1 TOOL Makes Installing Hinges Easy

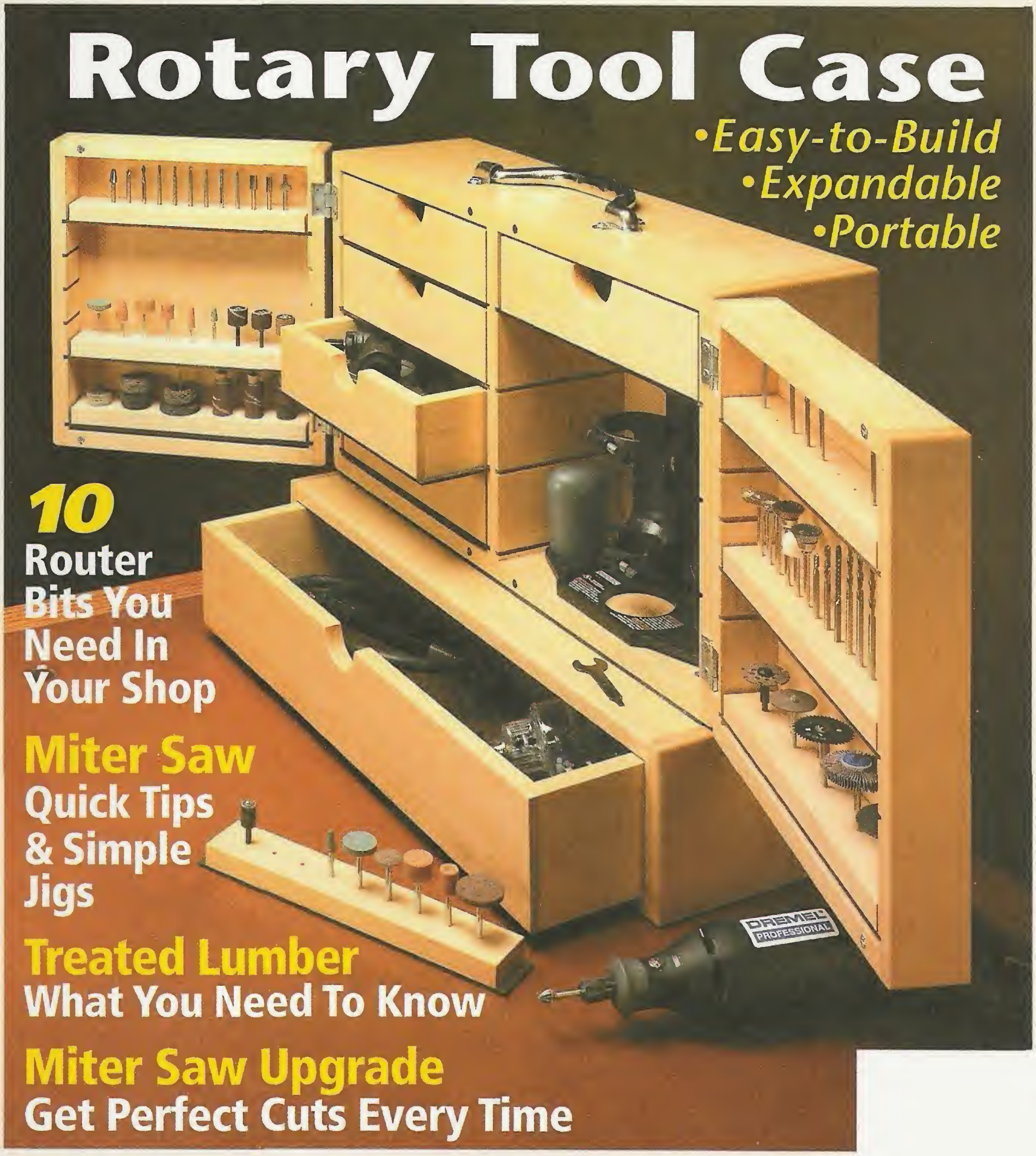
FIND OUT HOW TO GET THE MOST OUT OF YOUR LATHE

ShopNotes®

Vol. 12 Issue 67

Rotary Tool Case

- Easy-to-Build
- Expandable
- Portable



10 Router Bits You Need In Your Shop

Miter Saw Quick Tips & Simple Jigs

Treated Lumber What You Need To Know

Miter Saw Upgrade Get Perfect Cuts Every Time

ShopNotes®

Issue 67 January 2003

PUBLISHER Donald B. Peschke
EDITOR Terry J. Strohman
ASSOCIATE EDITORS Bryan Nelson, Vincent Ancona
CONTRIBUTING EDITOR Phil Huber
ART DIRECTOR Cary Christensen
SR. GRAPHIC DESIGNER Kurt Schultz
SENIOR ILLUSTRATORS Roger Reiland, Mark Higdon

CREATIVE RESOURCES

Creative Director: Ted Kralicek • *Sr. Project Designers*: Ken Munkel, Kent Welsh, Ryan Mimick, Chris Fitch • *Shop Craftsmen*: Steve Curtis, Steve Johnson • *Sr. Photographer*: Crayola England

SPECIAL PUBLICATIONS

Corp. V.P.: Douglas L. Hicks • *Art Director*: Douglas A. Flint • *Sr. Graphic Designer*: Chris Glowacki • *Graphic Designers*: Vu Nguyen, Jonathan Eike • *Senior Editor*: Craig Ruegsegger • *Asst. Editor*: Joel A. Hess • *Editorial Intern*: Cindy Thurmond

CIRCULATION

Subscriber Services Director: Sandy Baum • *New Business Dir.*: Wayde J. Klingbeil • *Circulation Marketing Analysts:* Kris Schlemmer, Paula M. DeMatteis • *Renewal Manager*: Paige Rogers • *Sr. Graphic Designers*: Mark Hayes, Robin Friend • *Billing & Collections Mgr.*: Rebecca Cunningham • *Multimedia Promotion Mgr.*: Rick Junkins • *Promotion Analyst:* Patrick Walsh

CORPORATE SERVICES

V.P. of Finance: Mary R. Scheve • *Controller:* Robin K. Hutchinson • *Sr. Acct.*: Laura J. Thomas • *Accts. Payable*: Mary J. Schultz • *Accts. Receivable*: Margo Petrus • *Prod. Dir.*: George Chmielarz • *Electronic Pub. Dir.*: Douglas M. Lidster • *System Admin.*: Cris Schwanebeck • *P.C. Maint. Tech.*: Robert D. Cook • *Pre-Press Image Specialists*: Troy Clark, Minniette Johnson • *New Media Mgr.*: Gordon C. Gaippe • *Multimedia Art Dir.*: Eugene Pedersen • *Web Server Admin.*: Carol Schoeppler • *Web Content Mgrs.*: David Briggs, Sue M. Moe • *Web Designer*: Kara Blessing • *Prof. Dev. Dir.*: Michal Sigel • *H. R. Asst.*: Kirsten Koele • *Office Mgr.*: Natalie Lonsdale • *Facilities Mgr.*: Kurt Johnson • *Admin. Asst.*: Jeanne Johnson • *Mail Room Clerk*: Lou Webber

MAIL ORDER

Operations Director: Bob Baker • *Customer Service Mgr.*: Jennie Enos • *Warehouse Supr.*: Nancy Johnson • *Buyer*: Linda Jones • *Admin. Asst.*: Nancy Downey • *Sr. Cust. Serv. Reps.*: Tammy Truckenbrod, Anna Cox, Deborah Rich, April Revell • *Cust. Serv. Reps.*: Valerie Jo Riley, Kim Harlan • *Warehouse*: Sylvia Carey

WOODSMITH STORE

Manager: Dave Larson • *Asst.Mgr.*: Tim Thelen • *Sales Staff*: Wendell Stone, Larry Morrison, Gregory Kauzlarich, Mark Johnson, Brian McCallum • *Office Mgr.*: Vicki Edwards

ShopNotes® (ISSN 1062-9696) is published bimonthly (Jan., March, May, July, Sept., Nov.) by August Home Publishing, 2200 Grand, Des Moines, IA 50312.
ShopNotes® is a registered trademark of August Home Publishing

Subscriptions: Single copy: $4.95. One year subscription (6 issues), $27.95. Canada/International add $10 per year, U.S. funds.
Periodicals Postage Paid at Des Moines, IA and at additional mailing offices.
Postmaster: Send change of address to *ShopNotes*, P.O. Box 37103, Boone, IA 50037-2103.
Subscription Questions? Write to: *ShopNotes* Customer Service, P.O. Box 842, Des Moines, IA 50304-9961. Or call 1-800-333-5854, 8:00 am to 5:00 pm, Central Time, weekdays. FAX 515-283-0447
Email: ShopNotes@shopnotes.com
Internet: http://www.shopnotes.com

PRINTED IN U.S.A.

EDITOR'S NOTE

Cutoffs

I think it's natural for woodworkers to be impressed by big, heavy-duty machinery. I've certainly spent a fair share of time wishing for a more powerful table saw or a bigger jointer. If you have the space (and the money), large tools like these can be a great asset in the shop.

But for many woodworkers, myself included, shop space is a precious commodity. So I'm always looking for new ways to make my existing tools work more efficiently.

Take a power miter saw for example. It's compact, portable, and makes quick work of cutting long workpieces to finished length. So it makes sense to stretch its capabilities by providing support for long pieces. And we've done that in the past. (In issue No. 58 we featured a shop-built support system.)

But what about small pieces? Like those little pieces of molding that are a pain to hold in place while cutting. At the same time you have to make sure your fingers are out of harm's way. Or how about when you need to trim a little bit off the end of a workpiece? As you make the cut, you tense up, hoping the saw blade won't grab the small cutoff and fling it across the shop.

So how do you cut small pieces safely and accurately? On page 8 we've come up with one way to do it — a unique table and fence system for your miter saw. With this accessory you can safely hold small workpieces in place. And with an adjustable fence and a zero clearance base, tearout on the back side of the workpiece is virtually eliminated. It's a small project that makes a big improvement to the miter saw.

We've made some "big improvements" to a couple of other tools in this issue as well. First there's the lathe stand on page 14. It's designed to provide plenty of storage for mini-lathe tools and accessories. (It will also hold many full-size lathes, if you have one of these.)

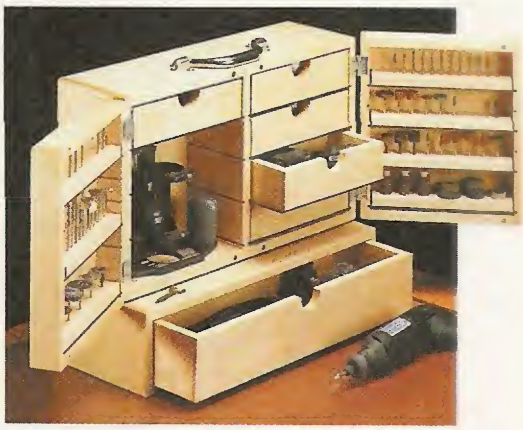
Finally, be sure to check out the rotary tool storage case on page 26. We've solved the "big" problem of storing lots of small accessories.

Terry

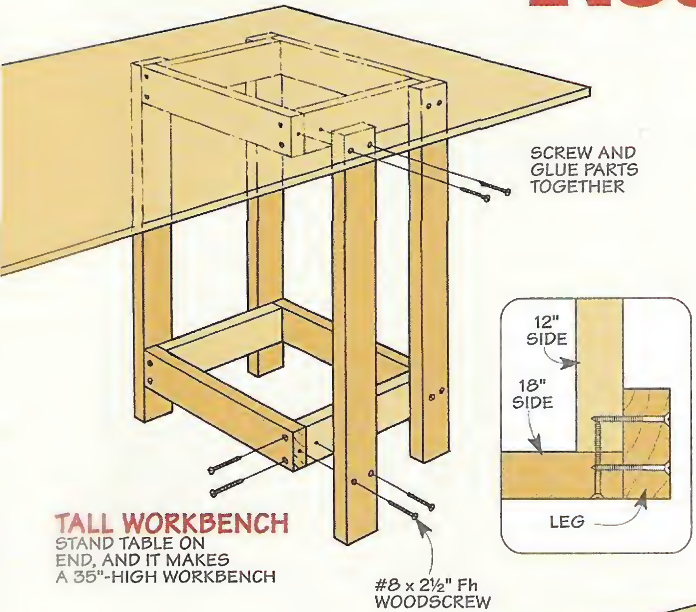
Contents

Features

Departments



Readers' Tips



Multi-Level Work Table

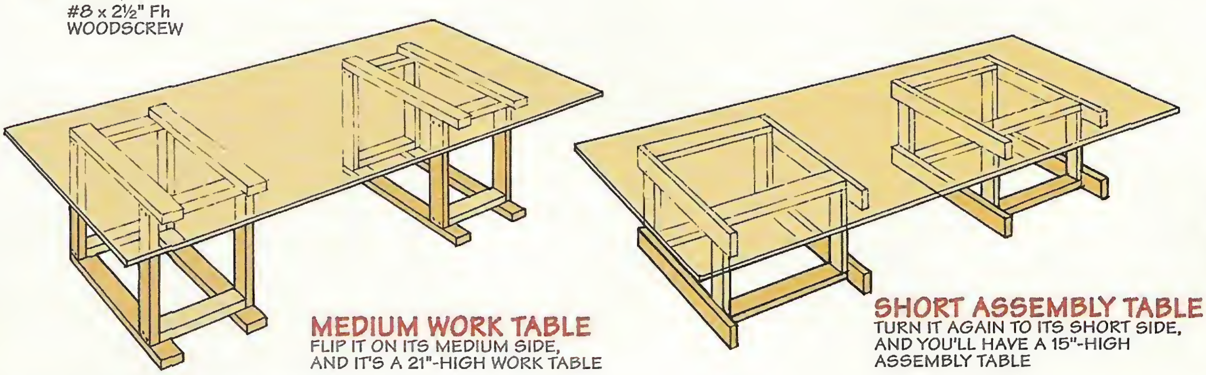
■ While working on projects in my shop, I've found that one size doesn't fit all when when it comes to tables for gluing up and assembling projects. So I came up with this sturdy, convertible work table.

As you can see in the drawings, the table can be set at three different heights. When upright, the table is 35" high. Turn the table on its side for 15"- or 21"-high work surfaces.

The tables are pretty easy to build out of "two-by" stock. To make a worktable you'll need four lengths each of 34¼", 17¼", and 11¼".

After cutting the pieces to length, make two frames by gluing and screwing the 11¼" and 17¼" pieces together as you see in the illustration to the left. Next, attach the 34¼"-long legs to the frames, as in the detail. All that's left is to set a sheet of plywood over the two tables to form the work surface.

Emmette Carrol
Hampton, Georgia



Dipped Handles

■ I've found that stamped wrenches used for changing table saw blades and routers bits are too thin and uncomfortable to grip. I was inspired by a hammer I made in high school shop class that used rope and liquid rubber to make a handle.

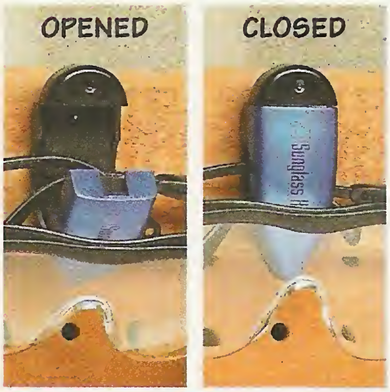
The first step is to cover the handles with rope. (You may need to use a thinner twine for wrapping router wrenches so that they can still pass by each other while changing bits.) I used hot glue to keep the rope from slipping off the handle, as you can see in the lower photo. The trick is to apply a small amount of glue at a time so that it doesn't harden before you finish wrapping the handle.

Finally, after wrapping the handle, simply dunk the handle in a liquid rubber dip that's available at most hardware stores, as you can see in the far left photo. It only takes a few minutes for the rubber to dry and the wrench is ready to use.

Eric Johnson
Edgewood, Kentucky

Quick Tips

▲ To shim deep hinge mortises, **Bob Britzke** of Eureka Springs, AR uses 1/64" model airplane plywood, available at hobby stores.



▲ **Joe O'Hara** of Reading, PA mounted an inexpensive clip for sunglasses on his shop wall to keep his safety glasses close at hand.

▲ **Marty Rosen** of Venice, FL organizes his sheet sandpaper in hanging folders in a plastic file box from an office supply store.

Bench Vise Helper

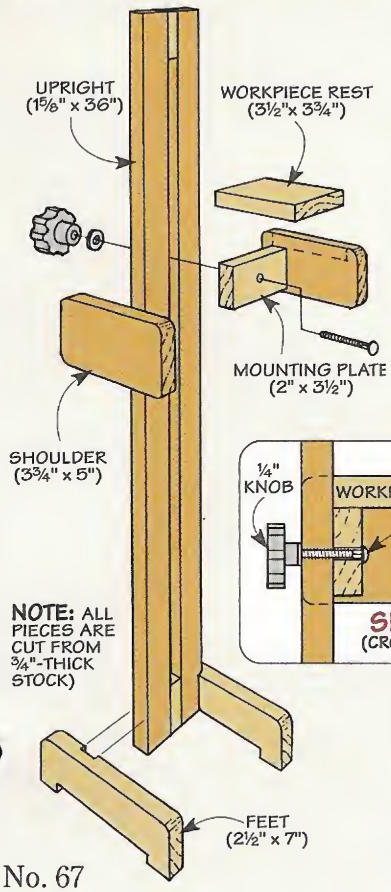
■ Whenever I clamp a wide panel or long board on edge to my workbench for sanding or planing, I need a way to support the other end. So I built this simple bench vise helper, as shown in the photos to the right. It's easy to make and allows me to clamp panels up to three feet wide.

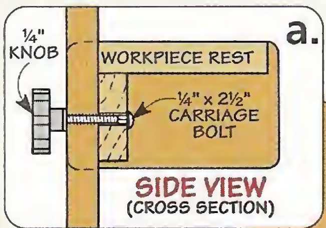
To make the vise helper, start by ripping two 36"-long uprights to width from 3/4"-thick hardwood. I glued two narrow spacers between them to create a consistent 5/16"-wide slot, as you can see in detail 'b.'

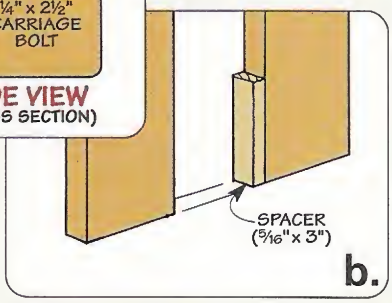
The next thing to do is cut a pair of feet to shape. Then cut a dado in each foot sized to hold the upright and glue the feet in place.

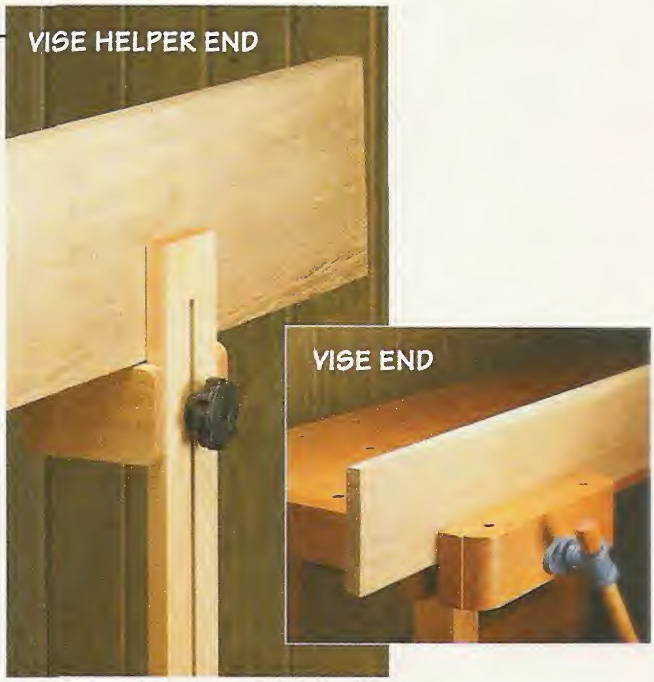
The last thing to make is a rest for the workpiece. I cut the rest and a mounting plate to size first and glued them together. Next, two shoulder pieces are cut and glued to the rest and the mounting plate to keep it parallel to the floor. I used a carriage bolt and star knob to secure the rest in place, as you can see in detail 'a.'

Edwin Hackleman
Omaha, Nebraska









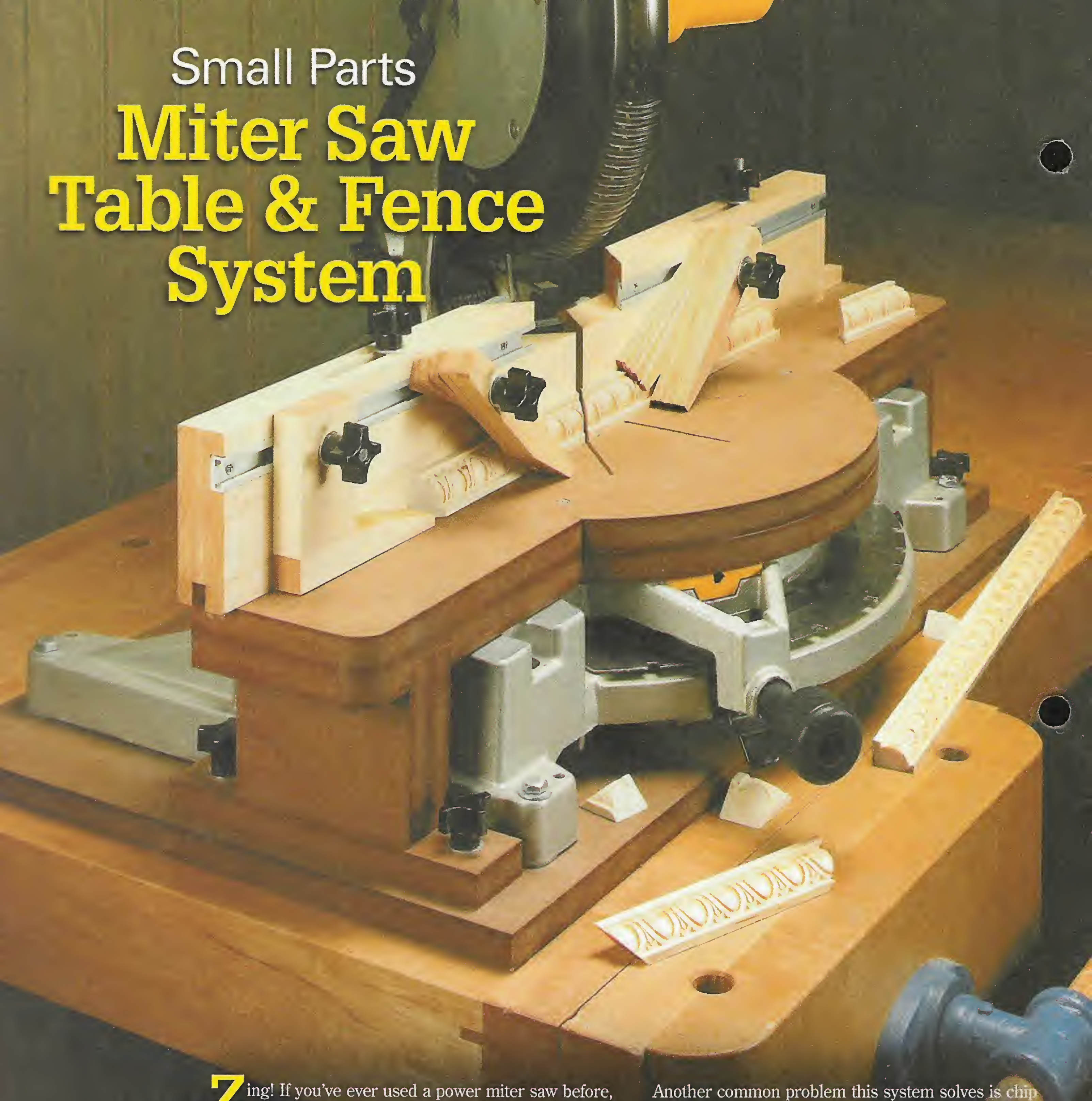
Send in Your Shop Tips

If you have a unique shop tip, we'd like to consider featuring it in one or more of our print or electronic publications.

We'll pay up to $200 for a tip we publish. Just write down the tip and mail it to *ShopNotes*, Attn.: Readers' Tips, 2200 Grand Ave., Des Moines, IA 50312. Or FAX it to 515-282-6741, or send us an email at shopnotes@shopnotes.com. Please include your name, address, and daytime phone number in case we have any questions.

Small Parts

Miter Saw Table & Fence System



Zing! If you've ever used a power miter saw before, you know the sound I'm talking about. It usually happens as you're cutting a small piece of molding. Just as soon as it's cut, the piece catches — *zing!* — and goes shooting past your ear.

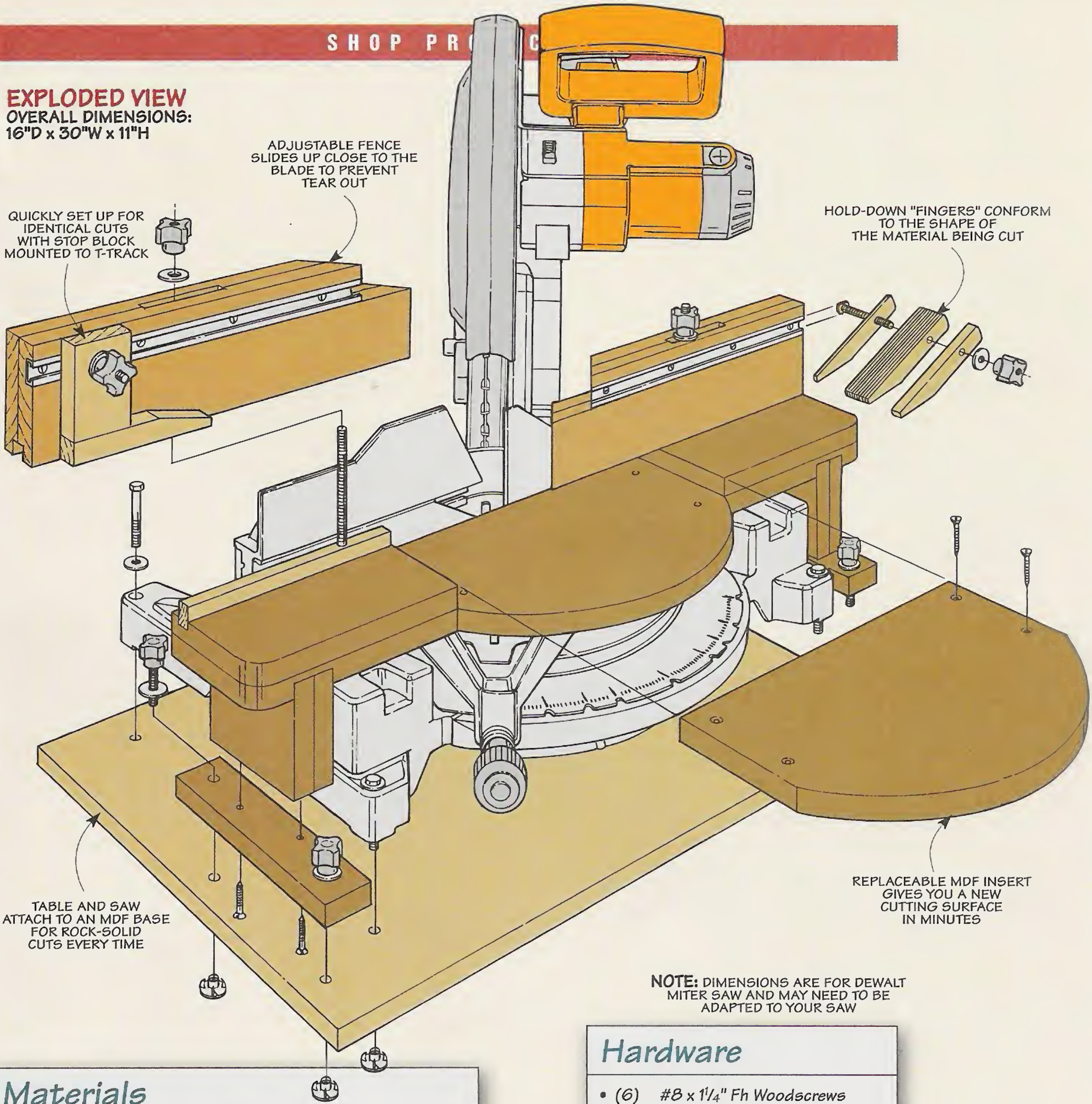
The problem is that the part getting cut is just too small to hold on to safely. To solve this problem, I built this table and fence system. It allows me to use a pair of unique hold-downs that are made up of multiple "fingers." They wrap around the workpiece and hold it steady, keeping your hands safely out of the way.

Another common problem this system solves is chip out. It does this in two ways. The first way is with a pair of adjustable fences. You can slide each fence right up to the blade creating a zero-clearance opening. That way the back of the workpiece is always fully supported, no matter what angle you're cutting.

The second way this system helps prevent chip out is by backing up the bottom of the material being cut with a smooth, flat cutting surface. And as the table gets chewed up from use, you can easily replace it with a fresh cutting surface by simply screwing in a new one.

EXPLODED VIEW

OVERALL DIMENSIONS:
16"D x 30"W x 11"H



NOTE: DIMENSIONS ARE FOR DEWALT MITER SAW AND MAY NEED TO BE ADAPTED TO YOUR SAW

Materials

Base

A Bottom	8 (rgh.) x 30 - 3/4 MDF
B Caps (2)	8 (rgh.) x 8 3/8 - 3/4 MDF
C Insert	8 x 13 1/4 - 3/4 MDF
D Runners (2)	3/4 x 1/2 - 8 3/8
E Feet (2)	1 3/4 x 8 - 3/4 MDF
F Legs (2)	4 1/2 x 3 3/4 - 1 1/2 MDF
G Base	16 x 28 - 3/4 MDF

Fence & Accessories

H Fences (2)	3 3/4 x 1 1/2 - 14
I Inner Fingers (20)	3/4 x 1/8 - 5 1/2
J Outer Fingers (2)	3/4 x 3/8 - 5 1/2
K Stop Block Leg	3/4 x 2 - 3
L Extension	3/4 x 3/4 - 5 1/2

Hardware

- (6) #8 x 1 1/4" Fh Woodscrews
- (2) 5/16" x 6" Carriage Bolts
- (4) #8 x 2" Fh Woodscrews
- (8) 5/16" T-Nuts
- (4) 5/16" x 1 1/2" Star Knobs
- (4) 5/16" x 1 1/2" Hex Bolts
- (13) 5/16" Washers
- (2) T-Track, 12" Long
- (8) #6 x 1/2" Fh Woodscrews
- (5) 5/16" Star Knobs
- (2) 5/16" x 2 1/4" Flange Bolts
- (1) 5/16" x 1 3/4" Flange Bolt

Note: A hardware kit, not including the MDF and hardwood, is available from ShopNotes Project Supplies. See sources on page 35 for ordering information.

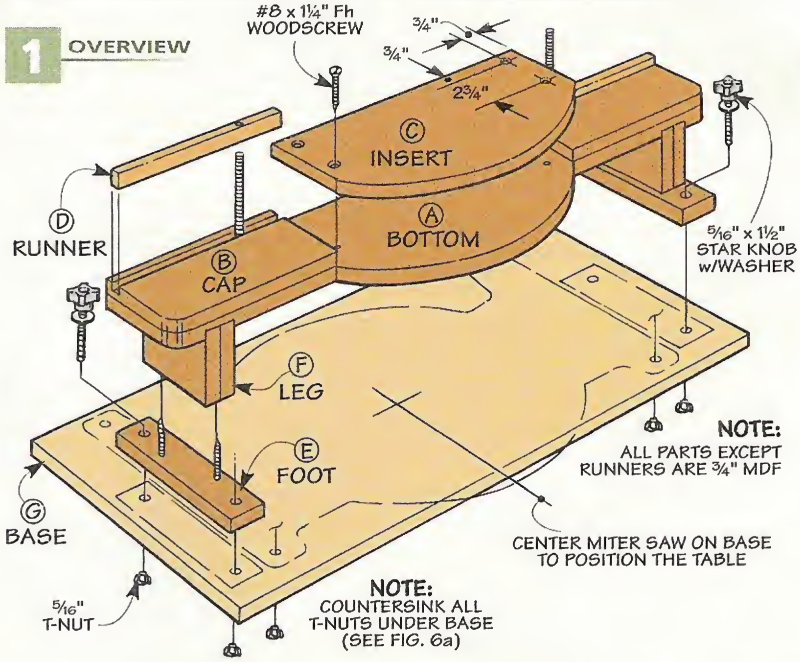
Table

The main part of this miter saw system is the table. It has two wings on each end and a half-round center section sized to fit around the table of the miter saw, as in Figure 1. It's made up of two layers of MDF and straddles the saw with two legs that connect the table to a base.

Although there's nothing complicated about making this system, more than likely you'll need to modify the dimensions for your saw. (This one is designed for a DeWalt DW705.) But don't worry, I'll give you some tips to help you do this.

Bottom – The first step in building the table is to cut a *bottom (A)* from 3/4" MDF to final length and rough width (at least 8"), as in Figure 2. The easiest way I found to do determine the width is to measure from the metal fence of the saw to the end of the blade insert, as shown in Figure 2a.

Next I cut two *caps (B)* and glued them to the ends of the bottom. Then an *insert (C)* can be cut to fit between the two caps. If you take a look at Figure 1, you can see that the insert isn't glued down. That's because it's designed to be replaced as it gets chewed up from use. Instead, I used screws to hold it in place, being careful to locate the screws away from any areas where the blade might pass.



With the basic table complete, the next thing to do is cut dadoes for the legs, like you see in Figure 3a. The idea here is to locate the dadoes so that your saw will be able to slide easily between the legs of the table.

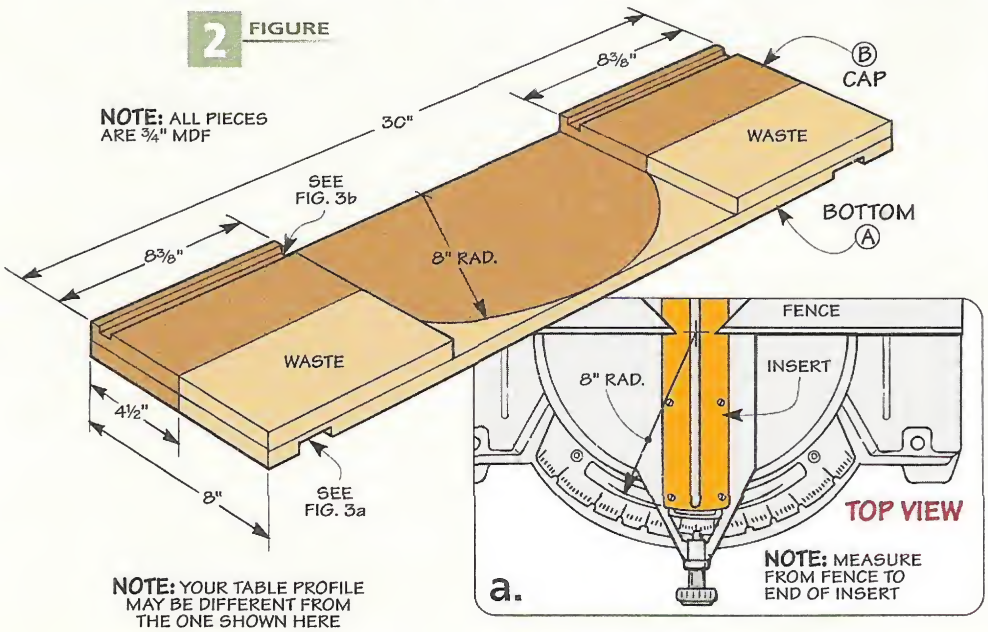
To cut the dadoes, I attached an auxiliary fence to the miter gauge to support the workpiece and used the rip fence as a stop block. The dadoes are sized to hold two layers of MDF, as in Figure 3a. After making the first dado, flip the pieces end for end and cut the second dado.

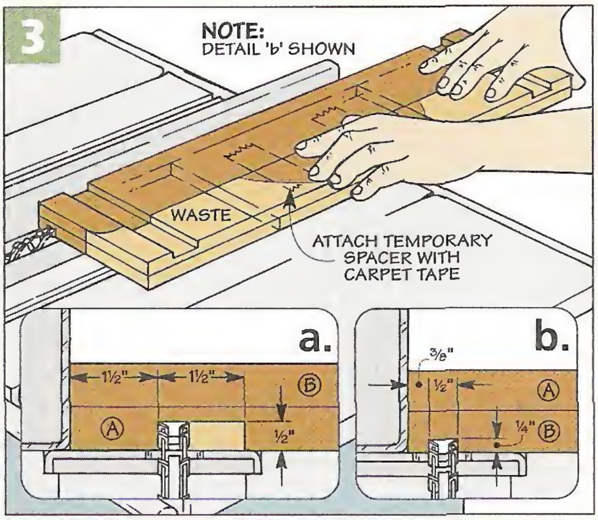
The other groove you'll need to cut is for the fence runners. This is just a 1/2"-wide groove cut in the cap pieces. However I didn't want to cut a groove in the insert, so I replaced it with a spacer that is attached to the bottom with carpet tape, as you can see in Figure 3. The spacer supports the table as it passes through the dado blade. After the groove is cut, screw the insert back in place before cutting the profile.

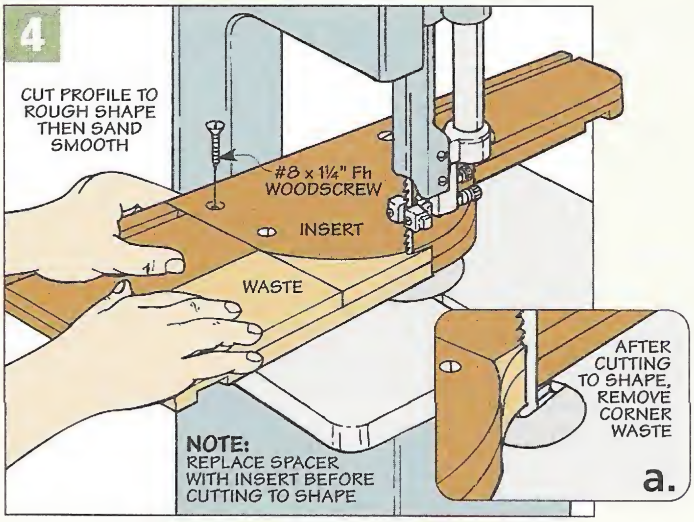
Profile – The trickiest part about making the table is figuring out the profile. I wanted as large a work surface as possible *and* still be able to read the angle gauge on the saw. In most cases the technique used earlier to measure the overall width of the bottom should also work as the radius of the profile. However, since all saws are different, you may need to reduce the radius a little in order to still read the angle gauge.

Once you determine the radius, you can lay out the profile on the table, cut it out to rough size on the band saw, and then sand it smooth, as you can see in Figure 4.

With the table cut to shape, the next step is to cut hardwood *runners (D)* to size to fit the grooves cut in







the table. The runners will guide the adjustable fences that will be added later. Then glue them in place, just as you see in Figure 5.

After the glue dried, I drilled a hole through each runner and the base for a carriage bolt that will hold down each fence, as in Figure 5a. Once the holes are drilled, flip the base over to drill the counterbores for the carriage bolt heads, centering them on the existing holes, as Figure 5b shows.

Legs & Feet – All that's left to do on the table is to make the legs and feet that support the table. The first step is to cut the *feet (E)* to size from ¾" MDF. Then I drilled a hole in both ends of each foot in order to mount the table to the base.

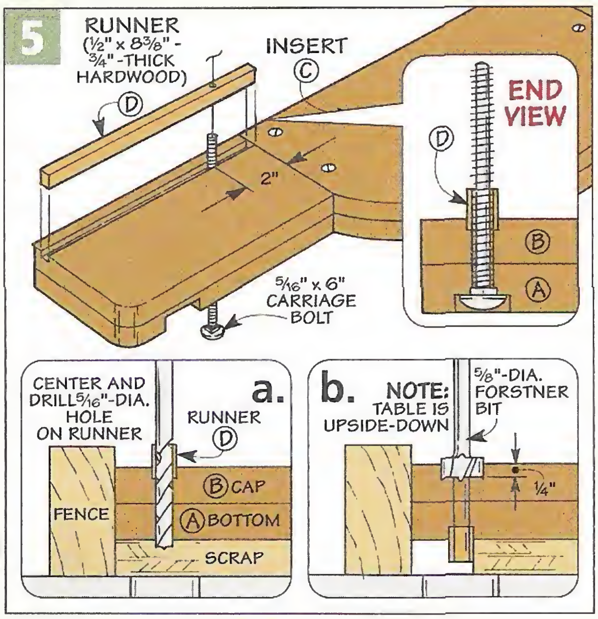
The next step is to make the legs. Here again the final height of the legs depends on your saw. The idea here is that the table should sit firmly on the saw. Set the table on the saw and place a foot next to the saw base. Then measure from the top of the foot to the bottom of the dado in the table, as in Figure 6a.

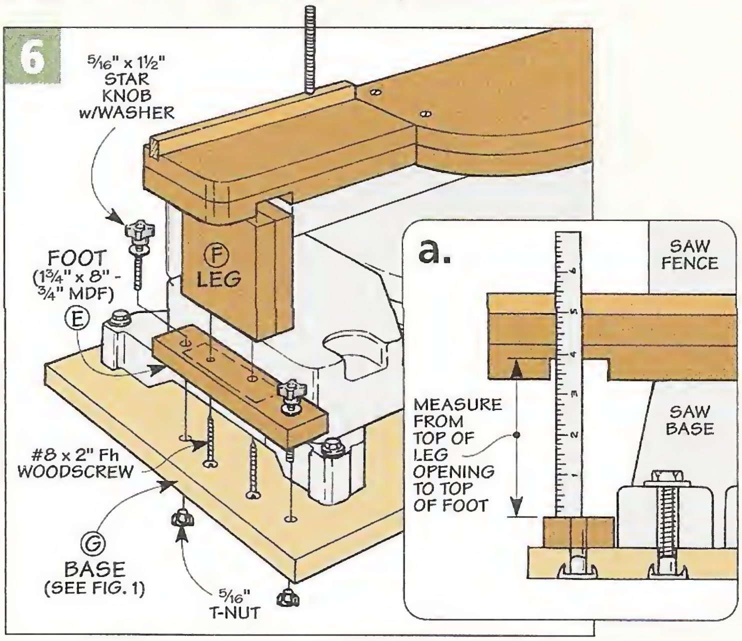
With the measurement in hand, you can make the legs. Each *leg (F)* is made up of two pieces of MDF that are glued together and cut to final size. Screw the feet to the legs and then glue the legs in the dadoes, as you can see in Figure 6.

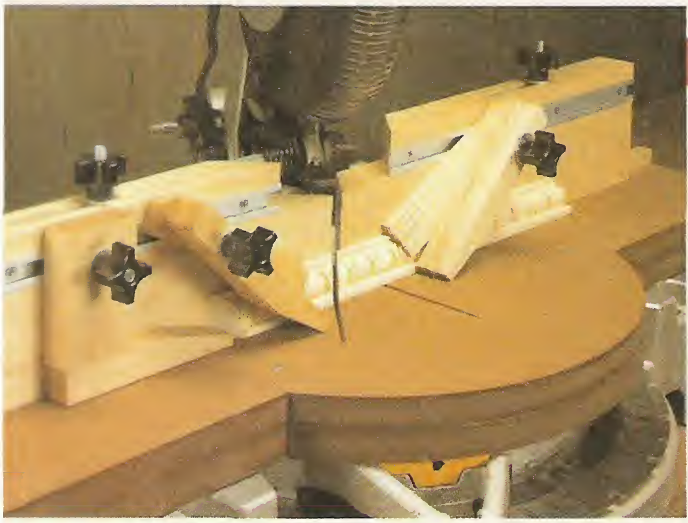
Base – Now that the table is complete, you can cut a large *base (G)* from MDF. There's nothing special about the base, it just has to be long enough for the table and wide (deep) enough to support the saw.

After cutting the base to size, I set the saw in place to mark the location of the mounting holes. Then I set the table on the base, making sure that the table was tight up against the metal fence of the saw. Next, mark mounting holes for the table and drill counterbored shank holes for T-nuts that anchor the table and saw.

Finally, after installing the T-nuts in the base, you can attach the saw with washers and hex bolts. The table mounts with washers and knobs, as you can see in Figure 6, so that it can be easily removed.

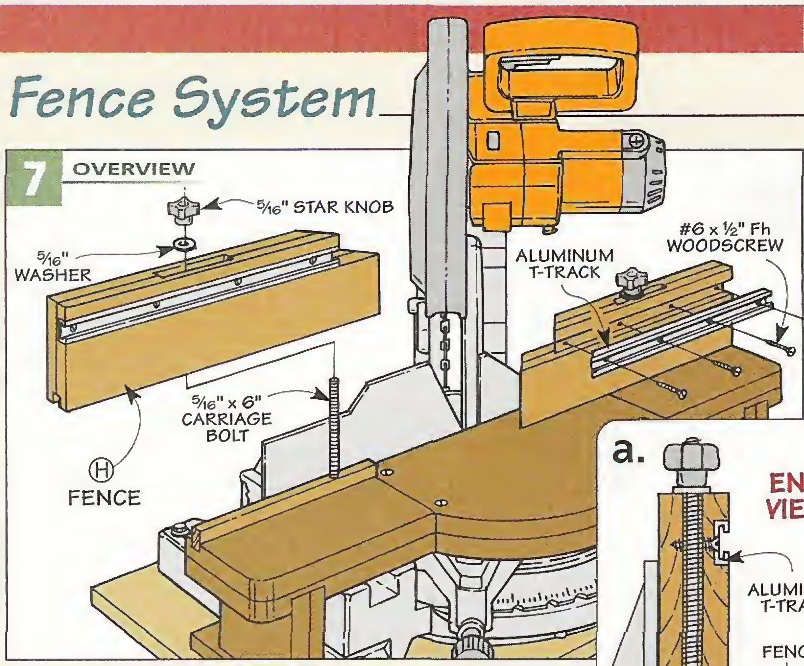


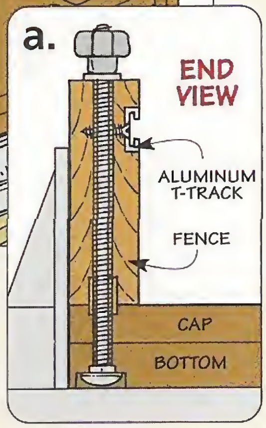




▲ *Hold-Downs and Stop Block. The hold-downs and stop block make cutting safer and more accurate.*

Fence System





With the table complete, I turned my attention to the fence system. The adjustable fences along with the hold-downs and stop block are really what make this system so effective.

As you can see in the photo, the fences can be set right next to the blade so they fully support the stock being cut, preventing chip out. There's also a pair of hold-downs mounted in a T-track in the fence that keep the workpiece from flying across the shop after it's cut.

Although the fences aren't hard to make, you'll have to keep track of them because they are mirror images and not identical. I labeled them "left" and "right" and laid out the cuts directly on the pieces.

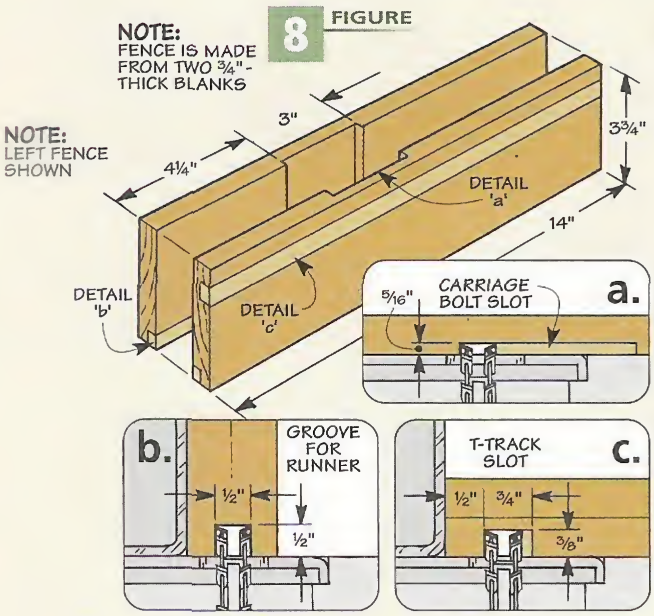
Each *fence (H)* is glued up from two ¾"-thick hardwood blanks, as shown in Figure 8. But before gluing them together, you'll need to make a slot for the carriage bolt to pass through. To create the slot, I cut a dado in each half and then glued the two pieces together, just as you see in Figures 8 and 8a. Then clean up any glue squeeze out with a chisel.

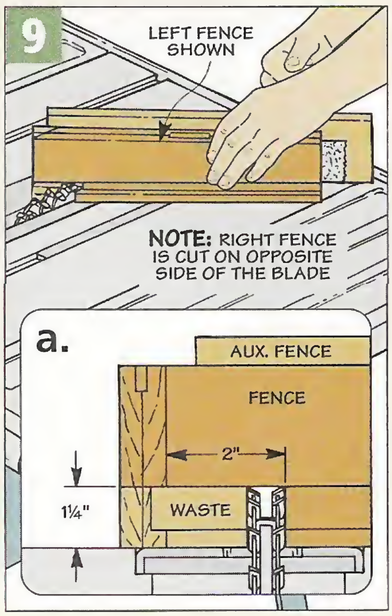
Once the pieces are glued together, the next step is to cut two grooves in each fence. If you'll look at Figure 8c, you'll see that the first groove is simply sized to fit a T-track used to hold the stop block and hold-downs that will be added later.

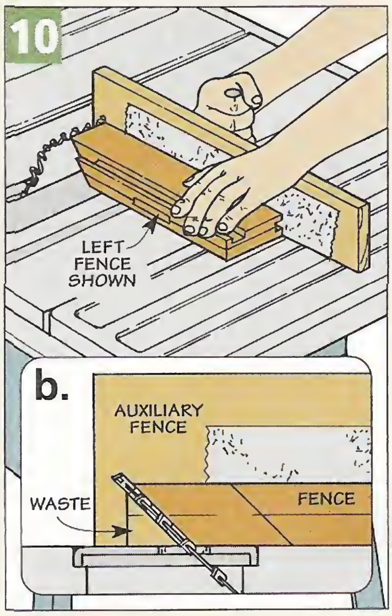
The other groove lets the fence slide along the runner in the table. What you are looking for is a snug but smooth sliding fit. So you may need to make a second pass over the dado blade. Just be sure to keep the same face of the fence against the rip fence to keep them aligned.

Bevel - At this point the fences are nearly finished. All that remains is to bevel the inside edge and cut a notch in the top to provide clearance for the blade guard, as in Figure 9.

With the dado blade still in the table saw, I cut an angled notch in the top of each fence. You can use your miter gauge when making this notch. The first cut defines the





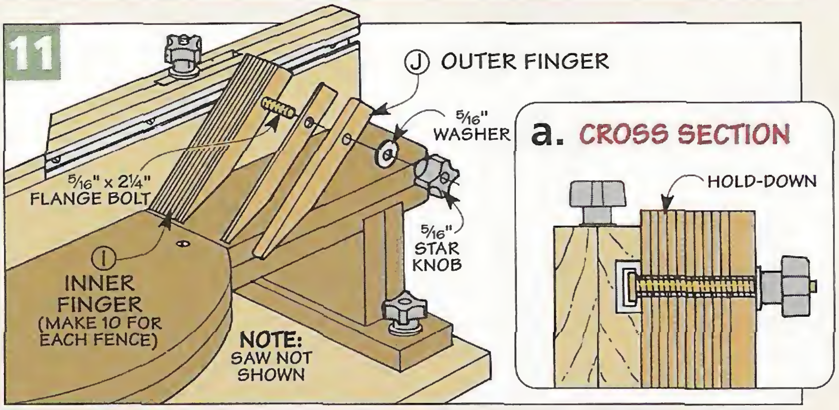


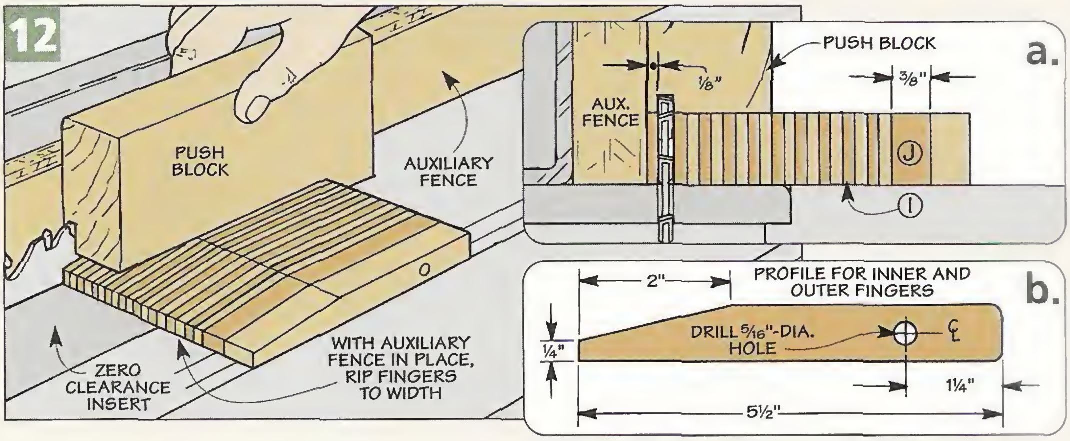
"shoulder." Then I removed the rest of the waste, as in Figure 9a. The only thing different about cutting a notch on the other fence is that you need to move the miter gauge to the other side of the blade and reposition the angle on the miter gauge. After cutting the notches, reinstall the regular blade in the table saw and miter the inside edge of each fence, as indicated in Figure 10.

Finally, I cut some aluminum T-track to fit in the groove in the face of the fence using a hack saw. I mitered one end to match the beveled notch and filed the ends smooth.

Assembly - The fence attaches to the table by slipping it over the carriage bolt and securing it with a washer and star knob, as indicated in Figures 7 and 7a.

Although you could stop right here and use the table as it is, you can make it work a lot harder by adding these next two parts.





HOLD-DOWNS

If you take a close look at the hold-downs in Figure 11, you'll see that they're made up of separate fingers. The thin *inner fingers (I)* allow the hold-down to conform to the shape of the material being cut. You can also see that the *outer finger (J)* is thicker, which provides stability so the thinner ones won't spread apart as they wrap around the workpiece.

I found it easiest to shape the fingers on an oversize blank. Then the blank can be cut to shape on the band saw, or you can sand the profile on the blank with a belt sander. Next, I rounded the ends to soften the sharp edges, as in Figure 12b.

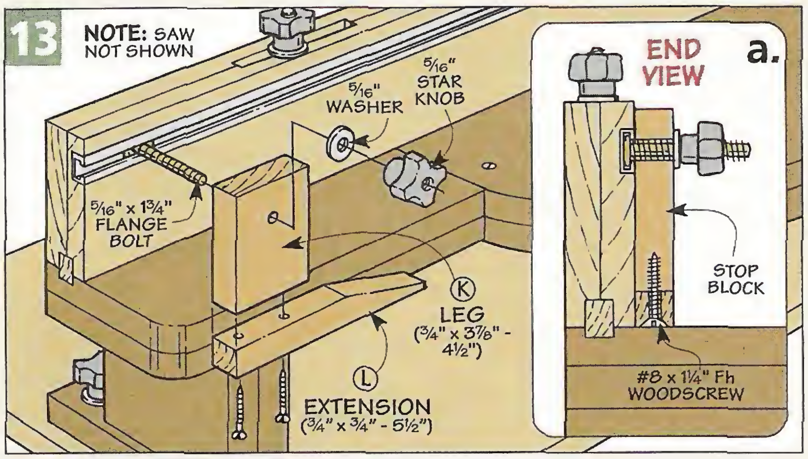
The last thing to do before ripping the fingers apart is to drill a hole for a flange bolt that connects the hold-downs to the fence. To support the workpiece while drilling, I clamped an auxiliary fence to the drill press.

The fingers can now be ripped to final width. It's a good idea to install a zero-clearance insert in the table saw so the parts won't fall through. Then set the auxiliary rip fence and cut the fingers using a push block, as in Figure 12. To attach the hold-downs to the fence, simply slip the fingers on a flange bolt with the wide finger on the outside. Next, slide the head of the bolt in the T-track and tighten it with a washer and star knob.

STOP BLOCK

The stop block lets you quickly set up to cut multiple parts to the same length. As you can see in Figure 13, it consists of two pieces — a leg and an extension. The long extension on the stop block allows you to use it along with the hold-downs, as in the photo on the opposite page.

To make the stop block, first cut the *leg (K)* to final size from ¾"-thick hardwood. Then drill a mounting hole for a flange bolt (Figure 13). The *extension (L)* for the stop block is cut to the same shape as the hold-down fingers, but it's ¾" thick. After cutting it to shape, it can be screwed to the leg. All that's left is to connect the stop block to the fence with a flange bolt, washer, and star knob, as shown in Figure 13a.



10 "Must Have" Router Bits

Shopping for router bits? Here's a look at the ones that really get a workout in our shop.

Open any woodworking catalog, and you are likely to find several pages full of router bits. The number of profiles available can be overwhelming. But how do you separate the "must have" bits from the not-so-necessary ones? To help you out with that decision, here is a quick glance at ten of the router bits that we find the most useful in our shop.

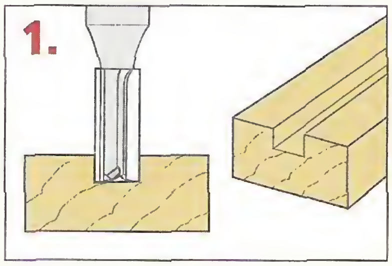
The bits aren't in any particular order, but I've split them into two groups. In the first group are bits that we use all the time. These bits have a place in every shop. The bits in the second group are ones that we also use quite often, but I would probably buy them only as needed.

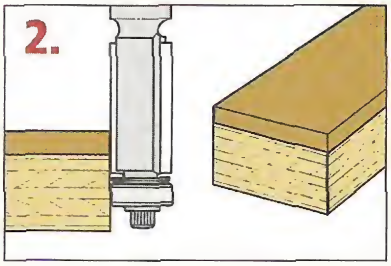
GROUP ONE

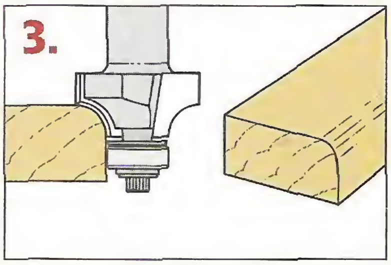
1. Straight Bit – Straight bits are the utility players in your team of router bits. They can be used for routing grooves, dadoes, slots, rabbets, and tenons. With a simple jig, you can even use them for cutting box joints or finger joints.

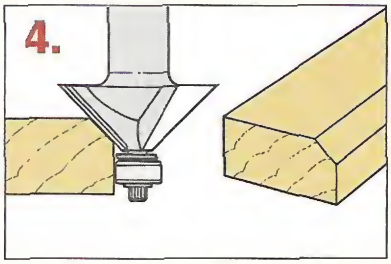
Straight bits come in several different sizes (diameters). I find the $\frac{1}{4}$" and $\frac{1}{2}$" diameters to be the most useful. If you need to make a groove wider than $\frac{1}{2}$", just do it in two passes. This allows you to custom fit the groove to match the thickness of the mating workpiece.

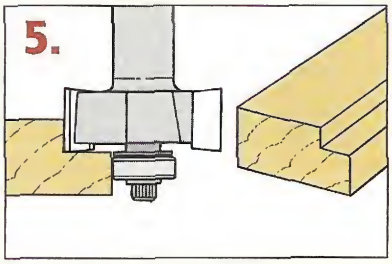
2. Flush Trim Bit – A flush trim bit is just a straight bit with a bearing mounted on the end. The bearing rides against the edge of the workpiece while the bit trims a second piece flush with the first.

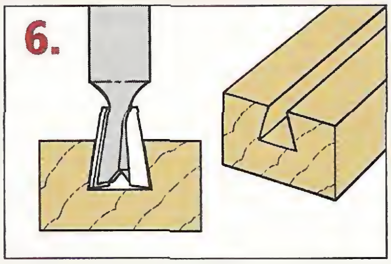


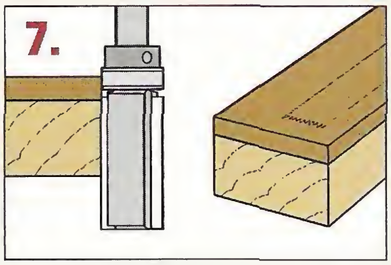


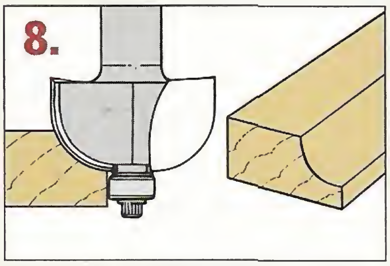


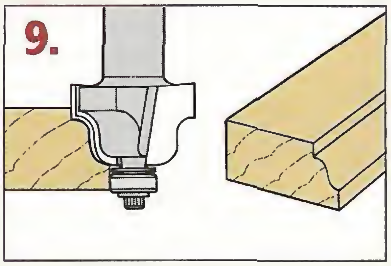


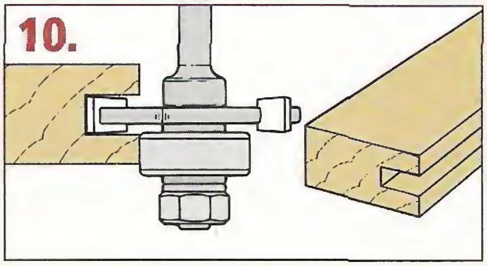












I use my flush trim bit for obvious tasks like trimming plastic laminate or hardwood edging on plywood. But I also use it whenever I glue up a workpiece with multiple layers. Just cut the first layer to exact size. Then cut the second layer slightly oversize and trim it flush after gluing the two layers together.

3. Round-Over Bit – Round-over bits are great for creating a soft, rounded profile on the edge of a workpiece. They have a bearing on the end so they can be used in a hand-held router. But by mounting them in a router table and using the fence as a bearing surface, you can round over both sides of a workpiece to create a round profile. Or create a "bullnose" profile by lowering the bit slightly to use just a portion of the cutting radius.

Round-over bits are available in a variety of sizes. I probably use the 1/4" and 3/8" sizes the most often. As you need them, you might want to add the 1/8", 1/2", and 3/4" sizes as well.

4. Chamfer Bit – Another bit that is handy for relieving the edges of a workpiece is a chamfer bit. Since you can vary the size of the chamfer by simply raising or lowering the bit, you can get by with just one size of bit. And although chamfer bits are available with different angles for special purposes, the only one I really use is a 45° chamfer bit.

5. Rabbeting Bit – A rabbeting bit is one of those bits that, after you try it, you'll wonder how you got along for so long without one. Although you can use a straight bit and a fence to create rabbets, a rabbeting bit makes the job so much simpler. It has a bearing on the end of the bit that automatically controls the width of the rabbet. And by changing the bearing you can cut rabbets of different widths.

GROUP TWO

6. Dovetail Bit – A dovetail bit is a necessity for routing half-blind dovetails with a jig. But even if you don't own a dovetail jig, you can use a dovetail bit along with a fence or in the router table to create sliding dovetail joints.

7. Patternmaker's Bit – This bit is a close cousin of the flush trim bit. The difference is that the bearing is mounted on the shank of the bit rather than on the end.

I use a patternmaker's bit for routing with templates (usually when making multiple, identical parts). After cutting your workpiece to approximate size, just carpet tape the template to the top. The bearing follows the profile of the template while the bit trims the workpiece flush.

8. Cove Bit – A cove bit is the reverse image of a round-over bit. Instead of creating a rounded edge, it creates a concave profile. I use cove bits all the time when making built-up moldings for picture frames or furniture projects. Like round-over bits, cove bits come in different sizes, so you'll probably want at least a couple.

9. Ogee Bit – If you really want to dress up a project, ogee bits are one way to do it quickly and easily. They can add style and elegance to an otherwise plain-looking project.

While there are different types of ogee bits (Roman, classical, reverse ogee), I find that I use the Roman ogee more than the others. Even so, it's best to buy ogee bits as you need them so you can be sure of getting a profile that suits the project at hand.

10. Slot-Cutting Bit – This last bit is one you might not expect to see in a list of top ten router bits. But I find a slot-cutting bit to be useful for routing slots for splines or panels. With a little ingenuity, you can even use a router and slot-cutting bit as a substitute for a biscuit joiner.

Slot-cutting bits are available in two or three sizes to cut slots of different widths. And like rabbeting bits, you can use different sizes of bearings to vary the depth of the slot.

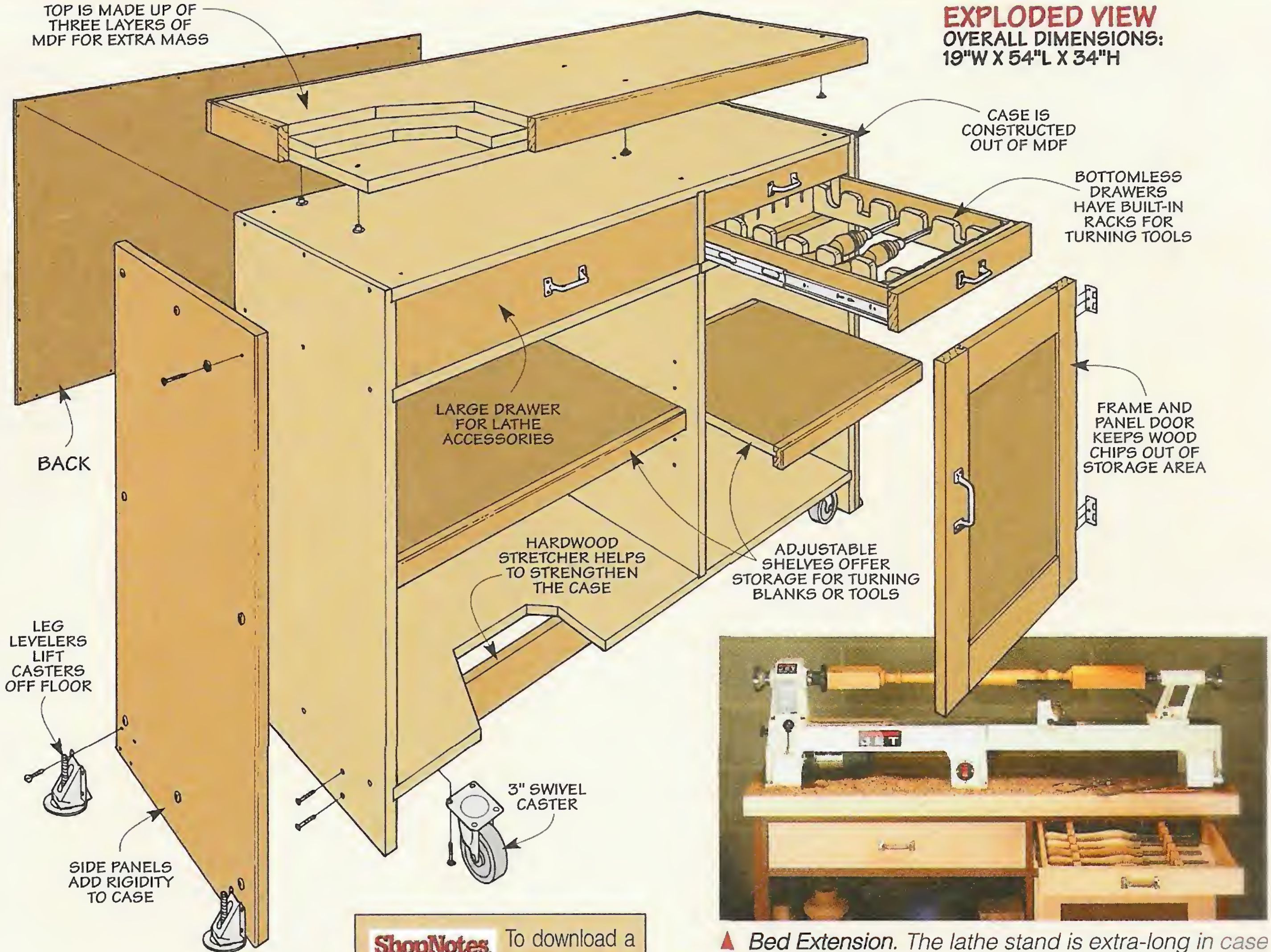
▲ *Shank Size. Most router bits are available in either 1/2" or 1/4" shanks. The 1/2" shank is stronger and less likely to vibrate or chatter during heavy cuts.*

Mini-Lathe Stand

Super-size your mini-lathe with this all-in-one lathe stand and workcenter

A mini-lathe packs some pretty serious turning capability into a tiny package. But just because they are small doesn't mean that you can set your mini-lathe up on a wimpy, lightweight stand. Just like a full-size lathe, a mini-lathe needs a stand that is heavy and rigid enough to absorb vibrations.

The lathe stand shown here certainly meets those criteria, but it also offers a lot more than this. The top is extra large to give you room for a grinder or a bed extension (see photo on opposite page). A large drawer provides plenty of space for lathe accessories. And a pair of specialized tool drawers keep all your turning tools ready to go at a moment's notice. A couple of shelves offer a place for keeping turning blanks and other supplies. And to top it all off, this stand is mobile — which is especially convenient if you have a "mini"-shop to match your lathe.



▲ *Bed Extension.* *The lathe stand is extra-long in case you decide to expand your turning capacity by adding a bed extension to your mini-lathe.*

ShopNotes ON-LINE EXTRAS — To download a free cutting diagram for the Mini-Lathe Stand, go to: www.shopnotes.com

Materials

Case

A	Top/Bottom (2)	17 3/4 x 49 1/2 - 3/4 MDF
B	Sides (2)	17 3/4 x 31 1/4 - 3/4 MDF
C	Vertical Divider (1)	17 3/4 x 27 1/4 - 3/4 MDF
D	Large Horiz. Divider (1)	17 3/4 x 28 3/4 - 3/4 MDF
E	Small Horiz. Divider (1)	17 3/4 x 20 1/2 - 3/4 MDF
F	Stretchers (2)	3/4 x 3 - 49
G	Side Panels (2)	18 1/8 x 31 1/4 - 3/4 MDF
H	Back (1)	28 1/4 x 50 1/2 - 1/4 Hdbd.
I	Top Layers (3)	17 1/2 x 52 1/2 - 3/4 MDF
J	Front/Back Edging (2)	3/4 x 2 1/4 - 54
K	Side Edging (2)	3/4 x 2 1/4 - 17 1/2

Drawers & Shelves

L	Sm. Drwr. Frts./Backs (4)	1/2 x 2 1/2 - 18 1/2
M	Sm. Drwr. Sides (4)	1/2 x 2 1/2 - 16 1/2
N	Gluing Blocks (8)	3/4 x 3/4 - 2 1/2
O	Sm. False Fronts (2)	3/4 x 2 1/2 - 19 7/8
P	Divider Strips (4)	2 1/2 x 17 - 1/4 Hdbd.
Q	Tool Supports (4)	3/4 x 2 1/2 - 15 1/2
R	Lg. Drwr. Front/Back (2)	1/2 x 5 - 26 3/4
S	Lg. Drwr. Sides (2)	1/2 x 5 - 16 1/2
T	Lg. Drwr. Bottom (1)	16 x 26 3/4 - 1/4 Hdbd.
U	Lg. False Front (1)	3/4 x 5 1/8 - 28 1/8
V	Large Shelf (1)	15 3/4 x 28 1/8 - 3/4 MDF
W	Small Shelf (1)	15 3/4 x 19 7/8 - 3/4 MDF
X	Large Shelf Edging (2)	3/4 x 1 1/2 - 28 1/8
Y	Small Shelf Edging (2)	3/4 x 1 1/2 - 19 7/8

Door

Z	Rails (2)	3/4 x 3 - 14 5/8
AA	Stiles (2)	3/4 x 3 - 20 5/8
BB	Panel (1)	14 5/8 x 15 3/8 - 1/4 Hdbd.

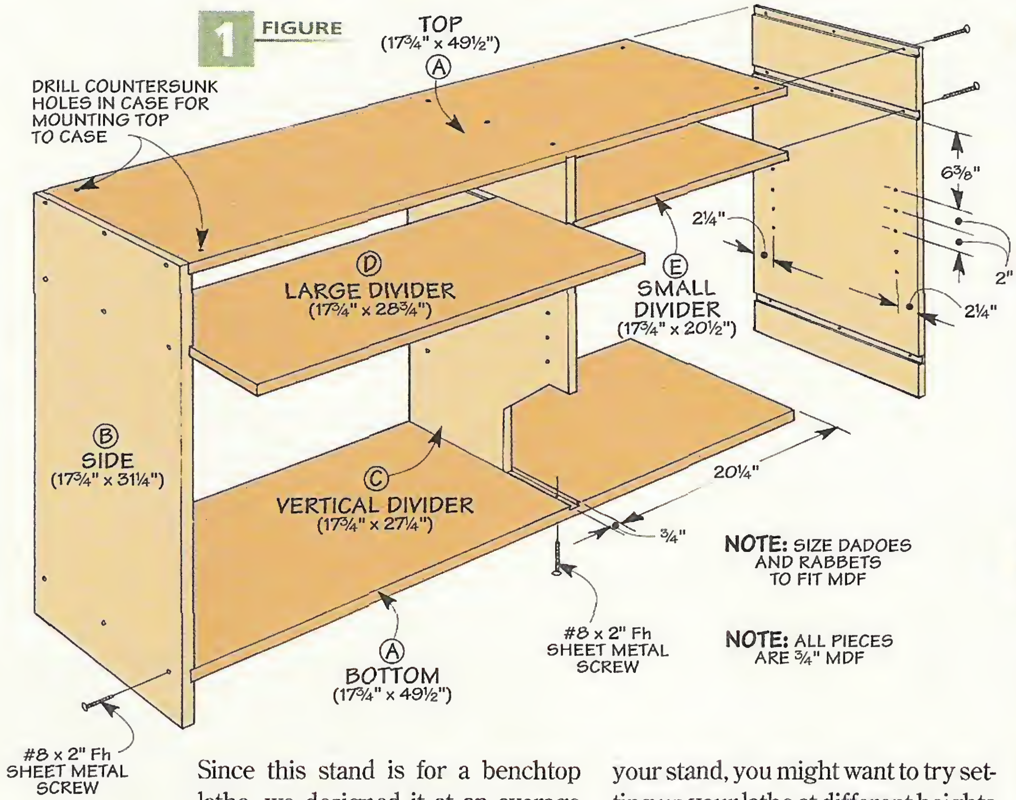
Dust Hood

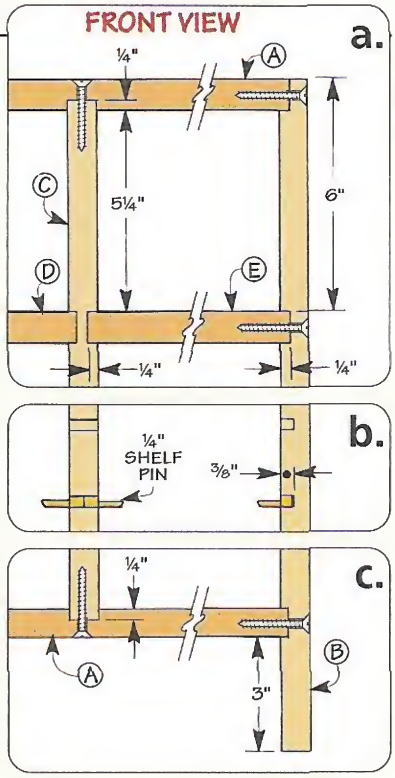
CC	Top/Bottom (2)	4 1/2 x 10 - 3/4 MDF
DD	End (1)	4 1/2 x 4 - 3/4 MDF
EE	Back (1)	4 x 5 1/4 - 1/4 Hdbd.
FF	Back (1)	4 x 6 3/8 - 1/4 Hdbd.

Hardware

- (36) #8 x 2" Fh Sheet Metal (S. M.) Screws
- (4) 3" Swivel Casters
- (16) #12 x 5/8" Ph S. M. Screws
- (16) #8 x 1 1/4" Fh S. M. Screws
- (16) #8 Finish Washers
- (36) #6 x 1" Fh S. M. Screws
- (4) Leg Levelers
- (16) #10 x 5/8" Ph S. M. Screws
- (4) 1/4" T-nuts
- (14) #8 x 1" Fh Woodscrews
- (3 pr.) 16" Full-Extension Drawer Slides w/screws
- (4) 3 7/8" Drawer Pulls w/screws
- (8) 1/4" Shelf Pins
- (2) 2" x 1 3/8" Hinges w/screws
- (1) Magnetic Catch w/screws
- (1) 5/8" x 3 1/2" Steel Rod

Case





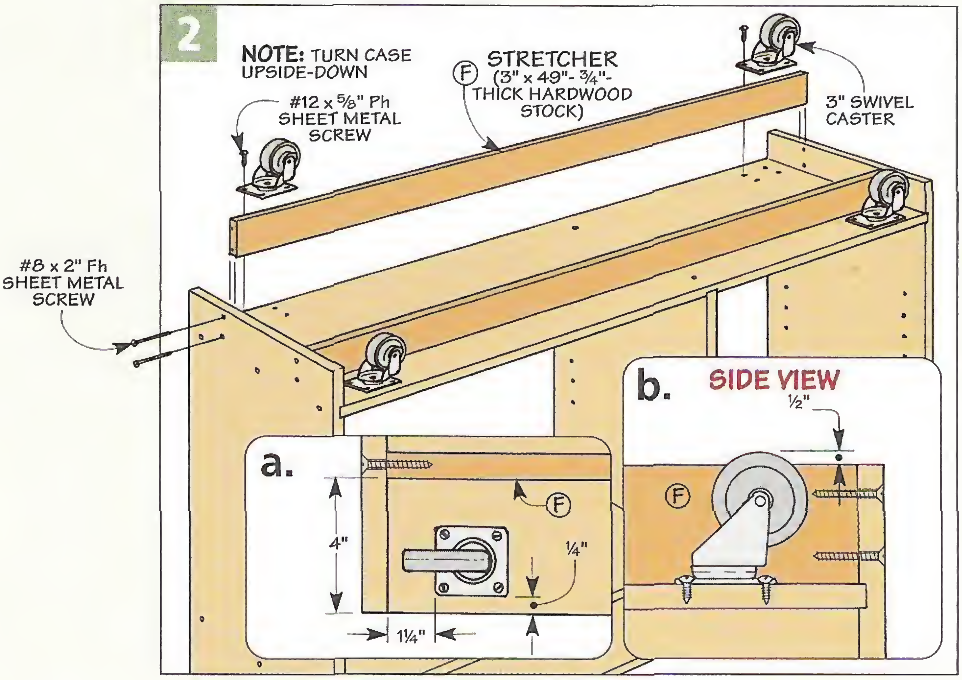
Since this stand is for a benchtop lathe, we designed it at an average workbench height — 34". This height seems just about right for me (and my back). I can see what I'm doing without having to stoop over the lathe. But a couple of people here felt that the stand was a little on the tall side. So before you start building your stand, you might want to try setting up your lathe at different heights to see which is the most comfortable for you. Then make any adjustments to the plans accordingly.

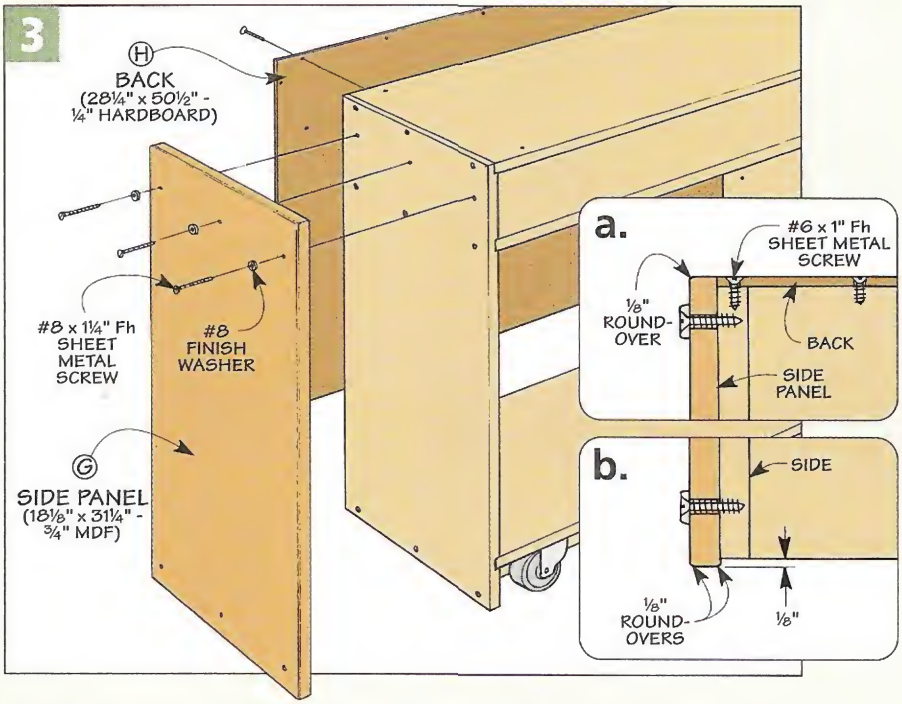
Case – The case of the stand is built out of ¾" medium-density fiberboard (MDF). I started by cutting all the pieces to the dimensions shown in Figure 1. You'll need a *top* and *bottom (A)*, two *sides (B)*, a *vertical divider (C)* and *large* and *small horizontal dividers (D, E)*.

Dado and rabbet joints are used to lock the case pieces together like a giant wooden puzzle. This helps to keep the stand rigid and prevent it from racking. But in order for everything to fit properly, you need to accurately lay out and cut the dadoes and rabbets (Figures 1a and 1c).

Before assembling the case, I drilled some shelf pin holes in the sides and vertical divider, as shown in Figure 1b. (I used a *Vix* bit and a handy template to drill these holes, see page 34.) I also drilled four countersunk holes in the top panel of the case. These are for the screws that will be used later to attach the layered top of the lathe stand. Once this is done, you can glue and screw the case together (Figure 1).

To help stiffen the case even more, I flipped it over and added a couple of hardwood *stretchers (F)* to the bottom, as shown in Figure 2. These are cut to fit between the two sides and then screwed in place. After you've done this, you can add





the casters and then turn the case right-side-up again to work on the side panels and the top.

Side Panels – If you take a look at Figure 3, you'll see that I added an extra side panel of MDF to each end of the case. These *side panels (G)* help to give the case extra strength and rigidity.

The side panels are the same height as the sides of the case, but they're slightly wider. There's a reason for this. If you take a look at Figure 3a, you'll see that the side panels extend beyond the back edge of the case by ¼" to create a rabbeted opening for a hardboard back. And they also extend beyond the front edge of the case by ⅛" to create a shadow line (Figure 3b).

Before the side panels are added to the case, I rounded over some of the edges. On the *outer* face of each panel, rout a ⅛" roundover on the front, back, and bottom edges. Then round over the front edge only of the *inner* face of each panel. After you've done this, the side panels can be attached to the case with screws and finish washers.

Back – Once the side panels are in place, you can cut a *back (H)* for the case out of ¼" hardboard. This back is sized to fit between the two side panels and is then simply screwed in place (Figure 3).

Top – The last major component of the case is the top. I wanted the top to be heavy and solid, so I made it out of three *layers (I)* of MDF (Figure 4). This will give the stand plenty of mass to help absorb any vibrations from the lathe.

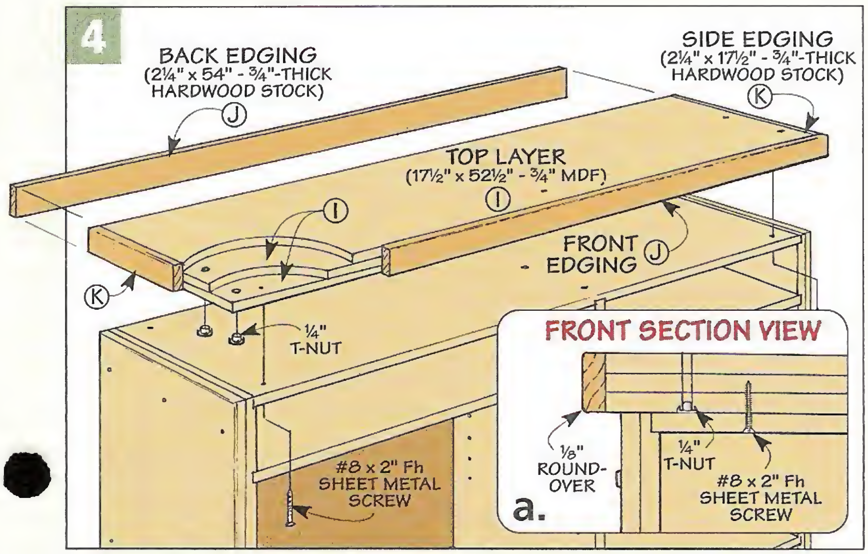
To make the top, I started by cutting the first layer to exact size. Then I cut the second layer slightly oversize. After gluing the two layers together, I trimmed the second layer flush with the first, using a router and flush trim bit. Then I just repeated this process with the third layer of MDF.

To complete the top, I added some hardwood *edging (J, K)*, as shown in Figure 4. Then I rounded over all the edges. Before screwing the top to the case, you'll need to add some T-nuts for mounting your lathe. The easiest way to do this is to set the lathe on the top and use it as a template to mark out the hole locations. Then just drill counterbored holes for the T-nuts and install them in the underside of the top.

To attach the top, I placed it on the case and centered it from side-to-side and front-to-back. Then using an awl, I marked the locations of the screw holes on the underside of the top. After drilling pilot holes in the top, you can attach it to the case with screws. You'll need a stubby screwdriver here since there isn't much clearance.

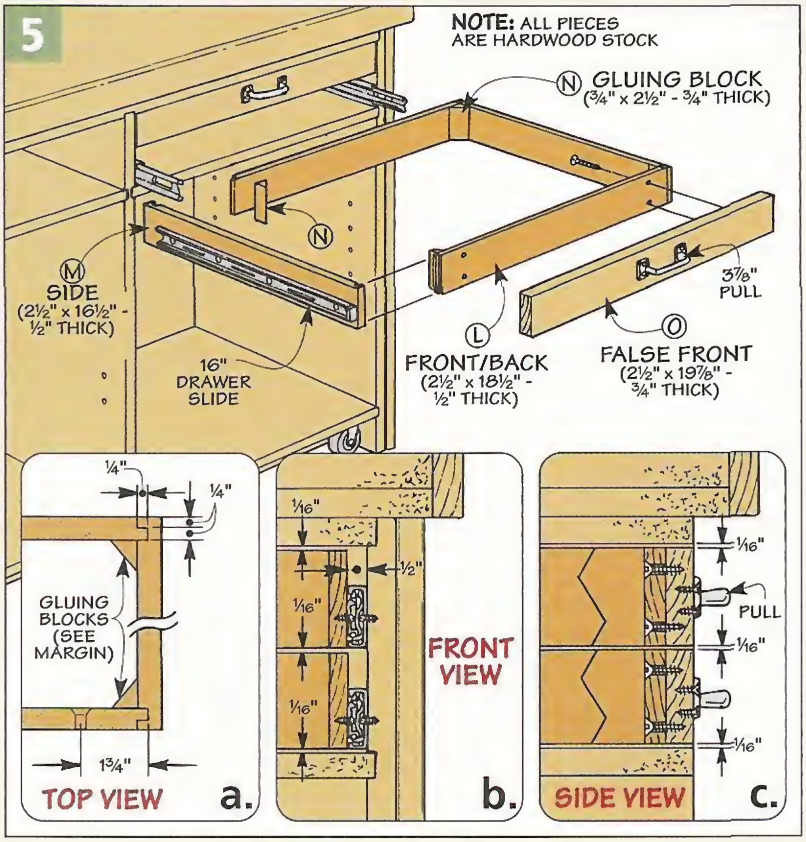
Levelers – Although the stand is mounted on casters, the last thing you want when using a lathe is for the stand to scoot around the floor of your shop. So I attached a pair of adjustable leg levelers to each end of the stand. By using the screw mechanism in the leg levelers, you can lift the lathe stand off the casters, see photo above.

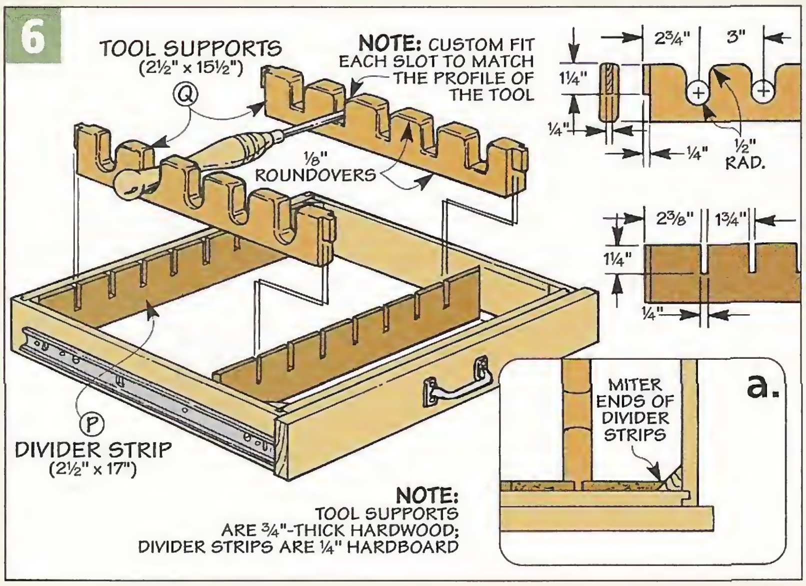
▲ *Casters and Levelers. An Allen wrench is all you need to level the stand and raise the casters up off the floor.*



Drawers

▲ *Tool Storage. The two smaller drawers pull out to become a pair of handy tool racks.*



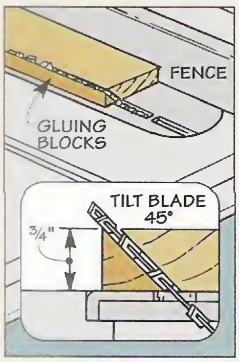


With the basic structure of the lathe stand complete, you can start making the drawers and shelves that fit inside it. There are three drawers in the stand — a large drawer on the left and two smaller drawers on the right to hold an assortment of turning tools. I made these first.

As you can see in Figure 5, the drawers for the turning tools are a little unusual. They're built like ordinary drawers, but they don't have any bottoms. The idea here is that you can leave the drawer open while you are turning and any chips that land inside will simply fall through to the floor. A custom-fitted tool rack inside each drawer holds your turning tools in place and makes it easy to switch back and forth between tools.

To make the tool drawers, I cut pieces for the *fronts* and *backs (L)* and the *sides (M)* to size from ½"-thick stock. As you can see in Figure 5a, the drawer pieces are joined with locking rabbet joints. After you've cut all these joints, you can glue up the drawers.

Because these drawers don't have any bottoms, I decided to add some *gluing blocks (N)* to help strengthen the joints. These are nothing more than triangle-shaped blocks ripped from the edge of a long piece of stock, as shown in the margin drawing at left. They're simply glued in place in each corner of the drawers.



▲ *Gluing Blocks. To make the gluing blocks for the corners of the drawers, just rip a beveled piece from the edge of a wider piece of stock.*

The drawers are mounted on full-extension, metal drawer slides (Figure 5b). This allows you to pull each drawer all the way open so that you have quick access to any tool in the drawer while you are turning.

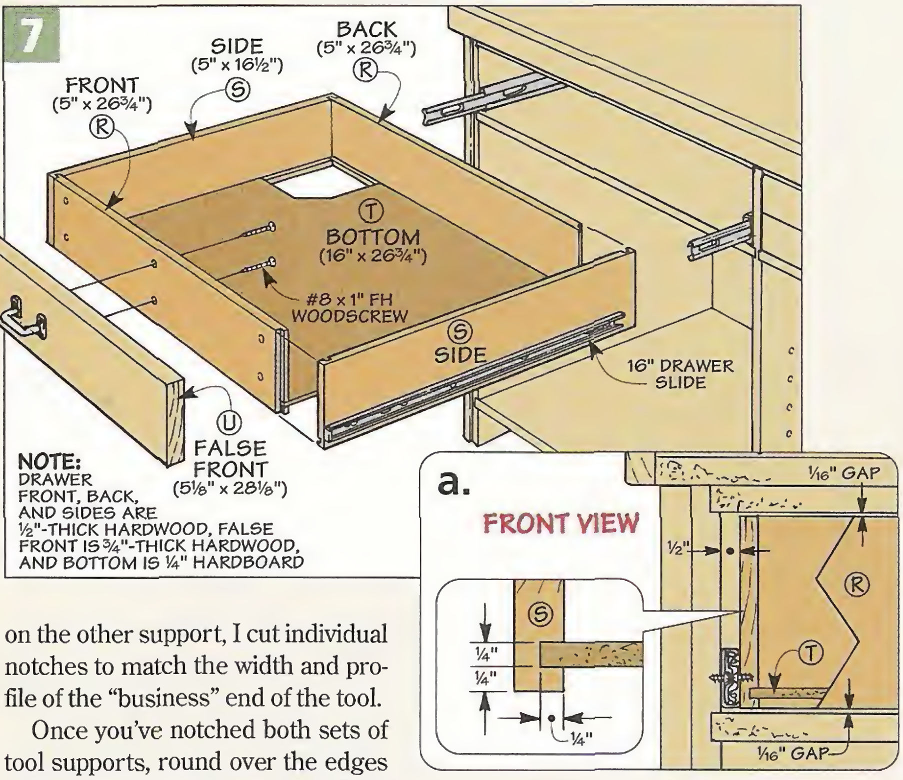
False Fronts – Once the drawers are mounted in the stand, you can add a *false front (O)* to each one. These are cut from 3/4" hardwood stock and screwed in place, as you see in Figures 5 and 5c. Then a pull is mounted to the front of each drawer.

Tool Racks – Each drawer is fitted with an adjustable tool rack. These racks are made up of two parts (Figure 6). A pair of tool supports cradles the tools. These slip into notches that are cut into a couple of divider strips mounted to the front and back of each drawer. This allows you to move the tool supports closer together to accommodate shorter "mini" turning tools.

I made the *divider strips (P)* first. These are just strips of 1/4" hardboard. As you can see in Figure 6a, each one is mitered on the ends to allow it to fit over the gluing blocks in the corners of the drawer. Then I cut a row of evenly-spaced, 1/4"-wide notches along the face of each strip. Once this is done, the strips can be glued to the front and back of each drawer.

The *tool supports (Q)* are made from 3/4"-thick hardwood stock. A small tenon is cut on each end, as you can see in Figures 6 and 6a. You'll need to size these tenons to fit the notches in the divider strips. Once you've done this, you can start to lay out the notches in the supports for your turning tools.

I decided to customize the tool supports so that each turning tool has its own space. But don't worry — this isn't as complicated as it might sound. On one of the supports, I cut five identical, U-shaped notches for the tool handles. Then on the other support, I cut individual notches to match the width and profile of the "business" end of the tool.



Once you've notched both sets of tool supports, round over the edges of the supports with a router. Then the tool supports can be slid into place in the drawers.

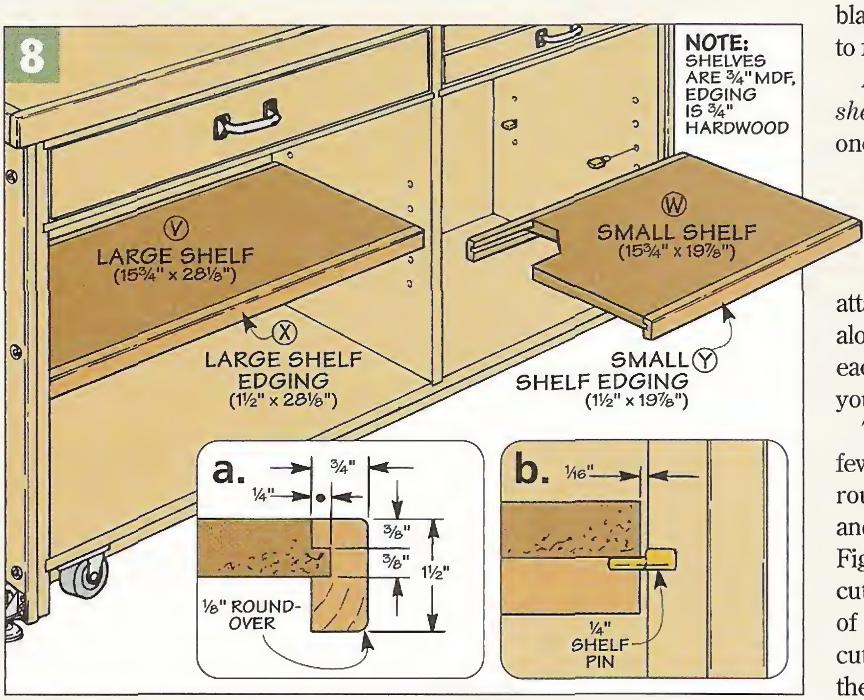
Large Drawer – After building the smaller tool drawers, the large drawer shouldn't bring any surprises. As you can see by looking at Figure 7, its construction is identical to the other two drawers. The only difference (other than its size) is the fact that it has a hardboard bottom. And since this bottom helps to strengthen the drawer, you don't have to bother with the gluing blocks in the corners.

Shelves – In addition to the drawers, the lathe stand also features a couple of shelves (Figure 8). These are great for storing turning blanks or accessories that are too big to fit in the drawer above.

Aside from their length, these *shelves (V, W)* are identical. Each one starts off as a piece of MDF.

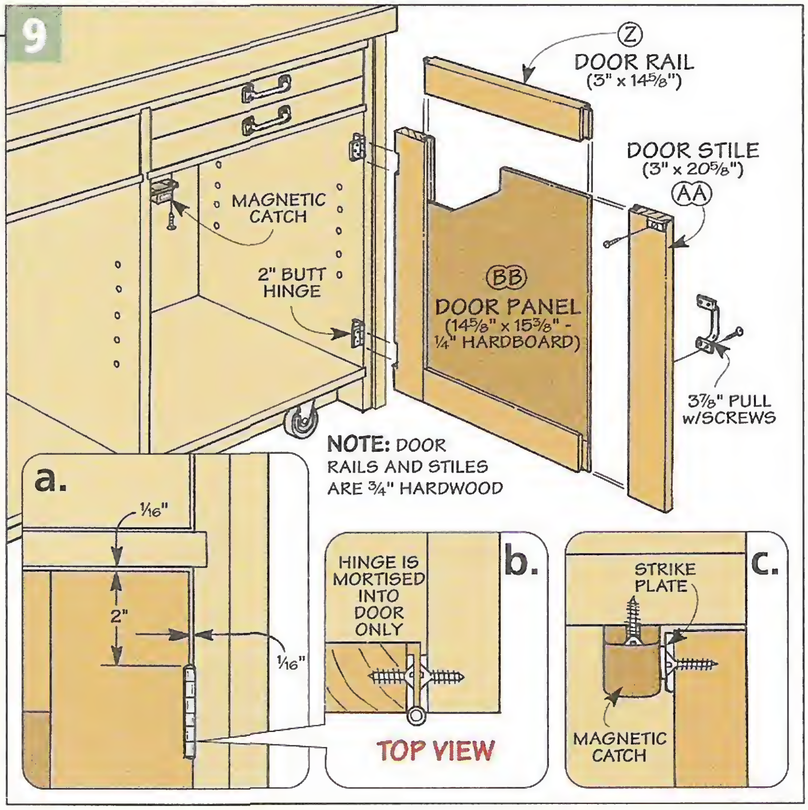
To help stiffen and strengthen the shelves, hardwood edging is added to the front and back edges. In order to attach the edging, I cut a rabbet along the front and back edges of each shelf to create a tongue, as you see in Figure 8a.

The *shelf edging (X, Y)* is just a few pieces of hardwood with roundovers routed along the top and bottom edges, as shown in Figure 8a. I attached the edging by cutting a groove on the inside face of each piece to match the tongues cut on the shelves. Then just glue the edging in place.



Door

▲*Door.* This door keeps chips and debris from collecting inside the storage area.



To complete the lathe stand, I added a door to the lower right-hand storage area. If you are going to keep a grinder or other tool in this compartment, the door will help to keep dust and wood chips from getting inside.

As you can see in Figure 10, the door is built using frame and panel construction. I starting by cutting the *door rails (Z)* and *door stiles (AA)* to size from ¾"-thick hardwood. Then a centered groove for a hardboard panel is cut on the inside edge of each door piece (Figure 11). After this is done, stub tenons are cut on the ends of the rails to fit in the grooves in the stiles.

Before assembling the door, I cut a *door panel (BB)* to size from ¼" hardboard. Then you can glue up the door frame around the panel.

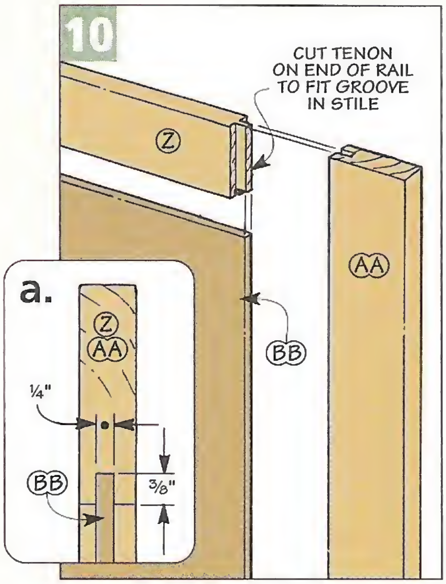
Hardware – The door is mounted to the lathe stand with a pair of butt hinges. But I ran into a little problem when I went to the hardware store to pick out the hinges. I wanted to use nickel-plated hinges to match the drawer and door pulls. But all I could find were brass-plated hinges. So I wound up painting the hinges silver to match the rest of the hardware.

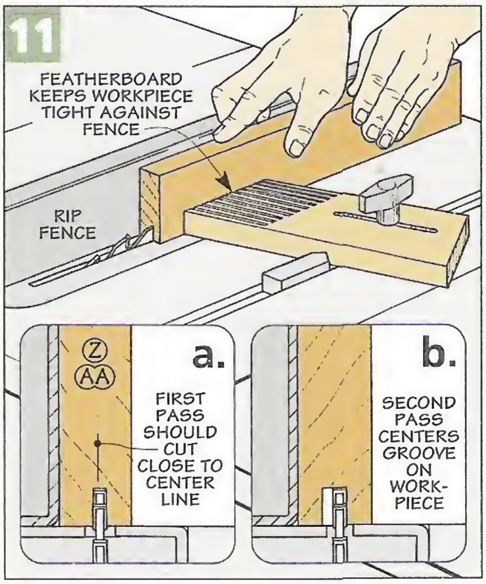
The hinges are mortised into the edge of the door. I cut a couple of shallow notches in the door stile for the hinges (Figures 9a and 12). You don't have to worry about mortising the hinges into the case, since they're just mounted directly to the surface, as shown in Figure 9b.

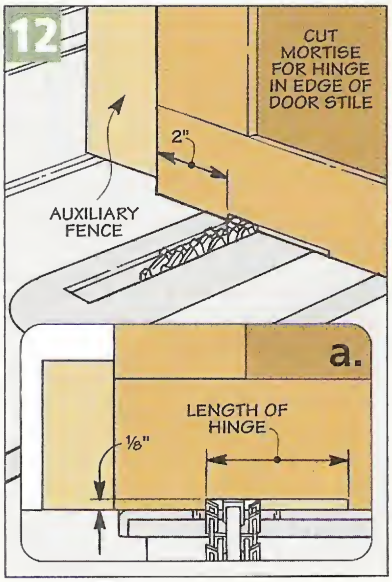
After the door was installed in the case, I added a door pull and a magnetic catch. The pull is centered on the left-hand door stile. And the magnetic catch is located in the upper, left-hand corner of the door.

After finishing the lathe stand, I decided to mount a work light to the top. I picked up an inexpensive swing arm lamp at an office supply store. This type of lamp can be adjusted to shine right over the area where you are working.

With the lathe stand finally complete, you can mount your lathe to the top. This is simply a matter of setting it in place and attaching it to the top with some hex bolts.







Dust Hood

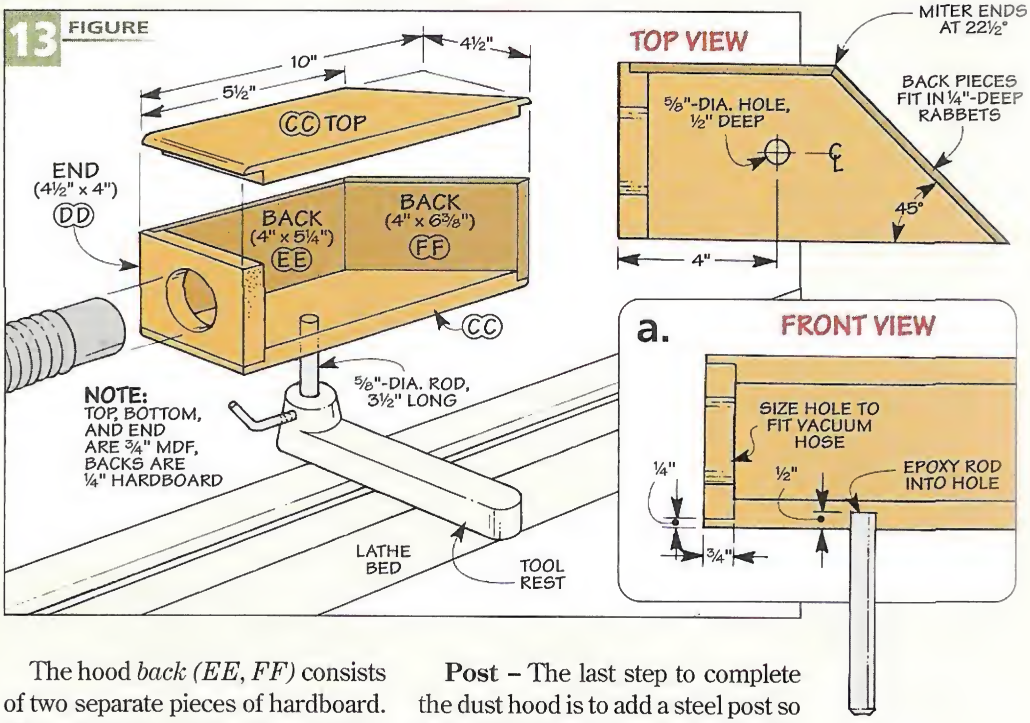
Once the lathe stand was finished, I began making a shop-built dust hood for the lathe. This hood is designed to collect the fine dust created when sanding a workpiece on the lathe (not the heavy chips from turning).

The dust hood is built out of hardboard and MDF (Figure 13). I started by cutting a *top* and *bottom (CC)* to size from 3/4" MDF. In Figure 14, you can see how I mitered the end of each piece.

The next step is to cut rabbets along three edges of the top and bottom for the back and sides of the dust hood, as you see in Figure 15. There are a couple of things to be aware of here. First, you'll need to make two different sizes (widths) of rabbets. The rabbets along the back and mitered edges should be sized to hold 1/4" hardboard pieces. But the rabbet along the short end of each piece needs to be wider to hold a piece cut from 3/4" MDF.

The second thing to keep in mind when cutting the rabbets is that the top and bottom pieces should be mirror images of one another. In other words, the rabbets will be facing each other when the pieces are assembled.

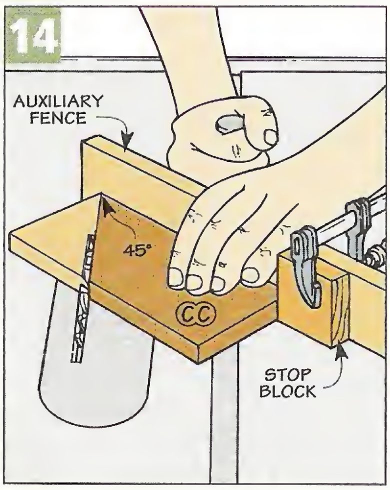
Once you've cut all the rabbets, you can make the remaining pieces. The *end (DD)* is cut from 3/4" MDF. A hole is drilled in the center of this piece for a vacuum hose, and a rabbet is cut along one edge for the back.

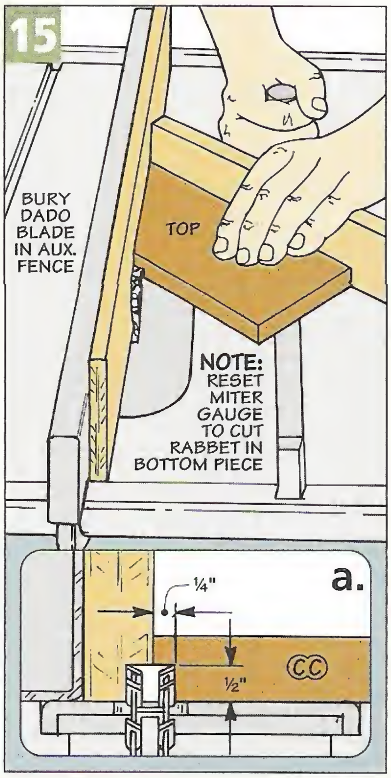


The hood *back (EE, FF)* consists of two separate pieces of hardboard. These pieces are mitered to fit in the rabbets cut in the top and bottom of the dust hood (see top view in Figure 13). Once this is done, all the pieces can be glued together. Then rout a small roundover on all the exposed edges of the dust hood.

Post – The last step to complete the dust hood is to add a steel post so that the hood can be mounted in the tool rest base of the lathe. I simply cut a short length of 5/8"-dia. steel rod (to match the size of the hole in the tool rest base of my lathe) and filed a chamfer on one end. After drilling a 5/8"-dia. hole in the bottom of the dust hood, the rod can be epoxied into the hole (Figure 13a).

To use the dust hood, you'll need to remove the lathe tool rest from its base and turn the base around on the bed of the lathe. Then simply position the dust hood so it's directly behind the area that you're sanding, see photo below.





▲ *Dust Hood. Hooked up to a shop vacuum, this dust hood does a great job of picking up the fine dust that is created while sanding a project on the lathe.*

Miter Saw Quick Tips & Simple Jigs

With a few handy tips and jigs, you can make your miter saw safer, work harder, and cut more accurately.

The miter saw table and fence on page 6 is a great full-featured accessory for any miter saw. But if you're looking to get better results right now, you don't have to spend a lot of time (or money) to do it. On the next few pages, you'll see a number of quick tips and a few simple jigs for getting great results.

Tune-Up – But tips and jigs won't help much if your miter saw isn't tuned up and running smooth. So it's a good idea to take a look through your owner's manual to see what it takes to tune up your saw. For a quick reference on the basics, take a look at the box below.

One last thing. The tips and jigs shown here will come in handy whether you own a small 8" saw that only cuts miters or a large 14" sliding, compound miter saw with all the bells and whistles.

ZERO-CLEARANCE INSERT

Take a look at most miter saws and you'll see an insert in the base that allows the saw blade to pass through. And it's the cause of one of the biggest problems with most miter saws.

The opening in the insert that the blade passes through is usually *quite* a bit larger than the actual thickness of the blade. So there's nothing to support the edges of the workpiece when the blade cuts through. And that can cause some heavy tearout along the bottom face.

One way to solve this problem is to use a *zero-clearance insert.* A zero-clearance insert "wraps" around the blade as it passes through the workpiece. Since the workpiece is fully supported right up to the blade, it practically eliminates any tearout along the bottom.

Now, you can buy zero-clearance inserts for a number of miter saws. But you can also make your own. The first step is to start with a blank that's the same thickness as the existing insert for your saw.

Unfortunately, the thickness of the insert isn't likely to match any hardboard or plywood you have around the shop. So it's best to make the insert from a piece of hardwood that's planed to match the thickness of the existing insert. This way, you can be sure the insert will be flush with the surface of the miter saw table.

Once you have the blank the right thickness, you can rip it to width to

Tune-Up Checklist

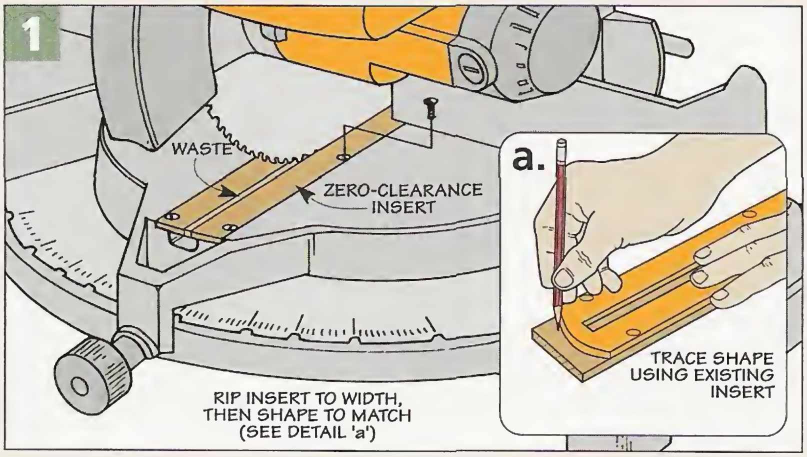
1. *Remove Sawdust. Clean off any sawdust along with caked-on pitch and resin — especially around moving parts.*
2. *Inspect Brushes. Check brushes for wear. Replace them once they become shorter than what's recommended in the owner's manual for the miter saw.*
3. *Lubricate Pivot Points. Oil the main pivot points on the saw to ensure smooth operation and easy adjustment.*
4. *Check Blade Guard. Tighten the blade guard if necessary and replace any worn parts in the linkage.*
5. *Align Fences. Adjust two-part fences to ensure accurate alignment across the fence face.*
6. *Adjust Miter & Bevel Settings. To produce accurate cuts, adjust miter and bevel settings according to the manual.*

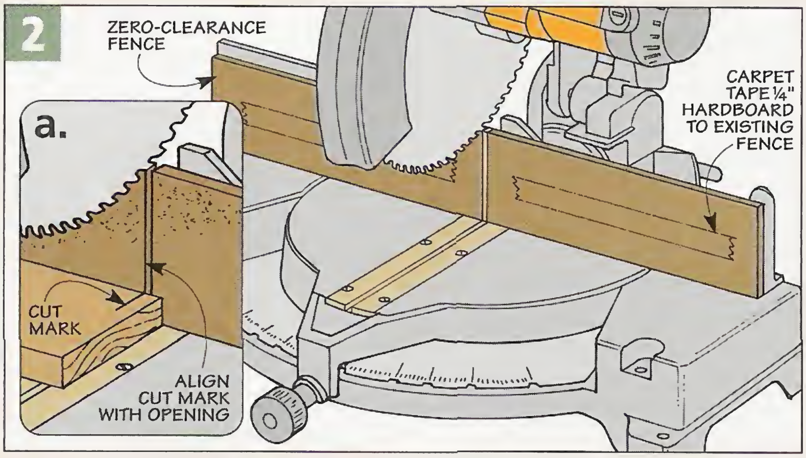
match the opening in the saw table. (It's a good idea to make a few extras blanks while you're at it.)

The next step is to shape the ends of the blank to match the opening. And that's an easy task because you can use the existing insert as a pattern and simply trace around the ends (Figure 1a). Then cut outside the layout lines on the blank and sand the ends until the insert fits perfectly.

At this point, all that's left to do is drill a set of counterbored (or countersunk) holes for the screws used to hold the original insert in place.

After installing the insert, creating the "zero clearance" is just a matter of turning the miter saw on and making a smooth, even cut.





ZERO-CLEARANCE FENCE

The zero-clearance insert eliminates tearout along the bottom of a workpiece. But tearout along the *back* of the workpiece is also a problem.

Just like in the base, tearout occurs because there's usually a large gap along the face of the fence where the blade passes through. Besides not supporting the workpiece, this gap can cause a small cutoff to catch on the blade and "explode" or "shoot" to a corner of the shop.

Here again, you can solve this problem by making a zero-clearance fence, as in Figure 2. What's different here is that instead of replacing the existing fence, you simply add a strip of $^1/_4$" hardboard that's sized to roughly match the height and length of the existing fence. This way, you maintain as much of the cutting capacity of the saw as possible.

A few strips of carpet tape is all it takes to attach the fence. Then once the fence is in place, the first cut you make will create a zero-clearance opening just like the insert in the base of the miter saw.

An added benefit is that the zero-clearance opening makes it easy to line up your cuts. All you need to do is make a small cut mark along the edge of the workpiece (Figure 2a).

One thing to keep in mind is that when you change the miter setting, the zero-clearance opening will "open" up. So be sure to replace the fence with a fresh one whenever you change to a new miter setting.

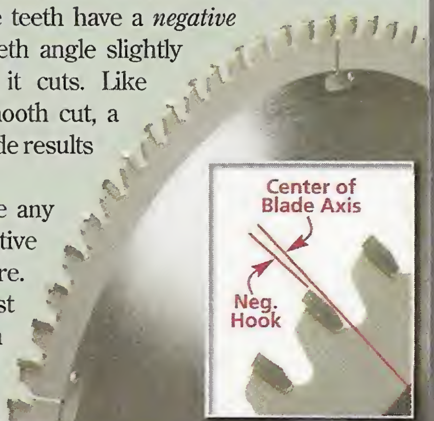
And one more tip. A zero-clearance insert and fence are sure to make a big improvement in your cuts. To improve your cuts even more, check out the box at left.

Miter Saw Crosscut Blade

The saw blade that comes with most miter saws is fine for general woodworking. But for better results, take a look at the blade shown below.

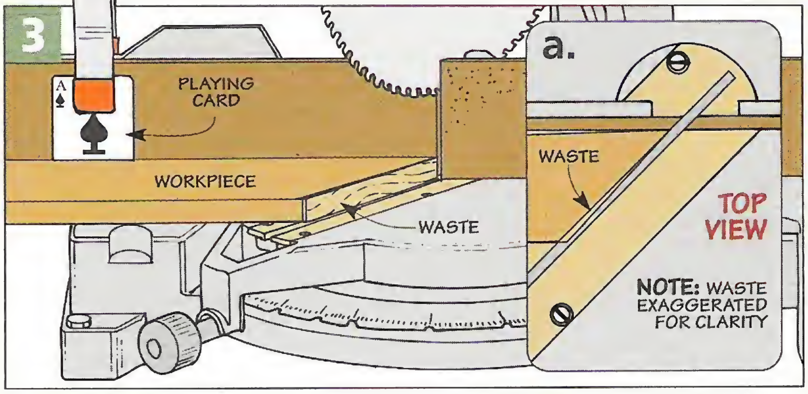
Hook Angle – This blade has a tooth pattern that's typical of most saw blades — a number of alternating top bevel teeth. But in the inset photo, it's easier to see that the teeth have a *negative* hook angle. This means the teeth angle slightly *away* from the workpiece as it cuts. Like skewing a hand plane for a smooth cut, a negative hook angle on a saw blade results in a smooth, tearout-free cut.

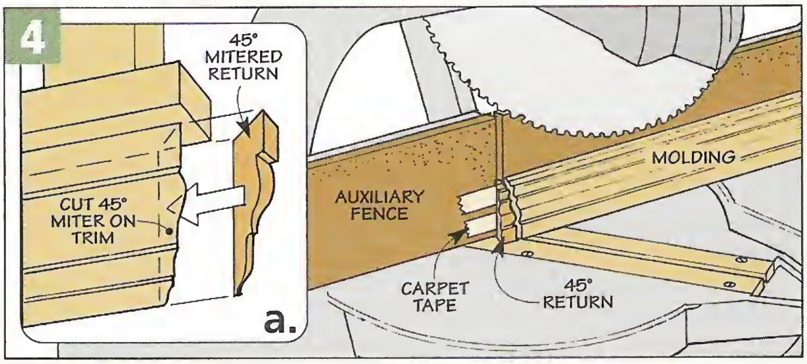
Cost & Availability – Like any good saw blade, one with a negative hook angle can cost $60 or more. You can find this blade at most woodworking stores. Or you can refer to the sources listed in the margin on page 35.

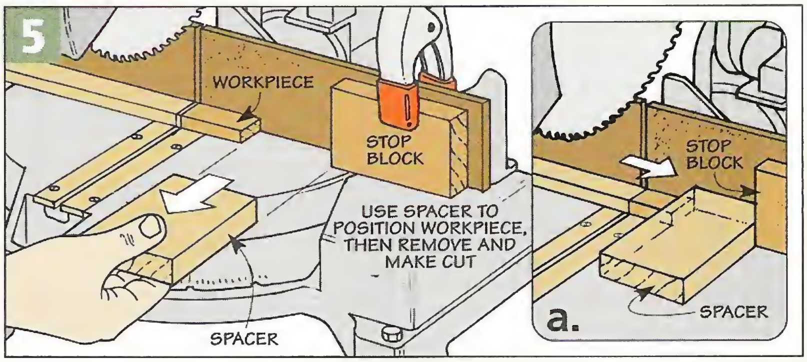


Quick Tips

After adding a zero-clearance insert and fence, the quick tips below should provide the answers to a few common miter saw problems.







SHIM IT RIGHT

One of the more frustrating things about cutting a miter is that it isn't all that unusual for it to be off just a hair. And that little bit can easily ruin how pieces fit together. The problem is trying to adjust the miter saw table to trim a small amount off the end of the workpiece is all but impossible.

To solve this, I don't adjust the miter setting. Instead, I turn to an old deck of playing cards I keep around the shop. To change the angle slightly, I clamp a playing card (or two) along the fence and then slide the workpiece in position (Figure 3). Note: You can use just about any thin piece of material to do this.

The playing card "kicks" the workpiece out slightly, as in Figure 3a. This allows you to trim a small sliver off the end. To vary the amount of material you slice off, simply add another card or two (to remove more material) or slide the card away from the blade (to remove a little less).

MITERED RETURNS

Exposed end grain on trim moldings really stands out in a room. A good way to solve this is to cut a mitered return, like you see in Figure 4a.

But there is one small problem. The size of the mitered return makes it all too easy for it to get chewed up by the saw blade after you make the cut.

One way to handle a workpiece this small is to secure the piece of trim molding to the auxiliary fence with carpet tape, as illustrated in Figure 4. This helps keep the return from flying across the room or getting chewed up by the blade.

And regardless of the size of the workpiece, it's always a good idea to make a smooth cut through the workpiece *and* let the saw blade come to a complete stop before raising it.

CUTTING MULTIPLES

Whenever I have to cut a number of pieces to identical length, I like to use a stop block. A stop block ensures that each piece is identical without having to lay out each piece and then line the cut up perfectly.

But cutting a number of *short* pieces to identical length is a challenge. Since you can't clamp a stop block at the proper position *and* hold the workpiece without your fingers being too close to the blade, it's best to change the technique slightly.

Instead, position the stop block and clamp it in place allowing for a *spacer* between the block and the workpiece. You can see this illustrated in Figure 5a.

Then when you're ready to cut the workpiece to size, rest the spacer against the stop block and then butt the workpiece against the spacer. As you hold the workpiece in place safely on the opposite side of the blade, slide the spacer out.

Now you can make the cut without having to worry about the small workpiece being trapped and possibly binding. To cut the remaining workpieces, just repeat the process using the spacer once again to position the workpiece.

Handy Jigs

Although quick tips will get you through a number of problems, there are times when you might need just a little more. In the drawings at right you'll see a workstation and a couple jigs that are sure to help out.

WORKSTATION

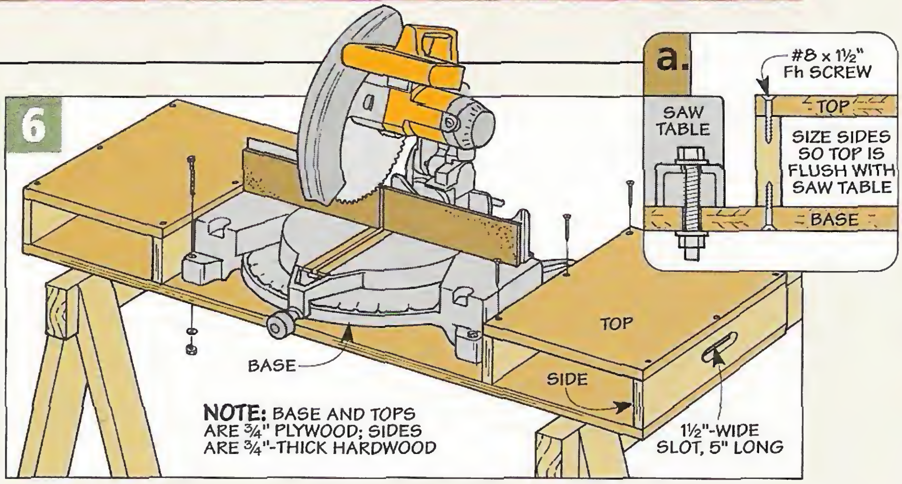
The nice thing about miter saws is they're portable. But that portability comes at a price — the saw table doesn't always provide solid support for cutting longer workpieces.

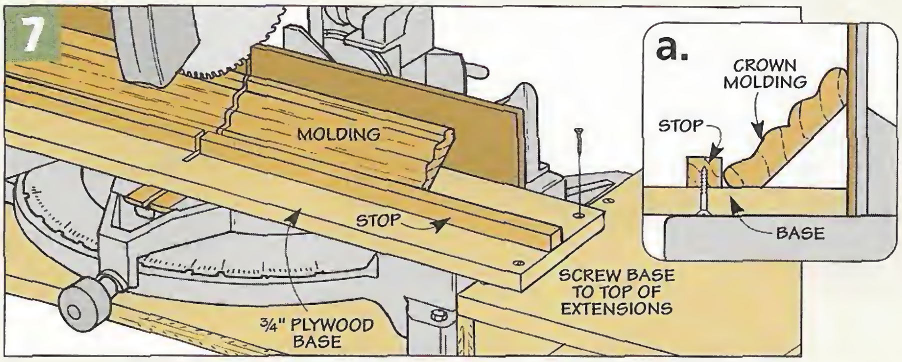
A simple way to make your miter saw work "bigger" without creating an elaborate system is to mount it to a simple workstation, as in Figure 6.

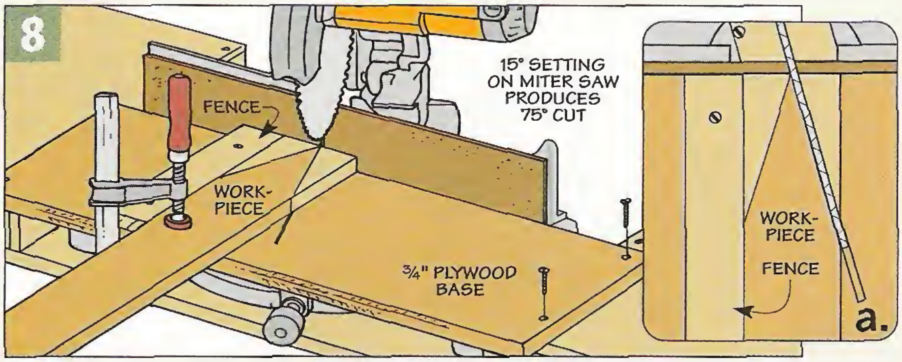
The workstation starts out as a plywood base that's sized to fit the depth of the saw. But you'll want to make it about 16" longer than the width of the saw.

The extra length provides space for a pair of U-shaped extensions that are attached to the base to form a "box" on each side of the saw. The tops of the extensions are plywood, while the sides are 3/4"-thick hardwood to provide a solid bite for the screws that hold the pieces together.

The sides are sized so that once everything is assembled, the top of the extensions are flush with the saw table, as in Figure 6a.







CROWN MOLDING JIG

Miter saws are great for cutting crown molding. Especially since you can often cut it so that it's laying flat on the table. Most miters saws have settings for one or two of the common spring angles (the angle the crown tilts away from the wall).

But this often involves "eye-balling" the settings, which isn't very accurate. And it doesn't help when you have to cut crown molding that has a different spring angle.

I find it best to cut crown molding the "old-fashioned" way — with the molding tipped upside-down and backwards between the table and fence.

But holding the workpiece in place securely can be a problem. To solve this, all you need to do is add a plywood base, like you see in Figure 7. The table is sized extra-wide to avoid cutting all the way through the table. To position the molding properly, simply screw a hardwood stop along the front edge of the base so the crown molding rests at the correct angle, as illustrated in Figure 7a.

BEYOND 45°

Although it doesn't happen often, sometimes I need to cut angles well past 45°, like the top of a picket for a fence, as shown in Figure 8a. As you may have expected, the solution to this problem is a shop-made jig.

The jig is just a plywood base with a hardwood fence screwed perpendicular to the back edge, as you can see in Figure 8a. Since the fence "rotates" the workpiece 90°, you end up with the complementary angle of the setting on the miter saw.

Confused? Well think of it this way. When the saw table is set to 15°, the jig gives you the complementary angle, or 75° in this case.

Angles like this often result in long cuts that work best on a sliding miter saw. But in many cases, you can use any type of miter saw, cutting as far as possible. Then you can complete the cut with a hand saw.

Rotary Tool
Storage Case

This handy storage case keeps your rotary tool and accessories stored conveniently in one place.

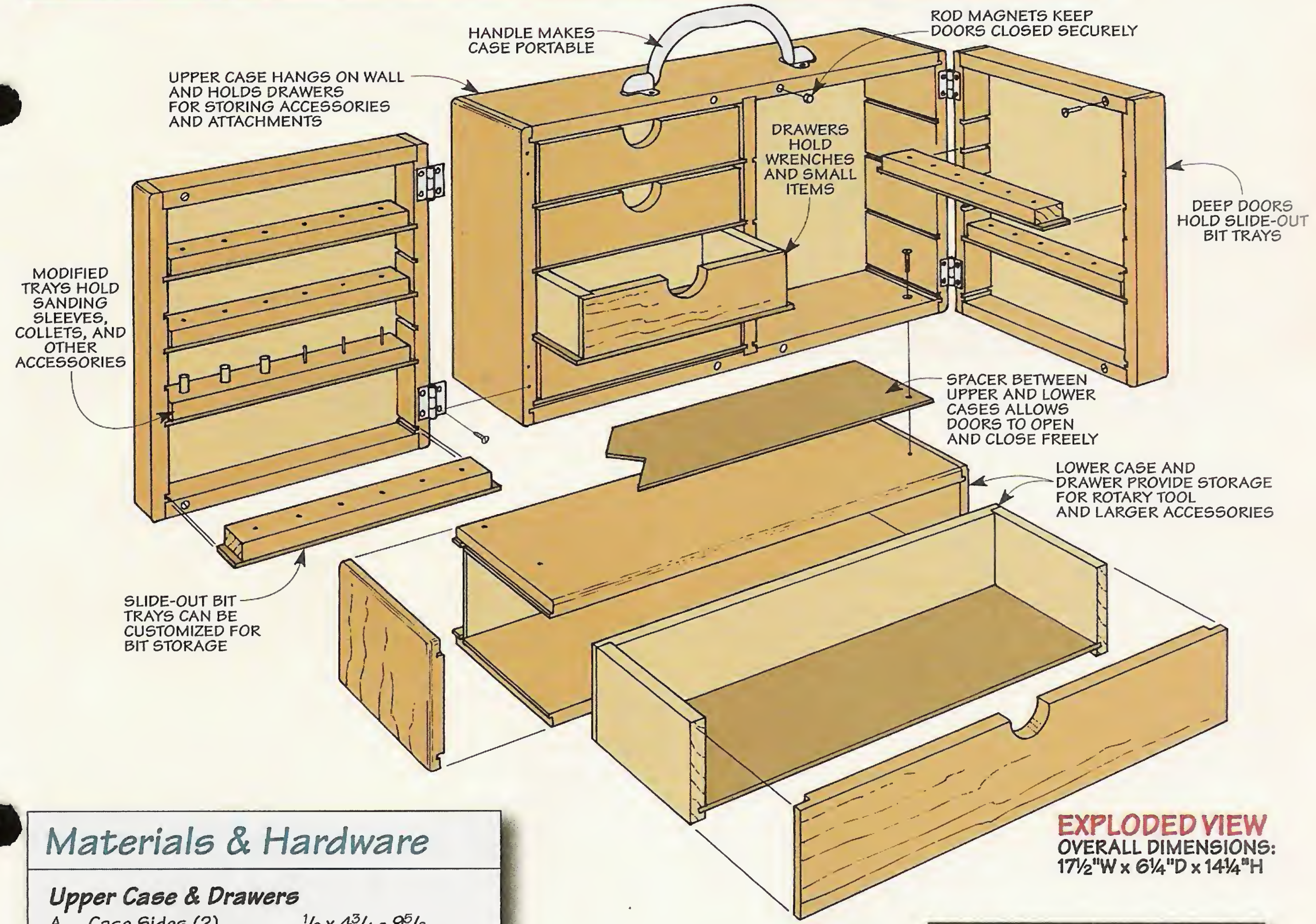
I purchased a rotary tool a few years ago. It came with a little plastic storage case that held the rotary tool, some bits, and a couple of accessories. But over time, I kept adding more bits and a few accessories. So it wasn't long before everything wouldn't fit neatly in the case.

To solve this problem, I built the rotary tool storage case shown below. It keeps everything organized and hangs conveniently on a wall. Yet, you can easily remove the case and carry it right to where you need it.

The case is designed to be built as a series of smaller projects. You can start with just the upper case and drawers. This way, you can begin using it right away.

Later, you can add a pair of doors. The doors will hold quite a few bits and accessories, as you can see below. Or you can modify one of the doors to keep all your manuals in one place (see photo on opposite page).

Finally, build the lower case and drawer to hold the rotary tool along with any larger accessories.



EXPLODED VIEW
OVERALL DIMENSIONS: 17½"W x 6¼"D x 14¼"H

Materials & Hardware

Upper Case & Drawers

A	Case Sides (2)	1/2 x 4 3/4 - 9 5/8
B	Case Divider (1)	1/2 x 4 - 8 7/8
C	Case Top/Bottom (2)	1/2 x 4 3/4 - 17
D	Case Back (1)	16 3/4 x 8 7/8 - 1/4 Ply.
E	Drwr. Bottoms (5)	4 x 8 1/4 - 1/8 Hdbd.
F	Drwr. Fronts/Backs (10)	1/2 x 1 7/8 - 7 3/4
G	Drwr. Sides (10)	1/2 x 1 7/8 - 3 1/2
H	Cleats (2)	1/2 x 2 - 16 1/2

Doors & Bit Trays

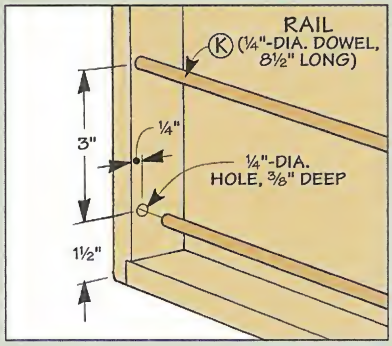
I	Tops/Bottoms (4)	1/2 x 1 1/2 - 8
J	Sides (4)	1/2 x 1 1/2 - 9 5/8
K	Rails (2)	1/4 x 8 1/2 Dowels
L	Fronts (2)	8 x 8 7/8 - 1/4 Ply.
M	Tray Bases (7)	1 1/4 x 8 - 1/8 Hdbd.
N	Bit Holders (7)	1/2 x 1 1/4 - 7 1/2

Lower Case & Drawer

O	Case Top/Bottom (2)	1/2 x 6 1/4 - 17
P	Case Sides (2)	1/2 x 6 1/4 - 4
Q	Case Back (1)	16 3/4 x 3 1/4 - 1/4 Ply.
R	Spacer (1)	4 1/2 x 17 - 1/8 Hdbd.
S	Drawer Sides (2)	1/2 x 2 15/16 - 5
T	Drawer Frt./Bck. (2)	1/2 x 2 15/16 - 16 3/8
U	Drawer Bottom (1)	5 x 15 7/8 - 1/8 Hdbd.

- (1) 9/16" Handle w/(4) #6 x 1/2" Rh Screws
- (4) 1/4" Rod Magnets
- (4) #6 x 1/2" Fh Woodscrews
- (2 Pr.) 1" x 1" Hinges w/(16) # 4 x 1/2" Fh Screws
- (4) #8 x 1" Fh Woodscrews

Optional Door

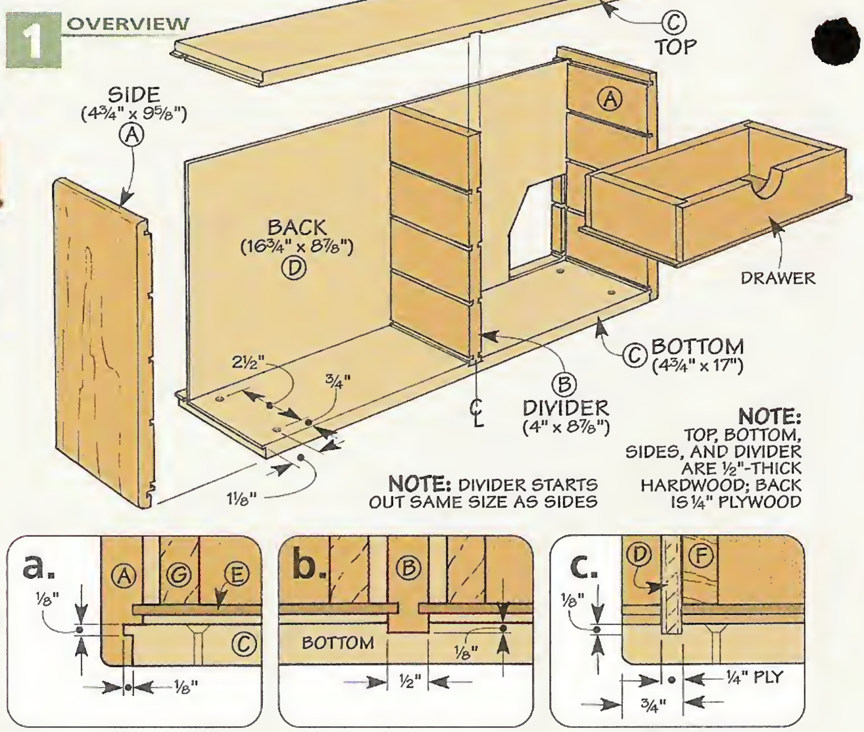


Along with the rotary tool and accessories, you'll also end up with quite a few manuals. To keep them close at hand and neatly stored, you can build the optional door shown above.

The basic construction of the door is identical to the one that houses the bit trays. But instead of having kerfs in the sides for the trays, a couple of dowels are mounted in the door. The dowels act as rails to keep the manuals in place, as in the photo. Note: Just be sure to install the dowels when you assemble the door.

Case & Drawers

▲ *Upper Case. The upper case will accept eight drawers. Or you can build fewer depending on your storage needs.*



One of the nice things about the design of this rotary tool storage case is that it's modular. So you can build as much or as little of it as you like. As you can see above, with up to eight drawers the upper case makes a great storage project in itself. So that's where I started.

Building the case isn't complicated. As you can see in Figure 1, it's nothing more than a top and bottom connected by two sides and a center divider along with a plywood back.

Sides – The first thing I did was cut a couple $1/2$"-thick hardwood blanks to size ($4^3/4$" x $9^5/8$") for the *sides (A)*. While I was at it, I cut an identical blank for the *divider (B)*.

Why make a blank for the divider? The reason has to do with aligning some kerfs in the sides *and* divider to support the drawers of the case. But more about that later. For now, you can set the divider aside.

Tongue & Dado Joint – At this point, you're ready to begin work on the joinery that holds the case together. As you can see in Figure 1a, I used a tongue and dado joint. I like using this joint on small cases since it not only provides great mechanical strength, but almost guarantees that everything lines up automatically during assembly.

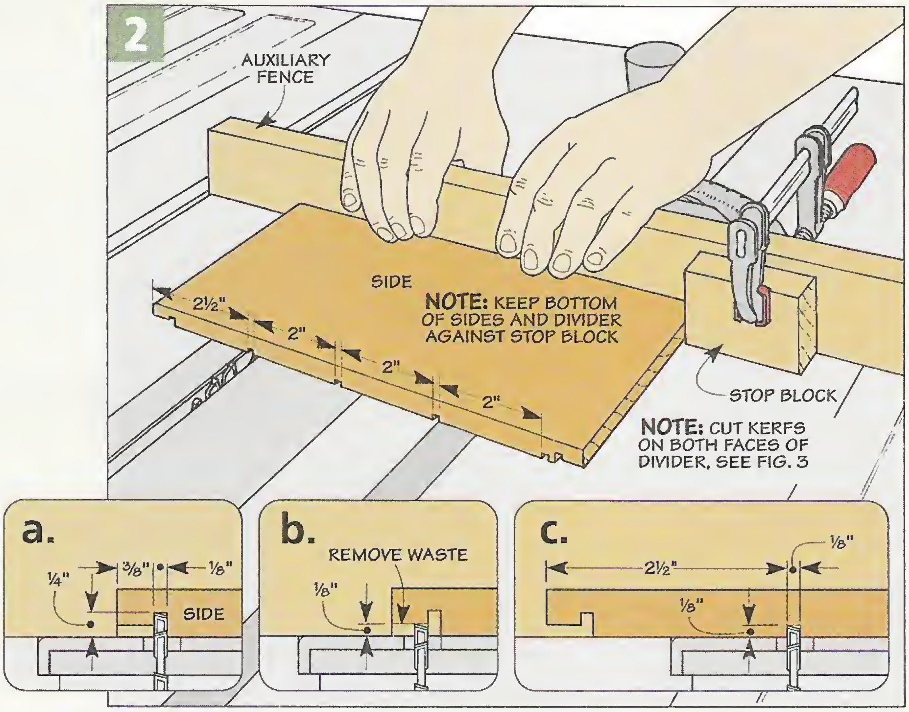
Cutting this joint is a simple two-step process on the table saw. The first step is to cut a kerf at the top and bottom of each side for the tongue, like you see in Figure 2a.

The second step is to lower the saw blade for an $1/8$"-deep cut and then nibble away at the remaining waste, as seen in Figure 2b.

Drawer Kerfs – Now you're ready to turn your attention to the "joinery" that's used to support the drawers. As I mentioned earlier, a series of kerfs cut in the sides and divider are used to support the drawers. The kerfs do this by accepting the *bottom* of the drawer (Figure 1a).

To keep the kerfs aligned, I used a stop block to position the sides and divider as I cut each $1/8$"-deep kerf 2" apart (Figures 2 and 2c).

Top & Bottom – Once all the kerfs are cut, you're ready to work on the top and bottom of the case. You can start by cutting the *top* and



bottom (C) to final size from 1/2"-thick hardwood (Figure 1). Then cut a small tongue on the ends of each piece to fit the kerfs cut in the sides, as you see in Figure 1a.

There's a couple more things to complete on the top and bottom before assembling the case. The first is to cut a shallow centered dado in the top and bottom to accept the divider, as in Figure 1b.

(Note: If you're planning on adding the lower case later, it's best to drill a set of countersunk screw holes in the bottom piece at this time, as shown in Figure 1.)

Back – The last thing to do to the top and bottom, along with the sides, is to cut grooves to accept the 1/4" plywood *back (D)*. You can see this in Figures 1 and 1c.

At this point, the case is almost ready for assembly. But there's one more thing to do. And that's to cut the divider to final size.

As you may recall, the divider was cut to the same size as the sides. To fit the divider in place and keep the kerfs aligned, you'll need to trim the same amount off the top and bottom until the divider just slips between the top and bottom of the case (Figure 3). Finally, you'll need to rip the divider to width so it's flush with the front edge of the case.

Assembly – After gluing up the case, I eased the back edge and outside corners by routing an 1/8" roundover, like the one you see in Figures 1a and 1c.

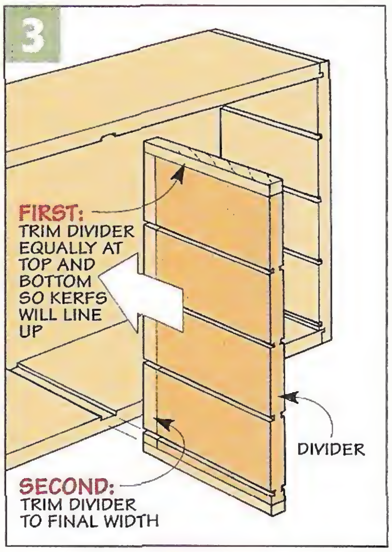
Drawers – With the case complete, you can start working on the drawers. As I mentioned earlier, the *drawer bottoms (E)* support the drawers in the case by extending past the sides (Figures 4 and 4b). So I started by cutting them to size so they fit between the kerfs in the case (Figures 1a and 1b).

What you're looking for here is a slightly snug fit so the drawers don't slide out too easily. Then you can cut the bottoms to width so they're flush with the front of the case.

With the bottoms fit to the case, you're ready to cut the *drawer fronts/backs (F)* and *sides (G)* to size. To do this, you'll need to allow for the joinery detailed in Figure 4a as well as an even gap (1/8") around the sides and top once they're installed.

Once all the joints have been cut, there's one last thing to do before assembly. And that's to make a cutout in the top of each drawer front to create a "finger hole" for opening the drawers. An easy way to do this is shown in the photo at right.

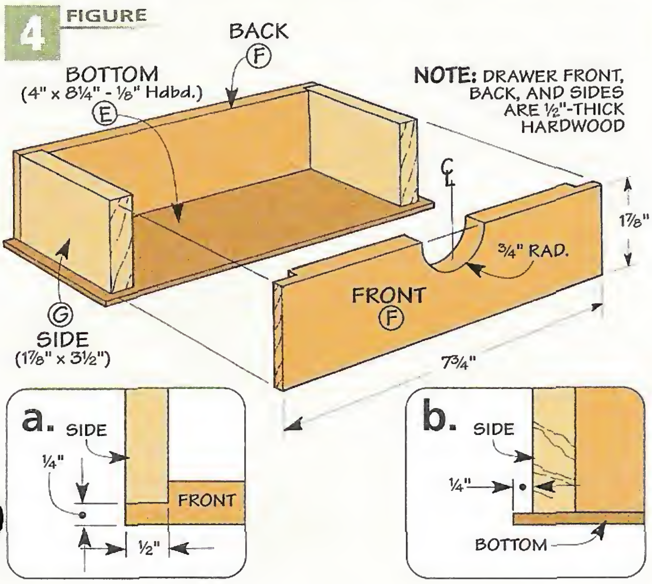
After cutting all the openings, you can assemble each drawer by gluing the sides to the fronts and backs. Then center each assembly on a bottom so it extends evenly from each side, as in Figures 4 and 4b.

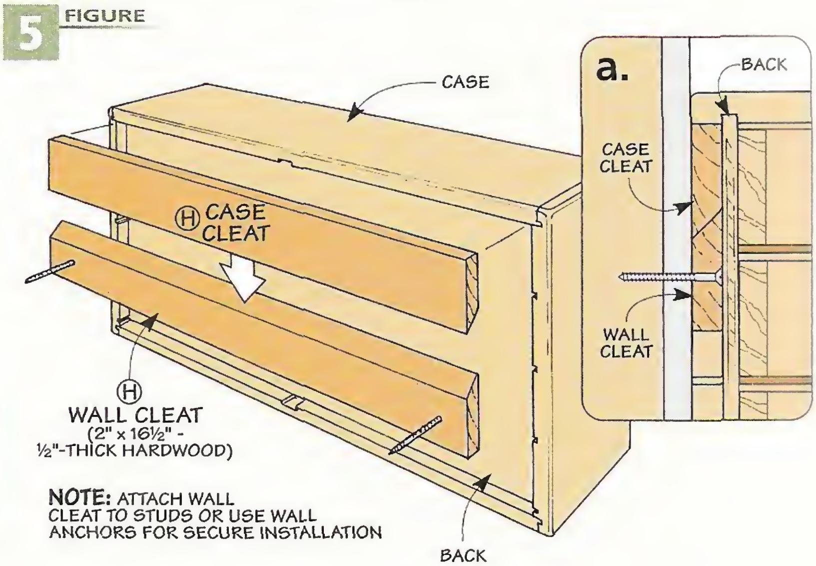


◄*Finger Openings. Clamping a pair of drawer fronts together provides solid support when drilling the circular cutouts for the finger openings.*

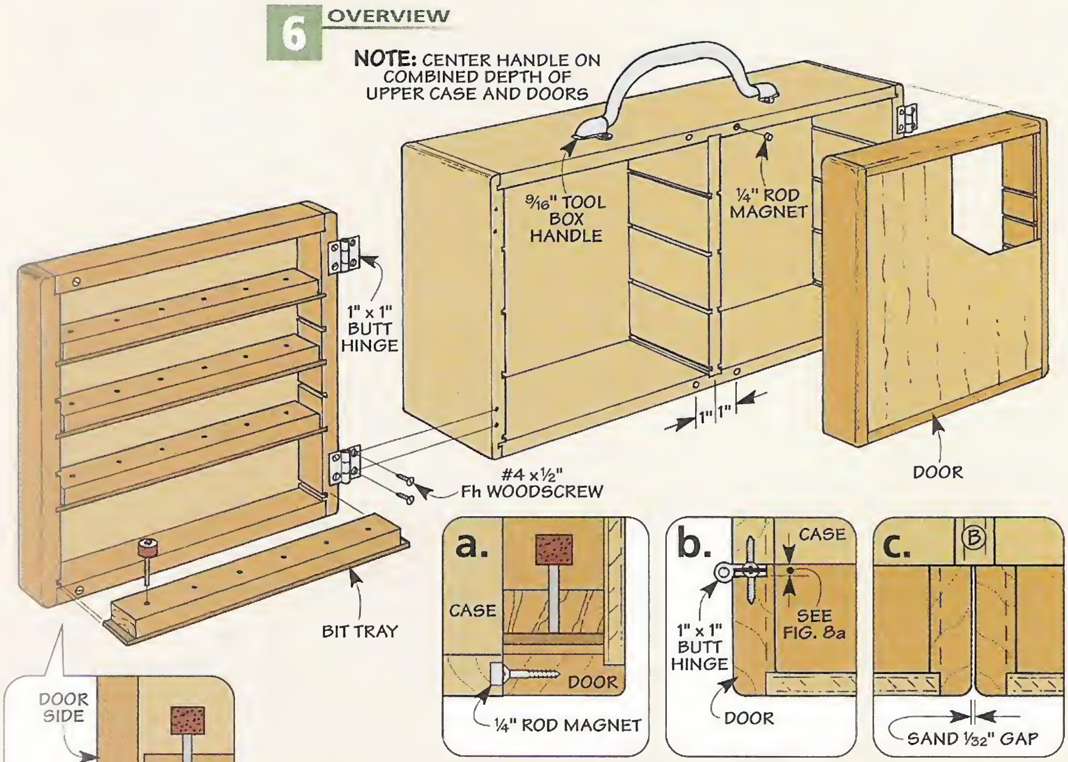
Cleats – All that's left at this point is to add a system for mounting the case to the wall. I like to use a pair of interlocking *cleats (H)*, like the ones you see in Figure 5.

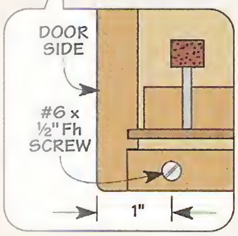
After beveling the edge of each cleat to 45°, you can glue one cleat to the case and screw the other to the wall, as shown in Figure 5a.





Doors & Bit Trays





Although you can use the upper case as is, adding a pair of doors provides a couple benefits. First, it encloses the upper case to keep out dust. And second, by making the doors "deep," it provides a convenient way to store rotary bits and other accessories.

Doors – Each door is a plywood panel wrapped with a top, bottom, and sides (Figure 7). What's important here is to size the doors so they're flush with the edges of the case.

Determining the length of the sides is easy enough. The length matches the height of the case (Figure 6). As for the top and bottom, you'll need to size them so each door is half the width of the upper case after allowing for the rabbets used to assemble the doors (Figures 6c and 7a).

Determining the depth is easy also. I simply cut the *top/bottom (I)* and *sides (J)* to a width of $1^1/_2$" to accommodate larger bits and accessories.

With the pieces sized, you're ready to cut the rabbets in the sides, as shown in Figure 7a. And in Figure 7b, you'll see another rabbet that needs to be cut along the *outside* edge of *all* the pieces to accept the $^1/_4$" plywood door front.

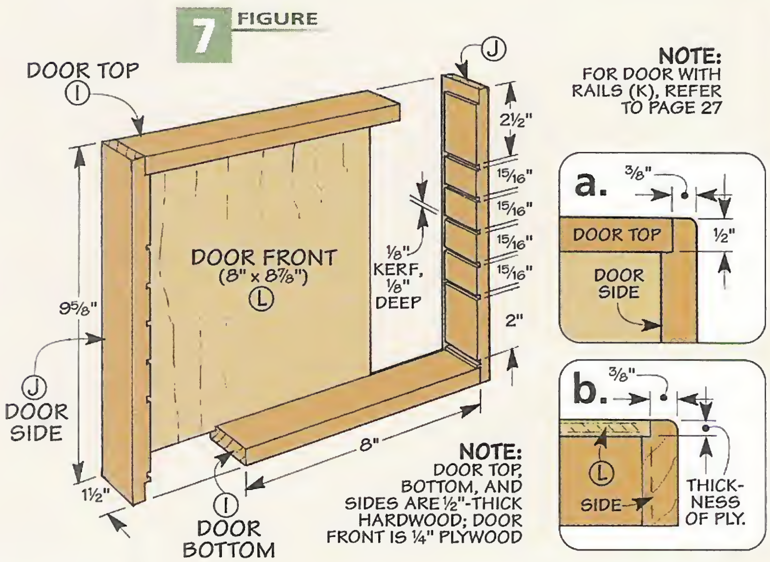
Since you want the plywood to end up flush with the outside of the door pieces it's a good idea to check the actual thickness of your plywood before cutting the rabbet. (My plywood was a hair over $^3/_{16}$" thick.)

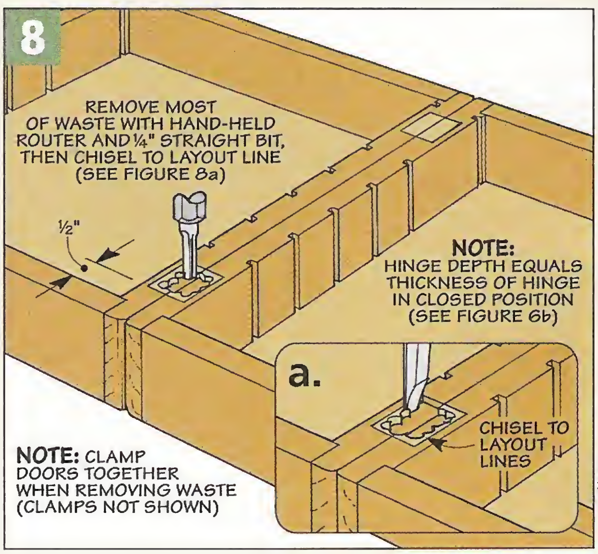
Like the sides of the upper case, you'll need to cut kerfs to accept the trays that hold the bits. The location of these kerfs is detailed in Figure 7. Or if you're planning to add the optional door, you'll need to drill a set of holes for a pair of *rails (K)* instead of cutting the kerfs (refer to page 27).

Now you're ready to size the plywood *door front (L)*, as in Figure 7. To do this, I dry assembled the doors and trimmed each door front until it fit perfectly.

After gluing up the doors, you can round over the front edge and outside corners just like the upper case.

Install Doors – To mount the doors, you'll need to cut a pair of mortises in each door for the hinges (Figure 6). A simple technique for removing most of the waste and then fine-tuning the fit is shown in Figures 8 and 8a. Then before installing the





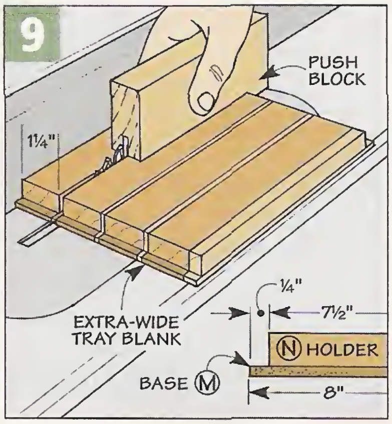
doors, I sanded the inside edge of each one to ensure the doors opened and closed easily (Figure 6c).

To hold the doors closed, I added a set of rod magnets to the main case and screws to the top and bottom of each door (Figures 6 and 6a). Finally, a handle centered on the top of the case makes it easy to carry when you need to (see photo below).

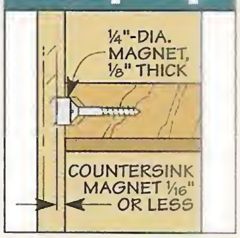
Bit Trays – Each bit tray is similar to the drawers in the upper case. Here again, the bottom of each tray is an 1/8" hardboard *base (M)*. Gluing on a 1/2"-thick hardwood *bit holder (N)* provides a place to store the bits.

Instead of making individual trays, you can make an extra-wide one (Figure 9). Then just rip each tray to final width so they fit flush with the inside face of each door (Figure 6a).

To store the bits, just drill centered holes along the length of each tray. For some items, like sanding sleeves and collets, I drilled larger holes and installed dowels or cut-off nails.



Shop Tip



▲ *Magnet "Catch." If the bit trays are a little loose, gluing a magnet in the door and adding a screw to the tray will act as a "catch" and prevent the tray from sliding out.*

Lower Case

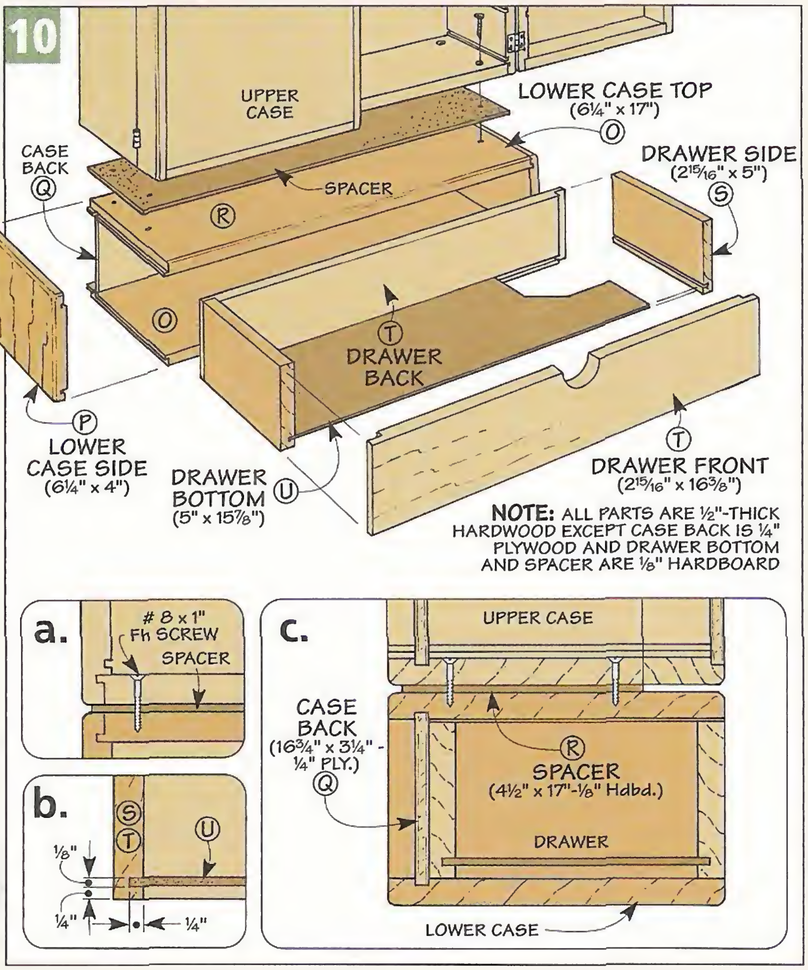
The upper case provides all the storage you need for most accessories. But the lower case you see in the drawing below provides a way to store the rotary tool itself, along with other odd-sized accessories.

Case – The joinery for the lower case should look familiar. It's identical to the upper case — a tongue and dado joint, as in Figure 10a. So once you have the *lower case top/bottom (O)* and *sides (P)* cut to final size, you can complete the joinery. Then after cutting a groove for the 1/4" plywood *back (Q)*, you can assemble the lower case.

After routing a roundover on *all* the outside edges of the lower case, you're ready to screw the two cases together. To ensure the doors wouldn't bind, I slipped an 1/8" hardboard *spacer (R)* between the cases before screwing them together, as you can see in Figures 10 and 10c.

The spacer is sized so it's flush with the front edge of the upper case and it's set in from the sides and back (Figures 10a and 10c).

Drawer – All that's left to do is add the drawer. Here again, to join the *drawer sides (S)* to the *front/back (T)*, there's just a simple rabbet joint. But this time the 1/8" hardboard *bottom (U)* fits in grooves cut in the front/back and sides (Figure 10b). And as before, the drawer front has a circular finger opening.



▲ *"Briefcase" Sized. The compact size of the case makes it easy to carry your rotary tool and accessories right to where you need them.*

Shop Talk

Pressure-Treated Lumber

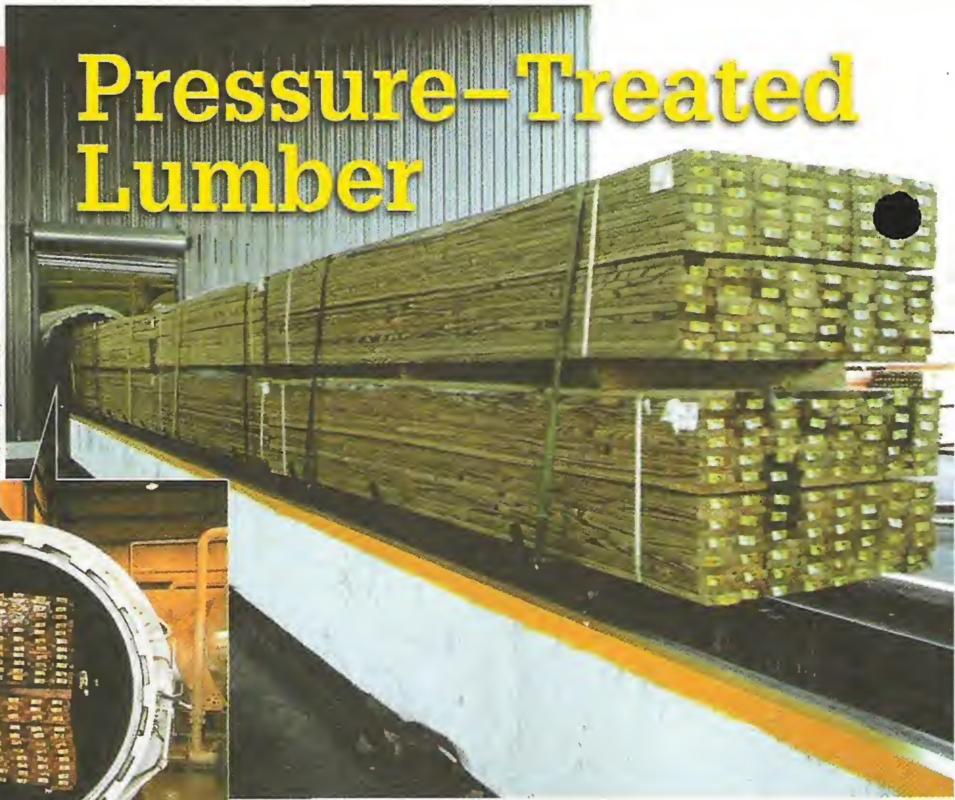


Photo courtesy of Osmose, Inc.

Photo courtesy of Osmose, Inc.

▲ *Feeling the Pressure. A stack of freshly-treated lumber is rolled out from a large pressure chamber. Inside the chamber, vacuum pressure is used to impregnate the wood with a liquid chemical preservative.*

If you've ever built a fence or a deck, you're probably already familiar with pressure-treated lumber. It's the wood with the funny-looking green color that you find at home centers, lumberyards, and in backyards all across the country.

But it's not the color that makes pressure-treated lumber so popular. It's the fact that it will stand up to the elements for years without rotting or decaying. Even termites turn their noses up at the stuff. In fact, you might almost say that pressure-treated lumber is the perfect wood for outdoor use.

Despite its advantages, pressure-treated lumber has received quite a bit of negative publicity during the past few years.

Chemical Preservative – Unlike redwood, cedar, or other naturally decay-resistant woods, pressure-treated lumber gets its resistant properties from a chemical preservative that is added to the wood. But this preservative isn't just sprayed or brushed on the surface. Instead, pressure is used to force the chemical solution down into the cellular structure of the wood.

The process for treating the lumber is fairly simple. The lumber is stacked in a pile and placed on a small flat-bed car on rails. The stack is then rolled into a large vacuum-pressure chamber (see photos above).

Once the door on the chamber is closed, the wood is placed under vacuum pressure, which pulls the air and moisture out of the cells in the wood. Then the chemical preservative solution is pumped into the chamber under pressure. The empty cells in the wood suck up the chemical solution like a sponge. Finally, the excess solution is pumped out of the chamber, leaving the cell walls coated with the preservative.

The preservative forms a chemical bond with the natural sugars present in the wood. This in turn prevents the growth of fungi that would normally feed on the wood, causing it to rot and decay.

Advantages – Aside from protection against fungi, the chemicals used to treat the lumber also make it unpalatable to termites. (However, treated lumber may still be attacked by other insects that burrow into the wood without eating it, such as carpenter ants or carpenter bees.)

Obviously, the biggest benefit to using pressure-treated lumber is the fact that anything you build with it will last much longer than if you used non-treated lumber. This not only means you save time and money, it helps to conserve our national timber resources as well. Since structures built with pressure-treated lumber don't have to be replaced nearly as often, fewer trees have to be cut down.

But pressure-treated lumber has some additional advantages over naturally decay-resistant woods. For one thing, pressure-treated lumber tends to be substantially cheaper than redwood or cedar. And the wood used to make pressure-treated lumber (typically Southern yellow pine or Douglas fir) is stronger than cedar or redwood from a structural standpoint. You can also purchase pressure-treated plywood, so you aren't limited to using only solid lumber.

Buying Treated Lumber – One thing to know when shopping for treated lumber is that it is available in different "strengths." When the wood is treated, a stronger solution can be used to create lumber that retains more of the preservative chemical. The retention level of the chemical solution is specified on a label found on the end of the board (see photo at right).

Most of the pressure-treated lumber you're likely to come across in home centers has a retention rating of .40 (measured in pounds of solution per cubic foot of lumber) and is rated for ground contact. This lumber can be used for deck framing, fence posts, and landscaping.

For wood that is going to be permanently buried in the ground, you'll want to use treated lumber with a .60 retention rating. And for above ground uses like fence pickets and deck planks, a retention rating of .25 is sufficient.

Using Treated Lumber – You can use treated lumber just like any other lumber, with a couple of exceptions. Because the chemicals used to treat lumber can be harmful if ingested in large quantities (more on this later), you shouldn't use treated lumber for any food storage or preparation surfaces, such as cutting boards, countertops, or water troughs. And also, don't use sawdust or wood chips from treated lumber for mulch or compost.

When you're working with treated lumber, it's a good idea to wear safety glasses and a respirator or dust mask. Then when you're finished working, make sure you sweep up any sawdust and scraps and change your clothes. But don't ever burn scraps of treated lumber. The chemicals in the wood can be released in the smoke.

The chemicals in treated lumber can react with ordinary iron or steel nails and fasteners, causing corrosion and leaving unsightly stains on your project. So you'll want to use hot-dipped galvanized or stainless steel fasteners. Treated lumber can be painted or finished just like any other wood.

IS IT SAFE?

Despite its advantages, pressure-treated lumber has received quite a bit of negative publicity during the past few years. The reason for this is the chemical that has traditionally been used to treat the lumber — chromated copper arsenate (CCA).

CCA contains arsenic, which can be harmful if you ingest enough of it. Environmentalists are concerned that the arsenic in treated lumber is leaching out of the wood and contaminating soil and groundwater. And parents and consumer groups are worried that playgrounds built with treated lumber pose a health hazard for children.

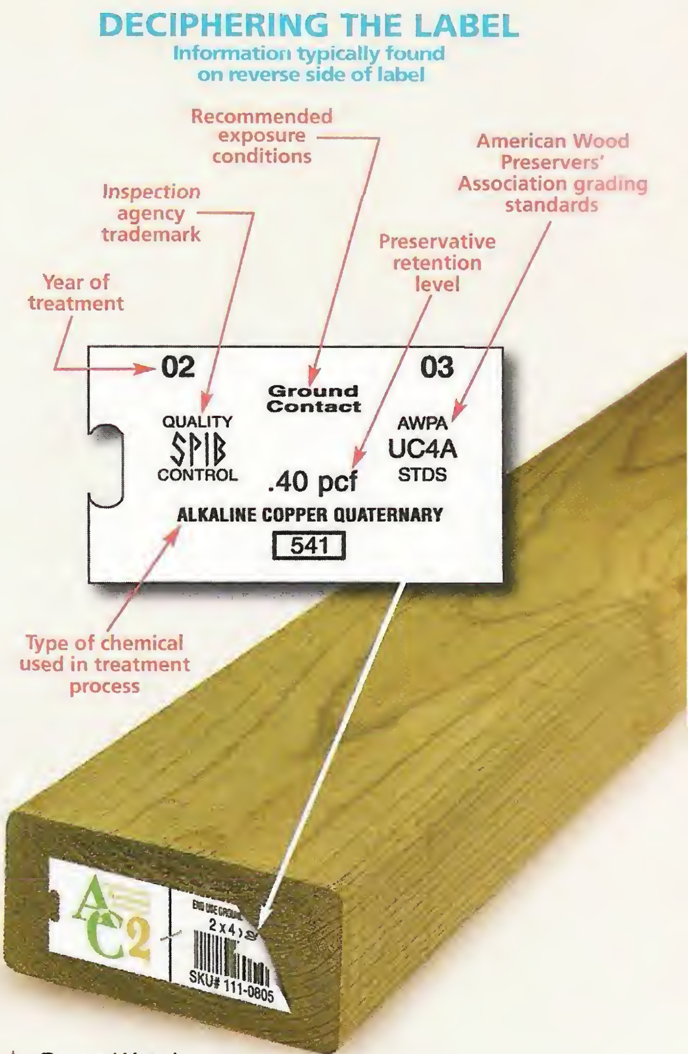
Is there any truth to these claims? That really depends on which set of "experts" you listen to. Groups on both sides of the issue point to studies that support their viewpoint.

But the debate is really a moot point. Under pressure from the media and consumer advocate groups, the Environmental Protection Agency (EPA), has mandated that production of CCA-treated lumber for residential use be banned by the end of 2003. As of this date, pressure-treated lumber producers will no longer be able to use CCA to treat their lumber.

But don't worry. You'll still be able to buy pressure-treated lumber. Fortunately, the lumber industry has already developed arsenic-free alternatives for treating lumber. The new chemicals are known as alkaline copper quaternary (ACQ) and copper azole. During the next year, the industry will be transitioning to these new solutions. (You may already be seeing these products on the market.) The new treated-lumber will look the same (it will still have the characteristic green hue), but it will not contain any arsenic.

Unfortunately for consumers, the cost will be about 25-30% higher than CCA-treated lumber. Additionally, the new chemicals used to treat the lumber are a bit more corrosive than the CCA. So it's even more important to use stainless steel or hot-dipped galvanized fasteners with the new pressure-treated lumber.

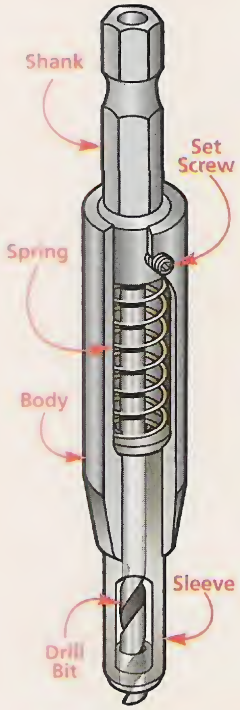
So what if you have a deck or swing set made out of CCA-treated lumber? Not to worry. According to the EPA, there is no need to demolish existing structures made from CCA-lumber. In fact, CCA-treated lumber can continue to be sold even after December 31 of 2003 (until the existing stock is depleted).



▲ *Green Wood.*
The chemicals used to treat the lumber leave it with a characteristic green hue which fades over time. But you can also purchase treated lumber that has been stained brown.

Tool Chest

Install hinges perfectly the first time with a set of drill bits that are inexpensive, indispensible, and dead-on accurate.

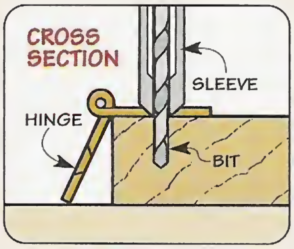


▲ *How It Works. The key to a Vix bit is a spring-loaded sleeve that slides into the body of the bit as you drill the hole.*

I'll never forget the first time I installed hinges on a project. After painstakingly laying out the position of the hinges on the door and cabinet, I used an awl to mark the location for the screws. Once I drilled the pilot holes and screwed the hinges in place, I swung the door closed — only to reveal uneven gaps around the edges and a corner that wasn't quite flush with the face of the cabinet.

The problem was the pilot holes for the screws weren't drilled perfectly centered in the hinge holes.

Vix Bit – Fortunately, that's not a concern since I started using a "tool" called a *Vix* bit (or self-centering drill bit). Now I can drill perfectly centered holes to just the right depth — every time.



A glance at the margin drawing reveals the secret to how this bit works. It's actually a drill bit wrapped by a spring-loaded mechanism that accomplishes three things.

First, there's a sleeve that automatically centers the bit over the hole in the hinge. The reason this works is that the end of the sleeve is beveled. This allows the bit to slip into the countersink in the hinge hole, centering the bit automatically (see Cross Section detail below). Second, as you drill the hole, the sleeve limits the bit to a specific depth. And third, the body has a set screw that allows you to adjust the drilling depth.

Setting the Depth – As I mentioned, the set screw in the side of the bit allows you to adjust the drilling depth. (Or easily remove the drill bit to sharpen or replace it.)

Setting the depth can be a bit tricky though. The problem is you need to depress the sleeve by hand (which isn't easy) and then measure the exposed bit.

Since this can be difficult, I find it easier to simply set the bit so it's flush with the end of the sleeve and then drill a test hole. Measuring the depth of the hole makes it easy to determine how much to adjust the drill bit. Simply loosen the set screw, reposition the bit, and then retighten the screw.

Size – One thing to keep in mind is that *Vix* bits come in different sizes to match the screws you're installing. I have a set of three *Vix* bits that handle #2 screws all the way up to #10 screws.

Cost – These bits cost about $7 to $10 apiece — or you can often buy them as a three-piece set and save a little. For sources, refer to the margin on the opposite page.

Shelf Pin Holes – One last thing. You can also get *Vix* bits that are large enough to drill holes for shelf pins (see box at left). All you need to decide is whether you want a bit for 1/4"-dia. holes or 5mm holes. (These larger shelf pin *Vix* bits cost anywhere from $25 to $30.)

Considering the time and effort that you put into building a project, the price of a *Vix* bit or two is well worth the cost since they pretty much guarantee perfect results.

Shelf Pin Template

With the larger Vix bits, you can drill holes for shelf pins. To do this, you'll need to make your own guide or use a commercial model with an indexing pin, like the one shown.

Sources

Miter Saw Table & Fence

■ The Miter Saw Table and Fence System on page 6 requires a few unique pieces of hardware you probably won't be able to find at your local hardware store or home center.

To solve the problem of rounding up all the hardware, *ShopNotes Project Supplies* has put together a kit that contains all the hardware you'll need to build the project including the T-track, through and studded knobs, T-nuts, flange bolts, carriage bolts, washers, and fasteners. All you need to supply is the hardwood and MDF, as well as hex bolts of the proper length for mounting your miter saw. To order, see the box below.

Table & Fence Kit
6867-100..............$28.95

Note: Similar style hardware is available from some of the sources listed in the margin.

Rotary Tool Storage Case

■ You won't have to round up much hardware for the Rotary Tool Storage Case on page 26. Other than some screws (detailed below), there are only three things you'll need.

Hinges – The first item is two pair of 1" x 1" zinc-plated butt hinges and mounting screws (#4 x $\frac{1}{2}$"). I picked up the hinges at a local hardware store.

Magnets – Instead of using a visible catch to hold the doors closed, I used "invisible" hardware. All it takes is a set of four $\frac{1}{4}$" x $\frac{1}{4}$" rod magnets from *Lee Valley* (99K36.01). Adding #6 x $\frac{1}{2}$" Fh woodscrews to each door provides a "catch" for the magnets.

Handle – Finally, to make it easy to carry the storage box around, I used a $\frac{9}{16}$" tool box handle from *Lee Valley* (00S03.20). You'll need four #6 x $\frac{1}{2}$" Rh woodscrews to attach it.

Mini-Lathe Stand

■ The Mini-Lathe Stand on page 14 requires a number of unique items besides your typical hardware.

Casters & Levelers – First, to make the cabinet solid, yet mobile, there's a caster *and* leveler installed at each corner.

The 3" casters we used swivel, *and* they're non-locking. *Lee Valley* carries the casters (00K27.10) along with the levelers (01S08.01). The nice thing about the levelers is they're easily adjusted from the top with an Allen wrench (see photo at right).

Casters and levelers similar to the ones we used are available from other sources (see margin).

Slides – To make it easy to reach the entire contents of the three drawers, they ride on full-extension, metal slides. (We used 16"-long black slides for the stand.) These types of slides are available at some home centers. Or you can order them from the sources listed in the margin.

Light – Finally, to put your turnings in a "favorable light," you can add the optional swing-arm lamp.

We found ours at a local office supply store. Or you can check out the lights available from *McMaster-Carr* (see margin).

MAIL ORDER SOURCES

Similar project supplies may be ordered from the following companies:

Lee Valley
800-871-8158
leevalley.com
Casters, Drawer Slides, Levelers, Rod Magnets, Tool Box Handle

McFeely's
800-443-7937
mcfeelys.com
Crosscut Blades, Drawer Slides, Knobs, Vix Bits

McMaster-Carr
630-833-0300
mcmaster.com
Casters, Lights

Reid Tool
800-253-0421
reidtool.com
Casters, Drawer Slides, Knobs

Rockler
800-279-4441
rockler.com
Casters, Drawer Slides, Flange Bolts, Knobs, Router Bits, T-Nuts

Woodcraft
800-225-1153
woodcraft.com
Drawer Slides, Flange Bolts, Knobs, Router Bits, T-nuts, Vix Bits

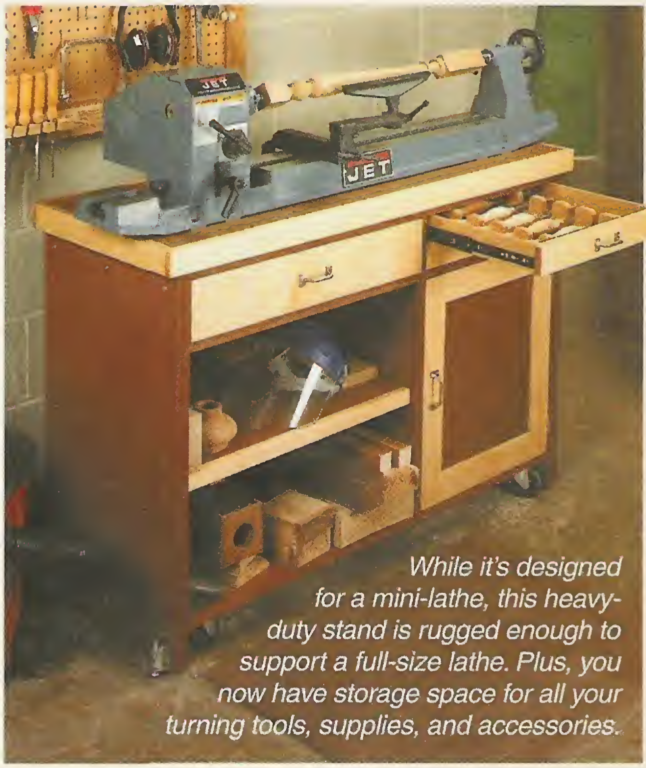
Woodsmith Store
800-835-5084
Crosscut Blades, Drawer Slides, Flange Bolts, Knobs, Levelers, Router Bits, T-nuts, Vix bits

Woodworker's Supply
800-645-9292
woodworker.com
Casters, Crosscut Blades, Drawer Slides, Router Bits

Scenes from the Shop

▲ *Set up shop just about anywhere with this portable rotary tool storage case. Bits are stored conveniently on slide-out trays that fit into the doors of the case. And drawers in the main case offer plenty of space for the rotary tool as well as a variety of other accessories. Detailed construction plans start on page 26.*

Our mini-lathe stand even works great as an all-around shop workstation. Since it's mobile, you can move it right where it's needed. For step-by-step instructions, turn to page 14.



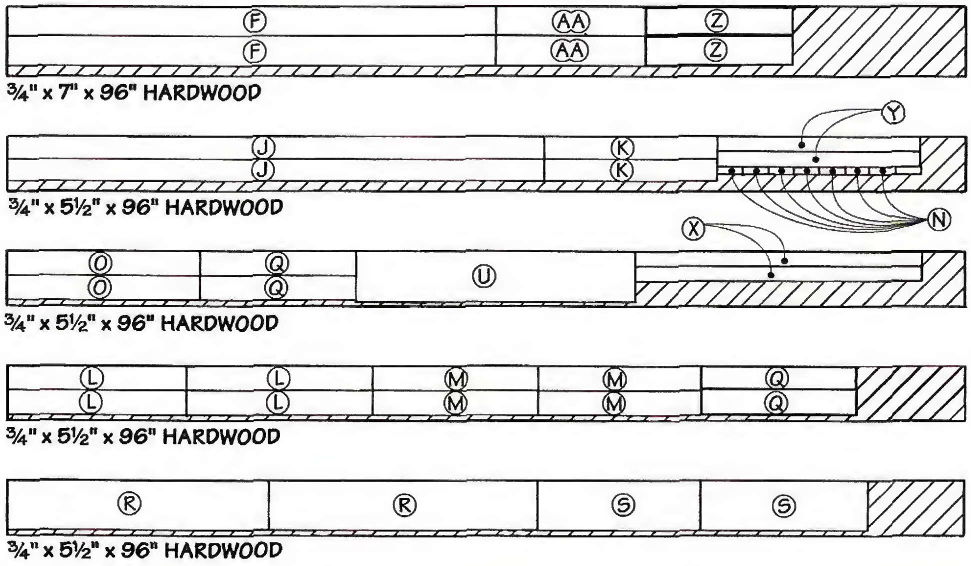
While it's designed for a mini-lathe, this heavy-duty stand is rugged enough to support a full-size lathe. Plus, you now have storage space for all your turning tools, supplies, and accessories.

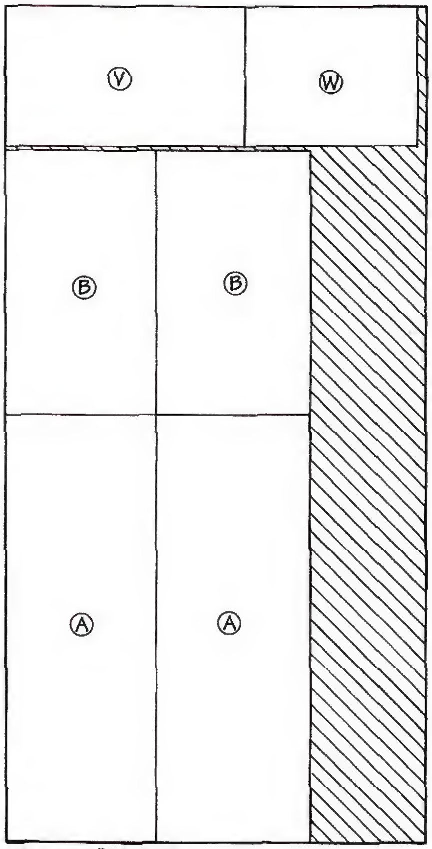
ShopNotes Cutting Diagram

Mini-Lathe Stand

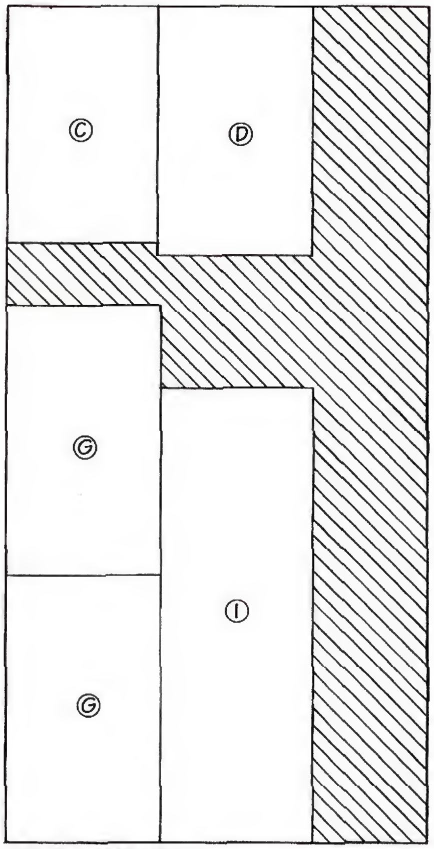
Materials

Case		R Lg. Drwr. Front/Back (2)	$1/2$ x 5 - 26$3/4$
A Top/Bottom (2)	17$3/4$ x 49$1/2$ - $3/4$ MDF	S Lg. Drwr. Sides (2)	$1/2$ x 5 - 16$1/2$
B Sides (2)	17$3/4$ x 31$1/4$ - $3/4$ MDF	T Lg. Drwr. Bottom (1)	16 x 26$3/4$ - $1/4$ Hdbd.
C Vertical Divider (1)	17$3/4$ x 27$1/4$ - $3/4$ MDF	U Lg. False Front (1)	$3/4$ x 5$1/8$ - 28$1/8$
D Large Horiz. Divider (1)	17$3/4$ x 28$3/4$ - $3/4$ MDF	V Large Shelf (1)	15$3/4$ x 28$1/8$ - $3/4$ MDF
E Small Horiz. Divider (1)	17$3/4$ x 20$1/2$ - $3/4$ MDF	W Small Shelf (1)	15$3/4$ x 19$7/8$ - $3/4$ MDF
F Stretchers (2)	$3/4$ x 3 - 49	X Large Shelf Edging (2)	$3/4$ x 1$1/2$ - 28$1/8$
G Side Panels (2)	18$1/8$ x 31$1/4$ - $3/4$ MDF	Y Small Shelf Edging (2)	$3/4$ x 1$1/2$ - 19$7/8$
H Back (1)	28$1/4$ x 50$1/2$ - $1/4$ Hdbd.	**Door**	
I Top Layers (3)	17$1/2$ x 52$1/2$ - $3/4$ MDF	Z Rails (2)	$3/4$ x 3 - 14$5/8$
J Front/Back Edging (2)	$3/4$ x 2$1/4$ - 54	AA Stiles (2)	$3/4$ x 3 - 20$5/8$
K Side Edging (2)	$3/4$ x 2$1/4$ - 17$1/2$	BB Panel (1)	14$5/8$ x 15$3/8$ - $1/4$ Hdbd.
Drawers & Shelves		**Dust Shield**	
L Sm. Drwr. Frts./Backs (4)	$1/2$ x 2$1/2$ - 18$1/2$	CC Top/Bottom (2)	4$1/2$ x 10 - $3/4$ MDF
M Sm. Drwr. Sides (4)	$1/2$ x 2$1/2$ - 16$1/2$	DD End (1)	4$1/2$ x 4 - $3/4$ MDF
N Gluing Blocks (8)	$3/4$ x $3/4$ - 2$1/2$	EE Back (1)	4 x 5$1/4$ - $1/4$ Hdbd.
O Sm. False Fronts (2)	$3/4$ x 2$1/2$ - 19$7/8$		
P Divider Strips (4)	2$1/2$ x 17 - $1/4$ Hdbd.		
Q Tool Supports (4)	$3/4$ x 2$1/2$ - 15$1/2$		

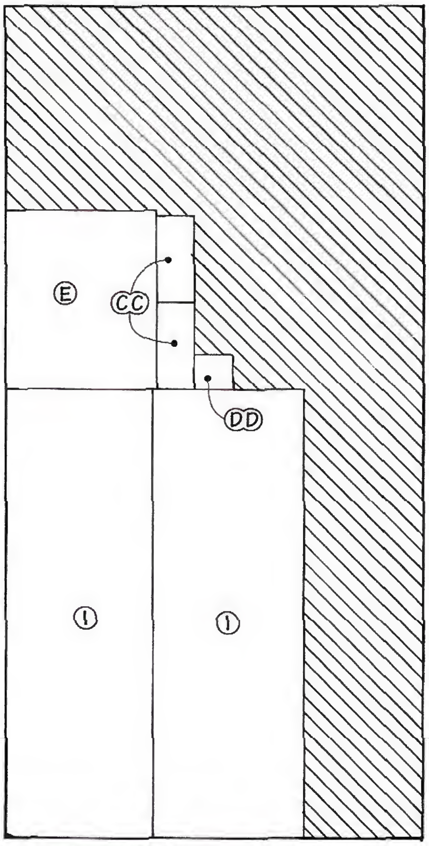




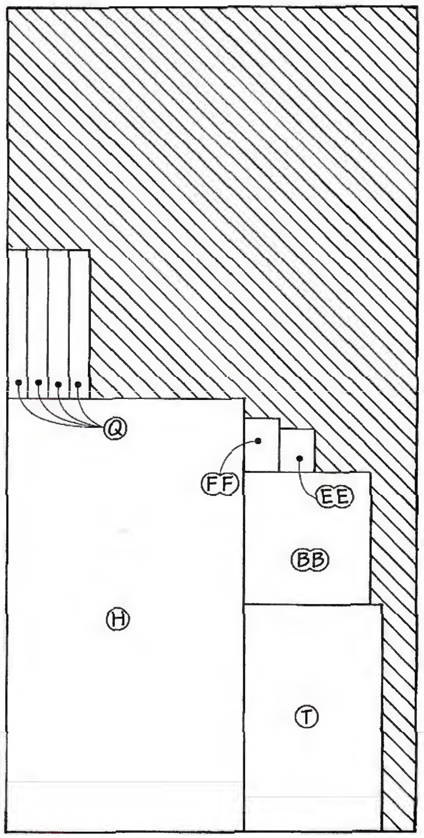
49 x 97 - ¾" MDF



49 x 97 - ¾" MDF



49 x 97 - ¾" MDF



48 x 96 - ¼" HARDBOARD

