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Vol. 23 Issue 138

Upgrade Your Table Saw!

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- Low-Cost Design

PLUS:

Strong & Sturdy
Router Joinery

Pocket Hole Joinery
Faster & Easier Than Ever!

Long Holes in End Grain
Shop Secrets Revealed

A Publication of August Home Publishing

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Bevel Gauges *page 40*

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Cutoffs

As a woodworker, I always want to make the best use of material. So when a project comes along where all that's left over at the end is a pile of sawdust and maybe a cutoff or two, it makes me happy. And that's the case with the sawhorses you'll find on page 14.

I knew our Assistant Design Director, Chris, was working on a sawhorse that was sturdy and compact. When I saw the final design, I was more amazed that you could cut four of them out of a single 5' x 5' sheet of Baltic birch plywood — with the only waste created by the saw cuts and a couple of small cutouts. Each sawhorse folds to ¾" thick. So a set of four only takes up 3" of space.

If you have your own great shop design where you've made the best use of material, offcuts, or hardware, please drop us a note. If it's an idea we think others will find useful, we'll feature it in a future issue of *ShopNotes*.

There are more great projects and articles in this issue, as well. So after you send in that great idea, sit back, relax, and take a look.

Bryan

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from our Readers

Tips for Your Shop

Router Table Fence Micro-Adjuster

THE WINNER!

I needed a simple, but effective, way to finely adjust my router fence and still be able to return it to its original position. This fixture gives me the precise fence adjustment that I need.

Body. The wood parts for the body and fence block are small. So to safely cut these, start with oversize blanks. I laid out and cut the notches and rabbets, and then drilled the holes for the threaded inserts and bushings. Then I cut the parts to final size. (You may need to adjust the dimensions and hole locations to suit your fence and table.)

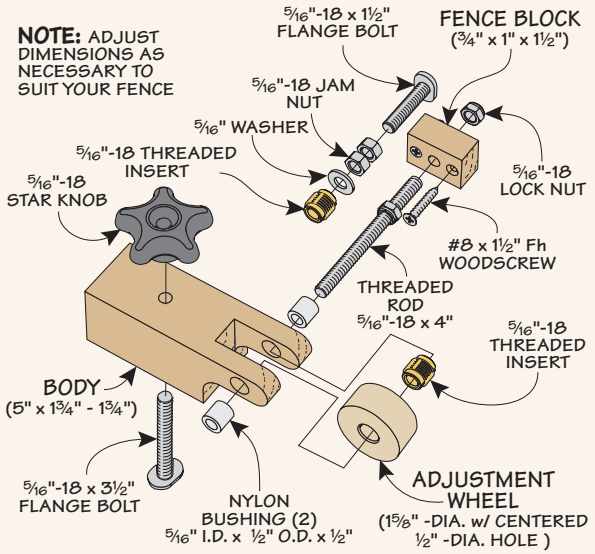
Adjustment Mechanism. I cut out the adjustment wheel with a hole saw and installed a threaded insert into the center after enlarging the hole. The wheel assembly is screwed onto the threaded rod which is inserted through two nylon bushings in the body. Another threaded insert is used for the stop bolt and a jam nut locks it in place (top view).

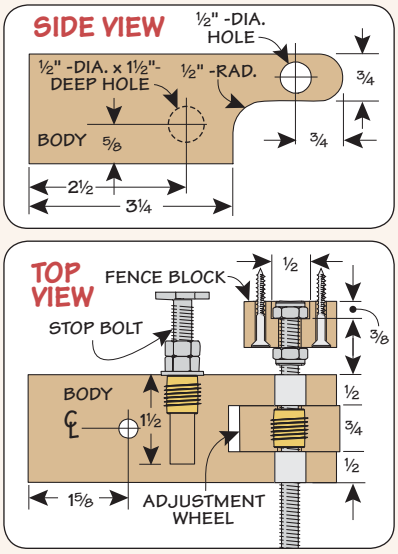
Table Clamp. The body is clamped to the table with a flange bolt and a star knob. If your table doesn't have a slot or a T-track for the fence, a simple C-clamp will hold the adjuster in place.

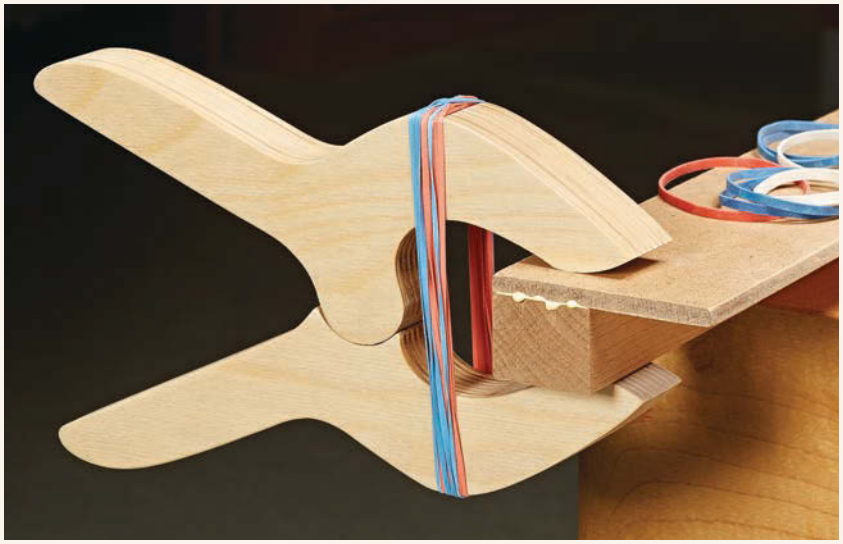
Fence Block. The fence block may also have to be modified to suit your particular fence. It should be located so the hole for the threaded rod lines up with the hole in the body. Two lock nuts are tightened against the block so the rod doesn't spin. It can be attached to the fence with machine screws and wing nuts or just screwed in place as shown in the photo and drawing.

To use the micro-adjuster, roughly position the fence and tighten the knob to lock the body. Turn the adjustment wheel to precisely position the fence as needed. The stop bolt allows you to return the fence to its original, starting position, if that becomes necessary later.

Bill Huber
Haslet, Texas

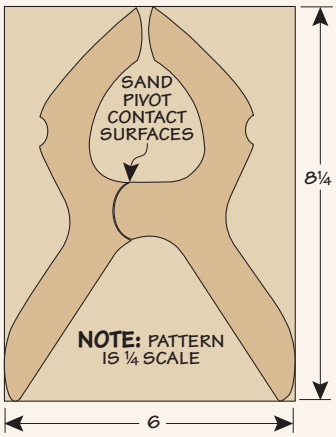






Shop-Made Spring Clamp

I was short a couple of light-duty spring clamps one evening after the stores had closed. So I came up with this simple design to quickly make some of my own.



Starting with the pattern on the left, lay out and cut the two clamp parts. Almost any wood you have laying around will work, but I used plywood for its strength. Ease the edges and sand the pivot contact surfaces for a comfortable grip and smooth operation.

Wrap rubber bands around the jaws to provide the clamping pressure. By varying the number of rubber bands, you can adjust the pressure to suit the job.

Serge Duclos
Delson, Québec

Submit Your Tips!

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

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and click on the link
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 a *Kreg K5 Jig*.

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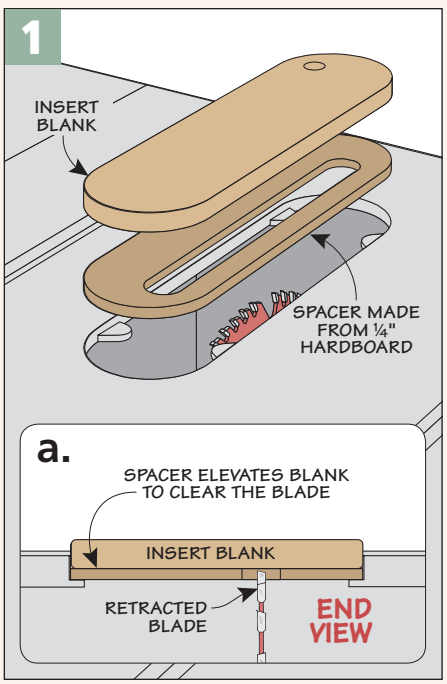
Zero-Clearance Insert Spacer

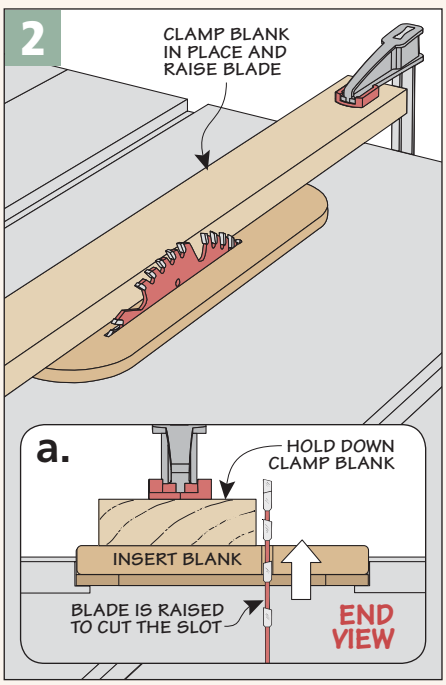
I make my own zero-clearance inserts, but my saw blade can't be lowered enough to cut the blade slot in the insert blank with the insert in place. So I came up with this idea.

I made a spacer from hardboard sized to fit the saw opening. It has to be just thick enough to clear the blade's teeth when the insert blank is set in the opening (Figure 1). Cut an oversize slot for the blade with a jig saw and it's ready to use.

To cut the blade slot in a new zero-clearance insert blank, I lower the blade and place the spacer in the opening. Put a blank insert on top and clamp it down (Figure 2). Turn on the saw and slowly raise the blade until it cuts through the blank.

Jim Moorehead
Barrigada, Guam





Quick Tips

▲ ***Peter Sherril*** *of Forestville, Wisconsin, uses a wine cork to cap the fittings and keep dirt out of his air tools. He just drills a hole in the center and simply presses them on.*

▲ ***Richard Kidd*** *of Tremonton, Utah got tired of screwdrivers chewing up the plastic lids on his cans of solvent. So he made an opener from a scrap of wood and a Z-Clip.*

Easy Edge Trimming

I prefer to put the edging on my plywood cabinets after they're all assembled and then trim it flush with a router. But I needed a way to support the router and be able to cut into the corners. This jig solves both problems.

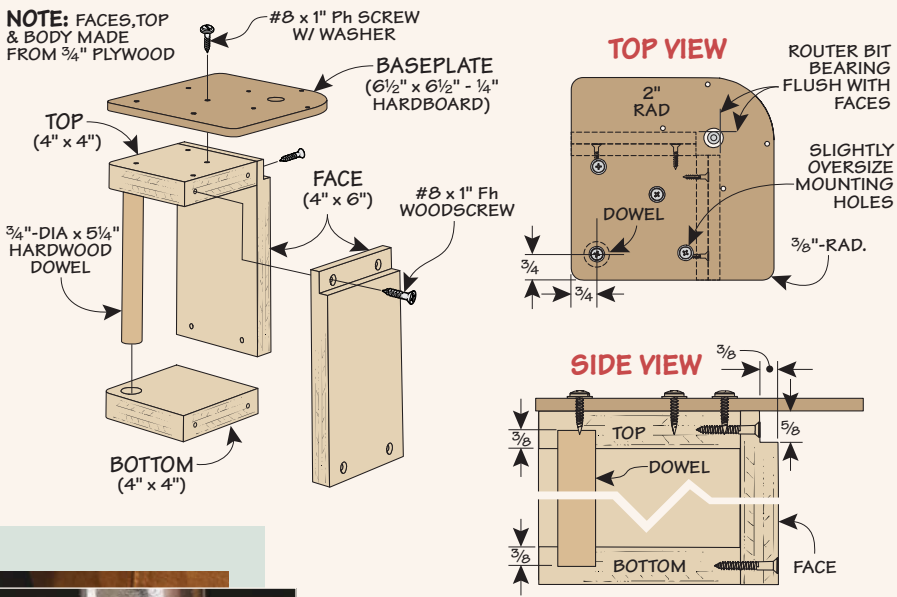
The jig is easy to use. Just place the baseplate on the edging surface and feed it into the casing until the jig face contacts the surface of the workpiece. The little bit of wood left inside the corners can easily be cleaned up with a chisel.

It's constructed so the router bearing on a ½" flush-trim bit lines up with the two adjacent faces of the jig. The faces ride against the surface of the workpiece to keep the router stable. A dowel provides a handle for a good grip. And a notch under the top allows for the edging overhang.

To build it, I cut the pieces for the top, bottom, and faces from plywood. Next, cut a rabbet for the recesses on the faces and then glue and screw these parts together as shown. After cutting the router baseplate, mark and drill the mounting holes using your router as a template. Then mount the baseplate drilling the holes a little oversized to allow for adjustment. The router is positioned so that the bit bearing is perfectly flush with the two jig faces.

The jig works equally well on the outside cabinet surfaces and prevents rounding off the corners, too. Trimming plywood edging is a whole lot easier now.

Ben Volz
Parker, Colorado



▲ *A paint roller cut into sections makes a great buffing wheel for* ***Bill Wells*** *of Olympia, Washington. He presses them onto a 1½" hole saw chucked into his drill press to buff small items. They're available in a variety of naps for use on different materials.*

strong & sturdy joinery with Slot Cutters

Find out how this essential router bit strengthens tricky joints and makes assembly easier.

Tight-fitting joints are essential to building good projects. I keep a few tricks up my sleeve to make sure the joints in my projects are the best they can be. One of those tricks is a slot-cutting router bit.

It's natural to think of using a slot cutter for creating the grooves for tongue and groove joinery or to house a panel. But I use a slot cutter for a few other joinery tasks, as well.

Aligning Parts. Probably the most frequent use for my slot cutter is creating long edge joints. I use the slot cutter to create matching slots in a pair of workpieces. A spline spans the grooves to lock the parts together. The spline registers each board to the next one and helps to straighten out any minor bowing along the length of each piece.

I'll turn to this technique when gluing up a large tabletop or when joining wide aprons to the edges of a table or benchtop. Another good application is attaching wide edging pieces to a plywood panel.

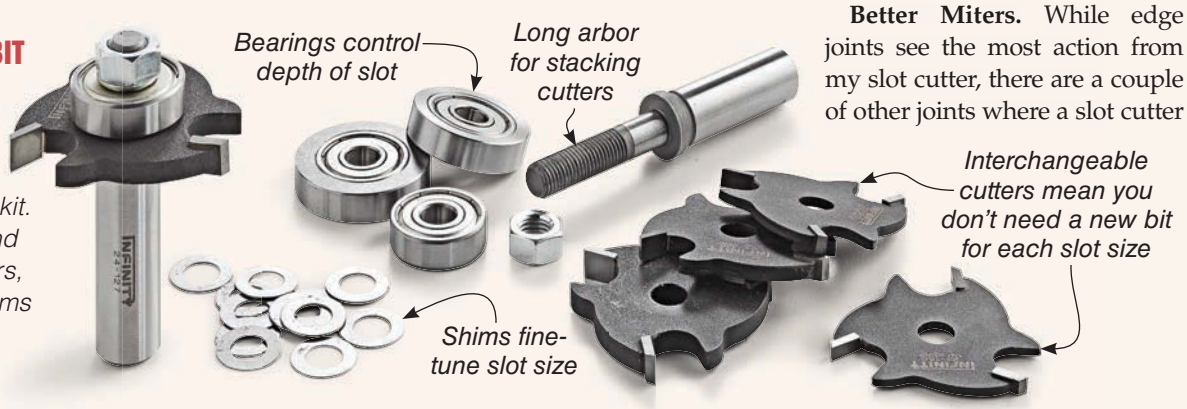
No Glue. Here's the catch: The spline doesn't really add much strength to the joint. Long-grain edge joints have plenty of strength on their own. Instead, the spline aligns the parts. The interlocking spline keeps the surface of the glueup flat and saves me time planing or sanding the joints flush after assembly. Since the spline isn't a structural part of the joint, it isn't necessary to glue it in place. In fact, adding glue to the spline joint just adds more time and may increase the amount of squeeze-out you have to clean up.

Since I use this approach mostly on large assemblies, I usually cut the spline slots with a hand-held router, as shown in the photo above. Orient the boards so that they're all face up. This way the grooves will be consistent with the top, show face of the workpieces.

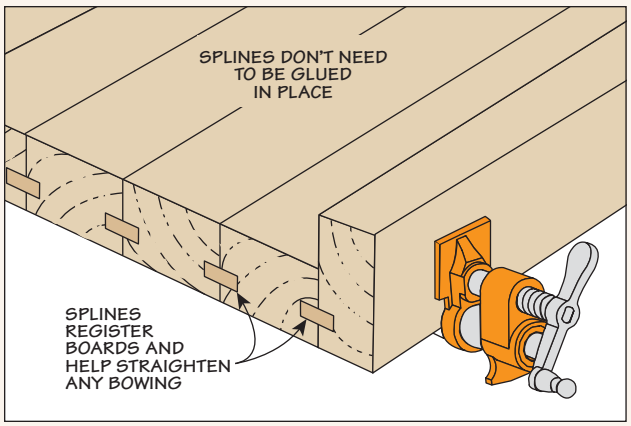
Depending on the look of the project, you can cut the spline grooves so they're visible after assembly. Or you can stop them short of the end of a workpiece and hide the splines from view.

Better Miters. While edge joints see the most action from my slot cutter, there are a couple of other joints where a slot cutter

SLOT CUTTER BIT



► ***Better Bit.*** *A high-quality slot cutter is like a bit kit. You can swap (and even stack) cutters, bearings, and shims to create a slot to suit your needs.*



Beef Up Miters. *Cutting a slot across a miter joint lets you add a spline to create a stronger joint.*

can be an essential part of creating better assemblies. One good example is when I'm cutting and fitting miters. While miters offer a pleasing appearance, they aren't without challenges.

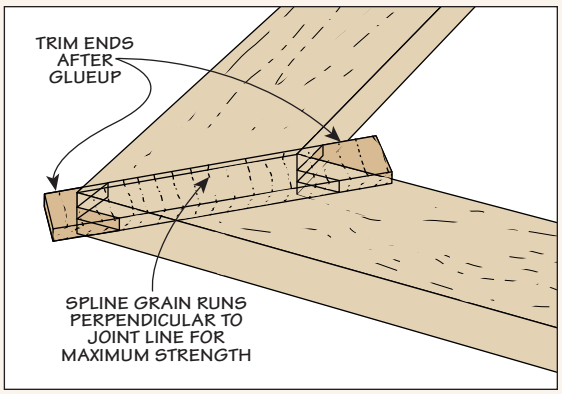
There are two issues here. The first is the glue faces of a miter joint are largely end grain, so they're not very strong. The other issue is that the angled faces make it tough to keep the parts aligned for assembly.

Using a slot cutter and spline solves both of these issues in one step. Like before, the spline keeps the parts aligned. In this case, I glue the spline in place. The additional glue surface created by the spline adds a long-grain connection.

Not all miters are the same, though. There are two basic types that you'll use: miter joints like you would see in a picture frame and joints used to make boxes. (The box below shows how to add a spline to a case miter joint.)

Frame Miters. The method to strengthen a frame is similar to long grain joints. However, the differences are important. I install the slot cutter in a router table (upper right photo). It makes routing grooves in the narrow parts easier. An MDF push block guides the workpiece past the bit and stops tearout on the back edge. The push block is cut to match the angle of the workpiece. (Here again, stop the slot short of the end if you don't want the spline visible.)

The spline also deserves some mention. Notice in the drawing



that the grain of the spline runs side to side. This way, the grain runs across the joint to add strength when it's glued in place.

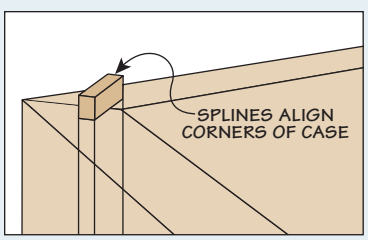
Whether it's reducing assembly hassles or strengthening joints, a slot cutter is a valuable addition to your bit collection. The result is better projects in less time.

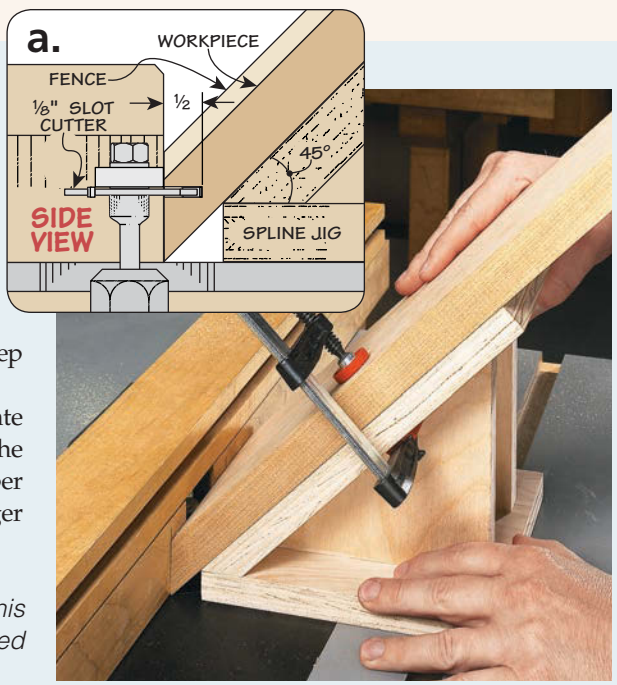
stronger Mitered Cases

Wrapping the grain of box sides around corners is a great way to add detail to a fine project. But like a frame miter, the joint still has a lot of end grain glue surfaces and may not be very strong.

The trick to adding a spline to this joint is cutting the slot square to the mitered face. The solution is an angled sled for the router table. This holds the workpiece at the correct angle so that you can rout the slot consistently. The sled has a fence along the back edge to register the workpiece and keep it square to the fence.

Detail 'a' shows how I locate the slot closer to the heel of the miter in order to rout a deeper slot. This lets me use a longer spline to create a stronger joint.





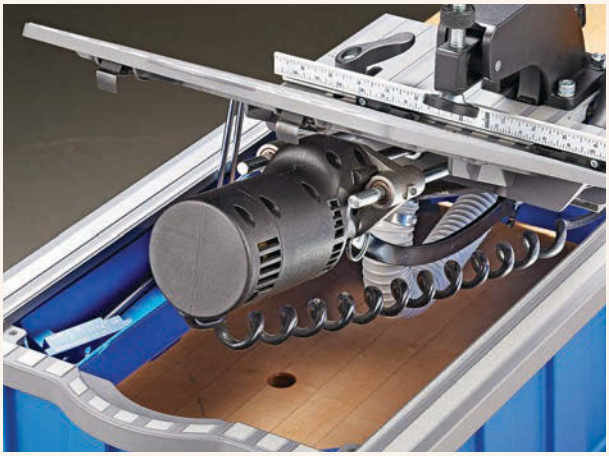
► ***An Easy-to-Build Sled.*** *This plywood sled holds a mitered workpiece for cutting slots.*

Kreg's Foreman

Pocket Hole Machine

For users of pocket hole joinery, this machine will greatly speed up the process over standard jigs.

Pocket hole joinery is the go-to method of joining wood for many woodworkers. If you use this method on a regular basis, the new *Kreg Foreman Pocket Hole Machine* can really increase your productivity over other jigs currently on the market.



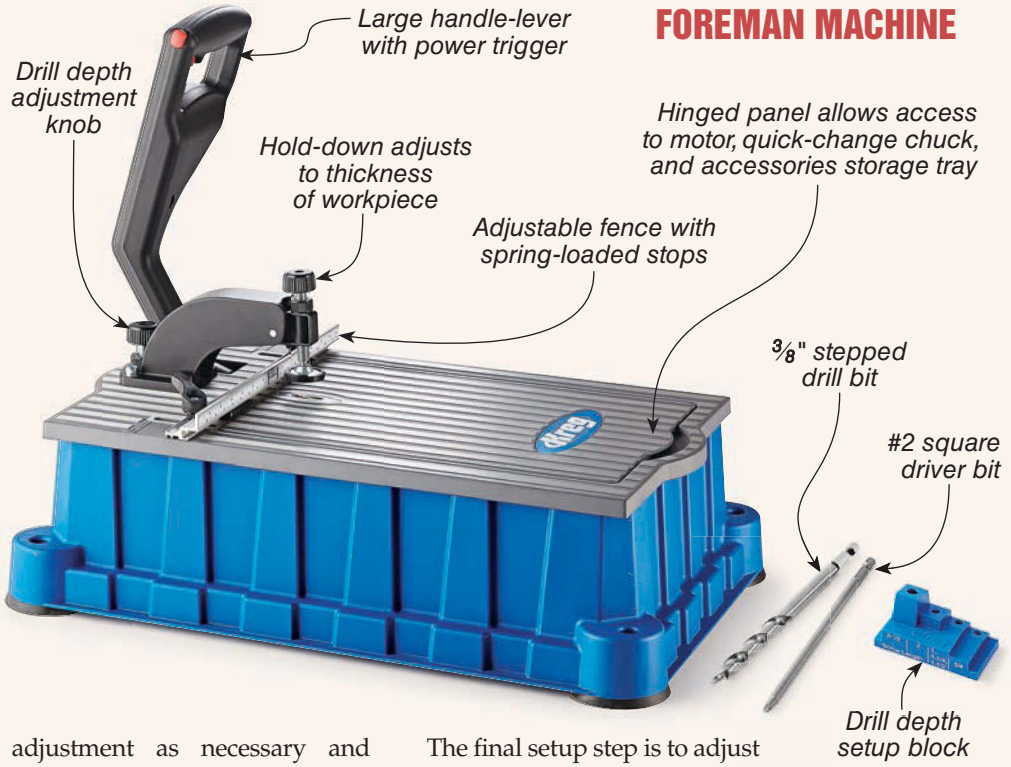
▲ ***Access Panel.*** *Simply lift the access panel and lock it in place to change the drill bit and guide, or reach the built-in accessory storage tray.*

With a standard jig, you have to position and clamp the part, then drill the pocket hole with a power hand drill. The *Kreg Foreman* is a self-contained unit that clamps the positioned workpiece and drills the pocket hole all in one smooth motion.

Features. The *Foreman* features a built-in drill motor that drives a stepped drill bit. When the machine is turned on, and the handle is pulled down, the drill extends from below the table to drill the pocket hole. The *Foreman* has a large, cast aluminum table to support wide panels and long pieces, and an adjustable fence with stops to position the workpiece. And, at $399, it's half the price of *Kreg's* other pocket hole machines (refer to sources on page 51). The *Foreman* is lightweight and compact, so it can be stowed under a bench or on a shelf to save space.

Assembly. The machine is nearly ready to go out of the box. Assembly was simple and straightforward. A dust collection port connects to a shop vacuum for which you will likely need an adapter (photo left). Hooking up the dust collection is recommended, but if you don't attach a vacuum, *Kreg* advises leaving the hose disconnected from the shroud so it doesn't clog.

The access panel in the tabletop can be leveled if necessary, but mine was already flush. I also adjusted the pressure of the quick-release fence locks.



Setup. To set up the machine, start by positioning the fence using the registration marks cast into the tabletop as shown in the upper left photo below. These are provided for ½", ¾", and 1½"-thick stock. I would like to have had marks at 1" and 1 ¼", as well. The maker recommends adjusting the fence and drilling test holes for other stock thicknesses. So you'll have to mark these yourself for future reference.

Next, you set the drill depth. To do this, pull the handle all the way down. Retract, or extend, the drill bit as necessary with the drill depth adjustment knob until the tip just touches the fence.

A setup block is provided to make the final drill depth adjustment. The block is positioned as shown in the upper right photo below. Then the drill bit is extended into the proper hole until it contacts the drill bit shoulder. Fine-tune the depth adjustment as necessary and tighten the jam nut. The manual provides a screw length selection guide, but it would be helpful to have one right on the machine.

The final setup step is to adjust the hold-down clamp shown in the lower left photo below. First, you fully raise the control arm and place your workpiece against the fence. Then turn the clamp adjustment knob until it just contacts the workpiece. The manual says to back it off a half turn, but I found I needed a little more pressure than that when drilling harder woods. Another jam nut locks the hold-down clamp securely in place.

The two adjustable stops provide precise positioning. They are locked in place and have spring-loaded fingers that retract when they're not needed. In addition, there are markings on the fence to indicate the minimum recommended distance to drill a hole from the edge of the piece (lower right photo).

Operation. To use the machine, you simply set the work in place, pull the trigger, and pull down on the handle. Not having to fiddle with clamps or a hand drill really speeds up the process. The *Foreman* has plenty of power and dust removal is efficient.

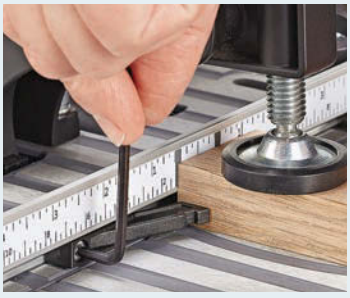
If you use pocket screw joinery a lot, this machine is definitely worth a closer look.

setting up the Foreman Machine

▲ ***Fence.*** *Registration marks are provided to set the fence for the wood thickness.*

▲ ***Drill Depth.*** *A block is provided for setting drill depth based on the screw length.*

▲ ***Hold-down.*** *After the initial adjustment, the hold-down engages as the hole is drilled.*



▲ ***Stops.*** *Retractable stops can be set to position holes anywhere on a workpiece.*

▲ ***Optional Accessories.*** *The bit supplied will handle most situations, but other sizes are available.*

uses for Foam

Humble foam has a lot of valuable uses in the shop. Here are a few favorites.

Woodworkers by and large are a creative bunch. We're constantly finding new and unique ways to use different materials in the shop. And one of those materials is foam. Over the years, we've seen some pretty handy tips for using foam in the shop. But as you'll soon discover, there are different types, each with its own strengths and weaknesses.

Closed-Cell Foam. In simple terms, foam falls into two categories: open-cell and closed-cell. Open-cell foam is the soft foam typically used for things like mattress toppers and padding in upholstered furniture.

Closed-cell foam is the more dense or rigid foam. The white *Styrofoam* material often used as packing material and in disposable cups is considered a closed-cell foam. The problem is, for shop use, it's messy to work with. Instead, I use other varieties of closed-cell foam as shown in the photos on these two pages.

▲ ***Custom Blocks.*** *Sanding curved profiles is hassle-free with a matching extruded polystyrene sanding block.*

▲ ***Seal Off Openings.*** *Craft foam is useful for sealing off openings, as on this table saw, for more efficient dust collection.*

Extruded Polystyrene. One of the most popular types of foam is extruded polystyrene. It's the type used in the rigid sheets of pink or blue insulation you find at home centers. For cutting sheet goods down to rough size for project parts, it makes a great backer board, as shown in the main photo above.

It's easy to form shapes in this foam with typical woodworking tools. With a band saw, you can cut curved shapes to make a sanding block, for example (lower left photo). Other options for cutting foam are shown in the box on the opposite page.

EVA Foam. Another useful foam in the shop is ethylene-vinyl acetate (EVA). You might know it better as craft foam. You can find it at hobby suppliers.

EVA foam is available in a range of thicknesses and sizes. Some sheets come with an adhesive backing. I use that to seal gaps in my table saw for better dust collection (near left photo).

▲ **Plugs.** *Prefinishing parts makes the finishing process easier. Plug openings with backer rod to keep out finish.*

▲ **Custom Drawer Liners.** *The density of polyethylene helps it to retain its shape, but it's also easy to cut. Here, I used a knife to cut out custom recesses for my tools to keep them organized and in place.*

Polyethylene. One common type of closed-cell foam you may already be familiar with is polyethylene. Some computer and electronics manufacturers use it to protect their products during shipping. It's a spongy type of foam that bounces back to shape when compressed.

I use backer rod (a type of polyethylene) to plug mortises when prefinishing project parts before assembly. You can see what I mean in the left photo above.

Polyethylene is easy to cut with a hobby knife. This makes it great for custom drawer liners, as in the upper right photo.

Balsa-Foam. A unique foam I recently came across is called *Balsa-Foam*. It's used a lot in model making and for building sets for model railroading. You can find it at major art suppliers.

Balsa-Foam is a lightweight but rigid, phenolic-based foam available in different densities. It's great for prototyping a design for parts such as drawer pulls or the saw handle shown in the photo at right. It shapes easily with rasps and sandpaper.

Using foams in your shop can solve some unique problems. It pays to understand and put these versatile materials to use.

▲ **Balsa-Foam.** *This lightweight foam cuts and shapes easily. Use a band saw or coping saw to cut it to rough shape, then smooth it with rasps.*

tools for Working With Foam

Working with foam is easy. For making straight cuts, use a utility knife with snap-off blades (left). Extend the blade to cut through the material in one pass.

A hot wire knife (right) is used to create custom shapes. Most hobby stores carry them. (The one shown here requires a separate transformer.) You can bend the wire into almost any shape to melt through the foam. To avoid harmful fumes, use it in a well-ventilated area.

▲ **Easy Shaping.** *A hot-wire knife melts away the foam for clean cuts.*

fold-flat Sawhorses

A unique design transforms a single piece of plywood into sturdy, versatile shop helpers.

▲ ***Low Profile.*** *The sawhorse folds flat into an easy-to-carry panel size. It also doesn't take up much space in your shop.*

A set of good sawhorses is an essential part of any workshop. You can use them to create a temporary surface for assembly and finishing, break down sheet stock and long boards, or even serve as a short-term lumber rack.

Many sawhorse designs take up a lot of space. So I'm always on the lookout for one that's compact but still rugged enough for heavy use. The version you see here is tough to beat. The idea came from a space-saving folding chair design.

Each one is cut from a single piece of ¾" plywood and folds out into a solid A-frame shape. To set them up, swing out the short leg and flip up a shelf that locks onto horns in the long leg.

Careful Layout. The most challenging part of these sawhorses is the layout. Before you pick up

a saw, you need to transfer all the layout lines from the drawings at right to your plywood blank.

Simple Hinges. The three parts of each sawhorse are linked by steel pins in shallow recesses. It pays to cut the recesses for these now in order to guarantee dead-on alignment down the road.

Figure 1 shows how to cut the recesses with a hand-held router and a straight bit. The router is guided by a hardwood straightedge. For the strongest joint, I located the recesses on the back face of the blank. With this arrangement, the stress on the pins bears against the plywood legs and not the plugs when the sawhorses are loaded up.

While you have the router out, you can also hollow out a tray in the front face of the shelf. This is shown in the lower drawing at right. The tray keeps small items from rolling onto the floor.

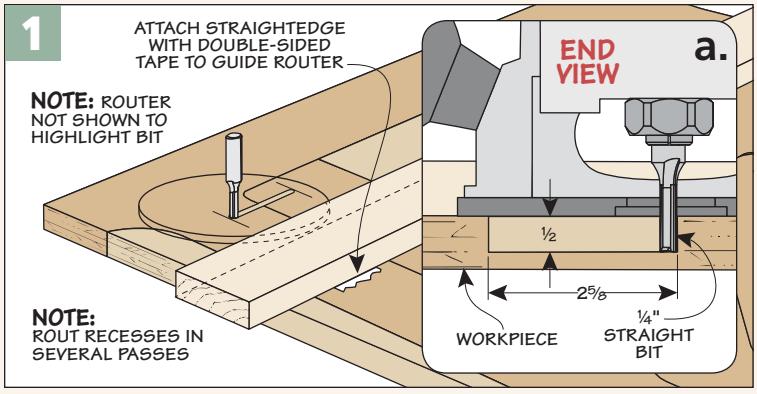
Jig Saw Work. Cutting out the three parts from a single blank is a perfect job for a jig saw. I did drill a few holes, though. Some line up with inside radii and provide a starting point for the saw blade. Another pair of holes is drilled in the shelf. These slip over the horns to set up the sawhorse.

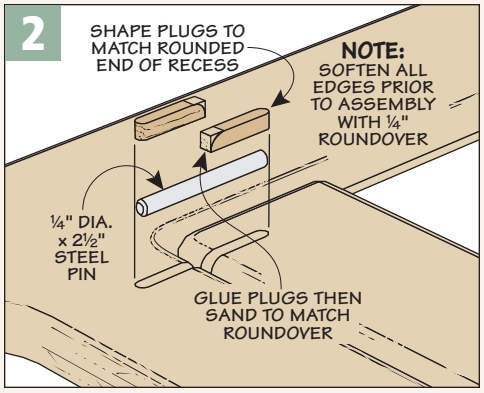
Speaking of the blade, I chose one designed to leave a smooth cut edge. It's also a good idea to turn off the orbital action on the saw and work as close to the layout lines as possible. Take a little time sanding and straightening the cut edges. Then ease the edges with a slight roundover.

After cutting the pieces apart, it's time to bring them together. This involves cutting steel rod to fit the recesses you routed earlier (Figure 2). The pins are covered with hardwood plugs. Find out how to make them on page 33.

There's one final detail to mention. The horns in the long leg may not fit into the holes in the shelf. So you'll need to do some fine-tuning with a file. For the sawhorse to be sturdy, you want a snug fit. Go easy removing material and test the fit often.

These sawhorses take up very little space when stored. But they're just so handy that they'll spend more time set up and in use in your shop.



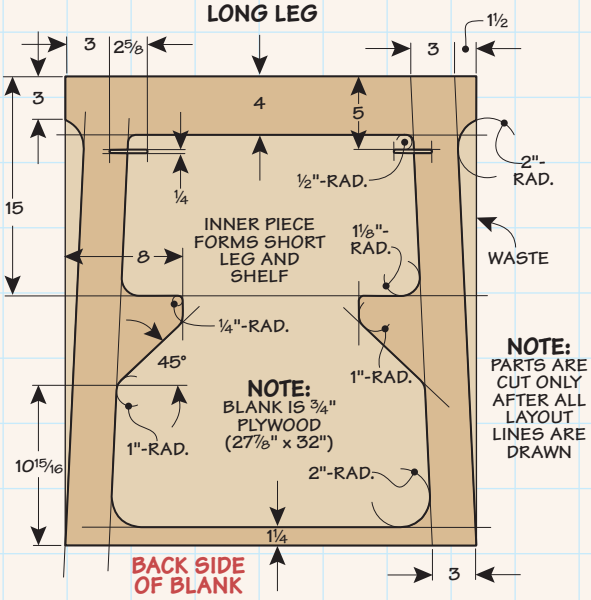


ShopNotes GO ONLINE EXTRAS

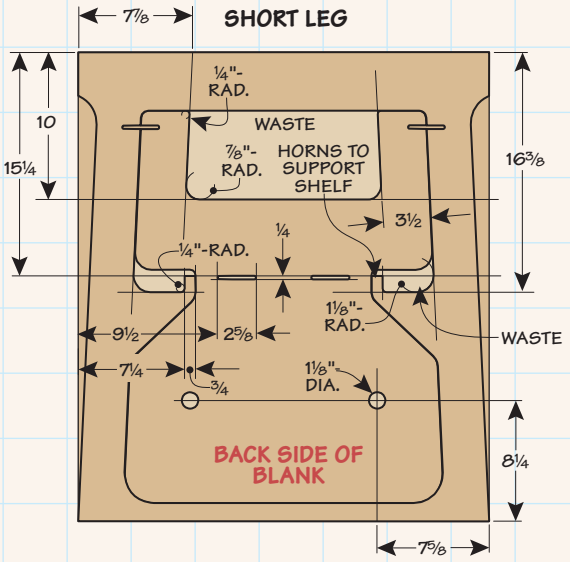
To download a free cutting diagram for the sawhorses, go to: ShopNotes.com

LAYOUT PATTERNS

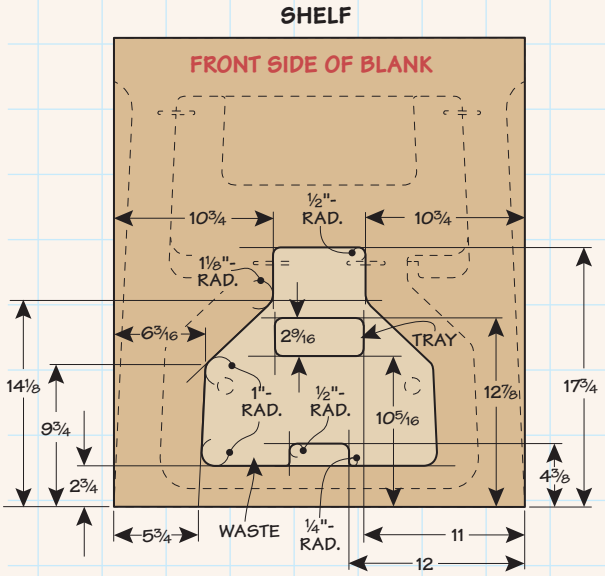
LONG LEG



SHORT LEG



SHELF



NOTE: TRAY IS ¼" DEEP

sliding Saw Table

Take the guesswork out of making square cuts on large panels with this must-have table saw add-on.

Sliding tables are usually found on large, industrial table saws used for panel-cutting. And there's a good reason for that. A sliding table guarantees precision cuts, particularly on wide panels.

With the sliding table shown here, you can upgrade your ordinary table saw to make square crosscuts every time. The table replaces a wing on your saw's table. You may have to shorten or move the fence rails, but this modification is worth it.

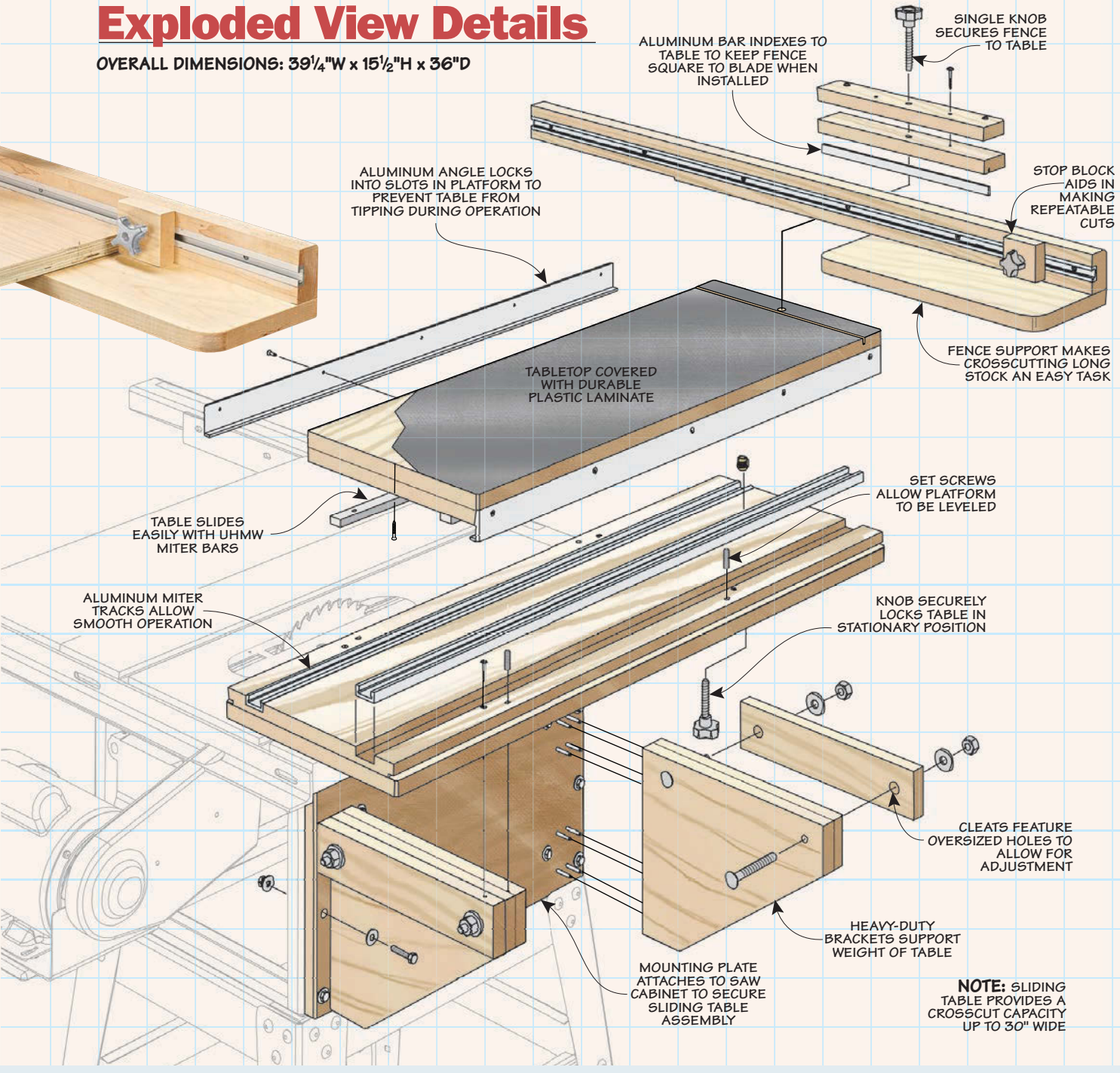
The sliding table has the capacity to crosscut a 30"-wide panel with ease. The fence automatically registers square to the blade when installed and can be easily removed. This fence also features a side support to help when crosscutting long stock. (For a dedicated outrigger support, turn to page 22.)

If you've been looking to improve the accuracy and capacity of your table saw, this sliding table is the perfect reason to get out in the shop and do so.

Locked. *To use the sliding table as a stationary wing for basic cuts, lock it in place with a knob located underneath.*

Exploded View Details

OVERALL DIMENSIONS: 39¼"W x 15½"H x 36"D



Materials & Hardware

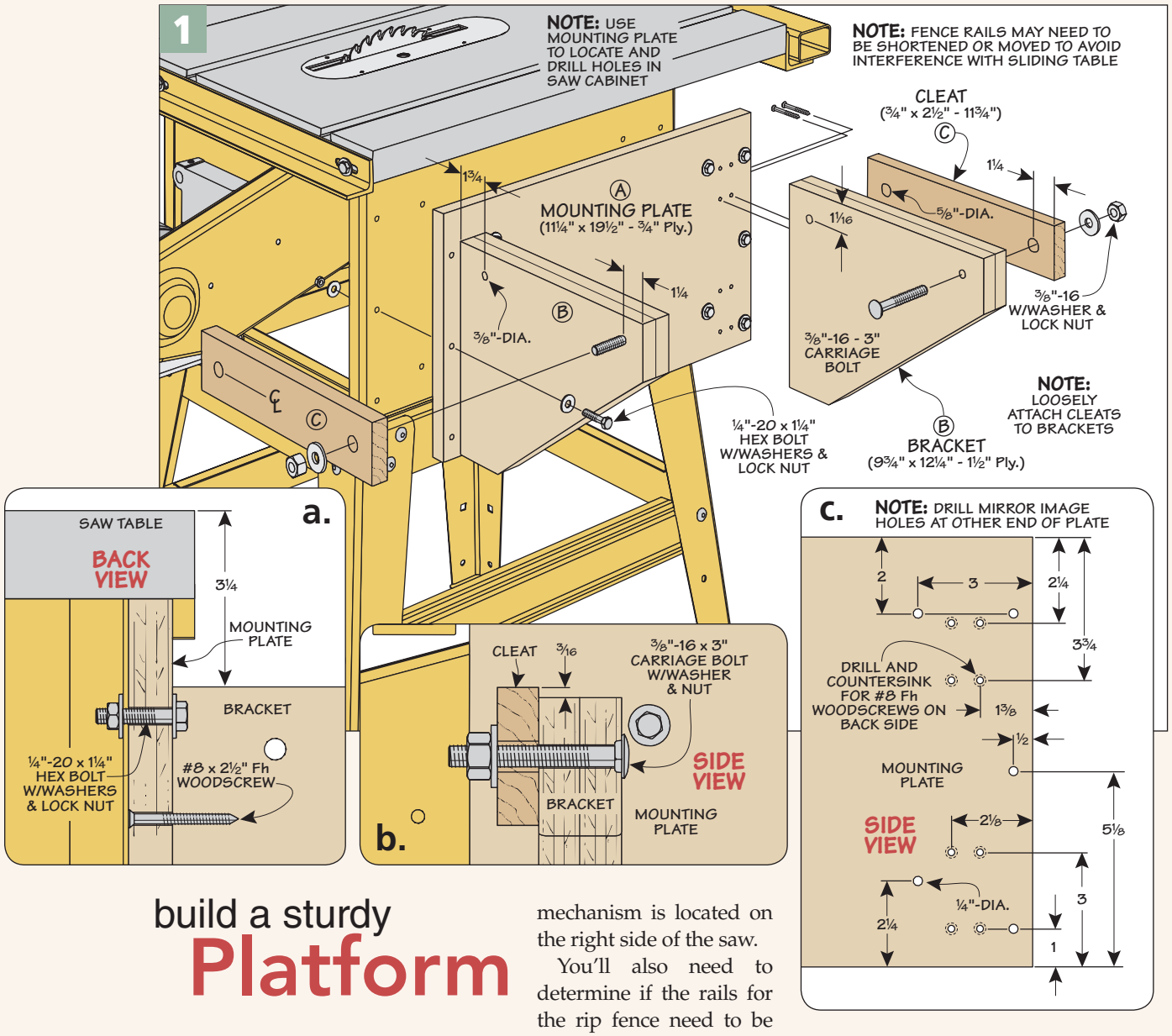
SLIDING TABLE

A	Mounting Plate (1)	11¼ x 19½ - ¾ Ply.
B	Brackets (2)	9¾ x 12¼ - 1½ Ply.
C	Cleats (2)	¾ x 2½ - 11¾
D	Platform (1)	12 x 36 - 1½ Ply.
E	Table (1)	12 x 30½ - 1½ Ply.

FENCE ASSEMBLY

F	Fence Base (1)	¾ x 2 - 12
G	Mounting Block (1)	¾ x 2 - 12
H	Fence (1)	1¼ x 2 - 39⅛
I	Stop Block (1)	¾ x 1⅞ - 2
J	Fence Support (1)	¾ x 6 - 14

- (22) #8 x 2½" Fh Woodscrews
- (10) ¼"-20 x 1¼" Hex Bolts
- (20) ¼" Washers
- (10) ¼"-20 Lock Nuts
- (4) ⅜"-16 x 3" Carriage Bolts
- (4) ⅜" Fender Washers
- (4) ⅜"-16 Lock Nuts
- (4) 5/16"-18 x 1½" Nylon Set Screws
- (2) 5/16"-18 Threaded Inserts
- (7) #8 x 1½ Fh Woodscrews
- (4) #7 x 1¼ Washerhead Woodscrews
- (1) ¼"-20 x 1½" Flange Bolt
- (10) #8 x ¾" Ph Sheet Metal Screws
- (15) #6 x ⅝" Fh Woodscrews
- (2) 48" Miter Tracks
- (1) 48" Mini T-Track
- (2) ¾" x ⅜" x 36" UHMW Miter Bars
- (2) 5/16"-18 x 3" Star Knobs
- (1) ¼"-20 Insert Knob
- (2) ⅛" x 1½" - 36" Aluminum Angles
- (1) ⅛" x ½" - 12" Aluminum Bar
- (1) 14" x 36" Plastic Laminate



build a sturdy Platform

Before building the sliding table for your table saw, there are a few things to consider. The sliding table was designed to replace the left wing of the table saw. This assumes that the blade tilt mechanism is located on the right side of the saw.

You'll also need to determine if the rails for the rip fence need to be moved or modified. On my saw, I cut the rail flush with the edge of the main table. This provides clearance for the table to slide. You may be able to drill new mounting holes in the rail and reposition it so it's not in the way of the sliding table.

With those preliminary tasks done, it's time to start building the supporting structure. It starts with the mounting plate.

Plate & Brackets. There are a couple of things to note when making the mounting plate. First, ensure the mounting holes don't interfere with any wiring or mechanisms inside the saw cabinet. I had to form a notch in the plate to get around some wiring on the saw cabinet, as shown in the photo at left.

Before mounting the plate, build a couple of brackets to support the sliding table. For strength, they're made from two layers of ¾" plywood and then cut to shape (Figure 1). Two holes at the top are used to attach the cleats that support the platform.

To locate the brackets on the mounting plate, I temporarily attached the plate to the saw with double-sided tape. After measuring down from the top of the saw table to locate the brackets (Figure 1a), remove the plate and attach the brackets with screws from the back side. It's important that the brackets are

Notched Mounting Plate. *Avoid obstructions by cutting relief notches in the mounting plate.*

square to the plate and parallel to one another before installing the plate assembly.

At this stage, you're ready to permanently attach the mounting plate to your saw. Use the holes in the plate to mark and drill the holes in the saw cabinet for the bolts that hold it in place.

Adjustable Cleats. The platform on which the sliding table rides rests on a pair of cleats. Figure 1 shows that the cleats are pretty simple to make. Cut them to size and drill a pair of oversized holes. These holes allow for some adjustment to make the sliding table level and parallel when you attach the platform and sliding table later on.

Loosely attach the cleat to the brackets with carriage bolts, washers, and lock nuts. Snug them up by hand but don't fully tighten them just yet.

Platform Construction. Now that the mounting plate and brackets are solidly mounted on the saw, it's time to concentrate on the platform that sits on top. It serves as the base for the sliding table (Figure 2).

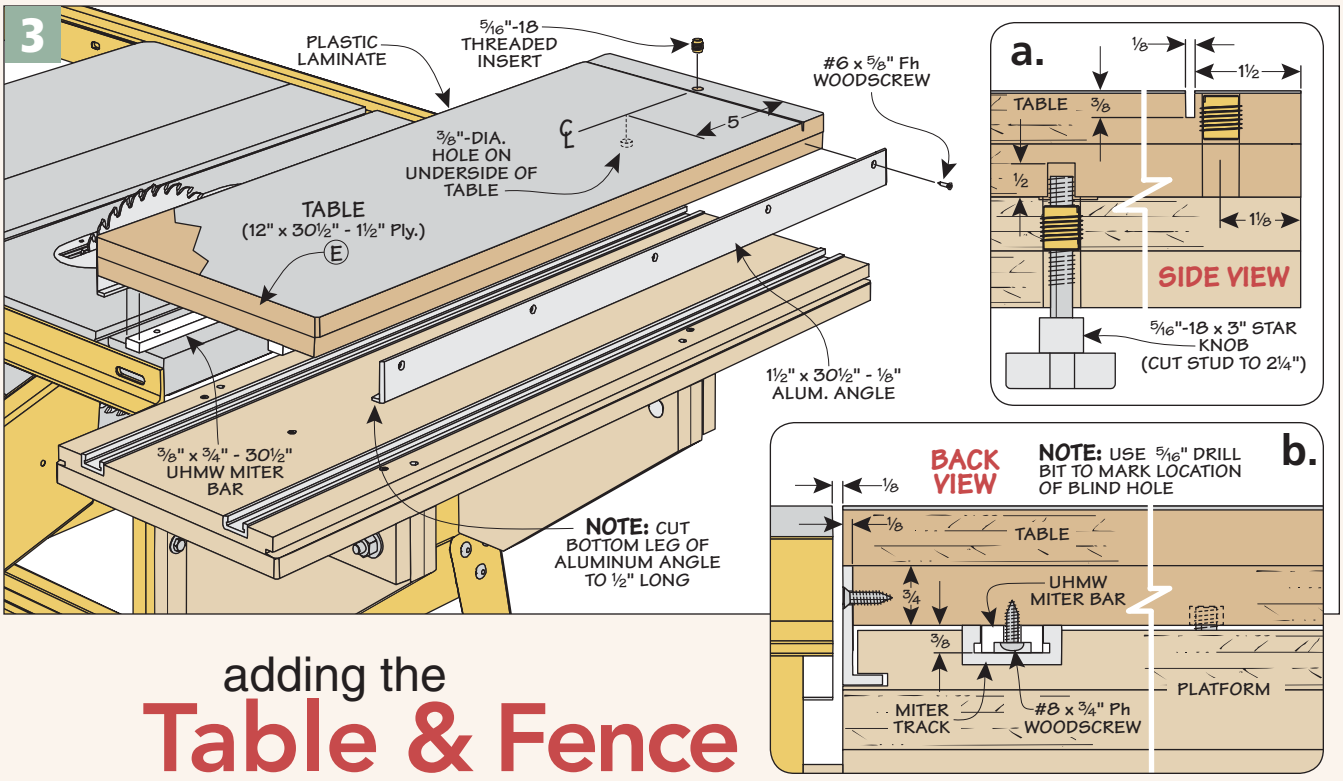
Start by gluing up two layers of plywood. After you cut the platform to size, it requires a little work at the table saw. The first task is to cut a pair of grooves for the miter tracks, as in Figure 2c. Note that the grooves aren't as deep as the thickness of the miter tracks. The miter tracks sit proud to provide clearance so that the sliding table can glide easily.

A pair of glides made from aluminum angle keeps the sliding table from tipping during use. These guides run in grooves cut into the sides of the platform (Figure 2c). After cutting the grooves, you'll need to trim the top long edge of the platform to provide clearance for the aluminum angle. This allows the table to slide smoothly.

Drilling Holes. There are a few holes to drill in the platform. Six countersunk holes are used to attach the cleats later. To mark their location, I placed the platform on the cleats, flush with the front edge of the saw.

There are four holes that are drilled and tapped for long set screws (Figures 2 and 2b). These are centered on the brackets and used to level the platform after the table is installed. Finally, install a threaded insert for the knob that locks the table in position.

With this done, install the two miter tracks with screws through countersunk holes.



adding the Table & Fence

The platform is complete except for fastening it to the cleats. You'll wait to do this after the sliding table is ready to install.

Sliding Table. Like the platform, the sliding table is made from two layers of plywood cut to final size (Figure 3). Plastic laminate on the top adds durability and allows the workpiece to slide smoothly over it when it's locked in place. I used spray adhesive to attach the laminate and then trimmed it with a router and flush-trim bit.

There are a couple of tasks to do at the table saw. You can see in Figure 3a a narrow kerf cut in the top of the table at one end. This is used to index the fence square to the blade when it's installed. And there are shallow rabbets cut along the long edges of the sliding table, as shown in Figure 3b. This provides a recessed surface to mount the aluminum angle runners flush with the edges of the sliding table.

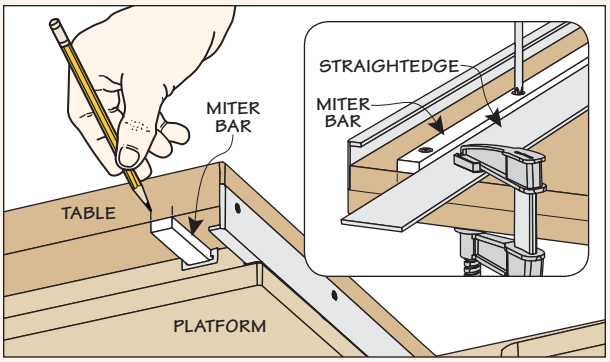
The next thing to do on the table is install a threaded insert. It's used to attach the fence with a studded knob (Figure 3a).

Angle Runners. Making the aluminum runners requires just a couple of steps. One of the legs of each angle needs to be cut shorter to fit into the grooves in the sides of the platform. After cutting the angle to length, use a carbide blade in your table saw for the ripping operation. Just make sure to wear safety goggles and take it slow and steady through the cut. File all of the cut edges smooth before installing the runners on the sliding table with screws, as shown in Figure 3b.

Miter Bars. A pair of UHMW miter bars allow the table to slide smoothly in the miter tracks. There are a couple of tricks I learned when installing them. After cutting the bars to length, drill oversized, counterbored holes for the screws. Place the bars in the miter tracks and then slide the table into position over the platform. The aluminum runners should slide into the slots in the platform. After making sure the outside edges of the platform and table are flush, mark the location of the miter bars at each end of the sliding table. The illustration on the lower left shows how I did this.

The plastic miter bars are pretty flexible. To keep them straight while fastening them to the sliding table, the detail drawing at left shows the process I used.

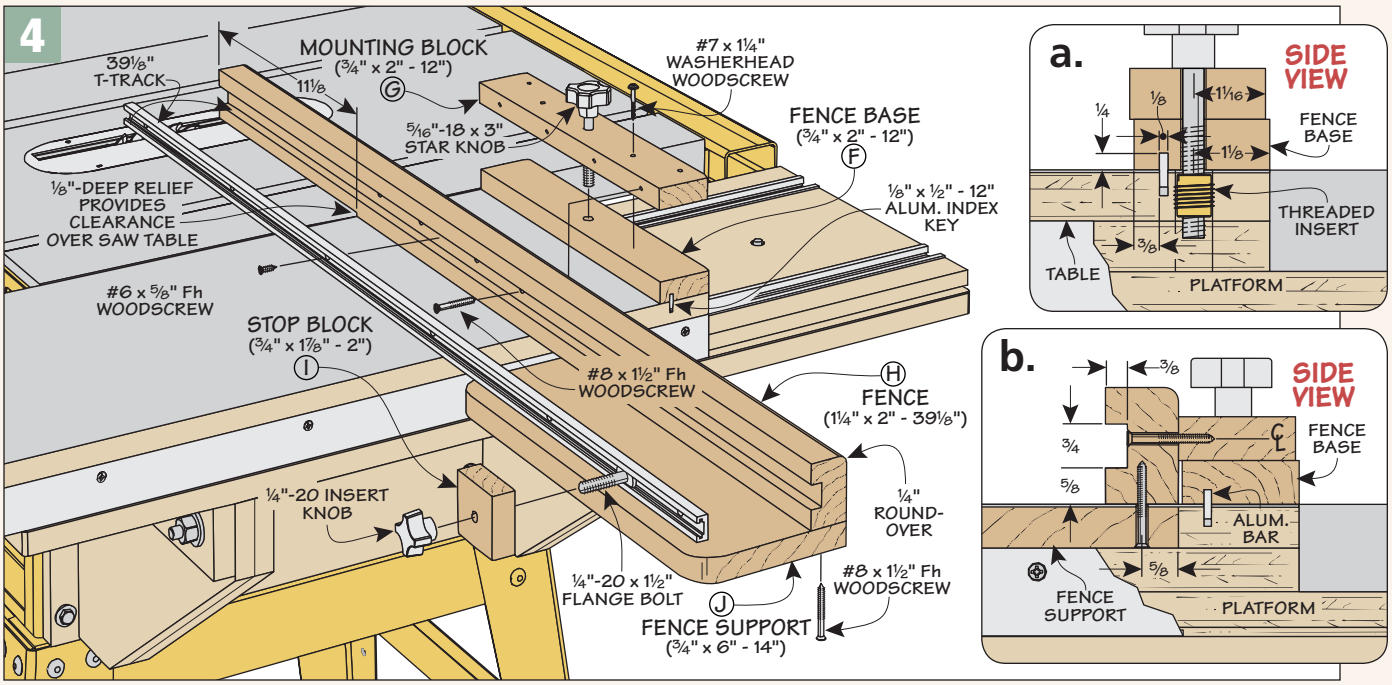
Final Adjustments. The box on the opposite page steps you through the process of positioning the table and platform, leveling them, and installing the cleats. In the end, the sliding table should be flush with the top of the saw table and slide smoothly parallel to the saw blade.

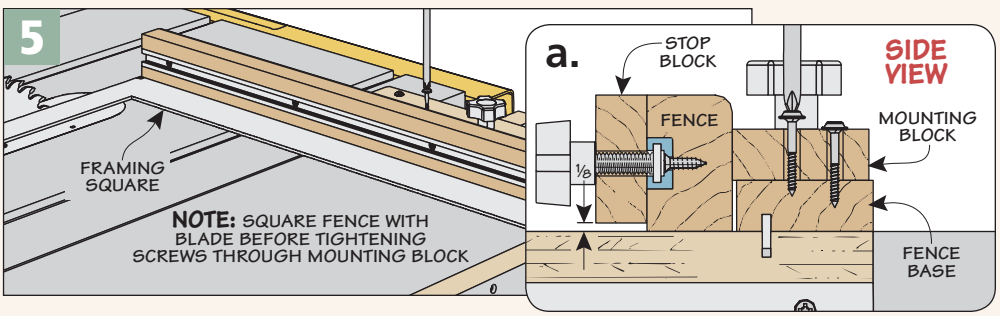


▼ ***Miter Bars.*** *Mark the location of the miter bars at each end. Connect the marks with a straightedge while installing the bars with screws.*

FENCE

The last piece to add is the fence. Figure 4 shows how it's put together. The fence is attached to a mounting block, which in turn is fastened to the fence base.





Simple Construction. The mounting block and fence base are identical in size. I cut a kerf on the bottom of the base for the aluminum index key (Figure 4a). It's secured with epoxy. I positioned the base on the table to mark the location for the locking knob using a drill bit from the underside of the table. I also drilled oversized holes in the mounting block that are used to attach it to the base later.

T-Track Fence. Figures 4 and 5 show the specifics on building the fence. It's a single piece with a groove for a T-track. For dust relief, I cut a shallow notch on the bottom edge in the area that rides over the table saw (Figure 4).

Assembly. Now set the mounting block on the base and butt the fence against it. Locate and drill holes in the T-track groove and then fasten the fence to the mounting block. Finally, use a framing square to set the fence square to the blade before fastening the mounting block to the base with washerhead screws.

All that's left is to add a simple stop block and fence support. The stop block is sized to provide dust relief under it. The fence support is simply fastened with screws to the bottom of the fence.

After making some test cuts, you'll soon appreciate how a sliding table can improve your woodworking joinery.

Aligning the Sliding Table

▲ ***Fasten Cleats.*** *Loosely attach the cleats until after the table is level and parallel.*

▲ ***Leveling.*** *Use a straightedge to make the sliding table flush with the saw table by adjusting the set screws.*

▲ ***Parallel.*** *Before fastening the cleats to the platform, use a framing square to create space between the sliding table and saw.*

table saw Outrigger

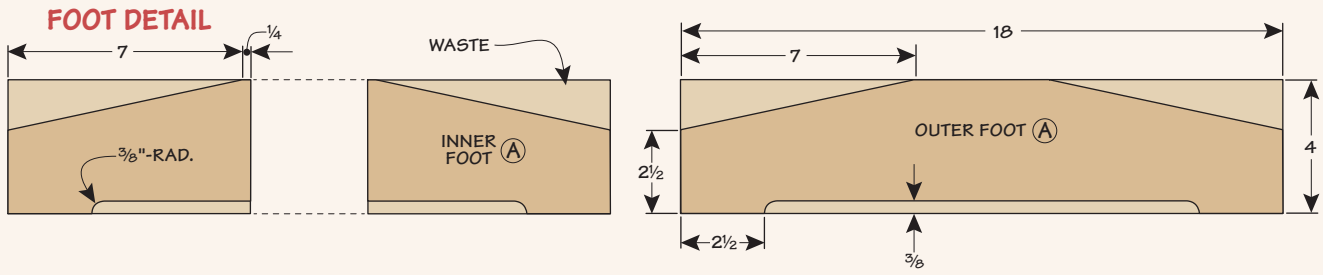
Ripping or crosscutting a long board is an easy task with this table saw sidekick.

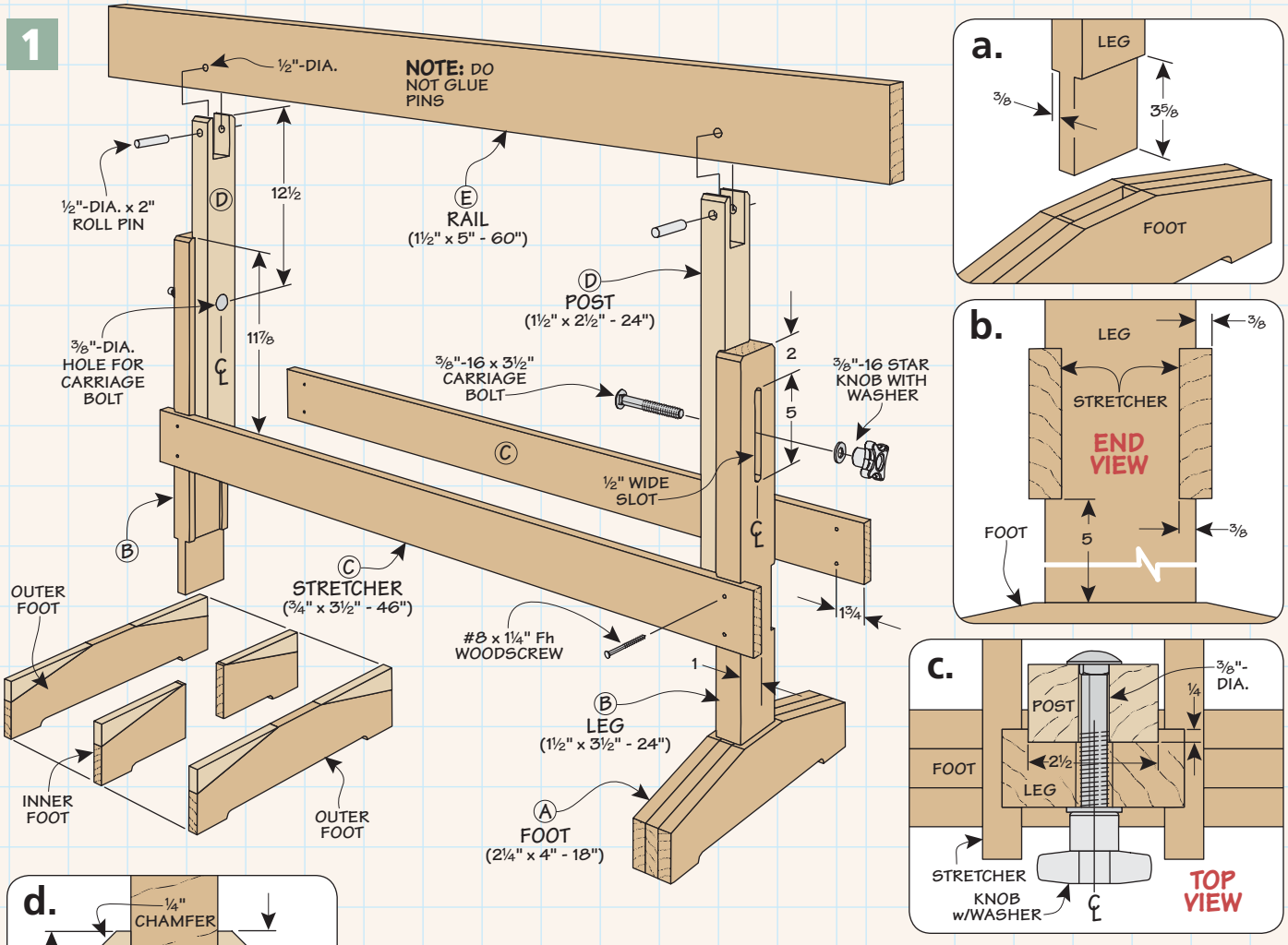
Supporting the end of a long board when crosscutting or ripping makes for a safer, more accurate cut. The outrigger you see above can be placed to the side of your saw to lend a hand when crosscutting. Or place it at the back of your saw to support a long board when ripping it.

Adustable Height. The outrigger features a pair of posts that ride in wide, shallow grooves on the inside of the legs. This allows you to adjust the height of the rail to match your table saw. A pin at each end of the rail allows it to pivot slightly to account for uneven floors.

Built-Up Feet. You'll start by building the feet. They're glued up from three layers of ¾" stock. The middle layer is in two segments to form an open mortise, as you can see in the drawings below. I used a waxed spacer during glueup to form the mortise. Then once the glue dries, cut the shape at the band saw and sand it smooth.

Slotted Legs. The legs are made from "two-by" material. A tenon on one end fits into the foot, as shown in Figure 1a. While the dado blade is installed on the saw, cut a notch on each





edge to hold the pair of stretchers, as you can see in Figure 1b.

As I mentioned, the height of the outrigger is adjustable. The legs play a key role in this adjustability. It starts with cutting the wide groove on the inside face for the sliding post. I also routed a slot to accommodate the hardware that is used for adjustment, as illustrated in Figure 1c.

Once all that's done, glue the legs into the feet and add the stretchers. They're simply cut to size and fastened with screws.

Posts. The posts are also made from "two-by" stock ripped to width to fit the groove in each of the legs. At the drill press, I drilled the hole for the carriage bolt and the hole through the end for the roll pin. Step over to the band saw to cut the notch in the end of the post that houses the horizontal rail.

Assemble the posts to the legs with the simple hardware shown in Figure 1. Now it's time to turn your attention to making the final piece — the rail.

Rail. The only thing to do to make the rail besides cut it to size is drill a hole at each end for the roll pins. (These pins can be found at the hardware store.) I located the holes so there would be ⅛" of clearance between the bottom edge of the rail and the bottom of the notch in the posts when the roll pins are in place.

Using the Outrigger. Now you can put the outrigger to use. For crosscutting, place it to the side of the saw so that the end of the board is supported throughout the cut. When ripping, the top of the rail should sit slightly below the saw's table at the outfeed end. This ensures the board won't catch on the outrigger. For cutting sheet goods, you may want to build a second one to provide maximum support.

Materials & Hardware

A	Feet (2)	2¼ x 4 - 18	• (8) #8 x 1¼" Fh Woodscrews
B	Legs (2)	1½ x 3½ - 24	• (2) ⅜"-16 x 3½" Carriage Bolts
C	Stretchers (2)	¾ x 3½ - 46	• (2) ⅜" Washers
D	Posts (2)	1½ x 2½ - 24	• (2) ⅜"-16 Star Knobs
E	Rail (1)	1½ x 5 - 60	• (2) ½"-dia. x 2" Roll Pins

multipurpose Lumber Center

This lumber rack has room for much more than boards.

As I searched for a board in my lumber rack a while ago, I happened to notice how much empty space there was between the stacks. I decided that space could be put to much better use, so I came up with this multifunctional lumber storage center.

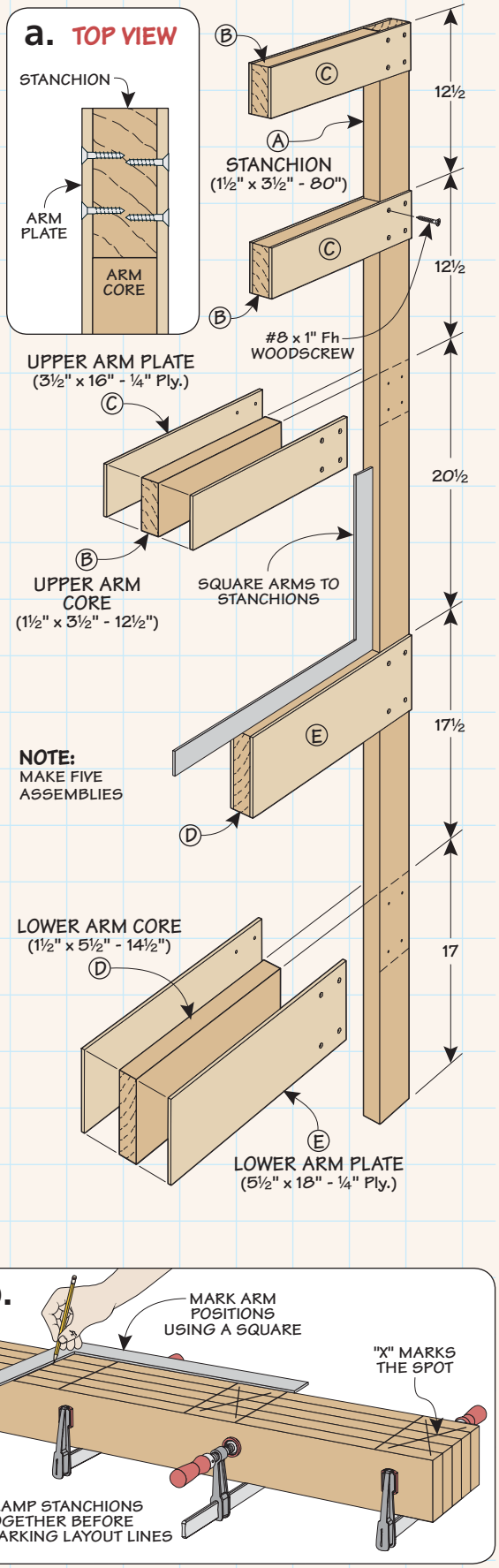
As you can see from the photo, this lumber center not only provides plenty of storage for boards of various lengths and widths, but it also keeps cutoffs and shorter stock well organized. There are deep, removable drawers for tools and supplies, as well.

Another nice feature is the addition of a worksurface with a built-in miter saw. I used to have to tote unwieldy boards across the shop to rough cut them but now I can make those cuts on the spot.

The rack is made of dimensional lumber and plywood available at any home center. The supports will safely hold a good-sized supply of lumber. Most of the weight rests on the floor, and it's kept upright by screwing it to the wall studs.


DEWALT

FIGURE 1



cutting all the Parts

The design of the lumber center is simple. It's essentially made up of a series of posts or stanchions. Attached to these are several horizontal arms that support the lumber and provide a place for mounting some storage drawers.

Stanchions & Arms. Each upright is made up of a solid wood stanchion and arms. The arms consist of a lumber core sandwiched and glued between two plywood arm plates.

I started by planing all the stanchion and arm cores to uniform thickness, and cutting them to length and width. Then I cut the arm plates to size and glued them to the cores.

Next, I laid all the stanchions on the floor so the ends were flush and clamped them together. Measure for the locations of all the arms and mark across the edges using a square. It helped me to draw an "X" where I wanted them positioned (Figure 1b). Now attach the arms with screws through the plates (Figure 1a). Check each one to make sure it's square with the stanchion, as shown in Figure 1.

BUILD THE SHELVES

In addition to minimizing the weight, partially assembling the unit on the floor makes it easier to attach the skins to the shelves. You'll be able to get your driver into tight spots and not have to fight gravity so much. You may also want to consider how you'll lift the unit into place against the wall. I built mine so the top shelf was closest to the wall to minimize maneuvering a heavy assembly into place.

I began by cutting the skins to size as shown in Figure 2, utilizing a similar technique for cutting the notches that fit around the stanchions, that I used for laying out the arms. After clamping them together, you can cut all the notches at the same time

Materials & Hardware

A	Stanchions (5)	1½ x 3½ - 80
B	Upper Arm Cores (15)	1½ x 3½ - 12½
C	Upper Arm Plates (30)	3½ x 16 - ¼ Ply.
D	Lower Arm Cores (10)	1½ x 5½ - 14½
E	Lower Arm Plates (20)	5½ x 18 - ¼ Ply.
F	Top Shelf Skin (1)	16 x 96 - ½-Ply.
G	Upper Shelf Skins (5)	16 x 96 - ½ Ply.
H	Lower Shelf Skins (4)	18 x 96 - ½ Ply.
I	Upper Shelf Short Cleats (3)	¾ x 3½ - 20
J	Upper Shelf Long Cleat (1)	¾ x 3½ - 26
K	Lower Shelf Short Cleats (6)	¾ x 5½ x 20
L	Lower Shelf Long Cleats (2)	¾ x 5½ x 26
M	Narrow Drawer Fronts/Backs (12)	¾ x 5⁷/₁₆ - 19⅞
N	Wide Drawer Front/Back (2)	¾ x 5⁷/₁₆ - 25⅞
O	Drawer Sides (14)	¾ x 5⁷/₁₆ - 16¾
P	Narrow Drawer Bottoms (6)	16 x 18⅞ - ¼ Ply.
Q	Wide Drawer Bottom (1)	16 x 24⅞ - ¼ Ply.
R	Saw Platform Front/Back (4)	1½ x 3½ - 26
S	Saw Platform Sides	1½ x 3½ - 16½
T	Saw Platform Top (1)	19½ x 26 - ½ Ply.

- (12) 3" Power Pro Lag Screws
- (200) #8 x 1" Fh Woodscrews
- (256) #8 x 1½" Fh Woodscrews
- (84) #8 x 1¼" Fh Woodscrews
- (8) #10 x 2½" Fh Woodscrews

with a circular saw (Figure 2a). In addition to saving a lot of time, it results in notches that are more consistent. (Note that the top shelf skin doesn't have notches.)

Next, I pre-drilled the holes in the skins and partially threaded in the screws to fasten them to the arms. This helps to locate the screws and hold them in place to get them started.

Fasten the lower shelf skins to the arms first, taking care to square each arm to the skins' front edge before driving the screws (Figure 3). Now you can cut the cleats to size and attach them through the bottom shelf skins. (Note that there are no cleats in the second and third highest shelves). The assembly is now rigid enough to lift in place.

Clearance, Level & Plumb. But before you do, you'll want to locate the studs in the wall. (Note: If you're installing the rack against masonry, you will have to install cleats on the wall first, using special masonry anchors).

Next, you'll want to locate the high and low spots on the floor and wall. Locating these now will help you level the entire unit once it's upright.

I started at the floor by laying a straight, 8'-long board on the floor along the wall and placed a carpenter's level on its edge. Raise one end of the board until it's level, then mark the highest part of the floor, as well as any dips or high spots.

Finally, check the wall for plumb by holding a level vertically at the stud locations and mark any dips or high spots. As I'll explain later, you may need to use shims once the rack is up.

FIGURE 2

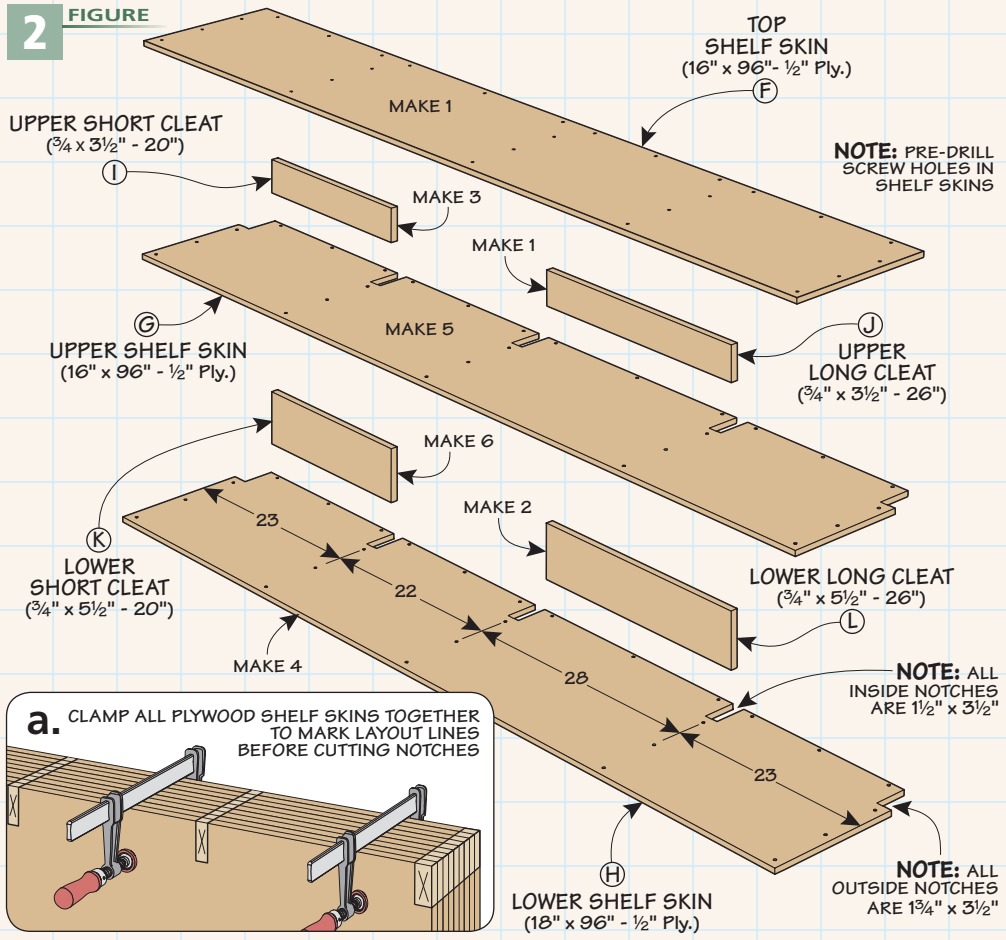
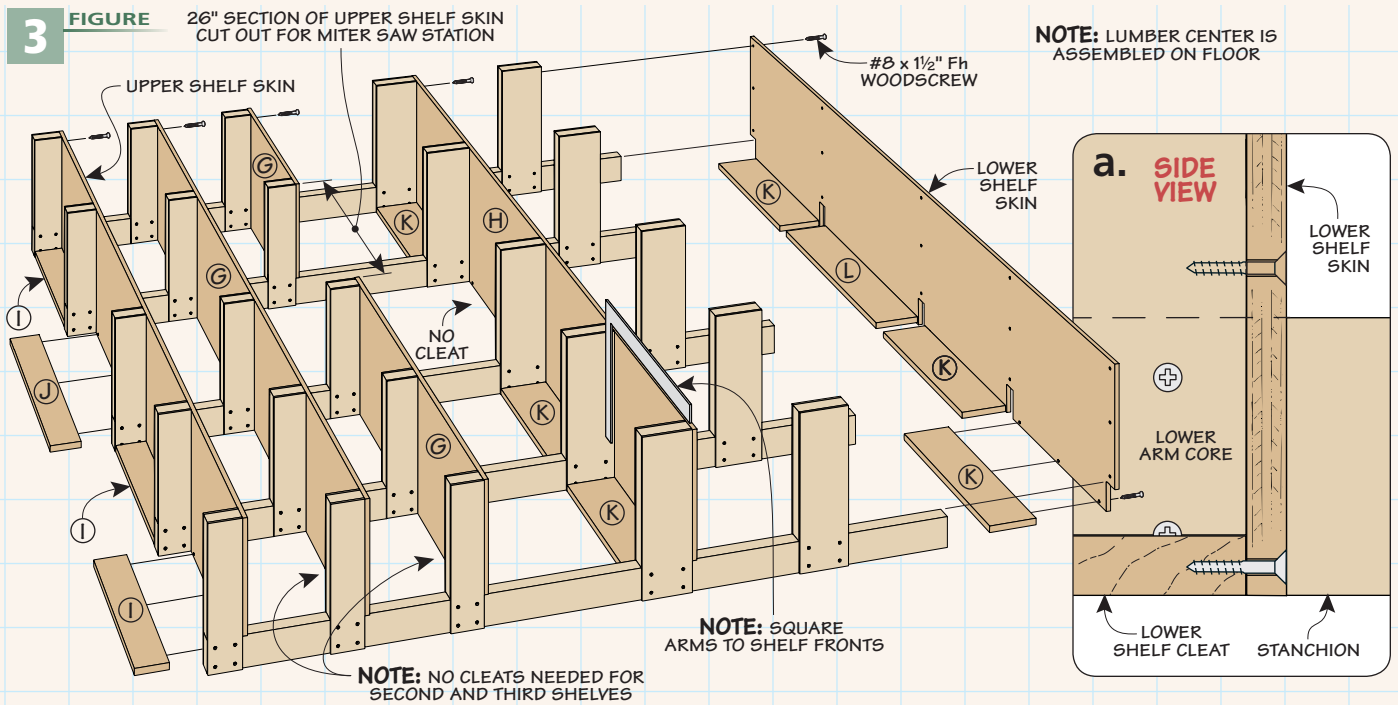


FIGURE 3



mount & add Storage

ShopNotes GO ONLINE EXTRAS

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

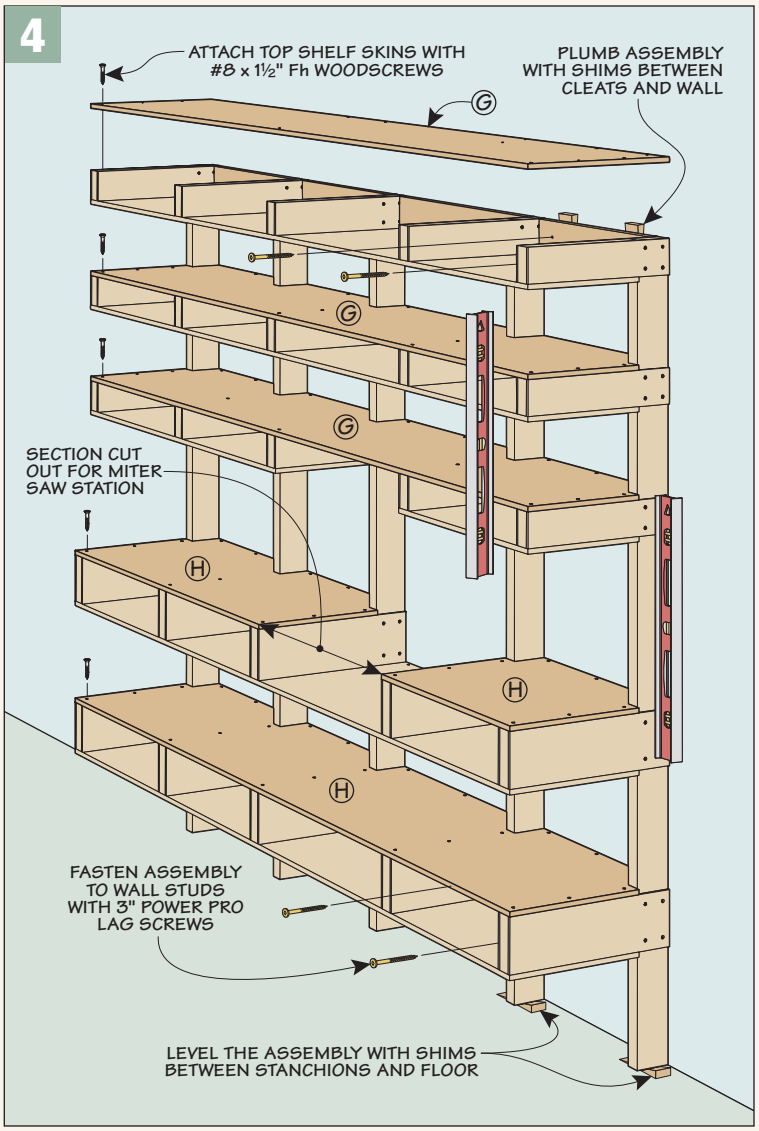
Setting the partially completed unit in place is definitely a two person job. And once in place, you'll need help to keep it there while you level, plumb, and fasten it to the wall.

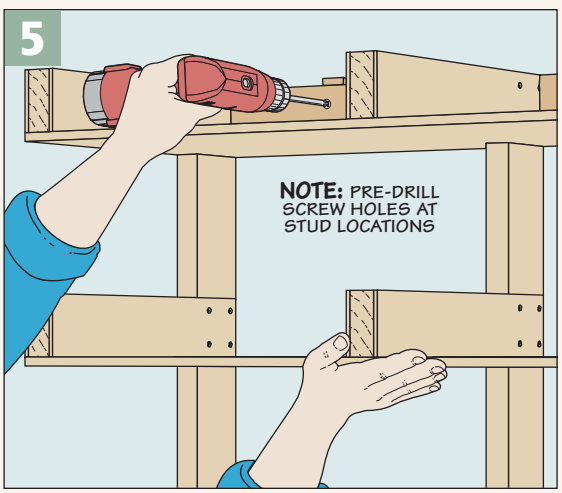
I found it was easiest to plumb the rack side-to-side first. Then locate the highest spot on the floor and drive one screw through the cleat into the wall at this point, as shown in Figure 5. (You'll want to have a supply of shims ready to put in place as you finish the installation). I used 3" construction lag screws because they have extra large heads and are less likely to pull through the wood (refer to Sources on page 51). Pre-drill the holes in the cleats, so the screws are sure to hit a stud.

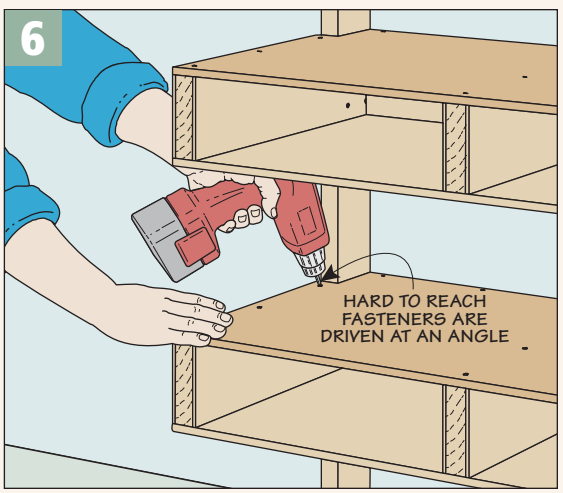
▲ ***Lag Screws.*** *Heavy-duty construction lag screws are used to anchor the lumber center to the wall studs.*

Next, I leveled the unit with shims under the stanchions as required (Figure 4). You may also have to place shims behind the cleats and drive screws through them to plumb the rack back-to-front, as shown in Figure 4. You should use a shim anywhere there is a gap behind a screw. Drive screws through all the top shelf cleats and all the lower shelf cleats into the studs in the wall.

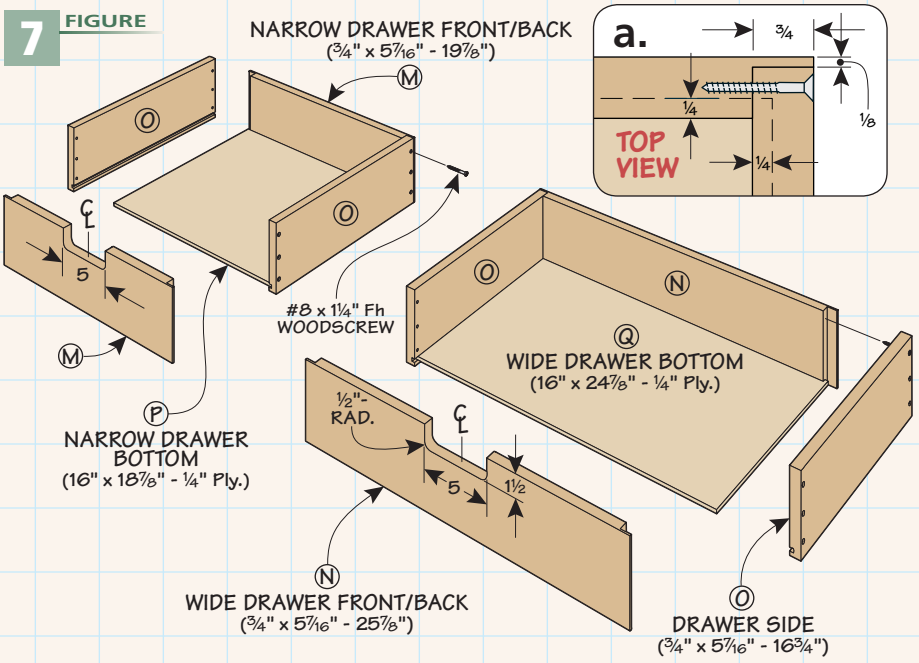
Fasten the Top Skins. Finish up by installing all the top shelf skins. You can lay each one across the arms and drive the screws through the pre-drilled holes. I had to drive some of the fasteners at an angle because there was not enough room for my driver, a bit, and a fastener to drive them straight in (Figure 6). You can learn about some other drill attachment options that will make it easier to drive fasteners in tight places in the Great Gear article found on page 48.







▲ ***Drawers.*** *Simple to build rabbeted construction will give you solid drawers for storing tools and supplies.*



MAKE THE DRAWERS

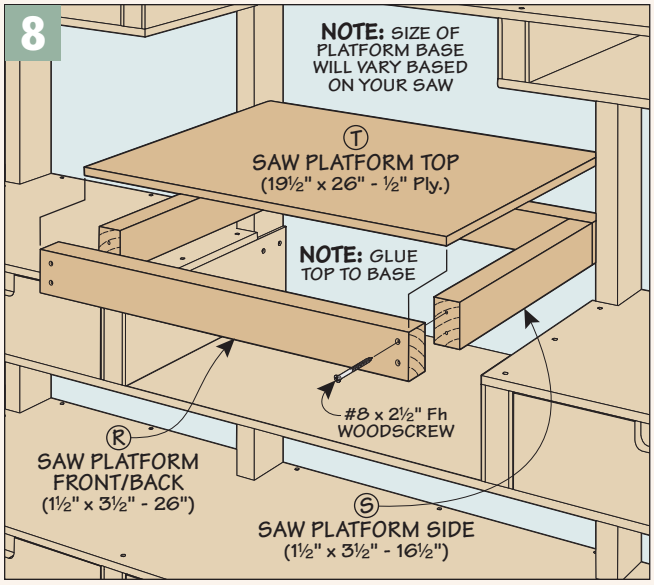
Making the drawers is pretty straightforward. They're simple boxes that rest on the bottom skins of the two lower shelves. Clearance between the drawers and the shelves is generous, and there are no runners to fuss with.

Start by cutting the fronts, backs, and sides from solid stock. Then cut the rabbets on the fronts and backs as shown in Figure 7a. Next, cut the grooves for the drawer bottoms. A notch is cut in each drawer front for a hand hold. You can ease the edges of the notches with a ¼" roundover bit. I took extra care when cutting the drawer bottoms to ensure they were square and snug in the drawer bottom grooves. This helps to keep the drawer boxes square when you fasten everything together.

Miter Saw Platform. The miter saw platform is the last component to put together. Most miter saws will require you to build a platform to raise it to the level of the shelf surface. This also provides a place to bolt the saw down, yet still retain some portability when required.

The best way to determine the height of the platform is to measure from the saw table to the surface of the shelf. Once I determined this measurement, I constructed the platform as shown in Figure 8. I ripped down two-by stock for the frame and used ½" plywood for the top, fastening it all together with glue and screws. Once it's complete, you can set the platform in place and position your saw as shown in the lower right photo. Then drill the holes for the mounting bolts.

Now you can start filling your center with boards, cutoffs, and woodworking supplies. You're sure to enjoy the extra storage, better organization, and increased convenience.



▲ ***Install the Miter Saw.*** *A platform for the saw raises it so it's level with the shelf but still allows you to pick up the saw and move it to another location as necessary.*

high-end look for

Low-Cost Hardware

Here are three, simple recipes to transform the look of ordinary, zinc-plated hardware.

Hardware adds the final touch to a project. The proper selection of hardware enhances the look and creates another layer of detail. The wrong hardware, on the other hand, draws your attention to the project in a bad way.

Before & After. *Shiny zinc-plated hardware can be an eyesore. But with a few steps, it can take on a whole new appearance in just a short time.*

For furniture projects, I spend a lot of time finding a good fit. But for shop and garage projects, it's tempting to take the easy route, pick up basic utility hardware, and call it good.

This kind of hardware is inexpensive and has a shiny, zinc coating that's designed to resist corrosion — all positive qualities. My beef is that it's just too shiny and stands out like a sore thumb.

The good news is you can upgrade the look of basic hardware without a lot of time or effort. Here are three looks to consider for your next project.

Basic Bare Steel. The first look is also the easiest to create — plain, unplated steel. It reminds me of old, industrial hardware with its bare, aged steel surfaces.

The shape of utility hardware fits right in. To get to the bare steel, you just need to remove the zinc coating. You have two choices — elbow grease or chemistry.

The photo above shows the first method. A wire wheel mounted in a drill press abrades the coating in a short amount of time. Depending on the makeup of the wheel, you may have scratches that can enhance the look. Finer, softer bristles on the wheel leave a dull, nearly scratch-free surface. A little sanding with fine sandpaper or steel wool takes care of removing unwanted scratches.

The other option to remove the zinc coating is to use an acid solution to dissolve it, as shown in the

▲ ***Remove Zinc Plating.*** *Diluted muriatic acid will remove the zinc plating from a hinge in just a few minutes. The result is a dull, bare steel surface with an old-time look.*

Playing With Fire. *Heating with a torch creates a muted, gun metal look to the hardware prior to "finishing." Stop when you have an even appearance.*

upper left photo. Muriatic acid is commonly available at hardware stores and home centers. Milder citric acid is available, as well. It just works a little more slowly, which gives you more control over the final appearance.

To mix up the acid, be sure to follow the instructions on the package and wear gloves and goggles for safety. Keep an eye on the hardware and remove it when it has the look you want. (Don't forget to do the screws, too.)

In order to remove the acid, I rinse the hardware thoroughly and dry if off. A quick buffing with steel wool gives it just the right appearance.

To Protect or Not. You could use the hardware as is. Just keep in mind that it's susceptible to rust. To prevent rust and lock in the look, I like to spray on a couple coats of satin lacquer.

Gun Metal Finish. You don't have to stop there. The uncoated steel is the starting point for creating a layered, "gun metal" finish on your hardware. And here you can have a little fun.

The first step is shown in the upper right photo. Get out a torch and pass a flame back and forth across the hardware. Take it easy here. Keep in mind that all you're looking to do is just change the color of the steel.

For the next step of the process, I brush on a coat of oil-based finish, as shown in the right photo. Then it's back to the torch to "cook" the oil (not ignite it) and enhance the color even more.

▲ ***Enhance It With Oil.*** *After applying a coat of oil-based finish, use a torch again to burn it. Buff out the surface once it cools and dries.*

If either of these two options won't work for your project, you have another choice. Take a look at the box below to learn more.

You don't need to settle for drab hardware. With these techniques, you can get a high-end look from inexpensive hardware.

a custom look with Spray Paint

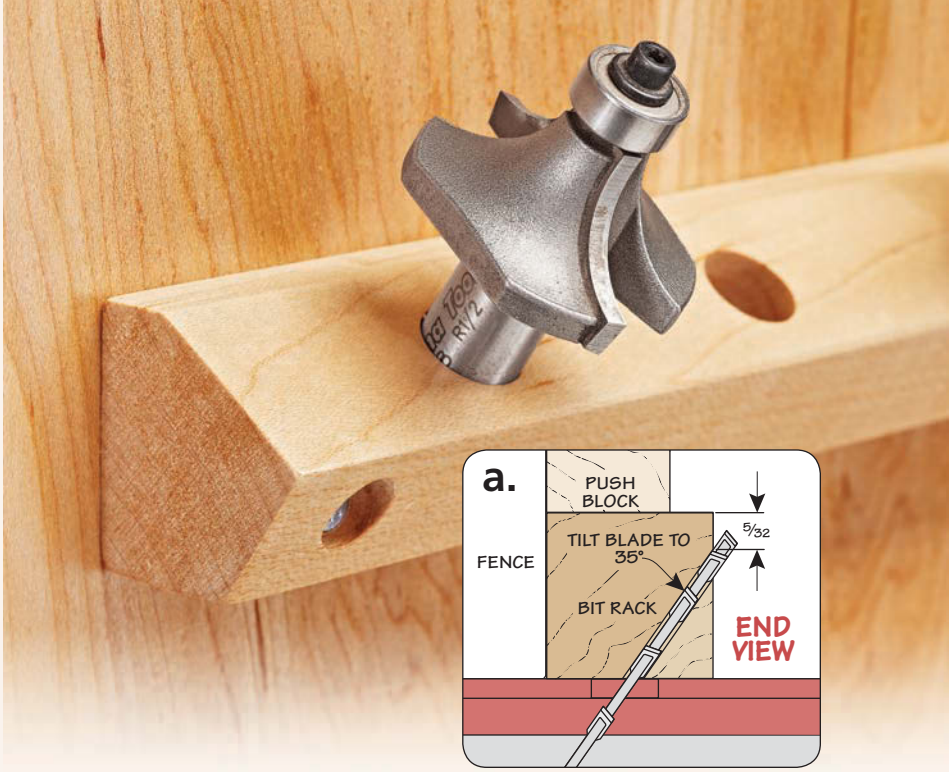
I use spray paint on small projects, so it's only natural to use it on hardware, too. Of course, you can find spray paint in a wide range of colors.

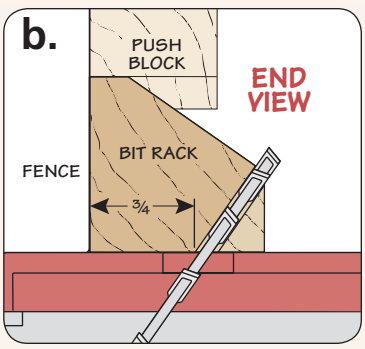
But what's surprising is the range of surface finishes available. You can find old-school "hammered" finishes and even metallic paints that do a good job of mimicking the look of oil-rubbed bronze or nickel.

Getting a good end result involves a few key steps. I like to degrease and clean the hardware with lacquer thinner. Then spray on a coat of primer. To avoid an overdone, dipped appearance, apply thin, even coats.

At last, you're ready for the color coats. Two coats will give you the coverage and protection you need.

Shop Short Cuts





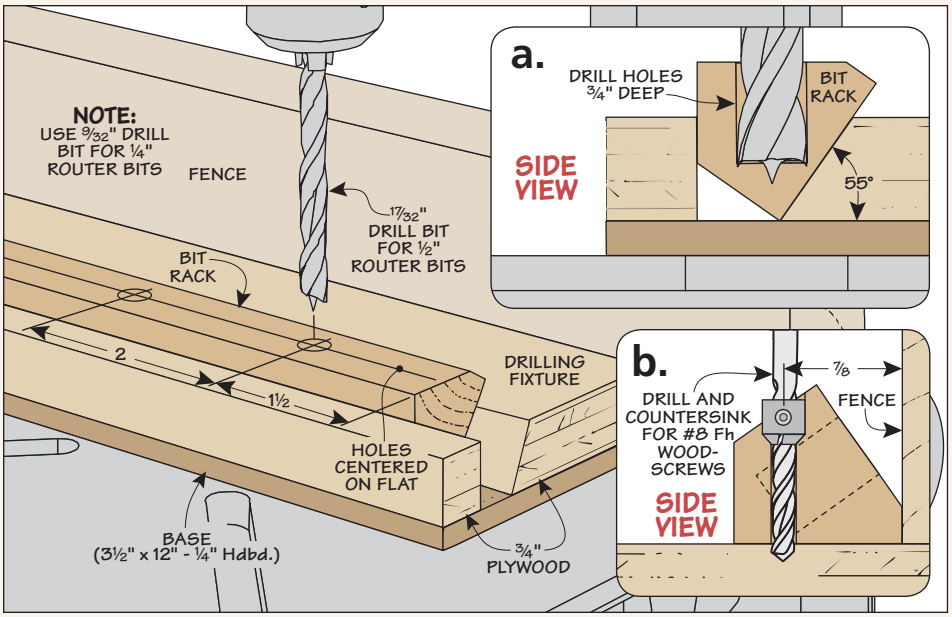
A Handy Router Bit Rack

Creating the angled bit racks for the router cabinet on page 34 only requires following a few easy steps. And there are a couple of tricks involved with drilling the router bit and mounting holes.

I began by making a few extra-long, 1¼"-wide blanks. You'll cut the blanks to final length later.

Rip the Bevels. Take a look at details 'a' and 'b' on the right. You can see how to cut the bevels while you're at the table saw. All you need to do is tilt the blade to 35°. After ripping the first bevel, rotate the workpiece a quarter-turn and adjust the rip fence to cut the second bevel. A push block keeps your hands safely away from the blade.

With the bevels cut, you can cut the racks to length. I used an auxiliary fence on the miter gauge. A stop block clamped to the fence guarantees the racks are the same length.



A Drill Press Cradle. To drill the series of holes for storing router bits, I made the fixture you see in the left drawings. It holds the rack at the proper angle so that the bit holes are drilled square to the beveled face.

The fixture starts with a hardboard base. On top of that, I glued two pieces of plywood to act as fences. One of the fences is wider and beveled along one edge, as you can see in detail 'a' at left. With this fence glued to the hardboard, use one of the rack blanks to position the second, narrow fence.

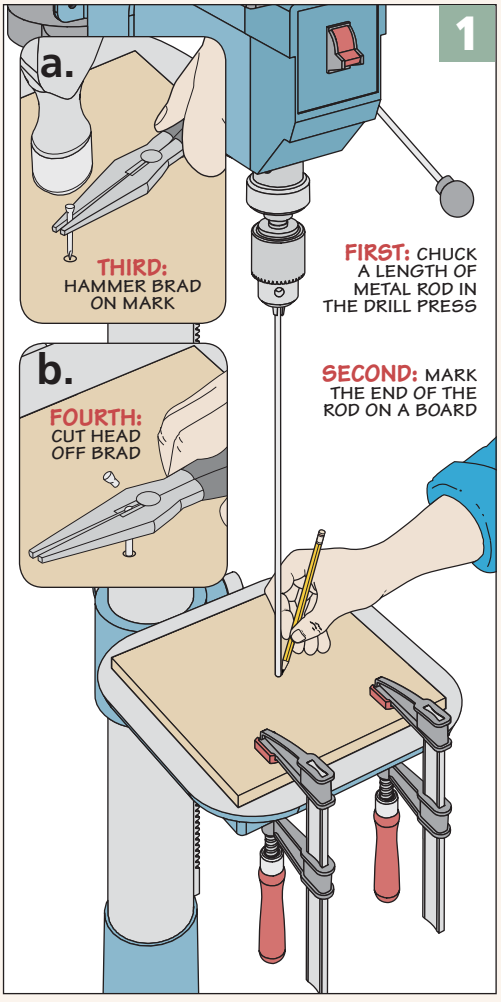
Adjust the drill press fence to locate the holes in the blank. Drill holes slightly larger than the shanks of ¼" and ½" shank router bits. Finish up by drilling a pair of countersunk screw holes for attaching each rack to the cabinet door, as shown in detail 'b.'

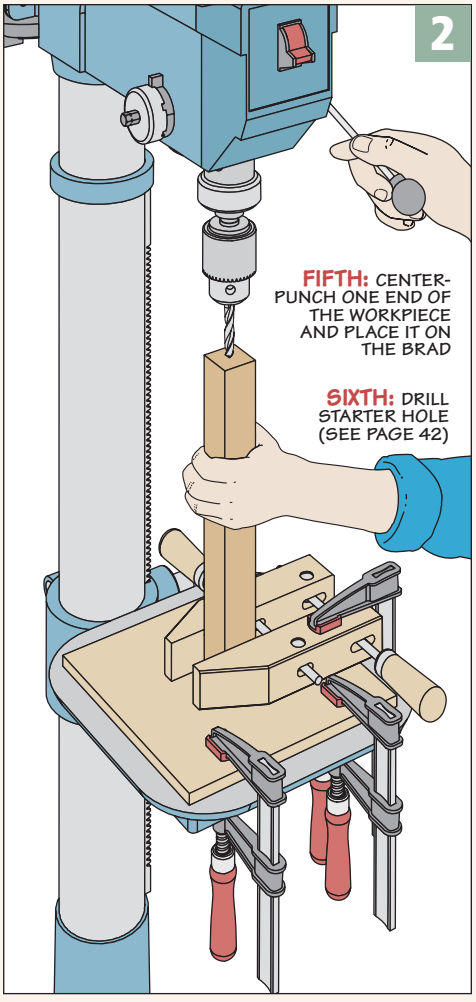
Aligning Deep Holes

The article on page 42 shows how to drill an accurate hole through the center of a long piece of wood. But first, you have to align the centers of both ends of the blank with the bit. This is easy to do on a lathe, but unlike the tailstock on a lathe, the drill press table moves side-to-side, losing the alignment.

In order to align the centers on a drill press, first adjust the drill press table to stand the piece on end. Then chuck the end of a length of straight metal rod in the drill press, and mark the location of the other end of the rod on a sacrificial board clamped to the table, as shown in Figure 1.

Since it's difficult to center the workpiece by eye, I drive a small brad at the mark and nip off the head (Figures 1a and 1b). Punch one end of the workpiece and place it on the brad. Use a hand-screw to hold it steady while you drill (Figure 2).





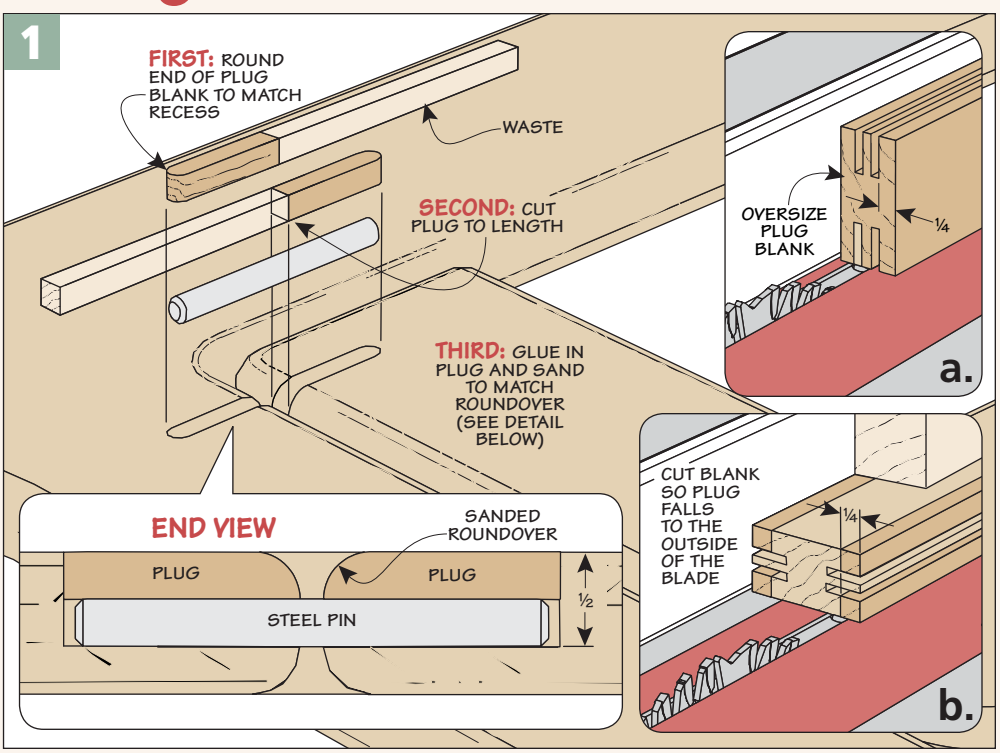
Making Custom Plugs

The sawhorses on page 14 use steel pins embedded in the legs to act as the hinges. The pins are covered by hardwood plugs so the mechanism is virtually invisible. The challenge is cutting the small plugs for a snug fit.

You can see the solution in details 'a' and 'b' — an oversize blank. Cutting a series of kerfs on the edges defines the thickness of the plugs. Then you can turn the blank face down to cut the plugs to width and free of the blank.

That still leaves the plugs extra long. That length comes in handy while shaping the end to match the rounded recess left by the router bit. At this point, just cut the plug to final length.

There's just one step remaining. You need to file and sand the plug to match the roundover.



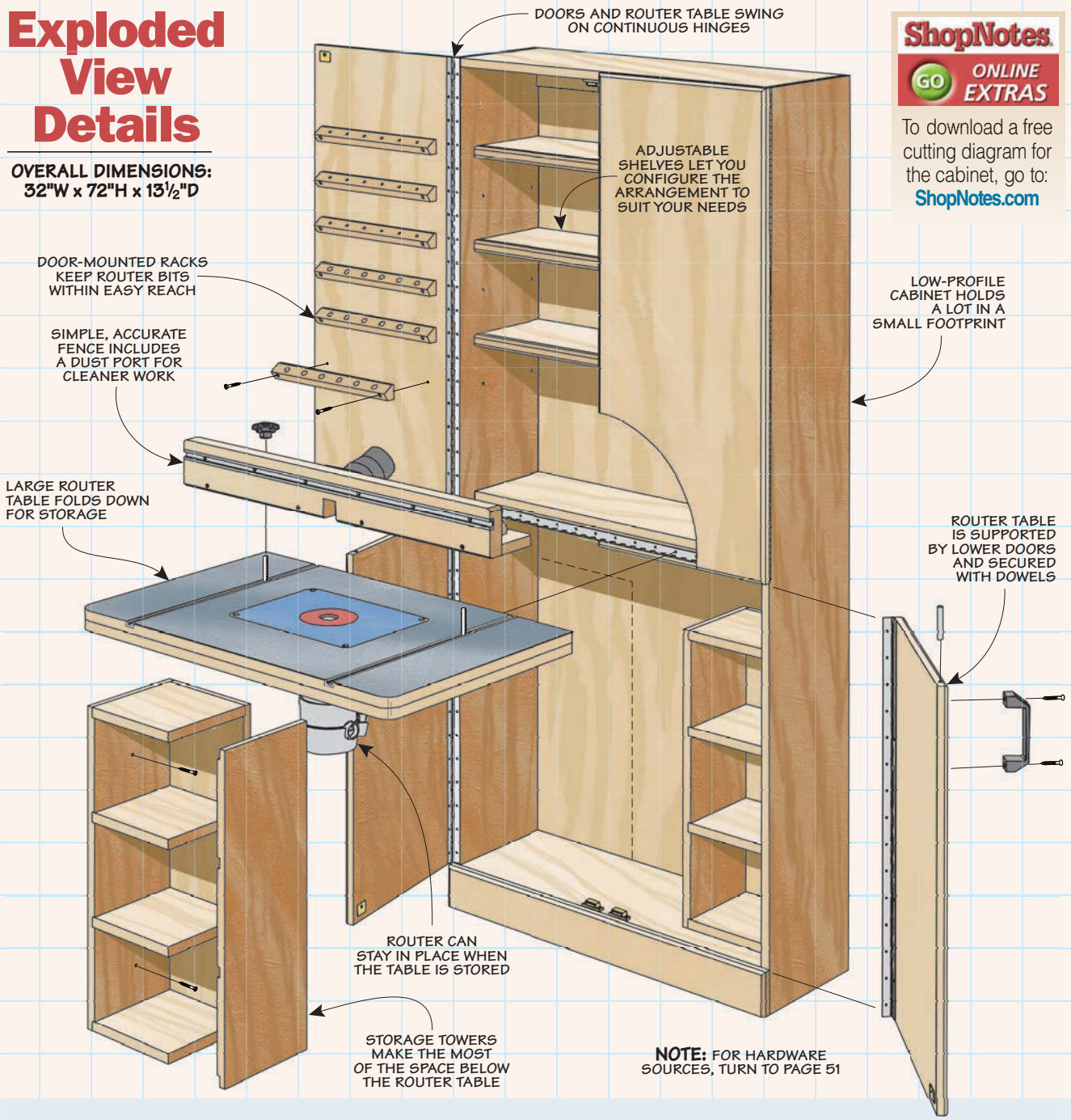
router table

Wall Cabinet

This compact shop storage cabinet does double duty as a top-notch router table.

Exploded View Details

OVERALL DIMENSIONS:
32"W x 72"H x 13½"D



NOTE: FOR HARDWARE SOURCES, TURN TO PAGE 51

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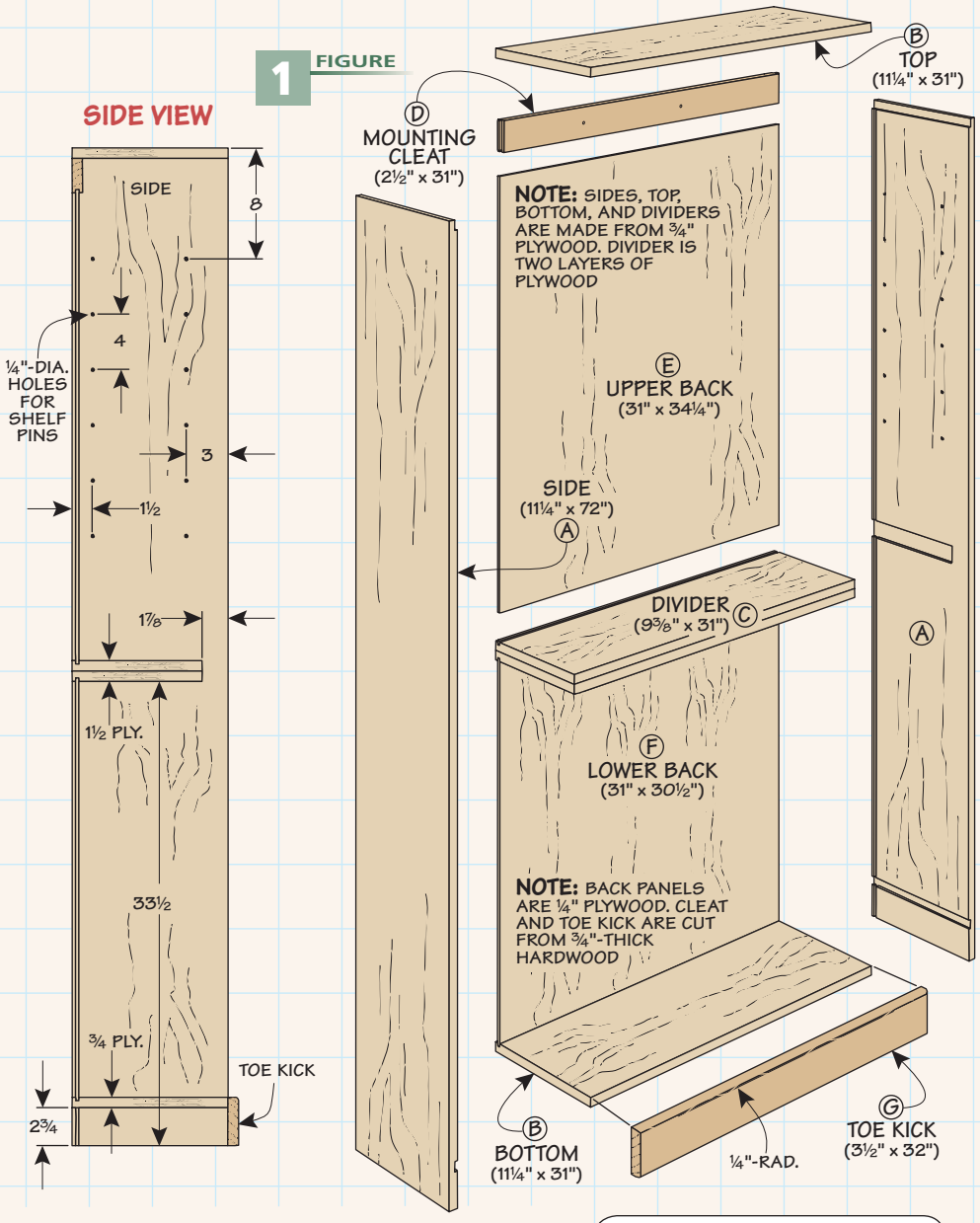
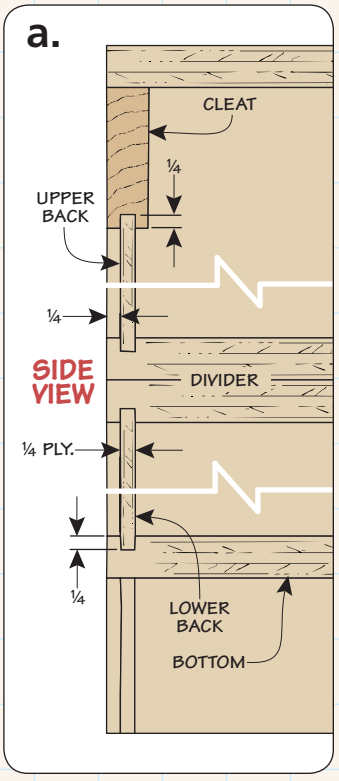
To download a free cutting diagram for the cabinet, go to: ShopNotes.com

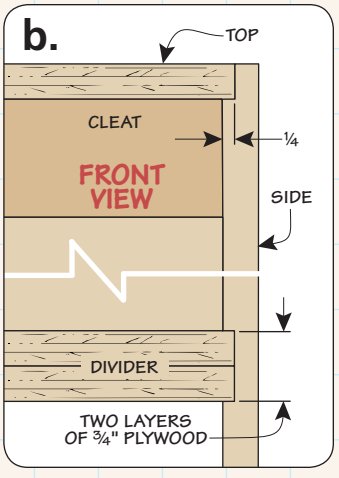
Materials & Hardware

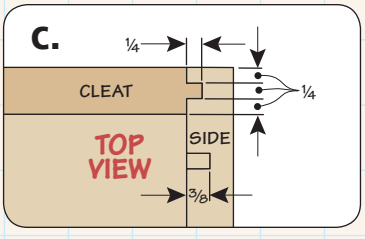
A	Sides (2)	11¼ x 72 - ¾ Ply.
B	Top/Bottom (2)	11¼ x 31 - ¾ Ply.
C	Divider (1)	9⅜ x 31 - 1½ Ply.
D	Mounting Cleat (1)	¾ x 2½ - 31
E	Upper Back (1)	31 x 34¼ - ¼ Ply.
F	Lower Back (1)	31 x 30½ - ¼ Ply.
G	Toe Kick (1)	¾ x 3½ - 32
H	Shelves (3)	8¼ x 30⅝ - ¾ Ply.
I	Edging (3)	¾ x 1 - 30⅝
J	Tower Sides (4)	8½ x 24 - ¾ Ply.
K	Tower Backs (2)	8 x 24 - ¾ Ply.
L	Tower Dividers (8)	8 x 8 - ¾ Ply.
M	Tabletop (1)	20 x 30¼ - 1½ Ply.
N	Tabletop Face (1)	20 x 30¼ Laminate
O	Fence Base (1)	¾ x 3½ - 30
P	Fence Face (1)	1 x 3½ - 30
Q	Braces (2)	¾ x 2½ - 2½
R	Dust Port Blocks (2)	¾ x 2¾ - 2⅞
S	Upper Doors (2)	15 15/16 x 38⅜ - ¾ Ply.
T	Lower Doors (2)	15 15/16 x 29⅞ - ¾ Ply.
U	Bit Racks (6)	1¼ x 13/16 - 13

- (12) ¼" L-Shaped Shelf Supports
- (2) 24" T-Tracks
- (16) #6 x ½" Fh Woodscrews
- (1) 1½" x 36" Continuous Hinge
- (168) #6 x ¾" Fh Woodscrews
- (1) Kreg Router Table Insert Plate
- (1 set) Insert Plate Levelers
- (2) 5/16" x 1½" Dowels
- (12) #8 x 1¼" Fh Woodscrews
- (4) #8 x 1½" Fh Woodscrews
- (4) #8 x 2" Fh Woodscrews
- (1) 36" T-Track
- (1) Universal Dust Port
- (4) #6 x ½" Rh Woodscrews
- (2) 5/16"-18 x 1½" Flange Bolts
- (2) 5/16"-18 Star Knobs
- (2) 5/16" Flat Washers
- (2) 1½" x 72" Continuous Hinges
- (4) 4" Door Handles
- (4) Magnetic Catches w/Screws
- (8) #8 x 1" Rh Woodscrews









a low-profile Case

A project that serves more than one workshop need is sure to get my attention. With plenty of storage and a built-in router table, this cabinet checks two critical items off my list. Here's the kicker: It takes up less than three square feet of floor space.

The secret behind the small footprint is that the router table is like a workshop Murphy bed — it folds out when you need it and tucks away when you don't.

Still not convinced? Plywood construction and straightforward joinery mean this project can be put to use after a long weekend's worth of work.

Big Parts. One of the few challenges of building this cabinet is cutting the large sides to size. A good approach is to use a circular saw to cut more manageable (but still oversize) blanks from a sheet of plywood. Just be sure to leave a straight factory edge on each blank. Over at the table saw, you can cut them to their final sizes without much trouble.

Solid Joinery. The table saw works fine for cutting parts to size, but for cutting the joinery, it isn't always the best option. I avoided wrestling with the parts by cutting the rabbet and dadoes for the top, bottom, and divider with a hand-held router.

A straightedge guide clamped to the parts guides the router for accurate cuts. The Side View drawing in the left margin has all the details. Take note that the wide dado for the divider is stopped. I used a chisel to square up the end after routing.

The other joinery step is cutting a groove along the rear edge

to accept the back. This works well at the table saw. The key is sizing the groove to match the thickness of the ¼" plywood.

Top, Bottom, & Divider. The sides are joined by the top, bottom, and divider. Figure 1a shows that the divider is made up of two layers of plywood. This creates a rigid mounting surface for the router table. And there are grooves on the upper and lower faces for the back panels.

The bottom has a groove cut in it, as well. But the top doesn't. The reason is that I added a hardwood cleat at the top to secure the cabinet to the wall. This way, the cabinet won't tip while you're using the router table.

There's a groove on the lower edge of the cleat, and a stub tenon cut on each end that slips into the grooves in the sides, as illustrated in Figure 1c. The cleat is glued to the lower edge of the top.

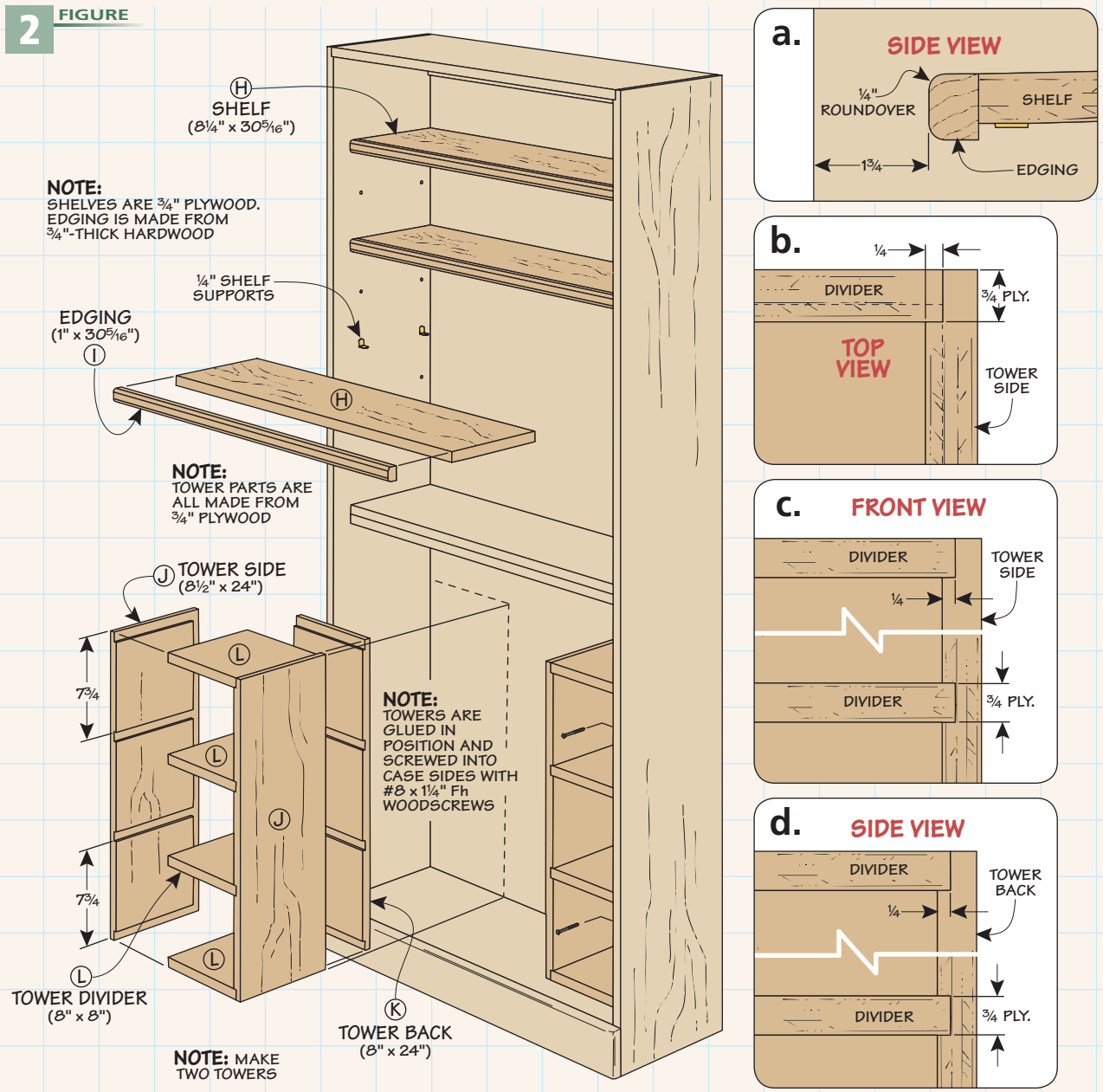
Assembly. You only need to cut the back panels to size before you're ready to assemble the case. To do this, lay one of the sides down on your bench. Add the bottom, divider, and top assembly. This creates two pockets to slip the backs into place.

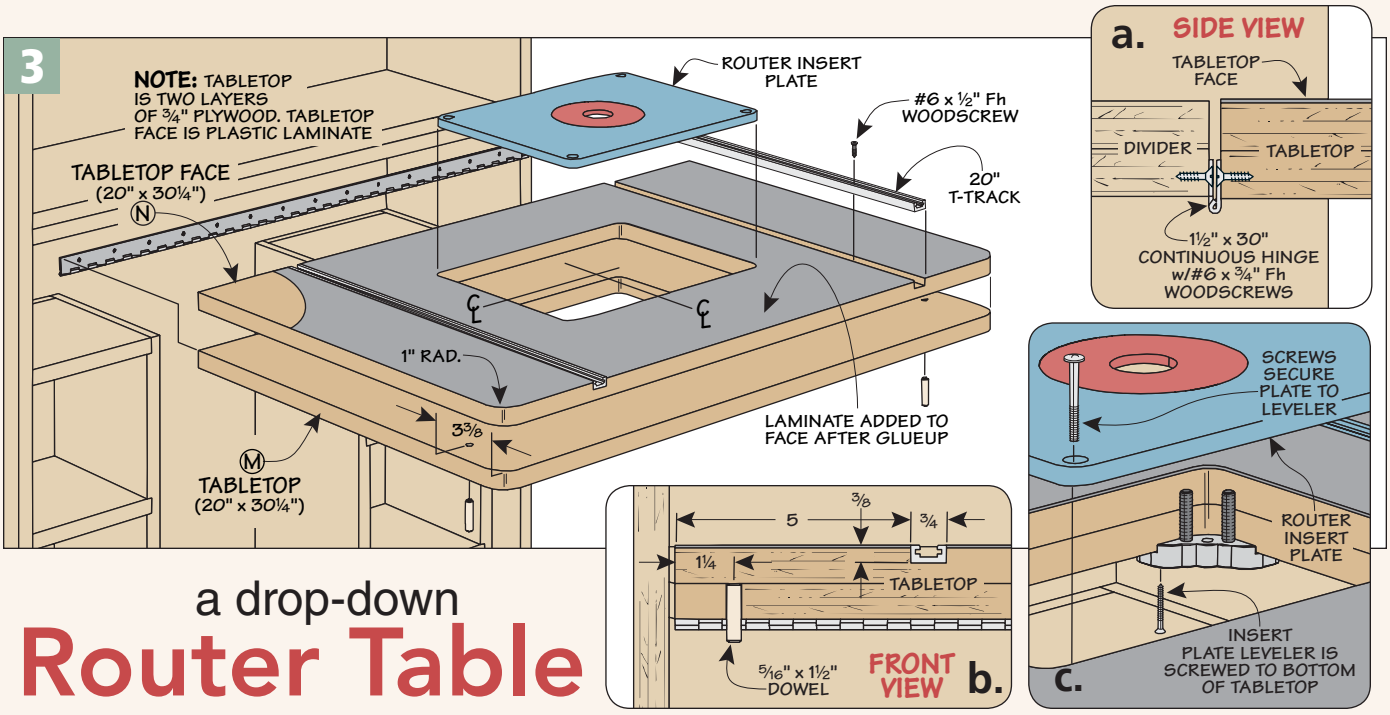
Cap it off with the other side, and you're ready to apply the clamps. As you put on the squeeze, check that the case is square. I waited until the case was dry before adding the toe kick at the bottom (Figure 1).

Add Some Storage. Inside the cabinet, three adjustable plywood shelves fit on supports in the upper portion. Wide hardwood edging provides extra stiffness, as in Figure 2a.

The lower part of the case holds two storage towers. The space between them is for the router when the table is stored. The towers are made from plywood and joined with dadoes and rabbets (Figures 2c and 2d).

FIGURE 2





a drop-down Router Table

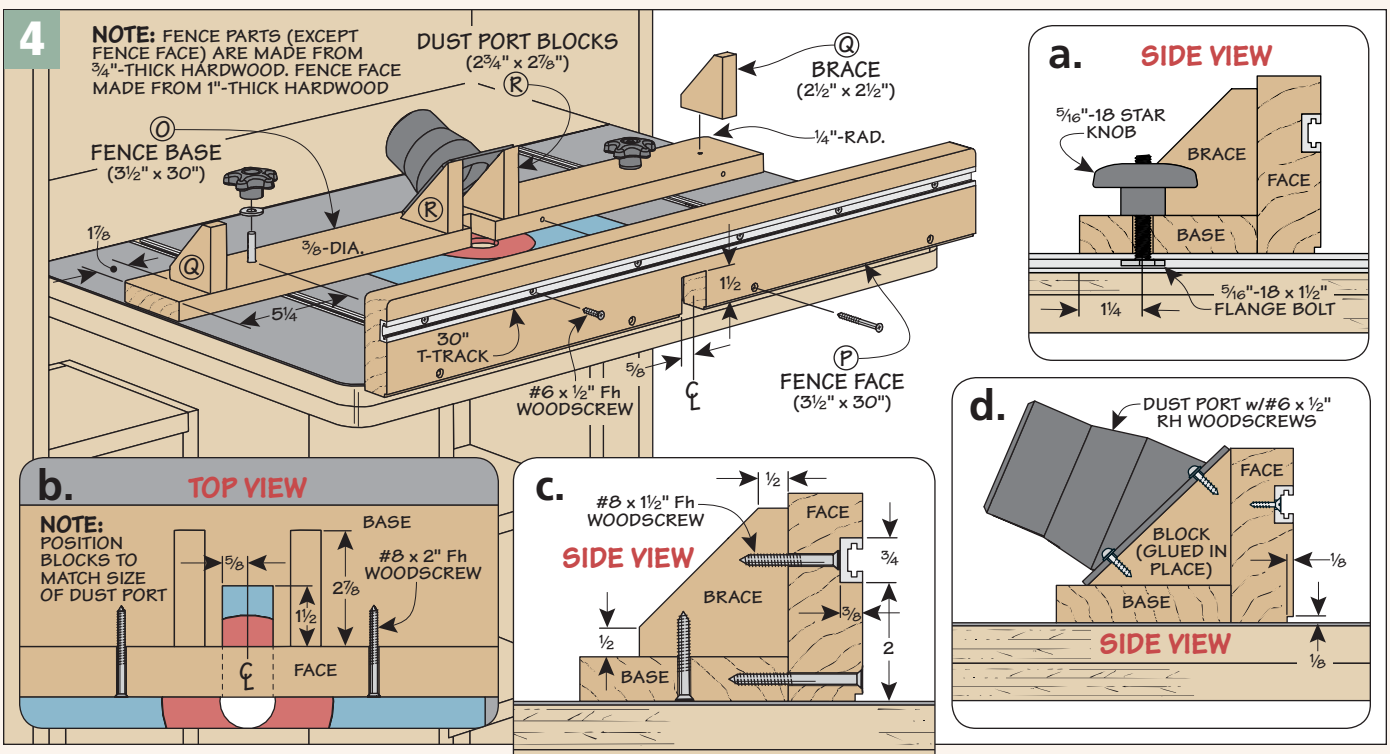
The work you've done up to now has dealt with the storage component of this project. From here on, the bulk of your efforts will be directed to the router table function. This involves making the table and a fence. Then wrap it up by adding doors and a few handy bit racks. All in all, nothing very complicated.

The Tabletop. The router table is designed to fold down into the cabinet for storage. The tabletop is attached to the thick divider with a continuous hinge at the back. In front, it's supported by the lower cabinet doors.

The construction of the tabletop is shown in Figure 3. It consists of two layers of plywood that are glued together. I also applied plastic laminate to the top face. This gives the top a smooth, durable worksurface.

A pair of T-tracks recessed in the top allow you to attach the fence or other accessories. What's important here is that the dadoes for the tracks match the thickness of the T-track or are slightly deeper (Figure 3b). You don't want a workpiece to catch on the track in use.

Insert Plate. The router is mounted to an phenolic insert plate. But I didn't want the plate to tip out of its opening in storage.



So I used an insert plate and leveler system that allows the insert plate to be screwed in place, as you can see in Figure 3c.

Making the opening isn't difficult. Start by tracing the insert plate on the tabletop. Then drill a starter hole and cut out the waste with a jig saw. Take your time and cut as close to the line as you can. Use the plate as a gauge for sanding and smoothing the edge. Aim for a nice slip fit without any play.

There's one final detail on the tabletop that's easy to overlook. A couple dowels are installed in the bottom face (Figures 3 and 3b). These are used to lock the tabletop to the lower doors for use.

No-Nonsense Fence. A good fence is essential for accurate cuts. That doesn't mean it needs to be complicated, though. The design in Figure 4 gets the job done with a few extras to boot.

The first is a T-track installed in the fence face. This is shown in Figure 4c. It's a versatile anchoring point for attaching featherboards, stop blocks, or bit covers.

The other add-on is a dust port, as in Figures 4b and 4d. This keeps dust and chips from blowing into the cabinet when you're using the router table.

The fence is an L-shaped assembly made from hardwood. A pair of braces near the ends adds stiffness to the face and keep it square, as in Figure 4c. Triangular blocks in the middle do the same and provide a mounting surface for the dust port.

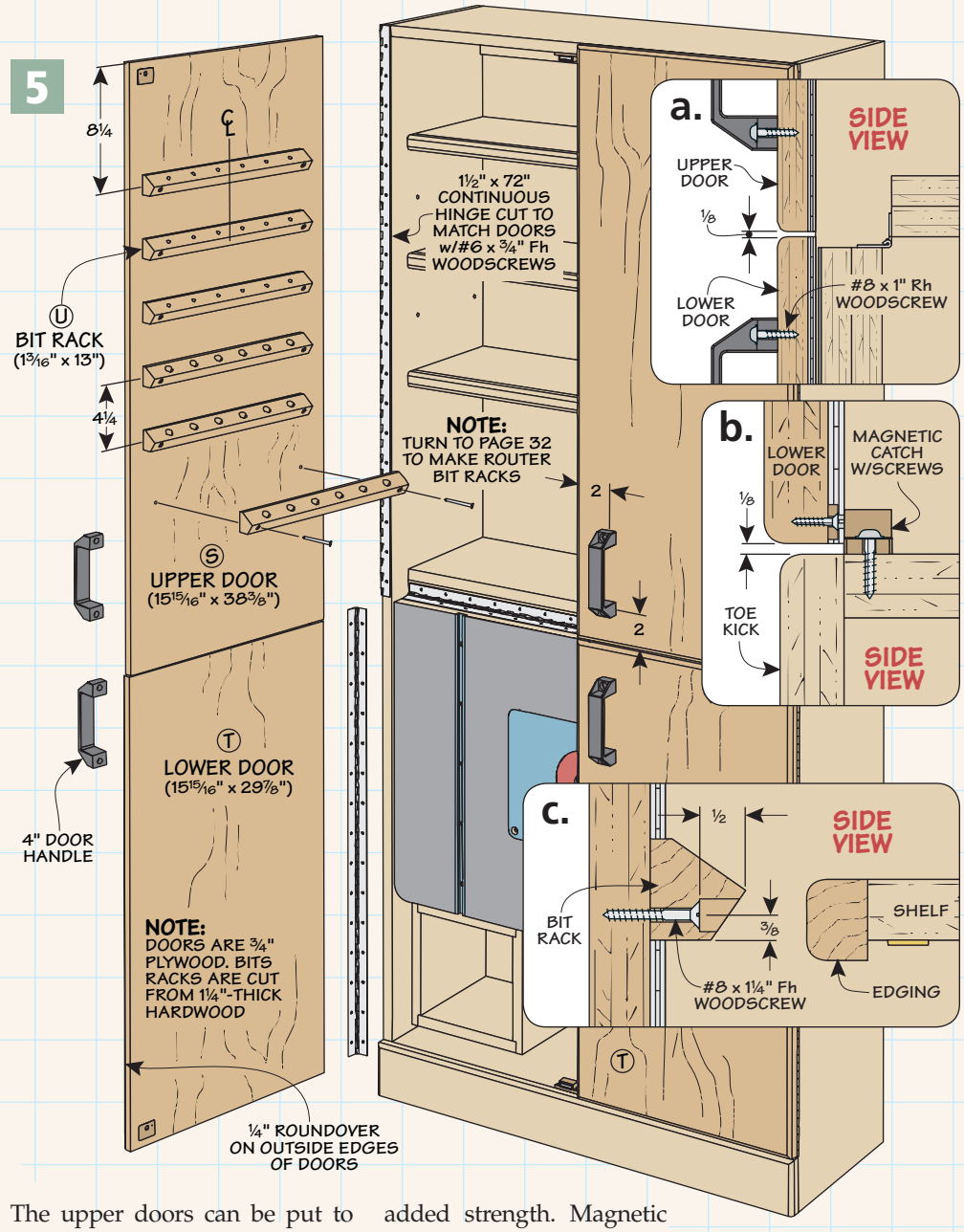
The Doors. The four doors for the cabinet do more than just keep everything looking tidy when you're not working. The upper doors can be put to use for more storage. And as I mentioned earlier, the lower doors support the router table.

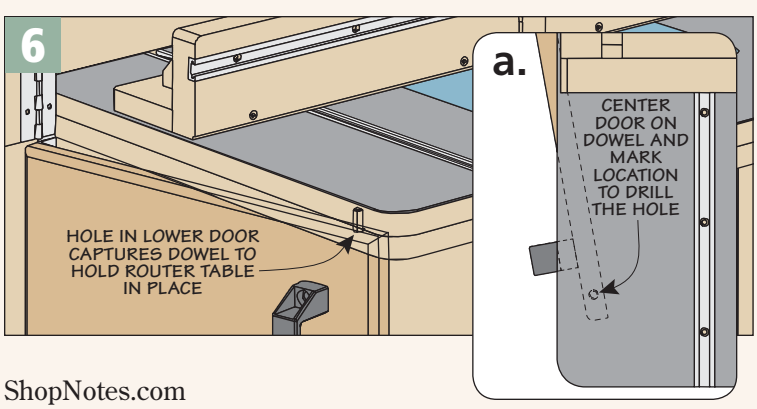
The doors are about as no-fuss as you can get, as shown in Figure 5. They're simple plywood panels with a roundover to soften the outside edges. The doors are hung on continuous hinges for added strength. Magnetic catches keep them closed.

Bit Racks. You can't do much with a router without bits. To keep your collection close at hand, check out the angled racks shown in Figures 5 and 5c. Shop Short Cuts on page 32 has the details for making them.

Table Support. The only thing left to do is to drill a hole in the top edge of each lower door. It needs to line up with the dowels in the underside of the table, as shown in Figure 6.

Once you set the cabinet in place, it's important to attach it securely to the wall. Then you can load it up. And I'm sure this workstation will become a focal point of your shop.





choosing & using Bevel Gauges

When it comes to working with angles, a reliable bevel gauge is a valuable addition to any shop.

A bevel gauge, sometimes called a sliding bevel, is indispensable for a number of tasks around the shop. They're are great for laying out joinery (main photo). And they can be used to set up for drilling angled holes and making bevel cuts on the table saw.

Bevel gauges have been around for hundreds of years. I have a couple of antique gauges that work as well now as they did when they were new. There's not much that can go wrong with such a basic layout tool.

How They Work. For all that it can do, a bevel gauge is pretty simple. It has two main parts — a body and an adjustable blade. The blade is slotted to allow it to extend on both sides of the body. When you set the blade at an angle, a locking mechanism holds the blade's position. The blade stores within the body when not in use.

Multiple Options. If you're shopping for a bevel gauge, you'll find a range of options. For just a few dollars, you can get an inexpensive model from the hardware store. Or you could spend upwards of $100 for a high-end model more suited for a machinist. The gauges shown below fit the lower to middle range of that spectrum.

What to Look For. My first bevel gauge was an inexpensive one I bought at a home center, similar to the plastic-bodied version shown in the photo at left. These gauges are typically made with either a wood or plastic body. The steel blade is locked into position with a simple bolt, washer, and wing nut.

A gauge like this works okay as far as setting angles. But there are a couple of issues. It's difficult to really cinch the blade tight. A slight bump can knock it out of position. And there are times

when the wing nut gets in the way since it sits proud of the face of the bevel gauge.

Improved Designs. I found it worth the extra dollars to invest in a bevel gauge that addresses these two issues. You can see examples of these improved designs on the opposite page.

Cam Lock. The *Veritas* gauges feature a recessed cam lock to secure the blade. Release the blade by simply lifting up on the lever. Press down on the lever to lock the blade in position.

There are a couple of benefits to this design. First, the entire cam assembly is recessed into the body of the bevel gauge. It never gets in the way.

Second, you can also adjust the clamping pressure using the slotted screw. This means the blade is less likely to lose its position in spite of the occasional bump.

Blade Clamp. Another type of clamping mechanism uses a threaded rod assembly. The *Shinwa* gauge locks from the tail end of the body. As you tighten the rod, the opposite end engages the brass, conical-shaped washer you see at the pivot end. Tightening the rod causes the washer to squeeze the blade. It only takes a slight turn of the rod to really cinch the blade securely.

These two styles of gauges are a definite improvement over the generic hardware store variety. But they all require some method to set the proper angle. If you're copying an angle from a project or workpiece, it's pretty intuitive. For setting up tools for angled cuts, you'll want a precise method for fixing the angle of the gauge. The box below shows a couple of options.

Digital Technology. Not surprisingly, a few companies offer digital solutions to measuring and marking angles. Two examples from *General Tools* and *Wixey* are shown above.

The benefit of a digital gauge is that you can set the angle without using a protractor. The *General* bevel gauge is accurate to 0.3° and mimics the look and feel of a traditional bevel gauge. Its plastic body houses the battery and electronics. The knob does a good job of clamping the blade, but unfortunately, it stands proud of the body.

The *Wixey* digital protractor is accurate to 0.1°. Instead of a conventional body and blade, it features magnets in the edges of the arms to make tool setup a breeze.

One particularly nice feature is the "Set Miter" button. It divides the current angle reading in two. This eliminates the math calculation required for cutting mating joints other than 45° miters.

Durability. For such a simple tool, you'll want to maintain your bevel gauge's accuracy over time. Just make sure to treat it like you would any fine tool. I like to hang mine near my workbench to keep it from getting nicked and banged around.

To find out where you can buy a bevel gauge for your shop, turn to Sources on page 51.

set up your Gauge

Setting an accurate angle on a bevel gauge is best done with a bevel setter or metal protractor, as shown at right. The *Veritas Bevel Setter* features an adjustable fence that can be aligned with a line etched on the blade.

The *General* protractor is another great option. Its fine markings and index mark make it easy to find or set an angle accurately.

▲ ***Bevel Setter.*** *Align the blade on the bevel gauge with the fence.*

▲ ***Protractor.*** *Setting an accurate angle is easy with this simple protractor.*

how to bore Deep Holes

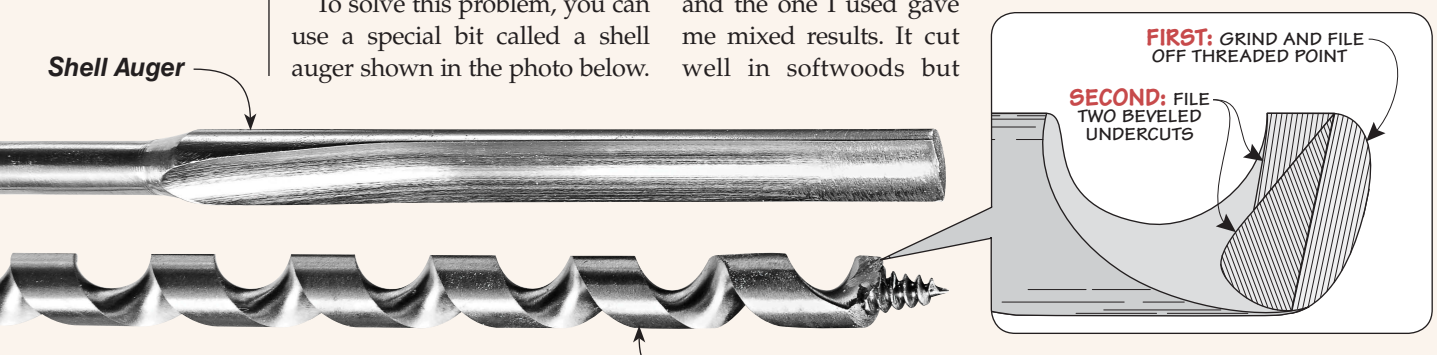
Alignment. *A straight metal rod aligns the V-block with the pilot hole.*

A long bit with a modified tip and a V-block will make this job easier.

If you've ever tried to drill a deep hole through the center of a piece of wood, you know how challenging it can be. And the deeper the hole, the more difficult it becomes to drill it straight.

The problem often occurs with a hole drilled into end grain. In this instance, it's easy for a standard twist bit or brad point bit to wander off center. These bits tend to take the path of least resistance, so they follow the softest grain.

To solve this problem, you can use a special bit called a shell auger shown in the photo below. Because it has no point, it isn't prone to deflection in the wood like a pointed bit. However, these bits are only available in limited sizes (refer to sources), and the one I used gave me mixed results. It cut well in softwoods but not as well in hardwoods, and it required frequent sharpening. I got better results with a ship auger by modifying the tip. These bits are available at



most home centers and come in various diameters and lengths up to 18", which allows you to drill a hole about 16" deep.

Modify the Drill Bit. To modify a ship auger, you start by grinding off the screw point. Then grind the edge as shown in the drawing on the opposite page. This modification provides enough "bite" without being too aggressive, and helps keep it drilling straight.

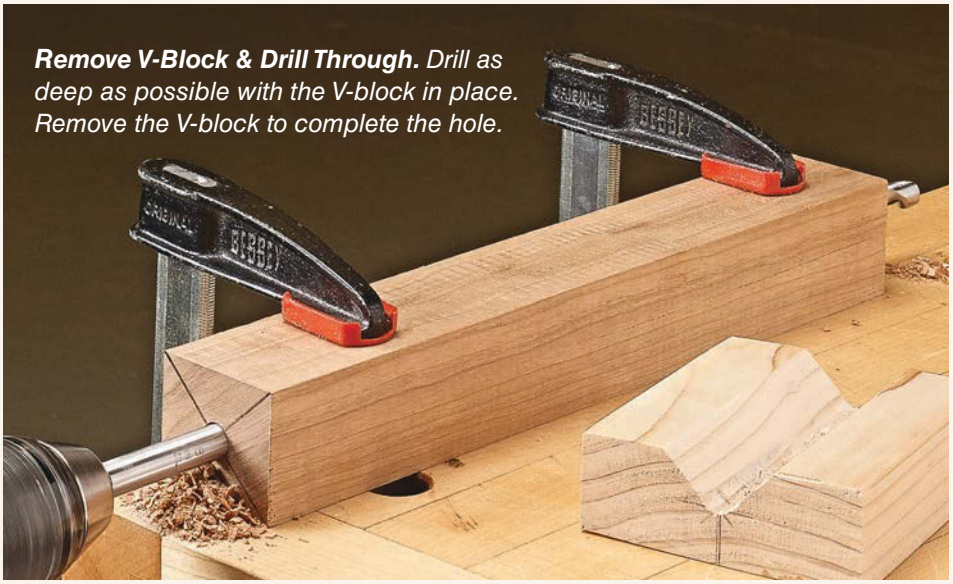
Start With Pilot Hole. The other challenge of drilling deep holes is feeding the bit straight as it drills. A drill press would seem to be the logical tool to use, but the depth you can drill is limited.

A drill press is still valuable for this operation, however, as it can be used to drill a pilot hole to get you started. I do this with a shorter drill bit the same diameter as the ship auger I plan to use. (Refer to Shop Shortcuts on page 32 for one method of aligning both ends of a long workpiece to ensure the hole goes straight-through the center.)

Keep the Bit Straight. Once the pilot hole is drilled, switch to the long ship auger bit chucked in a power hand drill to complete the hole. Even with a nice, straight pilot hole to get you started, the bit can still wander off center if it's not kept straight while drilling. To help with this, I make a V-block that lines up the bit with the hole and guides the bit as you drill. Align the V-block with the pilot hole using a length of metal rod, as shown in the photo on the opposite page.

To drill the rest of the hole, I set my drill to the low speed range. At low speed there will still be a lot of friction, and therefore, a lot of heat. You'll want to back the bit out often to clear the chips and let it cool. In addition, because the modified bits are not aggressive cutters, you'll need to put some force behind the drill. Keep the bit shaft in the valley of the block as you're drilling. Once the drill chuck hits the V-block, you can remove the V-block and continue drilling the hole.

Following these simple techniques will vastly improve the results you achieve when performing this type of operation. Give them a try the next time you're faced with drilling a deep hole in a project.

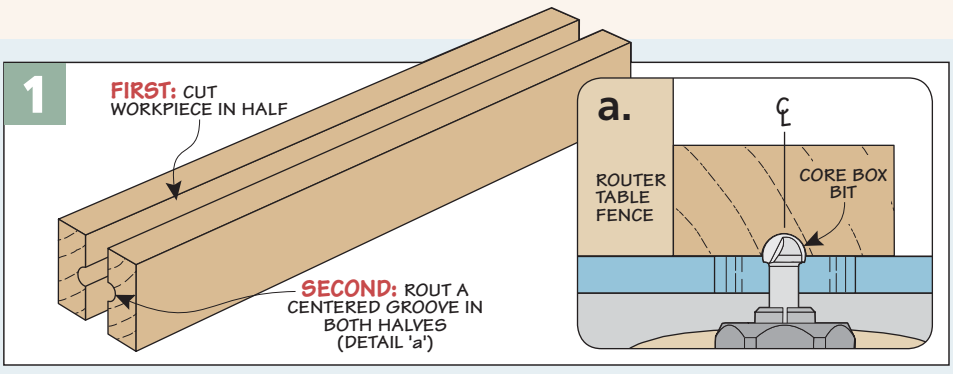


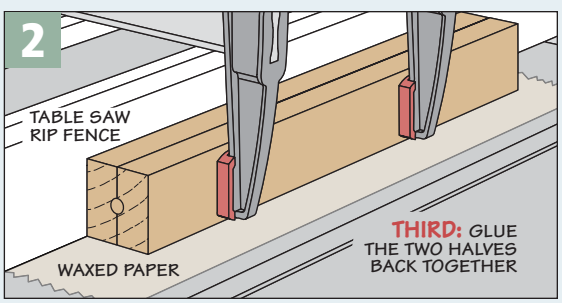
Remove V-Block & Drill Through. *Drill as deep as possible with the V-block in place. Remove the V-block to complete the hole.*

no-drilling Option

Sometimes I need to drill a hole that's just too long for any available drill bit. A wire chase through a floor lamp post is a good example. In these situations, an easy solution is to cut the piece in two. You can rout a channel with a core box bit centered on each half following the steps on the right. Then glue the two halves back together to form a complete hole.

A drawback to this method is that it will create a visible glue line. However, the glue line won't be as noticeable in straight-grained wood. Something else to watch for is glue squeezeout which can plug the hole and interfere with feeding a lamp cord. A little paraffin wax rubbed in the channel before gluing it back together will make squeezeout easier to remove.

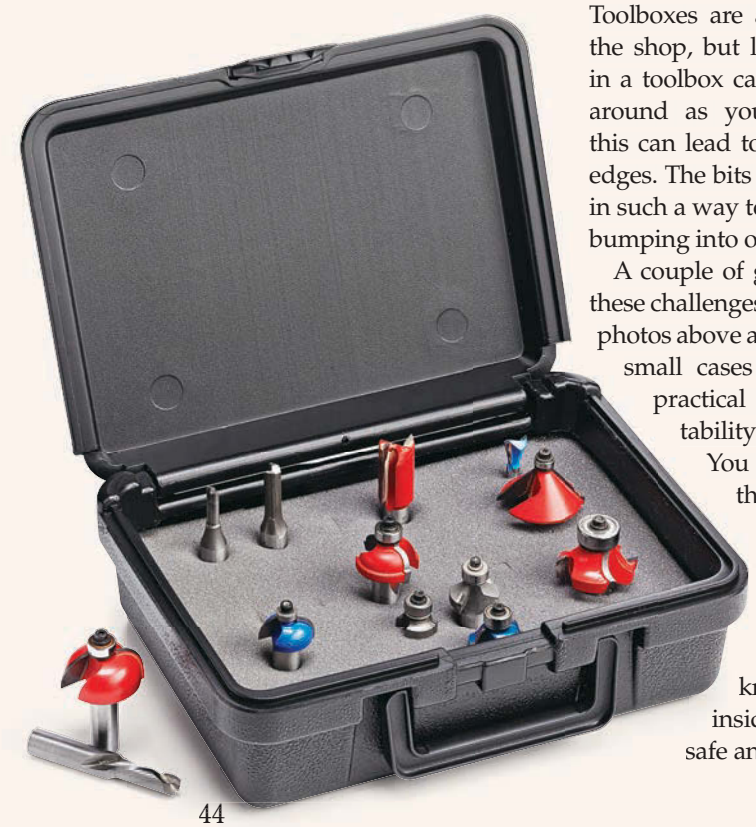




6 solutions for Router Bit Storage

Keep your router bits organized and protected with these handy storage options.

Whether you own dozens of router bits or just a handful, they're an investment worth protecting. Here are a few ways to store them safely while protecting their sharp cutting edges. Turn to Sources, page 51, to find out where to buy them.



PORTABLE CASES

Toolboxes are always handy in the shop, but leaving bits loose in a toolbox causes them to roll around as you move it. And this can lead to chipped cutting edges. The bits need to be stored in such a way to keep them from bumping into one another.

A couple of great solutions to these challenges are shown in the photos above and at left. They're small cases that offer some practical features — portability and protection. You can transport the case wherever you need and easily access the bits inside. And with the lid closed, you know that the bits inside will remain safe and sound.

Wood Case with Insert. The case you see above is sold by *Rockler*. It comes with a dense foam insert that's formed with rows of holes for storing bits with ¼" and ½"-dia. shanks. The lid of the case has a soft foam liner that compresses against the bits when the lid is closed.

If you don't need the portability of a case, the foam insert is sold separately. It's a great way to store bits in a drawer, toolbox, or even on top of the workbench.

Plastic Case. The case shown on the left from *Eagle America* provides similar benefits and features. The foam insert that holds the bits is made of a softer foam. The foam is cut with rows of X-shaped slits that snugly hold a router bit regardless of shank diameter. I had no problem loading it up with router bits.

Like the case above, the lid is also lined with foam to keep the bits in place. This durable case is ideal for protecting and storing bits in the shop or on the job site.

STORAGE CABINET

If your routing tasks are normally confined to one area of your shop, you may want to consider a wall cabinet for storing your router bits. The one you see at right is sold by *MLCS*.

As you can see, the 12" x 27" cabinet has the capacity for a lot of bits. The only downside is you have to purchase separate cabinets for ¼"-shank and ½"-shank bits. But if your router bit collection has gotten out of hand like mine has, spending less than $30 for each cabinet is worth it.

Portability. The cabinet is designed to be wall-mounted, but it works just as well as a portable container, too. The foam-lined lid will keep all your bits in place. It's the best of both worlds.

◀ ***Bit Case.*** *Compact bit storage is no problem with this handy cabinet.*

RACKS

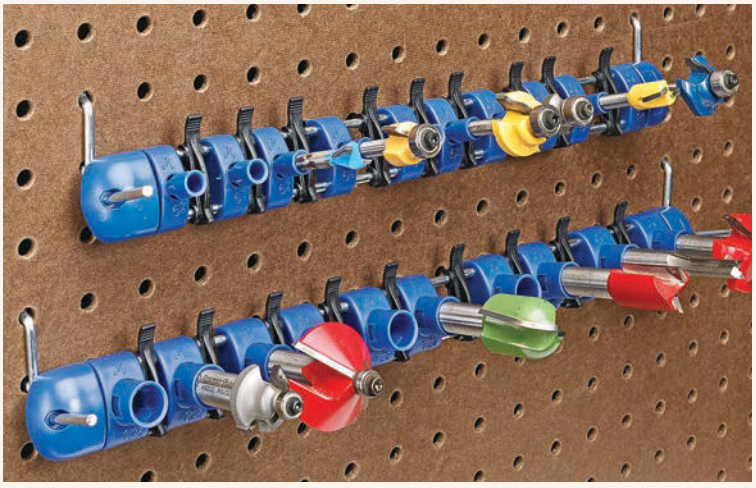
For a more modular and flexible solution for storing router bits, check out the options at right.

Metal Rack. There's a lot to be said for having your router bits out in the open within reach rather than tucked in a drawer or cabinet. The metal rack from *Rockler* shown on the upper right makes it easy to find the bit you need. You can mount the rack to a wall or stand, if desired, or simply let it sit on a workbench to keep your bits within easy reach.

Flexible Racks. The *Lee Valley* bit racks are available to hold ¼"-shank or ½"-shank bits (lower right photo). The plastic holders are a friction fit with the router bit shank. This means that the bits won't fall out of the rack even if it's tipped upside down.

You can simply hang the bit racks on pegboard hooks. They can also be mounted to the side of your router table or anywhere else that's convenient.

◀ ***Storage Rack.*** *Sturdy steel construction and an array of holes make it easy to store bits on a benchtop or router table stand.*



◀ ***Router Bit Rack.*** *The bit holders grip securely and can be positioned for optimal storage.*

BIT HOLDERS

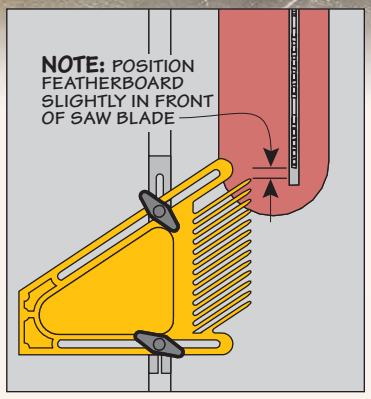
The most versatile options for storing bits are the bit holders shown at right. They're available in three sizes: ½", ¼", and 8mm. You can get half a dozen in a package for around $4.

The bit holders are mounted with a screw to create a custom storage solution. They provide the ulimate in flexibility.

◀ ***Bit Holders.*** *These plastic holders from Lee Valley make it quick and easy to design a custom storage solution.*

hold-downs & Featherboards

These low-cost accessories hold the key to making accurate cuts safely.



For a lot of woodworkers, the idea of shop safety seems to butt heads with a get-the-job-done practicality. However, the truth is that safe woodworking goes hand-in-hand with consistent, accurate work. As a woodworker, I'm always looking for ways to improve the results I get when using tools.

The table saw is a good place to show you what I'm talking about. No matter what kind of saw you have, an inexpensive accessory, a featherboard, can improve both results and safety.

► ***Grooves.*** *By providing firm pressure against the rip fence, a featherboard ensures that grooves will be accurately sized.*

Rip It Right. Many projects start with ripping parts from wider boards. There are two ways to use featherboards while ripping.

I attach a featherboard to the saw table when ripping long boards. The featherboard acts as a third hand to hold the workpiece tight against the fence while I control the back end.

The same setup works for ripping a number of parts from similarly sized blanks, as shown the photo above. Here the featherboard ensures consistency.

The Setup. The key to making this work is the location of the featherboard. You want it close to where the blade is cutting, as shown in the inset drawing above. But it should be ahead of the blade. If it's even with the blade, the pressure can force the waste piece against the blade

▲ ***Better Rabbets.*** *A shop-made hold-down works just like a featherboard to ensure a consistent cutting depth when creating rabbets.*

▲ ***Stack Them.*** *Double up a pair of featherboards to create a taller support system when cutting wide workpieces that are held on edge. Position the featherboards ahead of the blade.*

and could cause kickback. Set the featherboard so it presses the workpiece against the fence but doesn't create too much resistance to push the workpiece through the blade smoothly.

Joinery Done Right. Cutting joinery at the table saw offers more opportunities to put a featherboard to work. The lower left photo on the facing page shows a common task — cutting grooves in stiles and rails.

My aim here is to have consistently sized grooves no matter how many I need to cut. A featherboard presses the workpiece against the rip fence so it can't drift away. It also counteracts any minor bowing along the length of the workpiece that could lead to uneven groove widths. At times I'll attach a second featherboard behind the blade for an added measure of control.

Rabbets & Dadoes. A table-mounted featherboard isn't usually helpful (or even possible) when cutting rabbets or dadoes. However, the resistance caused by a dado blade may cause a workpiece to rise up out of the cut, leading to inconsistent joints.

A featherboard attached to the rip fence above the blade keeps the workpiece fully engaged with the blade and creates a uniform depth of cut, as shown in the upper left photo. This works well when cutting long parts where it's not as easy to provide downward pressure with your hand.

Shaping Wood. In addition to cutting parts and joinery, a table saw can be used for shaping wood. One example is creating a raised panel (upper right photo). With the workpiece held on edge, you don't want it tipping and spoiling the cut. I used a pair of featherboards to help hold the workpiece upright against the fence.

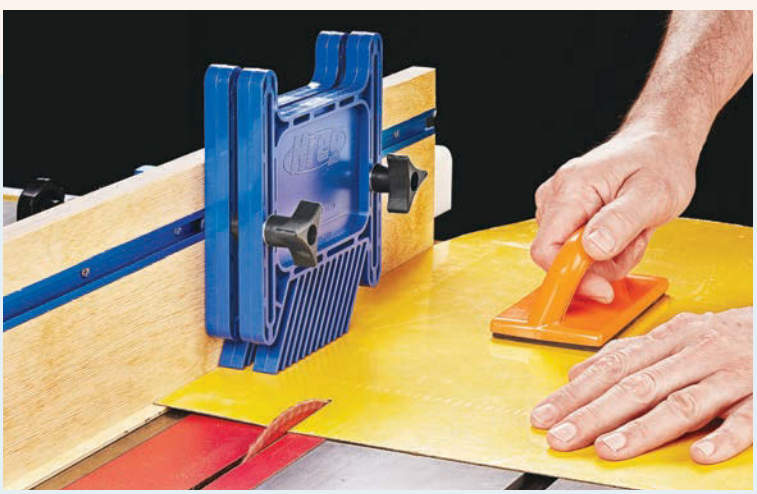
You can see another way a double featherboard can make a tricky cut easier in the box below. Table saw safety shouldn't get in the way of making cuts quickly and accurately. The ideas shown here will help you get the results you're looking for.

hold-down for Thin Stock

Cutting thin stock like plastic laminate, paper-backed veneer, or even thin plywood can be harder than it looks. The thin relatively flexible materials are prone to vibrating as they're being cut.

I take a three-pronged approach to make smooth cuts. The photo shows everything you need. A zero-clearance insert provides support and reduces chipout. Next, I made an auxiliary rip fence that includes a T-track for attaching featherboards. These hold the thin stock down and minimize chatter.

Finally, the fence has a lip along the lower edge. The purpose of this is to prevent the thin stock from slipping under the rip fence and wedging.



▲ ***Clean Cuts in Thin Stock.*** *A pair of featherboards attached to an auxiliary rip fence keep thin stock like plastic laminate from vibrating and chattering as it's being cut.*

must-have Drill Add-Ons

Get more use out of your drill and driver with these handy accessories.

▼ ***Insty-Drive.*** *Part of the Insty-Drive system, this chuck lets you quickly switch between ¼" hex bits.*

Sometimes the simple solutions are the best ones. The clever accessories for your drill and driver you see here fall in the category, "Why didn't I think of that?" Some of these will speed up your work in the shop, while others will help you out in a jam. You can find out where to get them in Sources on page 51.

Drilling & Driving Systems. One of the biggest hassles of using a drill has to be switching between drill and driver bits. So I looked at three "systems" that provide a complete solution for drilling and driving screws. Investing in one makes shop time more efficient.

DeWalt DrillDrive System. Countersinking and driving screws is one of the most common tasks in the workshop. The *DrillDrive* system you see above allows you to perform both functions in a snap. The heavy-duty, quick-change *DrillDrive* chuck fits in your drill's chuck.

The removable bit holder slips into the *DrillDrive* chuck. It houses a countersink drill on one end with a Phillips hex shank driver on the other end. Both bits are secured with set screws. The *DrillDrive* comes individually sized for #6, #8, or #10 screws.

To use the *DrillDrive*, simply insert the bit holder into the *DrillDrive* chuck with the drill bit exposed. After drilling the hole, remove the bit holder and flip it over to drive the screw.

Insty-Drive System. Another system of products is the *Insty-Drive* sold by *Rockler* (photos at left). The heart of the system is a drive sleeve with a hex socket that fits over a variety of drill bits in the *Insty-Drive* collection. These bits address the most common shop tasks and include

▲ ***A Quick Conversion.*** *Instantly switch from drilling to driving with the Insty-Drive system by slipping the sleeve containing a driver bit over the drill bit.*

countersink and self-centering bits, as well as standard drill bits.

Each bit is held in a hex-shaped bit holder with a set screw. The holder fits in a conventional drill chuck or the ¼" hex chuck found on cordless drivers.

Quick-Change Chuck. To add even more convenience to the *Insty-Drive* system, their *Quick Change Chuck* converts your 3-jaw drill chuck into a chuck that accepts ¼" hex-shank bits. You can see how it works in the lower left photo on the opposite page. The chuck makes the *Insty-Drive* system even more efficient. If you use your drill for driving screws, this chuck makes changing bits a quick task.

Snappy Tools. A system similar to the *Insty-Drive* is made by *Make It Snappy Tools*. The *Snappy* collection is primarily designed for drilling operations. Each drill bit holder features ¼" hex shanks to fit your driver. If you want to use the bits in a 3-jaw chuck, they supply a quick-change ¼" chuck adapter similar to the *Insty-Drive* chuck. You can see an example in the upper right photo.

Drill bits are held in their holders using a collet very similar to what you'd find on a router. So if a bit becomes dull or breaks, it takes no time at all to replace it with a new one.

Like the *Insty-Drive* system, the *Snappy* tools include self-centering bits. In addition, they also include plug cutters and a variety of chucks. All the bits and chucks are available separately or in various kits.

Impact Chuck. Getting more use out of your tools is always a plus. That's true for impact drivers, as well. Impact drivers are designed to hold driver bits with ¼" hex shanks. But there are times when it's convenient to use the driver for drilling.

Fortunately, there's an easy solution. You can buy a 3-jaw accessory chuck that is impact-rated. The one shown in the lower photo at right is from *DeWalt*. This makes it handy to use conventional drill bits.

These keyless adapter chucks also make it easy to use one tool for both drilling and driving. Simply drill a hole using the chuck then remove the chuck to use a driver bit to install a screw.

All of these accessories make driving fasteners and drilling easier. That makes shop time more efficient. And anything that gives me more time for woodworking is a plus in my book.

▲ ***Snappy Tools.*** *The Snappy system includes hex adapters for standard drill bits and a quick chuck you can install in your drill.*

▲ ***Impact Driver Adapter.*** *Rated for impact use, this adapter adds a 3-jaw chuck to your impact driver so you can use standard drill bits.*

problem Solvers

One of the problems with using a driver is that it's sometimes difficult to get into tight spaces. The two products shown at right solve this problem. With their ¼" hex chuck, they're designed for driving screws in small spaces.

The right-angle attachment (near photo at right) includes a handle that rotates and locks in a convenient position. This makes it easy to keep the bit locked into the screw. The flex-shaft driver (far right photo) provides another option for driving screws in tight, awkward spaces.

▲ ***Right Angles.*** *This small attachment with a locking handle chucks into your drill or driver for driving screws in tight spots.*

▲ ***Flexible Shaft.*** *Get more reach and flexibility in awkward spots with this handy driver accessory.*

Q&A

questions from our Readers

which drill?

Cordless or Corded

With all the great cordless options now available, is there any reason to consider buying a corded drill?
J. Smith
Watervale, New York

Cordless drills have certainly become the drill of choice for many woodworkers and craftsmen these days. The convenience of not being tethered to a wall outlet gives them a big advantage over drills with cords.

Either type will drill a satisfactory hole in most materials you'll normally work with. And both types share common features such as variable speeds, keyless chucks, and reversing switches.

Corded. However, don't assume corded drills are obsolete just yet. They have features that give them an advantage in a number of drilling operations.

Corded drills are generally much cheaper than cordless drills, both initially and over their lifetime, if you consider battery replacement cost. Their higher speed range makes them a better choice for drilling cleaner holes and for operations like grinding, buffing, and wire-brushing.

They're also more powerful, and they take up less room in your tool bucket because you don't have to lug around a charger and extra batteries. And they'll run all day so you never have to stop to recharge a battery.

Cordless. On the other hand, there's a reason that cordless drills are so popular. Along with convenience, cordless drills usually have higher torque (a plus for driving fasteners). A lower speed range helps when drilling large holes and hard materials like metals. In addition, they're much safer to use in wet conditions where a shock hazard exists. While early models had heavy batteries with short lives, manufacturers have made great strides to overcome these shortcomings.

As with most tool buying decisions, your choice will depend on your needs and requirements. The chart on the left lists some of the pros and cons of each type to help you make a better decision. In the end, you may opt to purchase one of each type.

	ADVANTAGES:	DISADVANTAGES:
CORDED:	• Lower cost (initial & over lifetime) • Higher speed (grinding & buffing) • More power • Extended operating time	• Less convenient (cord limits portability & safety) • Less torque at low speed • Electrical shock hazard
CORDLESS:	• Convenience & portability • More low-speed torque (drives fasteners better) • Instant stop • Lower speed range	• Higher cost (initial & lifetime) • Limited battery life • Separate charger (120V power) • Battery manufacturing and disposal (toxic metals)

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.

SLOT CUTTER *(p.8)*

- **Infinity Cutting Tools**
  Slot Cutter Set 00-236

FOAM *(p.12)*

- **Blick**
  Balsa Foam . . . . . varies
- **amazon.com**
  Hot Wire Knife . . .B001DXMF9M
  Transformer. B0017NQU9Y

SLIDING TABLE *(p.16)*

- **Peachtree Woodworking**
  48" Miter Track 1032
  48" Mini T-Track 1022
  UHMW Miter Bar. 1120
- **McMaster-Carr**
  5/16"-18 x 3" Knob. 6085K14
  1/4"-20 Insert Knob 61135K31
- **Nevamar**
  Laminate S-6054

OUTRIGGER *(p.22)*

- **McMaster-Carr**
  3/8"-16 Insert Knob 61135K35

LUMBER CENTER *(p.24)*

Lowe's
Power Pro Lag Screws . . 155907

ROUTER TABLE CABINET *(p.34)*

- **Essentra Components**
  Door Pulls. DUH-55
- **Kreg Tool**
  Insert Plate PRS3038
  Insert Plate Levelers PRS3040
- **Rockler**
  Dust Port. 92031
  72" Cont. Hinges. 39170

BEVEL GAUGES *(p.40)*

- **Home Depot**
  Polysteel T-Bevel. 100156737
- **Lee Valley**
  10" Sliding Bevel 05N44.01
  4" Sliding Bevel 05N44.02
  Alum. Sliding Bevel . . . 60N20.10
  Bevel Setter 05N66.01
- **Rockler**
  Digital Bevel Gauge 47091
  General Protractor 32848

DEEP HOLES *(p.42)*

- **Woodworker's Supply**
  3/8" Shell Auger. 153314

ROUTER BIT STORAGE *(p.44)*

- **Eagle America**
  Bit Storage Box. 499-5731
- **Lee Valley**
  Rack for 1/2" Bits 03K09.50
  Rack for 1/4" Bits 03K09.25
  1/2" Bit Holders 16J03.62
  1/4" Bit Holders 16J03.61
- **MLCS**
  1/2" Bit Cabinet 9683
  1/4" Bit Cabinet 9660
- **Rockler**
  Router Bit Tray. 42287
  18" Bit Rack 32602

DRILL ACCESSORIES *(p.48)*

You can find *Insty-Drive* drill and driver accessories at *Rockler*. The *Snappy Tools* system is available from *Make It Snappy Tools.*

- **amazon.com**
  DeWalt Chuck . . . B000KKWLE8
  Flip Drive B0000DD6LY
- **Lee Valley**
  Flex Holder 25K15.50
  Right-Angle Driver . . . 25K15.60

For a current list of updates or revisions to past issues, please visit shopnotes.com/updates.

MAIL ORDER SOURCES

Woodsmith Store
800-444-7527

Rockler
800-279-4441
rockler.com

amazon.com

Blick
800-828-4548
dickblick.com

Eagle America
800-872-2511
eagleamerica.com

Essentra Components
800-847-0486
essentracomponents.com

Home Depot
800-466-3337
homedepot.com

Infinity Cutting Tools
877-872-2487
infinitytools.com

Kreg Tools
800-447-8638
kregtool.com

Lee Valley
800-871-8158
leevalley.com

Make It Snappy Tools
940-686-6900
snappytools.com

McMaster-Carr
630-600-3600
mcmaster.com

MLCS
800-533-9298
mlcswoodworking.com

Nevamar
877-726-6526
nevamar.com

Peachtree Woodworking
888-512-9069
ptreeusa.com

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

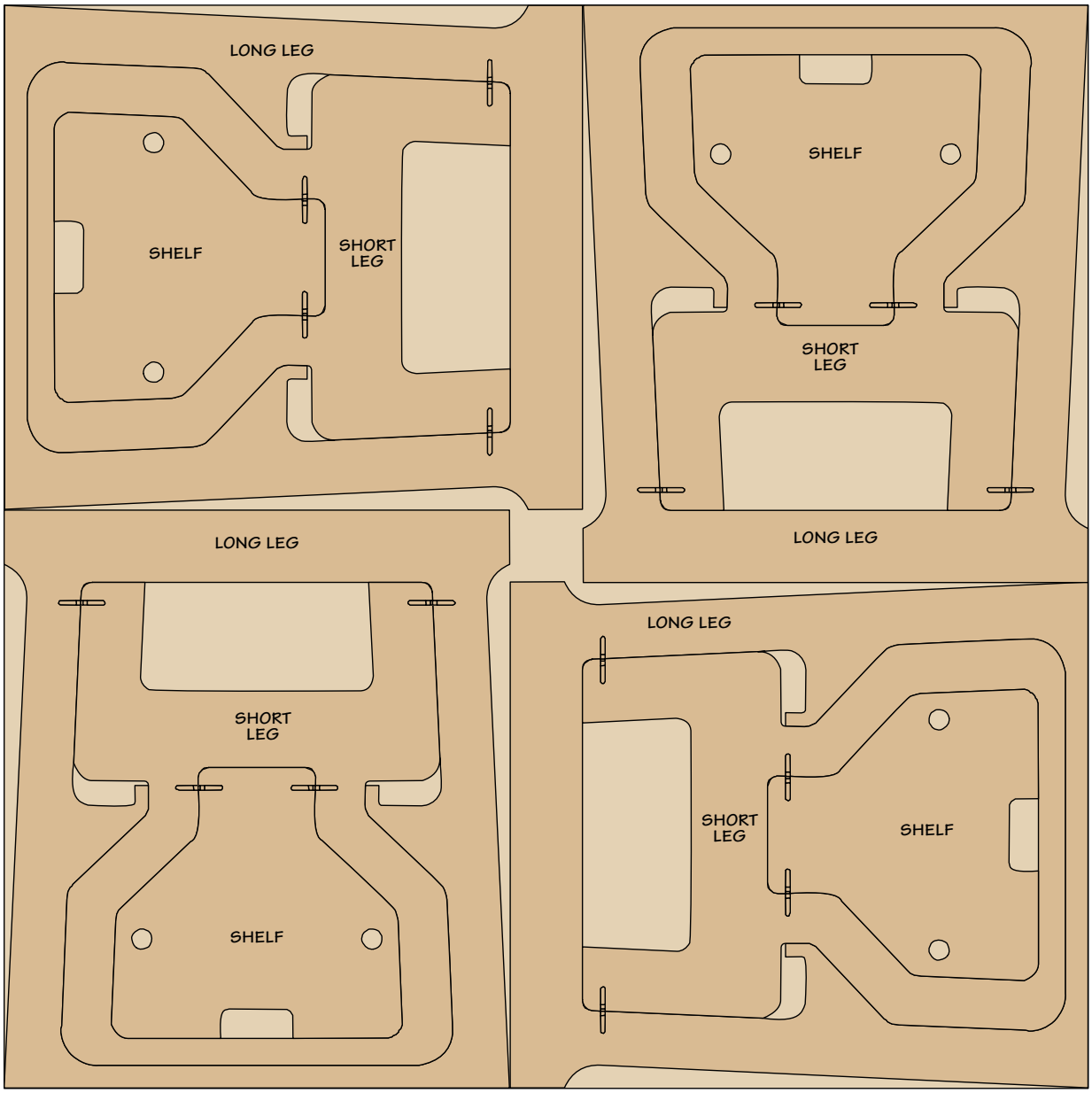
ShopNotes

Folding Sawhorse

NOTE:
SAWHORSES CUT FROM
60" x 60" - ¾"
BALTIC BIRCH PLYWOOD

NOTE:
CUT OUT
SAWHORSE BLANKS
WITH A JIG SAW

NOTE: FOR TWO OF THE SAWHORSES, THE ORIENTATION IS ROTATED 90° TO GRAIN DIRECTION, BUT DOESN'T AFFECT THEIR STRENGTH



ShopNotes

Router Table Wall Cabinet

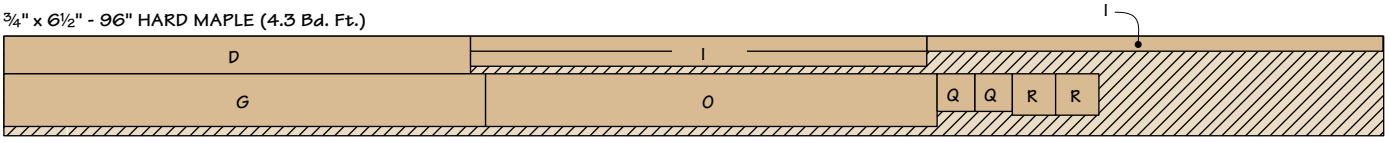
Materials List

A	Sides (2)	11¼ x 72 - ¾ Ply.
B	Top/Bottom (2)	11¼ x 31 - ¾ Ply.
C	Divider (1)	9⅜ x 31 - 1½ Ply.
D	Mounting Cleat (1)	¾ x 2½ - 31
E	Upper Back (1)	31 x 34¼ - ¼ Ply.
F	Lower Back (1)	31 x 30½ - ¼ Ply.
G	Toe Kick (1)	¾ x 3½ - 32
H	Shelves (3)	8¼ x 30⅝ - ¾ Ply.
I	Edging (3)	¾ x 1 - 30⅝
J	Tower Sides (4)	8½ x 24 - ¾ Ply.
K	Tower Backs (2)	8 x 24 - ¾ Ply.
L	Tower Dividers (8)	8 x 8 - ¾ Ply.
M	Tabletop (1)	20 x 30¼ - 1½ Ply.
N	Tabletop Face (1)	20 x 30¼ Plas. Lam.
O	Fence Base (1)	¾ x 3½ - 30
P	Fence Face (1)	1 x 3½ - 30
Q	Braces (2)	¾ x 2½ - 2½
R	Dust Port Blocks (2)	¾ x 2¾ - 2⅞
S	Upper Doors (2)	15 15/16 x 38⅜ - ¾ Ply.
T	Lower Doors (2)	15 15/16 x 29⅞ - ¾ Ply.
U	Bit Racks (6)	1¼ x 13/16 - 13

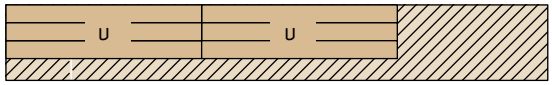
- (12) ¼" L-Shaped Shelf Supports
- (2) 24" T-Tracks
- (16) #6 x ½" Fh Woodscrews
- (1) 1½" x 36" Continuous Hinge
- (168) #6 x ¾" Fh Woodscrews
- (1) Kreg Router Table Insert Plate
- (1 set) Insert Plate Levelers
- (2) 5/16" x 1½" Dowels
- (12) #8 x 1¼" Fh Woodscrews
- (4) #8 x 1½" Fh Woodscrews
- (4) #8 x 2" Fh Woodscrews
- (1) 36" T-Track
- (1) Universal Dust Port
- (4) #6 x ½" Rh Woodscrews
- (2) 5/16"-18 x 1½" Flange Bolts
- (2) 5/16"-18 Star Knobs
- (2) 5/16" Flat Washers
- (2) 1½" x 72" Continuous Hinges
- (4) 4" Door Handles
- (4) Magnetic Catches w/Screws
- (8) #8 x 1" Rh Woodscrews

Cutting Diagram

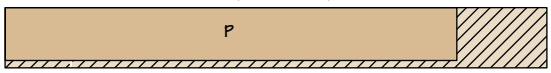
¾" x 6½" - 96" HARD MAPLE (4.3 Bd. Ft.)



1¼" x 5" - 36" HARD MAPLE (1.9 Bd. Ft.)

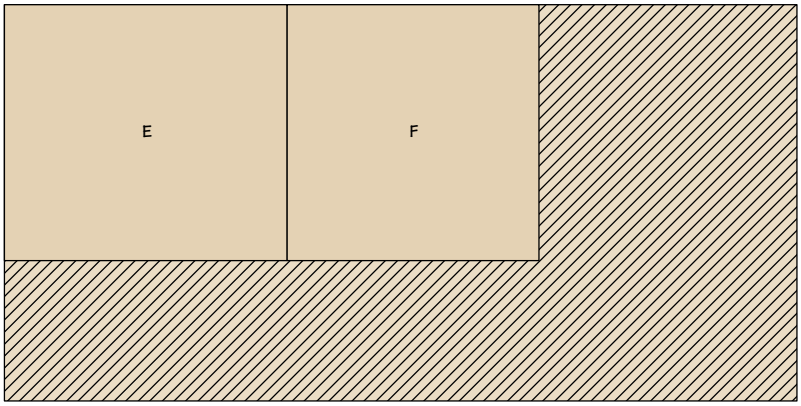


1" x 4" - 36" HARD MAPLE (1.3 Bd. Ft.)

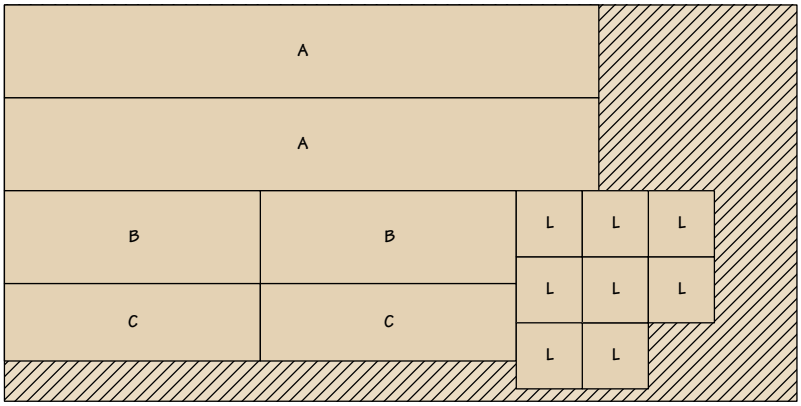


Cutting Diagram cont.

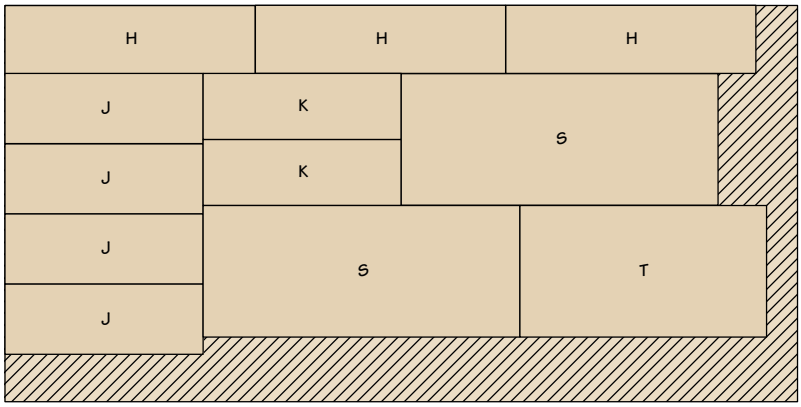
¼" x 48" - 96" MAPLE PLYWOOD



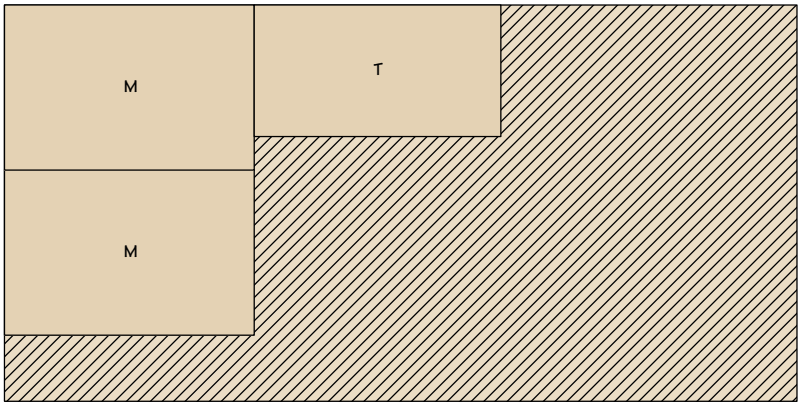
¾" x 48" - 96" MAPLE PLYWOOD



¾" x 48" - 96" MAPLE PLYWOOD



¾" x 48" - 96" MAPLE PLYWOOD



ShopNotes

multipurpose
Lumber Center

Materials List

A	Stanchions (5)	1½ x 3½ - 80
B	Upper Arm Cores (15)	1½ x 3½ - 12½
C	Upper Arm Plates (30)	3½ x 16 - ¼ Ply.
D	Lower Arm Cores (10)	1½ x 5½ - 14½
E	Lower Arm Plates (20)	5½ x 18 - ¼ Ply.
F	Top Shelf Skin (1)	16 x 96 - ½-Ply.
G	Upper Shelf Skins (5)	16 x 96 - ½ Ply.
H	Lower Shelf Skins (4)	18 x 96 - ½ Ply.
I	Upper Shelf Short Cleats (3)	¾ x 3½ - 20
J	Upper Shelf Long Cleat (1)	¾ x 3½ - 26
K	Lower Shelf Short Cleats (6)	¾ x 5½ x 20
L	Lower Shelf Long Cleats (2)	¾ x 5½ x 26
M	Narrow Drawer Fronts/Backs (12)	¾ x 5 7/16 - 19 7/8
N	Wide Drawer Front/Back (2)	¾ x 5 7/16 - 25 7/8
O	Drawer Sides (14)	¾ x 5 7/16 - 16¾
P	Narrow Drawer Bottoms (6)	16 x 18 7/8 - ¼ Ply.
Q	Wide Drawer Bottom (1)	16 x 24 7/8 - ¼ Ply.
R	Saw Platform Front/Back (2)	1½ x 3½ - 26
S	Saw Platform Sides (2)	1½ x 3½ - 16½
T	Saw Platform Top (1)	19½ x 26 - ½ Ply.

- (12) 3" Power Pro Lag Screws
- (200) #8 x 1" Fh Woodscrews
- (256) #8 x 1½" Fh Woodscrews
- (84) #8 x 1¼" Fh Woodscrews
- (8) #10 x 2½" Fh Woodscrews

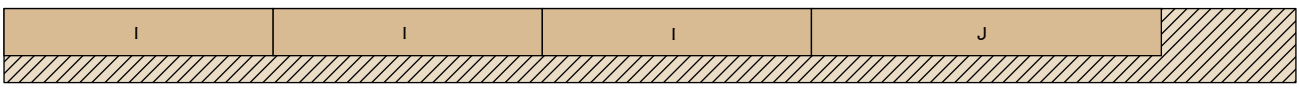
Cutting Diagram

2" x 4" - 8' DOUGLAS FIR (5 BOARDS)

2" x 4" - 8' DOUGLAS FIR (2 BOARDS)

2" x 4" - 8' DOUGLAS FIR

2" x 6" - 8' DOUGLAS FIR



2" x 6" - 8' DOUGLAS FIR

2" x 6" - 8' DOUGLAS FIR

Cutting Diagram cont.

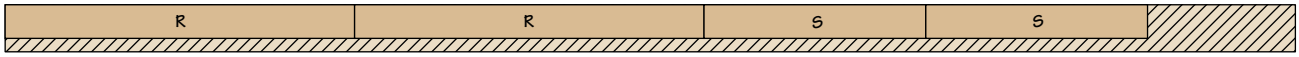
2" x 6" - 8' DOUGLAS FIR (3 BOARDS)

2" x 6" - 8' DOUGLAS FIR

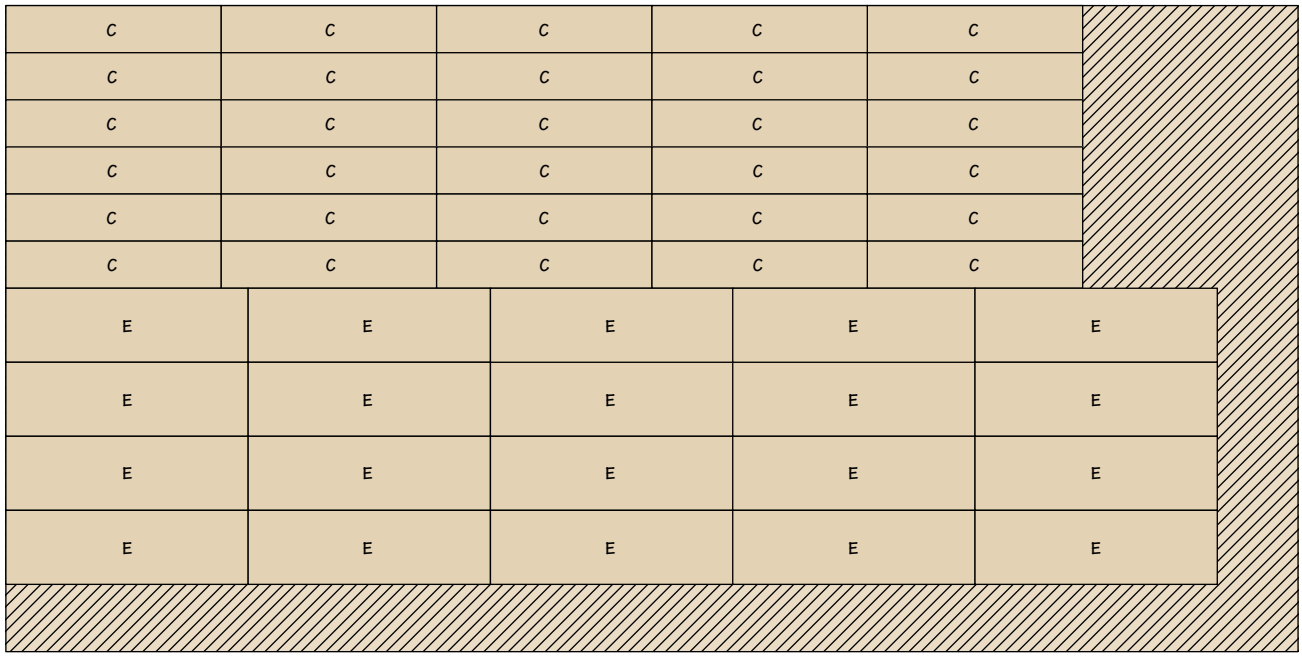
2" x 6" - 8' DOUGLAS FIR (2 BOARDS)

2" x 6" - 8' DOUGLAS FIR

2" x 4" - 8' DOUGLAS FIR

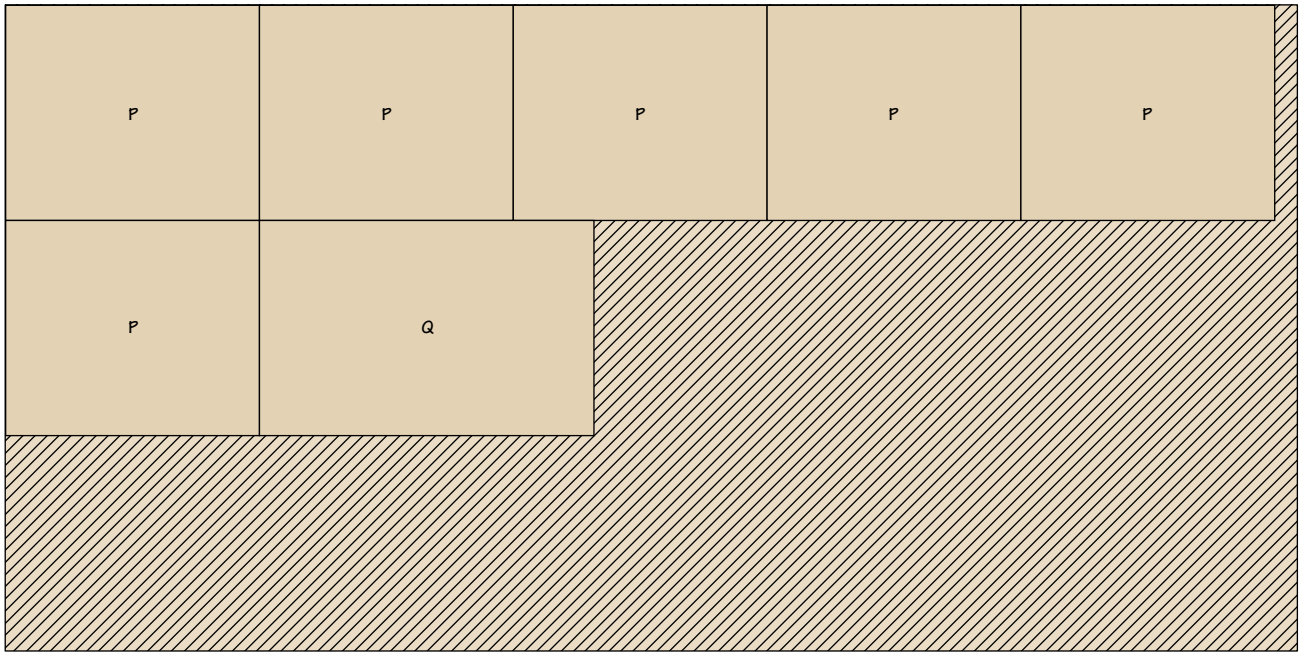


48" x 96" - ¼" PLYWOOD

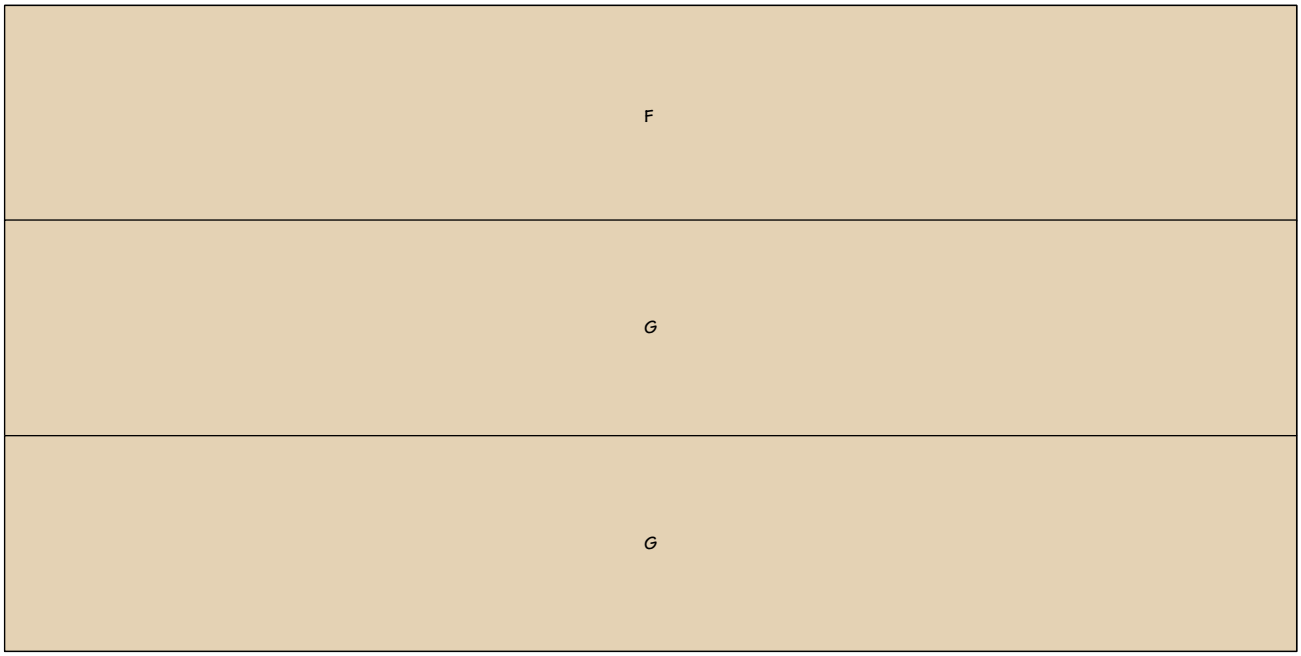


Cutting Diagram cont.

48" x 96" - ¼" PLYWOOD

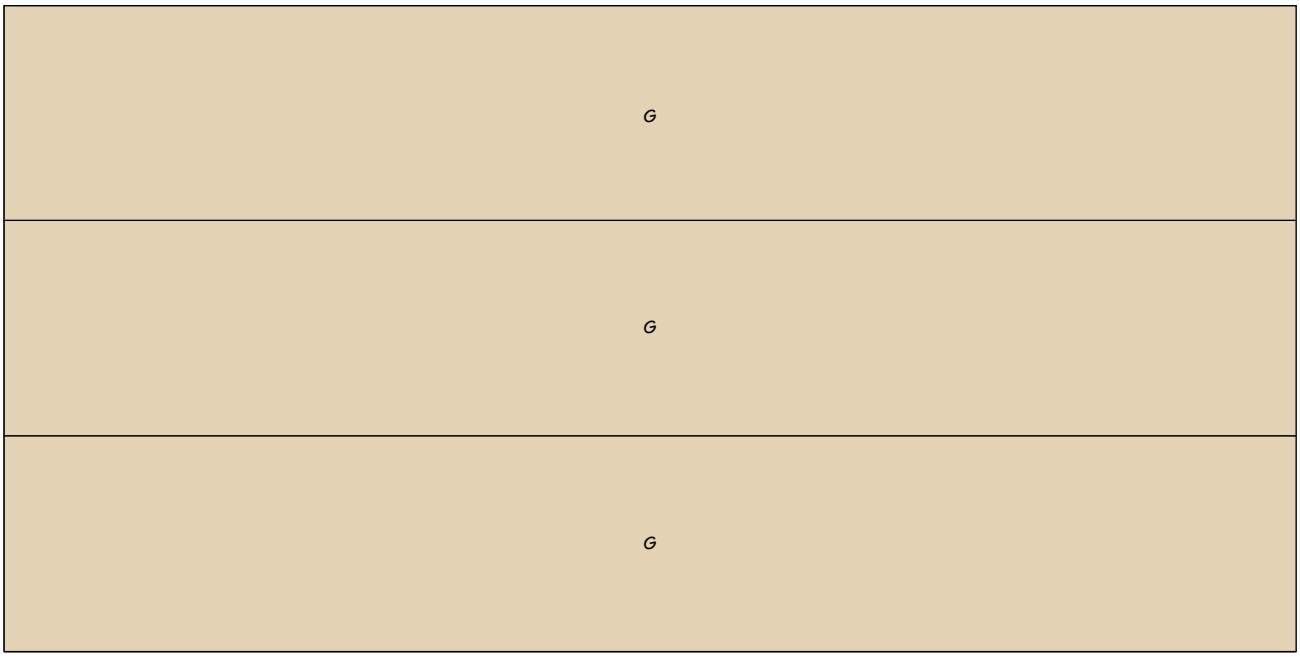


48" x 96" - ½" PLYWOOD

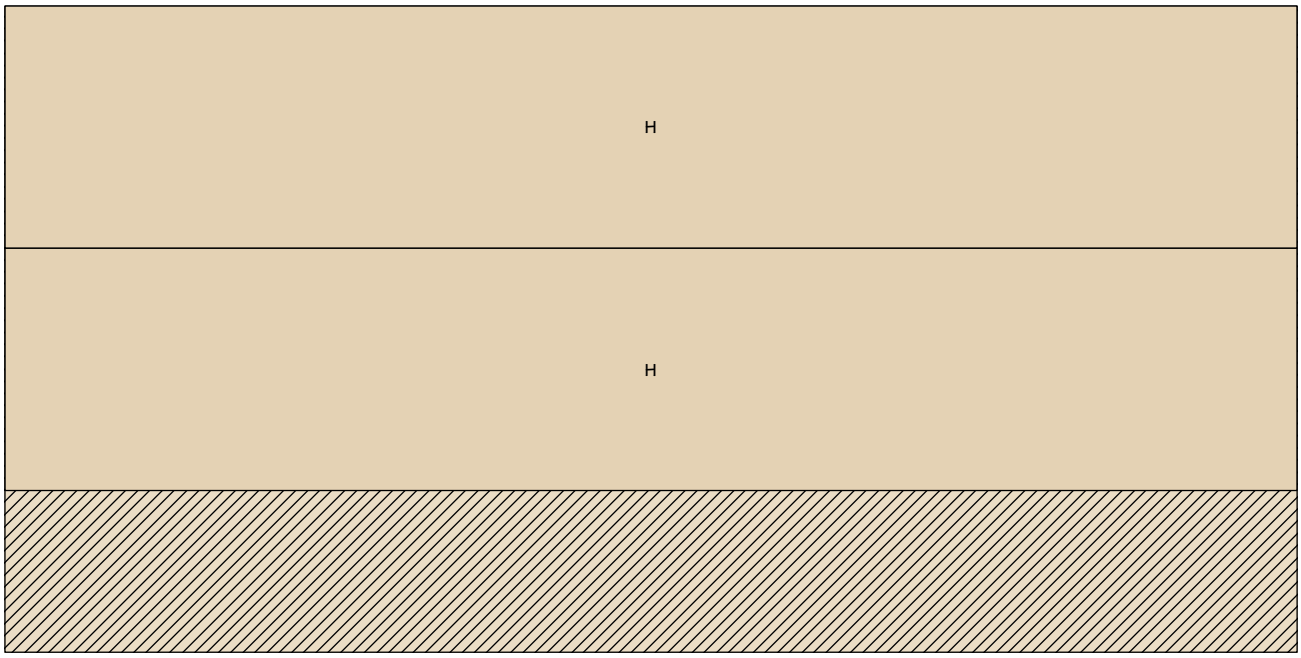


Cutting Diagram cont.

48" x 96" - ½" PLYWOOD

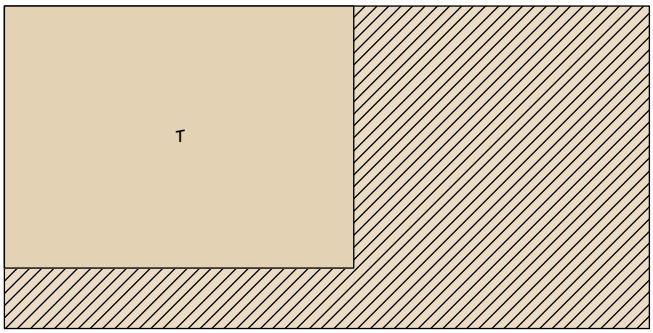


48" x 96" - ½" PLYWOOD (2 SHEETS)



Cutting Diagram cont.

24" x 48" - ½" PLYWOOD



Scenes from the Shop

This lumber rack has it all — sturdy shelves for long stock, built-in storage for cutoffs, and a bonus worksurface. You'll find complete plans starting on page 24.

ShopNotes.com

Here's a two-in-one project that will fit in any size shop. The cabinet provides valuable storage and also includes a fold-up router table. Detailed instructions begin on page 34.