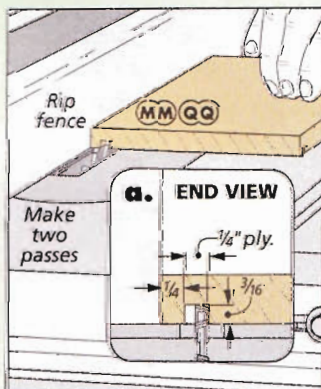
At this point, you can sand the drawer runners to 220-grit and wax the top and bottom edges to guarantee smooth sliding drawers. Finally install the runners in the slots in the cabinet with screws.

**THE SHELVES.** The plywood shelves are also pretty easy to make. You'll need to cut a groove in the edges of both ends to hold the hardwood shelf supports (detail

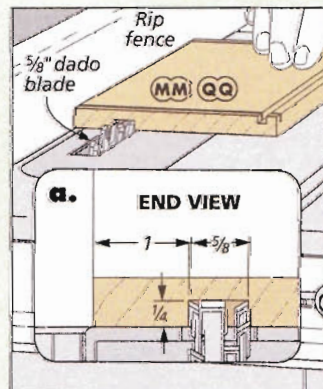
'a,' above). Shoot for a snug fit. The shelf supports aren't glued to either the shelf or the cabinet. This makes them easy to move around.

Next, I made hardwood edging for the front edges of the shelves. all you need to do is rout a chamfer on the top and bottom edges before gluing it to the plywood. Then the shelves just slide into position. You can reposition them as your needs change.

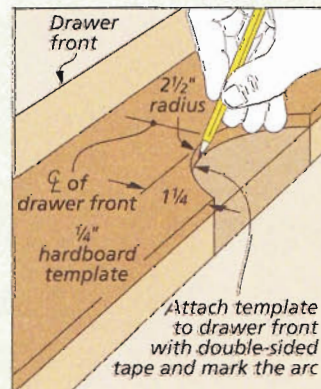
## Grooves & Front Cutout



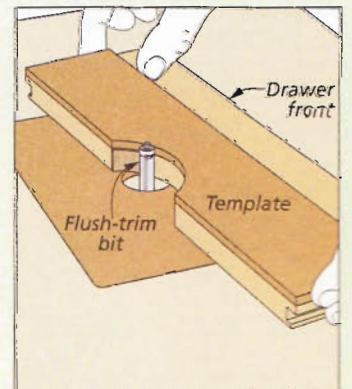
**Bottom Groove.** Cut a groove in each piece for the  $\frac{1}{4}$ " plywood drawer bottoms.



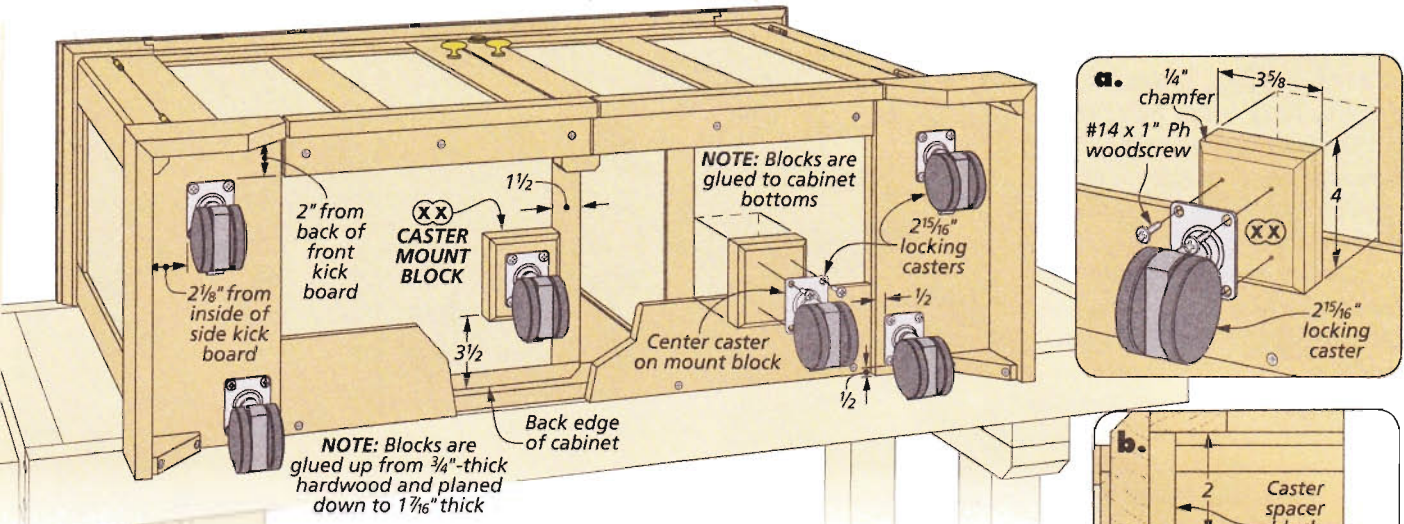
**Sides.** Use a dado blade to cut a groove on the outside faces for the drawer runners.



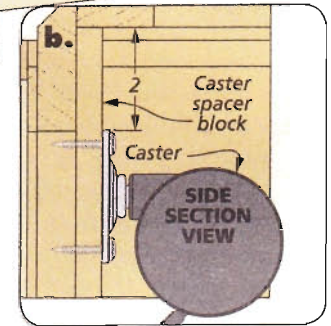
**Template.** It helps to make a hardboard template to mark the arc on the drawer fronts.



**Flush Trim.** After cutting the arc, you can use the template to flush trim the drawer fronts.



# final details CASTERS & CATCH



The cabinet is almost ready to go. All that remains is to complete a few details and add a finish. First up are the casters. Then you can install the catch on the door front.

**CASTERS.** I chose casters that are well-suited for just about any floor covering. They're also very easy to mount. The only thing to keep in mind is to install them all at the same height.

Since the cabinets already have plates for the casters, you can

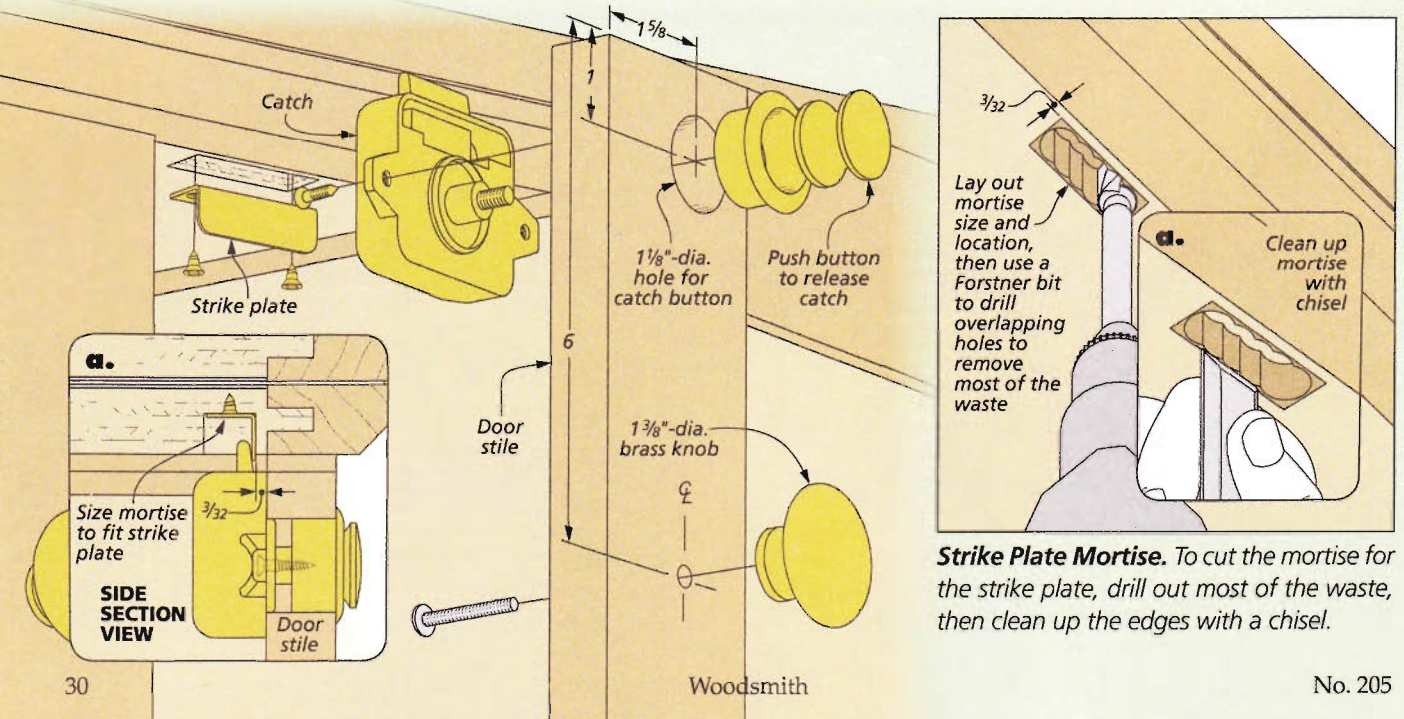
attach the casters to them using screws. For the inboard casters, however, you'll first need to make and install a pair of hardwood mounting blocks.

**MOUNTING BLOCKS.** I made the mounting blocks out of hardwood. It's important to be accurate with the height, so now is the time to plane the pieces to the right thickness. Then you can attach them to the case with glue and install the casters (detail 'a').

**CATCH.** The drawing and details below give you a good overview of how to install the catch. As you can see, the strike plate needs to be mortised into the underside of the top. The right drawing below shows how I cut the mortise. Then it's just a matter of installing the hardware and fine-tuning the fit.

After adding a finish and installing the knobs, you can move it into your workspace. There's no doubt it will be a welcome addition. **W**

## How-To: Install the Cabinet Catch

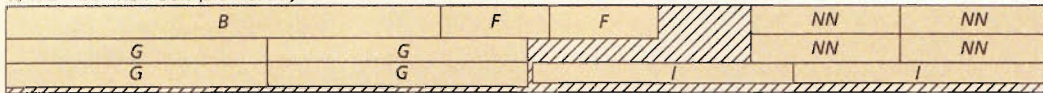


**Strike Plate Mortise.** To cut the mortise for the strike plate, drill out most of the waste, then clean up the edges with a chisel.

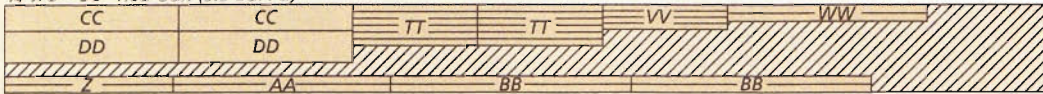
# Materials, Supplies & Cutting Diagram

<b>A</b> Back Top Rail (1)	$\frac{3}{4} \times 2\frac{1}{2} - 40$	<b>U</b> Kick Diagonal Brace (2)	$\frac{3}{4} \times 2\frac{3}{4} - 2\frac{3}{4}$	<b>OO</b> Sm. Drawer Backs (4)	$\frac{1}{2} \times 2\frac{5}{8} - 13\frac{1}{8}$
<b>B</b> Back Bottom Rail (1)	$\frac{3}{4} \times 3 - 40$	<b>V</b> Cabinet Sides (4)	$\frac{3}{4}$ ply. - $11\frac{1}{2} \times 23\frac{1}{8}$	<b>PP</b> Drawer Bottoms (6)	$\frac{1}{4}$ ply. - $11\frac{3}{8} - 13\frac{1}{8}$
<b>C</b> Back Stiles (2)	$\frac{3}{4} \times 2\frac{1}{2} - 24$	<b>W</b> R. Cab. Top/Bot. (2)	$\frac{3}{4}$ ply. - $11\frac{1}{2} \times 13$	<b>QQ</b> Lg. Drawer Sides (4)	$\frac{1}{2} \times 5\frac{3}{8} - 12$
<b>D</b> Back Panel (1)	$\frac{1}{4}$ ply. - $19\frac{1}{2} \times 40$	<b>X</b> L. Cab. Top/Bot. (2)	$\frac{3}{4}$ ply. - $11\frac{1}{2} \times 17\frac{1}{2}$	<b>RR</b> Lg. Drawer Fronts (2)	$\frac{3}{4} \times 5\frac{3}{8} - 13\frac{3}{4}$
<b>E</b> Side Top Rails (2)	$\frac{3}{4} \times 2\frac{1}{2} - 10$	<b>Y</b> Top/Bottom Edging (8)	$\frac{3}{4} \times 1\frac{1}{2} - 11\frac{1}{2}$	<b>SS</b> Lg. Drawer Backs (2)	$\frac{1}{2} \times 5\frac{3}{8} - 13\frac{1}{8}$
<b>F</b> Side Bottom Rails (2)	$\frac{3}{4} \times 3 - 10$	<b>Z</b> R. Top/Bot. Face Frame(2)	$\frac{3}{4} \times \frac{3}{4} - 15\frac{1}{2}$	<b>TT</b> Drawer Runners (12)	$\frac{5}{8} \times \frac{5}{8} - 11\frac{1}{2}$
<b>G</b> Side Stiles (4)	$\frac{3}{4} \times 2\frac{1}{4} - 24$	<b>AA</b> L. Top/Bot. Face Frame(2)	$\frac{3}{4} \times \frac{3}{4} - 20$	<b>UU</b> Shelves (2)	$\frac{3}{4}$ ply. - $11\frac{1}{2} \times 18\frac{3}{8}$
<b>H</b> Side Panels (2)	$\frac{1}{4}$ ply. - $19\frac{1}{2} \times 10$	<b>BB</b> Side Face Frame (4)	$\frac{3}{4} \times \frac{3}{4} - 22\frac{1}{8}$	<b>VV</b> Shelf Supports (4)	$\frac{1}{4} \times \frac{9}{16} - 11\frac{1}{2}$
<b>I</b> Corner Stiles (2)	$\frac{3}{4} \times 1\frac{7}{8} - 24$	<b>CC</b> Door Top Rails (2)	$\frac{3}{4} \times 2\frac{3}{8} - 16$	<b>WW</b> Shelf Edging (2)	$\frac{3}{4} \times \frac{3}{4} - 18\frac{3}{8}$
<b>J</b> Cleats (4)	$\frac{3}{4} \times 1\frac{1}{8} - 12\frac{3}{4}$	<b>DD</b> Door Bottom Rails (2)	$\frac{3}{4} \times 2\frac{7}{8} - 16$	<b>XX</b> Caster Mount Block (2)	$1\frac{7}{16} \times 3\frac{5}{8} - 4$
<b>K</b> Top Panels (2)	$\frac{3}{4}$ ply. - $12\frac{3}{4} - 36\frac{1}{4}$	<b>EE</b> Door Stiles (4)	$\frac{3}{4} \times 2\frac{1}{2} - 23\frac{5}{8}$	• (24) #6 x 1" Fh Woodscrews	
<b>L</b> Frame Front/Back (4)	$\frac{3}{4} \times 1\frac{1}{2} - 36\frac{1}{4}$	<b>FF</b> Door Center Stiles (2)	$\frac{3}{4} \times 2\frac{1}{2} - 19\frac{3}{8}$	• (20) #8 x 1 $\frac{1}{4}$ " Fh Woodscrews	
<b>M</b> Fixed Top Sides (2)	$\frac{3}{4} \times 5\frac{1}{8} - 14\frac{3}{4}$	<b>GG</b> Door Panels (4)	$\frac{1}{4}$ ply. - $7\frac{1}{4} \times 19\frac{3}{8}$	• (5) #8 x 2" Fh Woodscrews	
<b>N</b> Flip Top Sides (2)	$\frac{3}{4} \times 5\frac{3}{8} - 14\frac{3}{4}$	<b>HH</b> Door Toe Kick Top (2)	$\frac{3}{4} \times 2\frac{1}{2} - 15\frac{3}{8}$	• (24) #14 x 1" Ph Woodscrews	
<b>O</b> Base Frame Sides (2)	$\frac{3}{4} \times 7\frac{1}{8} - 14\frac{3}{4}$	<b>II</b> Door Toe Kick Backer (2)	$\frac{1}{2} \times 2 - 15\frac{3}{8}$	• (6) 2 $\frac{15}{16}$ " Locking Casters	
<b>P</b> Base Frame Back (1)	$\frac{3}{4} \times 4\frac{1}{2} - 33\frac{1}{4}$	<b>JJ</b> Door Toe Kick Front (2)	$\frac{3}{4} \times 1\frac{1}{2} - 15\frac{3}{8}$	• (1) Push-Button Catch	
<b>Q</b> Caster Spacer Blocks (2)	$\frac{1}{2} \times 6\frac{5}{8} - 14\frac{1}{4}$	<b>KK</b> Door Toe Kick Spacer (2)	$\frac{3}{16} \times 1\frac{1}{4} - 15\frac{3}{8}$	• (2 pr.) Wrap-around Hinges	
<b>R</b> Front Kickboards (2)	$\frac{3}{4} \times 3\frac{3}{4} - 7\frac{3}{8}$	<b>LL</b> Door Catch (1)	$\frac{3}{4} \times 1\frac{1}{4} - 2$	• (1 pr.) Leaf Hinges	
<b>S</b> Side Kickboards (2)	$\frac{3}{4} \times 3\frac{3}{4} - 15$	<b>MM</b> Sm. Drawer Sides (8)	$\frac{1}{2} \times 2\frac{5}{8} - 12$	• (2) 1 $\frac{3}{8}$ " - dia. Brass Knobs	
<b>T</b> Corner Glue Blocks (2)	$\frac{3}{4} \times \frac{3}{4} - 3\frac{1}{4}$	<b>NN</b> Sm. Drawer Fronts (4)	$\frac{3}{4} \times 2\frac{5}{8} - 13\frac{3}{4}$	• (2) $\frac{1}{2}$ " - dia. x $\frac{9}{16}$ " Dowel	

$\frac{3}{4}$ " x 8" - 96" Red Oak (5.3 Bd. Ft.)



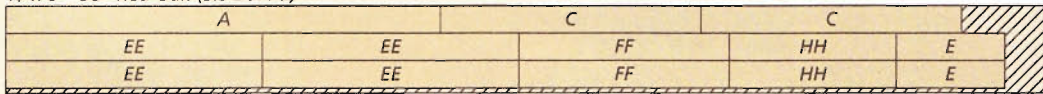
$\frac{3}{4}$ " x 8" - 96" Red Oak (5.3 Bd. Ft.)



$\frac{3}{4}$ " x 8" - 96" Red Oak (5.3 Bd. Ft.)



$\frac{3}{4}$ " x 8" - 96" Red Oak (5.3 Bd. Ft.)



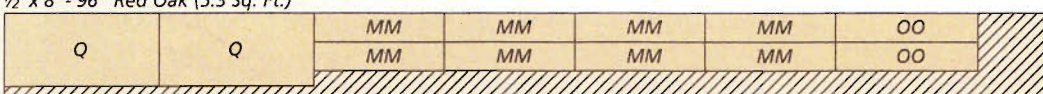
$\frac{3}{4}$ " x 8" - 96" Red Oak (5.3 Bd. Ft.)



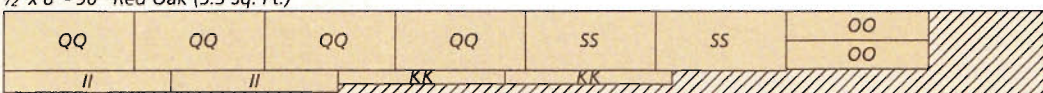
$\frac{3}{4}$ " x 8" - 96" Red Oak (5.3 Bd. Ft.)



$\frac{1}{2}$ " x 8" - 96" Red Oak (5.3 Sq. Ft.)



$\frac{1}{2}$ " x 8" - 96" Red Oak (5.3 Sq. Ft.)



**ALSO NEEDED:** One 48" x 96" sheet of  $\frac{3}{4}$ " Oak plywood  
One 48" x 96" sheet of  $\frac{1}{4}$ " Oak plywood

**NOTE:** Parts 'KK' planed to  $\frac{3}{16}$ " thick

## SHOP NOTEBOOK

### Hinge Mortises

A pair of special hinges allows the craft cabinet top to fold open. These hinges are mortised into both halves of the top. To create this mortise, all you need is a router and a shop-made template.

**TEMPLATE.** The template is simply a piece of 1/2" plywood with an opening sized to match the hinge. You can use one of the hinges to trace the outline onto the blank.

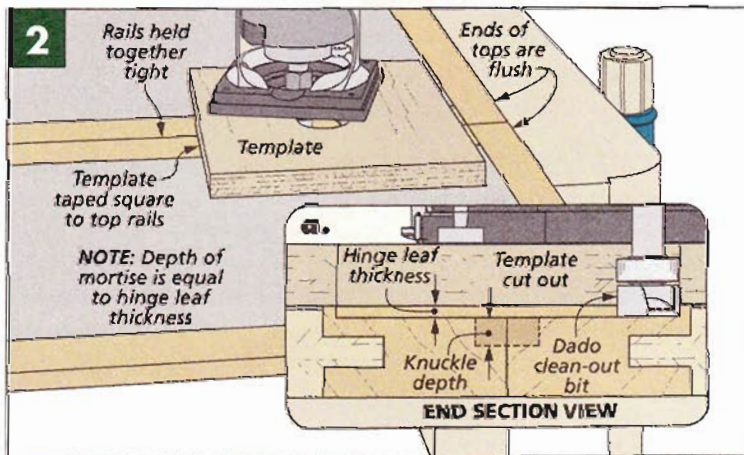
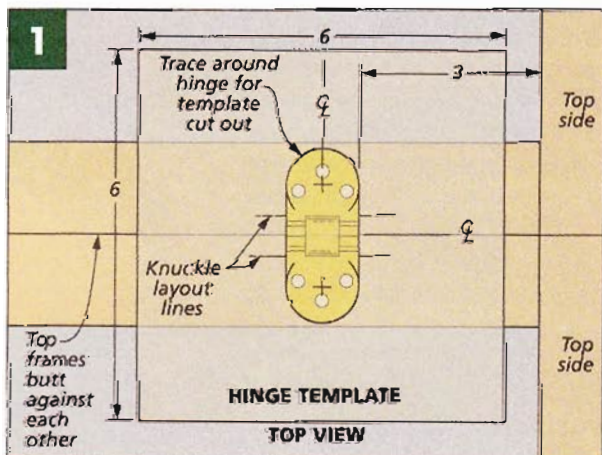


I used a Forstner bit to drill a hole at each end and removed the waste with a jig saw. Then sand the edges smooth with a sanding drum or by hand sanding.

**ROUTING.** To use the template, clamp the two halves of the top together. Then attach the template to the pieces with double-sided tape. As shown in Figure 2a, a dado clean-out bit makes

quick work of routing the shallow recess for the hinge leaves.

To create the deeper mortise for the hinge knuckle, first mark the edges of the mortise. Then, adjust the bit for a deeper cut and rough out the bulk of the waste, stopping just shy of the layout lines. Finally, you can square up the edges of the mortise with a chisel.

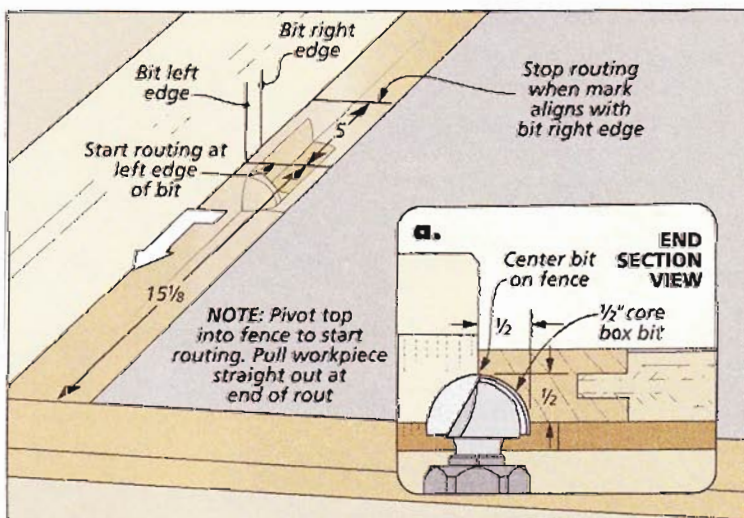


### Routing a Finger Pull

The finger pull on the top of the craft cabinet on page 20 makes it easy to lift the folding top. Routing the recess is a breeze using a simple router table technique.

Start by laying out the size of the opening on the workpiece. Then draw lines on the router table fence showing the left and right edges of the cove bit.

To rout the recess, just align the start mark on the workpiece with the left mark on the fence. Then move the workpiece until the stop mark meets the right mark on the fence. The result is a clean pull.

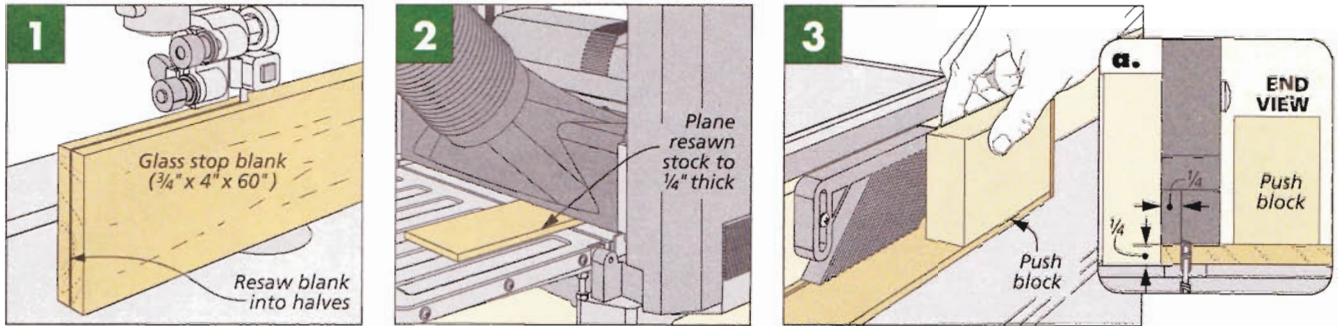


## Making Glass Stop

The glass panels in the doors of the tall clock on page 34 are held in place with  $\frac{1}{4}$ "-square strips of glass stop. Due to their small size, making these fragile pieces cleanly and accurately is a challenge. The illustrations below show how you can do it.

I started by cutting a single, oversized piece of  $\frac{3}{4}$ "-thick stock. This blank will make all the stop you'll need. Next, I resawn the blank into two roughly equal pieces at the band saw. This was followed by a stop at the planer to thickness the blanks to  $\frac{1}{4}$ ".

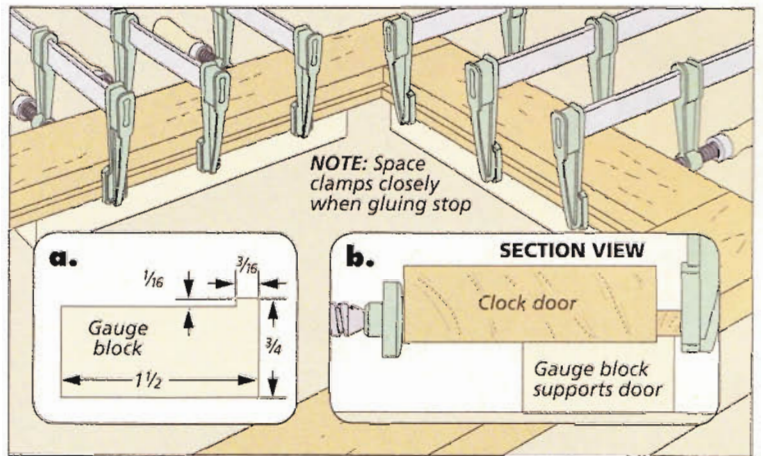
After jointing both edges of the blanks, you can rip  $\frac{1}{4}$ "-wide strips from them as shown in Figure 3. A featherboard placed behind the blade will keep the strips from flexing as they're cut. You can cut a strip from each edge, re-joint the blanks, and repeat.



## Rabbeted Gauge Blocks

When the glass stop is glued into the door frames of the tall clock, it's recessed  $\frac{1}{16}$ " from the front faces. Creating a consistent reveal when installing these flexible strips is tricky at best. My simple solution is shown in the drawing at right.

After cutting the stop to fit, I made a set of rabbeted blocks with a  $\frac{1}{4}$ " tall shoulder (detail 'a'). When installing the stop, you can support the doors on the blocks, as shown in detail 'b.' The gauge blocks create clamping clearance while automatically positioning the stop with the correct reveal. Just make sure the door frame and stop are in solid contact with the blocks before tightening the clamps.



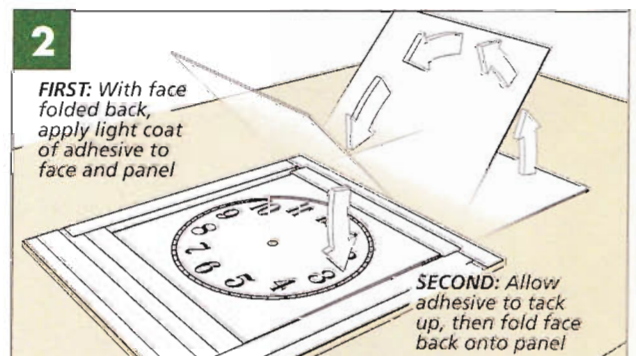
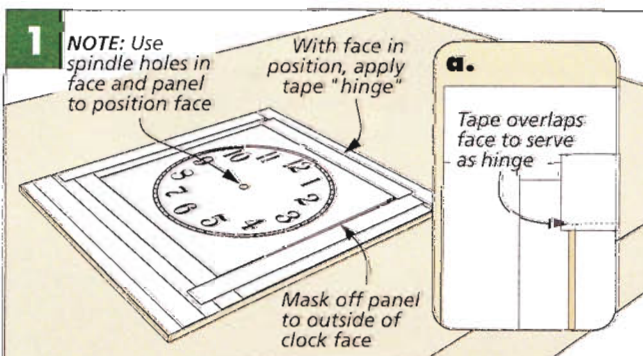
## Attaching the Clock Face

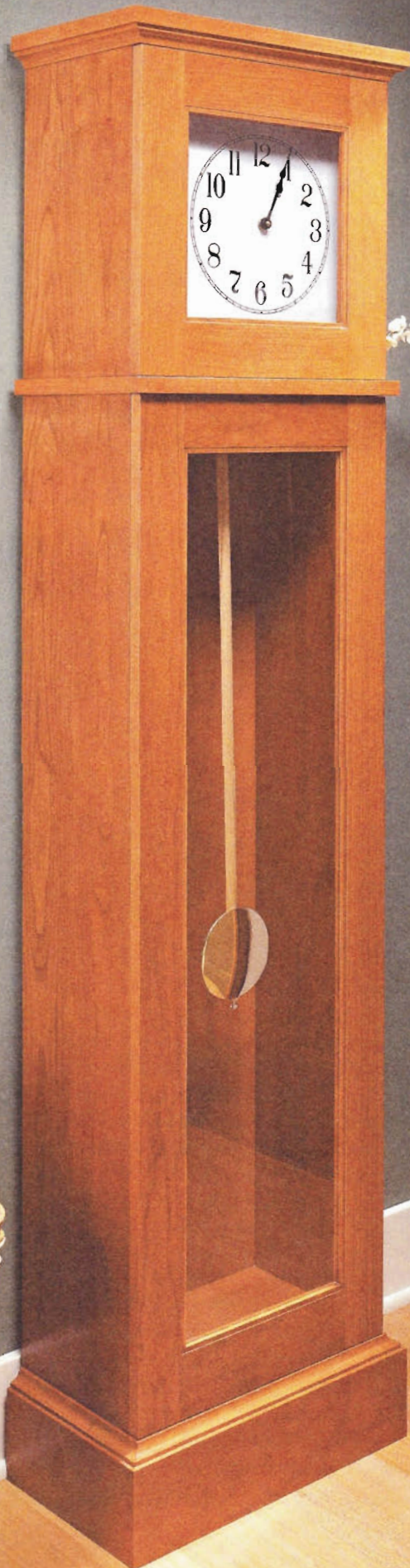
The trick to gluing the clock face to the face panel is making sure that it's positioned accurately. Masking tape is the answer.

First, I used the two spindle holes to align the face on the panel and mark around it. Next, I

masked off the area to the outside of the face to protect it from overspray of adhesive. Now you can reposition the face on the panel and apply a piece of tape that just overlaps the top edge of the face, as shown in Figure 1 and 1a.

Fold the face back to lie flat and spray both it and the panel with a light coat of adhesive. After allowing the adhesive to tack up, carefully fold the face back onto the panel and smooth it out from the top down (Figure 2). **W**





## shaker-style Tall Clock

A down-to-earth design and basic construction make building this elegant case clock a sure thing.

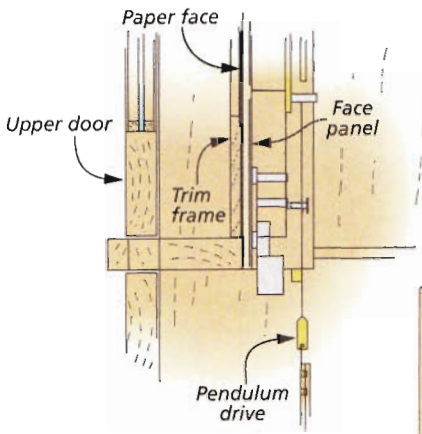
A grandfather-style or tall case clock has been penciled in on many woodworkers' wish list of future projects. However, it's also one that's often passed over and never realized. The job just seems too demanding and time-consuming. But this doesn't have to be the case. The tall clock shown here offers the look of a traditional classic but manages to rein in all the difficult and endless work.

The key is to not get carried away on fussy details. Basic joinery makes putting together the solid-wood case and other assemblies fast and straightforward. Likewise, the simple moldings create just enough interest to draw attention, but making them won't overwhelm you.

You don't even have to worry about the finicky installation of a wind-up mechanical movement. Battery power keeps the clock ticking, the pendulum swinging, and even provides the pleasant sound of hourly chimes. You get all the extras in a fraction of the time — so to speak.

# CONSTRUCTION DETAILS

**OVERALL DIMENSIONS: 16<sup>3</sup>/<sub>4</sub>"W x 10<sup>7</sup>/<sub>8</sub>"D x 70<sup>1</sup>/<sub>4</sub>"H**



**CLOCK FACE SECTION VIEW**

Trim frame installed around clock face

Heavy paper clock face glued to plywood panel

**NOTE:** Clock movement and pendulum are battery-powered

Access hole in case back for easy battery changes

Side trim attached with screw to allow for wood movement

Applied stop forms pocket for glass

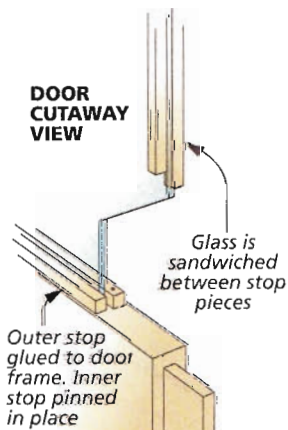
**NOTE:** For finishing information and sources of supplies, see page 51

**NOTE:** Door frames built with strong mortise and tenon joinery

Doors installed with no-mortise hinges

**NOTE:** Identical cove molding used on cornice and base

**DOOR CUTAWAY VIEW**



**NOTE:** Glass stop is fit into frames with simple butt joints

Cove molding made on router table

**NOTE:** Construction is all solid wood except for back and face panel

Cleats reinforce mitered base

**NOTE:** Base and cornice built separately and installed on case

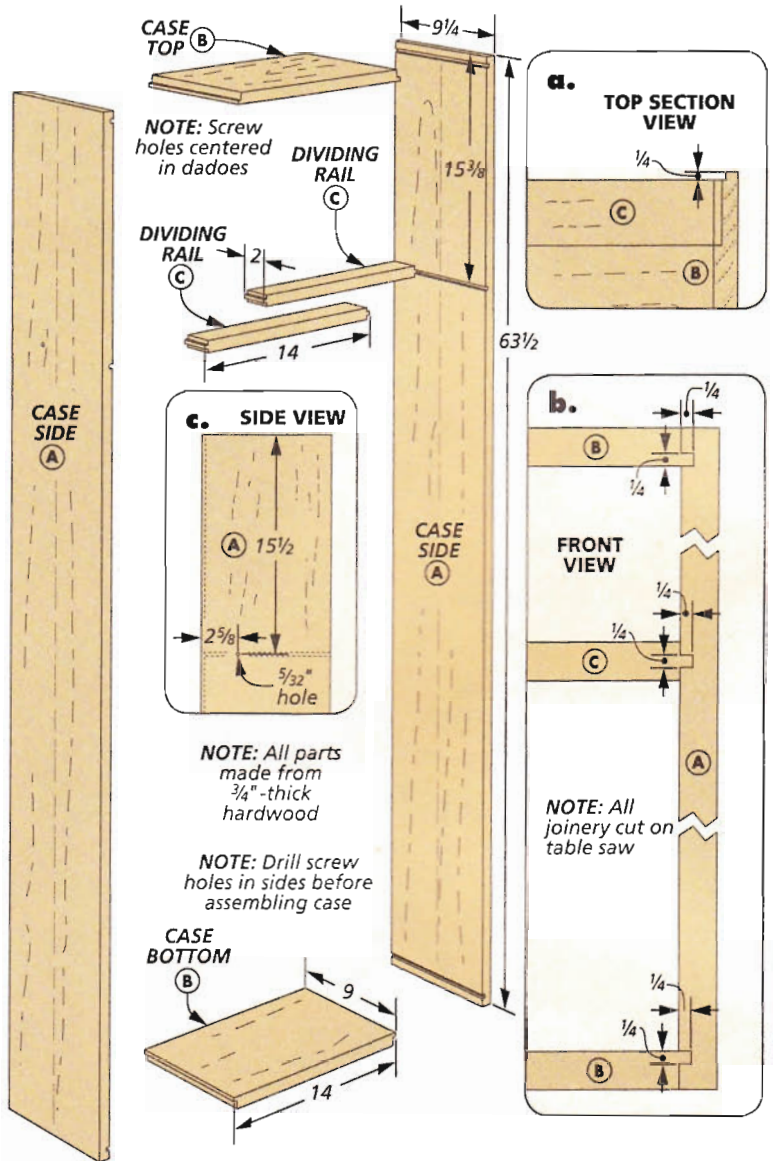
# start with the CASE & TRIM

The clock is made up of a case, a separate base and cornice, and upper and lower glass-panel doors. You'll start by constructing the case. Then you can add the other assemblies one at a time.

The solid-wood case is divided into a short, upper section that holds the clock movement and face and a tall, lower section for the pendulum. The divider between the sections consists of a pair of rails along with some trim.

**PANELS.** The first step is to glue up two long panels for the sides and two short panels for the top and bottom. Once the glue is dry and the panels are cleaned up, you can cut the sides, top and bottom, as well as the divider rails to final size. Note that the top and bottom panels are narrower than the sides to accommodate the case back (detail 'a').

**JOINERY.** The top, bottom, and rails are joined to the sides with a tongue and dado. The box below and detail 'b' provide an overview on this joinery. You can see how the tongues on the top and bottom are offset while those on the dividing rails are centered. And while the dado blade is still in the saw, you'll want to cut a

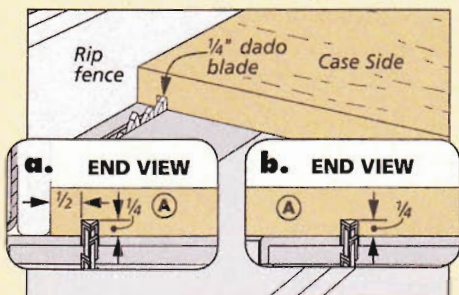


rabbit in each of the side panels to hold the 1/4" plywood back.

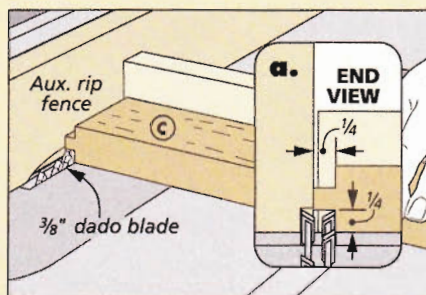
**SCREW HOLES.** There's one more minor detail to complete before starting the case assembly. As I mentioned, simple trim wraps the case at the line of the divider.

Since the side trim pieces run crossgrain to the sides, I glued them at the front only and fastened them with a screw through an oversized hole at the back. These holes are centered in the dados, as shown in detail 'c.'

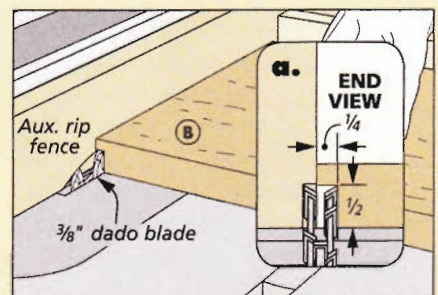
## How-To: Cut the Case Joinery



**Dadoes.** Cut the top and bottom dadoes with the same rip fence setting. Reposition the fence for the divider dadoes.



**Centered Tongues.** Make a pass on both faces to cut centered tongues. Sneak up on a snug fit to the dadoes.



**Offset Tongues.** Raise the blade to form the tongues on the inside faces of the case top and bottom.

**ASSEMBLY.** Now, you're ready for glue. The top, bottom, and front dividing rail should be flush with the front edge of the sides. The back dividing rail is installed flush with the shoulder of the rabbets in the sides. Make sure the case ends up square.

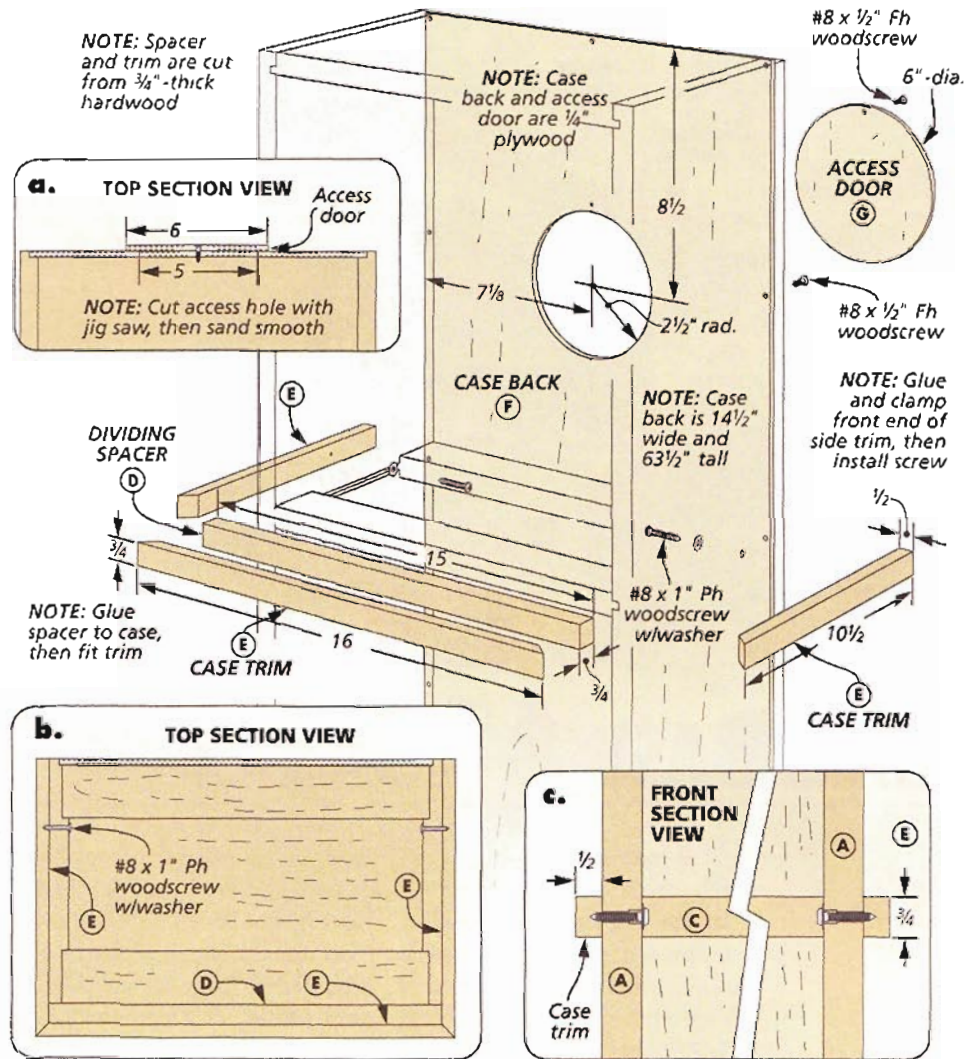
**DIVIDING TRIM.** When the clamps are back in the rack, you can start work on adding the dividing trim to the case. This actually consists of two parts — a front spacer and the square trim pieces that wrap the front and sides.

**SPACER.** The case doesn't have a face frame and the doors are sized to overlay the sides of the case. So the spacer acts as an extension of the front dividing rail to separate the two doors. It also provides a surface on which to attach the trim. This piece is cut to length to fit flush with the outside edges of the case and then glued to the front rail (detail 'b').

**THE TRIM.** Making and installing the trim is just a bit more work. As you can see in the details at right, the 3/4"-thick by 1/2"-wide pieces have square outside edges and are mitered at the corners.

I started by cutting one long strip to width and thickness. Next, cut the three pieces to rough length from it. The drawings below show how the pieces are then mitered to wrap the case.

The front piece is glued flush with the spacer. But as I mentioned, only the first few inches

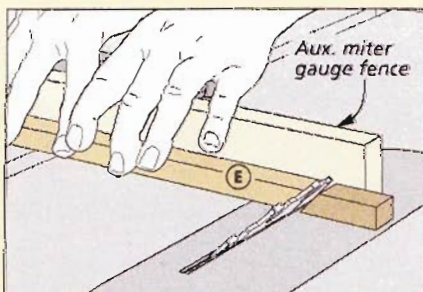


of the side pieces are glued. Use the screw holes you drilled earlier to fasten the back end (detail 'c').

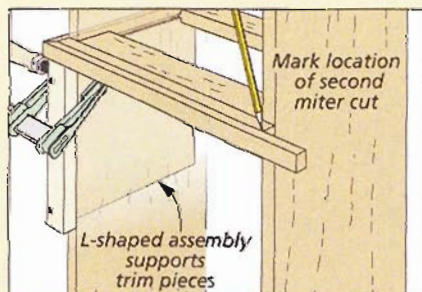
**THE BACK.** All the case needs now is a back. This 1/4" plywood panel is cut to fit between the rabbets in the sides and flush with the outer faces of the top and bottom. It will be attached with screws.

After cutting it to size, I laid out and cut a circular hole in the back to allow for quick battery changes. Then I cut a slightly larger, round plywood door that simply pivots on a screw (detail 'a'). You'll want to hold off on installing the back until after the clock face and movement are installed.

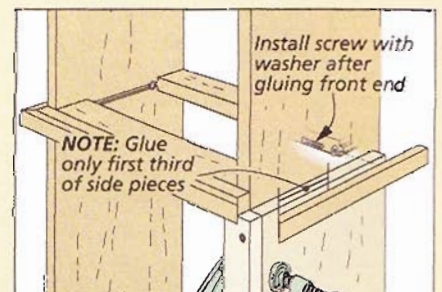
## Fit the Trim



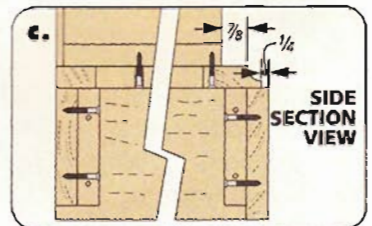
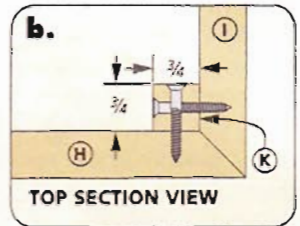
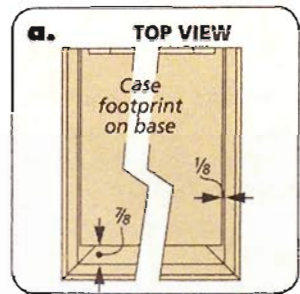
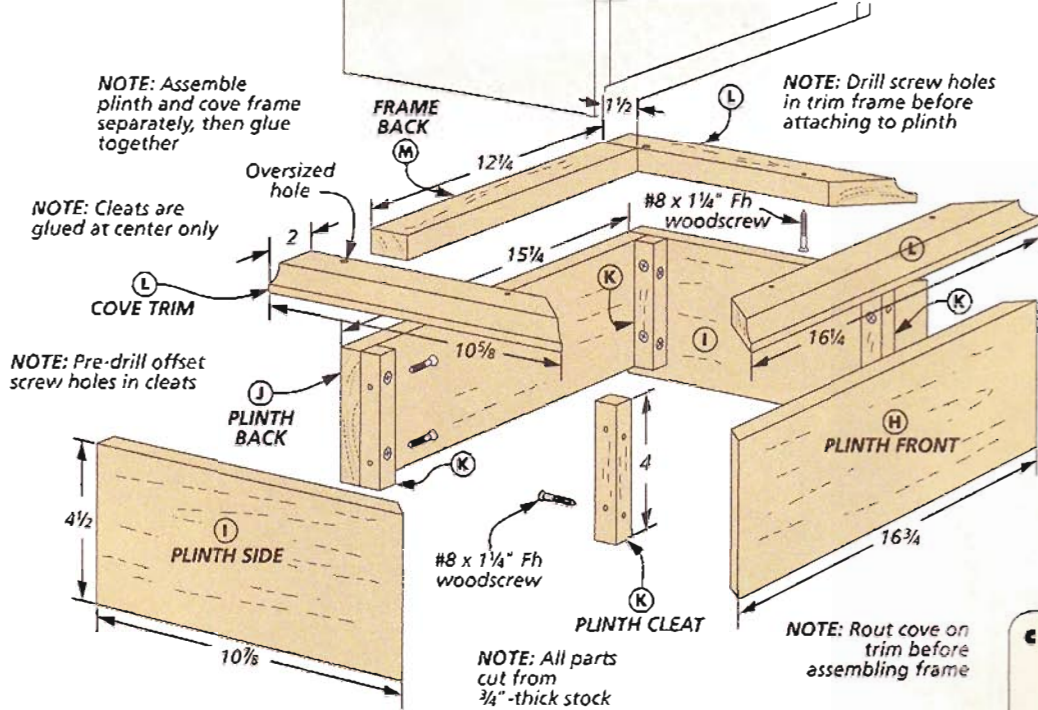
**First, Two Miters.** I started fitting the trim by mitering one end of the front piece and one of the side pieces.



**A Helper.** I used a support to position the pieces on the case while marking for the second cut on the front piece.



**Glue & Screws.** With all the pieces cut to fit, I first glued the front side piece to the spacer, then attached the side pieces.



## build the **BASE & CORNICE**

Next up is a base for the case. Then you'll top it off with a cornice.

**THE BASE.** The base is made up of a four-sided plinth frame that's capped with a molded frame, as shown above. The front corners of both frames are mitered while the back pieces are simply cut to fit between the sides.

**PLINTH FRAME.** You can begin work on the plinth by cutting the four pieces to width and rough length from 3/4"-thick stock. Note that the back piece is narrower to add stability to the base.

The box below shows the steps that follow. Next you'll miter the

front and sides into a three-sided assembly based on the dimensions given above. I should mention that the depth of the base is sized to account for the overlay door (detail 'a'). After crosscutting the sides to final length, I cut the back piece to fit. The measurements across the front and back of the frame should match.

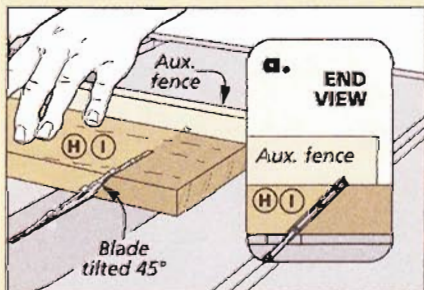
**ASSEMBLY.** With all the pieces cut to fit, the frame is ready to glue up. I spread glue on the miters and the ends of the back piece and then used band clamps to pull the joints tightly together. Make sure all the top edges are

flush and the back piece is flush with the ends of the side pieces.

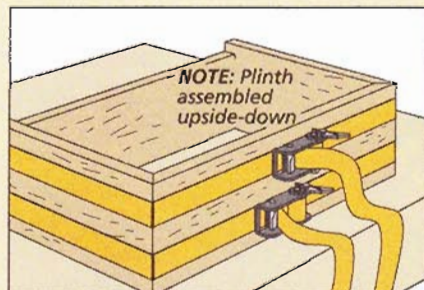
**CLEATS.** While the clamps are still in place, you can install some cleats to reinforce the joints, as shown in details 'b' and 'c.' Since the cleats are installed crossgrain, I glued them only through the center and installed screws near the ends. You'll want to pre-drill all the countersunk pilot holes in the cleats before adding them.

**MOLDED FRAME.** With the plinth frame assembled, you can add the molded frame to it. As I mentioned, it's constructed similar to the plinth. The important feature

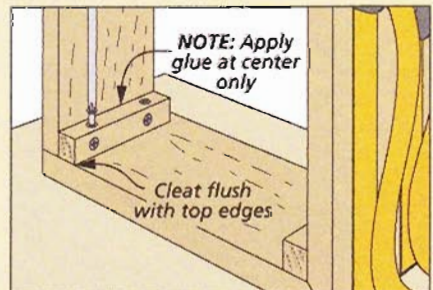
## How-To: Assemble the Plinth



**Miters.** Start by cutting the miters at the front corners of the plinth frame. Then crosscut the sides to final length.



**Assembly.** After cutting the back piece to fit between the sides, you can use band clamps to glue up the frame.



**Plinth Cleats.** Position the reinforcing cleats flush with the top edges of the frame. Just glue the center section.

is a 1/2" cove profile routed on the edges of the front and side pieces.

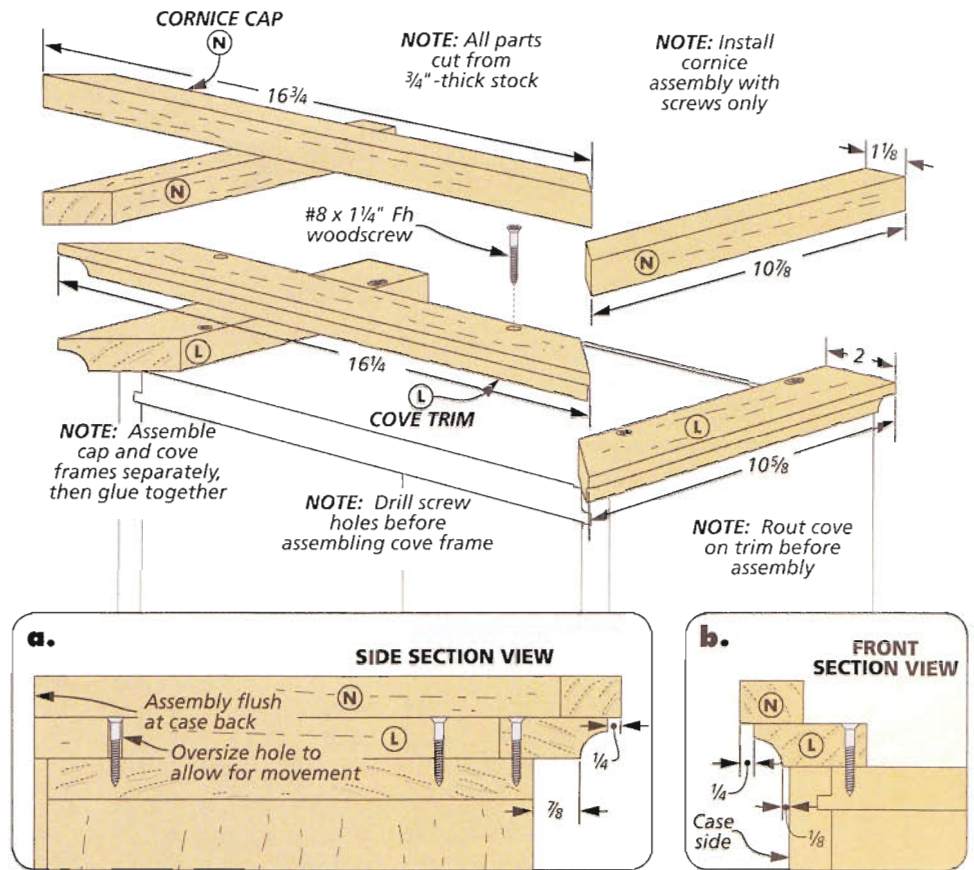
As before, start by cutting the pieces to width and rough length. The How-To box below shows how to proceed. After routing the cove on the front and side pieces, I mitered the front corners. Then crosscut the sides and finally, cut the back piece to length. Then, I assembled the joints using only hand pressure for clamping.

**ATTACH FRAME.** Before attaching the frame to the plinth, you need to drill the set of countersunk screw holes used to fasten the base to the case (detail 'c,' opposite page). Then the frame can be glued to the top edges of the plinth, flush at the back and with an even side-to-side reveal. When the glue is dry, install the base on the case in the same orientation (detail 'a,' opposite page).

### THE CORNICE

Now, you can turn your attention to the cornice. This assembly looks like a squat, upside-down version of the base. It consists of two, 3/4"-thick frames. The larger, upper frame has square edges while the smaller, lower frame has a cove profile. And like the base, the cornice is sized to allow for the extra depth the doors will add to the case (detail 'a'). One difference is that these frames are three sided with no back piece.

**UPPER FRAME.** Assembling the upper frame is straightforward.



I cut blanks to width and rough length, mitered the front corners, and then crosscut the sides to final length. And as before, my hands served as clamps.

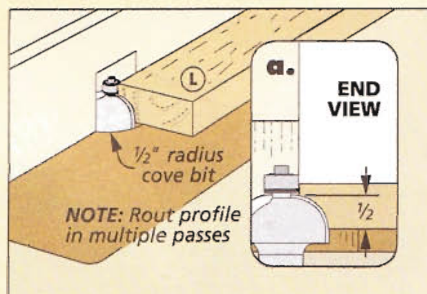
**LOWER FRAME.** Making the lower frame will seem familiar. It's identical to the molded base frame — minus the back piece. So again, you can refer to the How-To box below. Before gluing up the frame, I drilled a pair of countersunk screw holes in

the upper face of each piece, as shown above. These will be used to attach the cornice to the case.

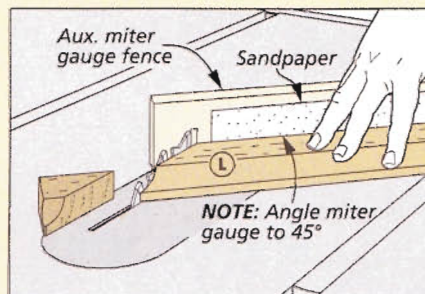
**INSTALLATION.** Adding the cornice to the case is a two-step process. First, I glued the upper and lower frames together. Just make sure the reveal is even all around.

When the glue is dry, you can fasten the cornice assembly to the case using the screw holes in the lower frame, as shown above. Be sure to align it carefully.

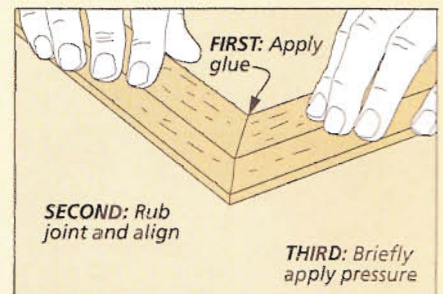
## Create the Molded Frames



**Rout a Cove.** The first step is to rout a cove on the extra-long blanks by raising the bit height in between passes.



**Miters Next.** Once the coves are completed, the pieces can be mitered and crosscut to length at the table saw.



**Rub Joint.** After applying glue to the miters, rub them together on a flat surface and hold them until the glue tacks.

# completing the CLOCK

You're in the home stretch. All you need now are a couple of doors and finally, the clock assembly.

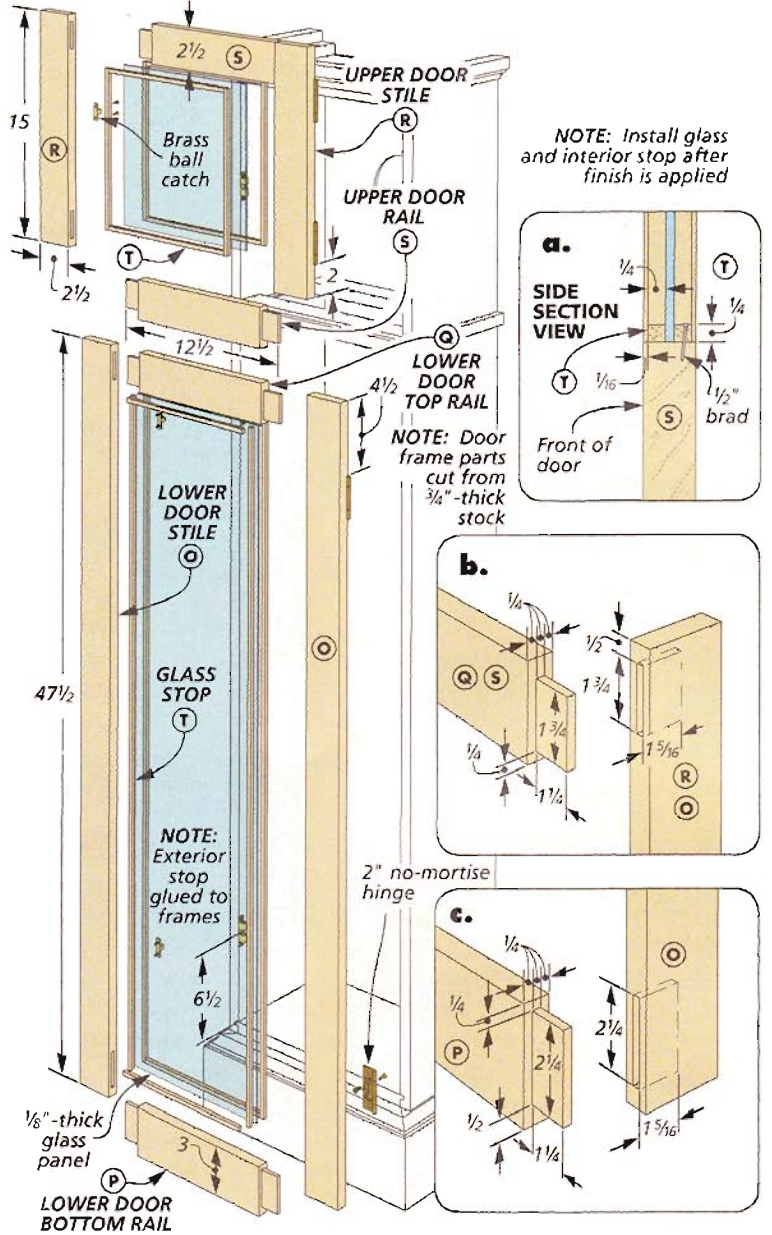
**DOORS.** The design of the glass-panel doors makes building them straightforward. You'll start by assembling two frames with mortise and tenon joints. Then stop is fit around the openings to create pockets for the glass.

**THE JOINERY.** Once the parts are cut to size, you can start on the door joinery. The technique I used to create the mortise and tenon joints is shown below while the drawings at right provide all the dimensions you'll need. When you assemble the frames, be sure to check for square.

**GLASS STOP.** Next comes adding the glass stop. And the first step is to make these  $\frac{1}{4}$ "-square pieces. You'll find guidance for this task on page 33.

Simple butt joints make fitting the inner and outer stop easy. The vertical pieces run full-length while the horizontal pieces are cut to fit between them. The outer stop can be glued into the frames now — the inner stop is pinned in place later while adding the glass.

Note that the stop is recessed  $\frac{1}{16}$ " from the front face of the doors (detail 'a'). If you turn to

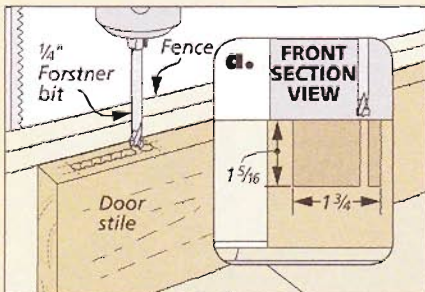


page 33, you'll see how I used gauge blocks to ensure this spacing was consistent all around.

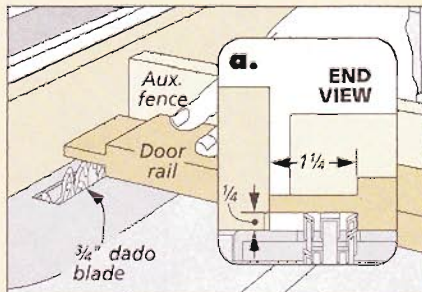
**HINGES.** With the outer stop in place, the two doors can be

installed on the case with face-mounted, no-mortise hinges. Lastly, I added a set of ball catches — two for the lower door and one for the upper.

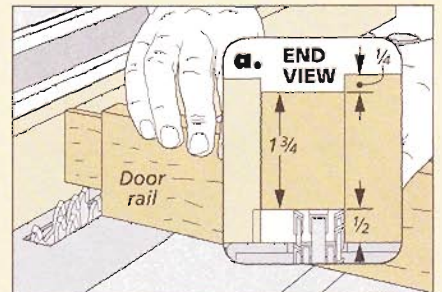
## How-To: Mortise & Tenon Joints



**Mortises.** After laying out the mortises on the stiles, drill out the waste at the drill press. Square them with chisels.



**Cheeks.** First, cut the tenons to length and thickness. The rip fence sets the length, the blade height, the thickness.



**Edge Shoulders.** Use the same blade height to cut the inside shoulders, then raise it to cut the outside shoulders.

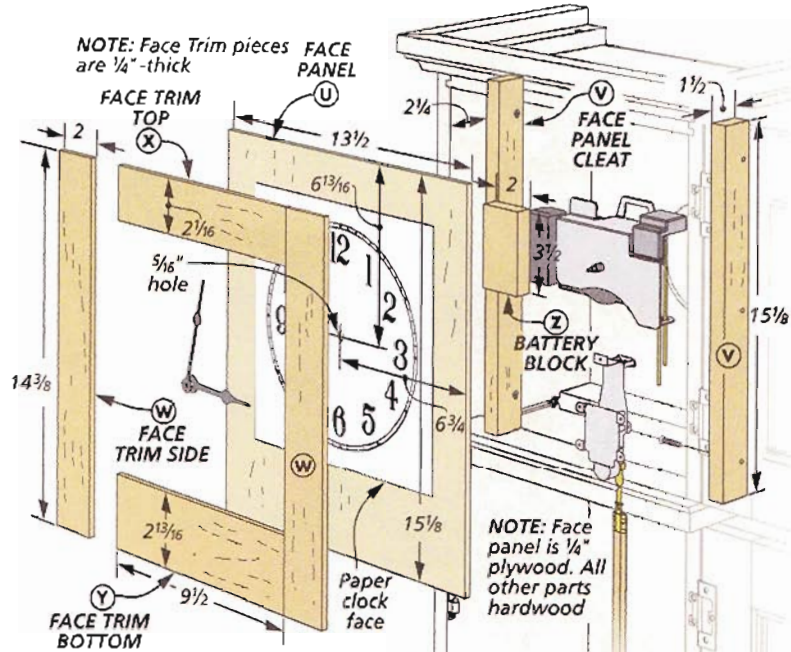
## THE FACE & WORKS

Now the clock is only lacking a couple of very important items — the clock face and, last but not least, the clock movement.

As shown at right, the face assembly consists of a paper face glued to a 1/4" plywood panel, a pair of vertical mounting cleats, and a thin trim frame. I started by cutting the face panel to fit snugly between the sides and from the underside of case top to the bottom of the front dividing rail. Next, I laid out and drilled a hole for the clock spindle. Then after cutting the cleats to size and drilling countersunk mounting holes in each, you can glue them to the back of the face panel (detail 'a').

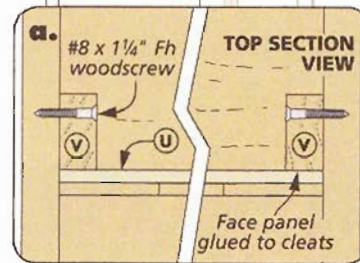
Before installing the panel in the case, I glued the paper face to it with spray adhesive. The key here is to get it positioned properly. The simple trick I used to do this is explained on page 33.

With the clock face in place, the assembly can be added to the case. A pair of spacers clamped flush with the inside edge of the front rail will help keep it aligned while you install the screws. You'll need to slide it in place from the back.



**TRIM FRAME.** Next comes the 1/4"-thick trim frame that wraps the face (drawing above). The frame should be sized to fit snugly in the opening and lap over the paper face about 1/4". Once the stiles and rails are cut to fit, you can glue them into a butt joint frame. I waited until after the finish was applied to glue the assembled frame to the face panel.

**THE WORKS.** All you have left to do is mount the movement and pendulum on the back of the face as shown. Other than adding a

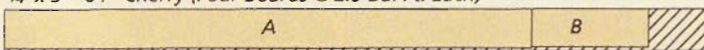


mounting block for the pendulum battery pack, it's just a matter of installing a few screws. And maybe the best part is, once everything is in place, no winding will ever be necessary. **W**

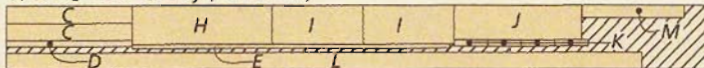
## Materials, Supplies, & Cutting Diagram

<b>A</b> Case Sides (2)	3/4 x 9 1/4 - 63 1/2	<b>M</b> Cove Frame Back (1)	3/4 x 1 1/2 - 12 1/4	<b>Y</b> Face Trim Bottom (1)	1/2 x 2 13/16 - 9 1/2
<b>B</b> Case Top/Bottom (2)	3/4 x 9 - 14	<b>N</b> Cornice Cap (1)	3/4 x 1 1/8 - 39 rgh.	<b>Z</b> Battery Block (1)	3/4 x 2 - 3 1/2
<b>C</b> Dividing Rails (2)	3/4 x 2 - 14	<b>O</b> Lower Door Stiles (2)	3/4 x 2 1/2 - 47 1/2		
<b>D</b> Dividing Spacer (1)	3/4 x 3/4 - 15	<b>P</b> Lower Door Btm. Rail (1)	3/4 x 3 - 12 1/2		
<b>E</b> Case Trim (1)	3/4 x 1 1/2 - 38 rgh.	<b>Q</b> Lower Door Top Rail (1)	3/4 x 2 1/2 - 12 1/2		
<b>F</b> Case Back (1)	1/4 ply. - 14 1/4 x 63 1/2	<b>R</b> Upper Door Stiles (2)	3/4 x 2 1/2 - 15		
<b>G</b> Access Door (1)	1/4 ply. - 6-dia.	<b>S</b> Upper Door Rails (2)	3/4 x 2 1/2 - 12 1/2		
<b>H</b> Plinth Front (1)	3/4 x 4 1/2 - 16 3/4	<b>T</b> Glass Stop (5)	1/4 x 1/4 - 60		
<b>I</b> Plinth Sides (2)	3/4 x 4 1/2 - 10 7/8	<b>U</b> Face Panel (1)	1/4 ply. - 13 1/2 x 15 1/8		
<b>J</b> Plinth Back (1)	3/4 x 4 - 15 1/4	<b>V</b> Face Panel Cleats (2)	3/4 x 1 1/2 - 15 1/8		
<b>K</b> Plinth Cleats (4)	3/4 x 3/4 - 4	<b>W</b> Face Trim Sides (2)	1/4 x 2 - 14 3/8		
<b>L</b> Cove Trim (1)	3/4 x 2 - 80 rgh.	<b>X</b> Face Trim Top (1)	1/4 x 2 1/16 - 9 1/2		

3/4" x 5" - 84" Cherry (Four Boards @ 2.9 Bd. Ft. Each)



3/4" x 7 1/2" - 84" Cherry (4.4 Bd. Ft.)



3/4" x 7 1/2" - 96" Cherry (5.0 Bd. Ft.)



1/4" x 5 1/2" - 60" Cherry (2.3 Sq. Ft.)



**ALSO NEEDED:** One 24" x 96" Sheet of 1/4" Cherry plywood

- (1) Clock Movement
- (1 pr.) Clock Hands
- (1) 10" Clock Face
- (1) Pendulum Drive Unit
- (1) Pendulum Assembly
- (2 pr.) 2" No-Mortise Hinges
- (3) Brass Ball Catches
- (2) 1" x #8 Ph Woodscrews
- (2) 3/16" Flat Washers
- (34) #8 x 1 1/2" Fh Woodscrews
- (21) #8 x 1/2" Fh Woodscrews
- (1) 1/8" x 9 7/8" - 9 7/8" glass
- (1) 1/8" x 9 7/8" - 41 5/8" glass
- 1/2" Brads



## routing stopped

# Dadoes & Grooves

Whether at the workbench or the router table, the key to making stopped cuts is an accurate layout and a guide.

It's not unusual for a project to call for a stopped dado or groove. That is, a dado that doesn't extend from one edge of the workpiece to the other, but starts or stops at some point in between. I often use this type of dado for shelves.

I normally rely on the table saw and a dado blade for cutting dadoes and grooves, but it's not very well-suited for stopped cuts. Instead, I prefer to use a router for this cut. The nice thing about using a router is that you can either use the router table or a hand-held router. Which method you use depends largely on the situation.

▼ Accurate layout marks are the first step in routing stopped dadoes and grooves.



▲ After aligning the jig with the layout marks and clamping it in position, attach the start and stop blocks with double-sided tape. This makes routing the groove almost foolproof.

**LAYOUT.** Regardless of the method you use, a successful operation starts with a good set of layout marks. For this, I like to begin by marking the ends of the cut first. Then you can connect the two end marks using a straightedge (as shown in the left photo).

**BIT SELECTION.** Another thing to consider is the router bit. The box on the opposite page shows the options for successful results.

### HAND-HELD TECHNIQUE

For hand-held routing, after marking the layout the next step is to set up a fence. This can be as simple as a straight piece of stock clamped in place to center the bit in the groove layout.

After setting up the fence, position the router so the bit is over the end marks and attach stop blocks at the appropriate spots to limit the length of the groove.

You can attach the blocks to the fence or workpiece with a couple pieces of double-sided tape.

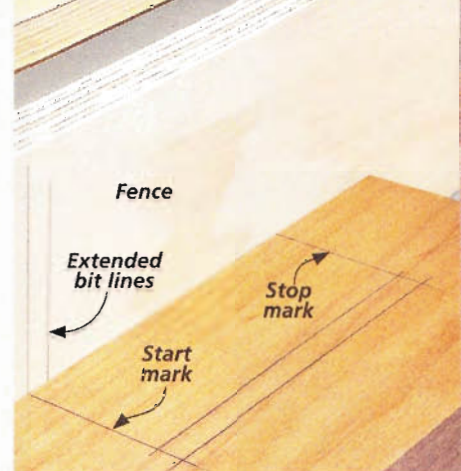
Alternatively, if you have several dados to rout, it's best to make a template or jig. Start with a cleat that indexes against one edge of the workpiece and a layout mark. This type of jig simply clamps in place. The main photo on the opposite page shows this type of guide in action.

**PLUNGE OR FIXED-BASE ROUTER.** I prefer to use a plunge router for this type of work. A plunge router allows you to start with the base flat on the jig or workpiece. Then, all you need to do is plunge the bit into the workpiece in a controlled manner.

But as you can see in the photos on the opposite page, a fixed-base router also works. You just need to start with the bit above the layout line and lower it into the work. The sides of the jig prevent the router from going off track.



▲ Use a straightedge to mark the leading and trailing edges of the bit on the fence. This gives you an easy reference for routing.



▲ By matching your layout marks to the bit positions on the fence, you're assured accurate cuts.

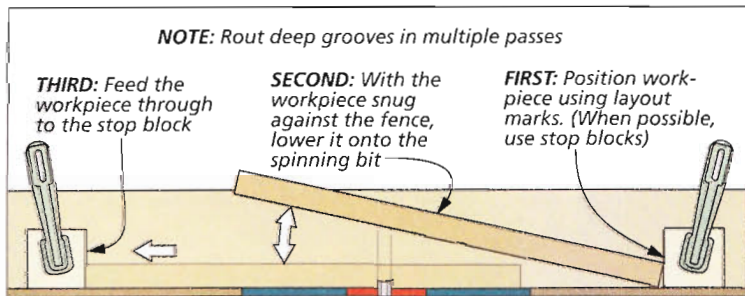
### ROUTER TABLE TECHNIQUE

For smaller workpieces, I prefer to use the router table. This method also begins with a layout. But this time the reference marks are on the router table fence as well as the workpiece. First, mark the leading and trailing edges of the bit on the fence (left photo, above). Make the layout marks on the workpiece on the opposite face

so they're visible while you're routing (right photo above).

Then it's a simple matter to rout the groove. The key is to align the start mark on the workpiece with the left mark on the fence, holding it firmly against the fence. Then, slowly lower the workpiece onto the spinning bit. Complete the dado by moving the workpiece to align the stop mark with the right mark on the fence. You can also clamp start and stop blocks to the fence for short pieces (drawing at left).

Regardless of which method you use, you'll quickly get the hang of routing stopped dados and grooves. You'll find that it opens up new possibilities for your woodworking projects. **W**



## Choose the Right Bit

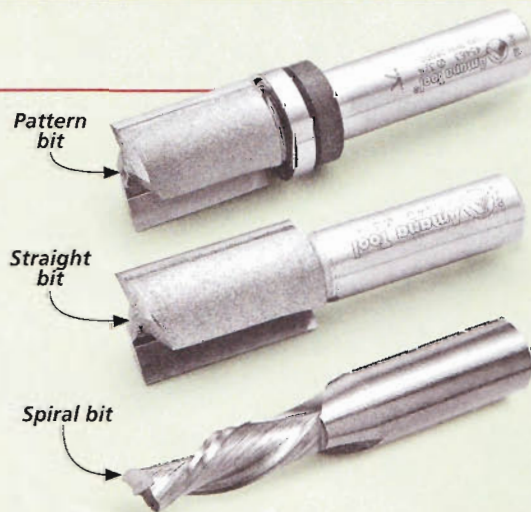
After choosing the method for cutting a dado, you still need to select a bit to match the task. The three bits shown at right are just a few of the possible choices.

**HAND-HELD ROUTING.** If you're using your hand-held router and a template like the one shown in the main photo, then a pattern bit is the perfect choice. Since the bearing above the cutter is equal to the diameter of the bit, your templates can be set up to match the desired position of the cut.

**STRAIGHT BITS.** When working at the router table, you don't need

a bearing to follow a guide of any kind. The fence controls the path of the workpiece. For that reason, a simple straight bit works fine. The big advantage is that these bits are less expensive. This allows you to keep several bits with different diameters.

**SPIRAL BITS.** When tearout is a problem, a downcut spiral bit can be a big help. As the name implies, this bit cuts downward, slicing into the wood, rather than lifting the fibers and causing tearout. This action results in a smooth edge.



▲ A pattern bit (top) is the best choice for template routing or when using a jig. The straight bit or spiral bit works best in the router table.



# 3 techniques for Table Saw Tenons

When it comes to making tenons at the table saw, there are several ways to go about it. Here are the pros and cons of each method.

The phrase “more than one way to skin a cat” is certainly over-used. But when it comes to cutting tenons on the table saw, it also happens to be true.

There are a number of methods for cutting tenons, and the technique you ultimately choose is dependent on several factors. Everything from the number of

tenons you have to make, to the size or complexity, to the smoothness you wish to achieve will impact your decision. To help you decide which tenon-making technique is right for you, let's take a closer look at the options.

## Standard Blade

Some projects call for short, stub tenons with just two faces rather than four (photo above). In these instances, you may decide to forgo changing your table saw setup and simply cut the tenons with a standard saw blade.

**HOW YOU DO IT.** When making tenons this way, first position the rip fence as a guide for cutting the shoulders of the tenon. Also, put a wood auxiliary fence on your miter gauge to back up

the cut. Then, after cutting the shoulders, you can slide the workpiece away from the rip fence for each subsequent cut to remove the waste from the cheeks of the tenon.

It's okay if there's a little waste left between each cut, as shown above. That's because once you're done, you'll use a sharp chisel to remove this waste and clean up the tenon (see the photo at left).

**PROS.** If a tenon is short, this method is fast and doesn't require devoting time to changing the saw blade setup.

**CONS.** For larger tenons or multiple tenons, this is not the best method. It can be time-consuming and leaves a lot of cleanup work afterward.

▼ After cutting tenons with a standard blade, some chisel cleanup may be needed.



## 2 Dado Blade

Many projects require tenons longer than the one shown on the opposite page. Any time your tenon is longer than half an inch or so, it's probably worth your time to swap out your standard blade for a dado blade.

**HOW YOU DO IT.** Your dado blade setup may not be as wide as the tenon you're planning to cut, but that's okay. As with the previous technique, you can make the cut with a series of passes over the dado blade.

Here again, you want to start by using the rip fence as a stop for establishing the shoulders of the tenon (photo at right). Then, you can move the workpiece away from the fence with each following pass to shave the waste from the cheeks of the tenon.

As before, it's a good idea to attach a wood auxiliary fence to your miter gauge to back up the cut. Also, use a zero-clearance insert plate with an opening for the dado blade you're using.

**PROS.** This method makes quick work of larger tenons, and even if you have to cut each tenon cheek in multiple passes, it's still faster than a standard saw blade. It also leaves cleaner cheeks than a standard saw blade.

**CONS.** One of the few drawbacks to this method is the time it takes



▲ With a dado blade, you can make quick work of cutting longer tenons.

to set up the dado blade and create an insert plate for it if you haven't done so previously. The surface of the tenon may also be marked with ridges and imperfections, but these can be sanded away if needed.

## 3 Tenoning Jig

If you make a lot of projects that use mortise and tenon joinery, especially through-tenons where you see the end of the tenon, then it might be worth investing some money or time into buying or building a table saw tenoning jig.

Once you get the jig set up and running, no method is better for making smooth-cheeked tenons quickly and accurately.

**HOW YOU DO IT.** Of course, table saw tenoning jigs vary a bit based

on the manufacturer. But they all hold the workpiece vertically so that you can cut each cheek with one pass through the saw blade. Tenoning jigs typically have a miter bar that runs in the saw's miter gauge slot (like the *General* jig shown below). And they feature several different adjustment points so you can fine-tune the settings to accommodate different sizes of workpieces or tenons.

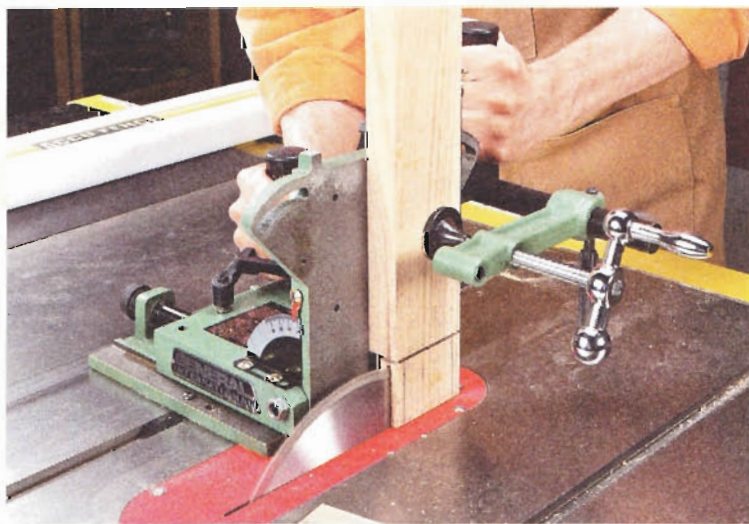
Before you use the jig, it's a good idea to cut the shoulders of the tenons first. You can do this using a standard blade with the workpiece lying flat on the saw table. Then, after cutting the shoulders, make sure to set up the jig so the waste from the tenon falls to the outside and doesn't get trapped between the blade and the jig.

**PROS.** A tenoning jig cuts tenons of almost any size easily. And you'll be hard-pressed to get smoother results (right photo). Also, once you learn how to use the jig, setups are quick and easy. There's also no need to change the blade to use a tenoning jig.

**CONS.** Really the only drawback to a tenoning jig is the cost, which is \$100 or more for a good one. You can build your own, but that requires a few hours of shop time.

**THE LAST WORD ON TENONS.** As you can see, each of these three methods has their place when it comes to making tenons on the table saw. Choosing the right one ultimately comes down to the project you're building. **W**

▼ A tenoning jig (top photo) creates a smoother tenon than a dado blade (bottom).



▲ A tenoning jig holds the workpiece vertically to cut the tenon cheek with a single pass over the saw blade. As shown, you'll want to cut the tenon so the waste falls to the outside.





## setting up your **Finishing Area**

Want a great-looking finish on your next project? The first step is to create an organized area in your shop for applying that finish.

Most woodworkers spend a good deal of time selecting the right finish — and applying it correctly. While that's certainly important, one part of the equation that's often overlooked is having a dedicated space in your shop for applying finish.

This doesn't have to be anything fancy like a spray booth or a

separate room. But it does help to have a clean, well-ventilated, and well-lit area that prevents dust from getting on your projects and ensures good results. Here are my recommendations for the area.

**A SEPARATE SPACE.** Chances are, your workbench is dedicated to using dust-producing tools. Plus, it probably has a clean surface

that you would like to keep that way. For these reasons, it's worth setting up a separate area of your shop for applying finishes.

When finishing, you don't need a vise, bench dogs, and the like. You just need a flat worksurface. In fact, this can be as simple as a hollow-core door set on a pair of sawhorses (photo, above). This way, you can break it down and stow it out of the way when you're not finishing.

**PROPER LOCATION.** Also, where you locate this area is critical not only for great results, but also for safety. If you can, it's a good idea to locate it away from where you generate the most dust. You can't eliminate dust in the shop completely, but at least moving to the opposite end of the shop will help minimize exposure.

As far as safety goes, there's no problem applying most



► Fasten a lazy Susan to a piece of plywood to create a turntable for small projects.

water-based finishes inside the walls of your shop. But it's still advisable to use the proper safety equipment, even in a wide-open area. For that matter, it's also a good idea to locate your finishing area next to a window or door if possible.

However, be mindful of the conditions outside before you decide to let outdoor air in. An open door or window sets up a risk for contamination from incoming dust, dirt, or bugs.

The conditions outdoors can also impact finish quality and the time it takes to dry. Ideally, the temperature should be above 65 degrees, and the humidity should be around 50 percent.

**LIGHT IT RIGHT.** Of course, lighting is critical for your finishing area, so you'll want to have the best lighting possible. I recommend two types: Bright overhead light, as well as task lighting that you can use to shine light across the project to look for runs or drips.

For overhead light, you can use an inexpensive fluorescent light fixture from any home center. As for task lighting, I like "architect-style" desk lamps with adjustable arms and shades (photo, below right). I found one with a sturdy base that's easy to move around the worksurface as I'm finishing a project.

**ADD A CABINET FOR SUPPLIES.** Since you're creating a separate area for finishing, I also recommend

## Finishing Supplies: Checklist

- Masks/vapor respirator
- Fire extinguisher
- Metal can with tight-fitting lid (for oily rags)
- Rubber gloves
- Safety glasses
- Rags/cloths/towels
- Sandpaper/steel wool
- Jars and strainers
- Roll of kraft paper
- Painter's pyramids
- Finish solvents
- Adjustable lamp
- Lazy Susan platform
- Shop vacuum



devoting a few extra feet of wall space to a dedicated finishing supplies cabinet. I picked up this metal cabinet at a local home center for around \$100 (see the photo, below left).

**HAVE THE RIGHT ACCESSORIES.** I'm guessing you've probably done enough woodworking to know what finishes you like (and don't like) to use for your projects. But beyond the actual finishes, there are some other finishing supplies you might want to consider. These include a lazy Susan for finishing small projects (photo, opposite page), a roll of kraft paper to protect your worksurface, and "painter's pyramids"

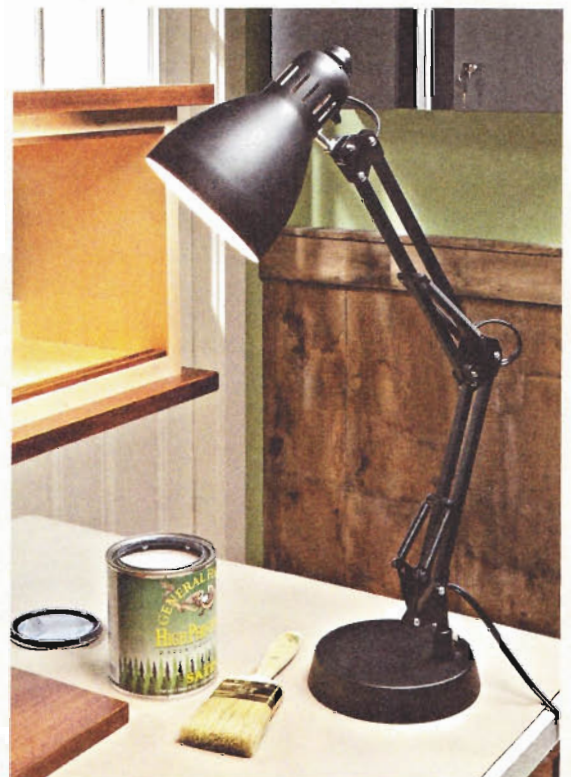
that elevate your project part for easy access to the edges. I've compiled a list of things in the box above to add to your finishing area. You'll also want to see the Sources on page 51.

Put it all together, and you'll be one step closer to a great finish. Now it's just a matter of making use of all those techniques you've learned over the years. **W**

▼ An adjustable lamp lets you check your finish from every angle.



▲ An inexpensive metal wall cabinet is a great place to store finishing supplies without taking up valuable floor space.



## tips for laying out

# Dovetails

With hand-cut dovetails, the layout is half the battle. Here's a common-sense approach to this task.

In this age of machine wood-working, hand-cut dovetails can be the mark of a higher level of craftsmanship. Whereas machine-cut dovetails provide uniformity, hand-cut dovetails offer variety. You're not constrained by a template or router bit angle when deciding what you want the dovetails to look like. It's all up to you.

But of course, this means you have to make decisions regarding the dovetail layout. This involves everything from design aesthetics to techniques. So I'll offer a few tips and tricks that make the whole process go smoother.

**STRUCTURAL OR DECORATIVE?** Dovetails form a strong structural connection by combining mechanical

**Purpose?** Lots of pins and tails create a stronger joint while wide tails and narrow pins look better.

Tails that are several times the width of narrow pins accentuate dovetail effect

Numerous tails and pins offer lots of gluing surface and a strong joint

and gluing strength. However, the joint can also have a decorative element. So before laying out the dovetails, you need to decide which is the priority.

If the dovetails won't be seen, strength may be the foremost consideration. Lots of tails and pins will accomplish this. However, when appearance is important, reducing the number of tails and pins will produce a more attractive joint (lower left drawing).

**WIDE TAILS & NARROW PINS.** Tails that are at least twice the width of the pins generally look best. Three or more times the width of the pins can be even better. Another advantage is that wide tails can mean less work.

Narrow pins offer a striking contrast, but don't get carried away. Remember that you have to be able to clean out the pin space between the tails with a chisel. For me, a pin that's 1/4"-wide at the base line is the minimum and even that's pretty tight.

**TAIL ANGLE.** The argument over the best tail angle to use will never be settled. So don't spend too much time worrying about it. It's really of minor importance.

The common wisdom has always been that you should mark a 1:8 (7°) slope for hardwoods and a 1:6 (9.5°) slope for softwoods. The theory goes that

in softer woods a steeper angle is needed for better holding power. Following the same argument, some even advocate a 1:5 (11.5°) slope when cutting dovetails that are purely structural.

For me, the choice is based more on appearance. Tails with angles that are too steep take on an unattractive, exaggerated appearance. And when the angle is too shallow, you start to lose the classic "dovetail" look, not to mention holding power. So I take a middle-of-the-road approach and rarely stray from laying out a 1:6 slope. It's a good, all-around compromise. But you can decide what looks best to you.

**MARK YOUR WORKPIECES.** When laying out dovetails, one common

Begin by marking all the workpieces for orientation. Once the joint is laid out, mark the waste to be removed

**No Confusion.** Clearly marking your workpieces is key to avoiding mistakes.

mistake is to misorient them on a workpiece. So before getting started, mark the pieces to avoid any confusion (lower right drawing, opposite page). And then refer to your labels often during the layout process.

**PINS OR TAILS FIRST?** I like to lay out and cut the tails first. One reason is that a tail layout is easier to figure out, as you'll see. Second, a tail layout on the face of a board gives you a good graphic representation of the final appearance of the joint, allowing you to make changes up front if you desire. Finally, from a procedural standpoint, it's easier to fit the pins to the tails than the reverse.

**THE BASELINE.** Start by scoring the baseline with a cutting gauge or a knife and combination square (upper right drawing). This gives you a sharp line to follow with a chisel when removing the waste.

I like to mark the baselines a bit long ( $\frac{1}{32}$ " or less) so that the tails and pins stand a hair proud in the assembled joint. Once the joint is assembled, you can plane or sand it flush. It's easiest to simply score both faces and edges of the tail board. If you don't want the scored line to show on the outside face, you can wait and score only between the tails after they've been laid out.

**A HALF PIN.** The rest of the layout is done with a sharp pencil. A pencil line is a little easier to see and follow than a scribed line. You'll start the layout by

marking a line for a half pin on the end at both edges. It's not half the width of a pin — it's just a one-sided pin. Each half pin is generally about  $\frac{1}{4}$ " to  $\frac{3}{8}$ " wide.

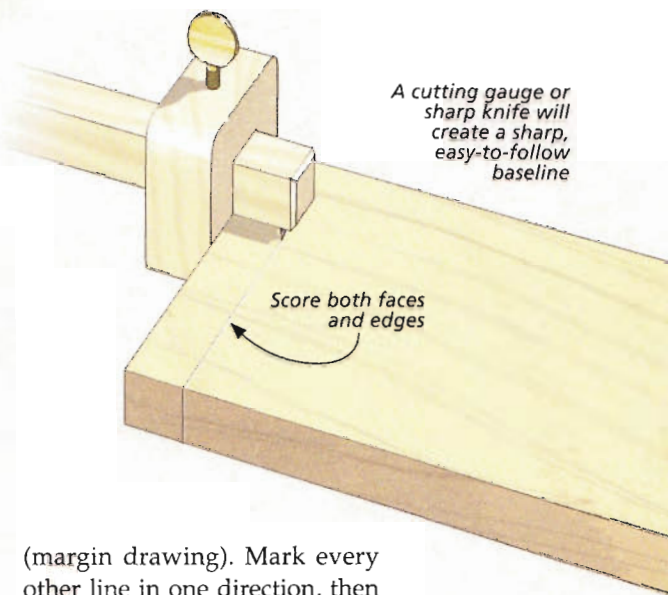
**DIVIDE & MARK THE TAILS.** The drawings below show how to complete the layout of the tails. First you need to decide on the number of tails you want. Then you can use a simple trick to lay them out evenly with only a little calculation or measuring.

First you measure the distance between the two half-pin lines. Then add one half the width of a half pin to this measurement. Finally, divide this total by the number of tails you decided upon. This final result is the compass setting you'll need to start the layout (Figure 1a).

After setting the compass to your calculated measurement, place the point on one of the half-pin lines and mark off a division. Move the point to the new mark and repeat the process until the final division falls past the opposite pin line, as in shown Figure 1.

Now, you'll mark off a second set of divisions in the same way starting from the opposite half-pin line (Figure 2). When you square lines across your compass marks, you'll have the start of perfectly spaced pins and tails.

Next, using the lines on the end of the piece, I lay out the tails on one face of the workpiece. A bevel gauge adjusted to the proper slope is my tool of choice for this task



(margin drawing). Mark every other line in one direction, then flip the gauge to mark the opposing sides. Lastly, mark the waste with an "X" so you won't cut on the wrong side of a line.

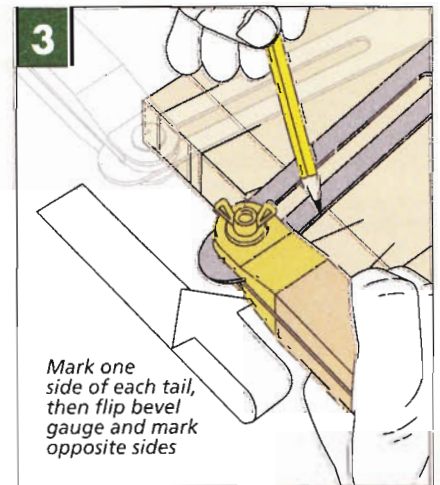
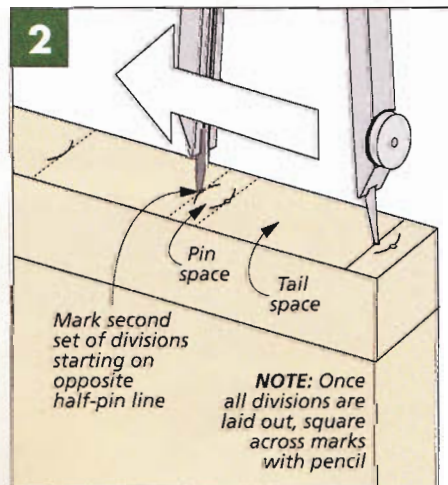
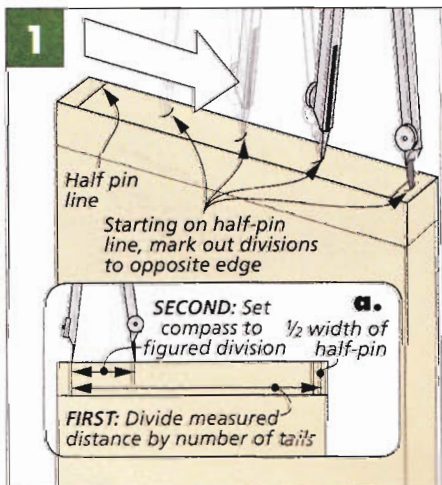
**MARK THE PINS.** Once the tails are cut, you simply mark the pin board from them. Clamp the pin board upright in the vise and lay the tail board over it, as in the main drawing on the opposite page. Use a straightedge to align the edges of the pieces and then be sure to align the pin board with the baseline of the tails.

Mark along the edges of all the tails with a sharp pencil. Then pick up a square and continue lines down the outside face of the pin board. And finally, scribe the baseline along both faces.

Sometimes it can seem like laying out the dovetails takes about as long as cutting them. I know this isn't true, and when you streamline the process, it all goes faster and turns out better. **W**



**Slope.** I use the graduations on a framing square to adjust the bevel gauge to the desired slope.



# Questions & Answers

## Wood Species: What's In a Name?

**Q** I was shopping for lumber recently and came across some Brazilian cherry. What is the difference between Brazilian cherry and American cherry?

Ivan Kovanich  
Pittsburgh, Pennsylvania

**A** It's fairly common to see names like Brazilian cherry, Bolivian rosewood, or Philippine mahogany when shopping for hardwoods. At first glance, it's easy to mistake these woods for the traditional species that woodworkers have known for years.

**HYPE.** But often, names like these are really just a marketing technique. For instance, Philippine mahogany is not really a mahogany at all. And Tasmanian oak is

actually a species of eucalyptus. These are both examples of less expensive woods masquerading as something they're not.

However, not every wood is given a name with the intention to deceive. Brazilian cherry looks very similar in color and grain to aged American cherry. Yet it's typically harder and slightly more expensive than American cherry.

Sometimes, a substitute wood is used because the "genuine" article is endangered or so heavily regulated that it's no longer commercially available.

Brazilian rosewood (*Dalbergia nigra*), is often considered "genuine" rosewood. But because it's a highly protected species, it's nearly

impossible to find commercially. A common substitute is East Indian rosewood (*Dalbergia latifolia*). Both are in the same genus, so both are considered rosewoods.

On the other hand, Bolivian rosewood (also known as pao ferro), is another common substitute for rosewood. However, this wood is actually in the genus *Machaerium*, so it's not classified as a true rosewood.

**SCIENTIFIC NAMES.** This brings us to another point. If you're shopping for a specific wood, particularly an exotic hardwood, it pays to ask for the scientific name. This is really the best way to know what you're buying. There are several websites that identify woods by their common

and scientific names. (One that I often use is [wood-database.com](http://wood-database.com).)

**CHARACTERISTICS.** While many substitute woods look similar to their namesakes, they may have different qualities and working characteristics, such as hardness, resistance to shrinking, and machineability.

For years, lignum vitae has been prized for its density, strength, and ability to resist decay, even in damp conditions. It's a naturally oily wood that grows only on a few Caribbean islands and has become harder to source in recent years.

As a result, a lot of wood dealers now sell "Argentine" lignum vitae. It's also a heavy, dense wood and is similar in appearance (see photos at far left). But it lacks some of the same qualities that make genuine lignum vitae so useful.

Finally, keep in mind that just because a wood may have a bogus-sounding name doesn't necessarily make it something to stay away from. Many of these woods are still quite beautiful and useful in their own right. Just make sure you know what you're getting before you lay down your hard-earned cash. **W**



▲ Argentine lignum vitae (top) is often used as a substitute for genuine lignum vitae (bottom).



▲ Brazilian cherry (top) is not related to American black cherry (bottom), although it looks quite similar.



▲ East Indian rosewood (top) and Bolivian rosewood (bottom) are two common rosewood substitutes.



## hardware & supplies

# Sources

Most of the materials and supplies you'll need to build the projects are available at hardware stores or home centers. For specific products or hard-to-find items, take a look at the sources listed here. You'll find each part number listed by the company name. See the right margin for contact information.

The *Woodsmith Store*, in Des Moines, Iowa, is an authorized *Rockler* dealer. They carry many of the hardware items used in our projects. And they ship nationwide. Their customer service representatives are available for your calls from 8am - 5pm Central Time, Monday through Friday.

### ARKANSAS STONES (p.8)

- **Woodcraft**  
Honing Stones . . . . .Varies
- **Dan's Whetstone Co.**  
Honing Stones . . . . .Varies

### RANDOM ORBIT SANDERS (p.10)

- **Amazon**  
Mirka CEROS . . . . .B007VTTNP6  
Festool Rotex 125 . . . . .B004R15I4Q

### CIRCULAR SAW (p.12)

- **Rockler**  
Greg Rip-Cut . . . . . 47494
- **Home Depot**  
Bora 50" Wide Clamp . . . 541050  
Bora Saw Guide . . . . . 542001  
Bench Dog Pro-Cut . . . . .10-019

### WALL SHELVES (p.16)

- **Lee Valley**  
7/8" Alum. Knob . . . . .00W32.50
- The door tracks and shelves were stained with *General Finishes' Brown Mahogany Gel Stain*. All the parts were sprayed with two coats of lacquer.

### CRAFT CABINET (p.20)

- **Rockler**  
2<sup>15</sup>/<sub>16</sub>" Locking Casters . . . 34387  
Push Button Catch . . . . . 64477
  - **Lee Valley**  
Flange Hinges . . . . . 00H60.12  
Brass Hinges . . . . . 00W23.01  
Brass Knobs . . . . . 00W90.12
- The craft cabinet was stained with *General Finishes' Candlelight Oil Stain*, and then sprayed with a couple coats of satin lacquer.

### TALL CASE CLOCK (p.34)

- **Klockit**  
"Bim Bam" Movement . . . 12228  
4<sup>1</sup>/<sub>16</sub>" Clock Hands . . . . . 66971  
10" Clock Dial . . . . . 26088  
Pendulum Drive Unit . . . . 19012  
Pendulum Assembly . . . . . 19070  
(Note: This pendulum is used in place of the pendulum supplied with the clock movement.)
  - **Rockler**  
2" No-Mortise Hinges . . . 28688  
Brass Ball Catches . . . . . 28662
- The clock was stained with a custom mixture of three parts *Zar Cherry* and one part *WoodKote Jel'd Cherry*. This was followed with two coats of spray lacquer.

### TABLE SAW TENONS (p.44)

- **Acme Tools**  
General Tenoning Jig . . . . .50-050

### FINISHING AREA (p.46)

- **Rockler**  
Painter's Pyramids . . . . . 21167  
Lazy Susan Hardware . . . . 28977
- **Home Depot**  
Husky Wall Cabinet . . . . . 236852  
Architect Desk Lamp . . . . . 560573

## MAIL ORDER SOURCES

Project supplies may be ordered from the following companies:

**Woodsmith Store**  
800-444-7527

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

**Acme Tools**  
877-345-2263  
acmetools.com

**Amazon.com**

**Dan's Whetstone Co.**  
501-767-1616  
danswhetstone.com

**General Finishes**  
800-783-6050  
generalfinishes.com

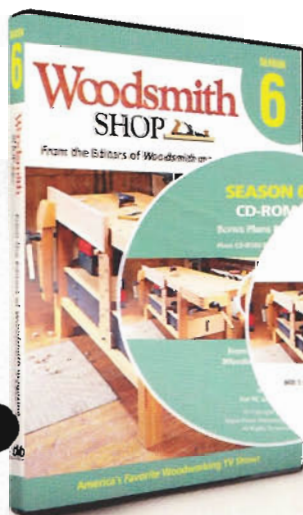
**Home Depot**  
800-466-3337  
homedepot.com

**Klockit**  
800-556-2548  
klockit.com

**Kreg Tool**  
800-447-8638  
kregtool.com

**Lee Valley**  
800-871-8158  
leevalley.com

**Woodcraft**  
800-535-4482  
woodcraft.com



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# looking inside

## Final Details

- ▶ *Tall Case Clock.* Inspired by traditional Shaker design, this tall clock features straightforward joinery paired with simple details. You can find step-by-step plans for building the clock beginning on page 34.



- ▶ *Wall-Mounted Shelves.* Sliding doors on these wall shelves allow you to use one side as storage and the other side for display. You can also arrange the shelves and storage units in different configurations to suit your available wall space. Turn to page 16 to get started.



- ▶ *Craft Center.* Swing-out storage compartments and a hinged top provide plenty of space for all of your hobby needs. And when you're done, this project folds up neatly and rolls out of the way. Complete plans begin on page 20.

