5 handy shop helpers — clamping tips & tricks

ShopNotes

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Vol. 18 Issue 106

Small Shop Project Center

Does It All – Cut, Rout, Join, Clamp, & Store

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- Must-Have Bit for a Flawless Fit
- Router Table Jig for Strong Joinery
- Secret Shop Accessories Revealed
- Table Saw Master Techniques

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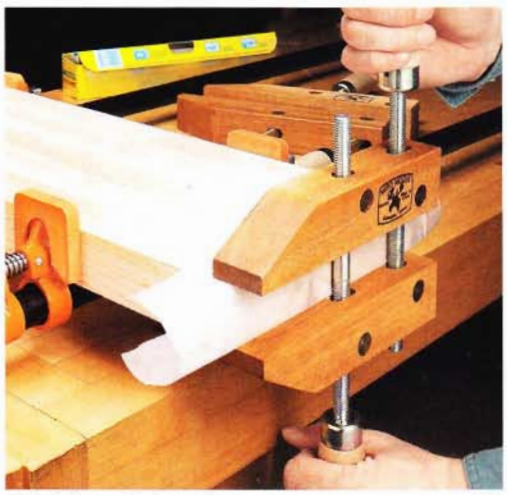

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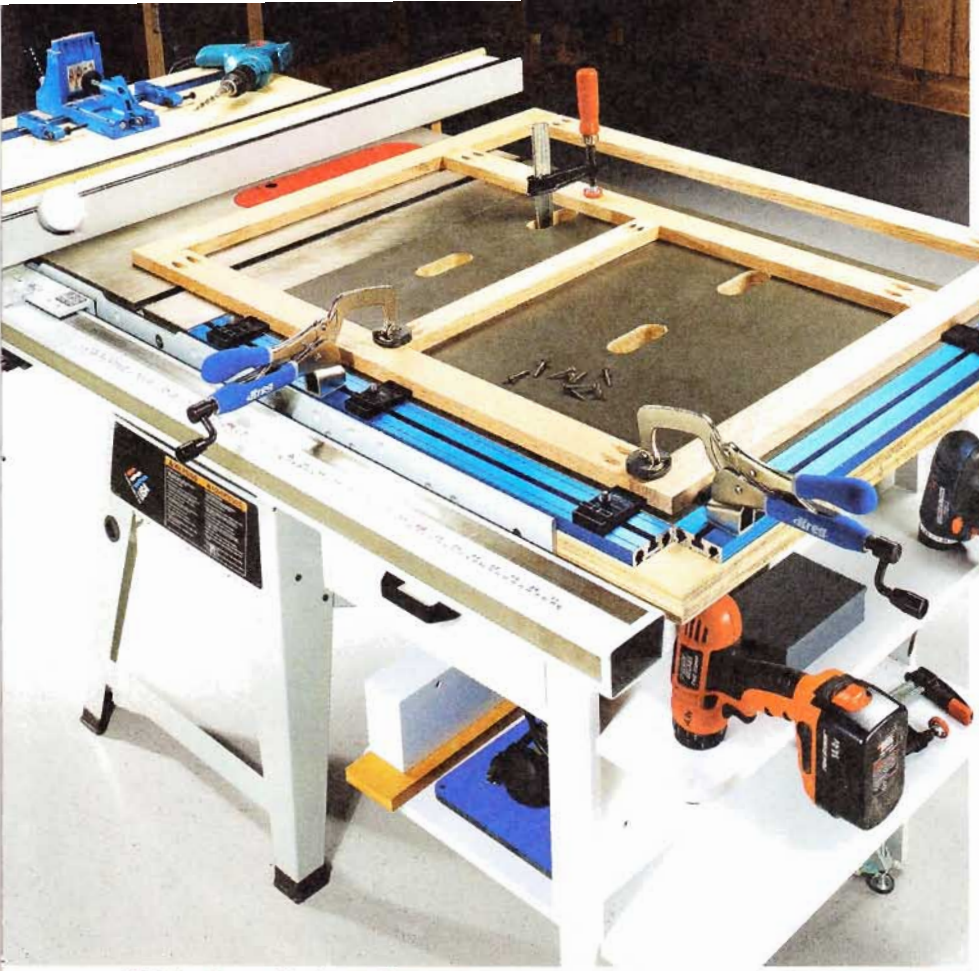


Table Saw Project Center page 24

Cutoffs

I'll be honest — I don't have a dream shop. You know, the shop where everything fits perfectly, there's always just the right amount and type of storage, and the latest tool is just an arm's length away. Like other woodworkers, I simply try to get everything I can from the tools I have and every square foot of storage space.

To help us all out, this issue is packed with projects and articles that address the needs of every woodworker — doing more with the time we spend in our shop.

The project center you see at left is a perfect example. At one time or another, we've all used our table saw to assemble a project. This project center takes it up a notch by replacing the stock wings of your table saw with shop-built versions. These new wings incorporate a router table, pocket hole station, assembly area, and loads of storage into a one-of-a-kind, compact work zone.

They say you can never have too many clamps. And that's true — until you try to organize and store them all. Our all-new, wall-mounted clamp rack (page 16) holds a ton of clamps in a compact space. And you can build it to suit the clamps you have. Buy more clamps? No problem. Just add a matching unit as your collection grows.

These two projects just touch the surface of what you'll find in this issue. Take a look inside for even more projects, tips, and techniques to get the most out of your shop.

Terry

ShopNotes GO ONLINE EXTRAS

This symbol lets you know there's more information available online at ShopNotes.com

from our Readers

Tips for Your Shop

Wall-Mounted Router Table

Like many home woodworkers in the U.K., space is at a premium in my garage workshop. My woodworking has to share the same space as the family car.

I solved part of the problem by building the fold-up router table you see here (main photo). Its large worksurface provides plenty of support for any size workpiece. But the best part is, it folds up against the wall to provide extra room to work when needed.

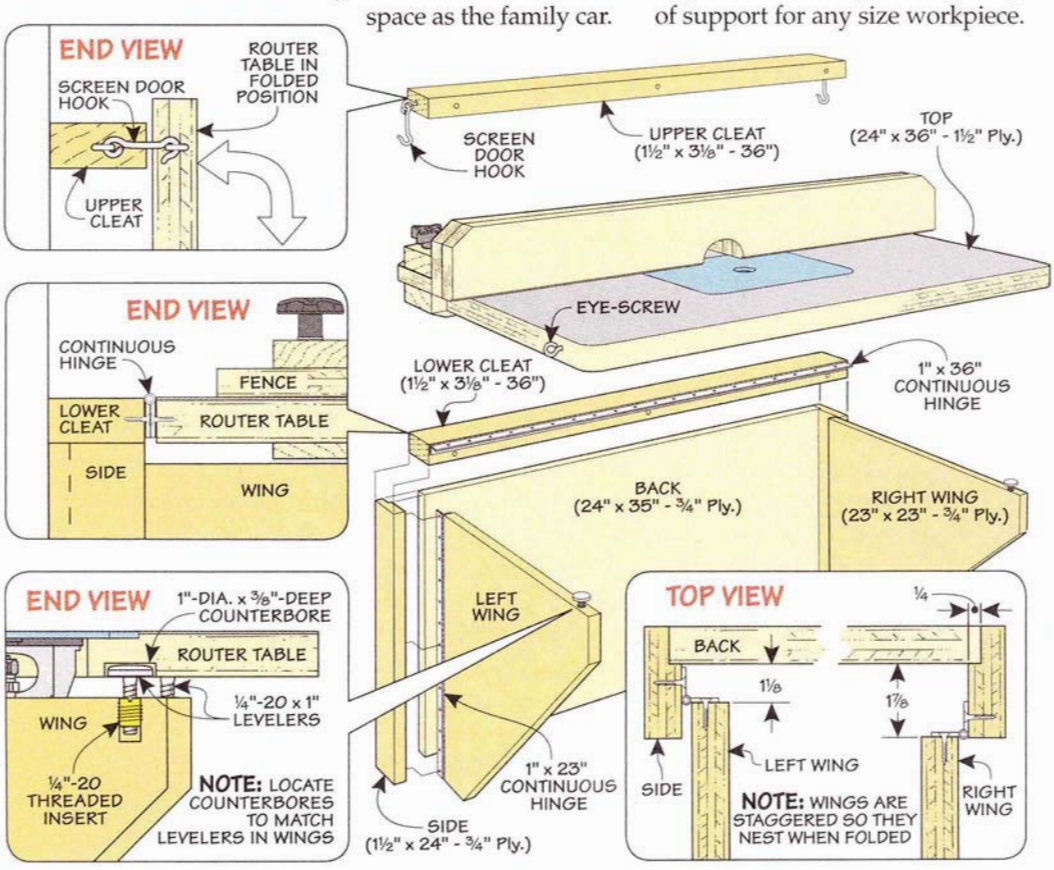
The drawings at left give you an idea of how it all works. The support structure with the folding wings is sized to fit my router table. The length of the two cleats (upper and lower) matches the width of the router table.

You can start with the back panel and add the two side pieces that hold the folding wings. The wings are attached to the sides with a continuous hinge. I staggered mine so the wings would fold flat, one on top of the other (Top View at left).

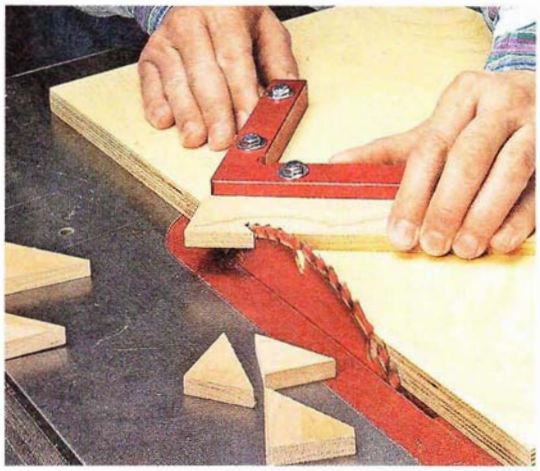
Next, I mounted the lower cleat to the back and sides then attached the top to it with a hinge. To locate the upper cleat, flip the top up against the wall. Then to hold the top in place against the wall, add the screen door hooks.

Finally, lower the top to locate the counterbores underneath for the leveling hardware, as shown in the lower end view at left.

Paul Liggins
Coventry, Warwickshire, England



45° Miter Sled



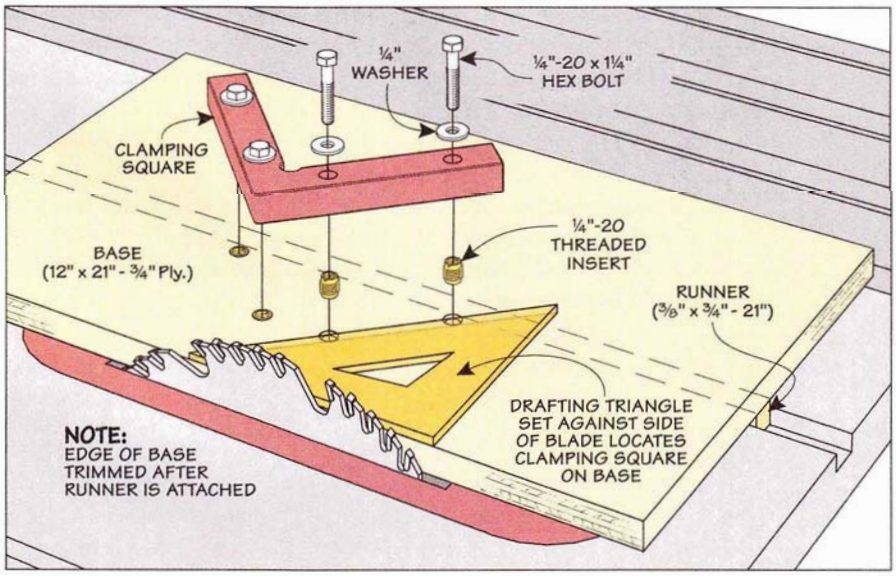
I use clamping squares all the time when assembling cabinet cases. But I've found another use for these multi-purpose shop accessories.

You can see in the photo and drawing below how I made a miter sled using a clamping square and a scrap piece of plywood. What's really nice is, it's easy and inexpensive.

I started with the base using a piece of plywood roughly 12" wide by 21" long. Then I mounted a runner underneath to fit the miter slot of my table saw. Locate the runner so you can trim the edge of the base to create a clean reference edge for locating the clamping square.

The last step is to attach the clamping square to the base, as you can see in the drawing below. A drafting triangle registered against the body of the blade positions the clamping square at the correct angle. Now, perfect, gap-free miters are guaranteed with this simple sled.

Craig Highsmith
Annandale, New Jersey



Submit Your Tips Online!

If you have an original shop tip, we would like to consider publishing it. Go to

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There, you'll be able to describe your tip in detail and upload photos or drawings. Or you can mail your tip to the editorial address shown in the right margin. We will pay up to $200 if we publish your tip. And if your tip is selected as the top tip, you'll also receive the *Bosch Impactor* shown on the right.

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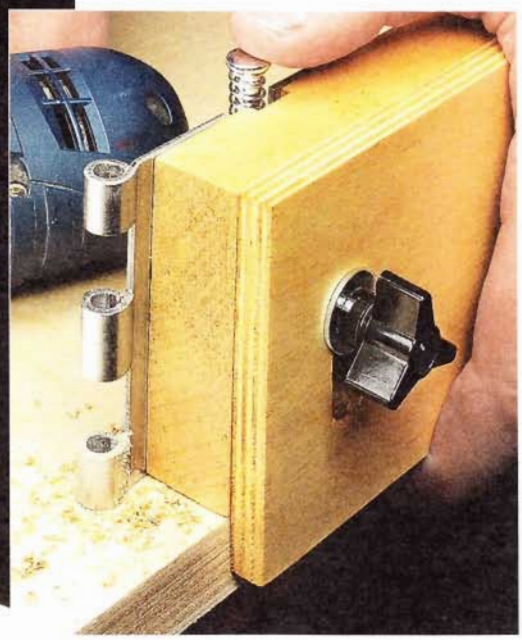


THE WINNER!

Shop-Built Drilling Jig

Recently I needed to drill some ¼" holes for shelf pins. Rummaging through the shop, I came up with the idea of using a door hinge, a block of wood, and plywood as a drill guide (photo above).

The hinge I used was for an entry door and had a pin that was ¼" in diameter. After removing the pin to separate the leaves, I attached one hinge leaf square to the wood block using round-head screws and washers. Note: My block was 1" thick by 8" long and the height (width) matches the length of the hinge (3" in my case).

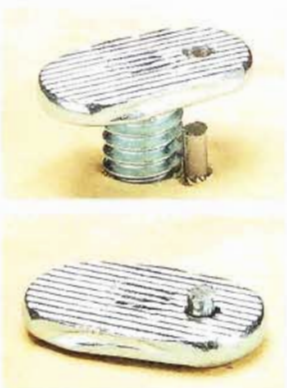
Next, I mounted the other hinge leaf to the block so that the barrels of each leaf were 2" apart. (You'll need to cut a shallow dado for the hinge knuckle.) This way, you can use the hinge leaf and pin to index the jig for evenly spaced shelf pin holes. A spring keeps the pin out of the way when it's not needed.

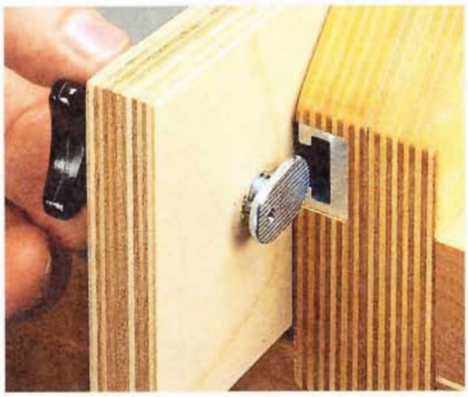
An adjustable fence serves as a reference for locating holes from the edge of the workpiece, as shown in the inset photo. The slots let you slide the fence to the opposite edge of the block. This way, you can flip the jig to drill mating holes on the opposite edge of the workpiece.

To use the jig, just chuck a ¼"-dia. bit in your drill. Adjusting the amount the drill bit protrudes below the bottom knuckle sets the desired hole depth. The drill chuck serves as a depth stop as it contacts the top of the jig.

Mark Gaskievicz
Post Falls, Idaho

Quick Tips





▲ *Adding T-track to jigs and fixtures makes them more versatile. But sliding accessories on and off the track can be a hassle because the head of the flange bolts aren't always aligned with the track.* ***Bill Huber*** *of Haslet, Texas has the solution. Drill a small hole in the flange bolt to fit over a small alignment pin in the jig made from a cut-off finish nail.*

▲ ***Charles Mak*** *of Calgary, Alberta found a unique solution to keeping pencils and and accessories handy at his power tools — inexpensive magnetic organizers used in lockers. You can find them online and at larger retail stores.*

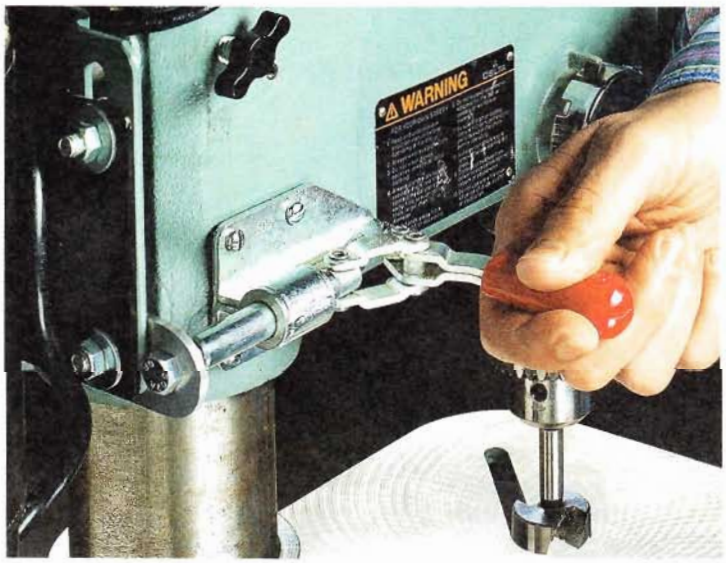
Inexpensive Storage

I'm a pack rat when it comes to hardware. This works to my benefit, though, since I rarely have to make a trip to the hardware store. But there's a minor problem. Storing all those miscellaneous pieces of hardware can be a challenge.

One day it occurred to me that I could use small plastic bags for storing the hardware and hang them on the pegboard. Once I started doing this, I quickly realized some advantages to this method. First of all, I can fit a lot of hardware in a small area. And second, everything is easy to see and pick out at a glance.

I use small food storage bags and sometimes order small, specialized bags from online sources.

Jim Dahlberg
Aztec, New Mexico



Drill Press Belt Release

Changing the speed of most drill presses involves moving the belt to a different location on the pulleys. But on some drill presses, releasing the tension on the belt so you can make this change can be a hassle.

I came up with a simple design for a "quick-release" to loosen the tension on the belt. As you can see in the photo at left, it requires mounting a toggle clamp on the drill press housing. You may have to drill and tap shallow holes to mount the clamp. The plunger of the clamp is attached to the motor mounting plate. (I had to add a small metal plate to engage the plunger, as you can see in the photo.)

On my drill press, toggling the clamp "off" releases the tension on the belt. Then it's easy to move the belt on the pulleys to change the speed.

Thomas Holloway
Maryville, Illinois

▲ *While gluing up a project,* ***Bryan Nelson*** *of Des Moines, Iowa found a use for all those "fake" credit cards he receives in the mail. They make excellent spreaders for getting an even film of glue on joints.*

▲ ***Bob Conway*** *of Olathe, Kansas has a window in his dust collector drum so he can check the sawdust level. To keep the plastic from attracting dust, he wipes it down with a fabric softener sheet.*

rockler Box Joint Jig

Looking for an easy way to make box joints? This jig from *Rockler* makes the whole process a snap.

I often built one-use jigs for cutting box joints at my router table. But that may not be the case any more since I tried out the *Rockler* box joint jig shown above. With it, you can start cutting perfect-fitting box joints in minutes (inset photo above).

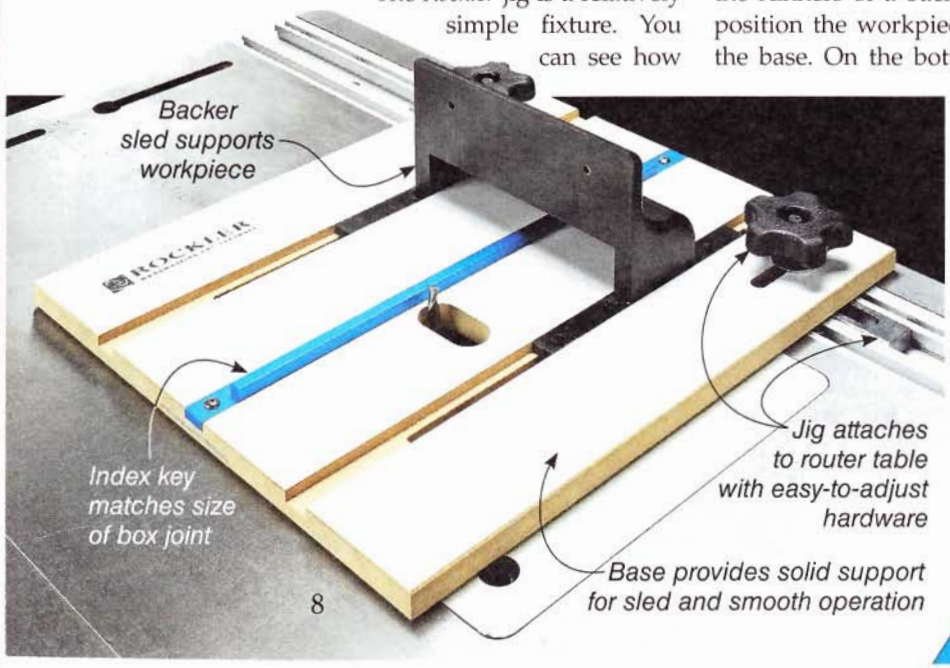
THE JIG

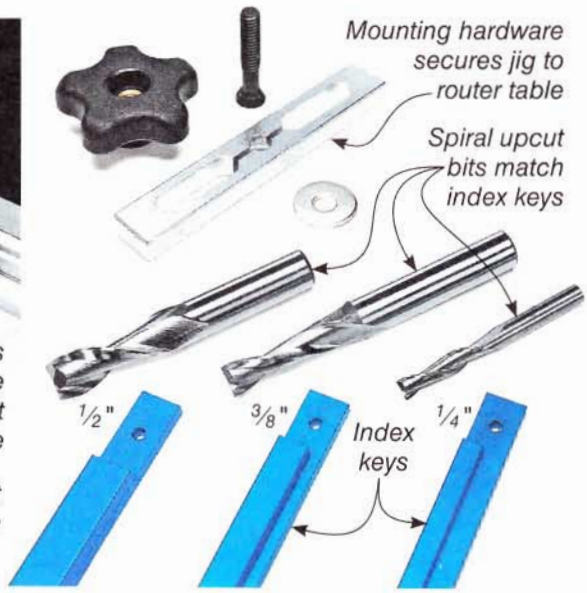
The *Rockler* jig is a relatively simple fixture. You can see how all the parts go together in the photo below. It only takes a few minutes to assemble the jig.

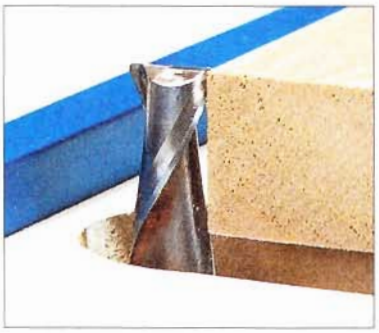
The melamine-coated base is made from ½" MDF. This provides a tough, wear-free surface. Designed into the base are a number of grooves and slots.

The two outside grooves accept the runners of a backer sled that position the workpiece square to the base. On the bottom of each runner is an extended tab. The tab fits into a narrow slot cut into the bottom of each groove. The tabs provide a positive stop and prevent you from routing through the back of the sled.

Precision Keys. In the center of the base is another groove that accepts one of three precision-machined aluminum indexing keys included with the jig (photo below). The keys match the most







▲ ***Positioning the Key.*** *Using a precision set-up bar makes quick work of positioning the key to produce perfectly spaced box joints.*

◀ ***Depth of Cut.*** *After the spacing is set, all that's left to do is set the depth of cut. Using a workpiece ensures an accurate setting.*

Add Solid Support. *To provide more support for the workpiece and back up the cut to prevent chipout, attach an auxiliary fence to the backer sled.*

common sizes of box joints: ¼", ⅜", and ½". Simply remove a couple of screws and replace the key.

Although you can use a straight bit to cut the box joints, I find that I get better results using a matching spiral upcut bit (photo below). Note: Bits are not included in the price of the jig ($80). For information on sources, turn to page 51.

Installing the Jig. Installing the jig on your router table is quick and easy. The mounting hardware consists of a pair of expandable, metal bars, and a set of machine screws, washers, and knobs. Tightening the knob expands the bar and locks it into the miter slot. Note: Although the jig is designed for use on a router table with a miter slot, you could remove the mounting hardware and clamp the jig in place.

The machine screws fit through a pair of adjustment slots. This way, you can easily position the clearance hole in the base of the jig over the bit. The hole is oversized to provide room for each size of router bit and allows you some "wiggle" room for fine-tuning the jig.

SETTING UP THE JIG

With the assembly complete, the first step in setting up the jig is to position the index key accurately. The spacing from the bit determines the size of the pin on the box joint. The pins should match the size of the bit and key. I use a precision set-up bar to do this (upper left photo).

At this point, you can tighten both knobs to lock the jig in place. Then, just grab a workpiece and use it to set the height of the router bit (inset photo above). Note: If your table features above-the-table height adjustment, you'll need to set the bit height first.

Although you could use the backer sled as is, it's a good idea to add an auxiliary fence (photo at upper right). This backs up the cut and makes it easier to support wider workpieces during the cut. Note: You'll need to cut a small notch in the auxiliary fence so it fits over the index key.

ROUTING BOX JOINTS

Using the jig to create box joints is simple. Position the workpiece against the key, make a pass, and then slip the newly created slot over the key and repeat the process. To cut the mating piece, simply flip the first workpiece around and use it to position the mating piece.

After cutting the box joints in both pieces, you may find that you need to fine-tune the fit a bit. For more on this, check out the photo at right.

In just a few minutes of making test cuts, I was able to create tight-fitting joints. But as I found out, there are a couple things to keep in mind as you use the jig.

For starters, make sure you keep the backer sled perpendicular to the base as you make a pass. It doesn't take that much effort to flex the runners of the jig if you lean over to watch the cut.

Doing this produced slightly angled bottoms on the slots. So when I assembled the joint, I ended up with small gaps. On the next test cut I paid more attention to the position and ended up with straight, flat bottoms on the slots.

The runners on my sled also had some minor side-to-side play, as well. So I made sure to always keep the pressure against the same side of the slots for consistent pin sizing.

If you pay attention to these minor issues, you'll find that the *Rockler* box joint jig is a great choice for making tight-fitting box joints on the router table.

▼ ***Fine-Tuning.*** *By loosening one of the knobs (or a clamp) and pivoting the jig, you can easily zero in on snug-fitting box joints. Pivoting the key toward the bit will loosen the fit, while pivoting away will result in a tighter fit.*

7 must-have Shop Tapes

Learn how these tapes can lend a helping hand for a wide range of tasks around the shop.

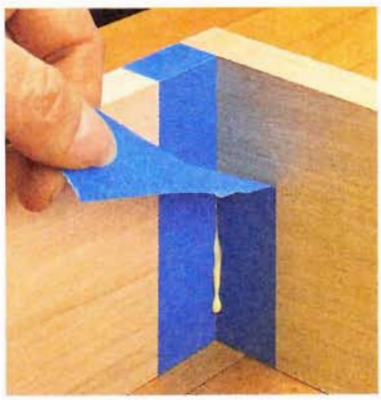
1 A roll of double-sided tape ("carpet tape") should be in every woodworker's shop. It's great for temporarily positioning drawer fronts for installation (photo above) or attaching a template to a workpiece for routing.

Paper-backed carpet tape has plenty of strength for most applications. But for heavy-duty use, I go for the mesh or cloth-backed tape. The adhesive is much stronger. This is why woodturners use it for fastening a workpiece to a lathe faceplate.

To use double-sided tape, cut it to length and apply the unfaced, adhesive side to the workpiece. Then you can peel the paper backing off to expose the adhesive on the other side.

2 After using blue painter's tape, I won't go back to traditional masking tape again. Traditional masking tape is hard to remove and often leaves a residue on my projects. The blue variety eliminates these problems. Its adhesive is less tacky than traditional masking tape, so it comes off cleanly.

I use masking tape on project pieces to make cleaning up glue squeezout easier (photo at right). It's also handy for layout work — especially on darker woods. My pencil lines show up better. That's why I'll also use painter's tape to label parts on more complex projects. And when you've finished assembling the project, removing the tape cleanly is no problem at all.



3 I've thrown out the last roll of duct tape I had in my shop. It turned into a gummy mess and left behind a sticky residue when I needed to remove it.

Instead, I rely on "gaffer's tape." Its claim to fame is its use in the motion picture and television industry. Electricians on the set use it to tape down or bundle electrical cords. The best part is, when it's removed, it doesn't leave any of the adhesive behind.

But that's not the only reason for keeping a roll handy in the shop. Gaffer's tape is great for lending a hand when assembling a project. When the glue sets, you can remove it without the worry of cleaning up remnants of tape adhesive.

4 One of the handiest types of tape to have around the shop doesn't have any adhesive at all. It's shrink wrap or "shrink tape."

Shrink tape is available at businesses that rent trucks and sell moving supplies. It's unique in that it stretches and sticks to itself. This makes it ideal for bundling lumber and project parts. You can pull it tight as you wrap up the workpieces to create a secure bundle.

This handy feature also makes shrink tape useful when clamping awkward or odd-shaped parts. As you pull it tight, it conforms to the object to apply even clamping pressure. And it's a bonus that glue doesn't stick to it.

5 Nothing beats a high-quality packaging tape for quick repair and clamping jobs. I like to use the thicker, professional tape. The thinner tapes are hard to unwind from the roll and tear into shreds easily.

Packaging tape is useful for more than mending the cardboard boxes I use for storage in the shop. In the photo, you can see how it lends a hand when clamping up mitered boxes. Just lay out a length of tape on your bench with the adhesive side up. Then place your pieces with the outside face down on the tape. After applying a little glue to the joint, you can "roll up" the box while the tape acts as a hinge, connecting each corner perfectly.

NOTE: *To find out where to purchase these various tapes, refer to Sources on page 51*

6 One of my most recent discoveries is silicone tape. It's a thick, rubbery, high-friction tape which makes it ideal for adding some grip to tool handles and slippery clamp handles (photo below). Like shrink tape, there's no adhesive. The tape sticks to itself and it fuses together.

Silicone tape is useful for a variety of projects around the house and I keep finding uses for it in the shop — like wrapping the jaws of clamps so they won't mar my projects. And you can wrap a short length of tape around your fingers to protect them when grinding metal or to help you control a workpiece at the band saw or scroll saw.

7 Vinyl electrical tape (not the cloth-backed variety) is handy for a lot more tasks than tying up loose ends of electrical work. Its stretchy nature makes it a great clamping aid. I'll sometimes use several strips as "clamps" when gluing hardwood edging to plywood, for example (photo below).

Electrical tape is great for tying up the slack in my stationary power tool cords to keep them up off the floor and out of the way.

You'll find vinyl tape in a variety of colors. I keep a few colors on hand to make labels for hardware bins or containers. I also place an identifying strip of tape around some of my tools that tend to get "borrowed" on occasion.

all about Dust Masks

These low-cost accessories will keep you breathing easy during dusty shop tasks.

There's no question I enjoy the time spent in my shop. But one thing can put a damper on that in a hurry — dust. Some tools (sanders and routers) and materials (MDF) create clouds of dust that are difficult to collect at the source and can be a real nuisance. Worse still, fine dust can aggravate allergies and lead to other health problems. This is why I consider an effective dust mask a must-have accessory.

There's more to choosing a dust mask than just grabbing a pack of masks at the hardware store, though. You want to make sure the mask is right for the job. And it should fit well and be comfortable.

Right Rating. For starters, the mask needs to be rated to trap wood dust. So look for a mask with a rating of N95 or higher. A mask with this rating will filter out 95 percent of the harmful dust particles from the air.

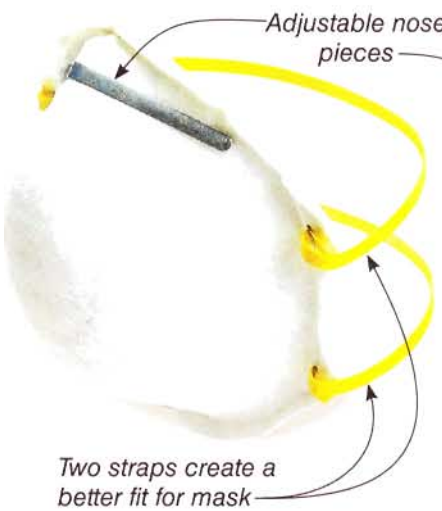
There's one other important thing I'd like to mention. These masks are for dust only. Strong fumes from finishes and solvents require the use of a cartridge-style organic vapor respirator.

Two Styles. Besides the filter rating, another thing to consider is the style of mask. As you can see, masks come in a range of styles. They can be divided into two main types — disposable masks, and respirators with replaceable filters.

Disposable Masks. The masks shown on the bottom of the page

NOTE: For sources of the masks, turn to page 51

Basic Dust Mask ($.75)



Saf-T-Fit Plus ($1.50)

Pocket MXV ($3)

Comfort-Fit Respirator ($15)

are the most common. The main advantages of a disposable mask are its low cost and effectiveness. The basic mask (far left photo) works well for short-term use. But better quality masks have some features to give you a comfortable, more air-tight fit. (The box at right provides some tips for getting the best fit with a mask.)

Upgrades. One of the problems I have with a basic dust mask is that after a short time, my face gets hot and sweaty. And every time I exhale, the warm, moist air fogs up my glasses. To solve these issues, some masks are designed with exhalation valves. This feature is well worth a slightly higher price.

Another comfort feature is shown in the right mask on the facing page. This one is made from soft, flexible cloth. The breathable fabric keeps your face cooler and fits the contours of your face without creating pressure points.

Respirator Masks. If you plan to wear a mask for long periods of time, then a comfortable fit is really important. That's where the masks on this page stand out. The big difference is the two-piece design.

Face Piece. Each mask has a permanent, soft rubber face piece with adjustable straps. The flexible rubber forms a tighter seal on your face without pinching. And the wide, adjustable straps give you more control in adjusting the fit of the mask to your face.

Throwaway Filter. A replaceable filter completes the mask. It slips onto the face piece. What I like is they feel less constricting and more breathable than disposable masks, which goes a long way toward keeping my face cool.

What's the right mask? The answer is the one you'll wear. And you can be sure it will keep you breathing easier and enjoying your shop time more.

Low-Profile Respirator ($16)

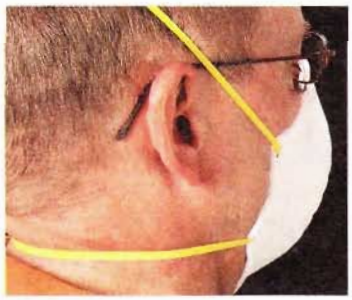
Get the Right Fit

In order to take full advantage of the benefits a dust mask has to offer, you need to wear it correctly. Just slipping it over your face isn't enough.

Ideally, you want *all* the air you breathe to pass through the mask. The design of the mask and the shape of your face are rarely a perfect match. (Note: Facial hair prevents the mask from getting a tight fit on your face and reduces its effectiveness.)

Thankfully, a good mask allows you to fine-tune the fit. How you do this depends on the style of dust mask you choose. For disposable masks, you can take a look at the steps shown in the photos below. To adjust the rubber face piece on a respirator, all you need to do is adjust the position and tension of the straps until you have a good seal.

◄ ***Nose.*** *Press nose piece down and in to conform it to the shape of your nose for a tight seal.*



◄ ***Straps.*** *The lower strap goes below the ear. The upper strap wraps around the crown of your head.*

◄ ***Check for Leaks.*** *Feel for air leaks when you exhale. Adjust the straps to create a tighter fit.*

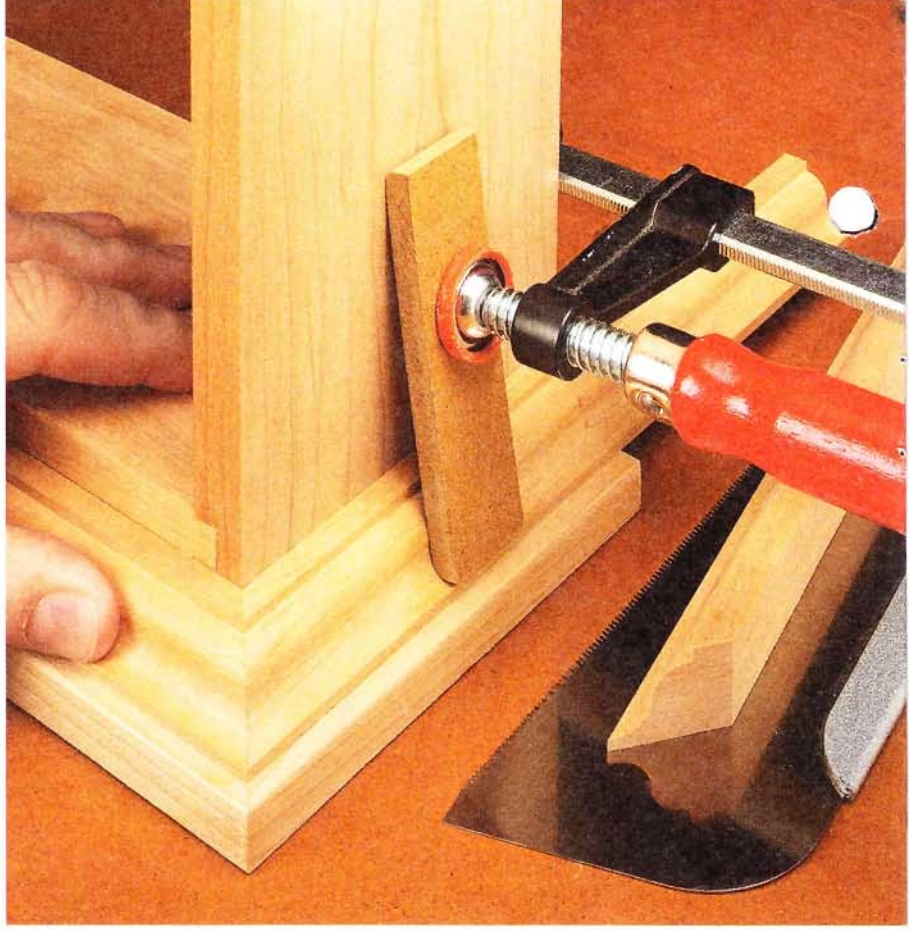
► ***Keep it Clean.*** *For longer life, allow the mask to dry and store it in a plastic bag between uses.*

HANDS-ON

Technique

perfect mitered Molding

With a few simple techniques, you can fit seamless moldings to almost any project.



Applying molding to a project adds detail to and softens transitions on furniture projects. And often, the profile of the molding helps define the style of the project.

Since the molding attracts so much attention, you want to make sure it's installed right. That usually boils down to getting tight-fitting mitered corners.

Most of the time, a project only requires molding on three faces — the front and two sides. That means you only have to focus on fitting two miter joints each for the top and bottom of the project.

The Approach. Getting good results takes a plan. When you think about it, your attention is focused on the front of the piece. So that's where I start. And I have two goals: Cutting the molding to the right length and cutting an accurate miter. If either of these isn't right, there will be a gap.

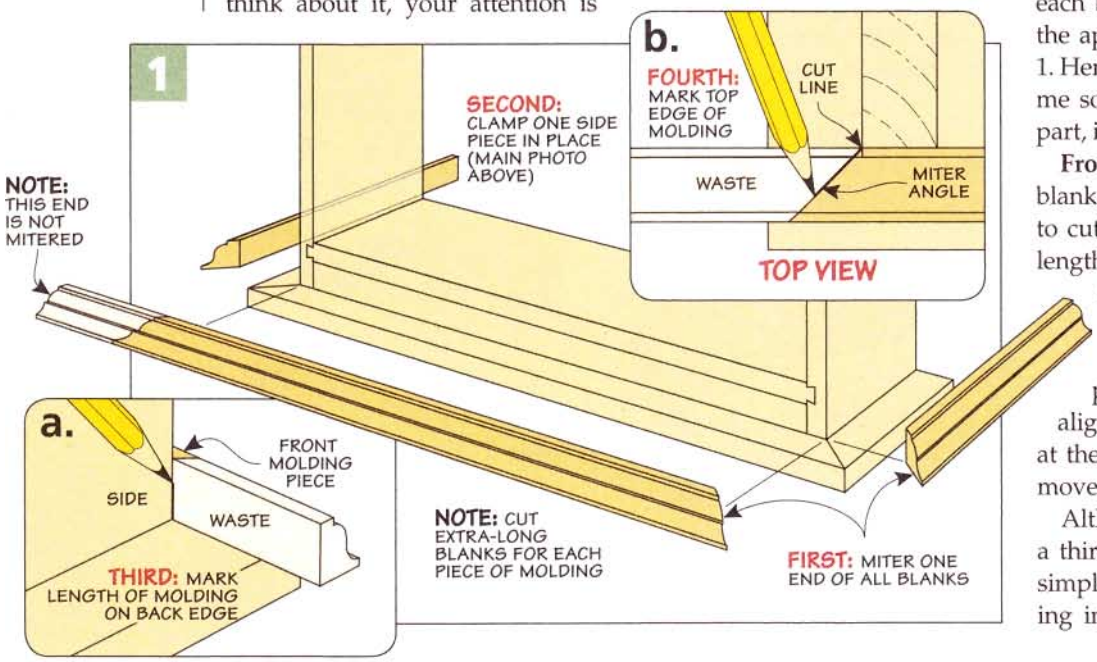
For small projects, like the wall shelf shown here, I like to cut the molding with a handsaw and miter box. The thing is, it's difficult to "tweak" a cut with a handsaw. So I've come up with a straightforward, unique approach to adjusting the fit of each miter joint.

Begin With Blanks. To start with, I make extra-long molding blanks for each side. I also label the parts to indicate which face goes against the case. It's all too easy for one of the blanks to get turned around and be cut the wrong way.

Then you can miter one end of each blank. Just be sure to miter the appropriate end, as in Figure 1. Here again, the long blanks give me some wiggle room to recut a part, if necessary.

Front First. With the molding blanks laid out, the next step is to cut the front molding piece to length. And instead of measuring, I like to mark the length directly on the blank. To do this, use one of the side pieces as an index block to align the front molding exactly at the right corner. Then you can move to the opposite end.

Although it seems like you need a third hand to do this, there's a simple trick. Hold the side molding in place with a small clamp



and a strip of hardboard, as shown in the photo on the facing page.

Mark the back side of the molding piece with a pencil and carry the mark to the top edge, as shown in Figures 1a and 1b. This way, you can see the mark when the molding is held in the miter box. Line up the workpiece so that the saw will just cut away the mark at the back edge of the molding.

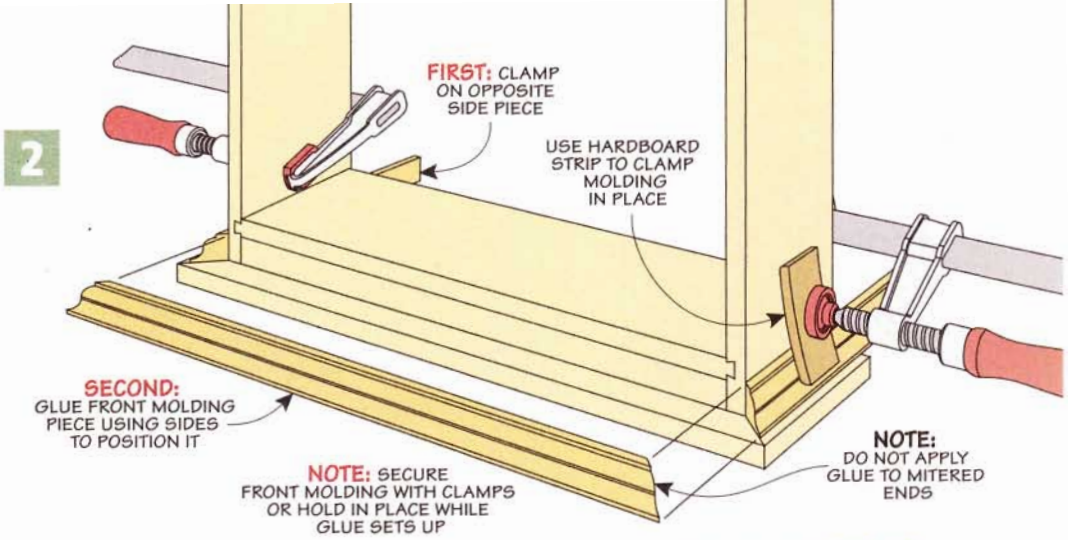
It's a good idea to double-check the fit of the piece before going any further. Clamp both side blanks in place and fit the front molding piece (Figure 2). Don't worry about any small gaps in the joints at this point — you'll take care of those in a minute. If the strip of molding is too long, you can sand it down. But if it's too short, you'll need to make up a new piece.

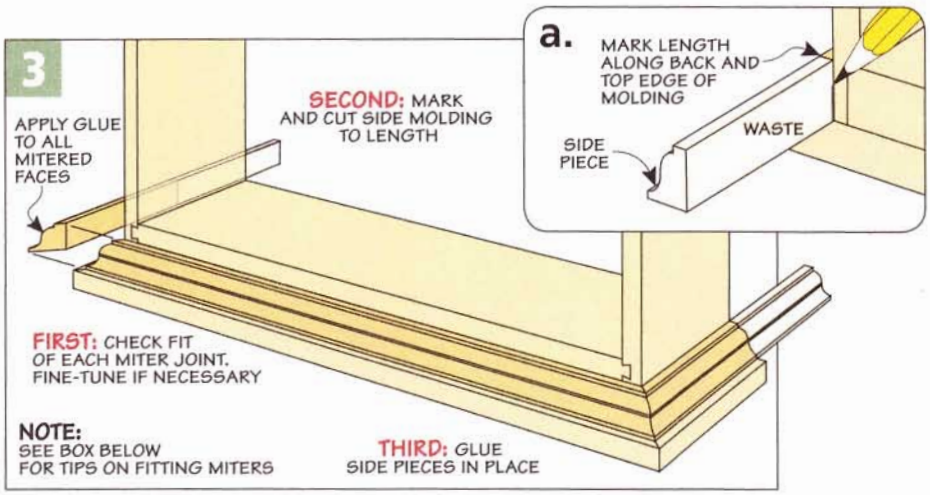
Attaching the Molding. The next step is to attach the front molding piece to the project. For small cabinets and shelves, I prefer to glue the molding in place.

Side Pieces. Now you can turn your attention to the side molding. Since you've already mitered them, it would seem all you need to do is cut each piece to length and glue it down. But now is the time to check the fit of each joint. How well does it comes together? If there are gaps, you can fine-tune the side piece until you get a tight-fitting joint. You can see how I do this in the box below.

The final step in the process is marking and cutting the side pieces to final length. Once again, I mark the length directly on each piece (Figure 3a). Then it's just a matter of crosscutting to the line. When gluing these pieces in place, I like to spread some glue on the mitered face, which helps to conceal the joint line, as in Figure 3.

On a small project, details make a big difference. And once you master this technique, you can get them right every time.





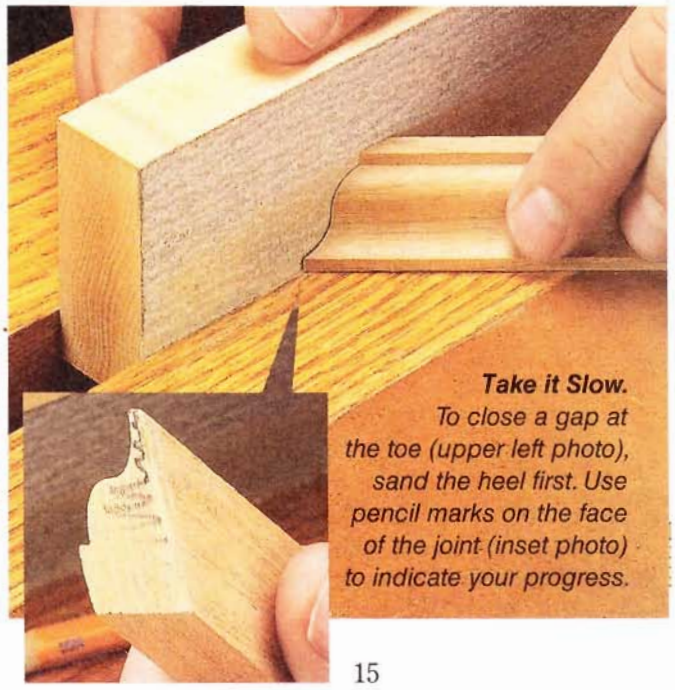
fine-tune the fit
No More Gap

Even with careful cutting, a miter joint may not close tightly. If you find an open joint line, don't worry. The solution is a simple sanding block.

The key is knowing where to sand. You want to remove just enough material from where the joint is tight until the gap closes. To do this, first darken the face with a pencil. This helps you monitor your progress. Then drag the face across a sanding block held in a vise. Here, you're sanding only where the joint is tight, as in the main photo at right. After a couple of strokes it should look like the inset photo. This leaves a slightly faceted face. To smooth it out, remark the face and make a few more passes to create a flat surface.

▲ *Gap at Toe*

▲ *Gap at Heel*



Take it Slow. *To close a gap at the toe (upper left photo), sand the heel first. Use pencil marks on the face of the joint (inset photo) to indicate your progress.*

wall-mounted Clamp Rack

Get high-capacity clamp storage in a compact space.

Clamp storage is a problem every woodworker faces. But this compact, wall-mounted system provides the perfect answer.

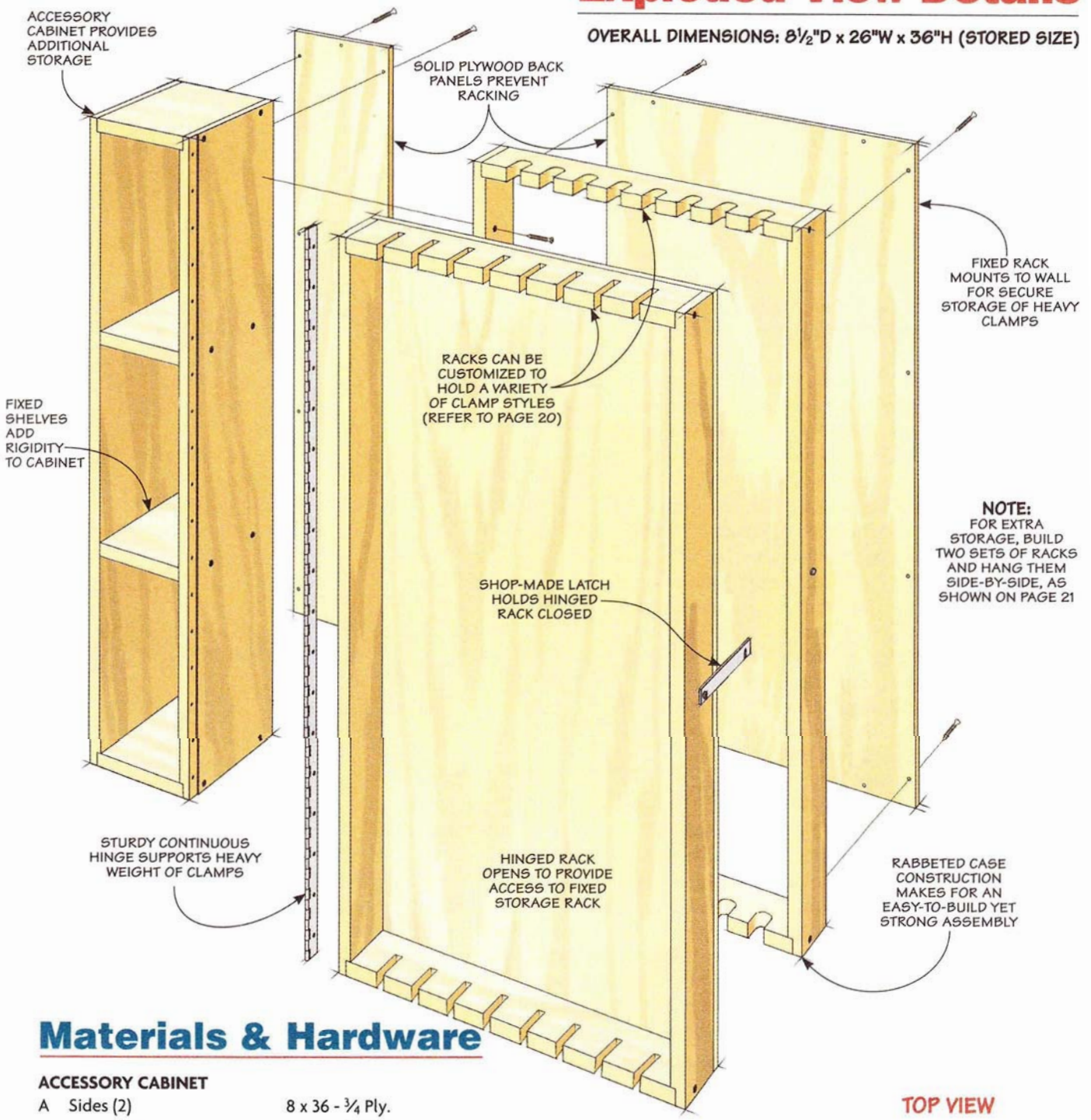
Hinged and fixed racks are anchored to a tall cabinet. The racks can be customized to hold F-style bar clamps, parallel-jaw clamps, pipe clamps, and aluminum bar clamps. Add-on racks hold spring clamps, handscrews, and C-clamps — all without taking up much wall space.

It's a project you can expand to suit your clamp collection. And best of all, it's easy to build.

▲ ***Double Capacity.*** *A hinged rack opens up to reveal even more storage behind.*

Exploded View Details

OVERALL DIMENSIONS: 8½"D x 26"W x 36"H (STORED SIZE)



Materials & Hardware

ACCESSORY CABINET

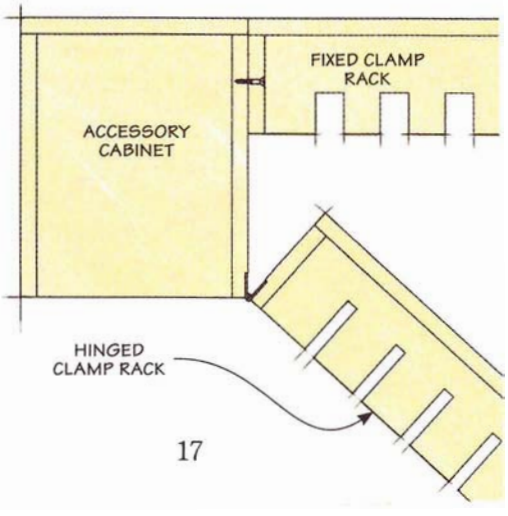
A	Sides (2)	8 x 36 - ¾ Ply.
B	Top/Bottom (2)	8 x 6 - ¾ Ply.
C	Back (1)	7 x 36 - ½ Ply.
D	Shelves (2)	8 x 5½ - ¾ Ply.

CLAMP RACKS

E	Sides (4)	3 x 36 - ¾ Ply.
F	Clamp Holders (4)	3 x 18 - ¾ Ply.
G	Backs (2)	19 x 36 - ½ Ply.
H	Latch (1)	¾ x 6 - ⅛ Aluminum

- (1) 1½" x 36" Continuous Hinge w/Screws
- (3) #8 x 1¼" Fh Woodscrews
- (56) #8 x 1½" Fh Woodscrews
- (2) #8 x ¾" Ph Sheet Metal Screws

TOP VIEW



ShopNotes GO ONLINE EXTRAS

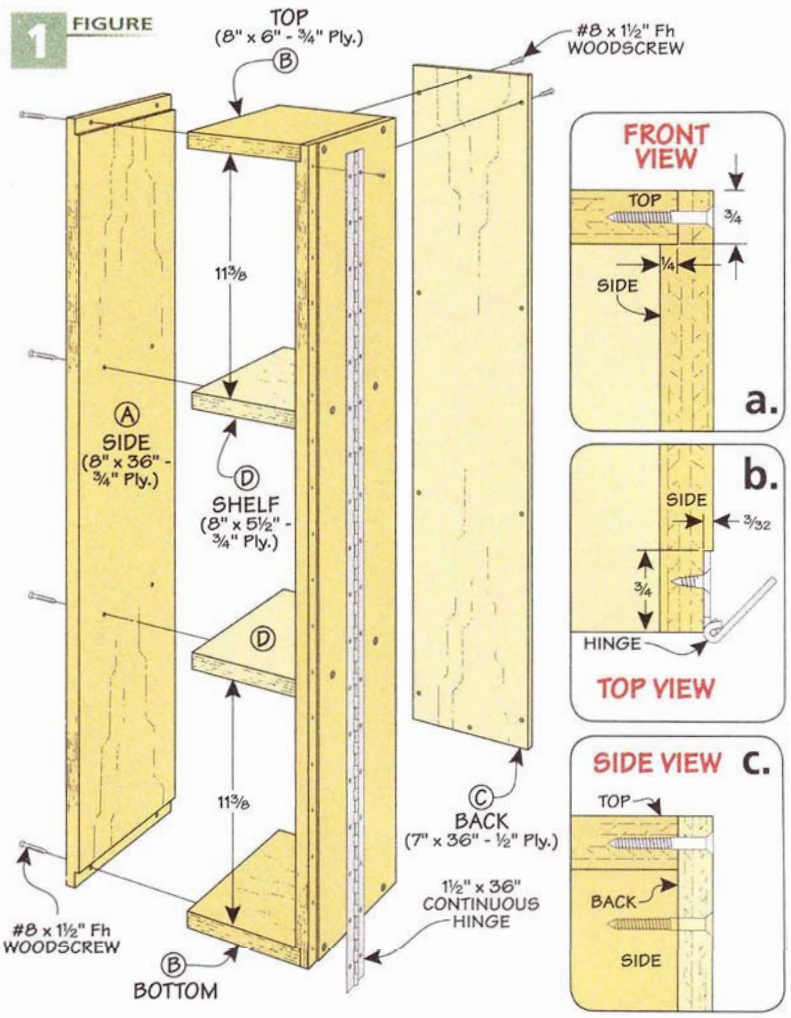
To download a free cutting diagram & 3-D model of the clamp rack, go to: ShopNotes.com

building simple Cases

A tall accessory cabinet serves as the foundation for the two clamp racks. The fixed clamp rack is attached securely to the accessory cabinet, both of which will be mounted to the wall. The hinged clamp rack is attached to the front edge of the accessory cabinet.

Building the three components of the clamp rack is an easy process. The joinery is pretty simple. Rabbets on the ends of the sides hold the top and bottom. And a plywood back keeps everything square and rigid.

Since you'll be using the table saw to cut the joinery, you might want to read ahead before you start. This way, you can minimize switching back and forth between a standard blade to cut the parts and a dado blade to cut the joinery. It's easier to cut all the parts to size first, then switch to a dado blade to cut all the rabbets.



ACCESSORY CABINET

If you study Figure 1 for a moment, you'll notice that the sides, top, bottom, and shelves of the accessory cabinet are all the same width. So it makes sense to rip the plywood for all these pieces to width first. Then you can cut them to final length before cutting the rabbets for the joinery.

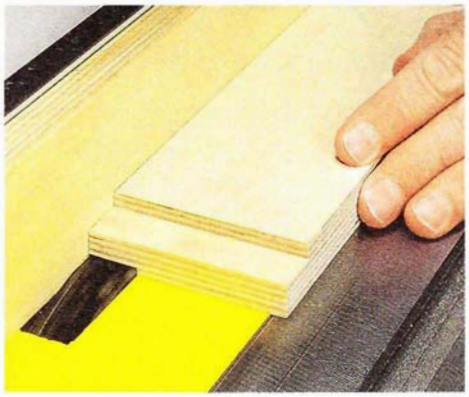
The joinery is easy to cut with a dado blade in the table saw. You can see in the left photo below how I buried the blade in an auxiliary rip fence. This makes it easy to cut the all the rabbets in one pass.

Hinge Rabbet. To hold the leaf of the continuous hinge, there's a shallow rabbet that runs along the outside front edge of one cabinet side (Figure 1b). The depth of the rabbet is one half the thickness of the closed hinge. Later, you'll cut a matching rabbet on the front, hinged cabinet.

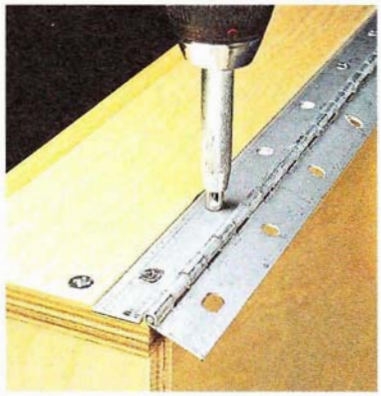
Cabinet Assembly. Assembling the accessory cabinet involves some glue and a few screws. Then you can measure for the plywood back and cut it to size, taking care to make your cuts square. The back can then be fastened to the case with glue and screws.

The shelves can be added at this point. They're simply fastened in place with screws, keeping them square and level (Figure 1).

Hinge. With the shelves installed, the cabinet is complete. Now you can install the hinge. I used a self-centering bit to locate the screw holes, as shown in the near left photo. You can turn your attention to the clamp racks next.



▲ ***Cutting Rabbets.*** *A dado blade buried in an auxiliary fence makes quick work of the joinery.*



▲ ***Self-Centered.*** *Use a self-centering drill bit to accurately locate pilot holes for the screws.*

CLAMP RACKS

The assembly process for the two clamp racks (fixed and hinged) are the same, with one minor exception. As I said earlier, the side of the front, hinged rack is rabbeted to accommodate the continuous hinge. Figures 2 and 3 show you how everything goes together.

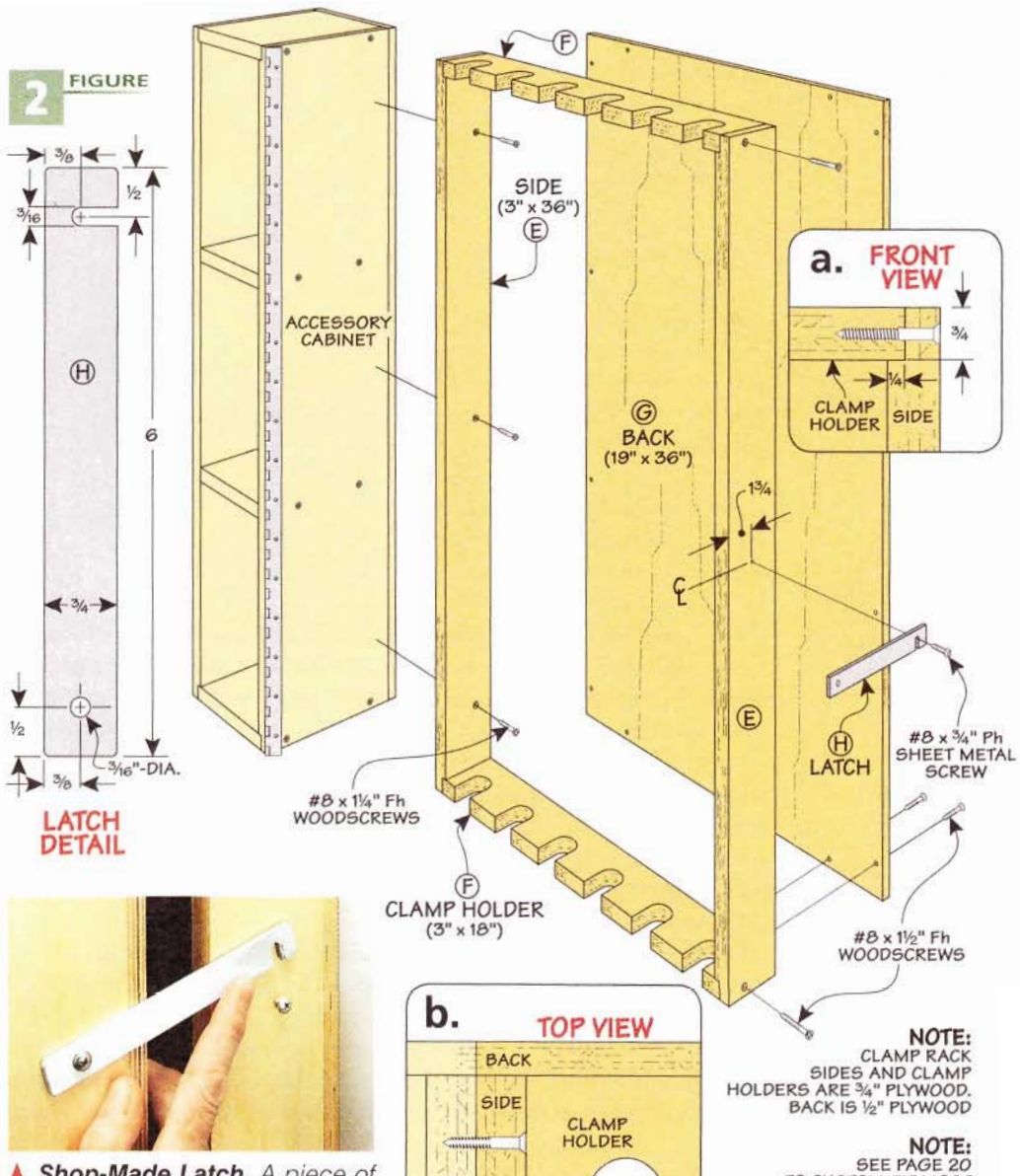
Custom Clamp Holders. There is something else I need to point out before you start building the clamp cabinets. The tops and bottoms of the two clamp racks are designed to hold a particular style of clamp, as you can see in Figures 2 and 3. Turn to page 20 to see some other options along with the detailed drawings you need to help you build them.

This is where it might help to stop and take inventory of your clamps. You can determine how best to organize your clamps and what style of clamp holder to build. The nice thing is, the top and bottom of the racks are all the same size. So it's easy to come up with an arrangement that fits your assortment of clamps.

Rack Construction. After deciding on the style of holders you need, building the cabinets follows along the same lines as the tall accessory cabinet. And don't forget to cut the rabbet for the hinge on the front cabinet before starting on the assembly.

Final Assembly. With the two clamp racks complete, you can attach the fixed rack to the accessory cabinet with screws. The backs of both cabinets should be flush. Then, just fasten the hinged rack to the front of the cabinet.

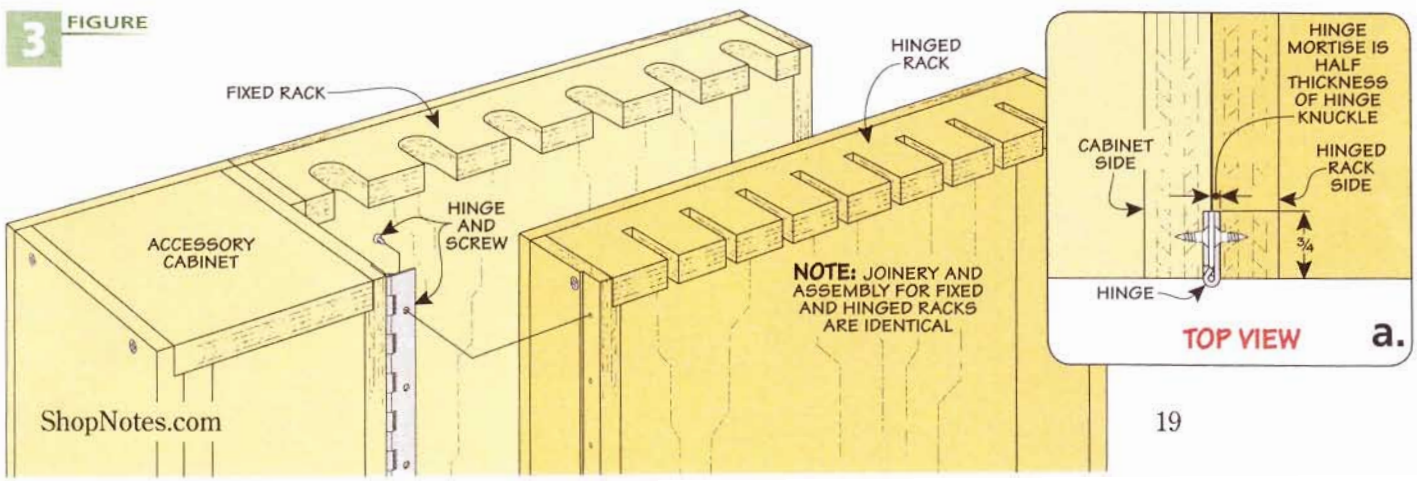
FIGURE 2



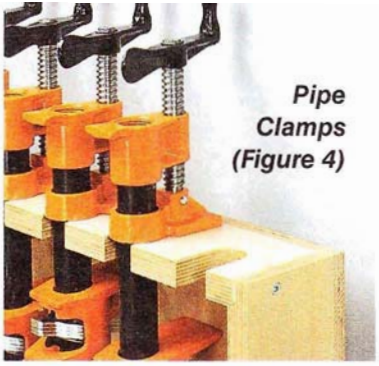
▲ ***Shop-Made Latch.*** *A piece of aluminum bar stock and a couple of screws make a simple latch.*

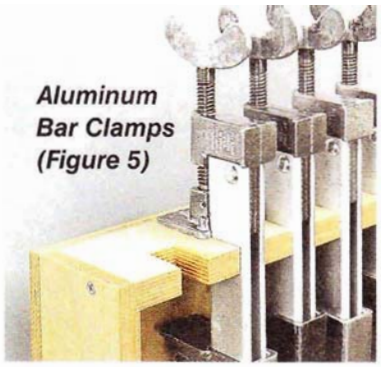
Custom Latch. To finish up, a simple, shop-made latch secures the hinged rack in the closed position, as you can see in the photo above. A hacksaw, drill, and a file are all you need to make the latch. The latch drawing in Figure 2 gives you all the details. Mount the latch to the racks with a couple of screws. Finally, you can securely mount the rack on the wall using long screws into the wall studs.

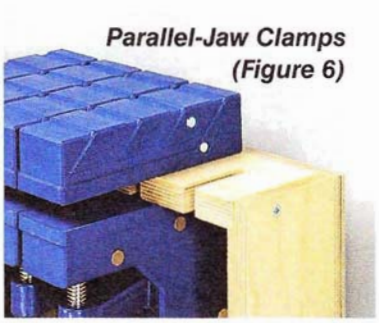
FIGURE 3

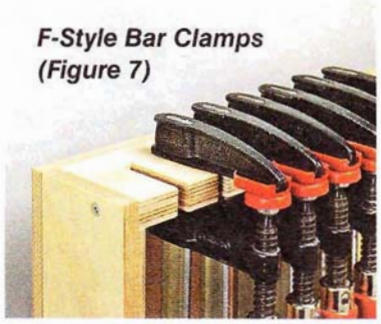


custom clamp Holders









▲ ***Versatile Clamp Storage.*** *By customizing the top and bottom clamp holders, you can create compact storage for a variety of clamp styles. The holders are easy to make for any style of clamp.*

It's not unusual for woodworkers to end up with a wide range of clamp styles in their shops. The great thing about this clamp rack is that you can customize it to exactly suit the collection of clamps you have in your shop.

The photos at right show some ideas for making clamp holders for the most common styles of clamps. You'll find the dimensions for these in the figures below.

Custom Holders. The process for making the holders is pretty simple. In Figure 4, you can see the rounded notches I made for pipe clamps. After laying out their locations, I drilled the holes, then cut out the waste at the table saw.

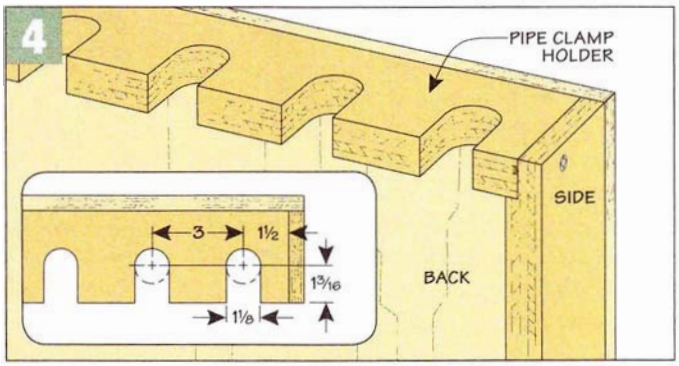
For the other styles of clamps shown in the photos, you can refer to Figures 5 through 7. The notches for these clamps are cut at the table saw using a dado blade.

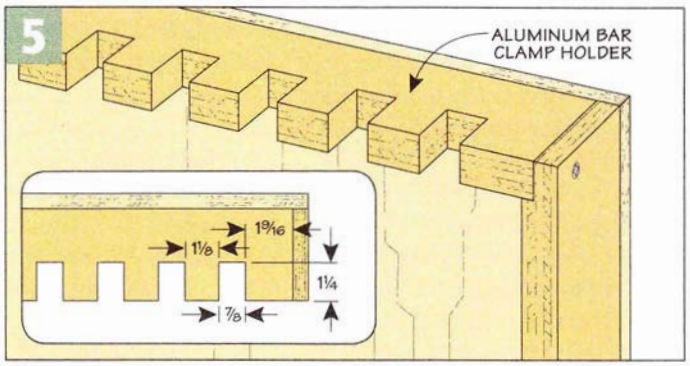
To make cutting the clamp holders easier, lay out all the notches on the blanks, then use those marks to line up the cuts at the table saw. An auxiliary fence on your miter gauge will help support the workpiece and prevent tearout.

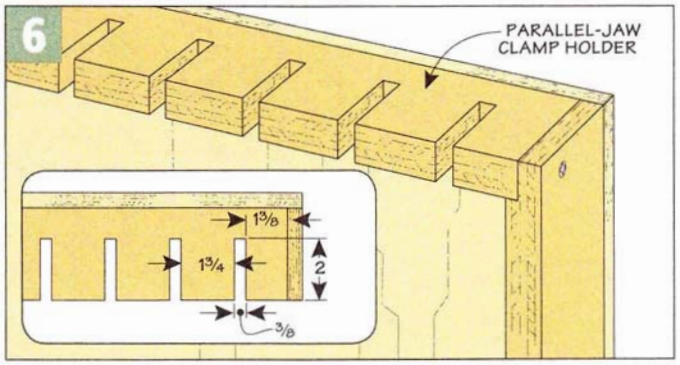
Customizing. For other styles of clamps, you'll need to do a little planning. Lay out your clamps side-by-side and determine the spacing and dimensions of the notches needed to hold them.

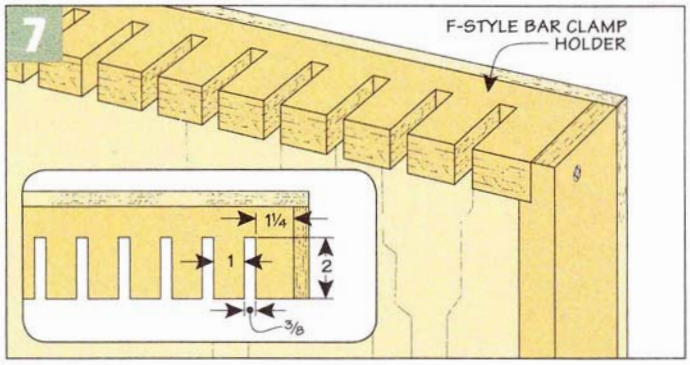
Accessory Racks. When it comes to other hard-to-store clamps like handscrews, small F-style bar clamps, C-clamps, and spring clamps, take a look at the next page. You'll find easy ways to pack a lot of clamps into your new clamp rack using scraps of plywood and a few dowels.

Then the next time you go to assemble a project, you'll be glad to have all your clamps organized and within easy reach.







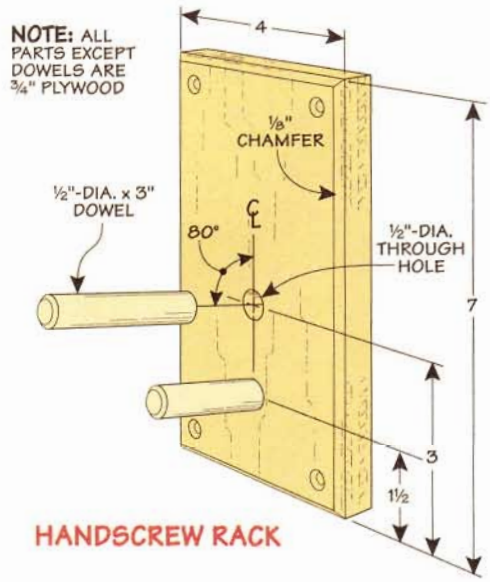


Add-On Clamp Racks

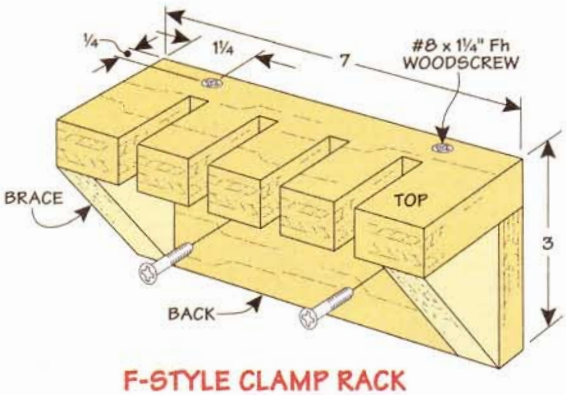
It's one thing to build a nice clamp rack for all your big clamps. It's another challenge entirely to find a way to store all the other small, miscellaneous clamps you have lying around the shop.

In the photo at right, you can see the four specialized racks I added to hold various styles of clamps. Most are nothing more than a plywood back with a couple of dowels inserted at a slight upward angle. There's even a small rack for short, F-style bar clamps. You can see all the details for each of the racks in the drawings below. After they're assembled, a few screws are all you need to fasten them to the cabinet (in any available space) to keep all your clamps at hand.

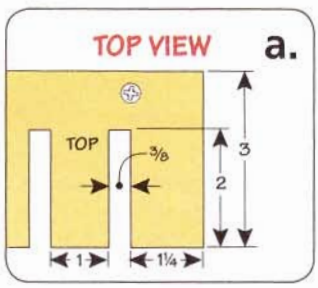
▲ **Compact Storage.** *Build a second rack to double your storage capacity. Add-on racks fill in the spaces to store smaller clamps.*

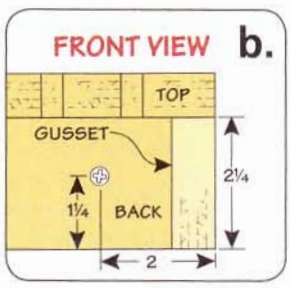


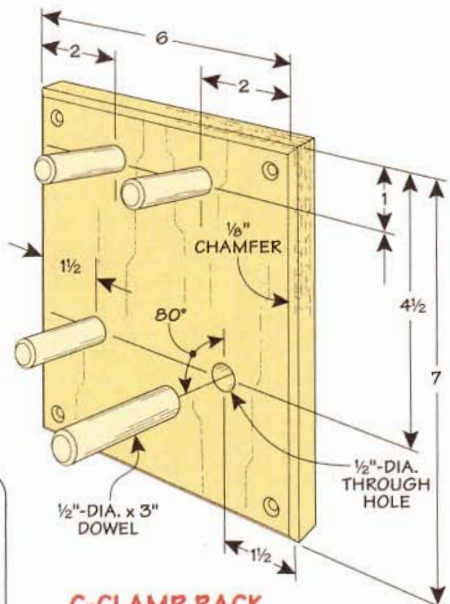
HANDSCREW RACK



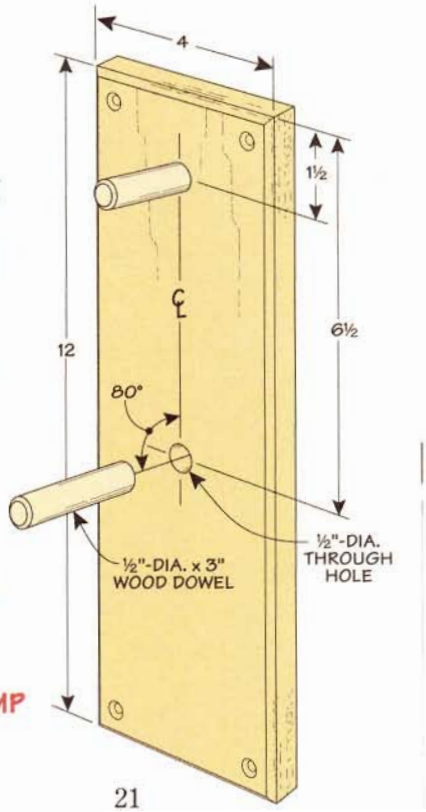
F-STYLE CLAMP RACK







C-CLAMP RACK



SPRING CLAMP RACK

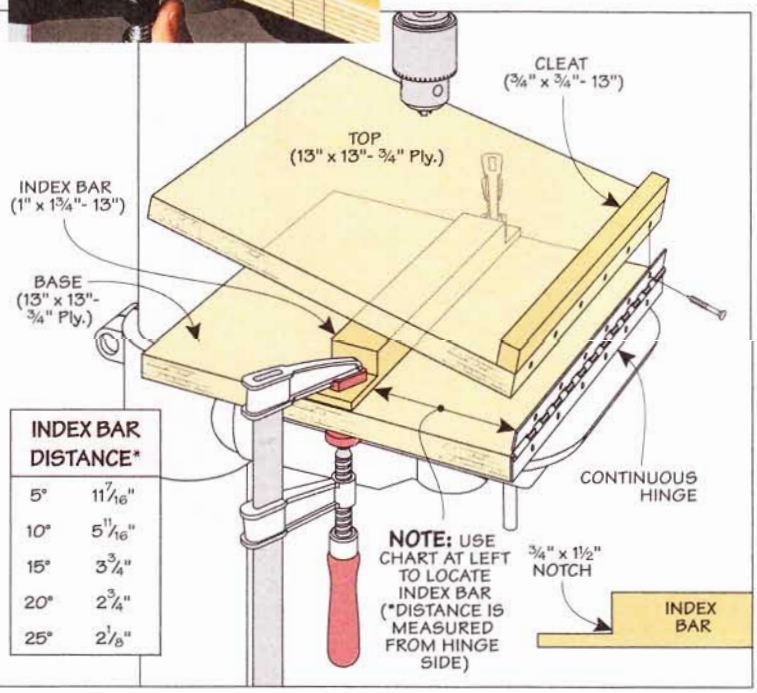
Shop Short Cuts

Angled Drilling

Drilling the angled holes for the dowels on the accessory clamp racks (page 21) is a simple task with this shop-made jig. It's quick to build and easily clamps to your drill press table.

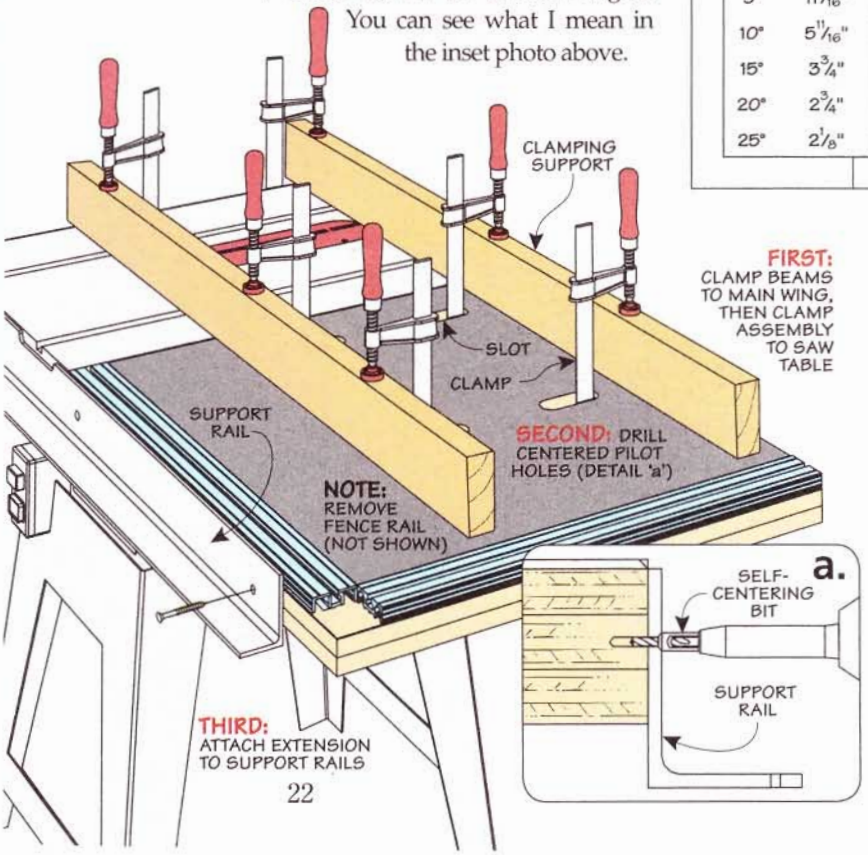
The jig is just a plywood base and top with a hardwood cleat. The top is connected to the base with a continuous hinge (drawing at right). Finally, a hardwood index bar is sandwiched between the base and top to set the drilling angle.

To make setup fast, I marked the base with lines to indicate where to locate the bar for different angles. You can see what I mean in the inset photo above.



INDEX BAR DISTANCE*	
5°	11 7/16"
10°	5 11/16"
15°	3 3/4"
20°	2 3/4"
25°	2 1/8"

◀ ***Index Marks.*** *Use the chart below to locate the index lines for the most common angles.*



Clamping Beams

Holding the heavy main wing, shown on page 24, in place while you attach it to the table saw can be a challenge if you don't have a helper. But, as you can see in the drawing at left, a couple of clamping beams made from straight "two-by" stock, allow you to accomplish this task by yourself.

Start by removing the fence rail on the front of the saw. Then, clamp the beams to the main wing. (The slots on the wing come in handy here.)

Next, drill pilot holes as shown in detail 'a.' To do this, I used the existing countersunk holes in the metal support rails to guide a self-centering drill bit. Now all that's left is to screw the wing in place.

Perfect-Fitting Router Plate

I used a foolproof method to make the router insert opening for the table saw project center on page 24. The secret is to use the actual plate as a template for positioning a set of strips that guide a pattern bit. Depending on the length of your pattern bit you may need to adjust the thickness of your guide strips. I made mine 1" thick.

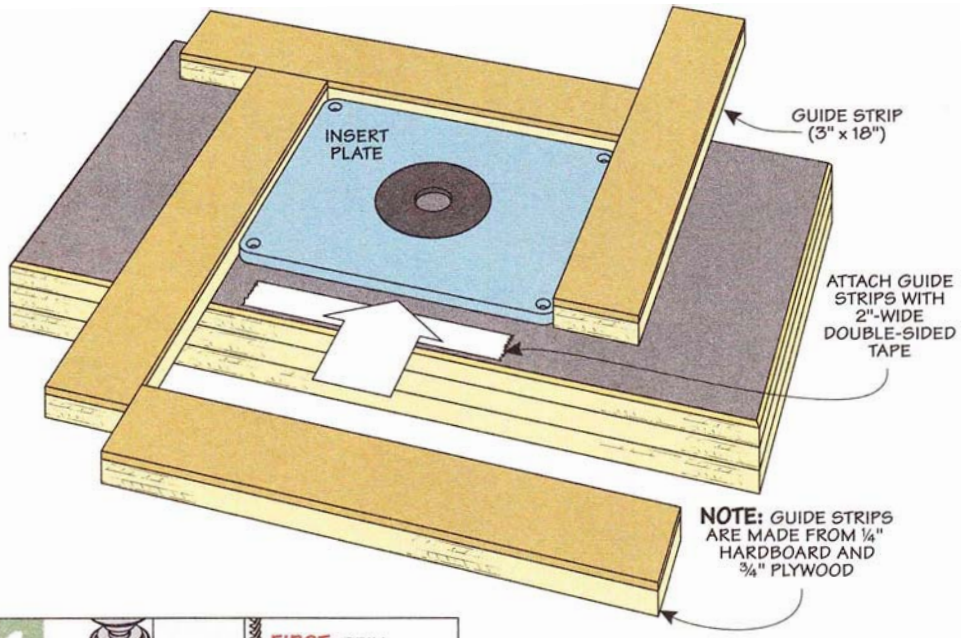
Position the Strips. To create the opening, I used double-sided tape to position one strip parallel with one edge of my router tabletop. Then, I used the insert plate to locate the other strips, as shown in the drawing above.

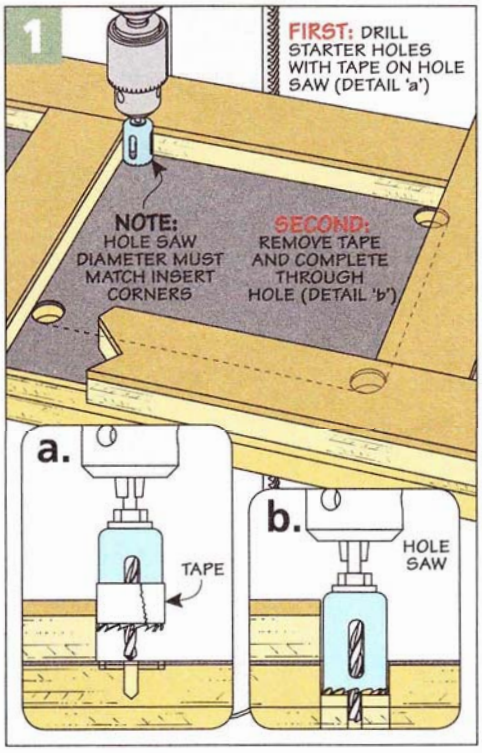
Starter Holes. A hole saw, sized to match the corner radius of your router plate, makes quick work of drilling four starter holes, as shown in Figures 1 and 1a. A few layers of tape on the hole saw position it correctly to protect the guide strips from damage.

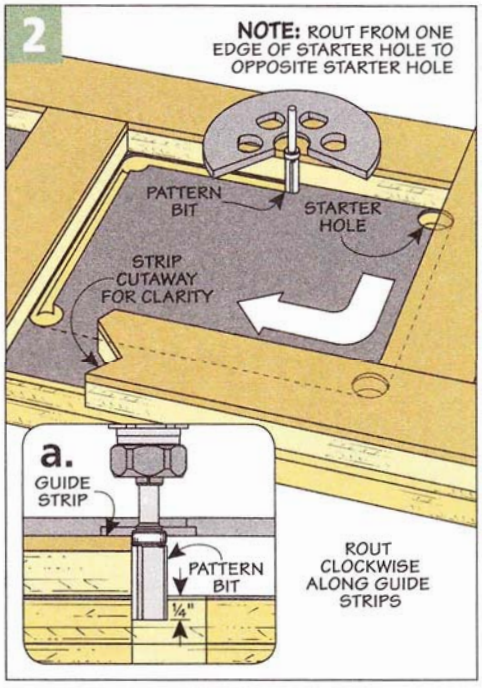
Rout a Groove. Once the holes are drilled, set your pattern bit to rout a ¼"-deep groove (Figure 2a). Now you can set the bit into one of the openings so the router is resting on the guide strips (Figure 2). Use the strips to guide the bearing on the bit as you rout in a clockwise direction. But, to maintain the radius in the corners, rout only to the edge of the starter holes.

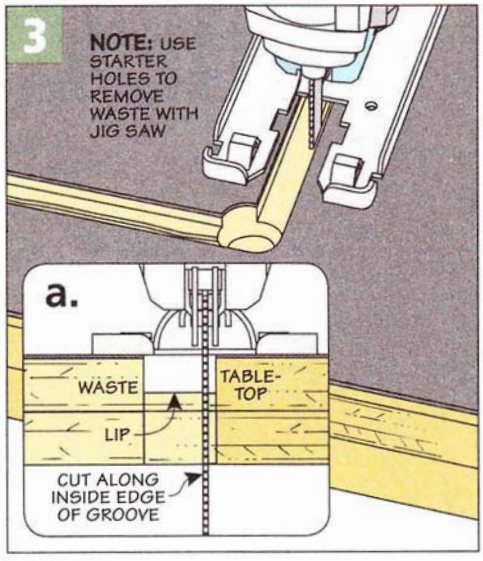
Remove the Waste. With the groove routed, you can remove the strips and cut out the waste. In Figure 3, you'll see how a jig saw makes quick work of this. All you need to do is stick close to the outside edge of the groove, as you can see in Figure 3a.

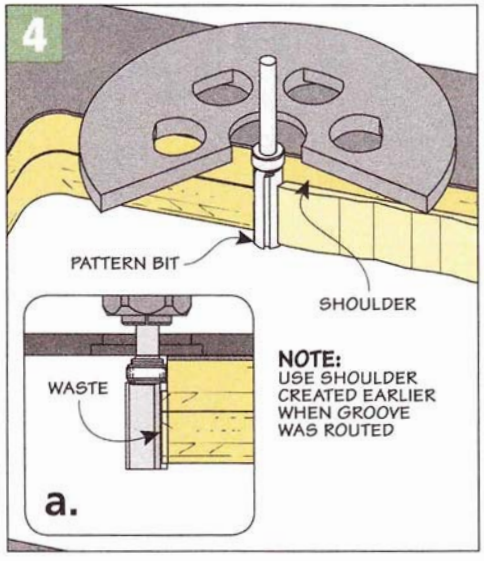
Finish Routing. Now you can switch back to the pattern bit to complete the opening. But, instead of the guide strips, you'll use the shoulder of the groove you routed to guide the bit. Since there's only a small amount of waste to remove, a single pass is all it takes to complete the opening (Figures 4 and 4a.)









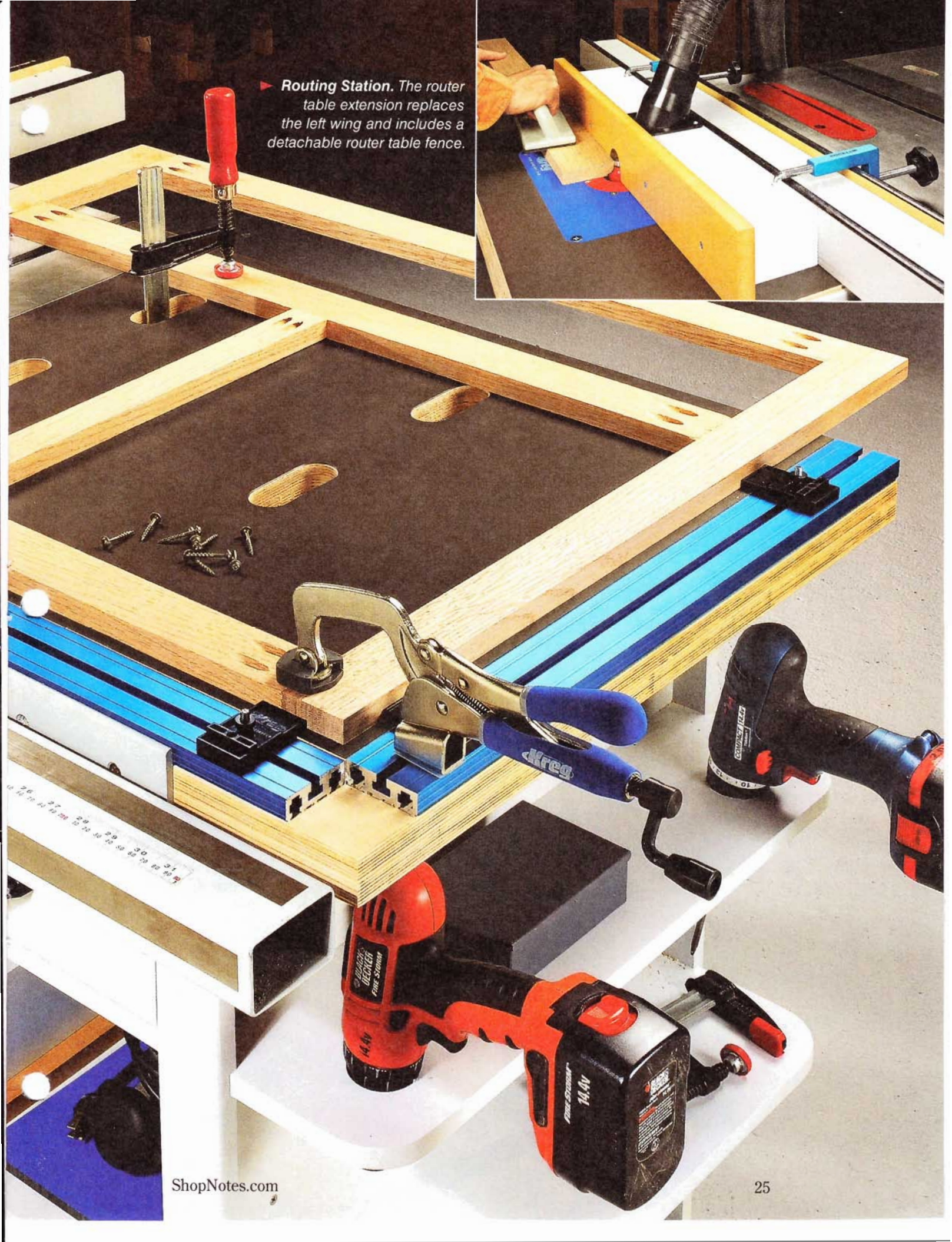


dream shop
project

multi-purpose Table Saw Project Center

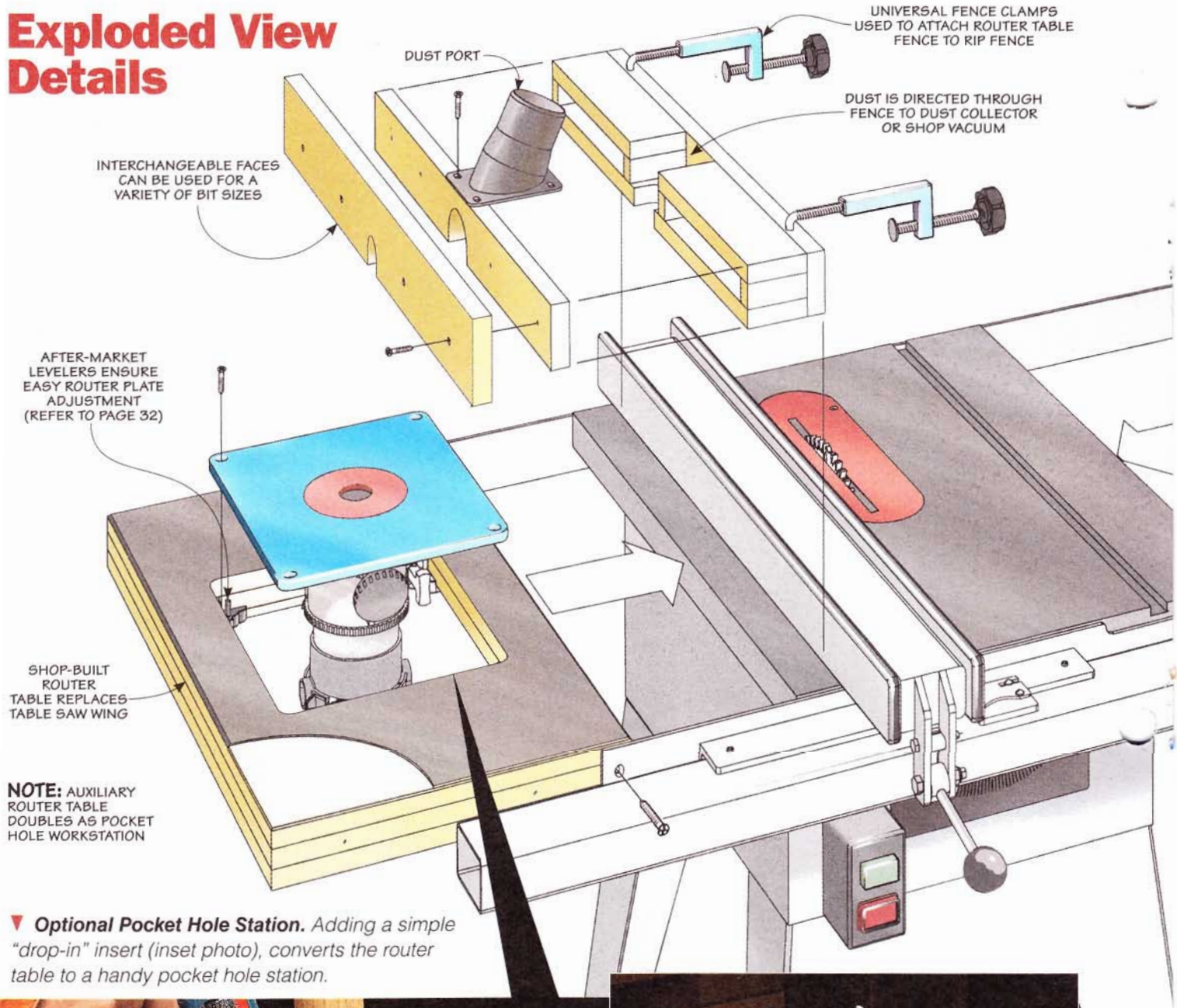
I don't know many woodworkers who aren't looking for a way to use the space in their shop more efficiently. So, if a single workstation can pull double, or even triple duty, it's sure to be a hit.

The table saw upgrade shown in the photo adds capabilities without taking up more valuable floor space. With the help of some hard-working accessories, I've turned an ordinary contractor's-style table saw into a versatile joinery, assembly, clamping, and routing station (inset photo). Throw in some storage shelves, a drawer, and tool holsters, and it becomes a one-of-a-kind workshop powerhouse.

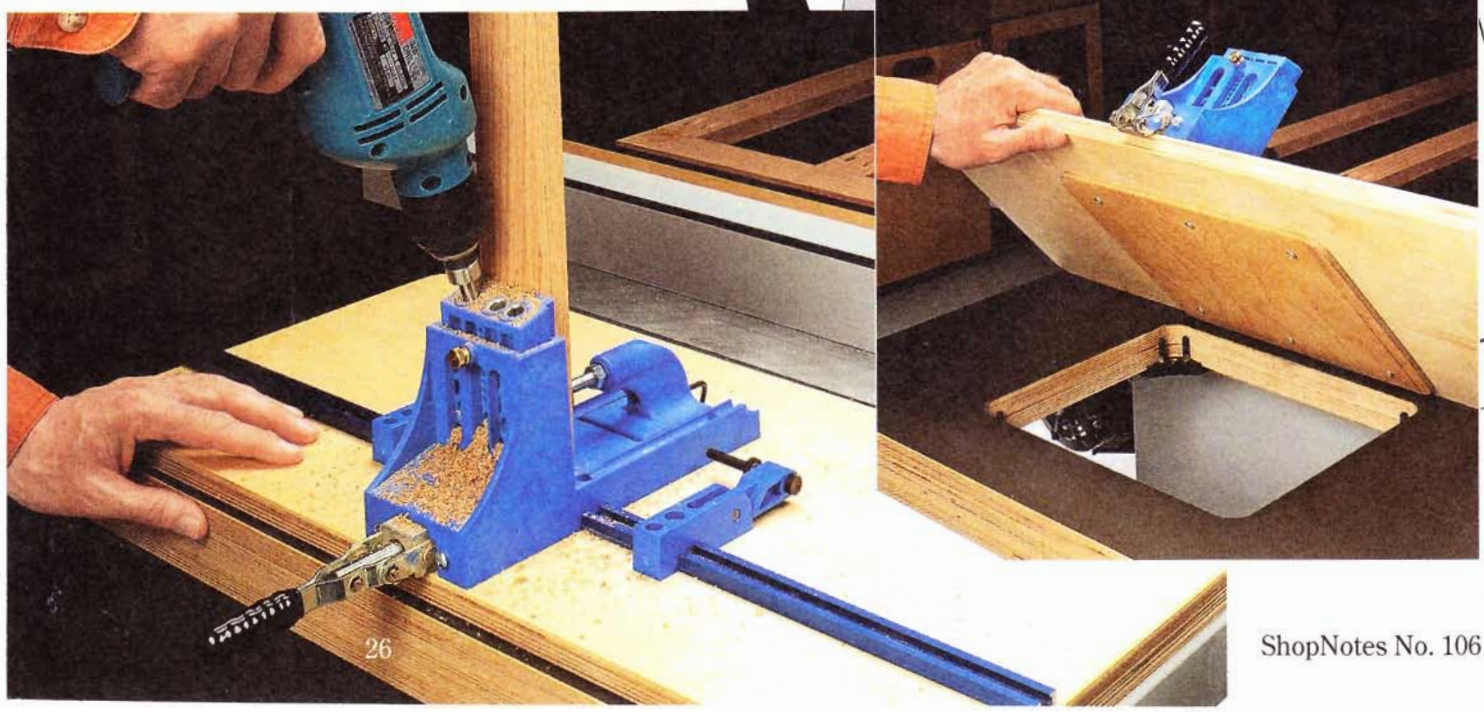


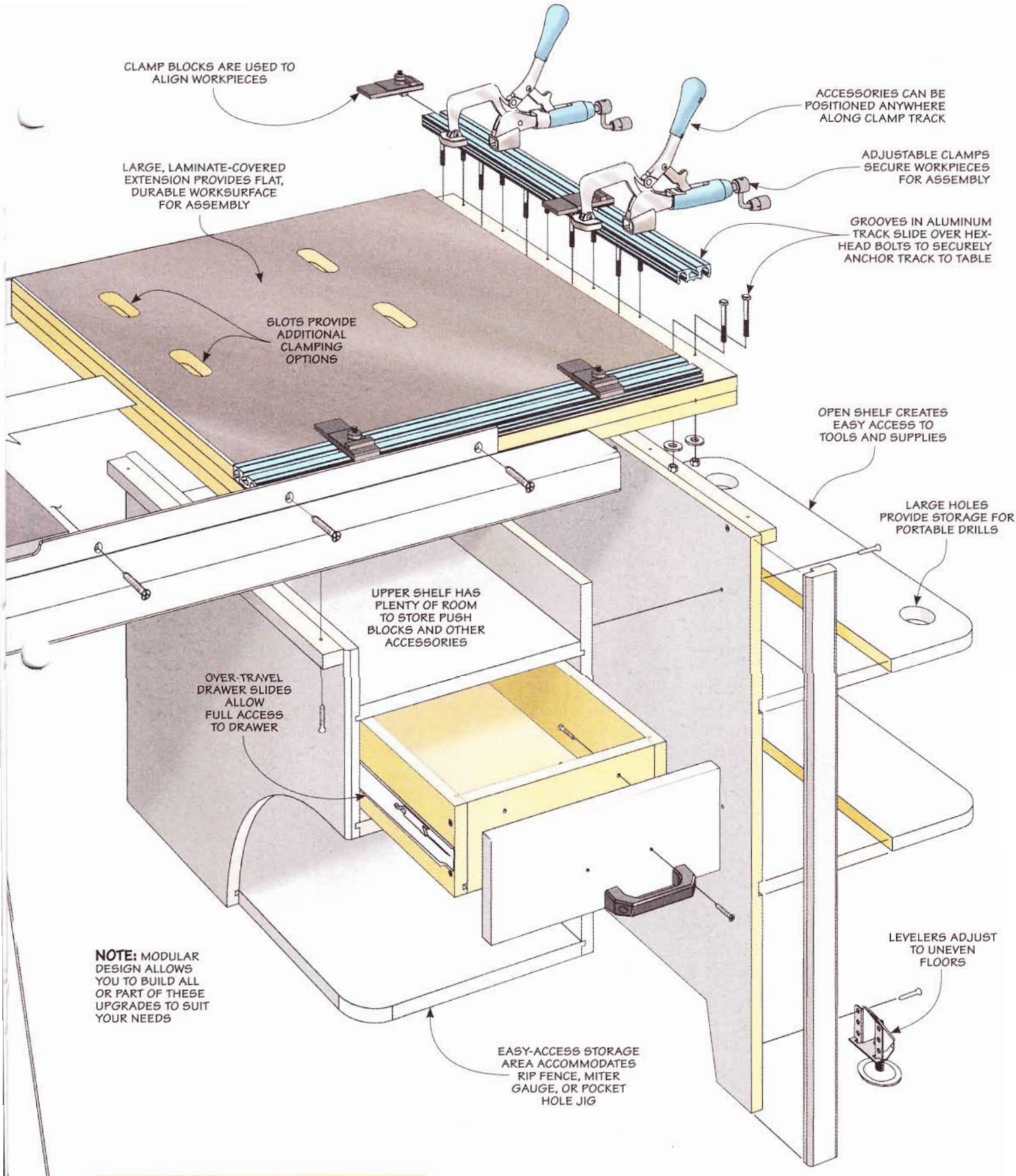
Routing Station. *The router table extension replaces the left wing and includes a detachable router table fence.*

Exploded View Details



▼ ***Optional Pocket Hole Station.*** *Adding a simple "drop-in" insert (inset photo), converts the router table to a handy pocket hole station.*





ShopNotes GO ONLINE EXTRAS

To download a free cutting diagram for the Table Saw Project Center, go to: www.ShopNotes.com

construct the
Main Wing

One practical workshop design places the table saw in the middle of the shop. It's a good rule that provides clearance for any size workpiece. The project center takes advantage of this placement by replacing the extension wing on the right side of the table saw with an assembly table.

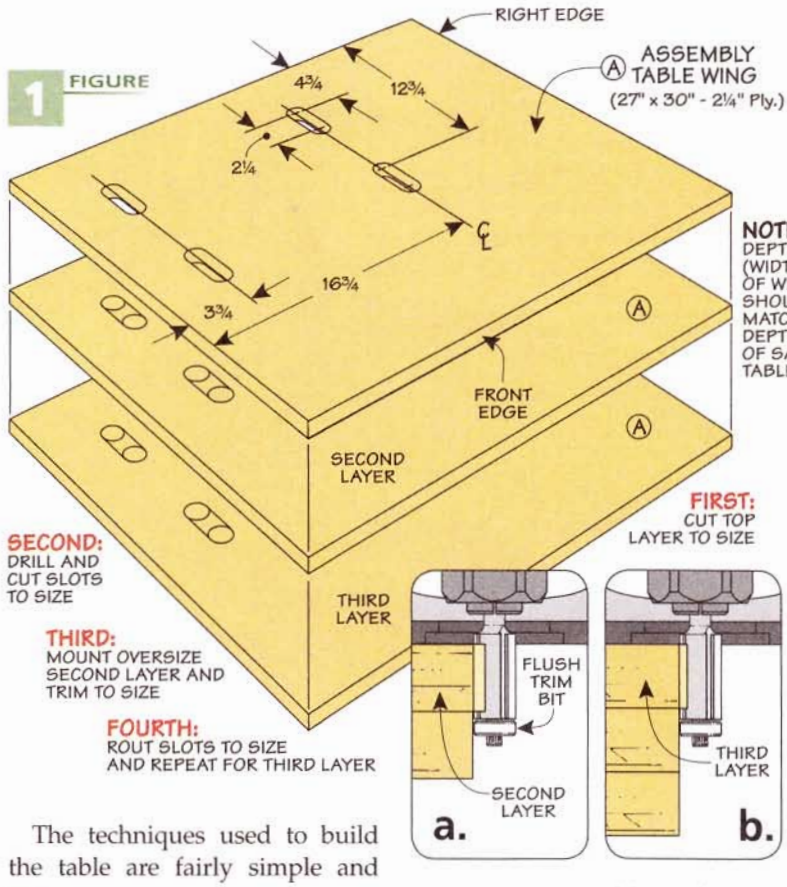
Assembly Table Wing. Before you get started, I want to point out that you'll need to size the depth (width) of the wing to fit your saw. The dimensions shown are what I used to fit my contractor's saw.

One of the things that make this replacement wing unique is the clamp track located at the front and right edges of the table. I used an extruded aluminum track with slots on the bottom for mounting it to the table with hex-head bolts. A slot on top holds adjustable locking clamps and other accessories anywhere along its length. To learn more about the accessories, check out the box on the next page.

You can find this type of track from various manufacturers. You'll find sources for two kinds of clamp track on page 51.

In addition to clamp track, the wing has four slots cut into the top for extra clamping options.

1 FIGURE



The techniques used to build the table are fairly simple and straightforward. The assembly table needs to be sturdy, so it makes sense to start by building up an extra-thick plywood base.

Layered Top. The assembly table is made up of three layers of Baltic birch plywood, topped with a sheet of plastic laminate. To make things easy, I cut the top layer to size, then laid out and cut the four clamping slots, as shown in Figure 1. This first workpiece is then used as a template to shape the two remaining pieces.

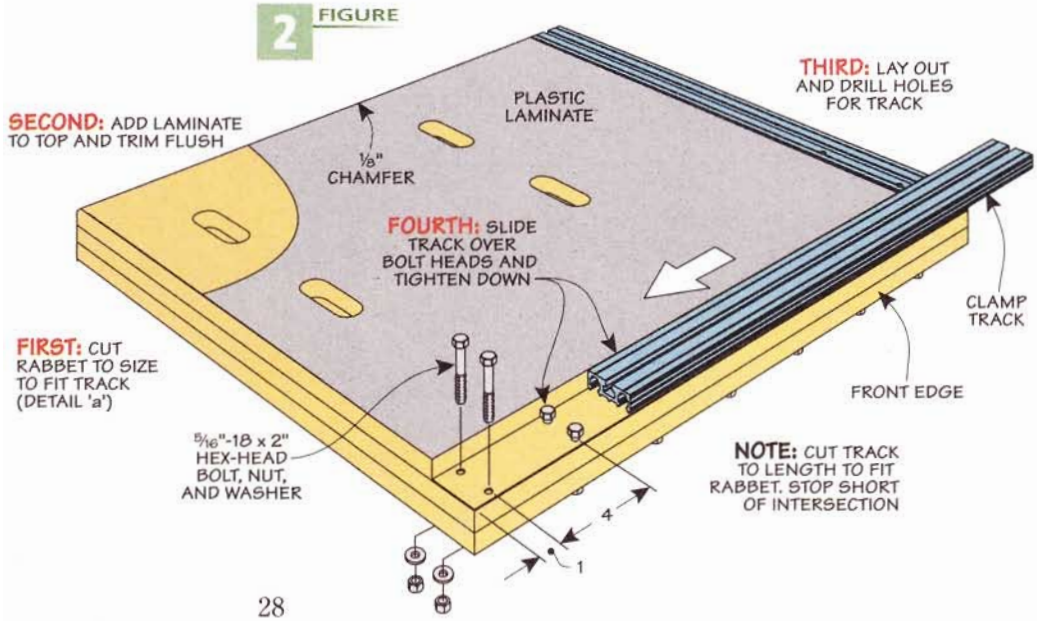
The key is to add one layer at a time, cutting it slightly oversize and roughing out the slots. Then you can bond the second piece to the top layer with contact cement. To learn more about the spray contact cement I used, turn to page 50.

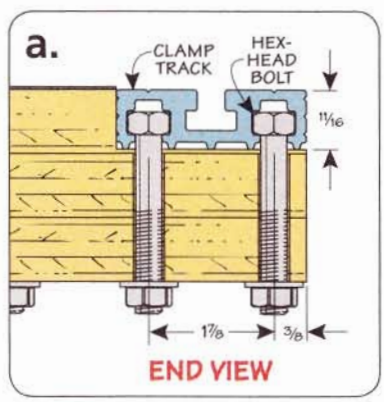
To clean up the edges and the slots, I used a router and flush trim bit, as in Figure 1a. Then I simply repeated the process for the last plywood layer (Figure 1b).

Add a Rabbet. With the base complete, you're ready to cut a rabbet for the clamp track shown in Figures 1 and 2. A dado blade is perfect for this job.

However, there's one thing to keep in mind here. You want the

2 FIGURE



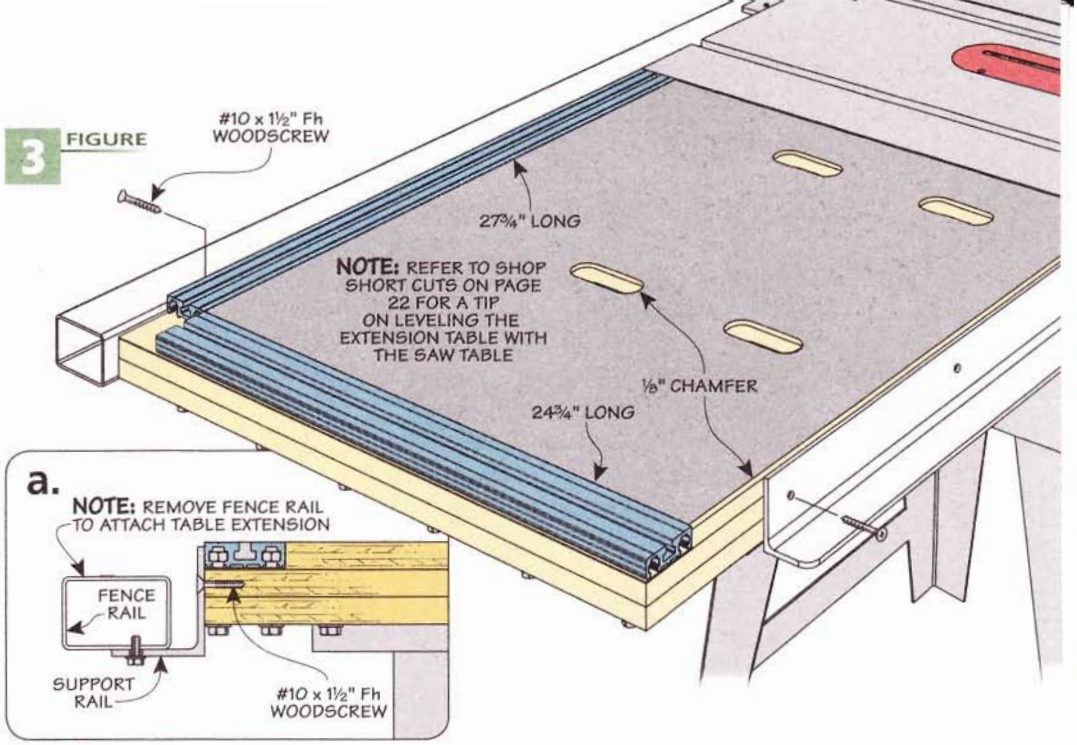


track to sit flush (or slightly below) the top of the worksurface, so measure carefully and don't forget to account for the laminate, which will be added next.

Plastic Laminate. I wanted a smooth, durable worksurface for the assembly table, so I added a final layer of plastic laminate to the top, as shown in Figure 2.

With the laminate in place, carefully cut starter holes in the waste areas of the four clamping slots. Then, using a router and flush trim bit, trim the laminate flush with the edges of the slots and around the outside of the top. Finally, switch over to a chamfer bit and rout a shallow chamfer along the edges of the slots and the back, exposed edge of the table (Figure 2).

Add the Track. The next step is to secure the track to the table. To do this, drill a series of holes, as illustrated in Figure 2. What's important here is to pay close attention to the spacing of the mounting holes. If the holes are spaced too far apart, the track tends to lift up from the table.



After cutting the track to length, go ahead and install the hex-head bolts, washers, and nuts with a loose fit. Then, all that's left to do is slide the track in place over the bolt heads and tighten the nuts. You can see the track stops short of the corner where the two rabbets intersect. This makes it easier to add or remove accessories.

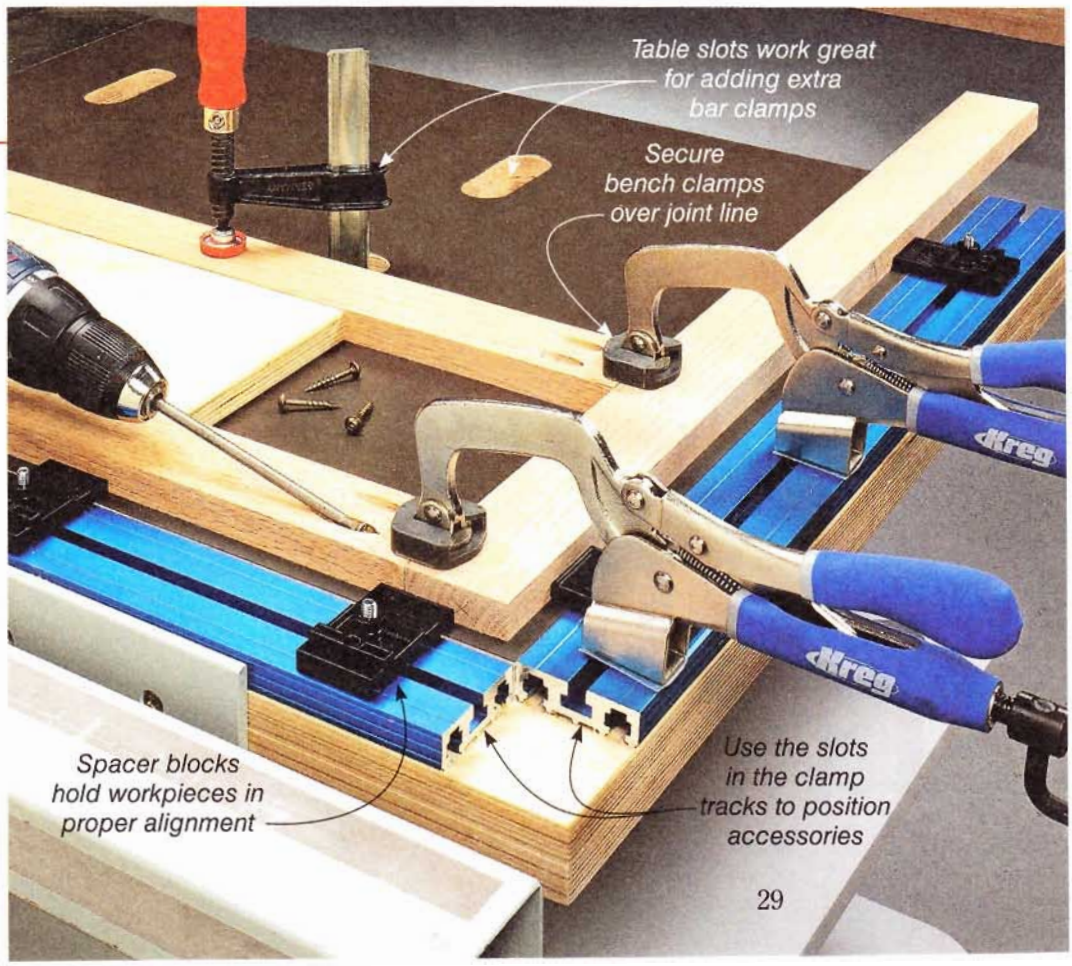
Install the Assembly Table. To install the table, you'll first have to remove the wing that came with your saw, as well as the fence rail. Now, simply attach the table with woodscrews, using the existing holes in the support rails (Figures 3 and 3a). For more tips on how to level the assembly table with the saw table, turn to page 22.

Clamping Accessories

This assembly table is like having an extra workbench *and* another pair of hands in your workshop.

Clamping System. There are two ways to secure a project to the table. The first uses the clamp track to hold locking clamps, as shown in the photo. The slots in the track let you place a clamp where it's needed most. Plus, specially designed plastic blocks help align your workpieces. The adjustable blocks allow you to position both workpieces so that the center of the locking clamp head is directly over the joint line.

Table Slots. Finally, four handy slots in the top of the assembly table work great for positioning a bar clamp wherever you need a little extra support.



creating

Storage

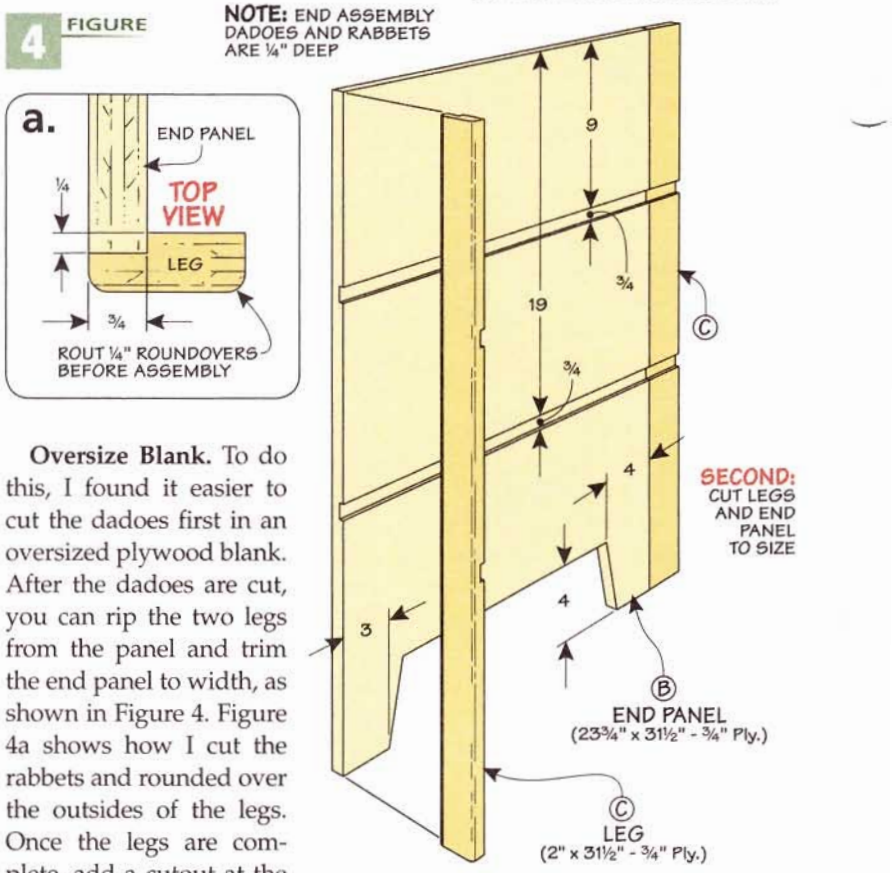
With the main wing installed, it's time to add some support and storage underneath. To do this, I built a sturdy end assembly that's made up of a wide panel and two integral legs. A look at Figures 4 and 5 give you the idea.

Adding a couple of narrow, open shelves provides some extra storage to this area. And, two holes in the top shelf create quick-access "holsters" for cordless drills. Finally, to make it easy to adjust the end assembly on an uneven floor, there are a couple of heavy-duty leg levelers.

END ASSEMBLY

As you can see in Figure 4, I used a pair of dadoes in the end assembly to hold the shelves in place. The challenge is making sure the dadoes align once the legs and the panel are joined together.

FIGURE 4



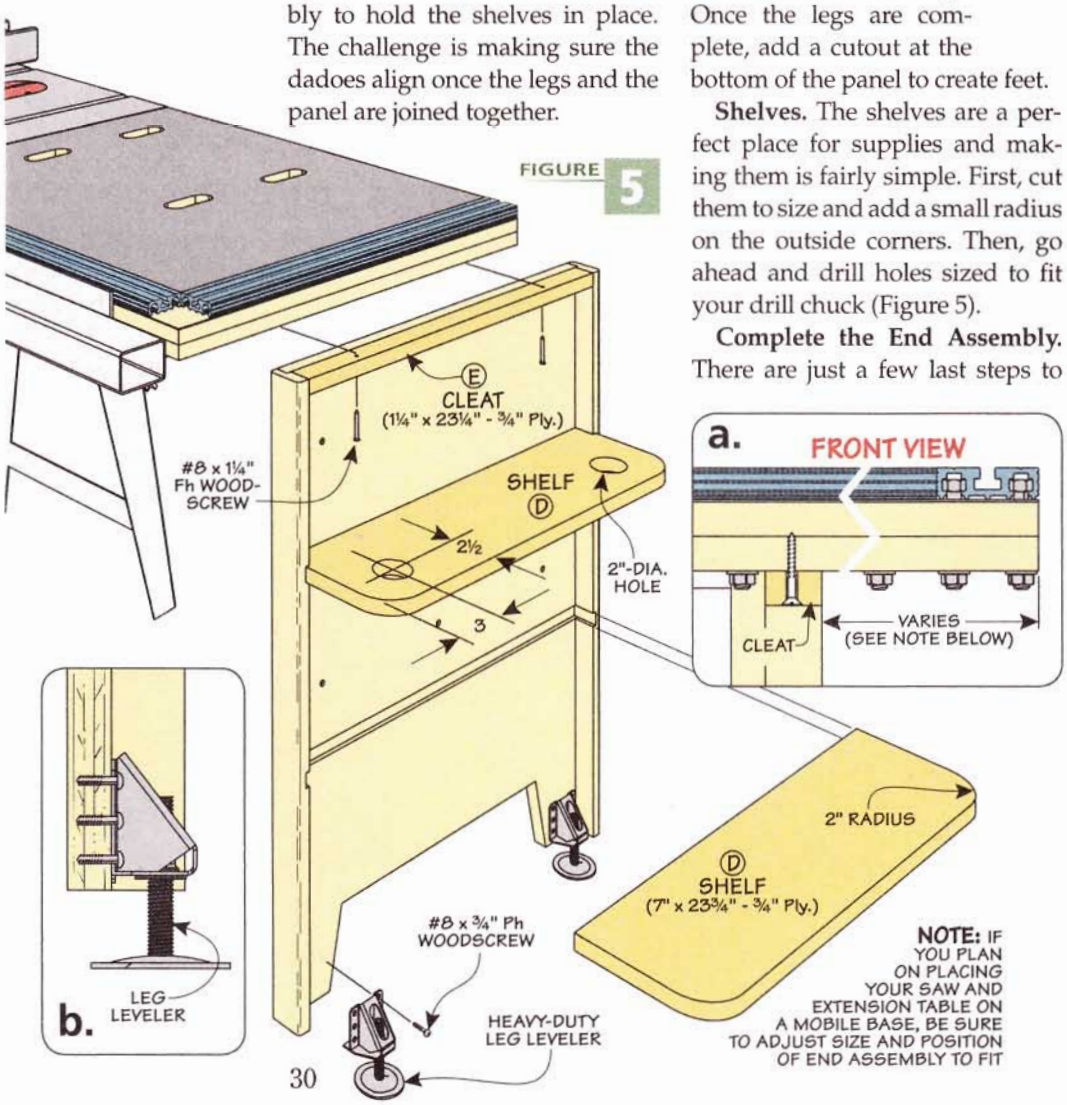
Oversize Blank. To do this, I found it easier to cut the dadoes first in an oversized plywood blank. After the dadoes are cut, you can rip the two legs from the panel and trim the end panel to width, as shown in Figure 4. Figure 4a shows how I cut the rabbets and rounded over the outsides of the legs. Once the legs are complete, add a cutout at the bottom of the panel to create feet.

Shelves. The shelves are a perfect place for supplies and making them is fairly simple. First, cut them to size and add a small radius on the outside corners. Then, go ahead and drill holes sized to fit your drill chuck (Figure 5).

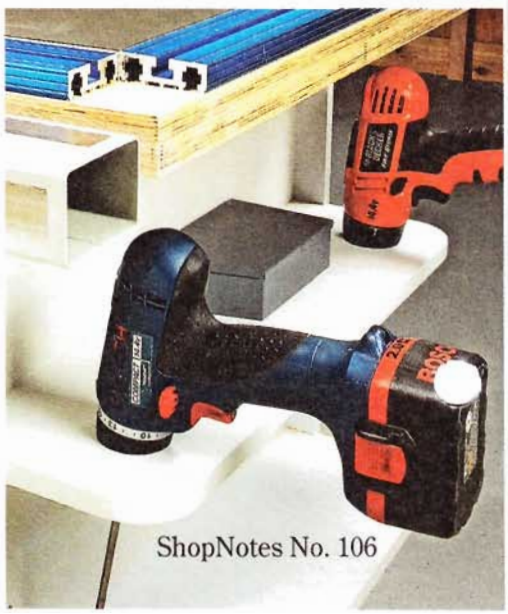
Complete the End Assembly. There are just a few last steps to complete before you can assemble and install the end panel below the assembly table. First, glue the legs and shelves to the panel.

Then, to make it easier to install the end panel to the main wing, I went ahead and added a small cleat at the top of the end panel assembly (Figures 5 and 5a). This is also a good time to drill the countersunk

FIGURE 5



▼ ***Drill Holster.*** *Two holes drilled in the upper shelf provide storage and easy access to your drills.*



holes on the outside of the panel and the cleat, as shown in Figure 5. These holes are used later to attach the end assembly to the cabinet you'll build next.

Finally, if you're going to paint the assembly, now's the time to do it. Then, add the leg levelers and mount the panel to the table with screws. You can see what I mean if you check out Figures 5 and 5b. If you're using a mobile base, be sure to position the end assembly so it fits onto the base extension.

CABINET ASSEMBLY

All the open space below the extension table creates another great opportunity for storage. To take advantage, I added a cabinet featuring a large open bay, a storage shelf, and an easy-access drawer.

To make the cabinet, I used tongue and dado joinery, like you see in Figure 6. Start by cutting the sides to size. Each side has three grooves to hold the shelves. The upper and middle shelves form a drawer compartment and have a rabbet to hold a back.

Bottom Shelf & Side. As you can also see in Figure 6, I added a large opening along the front edge of the left side piece. This cutout provides easier access to the entire bottom shelf. You'll also need to remove the exposed portion of the tongue on the lower shelf. I laid out the end point of the tongue and then used a router and flush trim bit to carefully trim to the line. Finally, round the exposed corner of the bottom shelf.

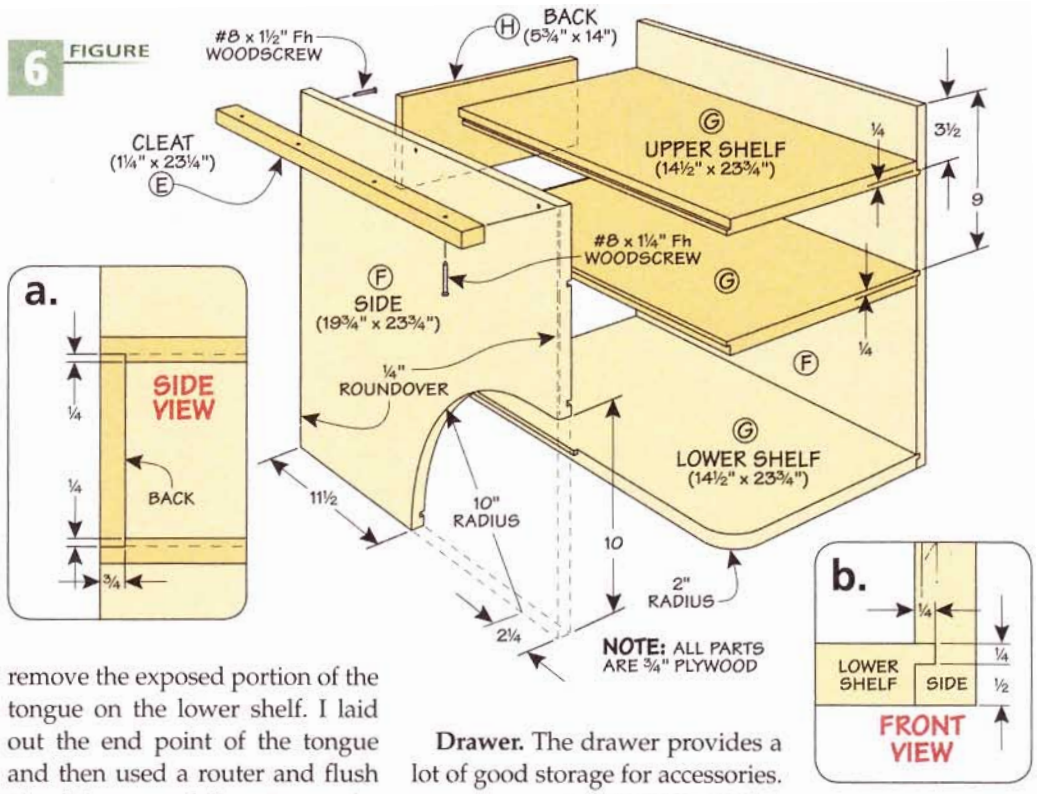
Assembly. Now it's time to assemble the sides and shelves with glue. Also, cut a back piece to size, but wait until after you've built the drawer and installed the slides before gluing it in place.

Before you start on the drawer, paint the cabinet and attach it to the assembly table. Here again, I used a cleat and screws (Figure 6).

Drawer. The drawer provides a lot of good storage for accessories. But, the deep overhang created by the fence rail limits access, so I used "over-travel" drawer slides to solve the problem (Figure 7b).

Tongue and dado joinery (with a groove on the inside for the bottom) works well for the drawer. Just be sure to account for the metal slides when you size the drawer parts. I also added screws to reinforce the joinery. Finally, after installing the slides and the false front, I added a pull to complete the cabinet.

FIGURE 6



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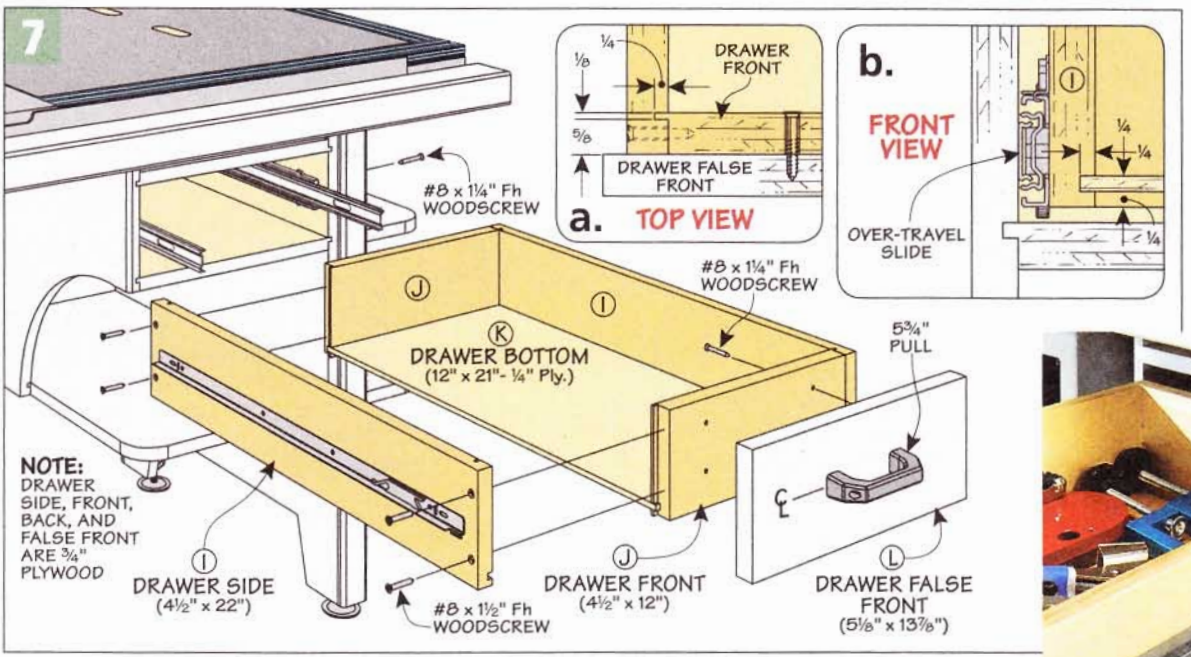


▼ ***Over-Travel Slides.*** *These drawer slides provide plenty of access to the back of the deep drawer.*

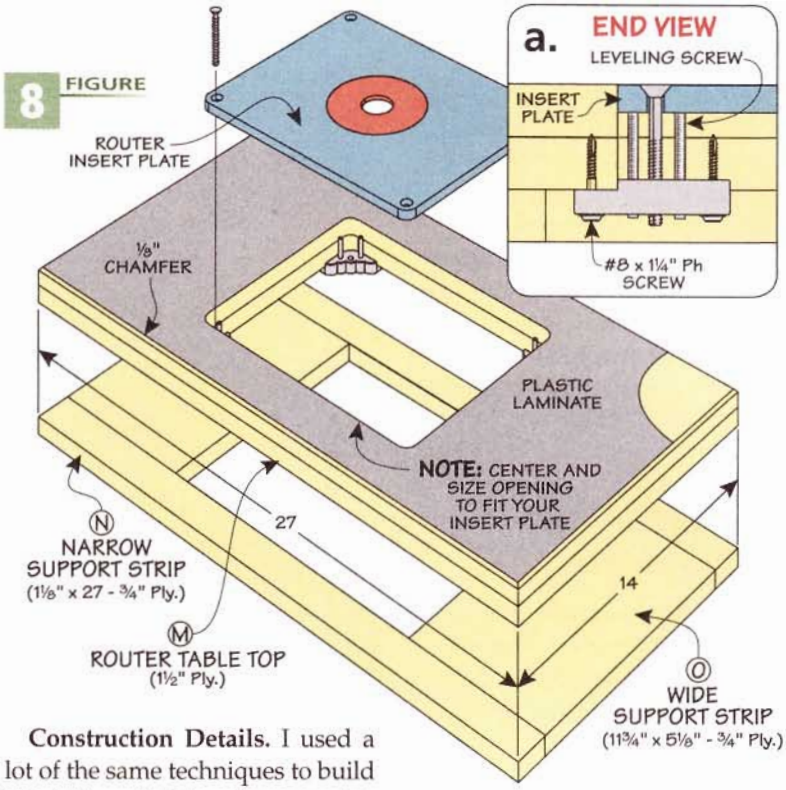
router table

Extension

One of the things I like most about this project is it really turns your table saw into a multi-purpose workstation. The router table extension and fence are proof of that (photo on opposite page).

Even though it only takes up a small amount of space, this router table is big enough for most routing operations. And the router table fence attaches to the table saw rip fence using universal fence clamps. This way, it can be easily locked in place wherever it's needed, as you can see in the photo on the next page. Plus, the clamps make it easy to remove the fence and store it in no time at all.

Drilling Station. To complement the router table, the wing doubles as a pocket hole drilling station. To do this, I mounted my pocket hole jig to an auxiliary base, then added a simple plywood insert that fits into the opening for the router plate insert. If you take a look at the photos on page 26, you'll see what I mean.



Construction Details. I used a lot of the same techniques to build this table as I did on the assembly table, with a few small changes.

First of all, the router table has just two full-size layers of ¾" plywood. And like before, I cut the first layer to size, then used it as a template to complete the second. But, instead of slots, I added an insert plate opening (photo below). For more on how I did this, refer to Shop Short Cuts on page 23.

Plate Levelers. If you take a look at the inset photo below, you'll see the insert plate levelers I used. These levelers are designed to work on router table tops up to 1½" thick. After installing the levelers, I added four support strips to create a "third layer" for the top, as you can see illustrated in Figure 8. This provides some additional strength to the table and gives it the built-up look that I wanted.

Materials & Hardware

ASSEMBLY TABLE WING & STORAGE

A	Assembly Table Wing (1)	27 x 30 - 2¼ Ply.
B	End Panel (1)	23¾ x 31½ - ¾ Ply.
C	End Legs (2)	2 x 31½ - ¾ Ply.
D	Shelves (2)	7 x 23¾ - ¾ Ply.
E	Cleats (2)	1¼ x 23¼ - ¾ Ply.
F	Cabinet Sides (2)	19¾ x 23¾ - ¾ Ply.
G	Cabinet Shelves (3)	14½ x 23¾ - ¾ Ply.
H	Cabinet Back (1)	5¾ x 14 - ¾ Ply.
I	Drawer Sides (2)	4½ x 22 - ¾ Ply.
J	Drawer Front/Back (2)	4½ x 12 - ¾ Ply.
K	Drawer Bottom (1)	12 x 21 - ¼ Ply.
L	Drawer False Front (1)	5⅛ x 13⅞ - ¾ Ply.

ROUTER TABLE WING & FENCE

M	Router Table Top (1)	14 x 27 - 1½ Ply.
N	Narrow Support Strips (2)	1⅛ x 27 - ¾ Ply.
O	Wide Support Strips (2)	11¾ x 5⅛ - ¾ Ply.
P	Fence Back/Frt./Btm. (3)	2½ x 24 - ¾ Ply.
Q	Fence Tops (2)	2½ x 10¼ - ¾ Ply.
R	Fence Filler Blocks (4)	1 x 2½ - ¾ Ply.
S	Fence Face (1)	3¼ x 27 - ¾ MDF

- (6) #8 x 1½" Fh Woodscrews
- (10) #8 x 1¼" Fh Woodscrews
- (24) #10 x 1½" Fh Woodscrews
- (12) #8 x 1¼" Fine Ph Screws
- (16) #8 x ¾" Ph Screws
- (2) Clamp Tracks (33¾" long)
- (1 set) Clamp Blocks
- (2) 3" Locking Bench Clamps
- (1) Router Plate
- (4) Router Plate Levelers
- (2) Universal Fence Clamps
- (1) Dust Port
- (2) Heavy-Duty Leg Levelers
- (1 pr.) 22" Over-Travel Drawer Slide
- (1) 1 17/32" x 5¾" Drawer Pull w/Screws
- (26) 5/16"-18 x 2" Hex-Head Bolts
- (26) 5/16"-18 Hex Nuts
- (26) 5/16" Washers

▲ ***Leveling Hardware.*** *These levelers make adding and leveling an insert plate easy.*

Then, to complete the router table extension, I added plastic laminate to the top of the table. After trimming it flush, I routed a small chamfer on the top front and side edges of the router table extension (Figures 8 and 8a). To match the assembly table, I left the edges of the plywood table unpainted.

BUILD THE FENCE

The next step is to add a sturdy router table fence. There are several things I like about this design. First, it's easy to build, with no fancy joinery. Second, the integral dust channel whisks chips up through the fence and out to a shop vacuum or dust collector.

Another nice feature is its replaceable face. You can make extras to keep on hand. It's just a piece of MDF with an opening sized for your most common bits.

Finally, I used special clamps to attach the fence to the rip fence. Where other clamps might be in the way, these clamps keep the fence face unobstructed, as in Figure 9 and the photo above. For sources, turn to page 51.

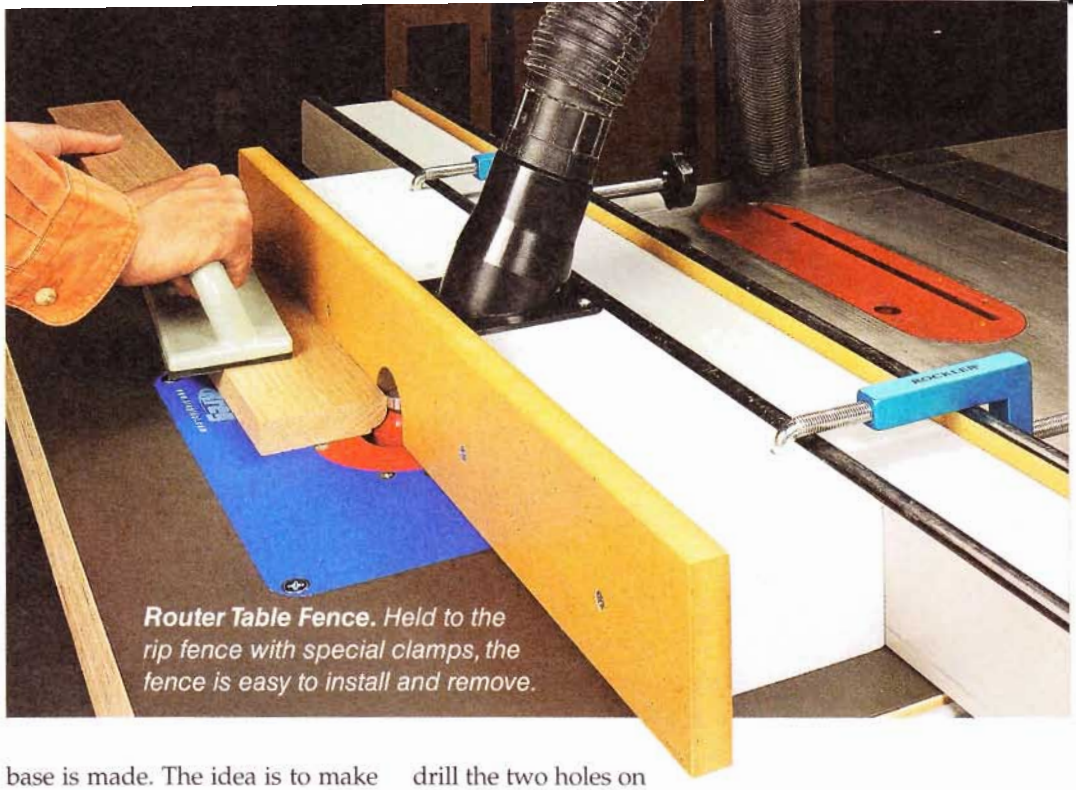
Basic Fence. If you take a look at Figure 9, you'll see how the fence base is made. The idea is to make an opening big enough for the dust port, while at the same time providing a solid base for clamping everything to the rip fence.

Go ahead and cut the base pieces to size, but before you glue them up, make the notches in the bottom and front pieces. To do this, I simply drilled a hole and then removed the waste.

Once everything is cut to size, you can glue up the pieces, paint everything but the fence face, and drill the two holes on the back edge of the fence for the clamps.

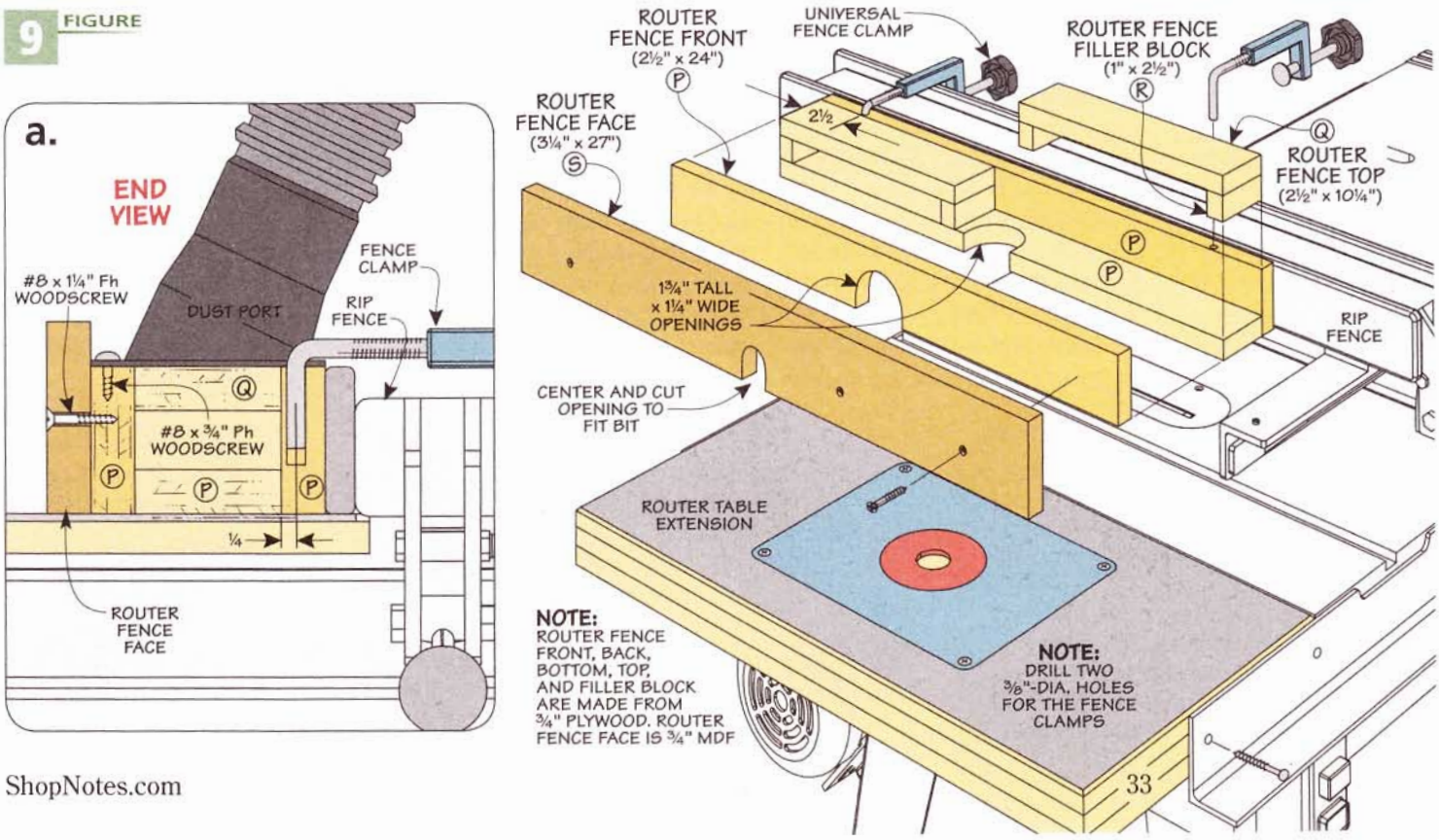
Now you can work on making some replaceable faces. The size of the opening should accommodate your most commonly used bits. Finally, fasten the face in place and add the dust port.

This table saw project center is perfect for expanding the capabilities of your saw. And the best part is, it only takes a few days in the shop to complete.



Router Table Fence. *Held to the rip fence with special clamps, the fence is easy to install and remove.*

FIGURE 9



must-have Countersink Bits

Choosing the right countersink can make or break the look of a project. Here's what you need to know.

It may not be the jazziest accessory in a toolbox, but using the right countersink bit can be the difference between a project with a great fit and finish and one that doesn't quite make the grade. So I decided to try out a number of different countersinks to see how well they worked and which ones were best for a woodworking shop.

The countersinks you see on these pages are a sampling of what's available. They'll all cut a cone-shaped opening at the top of a screw hole. But if you work with a wide range of materials, from hardwood and sheet goods, to brass, aluminum, and plastic, not all of them will do the job equally well.

Countersink Size. Before I talk about results, there are a couple things I'd like to mention. First, it's important to get a countersink with the right countersink angle. For a screw to seat correctly, the angle of the countersink must be the same as the screw head. Most often that will be 82°.

It's also important to know that some countersink bits require you to drill a pilot hole first. The pilot hole centers the bit so it cuts evenly on all sides of the hole.

But there's an upside to this style of bit — you can drill a countersink for a wider range of screw sizes. Simply increasing or decreasing the drilling depth will change the diameter of the countersink.

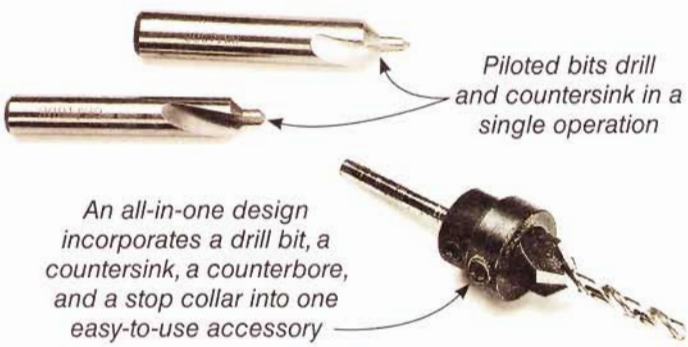
You won't have to drill a hole with countersink bits that have a center pilot at the end (lower left). Piloted bits allow you to quickly countersink in any material and even resize holes in hardware, like a hinge. But you will have to buy bits in different diameters to correspond to specific screw sizes.

The Cutting Flutes. The size and angle of the countersink are important. But I found that it was the cutting flutes that were most critical. Both the number of flutes and the design of the flute had the greatest affect on the results.

RESULTS

To determine how well each type worked, I drilled a number of countersinks using both a drill press and a hand drill. And I tried them out in a wide range of materials, as in the photo above.

▼ ***Styles.*** *The fluted countersinks shown below are the most common type available and come in both piloted and unpiloted versions with varying flute designs.*

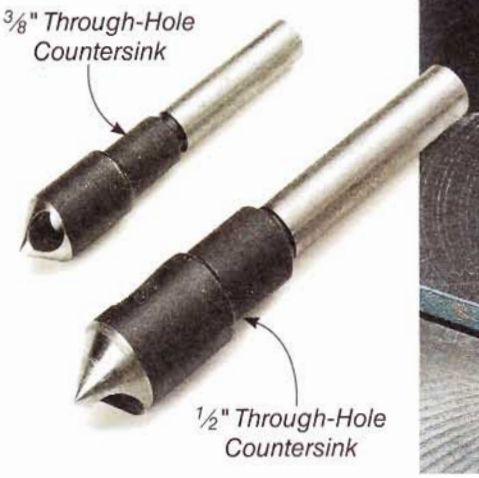


Fluted Bits. In general, whether I was drilling a countersink at the drill press or with a hand drill, I got the poorest results using a fluted bit. Whether it was a single flute or a multi-flute bit (lower right photos on the opposite page), the countersinks often had a rough, uneven surface. This was especially true in hardwoods and sheet stock — the materials I work with most often.

Piloted Bits. On the other hand, piloted bits (lower left photo on opposite page) worked great in both sheet goods and hardwood. But when it came to drilling in metal, the results were disappointing.

All-In-One. Results got even better with the all-in-one countersink bit with four flutes (lower left photo on opposite page). It's the type that gives you the ability to drill, countersink, and even counterbore in one quick and easy operation.

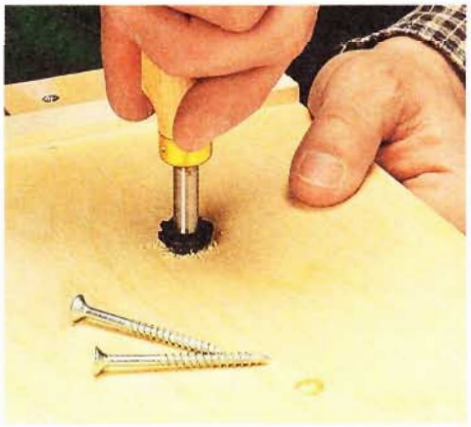
The countersink is attached to the body of the drill bit and is held in place with a couple of set screws. This makes it easy to adjust the drilling depth so only one countersink and bit is required for many screw lengths. But you do need one for each of the screw sizes you use most often.



Through-Hole Design. The best results came when I was using a zero-flute or through-hole countersink. These bits are often referred to as "Weldon-style" bits and they're easy to identify. They have an angled hole drilled through the body of the bit, like the ones in the upper left photo.

Regardless of material or drilling speed, I always ended up with a perfect countersink. Unlike the other countersinks that scrape material away, a through-hole countersink slices the material to produce a continuous, curly shaving. So there's virtually no vibration or chatter. In my shop, the two sizes shown in the photo above handle just about all my needs.

▲ ***First Choice.*** *When it comes to drilling smooth countersinks in a wide range of materials, like this aluminum angle, a through-hole countersink is the best choice.*



▲ ***By Hand.*** *The flutes of this hand countersink work quickly on many shop projects.*

Specialty Countersinks. Need to add a countersink and don't want to dig out your drill? Then check out the hand countersink shown at left. The eight cutting flutes make quick work of adding a countersink quickly and easily just about anywhere.

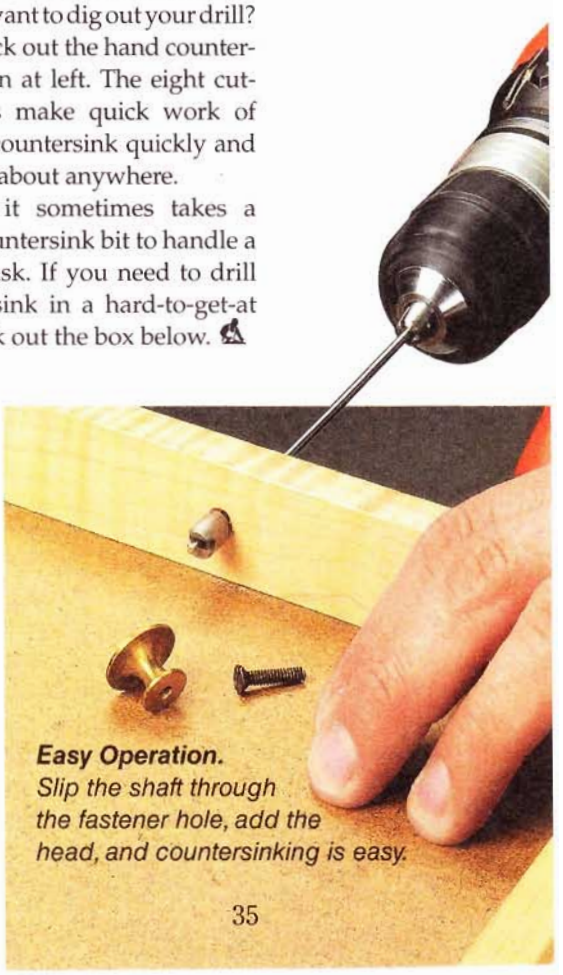
Finally, it sometimes takes a special countersink bit to handle a difficult task. If you need to drill a countersink in a hard-to-get-at area, check out the box below.

countersinking In Tight Spots

There are times when there simply isn't enough clearance to use a standard countersink — like on the inside of a drawer. When that's the case, a tight-spot reverse countersink is the answer (photos at right).

This countersink is a two-piece system. One part is a 6"-long tempered steel shaft that has a small "hook" on the end. The hook locks the countersinking head in place during use. You can buy these reverse countersinks in sizes ranging from 3/32" up to 1/4" to suit just about any need (For sources, refer to page 51).

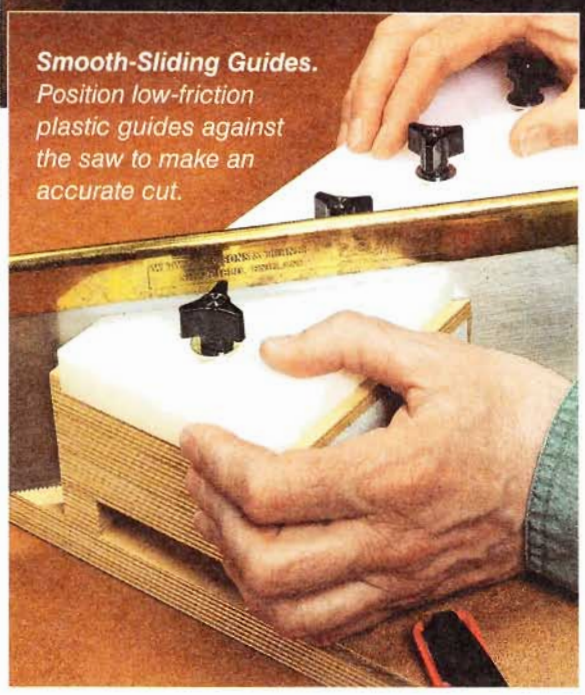
▼ ***Unique Design.*** *A hook at the end of the shank holds the countersink head in place during use.*



Easy Operation. *Slip the shaft through the fastener hole, add the head, and countersinking is easy.*

best-built
jigs & fixtures

handsaw Miter Box



Smooth-Sliding Guides. *Position low-friction plastic guides against the saw to make an accurate cut.*

This handy jig makes it easy to get perfect cuts in small pieces.

Cutting small pieces like delicate molding or thin glass stop poses some unique challenges. Since the pieces are often very small, they can be hard to hold down and cut safely at the table saw or miter saw. But it's important that each piece is cut accurately for a tight fit.

For this reason, I usually rely on a handsaw and a miter box. Now, I'm not talking about the cheap, plastic miter boxes you find at hardware stores. The wide slots in these miter boxes don't do a good job of guiding the saw. Instead, I made the miter box you see in the photo above. (You'll find a version for a Japanese saw on page 39.) To guide the saw, a set of low-friction guides press against the body of the saw plate without binding (inset photo). The results are safe, accurate cuts.

Besides precision cuts, this miter box has another key advantage — simplicity. You can build it and start using it in an afternoon.

BUILD THE FENCE

The miter box is made up of two components — the adjustable fence and the base. The most important part is the fence. So that's where I began building it.

The fence has two roles. First, it provides a wide, flat face to fully support the workpiece. The second role is to guide the saw accurately during the cut.

Plywood Fence. To handle each of these tasks, the fence is made from two different materials. To support the workpiece, the main part of the fence is made from a four-layer, plywood sandwich, as shown in Figure 1. The drawing also shows how the fence is created from a long blank.

When gluing up the blank, the important thing to keep in mind is the front is the reference face for supporting a workpiece. So the edges should be smooth and flat.

Two Grooves. Before cutting the fence into individual sections, I cut a groove in the top and bottom of the blank. The upper groove is sized to hold a piece of ultra-high molecular weight (UHMW) plastic for the saw guides you'll make later. The other groove creates a sawdust-catching channel that keeps dust from building up between the fence and workpiece. I cut both of these grooves in several passes with a dado blade at the table saw, as shown in Figure 1a.

At this point, you can cut the blank into four sections (Figure 2). Cutting a workpiece this thick can be a challenge for some table saws. But since the plywood doesn't guide the saw, the cut doesn't need to be perfect. So I cut the fence pieces at the band saw and then sanded the edges smooth.

The next step is to install a threaded insert in each section. These make it easy to attach the adjustable saw guides.

Base. The fence sections are glued to a plywood base (Figure 2). To keep the sections aligned, I attached a piece of hardboard to the base with double-sided tape. It also serves as a replaceable cutting surface. This way, you can "renew" the base when it gets chewed up.

FIGURE 1

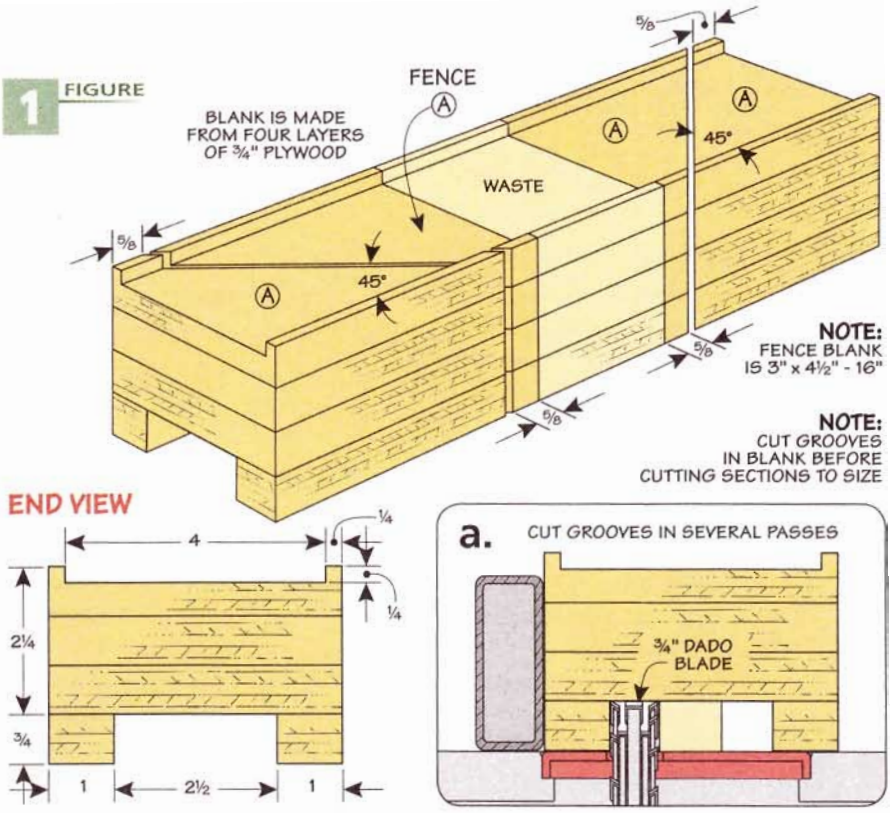
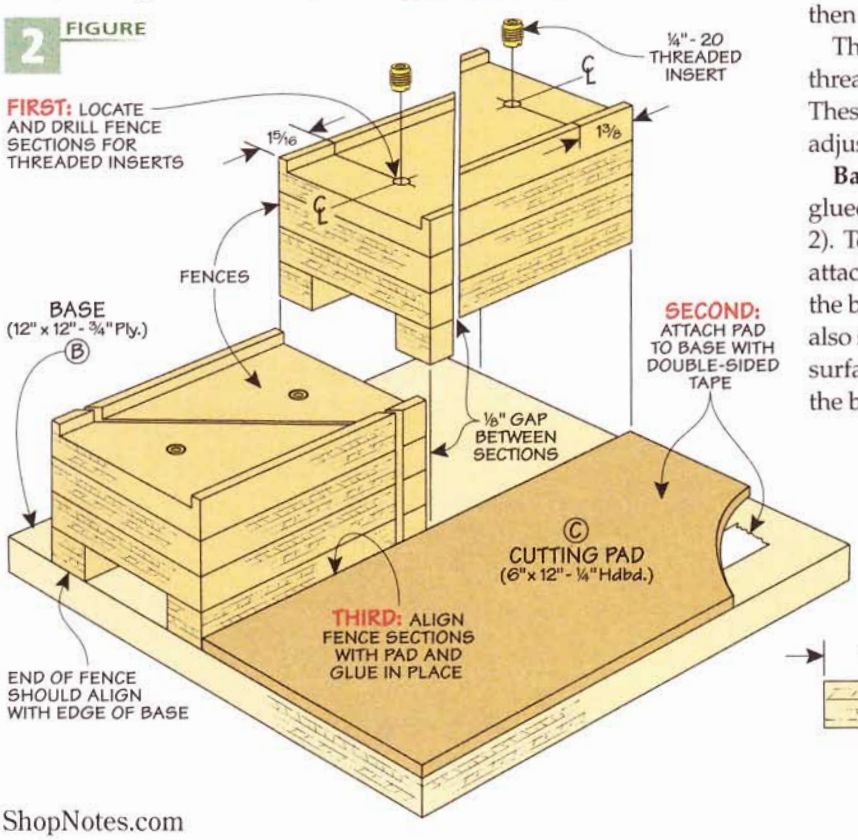
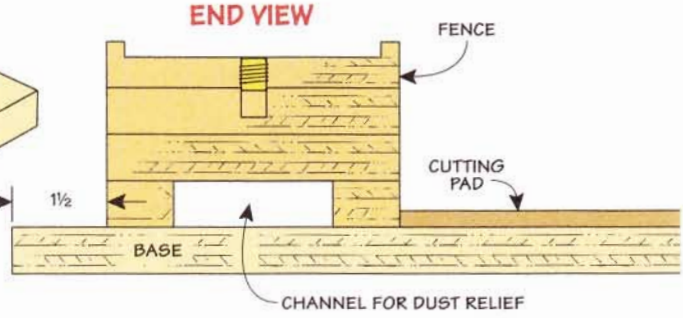


FIGURE 2





smooth-sliding
Guides

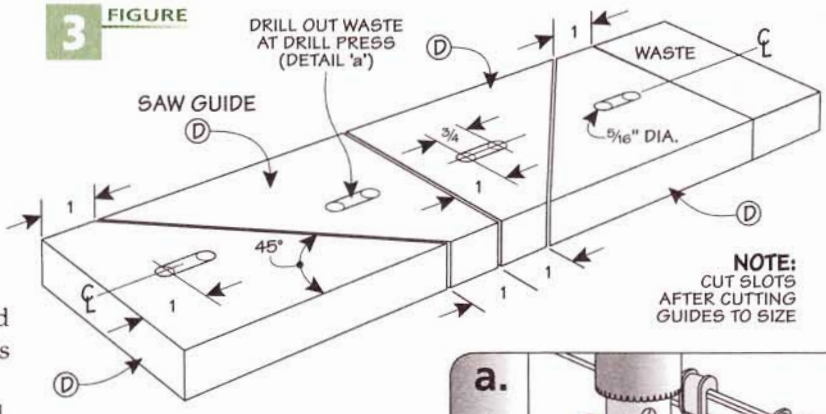
I mentioned earlier that the fence served two functions — supporting the workpiece and guiding the saw. Completing the plywood fence sections and attaching them to the base takes care of the first function.

Saw Guides. For the second, you can turn your attention to the four saw guides. These guides are made from UHMW plastic and keep the saw traveling in a straight, square line.

The guides are cut from a long blank, as shown in Figure 3. Each piece has a 45° cut on one end and a 90° cut on the other end.

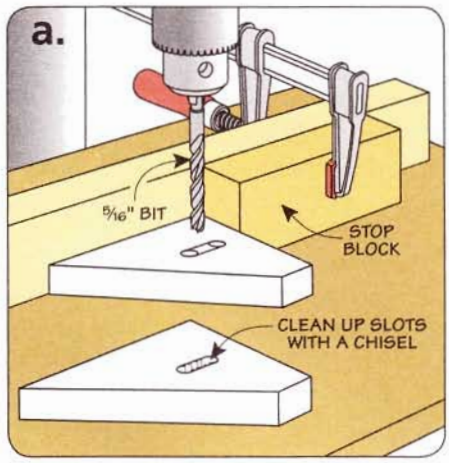
It's important that these pieces are accurately cut since they actually guide the handsaw during use. So before cutting the guide pieces to size, I took some time to fine-tune the saw blade and miter gauge settings on my table saw.

FIGURE 3



NOTE: SAW GUIDE BLANK IS ¾" x 4" - 14" UHMW PLASTIC

Adjustment Slots. The saw guides are attached to the fence with studded knobs, as in Figure 4. The studs fit in slots that are cut in each guide. To make the slots, I drilled a series of holes at the drill press (Figure 3a). Then I cleaned up the edges with a chisel.



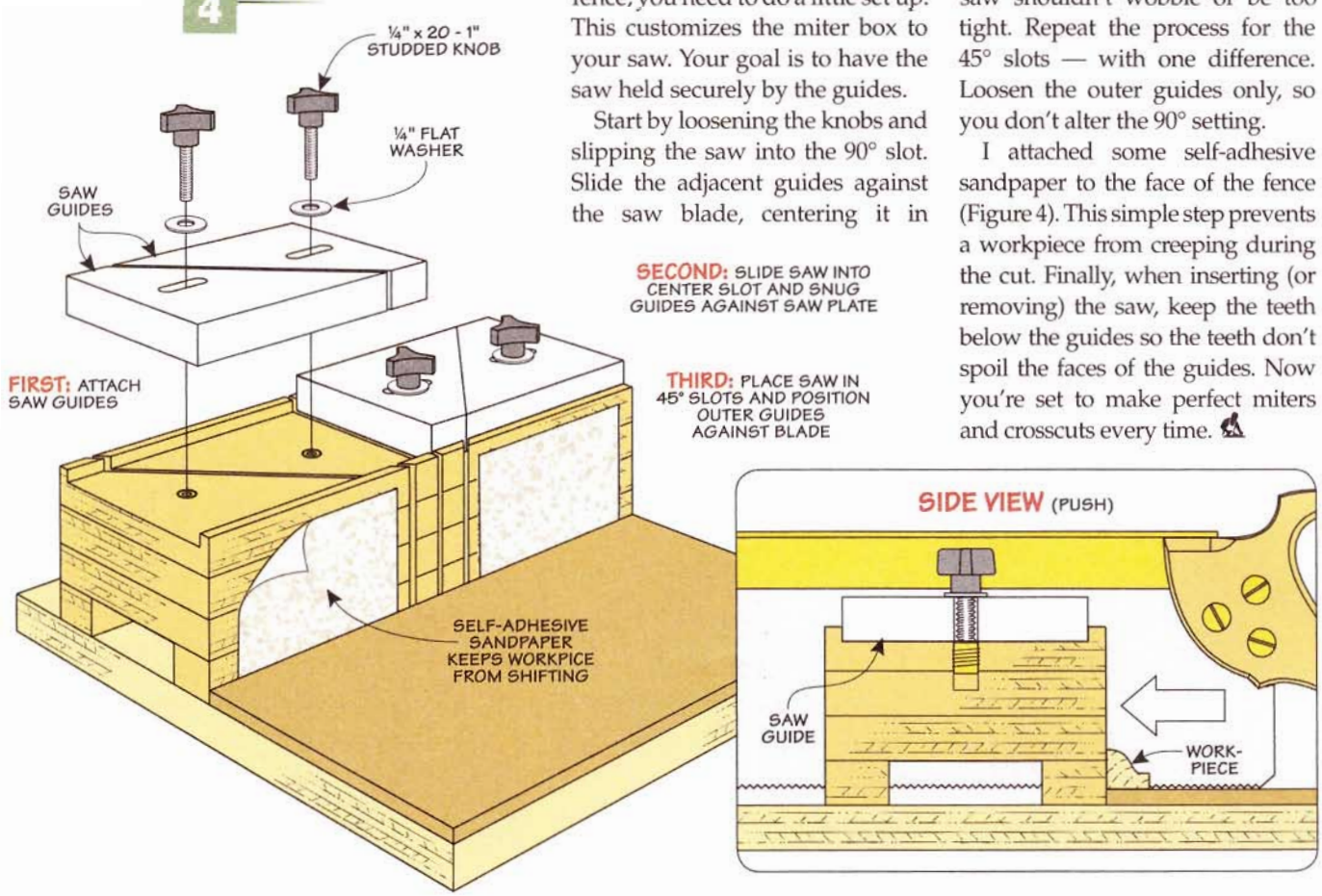
SETTING UP THE MITER BOX

After attaching the guides to the fence, you need to do a little set up. This customizes the miter box to your saw. Your goal is to have the saw held securely by the guides.

Start by loosening the knobs and slipping the saw into the 90° slot. Slide the adjacent guides against the saw blade, centering it in the slot. After tightening the knobs, move the saw back and forth. The saw shouldn't wobble or be too tight. Repeat the process for the 45° slots — with one difference. Loosen the outer guides only, so you don't alter the 90° setting.

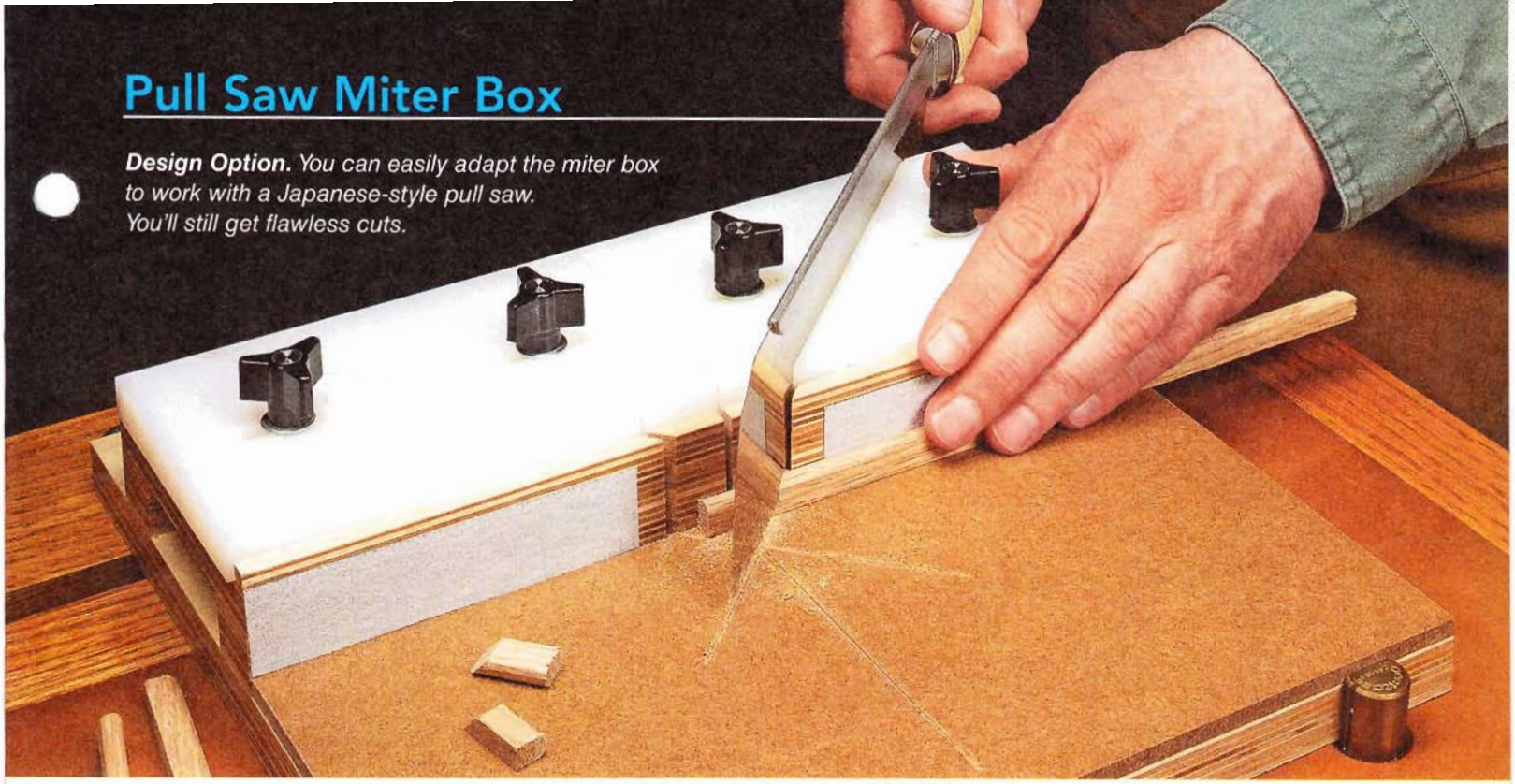
I attached some self-adhesive sandpaper to the face of the fence (Figure 4). This simple step prevents a workpiece from creeping during the cut. Finally, when inserting (or removing) the saw, keep the teeth below the guides so the teeth don't spoil the faces of the guides. Now you're set to make perfect miters and crosscuts every time.

FIGURE 4



Pull Saw Miter Box

Design Option. *You can easily adapt the miter box to work with a Japanese-style pull saw. You'll still get flawless cuts.*



The miter box was originally built to be used with a Western-style back saw. But with a few modifications, you can make a version that works with a Japanese-style pull saw, as shown in the photo above.

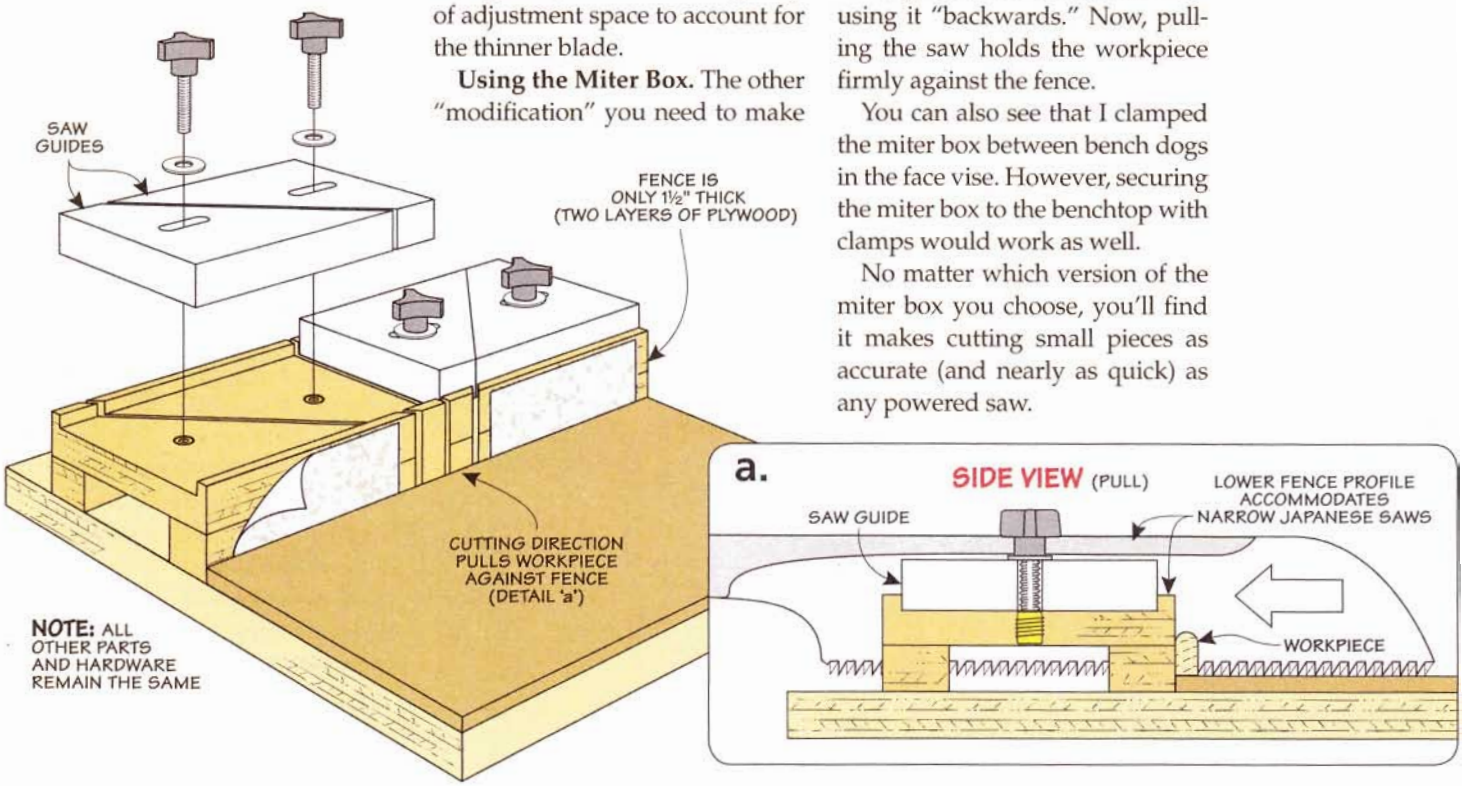
Shorter Depth. The biggest difference between the two saws is the shorter depth of cut found on most Japanese saws. To compensate for this, all you need to do is shorten the height of the plywood fence assembly, as shown in the drawing below. In this case, all I did was reduce the number of plywood layers from four to two. The grooves on the top and bottom are the same. And I didn't change the saw guides, either. There's plenty of adjustment space to account for the thinner blade.

Using the Miter Box. The other "modification" you need to make with the Japanese saw version of the miter box is in how it's used. Since a Japanese saw cuts on the pull stroke, the cutting action would pull the workpiece away from the fence. And this could lead to an inaccurate cut.

As you can see in the photo above, the solution is as simple as turning the miter box around and using it "backwards." Now, pulling the saw holds the workpiece firmly against the fence.

You can also see that I clamped the miter box between bench dogs in the face vise. However, securing the miter box to the benchtop with clamps would work as well.

No matter which version of the miter box you choose, you'll find it makes cutting small pieces as accurate (and nearly as quick) as any powered saw.



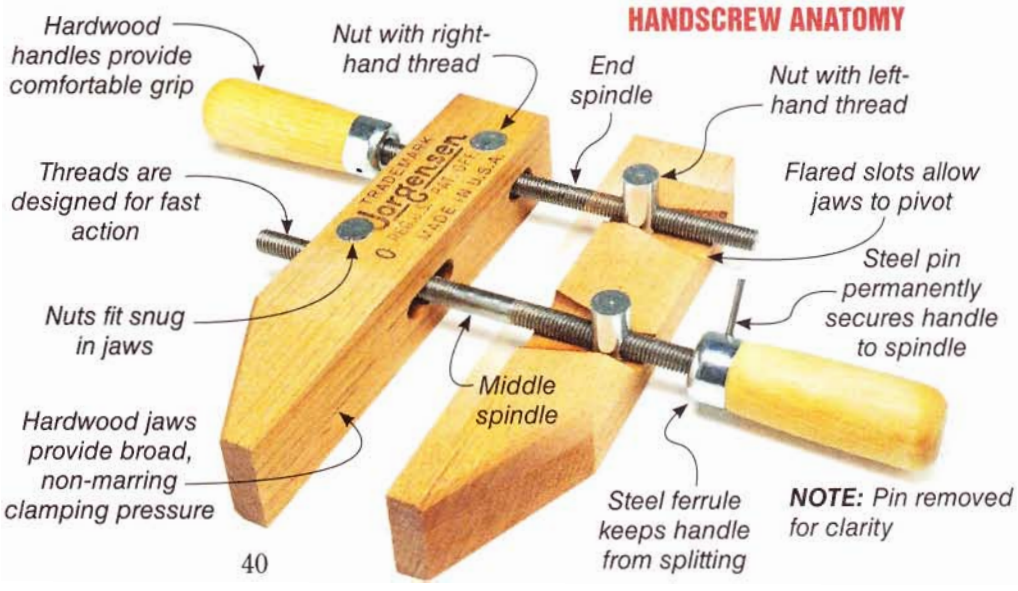
an inside look at Handscrews

Find out why these century-old clamping tools still deserve a place in your shop.

Give a woodworker a handscrew clamp and you're likely to get one of two reactions. They will either ask what they're supposed to do with it or state, "I couldn't live without them in my shop." If you fall in the first camp, you might want to give handscrews a look.

History. Wood handscrews have been around for over a century. The early ones were basic devices with wood threads, but they were a mainstay in every woodshop.

In the 1890's, a cabinetmaker by the name of Jorgensen came up with a better design. He replaced the wood threads with spindles and steel nuts, like you see below. The *Adjustable Clamp Company* was born and the company still makes handscrews in Chicago, Illinois, using Jorgensen's original design.

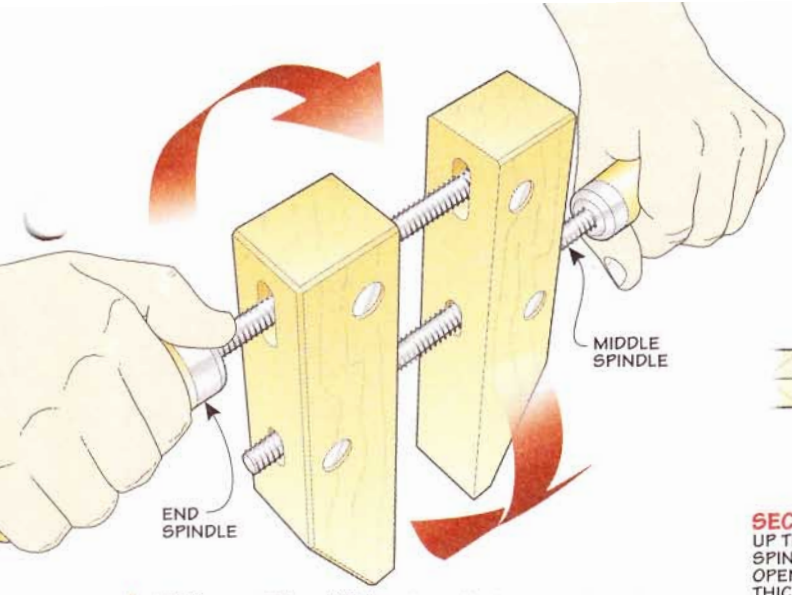


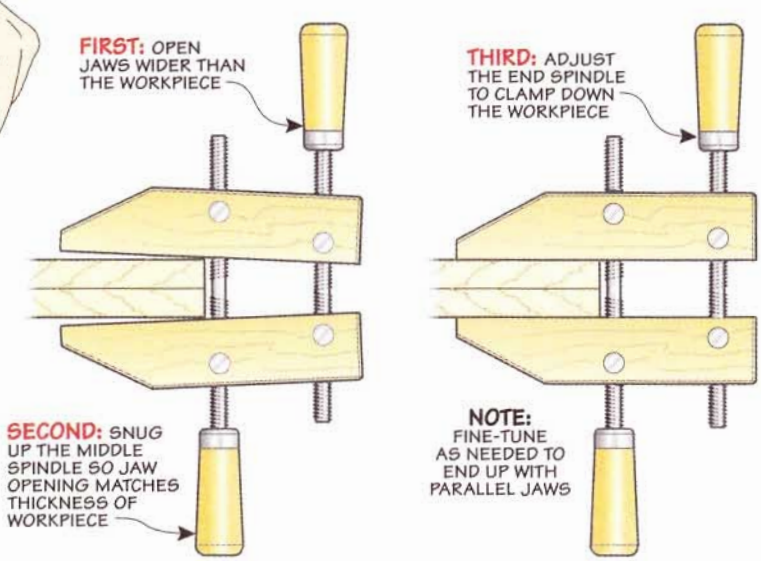
How They Work. What makes a handscrew different from other woodworking clamps is the way the jaws can pivot out of parallel. The photo below shows how its construction makes this possible.

The two steel spindles are threaded through cylindrical nuts in the hardwood jaws. One end of each spindle has a right-hand thread and the other end a left-hand thread. When you turn the handle, the jaws move in opposite directions to open or close. Flared slots allow the nuts and spindle to swivel in the two jaws to move them out of parallel.

What This Means. This unique construction is what makes a handscrew so handy in the shop. Keeping the large jaws parallel provides a long reach and a broad clamping surface — perfect for leveling the joints of a glueup (main photo above).

But you can angle the jaws inward, too. Doing this lets you apply a lot of clamping pressure





▲ ***Riding a Bike.*** *With a handle in each hand, you can quickly open or close the jaws by "pedaling" — forward to tighten, backward to loosen.*

right at the ends of the jaws. The bottom line is there are dozens of ways to use handscrews. To take a look at some of our favorites, you can check out the box at the right and our *Online Extras* on the web at *ShopNotes.com*.

Features. When you're shopping for handscrews, there are some features you'll want to look for. I've used quite a few different handscrews from various manufacturers and some are better than others. The two brands I like best are the *Jorgensen* brand and those made by the *Dubuque Clamp Works* in Iowa. You can find out where to get them in *Sources* on page 51.

These clamps have stout spindles and smooth-operating threads. The steel nuts fit snug in the holes in the jaws. This means there's no sloppiness when I tighten down the clamp. The jaws are flat, straight, and square. These clamps may cost a couple of bucks more than other brands, but you'll quickly appreciate their quality and value.

Sizes. You can find handscrew clamps in a variety of jaw lengths, from 4" to 24" (photo below). The jaw reach and open capacity is about half of the overall jaw length. I find the smaller sizes (10" or less) more useful for my shop.

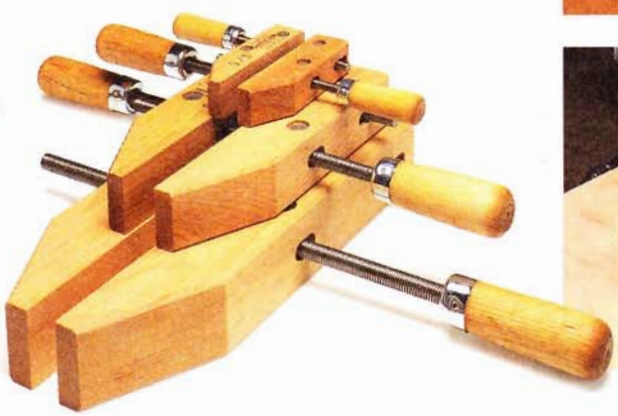
No License Required. It might take a little practice to get the hang of using a handscrew. I find it works best to put the handle for the end spindle in my right hand (I'm right-handed). Then it's like riding a bike. The drawings above show how you can use this technique to clamp a workpiece.

In no time at all, I'm sure you'll see how useful handscrews are. It's no wonder they've been around for over a hundred years.

ShopNotes GO ONLINE EXTRAS

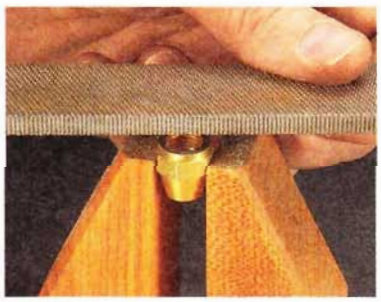
To get more tips for using handscrews, go to:

ShopNotes.com



► ***Size Variety.*** *Handscrews are available in a range of sizes to suit just about any clamping need.*

handscrew tips: Uses



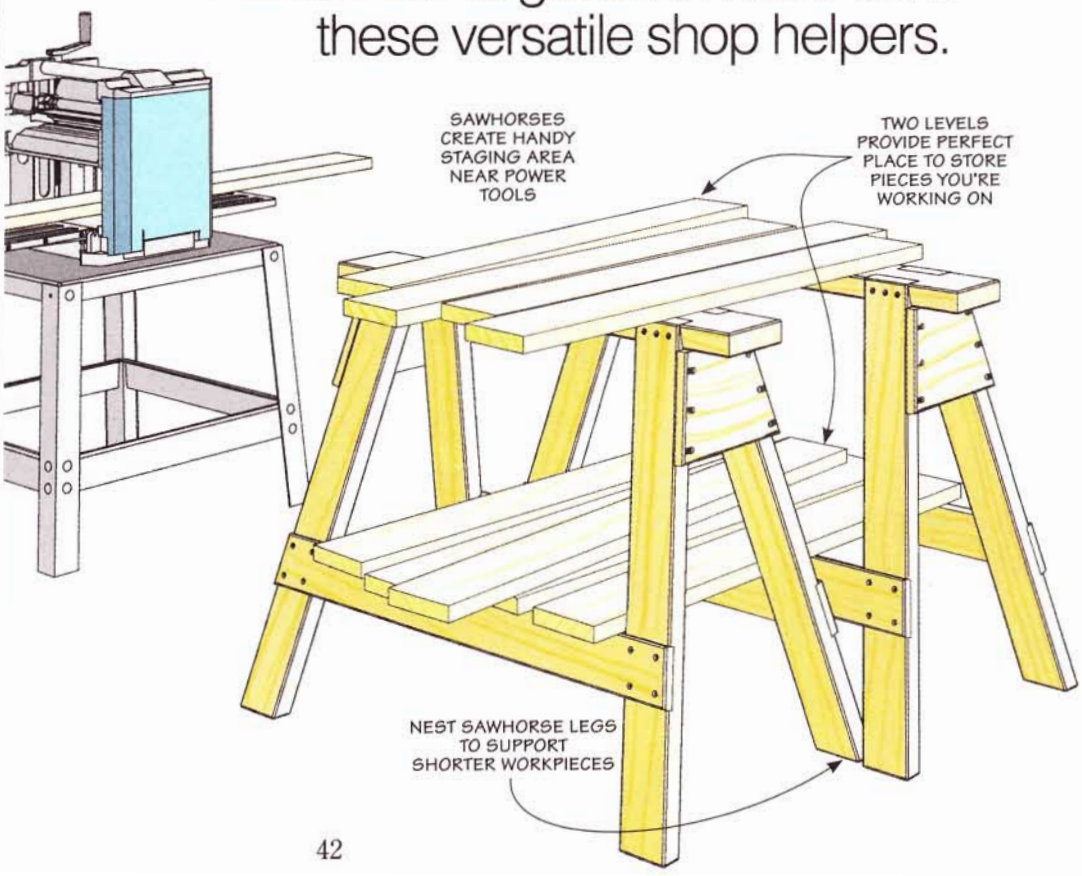
◄ ***Small Parts.*** *For clearance when working with small parts, clamp them in a handscrew, then clamp the handscrew in your face vise.*

◄ ***Go Vertical.*** *A pair of handscrews clamped to the benchtop make a stable base for working the edge of a workpiece.*

◄ ***Extra Hands.*** *A handscrew acts as an extra hand to clamp small or awkward parts for safe and accurate drilling.*

top 5 upgrades for Sawhorses

Here's how to get even more from these versatile shop helpers.



▲ CUTTING GRID

Just about every shop has a pair of sawhorses stashed somewhere. Most of the time, they're used to break down sheets of plywood or MDF. The problem is supporting the workpiece to prevent it from falling or pinching the blade.

My solution is the knock-down cutting grid shown above. It's an open gridwork made from interlocking "two-by" rails. It offers full support to the sheet, and can be stored in a small amount of space.

◄ STORAGE RACK

I know it might seem obvious, but one of the handiest uses for my sawhorses is creating a staging area to store parts and lumber.

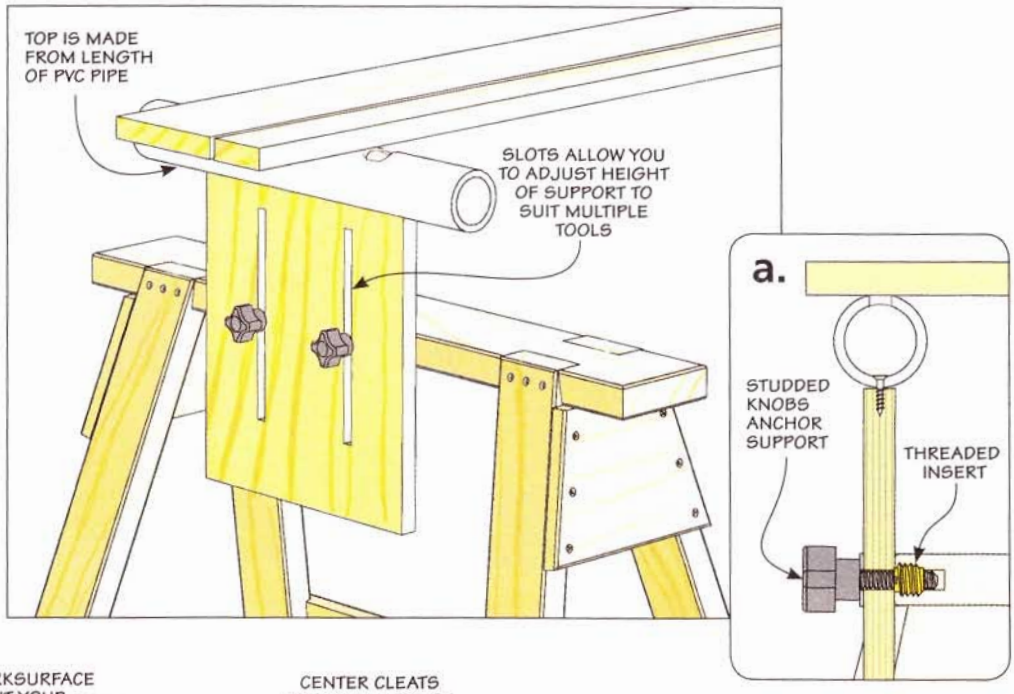
For example, at the beginning of a project, I like to set up the horses between the jointer and planer, as shown at left. Then, as parts are milled, they can be placed in a completed stack spanning the sawhorses' lower stretchers.

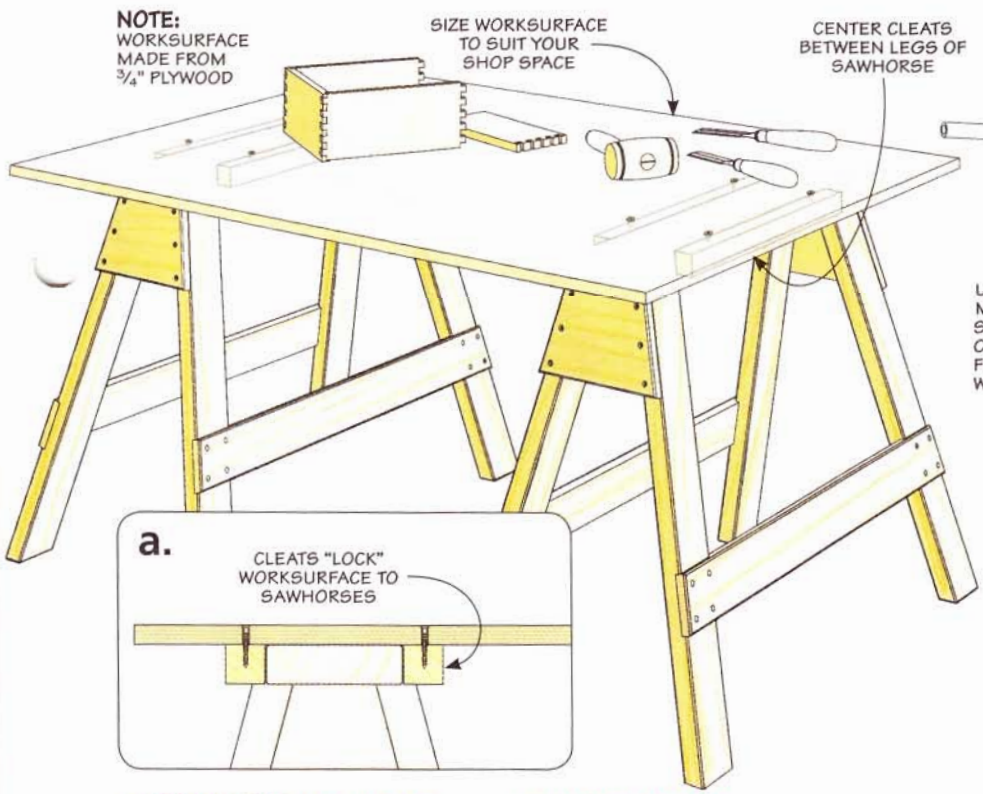
OUTFEED SUPPORT ►

In a small shop like mine, there's not a lot of room for extra accessories. So instead of getting separate outfeed supports, I turn to my trusty sawhorses and the simple, adjustable height add-on shown in the drawing at right.

The support is a plywood panel with a piece of PVC pipe screwed to the top. The smooth, curved surface of the pipe allows a workpiece to slide easily without catching.

A pair of slots in the plywood let you attach the support to the sawhorse with washers and studded knobs. I installed a pair of threaded inserts in the top rail of the sawhorse to hold the knobs.





▲ INSTANT WORKSURFACE

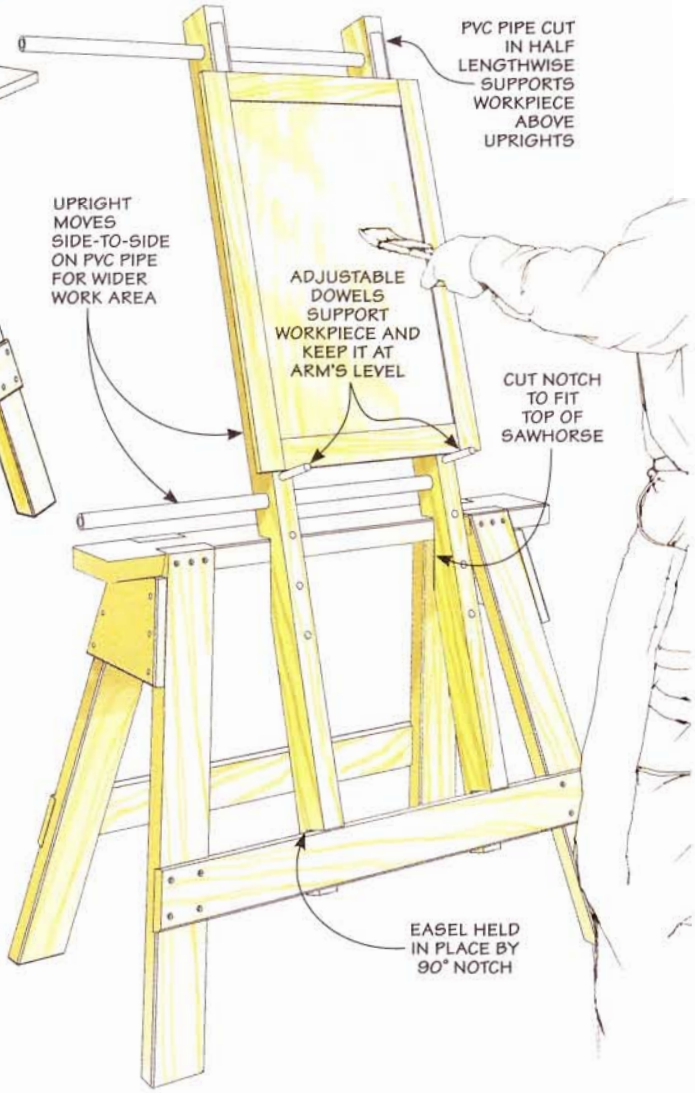
When it comes time to assemble a project, I can quickly run out of bench space. And having a second permanent bench isn't an option.

To create some additional real estate, I keep an extra worksurface stashed in my lumber rack. The plywood panel has two sets of cleats that fit over my sawhorses. This "instant bench" also comes in handy for projects outside the shop.

FINISHING EASEL ►

Finishing cabinet doors and other large panels requires a lot of space. And bending over a bench can leave you with an aching back. The adjustable easel you see at right solves those problems by freeing up your bench and placing the work at a comfortable height.

You'll find this easel stores in a compact space and is quick and easy to set up when you need it.



3 handy techniques for Table Saw Mortising

Making mortises on your table saw is fast, easy, and accurate with the right approach.

Mortise and tenon joinery is my go-to joint for creating fine furniture and rock-solid shop projects, as you can see in the photos below. About the only downside to using this versatile joint is the time it takes to cut all the mortises for the project by hand.

Well, for many projects, there's an easier way to do this — the table saw. As you're about to see, there are a few tricks to doing this quickly and easily. But don't worry, you'll still end up with a great-looking joint that will stand up to the test of time.

MORTISES IN AN EDGE

Whenever I have to add a row of spindles to a project, like the one you see in the lower left photo, I know there's no way around having to make a lot of mortises. And drilling out and chiseling all of them square isn't something I look forward to doing. To save myself the time and hassle of cutting each mortise individually, I cut a groove in one edge of a workpiece and then glue in a "mortise strip." The drawings on the opposite page cover the entire process.

Grooves. Cutting the centered groove in the edge of a workpiece is the easiest part of this technique, so that's where I like to start. You can see how to do this in Figure 1 by making two passes at the table saw.

Easy Mortise Strips. As the name implies, the mortise strips are just narrow pieces of wood with notches cut in them. When the

▲ ***Edge Mortises.*** *A series of mortises in the edge of these stretchers accepts the tenons on the ends of the spindles.*

▲ ***Heavy-Duty Through Mortise.*** *The wide, through mortises of this bench make for solid construction and add a classic look.*

▲ ***Through Mortises in a Panel.*** *Add style and elegance along with sturdy joinery with through mortises in the face of a panel.*

strips are glued into the grooves, the notches create the mortises.

But instead of trying to cut the notches in a bunch of narrow, individual strips, you start with a wide blank cut to the same length as the grooved workpiece. (The thickness of the blank matches the depth of the groove you cut earlier.) Then once the notches (dadoes) are cut, simply rip strips off the blank that match the width of the groove.

Notches. The key to good results is spacing the dadoes evenly. To do this, I use a simple indexing jig, like you'd use for box joints (Figure 2).

First, cut a centered dado and then glue an index key into the auxiliary fence (Figure 2a). This ensures that the remaining dadoes will be accurately spaced.

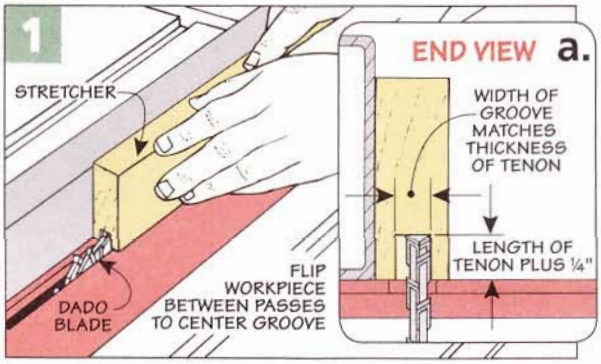
After that, all you need to do is readjust the auxiliary fence to position the key away from the dado blade so that it matches the desired spacing of the dadoes, as in Figures 3 and 3a.

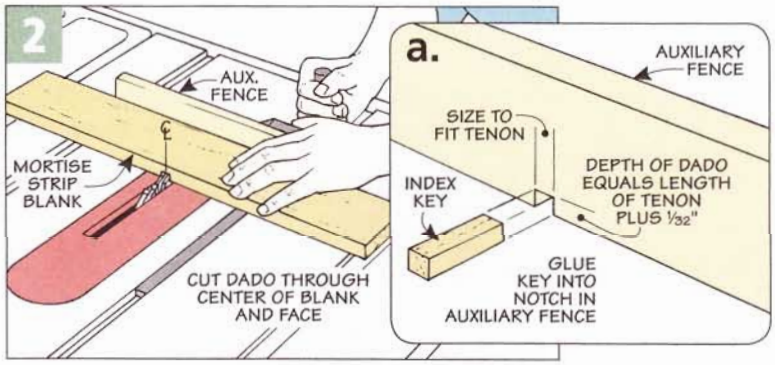
The next step is to cut a series of dadoes on one side of the center notch. The actual number will depend on your design, but the process for cutting them is identical. Simply place each newly cut dado over the key to cut the next one.

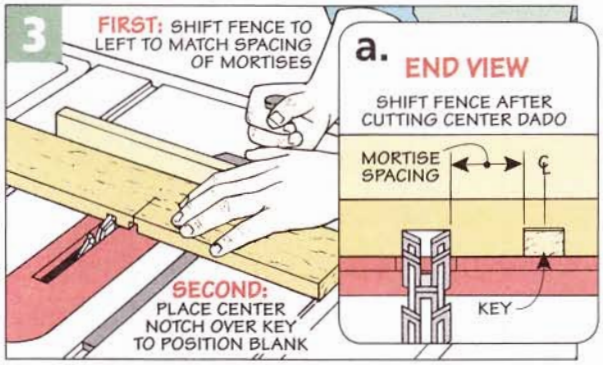
With one side complete, just turn the workpiece around and cut the remaining dadoes on the other side of the centerline, following the same procedure (Figure 4).

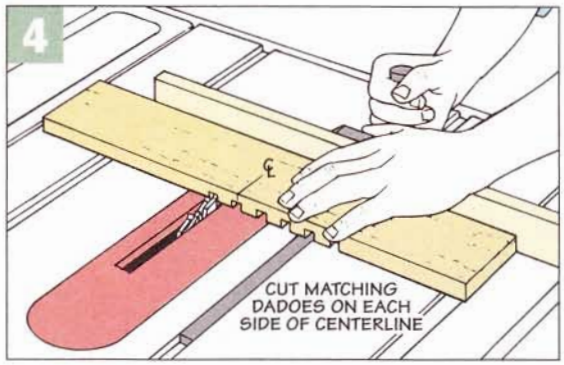
Rip the Mortise Strip. It's important that the mortises on the upper and lower stretchers line up after the strips are ripped and glued in place. So it's a good idea to draw a reference line on one end of the blank before ripping the strips free (Figure 5). Then, just make sure the marks are at the same end of the stretchers when gluing the strips in place. Note: Use a sparing amount of glue when you install the strips to avoid getting any in the mortises.

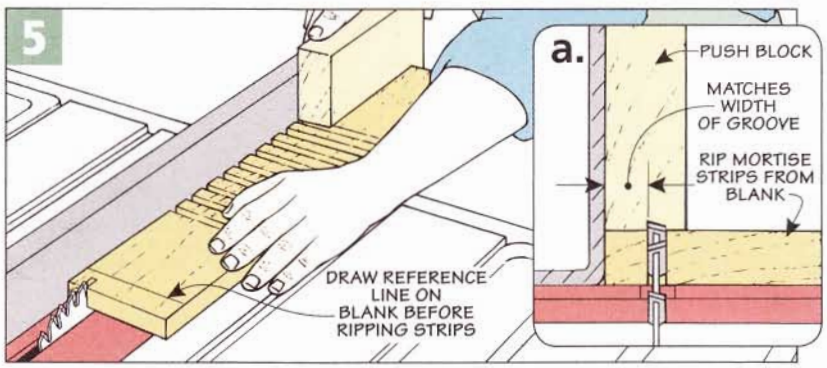
▲ ***Evenly Spaced.*** *A notched mortise strip fits into a groove in the stretcher resulting in evenly spaced spindles.*

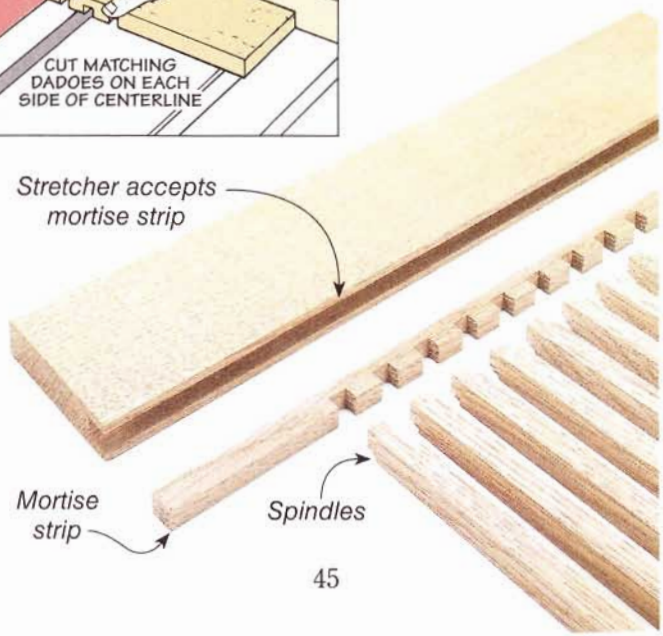










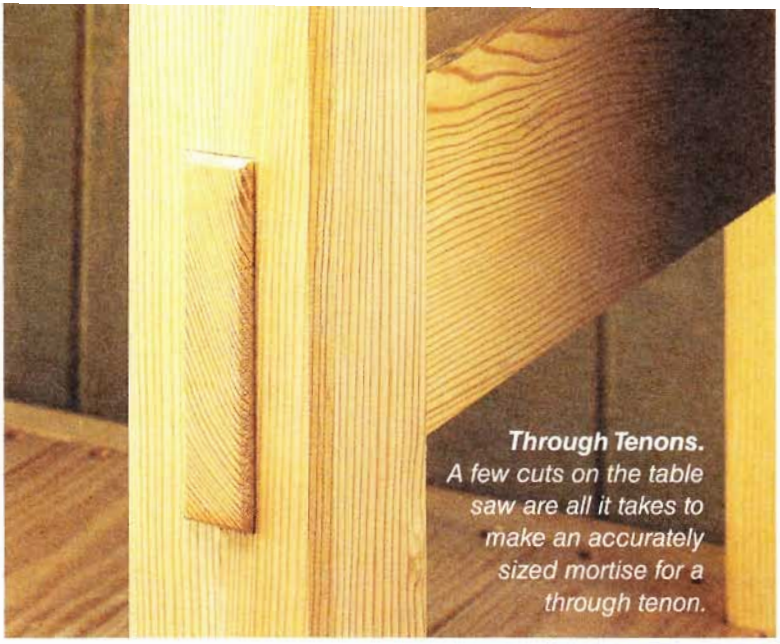


Heavy-Duty Through-Mortise

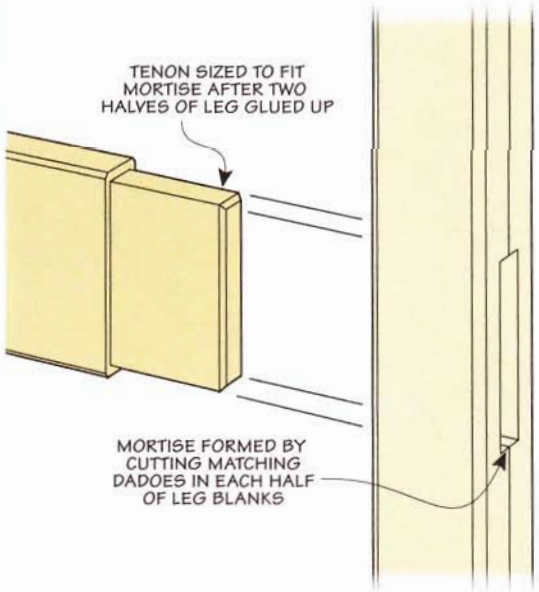
Making a number of small mortises quickly and easily is a great technique for the table saw. Using a slightly different method, you can create a through mortise in a leg to accept the tenon of a stretcher or rail, as in the photo at right.

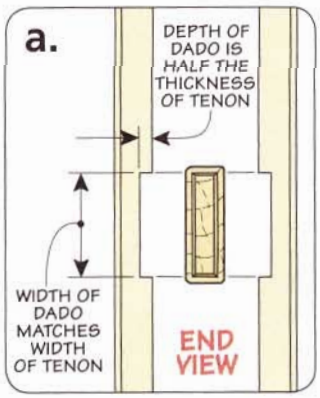
In the past, I'd drill or chop out the mortise. But there are a few downsides to doing that. It takes a lot of time. And keeping the sides of the mortise perfectly flat and square can be a challenge. Using a table saw solves all these problems.

Start with Two Halves. To create the mortise, you make the leg out of two separate pieces (drawing below). Then, instead of making the mortise after the leg is glued up, you cut dadoes on the inside face of both halves of the leg first (detail 'a'). This way, you end up with perfectly sized mortises once the two parts are glued together. And by carefully selecting the two parts of the leg, the joint line is almost invisible.



Through Tenons. *A few cuts on the table saw are all it takes to make an accurately sized mortise for a through tenon.*



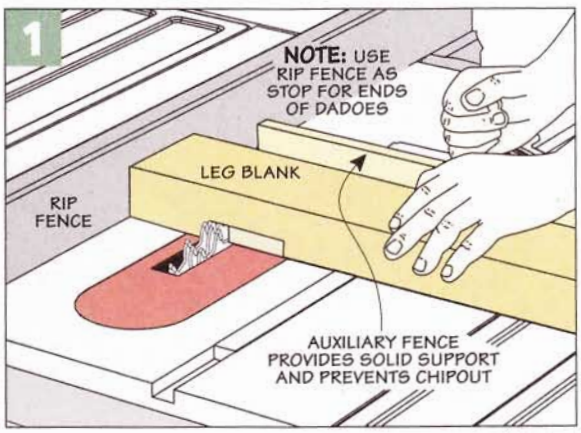


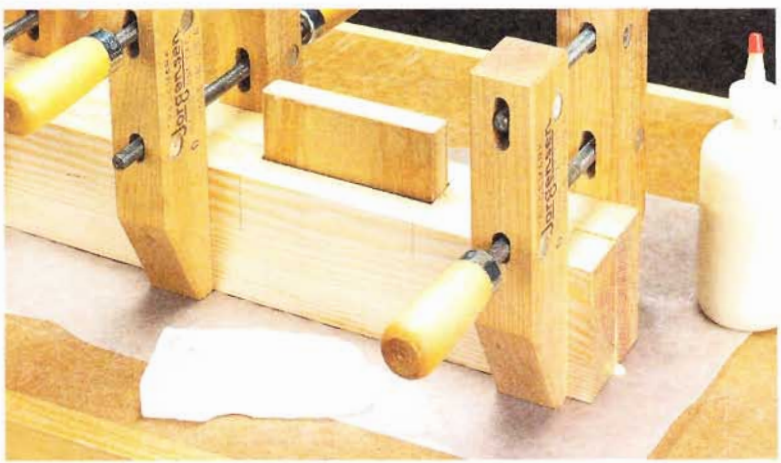
Making the Cuts. When I make a leg this way, I start by cutting two blanks to exact length and thickness, but I make them extra wide. This way, I can plane the legs down to finished width after they're glued up.

Once the blanks are sized, you can go ahead and cut the dadoes that will form the mortises, as in Figure 1. I use the rip fence as a stop as I work to ensure that each pair of dadoes lines up once the blanks are glued together. And be sure to make all the cuts at one rip fence setting before moving on.

Keeping the Parts Aligned. When it comes to gluing up the two halves of the leg, the trick is keeping the dadoes aligned as you clamp the pieces together. To do this, I use simple "keys," like the one you see in the photo below.

All you need to do is cut some scrap blocks (I like to use MDF) to fit snugly in the mortises in the leg. Once the glue dries, all that's left to do is plane each leg down to its final width. The end result is a perfect through mortise ready to accept a tenon.





▲ ***Perfect Alignment.*** *A waxed MDF block acts as a "key" to keep the two halves of the leg aligned during the glueup. Chamfer the edges of the key to make removing it easier once the glue dries.*

Mortises in a Panel

The last table saw mortising technique is used to create a mortise or mortises across the width of a workpiece, like the end of the bench shown in the photo at right.

Creating these mortises by hand requires starting with a lot of careful layout. Once that's complete, then you have to spend even more time chiseling out the mortises perfectly to accept the tenons on the ends of the stretcher. This entire process is a snap at the table saw.

Start with Separate Workpieces. As you can see in the drawing below, the two mortises start out as notches cut into the edges of three separate workpieces. These workpieces make up the end panel of the bench. When the pieces are assembled, the notches align to form the through mortises.

Sizing the Workpieces. The first step in this process is to cut the three workpieces that make up the end of the bench. I like to start by planing the stock to final thickness. And then you'll want to make sure the width of the middle board is sized accurately. Determining the width of the middle piece is simple. It's the same as the center-to-center distance between the mortises. This ensures that you end up with the correct spacing between the two mortises and that the mortises end up the right size.

Cut the Notches. Once the workpieces are cut to size, you can begin work on cutting the notches that create the mortises. But before you get started, take a little time to mark the bottom of each workpiece, like you see in Figure 1.

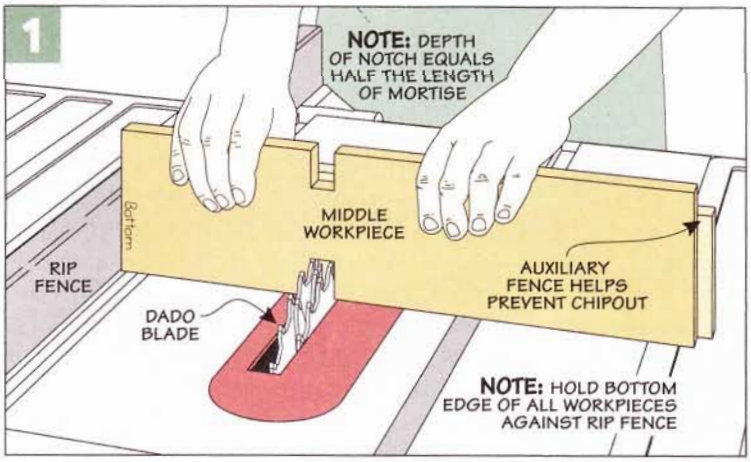
At this point, you're going to use the rip fence as a stop to locate each of the notches. So when you cut the notches, just be sure to hold the bottom edge of each piece tightly against the rip fence. This way, the notches line up to form accurately sized mortises.

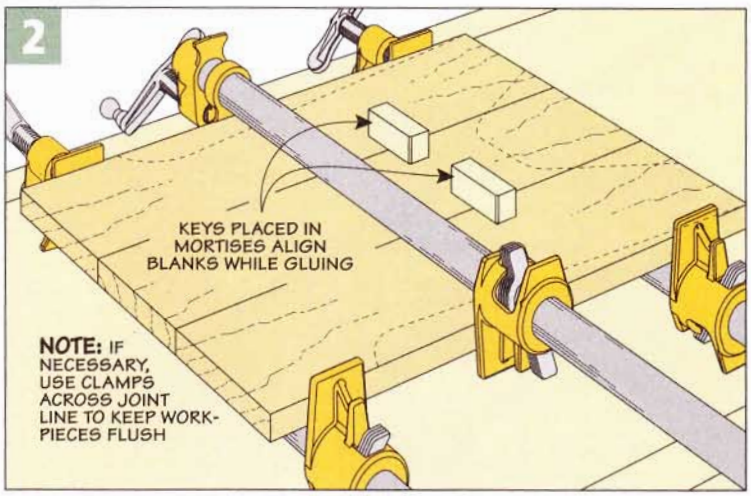
Glue Up. Once all the notches are cut, you can glue the workpieces together to form the end panel. Here again, there's a simple trick to keeping the notches aligned during assembly.

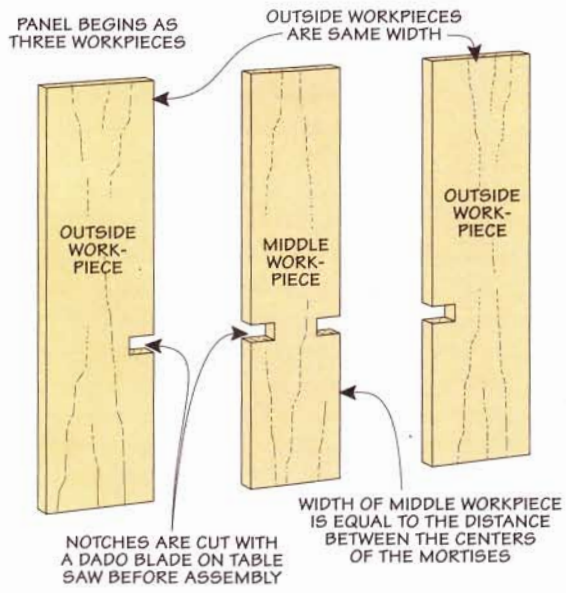
The solution is some hardwood "keys" sized to fit the assembled mortises, like you see illustrated in Figure 2. When the keys are inserted during the glueup, they'll keep the notches aligned on all three pieces while the clamps are tightened down. As before, a little wax on the keys will keep them from sticking. And if you need to, you can add clamps across the joint lines to keep everything flush.

After the glue dries, you can complete any remaining steps on the end panel, like the shaping you see in the photo above.

▲ ***Dual Mortises.*** *The trick to creating two identical mortises in a panel is to cut notches in separate pieces and then glue up the panel.*







one-handed Clamps

Check out the latest innovations in these handy shop tools.

When one-handed clamps first came out, they worked okay for light-duty clamping tasks, but they had a few drawbacks. First, it was difficult to apply a lot of clamping pressure. Then, when it was time to remove the clamp, you sometimes needed two hands to release the pressure.

The *Adjustable Clamp Company* (the maker of *Jorgensen* clamps) and *Irwin* set out to change all that by introducing some new, one-handed clamps. You can find sources for these clamps on page 51.

IRWIN QUICK-GRIP

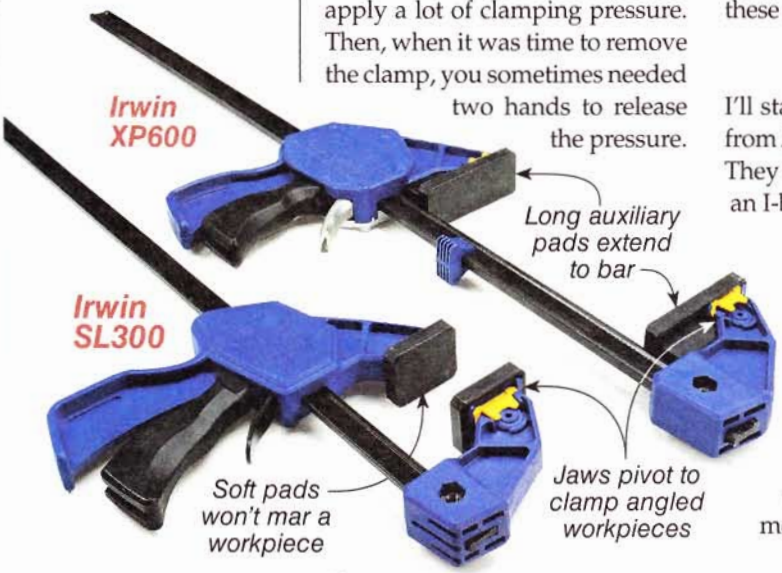
I'll start with the two new clamps from *Irwin* — the *SL300* and *XP600*. They both feature a bar shaped like an I-beam for added rigidity.

Plenty of Pressure. The main feature of these clamps is the clamping force they provide. The *SL300* is rated for up to 300 lbs. of sustained clamping force while the *XP600* is rated at 600 lbs. That's more than enough pressure to tackle most of my assembly tasks.

When removing the clamp, the release trigger takes little effort to activate. That's a big improvement over older style clamps where I often had to use two hands.

Swivel Jaws. Another feature I like is the swivel jaw that allows you to clamp tapered or odd-shaped workpieces. (Both jaws on the *XP600* swivel.) But you can lock the jaws parallel for clamping square assemblies. Both clamps feature removable pads. However, the pads on the *XP600* have a larger bearing surface that runs down to the bar. These let the clamp act like a smaller version of a parallel jaw clamp, as in the photo above.

Spreader. Another handy feature allows you to remove the fixed jaw, flip it around and attach it to the other end. Now, the clamp



works like a spreader to push apart stubborn assemblies.

Lengths. To cover a wide range of assembly needs, the *XP600* is available in clamping capacities ranging from 6" to 50". The maximum capacity of the longest *SL300* is 36".

JORGENSEN ISD³

Competition in the marketplace often results in better products and the new *Jorgensen ISD³* from *Adjustable Clamp Company* proves it (photos above). Its reinforced plastic jaws and handle make the clamp lightweight. But don't let its looks fool you. This clamp can handle just about any task.

Double the Length. The most unique feature of the *ISD³* clamp is its ability to join up with another *ISD³* clamp. The fixed jaws can be flipped over and locked together to make one long clamp. You can see how this works in the photos above. The interlocking jaws give you an additional 6" of clamping capacity. For example, two 12" clamps have a combined capacity of 30". This gives you more clamping options without needing a lot of clamps. (The clamps are available in 6" to 36" bar lengths.)

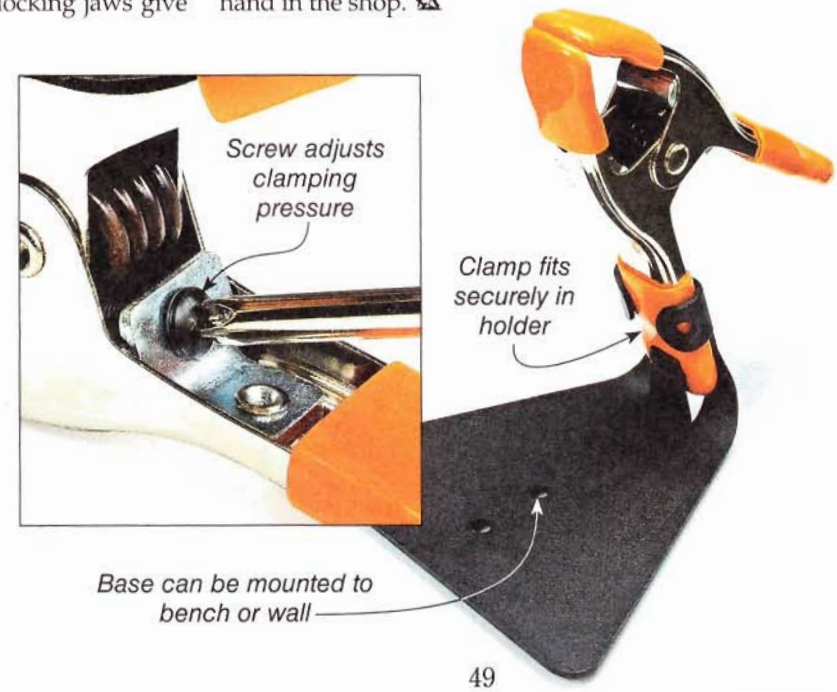
Smooth Operator. I found the rubberized, non-slip handle of the *ISD³* comfortable. And the trigger required only a light touch to release the pressure. Plus, the textured, soft-rubber pads have a solid grip without leaving marks on your project. Finally, the *ISD³* can also be used as a spreader.

You'll find another clamp innovation in the box below. It's more proof that technology can lend a hand in the shop.

adjustable: Spring Clamp

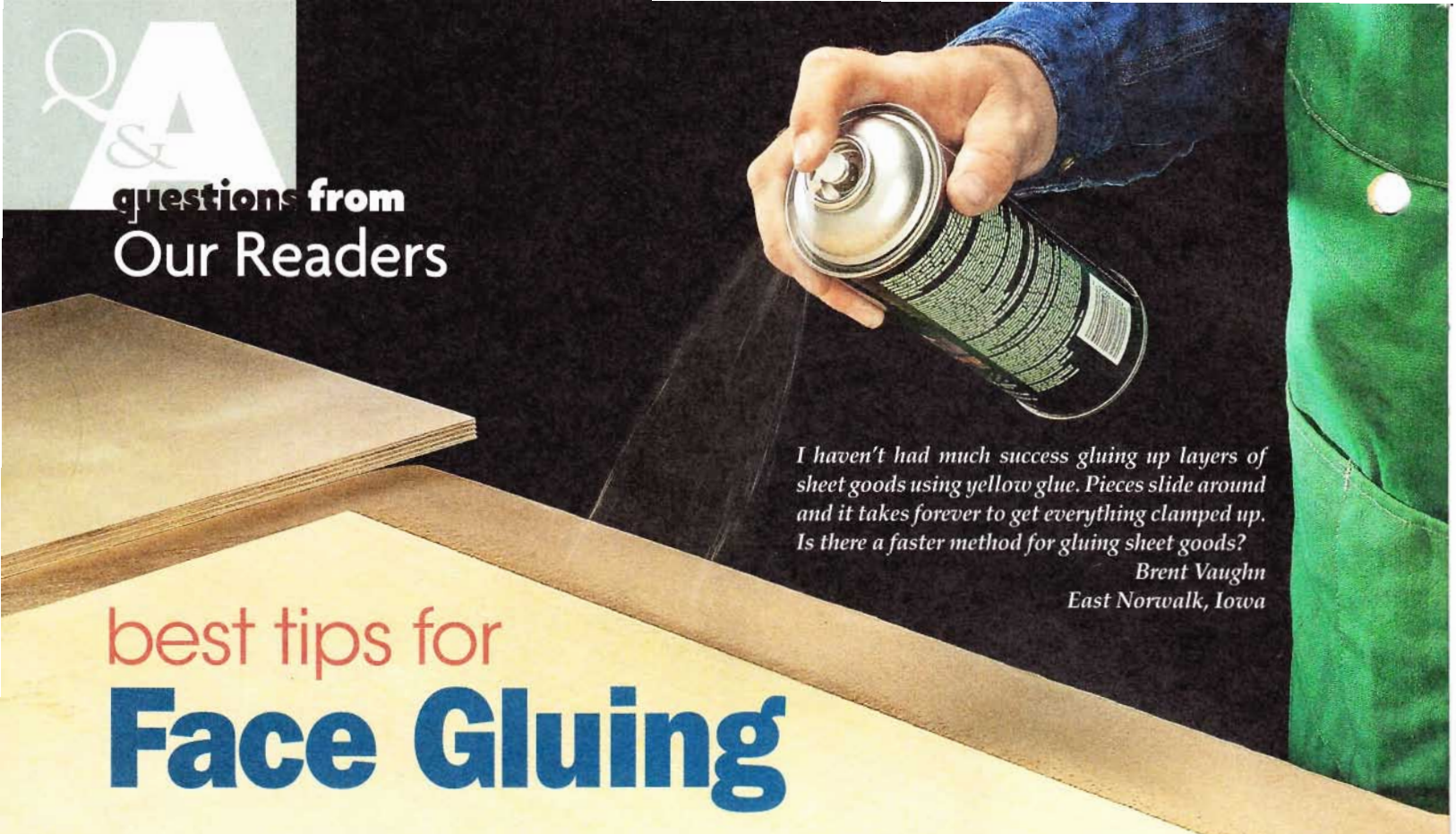
Spring clamps come in handy in the shop for a lot of tasks. The *Adjustable Clamp Company* made them even better. The *Pony* brand *Adjust-a-Clamp* shown at right lets you adjust the clamping pressure. A small screw on the back side controls the amount of pressure the spring exerts on the clamp and therefore, the workpiece. It's a great feature to have when you need to lighten up the pressure for more delicate jobs.

To make the spring clamps even more useful and versatile, you can purchase a kit that includes two clamps and the mounting base you see at right. (You can also purchase the base separately.)



Q&A

questions from
Our Readers



I haven't had much success gluing up layers of sheet goods using yellow glue. Pieces slide around and it takes forever to get everything clamped up. Is there a faster method for gluing sheet goods?

Brent Vaughn
East Norwalk, Iowa

best tips for Face Gluing

Gluing large panels face-to-face can be a hassle, especially when you use yellow glue. For one thing, the panels slide all over. And, it takes a lot of clamps and several cauls to get a good bond.

But there's an easier way to attach panels, and it's a method that you may have already used to join plastic laminate to a plywood substrate — contact cement.

With contact cement, you don't have to mess with clamps. Just spread on a couple of coats, let each one set up for at least 10-15 minutes, then join your pieces.

Spray It On. Normally, a long open time is a benefit, especially if you're working with large workpieces. But when I'm face-gluing sheet goods, I prefer to use contact cement in an aerosol can.

With spray contact cement, it's easy to double-coat both faces quickly. Plus, set-up time is fast — just 2-5 minutes for each coat. Best of all, the faster set-up time means you aren't exposed to harmful fumes as long.

Note: It's still a good idea to wear a respirator and work in a well-ventilated area. Whenever possible, I try to spray solvent-based products outdoors.

High Cost. There is one drawback to sprays though — the cost. The spray I use (*3M Hi-Strength 90*) can be found in most hardware stores and costs about the same as a gallon of regular contact cement (with just under half the coverage), making it expensive to use. But, when time is a factor, the higher cost is well worth it.

Application. Another great benefit to spraying is the adjustable nozzle. Three settings (narrow, medium, and wide) allow you to adjust your spray to suit the size or shape of your workpiece. This also means you won't need to spread it with a roller.

For the strongest bond, I always apply two coats. The first coat has a gel-like consistency. But as the solvents disperses, the cement takes on a tacky appearance, which means it's time for a second coat.

Assembly. After the second coat has dried, the workpieces are ready to be bonded. Just remember to carefully align them, because once they touch, you won't be able to move them around. To avoid problems, I cut one of the pieces slightly oversized and then trim it flush with a router and flush trim bit.

Setting the Bond. To set the bond, I use a wood block and a mallet (photo below). Just start in the center of the workpiece and work your way out. For a better bond along the edges, I use a clamp with a wide head and work my way around, giving it a good tightening every few inches or so.

▲ ***A Good Bond.*** *To get the best bond possible, use several blows from a mallet — working your way around the entire workpiece.*

Sources

Most of the materials and supplies you'll need for 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.

BOX JOINT JIG *(p.8)*

- **Rockler**
  - *Router Table Box Joint Jig* . . .29502
  - *¼" HSS Spiral Upcut Bit* . . .62984
  - *⅜" HSS Spiral Upcut Bit* . . .38238
  - *½" HSS Spiral Upcut Bit* . . .63008

TAPE *(p.10)*

- **Lee Valley**
  - *Gaffer's Tape* 25U06.01
  - *Silicone Tape* 23K30.01
  - *Turner's Tape, 1" x 75'* . . .25U03.11
  - *Turner's Tape, 2" x 75'* . . .25U03.12
- **U-Haul**
  - *Stretch Plastic Wrap*. 49022

DUST MASKS *(p.12)*

You can find basic N95 dust masks, like those described in the article, at most well-stocked hardware stores and home centers.

- **Woodcraft**
  - *FastCap Pocket MXV* 836875
- **Lee Valley**
  - *Comfort-Fit Resp*. . . . . .Sizes Vary
  - *Low-Profile Resp*. 22R20.25
- **Lab Safety Supply**
  - *Willson Saf-T-Fit Plus* . . . . . Varies

TABLE SAW STATION *(p.24)*

- **Woodsmith Store**
  - *Klamp Trak* 618057
  - *Klamp Blocks* 618059
  - *Bench Klamps (3")* 415585
  - *Router Insert Plate* 618062
  - *Insert Plate Levelers* 618063
- **Woodpeckers**
  - *Dual Purpose Track*. . . DPTRACK36
- **Rockler**
  - *Over-Travel Drawer Slides*. . .30812
  - *Universal Fence Clamps* 31373
  - *Dust Port* 92031
- **Reid Supply**
  - *Drawer Pull* DUH-55

COUNTERSINKS *(p.34)*

The reverse countersinks with 82° high-speed steel heads are available from *McMaster-Carr*. And the mating shafts fit hole sizes from $^{3}/_{32}$" diameter to ¼" diameter.

- **Lee Valley**
  - *⅜", 82° Countersink* 06J50.03
  - *½", 82° Countersink* 06J50.08
  - *Set of Two Above* 06J50.20
  - *82° Hand Countersink*. . . .50K62.01

MITER BOX *(p.36)*

- **Lee Valley**
  - *1⅛" Knob w/ Stud* 00M51.02
  - *¼"-20 Threaded Inserts* . 00M90.01
  - *4" x 24" - ¾" UHMW* 46J90.14

HANDSCREWS *(p.40)*

My favorite online sources for handscrews are *Adjustable Clamp Company*, *Lee Valley*, *The Best Things*, and *USA Clamp Company*.

BAR CLAMPS *(p.48)*

I found *Jorgensen* one-handed bar clamps at *Adjustable Clamp Company*. The *Irwin Quick Grip* bar clamps can be found at many hardware stores and home centers. You can find a local dealer by visiting *Irwin.com*.

MAIL ORDER SOURCES

Woodsmith Store
800-444-7527

Rockler
800-279-4441
rockler.com

Adjustable Clamp Co.
312-666-0640
adjustableclamp.com

Irwin
irwin.com

Lab Safety Supply
800-356-0783
lss.com

Lee Valley
800-871-8158
leevalley.com

McMaster-Carr
630-600-3600
mcmaster.com

Reid Supply
800-253-0421
reidsupply.com

The Best Things
800-884-1373
thebestthings.com

U-Haul
800-468-4285
uhaul.com

USA Clamp Company
usaclamp.com

Woodcraft
800-225-1153
woodcraft.com

Woodpeckers
800-752-0725
woodpeck.com

Scenes from the Shop

It only takes an afternoon to build this miter box. But you'll use it for years to come making precision cuts on small parts with a handsaw. Step-by-step plans begin on page 36.

We put several styles of countersinks to the test in our shop. Turn to page 34 to find out which ones we like best.

▲ **Mitered Molding.** *Adding molding to a project is a sure-fire way to give it some style. And with a simple approach, you can trim the molding for a perfect fit. Turn to page 14 to learn the secret.*