TOP SHOP UPGRADE
In A Weekend

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Multipurpose Table

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- The Ultimate
  Mortise & Tenon Joint
- Custom Tools:
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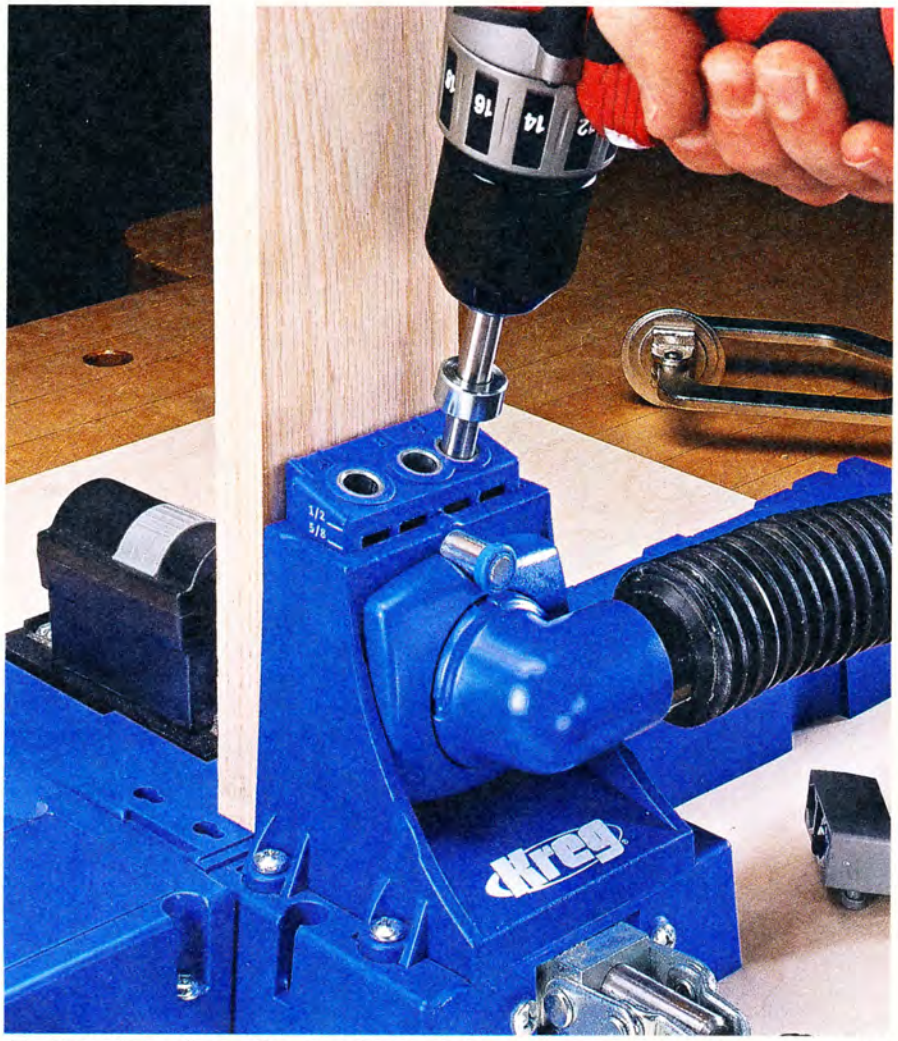

Easier-Than-Ever Pocket Hole Joinery page 48

Cutoffs

It seems like the summer just flew by and we're well into what I consider prime woodworking season. I can open the doors, work on my latest project, and enjoy the late fall weather at the same time.

One of the things I do this time of year is spend a little time improving my shop — tuning up tools, creating some extra storage here and there, and adding a new jig or fixture to make working with my tools safer and more accurate. Well, if that's part of your fall routine, this issue has a lot to offer.

There's a new one-wall storage solution using shop-made slat wall (page 32). It's a great way to make better use of valuable shop space. Plus, it's easy to add new components or adjust the setup if your needs change.

Another article to check out is the one on miter gauge add-ons (page 10). You're sure to get more out of your table saw by incorporating any or all of them. There are even more useful projects, tips, and techniques inside than I can mention here, so turn the page and find more ideas you can use in your shop.

Bryan

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from our Readers

Tips for Your Shop

Band Saw Fence

It seems that no matter how well I tune up my band saw, I occassionally have to fight drift when ripping or resawing. The blade tends to wander off the cut line.

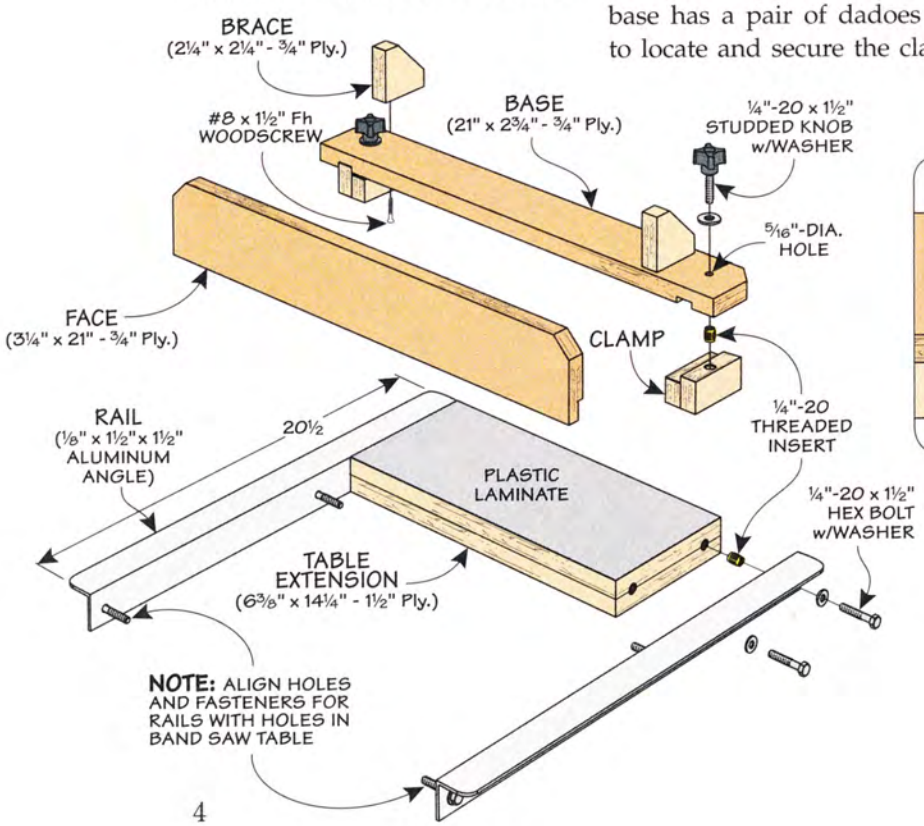
Adjustable. To correct for blade drift, the angle of the band saw fence shown above can be adjusted. The drawings below show how it goes together.

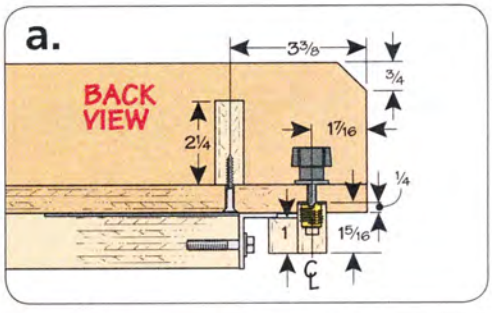
I started by fastening aluminum angle rails to the saw's table. I made an extension to fill in the space between the table and riser.

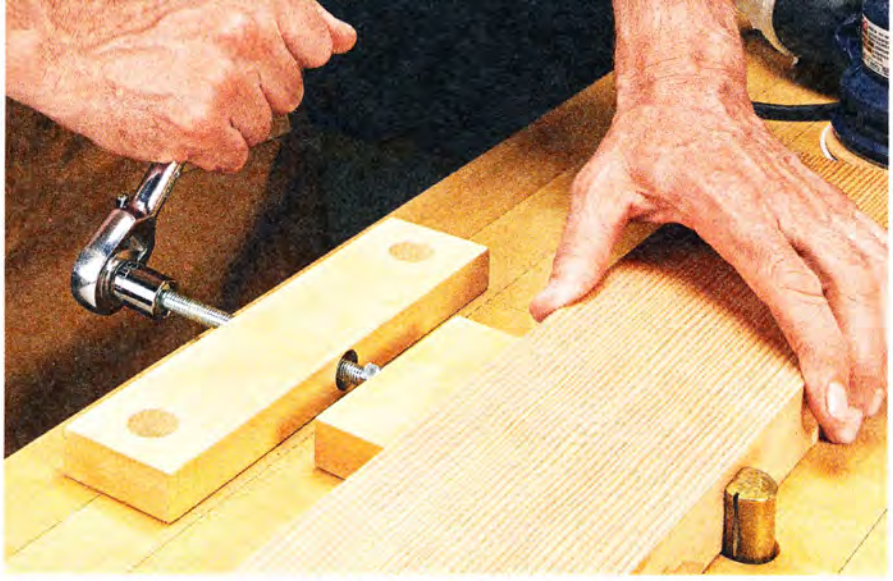
The fence consists of a base, braces, clamps, and a face. The base has a pair of dadoes used to locate and secure the clamps. A pair of braces support the face of the fence. They're attached with screws. The clamps are made from two layers of plywood as shown below. They're fastened with knobs and threaded inserts.

Finally, glue the face to the base. Slide the fence over the rails and tighten the clamps. It can be skewed to account for blade drift.

C.H. Jordan
Houma, Louisiana







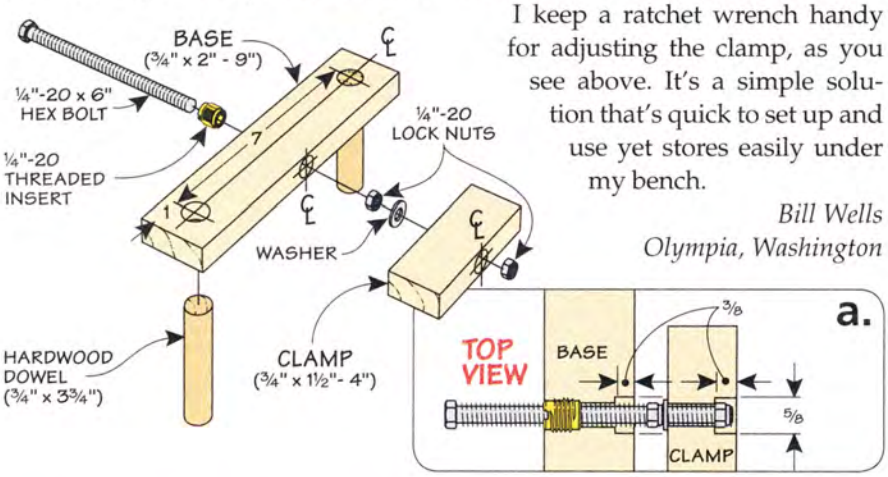
Speedy Bench Top Clamp

Lacking a quick and easy way to clamp a workpiece to the top of my workbench, I devised the clamp you see above. Its low profile makes it easy to sand or plane the workpiece.

The base is made with two dowel pins that slip into a pair of holes in the benchtop. The holes are opposite a bench dog (photo above). A hole is drilled through the edge of the base and a threaded insert installed. The clamp is loosely fastened to the long bolt with lock nuts and washers. It should rotate freely on the bolt.

I keep a ratchet wrench handy for adjusting the clamp, as you see above. It's a simple solution that's quick to set up and use yet stores easily under my bench.

Bill Wells
Olympia, Washington



Submit Your Tips Online!

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

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SUBMIT A TIP

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 *Porter-Cable* compact router kit shown on the right.

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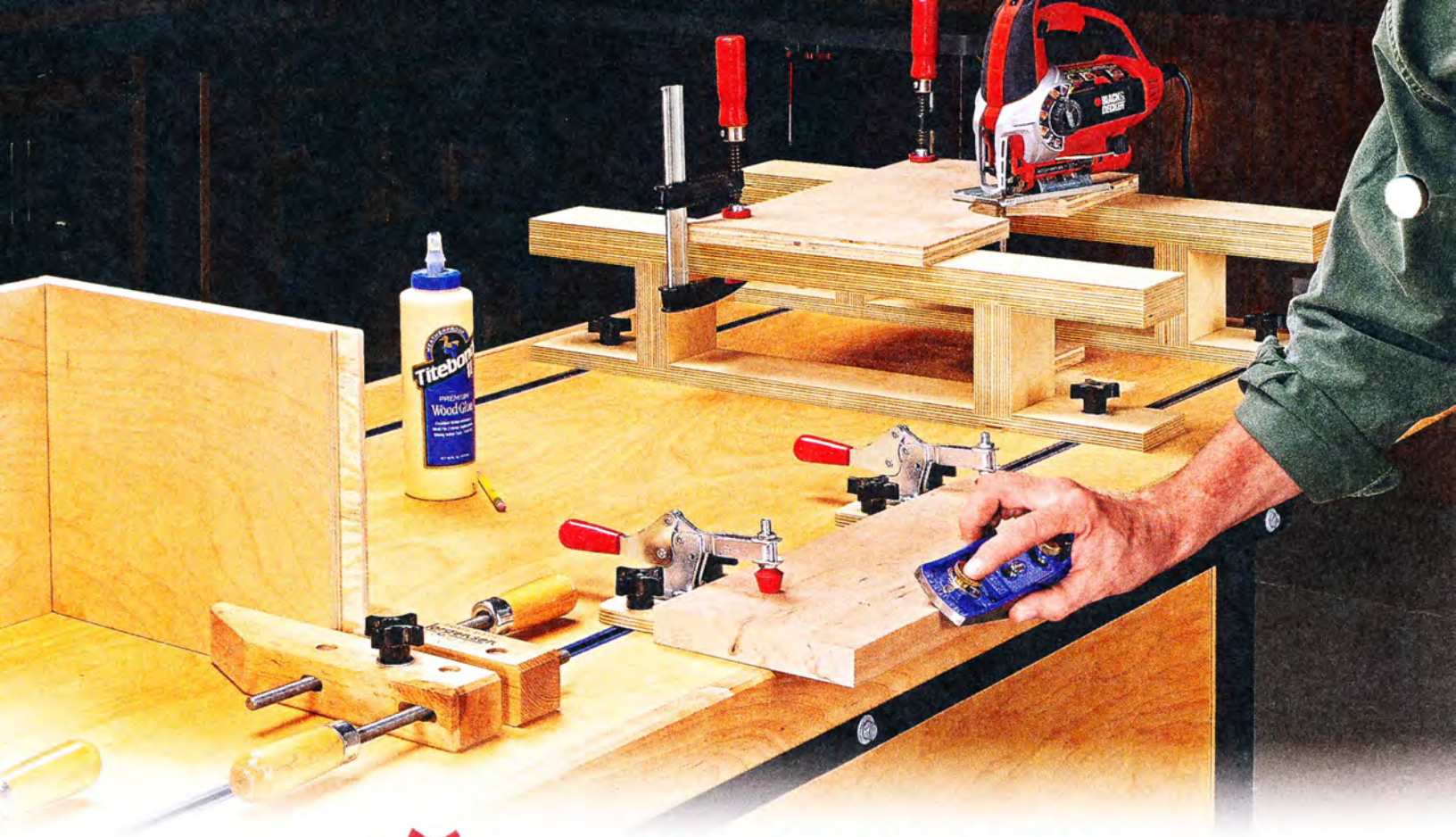


THE WINNER!

Clamping Workstation

The heart of my shop is my workbench. It provides a large worksurface for project assembly. But I took mine a step further and converted it into a multipurpose clamping workstation. You can see above some of the handy accessories I added.

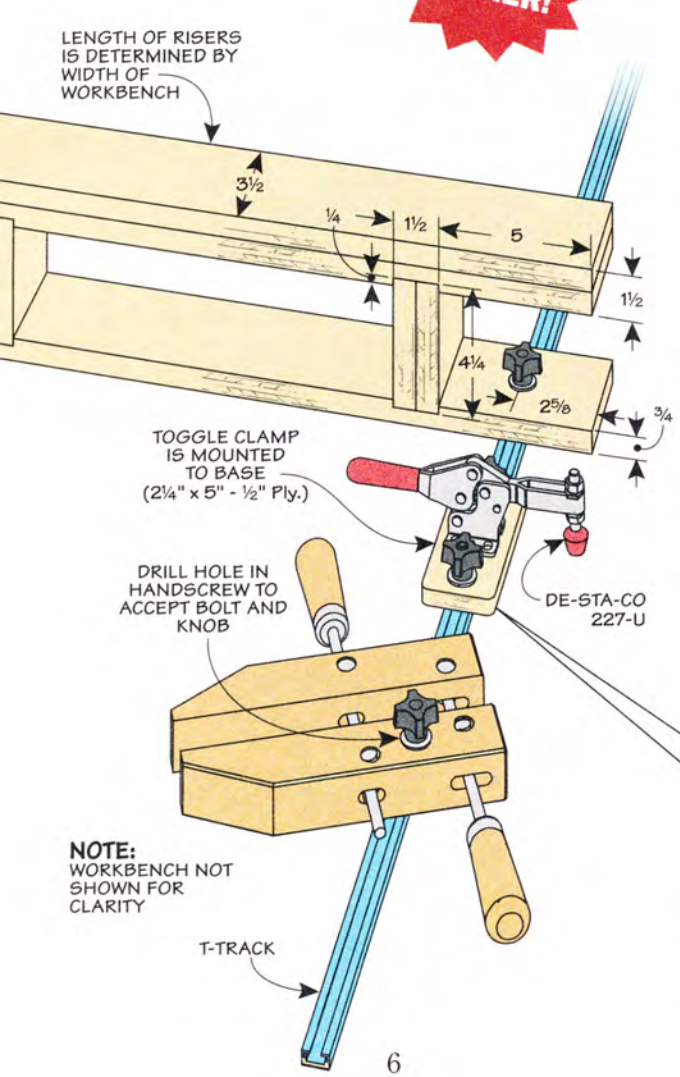
I started by embedding two parallel T-tracks the length of the bench. To those, you can attach any manner of clamping and assembly aids. You can see a few in the drawings at left.

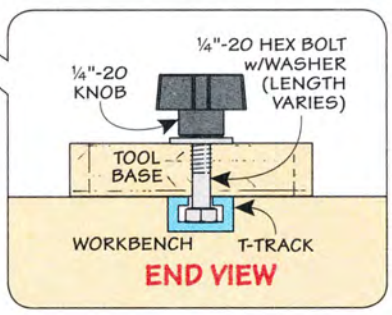
For tasks like sawing or drilling, I made a pair of risers that elevate the work. They fasten to the T-track with bolts and knobs. I also modified a pair of handscrews to act as extra hands during assembly (photo above).

All you need to do is drill a hole through one of the jaws and add a bolt and knob to secure it to the T-track in the benchtop.

Finally, I made simple hold-downs from toggle clamps. The clamps are mounted to plywood bases, which in turn are fastened to the T-track. All are simple accessories that help out with many shop tasks.

Bernard LeBlanc
Greenville, New Hampshire





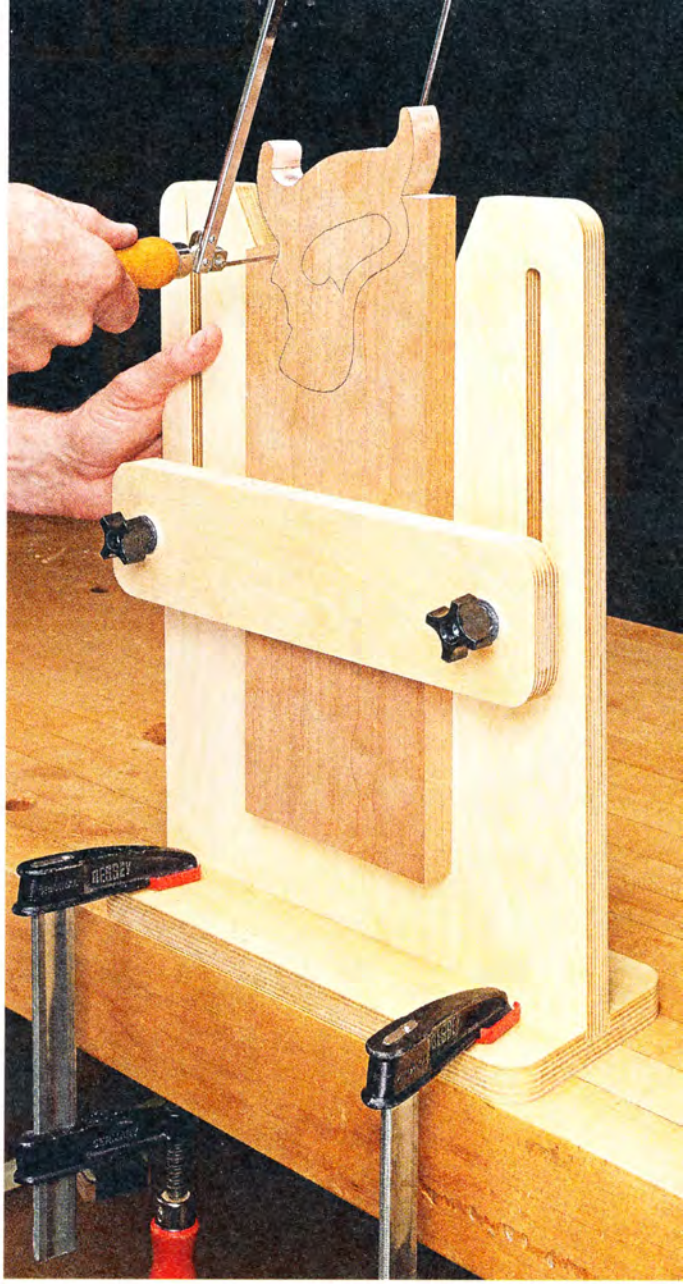
Coping Saw Vise

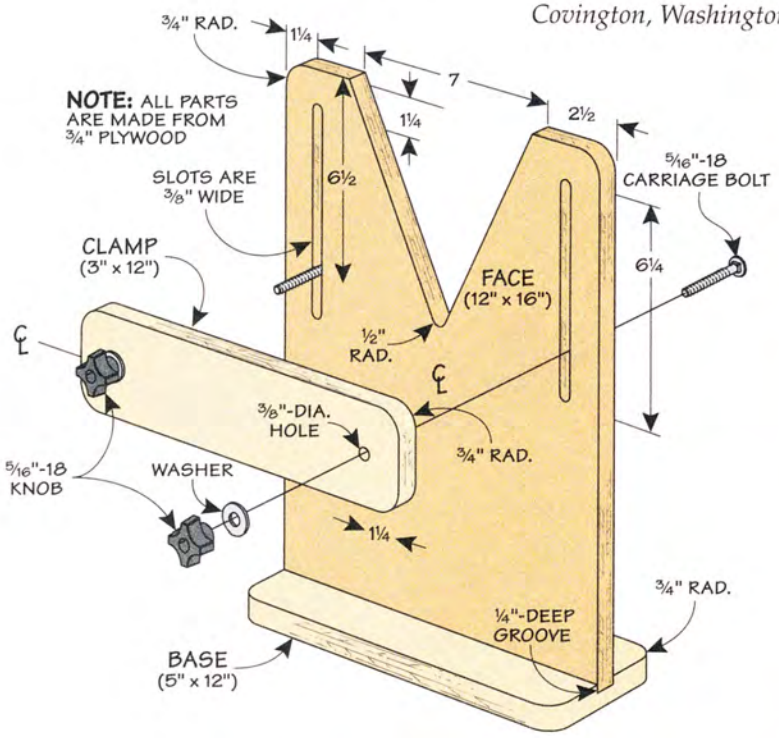
When using a coping saw, I sometimes find it easier to saw with the workpiece held vertically. The birdsmouth vise shown here positions the workpiece at a comfortable height for sawing.

The drawings below show how it goes together. The base is grooved to hold the vise face. I cut a large V-notch into the face of the vise to provide clearance for the saw blade as you cut. A pair of slots provides adjustment for the clamp. I fastened the clamp with pairs of carriage bolts, knobs, and washers.

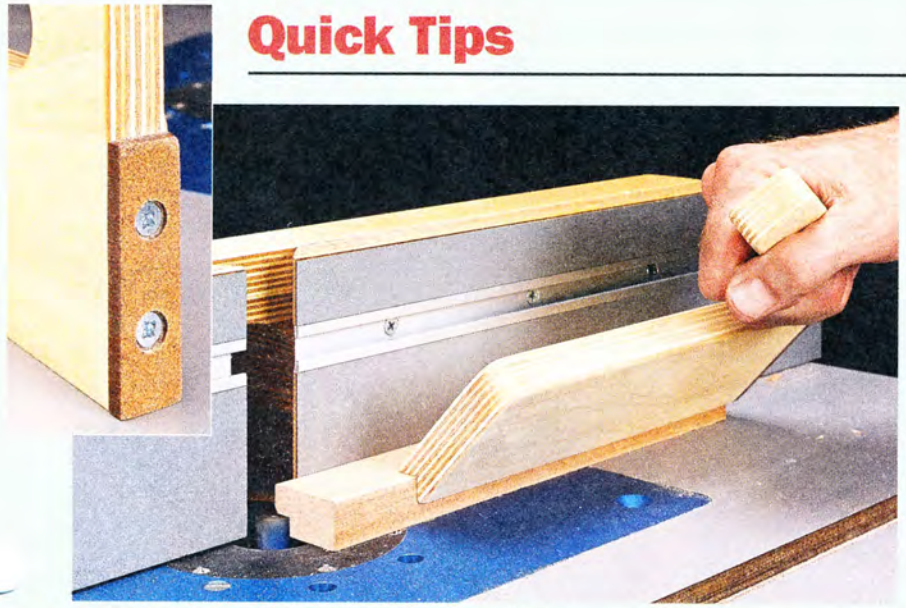
To use the vise, simply secure it to your worksurface. Place the workpiece between the clamp and face then tighten the knobs.

Stephen Carroll
Covington, Washington

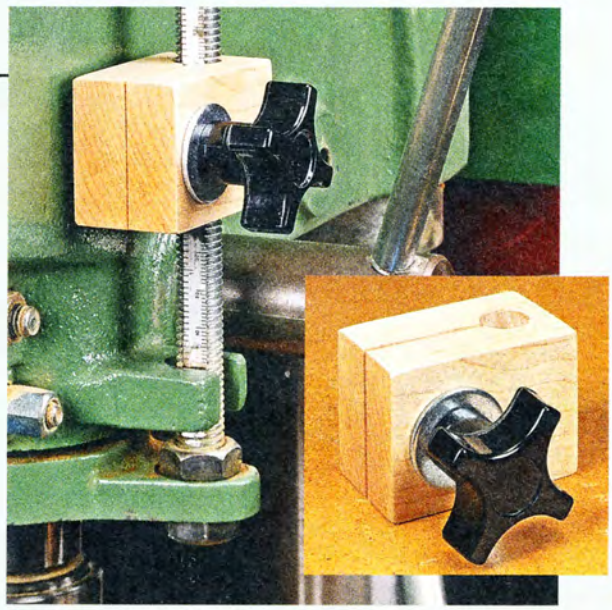




Quick Tips



▲ ***Len Urban*** *of Rancho Mirage, California, made a handy push stick for his router table. It has a V-notch along the bottom edge to hold the workpiece against the fence and table at the same time.*



▲ *To make adjusting the depth stop on his drill press easier,* ***Rob Mousel*** *of Hanover, Minnesota, built this quick-adjusting stop block.*

routing Easy Mortises

All it takes to make smooth, accurate mortises is a plunge router and an edge guide.

Creating accurate mortises with smooth, square sides is a fundamental skill in woodworking. It's also essential for making strong joints that assemble easily and hold together for the long haul.

It turns out that with the right tool (a plunge router), the actual cutting of the mortise is pretty quick and effortless. The catch is that you need to add careful layout and setup to the mix to ensure the best results. Thankfully, neither of these is difficult.

Why a Router? A plunge router is the tool of choice for a few reasons. The plunge mechanism makes feeding the bit into the workpiece a piece of cake. And the router allows you to step down to the final depth in several controlled passes.

Of course, having the right bit is an important ingredient. I like to use a spiral upcut bit. It's designed to pull chips up and out of the mortise for efficient and cooler cutting.

The other piece of equipment is a router edge guide. You use this to set the position of the bit in relation to the edge of the workpiece. Once it's set, you can make a number of mortises consistently.

Layout. Before you can start routing, however, you need to

▲ ***Lay Out the First Mortise.*** *On one workpiece, draw the outline of the final mortise size. You'll use this to set up the router and edge guide.*

▲ ***Set the Edge Guide.*** *Adjust the fence on the edge guide so that the router bit is centered in the mortise layout. You only need to do this once.*

make sure you'll be cutting in the right place. And that's where the layout comes in.

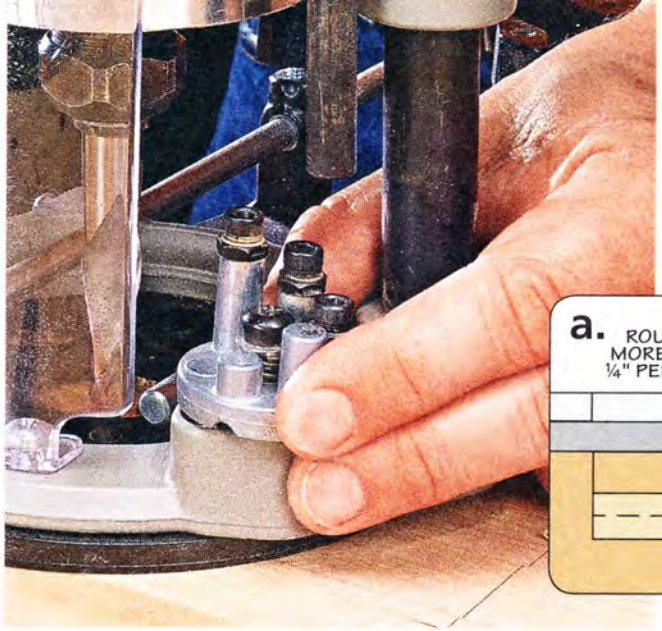
I don't lay out all the mortises on every workpiece the same way. I start by drawing the final size of one of the mortises on one of the workpieces, as shown in the lower left photo on the facing page. This complete drawing can be used to set up the router and edge guide.

For all the other similar mortises, I just mark the starting and ending lines. You can see these in the main photo to the left.

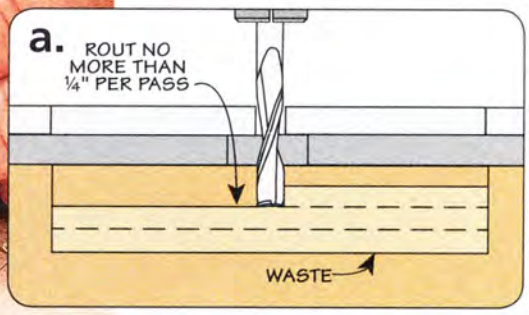
On to the Setup. There are a few components to set up for cutting mortises. I start by setting the depth stop for the final depth.

From there, you can use the layout to adjust the fence on the edge guide so the router bit is centered in the layout marks, as you can see in the lower right photo on the facing page.

Routing a mortise into the narrow edge of a workpiece doesn't provide a lot of support for the router. One wobble and the mortise (and workpiece) is spoiled. To solve that problem, I clamp all the similar parts together to create a wider surface for the router base, as the main photo on the facing page shows.



◀ ***Multiple Passes.*** *Rout the mortise in a series of several, shallow passes (below). Use the turret stop to make it easy.*



Routing Mortises. Now you can set the router in place on the workpieces at the left end of a mortise. As you face the workpiece, you will rout from left to right (main photo, opposite). Hold the edge guide against the workpiece with gentle pressure and turn on the router. As the bit plunges into the wood, you will feel some slight resistance. When the depth stop bottoms out, slide the router to the end of the mortise, then raise the bit.

I like to rout all the mortises on a single workpiece at once. Then it's just a matter of rotating the depth stop and repeating this process until the mortise is complete, as in the photo above.

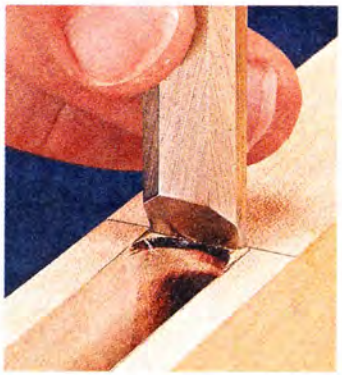
On the final pass, you can clean up any "steps" in the ends of the mortise. You may notice some burn marks in the ends. This is normal. And it won't affect the strength of the joint either, since the end grain doesn't make a strong glue surface.

At this point, you can unclamp the part and move it to the back of the group. Now you're ready to go on to the next one. In short order, you'll have all the mortises routed. But there's one more step left. And you can read more about that in the box below.

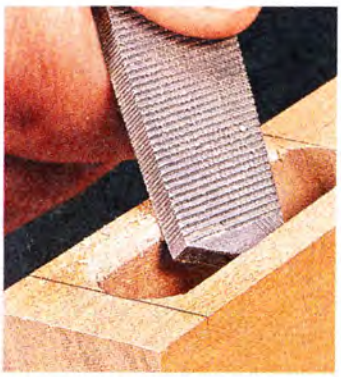
final Details

Using a router to create mortises leaves rounded ends. Cutting a mating tenon usually results in square corners. So in order to get a good fit, you have a couple of choices: You can cut the tenon and shape the ends to match the mortise. Or you can square up each end of the mortise.

▲ ***Round Tenon.*** *Use a file to shape the ends of the tenon to fit into the mortise.*



▲ ***Square Mortise.*** *Or you can use a chisel to square up the ends of the mortise.*



▲ ***Chamfer.*** *File a slight chamfer to make inserting the tenon easier.*

Shape the Tenon. The simplest option in my book is to shape the tenon. The side grain on the tenon takes less time and effort to cut than the end grain in the mortise. And I have better visibility, as well. Keep in mind that the tenon doesn't need to be a perfect match. Just knock off the corners to allow the tenon to slide into place.

Square It Up. The other option is to use a chisel to create a square end. If your chisels are sharp, it doesn't take much time. But it can be more difficult to keep the ends vertical.

No matter what you do, I like to chamfer the edges of the mortise to provide glue relief and ease the assembly.

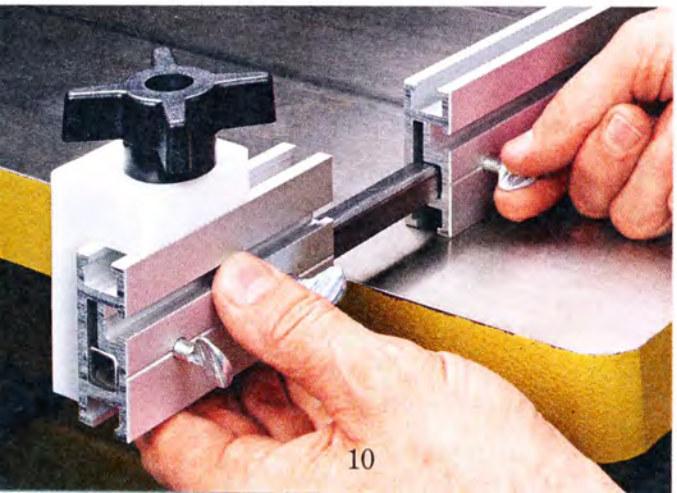
upgrades for your Miter Gauge

Upgrade the accuracy of your miter gauge with a few simple, add-on accessories.

For crosscutting pieces to length on the table saw, the miter gauge is the go-to table saw accessory. But let's face facts — the stock miter gauge that came with your saw may leave a lot to be desired.

One problem with a miter gauge is the short and narrow face. It's barely wide enough to support a longer workpiece without it having a tendency to pivot during the cut. But the biggest problem is that there's nothing to back up the cut to prevent chipping and tearout.

Buying a whole new, aftermarket miter gauge can be pricey. That's where some shop-made and aftermarket accessories come in. Here are a few inexpensive options you can add to your existing miter gauge. They make your crosscuts more accurate. You can find out where to get them in *Sources* on page 51.



▼ ***Extension.*** *The fence extension slides out for cutting longer workpieces to length.*

AUXILIARY FENCE

Attaching a long auxiliary fence to your miter gauge is one of the easiest and most beneficial additions for your saw. There are a number of aftermarket fences you can purchase.

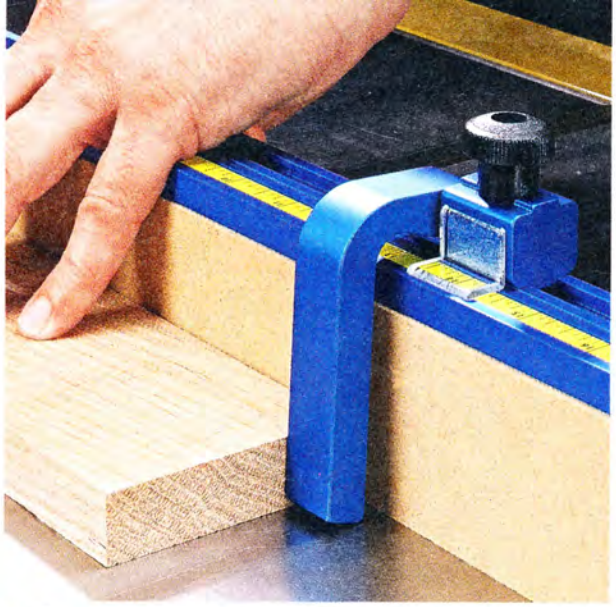
Reduced Tearout. For an aftermarket fence (most are made from aluminum), I like to adjust the end of the fence until it's almost touching the blade. This way, the workpiece is supported all the way up to the cut line.

Support & Safety. Another benefit of adding an auxiliary fence is the support it provides to longer workpieces. Not only does this make crosscutting operations more accurate, but it's also safer. The workpiece has less of a tendency to pull or pivot away from the miter gauge fence and bind on the blade. The aluminum fence shown at left includes an extension that slides out. This provides additional support for extra-long workpieces.

Shop-Made Fence. You don't have to spend a lot of money to add an auxiliary fence to your miter gauge. A simple MDF fence does the job equally well.

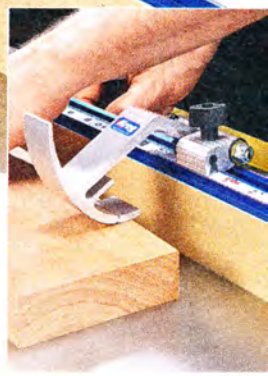
A shop-made fence has a couple of advantages over an aftermarket fence. Like I said, it's inexpensive. A second advantage is that it can straddle the blade. This provides support for a workpiece on both sides of the cut to prevent chipout. Plus, the fence also pushes the scrap piece away from the blade. And when the fence gets "chewed up" from the blade, it's easy to replace.

T-Track. Most aftermarket fences incorporate T-track along the top edge. This makes it easy to add accessories like an adjustable stop. To provide the same capability to your shop-made fence, you can purchase a T-track aluminum extrusion designed to fit over the top edge of a fence.



▲ **Rockler Flip Stop.** *The simple design of this stop is ideal for making repetitive cuts and swings out of the way when not needed.*

▲ **Kreg Swing Stop.** *The sturdy stop flips up out of the way or, more conveniently, slides out of the way when making initial rough cuts (right).*



You can see a couple of examples in the photos above.

FENCE STOPS

Adding a stop to your fence enables you to cut workpieces to consistent lengths. The stops shown above and on the opposite page fit in the T-track slots at the top of the fence. The *Rockler* and *Kreg* stops shown above have the added feature of being able to flip up out of the way when not needed. The curved shape of the *Kreg* stop allows the workpiece to slide under it, as you can see in the inset photo at right.

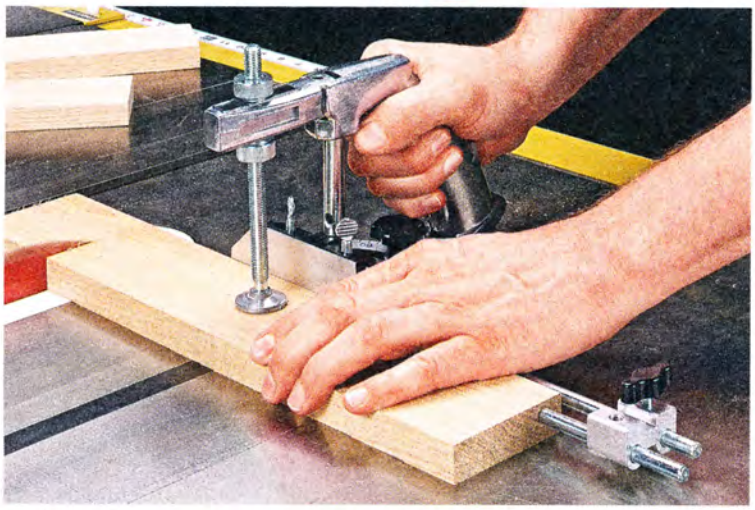
The stops shown above also incorporate a cursor that works in tandem with a measuring tape along the edge of the track. After it's calibrated to your blade, it makes adjusting the stop precise.

CLAMPING GAUGES

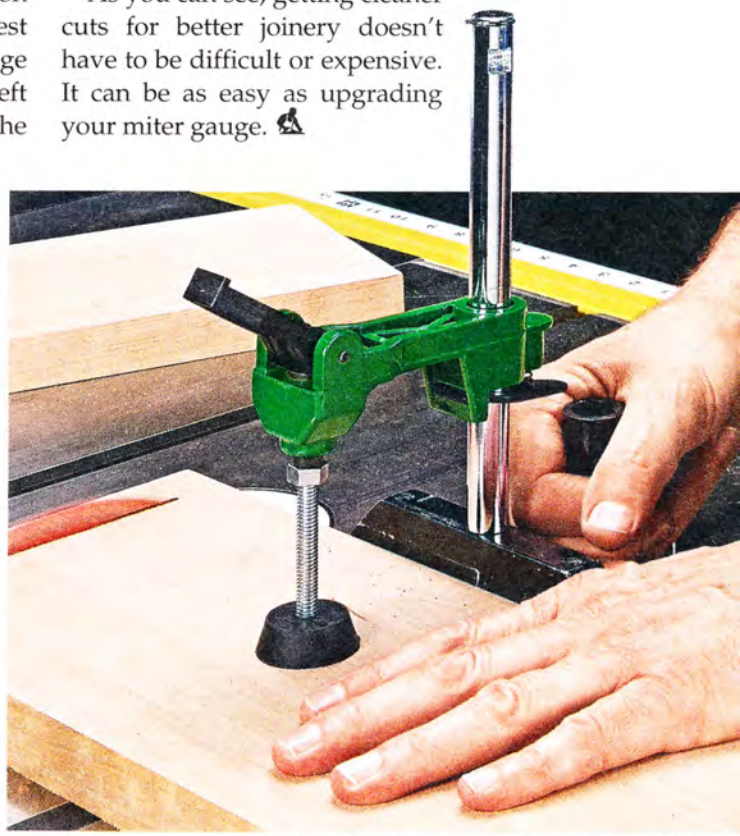
Once standard equipment on some table saws, you can invest in an aftermarket miter gauge that incorporates a clamp (left photo below). It keeps the workpiece from creeping during the cut, especially when cutting miters. The add-on hold-down shown below right can be attached to a miter gauge that already has a threaded hole in the fence. Both options clamp the workpiece tight to the miter bar to allow the workpiece to slide across the table.

As you can see, getting cleaner cuts for better joinery doesn't have to be difficult or expensive. It can be as easy as upgrading your miter gauge.

clamping Miter Gauges



▲ **Squeeze Action.** *This aftermarket miter gauge includes a hold-down and adjustable stop. Squeeze the handle to firmly clamp the workpiece during the cut.*



▲ **Add-On Hold-Down.** *If your miter gauge has a threaded hole in the top of the fence, you can add this post hold-down. The cam-action lever applies clamping pressure.*

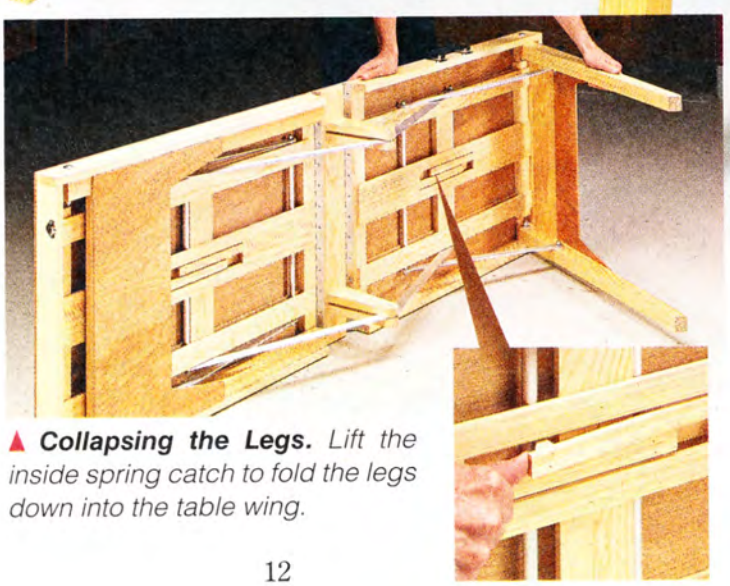
multipurpose Folding Table

Lightweight and portable, this handy folding table is also tough enough to hold a heavy load.

Whether you could use an extra worksurface in the shop or a handy table for get-togethers, this project is sure to get a lot of use. It's a table that folds up into a compact package for storage (photo, opposite page). But when it's set up, it's strong enough to stand up to heavy-duty shop use.

The secret lies in the folding mechanism. It allows the legs to extend and lock into position. Plus, the wings lock securely for a strong and stable worksurface. The mechanism includes ingenious wood catches that snap in place to lock everything together. By gently pulling up to release the catches, the table folds back up just as quickly.

Taking a look at the photos and drawings, you might think it's pretty complicated to build. But I'll show you how to break it down into small steps.

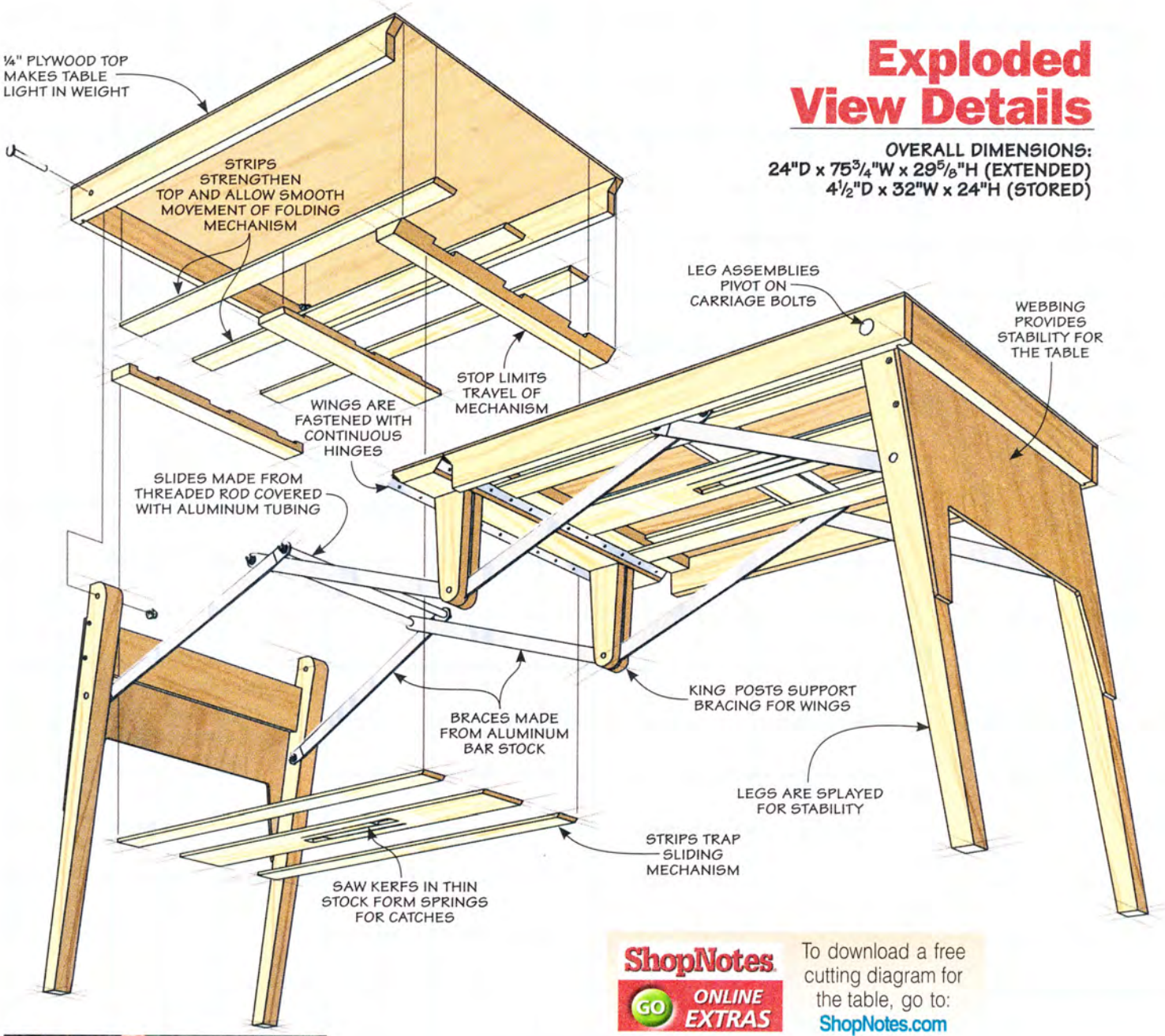


▲ ***Collapsing the Legs.*** *Lift the inside spring catch to fold the legs down into the table wing.*

▲ ***Folding the Wings.*** *Release the outermost catch to fold each wing before securing the latches.*

Exploded View Details

OVERALL DIMENSIONS:
24"D x 75¾"W x 29⅝"H (EXTENDED)
4½"D x 32"W x 24"H (STORED)



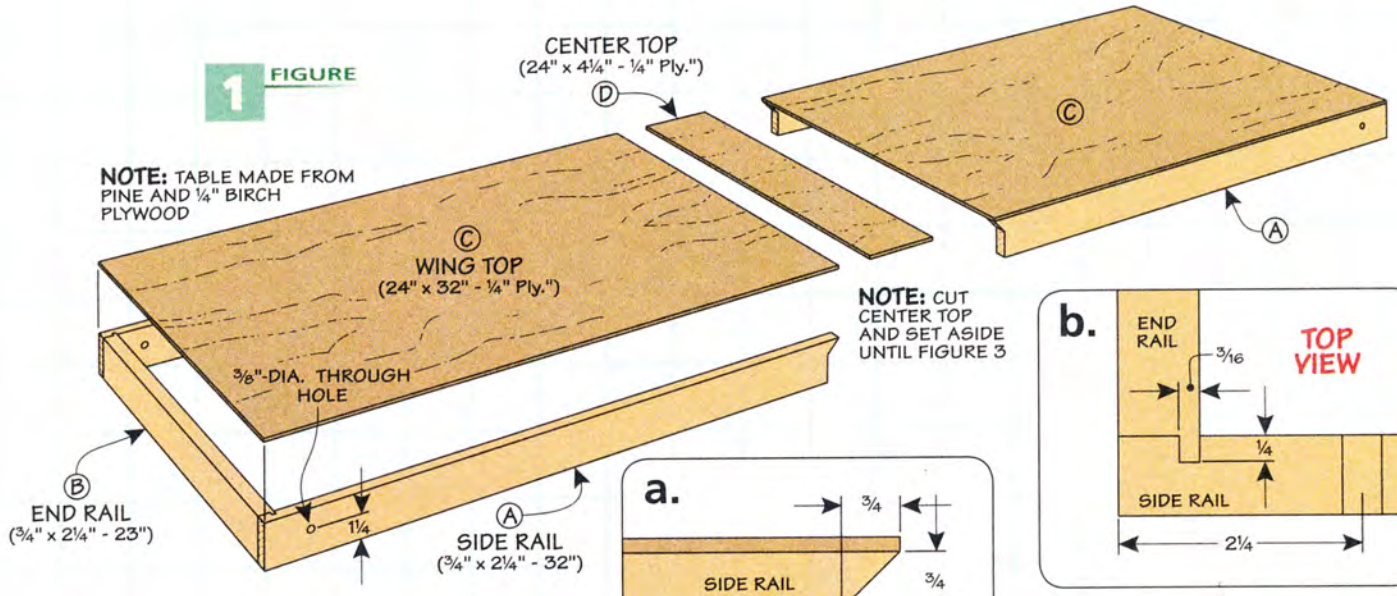
ShopNotes GO ONLINE EXTRAS

To download a free cutting diagram for the table, go to: ShopNotes.com

▲ ***Ready to Travel.*** *Folded up, the table is easy to store or move to your next project, party, or picnic.*

Materials & Hardware

A	Side Rails (4)	¾ x 2¼ - 32	R	Wing Braces (4)	1 x 21 - ⅛ Alum.
B	End Rails (2)	¾ x 2¼ - 23	S	Pins (2)	⅜-Dia. x 1¾ Alum. Rod
C	Wing Tops (2)	24 x 32 - ¼ Ply.	T	Leg Braces (4)	1 x 20 - ⅛ Alum.
D	Center Top (1)	24 x 4¼ - ¼ Ply.	U	Catch Plates (2)	¼ x 4 - 30½
E	Hinge Rails (2)	¾ x 2¼ - 22½	V	Catches (4)	⅝ x ¾ - 1⅛
F	Slide Stops (2)	¾ x 2⅝ - 16⅛	• (2) 1½" x 24" Continuous Hinges		
G	End Blocks (2)	¾ x 2 - 17⅝	• (48) #6 x ⅝" Fh Woodscrews		
H	Slide Strips (10)	¼ x 2 - 31¼ Rgh.	• (4) ⅜"-16 x 3" Carriage Bolts		
I	Center Block (1)	¾ x 4¼ - 24	• (4) ⅜" Washers		
J	King Posts (4)	¾ x 2½ - 7	• (4) ⅜"-16 Lock Nuts		
K	Legs (4)	1½ x 2 - 29⅞	• (4) ¼"-20 x 2" Carriage Bolts		
L	Leg Rails (2)	¾ x 3½ - 19½	• (12) ¼"-20 Lock Nuts		
M	Webs (2)	22½ x 14 - ¼ Ply.	• (12) ¼" Washers		
N	Leg Rods (2)	¼"-20 x 17⅝ Thd. Rod	• (8) #8 x 3" Fh Woodscrews		
O	Leg Slides (2)	½-O.D. x 16⅜ Alum. Tube	• (8) #8 x 2½" Fh Woodscrews		
P	Wing Rods (2)	¼"-20 x 17⅜ Thd. Rod	• (1) Case Handle		
Q	Wing Slides (2)	½-O.D. x 16⅛ Alum. Tube	• (1 pr.) Draw Catches		



start with the Wings

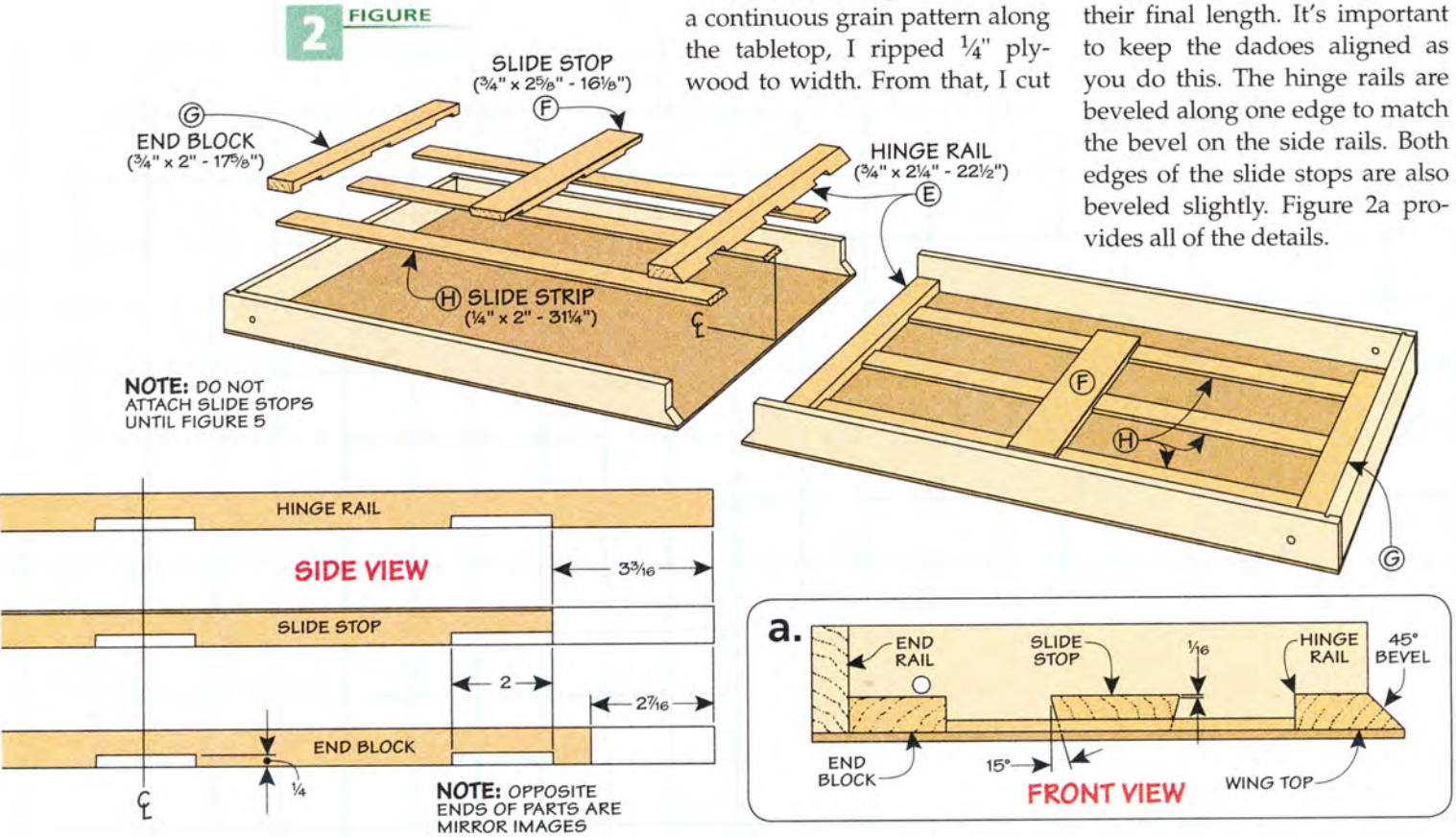
Building the table starts with making a frame and adding a top for each wing. Then you'll turn the wings upside down to work on adding the folding mechanisms and legs.

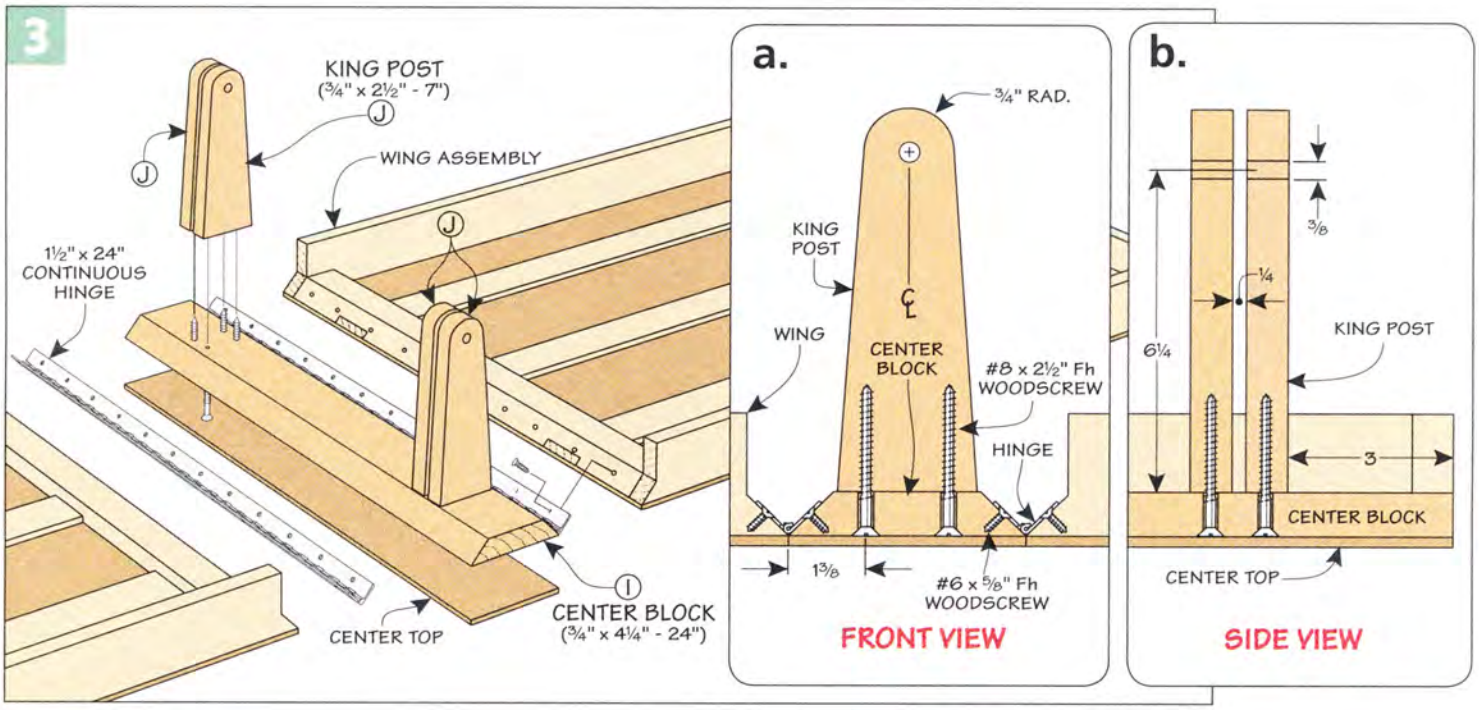
Simple Frame. Figure 1 above shows how each wing starts with a pair of side rails and an end rail. Each side rail has a beveled notch on the ends where the wings fold up (Figure 1a). A pivot hole at the opposite end will be used to attach the legs. The end rail is joined to the side rails with a tongue and dado joint (Figure 1b). I dry-assembled the rails so I could measure for the top.

Continuous Top. To maintain a continuous grain pattern along the tabletop, I ripped ¼" plywood to width. From that, I cut the tops for each wing from each end and saved the cutoff for the center. (You'll add it later, after the wings are attached).

The hinge rails complete the frame. Since the hinge rails are similar to the slide stops and end blocks, I cut all of these parts to width (Figure 2). But I cut them all to the same length to start (22½"). This makes it easy to align and cut the dadoes that fit over the three slide strips.

After you cut the dadoes, cut the slide stops and end blocks to their final length. It's important to keep the dadoes aligned as you do this. The hinge rails are beveled along one edge to match the bevel on the side rails. Both edges of the slide stops are also beveled slightly. Figure 2a provides all of the details.





Wing Assembly. I started putting each wing together by gluing up the side rails, end rail, and hinge rail, making sure everything was square. Then I added the plywood top.

The three slide strips on each wing allow the mechanism that's used to fold the wings and legs to slide smoothly. Cut them to width for a smooth fit in the dadoes of the hinge rail. I beveled one end of the strips to match the bevel on the hinge rail.

You can apply glue and slip the beveled end of the strips into the dadoes in the hinge rail. The end block helps align the strips along the end rail. Just make sure the strips remain centered on the width of the wing and are parallel to the side rails. The drawing at right shows the simple method I used to clamp everything while the glue dried.

The slide stop shown in Figure 2 is not attached yet. You'll determine its final position after building the folding mechanisms for the wings and legs later on.

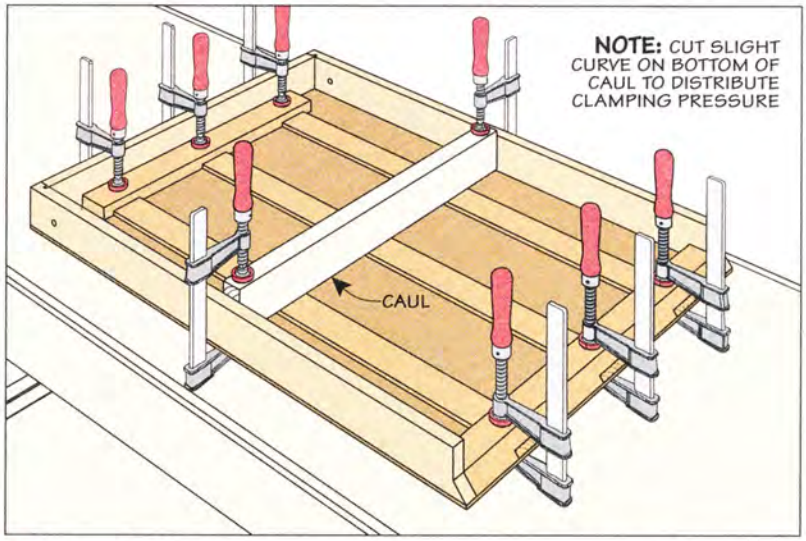
Center Section. The two wings are attached with hinges to a center block. You can see in Figure 3 how both edges are bevel-ripped to match the bevels on the wings.

A pair of king posts are needed to support the bracing for the wings. Each post is made from two pieces spaced ¼" apart. This spacing allows the bracing for each wing to pivot on an aluminum pin. After cutting each piece to shape and drilling the holes for the pins, I attached them to the center block with screws.

With that done, you can glue on the center top you cut earlier. Then it's time to attach the wings by installing the hinges.

To eliminate gaps in the top when it's extended, I clamped the wings and center tightly together before marking the hinge screw locations on the hinge rail.

Simply lay the hinges in place to mark for the screws. After marking the holes, I removed the clamps and installed the hinge leaf on the wing first since the king posts were in the way for a few of the screws. Then you can reapply the clamps to install the remaining screws in the other hinge leaf. As you install the screws, keep checking that the wings fold and meet evenly all around before moving on.



▲ ***Clamping Cauls.*** *Apply clamps over the strips on the hinge and end blocks. To glue the strips to the top in the center, clamp a board on edge to apply pressure all across the top.*

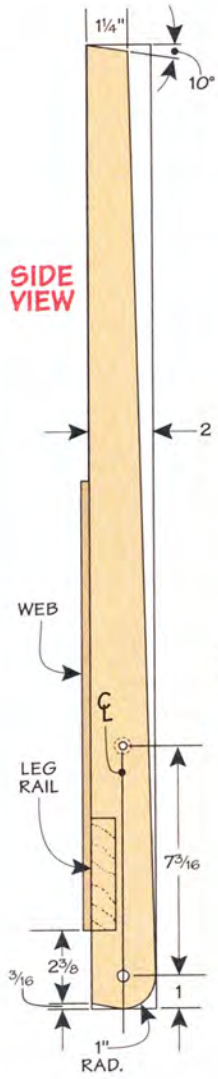
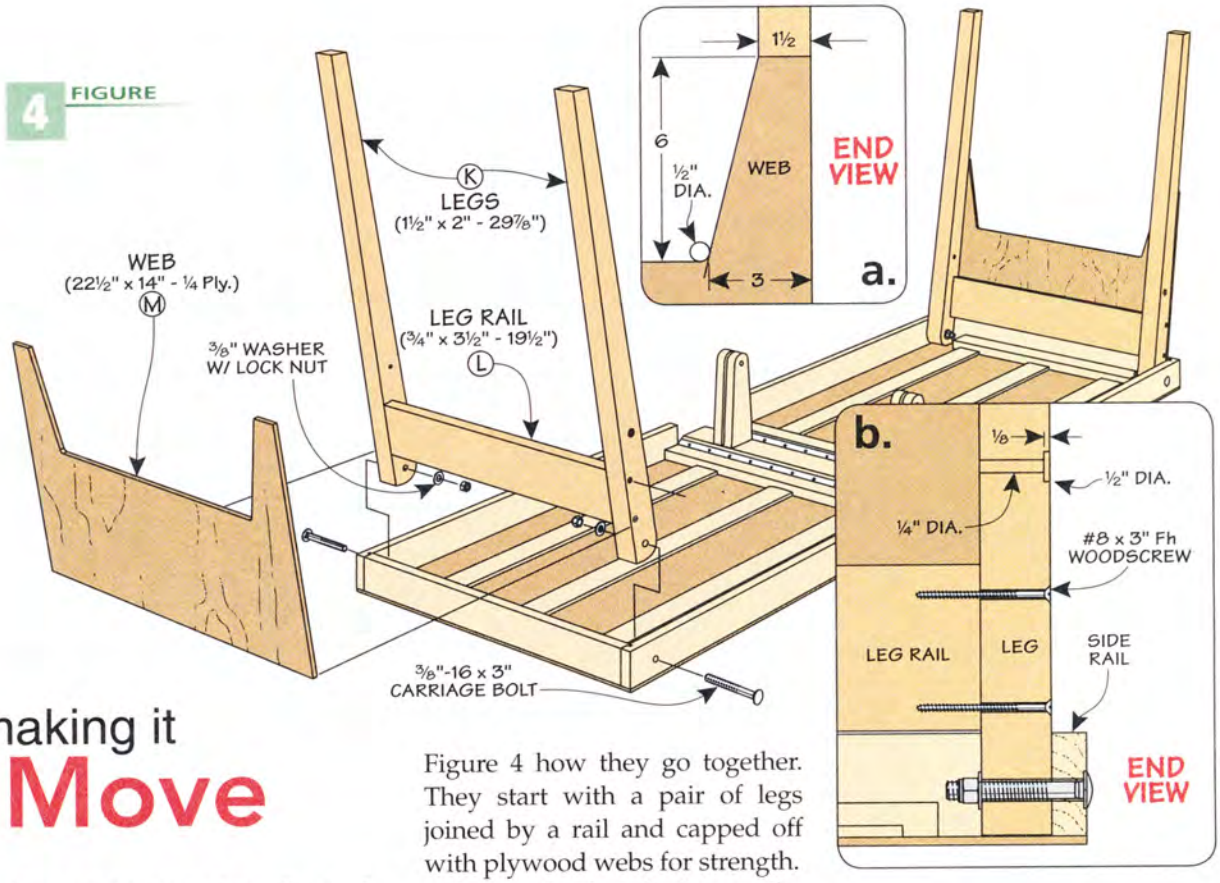


FIGURE 4



making it Move

The mechanism that allows the legs and wings to fold together looks more complicated than it really is. If you take it step-by-step, one piece at a time, it will come together in short order.

Leg Assemblies. The first order of business is making a pair of leg assemblies. You can see in Figure 4 how they go together. They start with a pair of legs joined by a rail and capped off with plywood webs for strength.

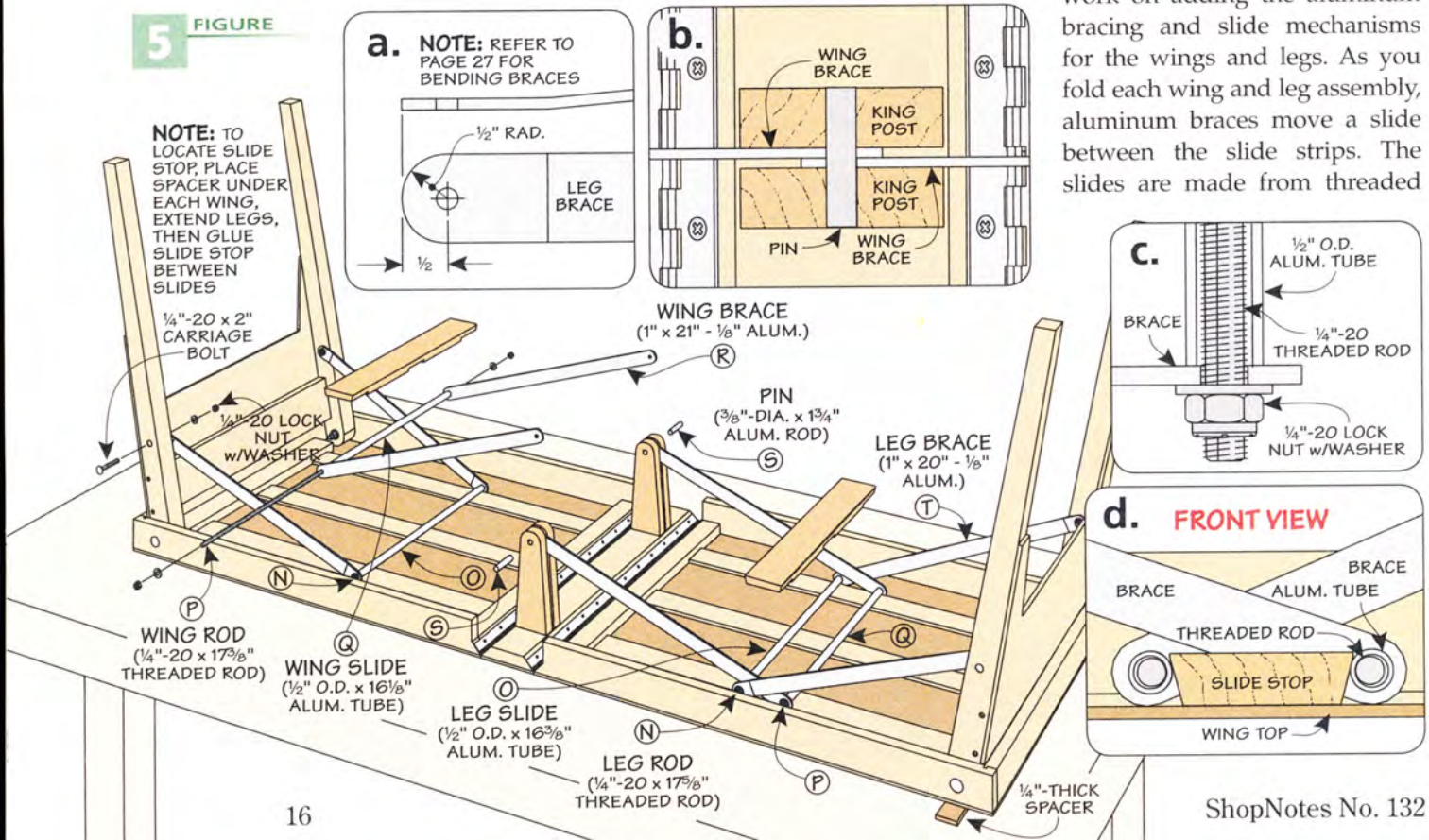
Before shaping the legs at the band saw, I drilled the pivot holes for the carriage bolts and counterbored holes for attaching the aluminum braces. The left margin drawing shows the overall shape of the legs.

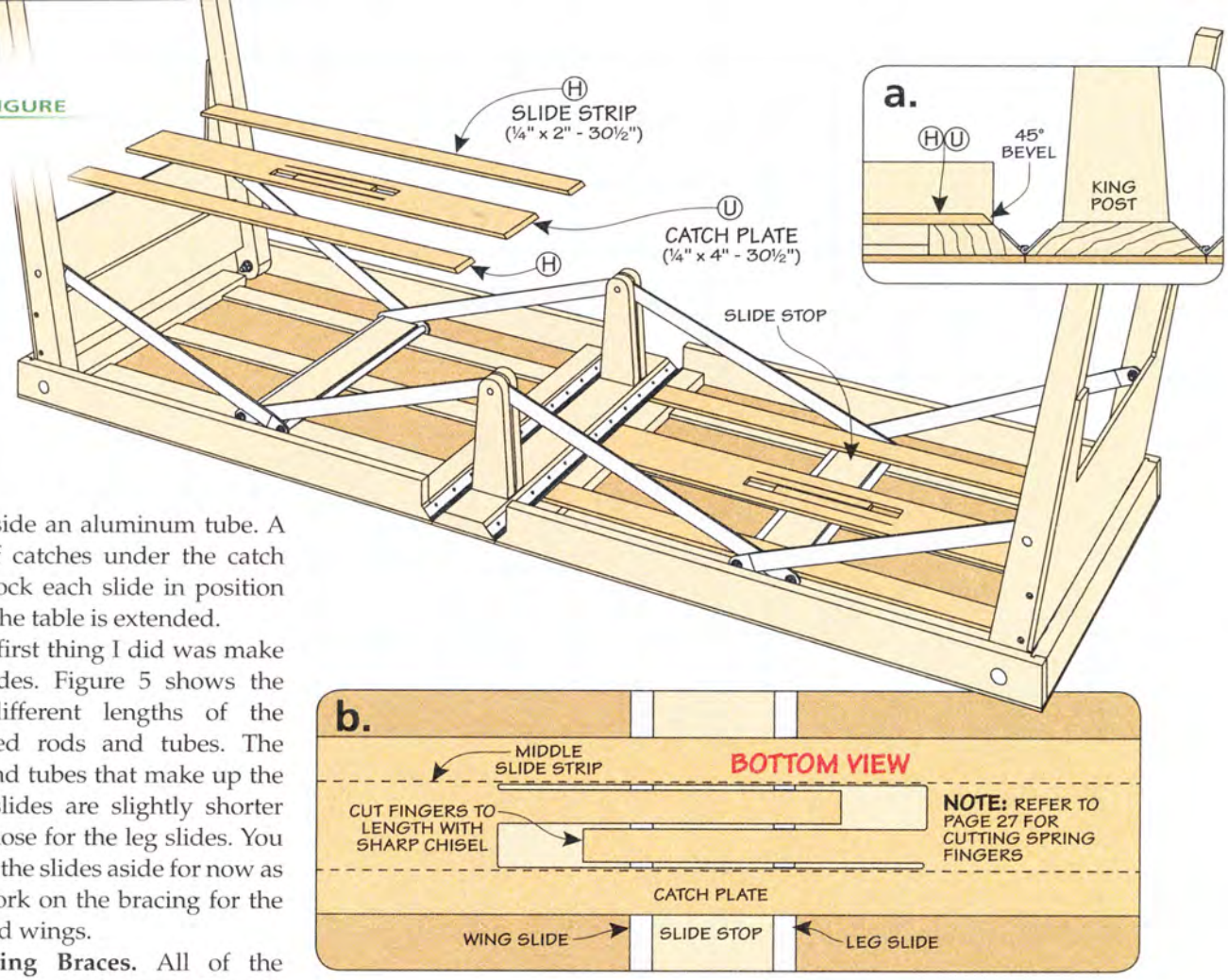
A simple rail is screwed to each pair of legs. Then a plywood web finishes off the assemblies. It stiffens the legs to create a solid foundation for the table.

Fasten the legs into the wing frames with carriage bolts, washers, and lock nuts, as you can see in Figure 4b.

Metalworking. Next, you'll work on adding the aluminum bracing and slide mechanisms for the wings and legs. As you fold each wing and leg assembly, aluminum braces move a slide between the slide strips. The slides are made from threaded

FIGURE 5





rod inside an aluminum tube. A pair of catches under the catch plate lock each slide in position when the table is extended.

The first thing I did was make the slides. Figure 5 shows the two different lengths of the threaded rods and tubes. The rods and tubes that make up the wing slides are slightly shorter than those for the leg slides. You can set the slides aside for now as you work on the bracing for the legs and wings.

Making Braces. All of the braces are made from 1"-wide aluminum bar stock. The leg braces are 1" shorter than the wing braces. After cutting them to length, you can drill the holes at each end. Note that the wing braces have two different diameter holes (⅜"-dia. for the pin in the king post and ¼"-dia. for the threaded rod in the slide). After drilling the holes, I went to the grinder to form a ½" radius at each end, as shown in Figure 5a.

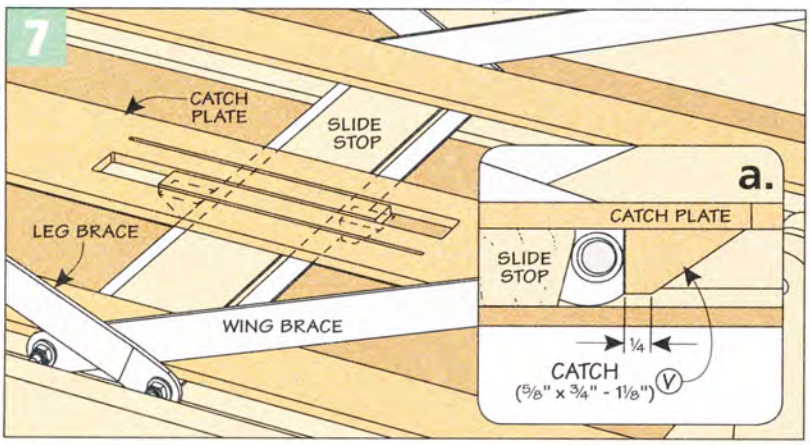
The leg braces need to be bent slightly at each end to provide clearance when folding the legs for storage. Shop Short Cuts on page 27 provides the details.

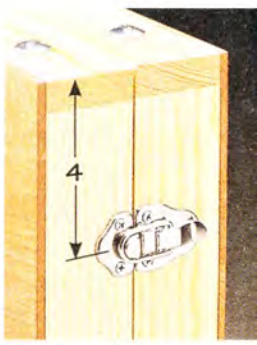
Nuts & Washers. Using Figure 5 as a guide, you can assemble the mechanism with washers and lock nuts. The wing braces are joined to the king posts with ⅜" aluminum rod pins. The leg braces join the legs with carriage bolts, washers, and nuts.

Slide Stop. Now you can mount the slide stops in their final positions. To do this, I placed a spacer under each wing (Figure 5). This "pretensions" the table so it will sit flat when extended. Then, with the legs extended, I glued the stops in place between each pair of slides, as you can see in Figure 5d and Figure 6.

Catch Assembly. After making sure all of the joints pivot freely without binding, you're ready to finish off with the spring catch assembly and slide strips (Figure 6). The catch assembly consists of a catch plate that has spring "fingers" cut into it. A small, triangular-shaped catch on the underside of the fingers traps the slides against the slide stop when the table is extended. After you cut the catch plates to size, turn to Shop Short Cuts on page 27 to see how I formed the spring fingers.

Now you can glue the catches to the bottom of the fingers. The catches should be tight against the slides. After the glue dries, you're ready add a handle and a pair of draw catches. Then you can put the table into service in your shop or next party.





▲ ***Final Detail.*** *Attach draw catches to the table to keep it closed.*

compact Router Table

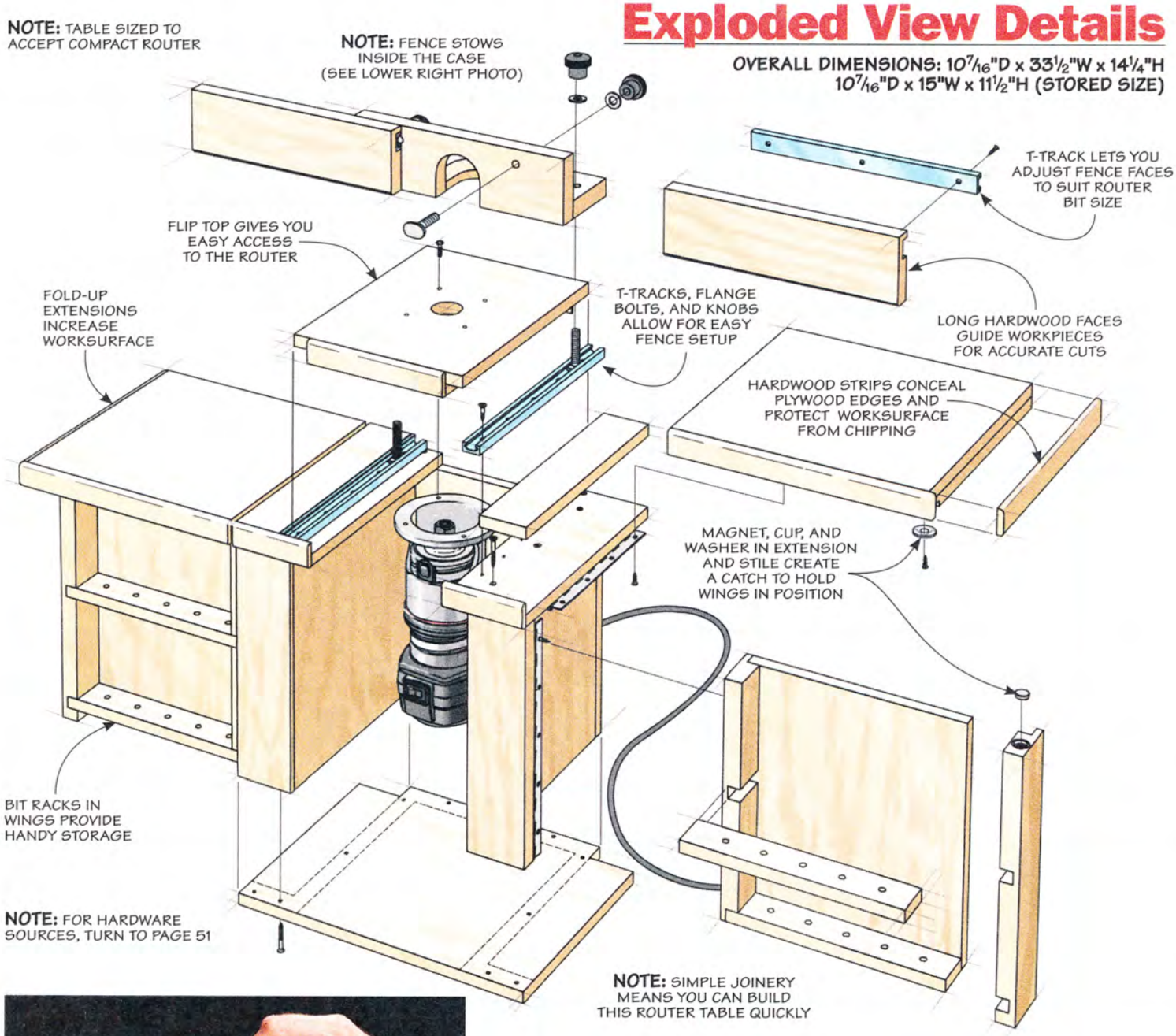
Don't be fooled by its small size. This portable router table packs in a lot of big-time features.

If you've used one of the new compact routers, you know how true the saying, "Good things come in small packages" can be. And just like its bigger brothers, putting a compact router in a table only adds to its versatility. But a full-size table would be out of place for these go-anywhere tools. So I came up with a router table that complements the scale.

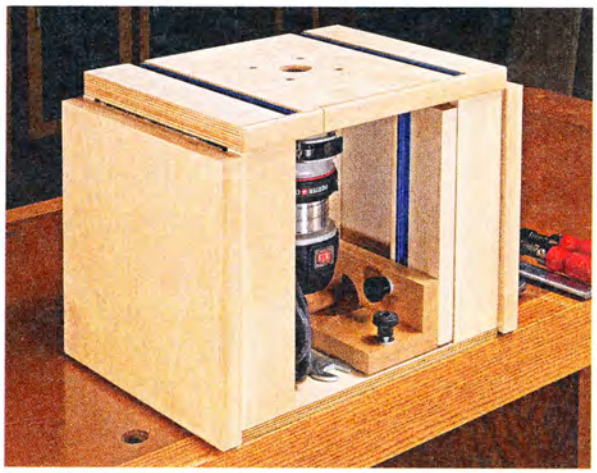
As you can see in the photo above, the table transforms any surface into a routing station. Two lift-up extensions provide a surprising amount of workspace. The support wings below double as router bit storage. And when the job is complete, it all folds into a compact box that can tuck away on a shelf. To top it off, you can build it in a weekend.

Exploded View Details

OVERALL DIMENSIONS: 10 7/16"D x 33 1/2"W x 14 1/4"H
10 7/16"D x 15"W x 11 1/2"H (STORED SIZE)



▲ ***Easy Access.*** *The center section of the top flips open for making adjustments or removing the router without bending over.*



▲ ***Compact Storage.*** *Fold the wings in, drop the extensions, and tuck the fence inside the case for storing or transporting the table.*

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start at the Bottom

For the construction of the router table, I kept a few goals in mind. First, it needed to be easy to lift and carry. So I wanted the overall project to be as light as possible. After all, it's designed to house a small, compact router.

The second goal relates to the first. Even though the project is lightweight and the router is small, the router table needs to be stout enough to stand up to heavy use without flexing.

Finally, the idea is to put the router table to work in my shop sooner rather than later. So the joinery shouldn't be fussy.

Solutions. Meeting those goals ended up being fairly straightforward. I used ½" Baltic birch plywood to create strong, lightweight panels. Some pieces of hard maple add strength and protection in a few key places.

Glue and screws handle most of the joinery. But I also included some rabbets and dadoes to register parts to make the assembly stress free. The end result is that you should have no problem building this router table in a couple of easy days in the shop.

Case Overview. You can get a good idea of how these solutions play out in the central case. Figure 1 shows the parts of the case. Now, it doesn't look like a typical, box-like case. Instead, it has a large opening in the front.

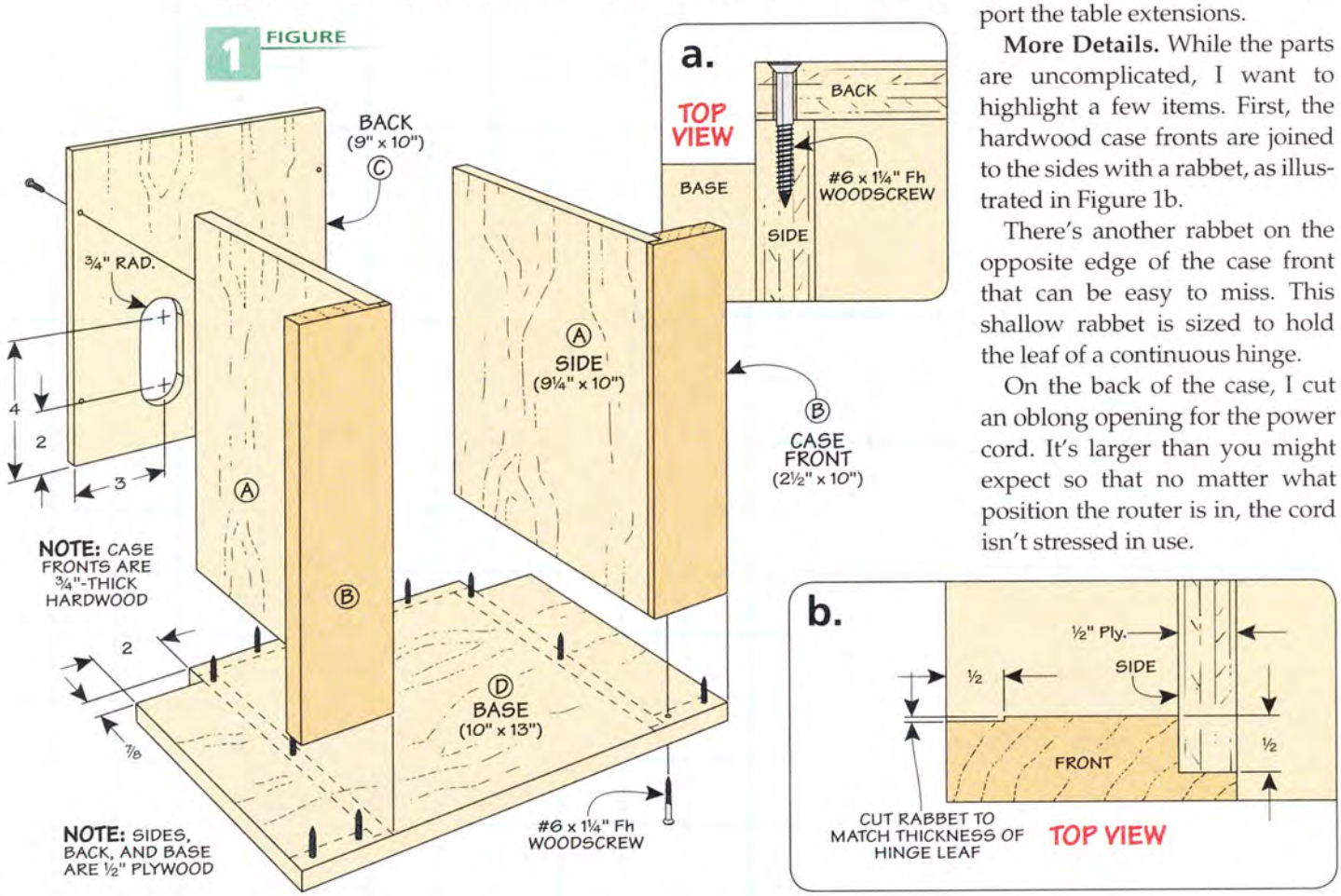
In addition, the sides are set in from the ends of the base. This detail creates pockets for the wings that swing open to support the table extensions.

More Details. While the parts are uncomplicated, I want to highlight a few items. First, the hardwood case fronts are joined to the sides with a rabbet, as illustrated in Figure 1b.

There's another rabbet on the opposite edge of the case front that can be easy to miss. This shallow rabbet is sized to hold the leaf of a continuous hinge.

On the back of the case, I cut an oblong opening for the power cord. It's larger than you might expect so that no matter what position the router is in, the cord isn't stressed in use.

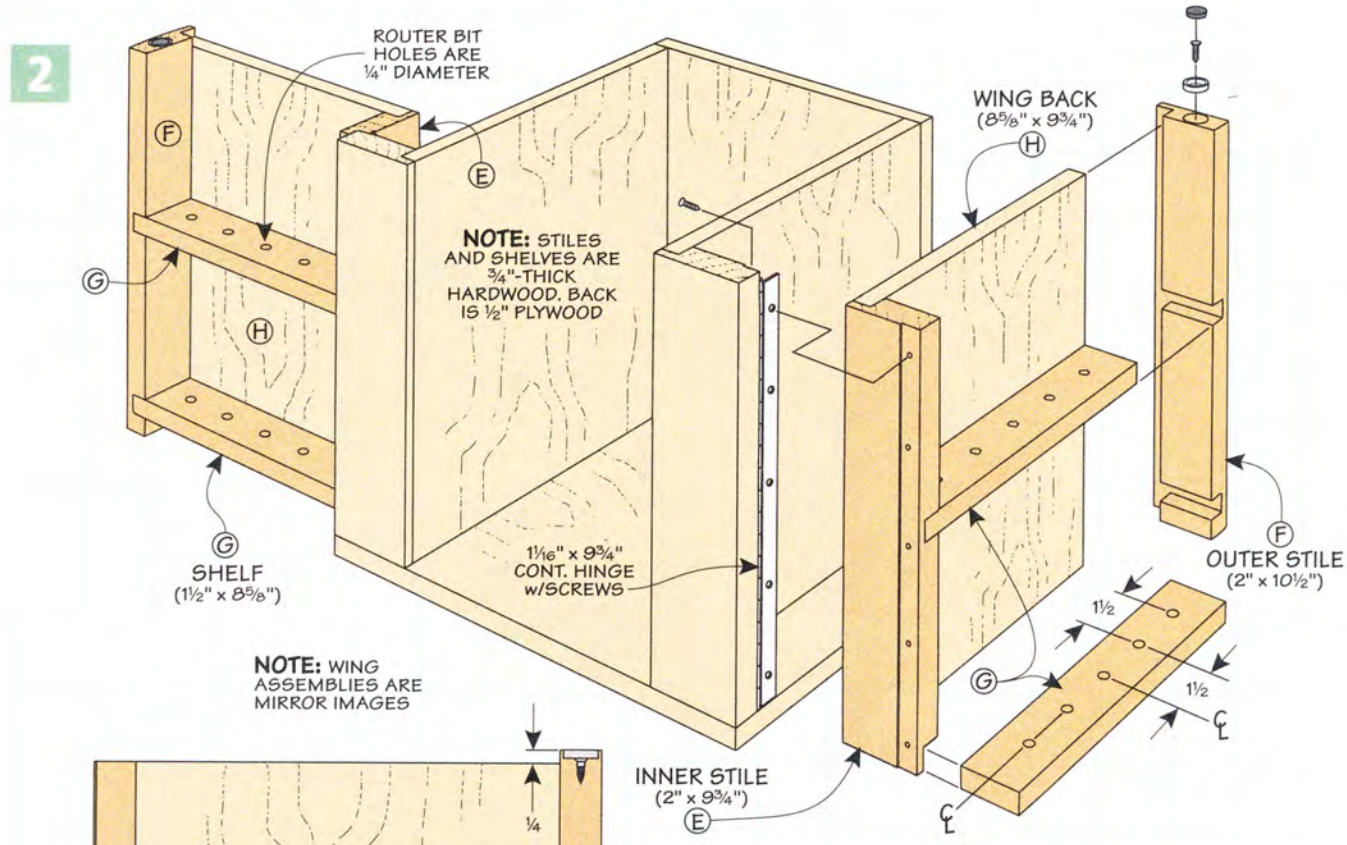
FIGURE 1

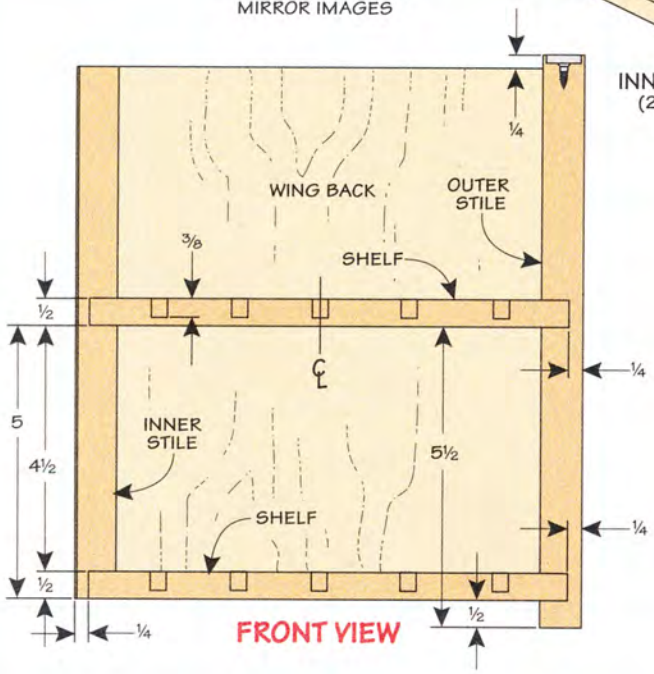


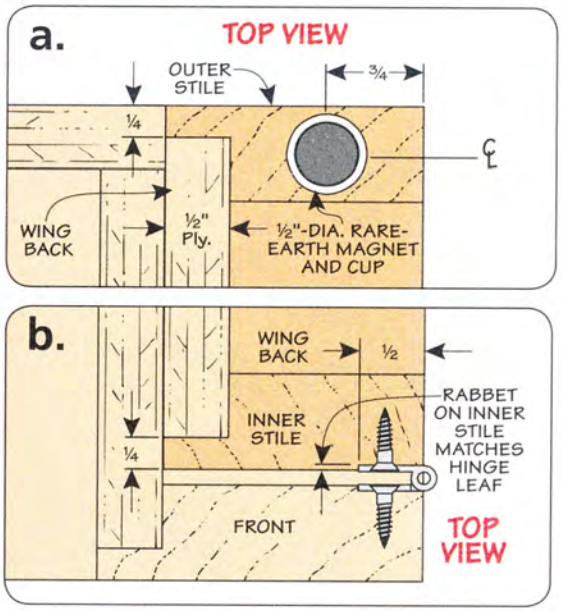
Materials & Hardware

A	Sides (2)	9¼ x 10 - ½ Ply.
B	Fronts (2)	¾ x 2½ - 10
C	Back (1)	9 x 10 - ½ Ply.
D	Base (1)	10 x 13 - ½ Ply.
E	Inner Stiles (2)	¾ x 2 - 9¾
F	Outer Stiles (2)	¾ x 2 - 10½
G	Shelves (4)	¾ x 1½ - 8⅝
H	Wing Backs (2)	8⅝ x 9¾ - ½ Ply.
I	Supports (2)	10 x 3½ - ½ Ply.
J	Fillers (2)	10 x 2 - ½ Ply.
K	Top (1)	10 x 7½ - ½ Ply.
L	Subtop (1)	9¼ x 6 - ½ Ply.
M	Hinge Block (1)	¾ x ½ - 6
N	Table Extensions (2)	10 x 10 - 1 Ply.
O	Edging (1)	¼ x 1 - 55 rgh.
P	Fence Base (1)	¾ x 2¾ - 9½
Q	Fence Backer (1)	¾ x 2¾ - 9½
R	Fence Faces (2)	¾ x 2¾ - 9½

- (24) #6 x 1¼" Fh Woodscrews
- (2) 1 1/16" x 9¾" Cont. Hinges w/Screws
- (2) ½" Rare-Earth Magnets
- (2) ½" Magnet Cups w/Screws
- (2) ½" Magnet Washers w/Screws
- (2) 10" T-Tracks w/Screws
- (1) 1 1/16" x 6" Cont. Hinge w/Screws
- (2) 1 1/16" x 7" Cont. Hinges w/Screws
- (2) 9½" T-Tracks w/Screws
- (4) 5/16"-18 x 1½" Flange Bolts
- (4) 5/16"-18 x 1"-dia. Round Knobs
- (4) 5/16" Flat Washers







The final case detail to note is the base. You need to cut a notch at each of the back corners to accept the outer stile of the wings. Assembly then is just a matter of gluing and screwing the parts into place.

SWING-OUT WINGS

The swinging wings attached to either side of the case are up next. Their primary purpose is to support the table extensions. So they're "overbuilt" to stay rigid over the long haul.

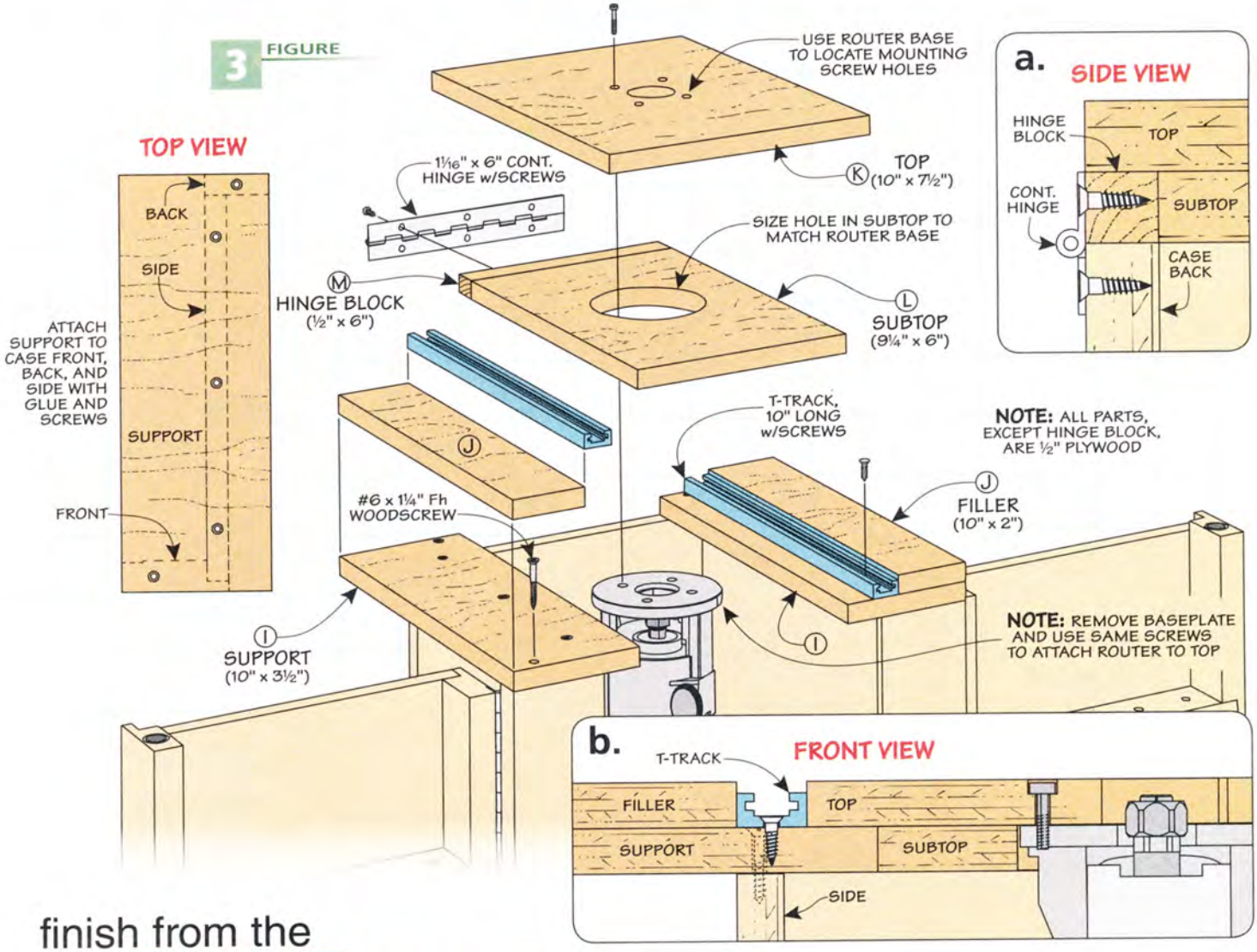
There's a side benefit to this design. The shelves create bit racks with the addition of a few holes, as shown in Figure 2.

Mirror, Mirror. You don't want to get ahead of yourself making the wings. Notice that they aren't identical. They're mirror images, so it's a good idea to label your parts clearly to keep things organized.

Wing Stiles. Each wing is made up of a pair of stiles joined by shelves and a back. The front view in Figure 2 shows a critical detail. The outer stile is longer than the inner stile to match the height of the case. This allows the outer stile to act as a leg to prop up the table extension and ensures the top stays flat and even.

To keep the wings in the open position, I recessed a strong, rare-earth magnet and cup into the top of the outer stile (Figure 2a). It forms a catch with a matching washer that gets installed on the underside of each table extension.

The inner stiles have a pair of rabbets, just like the case fronts, as shown in Figure 2b. And both stiles have dadoes to house the shelves that hold router bits.



finish from the

Top Down

The case and wings make up the support structure for the router table. The top is where the rubber meets the road. And while the construction of the top is relatively easy, there are a lot of things going on. So I want to start by giving a bird's eye view. After that, we can zoom in for a closer look at a few key points. The project wraps up with a unique fence on the facing page.

From the Top. There are five sections that go into the top assembly. In the middle, a hinged section holds the router, as shown in Figure 3. A continuous hinge along the back allows it to open like the hood of a car to give you access to the router.

On either side of the center section are a pair of fixed sections as well as some T-track for the fence. A pair of flip-up extensions hinged to the fixed pieces completes the assembly, as in Figure 4. The extensions also cover the wings to add some protection for the router bits in storage.

Doubled Up. With all the moving parts, I wanted to make sure the top was as stiff and rugged as possible. To do this, the sections are all made from two layers of plywood. But each section is a little different.

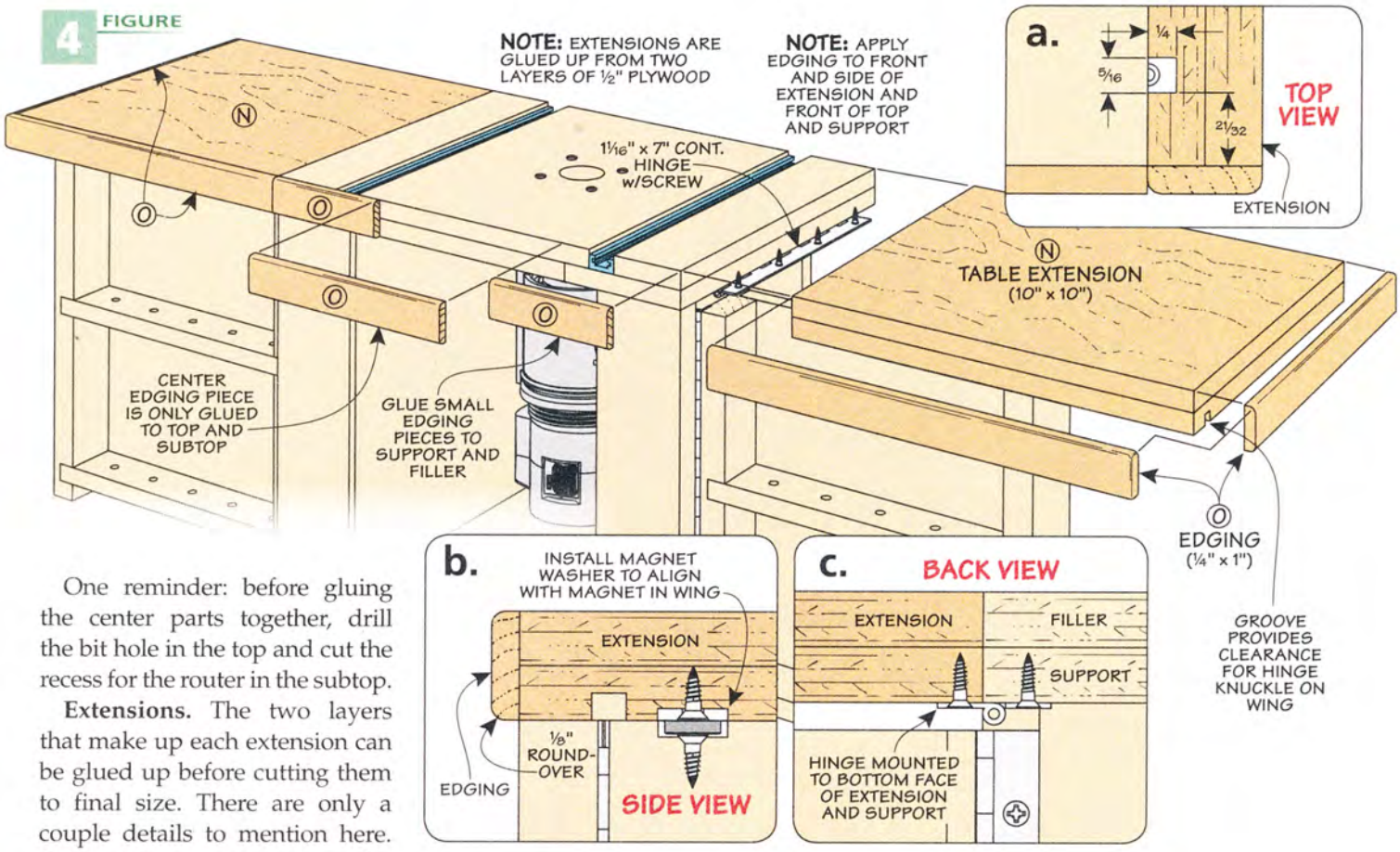
Fixed Sections. I began with the two fixed sections, as you can see in Figure 3. The lower layer consists of supports that are glued and screwed to the top of the case. What's important here is that the outer edge of these pieces is flush with the edge of the case fronts. Narrow fillers are glued flush with the outside edges of the supports (Figure 3b).

I want to make a side note here. I cut all the top pieces from an extra-long blank. This way, the grain flows from one end of the top to the other. No, it doesn't improve the performance of the router table. But it is an extra touch that helps make the finished project look its best.

The T-track that guides the fence is the last part of the fixed section. Once it's in place, you can see how the remaining portion of the support creates a lip that holds the center section.

Center Section. The distance between the T-track segments defines the length of the top, while the space between the supports determines the size of the subtop. Take a look at Figure 3a. I added a hardwood strip to the back edge of the subtop. It provides a solid anchoring point for the hinge screws.

FIGURE 4



One reminder: before gluing the center parts together, drill the bit hole in the top and cut the recess for the router in the subtop.

Extensions. The two layers that make up each extension can be glued up before cutting them to final size. There are only a couple details to mention here. First up is a groove cut on the underside (Figure 4a). This creates clearance for the protruding hinge knuckle on the wings.

The other detail is to add the washer to align with the magnet in the top of the wing (Figure 4b).

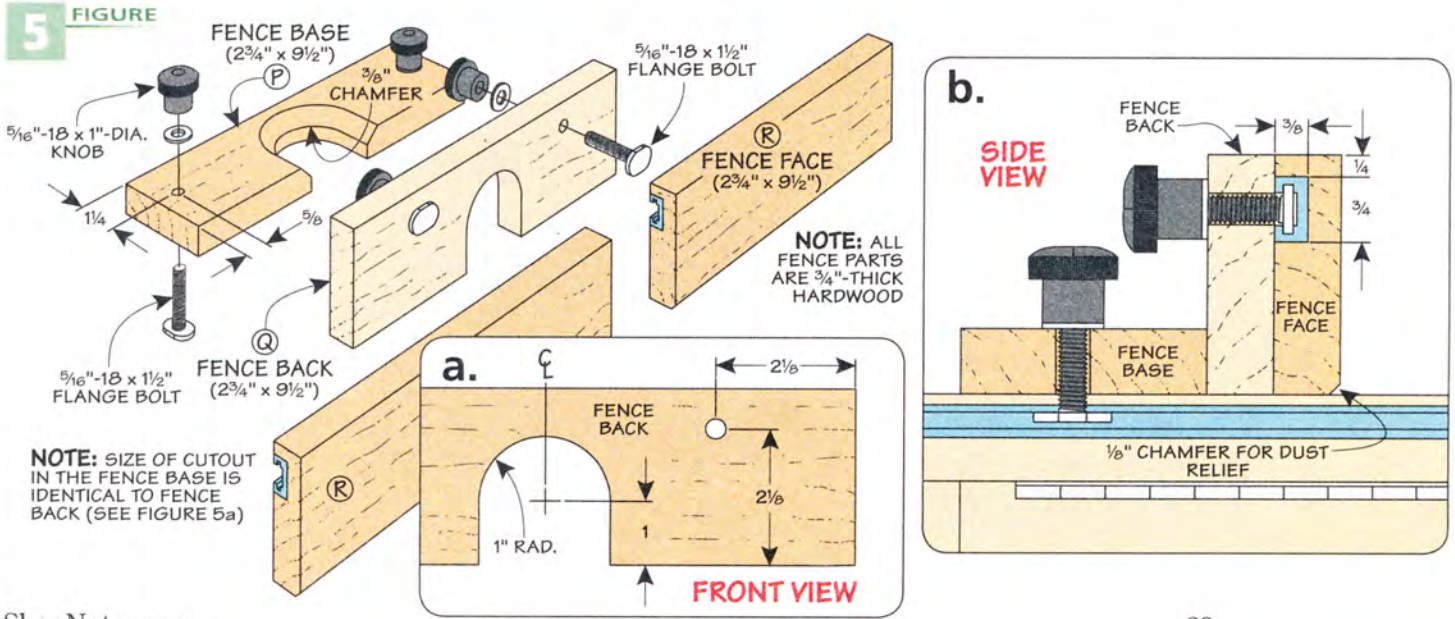
Edging. Plywood makes great panels. But the edges are vulnerable to chipping. To add some protection, I glued thin hardwood strips to the front edge, as shown in Figure 4. The extensions have edging on the front and ends. To attach the extensions, I flipped the table upside down. This also keeps the sections flush.

FENCE

The final piece of the puzzle is the fence. Figure 5 shows how it works. A short, L-shaped section has cutouts to accommodate the bit and knobs to lock it to the T-track in the top. A pair of adjustable hardwood faces provide solid workpiece support. A length of T-track inset in the back face allows you to adjust the size of the bit opening, as in Figure 5b. The faces also fold upright to store the fence inside the case.

Putting the router table to use is simply a matter of clamping it to a worksurface. Then you're ready to get even more versatility from your compact router.

FIGURE 5



3 ways to dress up Cabinet Doors

Take your doors from ordinary to extraordinary with some applied moldings you make yourself.

▲ ***Stub Tenon & Groove.*** *A tongue that fits perfectly in a groove creates strong doors quickly.*

One of my favorite techniques for making doors is to use stub tenon and groove joinery. You can see the elements of its construction in the left photo. A plywood panel is captured in grooves cut in the stiles and rails of the door frame. Short tenons cut on each end of the rails are sized to fit the grooves as well. The result is a sturdy door that's easy to make on the table saw.

This type of door is well suited to many project styles. I've used it on projects ranging from simple shop cabinets, to Shaker and Arts & Crafts furniture, too. About the only downside of this door is that the square profile of the parts can look a little bland.

Several Options. To spice up the look, I've come up with a few techniques that start with a stub tenon and groove frame made at the table saw. From there, you can customize the look with shop-made moldings using router bits you probably already have. This gives you greater design flexibility without spending a lot of money on single-use bits.

In the examples that follow, I'm going to highlight how the techniques work with a specific router bit or profile. But that doesn't mean it's the only option. Take a look in your router bit cabinet to see what you have (and like) that can work in its place.

SIMPLE PROFILES

The corner of the frame shown in the lower right photo provides a good example of the easiest way to dress up a basic door. I used a beading bit to create a narrow strip of molding that's glued to the inside edge of the frame where it meets the plywood panel.

Making the Profile. The left photo below shows the first step in creating the bead molding strip. The bead is first routed on

▲ ***Rout the Bead.*** *Rout a bead on each edge of a blank, then cut them free at the table saw.*

two sides of an oversize blank. This not only makes the best use of the material, it also keeps my hands safely away from the bit.

From there, I cut the strips to final size at the table saw. The ends of the molding are mitered to wrap around the frame.

Assembly Tip. Take it easy on the glue when you apply the molding to the frame. A thin line of glue is all you need. Otherwise, you can end up with squeeze-out that can be tricky to remove from the tight corners and crevices where the bead meets the frame.

Other Choices. The bead profile creates a nice shadow line between the molding and frame. But you can use other small profiles. For example, I've made simple quarter round moldings and small chamfers, too.

BOLECTION MOLDING

The second technique is to add a larger, more complex molding profile. At first glance, it may not seem that different than the smaller profile I just talked about.

The difference however, is that the larger profile doesn't just rest on the inside of the frame. Instead, it wraps up and over onto the face of the frame. This adds another dimension to the completed door. You can see this in the example in the right margin photo.

This type of molding is called a bolection. It's modeled after the large moldings used in architectural wainscoting for a room.

▲ ***Routing the Profile.*** *On an extra-wide blank, rout the profile in two steps. A bearing-guided bit shapes the edge and a second profile bit completes the "top" of the molding.*

Two-Step Profile. There's a little more involved in making this molding. The profile combines two bits, as shown in the photos above. A cove and bead bit forms the majority of the profile. (Here again, I'm using an extra-wide blank for safety.)

To complete the half-round bead detail on what will be the top of the molding, you need to switch to a bit that doesn't have a bearing (right photo above). This ovolo bit also creates a flat groove that results in a square shoulder on the molding strip.

The Step. In order for the molding to wrap over the frame, you need to cut a groove on the back face of the molding. Since I was already at the router table, I just used a straight bit, as shown in the main photo on the opposite page. The key here is the height of the bit needs to match the shoulder on the frame. Then you can rip the molding to size and miter it to fit.

▲ ***Cut to Size.*** *At the table saw, set the rip fence and cut the molding strip to final width.*

With just of bit of work, you can make a big difference in the overall look of your project. Try one of these techniques and I'm sure you'll agree.

Bolection

another look
Go for Glass

The third option for changing up the look is to substitute a glass or plastic panel for the plywood panel in the door. For small doors, the joinery remains the same. On larger doors, reinforce the corner joints with dowels or mortise and tenon joints.

After gluing up the door, the next step is to rout away one side of the groove to create a pocket for the glass, as shown in the near right photo. You'll also need to square up the corners with a chisel.

You can secure the glass with simple strips of stop or use one of the other techniques to add molding to the outer face of the frame (far right photo).

▲ ***A Pocket.*** *By routing a rabbet in the back side of the frame, you create a pocket for the glass panel.*

Glass panel & bead profile

Shop Short Cuts

Slat Wall

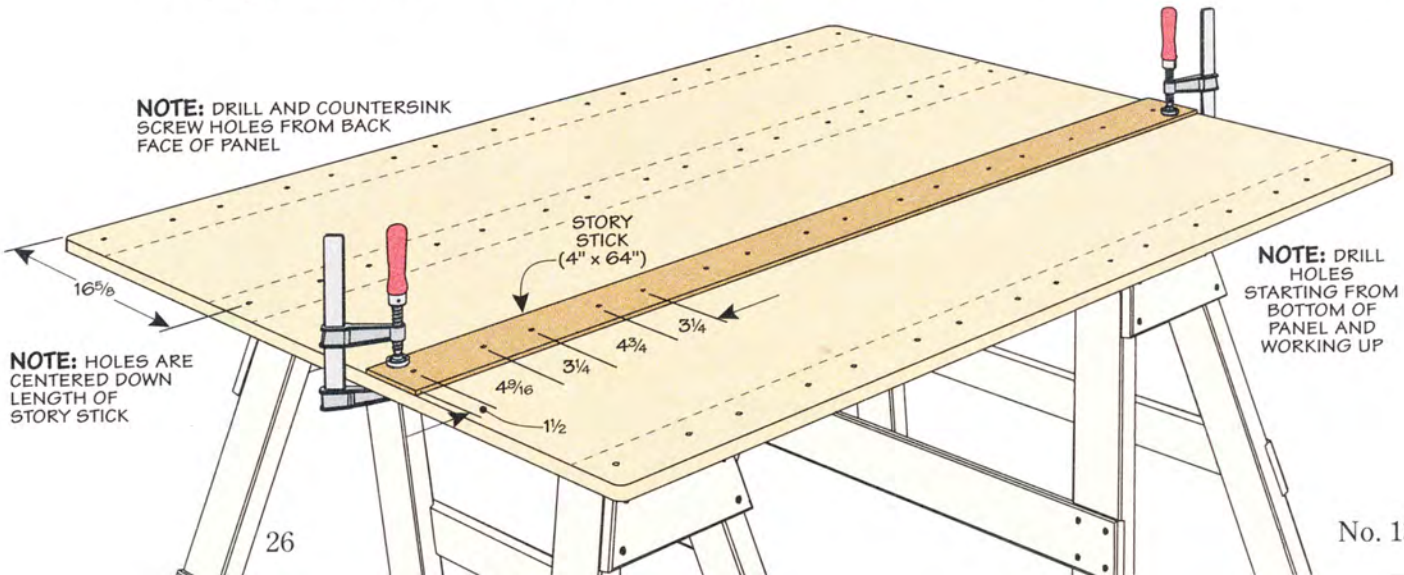
Drilling all the screw holes and then evenly spacing all the slats for the slat-wall storage system on page 32 can be both tedious and exacting. To make the job a bit easier, I used a couple of tricks.

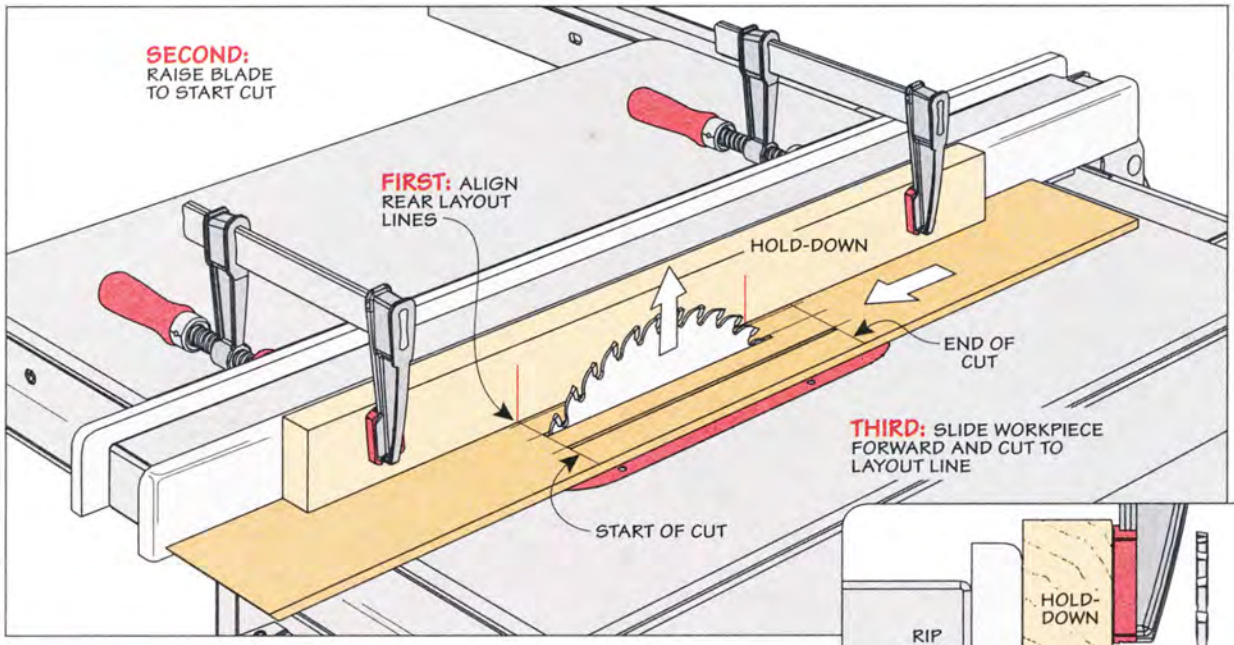
Story Stick. To lay out and drill the screw holes, I made a simple story stick, as shown below. This is nothing more than a narrow strip of hardboard with a row of carefully laid out holes. I used the story stick as a template to drill rows of holes through the back of the slat wall without having to lay them all out individually.

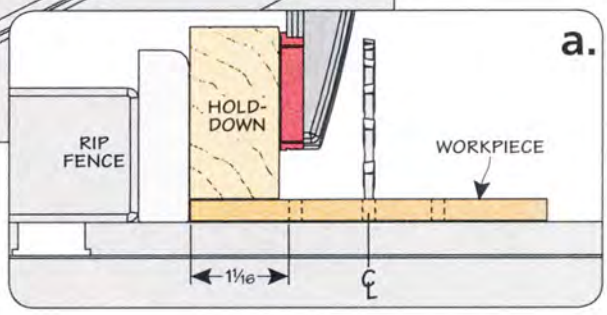
Slats. When it comes to attaching the slats, the goal is to get them all parallel and evenly spaced. To do this, I ripped several 2⅛"-wide spacers. You'll use these to position the slats.

Start by attaching the bottom filler flush with the bottom edge of the back panel. Then alternate spacers and slats. When you get to the top filler, you can mark it for width and then trim it to fit flush with the edge of the panel.

To attach the slats, I simply set the panel on some sawhorses and drove screws up from underneath, as in the photo above.







Plunge Cuts

Making the spring catches for the folding table (page 12) is a pretty simple process. It just takes some careful setup at the table saw.

The cuts that form the fingers for the spring action are made by raising the blade through the stock. A few simple preliminary steps make it safe and easy.

Layout Lines. The first thing to do is clamp a board to the rip fence to act as a hold-down. Leave space underneath for the workpiece to slip under.

To mark where the blade will cut, raise it to its full height. Slide the fence next to the blade and strike lines on the hold-down at the front and back edges of the blade. Then lower the blade. Also mark layout lines on the workpiece for the start and end of the three plunge cuts.

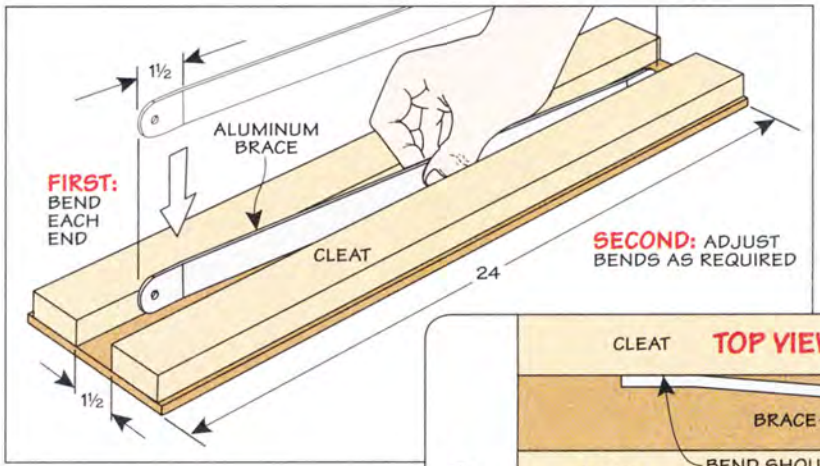
Making the Cuts. Now position the fence for making the first outside cut. Position the workpiece so the line at the rear of the workpiece aligns with the rear layout line on the hold-down. Start the saw and raise the blade slowly while holding the workpiece. With the blade at full height, advance the workpiece to finish the cut at the opposite layout line. Then you can turn off the saw and lower the blade. Rotate the workpiece 180° to make the second cut. Readjust the fence to make the center cut.

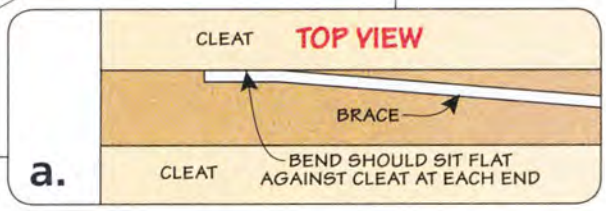
Bending Gauge

The aluminum braces that support the legs on the folding table require an offset bend at each end to provide clearance for the slide mechanism. The bend is so slight, it's difficult to determine the correct angle.

To help gauge the amount of bend, I made a simple jig, as shown at right. It consists of two cleats spaced 1½" apart. They're glued to a piece of hardboard.

To use the gauge, slightly bend each end of the brace by aligning the bend line with the top of the jaws in a machinist's vise.





Hold the brace close to the vise jaws and gently bend it. Repeat at the other end, making sure to bend in the opposite direction. To check your progress, insert the brace between the cleats. The flat at each end of the brace should seat squarely on the edge of the cleat (detail 'a').

easy-to-use Lathe Duplicator

After building this duplicator, you'll be surprised at how easy it is to make a copy of any turning.

The lathe is the only tool in the workshop where you can start with a raw piece of wood and make something beautiful in no time. But when it comes to making duplicate parts, like legs for a table, getting them all to look the same can be a real challenge.

The simple design of the duplicator above takes the guesswork out of turning copies. It mounts to the bed of your lathe to provide a platform for a template and a worksurface for the cutting tool holder. The template is created with a marking tool that follows the contour of the original turning. After cutting the template to shape, the tool holder can then follow the template to create copies. It's really a simple process you can master in no time.

Building a Platform. The first part of the duplicator I worked on was the platform (Figure 1). It consists of a plywood base, a cleat to fasten the base to the lathe, and a riser to hold the template. I sized mine to fit a midi-size lathe, as you can see above. You can easily adjust the dimensions for your lathe.

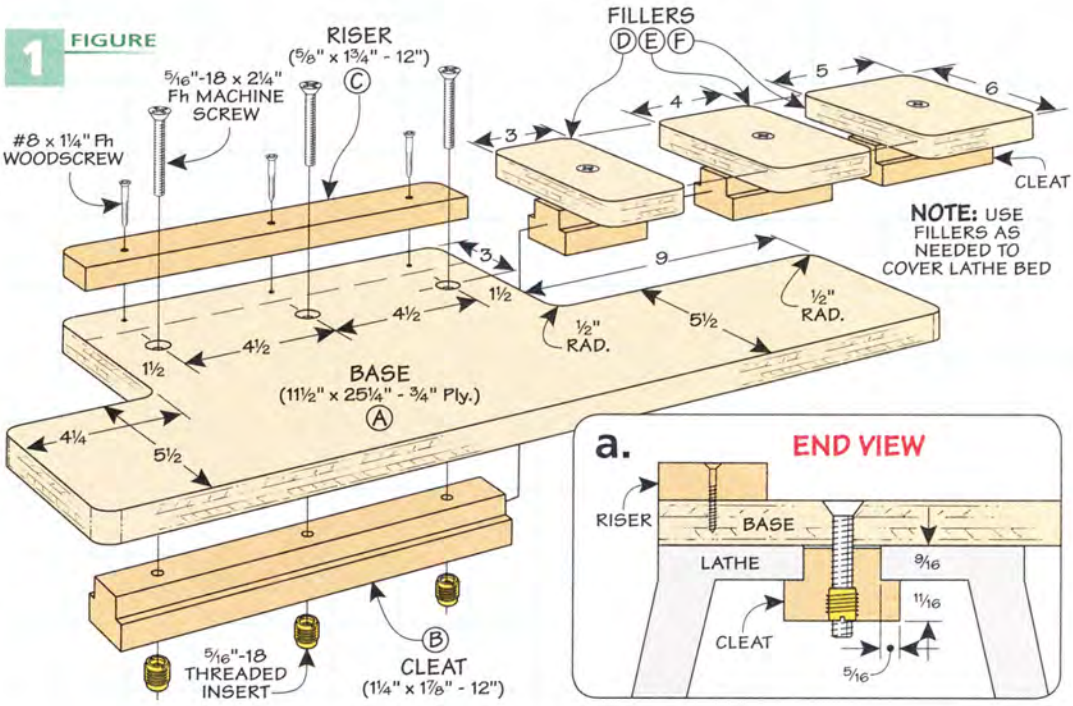
Simple Cleat. The cleat is sized to fit between the ways of your lathe bed. If you make it extra-long, you can use the cutoffs to make the fillers later. A pair of rabbets cut along the top edges of the cleat form a tongue to fit between the ways. Take care to ensure the height of the tongue is just slightly below the surface of the ways when installed. This keeps the base tight to the lathe bed during use (Figure 1a).

The cleat is fastened to the plywood base with machine screws and threaded inserts. So you'll need to install the three threaded inserts before moving on.

Base. The plywood base is pretty simple to make. I cut it to overall size, drilled the inside corners, and then cut it to shape. A little work at the disk sander quickly forms each radius on the outside corners. The last thing to do is drill and countersink for the machine screws used to fasten the base to the cleat on the lathe.

Riser. A simple hardwood riser completes the platform assembly. Its purpose is to elevate the profile template to allow the tool holder to follow the profile. After shaping the outside corners, fasten the riser to the base before adding the fillers.

Fillers. Depending on the size of the workpiece you're turning, you may need to fill in the gap between the base and tailstock of the lathe. So I made a range of fillers using the cutoffs from the cleat and base (Figure 1).

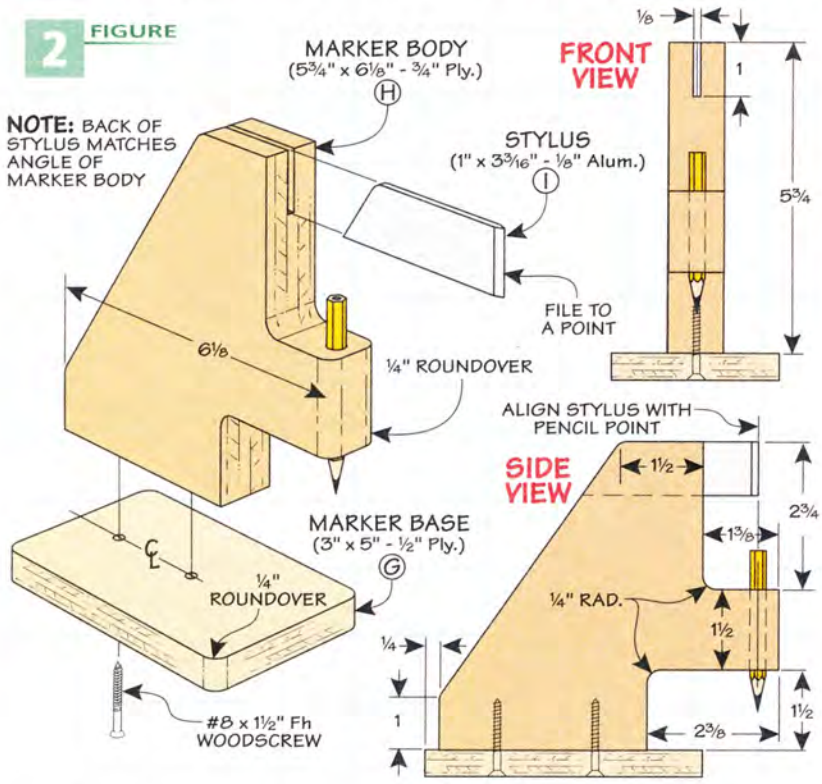


MARKER ASSEMBLY

Now you can fasten the platform assembly to your lathe and get started on the marker assembly. As you can see in Figure 2, it's fairly simple to make. It consists of a plywood base and body with an aluminum "stylus." The body is designed to hold a pencil so that you can scribe the profile of an original turning on a blank piece of hardboard to create a template. The aluminum stylus traces the profile of the original turning while the pencil recreates the profile on the template blank.

Base & Body. Figure 2 covers everything you need to know to make the base and body of the marker assembly. I cut the 1/8" kerf in the top of the body before cutting it to final shape. After shaping the body, you can drill the hole for the pencil. You want a friction fit, but not too tight. You'll press down on the pencil with your finger as you trace the profile onto the template blank. I'll talk more about that later.

Stylus. To make the stylus, I cut a piece of aluminum to rough length and formed a point on one end. Insert the aluminum into the slot and insert a sharpened pencil upside down to align the points. Trace the shape of the body onto the back end of the stylus then cut and file it to final shape before gluing it into the body. Figure 2 shows what it should look like.



building the Tool Holder

▲ ***Cutting Tool.*** *An inexpensive carbide cutter in the tool holder shapes the wood.*

The tool holder is the key to the duplicator. Like the marker assembly, it has an aluminum stylus that traces the outline of the template. At the same time, a cutting tool shapes the wood spinning in the lathe.

Base & Body. The base of the tool holder is shaped a little differently than the marker base. I made it wider so I could add a knob. This gives you more control of the tool as it's cutting. Figure 3 provides the details for making the base.

The body of the tool holder needs to be stiff and stout, so I glued up two layers of ¾" plywood. Before cutting the ⅜"-wide groove in the top that holds the cutting tool, you want to have the cutting tool handy (margin photo). Size the groove for a snug fit. The tool's shank should be just slightly proud of the top of the body. This way, the aluminum clamp is sure to keep it secure as it's cutting. With that done, you can finish shaping the body of the tool holder.

I wanted to be able to adjust the position of the template stylus as needed, so I added a threaded insert and knob. The stylus is shaped to a point as before.

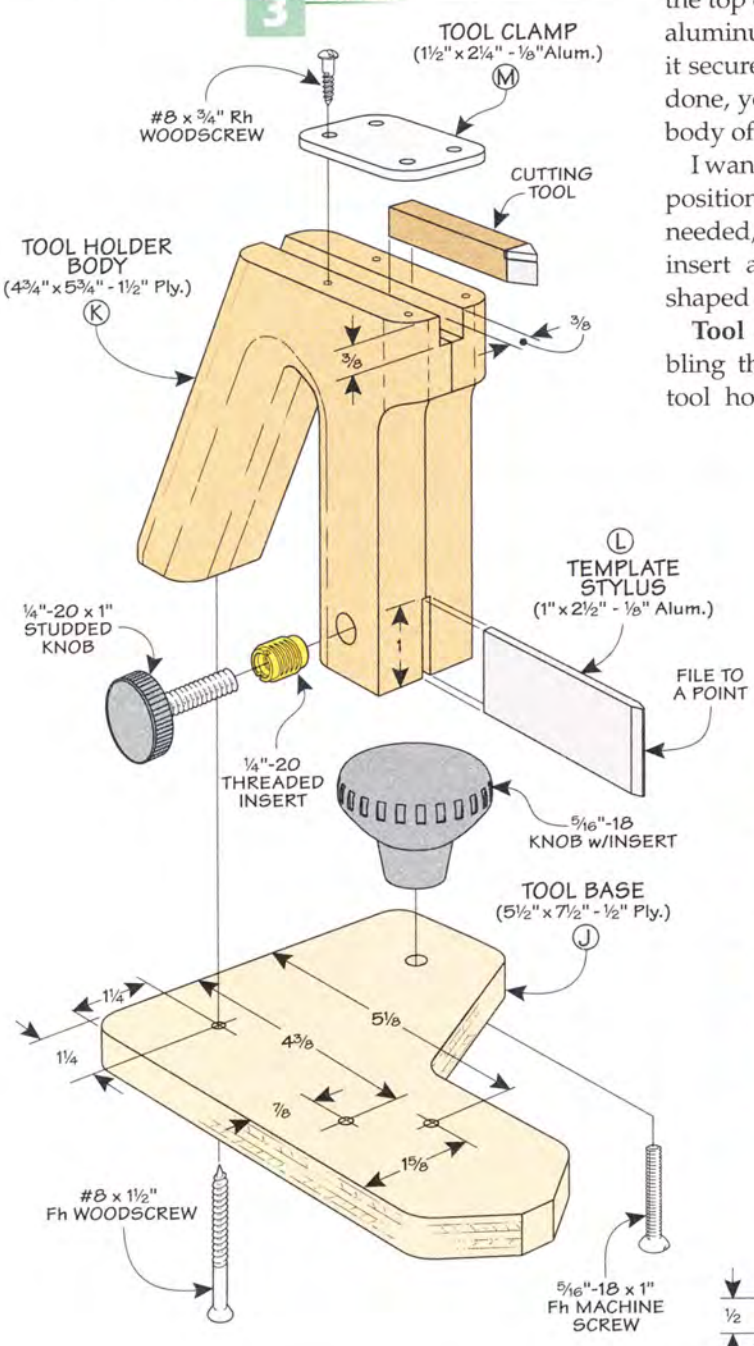
Tool & Clamp. After assembling the base and body of the tool holder, you can make the tool clamp. It's a simple aluminum plate held in place with four screws. I rounded the corners before installing it.

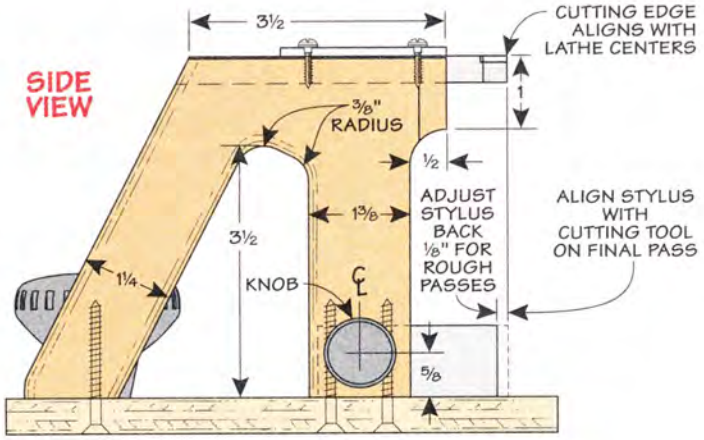
About the Tool. The cutting tool I used is designed for metalworking (margin photo at left). It works great for this application because the cutting edge is made from carbide and lasts a long time. And when it does get dull, it's not expensive to replace (refer to Sources on page 51).

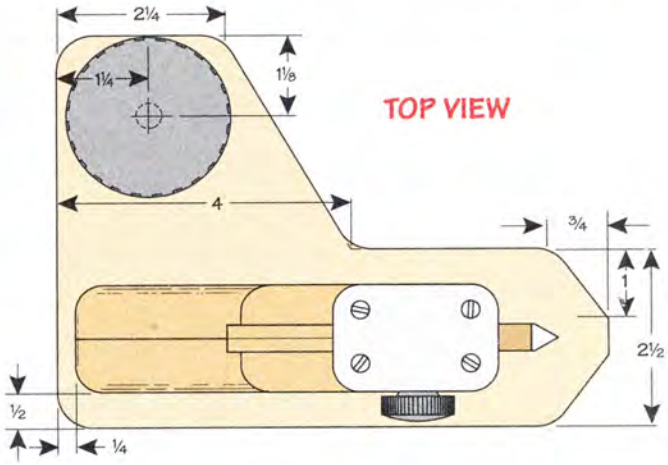
Using the Duplicator. The photos at right step you through the process of making duplicate parts. The key points are to keep the tool holder firmly on the base as you start to cut into the wood. And don't try to cut too deep. Light skim cuts work best.

For round profiles, I'll use a roughing gouge to remove the bulk of the wood first, then switch to the duplicator's tool holder for cutting the finer details. I start with a roughing pass then finish up with a light finishing pass before sanding.

FIGURE 3







Using the Lathe Duplicator

▲ ***Template Blank.*** *Position a hardboard blank so that the front edge is aligned with or projecting slightly beyond the front profile of the turning and then fasten it with screws.*

▲ ***Marking the Profile.*** *With pressure on the pencil, follow the outline of the original turning to scribe its shape on the hardboard template before cutting and sanding to shape.*

▲ ***Roughing Out.*** *With the cutting tool set slightly behind the point of the stylus, make light cuts until the stylus contacts the template all the way across its length.*

▲ ***Finishing Cut.*** *Align the cutting tool with the point of the stylus and continue making light cuts while following the template until the profile is complete.*

▲ ***Sanding.*** *Start with 80-grit paper and work your way through finer grits until the scratches disappear. Take care not to sand away crisp details.*

▲ ***Identical Match.*** *Using the template, you can create as many duplicates of the original turning as you need. It's an easy process once you get a little practice.*

Materials & Hardware

A	Base (1)	11½ x 25¼ - ¾ Ply.	I	Stylus (1)	1 x 3³⁄₁₆ - ⅛ Alum.
B	Cleat (1)	1¼ x 1⅞ - 24 rgh.	J	Tool Holder Base (1)	5½ x 7½ - ½ Ply.
C	Template Riser (1)	⅝ x 1¾ - 12	K	Tool Holder Body (1)	4¾ x 5¾ - 1½ Ply.
D	3" Filler (1)	3 x 6 - ¾ Ply.	L	Template Stylus (1)	1 x 2½ - ⅛ Alum.
E	4" Filler (1)	4 x 6 - ¾ Ply.	M	Tool Clamp (1)	1½ x 2¼ - ⅛ Alum.
F	5" Filler (1)	5 x 6 - ¾ Ply.			
G	Marker Base (1)	3 x 5 - ½ Ply.			
H	Marker Body (1)	5¾ x 6⅛ - ¾ Ply.			

- (1) 60° Carbide Tool Bit w/⅜" Shank
- (4) #8 x ¾" Rh Woodscrews
- (6) ⁵⁄₁₆"-18 Threaded Inserts
- (6) ⁵⁄₁₆"-18 x 2¼" Fh Machine Screws
- (1) ⁵⁄₁₆"-18 x 1" Fh Machine Screw
- (5) #8 x 1½" Fh Woodscrews
- (3) #8 x 1¼" Fh Woodscrews
- (1) ¼"-20 Threaded Insert
- (1) ¼"-20 x 1" Studded Knob
- (1) ⁵⁄₁₆"-18 Knob w/Insert

dream shop project

slat-wall Storage System

This modular wall unit offers loads of storage space as well as the ultimate in flexibility.

If there's one certainty when it comes to setting up a shop, it's this — as soon as you've got everything arranged the way you want it, your storage needs will change. You'll get a new tool, accumulate some extra hardware, or just come across something that is too good to pass up. And that usually means getting rid of something else or reorganizing a drawer or shelf to create extra space.

But that's the beauty of this one-wall workshop — it's both flexible *and* expandable. It uses an arrangement system that is commonly found in department stores — slat wall. Our slat wall is nothing more than a sheet of plywood with rows of evenly spaced slats attached to the front. Grooves between the slats allow you to hang a variety of shelves, racks, bins, and other storage fixtures. And rearranging any accessory is simply a matter of lifting it off the slat wall and moving it to a new position.


STANLEY
FatMax

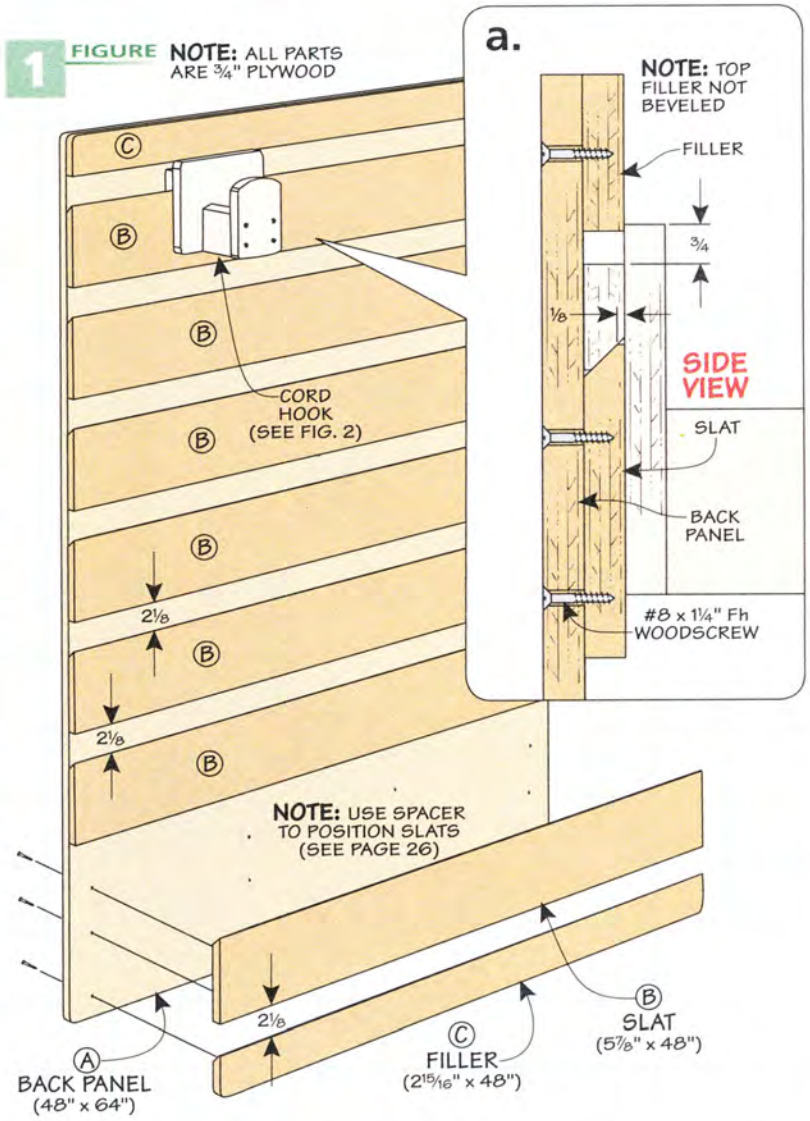
make the Slat Wall

The heart of this storage system is the shop-made slat wall. Each section of slat wall consists of a plywood panel with several evenly spaced slats. The top edge of each slat is beveled at 45° to create a lip. Each hanging accessory has a matching beveled cleat. This allows you to simply hook the accessory over the slat and position it wherever you wish on the panel. Detail 'a' illustrates how this beveled cleat system works. (This is sometimes referred to as a French cleat.)

Slat Wall. Making each section of slat wall is pretty straightforward. As you can see in Figure 1, each section consists of a plywood panel plus seven wide slats and two narrow filler strips at the top and bottom.

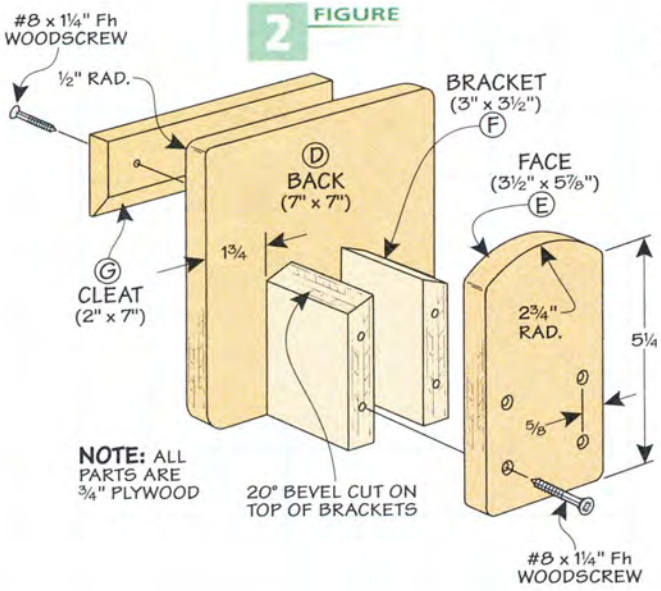
After cutting the panels to size, I cut the slats to final width, then cut a 45° bevel along one edge of each one. Note that there's a narrow (⅛") flat at the tip of the bevel, as shown in Figure 1a.

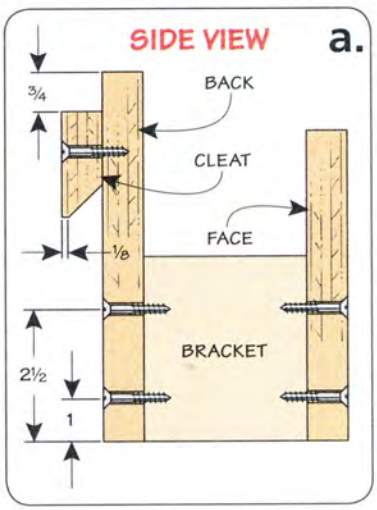
The bottom filler can also be cut to width and beveled, but leave the top filler extra wide (and unbeveled) for now. You'll trim it to final width later, after you attach all the slats.



The trickiest part of attaching the slats is getting them evenly spaced. Page 26 shows a tip for doing this, as well as drilling all the countersunk screw holes in the back panel. Once the slats are attached, all that's left is to round off the corners.

Because the slat wall may end up holding a lot of weight, make sure that you securely fasten each section to your shop wall using lag screws or wall anchors.





COMPONENTS

The slat wall is just the backdrop for this storage system. What makes it so useful is the range of storage components that mount to the wall. You can mix and match these to suit your needs. And the order in which you build them doesn't really matter.

The arrangement shown in the photo on the previous page is just one suggestion. The materials and hardware list on the facing page shows the number of parts you'll need for this configuration. But if you're going to build a different combination of components, you'll have to

adjust the number of parts. As a bonus, we've also included plans for a vise stand and a shop light mount at *ShopNotes.com*.

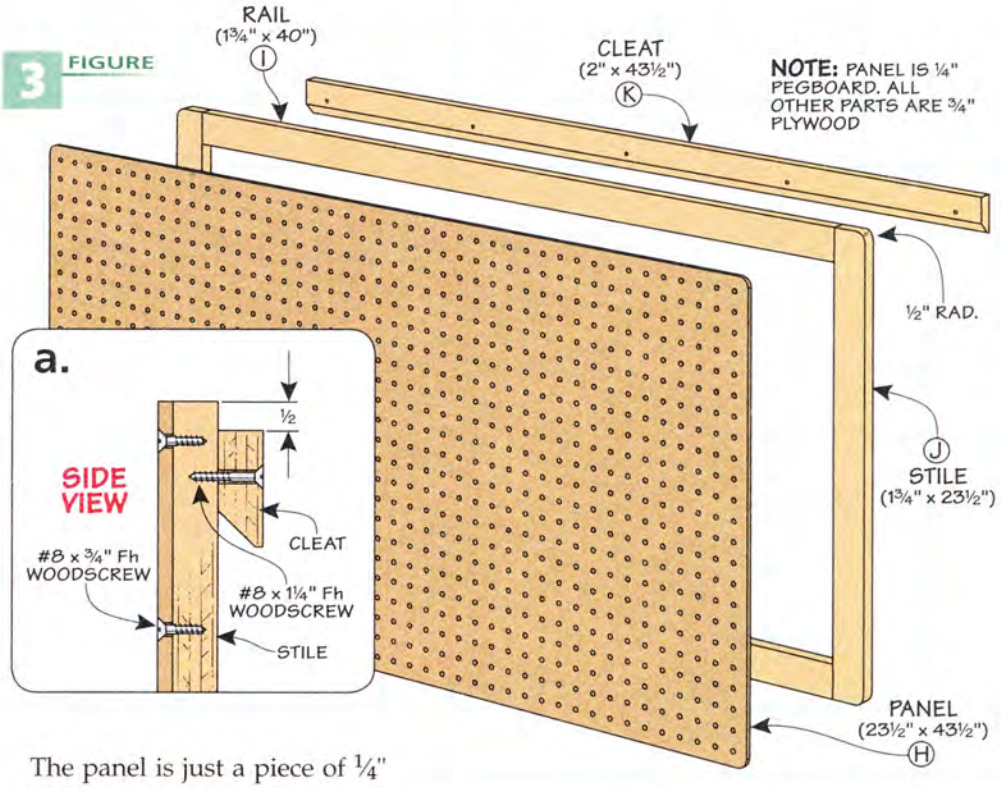
Cord Hook. One of the simplest components is a basic hook. It's great for hanging up extension cords, air hoses, or even a shop vacuum hose.

As you can see in Figure 2, the hook consists of just five parts — a back, face, a pair of brackets, and a cleat. All the parts are cut from ¾" plywood. The two brackets are beveled to ease the edges and conform to the shape of a coiled cord or hose. The top edge of the face also has a radius to prevent snags and catches as you lift a cord on or off the hook.

The parts are simply glued and screwed together. Then the cleat is added to the back.

Pegboard. No shop storage system would be complete without pegboard. This basic panel allows you to hang up your most-often used tools so they're ready to go at a moment's notice.

FIGURE 3



The panel is just a piece of ¼" pegboard mounted to a plywood frame (Figure 3). The frame creates clearance between the pegboard and the slat wall for hooks.

Because the frame doesn't provide much structural support, I didn't bother with joinery. I simply cut the rails and stiles to length and attached them directly to the back of the pegboard panel with screws. Then after rounding off the corners, you can add a beveled cleat to the back.

Materials & Hardware

SLAT WALL (3 sections shown)

A	Back Panels (3)	48 x 64 - ¾ Ply.
B	Slats (21)	5⅞ x 48 - ¾ Ply.
C	Top/Bottom Fillers (6)	2 15/16 x 48 - ¾ Ply.

CORD HOOKS (2 shown)

D	Backs (2)	7 x 7 - ¾ Ply.
E	Faces (2)	3½ x 5⅞ - ¾ Ply.
F	Brackets (4)	3 x 3½ - ¾ Ply.
G	Cleats (2)	2 x 7 - ¾ Ply.

PEGBOARD

H	Panel (1)	23½ x 43½ - ¼ Pegboard
I	Rails (2)	1¾ x 40 - ¾ Ply.
J	Stiles (2)	1¾ x 23½ - ¾ Ply.
K	Cleat (1)	2 x 43½ - ¾ Ply.

WORKSTATION

L	Side Supports (2)	15 x 14 - ¾ Ply.
M	Drawer Divider (1)	15 x 21 - ¾ Ply.
N	Filler Block (1)	3¼ x 20½ - 1½ Ply.
O	Top Layers (2)	16 x 24 - ¾ Ply.
P	Cleat (1)	2 x 24 - ¾ Ply.
Q	Drawer Front/Back (2)	½ x 2¾ - 19
R	Drawer Sides (2)	½ x 2¾ - 12
S	Drawer Bottom (1)	11½ x 19 - ¼ Hdbd.
T	Drawer False Front (1)	3⅛ x 20⅜ - ¾ Ply.

CABINET

U	Case Sides (2)	7¼ x 28 - ¾ Ply.
V	Case Top/Bottom (2)	7¼ x 20 - ¾ Ply.
W	Case Back (1)	20 x 27 - ¾ Ply.
X	Doors (2)	10 7/16 x 28 - ¾ Ply.
Y	Shelf (1)	6½ x 19⅜ - ¾ Ply.
Z	Cleat (1)	2 x 21 - ¾ Ply.

BINS (6 shown)

AA	Ends (12)	7¾ x 5 - ¾ Ply.
BB	Fronts (6)	5 9/16 x 17 - ¾ Ply.
CC	Backs (6)	5 x 17 - ¾ Ply.
DD	Bottoms (6)	3¾ x 17 - ¾ Ply.
EE	Cleats (6)	2 x 18 - ¾ Ply.

TOOL TOTE RACKS (2 shown)

FF	Sides (4)	5 x 24 - ¾ Ply.
GG	Rack Shelves (6)	9 x 20 - ¾ Ply.
HH	Shelf Lips (6)	½ x 1¼ - 20
II	Cleats (2)	2 x 21 - ¾ Ply.

TOOL TOTES (6 shown)

JJ	Ends (12)	½ x 5¾ - 8
KK	Fronts/Backs (12)	½ x 2½ - 18½
LL	Bottoms (6)	8 x 18 - ¼ Hdbd.
MM	Handles (6)	¾"-dia. x 18" EMT Conduit

SHELVES

(3 small, 2 medium, and 1 large shown)

NN	Sm. Shelf Tops (3)	6 x 24 - ¾ Ply.
OO	Sm. Shelf Backs (3)	3 x 20½ - ¾ Ply.
PP	Sm. Shelf Supports (6)	5 x 4½ - ¾ Ply.
QQ	Med. Shelf Tops (2)	9 x 24 - ¾ Ply.
RR	Med. Shelf Backs (2)	4½ x 20½ - ¾ Ply.
SS	Med. Shelf Supports (4)	7½ x 6¾ - ¾ Ply.
TT	Lg. Shelf Top (1)	12 x 24 - ¾ Ply.
UU	Lg. Shelf Back (1)	6 x 20½ - ¾ Ply.
VV	Lg. Shelf Supports (2)	10 x 9 - ¾ Ply.
WW	Cleats (6)	2 x 22 - ¾ Ply.

SPRAY CAN RACK

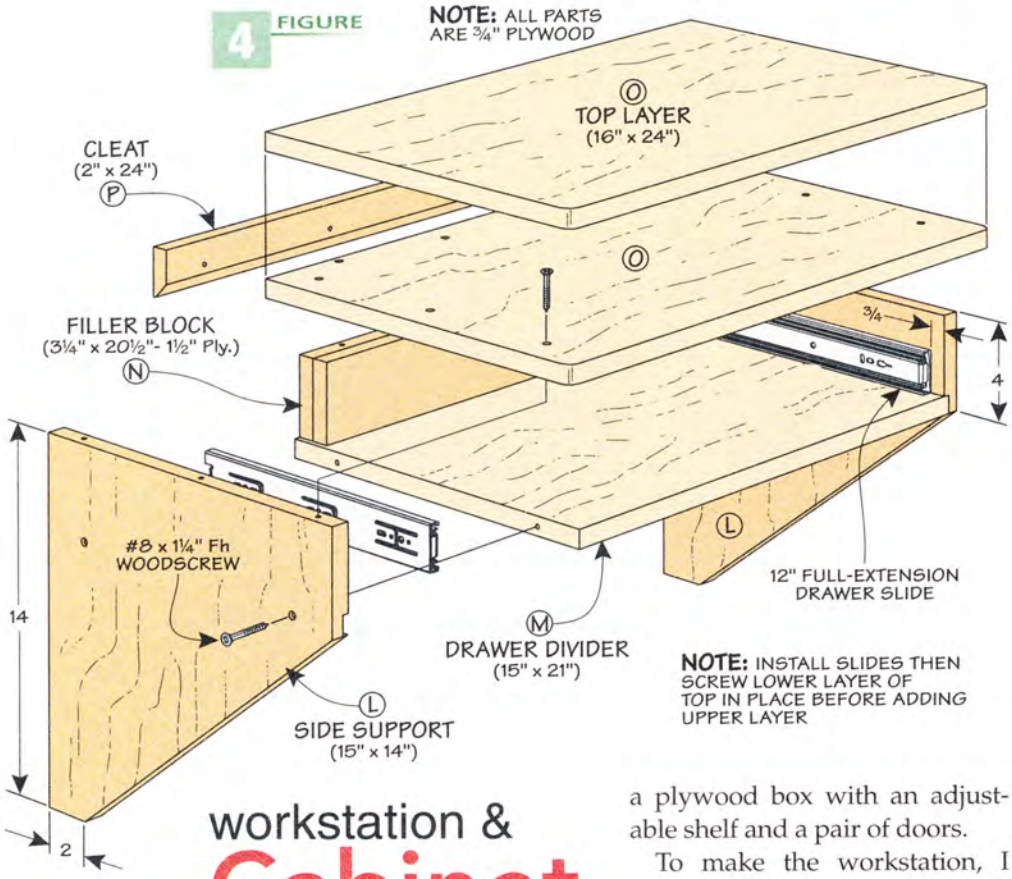
XX	Sides (2)	5 x 34½ - ¾ Ply.
YY	Backs (2)	3½ x 16½ - ¾ Ply.
ZZ	Rails (9)	½"-dia. x 17" EMT Conduit
AAA	Cleat (1)	2 x 18 - ¾ Ply.

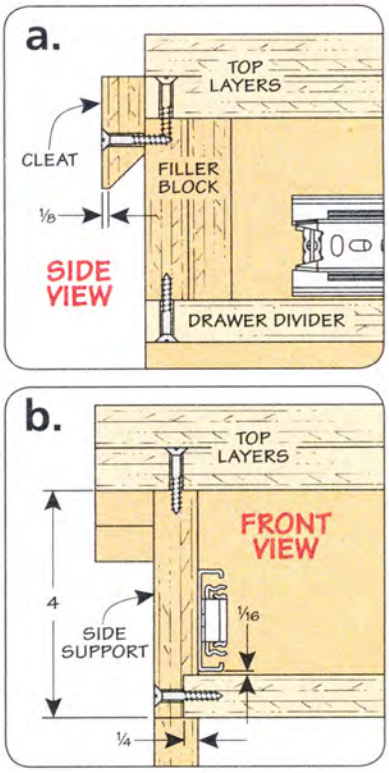
- (1 pr.) 12" Full-Extension Drawer Slides
- (3) Door Pulls
- (2 pr.) 2½" No-Mortise Hinges w/Screws
- (4) ¼" Shelf Supports
- (448) #8 x 1¼" Fh Woodscrews
- (12) #8 x ¾" Fh Woodscrews

ShopNotes GO ONLINE EXTRAS

To download a free cutting diagram for the Slat-Wall System, go to: ShopNotes.com

FIGURE 4





workstation & Cabinet

The workstation and cabinet shown on these two pages are definitely the most involved of the slat wall components. But even so, they aren't complicated to build. The workstation is just a thick, plywood top mounted to a couple of supports. A shallow drawer beneath the top provides storage space for pencils, layout tools, or a few basic hand tools. The cabinet is nothing more than a plywood box with an adjustable shelf and a pair of doors.

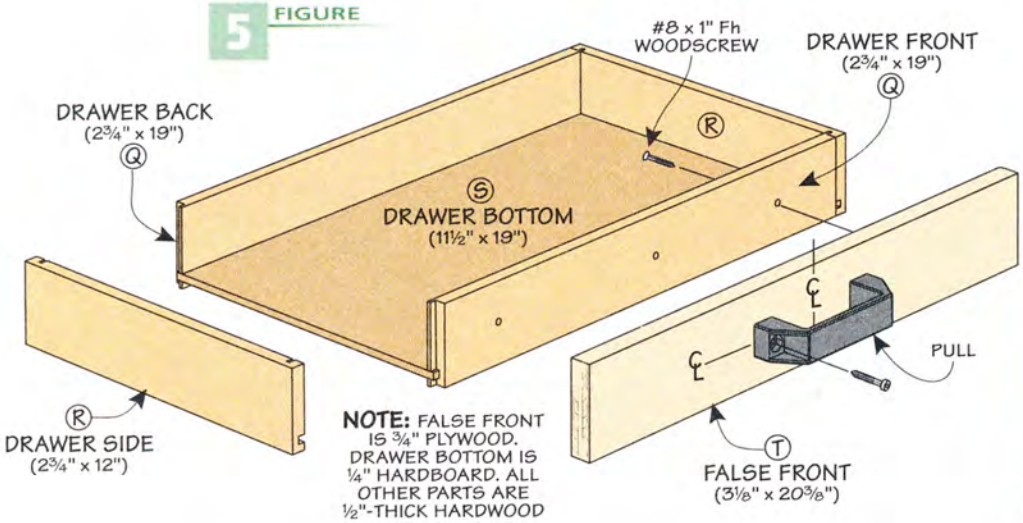
To make the workstation, I started with the two side supports (Figure 4). After cutting these to overall size, each one receives a dado to hold a drawer divider, as shown in Figure 4b. Then a large bevel is cut on the front corner of each support.

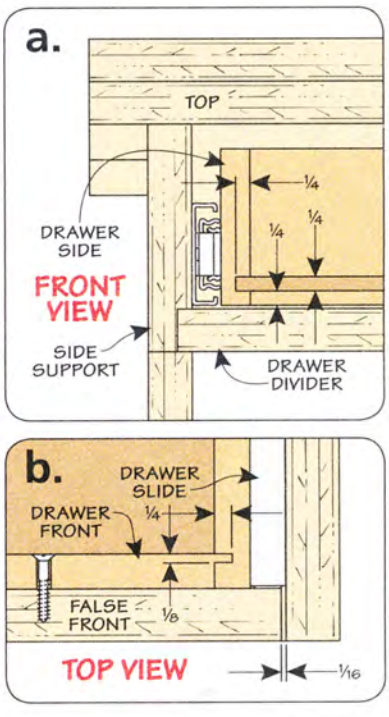
Once the drawer divider is cut to size, you can screw the supports to the divider. A filler block (glued up from two layers of plywood) is cut to fit between the supports at the back. And then I installed the drawer slides before moving on to the top.

The top is made up of two layers of plywood. However, the lower layer is screwed to the side supports and filler block first. Then the upper layer is glued to the lower layer. A beveled cleat on the back completes the carcase of the workstation.

Drawer. As you can see in Figure 5, I used ½"-thick hardwood for most of the drawer parts. The drawer front and back are joined to the sides with tongue

FIGURE 5





and dado joints. The hardboard drawer bottom is captured in a groove cut on the inside face of all four drawer pieces.

A plywood false front completes the drawer. After adding a pull and the slides, it can be installed in the workstation.

Cabinet. As I said earlier, the cabinet is really little more than a plywood box (Figure 6). The sides are rabbeted on the ends to accept the top and bottom. And all four pieces are rabbeted along the back edge to hold the back. Before screwing the case together, you'll want to drill shelf pin holes in the sides, as shown in Figures 6 and 6b.

Doors. The doors are simply two plywood panels cut to fit on the front of the case. They are mounted with no-mortise hinges.

Shelf. To complete the cabinet, I added a shelf. Again, this is just a plywood panel cut to size. The shelf rests on ¼" shelf pins. Like the other components, the last step is to add a beveled cleat to the back (Figure 6d).

BINS

When I first saw the storage bins on this project, they reminded me a little of feed troughs you might see on a farm. But they're handy for storing objects that are too awkward or cumbersome to hang on a hook or set on a shelf.

To make the bins, I started by cutting the ends to size and cutting a taper along the front edge of each one, as shown in Figure 7. Then the ends are rabbeted on three edges to hold the front, back, and bottom.

If you look at the Side View in Figure 7, you'll notice that the mating edges of the front and bottom pieces are beveled. After screwing everything together, you'll need to trim and sand the upper front corners of the ends flush with the front. Then just add a cleat to complete the bin.

FIGURE 6

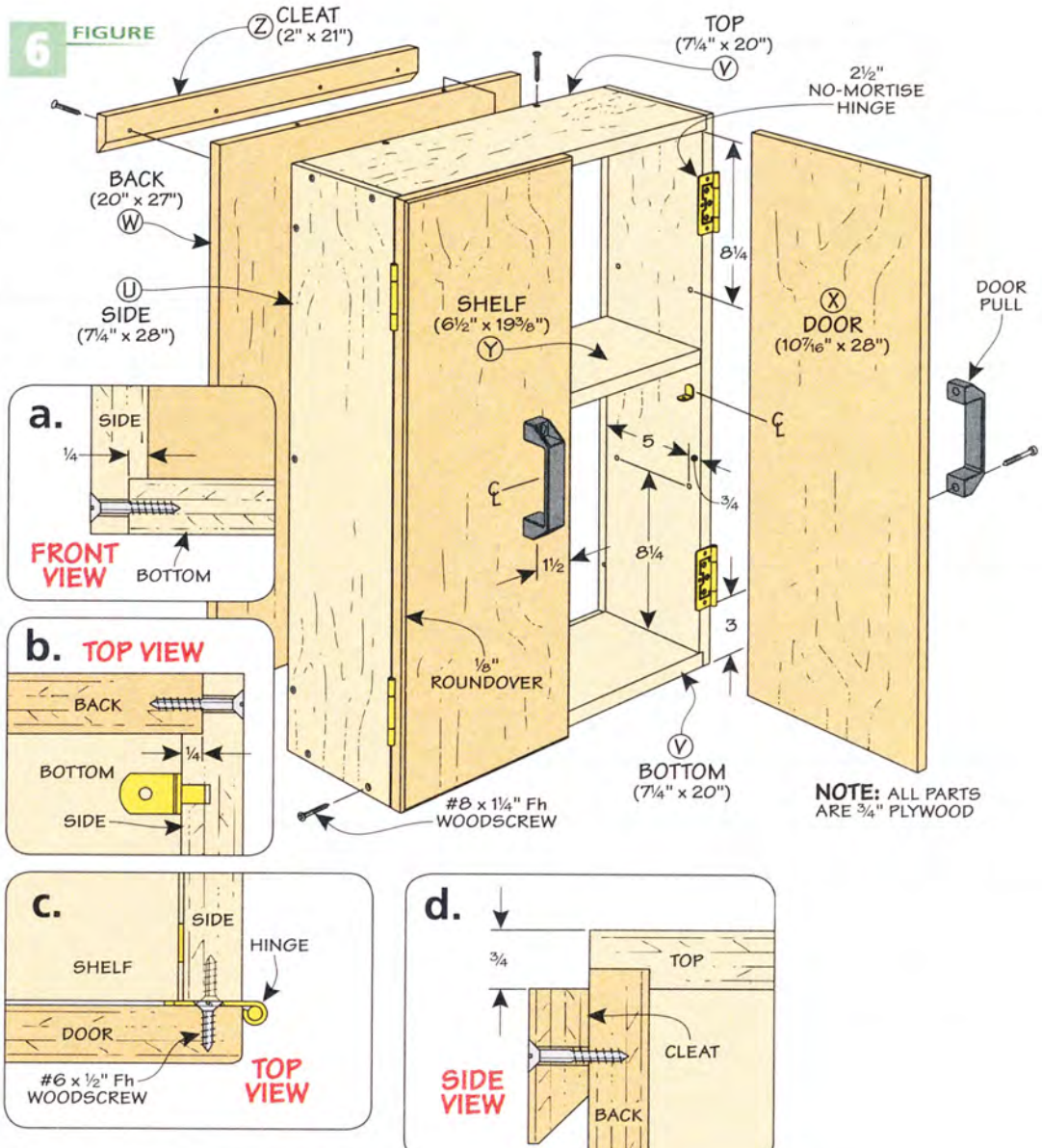
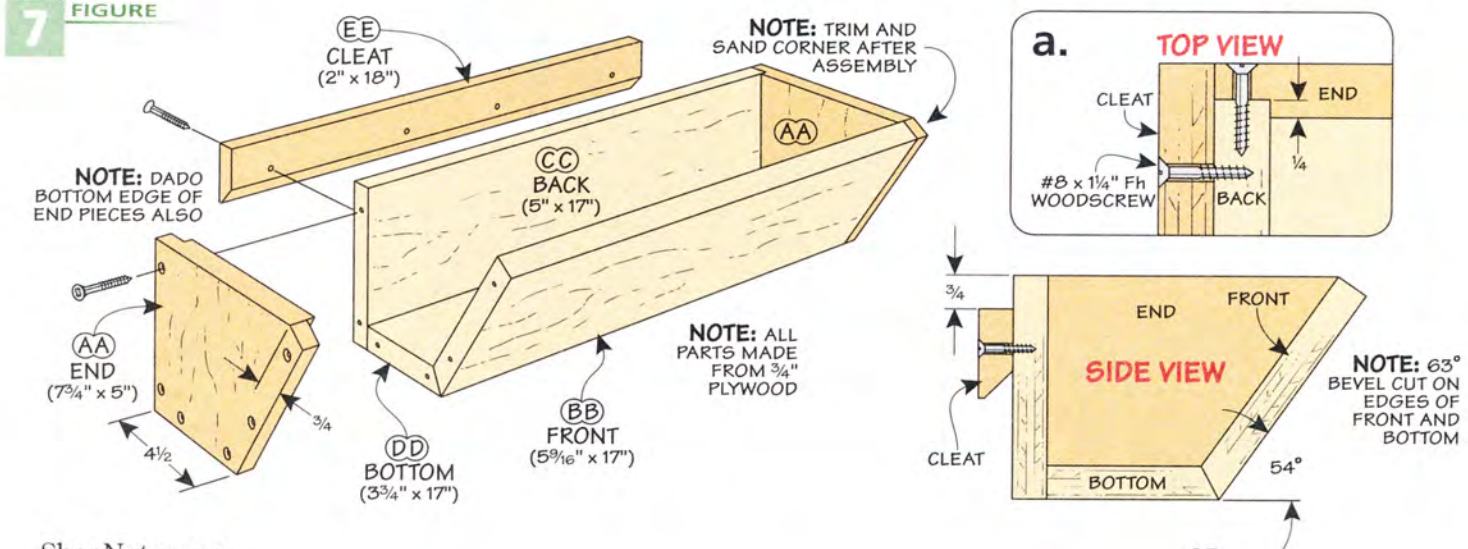
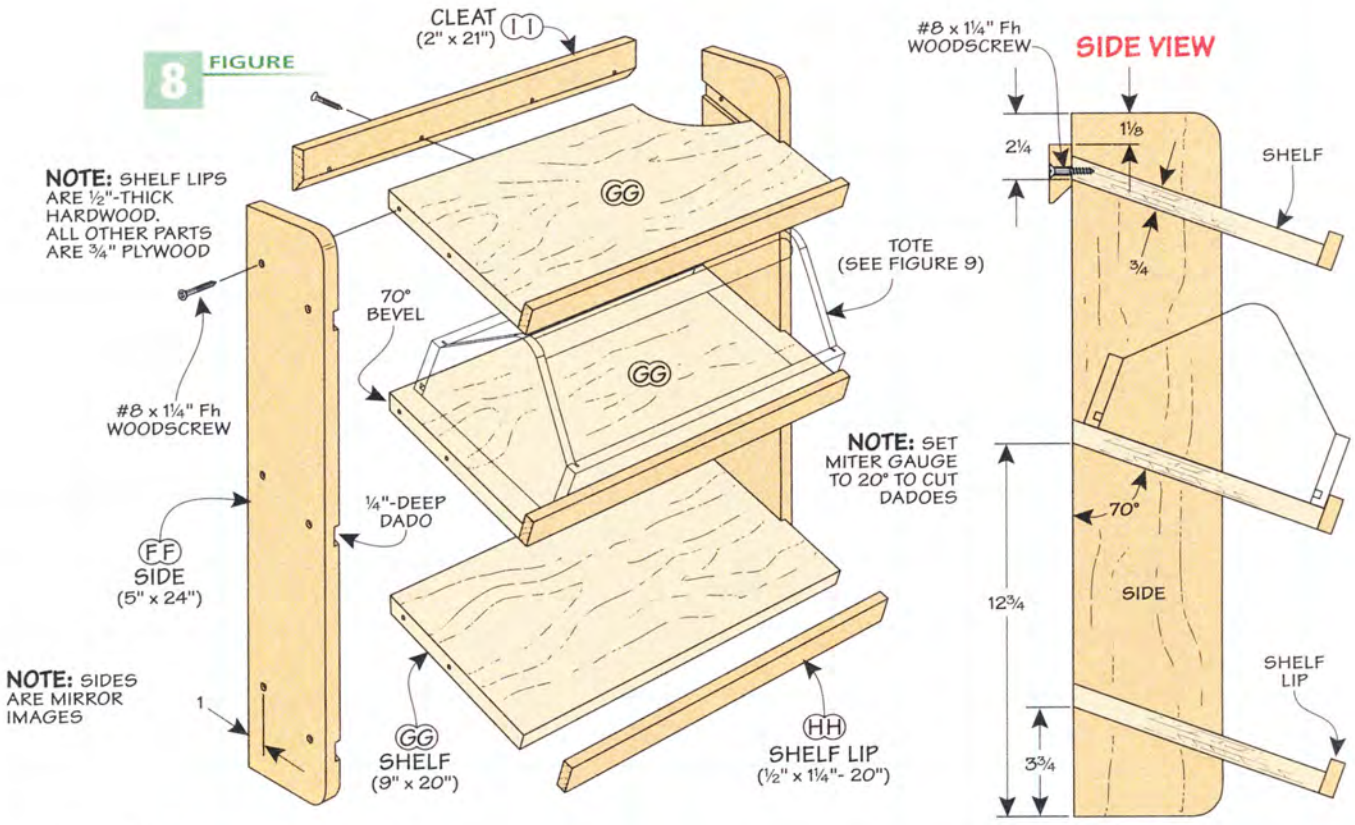


FIGURE 7





tool totes & Shelves

Although this wall unit will hold a lot of stuff, chances are there will be times when you'll want to take some of your tools or supplies with you offsite. That's why I included a set of tool totes. Having multiple totes allows you to organize your tools according to the job at hand (plumbing, electrical, painting, etc.).

Before building the totes, I made a pair of racks to store them. Each rack consists of two sides and three shelves that are angled for easy access. A lip on the front of each shelf holds the tote in place.

As you can see in Figure 8, the sides are simply narrow pieces of plywood. Angled dadoes hold the shelves. I cut these on the table saw using a miter gauge.

The plywood shelves are just cut to size. If you look at the side view in Figure 8, you'll notice that the back edge of each shelf is beveled to fit flat against the slat wall. Then a hardwood lip is glued to the front edge of each shelf and the rack can be screwed together.

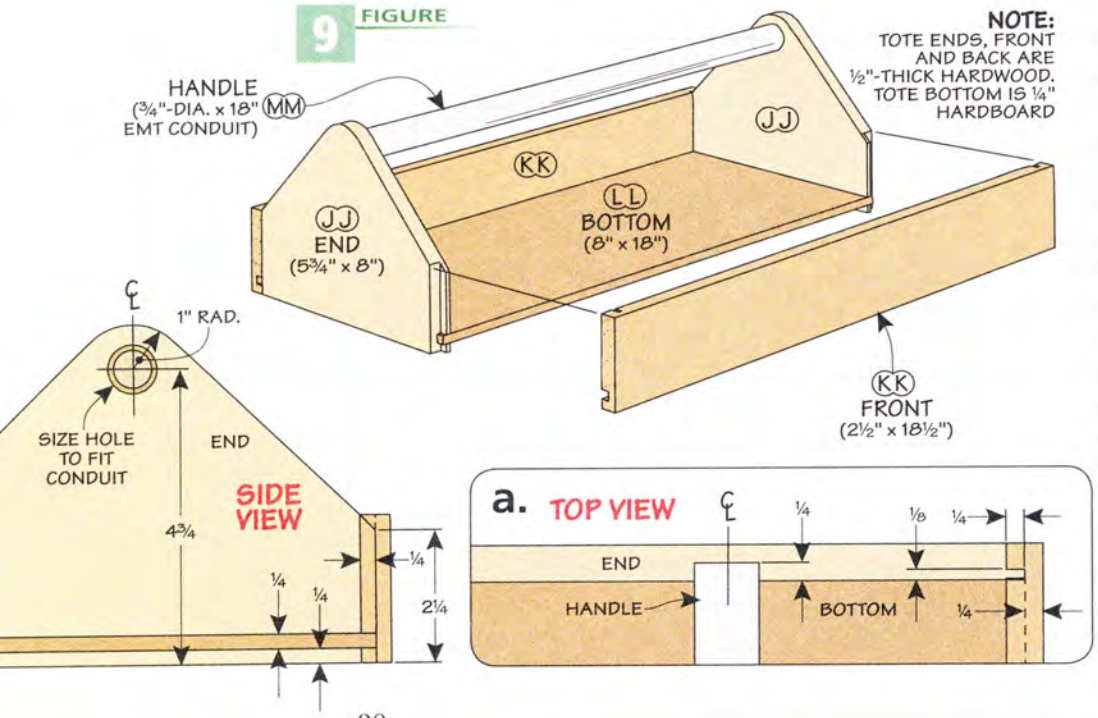
TOTES

The totes are all the same size, so you can knock them out quickly by making multiple parts and setting up a mini assembly line in your shop. Each tote is made up of five parts plus a handle.

I started by cutting all the ends, fronts, and backs for the totes to overall size. You'll want to leave the ends square until you're done with the joinery.

The front and back are connected to the ends with tongue and dado joints. Dadoes cut near the ends of each front and back piece accept tongues cut on the ends of the end pieces. Figure 9a has all the details on the joinery.

In addition to the tongue and dado joints, you'll also need to cut a groove on the inside face of all the pieces for the tote bottom, as shown in the side view in



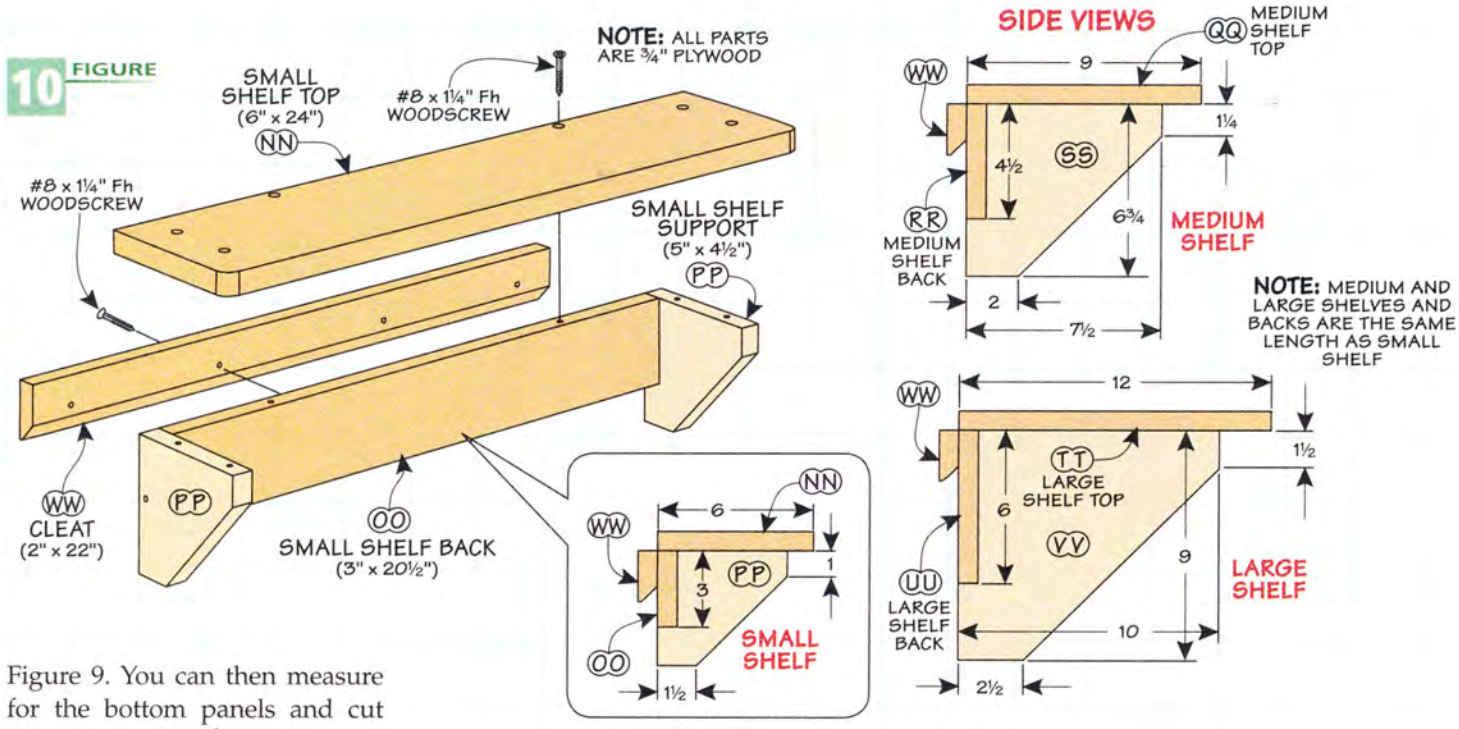


Figure 9. You can then measure for the bottom panels and cut them to size from ¼" hardboard.

The handle of each tote is made from a piece of ¾" EMT conduit, cut to length. When you assemble the tote, the handle is captured in shallow holes drilled on the inside faces of the tote ends.

Before starting assembly, however, the last step is to cut the angled profile on the ends. I did this by taping each pair of end panels together and rough cutting the profile at the band saw. Then a couple minutes at the sander completes the job.

SHELVES

For items that get used frequently, shelves are handy. They allow you to quickly find what you're looking for. I made three sizes of shelves, as shown in Figure 10. Other than the dimensions, the construction is identical.

Each shelf is made of a top, a back, and a pair of angled supports. These parts are simply cut to size and screwed together. I found it easiest to assemble the back between the two shelf supports first, then add the top. Again, like all the other components, a beveled cleat rounds out the assembly.

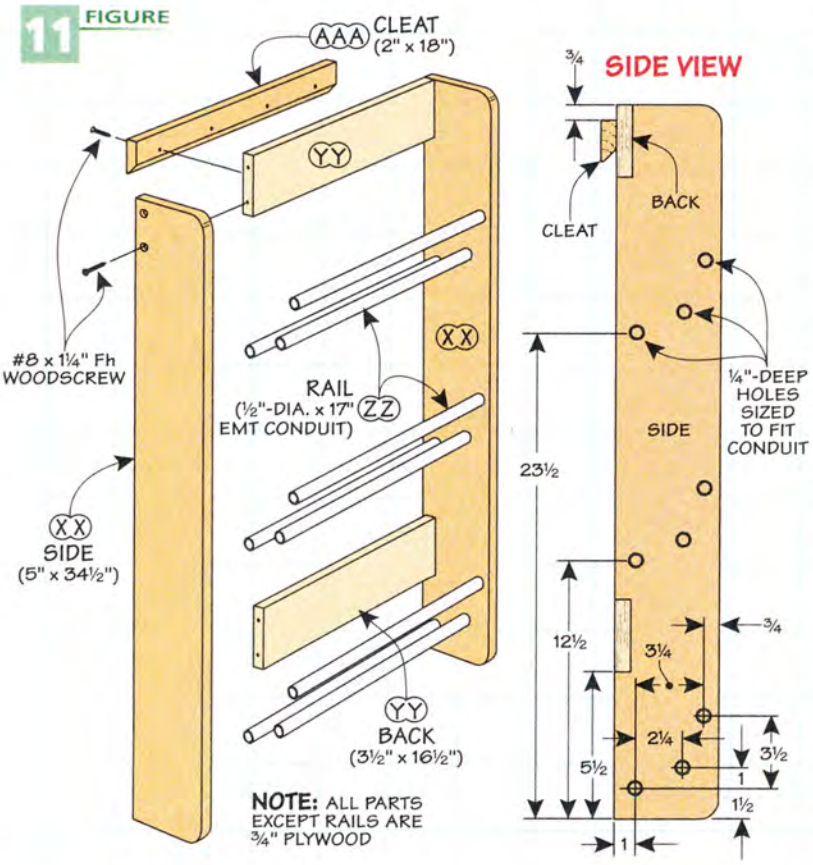
SPRAY CAN RACK

Whether you're building this project for a garage or for a wood shop, chances are you'll need storage for spray cans. The rack shown in Figure 11 holds up to 18 standard-size spray cans.

The two sides of the rack are mirror images. Each one is cut to size, and then a series of shallow holes is drilled on the inside face to hold several lengths of ½" conduit. The rails are cut to length and fit loosely in the holes.

Along with the rails, a pair of back supports are also sandwiched between the sides and then simply screwed in place. Add a cleat and you're done.

After hanging the components on the slat wall, you can start rounding up all the stuff in your garage that needs organizing.

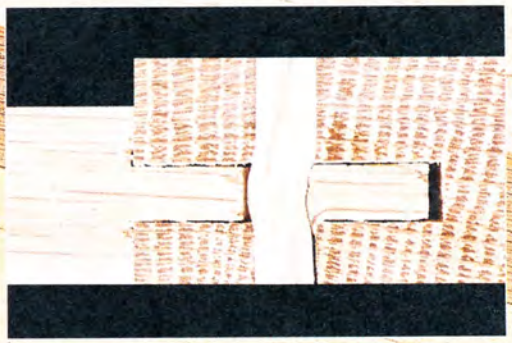


HANDS-ON
Technique

Create rock-solid mortise and tenon joints in no time using this simple, traditional technique.

no-glue, no-clamp

Drawbore Joinery



▲ ***Drawn Tight.*** *A peg, forced through offset holes in the mating parts, draws the tenon tightly into the mortise.*

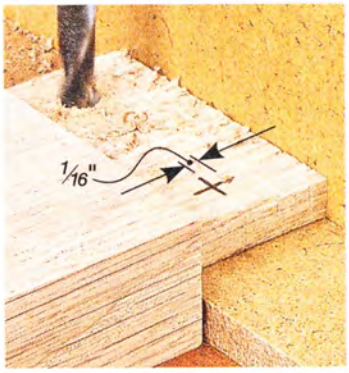
For a project to stand the test of time, it must have strong joinery that resists movement. That's why mortise and tenon joinery is so popular among woodworkers. And during assembly, that normally requires clamps to bring the joint together and glue to lock the parts in place. It's possible, however, to completely forgo both clamps and glue and have rock-solid joints using drawbore joinery.

How it works is simple: Offset holes are drilled through both the mortise and tenon. Then a peg is forced through the holes to draw the joint together and hold it securely in place. This creates a mechanical connection that won't loosen over time, unlike joints that have only been glued.

Mortise & Tenon. When drawboring, the joint starts out as a regular mortise and tenon. This means you cut the mortise first and then cut the tenon

▲ ***Mortise Holes.*** *Remove the tenon and drill holes through the mortise.*

▲ ***Mark Tenon.*** *Locate the centerpoint of the mortise holes on the tenon.*



▲ ***Tenon Holes.*** *Drill holes in the tenon approximately 1/16" closer to tenon shoulder.*

▲ ***Offset Holes.*** *The offset holes are visible when viewed through the mortise holes.*

to match. But leave the tenon approximately ⅛" shorter than the depth of the mortise.

Offset Holes. After cutting the mortise and tenon to fit, you're ready to drill the holes through the mortise. For typical woodworking projects, a hole size of ¼" should be sufficient. Locate the hole so it's roughly centered on the depth of the mortise. But to avoid splitting the workpiece, drill at least ½" from the edge of the workpiece. Then insert the tenon in the mortise. Using the point of the drill bit, mark the hole location. The photos at the bottom of the previous page show the details.

Now you can remove the workpiece and drill a hole through the tenon approximately 1/16" to 3/32" closer to the tenon shoulder. A scrap piece under the face of the tenon helps reduce tearout. After drilling the holes, insert the tenon back into the mortise to check the results (right photo at the bottom of the previous page).

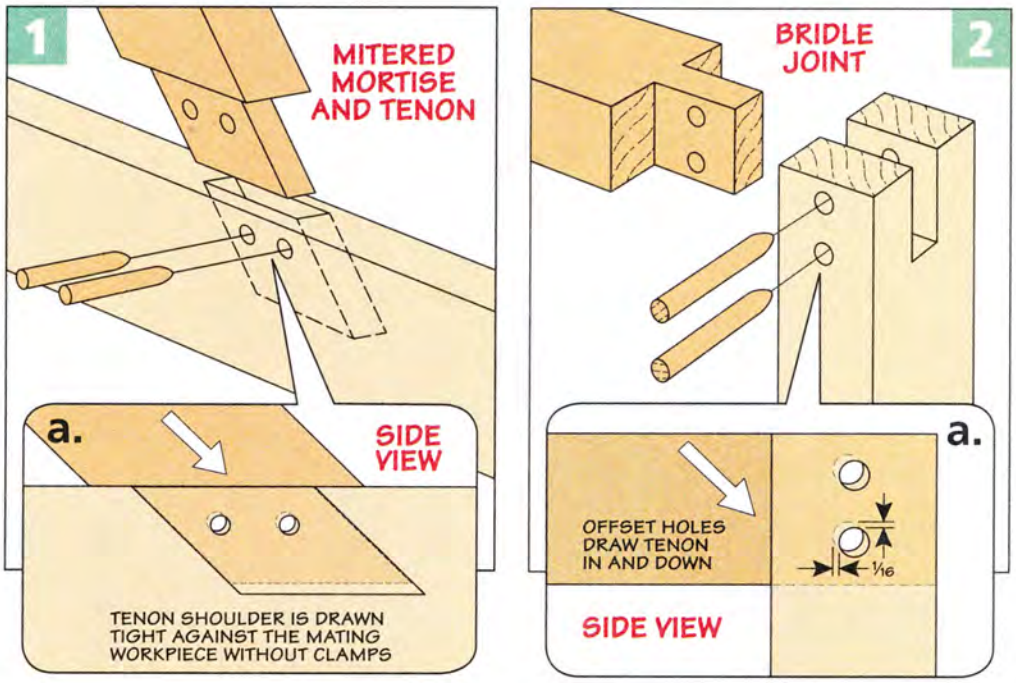
Peg. You'll use a peg to lock the joint in place. You can either use a dowel or make your own pegs. For details on making your own, see the box below. If you use a dowel, make sure that the dowel is sized accurately. Dowels are often either larger or smaller than their stated size.

Taper the end of the peg and use a hammer or mallet to drive it through the holes in the mortise and tenon (main photo, opposite page). Make sure the hole is located over one of the dog holes on your bench.

The tapered end of the peg will work its way through the holes, pulling the shoulders of the tenon tight against the mating workpiece. Trim both ends of the peg with a saw, then use a chisel to bring the peg flush with the workpiece. To see a cross-section view of a finished joint, check out the inset photo on the opposite page.

Uses. You'll notice that no clamps were involved while making the joint. This really makes drawbore joinery handy when working with joints that are difficult to clamp. Two examples are the mitered mortise and tenon and the bridle joint shown above. The technique is the same as discussed for a standard mortise and tenon. But for the bridle joint, you need to offset the holes in the tenon in two directions. The detail drawing above shows you how.

Drawbore joinery can be used on almost any project. But consider using it the next time you have a joint that's difficult to clamp or if you just want to master a new technique.



make your own Drawbore Pegs

Making your own drawbore pegs is easy, and it gives you greater control over the quality, color, and grain of your pegs. It starts with choosing straight-grained stock.

Rip a number of extra-long hardwood blanks to ¼"-square. Use a V-block to help shape the pegs as shown in Step 2 to the right. The extra length of the blank allows you to hold onto it while you remove the sharp edges with a block plane.

Once you have rounded off the blank (it doesn't have to be perfectly round) you're ready to taper the end. I use a pencil sharpener for this task. The tapered end allows the peg to fit in the reduced opening created by the offset holes in the mortise and tenon.

creating Special-Purpose Chisels

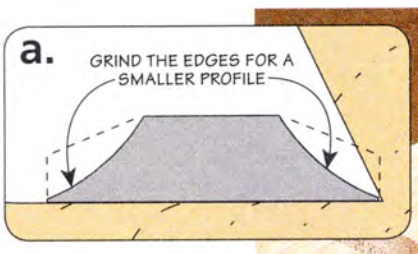
Transform an ordinary hardware store chisel into a must-have tool.

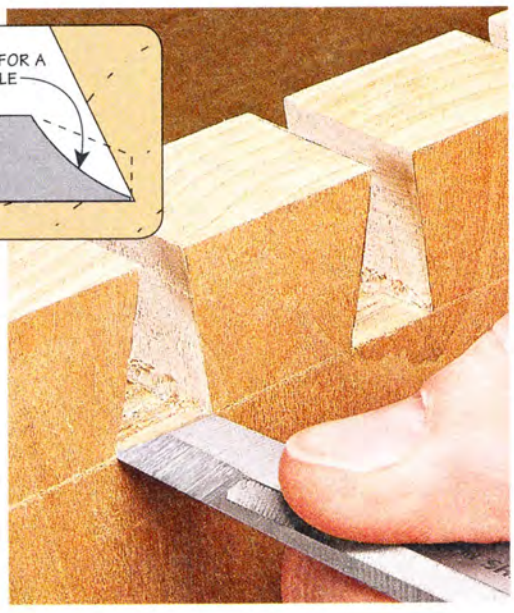
A quality set of bench chisels will tackle everything from making mortises to fine paring cuts. But over the years, I've found that a few specialty chisels really come in handy in certain situations.

On these pages you can see four that I use: a dovetail chisel, a scraper chisel, a "duckbill" chisel, and a skew chisel.

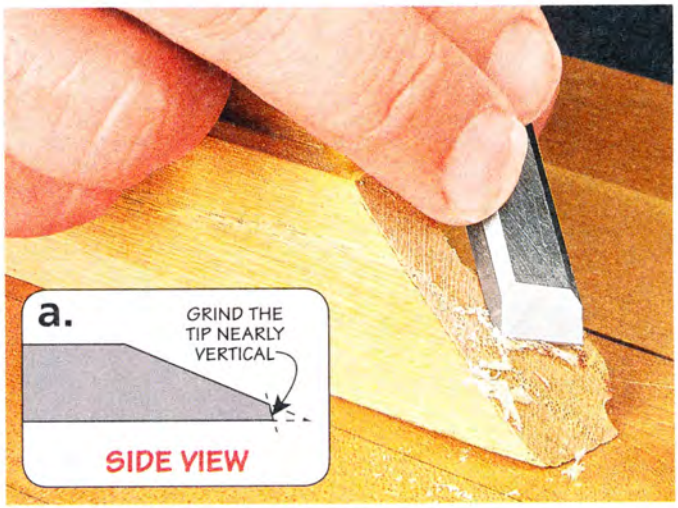
Make It Yourself. Most of these chisels are available in woodworking catalogs. But I didn't buy any of these. Instead, I shaped their unique profiles on inexpensive chisels that I found at the hardware store or at flea markets. In under 30 minutes, you can create a custom tool that does exactly what you need.

Grinding. Reshaping the chisels is best done at a standard bench grinder. I upgraded to a cool-running wheel that's less likely to overheat the chisel blade. It's also a good idea to use a light touch as you work and keep a can of water close at hand to cool the blades periodically.



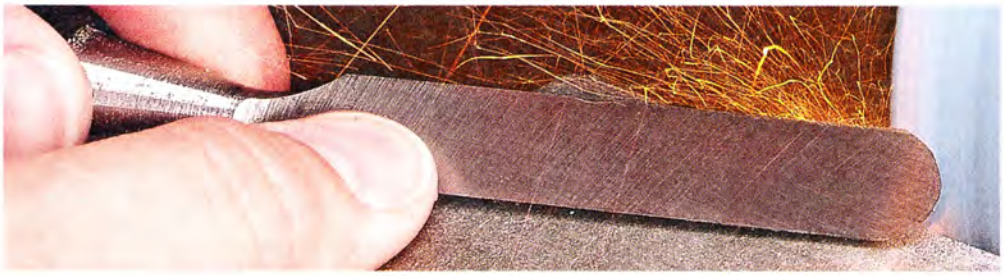


► ***Dovetail Chisel.*** *Relieve the edges of an ordinary chisel to allow access in tight places like between dovetails.*



▲ ***Scraper Chisel.*** *The steep (70° to 90°) bevel of this chisel lets you take fine, controlled cuts on end grain and remove glue from inside corners without tearout.*

► **Two-Step Shaping.** *With the tool square to the wheel, shape the curved profile (top photo). Then with a rolling motion, form the domed bevel taking light cuts (bottom photo). Finally, hone the edge.*



▲ **No Corners.** *The curved edge doesn't easily catch on the surface of the wood, so it makes quick work of flush trimming plugs.*

Start with one style and use it for a while to get the hang of it. If you don't like it, you can grind another profile, and you aren't out anything but a little time.

Dovetail Chisel. No matter whether I make dovetail joints with a router and jig or cut them by hand, there's always a little cleanup work to be done. The trouble is most bench chisels have thick, flat sides that can mar the angled faces of the joints.

The solution is shown in the lower left photo on the facing page. I relieved the sides of the chisel to allow access into these tight places. The main image shows how I did this on the grinder. The goal is to leave very tiny flats along the sides, rather than sharp knife edges (detail 'a' on left side of page 42). It's a good idea to check your progress often. Since most dovetails are in stock that's ¾" thick or less, I only grind the first 1" of the chisel.

Scraper Chisel. At first glance, it doesn't look like the next chisel could work well (lower right photo on the facing page). Instead of a shallow bevel, the end of the chisel is ground nearly square (anywhere from 70° to 90° works). The truth is it works more like a card scraper than a typical bench chisel.

The steep bevel angle prevents tearout no matter which direction you use it. I show it fine-tuning a miter, but it also works well cutting across the grain leaving a smooth surface.

Making a scraper chisel is straightforward, if you don't mind the pun. Simply turn the chisel bevel side down on the grinder and grind a small facet on the end. That's it. The tool is ready for use without any further work.

Duckbill Chisel. The chisel shown in the photos above reminds me of a carving gouge. The difference is it has a flat back. The main advantage is that there aren't any sharp corners that can dig into a workpiece and leave difficult-to-remove tracks.

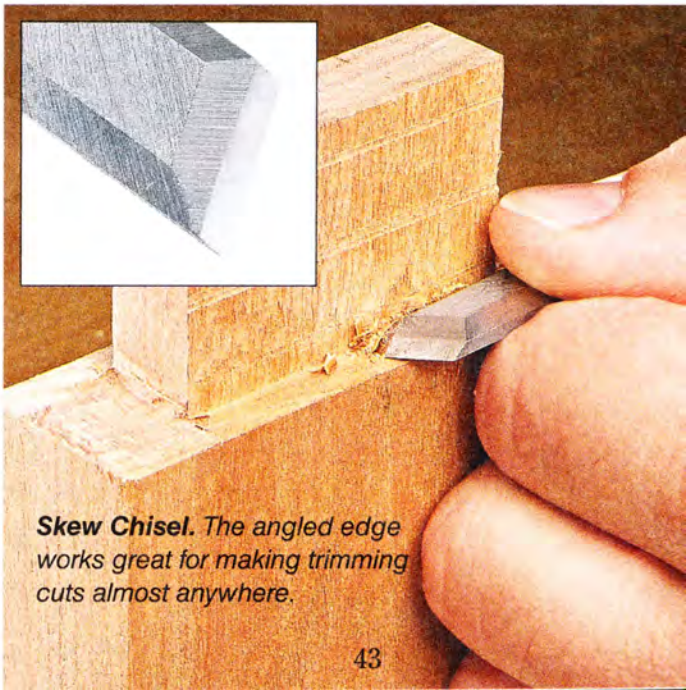
I made one primarily for trimming plugs flush with a surface, as shown in the upper right photo. Since then, I've found it handy for other trimming tasks.

Of all the chisels, grinding this one is the most involved. But don't sweat it. The key is to separate shaping the profile into two steps (upper left photos). Remember, only the very edge of the tool does any cutting, so the bevel doesn't have to look perfect.

Skew Chisel. The final chisel is a skew chisel where the cutting edge is angled in relation to the sides. The chisel shown in the photos below has a 20° skew. The angled end reduces the amount of effort you need to push the chisel through the wood. This also creates a slicing cut that leaves a smooth surface behind.

No matter what I'm doing, one of these chisels always seems to be within easy reach. You're sure to find them just as handy.

▲ **Grind.** *Shape the skew angle with the tool flat and square to the wheel. Then do the bevel.*



Skew Chisel. *The angled edge works great for making trimming cuts almost anywhere.*

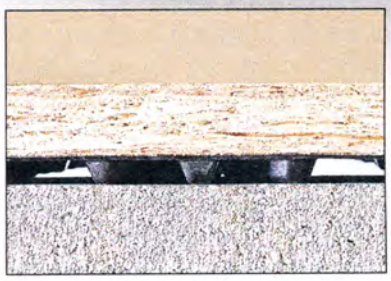
upgrade your Shop Floor

Any of these simple, low-cost flooring options will dramatically improve the comfort level in your shop.

The hours I spend in my shop seem to fly by. Before I realize it, it's time to head inside for dinner. My feet and back, on the other hand, are keenly aware of just how long I've been standing on the cold, unforgiving concrete floor in my garage shop — especially in winter.

It's clear I needed something different. I wanted to improve comfort, make the shop feel warmer, and limit moisture coming through the floor. Of course, the floor has to stand up to heavy tools and materials, as well as the occasional dropped chisel.

To my surprise, I came up with three options that meet these criteria and won't do serious harm to my wallet. (You can find sources for these on page 51.) Another advantage is that you can easily install any of these in a basement or garage in a short amount of time. (It does mean that you need to clean out your shop first, however.)



▲ ***Air Gap.*** *The plastic backer creates an air space for better insulation and sound reduction.*

DRI-CORE TILES

The most critical issue when talking about flooring in a garage or basement is moisture. Concrete floors are porous. So water can migrate up through the floor. This can lead to rust on tools. And it means you need to protect any installed flooring from rot.

One solution is shown in the left margin photo. *Dri-Core* subflooring is made up of two-foot-square panels. The top face is a ½" layer of oriented strand board (OSB). The OSB is tough enough to handle heavy traffic. The surface can be sealed with polyurethane or painted to brighten your shop.

The bottom face is heavy-duty plastic with a raised "star burst" pattern. This serves a few purposes. First, it creates a space for any water to drain away,

▲ **Platon Underlayment.** *The studded side of the underlayment faces the concrete floor. You can overlap and tape the joints together to create a continuous moisture barrier. Then place ¾" plywood sheets on top for the floor.*

◀ **Long Rolls.** *Platon comes in 50'-long rolls to minimize seams and trimming.*

preventing rot. The plastic prevents moisture from wicking up through the OSB. Plus, it creates an air layer that makes the floor feel a lot warmer than the bare concrete. You can see this in the inset photo on the facing page.

The panels lock together with tongue and groove joints on all the edges to create a smooth "floating" floor, as shown in the main photo on the facing page. It's a good idea to buy a package of shims, as shown in the lower right photo on the opposite page. You can stack them as needed to help account for uneven floors.

PLATON UNDERLAYMENT

Another flooring option is shown in the photo above. Instead of an all-in-one product, you have a separate underlayment and floor surface. *Platon* underlayment comes in a 44"-wide roll and has a dimpled texture (right margin photo). It works the same as the bottom face of the *Dri-Core* panels.

From there, you can add any type of flooring. For a workshop, ¾" tongue and groove plywood or OSB sheets are best. I do want to mention one thing. Only the long edges of these sheets have tongues and grooves. So you need to stagger the short seams to keep the floor as flat as possible.

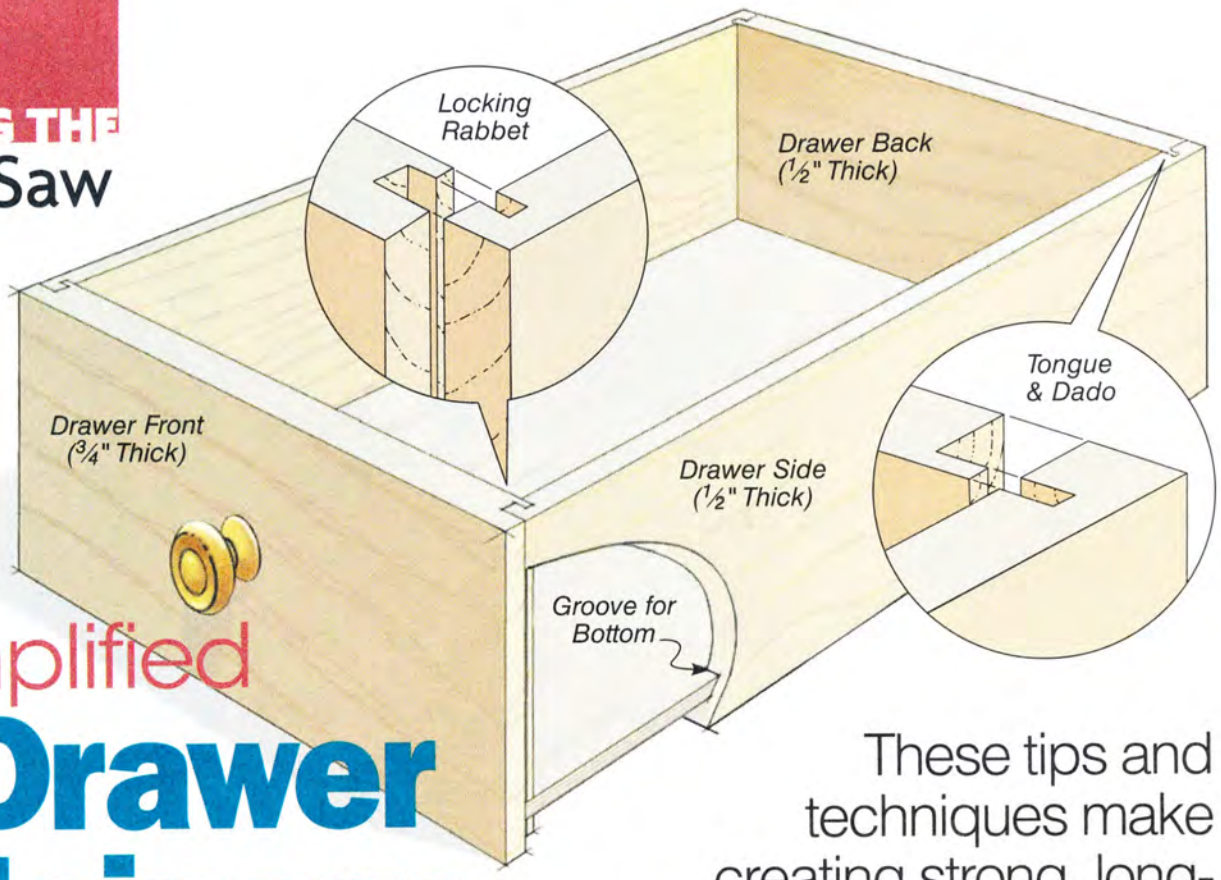
I was surprised how stiff each of these floors was. The plastic didn't feel spongy at all. (For a less-expensive option, check out the box below.) The big difference is how comfortable the floor feels on my feet and back, and that makes my shop time even nicer.

do-it-yourself
Plywood Floor

Inexpensive, AC plywood or OSB sheets create an ideal shop floor. The large sheets make quick work of laying down a floor. Plywood is certainly much softer than bare concrete, so your back and feet will thank you. A dropped tool is less likely to be damaged, and the wood floor absorbs sound to dampen the noise of power tools.

The catch is you can't simply place the sheets and call it done. Moisture moving through the concrete will quickly soak the plywood, turning it into a spongy, moldy mess. A simple, low-cost solution is to create a vapor barrier between the concrete and plywood floor with plastic sheeting. For the most durable barrier, use 6 mil plastic and overlap and tape the seams to create a continuous layer.

Two-Step Plywood Flooring. *Plastic sheeting creates a moisture barrier, and tongue and groove plywood makes a sturdy floor.*



simplified Drawer Joinery

These tips and techniques make creating strong, long-lasting drawers a breeze.

Choosing the joinery for a project is a bit of a balancing act. You want the joints to be strong and durable, so the joinery should match the function. At the same time, however, you don't want the construction to be fussy or time-consuming. Building drawers offers a perfect opportunity to accomplish these goals easily.

I want to start by talking about the requirements of drawer joints. For one thing, the joints at the front and back of the drawer don't need to be identical. The front shoulders the lion's share of the stress as the drawer is opened and closed. So these joints need to be as strong as possible.

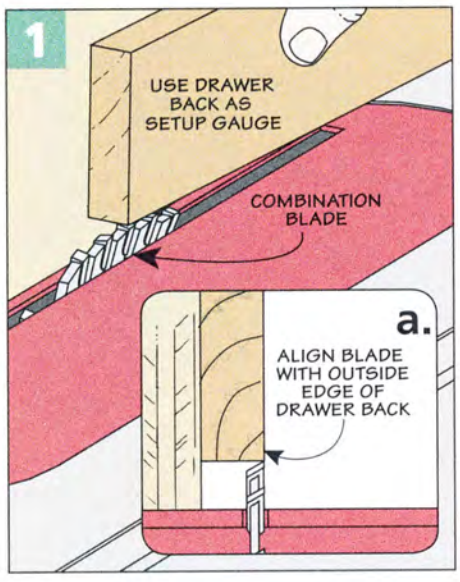
In the drawing above, you can see a joint we often use — a locking rabbet. It offers a good mechanical connection between the parts and provides a lot of glue surface. And it's straightforward to cut on the table saw.

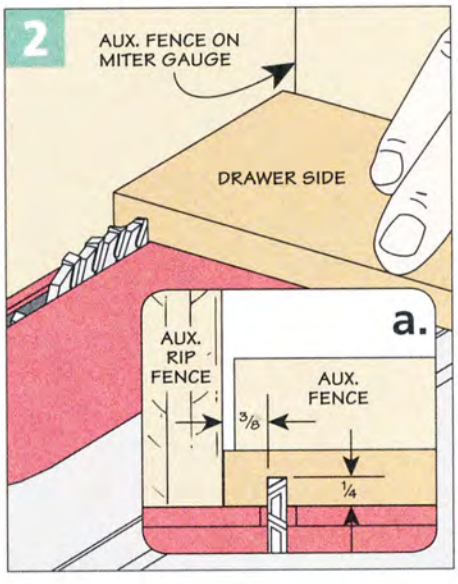
The joints at the back, on the other hand, see very little stress. So the joinery you choose here can serve a different need. I use these joints to help align and square up the parts during assembly. And for this, a simple tongue and dado joint does the trick.

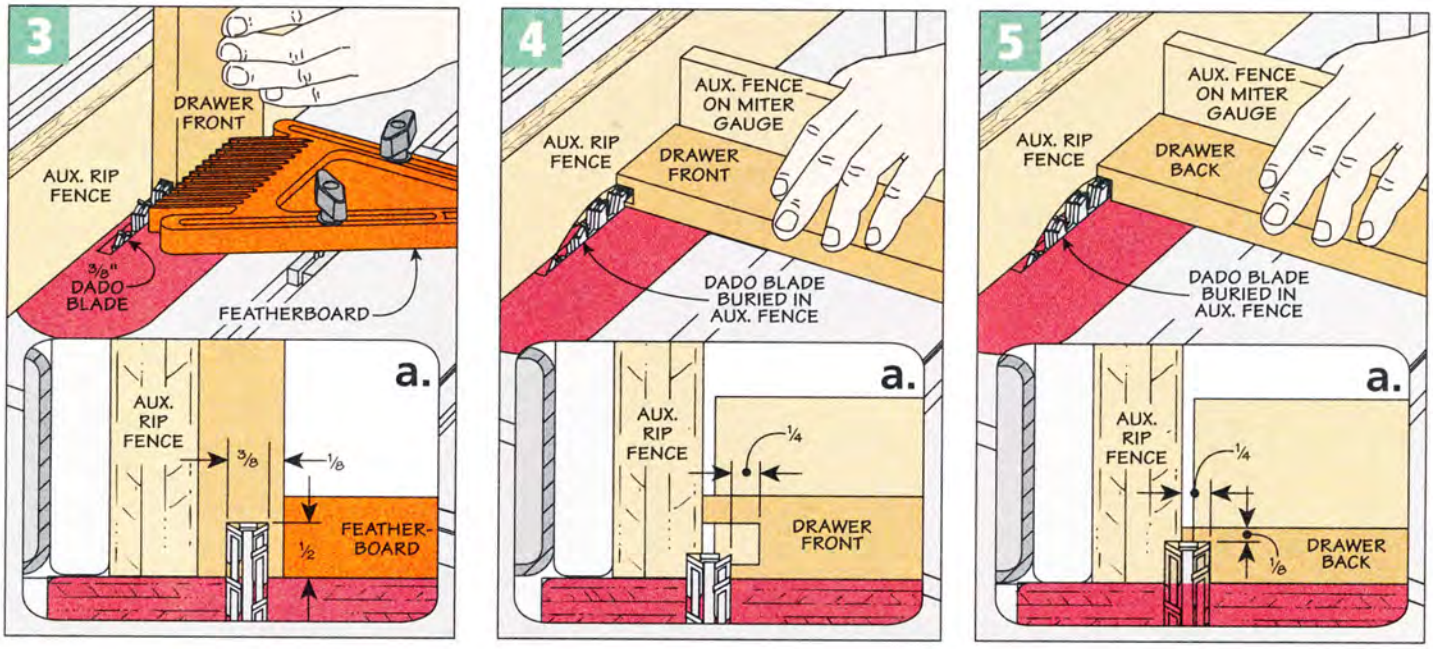
Using separate joints at the front and back of a drawer doesn't have to be more complicated. In fact, the two joints I've already mentioned can be created with a minimum of setup time.

The Setup. As I'll explain in a bit, the two joints lend themselves to a combined setup. But there's another element I want to mention. And that's the thickness of the drawer parts, specifically the fronts and backs. I like to use ¾"-thick material for the drawer fronts. It works better for cutting strong locking rabbet joints. And it forms a more rigid front.

At the back of the drawer, I use ½"-thick stock. Thinner drawer backs make sense with







the reduced load placed on them. It also helps reduce the overall weight of the drawer and increases the amount of storage space inside the drawer.

MAKING THE DRAWER

With a basic understanding of the reasons and benefits behind you, it's time to get started on the construction. Look closely at the drawing on the top of the opposite page and you'll see the one element the two joints have in common — a dado cut into the drawer side. You can use this dado as the starting point for creating both joints.

Cutting the Dado. Figures 1 and 2 on the opposite page show the setup for making the dado. The distance between the inside edge of the dado and the end of the workpiece is equal to the thickness of the drawer back.

I like to use a narrow, ⅛"-wide dado. It leaves the most material ahead of the dado, so it isn't liable to break off. This means you can cut it using a standard blade.

To support the workpiece and prevent tearout, attach an auxiliary fence to the miter gauge. Then you can cut all the dadoes in the drawer sides with the same setup.

Locking Rabbet. From here, you can go to work on either of the joints. But I like to take care of the more involved locking rabbet first. Then the tongue and dado at the back is a walk in the park.

The first step is shown in Figure 3. There are two keys points that deserve highlighting. The slot cut in each end of the drawer front needs to match the "stub" in the drawer sides. The slot is cut offset on the drawer front. The narrow tongue that's created needs to equal the width of the dado in the drawer side, as shown in Figure 3a.

In Figure 4, you see the remaining step to complete the locking rabbet. The thin tongue is trimmed to fit into the dado, allowing the side to fully seat.

Tongue & Dado. The dado portion of this joint is already complete. So the only thing that remains here is to cut the tongue on each end of the drawer back. This is formed by cutting a rabbet. Sneak up on the blade height in multiple passes to get a good fit, as shown in Figure 5.

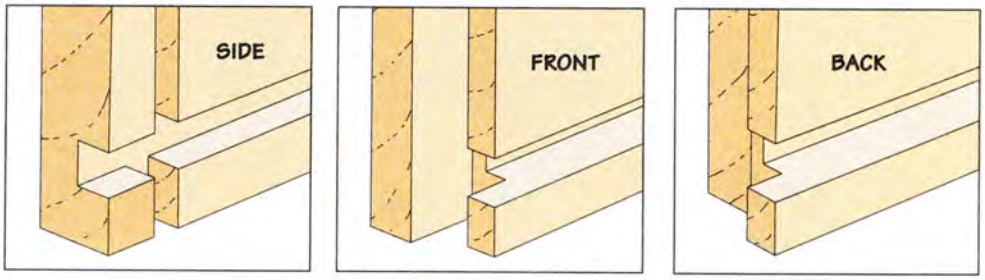
The groove for the drawer bottom is all that remains. The box below has a few more details.

Be sure to check for square when you glue up the drawer. The result is a long-lasting drawer.

adding the Bottom Groove

Adding the groove for the drawer bottom is easy to overlook. The drawings below show what the groove looks like on all the parts. I like to cut the grooves ¼" deep and start ¼" up from the bottom edge of the pieces. This depth means the drawer bottom cuts through portions of the joints. But don't worry, this won't interfere with the strength of the joints.

Cut the groove with a ⅛"-wide blade so that you can sneak up on the fit to match the undersized plywood bottom.



pocket hole jig
Kreg K5

An improved design and updated features make pocket hole joinery easier than ever.

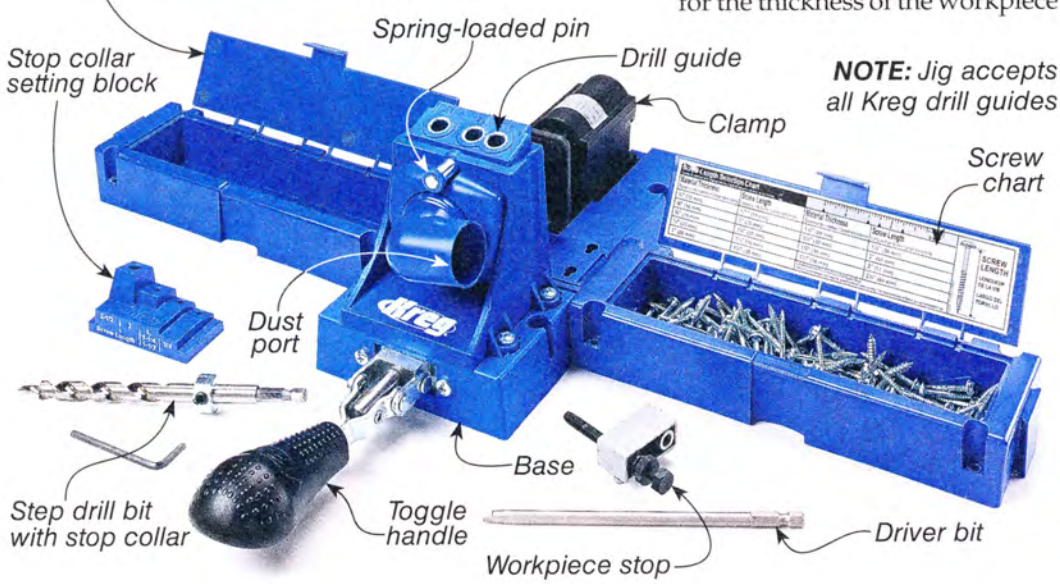
There's no doubt that pocket hole joinery has made woodworking easier. Since their first jig was introduced in the 1980s, *Kreg Tool* has been steadily improving the pocket hole jig. Their new *K5* jig continues that trend with some great new upgrades.

Drill Guide. If you've used *Kreg's* older jigs, the basic operation is the same. But the *K5* does incorporate some new design features. The first is the drill guide. It incorporates an easy-to-read scale, as you can see above. This helps you adjust it for the thickness of the workpiece you're drilling. The spring-loaded pin locks it in place and makes for easy adjustment.

Bit Depth. In order to drill a pocket hole to the right depth, you need to set the stop collar on the bit. The *K5* includes a handy, stairstep gauge. The upper right photo on the opposite page shows how it's used.

Adjustable Stop. For drilling holes in consistent locations on workpieces (like the rails of a face frame), *Kreg* has included a workpiece stop. It snaps into keyhole slots on either side of the base, as shown in the margin photo, opposite page.

New Clamp Design. You'll notice in the main photo that the clamp handle is on the front of the jig. This makes it convenient to clamp a workpiece in place. But the best part of the clamp assembly is that the mechanism



has been redesigned to auto-adjust for the workpiece thickness without the use of tools.

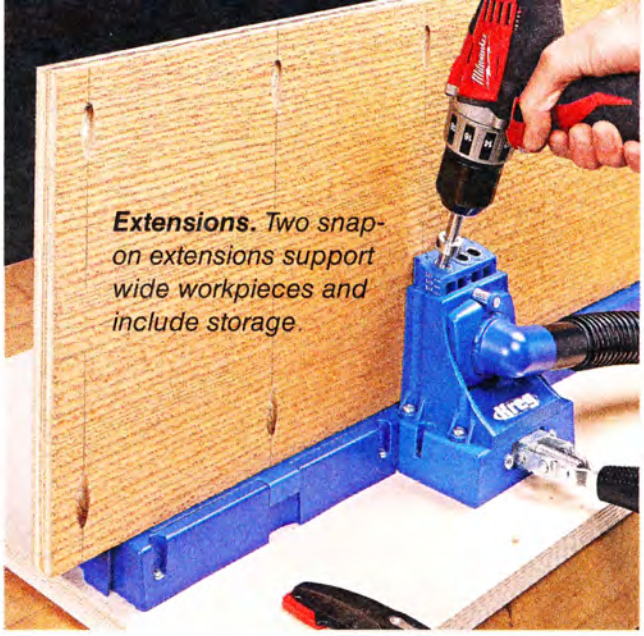
The photos below show how it works. The first step is to press down on the gray ratchet release and slide the clamp assembly back. Then you insert the workpiece to be drilled. With the handle down, slide the clamp against the workpiece (Photo 1).

Holding the clamp against the workpiece, raise the handle slowly until you hear two "clicks." This sets the pressure for the clamping pad (Photo 2).

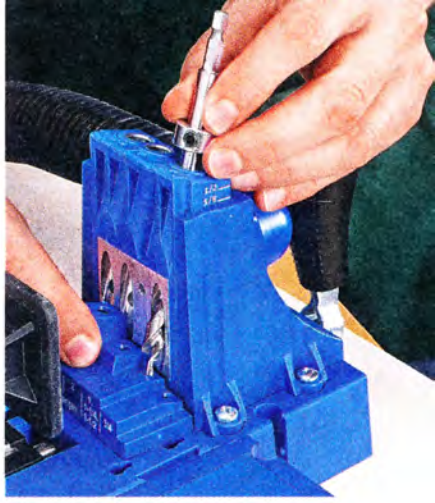
Finally, press the handle back down to secure the workpiece, as shown in Photo 3. The nice thing is, you only have to make this adjustment once as long as you're drilling workpieces of the same thickness.

Support & Storage. The *K5* incorporates two side extensions (left photo above). These lock onto either side of the jig's base.

The extensions serve two main purposes. First, they provide support for the workpiece — especially wide stock, as shown in the upper left photo. But another great feature is that the extensions also provide storage for accessories and screws, as you can see in the lower left photo on the opposite page. The covers snap securely to keep the contents contained as you move the jig around. (I mounted my jig on a plywood base.)



Extensions. *Two snap-on extensions support wide workpieces and include storage.*



▲ ***Drill Depth.*** *The stop collar setting block makes depth adjustment foolproof.*

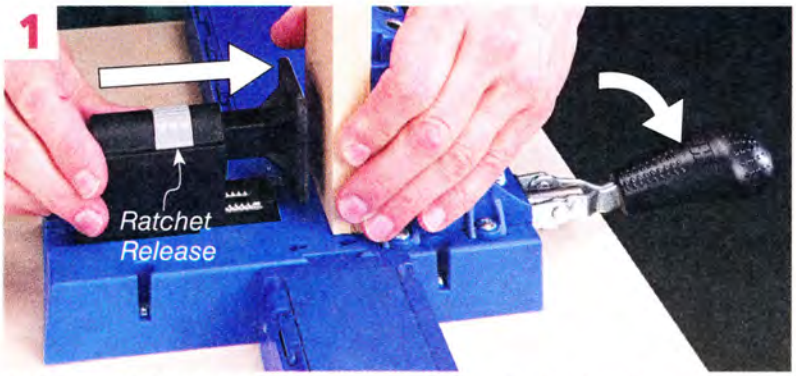
▲ ***Adjustable Stop.*** *The workpiece stop snaps into keyhole slots in the jig's base.*

One of the storage compartments includes a handy chart on the lid. It shows you what size of screws to use depending on the thickness of the workpieces.

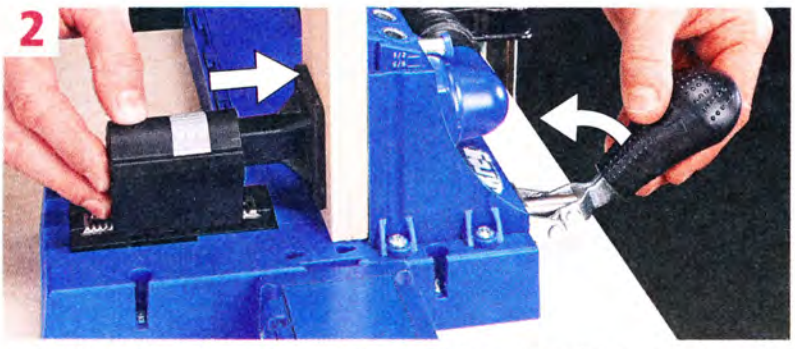
Here's another nice feature: The base and extensions on the *K5* are 1½" thick. This means that you can use "two-by" material as supports for extra-long workpieces if needed.

Dust Collection. Drilling pocket holes creates a lot of sawdust. *Kreg* designed a dust port to fit right behind the drill guide where the chips escape as you drill (main photo, opposite page). Simply attach your shop vacuum to the swivel connector. The dust port snaps off easily for those times when you don't have a shop vacuum handy.

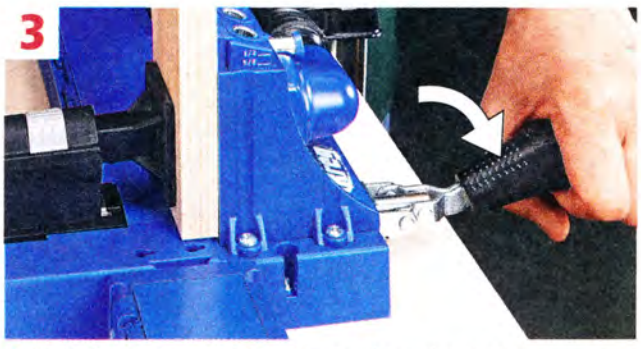
Bottom Line. If you rely on the speed, strength, and ease of assembly with pocket hole joinery, the $140 *K5* will definitely be a good investment.



▲ ***Clamp Adjustment.*** *With the jig's handle in the down position, insert the workpiece between the clamp and drill guide and then slide the clamp forward until it contacts the workpiece.*



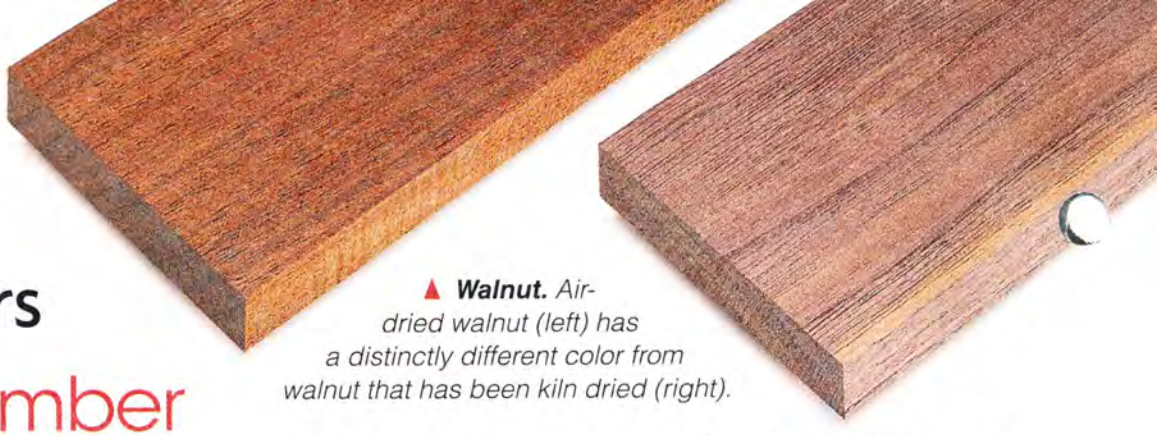
▲ ***Setting the Pressure.*** *While holding the clamp against the workpiece, lift the handle until you hear two "clicks." This sets the proper amount of pressure to hold the workpiece securely.*



▲ ***Set It & Forget It.*** *Once the clamp pressure is adjusted, simply insert the workpiece into the jig and press the handle down to secure it.*

questions from
Our Readers

drying lumber
Air vs. Kiln



▲ ***Walnut.*** *Air-dried walnut (left) has a distinctly different color from walnut that has been kiln dried (right).*

Are there advantages or disadvantages between air-dried and kiln-dried lumber?

Jay Wendt
Plano, Texas

Whether lumber is air-dried or kiln-dried, the goal is the same: to reduce the moisture content in the wood. Moisture content (MC) is expressed as a percentage of water in the wood to the weight of the wood if it were completely dry. When a tree is first cut, it has an MC from around 30% to more than 200% depending on the species and location. The latter means that the water in the wood weighs twice as much as the wood itself. Before lumber can be used to build furniture, the MC must be reduced. This can be done either by air drying or kiln drying.

Air. Air-dried lumber is just as it sounds, lumber that has been left to dry in the open air. Or more accurately, the moisture in the wood comes into equilibrium with that of the surrounding atmosphere (typically 15-20% moisture content). The rate of drying varies with the time of year, species of wood, size and shape of the piece, and method of stacking. A general rule is that it takes one year for every inch of lumber thickness.

Sawn timber is commonly dried by being piled in stacks with air space between the boards. The drawing below shows how this works. Careful attention must be paid to the lumber to ensure that there is enough air circulation so that mold doesn't form.

Once the lumber has reached moisture equilibrium with the outside environment, the boards need to be brought inside and re-stacked to bring the MC down to match the inside environment where the furniture will be built and used (approximately 10%).

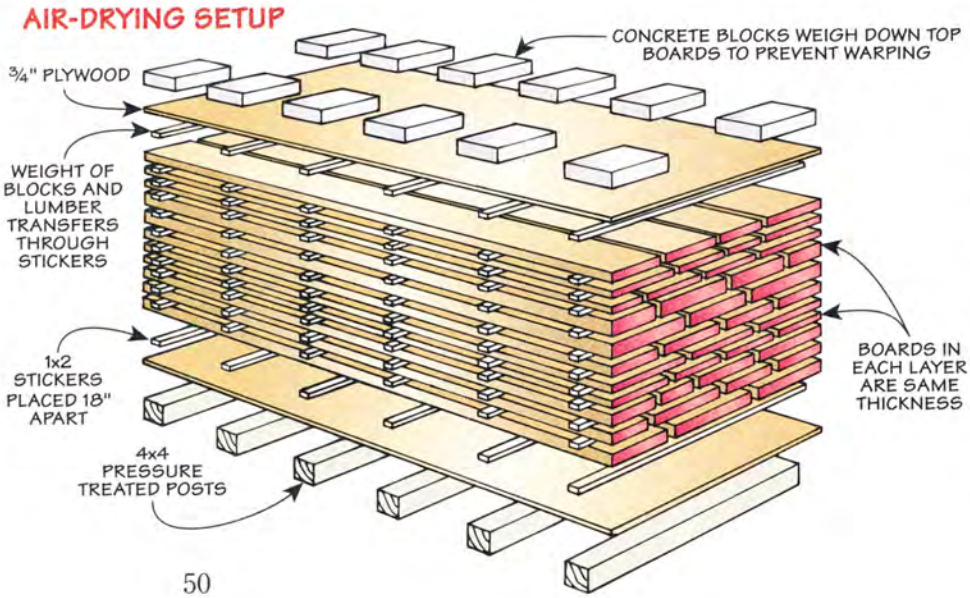
Kiln. Kiln drying offers greater control of temperature and humidity during the drying process. Most commercially available lumber has been kiln dried. This method allows timber to dry uniformly in a matter of days versus months or years. A kiln heats the lumber at a constant temperature and maintains a consistent humidity to prevent checking or warping.

Kiln drying can reduce moisture content all the way down to a usable level of between 6-10%. Kiln drying also helps kill any fungus or insects living in the wood which could migrate to other lumber nearby. Wood that has been kiln dried to a low MC is also less susceptible to fluctuations in humidity. (This is known as *sorption hysteresis*.) As a result, kiln-dried wood may have less seasonal expansion and contraction than air-dried wood. But it also means that kiln-dried wood can be less receptive to steam bending.

One downside of kiln-dried lumber is that it can alter the color of the wood. A good example is black walnut. The photos at the top of the page show the effects of kiln drying.

Additionally, drying lumber too quickly can create stresses in the wood that result in warping after being cut. This is referred to as *case hardening*. Overly dry wood can also become hard and brittle, making it more difficult to work with hand tools.

Which lumber to use may come down to the project at hand. But when done properly, both drying methods can produce excellent furniture-grade lumber.



Sources

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

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

EASY MORTISES *(p.8)*

- **Rockler**
  - *½" Spiral Upcut Bit* 36813
  - *¼" Spiral Upcut Bit*..... 82652

MITER GAUGE ADD-ONS *(p.10)*

- **Rockler**
  - *2¼" Flip Stop*..... 31214
  - *3" Flip Stop*..... 26991
  - *Kreg Top Trak* 26358
  - *Kreg Swing Stop*..... 21938
  - *R-to-L Measuring Tape* ... 69124
  - *T-Track Fence Cap* 39944
  - *T-Loc Fence Track*..... 25471
- **Peachtree**
  - *22" Miter T Fence* 1099
  - *Clamping Miter Gauge* 1247
  - *Cam Miter Hold-Down* 1251

FOLDING TABLE *(p.12)*

- **McMaster-Carr**
  - *⅜"-Dia. Alum. Rod* 8974K32
  - *½"-O.D. Alum. Tube*... 1658T63
  - *⅛" x 1" Alum. Bar*.... 89755K27
- **Lee Valley**
  - *Case Handle* 00S62.01
  - *Draw Catches* 00S71.01

The table was finished with a couple coats of spray lacquer.

COMPACT ROUTER TABLE *(p.18)*

- **Rockler**
  - *1"-Dia. Knobs*..... 34121
  - *T-Slot Bolts*..... 83311
  - *T-Track* 20054
  - *Rare Earth Magnets*..... 30810
  - *Magnet Cups* 31668
  - *Magent Washers*..... 37474

The router table was finished with a couple coats of lacquer.

LATHE DUPLICATOR *(p.28)*

- **Reid Supply**
  - *Carbide Tool Bit* RTB-0405
  - *5/16"-18 Knob*..... MPB-7
  - *¼"-20 Knob* RST-59

SLAT-WALL SYSTEM *(p.32)*

- **Reid Supply**
  - *Drawer Pulls* KHO-10
- **Lee Valley**
  - *2½" Hinges* 00H51.23
- **Rockler**
  - *¼" Shelf Supports*..... 33894
  - *12" Drawer Slides* 32466

The slat-wall system was painted with *Benjamin-Moore's ben* waterborne interior paints in an eggshell finish:

- *Gull Wing Gray* 2134-50
- *Iron Mountan*.....2134-30
- *Smoldering Red* 2007-10

SHOP FLOORING *(p.44)*

- **The Home Depot**
  - *Dri-Core Panels* 361018
- **Certainteed**
  - *Platon Underlayment*.....platon

KREG JIG *(p.48)*

You can buy the *Kreg K5 Pocket Hole Jig* from various online retailers including *amazon.com* and *Rockler* (49989). You can also find it at your local home center or hardware store.

MAIL ORDER SOURCES

Woodsmith Store
800-444-7527

Rockler
800-279-4441
rockler.com

amazon.com

Certainteed
800-782-8777
certainteed.com

The Home Depot
800-466-3337
homedepot.com

Lee Valley
800-871-8158
leevalley.com

McMaster-Carr
630-600-3600
mcmaster.com

Peachtree Woodworking
770-458-5539
ptreeusa.com

Reid Supply
800-253-0421
reidsupply.com

ShopNotes

Router Table

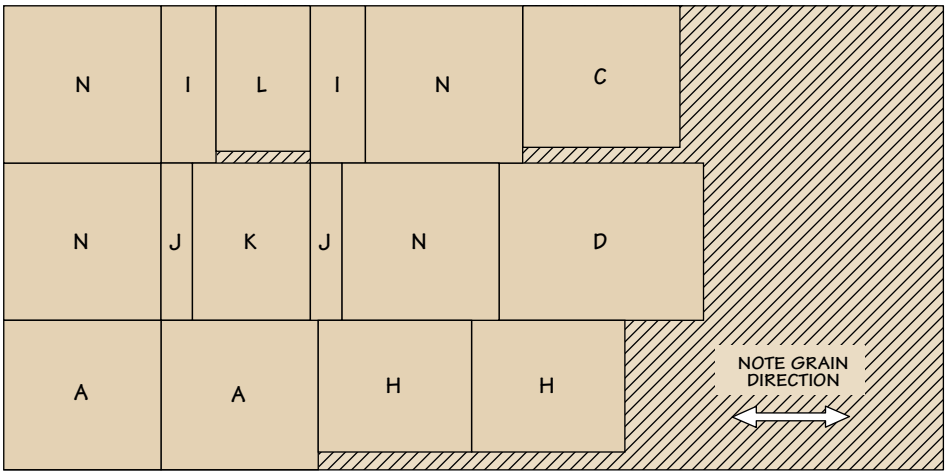
Materials List

A	Sides (2)	9¼ x 10 - ½ Ply.
B	Fronts (2)	¾ x 2½ - 10
C	Back (1)	9 x 10 - ½ Ply.
D	Base (1)	10 x 13 - ½ Ply.
E	Inner Stiles (2)	¾ x 2 - 9¾
F	Outer Stiles (2)	¾ x 2 - 10½
G	Shelves (4)	¾ x 1½ - 8⅝
H	Wing Backs (2)	8⅝ x 9¾ - ½ Ply.
I	Supports (2)	10 x 3½ - ½ Ply.
J	Fillers (2)	10 x 2 - ½ Ply.
K	Top (1)	10 x 7½ - ½ Ply.
L	Subtop (1)	9¼ x 6 - ½ Ply.
M	Hinge Block (1)	¾ x ½ - 6
N	Table Extensions (2)	10 x 10 - 1 Ply.
O	Edging (1)	¼ x 1 - 55 rgh.
P	Fence Base (1)	¾ x 2¾ - 9½
Q	Fence Backer (1)	¾ x 2¾ - 9½
R	Fence Faces (2)	¾ x 2¾ - 9½

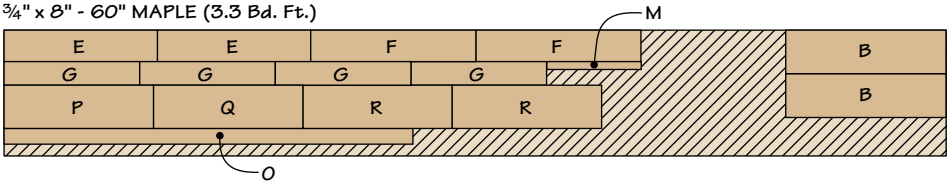
- (24) #6 x 1¼" Fh Woodscrews
- (2) 1 1/16" x 9¾" Cont. Hinges w/Screws
- (2) ½" Rare-Earth Magnets
- (2) ½" Magnet Cups w/Screws
- (2) ½" Magnet Washers w/Screws
- (2) 10" T-Tracks w/Screws
- (1) 1 1/16" x 6" Cont. Hinge w/Screws
- (2) 1 1/16" x 7" Cont. Hinges w/Screws
- (2) 9½" T-Tracks w/Screws
- (4) 5/16"-18 x 1½" Flange Bolts
- (4) 5/16"-18 x 1"-dia. Round Knobs
- (4) 5/16" Flat Washers

Cutting Diagram

30" x 60" - ½" BALTIC BIRCH PLYWOOD



¾" x 8" - 60" MAPLE (3.3 Bd. Ft.)



Cutting Diagram cont.

ShopNotes

Slat-Wall Workshop

Materials & Hardware List

SLAT WALL (3 sections shown)
A Back Panels (3) 48 x 64 - ¾ Ply.
B Slats (21) 5⅞ x 48 - ¾ Ply.
C Top/Bottom Fillers (6) 2 15/16 x 48 - ¾ Ply.

CORD HOOKS (2 shown)
D Backs (2) 7 x 7 - ¾ Ply.
E Faces (2) 3½ x 5⅞ - ¾ Ply.
F Brackets (4) 3 x 3½ - ¾ Ply.
G Cleats (2) 2 x 7 - ¾ Ply.

PEGBOARD
H Panel (1) 23½ x 43½ - ¼ Pegboard
I Rails (2) 1¾ x 40 - ¾ Ply.
J Stiles (2) 1¾ x 23½ - ¾ Ply.
K Cleat (1) 2 x 43½ - ¾ Ply.

WORKSTATION
L Side Supports (2) 15 x 14 - ¾ Ply.
M Drawer Divider (1) 15 x 21 - ¾ Ply.
N Filler Block (1) 3¼ x 20½ - 1½ Ply.
O Top Layers (2) 16 x 24 - ¾ Ply.
P Cleat (1) 2 x 24 - ¾ Ply.
Q Drawer Front/Back (2) ½ x 2¾ - 19
R Drawer Sides (2) ½ x 2¾ - 12
S Drawer Bottom (1) 11½ x 19 - ¼ Hdbd.
T Drawer False Front (1) 3⅛ x 20⅜ - ¾ Ply.

CABINET
U Case Sides (2) 7¼ x 28 - ¾ Ply.
V Case Top/Bottom (2) 7¼ x 20 - ¾ Ply.
W Case Back (1) 20 x 27 - ¾ Ply.
X Doors (2) 10 7/16 x 28 - ¾ Ply.
Y Shelf (1) 6½ x 19⅜ - ¾ Ply.
Z Cleat (1) 2 x 21 - ¾ Ply.

BINS (6 shown)
AA Ends (12) 5 x 7¾ - ¾ Ply.
BB Fronts (6) 5 9/16 x 17 - ¾ Ply.
CC Backs (6) 5 x 17 - ¾ Ply.
DD Bottoms (6) 3¾ x 17 - ¾ Ply.
EE Cleats (6) 2 x 18 - ¾ Ply.

TOOL TOTE RACKS (2 shown)
FF Sides (4) 5 x 24 - ¾ Ply.
GG Rack Shelves (6) 9 x 20 - ¾ Ply.
HH Shelf Lips (6) ½ x 1¼ - 20
II Cleats (2) 2 x 21 - ¾ Ply.

TOOL TOTES (6 shown)
JJ Ends (12) ½ x 5¾ - 8
KK Fronts/Backs (12) ½ x 2½ - 18½
LL Bottoms (6) 8 x 18 - ¼ Hdbd.
MM Handles (6) ¾"-dia. x 18" EMT Conduit

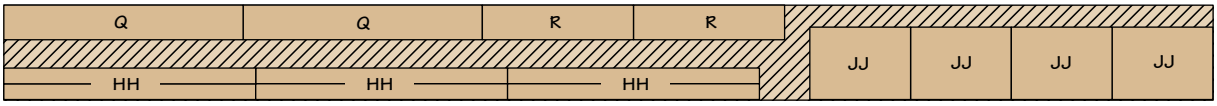
SHELVES
(3 small, 2 medium, and 1 large shown)
NN Sm. Shelf Tops (3) 6 x 24 - ¾ Ply.
OO Sm. Shelf Backs (3) 3 x 20½ - ¾ Ply.
PP Sm. Shelf Supports (6) 5 x 4½ - ¾ Ply.
QQ Med. Shelf Tops (2) 9 x 24 - ¾ Ply.
RR Med. Shelf Backs (2) 4½ x 20½ - ¾ Ply.
SS Med. Shelf Supports (4) 7½ x 6¾ - ¾ Ply.
TT Lg. Shelf Top (1) 12 x 24 - ¾ Ply.
UU Lg. Shelf Back (1) 6 x 20½ - ¾ Ply.
VV Lg. Shelf Supports (2) 10 x 9 - ¾ Ply.
WW Cleats (6) 2 x 22 - ¾ Ply.

SPRAY CAN RACK
XX Sides (2) 5 x 34½ - ¾ Ply.
YY Backs (2) 3½ x 16½ - ¾ Ply.
ZZ Rails (9) ½"-dia. x 17" EMT Conduit
AAA Cleat (1) 2 x 18 - ¾ Ply.

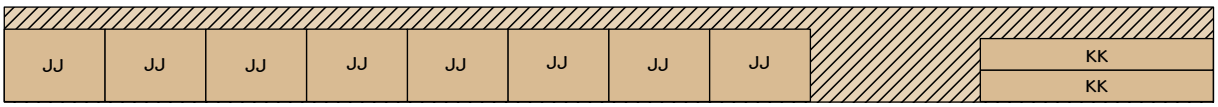
- (1 pr.) 12" Full-Extension Drawer Slides
- (3) Door Pulls
- (2 pr.) 2½" No-Mortise Hinges w/Screws
- (4) ¼" Shelf Supports
- (448) #8 x 1¼" Fh Woodscrews
- (12) #8 x ¾" Fh Woodscrews

Cutting Diagram

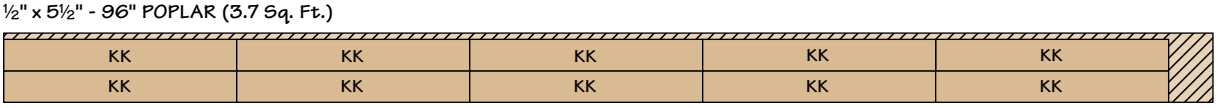
½" x 7½" - 96" POPLAR (5 Sq. Ft.)



½" x 7½" - 96" POPLAR (5 Sq. Ft.)

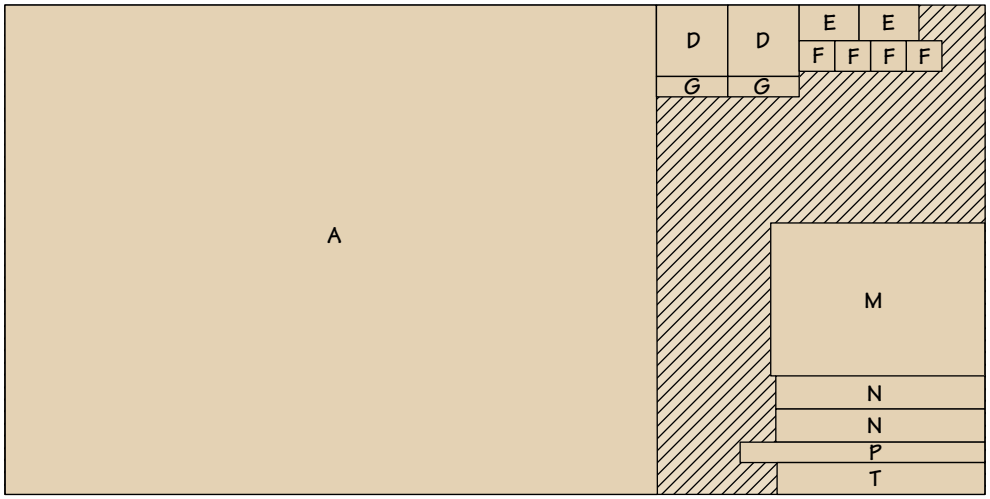


½" x 5½" - 96" POPLAR (3.7 Sq. Ft.)



Cutting Diagram cont.

48" x 96" - ¾" PLYWOOD



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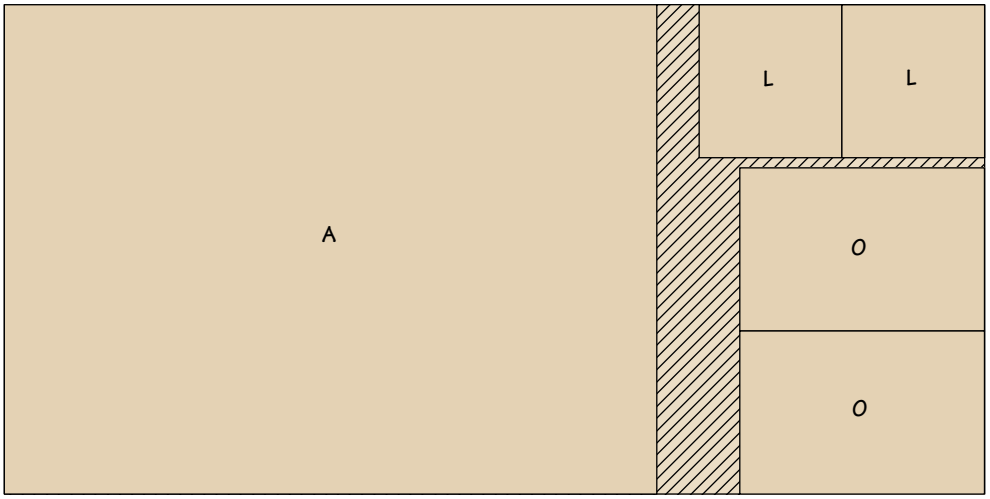
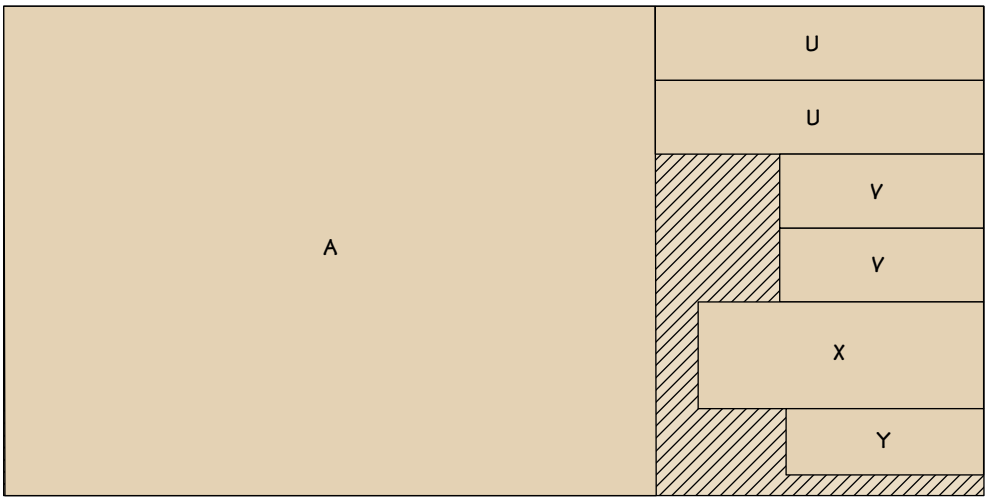
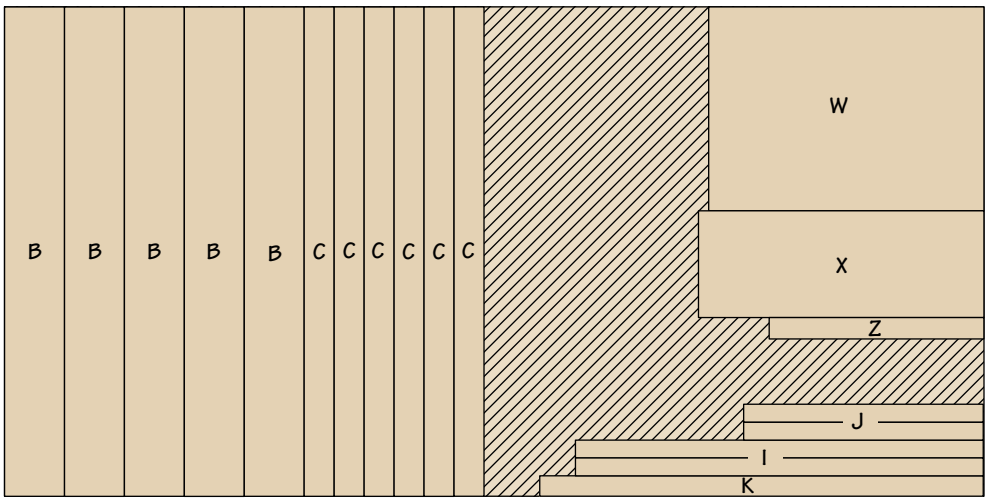


48" x 96" - ¾" PLYWOOD



Cutting Diagram cont.

48" x 96" - ¾" PLYWOOD



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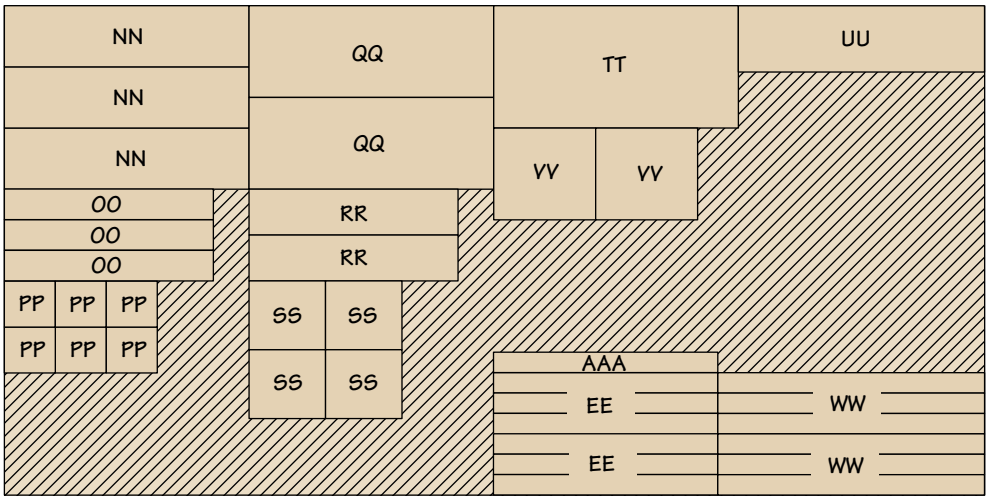

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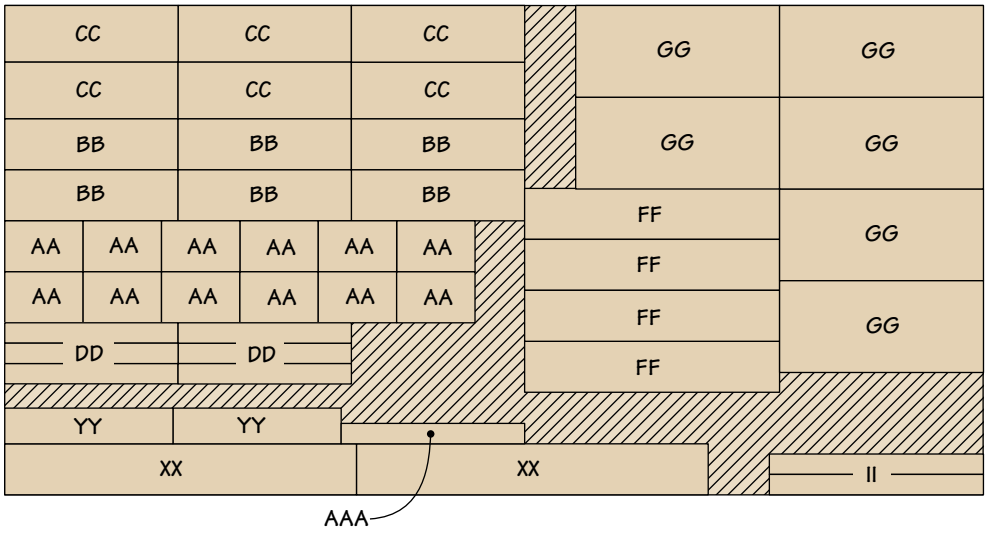
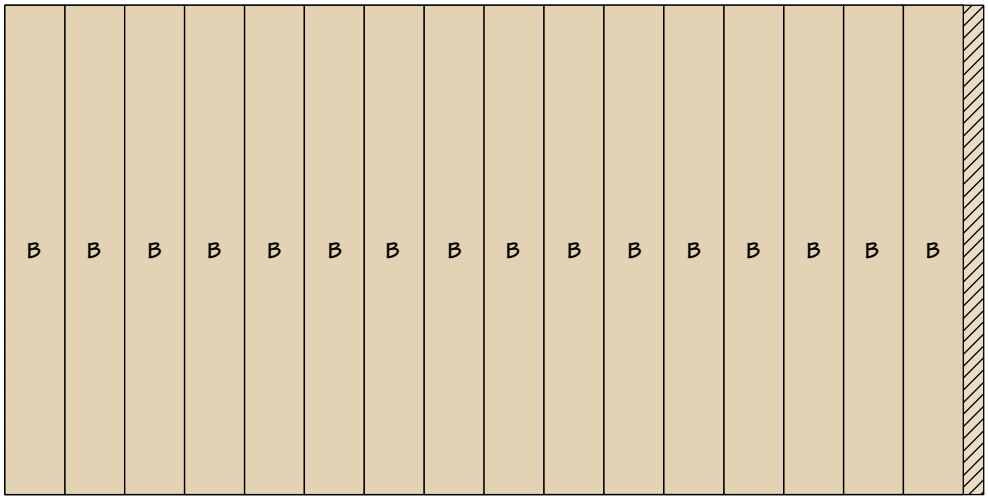
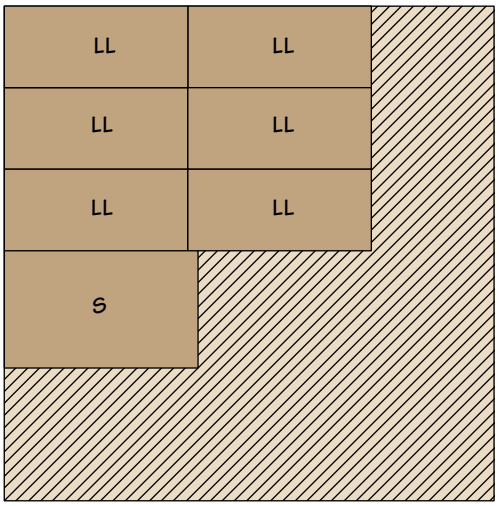


Cutting Diagram cont.

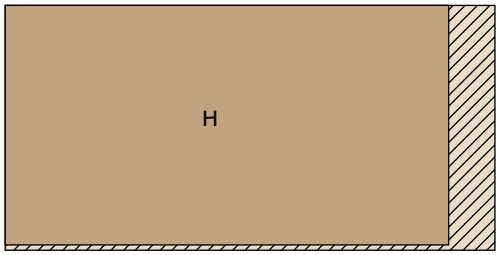
48" x 96" - ¾" PLYWOOD



48" x 48" - ¼" HARDBOARD



24" x 48" - ¼" PEGBOARD



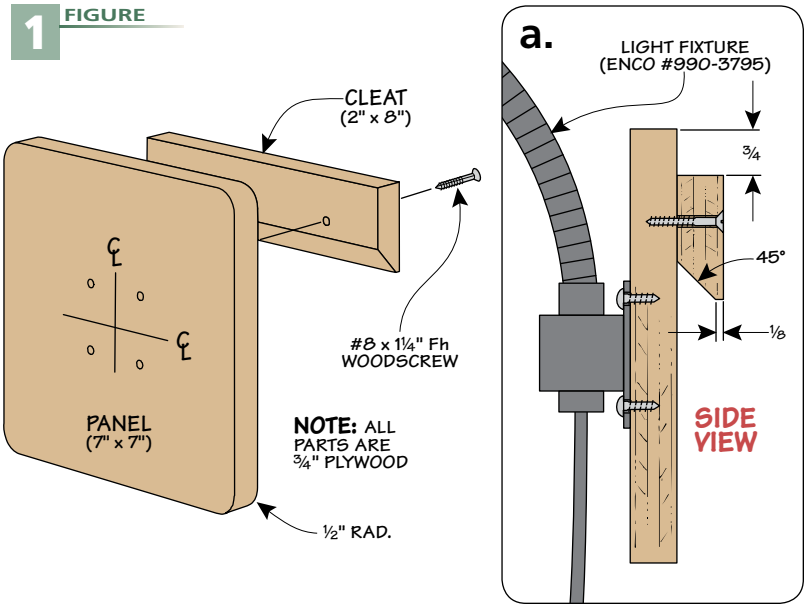
ShopNotes

slat-wall Add-Ons

As we were designing the slat-wall storage system, we kept coming up with new suggestions for components to add to the system. There are lots of possibilities, but we simply didn't have the space in the magazine to show everything. So here a couple of components that that didn't quite fit in the original article. One is a mount for a shop light, and the other is a vise table. Both of them utilize the same interlocking beveled cleats that are found on the other components.

Light Mount. As you can see in Figure 1. The light mounting component hardly needs any explanation. It's nothing but a small plywood panel mounted to a cleat. But the simplicity is part of the beauty of the design. You can screw a light fixture directly to the panel and then move it anywhere on the slat wall that you like.

FIGURE 1

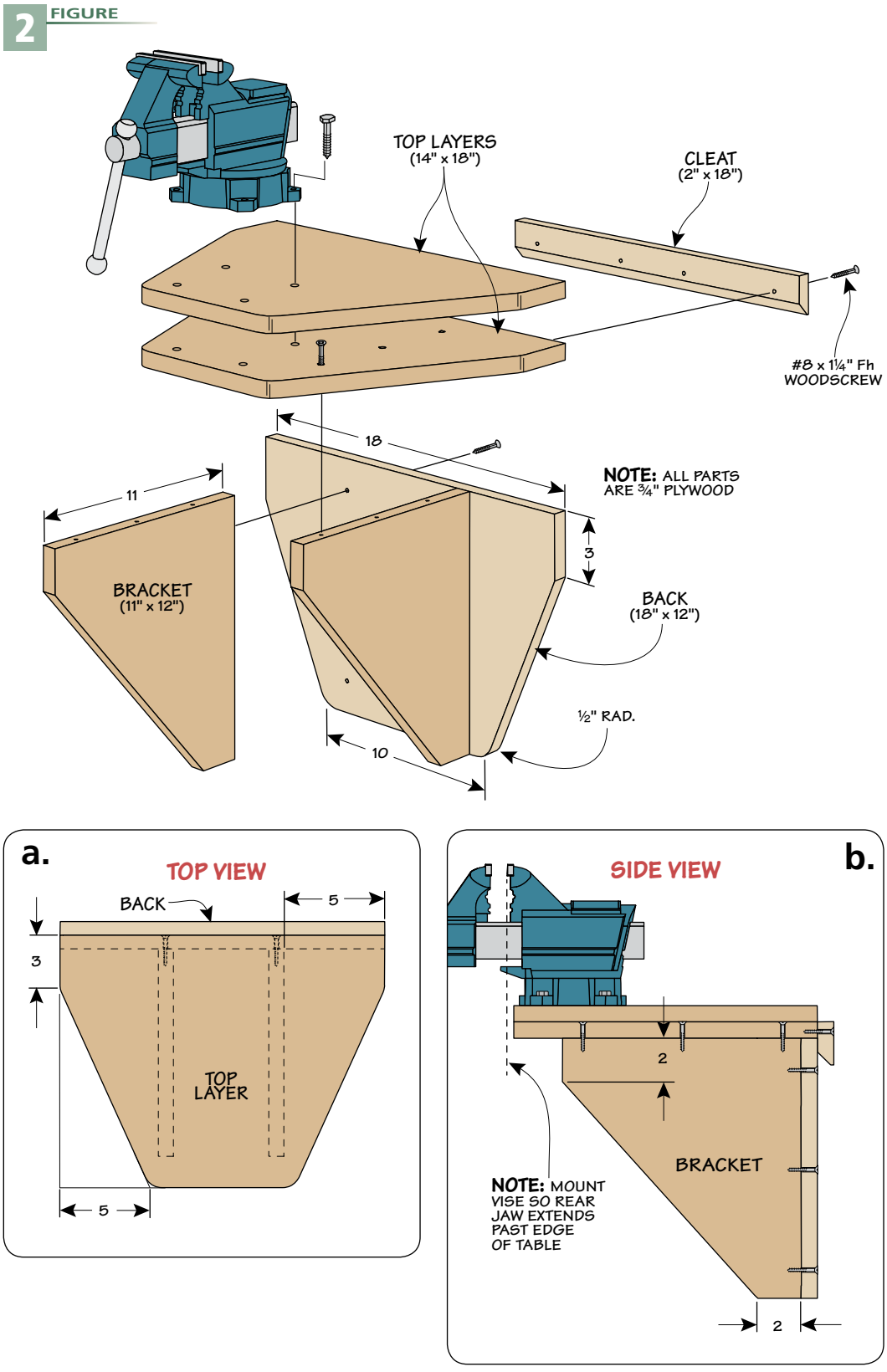


Bench Vise Table. The vise table shown in Figure 2 is the perfect mounting spot for a light-duty vise for general tasks. It's made up of just six parts. Start by cutting the parts for the back and supports to size. The top is made up of two layers, but they don't get glued together until after the stand is assembled. For now, cut the lower layer to size and leave the upper layer slightly oversize. (You'll trim it flush after assembly.)

Now you can glue and screw the back, supports, and lower top layer together. Once this is done, glue the upper top layer in place. After the glue is dry, you can trim the upper layer flush with the lower layer using a router and a flush-trim bit.

The last piece to add is the cleat. Then you can place the table on the slat wall and drill mounting holes for bolting your vise to the table. In order to clamp long workpieces vertically, make sure that you mount the vise so the rear jaw sits in front of the edge of the table (see detail 'b' at right).

FIGURE 2



ShopNotes

Folding Table

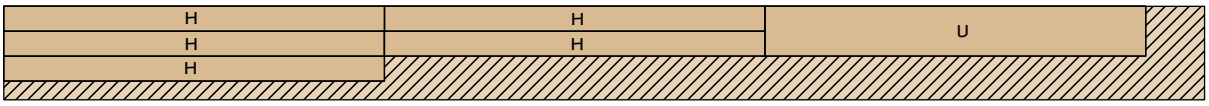
Materials List

A	Side Rails (4)	¾ x 2¼ - 32
B	End Rails (2)	¾ x 2¼ - 23
C	Wing Tops (2)	24 x 32 - ¼ Ply.
D	Center Top (1)	24 x 4¼ - ¼ Ply.
E	Hinge Rails (2)	¾ x 2¼ - 22½
F	Slide Stops (2)	¾ x 2⅝ - 16⅛
G	End Blocks (2)	¾ x 2 - 17⅝
H	Slide Strips (10)	¼ x 2 - 31¼ Rgh.
I	Center Block (1)	¾ x 4¼ - 24
J	King Posts (4)	¾ x 2½ - 7
K	Legs (4)	1½ x 2 - 29⅞
L	Leg Rails (2)	¾ x 3½ - 19½
M	Webs (2)	22½ x 14 - ¼ Ply.
N	Leg Rods (2)	¼"-20 x 17⅝ Thd. Rod
O	Leg Slides (2)	½-O.D. x 16⅜ Alum. Tube
P	Wing Rods (2)	¼"-20 x 17⅜ Thd. Rod
Q	Wing Slides (2)	½-O.D. x 16⅛ Alum. Tube
R	Wing Braces (4)	1 x 21 - ⅛ Alum.
S	Pins (2)	⅜-Dia. x 1¾ Alum. Rod
T	Leg Braces (4)	1 x 20 - ⅛ Alum.
U	Catch Plates (2)	¼ x 4 - 30½
V	Catches (4)	⅝ x ¾ - 1⅛

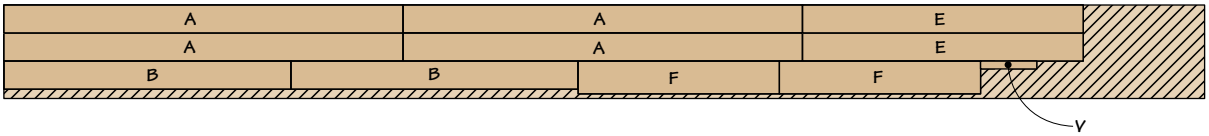
- (2) 1½" x 24" Continuous Hinges
- (48) #6 x ⅝" Fh Woodscrews
- (4) ⅜"-16 x 3" Carriage Bolts
- (4) ⅜" Washers
- (4) ⅜"-16 Lock Nuts
- (4) ¼"-20 x 2" Carriage Bolts
- (12) ¼"-20 Lock Nuts
- (12) ¼" Washers
- (8) #8 x 3" Fh Woodscrews
- (8) #8 x 2½" Fh Woodscrews
- (1) Case Handle
- (1 pr.) Draw Catches

Cutting Diagram

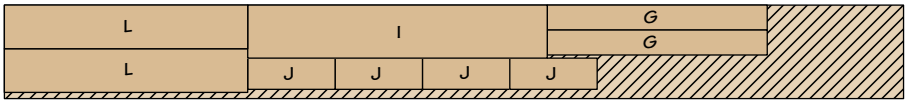
¾" x 7½" - 96" PINE (5.0 Bd. Ft.)



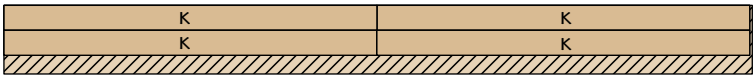
¾" x 7½" - 96" PINE (5.0 Bd. Ft.)



¾" x 7½" - 72" PINE (3.8 Bd. Ft.)



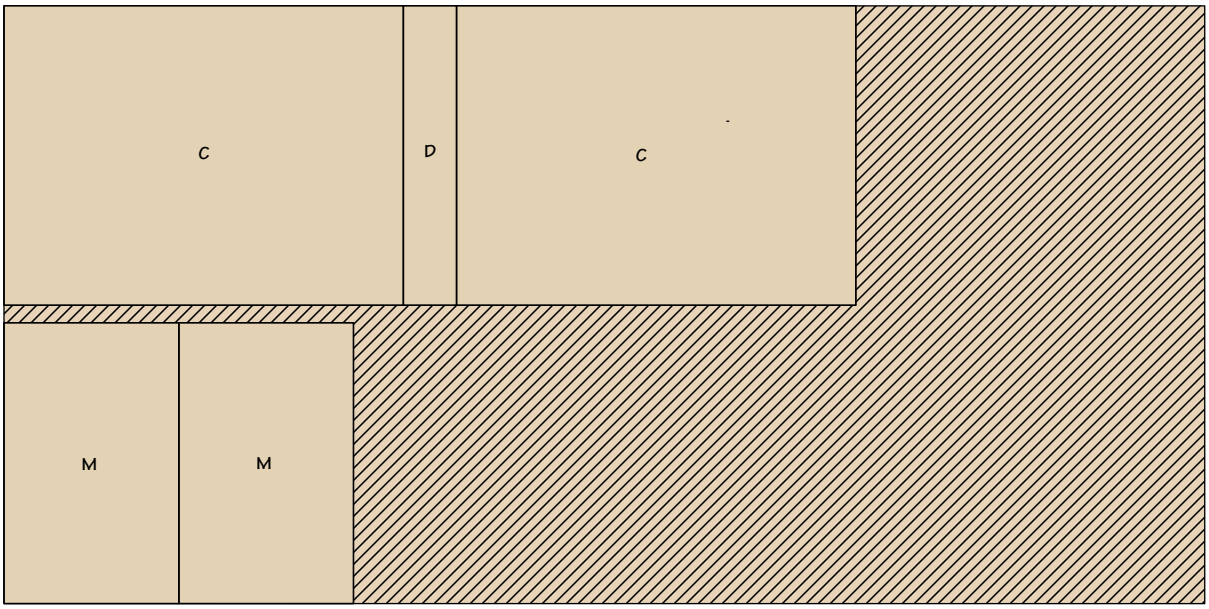
1½" x 5½" - 60" PINE (4.6 Bd. Ft.)



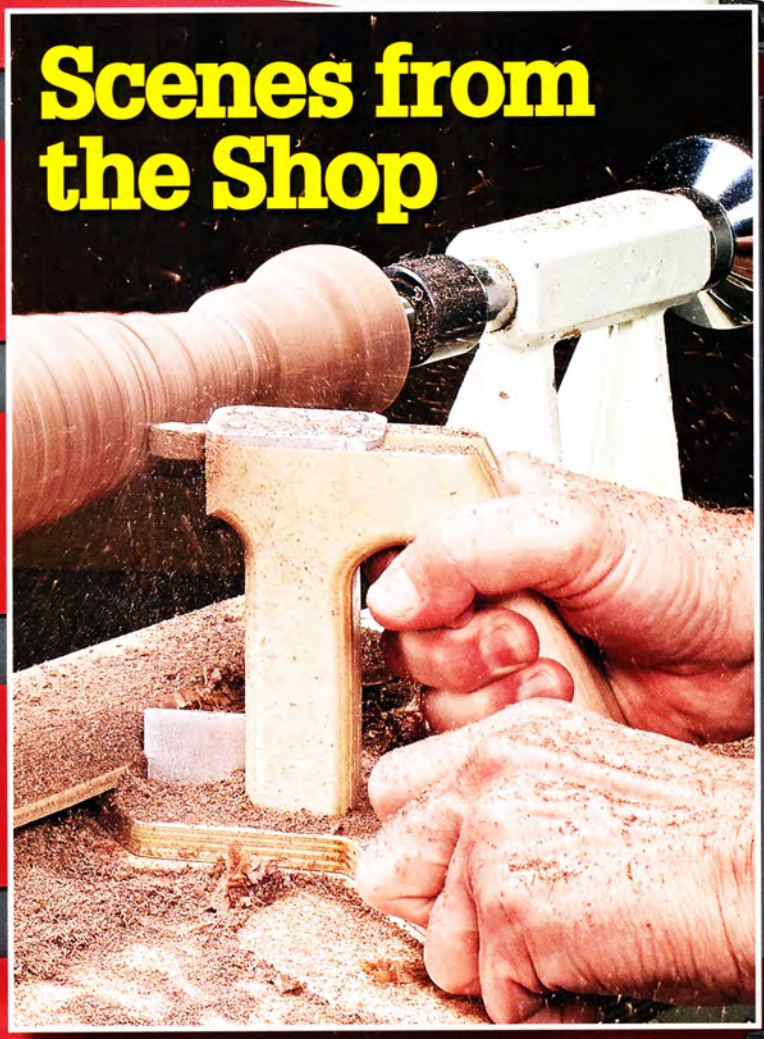
NOTE: PARTS 'H' AND 'U' RESAWN AND PLANED TO ¼" THICK

Cutting Diagram cont.

48" x 96" - ¼" PLYWOOD



Scenes from the Shop



▲ *Turning identical parts is a snap with this shop-built lathe duplicator. With a simple template, you can knock out matching items with ease. You'll find complete plans starting on page 28.*

▲ *The modular design of this slat-wall storage system allows you to move (or add) shelves and other components as your storage needs change. Detailed plans begin on page 32.*