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TOOLS
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ROUTER GUIDE: Micro-Adjustable for Precision Cuts

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Nº 279

AUGUST HOME PUBLISHING COMPANY

EDITOR'S NOTES

Over the years, I've known quite a few woodworkers who have set up shop in their garage. Some have actually converted their garage into a permanent shop, banishing the cars outside. Most though do what woodworkers have been doing for years — letting the cars and bicycles share space with tools and lumber.

Of course, that means trying to maintain a peaceful coexistence between shop and garage. In particular, organizing the shop to accommodate tools and cars, providing adequate storage, and controlling dust so it won't get tracked into the house.

Workbench Home Woodshop — Which brings me to the feature project in this issue — the *Workbench* Home Woodshop. It's a fully-functional woodworking shop that's set up in a two-car garage. And what's just as important, this shop can be quickly and easily converted *back* into a garage at the end of the day. In short, it truly is a shop *and* a garage.

If you'd like a sneak peek of the garage shop, turn to page 42. Then just open the centerfold to see how the projects, tools, and ideas in this shop can be used to make practical improvements to your own shop.

One final note — there's not enough room in one issue to tell you all about this shop. So we'll feature more projects and ideas from the shop in upcoming issues.

Woodsmith Store — While we've been working on our shop, the folks here at August Home Publishing (publisher of *Workbench*, *Woodsmith*, and *ShopNotes* magazines) have had another exciting project going on. The new Woodsmith Store has just opened its doors in Des Moines, Iowa. This retail woodworking store has over 20,000 square feet of floor space that's packed with woodworking tools, display shops, lumber, and supplies.

If you're traveling in the area, be sure to stop by and visit the store. Travel directions and a detailed map are available at www.WoodsmithStore.com

Tim

WORKBENCH

VOLUME 59 NUMBER 5

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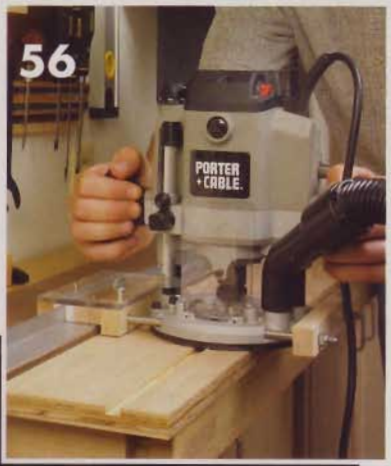

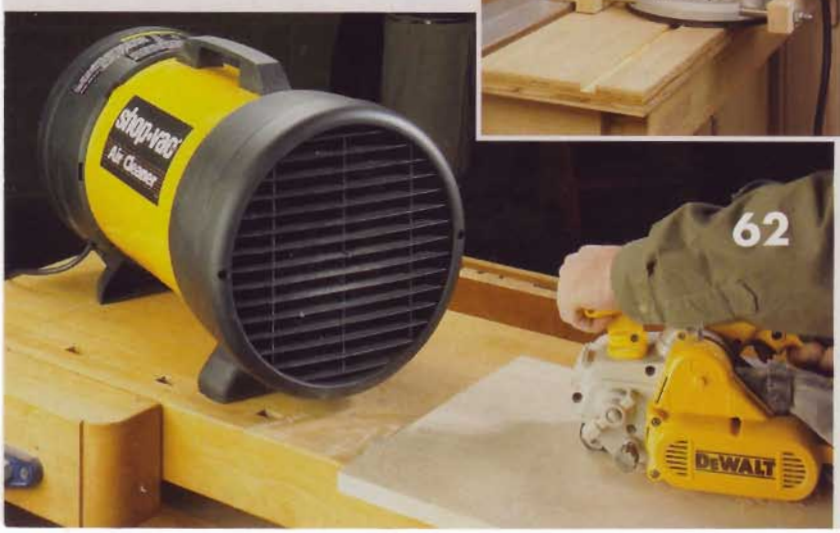

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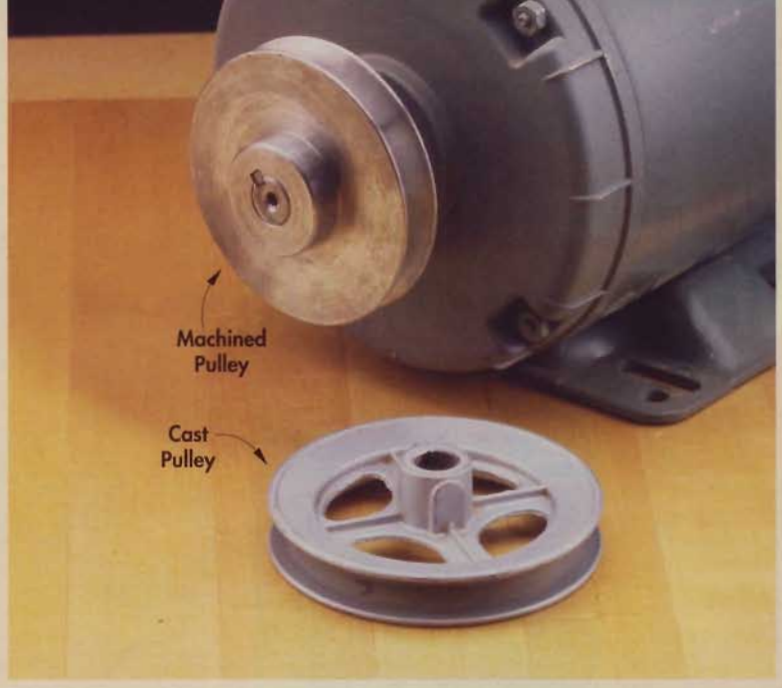


tool motor tune-up
PULLEY UPGRADE

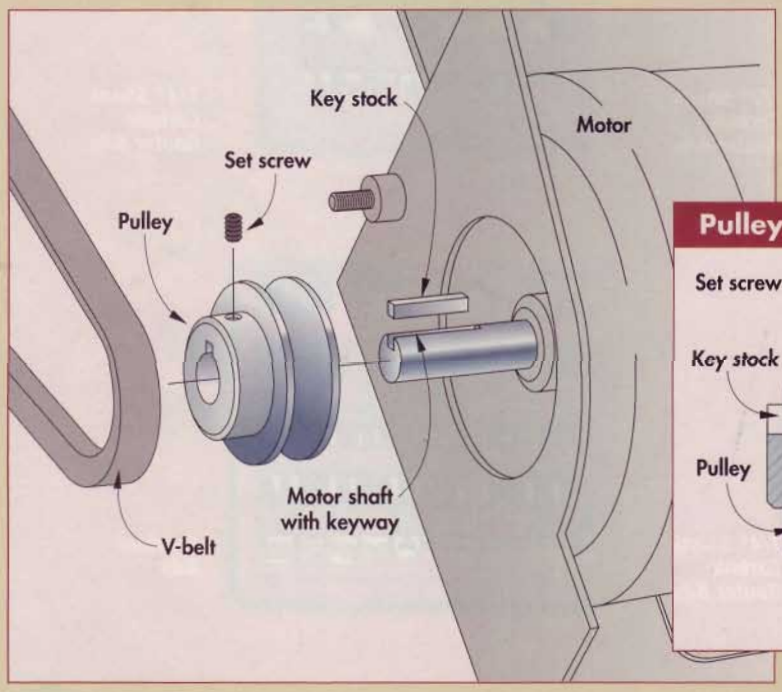
Q *I replaced the 1-hp motor on one of the tools in my shop with a 1.5-hp motor. Since then, the pulley keeps coming loose. Did I make a mistake adding a bigger motor?*

Jim Komar
Via the Internet

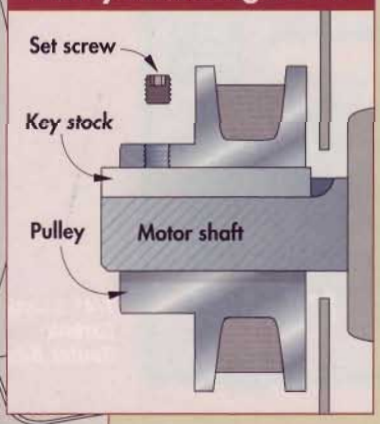
A From the sound of things, your new motor isn't the problem, as long as it doesn't exceed the manufacturer's recommendations for rpms. If the pulley is loose, chances are the key stock that holds it in place is worn and needs replacement *(see Illustration)*. Replacement key stock is typically available from the manufacturer or hardware stores.

As long as you're replacing the key stock, you may want to think about upgrading the pulleys as well. Many shop tools have cast pulleys, which you can recognize by their rough surface. The problem with these pulleys is they're not always balanced, which sometimes can cause them to wobble.

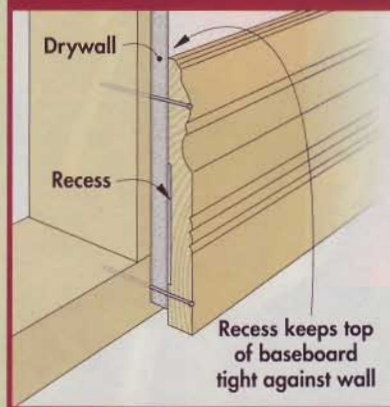
One solution is to install a machined steel pulley. These pulleys are turned on a lathe, so they are balanced to run true. Identified by a smooth, machined surface, the pulleys are available at most bearing supply stores.



Pulley Mounting Detail



The Reason for the Recess



Several readers have asked about the purpose of the shallow recess machined on the back of baseboard molding. It's there for one major reason.

The recess allows the baseboard to flex just a little with the opposing pressures of the top and bottom finish nails during installation. This way, if there are any irregularities in the wall, the top edge of the baseboard will still fit tightly against it.

Got Questions? We Have Answers!

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avoid crack-ups when DRILLING HOLES IN TILE

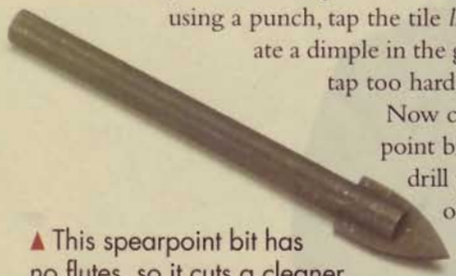
Q *I want to replace my shower curtain with sliding doors. To begin the installation, I'll need to drill some holes in the ceramic tiles. Any tips on drilling these holes without cracking the tile?*

Bob Schiffer
Reno, NV

A Tile usually cracks during drilling if too much pressure is applied when trying to break through the glaze. Fortunately, there are several things you can do to prevent that from happening.

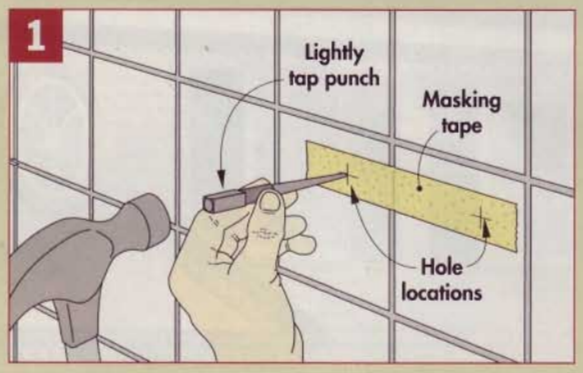
The first thing I'd suggest is buying a spearpoint bit like the one shown below. If you can't find one at a hardware store, check with a tile store.

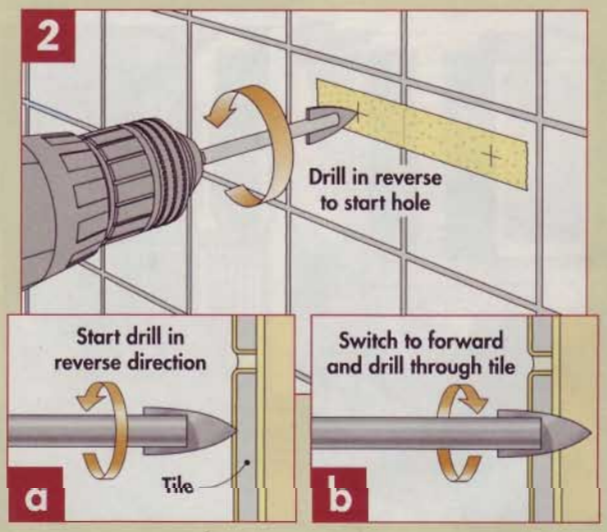
To prevent the bit from wandering, place a piece of masking tape over the area you'll be drilling and mark the hole locations on the tape. Then using a punch, tap the tile *lightly* at each centerpoint to create a dimple in the glaze *(see Fig. 1)*. Be careful not to tap too hard, as this could break the tile.



▲ This spearpoint bit has no flutes, so it cuts a cleaner hole through ceramic tile than a standard masonry bit.

Now carefully align the tip of the spearpoint bit with the dimple *(Fig. 2)*, set the drill to reverse, and drill just a few revolutions to make a small starter hole *(Fig. 2a)*. Then, with the drill set to the forward drilling position, drill through the tile exerting an even amount of pressure *(Fig. 2b)*.





Cut it Close with Phenolic Blocks

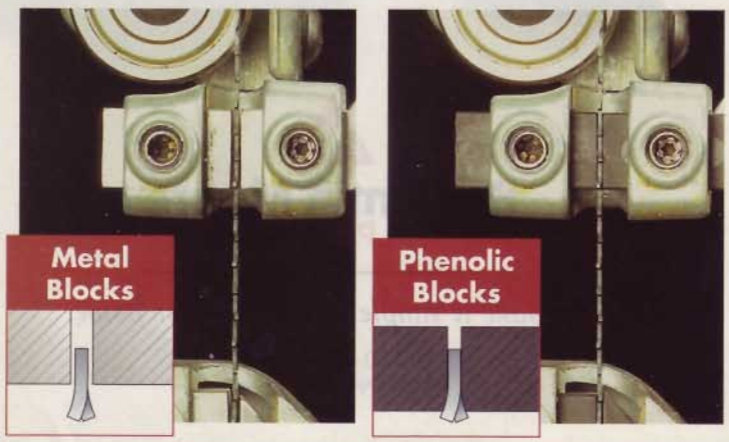
Q *Is there any advantage to replacing the metal guide blocks on my band saw with phenolic plastic blocks?*

Jason Lamberti
El Paso, TX

A Band saw guide blocks have one major purpose — to prevent the blade from wandering off course or twisting as you make a cut.

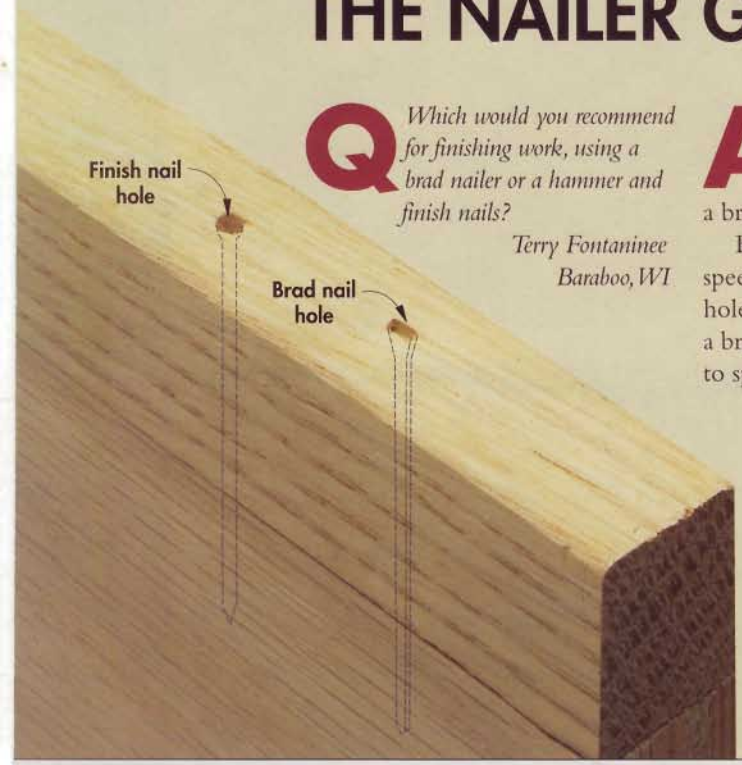
Metal guide blocks work fine in this capacity with most blades. They can be set very close to, but not touching the blade, which provides plenty of support for the blade during the cut. Plus, since I usually set the blocks slightly *behind* the blade teeth, there's no concern about the metal blocks damaging the teeth.

With narrow band saw blades, though, the metal blocks don't provide enough lateral support. The blade is just too narrow. Phenolic guide blocks, on the other hand, are ideal when working with blades $^1/_8$" or narrower. Since phenolic is a hard type of plastic, you can actually set the guide blocks *against* the sides of the blade without damaging the teeth. Of course, the blade will chew up the blocks, but they can be resurfaced by holding them against a stationary disc sander. Phenolic blocks are available in woodworking stores and catalogs.



hammer vs. brad nailer

THE NAILER GETS THE NOD



Q *Which would you recommend for finishing work, using a brad nailer or a hammer and finish nails?*

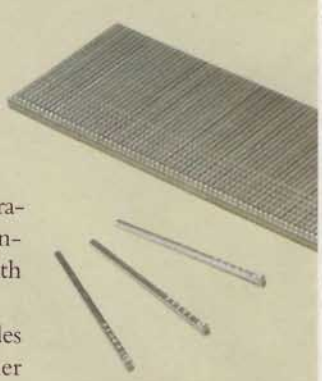
Terry Fontaninee
Baraboo, WI

A While using a hammer and finish nails is the traditional approach, it's much more time consuming than getting the job done quickly with a brad nailer.

Brads, however, have several other advantages besides speed. One is their smaller size, which leaves a smaller hole to be filled in a workpiece *(see Photo)*. In addition, a brad is blunted slightly at the tip, making it less likely to split the wood than finish nails.

While finish nails are round with a round head, brads are rectangular with a T-shaped head, which allows both driving and setting with a single shot from the nailer.

Of course, convenience is another benefit of using brads. Loading a clip into the nailer is much easier than constantly reaching into your nail bag. And the thin coating of glue on a clip of brads increases their overall grip in the workpiece.



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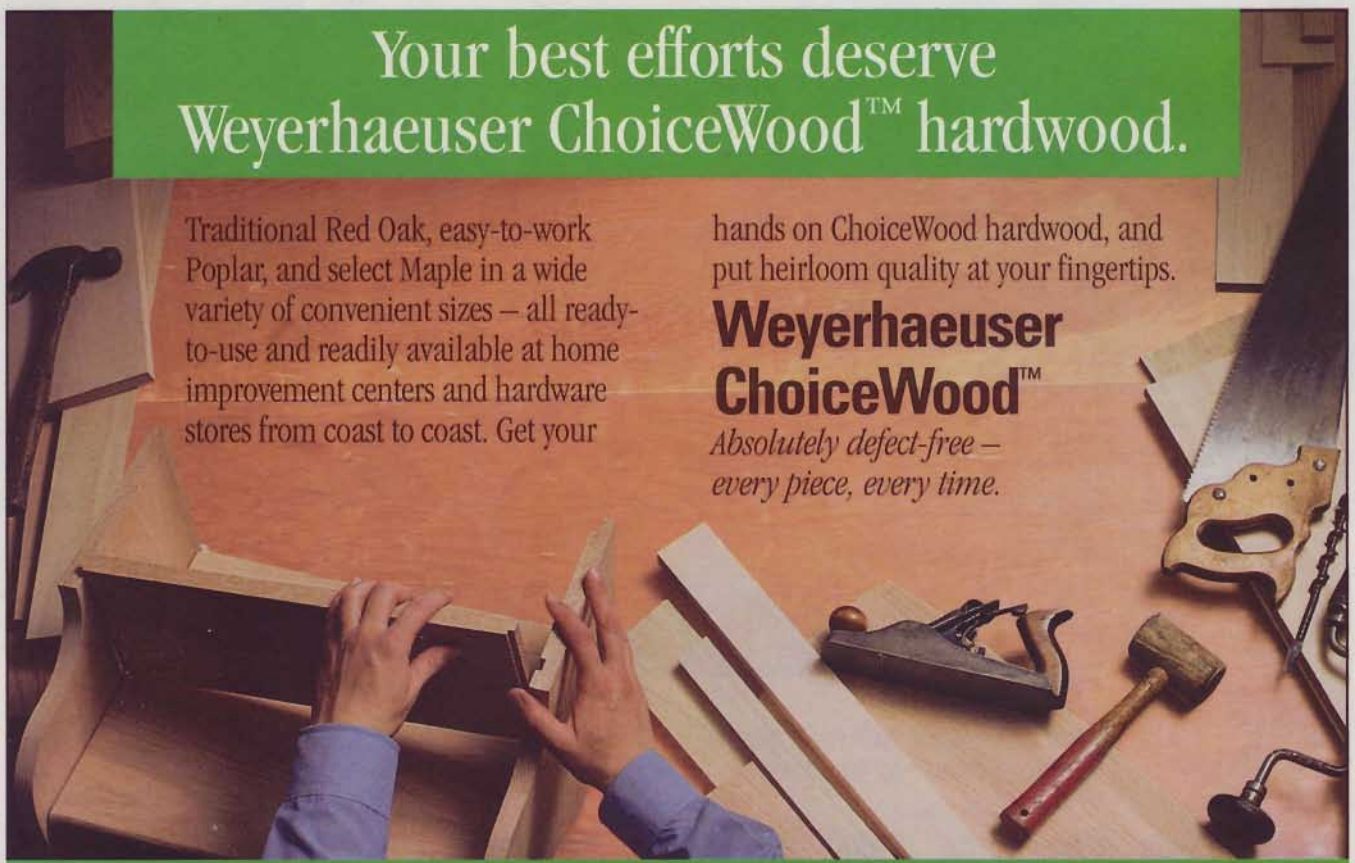


Weyerhaeuser

Product Information Number 210

adjustable angle TAPER SLED

Like a lot of woodworkers, I use a table saw and a shop-made jig to make tapered cuts. But unlike many jigs I've seen that are meant for cutting only one angle, my taper sled is adjustable for a wide range of angled cuts.

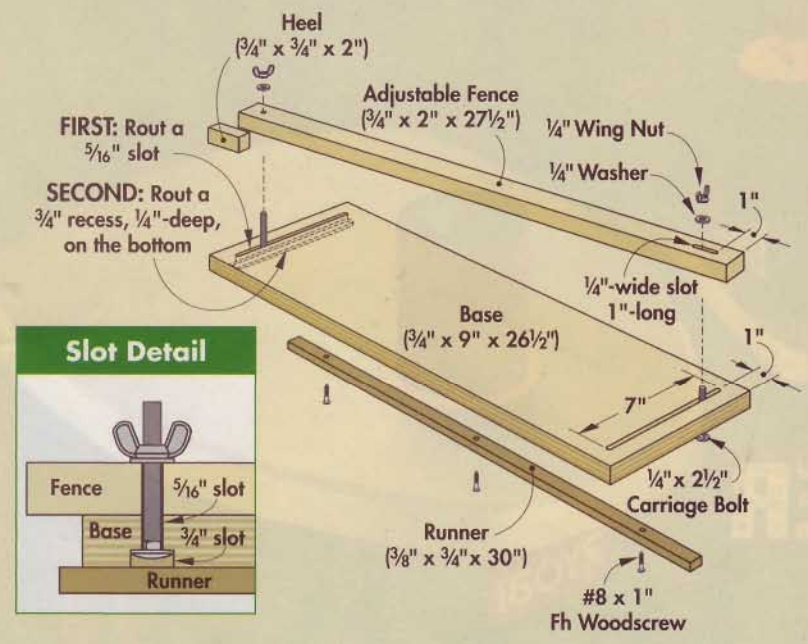
The basic principle of this sled is simple. The edge of the sled is a "reference edge" that indicates the path of the saw blade. So to set up the cut, you just align the layout line for the taper with the reference edge and then set the fence against the workpiece. As you slide the sled across the saw table, the blade cuts precisely on the line.

The sled starts off as an extra-wide base made of 3/4" plywood. Then, after attaching a hardwood runner that's cut to fit the miter gauge slot, a single pass is all it takes to establish the reference edge.

To make the fence adjustable, you'll need to rout a slot at each end of the base. Then, to provide clearance for the carriage bolts that secure the fence, add a shallow recess around that slot *(see Slot Detail)*. A small "heel" glued to one end of the fence helps to hold the workpiece in place during the cut.

Allan Bushman
Goleta, CA

CONSTRUCTION VIEW



Slot Detail

notched pail PIPE CUTTING PARTNER

I needed to cut some PVC pipe recently, but lacked a holder to steady the pipe during the cut. To remedy this, I just cut two V-shaped notches on opposite sides of the top rim of a plastic pail. Lay the pipe across the pail, nest it in the notches, and it stays put while you cut it to length. A decent-sized notch accommodates a variety of pipe sizes.

Wayne L. Smead
Minneapolis, MN

WIN BIG for Shop Tips!

The items above are just part of the **RUST-OLEUM** Paint & Finish Kit (valued at over **$400**) won by Allan Bushman for his featured tip!

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hang 'em up STORAGE BINS

I've always kept several of those plastic small-parts bins handy while working on shop projects. But they often end up getting knocked off onto the floor, scattering pieces everywhere. So much for organization.

To remedy this, I added the plastic bins to my pegboard setup, where everything is up off the work surface but instantly accessible.

It was an easy addition. Since the bins each have a lip on the back for hanging, all you have to do is cut a length of aluminum bar stock and add several screw holes that align with the holes in the pegboard. Place a couple of washers behind each hole to allow clearance for the lip of the bin, and drive a #14 sheet metal screw through each, directly into the pegboard hole. The result is a sturdy mounting bar to hang your parts bins.

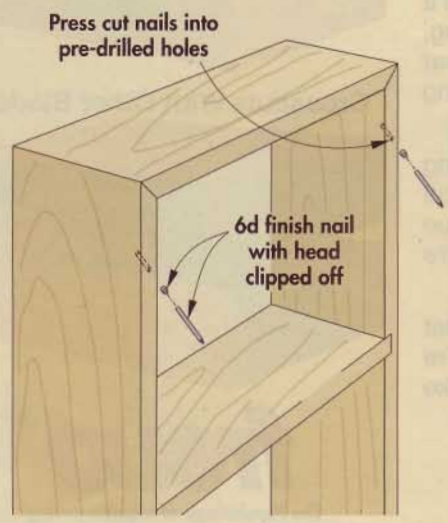
Jim Downing
West Des Moines, IA

flush mounting DISPLAY CASES

Traditional picture hangers don't allow picture frames or display cases to hang perfectly flat against the wall. My solution is to use nails installed in the back of the case (or frame) at an angle.

First, cut the heads off several 6d finish nails. Then drill holes in the back of the case upward at a 45° angle. Push the nails, "head end" first, into the holes *(see Illustration)*. Now hold the display case against the wall at the desired spot and push *in* and *down* so the nails penetrate the drywall. For heavier display cases, simply add additional nails.

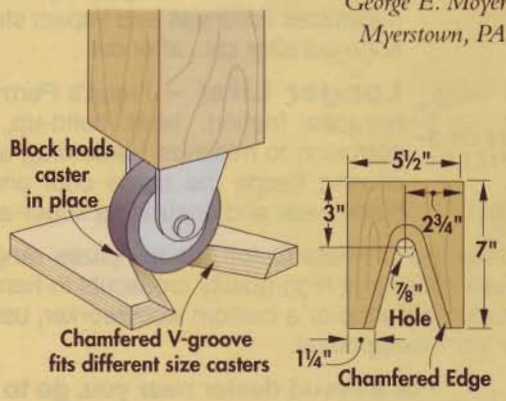
Marvin Clore
Cut Bank, MT



chock block Tool Brake

Mobile tools are great — unless they insist on being mobile while you're using them. One way to remedy this is to make a chock block. Take a piece of ¾" plywood and drill a hole in it *(see Illustration)*. Make angled cuts from the hole to the edge and chamfer the edges of the cutout. The result is an angled V-notch that works with a variety of caster sizes. Just wedge the chock tightly under the caster. The pressure of the wheel on the notch holds the chock in place.

George E. Moyer
Myerstown, PA



Craftsman LASER LEVEL

Not too many years ago, lasers could be found in two places: George Lucas films and professional construction sites.

On the construction sites, the need for precision offset the prohibitive cost of laser levels. The typical DIY'er, unfortunately, was still a slave to his 4-ft level and chalk line.

About two years ago, however, laser technology began showing up in consumer-priced products from several manufacturers. As remarkable as that was, it's even more remarkable to see how much the lasers have improved in just those 24 months.

The best example of that is the new Laser Trac Level from Craftsman. This is the most versatile, easy-to-use laser level I've come across for consumers, and it sells for the incredibly low price of $39.99.

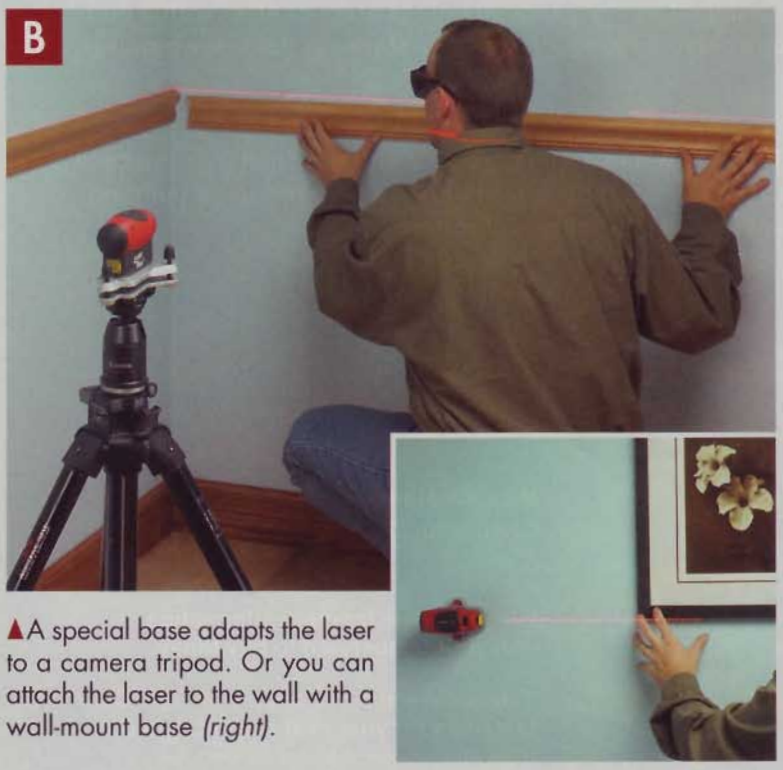
The Laser Trac is powered by two AA batteries and projects a line that's accurate to plus or minus $1/4$" at 30 feet. The line can be cast vertically, horizontally, or any angle in between. It can even be projected onto multiple or irregular surfaces without interruption. Hanging pictures, installing wainscoting and chair rail, or even setting fence posts at identical heights are just a few examples of how this laser can be used.

What I really appreciate about this laser, though, is that it can be mounted in so many positions using the bases that come with it. A surface-mount base lets you place the laser on just about any flat surface and level the unit up *(Photo A)*. The tripod mount adapts the laser to any standard camera tripod *(Photo B)*. Finally, a wall-mount base allows you to attach the laser directly to most walls *(Inset Photo)*.

The kit also comes with a pair of laser-enhancing glasses. Wearing these makes it much easier to see the laser in bright light situations, such as outside in the sunshine.

Everything included with the kit stows conveniently in a soft, zippered carrying case. The Laser Trac Level is available in Sears stores or online at www.Sears.com.

▲ Using the surface-mount base, which has three adjustable feet for leveling, turns anything from this ordinary stool to a stack of books into a makeshift tripod.



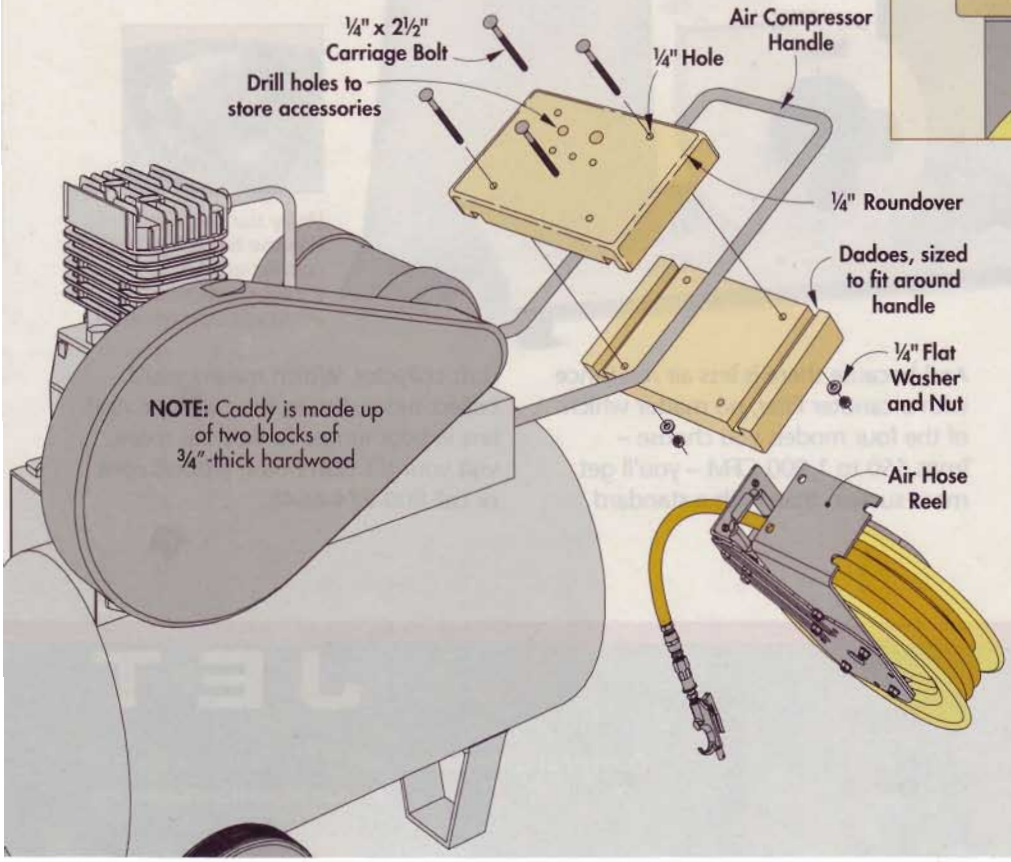
▲ A special base adapts the laser to a camera tripod. Or you can attach the laser to the wall with a wall-mount base *(right)*.

shop-built COMPRESSOR CADDY

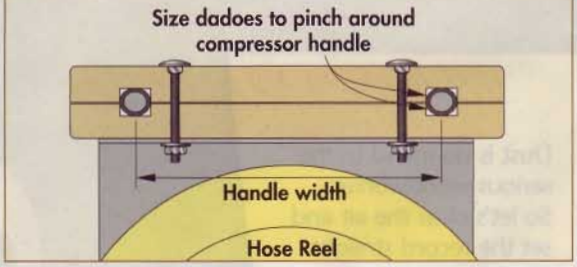
Hauling my "portable" air compressor from one place to another used to be a two-trip experience — one to move the compressor, another to get the air hose and tools I needed. But Chris Levan's handy compressor caddy has cut my haul time in half.

The compressor caddy is a thick block of wood mounted to the compressor's handle. It holds fittings and accessories, *and* it does double duty as a mounting surface for a hose reel.

The caddy is made up of two 3/4"-thick hardwood blocks with dadoes that "sandwich" the compressor handle. It's important to cut the dadoes so their *combined* depth is just a hair less than the diameter of the handle *(see Dado Detail)*. That way, the two halves can be bolted tightly together, pinching the handle and keeping the caddy in place. The top of the hose reel is secured to the lower half of the caddy using those same carriage bolts *(see Dado Detail)*. A simple series of various-sized holes in the caddy accommodate all the gauges, fittings, and attachments.



Dado Detail



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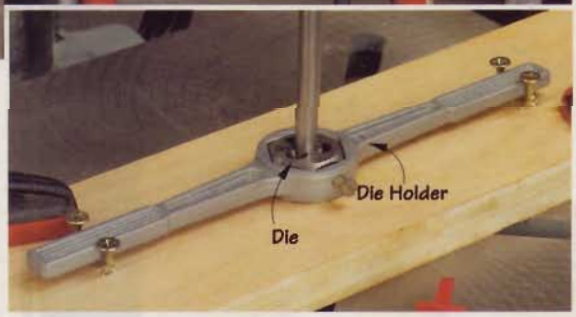
thread metal rods STRAIGHT & TRUE



▲ To ensure a straight, precise thread on a metal rod, use the drill press to thread the rod into a die centered on a piece of wood directly below.

For many shop projects (like the *Precision Router Guide* on page 56), you'll need to use a die to cut threads around the outside of a metal rod. A die is a hexagonal steel device with sharp teeth made for cutting threads in metal *(see Inset Photo below)*.

This technique is often trickier than it looks. The problem is the rod sometimes doesn't start straight into the die, and the thread that's cut will be crooked and unusable.

Fortunately, the solution is as close as your drill press. It holds the rod straight, so the thread can get off to a good start *(see Photo)*.

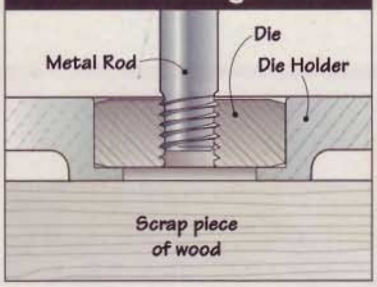
To use this technique, set a scrap piece of wood on the drill press table. Secure the die holder to the wood scrap with four woodscrews so that it won't spin around *(see Inset Photo below)*.

Now chuck the rod in the drill press and center the die in the die holder directly below the rod. At this point, clamp down the wood scrap so it will remain stable. Then, simply attach a pair of locking pliers to the rod and lower the rod down into the die.

Use the locking pliers to turn the rod clockwise in the die with one hand, and at the same time, place firm pressure on the hand feed lever with your other hand. This will ensure a clean, consistent thread. If the rod binds in the die, back the thread out about a half turn to remove built-up metal filings. Note: Use oil as a lubricant while cutting the threads.

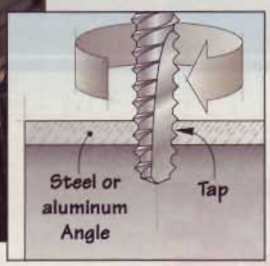
I only used this technique for the first ¼" of thread. Once I had it started, the threads were straight enough that I could finish them the usual way — by clamping the rod in a machinist's vise and cutting the threads with the die holder by hand.

Thread Cutting Detail



New Twist on Tapping Holes

For the *Precision Router Guide*, I also had to tap a number of holes in the aluminum angle used for the fences. To tap these holes quickly and accurately, I chucked a tap in my cordless drill and used the drill to guide it into a pre-drilled hole *(see Illustration)*. By adjusting the drill clutch to a low setting, the clutch slips rather than ruining the threads.



Once the clutch is set properly, hold the drill square to the metal and drive the tap slowly into the hole. Here again, use oil as a lubricant. If the tap binds, switch to reverse and back it out to remove the built-up metal filings. Continue drilling slowly until the threads are cut all the way through.

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THE HOME DEPOT
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GLUING WOOD STRIPS

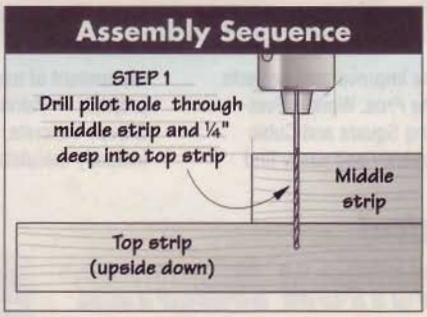
Assembling the front edging and support for the *Panel-Cutting Workstation* on page 50 presents an interesting challenge. They're each made up of individual strips of wood, which will tend to slip around during glue-up. To prevent this from happening, I used finish nails as registration pins to keep the pieces aligned.

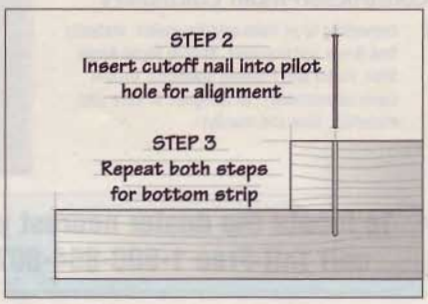
The basic idea here is to dry clamp two pieces together, drill a few pilot holes, and then insert the finish nails into the pilot holes to keep the two pieces aligned *(see Illustration)*. This way, when the pieces are pulled apart, glue can be applied between them. Then, when the pieces are clamped back together, the finish nails keep the pieces perfectly aligned as the glue dries.

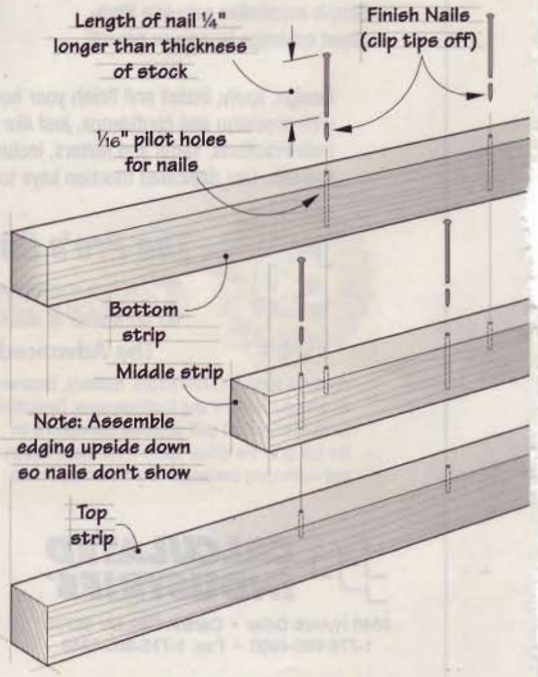
To make this work, I had to consider a few things while setting up the assembly. One is that I didn't want the nails to show on top, so I assembled the pieces upside down. I did the top two layers first, drilling the pilot holes and inserting the nails through the middle layer into the top *(see Assembly Sequence)*.

I only needed about 1/4" of each nail to be sticking into the top, just enough to grab it and keep it aligned. So I clipped off the tips of the nails. For 3/4" stock, I used 3d nails with the tips clipped off.

Once the first two layers are taken care of, repeat the process for the bottom layer *(see Step 3)*. This time, stagger pilot holes so they don't overlap the nail holes above them *(see Illustration)*. Then, pull apart the strips, glue them up, insert the nails, and clamp them together.



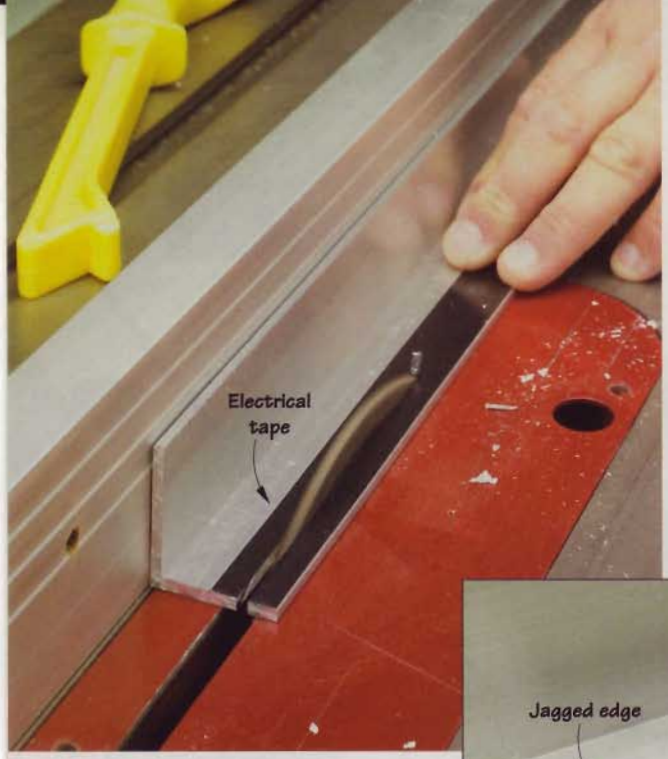




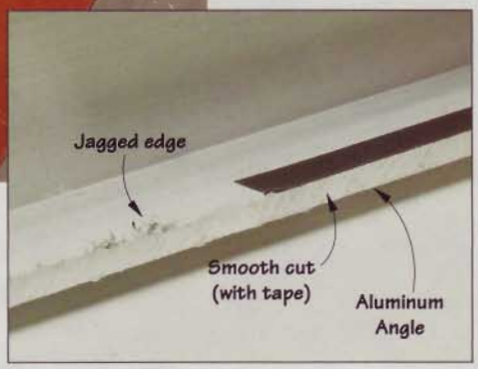
TIPS FROM THE WORKBENCH SHOP

for clean cuts in aluminum

TAPE DOES THE TRICK



▲ To obtain a smooth, clean cut on aluminum angle every time, run a strip of electrical tape down the cut line.



Cutting aluminum on a table saw isn't a problem, as long as you have a carbide-tipped blade. But it does tend to leave a jagged edge *(see Inset Photo)*.

In the past, my solution was to file the edge smooth. But while cutting the aluminum angle for the *Precision Router Guide* fences on page 56, I inadvertently cut through a manufacturer's sticker on the workpiece. Once the cut was completed, I noticed the edge underneath the sticker was perfectly smooth *(see Photo)*.

Intrigued, I ran a strip of electrical tape down the length of the next piece of aluminum angle. Then I ran the angle right through the blade, tape and all. The tape eliminated burrs on the edge, resulting in a smooth, clean cut. Now, I no longer have to spend valuable shop time filing the edges clean after cutting aluminum stock.

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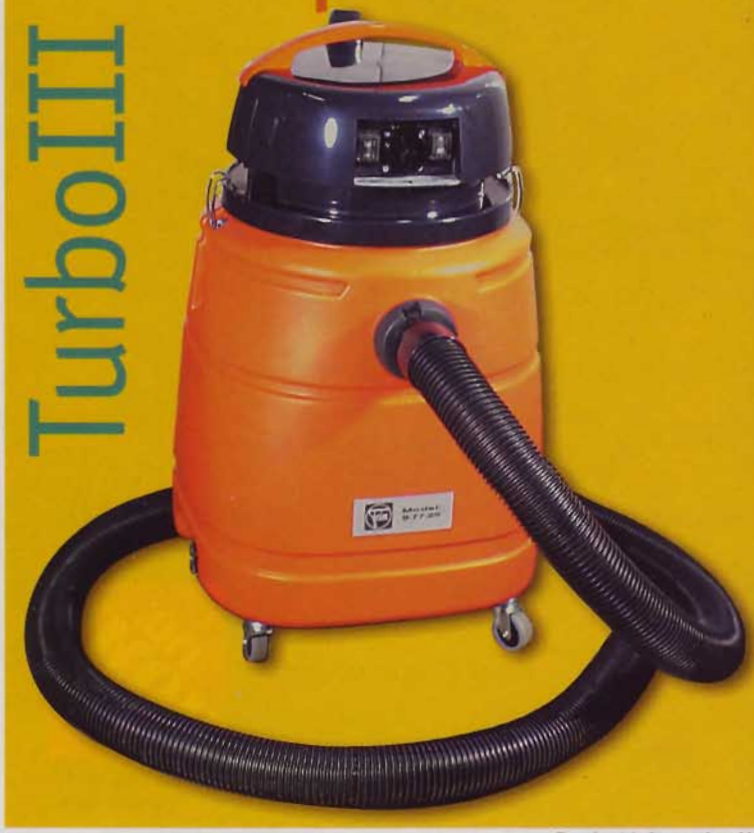

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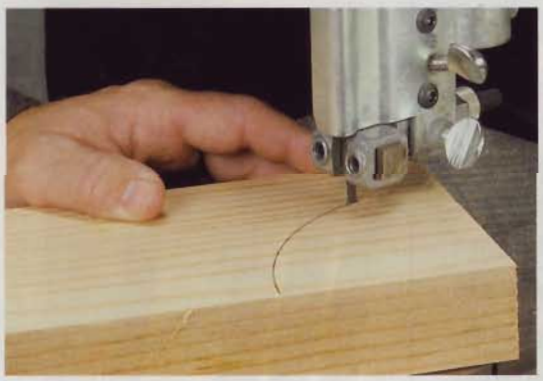
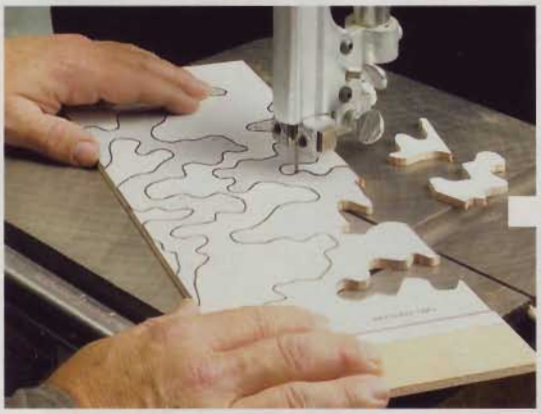
tips & tricks for using BAND SAW BLADES

To get the most from your band saw, get savvy about band saw *blades*. Here's practical advice from our shop to put you in the "know."

▲ A 1/2"-wide blade resists flexing, so it's ideal for resawing thick stock. A hook tooth pattern with 3 teeth per inch (tpi) clears out waste quickly.



▲ To make gently curved cuts, a 1/4"-wide skip tooth blade with 4 tpi works well. The small number of teeth and wide gullets make for fast cuts.



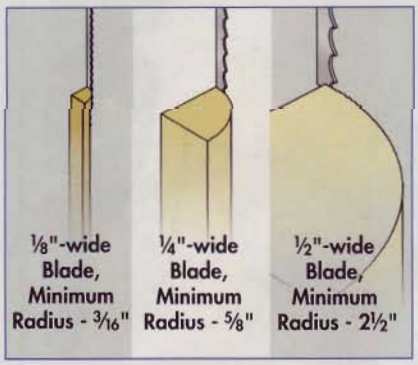
▲ For tight curves, use an 1/8" standard blade with 14 tpi. It produces a smooth cut, but with its high tpi and small gullets, it requires a slower feed rate.

Three Blades — Three Cuts

Band saw blades look simple — a thin band of metal with teeth. But the number of blade choices is a bit bewildering. So which blades do you need?

First of all, no single band saw blade can do everything well. As we build projects in the *Workbench* shop, we've found that three different types of blades will handle most any job *(see Photos at left)*.

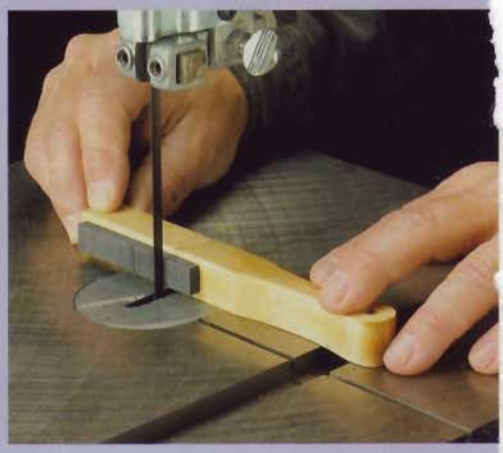
Having said that, keep in mind that the narrower the blade, the tighter the radius it can cut *(see Illustrations below)*. If a blade is too wide for the task at hand, the back of the blade will rub against the side of the kerf, so you can't make a tight turn *(Kerf Detail)*.



Smoother Cuts, Longer Life

One way to get a smoother curved cut is to round the back edge of the blade with a "tuning" stone (available at Rockler.com or 800-279-4441). With a rounded back, there aren't any sharp corners to get hung up on. Plus, it decreases wear on the blade.

Start by grinding an angle on both back corners while the saw is running. Then carefully round the back.

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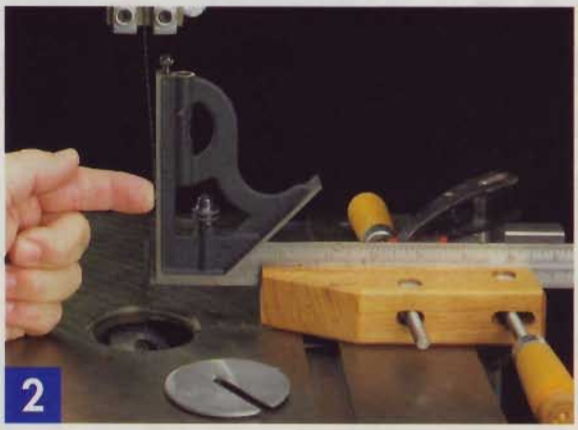

2

how much is enough? BLADE TENSION

A band saw blade has to be tensioned properly to run true. Even a new, sharp blade will create a barrel-shaped cut if it's not stretched tightly between the wheels. Although most band saws have a tension gauge, it's not always accurate.

So how do you know if a blade has the correct amount of tension? As a rule, a properly tensioned blade should deflect *approximately* 1/4" when the guide post is raised all the way up.

Simple Tension Gauge — An easy way to check the tension is to use a combination square as a gauge. First, set the square so 1/4" of the rule is exposed. Align the end of the rule with the cutting edge of the blade and clamp it in place , as shown in *Photo 1*. Then press the blade sideways *(Photo 2)*. If it's correctly tensioned, you should feel quite a bit of resistance as you push the blade against the body of the square.

Too Much Tension — It is possible to over-tension a band saw. At worst, this can cause the shaft of the wheel to bend or break. At best, it shortens the life of the blade. My experience though is that more people under-tension than over-tension their blades.

Blade Care Tips

Blade Storage
To prevent rust, coil the blade and store it in a sealable plastic bag. As insurance against moisture that might still form inside the bag, give it a quick shot of WD-40.

Lubrication
The heat that builds up when making a cut can damage a blade. Symptoms are gullets clogged with dust and a dry, rasping sound.

For a cooler running blade, wipe on a spray vegetable oil as a lubricant, turning the upper wheel by hand.

"break in" new BLADES

A new band saw blade is extremely sharp. In fact, sometimes it's *too* sharp. If you mount a new blade and make a heavy cut right off the bat, the tips of the teeth can chip, prematurely dulling the blade.

To understand why this happens, think of the teeth as being like the tip of a freshly sharpened pencil. If you press the pencil down too hard, the tip will break. If you ease up though, the tip wears down a bit so you can press harder without breaking it.

Break-In Period — The same thing applies to a band saw blade. To get the maximum life from a new blade, it needs a short "break-in" period. The idea is to slow down the feed rate, applying only about one-third the pressure for the first ten minutes of sawing. This reduces the initial sharpness of the teeth, but the blade will stay sharp longer.

This break-in period is especially important for 1/8" and 1/4" blades with a higher number of teeth per inch and a standard tooth pattern (teeth at 90° to the back of the blade).

divide & conquer

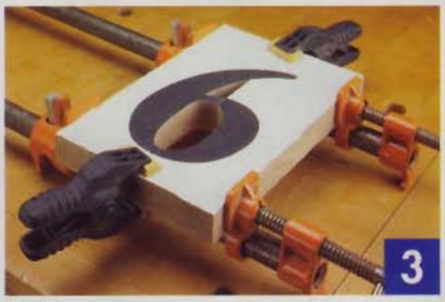
MAKING INSIDE CUTS

Usually, making an inside cut on a workpiece is the job of a scroll saw or jig saw. But if you're working with thick stock, these tools aren't up to the task. That's where a band saw comes in handy. The idea is to rip the workpiece in half to expose the inner areas *(Photo 1)*, make the inside cuts *(Photo 2)*, and then glue the pieces back together *(Photo 3)*.

For best results, make the initial rip cut with a narrow blade that has a large number of teeth per inch. (I use an 1/8" standard blade with 14 tip.) This creates a smooth surface that makes for a virtually invisible joint line when the pieces are glued together.

▲ To make inside cuts on a band saw, start by installing an 1/8" blade and a rip fence. Then using a slow, steady feed rate, rip the workpiece in half.

▲ Using the same blade, go ahead and make the inside cuts. To make it easy to clamp the pieces together *(Fig. 3)*, don't make the outside cuts just yet.



▲ Now glue and clamp the pieces together. (Spring clamps keep the ends aligned.) When the glue dries, make the outside cuts and remove the pattern.

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A NEW SLANT ON SHELVING

Usually, a display shelf focuses your attention on the items that are on, well, display. But with this slant-front shelving project, that's not necessarily the case. With its angled design, contrasting woods, and exposed dovetail joints, the shelving unit itself is one of the star attractions.

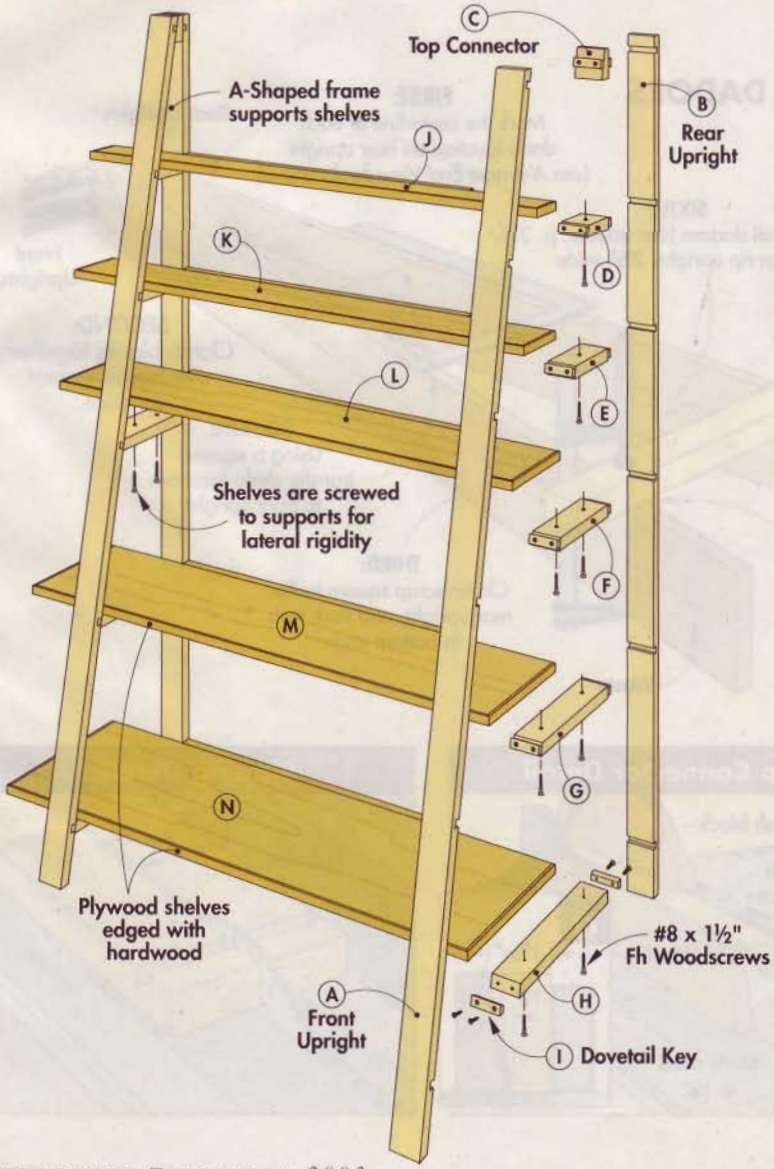
Appearance aside, the shelves still have to be sturdy enough to keep your valuables safe and secure. To accomplish that, they're supported by tall, A-shaped frames and thick shelf supports assembled with strong dovetail joints *(see Photo at right)*.

Now I know, cutting and fitting dovetail joints can be a bit intimidating even for a seasoned woodworker. Because of that, we've come up with a nifty technique that makes it considerably easier than it looks.

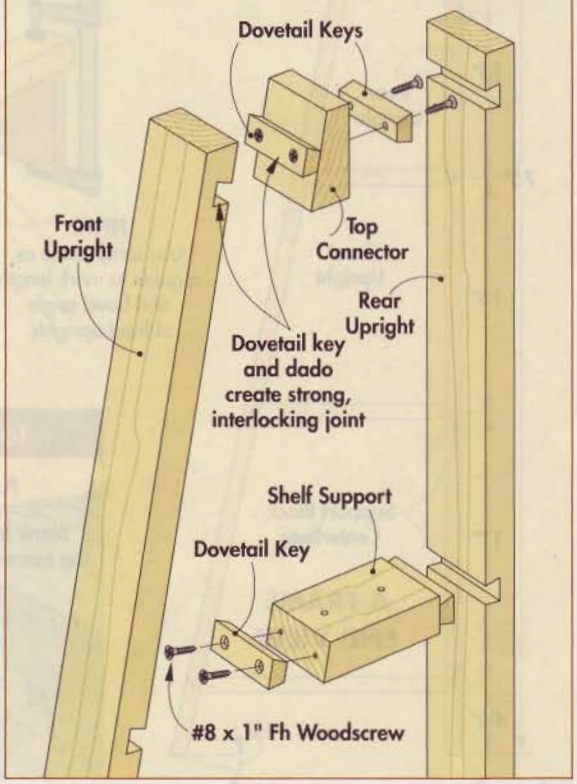
Dovetail Keys — The secret is a set of dovetail "keys" that are machined on a router table. These keys are *screwed* to a wedge-shaped block at the top and to the shelf supports, and then fit into dovetail-shaped dadoes in the A-frames *(see Dovetail Joinery Detail)*. Besides simplifying the joinery, this hides the screws, producing a strong, attractive joint.

▲ Strength and good looks — two reasons I used dovetails to join the A-frames of this slanted shelf unit.

CONSTRUCTION VIEW



Dovetail Joinery Detail



building the A-FRAMES

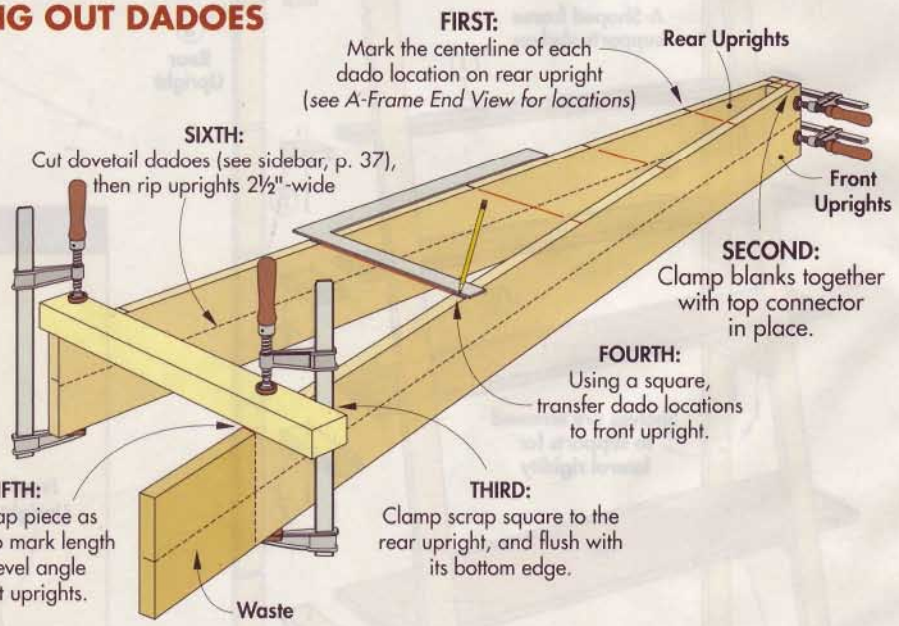
One thing that gives this project its distinctive look are the two A-shaped frames. Each frame has a vertical rear upright and an angled front upright *(see A-Frame End View)*. Notice too that there's a series of dovetail dadoes in each upright to hold the shelf supports and a wedge-shaped top connector block.

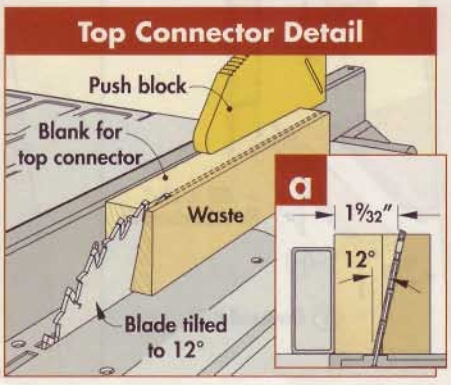
An important consideration in building the A-frames is to make sure that *each pair* of dadoes is accurately aligned. To accomplish that, I used a process that involves laying out the dadoes in two extra-wide blanks, routing the dadoes, and then ripping the blanks to width.

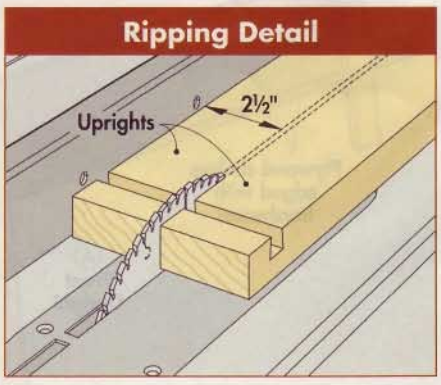
Prepare Blanks — The first step is to prepare two blanks from 1"-thick hardwood (I used maple.) Rip the blanks extra-wide (at least 6") so you can get two rear uprights from one and two front uprights from the other.

▲ The key to building the A-frames is to accurately transfer locations of the dadoes from the rear to the front uprights.

LAYING OUT DADOES







As for length, go ahead and cut the blank for the rear uprights to length (75"). But let the blank for the front upright "run long" for now.

One thing to note is that the top end of this extra-long blank is beveled at 12°, which will match the angle of the front uprights. Later, the bottom end will be beveled at this same angle.

Lay Out Dado Locations — The next step is to lay out the locations for the dovetail dadoes. Start by laying out the centerlines of the dadoes on the blank for the *rear* upright only *(A-Frame End View)*.

These centerlines will be transferred to the blank for the front uprights. But first, you'll have to position the blank at the same angle as the front uprights will be once the project is assembled, specifically at a 12° angle to the rear uprights.

Top Connector — An easy way to establish that angle is to make the wedge-shaped top connector that joins the uprights.

Ultimately, you'll need two top connectors (one for each A-frame). But for now, just make a single block that's long enough for both of them. This block is made by gluing up two 1"-thick pieces of hardwood, and then bevel-ripping it *(see the Top Connector Detail)*.

Now you can go ahead and clamp the beveled block between the blanks for the uprights. This is what establishes the angle of the front upright.

It's also a good idea to clamp a scrap piece of wood across the *lower* ends of the blanks *(see Laying Out Dadoes)*. This "fixes" the width at the bottom of the A-frame.

At this point, simply use a square to transfer the locations of the dadoes from the rear blank to the front *(see Photo on page 36.)*

The scrap piece comes in handy for something else too. You can use it to mark the final length of the blank for the front uprights.

Routing the Dadoes

Laying the dadoes out accurately is half the battle. The other half is routing the dovetail dadoes. To do that, I used a hand-held router, a 7° dovetail bit, and a T-square fence to guide the base of the router *(see Sidebar)*.

After routing all the dadoes, it's just a matter of bevel cutting the bottom end of the blank for the front uprights. Then rip the front (A) and rear uprights (B) to width *(see Ripping Detail)*. Finally, trim the two top connectors to length ($2^1/_2$").

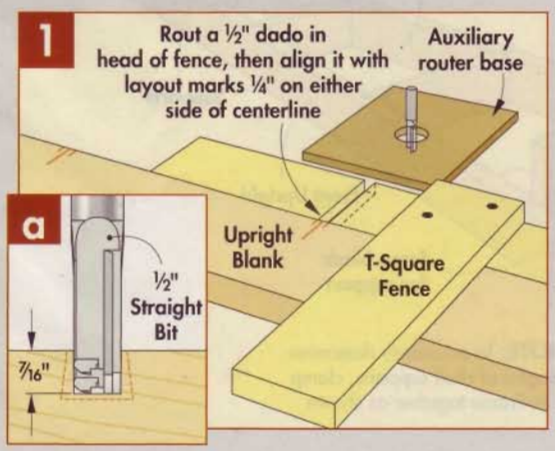
▲ I purchased a $^3/_4$" dovetail bit (7°) to rout the dadoes. It's available from Rockler (#9111) at 800-233-9359 or www.rockler.com

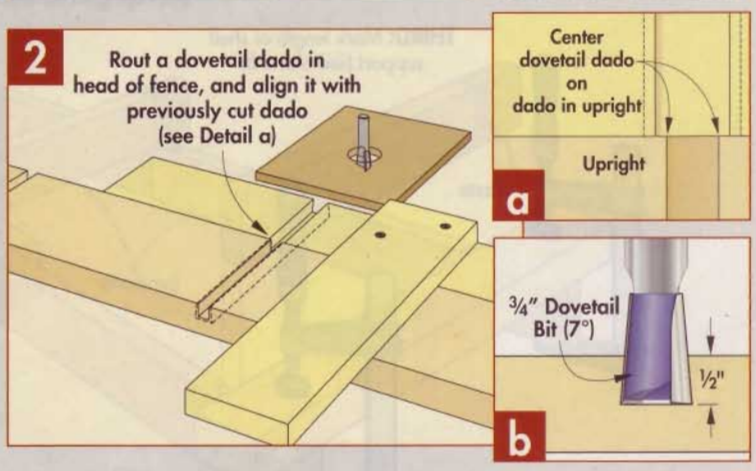
Dovetail Dadoes

An easy way to ensure consistent results when routing the dovetail dadoes is to clamp a T-square fence to the workpiece and use it to guide the base of the router.

The dadoes are cut in three passes: two successively deeper passes with a $^1/_2$" straight bit *(Figs. 1 and 1a)* and a final pass with a $^3/_4$" dovetail bit *(Fig. 2)*. To save time, make *all* the cuts at one setting, repositioning the fence for each subsequent setting. Then repeat the process for the other two setups.

This means you'll have to position the fence so the router bit is always centered over the previous cut. To do that, clamp the fence to a scrap piece and rout a dado in the "head" of the fence. Then use that dado as a reference when lining up the fence, as shown in *Figures 1 and 2*.





▲ To assemble the A-frames, apply a thin film of glue to the leading edge of the dovetail keys and tap the shelf supports into place.

"keys" to SUCCESS

One of the most interesting parts of this project is the use of dovetail "keys." Attached to the ends of the shelf support and the top connector, these keys provide the strength and classic good looks of dovetail joinery.

Shelf Supports — Before making the keys though, turn your attention to the shelf supports. They span the opening between the uprights like rungs on a ladder.

Altogether, you'll need five shelf supports for each A-frame. They're made from 1"-thick hardwood (maple) and ripped to the same width as the uprights ($2^1/_2$").

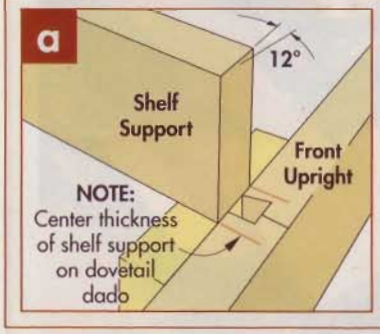
Before cutting the supports to length, the thing to be aware of is that one end of each support is beveled at a 12° angle to match the front upright. The other end is left square to fit against the rear upright.

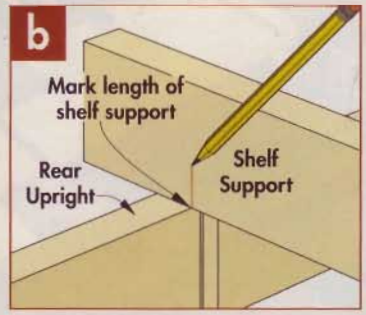
With that in mind, you'll need to cut each shelf support to length to fit between the uprights. To produce a good fit, dry-clamp the A-frame together, as shown in the *Illustration* below. Then, working with extra-long pieces, cut a bevel on one end, hold the piece in place, and mark the opposite end *(see Layout Details at left)*.

The Key Element

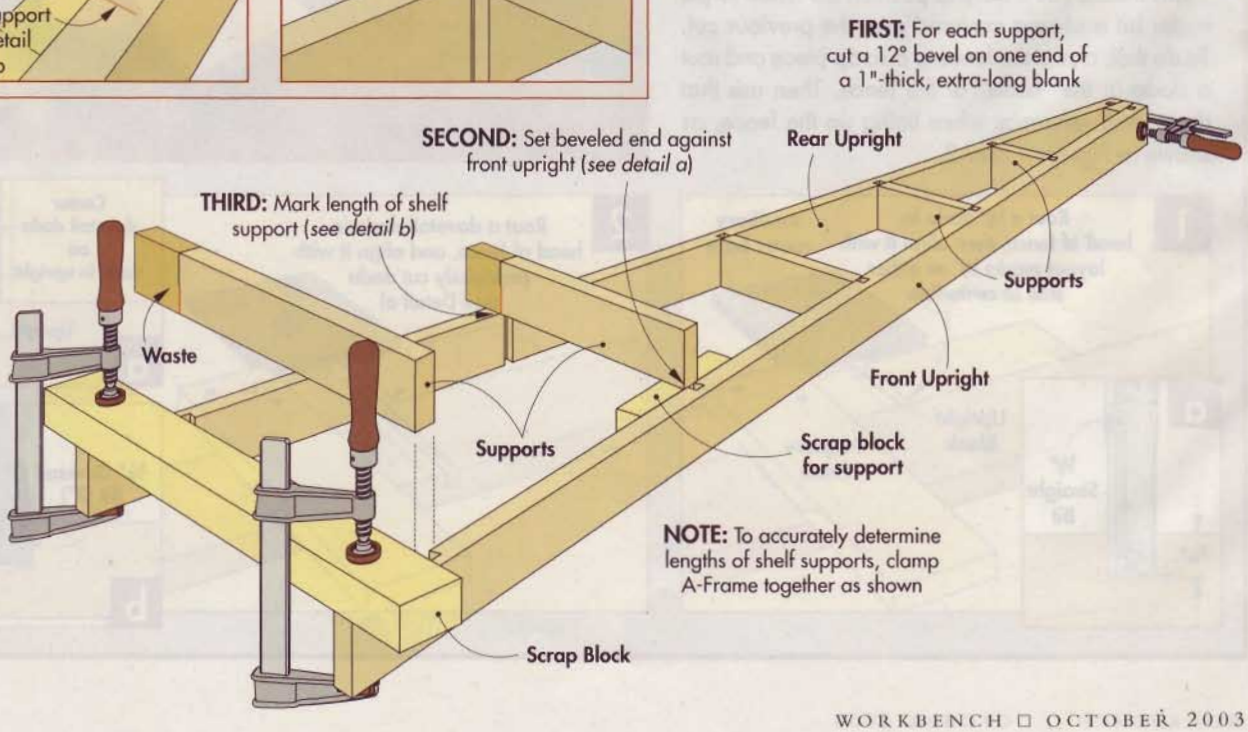
After trimming the shelf supports to length, it's time to get started on the dovetail keys. As I mentioned, these small wedge-shaped blocks are machined separately and then fastened to both ends of the shelf supports and

Layout Detail





SIZING THE SHELF SUPPORTS



the wedge-shaped connector blocks. The keys are made using a router table and the same 7° dovetail bit used to cut the dadoes in the uprights *(see Sidebar below)*. That way, the angled sides of the keys and the dadoes are certain to match.

To avoid working with small pieces, it's best to make the keys by routing both edges of an extra-long piece of $^3/_4$"-thick stock. Then after trimming off the "keyed" part of that workpiece, the individual keys (I) are cross-cut to their final $2^1/_2$" length.

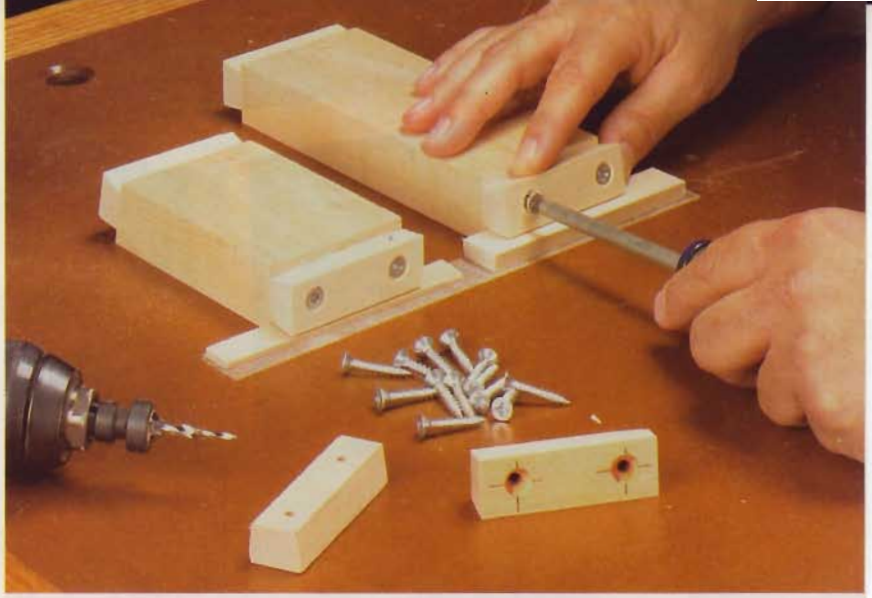
Attaching the Keys — Once the keys are made, it's just a matter of attaching them to the shelf supports. The idea here is to center the keys on the *thickness* of the supports *(Shim Detail)*. To do that, I used two angled shims, as shown in the *Photo* above.

The shims are easy to make. Simply rip a strip from some extra key stock on the table saw *(Details a and b)*. Notice that there are two different table saw setups, one to make the shim for the rear keys and the other for the front keys.

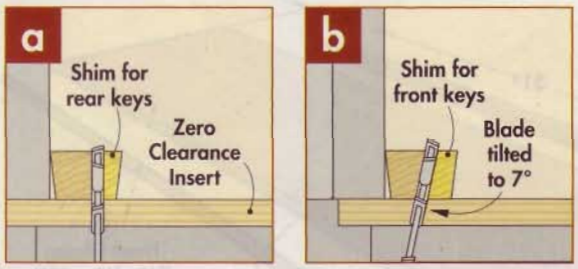
To prevent the shims from slipping around, attach them to the bench with double-face tape. Then butt the end of a shelf support against the appropriate shim, set a key in place, and drill holes for the mounting screws.

After fastening the keys to the shelf supports, you'll also need to install keys on the top connectors. Here, I aligned the keys to a centerline on the top connectors.

Assemble A-Frames — At this point, you're ready to assemble the A-frames. I found it easiest to start with the top connector, applying a thin film of glue to the keys and then tapping the block into place. Then repeat the process for the shelf supports, working your way down, as shown in the *Photo* on page 38.



▲ Two angled shims make it easy to center the dovetail keys on the thickness of the shelf supports.



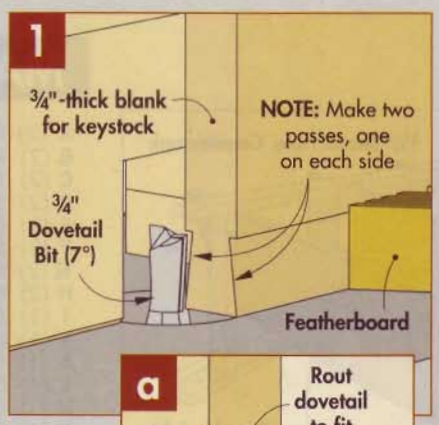
Dovetail Keys Made Easy

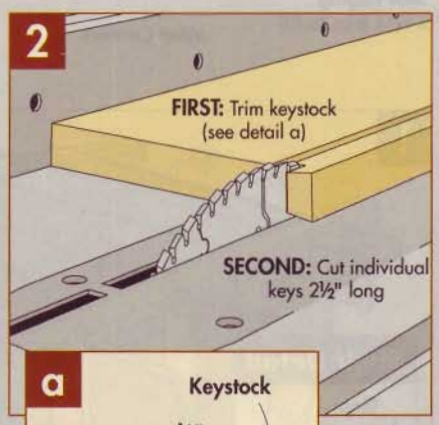
There's nothing complicated about making the dovetail keys. But it does take some patience getting them to fit just right.

Rout Keys — Start by mounting the dovetail bit in the router table. The exact height of the bit isn't critical, it just needs to be higher than the depth of the dadoes. (I set the bit at $^7/_8$".)

Now adjust the fence so the bit "grazes" the workpiece (as shown) and make two passes, one on each side *(Figs. 1 and 1a)*. Then check the fit of the key in one of the dovetail dadoes. If needed, nudge the fence away from the bit and repeat the process.

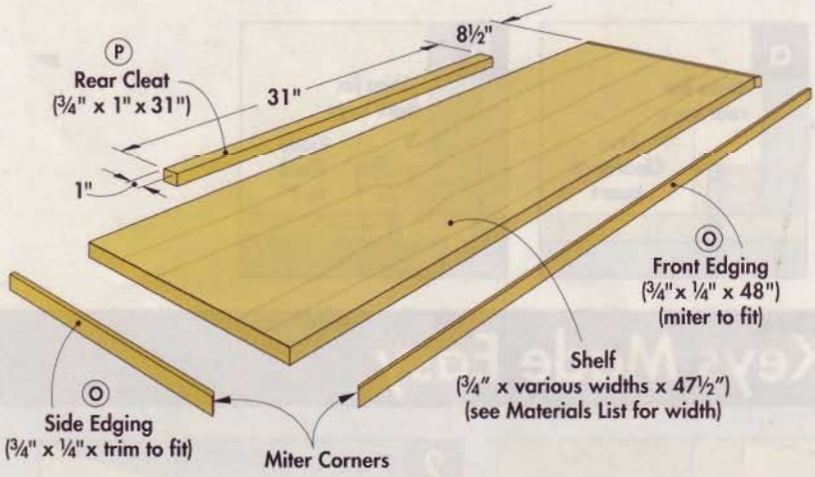
Trim Keys — Once you get a snug fit, it's just a matter of using the table saw to trim the keystock from the blank, as shown in *Figs. 2 and 2a*.

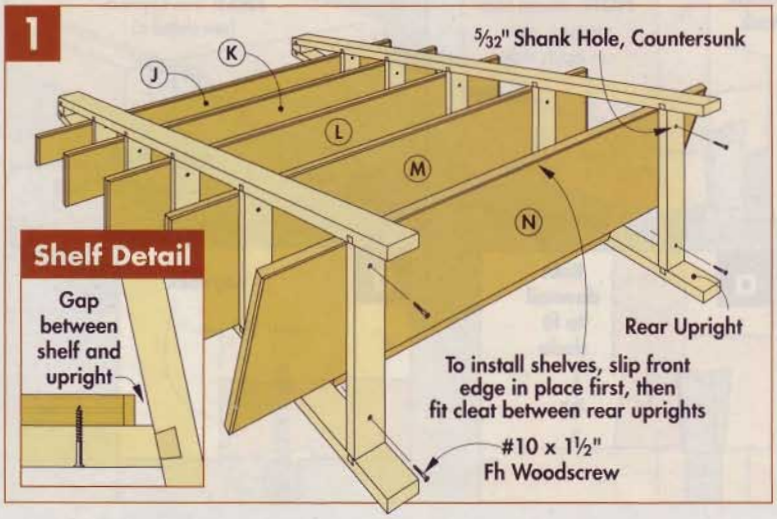




▲ A set of five progressively wider shelves completes this slant-front shelving unit. They're simply screwed to the shelf supports from below.

SHELF CONSTRUCTION





cherry on top
5 SHELVES

The shelves in a project are usually more functional than anything. But that's not the case with this slant-front shelving unit. To create a distinctive look, I made the shelves from cherry to contrast with the maple A-frames.

Sizing the Shelves — The five shelves are identical in length. As for width though, they "follow" the shape of the A-frames. That is, they're narrow at the top (the upper shelf is $3\frac{1}{4}$" wide), and they get progressively wider toward the bottom (the lowest shelf is 15"-wide).

Regardless of their size though, all of the shelves (J, K, L, M, and N) are $\frac{3}{4}$" plywood panels with thin strips of solid-wood covering the front edge and both ends *(see Shelf Construction Illustration)*. This edging (O) is simply mitered to length and glued in place.

All that's left to complete the shelves is to attach a hardwood cleat (P) to the back edge of each shelf. The purpose of these cleats is simple. When the shelves are installed, the cleats fit snugly between the rear uprights, adding side-to-side rigidity to the unit.

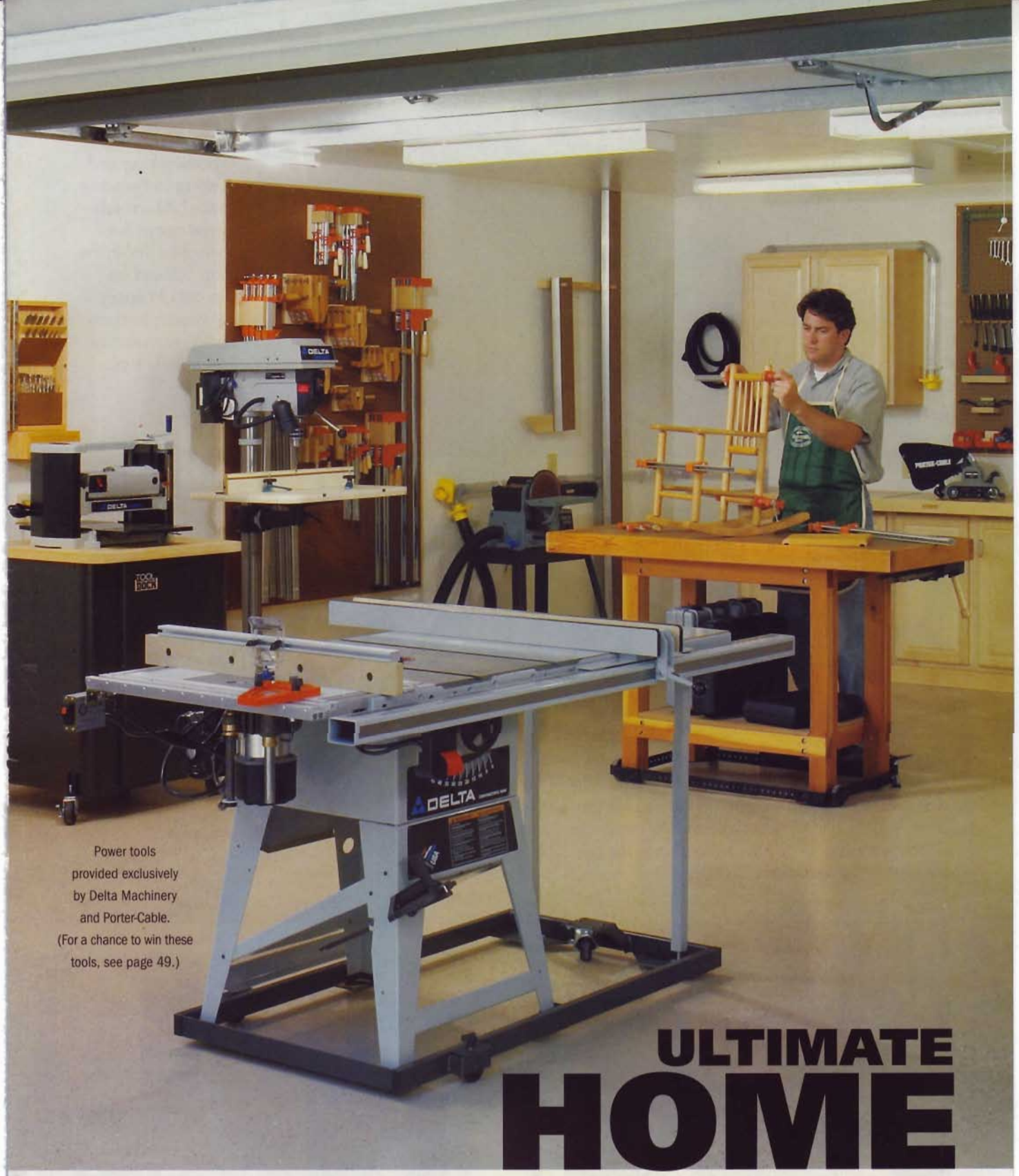
Install the Shelves — After gluing the cleats in place, it's time to install the shelves. I found it easiest to do this with the shelf unit resting on its back *(see Fig. 1)*. Start by sliding each shelf through its respective opening in the A-frame and then tipping the front edge into position first. Then lower the back edge of the shelf in place, fitting the cleat between the rear uprights. Finally, fasten the shelves to the supports, as shown in the *Photo* above.

ONLINE Extras
Slant-Front Shelving Unit Cutting Diagram
WorkbenchMagazine.com

MATERIALS LIST

A	(2)	Front Uprights (maple)	1" x $2\frac{1}{2}$" x $76\frac{43}{64}$"
B	(2)	Rear Uprights (maple)	1" x $2\frac{1}{2}$" x 75"
C	(2)	Top Connectors (maple)	$1\frac{9}{32}$" x $2\frac{1}{2}$" x $2\frac{1}{2}$"
D	(2)	Shelf Supports (maple)	1" x $2\frac{1}{2}$" x 4"
E	(2)	Shelf Supports (maple)	1" x $2\frac{1}{2}$" x $6\frac{3}{8}$"
F	(2)	Shelf Supports (maple)	1" x $2\frac{1}{2}$" x $9\frac{1}{8}$"
G	(2)	Shelf Supports (maple)	1" x $2\frac{1}{2}$" x $12\frac{1}{4}$"
H	(2)	Shelf Supports (maple)	1" x $2\frac{1}{2}$" x 16"
I	(1)	Dovetail Keys (maple)	$\frac{1}{2}$" x $\frac{1}{2}$" - 10 lin. ft.
J	(1)	Shelf (cherry ply.)	$\frac{3}{4}$" x $3\frac{1}{4}$" x $47\frac{1}{2}$"
K	(1)	Shelf (cherry ply.)	$\frac{3}{4}$" x $5\frac{1}{2}$" x $47\frac{1}{2}$"
L	(1)	Shelf (cherry ply.)	$\frac{3}{4}$" x $8\frac{1}{4}$" x $47\frac{1}{2}$"
M	(1)	Shelf (cherry ply.)	$\frac{3}{4}$" x $11\frac{1}{2}$" x $47\frac{1}{2}$"
N	(1)	Shelf (cherry ply.)	$\frac{3}{4}$" x 15" x $47\frac{1}{2}$"
O		Edging (cherry)	$\frac{1}{4}$" x $\frac{3}{4}$" - 40 lin. ft.
P	(5)	Cleats (cherry)	$\frac{3}{4}$" x 1" x 31"

HARDWARE
- (20) #10 x $1\frac{1}{2}$" Fh Woodscrews
- (48) #8 x 1" Fh Woodscrews

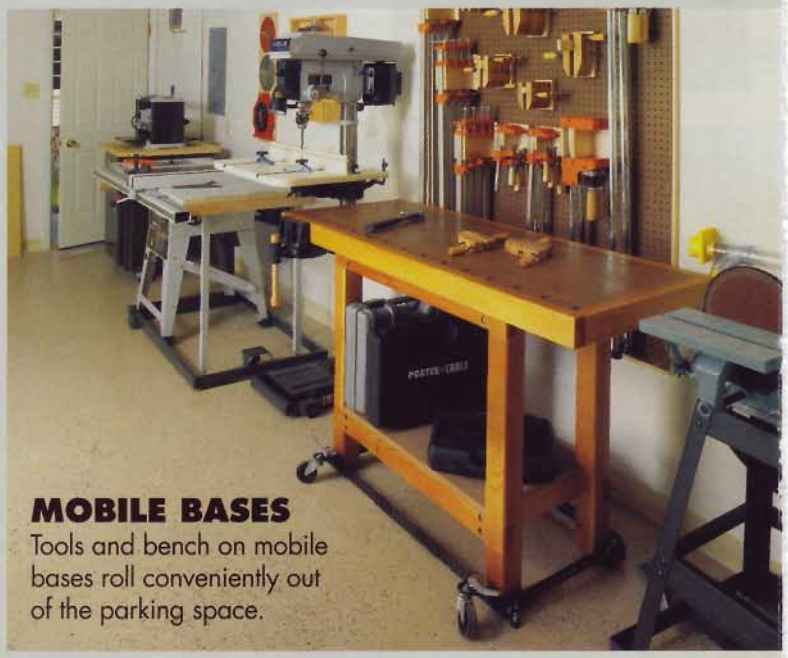


Power tools provided exclusively by Delta Machinery and Porter-Cable. (For a chance to win these tools, see page 49.)

ULTIMATE HOME WOODSHOP

A REAL GARAGE SHOP, FOR CARS TOO
Woodworking and parking in the same space? Absolutely ... just not at the same time. With the shop "closed up," two cars fit easily between the space-saving workstation and mobile tools.

SPACE-SAVING CABINETS
A set of 12"-deep manufactured wall cabinets provides handy storage for portable tools and supplies, yet still allows room for cars. To make the bench work big, a pull-out support arm *(below)* handles large workpieces easily.



MOBILE BASES
Tools and bench on mobile bases roll conveniently out of the parking space.

AFFORDABLE DUST COLLECTION
A tool-actuated vacuum connected to a system of piping, fittings, and blast gates serves as a dust collector for the sander, router, and circular saw.

A LOOK INSIDE THE WORKBENCH

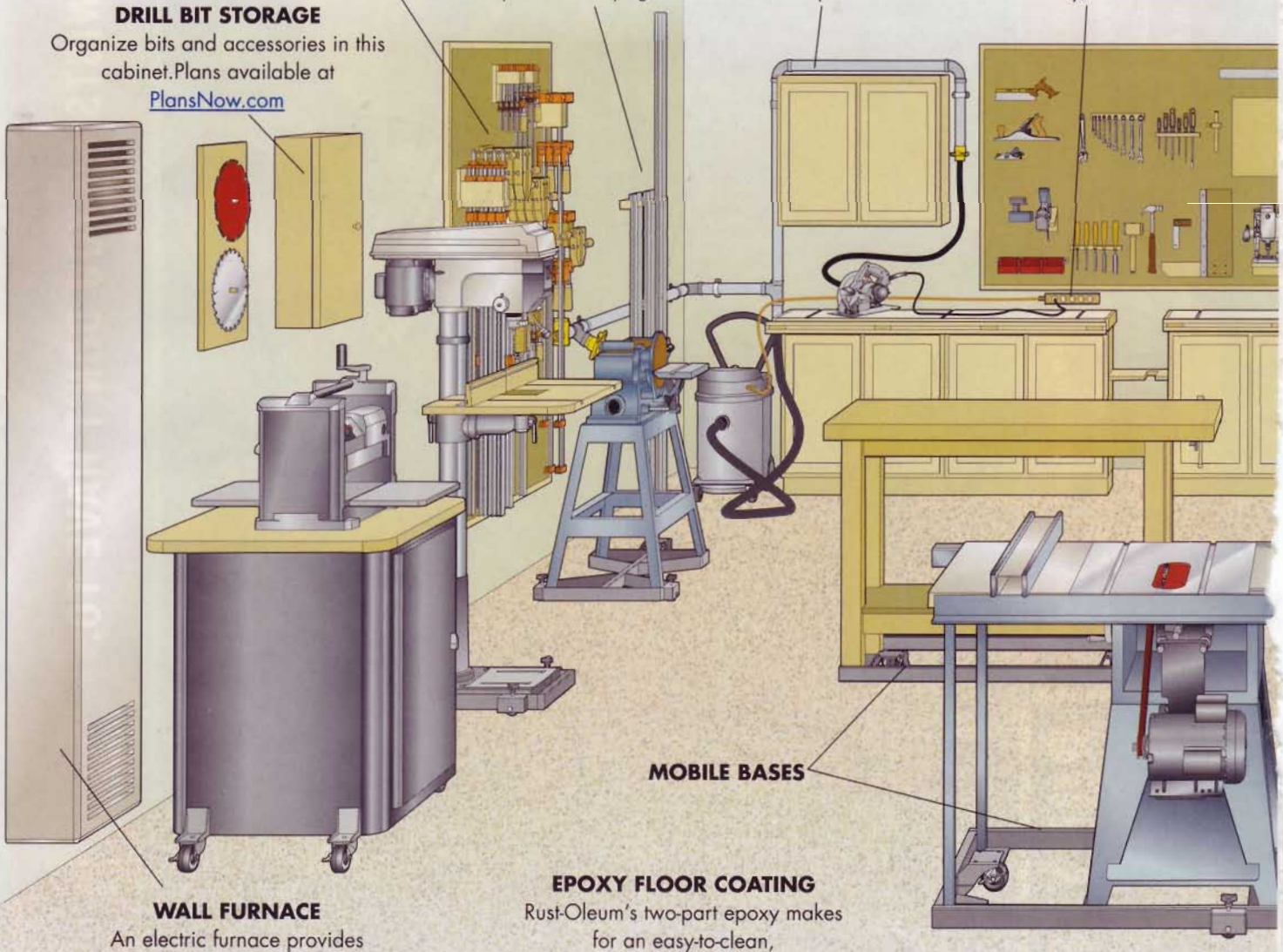
HOME WOODSHOP

I love oxymorons. My favorites are jumbo shrimp, exact estimate, and garage shop. These ideas simply cannot coexist. Or can they? Actually, with a bit of planning, the right tools, and few projects designed to maximize the available area, it is possible to have *both* a garage and a shop in the same space. (The jumbo shrimp thing is still just ridiculous.)

Tools on mobile bases, a workbench built on shallow cabinets, and an expandable worksurface are just a few of the ways we turned this two-car garage into an enormously capable shop *without* sacrificing parking.

In fact, a quick look at the photos on these pages will show you that this shop is full of amenities that would be welcome in *any* shop, regardless of whether it doubles as a garage. In this issue, you'll learn how to build the compact workstation (page 50) and the microadjustable routing guide (page 56). And be sure to watch future issues of *Workbench* for the construction details on the other innovative projects in this two-car garage home woodshop.

Of course, an important part of any shop project is selecting just the right tools to make woodworking as enjoyable, accurate, and productive as possible. A complete list of the tools and accessories that we selected to equip our shop is shown in the sidebar at right.



tool buyer's guide

DELTA deltawoodworking.com (800-438-2486)
- 10" Contractor's Saw (Model 36-444)
- P-20 20" Scroll Saw (Model 40-680)
- 6" Belt/9" Disc Sander (Model 31-695)
- 16 1/2" Drill Press (Model DP400)
- 12" Portable Planer (Model TP300)
- 14" Band Saw (Model 28-276)
- ShopMaster Air Compressor (Model CP503)

PORTER-CABLE porter-cable.com (800-321-9443)
- 7 1/4" Circular Saw (Model 447K)
- 2-hp Plunge Router (Model 8725)
- Cordless Jig Saw (Model 643)
- Power Tool-Actuated Wet/Dry Vac (Model 7812)
- 3 1/4-hp Speedmatic Router (for router table)
- 3" x 21" Variable-Speed Belt Sander (Model 352VS)
- Brad Nailer (Model BN200A)
- 5" Quick Sand Variable-Speed, Random-Orbit Sander (Model 333VS)
- 14.4-Volt Grip-to-Fit Cordless Drill (Model 9978)

BENCH DOG benchdog.com (800-786-8902)
- ProTop Router Table (replaces left extension wing on table saw)
- Power-Loc Remote Power Switch (for router table)

HTC (248-399-6185)
- Mobile Base for Table Saw (Model HRD-10-G)
- Mobile Base for Scroll Saw (Model HRS-2158)
- Mobile Base for Disk Sander (Model HRUS-330)
- Mobile Base for Band Saw (Model HRO-14)
- Mobile Base for Drill Press (Model HSK-593)
- Mobile Base for Workbench (Model HTC2000)

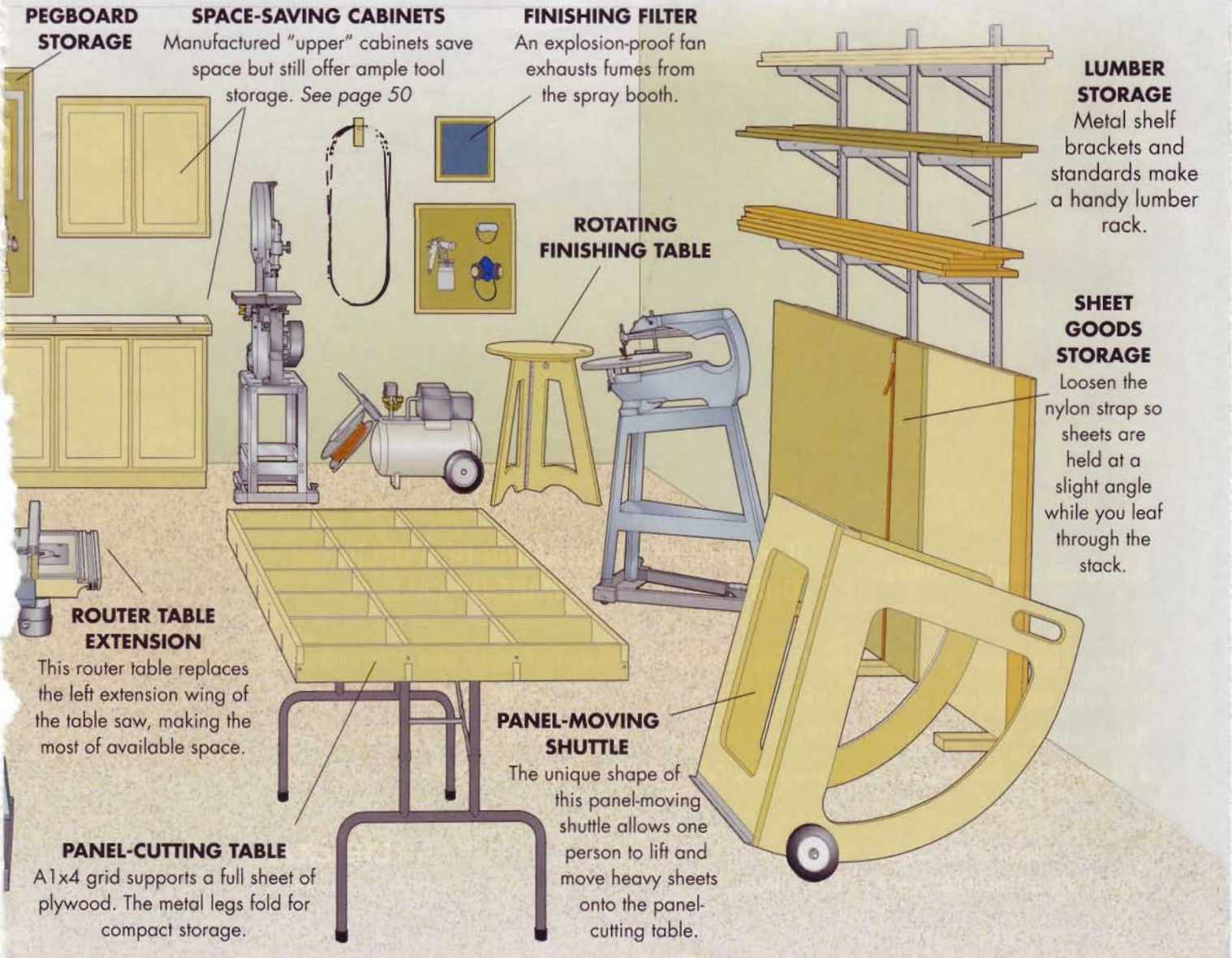
ROCKLER rockler.com (800-279-4441)
- Rockler Drill Press Table (Model 22810)
- Rockler Aluminum T-Track & Hold-Down Clamps

TOOL DOCK tooldock.com (866-573-0335)
- Tool Dock Mobile Station for Planer (Model TD800CH)

APOLLO SPRAY SYSTEMS hvlp.com (888-900-4857)
- Apollo Conversion Spray Gun

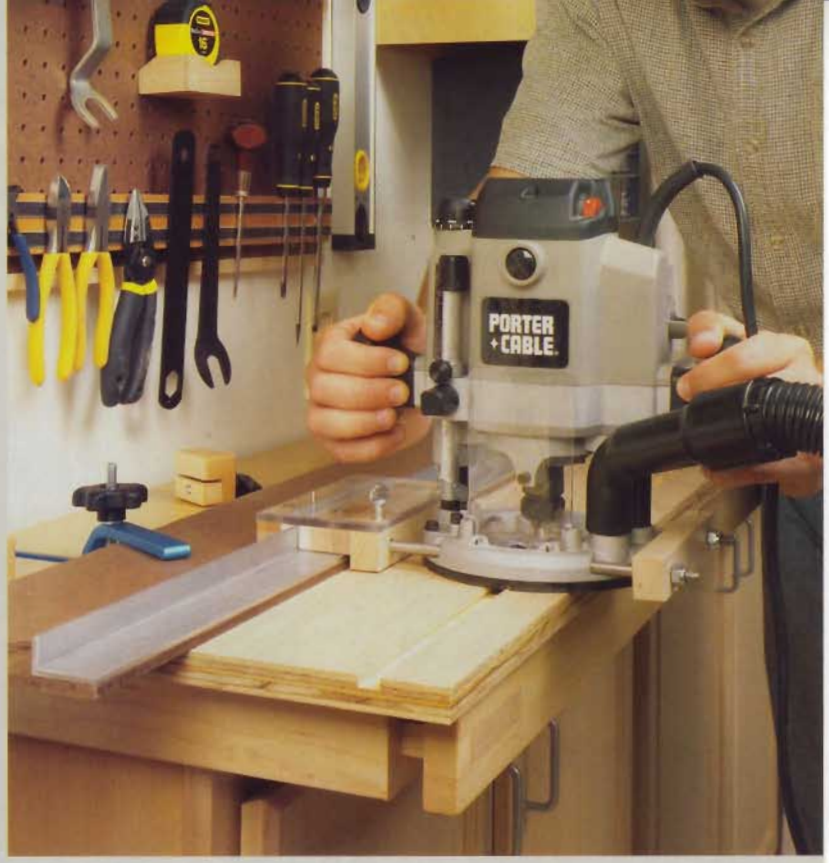
CRAFTSMAN craftsman.com (800-549-4505)
- Plastic Piping, Fittings, Blast Gates

ADJUSTABLE CLAMP CO. adjustableclamp.com (312-666-0640)
- Jorgensen Cabinet Master Clamps, Bar Clamps, Parallel Jaw Clamps, and Handscrews



▶ PRECISION ROUTER GUIDE

Using this microadjustable router guide *(Photo, right)*, you can quickly rout precise-fitting joints, cut stopped dadoes and grooves, or joint a straight edge on a board. The fences in this system double as edge guides for use with a circular saw *(Photo, below)*.

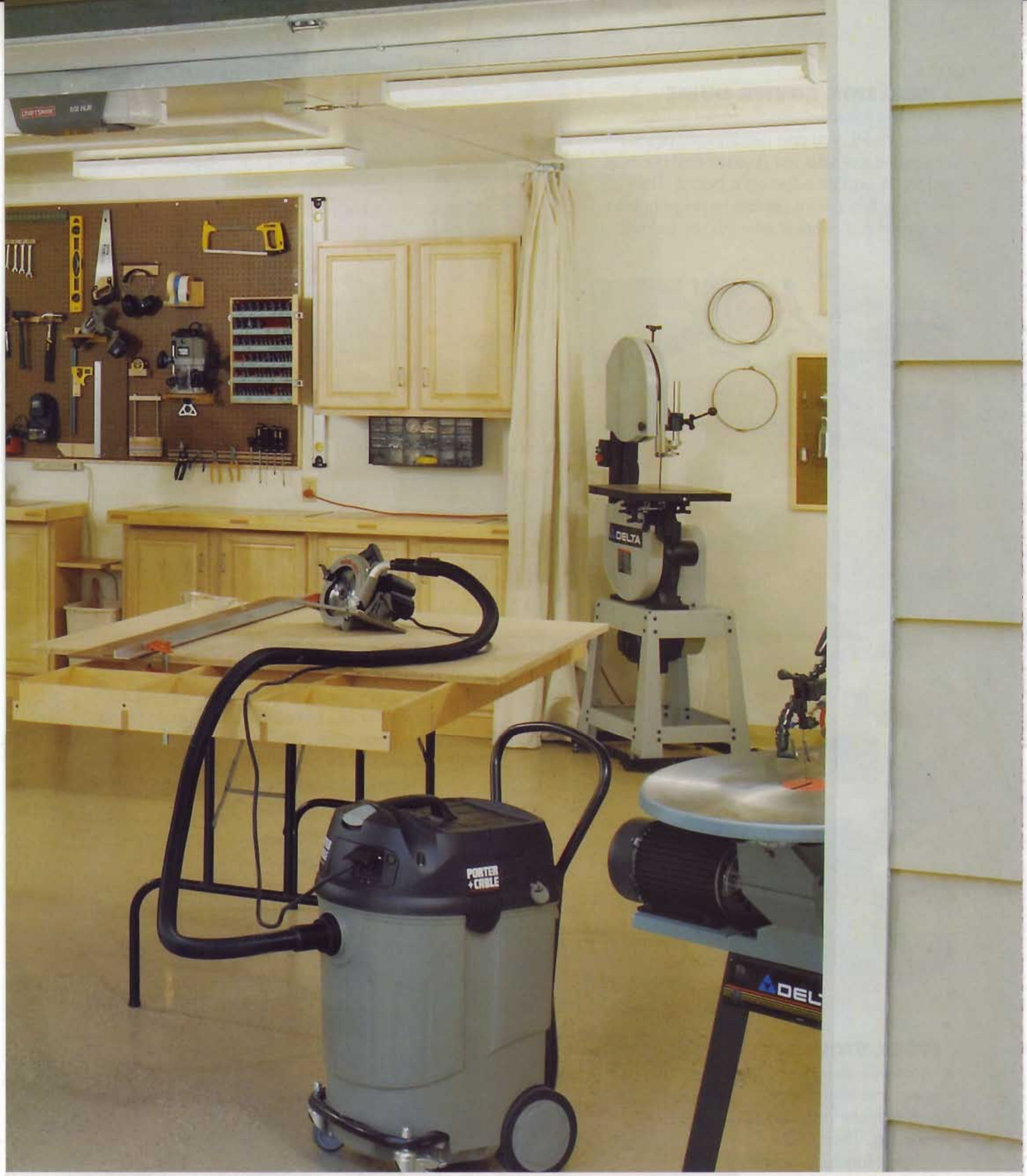


▼ BUILT-IN SPRAY BOOTH

Lightweight canvas curtains create a temporary spray booth *(Photo, below)*. Shower hooks installed in the curtains slide on aircraft cable that's fastened to eye-hooks mounted to the walls. A finishing station with a rotating platform makes spraying a project a breeze *(Inset Photo)*.

▲ STOCK STORAGE

A simple shuttle makes moving and lifting heavy sheets of material a one-person job. The shuttle acts like a furniture dolly to lift the sheets *(Photo above)*. Then with the arms folded in, it becomes a narrow cart for wheeling the sheet around the shop *(Photo right)*.



Having a garage shop often means having to choose between one or the other. It's either a garage or a shop, but not both. But with a bit of planning, the right tools, and a few clever projects, you really can have a shop in your garage — *without* exiling your cars to the driveway.

shop storage & panel-cutting

WORKSTATION

These space-saving storage cabinets have a hidden surprise—a sturdy support arm that extends out for cutting large panels to size.

In the planning phase of this garage shop, two things topped my wish list—storage for tools and supplies and a worksurface large enough to handle sheet goods.

The problem was both things could gobble up lots of space. So to get the best of both worlds, I installed a set of compact storage cabinets and added a top with a pull-out arm to support large panels *(see Photo above)*.

Space-Saving Storage — To address the storage issue, I purchased six "upper" cabinets at a home center. These cabinets are only 12" deep (compared to 20"-deep base cabinets). This keeps the workstation from crowding the garage, yet the shallow cabinets offer plenty of storage.

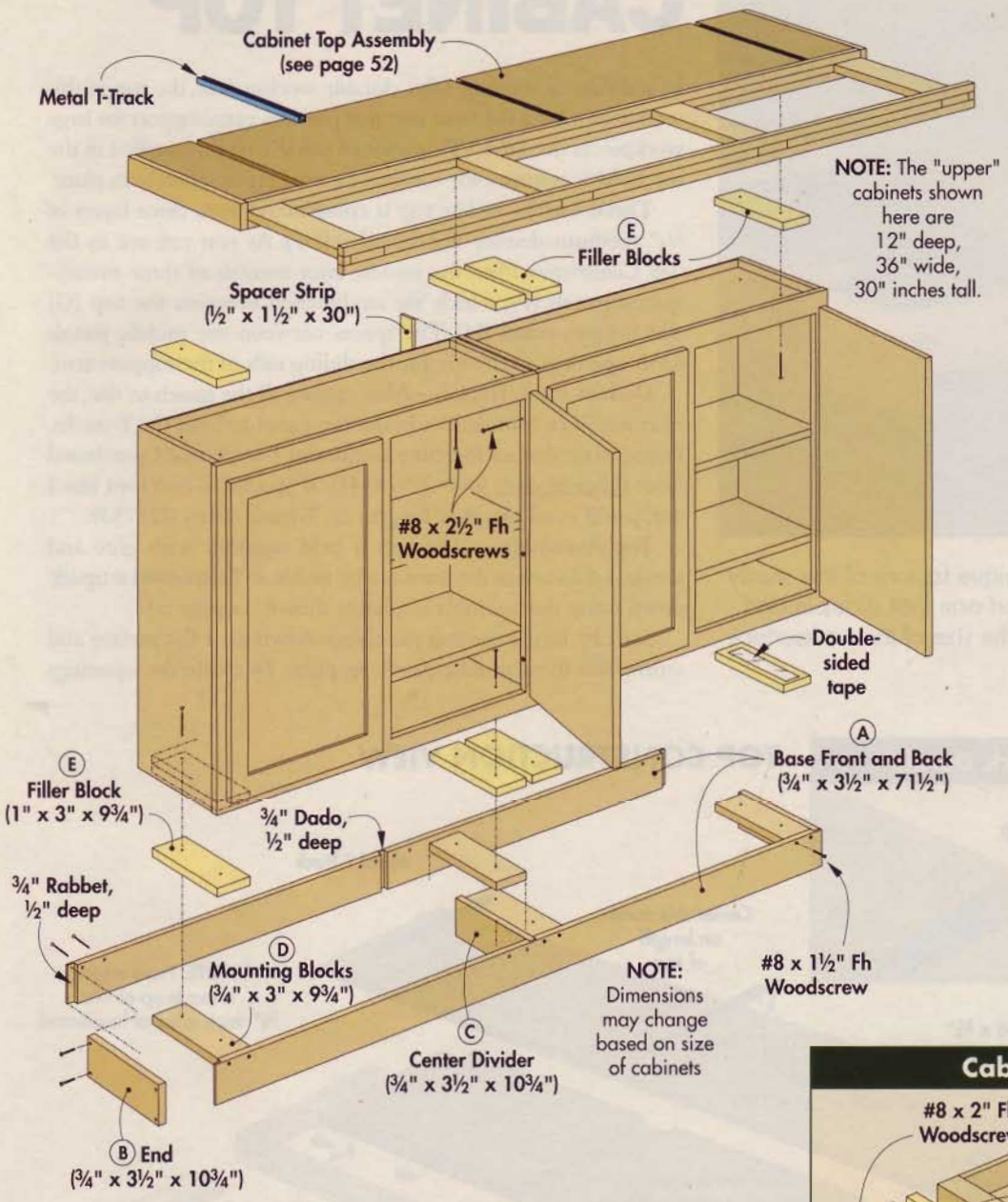
Assemble Cabinets — The advantage of installing store-bought cabinets is obvious — it's quick, and it's easy. Four cabinets, arranged in pairs, support the worksurface. The other two cabinets are mounted to the wall above the station.

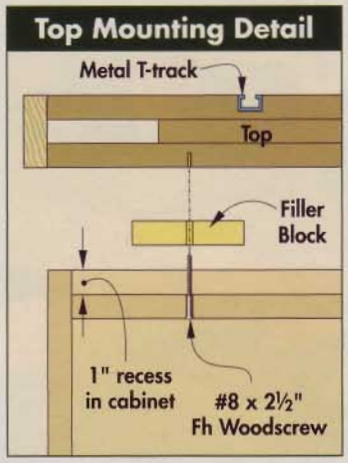
A look at the *Construction View* on page 51 shows how each pair of cabinets is connected. Notice that the face frames of the cabinets are screwed together *(Cabinet Assembly Illustration)*. On my cabinets, the face frames extended past the sides of the cabinets by $1/4$", creating a $1/2$" gap between the sides. So I made a $1/2$"-thick spacer, inserted it between the cabinets, and screwed it in place.

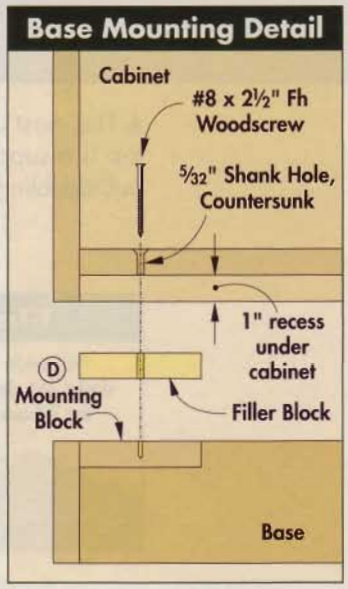
Build a Base — With the cabinets joined together in pairs, I set

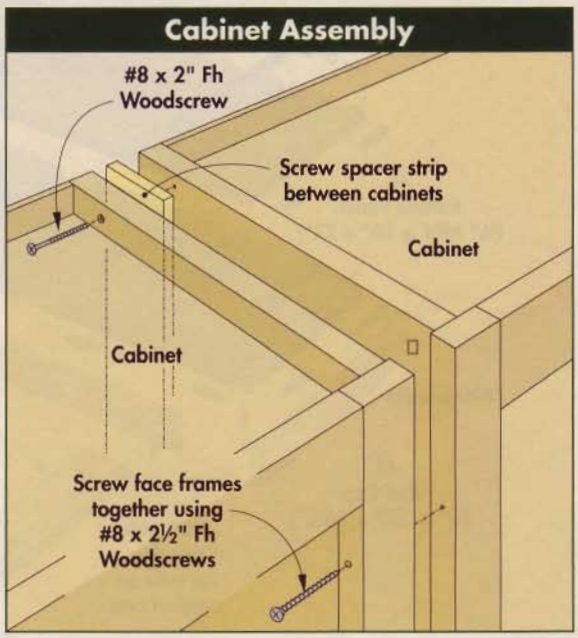
Construction View

Overall Dimensions (with top extended): 73½" W x 29⅝" D x 35¾" H









about building a base for them to sit on. It's made from ¾"-thick hardwood (maple to match the cabinets). The base is set in ¾" from the face of the cabinets, and the sides and back fit flush.

One thing to keep in mind when sizing the base is the joinery. The front and back (A) are rabbeted to hold the ends (B) and a centered dado accepts a divider (C). After cutting all these pieces to size, they're glued and screwed together. Then, four mounting blocks (D) are screwed to the base as a surface for securing the cabinets.

Install Cabinets — To install the cabinets, start by attaching filler blocks (E) to the recess underneath the cabinets with double-sided tape. Then set the cabinets on the base and screw down through the cabinets into the mounting blocks *(Base Mounting Detail)*. For a permanent installation, screw through the backs of the cabinets into the wall studs.

▲ The most unique feature of this sturdy top is a support arm that slides in and out, doubling the size of the worksurface.

make a multipurpose CABINET TOP

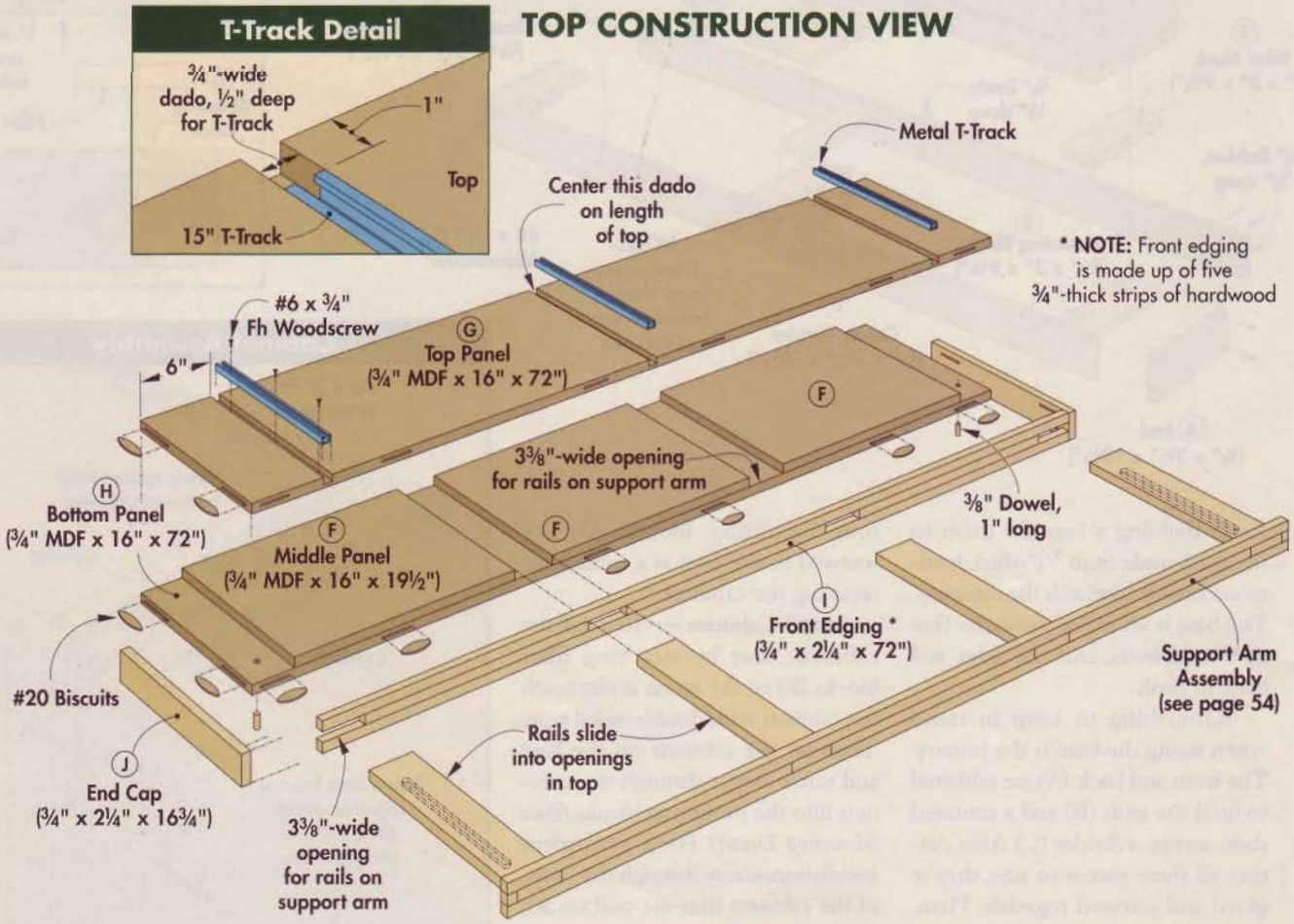
In addition to creating a flat, durable worksurface, the top of this workstation has a slide-out arm that provides extra support for large workpieces *(see Photo)*. Plus, a set of metal T-tracks installed in the top hold accessories for clamping a workpiece securely in place.

Three Layers — The top is constructed from three layers of 3/4" medium-density fiberboard (MDF). As you can see in the *Top Construction View*, the middle layer consists of three evenly-spaced panels (F), which are sandwiched between the top (G) and bottom panel (H). The spaces between the middle panels form openings in the top for the sliding rails of the support arm.

Dadoes for T-Tracks — After cutting all the panels to size, the next step is to rout dadoes in the top panel to hold the T-tracks. I sized these dadoes for some aluminum T-track that I purchased from Rockler.com (800-279-4441). If you build two tops like I did, you'll need two 4-ft. lengths of T-track (Item #21753).

Top Assembly — The top is held together with glue and screws. I didn't want the screws to be visible, so I assembled it upside down using the assembly sequence shown on page 53.

Start by laying the top panel face down on a flat surface and setting the three middle panels in place. To create the openings



for the rails, the middle panels are separated by a set of temporary spacers during assembly. I made these spacers 1/8" *wider* than the rails on the support arm. That way, once the top is assembled and the spacers are removed, the rails won't bind when you slide the support arm in and out.

Another thing to be aware of is the location of the screws. You'll want to make sure they don't line up with the dadoes for the T-tracks.

After gluing and screwing the top and middle panels together, remove the spacers and scrape off any glue that squeezed out, as this could interfere with the movement of the support arm. Then, apply a *light* film of glue to the middle panels and attach the bottom panel with glue and screws.

Edging — To cover the exposed front edge of the top, I added hardwood edging (I). It's comprised of five 3/4"-thick strips that fit around the openings in the top, essentially forming "mortises" in the edging.

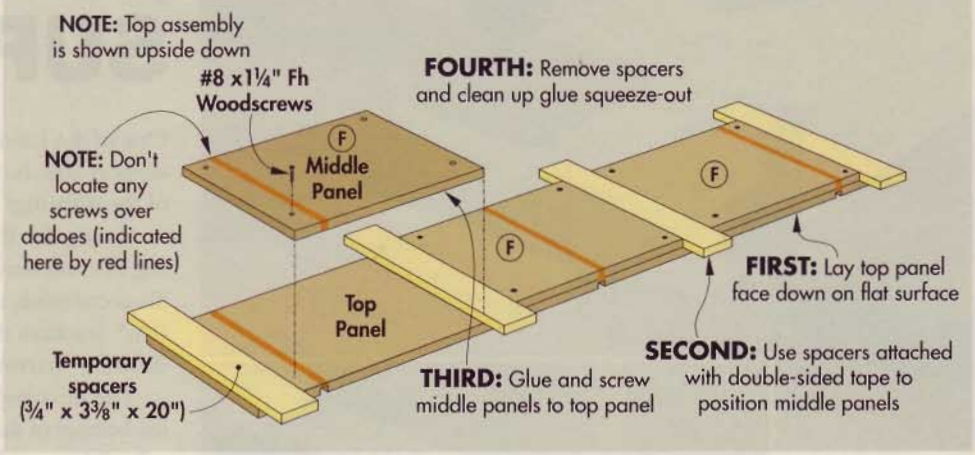
To accurately locate these "mortises," I used the top, with the spacers, like a glue-up template. The idea is to fit the spacers into their respective openings and then dry-assemble the edging strips around them.

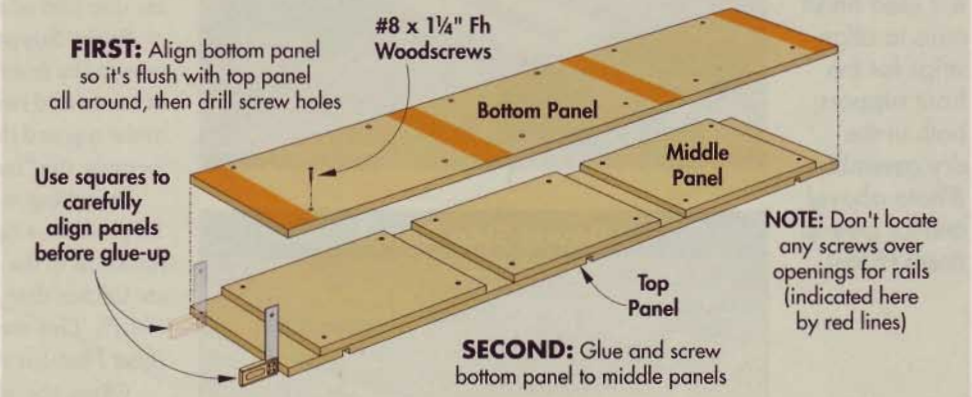
To help align the strips during this dry assembly, and to keep them from slipping around during glue-up, I used finish nails as registration pins. *(Refer to page 24 for more on this.)*

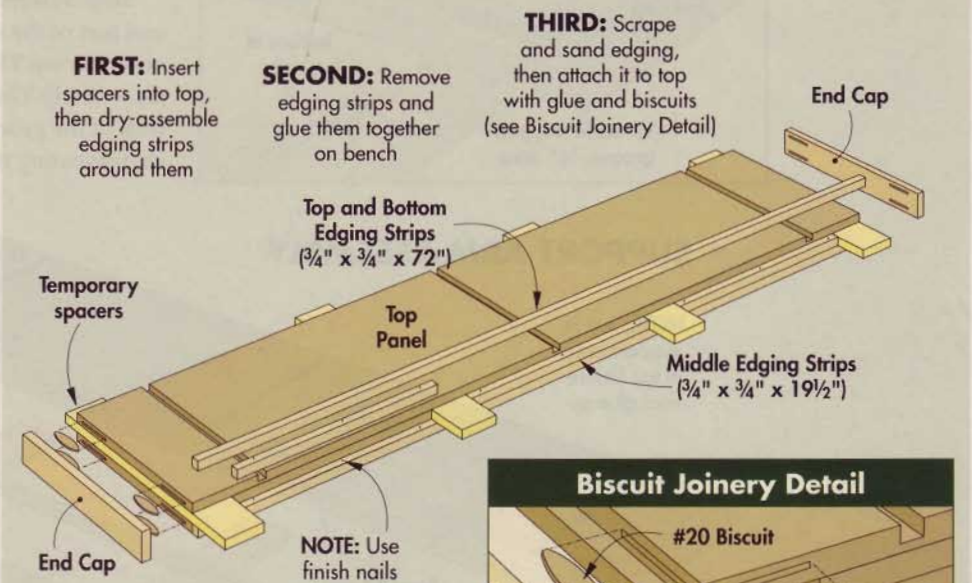
Once that's done, remove the strips and glue them together on the bench. When the glue dries, clean up the edging and attach it to the top with biscuits and glue *(Biscuit Joinery Detail)*. I also added two end caps (J), which are also attached with biscuits and glue.

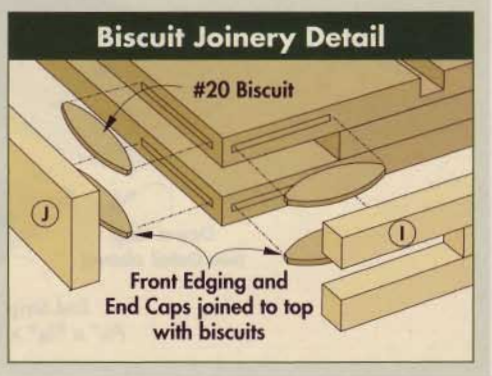
Install T-Tracks — Now all that's left is to install the T-tracks. If you look at the *T-Track Detail* on page 52, you can see that the aluminum track is set in from the back edge of the top. This setback allows you to insert the clamping accessories. With that in mind, cut the T-track sections to length and screw them into the dadoes.

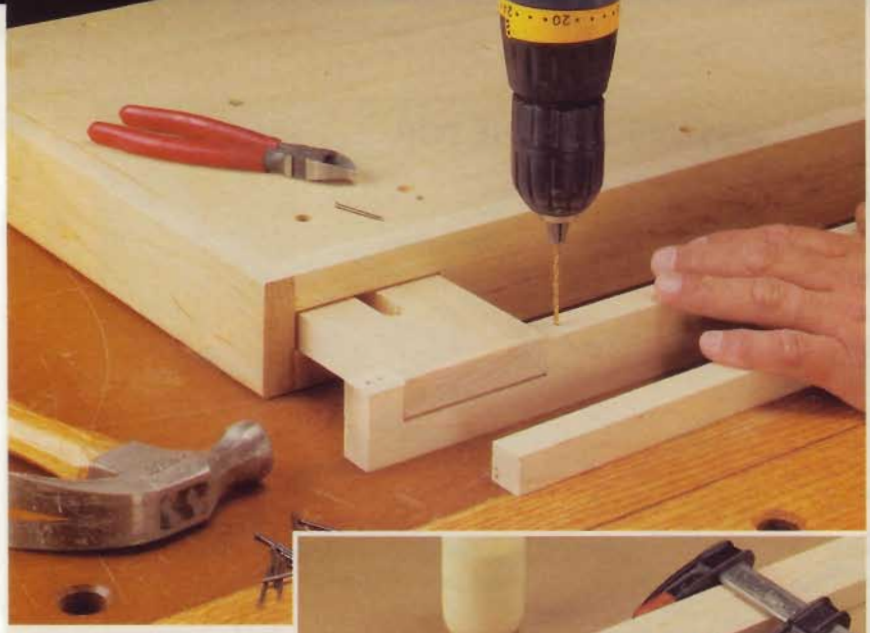
ASSEMBLING THE TOP

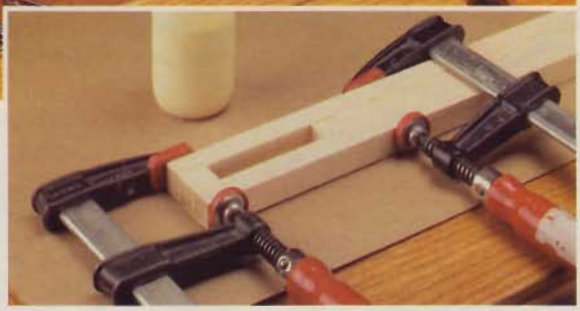












▲ I used finish nails to align strips for the front support, both in the dry assembly *(Photo above)* and for glue-up *(Inset Photo)*.

pull-out arm for SUPPORT

One of the handiest features of this project is a pull-out support arm. It consists of four rails that slide in and out of the openings in the top and a long front support.

Ready for Rails — To prevent the arm from binding, the rails have to slide smoothly without much play. To accomplish that, I planed the rails (K) $^{11}/_{16}$"-thick ($^{1}/_{16}$" less than the height of the openings) and ripped them $^{1}/_{8}$" narrower, ending up with $3^{1}/_{4}$" wide rails.

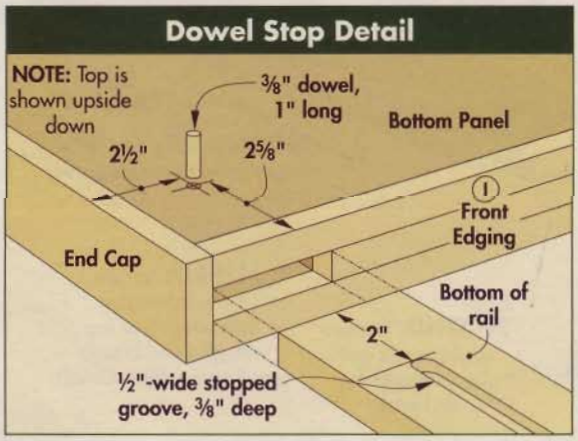
The next step is to rout a shallow, stopped groove in the bottom of the two rails that will be used for the outer rails of the assembly *(see Dowel Stop Detail)*. These grooves are one part of a "stop" system that's added later.

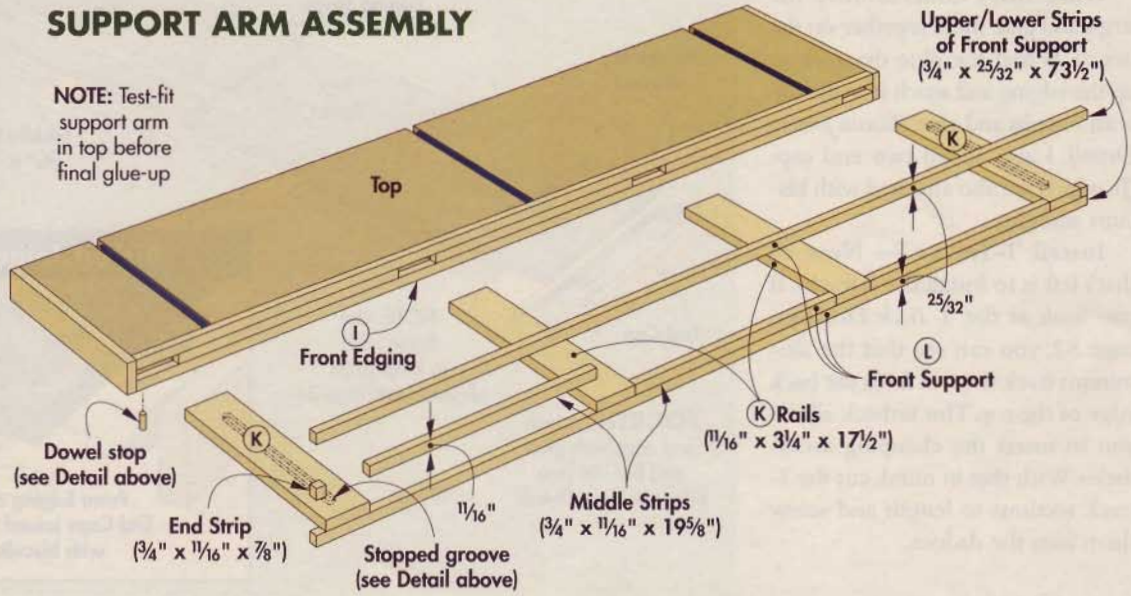
Front Support — Now you can turn your attention to the front support (L). Like the edging, it's made of hardwood strips. Only this time, the *rails* are inserted in the top, and the strips are dry assembled around them, forming the "mortises" for the rails *(see Photo above)*.

One thing to note is the *thickness* of the middle strips. To produce a tight-fitting joint, these strips match the thickness of the rails ($^{11}/_{16}$"). The upper and lower strips are thicker than their counterparts on the front edging ($^{25}/_{32}$"). This way, when you glue up the front support *(Inset Photo)*, it will match the height of the edging.

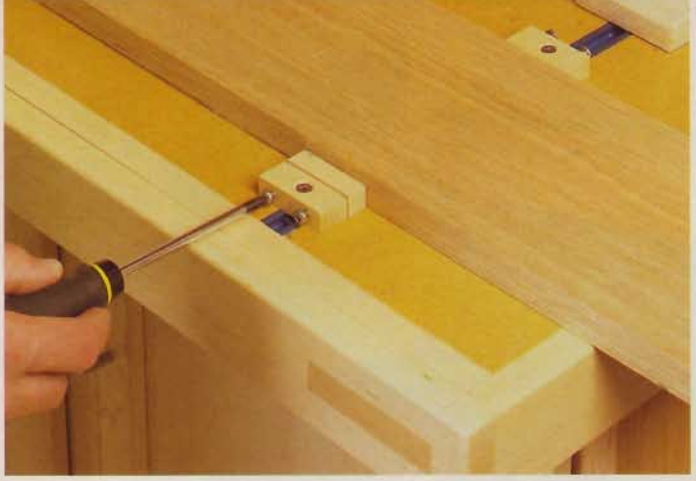
When the glue dries, glue the rails into the mortises, "pin" them with finish nails, and install the arm.

Stop System — Now all that's left is to add the second part of the stop system — a dowel installed underneath the top. The dowel fits into the groove on the rail *(Stop Detail)*. This way, when you slide out the arm, the ends of the grooves in the outer rails contact the dowels, preventing the arm from pulling all the way out.





3 BENCH Accessories



Shop-Made Mini-Clamps

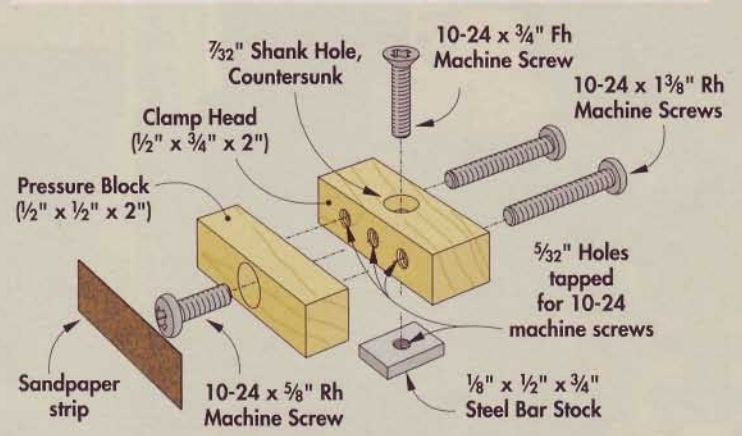
When you're sanding, routing, or planing, it's a nuisance to have to keep moving the clamps that hold the workpiece so they're not in the way of the tool. These mini-clamps solve that problem. They're only 1/2" tall, so they sit *below* the surface of 3/4"-thick material, which is what I work with most often. With their low profile design, the clamps won't interfere with the tool.

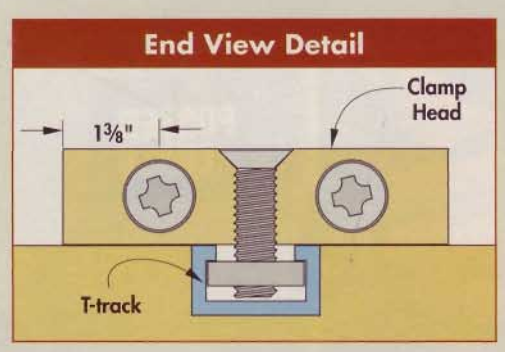
Each clamp consists of two small wood blocks: a clamp head that slides along the T-track and a pressure block that, like its name suggests, applies pressure against the edge of a workpiece.

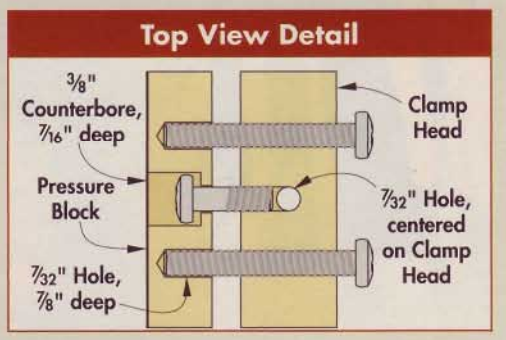
The *Illustration* at right will give you an idea of how the clamps work. Notice that a machine screw passes through a hole in the clamp head and into a threaded hole in a small metal bar. Tightening the screw pinches the bar against the T-track, "locking" the clamp in place *(End View Detail)*.

The actual clamping pressure is produced by two more machine screws that thread into the clamp head and into counterbores in the pressure block *(Top View Detail)*. As you tighten these screws, they push against the block, which presses against the workpiece. To keep the two blocks from coming apart, one last machine screw passes through a counterbore in the pressure block and threads into a hole in the clamp head.

Finally, sandpaper is attached to the face of the pressure block to improve the grip of the clamp.



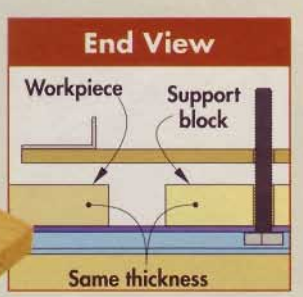




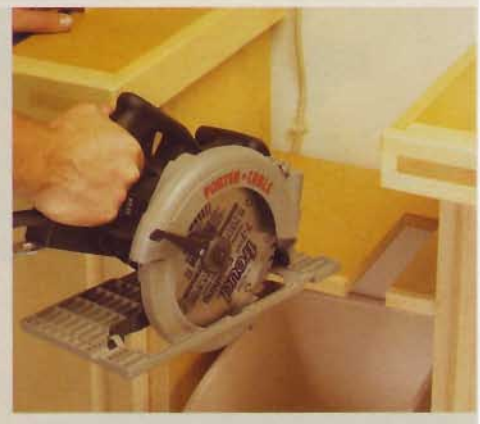
Auxiliary Support Block

Sometimes a workpiece is too narrow to fully support the fence. That's where this auxiliary support comes in. It holds the *unsupported* part of the fence level with the surface of the workpiece.

The support is a hardwood block with a bolt that slides in the T-track *(End View)*. To use the support, simply fit a hole in the fence over the bolt. Then clamp the fence with a metal hold-down.



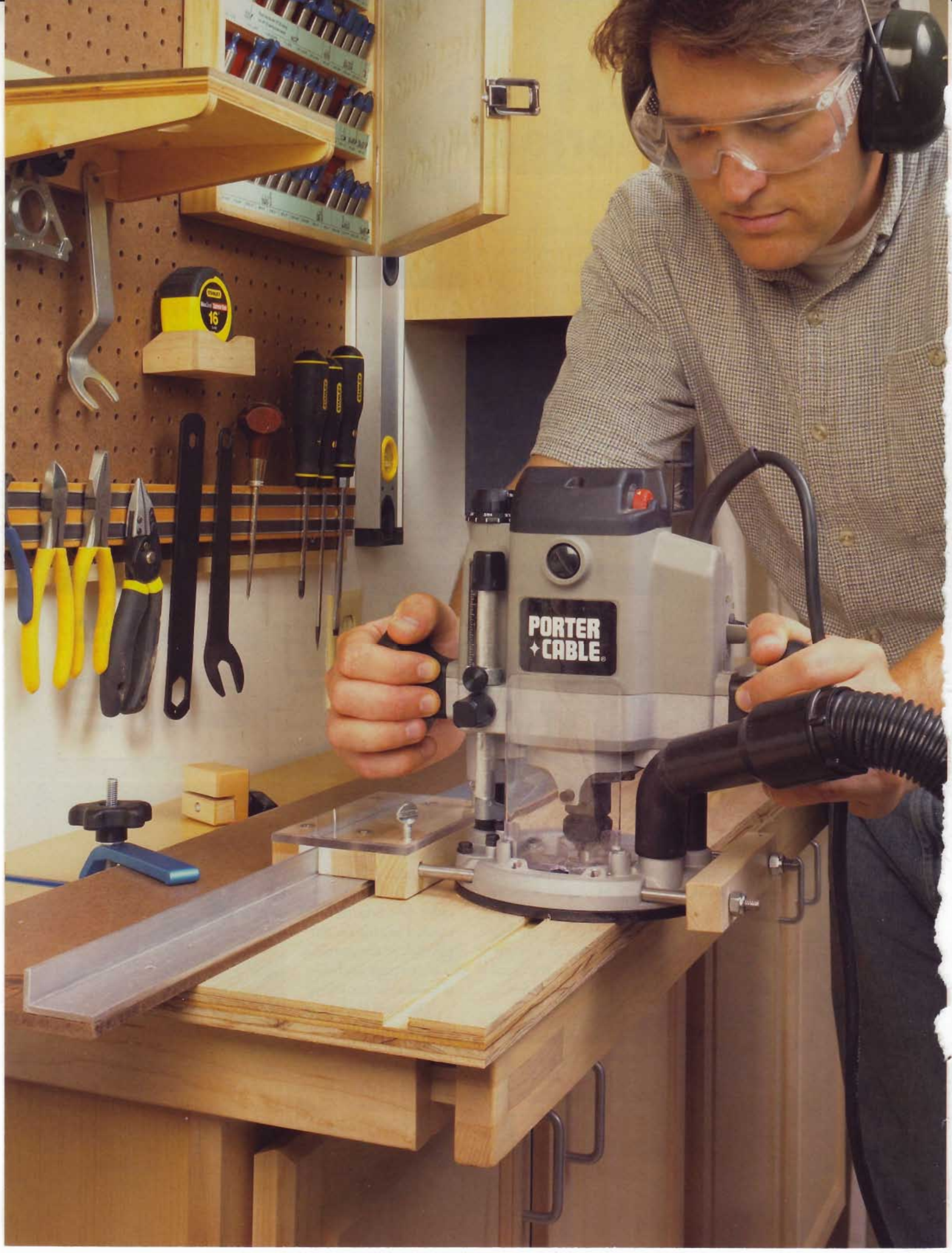
Saw Shelf



The opening between the cabinets is ideal for crosscutting boards to length. To keep my circular saw within easy reach, I installed a simple shelf in the opening and set a trash can below it for cutoffs *(see Photo)*.

The shelf is nothing more than a piece of 3/4"-thick MDF that's cut to fit between the cabinets. A notch for the blade and the blade guard allows the saw to sit flat on the shelf. And a strip of hardwood covers the front edge of the shelf.

All that's needed to support the shelf is a couple of cleats mounted to the cabinets. Just be sure to locate the cleats far enough down so the saw is below the top of the cabinets.


PORTER
CABLE

microadjustable ROUTER GUIDE

Custom-fit joinery, jointed edges, and decorative profiles are all standard fare for this microadjustable router guide. And during each of these operations, accuracy is automatic.

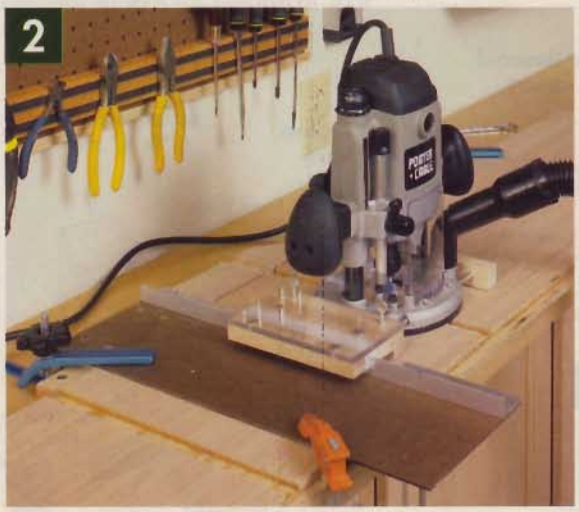
Routers are frequently praised as the most versatile tool in any woodshop. And I wouldn't exactly disagree with that. But it seems that routers get a lot of credit that's actually due the accessories that truly stretch the capability of the tool. Without the right accessories, even the best router is little more than a good tool with untapped potential.

This shop-made guide and fence system is a perfect example of what I'm talking about. Whether you use a plunge router *(see Photo at left)* or a fixed-base router, this system can quickly and easily transform your router into a handheld edge jointer *(Fig. 1)*, rabbeting and dadoing machine *(Fig. 2)*, and even a shaper *(Fig. 3)*.

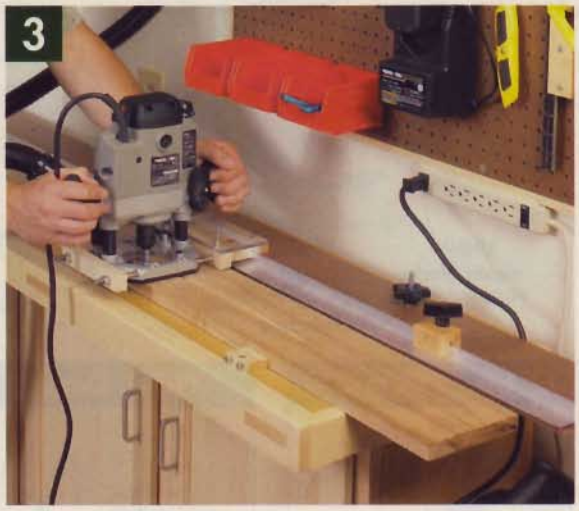
More importantly, it performs all of these functions with pinpoint accuracy.

Adjustable Guide & Fence — To guarantee that kind of accuracy, the router is attached to an adjustable guide that slides along a metal fence. As you'd expect, this fence ensures a perfectly *straight* cut. But there's more to it than that. The guide itself has a built-in mechanism that lets you customize the *width* of cut. This way, you can match dadoes and grooves perfectly to any thickness of stock. Also, once the guide is "fine tuned," you can make identical cuts over and over — without having to change the setting. (For more about how to use this microadjustable router guide, see page 61.)

What's more, the fences in this system double as edge guides for your circular saw. This makes this system almost as versatile as the router itself.

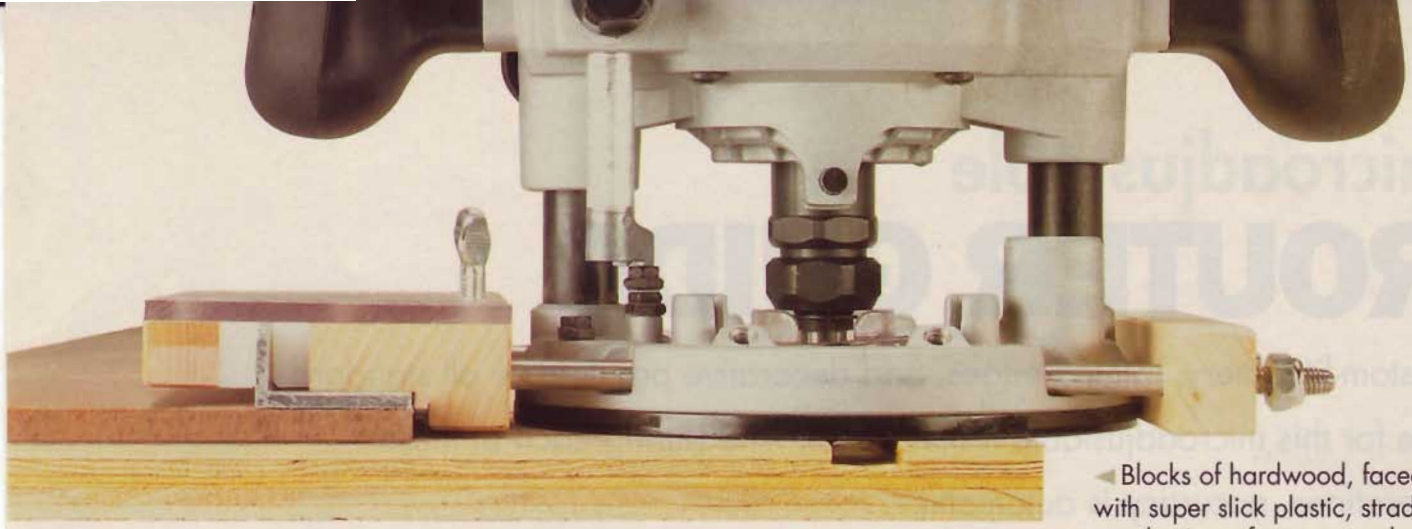


▲ DADOES & RABBETS
Routing shelf dadoes to the exact thickness of the plywood shelves that will fit in them is no problem with the fence and microadjustable guide.



▲ FLUTES, GROOVES, & SLOTS
Adding shop-made stop blocks to the fence makes it an ideal setup for routing all kinds of decorative profiles and functional details.

▲ EDGE-JOINTING BOARDS
Here one of the long fences serves as an edge guide that lets you joint a straight, square edge — perfect for gluing up solid-wood panels.



◄ Blocks of hardwood, faced with super slick plastic, straddle an aluminum fence to guide the router on its way.

building a precision

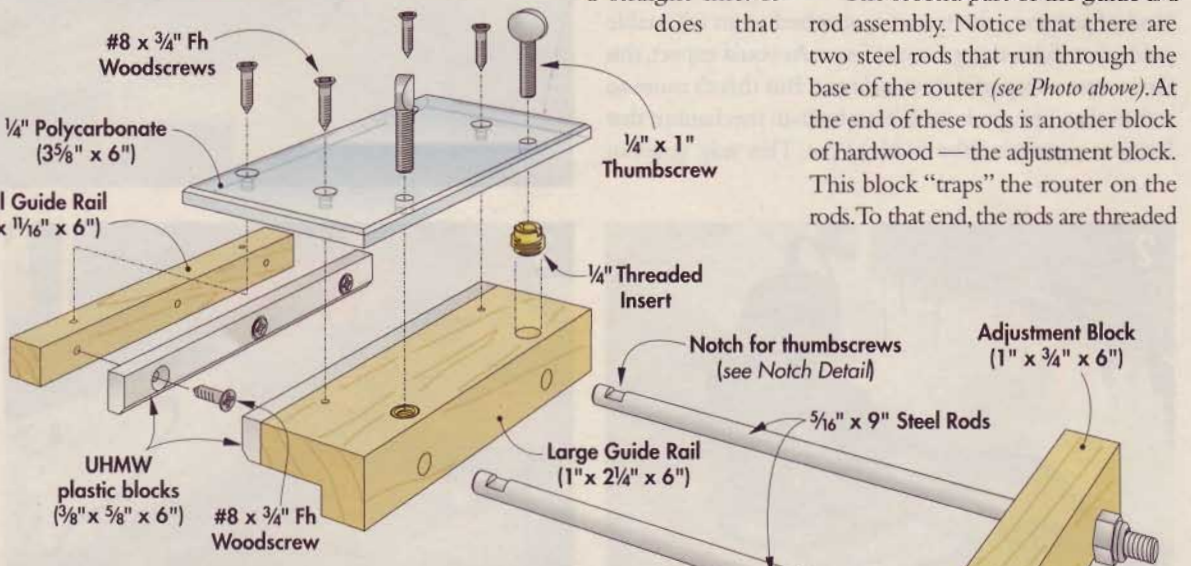
ROUTER GUIDE

At the heart of this system is an adjustable router guide. At first glance, it may look as though there's a lot going on here *(Construction View)*. But when you break the guide down into its basic parts and understand what each of those parts does, it all starts to become clear.

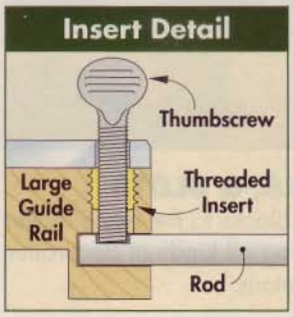
Let's start with the guide rail subassembly (that's the collection of pieces in the left side of the *Construction View*). The purpose of this assembly is to connect the guide to the metal fence and keep the whole works moving in a straight line. It does that with two hardwood rails that straddle the fence. These guide rails are faced with a strip of UHMW. This is an extremely slick plastic. It allows you to literally "pinch" the fence between the rails, but still have it slide freely. The guide rails are connected with a piece of polycarbonate and some woodscrews.

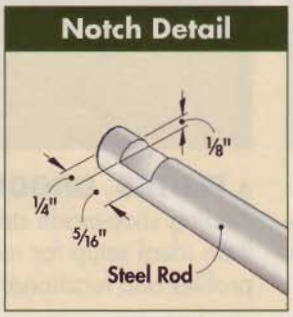
The second part of the guide is a rod assembly. Notice that there are two steel rods that run through the base of the router *(see Photo above)*. At the end of these rods is another block of hardwood — the adjustment block. This block "traps" the router on the rods. To that end, the rods are threaded

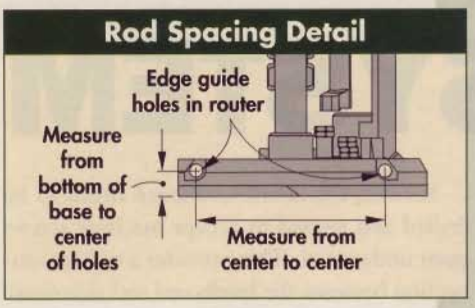
CONSTRUCTION VIEW



► The UHMW plastic used for the router guide is available in ⅜" - thick blocks from Rockler at 800-233-9359 or www.rockler.com







to accept nuts for tightening the adjustment block against the router base. This is also what gives the guide its micro-adjustability, as I'll explain later.

The critical steps in building this guide are getting the holes for the rods lined up perfectly between the adjustment block and the large guide rail, connecting the guide rails so they fit over the fence snugly, and threading the rods to accept the adjustment nuts.

Building Blocks — The secret to aligning the rod holes perfectly is to cut the large guide block and adjustment block from a single piece of stock *after* drilling the holes for the rods *(see Guide Assembly Construction Steps)*.

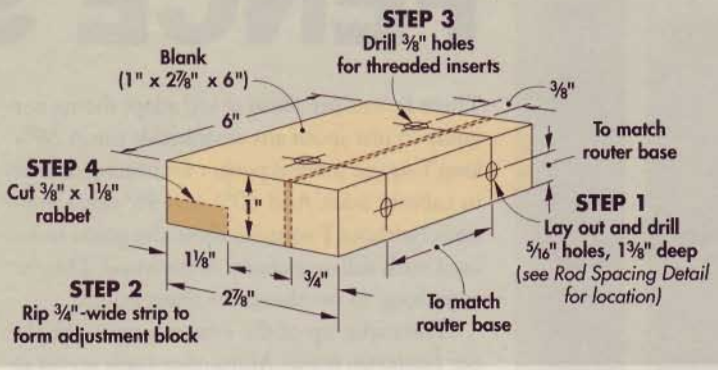
The small guide rail is cut from a separate piece of stock. Then the guide rails are assembled in two steps. The first step is to install the UHMW faces and threaded inserts.

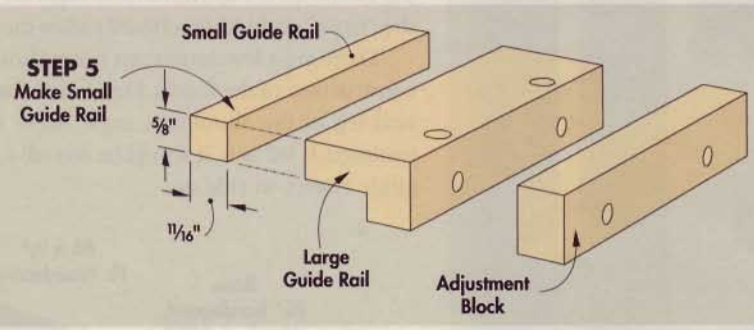
The second step is to connect the guide rails with a piece of polycarbonate. To ensure that the guides will slide smoothly along the fence, you'll need to shim the guide rails so the gap between them matches the thickness of the fence exactly. The simple way to do this is with a scrap piece of aluminum angle and some maksing tape *(see Step 8)*.

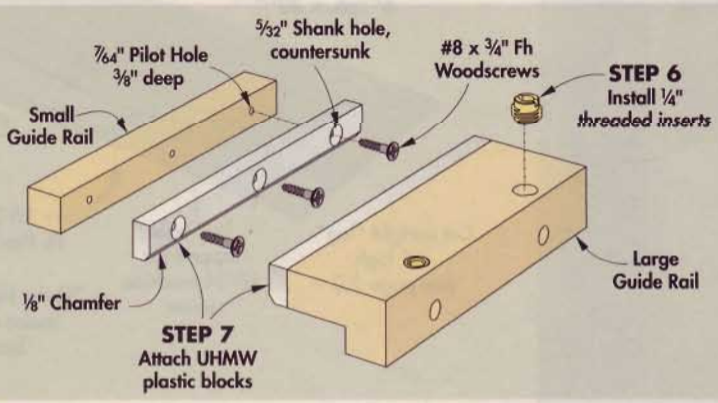
Rod Assembly — The steel rods need a couple modifications before assembly. First, each rod needs a notch filed near one end where thumbscrews will lock it into the large guide rail *(see Notch Detail on page 58)*. The second modification is to cut the threads to accept the adjustment nuts. A simple technique for cutting these threads accurately is explained on page 22.

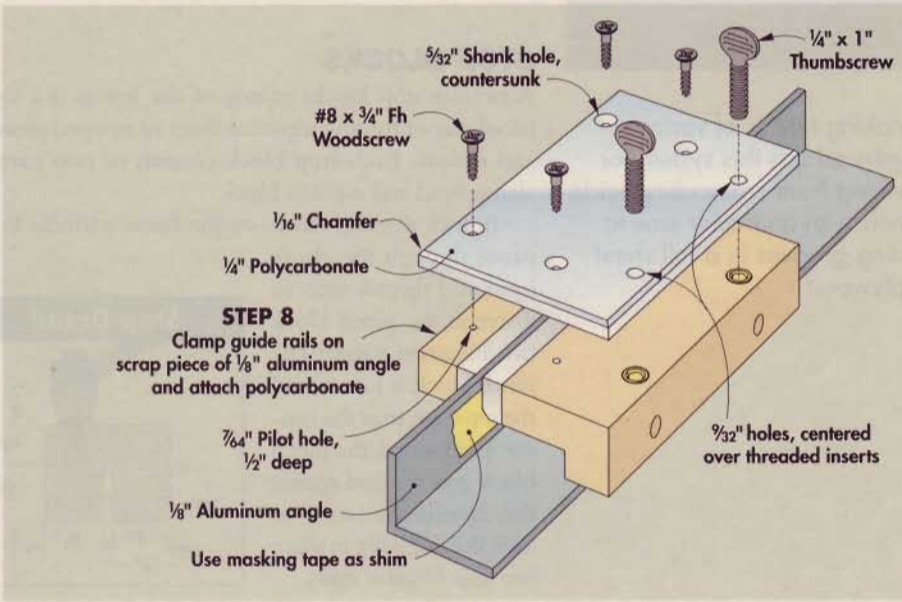
Finally, slide the adjustment block onto the steel rods and thread on a pair of lock nuts.

GUIDE ASSEMBLY CONSTRUCTION STEPS









▲ Making fences of various lengths adapts this system for anything from crosscutting wide panels with a circular saw to routing grooves in a full sheet of plywood.

versatile 3-pack

FENCE SYSTEM

Three fences *(see Photo at left)* adapt the router guide to just about any imaginable job. A 30"-long T-square fence is perfect for routing dadoes in cabinet sides. And 60"- and 96"-long versions (without T-squares) allow the guide to be used with full-size sheets of plywood. They're extra long to overhang the sheet goods.

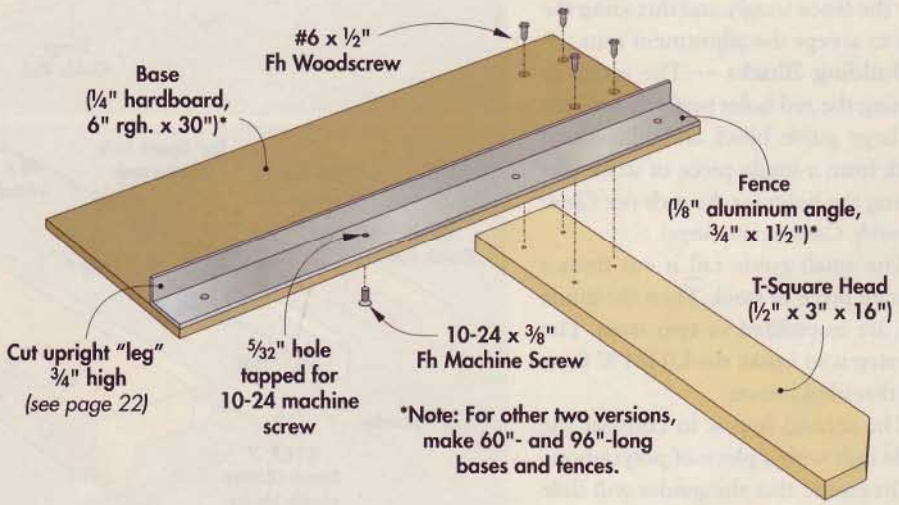
The make-up of the fences is quite simple *(see Illustration below)*. Aluminum angle serves as the "fence" and 1/4" hardboard makes the base.

There are a few important notes about the construction of the fences. First is that the vertical leg of the aluminum angle needs to be trimmed. If left as is, it would be too tall for the guide system to ride on.

Second, the aluminum fence needs to be drilled and tapped to accept machine screws from underneath. This provides a secure connection between the hardboard and aluminum without the hardware getting in the way of the router guide.

Note: See the techniques we used to trim, drill, and tap the fence in *Workbench Shop Tips*, beginning on page 22.

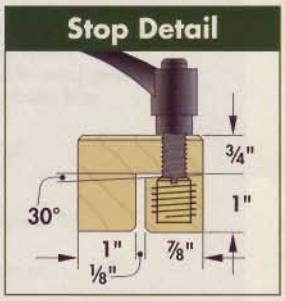
The hardboard base comes next. It also serves as a saw "track" so the fences can be used as edge guides with a circular saw. To fit the bases for your saw, leave the hardboard extra wide as you assemble the guide, then trim it to width with your circular saw for a custom fit.

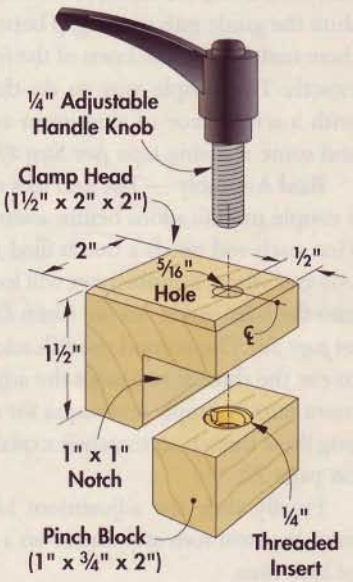


STOP BLOCKS

Attaching stop blocks to any of the fences is a foolproof way of routing identical flutes or stopped grooves and dadoes. Each stop block consists of two parts: a clamp head and a pinch block.

To lock the stop blocks on the fence, a handle knob passes through the clamp head and threads into an insert in the pinch block *(see Illustration at right)*. The pinch block is beveled on the top edge, so as the handle is tightened, the pinch block gets wedged against the aluminum fence to lock the assembly in place *(see Stop Detail at right)*.

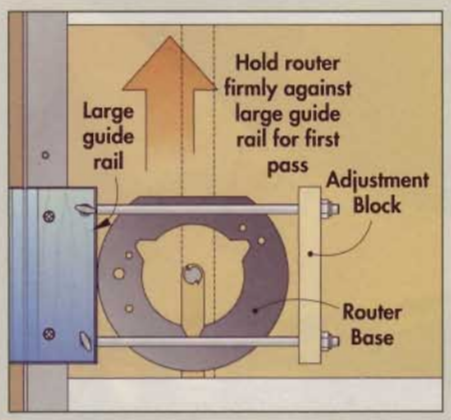




3 easy steps to
Routing Custom-Fit Dadoes

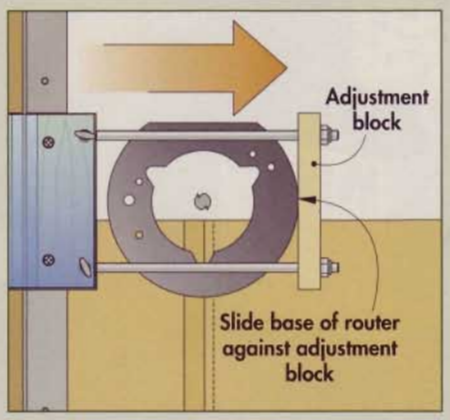
The value of an adjustable router guide is that it allows you to rout a rabbet or dado to perfectly match the thickness of stock you're using. This comes in particularly handy when working with sheet goods where nominal thickness ($^3/_4$" for instance) is different than actual thickness (more like $^{11}/_{16}$") and planing isn't an option.

By equipping your router with a bit that's smaller than the *actual* thickness of the stock (a $^1/_2$" bit would be a good choice for $^3/_4$" material) and using the adjustability of the guide, you can cut a perfect rabbet or dado in two passes. And because the guide is microadjustable, it's relatively easy to dial the guide in perfectly after just a couple of test cuts. The three-step process for routing perfect joinery is shown in the *Illustrations* below.



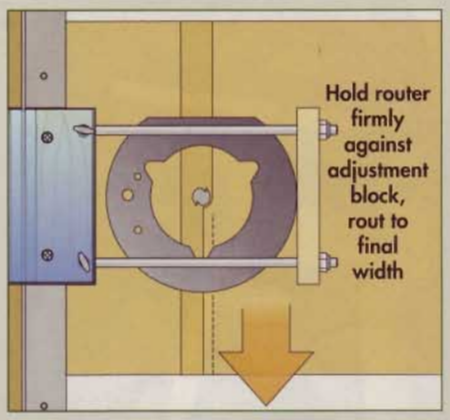
▲STEP 1

Make the first pass with the router against the large guide rail. The space between the router base and the adjustment block equals the difference between the bit ($^1/_2$") and the width of the dado ($^3/_4$").



▲STEP 2

When you reach the end of the first pass, slide the router sideways on the rods and butt the router base against the adjustment block. Then begin the second pass in the opposite direction.



▲STEP 3

Hold the router firmly against the adjustment block as you make the second pass. In this case (cutting a $^3/_4$"-wide dado with a $^1/_2$" bit), the bit will only be cutting another $^1/_4$" of width.

Compact Cut-Off Fence

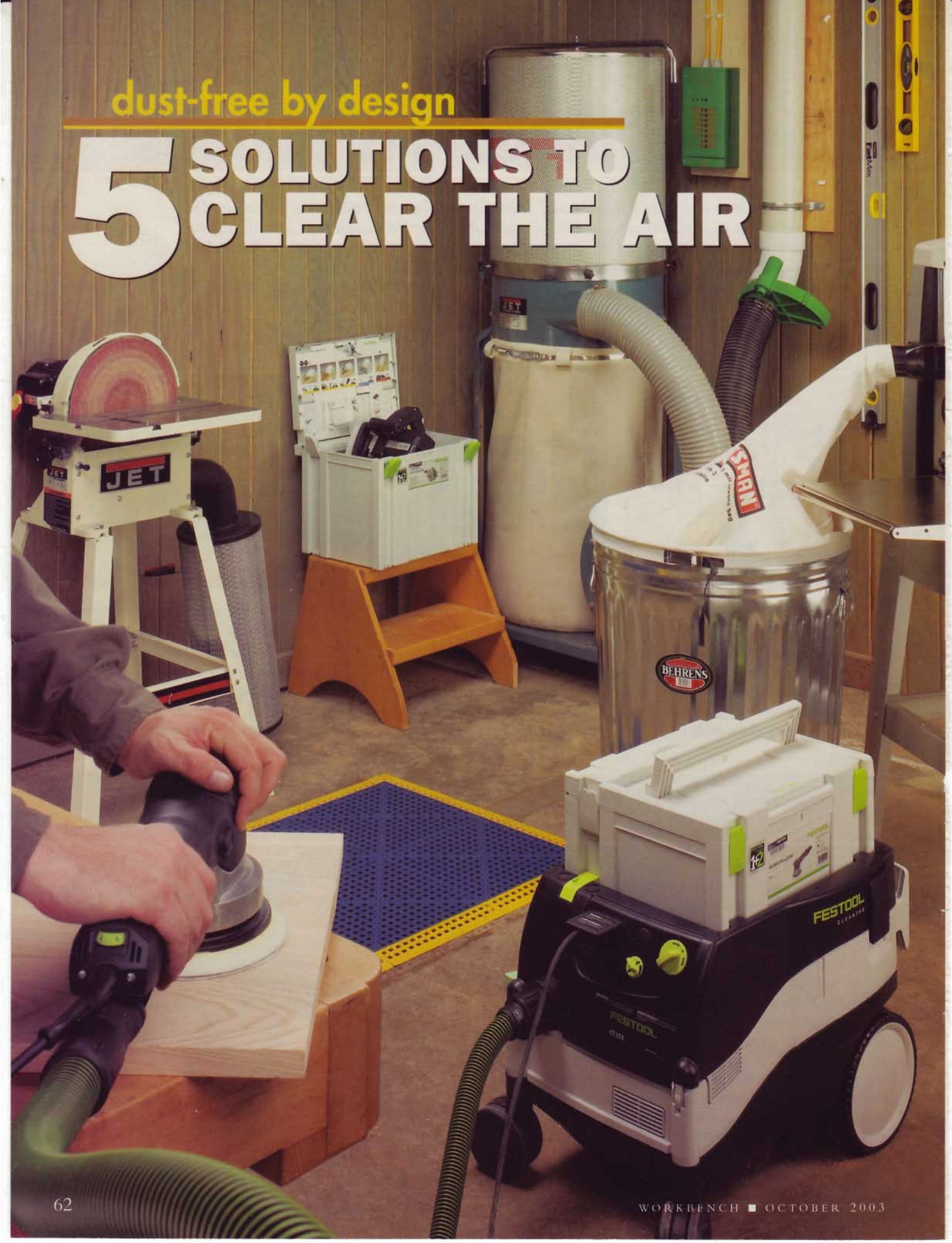
After making and using the three fences on the facing page, we thought it would be nice to have one more fence specifically for making accurate crosscuts in dimensional lumber with a circular saw *(Photo at right)*. We kept this one short (18") so we could use it in conjunction with the T-tracks and mini-clamps in the top of the workstation.

This fence also has a hardwood T-square to keep it perpendicular to the edge of the workpiece.

Apart from being shortened to fit in the space available at the shallow workbench, the construction details of this fence are the same as its longer companions. The aluminum angle fence has one trimmed leg and is tapped to accept machine screws from underneath. The hardboard base is extra wide to start and then trimmed to a perfect fit with the circular saw after the fence is installed.

dust-free by design

5 SOLUTIONS TO CLEAR THE AIR



Imagine spending an entire day working in your woodshop and at the end of the day you find virtually no dust to clean up. Moreover, you realize that if there's no dust covering the shop, then there's no dust clogging your lungs. It sounds too good to be true, but many of today's tools are designed and built with dust collection in mind, making dust-free woodworking more realistic than you might think.

In the following pages, we'll show you five areas where you can make simple but significant improvements to the way you control dust in your shop *(see the Sidebar at right for a quick overview)*.

5 Simple Solutions For Managing Dust

1. **Tool-Actuated Vacuums**
   Plug your tools into high-power vacs that turn on when the tool does.
2. **Collecting Dust at the Source**
   Stop dust before it spreads with tools designed for the task.
3. **Dust-Busting Tool Kits**
   Use tools designed to "tag-team" your dust control challenges.
4. **Cleaning the Ambient Air**
   Breathe easy in your shop with the latest in air purifiers.
5. **Improve Your Existing Collector**
   Make a good dust collector great with these simple add-ons.

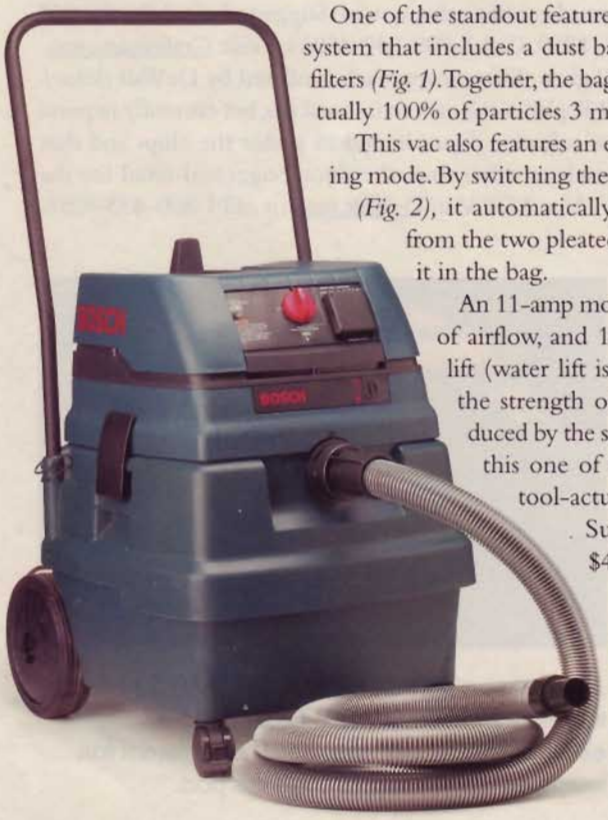
1 Tool-Actuated VACUUMS

AUTOMATIC EXTRACTION

One of the simplest and most affordable methods of dust control is a tool-actuated vacuum. A tool-actuated vacuum is one that has a power outlet to plug a tool into. When the tool is turned on, the vac comes on automatically.

Beyond the convenience of turning on each time you use the connected tool, these vacs also offer power, filtration, and ease of cleaning that surpasses lower-priced conventional wet/dry vacuums.

Bosch's model 3931 vac is one of the newest offerings in this category and has some of the best available features.

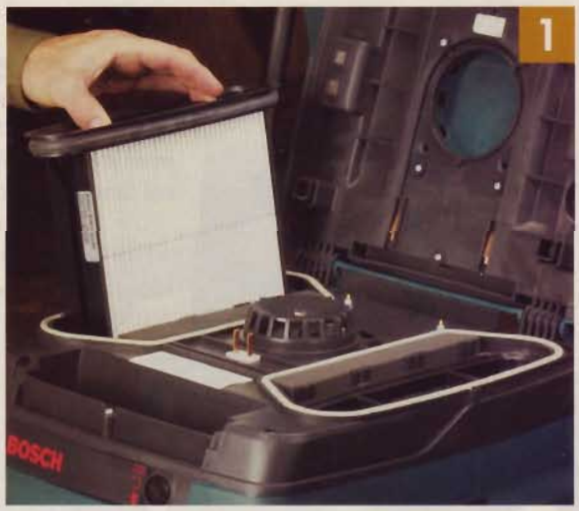


One of the standout features is a dual-filtration system that includes a dust bag and two pleated filters *(Fig. 1)*. Together, the bag and filters trap virtually 100% of particles 3 microns or larger.

This vac also features an exclusive self-cleaning mode. By switching the vac to Pulse-Clean *(Fig. 2)*, it automatically shakes dust loose from the two pleated filters and collects it in the bag.

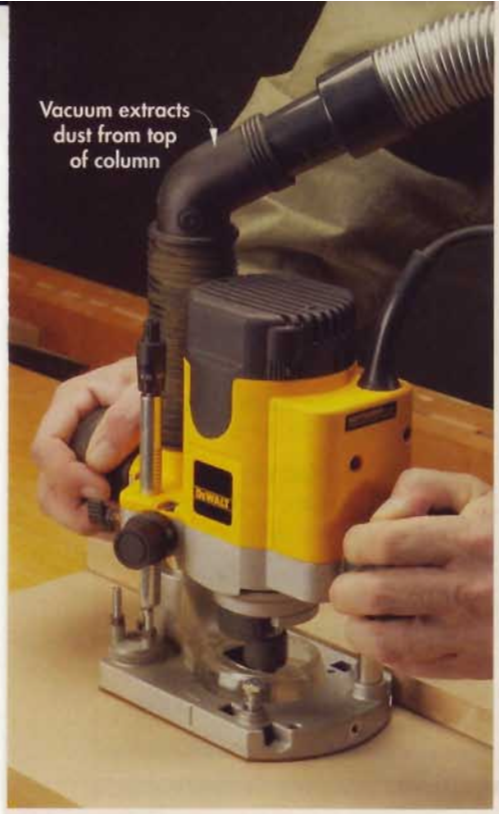
An 11-amp motor, 130 cu. ft./min. of airflow, and 100" of static water lift (water lift is a measurement of the strength of the vacuum produced by the suction motor) make this one of the most powerful tool-actuated vacs available.

Suggested retail is $429. For more information, visit Bosch's website at BoschTools.com or call 1-877-267-2499.



▲ The Bosch's pleated filters combine with a dust bag to capture nearly 100% of particles 3 microns and larger.

◄ A Pulse Clean mode automatically cleans the pleated filters. Also shown is the outlet for tool-actuated operation.



2 Collecting Dust AT THE SOURCE

▲ The base of DeWalt's DW621 funnels dust directly into the large inlet port at the bottom of the column.

DEWALT ROUTER

Through-the-column dust collection on DeWalt's DW621 has made it the industry standard for effective, integral dust collection for routers. A big part of the success of this system has to do with the design of the base, which funnels the dust into the column where it is extracted by a vacuum *(Inset Photo)*.

This is a tried-and-true system that other companies have failed to match. For years, this feature was only available on the DeWalt. However, a very similar system is now used on Black & Decker plunge routers as well.

Suggested retail for the DeWalt DW621 is $370. For more information, visit DeWalt.com or call 1-800-433-9258.

CRAFTSMAN & DEWALT PLANERS

Planers are notoriously messy machines, and previous efforts at controlling their untidiness have been mostly ineffective. Now, however, there's a new crop of planers that use their own internal fans to direct debris into integral dust ports.

Pictured at left is Craftsman's 15" planer that uses a common garbage bag or trash can for dust collection. This is a remarkably effective system, and the internal fan means there's no need for a dust collector. Craftsman's 12" and 13" planers also utilize this system. Suggested retail for the 15" planer is $799. Call 1-800-549-4505 or visit Craftsman.com.

A slightly different approach is offered by DeWalt *(below)*. This 13" planer still uses an internal fan, but currently requires a dust collector if you intend to gather the chips and dust somewhere other than the floor. Suggested retail for the DW733 is $379. Visit DeWalt.com or call 1-800-433-9258.

▲ A canvas "half bag" with a snap ring accepts typical garbage bags, as shown, or a 30-gallon trash can for collecting the dust from the planer.

▲ A snap-on port on the DeWalt DW733 allows the planer to connect to a dust collector with either a 2½"- or 4"-dia. hose. An internal fan keeps debris moving through the port.

BOSCH SANDER

Bosch distinguishes their 5" random orbit sander from others on the market by equipping the tool with a *genuinely* effective filter system. In place of the porous cloth bags that are common on other such sanders, Bosch uses a Micro-Filter dust canister that captures particles as small as a half micron. This results in as much as a 120% increase in trapped dust and a noticeable reduction in the dust cloud that typically fills the air while you're sanding.

Getting the dust into the filter in the first place is the job of the motor impeller, which creates a mild vacuum to draw the dust through the eight holes in the sanding disc and direct it to the canister. In concert with the filter, this makes the Bosch one of the cleanest sanders going *without* having to connect it to an external vacuum source. Suggested retail is $213. Call Bosch at 1-877-207-2499 or visit BoschTools.com for more information.

▲ Bosch's Micro-Filter system stores the bulk of the collected dust in the bottom of the canister. The finest dust is trapped in the pleated filter before it can escape into the air.

JET DISC SANDER

Jet's 12" disc sander established itself as truly one of the all-stars of this tool review. Before using the tool, I figured I'd be satisfied if it picked up *most* of the dust it created. After all, disc sanders can kick up a lot of dust.

So, after sanding a chunk of MDF as fast as I could, I was pleasantly surprised to find only a smattering of dust on the sander's table and no dust hanging in the air.

The secret to the success of this tool is twofold. First, a large impeller directly behind the sanding disc creates an enormous amount of airflow to pull dust from the outer edge of the disc and direct it into the onboard filter. The filter is part two of the dust collection equation. This canister-style filter traps dust particles as small as 2 microns and twists off easily for cleaning or replacement. Suggested retail is $396. Visit JetTools.com or call 1-800-274-6848.

◄ Jet's 2-micron canister filter twists on and off the sander quickly for cleaning and replacement.

HOW BIG IS A MICRON?

Microns are the units of measure used to indicate the size of dust particles. So how big is a micron? Well, the period at the end of this sentence is somewhere in the neighborhood of 400 microns.

3 Dust-Busting TOOL KITS

FEIN

At the heart of Fein's system is their line of Turbo Vacs (the Turbo II in this case). Along with incredible pulling power and super-quiet operation, this vac has the unique capability to power two tools simultaneously *(Fig. 1)*.

While many of the vacs in this article provide adequate suction for multiple tools, Fein is the only vac with a high enough amp rating for more than one tool at a time (20 amps for the Fein compared to 6, 7, and 10 amps for the other vacs we tested). Surprisingly, the vac can handle a 20-amp draw from the tools plugged into it, but the vac itself can be powered by a 15-amp outlet.

One improvement we would make to this vac is the filter *(see Fig. a)*. It's an effective filter (rated at 5 microns), though not terribly easy to clean and maintain.

Two key players on Fein's dust-busting team are a 6" random orbit sander and a 3¼-hp plunge router.

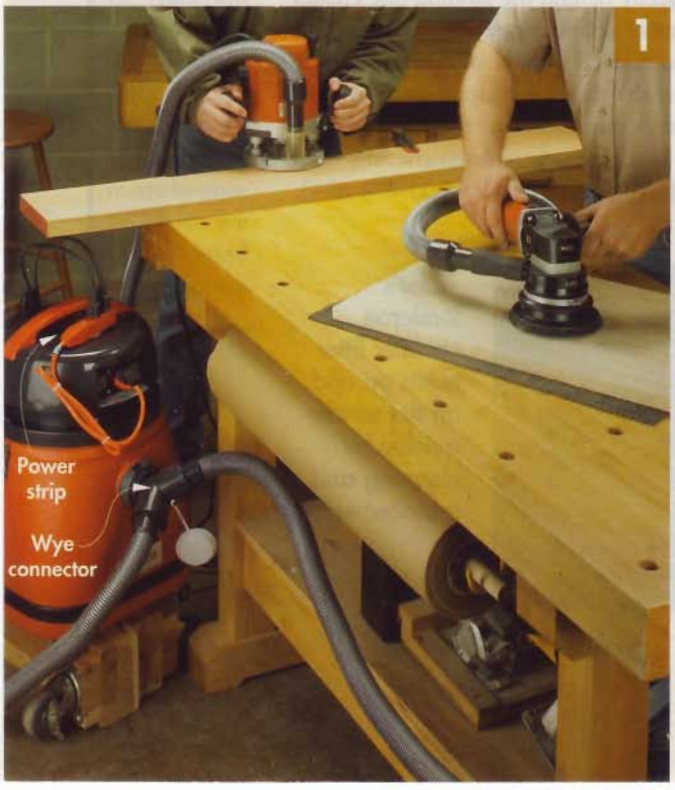
The sander is especially effective because of additional ports on the outside of the sanding disc that pick up dust that strays from underneath the tool *(see Photo below)*. Fein claims 98% extraction using this system.

On the router, a clear shroud is attached to the base and creates an enclosed area from which dust and debris can be drawn away from the bit. As simple as it sounds, the shroud works remarkably well.

One at a time or doubling the tools up, Fein's system of dust control is incredibly effective. Beyond that, the tools are individually among the best in their respective classes.

Suggested retail for these tools are: Turbo II Vac $387, 636-1 Random Orbit Sander $758, RT1800 Plunge Router $473. For more information, visit FeinUS.com or call 1-800-441-9878.

► Fein's cloth filter bag is effective, but makes for messy emptying. Pick up the optional cartridge filter and paper dust bag to get the best out of this vac.



◄ When you install a "Wye" connector (from Fein) and power strip (from the hardware store), the Turbo II Vac provides the necessary amperage and air flow to handle two tools simultaneously.

▲ Ports in the perimeter of the sanding disc grab dust that escapes from under the edge of the sander.

FESTOOL

Festool's CT22 dust extractor *(at right)* provides the pulling power in this system and also boasts features not found on the other vacs we evaluated.

First is a variable speed feature. This is one of those ideas that makes you wonder where it's been all these years. After all, not every job requires the full power of the vac to keep the dust corralled. So why listen to the motor at full volume?

Another novelty is the hose. Seemingly an innocuous component of the system, Festool's is something special. The hose is graphite impregnated to resist static buildup caused by dust rushing through it. If you've ever seen a "dust beard" grow on the outside of a vac hose, you'll immediately appreciate this thoughtful touch.

A two-stage filter system keeps dust from being reintroduced to the air once it reaches the vac, and a cleaning lever makes clearing the pleated filters quick and easy *(Fig. 1)*.

The flagship tools of this system are the model ATF 55 E Plunge Saw and the model RO 150 E Random Orbit Sander.

A fully-enclosed blade shroud on the saw *(shown above)* and unique hole pattern on the sander *(shown below)* are key to the dust collecting performance of these tools.

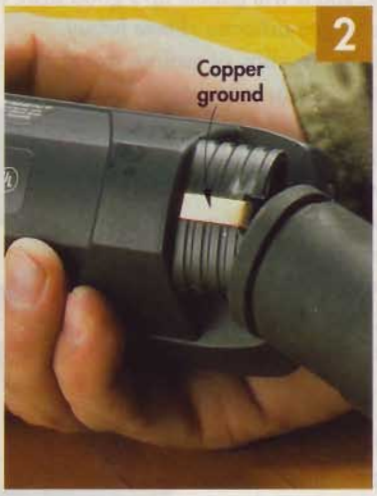
The enclosed shroud traps the dust so it can be collected instead of broadcast, as with the open blade guard on most circular saws.

Nine holes in the sanding pad, spaced near the edge of the disc, allow the vacuum a greater opportunity to capture the dust before it escapes from under the sander. There's another hole in the center of the pad, but this one is actually a "jet." That is, air blows out of this hole to keep dust moving toward the nine collection holes and to prevent the sandpaper from clogging up. One final piece of dust control technology on this sander is a copper ground in the dust port that works with the graphite-impregnated hose to eliminate static buildup *(Fig. 2)*.

Suggested retail prices for these tools are: CT 22 E Dust Extractor $375, RO 150 E 6" Random Orbit Sander $395, ATF 55 E Circular Plunge Cut Saw $375.

For more information visit Festool-USA.com or call 1-888-337-8600. Also be sure to visit one of Festool's leading U.S. distributors, SpecialtyTools.com or call them directly at 1-800-669-5519.

▲ A filter cleaner makes maintenance cleaning convenient. For more thorough cleaning or replacment, the filters snap out easily.



▲ A copper ground and graphite-impregnated hose eliminate electro-static charging.

▼ Ports near the edge of the pad collect the dust. A center "jet" keeps the dust moving in the right direction.

4 Cleaning The AMBIENT AIR

▲ A quick glance at the airflow indicator tells you if the filter needs to be cleaned. Remote operation lets you set the cleaner from anywhere in the shop.

DELTA AIR CLEANER

Delta's 50-875 Remote Air Purifier has all the features you should want in an air cleaner: three speeds, remote control operation, time-delay shut-off, and, of course, awesome filtration (traps 99% of particles over 1 micron).

Where this unit distinguishes itself is in making it easy to monitor its efficiency. In the past, climbing a stepladder to inspect the filter was the only way to know when a replacement was due. Delta has added an airflow indicator that lets you see at a glance when the filters have become dirty to the point of impeding performance *(Photo at left)*. That makes it much more likely that you'll replace and clean the filters in a timely fashion, ensuring the highest level of effectiveness and avoiding undue wear on the motor.

The three-speed blower provides airflow of 540, 630, and 1,200 cu. ft./min. — enough to recycle the air in a 20-ft. x 20-ft. shop 13 to 18 times per hour *(Inset Photo)*. A time-delay allows you to set the unit to continue cleaning the air up to $7\frac{1}{2}$ hours after you leave the shop.

Suggested retail is $333. Visit DeltaWoodworking.com or call 1-800-438-2486 for more information.

BENCHTOP AIR CLEANER

Shop Vac's Air Cleaner is a portable, affordable, and remarkably capable solution to airborne dust. Place this unit on a bench or even on the floor near your work, and it will gobble up a good share of the dust before it ever has a chance to get airborne *(Photo below)*.

Operating at 235 cu. ft./min. of airflow, this compact unit will recycle the air in a 15-ft. x 15-ft. room every 10 minutes.

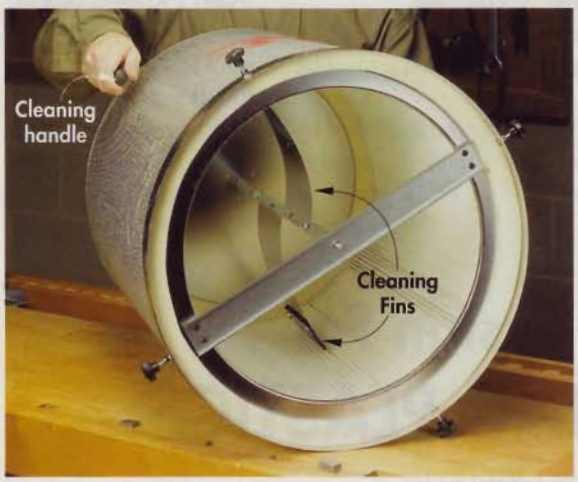
The two-stage filter *(Inset Photo)* grabs particles as small as 5 microns. And the filters are easily accessible for cleaning or replacement by removing the end grill. Suggested retail is $129. Visit ShopVac.com or call 570-326-3557 for more information.

► The portable Shop Vac Air Cleaner lets you take dust control right to the source. The two-stage filter is effective and accessible.

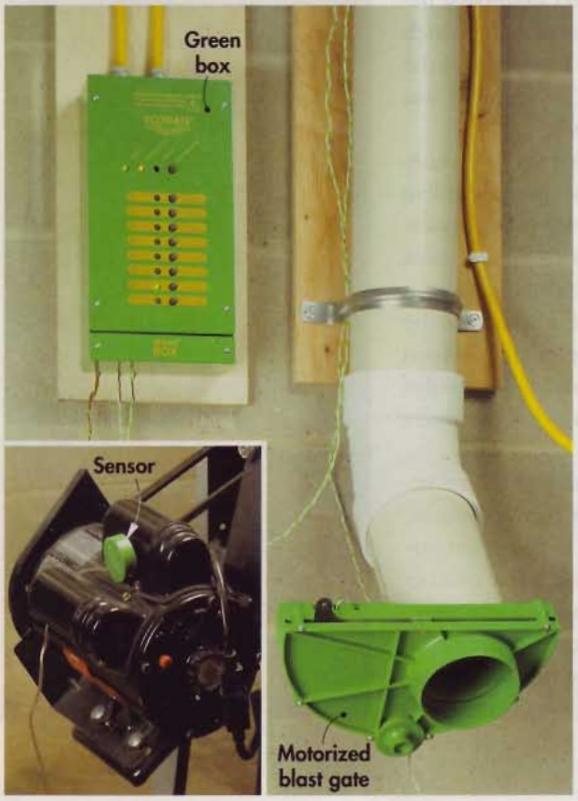
5 Improve Your Existing DUST SYSTEM

JET DUST COLLECTOR FILTERS

Adding a Jet canister filter is the best thing you can do for your existing dust collector. These filters have up to six times more filter area than standard bags and trap particles down to 2 microns (versus 30 microns for most standard bags). Cleaning is also easier — just twist a handle at the top to shake the filter clean *(Photo below)*. The loosened dust falls into the collection bag below. Canisters are available as add-ons to most popular brands of dust collectors and are standard issue on several Jet models. Suggested retail is around $200. Visit JetTools.com or call 1-800-274-6848.



◄Turning a handle on top of the canister rakes two cleaning fins over the inside of the filter, knocking dust loose to collect in the lower bag.



ECO-GATE

For a dust collector to be truly effective, it must be running anytime a tool is running. Yet most of us will make "one quick cut" or "one quick pass over the router" without turning the collector on and opening the appropriate blast gate. An automatic system from EcoGate will guarantee that the dust collector is on and the gate is open anytime you run a tool.

The system works with sensors that mount to the tool motor *(Inset Photo)*. The sensor tells the "brain" of the system, The Green Box, which tool is running. The Green Box, in turn, starts the dust collector running and opens the corresponding blast gate.

A basic system includes gates and sensors for four tools, along with the Green Box. Suggested retail is $499. Visit EcoGate.com or call 1-888-326-4283 for more info.

◄ Sensors attached to the tool motor tell the Green Box which tool is running. The Green Box turns the dust collector on and opens the corresponding motorized blast gate.

WORKBENCH APPROVED

First Alert TALKING ALARM

◄ Any household remote (not included) will program First Alert's talking alarm.

Imagine being awakened in the middle of the night by a blaring smoke alarm. It's a terrifying thought, made all the worse when you consider that you have no way of knowing where the danger is. Is there a fire in the kitchen? The basement? The bathroom down the hall?

Without knowing the source of the danger, it's impossible to formulate a safe escape plan for you and your family. First Alert solves that problem with their new talking smoke and carbon monoxide alarm.

With a prerecorded human voice, the First Alert will tell you which room the alarm has been triggered in, and whether the danger is smoke or carbon monoxide. The voice warning is accompanied by a beeping alarm.

The alarm can be conveniently programmed, tested, and silenced using any household TV or VCR remote control.

The First Alert model SC07 Combination Talking Alarm is powered by two AA batteries. Suggested retail is $39.95. To locate a retailer in your area, visit www.FirstAlert.com or call 630-851-7330.

Mortisers

Fisch Pricing

In the August 2003 issue of *Workbench* we inadvertently listed the price of the Fisch BTM-99 Benchtop Mortiser as $185. This price was for the 1/2-hp version of the mortiser, which has been discontinued. The retail price of the 3/4-hp mortiser is $250.

Krylon Fusion For PAINTING PLASTIC

In 1967, according to a popular film of the time, the future was plastics. Well, the future is now. Plastic is everywhere. A perfect example is the plastic shutter pictured here, which likely went on my house about the time that movie I mentioned was opening at theaters.

Plastic being what it is — nearly indestructible — the shutter is still in decent shape except for its faded color.

But now, thanks to Fusion paint for plastics from Krylon, just about anything made of plastic can be returned to its original glorious color. Or you can change the color altogether, if the original was never all that glorious to begin with.

The *Photo*, right, shows the shutter before and after Krylon Fusion. A bit of cleaning with an ammonia-based cleaner and a few coats of Fusion, and the shutter looks new.

Fusion costs about $6 per can at hardware stores. For more information, visit www.Krylon.com or call 1-800-457-9566.

Hole-In-One DRYWALL REPAIR

▲The EZ Drywall Repair Kit makes it simple to fill a "door ding" (left) so the hole can be patched with drywall compound (above).

Door knobs and drywall don't mix. A carelessly opened door can easily result in an ugly hole like the one pictured at right. This makes for a challenging repair.

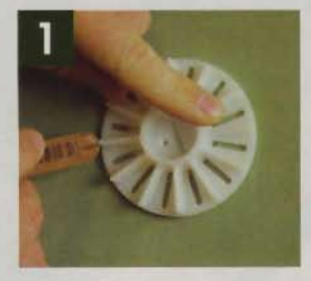
Fortunately, a simple solution is available from a company called Mighty Good Notions...A Hole-in-One Company. The company's EZ Drywall Repair Kit works in 1/2" or 5/8" drywall to repair holes up to 3" in diameter.

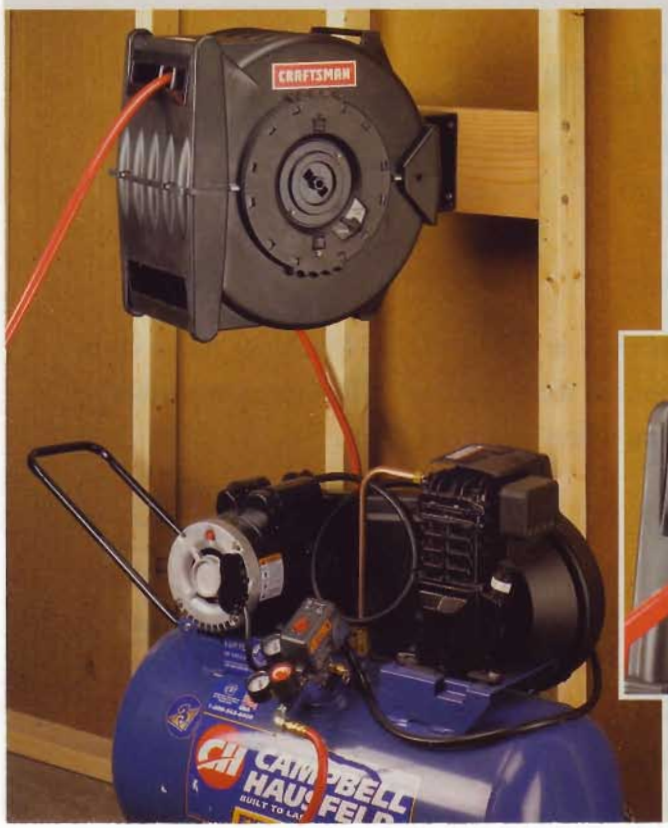
In the case of a "door ding" as shown here, the first step is to lay out and cut the hole to fit the 3" plug *(Figs. 1 and 2)*. After cutting the hole and cleaning up any rough edges with an included wedge saw, use the pull-T to insert the hole-in-one disk with a liberal coat of construction adhesive *(Fig. 3)*.

Now lock the disk, pull-T, and plug together as shown in *Figure 4* and give the construction adhesive 24 hours to harden.

The next day, you can patch the hole with drywall compound. After the compound has hardened, sand and paint the patch for an invisible repair.

The EZ Drywall Repair Kit sells for $5.95 and includes the disk, plug, pull-T, and wedge saw. You'll need to supply a pencil, keyhole saw, drywall compound, and putty knife for the job. To order a kit, call 1-801-756-9330 or visit www.ezdrywallrepair.com.





Level Wind HOSE REEL

Craftsman's new Level Wind Hose Reel is lightweight, portable, and keeps hose neatly wound when not in use. It can be mounted to a wall or ceiling, and by simply removing a pin from the mounting bracket, the polypropylene reel can be carried nearer the work area when necessary. The non-metal housing also eliminates rust and corrosion.

When mounted on the bracket, the reel can swivel freely or lock in one of seven positions based on your needs. Hose retraction is smooth and even, thanks to a layering mechanism that ensures the hose is evenly wound onto the reel *(Inset Photo)*.

The reel is available with either 50 or 75 feet of 3/8" hose or 50 feet of 1/2" hose. The reels range in price from $150 to $165 and are available in Sears stores or online at www.Sears.com.

new life for an old FLOOR

Chris and Bobby Jo Andreasen's dining room floor had seen better days. Originally installed in 1910, a persistent onslaught of stains, scratches — even plaster and tile at one point — had gradually contributed to the old floor's current condition.

The Andreasen's floor was in such bad shape, in fact, that the folks at Rust-Oleum (the makers of Varathane finishing products) named it the winner of their recent "America's Most Flawed Floor" contest. As a prize, this Des Moines, Iowa, couple received a complete floor refinishing courtesy of Varathane.

Using the Sander

The Varathane crew got to work using their ezV sander *(see Photo above)*. This sander, available for rent at many home centers and hardware stores, is designed to be a uniquely DIY-friendly tool.

Unlike a large drum sander, the ezV won't gouge the floor if you leave it running in one place. Plus, there's no need to worry about following the grain direction when sanding. In addition, the ezV is much more effective — and much less time-consuming — when compared with the average pad sander. All of this is possible because of the ezV sander's three unique random-orbiting heads, which are similar to the heads on an electric razor *(see Inset Photo at left)*.

Sanding with the ezV is actually a three-step process. First, 36-grit sandpaper is used to remove the old finish and flatten the floor. This is an important step, as cupping is typical in old planks. Then, two more passes are made over the floor using progressively finer grits (50- and 80-grit). The sanding discs adhere easily to the heads with a "hook and loop" system.

Sanding with the ezV is remarkably dust-free thanks to onboard dust collection and a powerful built-in vacuum. Dust is collected into a dust bag in a canister mounted on the handle.

The one area that the ezV can't sand is right around the edges and into the corners. This is such a small area, though, that it can be done using a portable power sander from the shop. A 5" random orbit sander with 60-grit sandpaper works particularly well.

Once sanding is completed, cleaning up the floor takes just a couple of passes with a shop vacuum. At this point, the floor is ready for a new finish to be applied *(see page 76)*.

▲ To avoid gouging the floor, the ezV sander has three random-orbiting heads, like the heads on an electric razor.

▲ After a thorough sanding, this dining room floor, originally installed in 1910, was ready for a finish *(see page 76)*.

Floor Finishing By the Numbers

Estimated cost for refinishing a 224-sq. ft. room, start to finish:

Sander Rental *(avg. 1-day rental cost for ezV)*	$40
Sanding Discs *(Ten 3-packs at $5.00 each)*	$50
Finish *(2 gallons, avg. cost $35 each)*	$70
Applicator *(applicator, 2 refills, and handle)*	$16
Total Cost	**$176**

Applying Finish

Once the floor was sanded, the homeowners had to decide whether to use a water-based or an oil-based finish.

Water-based finish gives a more translucent look that exhibits the natural grain of the wood. It requires four coats, with a 2 to 3 hour drying period between each coat. An advantage of water-based finish is no strong odor while the finish is curing.

Oil-based finish offers a warmer, "classic" wood look, and it is more durable than water-based. Oil-based finish needs three coats with a 3 to 4 hour drying time between coats.

After weighing the options, the homeowners chose oil-based. The first step is finishing the edges and corners with a small paintbrush *(Inset Photo)*. Then, a small puddle of finish is poured and pulled smoothly and evenly across the floor with an applicator *(see Photo)*. The floor is sanded lightly before the final coat.

▲ Varathane floor finishes are available in both water- and oil-based versions.

◄ After touching up the edges of the floor with a paintbrush *(left)*, a coat of an oil-based finish is put down using a lamb's wool applicator *(above left)*.

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DESIGN IN WOOD

Looking for inspiration for your woodworking projects? These award-winning entries from the 2003 San Diego Design in Wood Contest are sure to kindle the spark.

► Lidded Jar *Pete Campbell*
Intricate lacework "flows" with the grain of this cocobolo jar. Turned to shape on a lathe, this hollow vessel and its ebony spire are true masterpieces.

▲ Santa Cruz Lounger *Jared Rusten*
This walnut and maple lounger features gracefully curved, bentwood arms and slats, as well as wedged, through-mortise and tenon joinery.

▲ Hall Table *Jesse Cook*
The curly maple top of this hall table appears to "float" above an arched walnut base. And its folded corners add a whimsical touch.

Workbench's "Excellence in Design" Award Winner

Rectangular shapes within shapes — a simple, yet striking idea — characterizes the geometric design of this display table built by Terry Holzgreen. Constructed of maple with a red aniline dye stain and ebonized poplar, this finely crafted project gathered top honors at the fair, winning the Excellence in Design award sponsored by *Workbench* magazine.