

COLLECTOR'S EDITION:

CLASSIC SHOP JIGS & FIXTURES YOU CAN BUILD

**WOODWORKER'S
JOURNAL**

Winter 2004

WORKSHOP PROJECTS

**30 Great
Ideas
for the Shop**

**Build the
Ultimate
Panel Saw**

PLUS:

Sharpening Station

Box Joint Jig

Drill Press Tilting Table

Budget Workbench

Finishing Cabinet

Crosscutting Jig



**Fluting Jig
Absolute Accuracy!**

\$5.99 U.S.
\$7.99 Canada/Foreign

\$5.99 U.S. \$7.99 CAN

4 3 >

0 71486 02123 0

A Natural Progression to...



PROFESSIONAL



Titebond[®]

ORIGINAL
Wood Glue

Bonds Stronger Than Wood
Fast Set - Short Clamp Time
Water Cleanup & Non-toxic

WEATHERPROOF



Titebond

PREMIUM
Wood Glue

Excellent Water-resistance
Ideal For Exterior Applications
Strong Initial Tack - Fast Set

NET 8

The Best Wood Glue Ever

What makes Titebond® III Ultimate Wood Glue the best ever? It's waterproof, yet cleans up with water. It allows eight minutes of open assembly time and offers an application temperature as low as 47°F.



Plus it's vastly stronger, safer, easier to clean up and less expensive than polyurethane glues.

Titebond® III. We see it as a natural progression of tradition and excellence. You'll see it as the ultimate wood glue.

1-800-347-4583
www.titebond.com

Contents

Workshop Projects

Winter 2004



Page 20



Page 48



Page 26



Page 58



Page 34



Page 76



Page 64

6 Editor's Note

By Larry Stoiaken

Sometimes you just need to get away.

8 The Effective Workshop

By Chris Marshall

Set up your shop so it works right for you and your tools.

16 Adjustable Box Joint Jig

By Ralph Bagnall

20 The All-Purpose Shop Table

By Keith Hettinger

24 An Adjustable V-block Jig

By Dick Dorn

26 The Ultimate Sharpening Station

By Rick White

34 A Quick and Easy Band Saw Fence

By Dave Olson

36 Tilting Table for the Drill Press

By Jeff Greef

48 Shop-built Panel Saw

By Rob Johnstone

54 Build the Ultimate Fluting Jig

By Ralph Bagnall

58 Fire-retardant Finishing Cabinet

By David Larson

64 Building a Budget Workbench

By Rick White

72 Precision Crosscutting Jig

By Chris Inman

76 Craftsman's Toolbox

By Rick White

82 Shop Tricks

Some of the best tricks we've ever seen never make it out of the shop.

COLLECT DUST HERE.

OR HERE.



NOW
with remote control
and built-in timer!

PATENT PENDING



Dust is no friend to the serious woodworker. So let's clear the air and set the record straight. New canister dust collectors from JET feature exclusive V-Weave technology and filter dust that's 15 times as small as standard filters. Not only that, the new JET dust collectors have over six times the filtering capacity of standard units. The innovative canister design makes disposal easy. (No more messing with cloth bags.)

And because there is less air resistance with a canister filter, no matter which of the four models you choose – from 650 to 1,900 CFM – you'll get more suction than with a standard

dust collector. Which means you'll collect more dust in the collector. And less in your lungs. To find out more, visit your JET distributor, wmhtoolgroup.com, or call 800-274-6848.



J E T®

WMH TOOL GROUP, INC.

WINTER 2004

woodworkersjournal.com

LARRY N. STOIAKEN *Editor in Chief*

JOHN KELLIHER *Art Director*

ROB JOHNSTONE *Editor*

JEFF JACOBSON *Associate Art Director*

JOANNA WERCH TAKES *Associate Editor*

STEVE HINDERAKER *Photographer*

ANN ROCKLER JACKSON *Publisher*

JILL ARENS *Circulation Director*

KELLY ROSAAEN *Circulation Assistant*

SARAH M. GREER *Advertising &
Production Director*

ALLYSA TAUER *Advertising Assistant*

Special Projects Editor

CHRIS MARSHALL

Contributing Editors

MICHAEL DRESDNER

MIKE McGLYNN RICK WHITE

ADVERTISING SALES

J.F. Van Gilder Company

P.O. BOX 802405, Dallas Texas 75380

DAVID BECKLER david@jvgco.com

JIM VAN GILDER jim@jvgco.com

Phone: (972) 392-1892

Fax: (972) 392-1893

SUBSCRIPTION INQUIRIES

(800) 765-4119 or

www.woodworkersjournal.com

Write *Woodworker's Journal*, P.O. Box 56585, Boulder, CO 80322-6585. E-mail: woodworkersjournal@neodata.com.

Include mailing label for renewals and address changes. For gift subscriptions, include your name and address in addition to your gift recipient's.

BACK ISSUES & REPRINTS

Woodworker's Journal or *Today's Woodworker*

Call: (800) 610-0883

www.woodworkersjournal.com

Workshop Projects is published by Rockler Press Inc., 4365 Willow Dr., Medina, MN 55340. Single copy price, \$5.99 (U.S.); \$8.99 (Canada/other countries). Reproduction without permission prohibited.

Printed in the USA.

WEB SITE: www.woodworkersjournal.com
©2004 Rockler Press Inc., Printed in USA.

Get Away ... in Your Workshop

Most woodworkers I talk with don't think their shops are just a place to work. They're much more than that: a hideaway, a haven and sometimes, a castle. I'm not saying woodworkers are a highly unsociable lot nothing could be further from the truth. Sometimes a person just needs to get away. And the shop, with its familiar tools, allowable dust,



half-finished projects and very specific sense of place, allows us to "get away" right in the basement or garage of the rushed world we live in. And let me add; this is not a "guy thing." Women woodworkers profess the same sensibility about their shops as men.

If you're going to spend a lot of time in your shop, you might as well keep it humming. That's what this special issue will help you do. Workshop jigs and fixtures are all

about organization and efficiency. You'll find your tools faster, have better surfaces to work on and, with the right jigs, make fewer mistakes.

Here then, are a few favorites from the back pages of *Woodworker's Journal* and *Today's Woodworker* magazines. First, have a look at Ralph Bagnall's *Adjustable Box Joint Jig* on page 16 or Chris Inman's *Precision Crosscutting Jig* on page 72. No table saw should be without these ringer projects. If casework is your forte, be sure to add Rob Johnstone's *Shop-built Panel Saw* (page 48) to your "must build" list.

We've got a couple great jigs to hop up your drill press, too. Dick Dorn's *Adjustable V-block Jig* (page 24) and Jeff Greef's *Tilting Table for the Drill Press* (page 36) should have you covered, whatever drilling task comes along. Planning to do some resawing? Build Dave Olson's *Quick and Easy Band Saw Fence* (page 34) first. And routing fluted columns will be a piece of cake with the *Fluting Jig* shown on page 54.

This issue is also loaded with great shop fixtures, including a G. I.-approved *All-Purpose Shop Table* (page 20), a thrifty but solid *Budget Workbench* (page 64) and what truly is the *Ultimate Sharpening Station* (page 26). Or build Rick White's heirloom-quality *Craftsman's Toolbox* on page 76, just like our forebears used to make.

To order any of the hard-to-find hardware for these great shop projects, please check out the box on the *Pinup Shop Drawings* on page 39.



Larry N. Storaen

DURABILITY

ISN'T ALWAYS A PRETTY THING



The Hitachi power tool is crafted of the finest materials available, engineered to specifications unmatched, built with technology not found with any other manufacturer, designed to endure for years. Used by professionals and coveted by the novice...this, is the Hitachi power tool.



10 Amp
Reciprocating Saw
CR13V



12 Volt Impact Driver
w/ LED Job Light
WH12DAF



5/8"
Hammer Drill
FDV16VB2



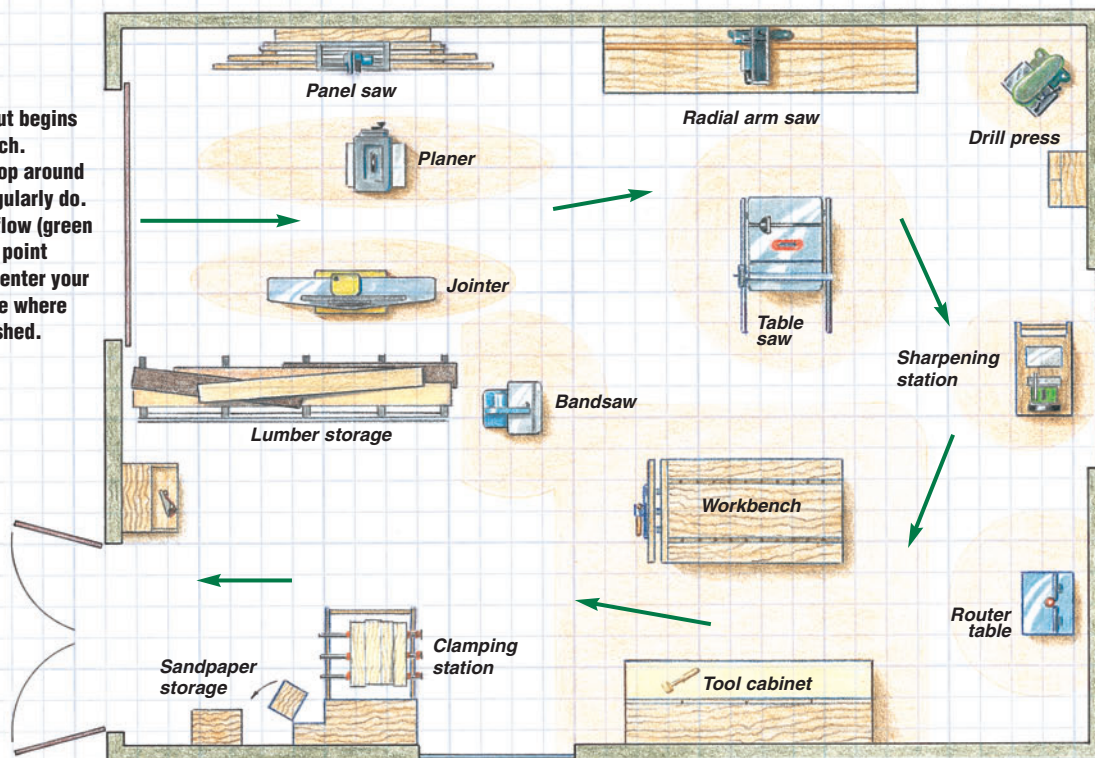
10" Slide Compound
Miter Saw w/ Laser Guide
C10FSH

HITACHI
Inspire the Next

Available Nationwide at



Better shop layout begins with a good sketch. Organize your shop around the tasks you regularly do. Design the workflow (green arrows) from the point where materials enter your shop to the space where projects are finished.



The Effective Workshop

By Chris Marshall

Creating a hard-working shop involves smart layout, the right kinds of organizers and some good old elbow grease.

What tops your shop wish list? Does “bigger” come to mind? If so, you’re in good company. Many woodworkers who write in tell us the same thing about their shops. Truth be told, there’s a certain New England plaid shirt celebrity with a workspace I’d trade for in a heartbeat... But that’s not a reality for me any time soon, and you’re probably in the same boat. Size up your shop, with its own unique limitations and restrictions, and you’re probably faced with that old poker adage about playing the hand you’re dealt. To some degree, we’re stuck with the workspaces we’ve got.

If you’re feeling like your shop isn’t a little slice of Eden to work in, it could be you’re not making the most of the space that’s already there. Maybe it’s high time to make your workshop “the next big project.” It probably won’t be as enjoyable as ripping into a fresh stack of maple or firing up a new router, but a few weekends spent assessing your layout, getting organized or tending to tool and machine maintenance could radically improve the way you work.

Lowdown on Layout

There’s no perfect shop layout that will suit every woodworker’s needs. Your style of work, the space you have to work in and the sheer volume of stuff you have to fit into your space all influence shop layout. However, it’s still worth the effort to put your shop under the “magnifying glass” from time to time to see if there are ways to improve efficiency and make your space work harder for you.

Scott Landis, a professional woodworker and author of “The Workshop Book” (The Taunton Press, 1998), says the first step to better order is to consider the way you work in your shop. Ask yourself the following questions: What kinds of operations do you perform repeatedly or only occasionally? How much wood do you use, and is it primarily lumber or plywood? How do materials flow through the shop from arrival and storage to the completed project?

continues on page 10 ...

If you want to rent tools



from trusted brands



that are professional-quality



and reliable



you can.

©2004, HOMER TLC, Inc. All rights reserved. See store for details. Tool rental available at most locations.

The Home Depot® is the most convenient place for all your equipment rentals.

We have better hours, more locations than anyone else, and the newest in professional tools from the most trusted names. And we always have Associates to help. You can get what you need and get back to work when you rent from The Home Depot. **You can do it. We can help.™**





Finishing guru Michael Dresdner maintains a separate clean area of his shop for applying finish. Not only does he get dust-free results this way, but it also allows him to keep finishing supplies, applicators and other cleaning solvents all within easy reach of the bench.

Take your answers to these questions a step further by drawing a birds eye sketch of your current shop that shows the location of all machinery, shelving and storage areas and workbench. Now use arrows to mark the path materials take from the raw stage through to that last brush stroke on the finishing table. Is there a logical traffic pattern, or do you crisscross the shop numerous times to complete a single task? Is your lumber rack close to the miter saw, table saw and jointer and planer—the machines you use to process it down from its heaviest and longest form into more manageable pieces? Are your clamps and fasteners located close to the workbench where you can get at

them easily during assembly? How many times do you have to move machinery from one place to another to set up the next steps when making parts?

Ideally, Landis says a workshop should function similarly to an efficient kitchen, where stages of food preparation happen in a “work triangle”—the imaginary footprint between sink, stove and refrigerator. Work triangles don’t literally have to be three points, but you should be able to move easily to various areas in your shop for completing a single task. Review your sketch and consider how you process a board from the moment you take it off the rack through the crosscutting and ripping phase. Look for ways to minimize backtracking, carrying and unnecessary lifting. If you spend most of your time at the bench, are the tools and materials you use most often within easy reach? How about sanding and finishing? There are work triangles here, too. Plan your shop triangles around these kinds of repetitive tasks with the goal of making your time and effort really count.

Getting Organized

It’s ten o’clock on a Saturday morning. Do you know where your block plane is? How about that chamfering bit you used last summer for the routing you need to do

continues on page 12 ...

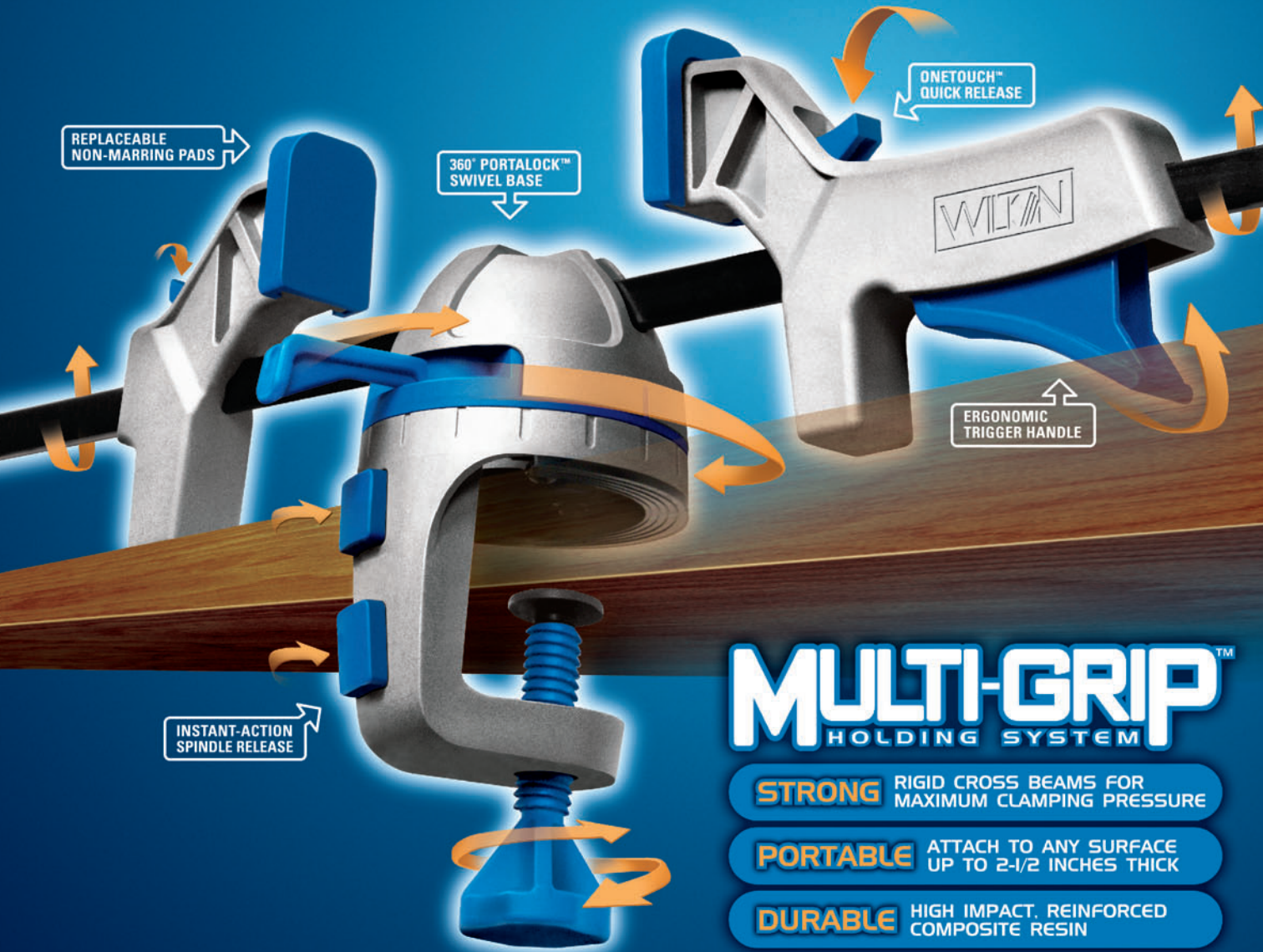


In the busy shop of contributing editor Mike McGlynn, sheet goods get knocked down to size using a commercial panel saw and the table saw soon after entering the shop. Smaller panels are easier for him to manage alone, which saves effort and leads to more efficient work.



An organized shop means different things to different woodworkers, as these two reader-submitted shop photos prove. The important thing is that you can find what you need easily, whether you’re surrounded by walls of stuff or you tuck everything away for a more minimalist approach.

GRIPPING BREAKTHROUGH



MULTI-GRIP™ HOLDING SYSTEM

STRONG RIGID CROSS BEAMS FOR MAXIMUM CLAMPING PRESSURE

PORTABLE ATTACH TO ANY SURFACE UP TO 2-1/2 INCHES THICK

DURABLE HIGH IMPACT, REINFORCED COMPOSITE RESIN

LIFETIME WARRANTY



VISE

BAR CLAMP

FREE STANDING

SPREADER

WORKSTATION

JOIN THE GRIPPING REVOLUTION!

To find MULTI-GRIP at a store near you, just call 1-800-519-7381
or visit www.wiltonmultigrip.com.





The author maximizes floor space in his cramped garage shop with the help of a two-sided, rolling lumber cart that also stores sheet goods and shorter offcuts in separate bins.

general neatness, frugality and work style influence storage habits, of course, but the kind of storage you have may be holding you back. After all, shop storage is more than just pegboard on the wall. To really get organized, you need several kinds of storage devices. Heavy-duty shelving is a necessity for storing boards off the floor where they'll stay dry and be easier to reach. The best lumber storage systems feature adjustable standards and brackets so you can change the spacing between shelves as your lumber quantities change. You also need a spot for storing scraps (not sized like a dumpster!) that you can actually find things in. Offcuts can come in handy, for sure, but make a pact with yourself to pitch or turn into kindling anything shorter than about 10"—you'll never miss these tidbits, and it's a good way to reduce extra clutter.

How about sheet goods storage? The ideal situation for keeping plywood flat would be to lay it horizontally, but who has that kind of room? More realistically, you'll need to store sheet materials on edge. Do you have space against a wall where you can walk full-sized sheet goods into your shop and simply slide them into place? Moving your lumber rack even 10" off the wall onto a free-standing rack could create a cubby for storing sheet goods neatly behind and out of the way.

An efficient shop needs a few shelved cabinets with doors for storing hand tools, small power tools, finishing supplies and other valuables that should be locked up or kept safe. (For a finishing supplies storage cabinet that even the fire marshal will love, see the project on page 58). All those nifty plastic carry cases

today? Could you find a 2" piece of oak dowel or a 1/4" brass flathead wood screw in under a minute? Think of how much more time you could spend actually woodworking if your tools and supplies were better organized and easier to find.

Many shops suffer from poor material storage, even when the shop layout is basically good. Your own



continues on page 14 ...



Imagine how much easier glue-ups would be if you could stow all your clamps, adhesives and fasteners into one convenient assembly cart like the one shown at left.

A Battery charging caddy is a great way to minimize bench clutter caused by cordless tools, batteries and all those chargers.

Don't Buy a Big Tiller For a Small Job!

If your garden is an acre or more, you may want to buy a big tiller. If it's any less, you should buy a Mantis Tiller/Cultivator. Big tillers till and weed 20" or more wide. The Mantis Tiller/Cultivator tills and weeds a practical 9" wide.

Big tillers weigh almost 300 lbs. The Mantis tiller weighs just 20 lbs.! Even turning a 300 lb. tiller in a backyard garden without running over crops (or yourself) is a challenge.

Costs Hundreds Less!

Most big tillers were designed to just till (but many now offer clumsy "add-on" attachments to try and justify their high cost.) The Mantis Tiller/Cultivator was designed from the beginning to precisely match a small, powerful engine to a variety of useful attachments for your yard and garden. Tiller. Cultivator. Furrower. Edger. Lawn Aerator. Lawn Dethatcher. Hedge Trimmer.

Most big tillers cost an arm and a leg. Despite the fact that the Mantis Tiller is a tough, durable, precision instrument... it costs a *fraction* of what you'll pay for a big tiller.

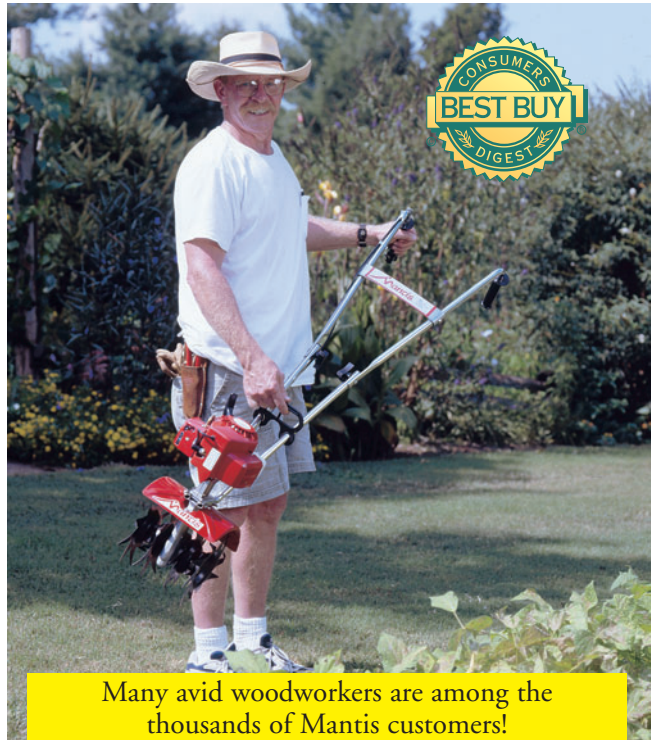
Look at the Warranty.

Most machines are *partially* covered for 90 days to a year. The Mantis Tiller/Cultivator's patented tines are *guaranteed forever against breakage*. If they ever break, return the broken one to us for a replacement. *The tiller unit is guaranteed for two years, from the date of purchase, against defects in materials or workmanship.*

If we didn't make such a fine machine,
we couldn't make such a fine offer.

- ♦ Easily weeds an average garden in 20 minutes.
- ♦ Does so many jobs...from lawn care to weeding...and more!
- ♦ Women and senior gardeners love the Mantis Tiller/Cultivator.
- ♦ Early order bonus (if you hurry).

The Best Buy Seal is a registered trademark of Consumers Digest Comm, LLC used under license



Many avid woodworkers are among the thousands of Mantis customers!

- ♦ **Patented tines guaranteed forever against breakage.**
- ♦ **Fun to use!** The Mantis Tiller/Cultivator is so much fun to use, gardeners everywhere love their Mantis Tillers.

The Mantis Promise

Try any product that you buy directly from Mantis with **NO RISK!** If you're not completely satisfied, send it back to us within one year for a complete, no-hassle refund.

For FREE VIDEO and Details call toll-free

1-800-366-6268

or mail the coupon today!

FREE Border Edger with Early Orders



Mantis
1028 Street Road
Dept MT6054
Southampton, PA 18966

- YES!** Please rush me **FREE VIDEO** and information on the Mantis Tiller/Cultivator and your **ONE YEAR NO-RISK TRIAL**. Tell me how I can get a **FREE BORDER EDGER** with my new tiller.

Name _____
Address _____
City _____
State _____ Zip _____

We Make Gardening Easier.®



that come with new power tools are great if you're a contractor on the go, but you can save loads of shelf or floor space by storing tools in a cabinet instead. Park those carry cases somewhere else, like the attic, until you need them. Or—take a deep breath—get rid of them altogether if they never get used.

Drawers are another handy and often underutilized storage system for workshops. An old multi-drawer kitchen cabinet or a rolling mechanics tool cart can be just the ticket for storing tool manuals, router bases, sharpening supplies, hand tools and other delicate instruments. While it's true that drawers can become magnets for clutter, if you put things back in the same drawer, you'll know just where to search first.

For smaller storables like fasteners and wood biscuits, nothing beats stackable plastic bins or large-

mouth lidded containers. Stack these items on shallow shelves and not more than two containers deep to keep your inventory visible. If you can see what you've got before you go shopping, you're less likely to end up with multiple half-full boxes of the same size screw.

If space is really tight, put your shop on wheels. Rolling machine bases make it easy to set up a work triangle in a flash, even if you typically work alone. Router tables and workbenches are more convenient to use when they're on wheels. A clamp cart is really handy if it can hold all manner of woodworking clamps and rolls right up to the workbench for project assembly. If you've got a garage shop, consider building a rolling lumber cart that you can wheel to your car for unloading plywood or new lumber arrivals. Your back will thank you in the long run.

The Shop Maintenance Calendar

Every Day (of use):

Empty shop garbage cans.

Clean out rag storage cans; put rags soaked with oil finish out to dry before tossing them.

Lubricate air-powered tools (nail guns, random-orbit sanders, etc.) and/or refill reservoirs on automatic oilers.

Every Week:

Clean sawdust from shop's floors and benches.

Drain moisture from compressor's air storage tank, pipes and manifold and filter/moisture trap(s).

Shake dust collector's filter bags to remove excess dust cake (more often if necessary).

Empty sawdust from dust collector bags or bins and shop vacuum (more often if necessary).

Touch up edges on chisels and plane irons.

Every Month:

Vacuum fine dust from tops of light fixtures and out of electrical outlets, switches and junction boxes.

Vacuum prefilters on air filtration devices.

Clean heavily used saw blades to remove pitch deposits. Inspect carbide teeth for chips or cracks.

Check the condition of the air filter and the oil level in

your compressor's pump (latter not required for oil-less models).

Test and reset ground-fault interrupt (GFI) outlets and circuits. Inspect power cords for signs of wear.

Twice a Year:

Inspect condition of machines and portable power tools: Lubricate gears and cranks as needed. Inspect the condition of motor brushes on handheld power tools and replace, if necessary.

Check fire extinguisher; recharge or replace if needed.

Change oil in air compressor pump (oil-less compressors exempt).

Treat stationary tool tops, metal tools, clamps, etc. with rust preventative coating.

Check compressed air system (tank, hoses, fittings) for leaks.

Inspect machine drive belts for wear and tighten them to remove extra slack.

Inspect central dust collection system's ductwork and flexible hoses for air leaks or clogs.

Check first aid kit for completeness; replenish supplies as necessary.

Sharpen or replace jointer and planer knives.

Go through the scrap bin and toss those tiny offcuts.

Keeping It All Shipshape

Efficiency means there's a place for everything and everything is in its place, but you'll also need to keep up with routine maintenance and general shop cleanliness. Here's where memories of your high school shop teacher and the business end of a long-handled broom may come to mind... But he was right: You'll do your best woodworking when the shop looks like you mean business and lets you get right down to it, so keep it swept up. We all know that blades, bits and cutters work best when they're pitch-free and honed to a keen edge. Maybe it's time for a marathon sharpening session soon. Dialing in those bevel cuts will be easier if your table saw arbor gears receive an occasional dab of paste wax to keep them meshing smoothly. Have you done this lately? If you want to buy another decade or two of time from your air compressor, drain condensation from the tank regularly to inhibit rust, just like the manual says. And now that wood dust is a suspected carcinogen, inspect and clean your shop vac and dust collection system often, not only to keep the dust down but also as a matter of personal health.

A few years ago, tool expert Sandor Nagyszalanczy wrote an excellent two-part series on shop and tool maintenance for *Woodworker's Journal*. If you didn't read these articles, it'd be worth your effort to order the back issues (April, June 2003). For Sandor's basic checklist of what to tend to and how often to tend to it, see the reprinted box on the facing page.

Why not make 2005 the "Year of the Shop?" Once you start making inroads toward better layout, organization and general tool and shop maintenance, I'll bet you spend more time woodworking than last year. Chances are, you'll be happier in the process.



Tool tune-ups don't have to be drudgery if you follow a regular maintenance schedule. It's also cheap insurance toward longer tool life.

Winter 2004

allprotools.com

full line of freud professional saw blades, router bits, and power tools

freud®

precisely what you need

Call today or place your order online
www.AllProTools.com
1-888-425-5776

WOW!

LOOK WHAT A TYPICAL TABLE SAW CAN DO.

Convert your table saw into a molder with the Magic Molder.

MAGIC MOLDER™

818.782.0226

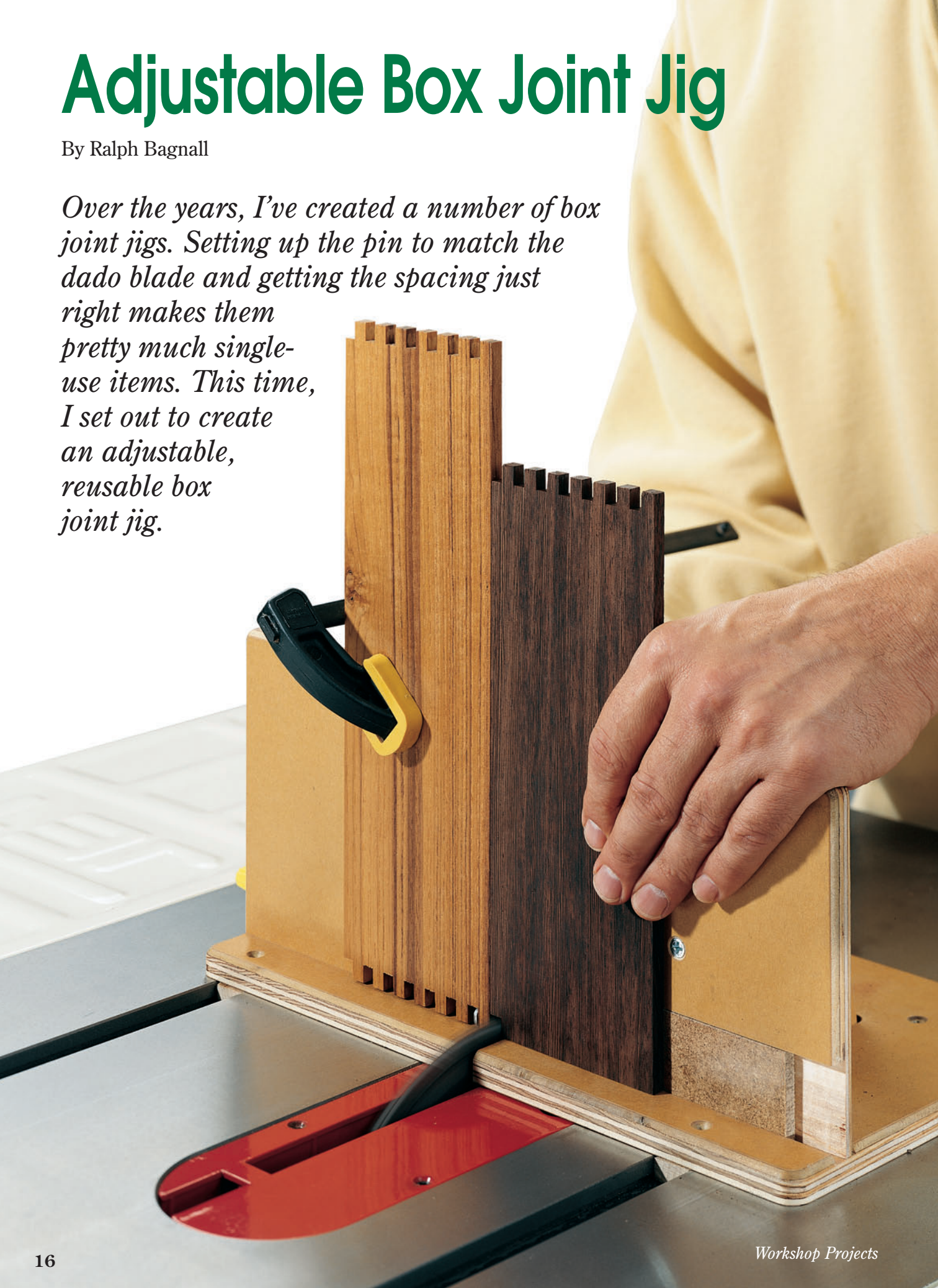
A Division of:
LRH
Enterprises, Inc.

9250 Independence Ave. Chatsworth, CA 91311 818.782.0226 or FAX 818.909.7602
Email: sales@lrhent.com Website: www.lrhent.com

Adjustable Box Joint Jig

By Ralph Bagnall

Over the years, I've created a number of box joint jigs. Setting up the pin to match the dado blade and getting the spacing just right makes them pretty much single-use items. This time, I set out to create an adjustable, reusable box joint jig.



Soon after I started designing my new adjustable box joint jig I figured out that having the pin precisely match the dado blade is unnecessary. The pin in my jig is quite thin, since only its leading edge is used to set the spacing. In addition, it's mounted on a sliding block, which allows me to make micro adjustments.

Machining the Parts

I cut the larger pieces of this jig out of 1/2" MDO. Shallow dado slots are milled into the base (piece 1) for the fence, braces, and sliding pin block (pieces 2 through 4). Two matching dados are cut into the rear face of the fence to receive the braces. The runners (pieces 5), which must fit snugly into your saw's miter slots, are cut next. I also cut openings in the braces to provide a safe place for my hands (see the *Drawings* on page 18).

The fence needs a wide slot to accept the replaceable backer (piece 6). The top of this slot is beveled to keep the backer in place. The bottom edge rides in the dado milled into the base. I used 1/4" hardboard for the backer. It is important that the face of the backer is flush with the face of the fence.

I made the hardwood parts out of maple. The sliding pin block has a rabbet on its bottom, creating a step that rides in the dado in the base; a 1/4" slot is milled through the block for the clamping screw (piece 7). Next, I drilled a 5/16" clearance hole in the base and counterbored it on the bottom. This hole houses the T-nut (piece 8), for the clamping screw. One end of the sliding pin block is drilled and tapped for the adjustment screw (piece 9), and the other end is mortised to accept the pin (piece 10). I made these cuts on a longer stick and trimmed the block off.

For hardware, you need a 1/2" x 3" reinforcing strap (for the

pin), a 1/2" x 1" corner strap, and about 12" of 1/4" #20 threaded rod with a few 1/4" #20 nuts. The corner strap simply holds the end of the adjustment rod, so one of the existing holes will need to be drilled out to 1/4". I opted to make my own knobs (pieces 11) for the threaded rods by screwing and gluing electrical connectors onto the ends.

If your dados are snug, you can dry-fit everything together. You are going to need to cut a notch in the fence to allow for index pin adjustment. Dry-fit all the parts except the pin, and mark the required opening. You also want to drill a hole in the right side brace for the threaded rod to pass through it.

Assembling the Jig

Now you can glue and assemble the jig. This is the time to add the runners for the miter slots. Set them into the miter slots, and use a square against the saw's fence to ensure the jig and runners are

square to the blade. For safety, I added a guard (piece 12) where the blade comes through the fence to keep the blade covered during use.

Using the jig couldn't be simpler. Set up your dado blade to the desired width. Slide the backer out of the way, loosen the clamping knob on the pin block, and turn the adjusting knob until the pin is the proper distance from the dado blade. Retighten the clamping knob and slide the backer up to the pin. Cut a pair of test parts. If the spacing is off, re-adjust the pin. From here on, the jig is used like any other box joint jig. When you use it again for a different spacing, simply trim off the cut end of the backer (you can do this several times) and slide it back into place.



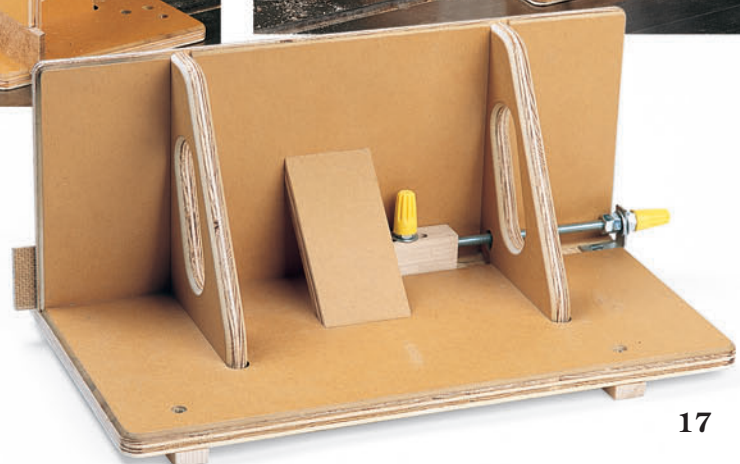
Drawings on next page...

Once the pin is adjusted, the first series of box joints can be formed (below).

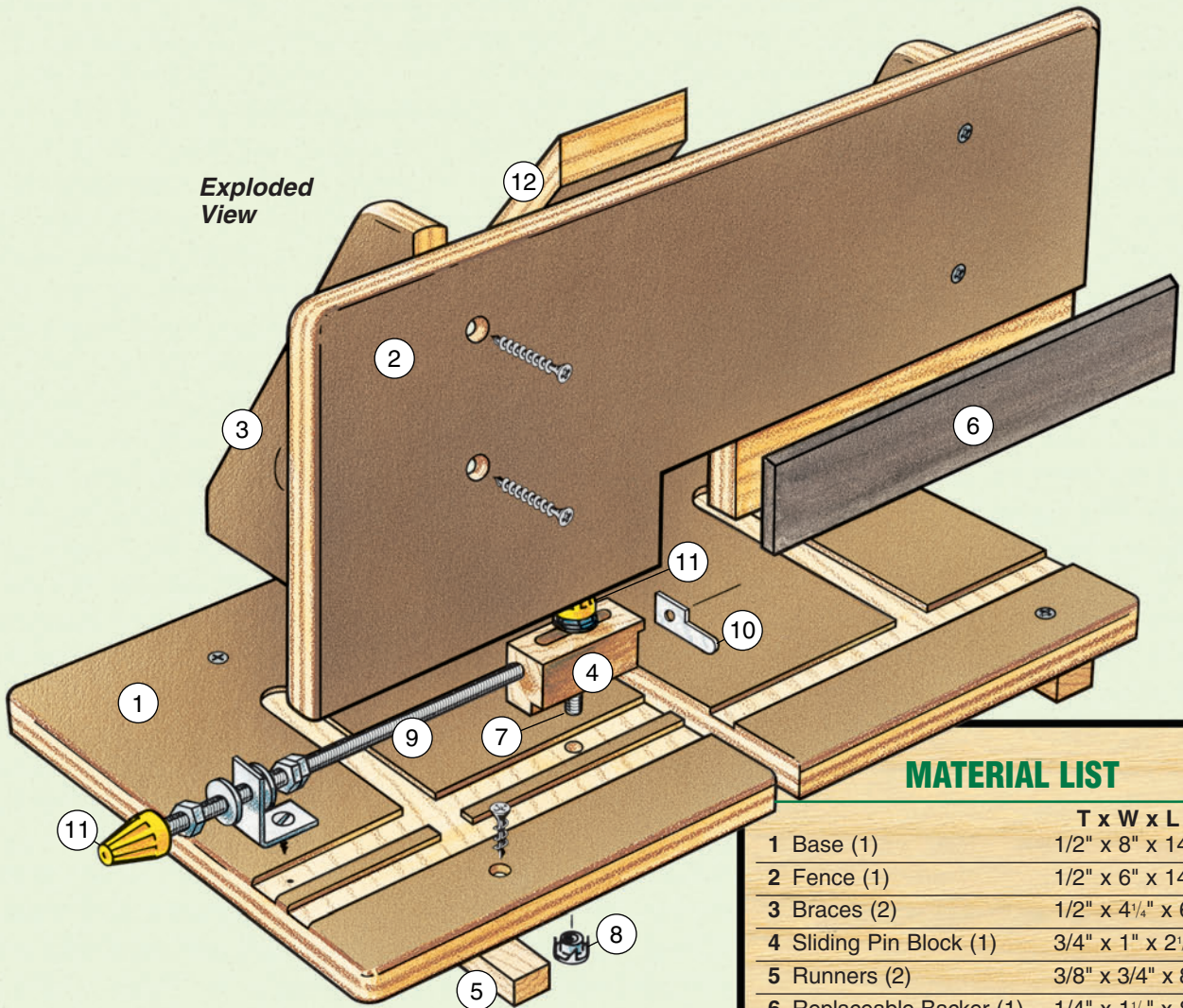
After the last cut, this piece is clamped in place and used to index the first cut on the joining side, as shown in the photo at right.



The author used electrical connectors (wire nuts) as knobs on his adjustment screws.



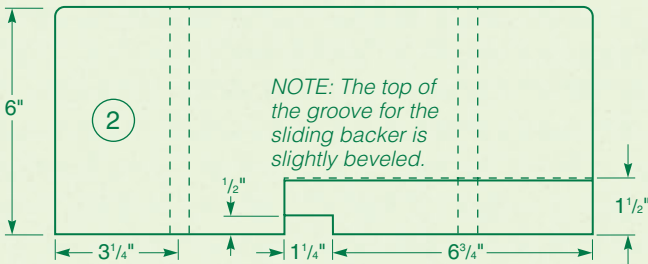
Exploded View



MATERIAL LIST

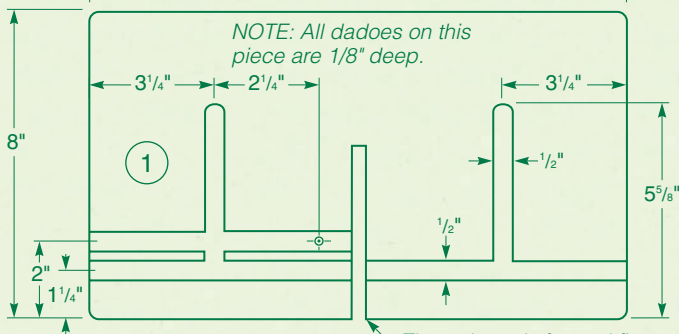
	T x W x L
1 Base (1)	1/2" x 8" x 14"
2 Fence (1)	1/2" x 6" x 14"
3 Braces (2)	1/2" x 4 1/4" x 6"
4 Sliding Pin Block (1)	3/4" x 1" x 2 1/4"
5 Runners (2)	3/8" x 3/4" x 8"
6 Replaceable Backer (1)	1/4" x 1 1/2" x 8"
7 Clamping Screw (1)	1/4" x #20 x 1 3/4"
8 T-nut (1)	1/4" x #20
9 Adjustment Screw (1)	1/4" x #20 x 5 3/4"
10 Pin (1)	Reinforcing strap
11 Knobs (2)	Electrical connectors
12 Guard (1)	1/2" x 2" x 4"

Fence (Front View)



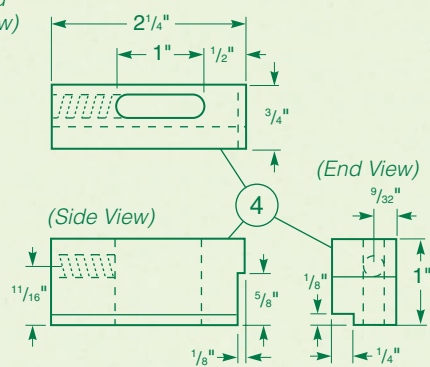
(End View)

Base (Top View)

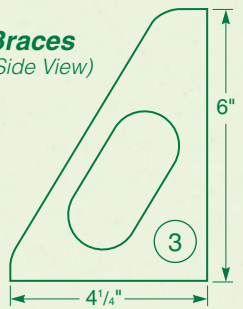


Through cut is formed first time jig is used.

Sliding Pin Block (Top View)



Braces (Side View)



The Toughest Glue On Planet Earth



Gorilla Glue is the versatile, interior/exterior adhesive ideal for most household fixes and building projects: furniture repair, crafts, woodworking, and general repairs around the house. Bonds wood, stone, metal, ceramic & more! Incredibly strong and 100% waterproof.



REQUEST YOUR FREE INFORMATION KIT!
www.gorillaglu.com
 1-800-966-3458

Save Money
Cutting
your own
wood!

Build your own:
Home
Stables
Furniture
Fencing
and more!

Distributor of
SIMONDS
Red Streak Bands

CALL NOW FOR YOUR FREE
CATALOG!

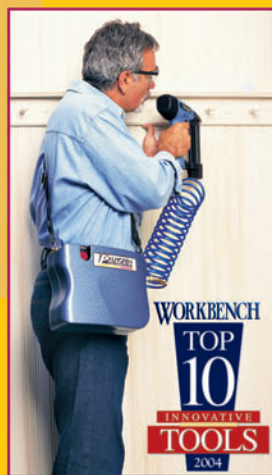
12 Volt
Head Up & Down
and
Forward & Reverse

MP-32 Package Deals
Available!



Cook's Saw Mfg., LLC
1-800-473-4804
www.cooksaw.com

PALMGREN INNOVATIONS



HIPSHOT® Portable Compressor

At only 6.6 lbs., this battery operated compressor is the ultimate in portability when used with a pneumatic-powered nailer or stapler. Great for contractors working on a punch list, general household projects, and for crafters. A Workbench Magazine Top 10 Innovative Tool for 2004!



dustup®

The patented chip and dust collection system that's built-in! More than just a bag, dustup is an impeller and duct system inside the tool to collect wood debris and deposit it into a 30 micron bag. Most Palmgren woodworking tools include a dustup chip and dust collection system for a cleaner & safer woodworking shop— look for the dustup logo!



turnmax®

Turnmax is an innovation found on many Palmgren tools. It's a Variable Speed Drive that delivers full working power at all speeds—even under full load at low speeds!



PALMGREN

The standard for quality
since 1919

800-621-6145

fax: 773-265-5740

email: sales@palmgren.com

www.palmgren.com

The All-Purpose Shop Table

By Keith Hettinger

One sheet of plywood is all it takes to expand your bench space.

You may hear a different story about the brass at the Pentagon, but our guys in uniform sure know how to squeeze a dime for all it's worth. As a GI during World War II, the author helped build thousands of these all-purpose tables at bases throughout the south Pacific. The design calls for only one sheet of 4 x 8 plywood and, judging from the plywood cutting diagram on the next page, every inch gets used short of the sawdust left on the ground.



Step 1: After cutting the plywood into sections (see *Plywood Cutting Diagram*, next page), follow the layout to cut the individual pieces to size.



Step 2: Make a tapering jig from scrap wood, as shown in the *Taper Jig Layout* drawing on the next page, and rip the leg panels to size and shape.



Step 3: Drill counterbored pilot holes in the wider leg pieces, then glue and screw the legs into four corner brackets. Glue plugs into the counterbores.



Step 4: Glue and screw the aprons to the leg brackets, making sure to secure the end aprons first to get the correct overlap at the corners.

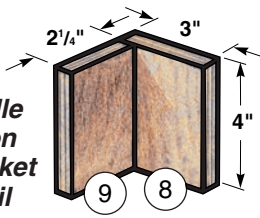


Step 5: Assemble the pieces for all the support brackets and install the middle apron. Next, mount the remaining brackets to the aprons with screws.

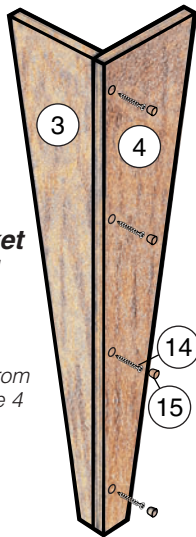


Step 6: Band the top with walnut and lay it on your workbench. Position the base on the top, check for squareness and screw the base to the top. Sand and finish with paint or varnish.

Middle Apron Bracket Detail

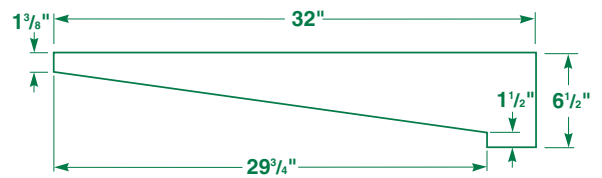


Leg Bracket Detail

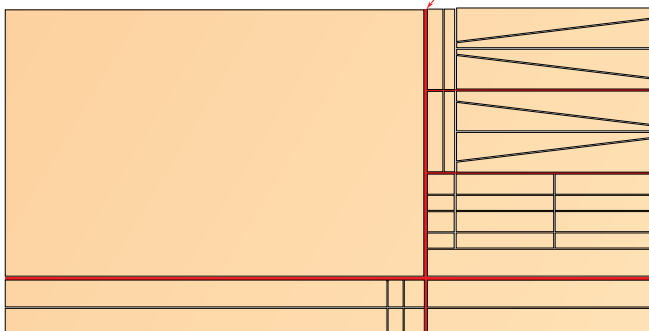


Note: piece 3 tapers from 4 1/4" to 3/4", and piece 4 tapers from 5" to 1 1/2".

Taper Jig Layout



Plywood Cutting Diagram



Cut your 4 x 8 sheet of plywood into manageable sections following the red lines, beginning with the line labeled first cut.

MATERIAL LIST

	T x W x L
1 Top (1)	3/4" x 39 3/4" x 62 1/2"
2 Walnut Banding*	1/2" x 3/4" x 22'
3 Legs (4)	3/4" x 4 1/4" x 29 3/4"
4 Legs (4)	3/4" x 5" x 29 3/4"
5 End Aprons (2)	3/4" x 4" x 33 3/8"
6 Side Aprons (2)	3/4" x 4" x 57"
7 Middle Apron (1)	3/4" x 4" x 33 3/8"
8 Middle Apron Supports (4)	3/4" x 3" x 4"
9 Middle Apron Supports (4)	3/4" x 2 1/4" x 4"
10 Side Supports (4)	3/4" x 3" x 14 1/2"
11 Side Supports (4)	3/4" x 2 1/4" x 14 1/2"
12 End Supports (2)	3/4" x 2 5/8" x 12"
13 End Supports (2)	3/4" x 1 5/8" x 12"
14 Screws (100)	#8-1 1/4"
15 Oak Plugs (16)	3/8" Dia.

*Optional

ROCKLER®

WOODWORKING AND HARDWARE



Build up to 15 different sizes of work stations
with our multi-function shop stands!



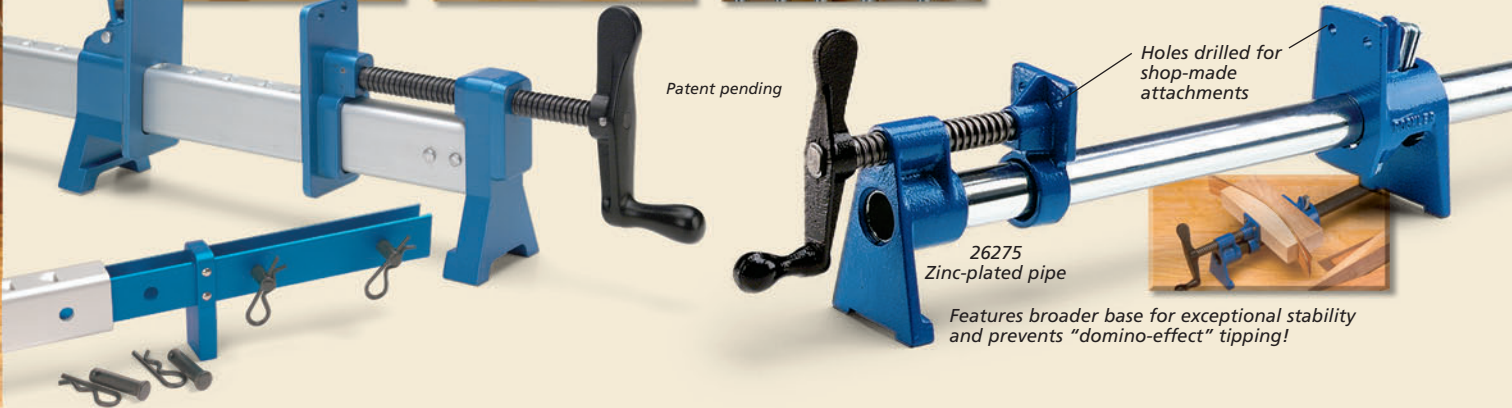
Our plans, kits and fixtures will make your shop a safer
and more efficient place to work!

Call **1-800-403-9736** or go to **Rockler.com/go/V377**

Woodworking supplies and tools to help make your shop safer, more productive and enjoyable



Rockler Innovation! The Sure-Foot™ bar and pipe clamps have unbeatable stability with a wider, higher base.



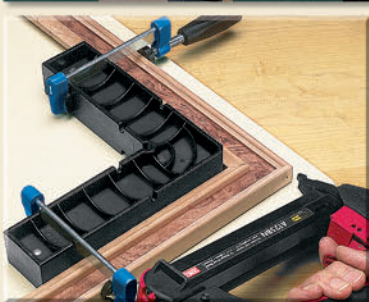
Patent pending

Holes drilled for shop-made attachments

26275
Zinc-plated pipe

Features broader base for exceptional stability and prevents "domino-effect" tipping!

Rockler Exclusive! Our jigs and jig-making components allow your shop work to be faster, safer and more accurate.



for your **FREE catalog** today!

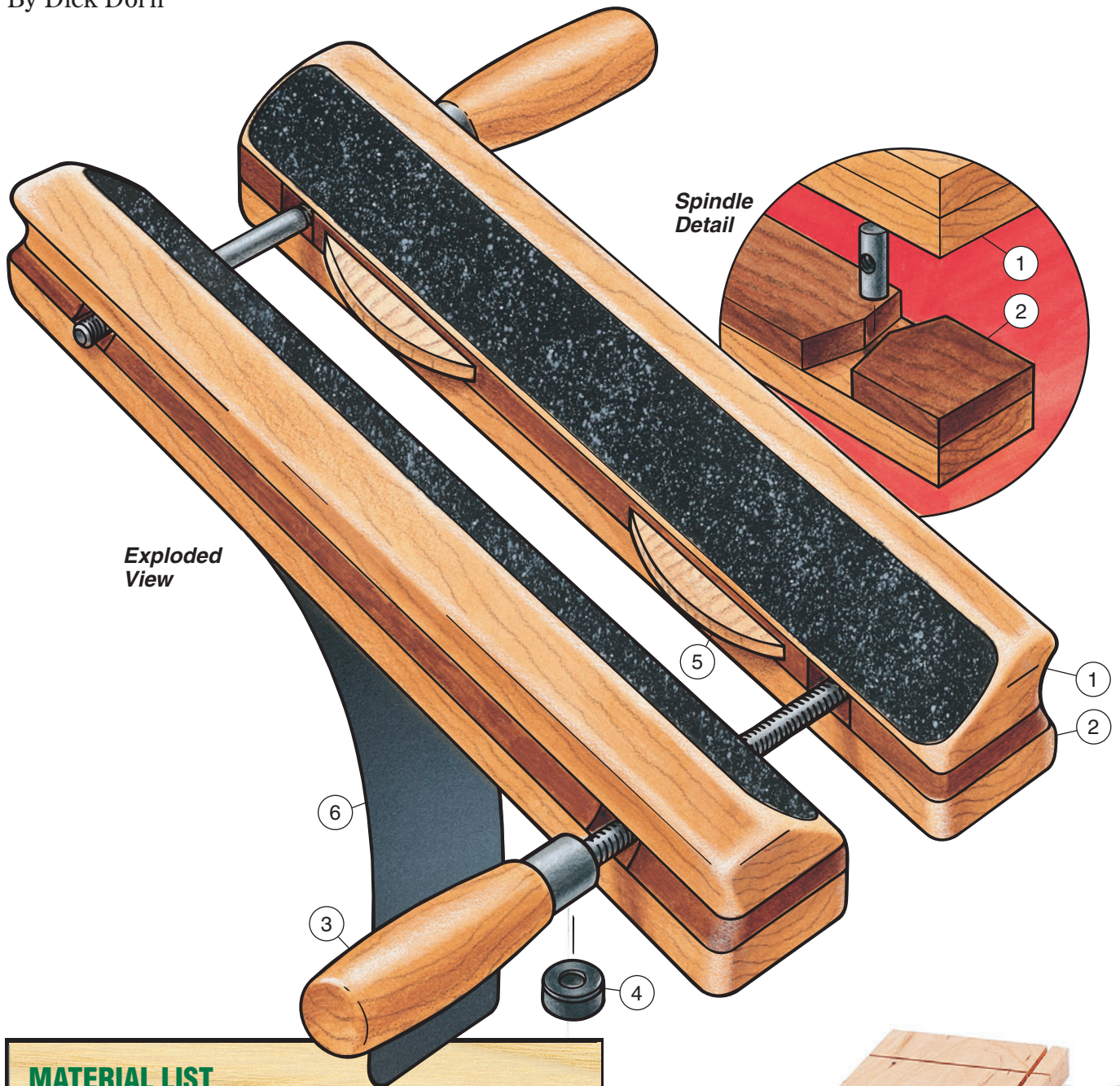
Code 75000

PHONE: 1-800-275-4441 Catalog code: FOOT: 1-877-ROCKLER Your nearest retail store: NET: www.rockler.com Order online

An Adjustable V-block Jig

Drill holes into edges, tapers or spindles with confidence using this hand screw-style drill press jig.

By Dick Dorn



Exploded View

Spindle Detail

MATERIAL LIST

	T x W x L
1 Jaw Tops (2)	1 1/4" x 2" x 14" (5/8" Maple)
2 Jaw Bottoms (2)	1" x 2" x 14" (5/8" Maple + 3/8" Walnut)
3 Handscrew Kit (1)	6" Maple handles
4 Ring Magnets (18)	3/8" x 3/4" Dia.
5 Biscuits (2)	1/4" x 2 1/2" x 1" Maple
6 No-skid Tape	2" x 5' roll stock

When I designed my adjustable V-block jig, it was with the mindset that this would be the last one I'd ever build. In practice it works similar to a hand screw clamp, but I think you'll find this jig to be considerably more versatile. Ring magnets are embedded in the bottom to hold your work steadily in place and the jaws open up to accept just about any size material you'll need to drill. Finally, no-skid tape ensures that your piece will stay put while you're busy drilling. Check the pinup shop drawings at the center of the magazine for the various drilling locations.



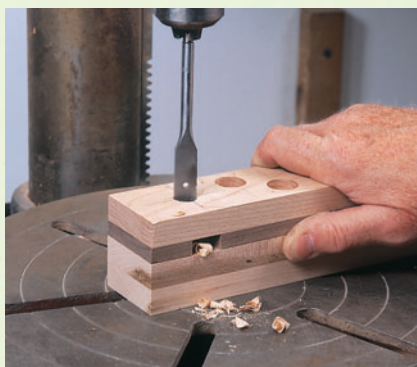
Drilling into edges and corners is easy with this magnetic V-block jig. The jaws can be opened to suit tapered or parallel edges, and no-skid paper holds spindles firmly in place.



Follow the Usual Drill to Build This Jig



Step 1: Glue up two pieces of 5/8" maple for the jaw tops and a piece of 5/8" maple and 3/8" walnut for the bottoms. Use the full size pattern on the *Pinup Shop Drawings* to lay out holes for the magnets and spindle nuts, and a Forstner bit to complete the drilling.



Step 3: Glue the top laminations to the bottom laminations and extend the spindle nut holes into the tops. Now take a couple of passes with a biscuit joiner to cut the slots for the biscuits and wrap up this step by securing the magnets with epoxy.



Step 5: Clamp an auxiliary fence at an angle to the table saw top and use scrap wood to establish the angle for the cove cut before cutting your project parts. To determine the exact fence angle, try raising the blade and sighting down the end of the blocks.



Step 2: Set the miter fence to about 5° when defining the walls of the spindle tracks (see full size pattern). This shape will keep the track a little wider at the edges than in the middle and help to prevent binding during use.



Step 4: Transfer the end view of each jaw to your workpiece and cut the 45° angles on the tops with the magnets riding along the rip fence. Switch to a router with a 1/2" roundover bit to soften the top edges and ends of each of the jaws.



Step 6: Glue the biscuits in place and insert the two nuts. Apply the no-skid tape and trim the excess. Sand thoroughly and apply a few coats of finish over everything, including the tape. Wrap up by inserting the spindles and the two handles.

The Ultimate Sharpening Station

By Rick White



Over the long haul, sharp tools will save you money and improve your craftsmanship. They're also a lot safer to use. Isn't it about time such an important aspect of your craft got the attention it deserves?

When I look back over the years, I notice a strong correlation between the time woodworkers spend in the shop and the shape of their tools. Novices rarely sharpen, while the pros are almost fanatical about slurries, grits and bevel angles. During my quarter of a century as a professional woodworker, I've accumulated most of the elements of a great sharpening station. Trouble was, they were so widely scattered around the shop that an otherwise calming activity — sharpening — was becoming more and more of a headache. When it took the better part of an hour recently to find all the things I needed to tune up a plane, I knew it was time to build them a home.

Start with the Carcass

Melamine-coated particleboard is a great choice for the carcass of this station because it's durable, inexpensive and resistant to the fluids involved in sharpening. It's heavy, too, and this extra weight doesn't hurt; the station needs to be solid to absorb the vibrations of machines and the elbow grease of a determined woodworker.

Begin construction by cutting parts to the dimensions shown in the *Material List* on the next page. After counterboring and predrilling for the screws (see the *Pinup Shop Drawings* starting on page 39 for locations), glue and screw the side bottom trim (pieces 1) to the bottom edge of two of the sides (pieces 2). Use three 2" screws (pieces 3) in each piece of trim.

The remaining side serves as a center divider and is attached to the bottom (piece 4) with screws. Lay out and predrill the countersunk holes in the bottom as shown in the *Pinup Shop Drawings*. Before attaching it, bore countersunk holes through two faces of the divider cleat (piece 5) and mount it to the back end of the divider, as shown on the *Exploded View* on the following page. Attach the center divider to the bottom, using care to keep the pieces square.

Next, glue and clamp trim (pieces 6 and 7) to the side and bottom edges of the back (piece 8). Now, with the T-shaped subassembly on a large flat surface, glue and clamp both sides to the bottom.

After the glue cures, glue and clamp the back to the sides and the bottom. Next, make sure the center divider is perfectly square within the cabinet cavity and drive screws into the back through the remaining holes in the divider cleat. To keep the assembly from moving, attach a temporary cleat across the top of the three sides. You can remove it once the face frame is in place.

Melamine

If you happen to have a chemistry lab attached to your shop, heat up a bucket of dicyandiamide and you'll have the chief component for making melamine resin. Add formaldehyde and you're on your way to a nice laminated plastic. Now all you have to do is impregnate some Kraft paper with phenolic resin and bond it to your melamine layer.

Too much? The alternative is to walk into a building supply center and ask for melamine board. They'll show you a stack of particleboard with a plastic covering that works great for projects like this sharpening center. Melamine comes in several colors and is sold oversized at 49" x 97" to allow for trimming.

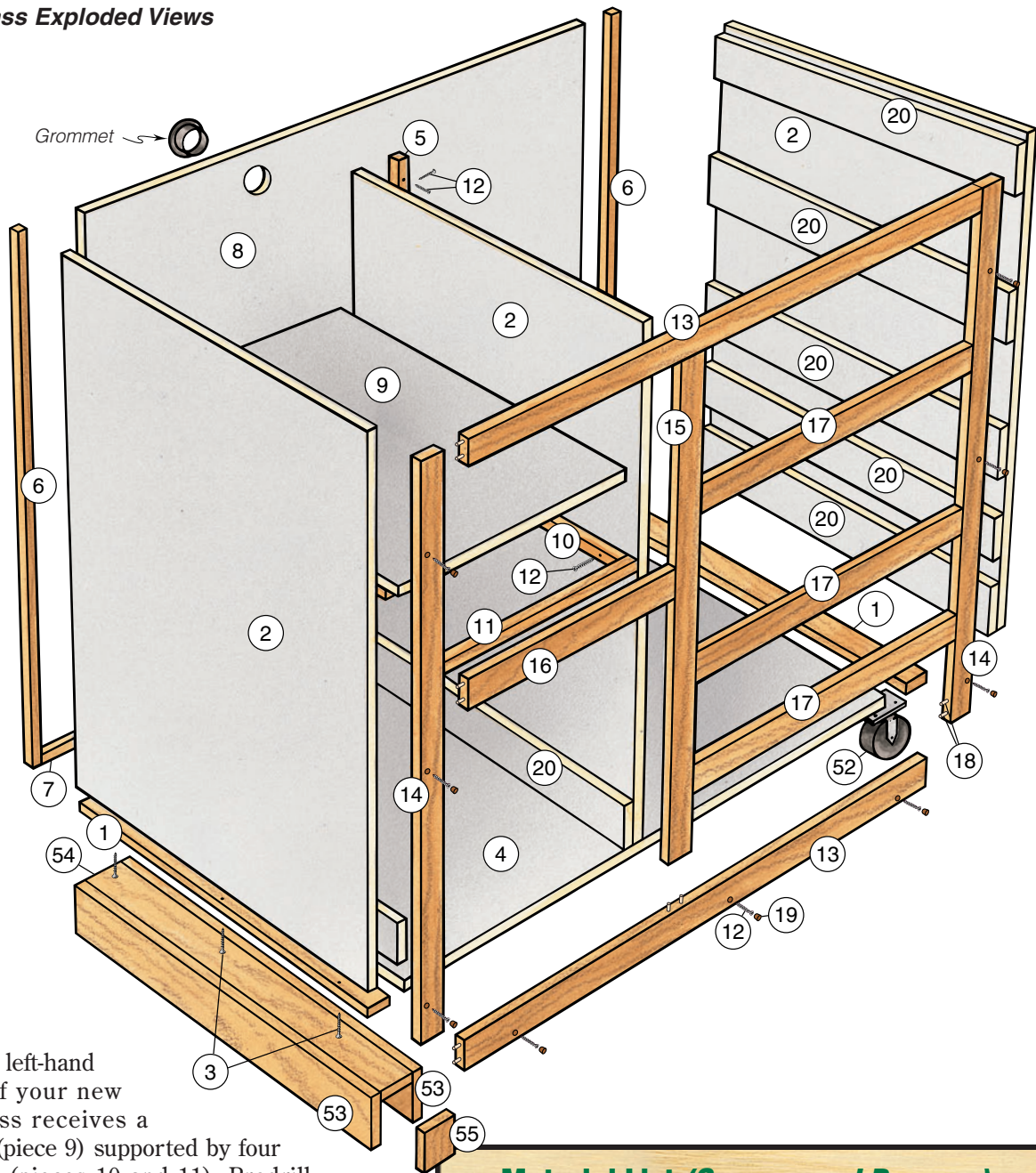
Four Steps to Chip-free Cutting

1. Use a zero-clearance insert.
2. Cut pieces slightly oversized.
3. Use a straightedge and a sharp knife to score the material at the exact size you need.
4. Put a carbide plywood-cutting blade (very slight set on the teeth) in your table saw and cut to exact size.



A zero-clearance insert is the real key to creating clean, chip-free edges when cutting melamine-coated materials on a table saw.

Carcass Exploded Views



The left-hand bay of your new carcass receives a shelf (piece 9) supported by four cleats (pieces 10 and 11). Pre-drill three of the cleats for 1¼" screws (pieces 12) at the locations shown on the *Pinup Shop Drawings*, then fasten the cleats in place. Drive screws up through the cleats to secure the shelf. The last cleat will be attached to the face frame later.

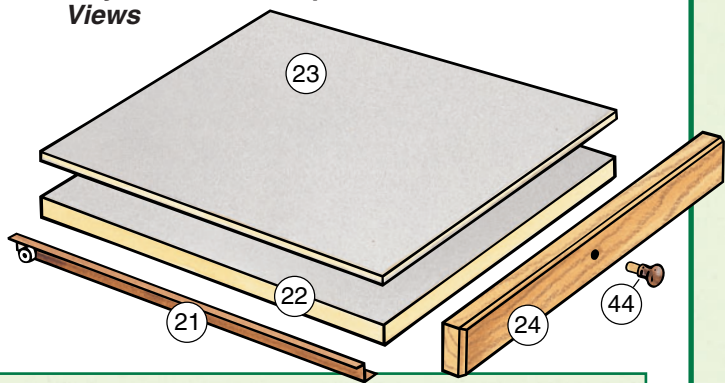
The Face Frame

With the rough treatment this sharpening station will receive over the years, it made sense to construct the face frame (pieces 13 through 17) out of a tough hardwood. I chose white oak because of its durability and good looks. All the joints are simple butts, each kept in line with a pair of 3/8" fluted dowels (pieces 18). Dry-fit all the

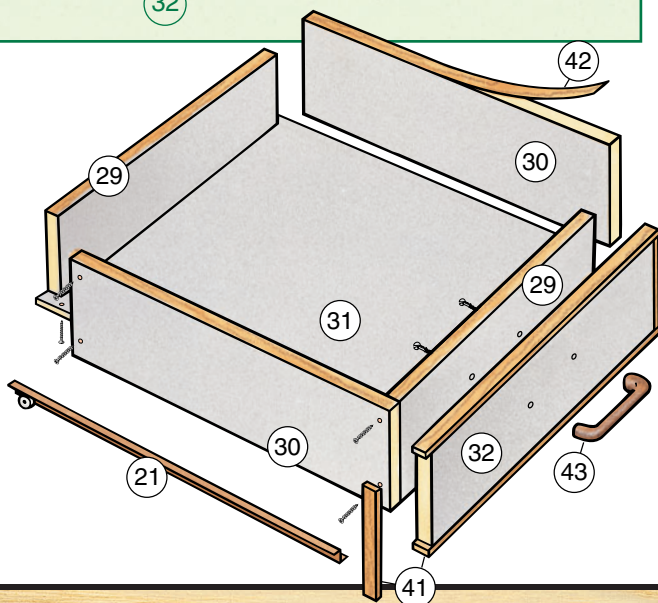
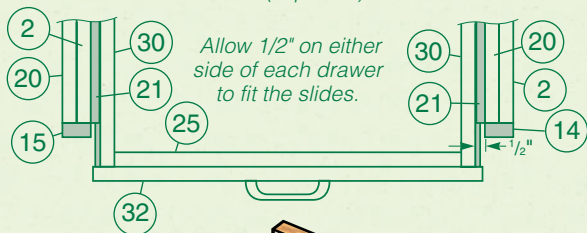
Material List (Carcass and Drawers)

	T x W x L
1 Bottom Trim, Sides (2)	3/4" x 1½" x 24"
2 Sides (3)	3/4" x 24" x 28½"
3 Large Screws (50)	#8 x 2"
4 Bottom (1)	3/4" x 24" x 35½"
5 Divider Cleat (1)	3/4" x 3/4" x 28½"
6 Back Trim, Sides (2)	3/4" x 3/4" x 29¼"
7 Back Trim, Bottom (1)	3/4" x 3/4" x 37"
8 Back (1)	3/4" x 28½" x 37"
9 Shelf (1)	3/4" x 14½" x 24"
10 Shelf Cleats, Sides (2)	3/4" x 3/4" x 22½"
11 Shelf Cleats, Front and Back (2)	3/4" x 3/4" x 14½"
12 Small Screws (50)	#6 x 1¼"
13 Frame Top & Bottom Rails (2)	3/4" x 1½" x 35½"
14 Frame Side Stiles (2)	3/4" x 1½" x 29¼"
15 Frame Middle Stile (1)	3/4" x 1½" x 26¼"

Tray and Drawer Exploded Views



Drawer Slide Detail (Top View)



How to Install Drawer Slides

This sharpening station uses Blum's low profile 3/4 extension slides. This all-purpose, bottom mounted steel slide features an epoxy coating and is self-closing, a nice feature on a project like this. Rated at up to 100 pounds per drawer, this is one of the easiest slides on the market — just follow the four steps below. Remember, you'll need 1/2" on each side of the drawer to accommodate your slides.



1. In the case of this sharpening station (and many other cabinet projects), spacer blocks are installed to provide a mounting surface flush with the face frame.



2. Once the spacers are installed, use your drill to mount the inside slide component to the bottom edge of your drawer bottoms. Be sure to drill pilot holes first.



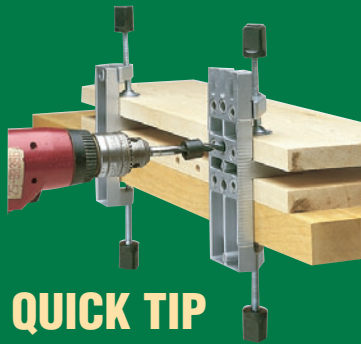
3. With the drawer components in place, move on to the casework components and mount them to the spacer blocks or cabinet sides, predrilling your pilot holes.



4. Locate the drawer fronts on the drawers. An old trick is to use double-sided tape to tack the drawer face in place before you secure it with screws.

	T x W x L
16 Frame Left Rail (1)	3/4" x 1 1/2" x 13"
17 Frame Right Rails (3)	3/4" x 1 1/2" x 21"
18 Frame Dowels (26)	3/8" Fluted
19 Trim Plugs (26)	3/8" Oak face grain
20 Drawer Spacers (7)	3/4" x 2 1/2" x 20 5/8"
21 Drawer Slides (6 pairs)	22" Blum 3/4 extension
22 Tray (1)	3/4" x 20" x 23 1/4"
23 Tray Liner (1)	1/4" x 20" x 23 1/4"
24 Tray Front (1)	3/4" x 1 1/2" x 20 5/8"
25 Left Drawer Front & Back (2)	3/4" x 14" x 10 1/2"
26 Left Drawer Sides (2)	3/4" x 14" x 22"
27 Left Drawer Bottom (1)	1/4" x 12" x 22"
28 Left Drawer Face (1)	3/4" x 12 1/2" x 14 1/2"
29 Upper Drawer Front & Back (2)	3/4" x 4 1/2" x 18 1/2"
30 Upper Drawer Sides (2)	3/4" x 4 1/2" x 22"

	T x W x L
31 Upper Drawer Bottom (1)	1/4" x 20" x 22"
32 Upper Drawer Face (1)	3/4" x 5 3/4" x 20 1/2"
33 Large Drawer Front & Back (2)	3/4" x 6 1/4" x 18 1/2"
34 Large Drawer Sides (2)	3/4" x 6 1/4" x 22"
35 Large Drawer Bottom (1)	1/4" x 20" x 22"
36 Large Drawer Face (1)	3/4" x 7 1/2" x 20 1/2"
37 Small Drawer Fronts, Backs (4)	3/4" x 1 3/4" x 18 1/2"
38 Small Drawer Sides (4)	3/4" x 1 3/4" x 22"
39 Small Drawer Bottoms (2)	1/4" x 20" x 22"
40 Small Drawer Faces (2)	3/4" x 2 1/2" x 20 1/2"
41 Drawer Face Trim (1)	1/4" x 3/4" x 26 1/4"
42 Drawer Edge Tape (1)	1/32" x 3/4" x 38 1/2"
43 Drawer Pulls (5)	Wood
44 Drawer Knob (1)	Wood



QUICK TIP

Dowels are easier to use for joinery if you have a way to place them accurately. Fixtures like the Dowel Pro Jig are a slick and easy way to use dowels like a pro.

parts according to the layout shown on the *Pinup Shop Drawings*, test their fit on your assembled carcass, and, when everything looks right, glue and clamp your frame together. Note: *The right edge of the center stile lines up flush with the right face of the center divider.* Make sure the frame remains flat and square during clamping.

Let the glue dry overnight, then remove the clamps and sand the frame smooth. Chisel out any excess glue in the inside corners. Make sure the lower edge of the face frame is flush with the bottom of the carcass, then predrill for countersunk screws (pieces 3) and join the subassemblies. Glue 3/8" oak plugs (pieces 19) in all the counterbored screw holes in the carcass, then sand them flush.

Inside Details

The face frame is flush with the left side of the large carcass opening, but you'll need to build out the right side before installing the drawer

slides. Glue and screw these spacers (pieces 20) in place now, following the locations on the *Pinup Shop Drawings*. Attach the remaining shelf cleat to the face frame at this time.

Building the Drawers

Storage is a primary concern with sharpening supplies, so this station features five drawers and a slide-out tray. All six units are mounted on 22" drawer slides (pieces 21). The tray (piece 22) is 3/4"-thick melamine with a 1/4" melamine liner (piece 23) glued to its top face. Place a heavy weight on it while the glue dries. Chamfer the front edges of the tray front (piece 24) with a chamfering bit chucked in your

router, as shown on the *Pinup Shop Drawings*. Attach the front to the tray with glue and finish nails, predrilling pilot holes for the nails, then setting and filling their heads.

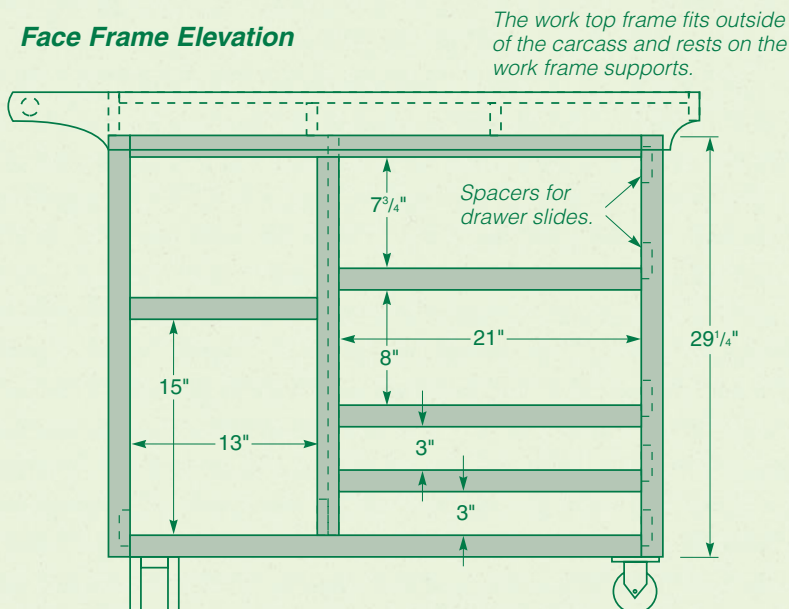
All five drawers (pieces 25 through 40) are built alike, and all are flush-mounted (that is, they don't overlay the frame). This is a workshop project, so the construction process was kept simple. Butt the fronts and backs to the sides, securing them with glue and screws. Attach the bottoms with glue and screws, then trim all four edges of each face with 1/4" hardwood stock (piece 41). Attach this trim with glue and 3d finish nails driven through predrilled pilot holes, setting and filling the heads as you go. Center the drawer faces on the drawers (See *sidebar* on preceding page) and attach them from the inside, predrilling the screw holes first. Wrap up the drawers by sealing the exposed top edges of the sides, fronts and backs with iron-on hardwood tape (piece 42), then drill holes in each drawer face for the pulls (pieces 43). Install the pulls and tray knob (piece 44), slide the drawers in place, and you're all set to start the work top.

Constructing The Work Top

The work top (piece 45) is a slab of 3/4" thick melamine-coated particleboard surrounded by a hardwood frame. The frame is composed of two ends (pieces 46 and 47), a pair of supports (pieces 48), two shaped sides (pieces 49), a handle and towel bar (piece 50).

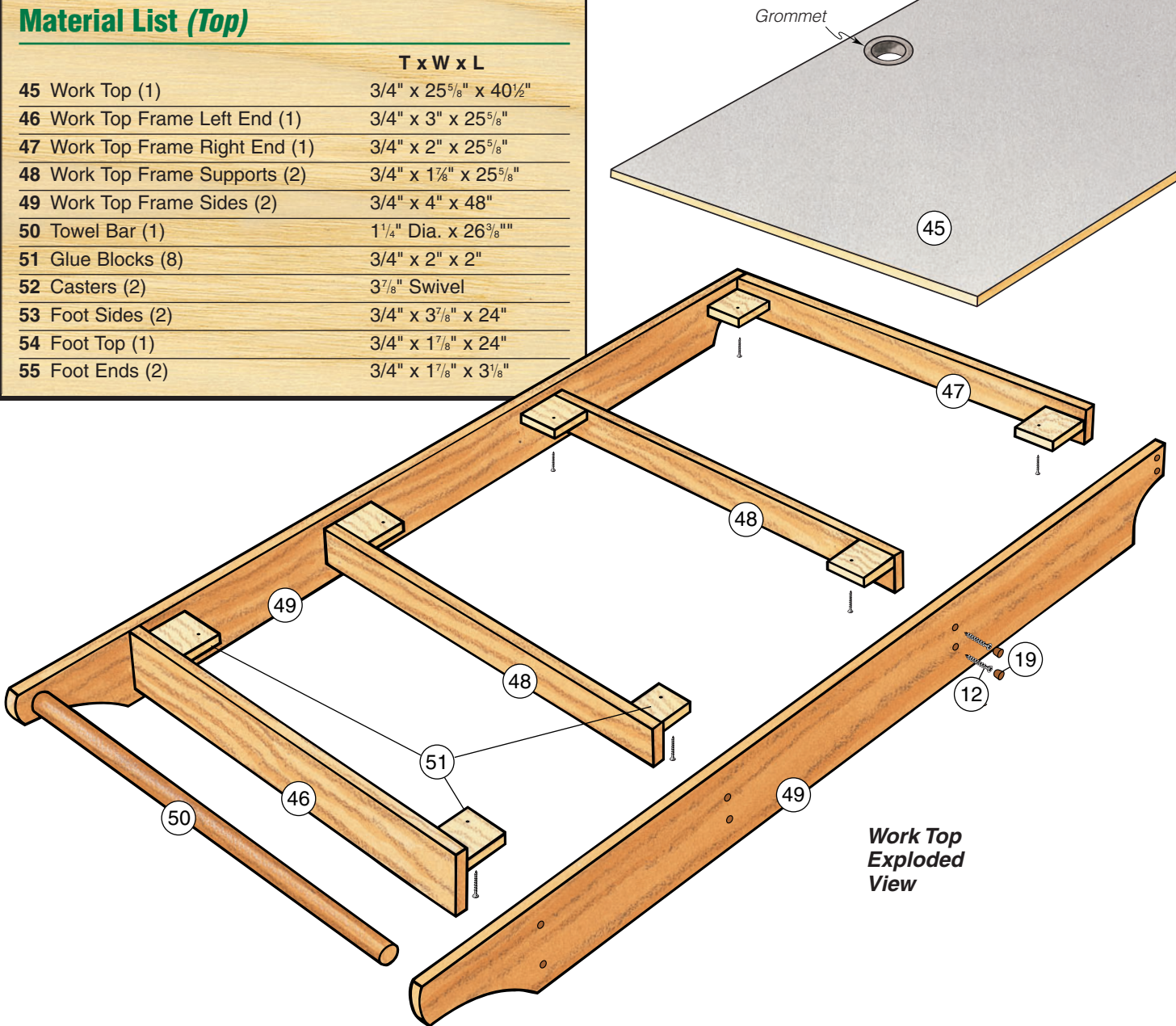
Transfer the profile of the sides from the elevations found on the *Pinup Shop Drawings*, then band

Face Frame Elevation



Material List (Top)

	T x W x L
45 Work Top (1)	3/4" x 25 5/8" x 40 1/2"
46 Work Top Frame Left End (1)	3/4" x 3" x 25 5/8"
47 Work Top Frame Right End (1)	3/4" x 2" x 25 5/8"
48 Work Top Frame Supports (2)	3/4" x 1 7/8" x 25 5/8"
49 Work Top Frame Sides (2)	3/4" x 4" x 48"
50 Towel Bar (1)	1 1/4" Dia. x 26 3/8"
51 Glue Blocks (8)	3/4" x 2" x 2"
52 Casters (2)	3 7/8" Swivel
53 Foot Sides (2)	3/4" x 3 7/8" x 24"
54 Foot Top (1)	3/4" x 1 7/8" x 24"
55 Foot Ends (2)	3/4" x 1 7/8" x 3 1/8"



saw them to shape. Clean up the saw cuts with a drum sander and drill the stopped holes on their insides for the handle. The work top is surrounded by the hardwood frame and held securely by glue blocks (pieces 51) and screws, as shown in the *Exploded View* above.

Frame Assembly

The white oak frame is held together with screwed butt joints. Temporarily clamp the frame elements together, then counter-bore and predrill for the large screws. You'll find all the locations on the *Pinup Shop Drawings*. While

you have the frame clamped, dry-fit it to the carcass. A half inch of the face frame's top rail should be peeking out below the bottom of the shaped sides. When everything fits, glue and screw the top frame together, trapping the handle as you do. Plug the screw holes as you did earlier and make sure the handle remains free to turn.

Place the frame on top of the carcass, locating it as shown on the *Pinup Shop Drawings*. Then glue and screw it in place, driving the screws from the inside of the cabinet into the frame.

Final Details

While you won't be moving this station around too much, it's always nice to be able to rearrange the workshop to accommodate new tools or big projects. Have a friend help you lift the project onto a couple of sawhorses, then bolt a pair of swivel casters (pieces 52) to one end of the bottom, at the locations shown on the *Pinup Shop Drawings*.

Bolt a matching foot on the other end: this is a simple hollow box made up of two sides, a top and two ends (pieces 53, 54 and 55). Butt joint, glue and clamp the foot



The Tormek Sharpening System

One of the premier sharpening machines on the market, the Tormek sells for about \$400. At that price it may not be for everyone, but its versatility demands a look. Replete with tons of gizmos to put an edge on everything from a curved gouge to a long planer knife, this British import is the real deal. Pair it with a traditional grinder and the only thing you won't be able to sharpen is your wits.



Two auxiliary sharpening aids team up to hone curved gouges, making a difficult task much easier.



Two auxiliary sharpening aids team up to hone curved gouges, making a difficult task much easier.



Keep the knives of your benchtop planer razor sharp on the water-bathed honing wheel.

together, then glue and screw it in place to complete the footings.

There isn't a lot of finishing to this project. Start by filling any nail holes you missed, then glue hardwood plugs over the tops of all the counterbored screws. Mask the melamine along all the hardwood edges, then clamp a square or a metal ruler along these same edges while you lightly sand the wood. Apply three coats of clear satin varnish to the hardwood, then install the drawers, adding the pulls and knob. If you have a power sharpening system and plan to use a magnifying lamp for better viewing (a good idea, by the way),

bore an access hole through the work top for running the power cords neatly behind the station. Protect the cords from abrasion with a grommet inserted in the access hole (see the *illustration* on page 31).

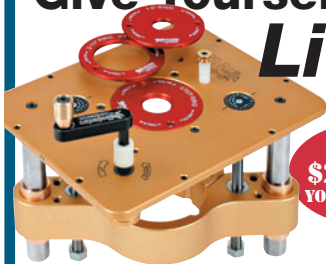
Now the fun begins. Start a search through your shop for all your containers of oil and mineral spirits, emery paper, stones and files. You'll probably be as amazed as I was at how much you've accumulated over the years. While you're at it, pick a couple of plane irons and chisels to give your new sharpening station a christening!



Plenty of storage

Tormek Sharpening System
Magnifying Lamp
Melamine, for easy cleanup.
Bench top grinder
Towel rack and handle
Lapping plate tray

Give Yourself a Lift!



ONLY
\$289.00
YOUR CHOICE

PRECISION ROUTER LIFT

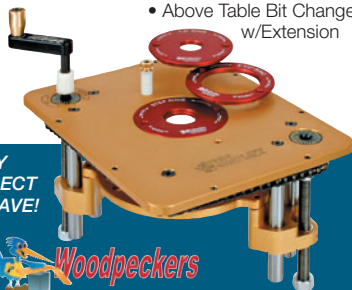
- Fits most fixed-base routers
- Above table bit changing
- 1/32" or 1/16" Pitch Screws
- Chain Sprocket Drive
- Automatic Brake

**INCLUDES
3 TWISTLOCK
RINGS**

UNILIFT

- Fits most plunge routers
- 1/32" or 1/16" Pitch Screws
- Manual Brake
- Above Table Bit Change w/Extension

**MADE IN
THE USA**



**BUY
DIRECT
& SAVE!**

Woodpeckers

www.woodpeck.com

1.800.752.0725

Made in the U.S.A.
and Built To Last.

*The Model "ABX"
Baker Band Resaw.*



- Powered by a mighty 30-HP electric motor.
- Very accurate cuts.
- Horizontal saw head, powered feed.
- 0.072"-kerf 1"-wide band blade.
- Blade height digital readout option available.
- Tilt Conveyor option allows angled cuts up to 26°*
- Powered hold-down.
- High production ready!

*Standard. Larger angles available.

**BAKER
Products**

PO Box 128
Ellington, MO 63638
(800) 548-6914

www.baker-online.com

Rockler.com
WOODWORKING SUPERSTORE



FREE!

Downloadable Music Box Plan

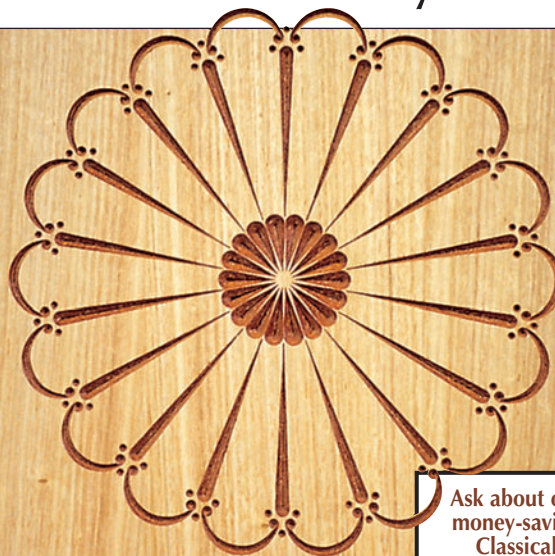
See how easy it is to build this attractive music box with our step-by-step instructions.

To download, visit: Rockler.com/go/musicbox

CMT

Fast, easy and extraordinary!

CMT's exclusive new 3D Router Carver™ System



Ask about our money-saving
Classical
Starter Set

Classical
Cabinet
Door



Classical
Drawer



Who says that intricate carving requires an artist's touch or the skill of a traditional woodcarver? Thanks to the patented 3D Router Carver System, anyone with a 1/2" collet plunge router can create dozens of beautiful designs easily, accurately and with complete repeatability. Rout 3-dimensional carvings on doors, drawers, cabinets, furniture or just about any flat wooden surface in minutes. Ask for your free 2004 - 2005 CMT catalog for details, then visit your CMT Distributor to get in on the fun!

The 3D Router Carver System is protected by U.S. Patent No. 5,146,965

Ask for a free catalog & a distributor in your area
888-268-2487 • www.cmtusa.com

CMT USA, Inc. • 307-F Pomona Drive • Greensboro, NC 27407



A Quick and Easy Band Saw Fence

By Dave Olson



Your band sawing results are sure to improve when using this easy-to-build accessory that quickly adjusts for resawing or ripping.

When I began woodworking, one of the first tools I purchased was a used band saw, which came without a fence. Knowing that I needed this essential accessory, I set about building one right away. I made it tall and sturdy for resawing wide boards, and I added a single-point attachment that's good for cutting along a scribed line while making adjustments for blade drift.

The jig has two parts: the base and the fence. Installing the base in the band saw table's groove automatically squares the jig to the blade. The fence is then placed on the base and slides back and forth to set the width of the cut. I hold it all in place with two bar clamps.

Baltic birch plywood is an ideal choice for making the jig since it's dimensionally stable, flat and strong. I used hard maple for the guides and glued plastic laminate to the fence to reduce friction and improve wear resistance. My jig is built for a Rockwell 14" band saw, but it's easy to resize it for any brand of band saw you may own.

Begin by cutting an extra-long piece of plywood 12" wide for the base and fence plate (pieces 1 and 2). By machining these two plates as one piece, you'll guarantee that they match perfectly. In addition, cut plywood to size for the fence and the braces (pieces 3 and 4).

Now install a 3/4" dado blade in your table saw, raise it 1/4" and plow the guide grooves in the plywood for the base and fence plate, as shown in the *Groove Elevation* on the next page. Cut this plywood into the two pieces for the jig and plow a 1/8"-deep rabbet in the base for the band saw slot guide.

To cut a perfect groove in the back of the fence for the fence plate, match your dado blade width exactly to the thickness of your plywood (make two passes with a narrower blade if necessary) and be sure the distance from the groove to the bottom edge of the fence also equals the plywood's thickness (see *Fence Joint Detail*). Getting these measurements dead-on is the key to keeping your completed fence



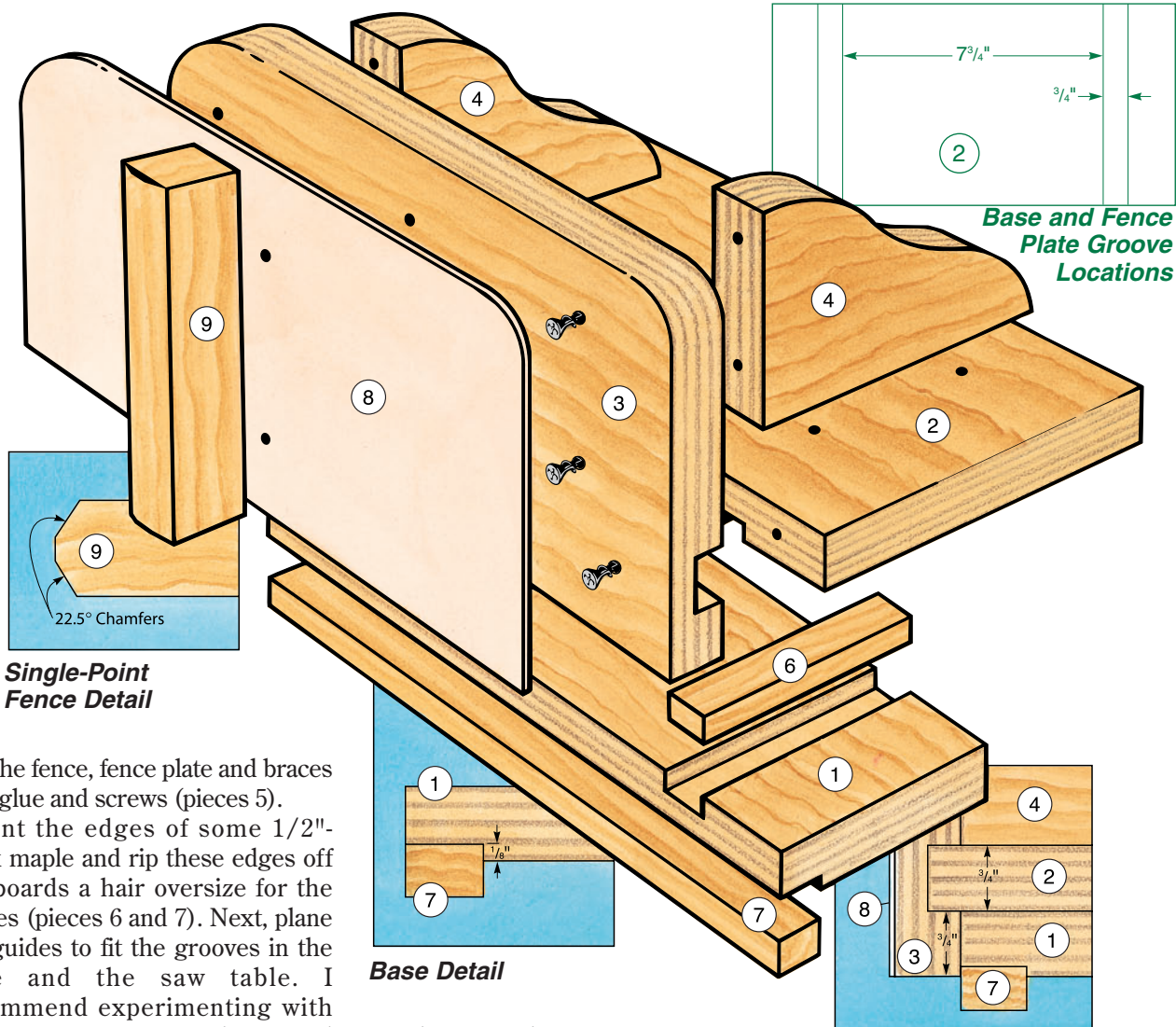
Figure 1: For ripping operations or resawing stock that's been milled four-square, the author recommends using the standard fence.



Figure 2: When working with a dull blade that tends to drift or when cutting along a scribed line, the single-point fence is often the better choice. It's also great for resawing.

plumb at any position on the band saw table.

After cutting the fence groove, trace the fence (piece 3) onto your stock, then band saw the pieces to shape and round the top corners of the fence as well. Next, drill all the countersunk pilot holes for screwing the pieces of the jig together, then



Base and Fence Plate Groove Locations

Single-Point Fence Detail

Base Detail

Fence Joint Detail

join the fence, fence plate and braces with glue and screws (pieces 5).

Joint the edges of some 1/2"-thick maple and rip these edges off the boards a hair oversize for the guides (pieces 6 and 7). Next, plane the guides to fit the grooves in the base and the saw table. I recommend experimenting with this step, using your planer and hand plane to find a method that works best for you.

As I mentioned, I covered the front of the fence with white plastic laminate (piece 8), which turned out to be a good color choice because it reflects light well and improves my ability to see the workpiece and blade. Cut your laminate a little larger than the fence and bond it to the plywood with yellow glue. Spread the glue evenly and back up the laminate with a piece of scrap plywood while clamping the assembly tight. After a few hours, trim the laminate with a flush-cutting router bit.

For the single-point fence attachment (piece 9), cut a piece of maple to size and chamfer one edge, as shown in the *Single-Point Fence Detail*, above. Sand the chamfers to improve the tracking of your stock, then clamp the

attachment to the fence and extend the pilot holes.

Give the jig a final, quick sanding and coat the wood with polyurethane. Avoid finishing the guides as this may make sliding the fence more difficult. Wax them instead, and reapply it occasionally.

The fence works best when using a new blade to cut a flat workpiece. When the blade is worn and no longer tracks accurately, or when you need to follow a line, the single-point attachment comes in handy (as long as its crown is 1/8" ahead of the blade). Either way, this jig is bound to improve your band saw's performance.

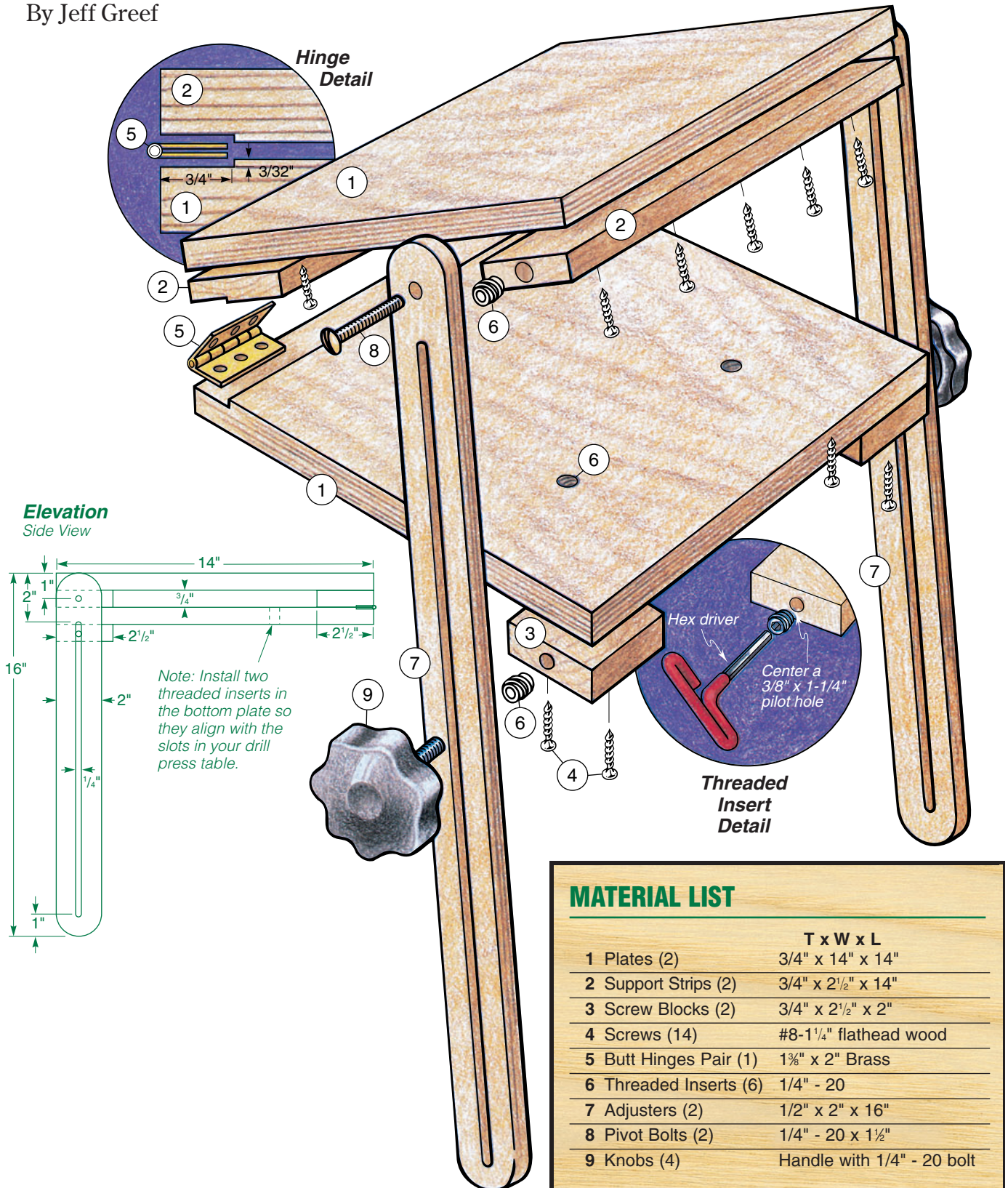
MATERIAL LIST

	T x W x L
1 Base (1)	3/4" x 12" x 3 1/2"
2 Fence Plate (1)	3/4" x 12" x 6 1/4"
3 Fence (1)	3/4" x 12" x 5"
4 Braces (2)	3/4" x 3 1/4" x 5"
5 Screws (13)	#8-1 1/2"
6 Jig Guides (2)	1/2" x 3/4" x 3 1/2"
7 Saw Slot Guide (1)	1/2" x 3/4" x 12"
8 Laminate (1)	1/16" x 5" x 12"
9 Single-Point Fence (1)	3/4" x 1 1/2" x 5 1/2"

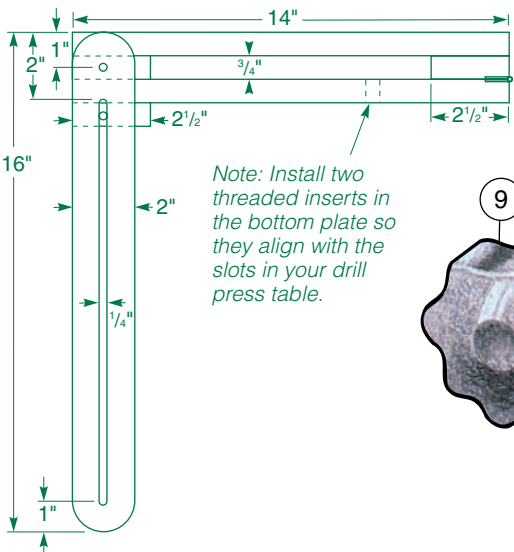
Tilting Table for the Drill Press

You'll never have to tip your drill press table again to drill angled holes once you customize it with this tilting table project.

By Jeff Greef



Elevation
Side View



Note: Install two threaded inserts in the bottom plate so they align with the slots in your drill press table.

MATERIAL LIST

	T x W x L
1 Plates (2)	3/4" x 14" x 14"
2 Support Strips (2)	3/4" x 2 1/2" x 14"
3 Screw Blocks (2)	3/4" x 2 1/2" x 2"
4 Screws (14)	#8-1 1/4" flathead wood
5 Butt Hinges Pair (1)	1 3/8" x 2" Brass
6 Threaded Inserts (6)	1/4" - 20
7 Adjusters (2)	1/2" x 2" x 16"
8 Pivot Bolts (2)	1/4" - 20 x 1 1/2"
9 Knobs (4)	Handle with 1/4" - 20 bolt

Ever tried drilling angled holes with a standard drill press? Setting up can be a real pain. But with this shop-made tilting jig your results will improve immediately. Clamp it right to your drill press table and add fences or stops to get accurate, repeatable borings in projects like the windsor chair seat shown here. Follow the six construction steps below and use the *Drawings* at left to build this essential shop jig in an afternoon.



Step 1: Cut stock to size and rabbet the lower plate and one strip to accommodate the hinges (see *Hinge Detail*). Fasten the hardwood to the plates and install the hinges.



Step 2: Drill pilot holes for the threaded inserts in the ends of the strips and screw blocks, and in the bottom plate. Wax the inserts and install them with a hex driver.



Step 3: Cut plywood for the adjusters and lay out the pivot hole and slot on each one. Drill the 1/4" pivot holes.



Step 4: Rout the slots in shallow passes with a 1/4" straight bit after marking the bit's cutting area on the fence. Use the marks as guides for starting and stopping the cuts.



Step 5: Secure your belt sander in a vise and shape the ends of the adjusters. Use a palm sander to smooth the jig's surfaces and ease all the corners. Apply a coat of sanding sealer.



Step 6: Bolt the adjusters to the upper plate assembly and clamp them to the screw blocks with knobs. Use the remaining two knobs to secure the jig to your drill press table.

"...dovetail one, or a hundred drawers – perfect every time."

– Norm Abram,
New Yankee Workshop

Dovetail Joints

Mortise & Tenons

"...I know of no better or faster way to cut mortise and tenons..."

– Christopher Schwarz,
Popular Woodworking Magazine

Made Easy



D4



No other jigs offer such versatility, precision and superb value for both the hobbyist or professional. The D4 Dovetail Jig routs through and half-blind dovetails up to 24" wide in boards up to 1 1/2" thick, with infinitely variable spacing of pins and tails – all on one jig. Plus it routs sliding and angled dovetails, decorative Isoloc joints, finger joints, and multiple mortise and tenons. And the new FMT Frame Mortise and Tenon Jig makes strong mortise and tenons simple. Joinery's never been easier.

Call For Your FREE Leigh Catalog 1-800-663-8932

www.leighjigs.com

LEIGH
Joining Tradition With Today



The LS Super System

Incra



Everything You Need in a Precision

Router Table/Fence Combo

- 17" Incra LS Super System
- 27" x 43" Woodpecker Router Table
- Dust Collection Cabinet
- Steel Leg Set & Wheel Kit

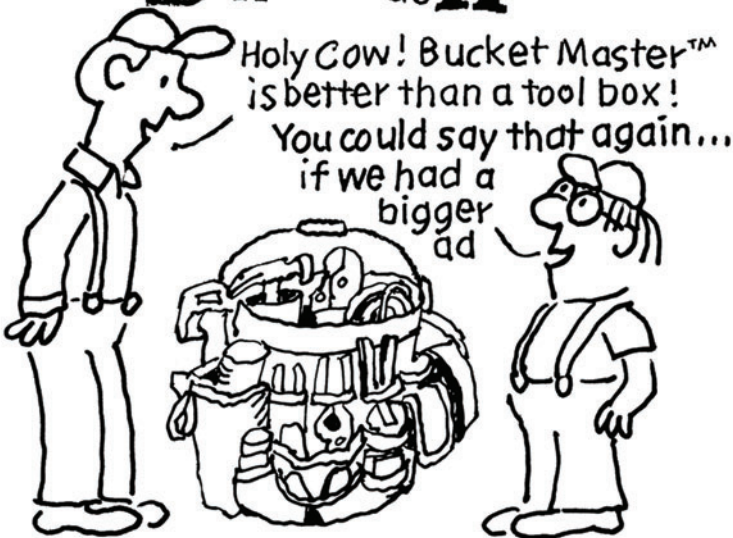
MADE IN THE USA



www.woodpeck.com

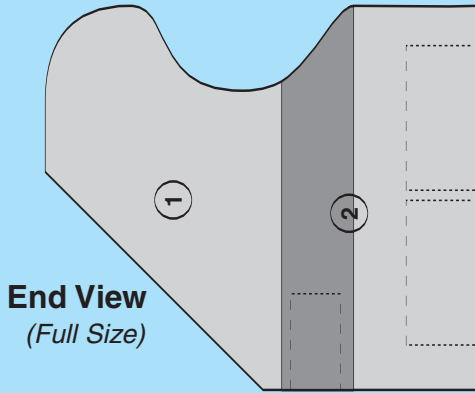
1.800.752.0725

DULUTH TRADING & H

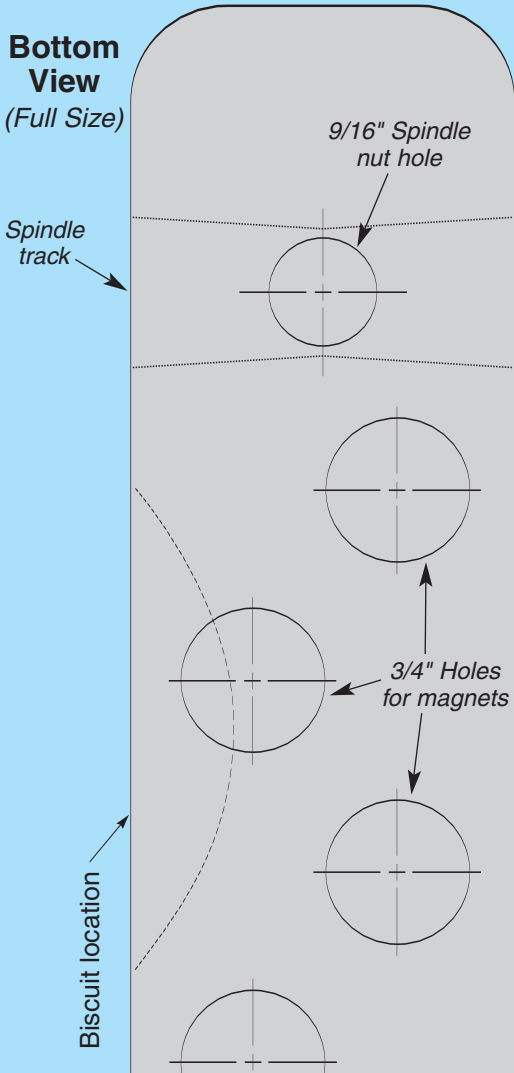


We stock wonderful, useful Equipment and Goods designed and tested by Tradesmen for Builders and ardent Do-It-Yourselfers. Get a Free Catalog at 800-505-8888 or order on line - www.DuluthTrading.com

V-block Jig



Bottom View (Full Size)



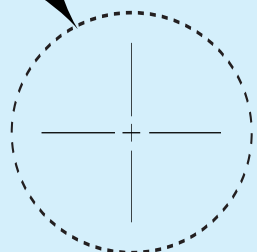
Sharpening Station

49

Work Top Frame Sides (Full-size Drawing)

Work top left end (piece 46) is held flush to the side (piece 2).

Towel bar (piece 50) location



Supplies

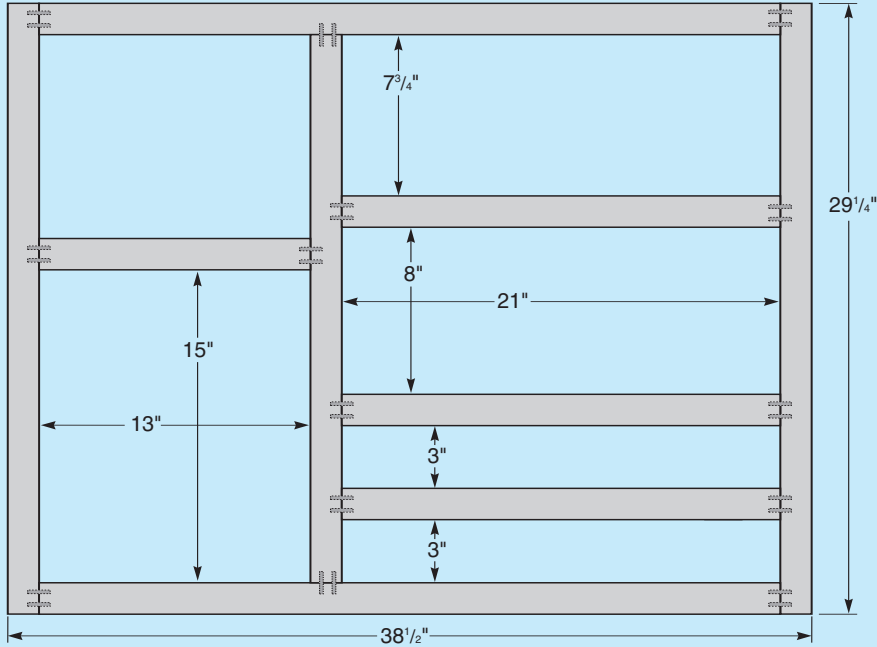
Sharpening Station

- Tormek Sharpening System#60467
- Casters#81688
- Drawer Slides (pair)#34967
- Plugs (pk/50)#20875
- Pulls#30106
- Knob (pair)#23077
- Iron-on Tape (50 ft.) #91679

Note: You'll need two casters, six pairs of drawer slides and five pulls to complete this project. Please call for current pricing – 800-610-0883

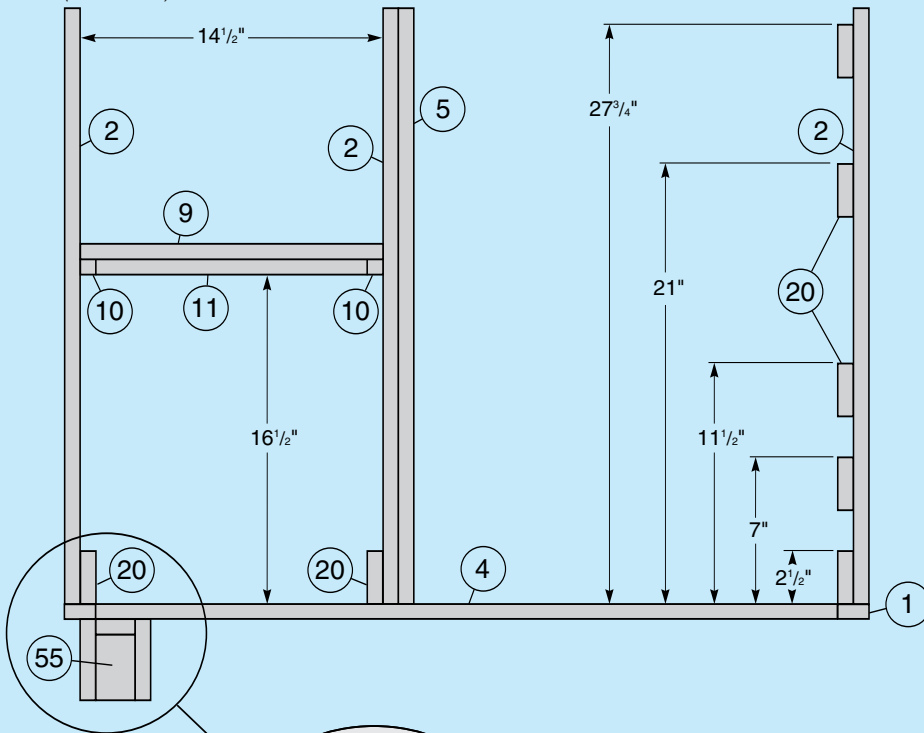
Face Frame Layout

(Front View)



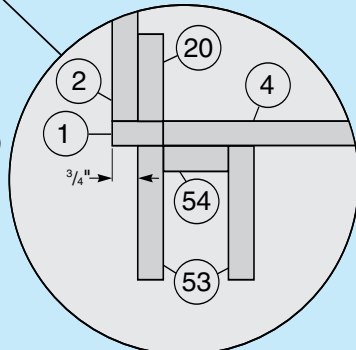
Carcass Joinery: Cleat and Spacer Locations

(Front View)

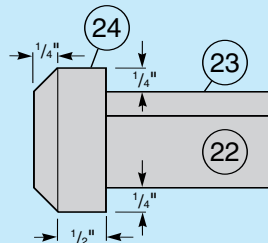


Foot Detail

(Section View)



Chamfer the front edges of the tray front.

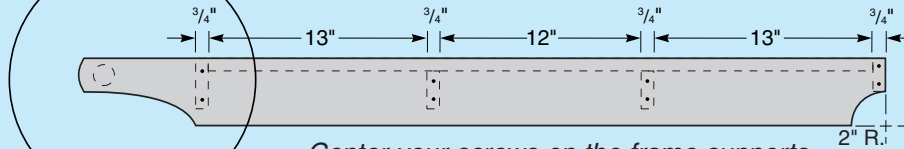


Tray Assembly

(Side View)

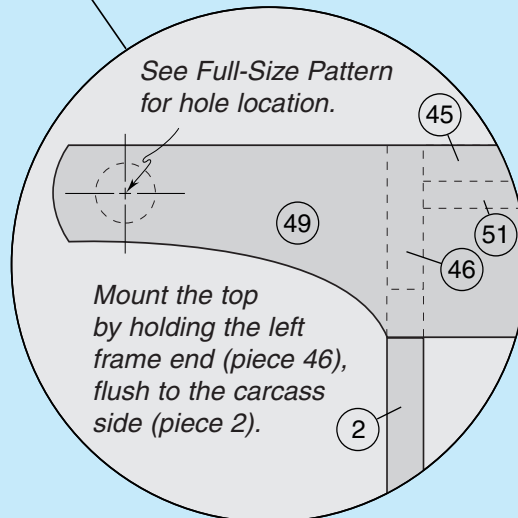
Work Top Support Locations

(Side View)



Center your screws on the frame supports and ends. Keep one inch between the screws on pieces 47 and 48, and two inches between the screws on piece 46.

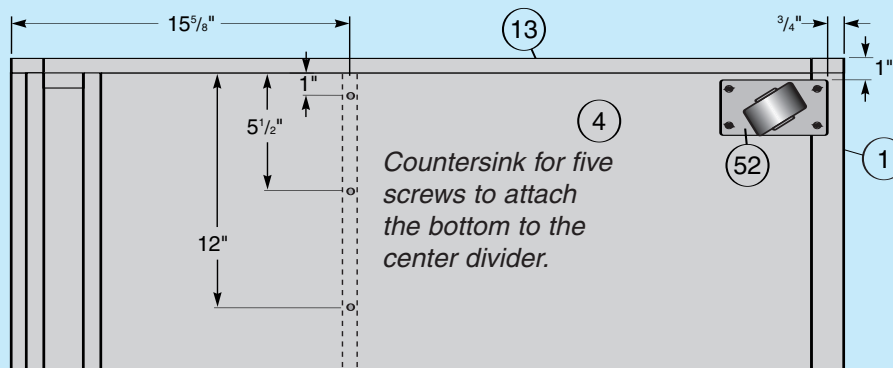
See Full-Size Pattern for hole location.



Mount the top by holding the left frame end (piece 46), flush to the carcass side (piece 2).

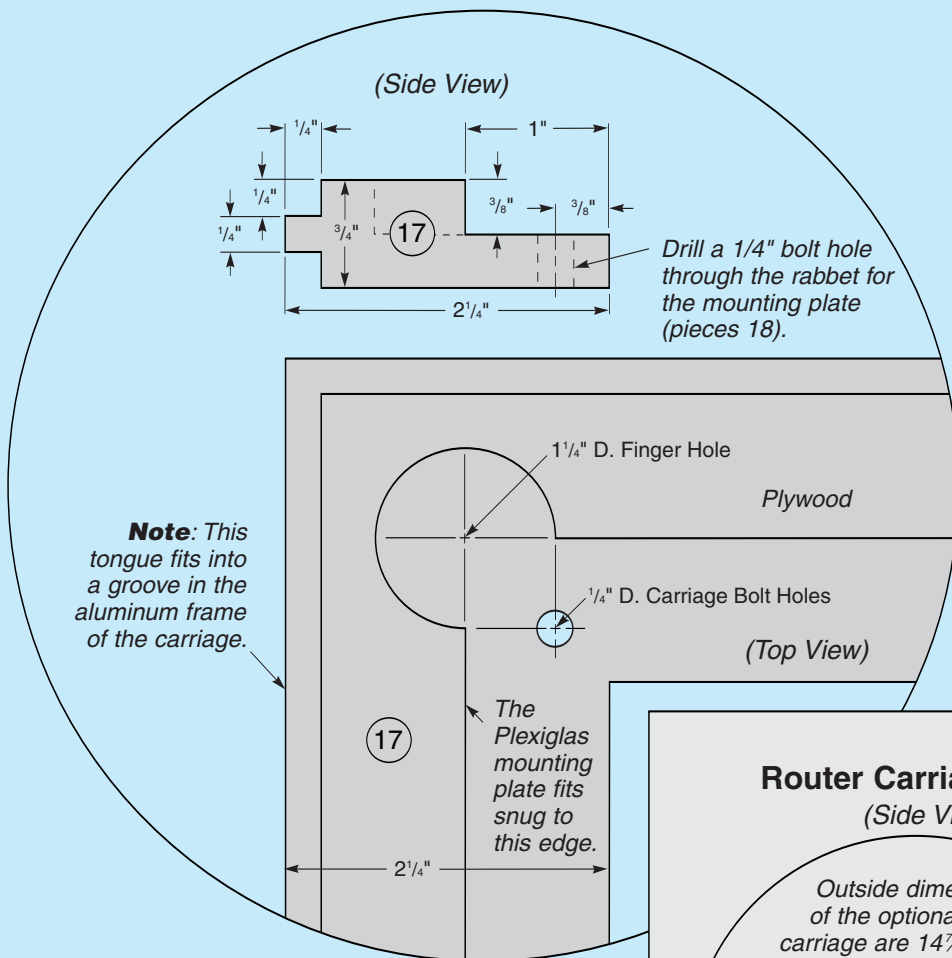
Caster Location

(Bottom View)

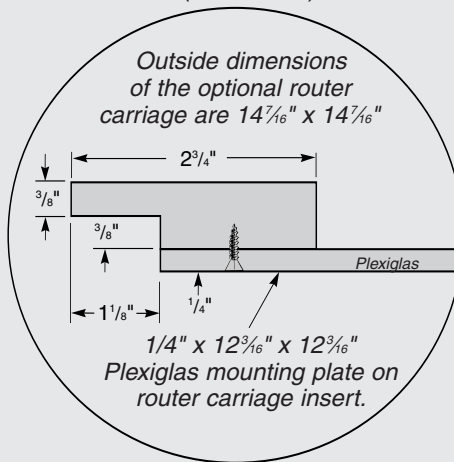


Countersink for five screws to attach the bottom to the center divider.

Saw Carriage Insert Detail

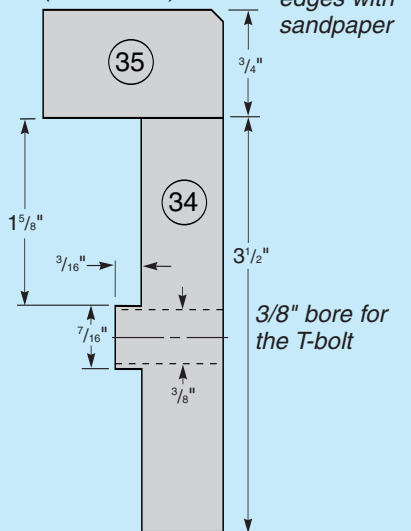


Router Carriage Insert (Side View)



NOTE: The router carriage is an optional piece used to attach a portable router to the saw carriage. Use it instead of the Plexiglas mounting plate (piece 18) which holds the circular saw. The Plexiglas is mounted to the bottom of this plywood insert to keep the router closer to the workpiece.

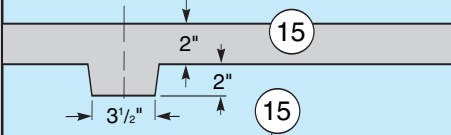
Stop Block Assembly (Side View)



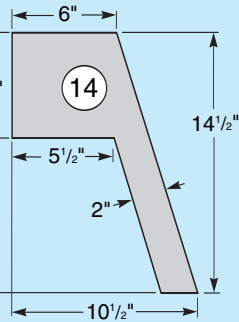
Pinup Shop Drawings

Shop-Built Panel Saw

Pulley Support (Top View)



Wall Brace (Side View)



Panel Saw Kit & Supplies

A custom hardware kit is available with all the parts necessary to complete the aluminum frame and carriage assembly.

Extruded Aluminum Kit#22223

The following supplies are also available:

Easy Grip Knob#68064

Five Star Knob#23812

Self-adhesive 6' Ruler#69124

T-slot Bolt#34771

T-slot Track#21753

Note: You'll need 4 easy-grip knobs and 1 five star knob. Please call for current pricing - 800-610-0883

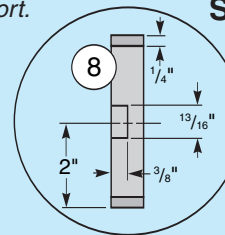
The wall braces are fastened to the column returns with glue and screws.

Trim the angle supports flush with the top of the cross support trim.

It is important to keep all of the structural members absolutely square as you assemble the plywood frame.

Keep the angle support aligned to the outer corner of the upper cross support.

Lower Cross Support Detail (End View)



The 48" long dado for the T-track (piece 30) is milled to the right of the saw blade.

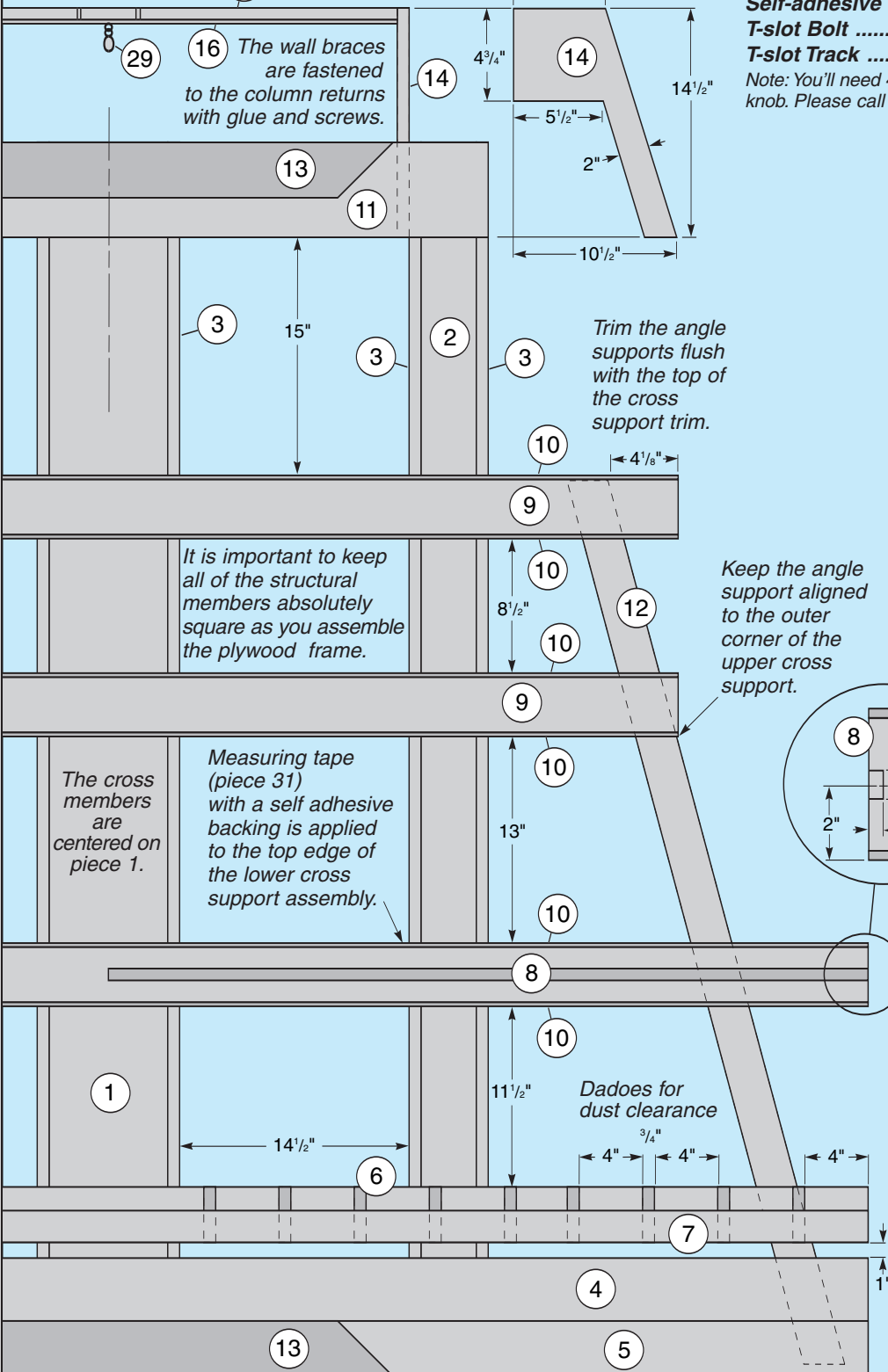
The cross members are centered on piece 1.

Measuring tape (piece 31) with a self adhesive backing is applied to the top edge of the lower cross support assembly.

Dadoes for dust clearance

All of the plywood pieces are fastened with screws and glue from the back or side. The hardwood trim and spacer blocks are attached with glue and brads.

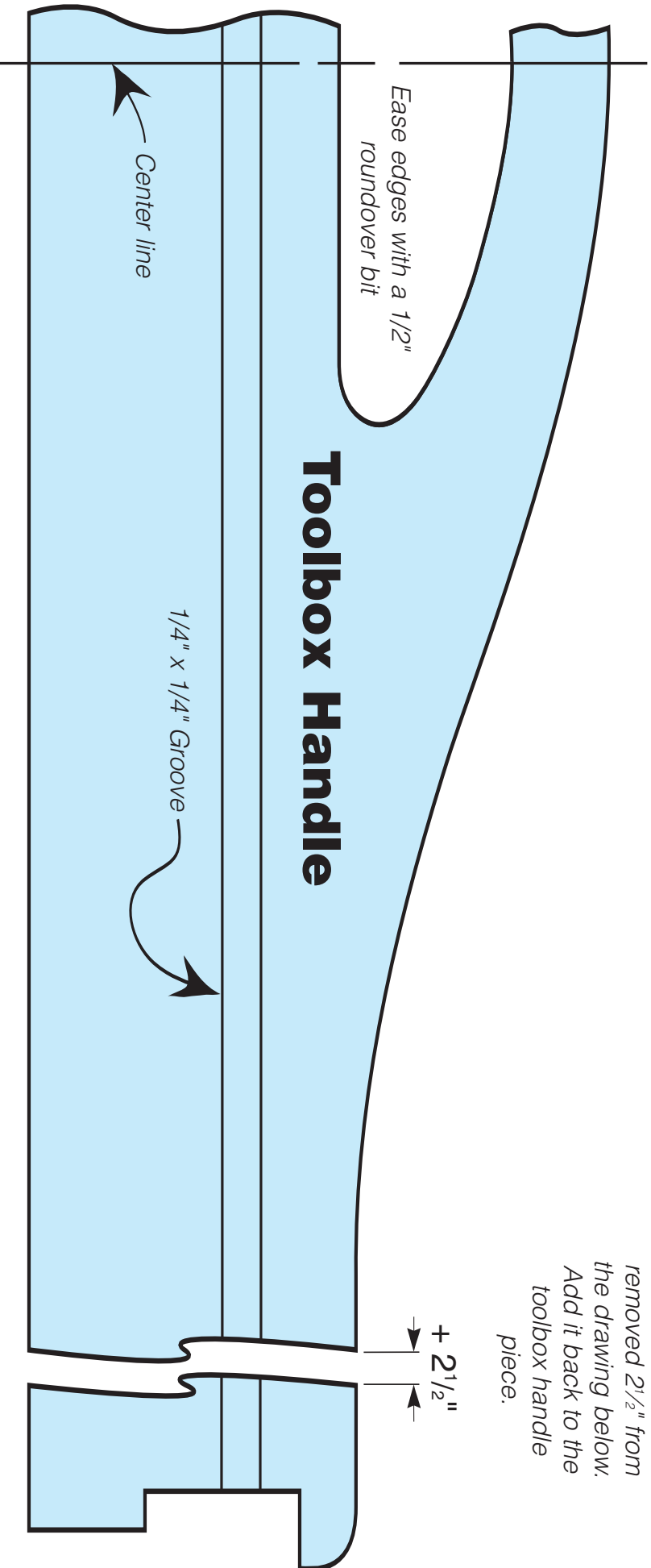
Panel Saw Frame Assembly (Front View)



Tool Box

Full Size
Patterns

Tray Handle Grip



To accommodate this PDF format, we removed 2 1/2" from the drawing below. Add it back to the toolbox handle piece.

The fastest way to join wood just got more precise...

NEW

Before joining your project with the simplicity and strength of Pocket Hole Joinery, you must cut your workpieces accurately.

Introducing, KREG Precision Measuring Systems. Woodworking machine accessories that help you to cross-cut your workpieces with more speed and repeatable precision than ever before.

Perfect for the miter saw, tablesaw, drill press, and more.

Visit www.kregtool.com today for more details.



2. Drill Pocket Holes



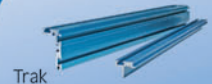
3. Join wood



Flipstop



Production Stop



Trak



Precision Miter Gauge System



The Blue Mark of Quality.

www.kregtool.com • 800.447.8638

~~Father knows best!~~ Mother knew

BY APPOINTMENT TO
H.M. QUEEN ELIZABETH II
MANUFACTURERS OF POLISHES
AND FIRE PROTECTIVE COATINGS
J.W. BULLOCK & CO. LTD. TIA HENRY FLACK (1986) LTD.



"Even though Father knew best most of the time, Mother introduced him to BRIWAX. She had used it for years to polish her furnishings long before Father ever started "refinishing" what are now my antiques. Like Father, I too, am a "Do-It-Yourselfer." I use BRIWAX to restore all my wood surfaces, for faux finishing, marble refurbishing, and more. Restoration and refurbishing of wood flooring and cabinets are made simple with BRIWAX's time-tested blend of the finest beeswax and selected Carnauba waxes. Because it cleans, polishes, and protects in one easy application, BRIWAX is also great for granite, plaster, stucco, concrete and untreated metals. Now with seven shades from which to choose, Mother would be jealous!"

- * Wood Cabinets
- * Wood Paneling
- * Wood Flooring
- * Concrete
- * Marble & Granite
- * Untreated Metals
- * Plaster
- * Stucco
- * Faux Finishes



Now Available in Clear & 7 Great Colors:



For Information on BRIWAX:
www.briwax.com or Call: 1-800-5BRIWAX





A separate plate can be made for the router (see drawings) to cut grooves and dados in your sheet stock. Be sure to clamp your stock in place when routing.

Shop-built Panel Saw

By Rob Johnstone

Get the accuracy the pros are used to at less than half the cost. Our aluminum sliding system is the key to success.

While renovating our 1906 home, I realized that what I really needed on site was a panel saw. Every job I tackled seemed to involve cutting large panels on the table saw. Working on my own, this was gruelling and dangerous work. But panel saws aren't cheap: basic models run about \$1500. The only real option was to build my own panel saw instead.

One of the biggest advantages to this tool is that you move the circular saw, not the workpiece, making it much easier for one person to handle large pieces of plywood or particle board. You can crosscut panels in the standard mode, or rotate the saw 90° to rip sheets of plywood. Any commercially available 7¼" circular saw will work with this design, but worm drive saws and larger units will not fit the carriage.

By making an additional mounting plate for the sliding carriage, you'll be able to install a portable router in your panel saw as well. This opens the door to cutting grooves, rabbets, dados and even decorative designs for doors and cabinet panels. I recommend dedicating one mounting plate to a saw and another to a router to facilitate quick changes. If you do, you'll soon wonder how you ever got along without a panel saw.

Easel Does It

The main component of the panel saw is a plywood frame, rather like an artist's easel, that supports both the work being cut and the saw carriage. For this frame I chose appleply, a voidless, veneer-core product that is durable and dimensionally stable.

After cutting all the parts to size (see the *Material List* on page 50), get started by attaching the column returns (pieces 3) to the edges of the center and side columns (pieces 1 and 2) with glue and screws. Next, glue the base (piece 4) to the base plate (piece 5) and secure it with screws driven through from the back.

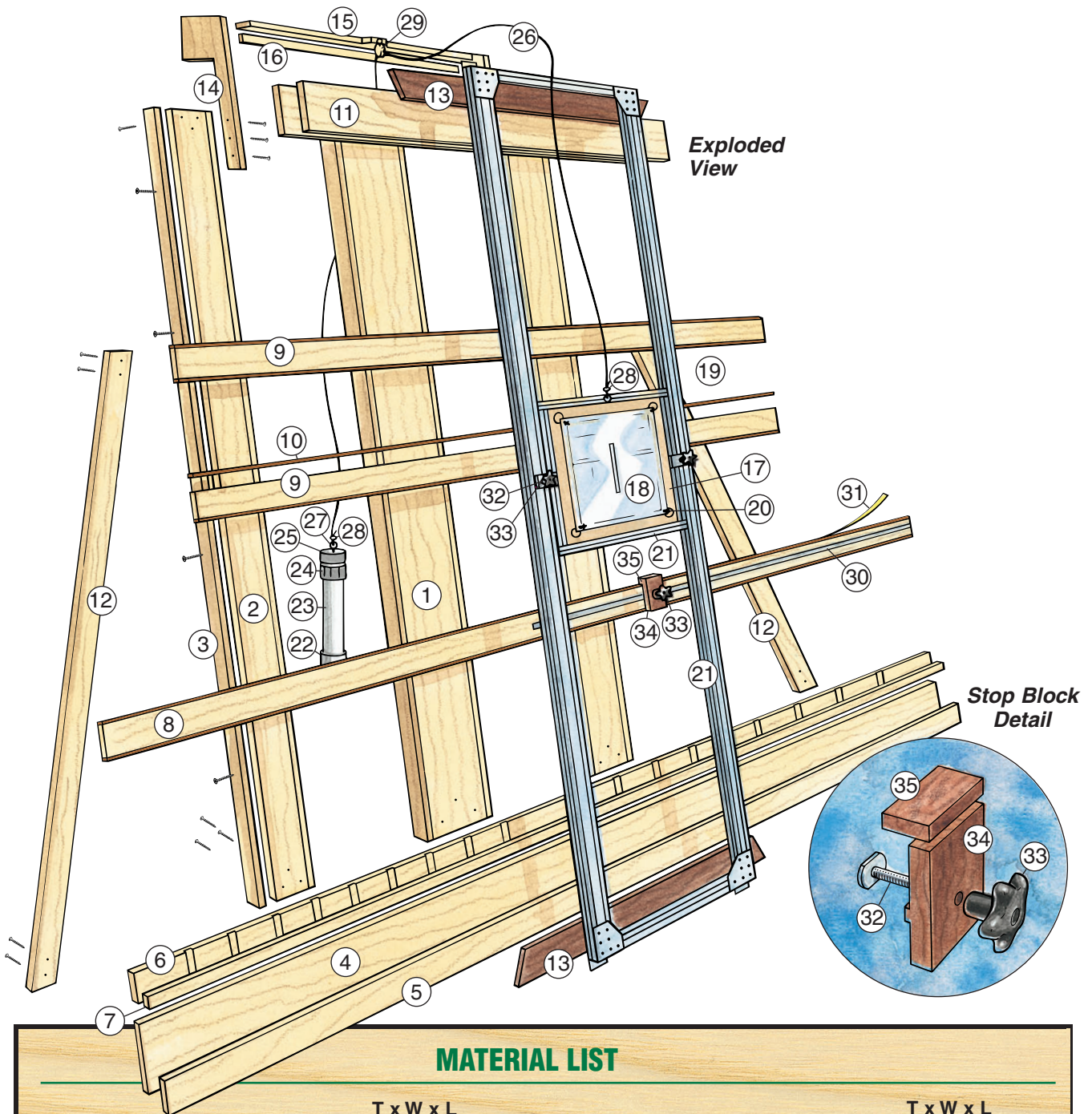
Sawdust accumulation is a problem with some panel

saws, and I've dealt with this by providing a series of dados in the bed beam (piece 6), through which excess dust can escape. Cut these dados on your table saw using a ¾" dado head and your miter gauge, following the locations given on the *Pinup Shop Drawings* between pages 39 and 46. Then glue and screw the bed (piece 7) to the bed beam.

With the ¾" dado head in your saw, go ahead and plow a groove in the lower cross support (piece 8) for some T-track that will be installed later (see the *Pinup Shop Drawings*). Stop the groove 48" into the piece. The upper cross supports (pieces 9) are not grooved. Rip the cross trim (pieces 10) from ¾" walnut stock or whatever other hardwood you have on hand, then glue and clamp them in place. Scrape the excess cured glue and sand the faces of all the pieces, then glue the two halves of the top stretcher (pieces 11) together.



Figure 1: When working on larger assemblies like this panel saw, keep an accurate square handy as you glue and screw each piece together.

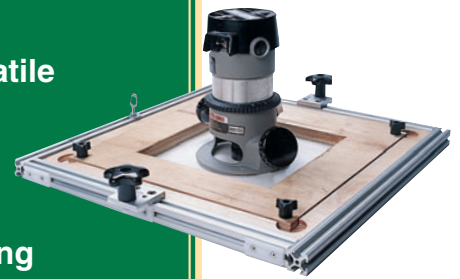


MATERIAL LIST

	T x W x L		T x W x L
1 Center Column (1)	3/4" x 7 1/2" x 78"	19 Carriage Bolts (4)	1" x 1/4" x 20
2 Side Columns (2)	3/4" x 3 1/2" x 78"	20 Easy Grip Knob (4)	7/8" x 1/4"-20
3 Column Returns (6)	3/4" x 1 1/2" x 78"	21 Extruded Alum. Kit (1)	Instructions with kit
4 Base (1)	3/4" x 7 1/2" x 96"	22 Cap (1)	2" pvc
5 Base Plate (1)	3/4" x 3 1/2" x 96"	23 Pipe (1)	2" x 12" pvc
6 Bed Beam (1)	3/4" x 3 1/2" x 96"	24 Coupling (1)	2" threaded pvc
7 Bed (1)	3/4" x 2" x 96"	25 Threaded Cap (1)	2" threaded pvc
8 Lower Cross support (1)	3/4" x 3 1/2" x 96"	26 Cable (1)	1/8" x 96" braided
9 Upper Cross Supports (2)	3/4" x 3 1/2" x 72"	27 Eye Bolts and Nuts (2)	1/4"
10 Cross Trim (6)	1/4" x 3/4" x 96"	28 Cable Clamp (2)	small
11 Top Stretcher (2)	3/4" x 6" x 48"	29 Pulley (1)	2"
12 Angle Supports (2)	3/4" x 2 1/2" x 58 1/2"	30 T-Track (1)	40"
13 Spacer Blocks (2)	1/2" x 3 1/2" x 36"	31 Measuring Tape (1)	Self adhesive
14 Wall Brace (2)	3/4" x 10 1/2" x 14 1/2"	32 T-Bolt (1)	5/16" x 1 1/2"
15 Pulley Support (1)	3/4" x 4" x 36 1/2"	33 Star Knob (1)	5/16" threaded
16 Support Brace (1)	3/4" x 1" x 36 1/2"	34 Stop Block (1)	3/4" x 2 7/8" x 3 1/2"
17 Carriage Insert (1)	3/4" x 17 1/4" x 17 1/4"	35 Stop Top (1)	3/4" x 1 1/4" x 3 1/2"
18 Mounting Plate (1)	Plexiglas 1/4" x 14 7/16" x 14 7/16"		



One great feature of this versatile panel saw is that, by simply making an extra Plexiglas™ mounting plate, you can quickly switch operations from sawing to routing.



Building the Body

As you assemble the body of the saw, it's very important that all structural members are absolutely square. Begin the process by marking center lines across the back of the top stretcher and the base assembly, then lay both pieces face down on a flat floor, edge to edge with their center lines matched up. Mark the locations of the columns on both pieces (see *Pinup Shop Drawings*), then separate the parts and set the columns in place. Square up all five pieces using a large square, then glue and screw the columns to the top stretcher and base assembly, as shown in *Figure 1*, page 49.

After the glue dries, set this assembly upright against a smooth wall surface to attach the bed beam and cross supports (see the *Pinup Shop Drawings* for locations). Drive the screws in from the back of the columns and use scrap spacers (see *Figure 2*) as you glue, clamp and screw them into position on the frame.

Temporarily clamp the angle supports (pieces 12) in place at the positions shown on the *Pinup Shop Drawings*. Transfer the locations of the cross supports onto the angle supports, then disassemble them and trim them at these angles using your power miter box. Clamp the angle supports back in place and secure each piece with screws.

Supporting Cast

Two long walnut spacer blocks (pieces 13) separate the frame from the aluminum track assembly that holds the saw. Cut these spacers from 1/2" stock, trim their ends at an angle with your power miter box (see the *Pinup Shop Drawings*), then glue and clamp them in place. Next, cut the wall braces and the pulley support

(pieces 14 and 15) to shape, then glue and screw them together. Glue and nail the support brace (piece 16) in place and install the entire brace subassembly onto the saw body.

A Carriage Built for Two

A plywood carriage insert (piece 17), installed in an aluminum frame, holds interchangeable Plexiglas™ carriages in place. Begin machining this insert by

cutting 1/4" rabbets on all its edges, then miter the corners (see the *Pinup Shop Drawings*). Cut the center out by raising your table saw blade through it and complete these cuts with a handsaw. Drill finger spaces at the corners with a 1 1/4" Forstner bit and make the interior rabbet on your router table, following the dimensions that are provided in the *Pinup Shop Drawings*.

Drill a 1/4" hole at each corner for carriage bolts (pieces 19) that hold the mounting plate (piece 18) in place. The mounting

plate itself is cut from 1/4" thick Plexiglas™. Each corner receives a 3/8" hole to match the 1/4" bolt holes on the carriage insert. Test-fit the Plexiglas in the insert, then epoxy the carriage bolts in place. I used the Easy Grip knobs (pieces 20) to hold the bolts in place while the epoxy cured.

Follow the instructions provided with the Extruded Aluminum Kit (piece 21) to assemble three sides of the aluminum carriage frame. It's an essential part of this project and something you should order rather than build yourself from bar stock. To order the kit, see the first page of the pattern. Slide in the carriage insert and add the fourth side (see *Figure 3*), then attach an eye bolt to the carriage to complete it.



Figure 2: Spacers are an absolute necessity when aligning the horizontal members on a frame this large. To ensure accuracy, be sure your spacers are true along their full length.

The Works

Turn again to the kit instructions to assemble the larger aluminum frame. As you did earlier, be sure to insert the carriage assembly before you add the fourth side. Center the completed large frame on the saw body, then secure it to the top and bottom with screws driven through the angle brackets and spacer blocks. The large frame can be adjusted to square by slightly loosening the corner brackets, sliding one end to the right or left, then tightening the brackets.

Taking Care of the Details

A critical component of a panel saw is the counterweight that helps the carriage slide easier. I made my counterweight by gluing a cap and threaded coupling to a length of PVC pipe (pieces 22, 23 and 24). The result is a tube with one threaded end and one capped end. Now drill a hole in a threaded cap (piece 25) and add an eye bolt (piece 27) for the cable (piece 26). Fill the tube with sand and lightly screw the threaded cap onto the pipe. Attach the pulley (piece 29) to the pulley support, then thread the cable through the pulley and connect it to the carriage and the counterweight with cable clamps (pieces 28), as shown in *Figure 4*. Attach your circular saw to the mounting



Figure 3: The plywood carriage insert fits a traveling aluminum frame. In turn, the saw is mounted to a Plexiglas plate, which is attached to the insert with threaded knobs.



Figure 4: After installing the pulley (inset), set the counterweight on a spacer and, with the saw at its highest position, attach the cable. Adjust the counterweight to equal the weight of the saw and carriage.



plate using 1/2" machine bolts in holes drilled through the saw's base and the Plexiglas™ mounting plate. Be sure the saw is mounted squarely.

Now stick self-adhesive measuring tape (piece 31) on the top edge of the low cross support and install the T-slot track (piece 30) in the dado you cut earlier. A T-bolt and star knob (pieces 32 and 33) are used to secure an adjustable L-shaped 3/4" thick stop (pieces 34 and 35) to the track. This stop is machined to fit the T-slot track, as shown in the *Pinup Shop Drawings*. Assemble the stop with glue and nails, drill a 3/8" hole through it for the T-bolt and sand the edges smooth before installing the bolt and knob, as shown in the *Stop Block Detail* on page 50.

Finishing Up

I finished this project with a wipe-on oil/varnish blend to both to protect the wood and to help control dust. You can use any finish you like. With that done, you'll need to decide whether you want to mount your saw to the wall or floor. One good way to handle this is to mount a cleat to the wall between the wall braces (pieces 14), and then screw the supports to this cleat.

I hope you enjoy your saw as much as I have mine. If

you come up with some further improvements on your own, be sure to pass them along to us to share with fellow readers.

REBATE!
\$2 OFF on our POKYIT JIG KIT

**(a great buy
Just got better)**

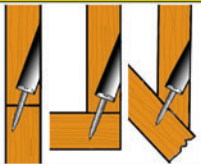
THROUGH DEALERS ONLY
\$39.95
SUGG. RETAIL
(less \$2 rebate)

THE KIT INCLUDES:

- Pocket Jig with Clamp
- 3/8" Steel Step Drill Bit
- Adjustable Stop Collar for Drill Bit
- Hex Wrench for Drill Bit Collar
- A Supply of Square Drive Screws
- 6" Steel Square Drive Bit



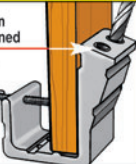
You can use this versatile pocket jig kit to make numerous types of joints.



Heavy-duty aluminum extrusion with hardened steel drill bushings.

Shown in use

the clamp holds the wood firmly in place for accurate drilling.



The POKYIT JIG™ KIT is available at these dealers:

- AMAZON.COM 800-635-5140
- EAGLE AMERICA 800-872-2511
- HARTVILLE TOOLS 800-345-2396
- WOODWORKERS SUPPLY 800-645-9292
- McFEELYS 800-443-7937
- WOODWORKERS CHOICE 800-892-4866
- WOODCRAFT SUPPLY 800-225-1153
- PRICECUTTER 888-288-2487
- ROCKLER TOOLS 800-279-4441

To receive your rebate, clip & mail us this ad with proof of purchase. (Sales slip or package bar code will do the trick)

SIMP'L PRODUCTS Inc. 21 Bertel Avenue, Mount Vernon, NY 10550
Web Site: woodjigs.com E-Mail: info@woodjigs.com

WJ 11-04

GROSS STABIL

PROUDLY INTRODUCES...

**Scott Phillips
Signature Series
PC² Parallel Clamp**

PC² is a revolutionary new Parallel Clamp for woodworking professionals.

- Clamping area of 5 1/2" x 1 3/4".
- All durable clamping parts are all replaceable.
- Malleable cast iron locking mechanism.
- Longer spindle travel compared to the competition.
- Clamping length from 12" to 100".
- Solid wooden handle for easy-to-grip use.
- Clamp can easily be made into a spreader clamp.
- Galvanized steel rail.
- Sustains clamping pressure throughout the entire pad surface. Tested to 1,100 lbs.
- Superior strength, heavy-duty components ensure a lifetime of dependable use.



NOW AVAILABLE AT:



and other fine woodworking stores

WWW.GROSSSTABIL.COM or 1-800-671-0838

*Decorative
Corner Legs*

Osborne Wood Products, Inc. introduces 2 new French style legs. These beautifully carved pieces add a touch of class to any application.



www.osbornewood.com

OSBORNE
Wood Products, Inc.

Call for a catalog: 1-800-746-3233 • Order line: 1-800-849-8876
8116 Highway 123 North • Toccoa, GA 30577 • Email: turn@alltel.net

ROCKLER
WOODWORKING AND HARDWARE



Call or go online to get your **FREE** catalog today! Code 75002

1-800-403-9736 -or- rockler.com/go/V4393

Build the Ultimate



This jig will help keep you on the straight and narrow. Plow decorative flutes with accuracy and ease, employing the unique second fence.

Fluting Jig

By Ralph Bagnall

Transfer your router's mounting hole pattern to the jig, using its own plastic base. The jig's router base is made from 1/4" plywood.



Over the years, I have made many a decorative flute cut by simply using a router and an edge guide. But a recent job, which required me to make a number of fluted newel posts (with varied spacings between the flutes), inspired me to create a dedicated jig. Because edge guides can allow the router to waver during the cut, spoiling the flute, I needed a jig that would keep the router on track.

But how do you hold the jig snug to both sides of the stock and still allow it to slide easily while routing? My solution was an adjustable and flexible second fence. It keeps the fixed fence firmly against the edge of the stock as you rout, while allowing for small variations in the stock's width.

The body of the jig is made from good-quality 1/2" plywood, while 1/4" plywood is used for the router base. For strength and durability, I chose straight-grained hardwood for the guides and fences. Go ahead and cut all the parts to size using the *Material List* on page 56 as a reference. Lay out the grooves and holes on the jig and router base (pieces 1 and 2), using the *Elevation Drawings* on the next page. Everything is symmetrical, so start with an accurate centerline and work outward toward each side. Remove the sub-base from your router and center it on the router plate center hole so you can mark and drill the mounting holes (see top photo).

Use a drill press circle cutter (see photo, right) for the 3" openings in both bases. Use your table saw or band saw to remove the rest of the waste in the jig base and follow up by milling the slots in both bases (see photo sequence, page 57). If you don't have a router table, you can cut the slots with a jigsaw.

The author used an adjustable circle-cutting attachment on his drill press to form the 3" diameter openings on the jig base and router base. He removed the rest of the waste on his table saw.

Milling Solid Stock

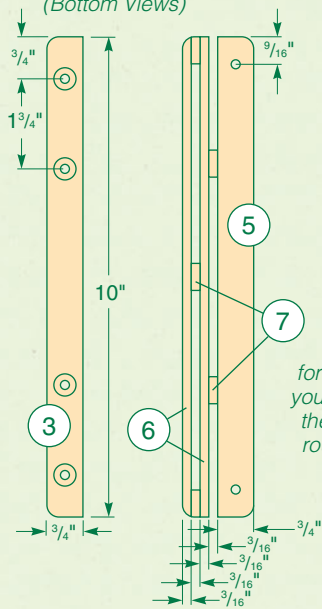
The fixed fence (piece 3) is a straight piece of stock, slightly rounded at the ends, glued and screwed to the edge of the jig base. The guides (pieces 4) receive a small rabbet and are affixed to the face of the base. Mount them by attaching one of the guides to the jig base, slide in the router base, then add the second guide. The fit must be snug enough to guide the router base without binding.

Now that you have the guides properly in place, check the accuracy of the T-nut hole locations, drill the holes and counterbore for the T-nuts.

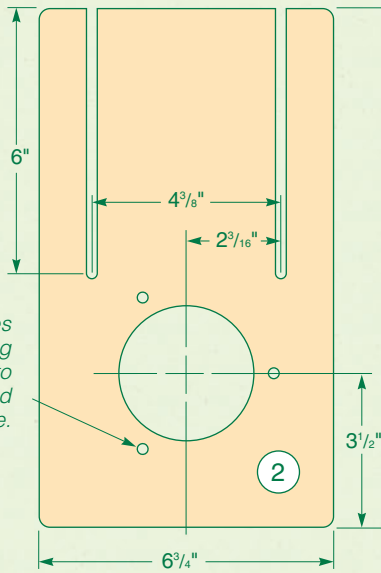
Next, the spring fence (piece 5) — the flexible fence that makes the whole jig work well — needs to be built. Thin strips of hardwood held together with small blocks (pieces 6 and 7) provide a spring effect that holds the workpiece firmly against the fixed guide.



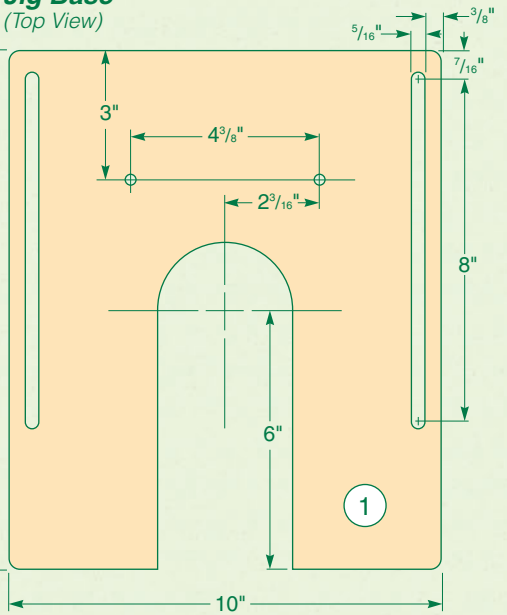
Fixed and Spring Fence
(Bottom Views)



Router Base
(Top View)

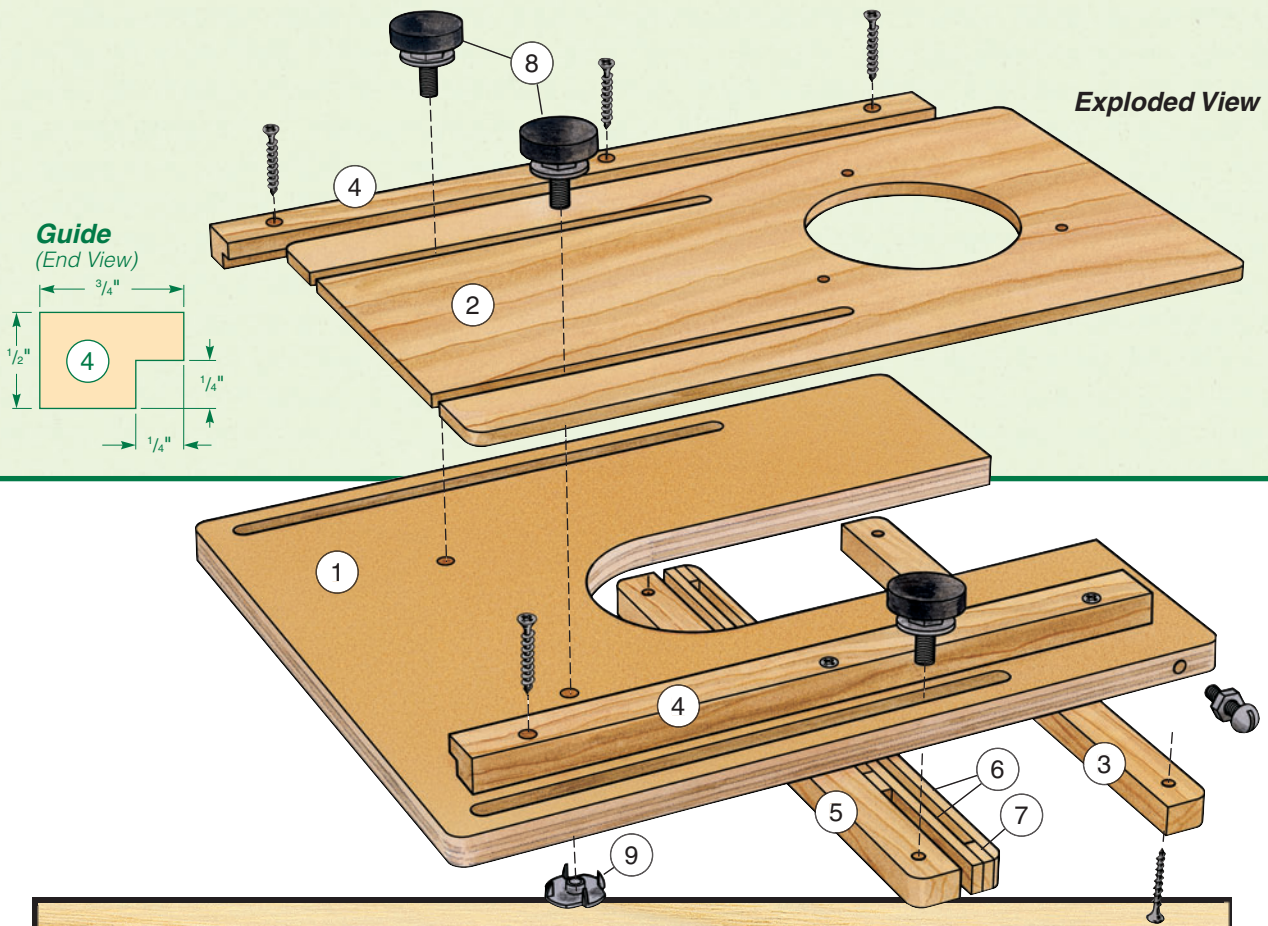


Jig Base
(Top View)

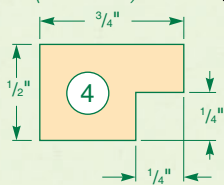


Drill holes for mounting your router to the plywood router base.

Exploded View



Guide
(End View)



MATERIAL LIST

	T x W x L		T x W x L
1 Jig Base (1)	1/2" x 10" x 12"	6 Tension Strips (2)	3/16" x 1/2" x 10"
2 Router Base (1)	3/16" x 6 3/4" x 12"	7 Tension Spacers (5)	3/16" x 1/2" x 1/2"
3 Fixed Fence (1)	1/2" x 3/4" x 10"	8 Knobs (4)	1/4" - 20
4 Guides (2)	1/2" x 3/4" x 11 1/2"	9 T-nuts (2)	1/4" - 20
5 Spring Fence (1)	1/2" x 3/4" x 10"		



Making the slots in the jig base is a three-step process. After you've marked where the slots belong on the base, set up your router table with a 1/4" straight bit. Drop the jig base onto the bit and after the bit protrudes through the plywood, slowly push the piece forward until the cut is complete.

Using the Jig

Putting this jig to work is easy as pie (and I mean apple... not the transcendental number). Mount the router, then slide the router plate onto the base, and set the center of the bit at the desired distance from the fixed fence. Finally, set the depth of cut. Don't be afraid to make more than one pass if needed. For stopped flutes, you'll have to clamp stop blocks at each end of the workpiece. The stops on the base sides can be set to stop the jig at the right spot at each end.

After the first flute is cut, the jig is reversed, then set back in place. This creates two evenly spaced flutes. After the second cut, the router plate knobs are loosened, and the router is repositioned for the next flute in sequence and the whole process is repeated.

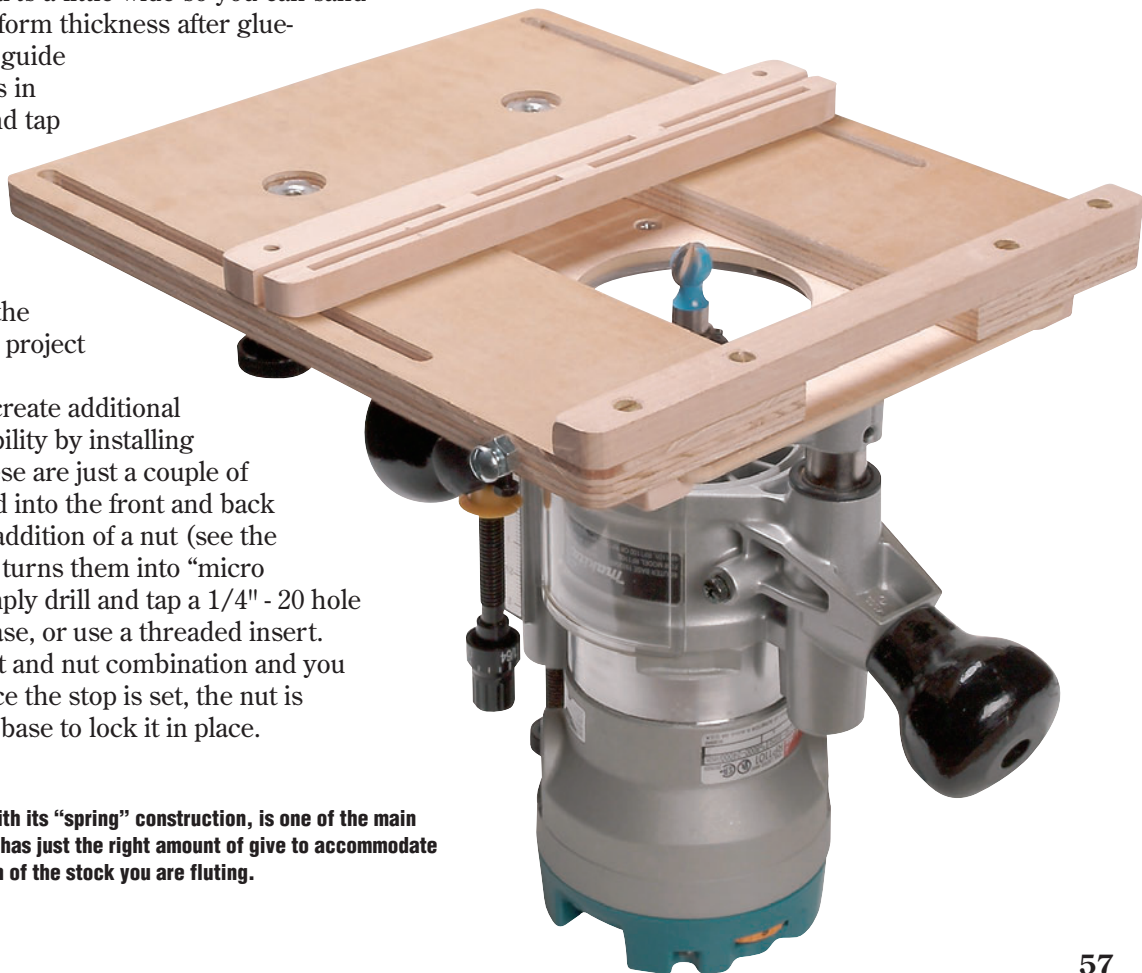
After building the prototype, I quickly began using this jig for all sorts of tasks. The two-fence system makes slotting and grooving long narrow parts easy and accurate. So, next time you need to flute a table leg or make wooden slides, grab this jig. It will keep you on the straight and narrow!



Mill up the fence parts a little wide so you can sand the assembly to a uniform thickness after glue-up. Check the spring guide against the outer slots in the base, then drill and tap 1/4" - 20 holes in the body of the guide for the knobs. Install the knobs and T-nuts (pieces 8 and 9) and you have the lion's share of this jig project behind you.

The final step is to create additional accuracy and adjustability by installing adjustable stops. These are just a couple of stove bolts that thread into the front and back edges of the jig. The addition of a nut (see the *Exploded View* at left) turns them into "micro adjustable" stops. Simply drill and tap a 1/4" - 20 hole in each edge of the base, or use a threaded insert. Mount your stove bolt and nut combination and you are ready to rout. Once the stop is set, the nut is tightened against the base to lock it in place.

The jig's moveable fence, with its "spring" construction, is one of the main reasons it is so effective. It has just the right amount of give to accommodate minor variations in the width of the stock you are fluting.



Fire-retardant Finishing Cabinet

By David Larson

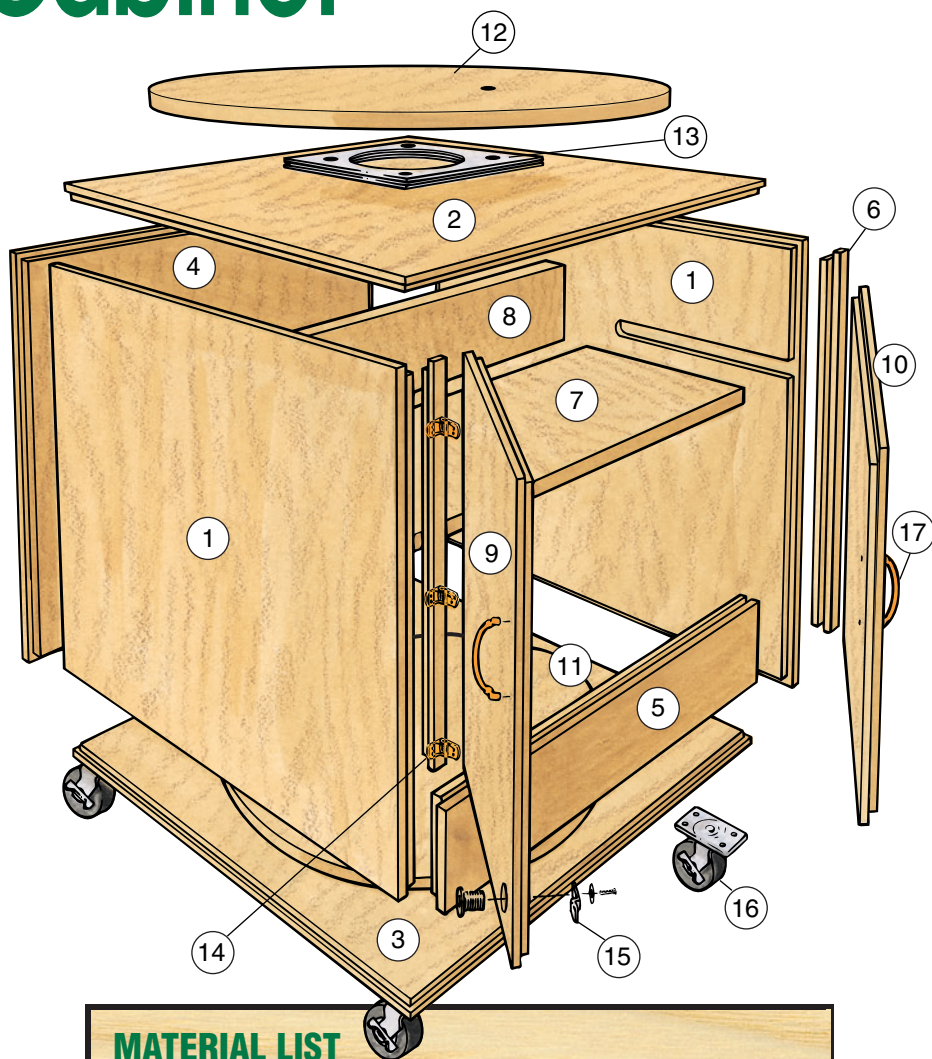
The accumulation of finishing supplies and solvents, and the challenge of storing them in a safe way, is a common problem to every shop. Often the situation develops so gradually that it goes completely unnoticed.

I've been working wood for several years and spend lots of time fixing my house and refinishing antiques. Consequently, I've accumulated quite a few cans of stains, varnishes, oils, strippers and solvents (mineral spirits, turpentine, lacquer thinner and alcohol). My guess is that most woodworkers are in the same boat. When I realized how many of these flammable materials I had carelessly stacked on open shelves, I knew I had a problem to solve.

What To Do?

My first task was to find out the proper method for storing flammable liquids. My search quickly led to the State Fire Marshall's office where I obtained the codes for a flammable liquid storage cabinet. I should point out that these codes apply to Minnesota, and there is no unified national code. You should check with your State Fire Marshall to see if you have additional codes to consider when building this cabinet.

On the whole, the codes are straightforward (see *Tint Box*, next page), although two of the requirements may be unfamiliar to woodworkers. The first is intumescent paint. This is a special paint that swells and chars in the presence of heat, forming an insulating fire-retardant barrier



MATERIAL LIST

	T x W x L
1 Sides (2)	1" x 23 ³ / ₄ " x 23 ³ / ₄ "
2 Top (1)	1" x 23 ³ / ₄ " x 23 ³ / ₄ "
3 Bottom (1)	1" x 23 ³ / ₄ " x 23 ³ / ₄ "
4 Back (1)	1" x 23 ³ / ₄ " x 22 ⁹ / ₄ "
5 Sill Plate (1)	1" x 4 ¹ / ₂ " x 23 ³ / ₄ "
6 Stiles (2)	1" x 1 ¹ / ₂ " x 19 ¹ / ₄ "
7 Shelf (1)	1" x 12" x 23 ³ / ₄ "
8 Retaining Wall (1)	1" x 4" x 22 ³ / ₄ "
9 Left Door (1)	1" x 10 ⁷ / ₈ " x 19 ¹ / ₄ "
10 Right Door (1)	1" x 11 ⁷ / ₈ " x 19 ¹ / ₄ "
11 Lazy Susan Platform (1)	3/4" x 21 ¹ / ₄ " x 21 ¹ / ₄ "
12 Lazy Susan Platform (1)	1" x 21 ¹ / ₄ " x 21 ¹ / ₄ "
13 Lazy Susans (2)	6" x 6" Ball bearing type
14 Spring Closing Hinges (6)	Brass
15 Disk Tumbler Cam Lock (1)	
16 Locking Casters (4)	2 ¹ / ₂ " Dia.
17 Handles (2)	3" Brass

1. Use 1" thick exterior plywood
2. Exterior joints must be rabbeted
3. All joints must be screwed from two directions
4. Doors must be self-closing and equipped with strong hinges and a catch
5. The bottom of the cabinet must be liquid tight for a height of at least 2"
6. Doors must be well fitted and, if two doors are used, they must have a rabbeted overlap of at least 1"
7. Cabinets must be covered with an intumescent type paint



between the wood and the flame. Normal paints burn or slough away when exposed to high heat. I found intumescent paint at a large local paint supply, and it's a common product for the building trades.

The other unusual requirement is sealing the bottom of the cabinet. At first blush this seems easy; just use caulk. But I soon realized that common caulks are petroleum-based, as are most of the liquids in the cabinet. This means that a spill inside the cabinet of mineral spirits, for instance, would soften the caulk and render the cabinet unsealed. The leak could then cause a fire in the shop. When I mentioned this to the folks at the paint store they had a solution: epoxy caulk. Epoxy is very resistant to chemicals, and even strippers have a difficult time removing epoxy finishes. The product I used is called Epoxy Caulking Compound from Pittsburgh Paints.

It's important to note that this flammable liquid storage cabinet only delays a fire from reaching the finishing supplies. It cannot prevent the materials from catching fire altogether. The delay, however, allows time for fire fighters to extinguish the flame before it reaches the finishing supplies.

Cabinet Features

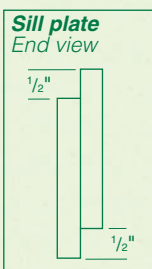
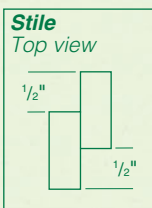
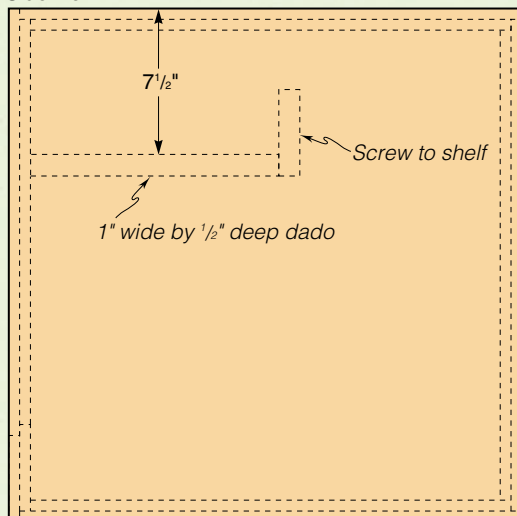
After completing the design I collected the materials for my cabinet from the lumberyard and paint store. See the *Pinup Shop Drawings* for ordering hardware for this project.

I built the cabinet from a single sheet of 1" thick plywood, and I put the cabinet on casters so I could roll it right to my workbench when it's needed. In addition, I installed a lazy susan shelf on top of the cabinet to use as a finishing stand. I can set a project on the shelf and brush on a finish while having full

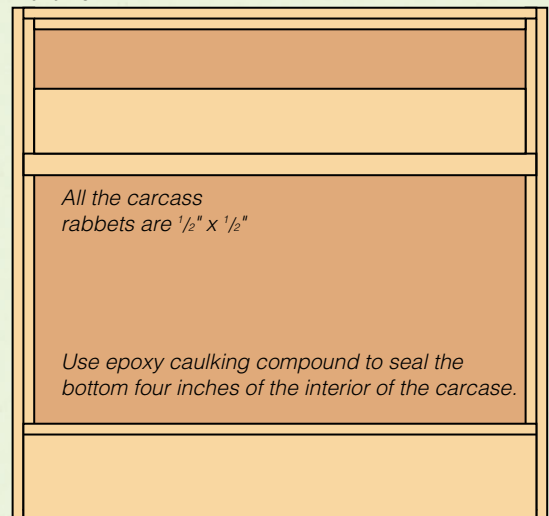
Elevation Drawings

(Drive screws from both sides of all rabbeted joints at 3" intervals.)

Carcass
Side view



Carcass
Front view



access to the workpiece. I also installed a lazy susan shelf in the bottom of the cabinet to make the inside space fully accessible. This allows me to bring any can of material right to the front, where it's easy to reach.

Since I had plenty of vertical space in the cabinet I added an upper shelf to store quart and pint containers. This shelf is only 12" deep so I don't have to reach too far for cans in the back. The addition of a retaining wall keeps the cans from falling off the shelf.

One important point the Fire Marshall made was to avoid hanging paint brushes or other objects on the outside of the cabinet. They will catch fire right next to the paint and ruin its effectiveness.

Building The Cabinet

Begin building your cabinet by cutting the plywood to size following the *Cutting Diagram* on this page. Next, install a 1/2" dado blade in your table saw and raise it 1/2" to cut rabbets on all edges of the sides (pieces 1), top (piece 2), bottom (piece 3), back (piece 4), the sill plate (piece 5) and stiles (pieces 6). For pieces 1 through 4, the rabbets are all on the inside face of the plywood, but for pieces 5 and 6 three edges are rabbeted on the inside face and one long edge should be rabbeted on the outside face. Once you've rabbeted the sides, rout the 1/2"-deep stopped dados for the shelf (piece 7) with a 1" diameter straight bit.

Center and screw the retaining wall (piece 8) to the back edge of

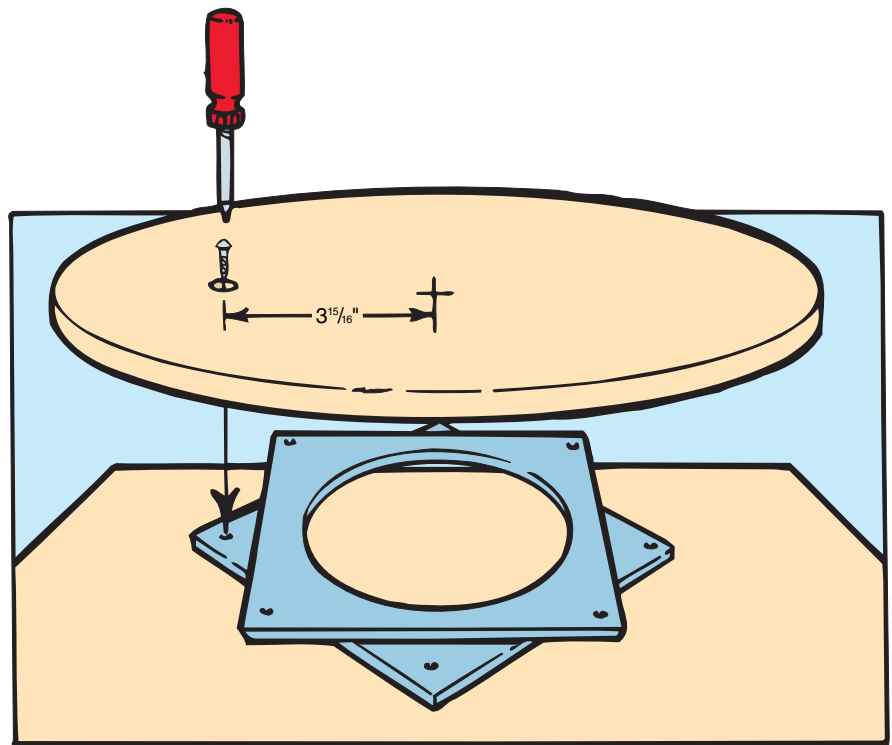
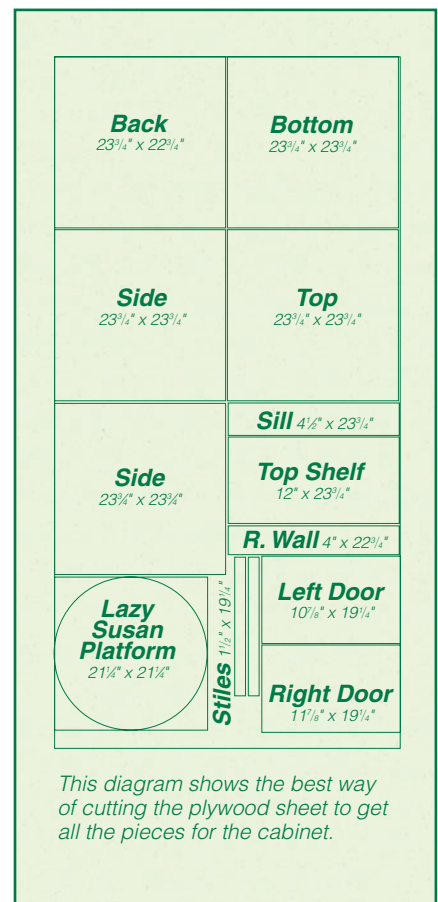


Figure 1: To install the lazy susan, first drill a 1/2" access hole 3¹⁵/₁₆" from the center of the platform. Secure the lazy susan to the platform and use the access hole to screw the assembly to the base.

the shelf, then dry-assemble the cabinet. With everything clamped together, drill 3/8" counterbores and 5/32" pilot holes from both directions along every rabbet joint, and drill several holes into each side of the shelf joint. Now take apart the pieces, spread glue in the rabbets and dados, and reassemble the cabinet. Drive #6-2 1/2" screws in all the pilot holes, then cover the screws with 3/8" wood plugs.

The doors (pieces 9 and 10), which you've already cut to size, must be rabbeted on three edges to fit into the cabinet, and on the fourth edge for the 1" overlap. Note: *The 1" rabbet on the right door (piece 10) should be cut on the front face, while all other door rabbets should be cut on the back face.* Complete these rabbets, then use a jigsaw to cut the round lazy susan platforms (pieces 11 and 12). I couldn't cut both platforms out of



This cabinet is a safe place to store flammable materials, and the lazy susan makes a perfect finishing stand.

the sheet of plywood, so I used scrap 3/4" plywood for the inside lazy susan.

Now install all the hardware on the cabinet, starting with the lazy susans (pieces 13) and the platforms (see *Figure 1*, left). I used three hinges (pieces 14) on each door for more than enough support. For peace of mind, I installed a disc tumbler lock (piece 15) in the left door to keep the cabinet secure. Since the lock works on doors up to 7/8" thick, I drilled a 1/8" deep mortise to recess the face plate before drilling the through hole. The last bits of hardware to mount are the casters (pieces 16) and the handles (pieces 17).

Finishing Up

Remove all the hardware so you can all cabinet surfaces. As an extra precaution, I coated both the outside and inside of the cabinet with the intumescent paint.

Once the paint dries, apply the epoxy caulk to all the inside seams that are within 4" of the bottom cabinet panel. Your goal is to make the bottom area completely leakproof. Mix the epoxy carefully, then apply it with a tongue depressor. I'd suggest wearing latex gloves to keep the epoxy off your hands.

Now screw all the hardware back into place and find a safe spot to store the key to the lock. Not only have I found the cabinet to be a safe place for organizing my finishing supplies, but the addition of the lazy



susan platform has come in handy many times for working on small projects. However, a word of caution is due here. Don't use the platform for spray finishing because the overspray will land on the cabinet and reduce the effectiveness of the intumescent paint. Since mine is just a hobby shop, this isn't ever a limitation — I don't even own spray equipment. If you do spray all your projects, consider leaving the top lazy susan off altogether.

The cost of this project ran me about \$150. The major expense was

the paint and caulk, and I only used about half of this material. If you can interest a friend in this project you could split the cost of these materials, saving each of you about \$40.

The cost might deter a few woodworkers from building the cabinet, but when you consider the risks of storing flammable liquids improperly, it seems minimal, and it's far less than buying a commercially available fire-rated cabinet.

ADVERTISING INFORMATION

AllProTools.com

888-425-5776

www.allprottools.com

A seller of major brand portable power tools for woodworking and industrial applications.

pg. 15

Journeyman Tool

920-485-0350

www.beadlock.com

BeadLOCK™ loose tenon joinery system for making mortise and tenon joints with a hand drill.

pg. 63

Baker Products

573-663-7711

www.baker-online.com

Offers several different models of resaws, portable sawmills and pallet manufacturing equipment.

pg. 33

Kreg Tool Company

800-447-8638

www.kregtool.com

Supplies a full line of pocket-hole joinery systems and other woodworking accessories.

pg. 47

Briwax

800-5-BRIWAX

www.briwax.com

Briwax protects, restores and reconditions fine furniture. Available in clear and seven other colors.

pg. 47

Leigh Industries

800-663-8932

www.leighjigs.com

Offers a complete line of joinery tools including the Frame Mortise and Tenon Jig.

pg. 38

CMT USA

888-268-2487

www.cmtusa.com

Maker of top quality bits and saw blades and dado blades for over 30 years. The only producer of orange router bits.

pg. 33

LRH Enterprises

800-423-2544

www.lrhent.com

Supplies custom, made-to-order cutters and bits for detailing. MAGIC Molder offers versatility to pro and home shops.

pg. 15

Cook's Saw Manufacturing, LLC

800-473-4804

www.cookssaw.com

Increase your income with a portable sawmill. Enables you to mill lumber for any purpose.

pg. 19

Mantis

800-366-6268

www.mantisgardentools.com

Manufactures lightweight garden tillers, attachments and other gardening hand tools.

pg. 13

Country Accents

570-478-4127

www.piercedtin.com

Hand-punched and hand-pierced panels of tin, copper or brass, including custom sizing and designs.

pg. 63

Osborne Wood Products

800-849-8876

www.osbornewood.com

Hardwood custom wood parts; specializing in white pine but also available in maple, oak, cherry and other.

pg. 53

Duluth Trading Company

877-382-2345

www.duluthtrading.com

Safety and job site protection; storage gear; tool belts, bags and holsters; tools and shop supplies; clothing; more.

pg. 38

Palmgren

800-621-6145

www.palmgren.com

Sells machine shop and general purpose products and a new line of professional woodworking tools.

pg. 19

Franklin International

800-347-4583

www.titebond.com

Titebond® adhesives and the HiPURformer Advanced Bonding system.

pgs. 2-3

Prox-Tech, Inc.

877-PROXXON

www.proxxon.com

German-engineered PROXXON woodworking tools, lathes and milling systems.

pg. 70

Gorilla Glue

800-966-3458

www.gorillaglu.com

One hundred percent waterproof glue bonds to wood, stone, metal, ceramic, concrete, etc.

pg. 19

Rockler Woodworking & Hardware

800-279-4441

www.rockler.com

Premier supplier of hardware, tools, lumber, plans and supplies. Many unique proprietary products.

p. 22-23

Gross Stabil Corporation

517-279-8040

www.grossstabil.com

Specializing in high quality clamps, casters, glides and bases for the furniture industry.

pg. 53

Shopsmith, Inc.

800-543-7586

www.shopsmith.com

Multi-purpose woodworking machines and other tools and accessories.

pg. 63

Haddon Tool

888-705-1911

www.haddontools.com

Designs chain saw lumbermaking tools for woodworkers and log home builders.

pg. 63

Simp'l Products

914-662-2820

www.woodjigs.com

Makers of easy-to-use, economical jigs for sawing and joint-making.

pg. 53

Hitachi Power Tools

800-829-4752

www.hitachi.com/powertools

Manufactures, distributes and services a complete line of heavy-duty woodworking tools.

pg. 7

Wilton

800-274-6848

www.wiltoncorp.com

Offers a line of benchtop power tools, woodworking hand tools and metalworking tools, as well as Multi-Grip clamps.

pg. 11

Home Depot

800-553-3199

www.homedepot.com

World's largest home improvement retailer, with building materials and lawn and garden products.

pgs. 9 & 83

Woodpeckers, Inc.

800-752-0725

www.woodpeck.com

Vendor of Inca jigs and products; also manufacture lifts for a variety of routers; plus router tables, stands and cabinets.

pgs. 33, 38 & 63

JET Equipment

800-274-6848

www.jettools.com

An industry leader of woodworking machinery, accessories, abrasives, blades, dust collectors and more.

pg. 5

Woodworker's Journal

800-765-4119

www.woodworkersjournal.com

The #1 Woodworking Magazine in America! For special subscription rates call or visit our web site. Mention code 4799.

pg. 70

**FREE!
FREE!
FREE!**



**“Sawdust Therapy”
TV Show**

We want to send you this informative 30-minute Woodworking TV Show (on DVD/CD). *Sawdust Therapy* has appeared on TV stations across America over 20,000 times and viewed by millions of folks interested in woodworking.

We'll also send you an information-packed, full-color brochure describing the Shopsmith MARK V. It's the most amazing woodworking tool ever invented...and converts from a 10" Table Saw to a Vertical Drill Press, Disc Sander, Boring Machine and Lathe in less than a minute!

And, since it uses a single motor, spindle and stand, the MARK V is a great value and fits in about the same space as a bicycle. See why more than a million owners would agree – it's your better alternative to a shop full of individual tools – all at an affordable price.



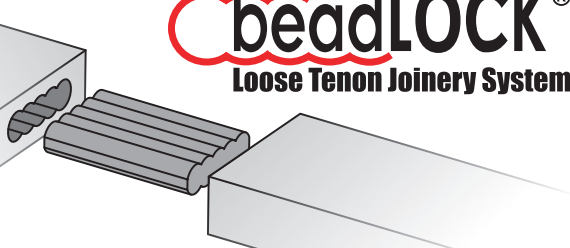
**When You Think
of Woodworking –
Think Shopsmith!**

SHOPSMITH MARK V

Call Toll Free 1-800-543-7586 for more info,
or request on-line at:

www.WODJA.MARKVINFO.htm

**Strong.
Simple.
Safe.
Accurate.
Clean.
Quiet.
Versatile.**



beadLOCK®
Loose Tenon Joinery System

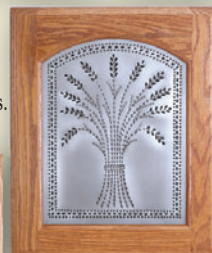
www.beadlock.com • Journeyman USA, LLC • Horicon, WI • 920-485-0350

quality pierced tin

Visit us on the web at www.piercedtin.com

Add that **Distinctive Look** to your woodworking projects. Quality handcrafted affordable panels. 100's of award winning designs, or let us custom design your own panels. Easy to order standard sizes OR custom made to your exact specifications in 14 different metals, including copper and brass. Do-it-yourself materials & kits, too! Colorful 100+ pg. catalog \$5.00 or catalog with 14-pc. sample set \$25.95 postpaid.

MasterCard, Visa,
Discover accepted.



Country Accents® since 1979
1723 Scaife Road,
Dept. WWJ-04/05
Williamsport, PA 17701
Ph. 570-478-4127 • M-F 8-5

**OVER 500 ONLINE
PLANS**

www.woodworkersjournal.com

HADDON LUMBERMAKER



This low cost 4 lb. attachment turns any chain saw into a portable saw mill and accurate cutting tool. Lets you make good custom cut lumber from logs - RIGHT WHERE THE TREE FALLS! Pays for itself with the lumber from the first tree you cut. Out-performs other products many times its size and price! Call or write for a free brochure. To order call us with your credit card number or send \$84.95 + \$10.00 S&H to:



1-888-705-1911

HADDON TOOL, INC.



21967 W. Vernon Ridge Rd., Mundelino IL 60060
visit us on the internet at <http://www.haddontools.com>

**Give Your Work the
Finishing Touch
it Deserves**



- Solid Brass Hardware
- Wide Selection
- Quantity Discounts



www.woodpeck.com

1.800.752.0725

Building a Budget Workbench

Build yourself the ideal work center for about \$300.

By Rick White

Every woodworker dreams of owning a classic European workbench. The beautiful maple top and elaborate shoulder vise symbolize the essence of fine craftsmanship. But how many of us look at these benches and end up saying “it’s just too nice to use in my shop.” And when we see the cost of building such a bench we pass on the project altogether.

On the other hand, settling for a barely adequate bench is frustrating. Without a vise you can’t hold your workpiece, and without a heavy, solid surface you can’t expect to strike a chisel without having it bounce around and damage your wood.

Being caught between a rock and a hard place over a workbench is no fun. It is the heart and soul of a shop. With this dilemma in mind, I set out to build a completely functional workstation for around \$300.

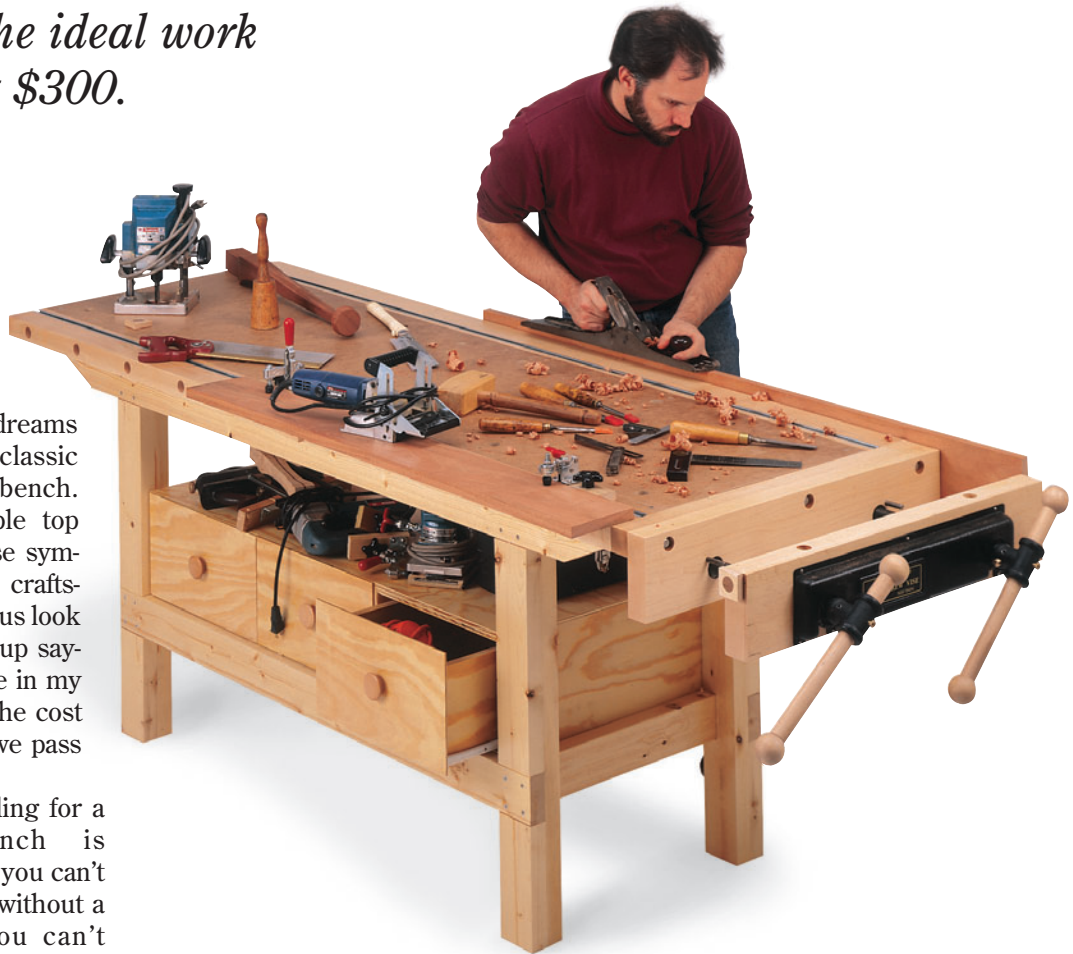
About half of that cost was for a Veritas vise and a metal T-slot system. The vise has two screws connected by a bicycle chain that overcomes the racking problem commonly experienced with traditional vises. The chain drive can be quickly released to operate the screws independently, making it possible to cant the jaws a little when holding stock out near the edge of the bench. The T-slot system is very flexible and, as you’ll see, lends itself to dozens of homemade accessories.

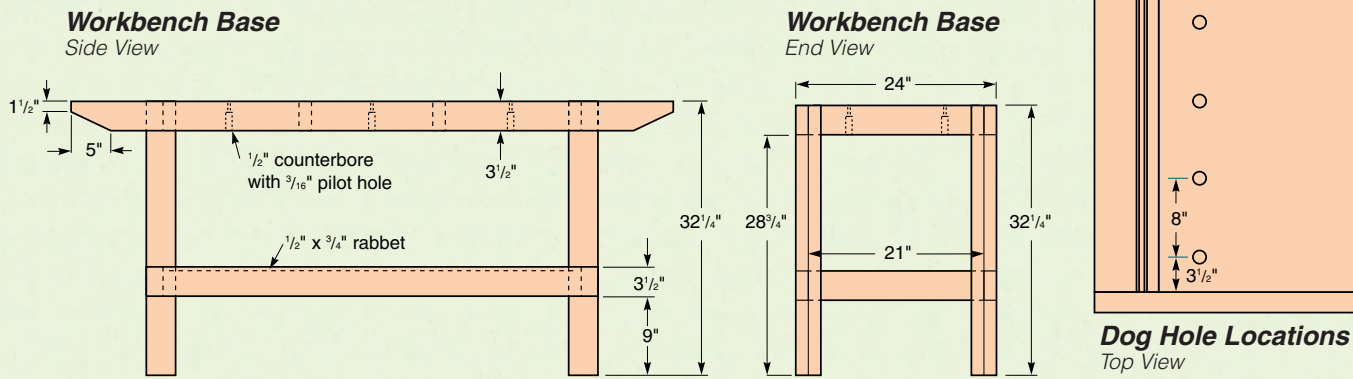
The first thing a bench should offer is a sturdy surface, and this one fills the bill. When I recently surfaced an oak board with a hand plane the bench didn’t budge an inch. The hardboard top makes a sound work surface, and since it’s screwed down, it’s easy to replace when it’s worn or damaged. There’s plenty of room for handling large panels, and I can clamp wood for sanding, surface and edge planing, edge and panel routing, joint cutting, and up to this point, any operation I can think of. The completed bench is heavy, which is perfect for deadening the blows of a pounding mallet.

In addition to the basic bench, I later added a cabinet to the leg structure. Although this wasn’t part of my original project, spending an



The basic T-slot system opens up all sorts of jig possibilities for holding a project while drilling, routing, planing, sanding, or cutting at the workbench.





additional \$50 for one more sheet of plywood and three pairs of drawer slides has made better use of this otherwise empty space. An *Exploded View* on page 69 will guide you through this addition if you want to go the extra mile.

Building The Base

The base of the workstation is made with standard 2 x 4 stock, and most of the joinery is done with lap

joints and screws. All the cutting was done with a table saw and, for this phase of the project, the only other tool I used often was a drill.

Begin by gluing up 2 x 4 stock for the legs (pieces 1) after cutting the pieces a couple inches longer than the *Material List* lengths (see page 66). Use two pieces of lumber for each leg, spreading yellow glue on both mating surfaces to get a perfect bond, then clamp the pieces together. Clean off the excess glue from each lamination before it hardens.

Once the legs are removed from the clamps go ahead and cut all the base pieces to length. The side aprons (pieces 2) and top supports (pieces 3) give the top much of its rigidity and help keep the base from racking. The side stretchers (pieces 4), the end aprons (pieces 5) and end stretchers (pieces 6) complete the base, creating great stability and adding substantial weight to the bench.

Lay out the lap joint locations on the legs as shown in the illustration above and in the *Lap Joint Detail* on page 67. Keep in mind that all the leg joint positions are essentially the same, but as with all table legs, each one has to mirror the leg across from it. To cut the laps, install a 3/4 inch dado blade in your table saw and raise the blade 1 1/2 inches. With the aid of your miter gauge take several passes to remove the wood in each joint area.

Now lower the dado blade to 3/4 inch and lay out the dadoes on the side aprons for joining with the top supports (see *Elevation* at left). Cut each dado with a couple passes over the blade. Next, cut a 3/4 inch wide by 1/2 inch deep rabbet along the top inside edge of each side stretcher. Stop the rabbets 1 inch from each end of the pieces. To protect your fence during these rabbeting cuts, be sure to clamp on a sacrificial wood face.

Before assembling the base, take care of two more small details that are easy to do now while other frame parts aren't in the way. First, drill 1/2 inch counterbores with 3/16 inch pilot holes in the bottom edge of the four aprons and two top supports (see *Drawing* above).

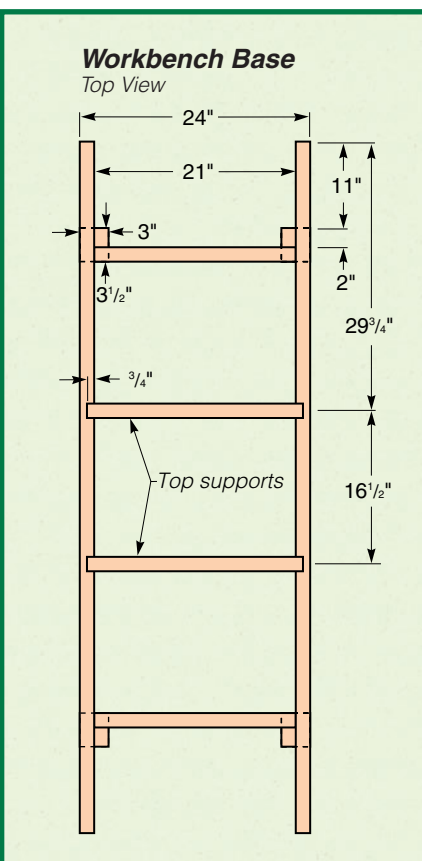
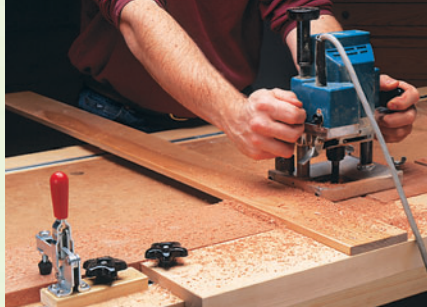


Figure 1: Batten boards, which feature a curve of about 1/8 inch on their bottom edge, are used to apply pressure at the middle of a wide panel assembly during glue-up to hold it flat.

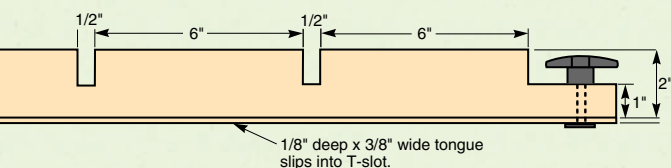


The clamp support jig steadies my bar clamps on the bench top while I adjust boards in a panel assembly. This allows me to work at a comfortable height and spares me from tipping clamps during an assembly.

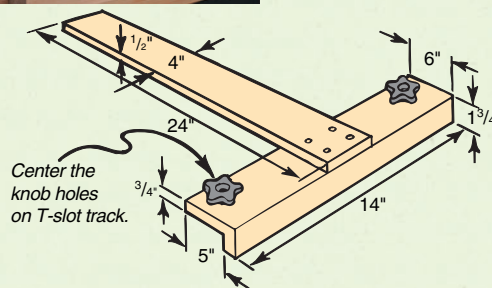


My favorite workbench invention is the T-square jig. For routing multiple dados across a panel it is unsurpassed for speed and, since everything works off the edge of the bench, it's also very accurate.

Clamp Support Jig



T-Square Jig



These holes will be used later for screwing down the bench top. The second detail is trimming the angles on the ends of the side aprons, as shown in the left *Illustration* on page 65. The best tool for cutting the angles is a handheld circular saw, but a jigsaw will work almost as well. After making the cuts, smooth the edges with a belt sander and 80-grit paper.

Assemble the workbench base in two stages: First glue and screw the side aprons and stretchers to the legs, then join these structures with the end aprons, end stretchers and the top supports. Make sure that the two side stretcher rabbets face each other on the base assembly. Clean up any glue squeeze-out and sand the base to remove all the sharp edges.

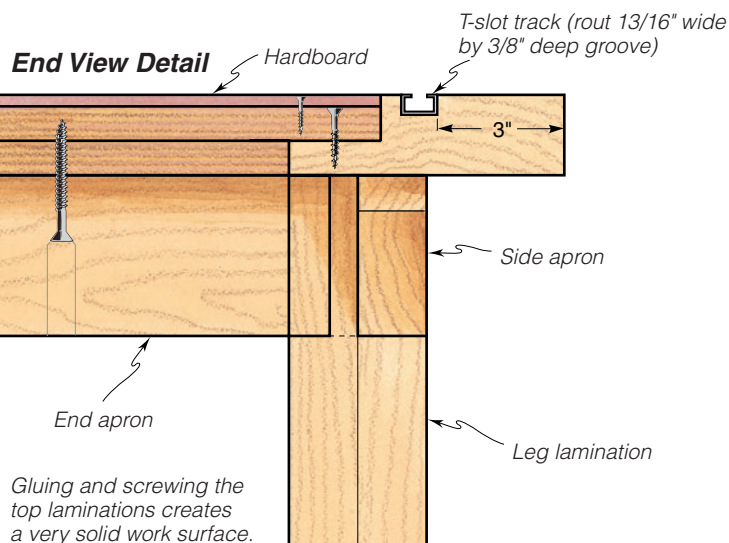
Since my shop floor is anything but level, I installed a leveling glide (pieces 7) in the bottom of each leg. To install these optional glides, flip the base upside down and drill a 1/2" diameter by 2" deep hole in the center of the leg bottoms, then secure the threaded plates included in the package and screw in the levelers.

Moving Up To The Top

The top is basically a three-layer sandwich that's banded with thick maple rails. First, two panels of fir plywood (pieces 8 and 9) are laminated together to make the top stable and heavy, then above the plywood a layer of removable hardboard (piece 10) is added to take the dings and dents suffered by any workbench. When the

hardboard becomes too scarred from working at the bench, remove it and use it as a template for making a new one. To complete the top assembly, maple rails (piece 11) are attached to the plywood, giving the top an attractive edge and a durable surface for anchoring the T-slot tracks (pieces 15).

Start building your top by cutting the two plywood panels to size and gluing them together. Use a brush or roller to spread yellow glue over both mating surfaces, then center the smaller panel on top of the larger one. Next, in order to keep them from slipping out of position, drive a brad into the assembly at each corner of the smaller panel. Clamping the plywood requires consistent pressure throughout the lamination, so make sure you've



MATERIAL LIST

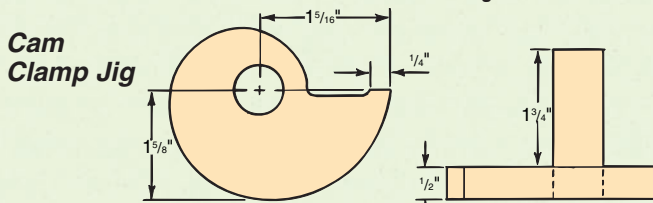
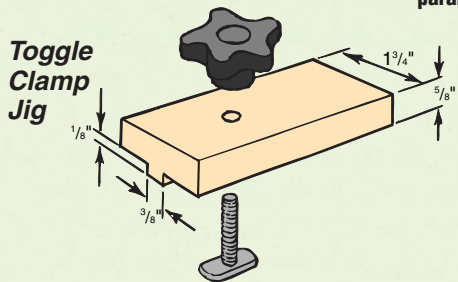
	T x W x L
1 Legs (4)	3" x 3 1/2" x 32 1/4"
2 Side Aprons (2)	1 1/2" x 3 1/2" x 76"
3 Top Supports (2)	1 1/2" x 3 1/2" x 22 1/2"
4 Side Stretchers (2)	1 1/2" x 3 1/2" x 54"
5 End Aprons (2)	1 1/2" x 3 1/2" x 21"
6 End Stretchers (2)	1 1/2" x 3 1/2" x 21"
7 Leveling Glides (1 set)	Heavy-duty
8 Top Panel (1)	3/4" x 22" x 80"
9 Bottom Panel (1)	3/4" x 18" x 80"
10 Hardboard (1)	1/4" x 22" x 80"



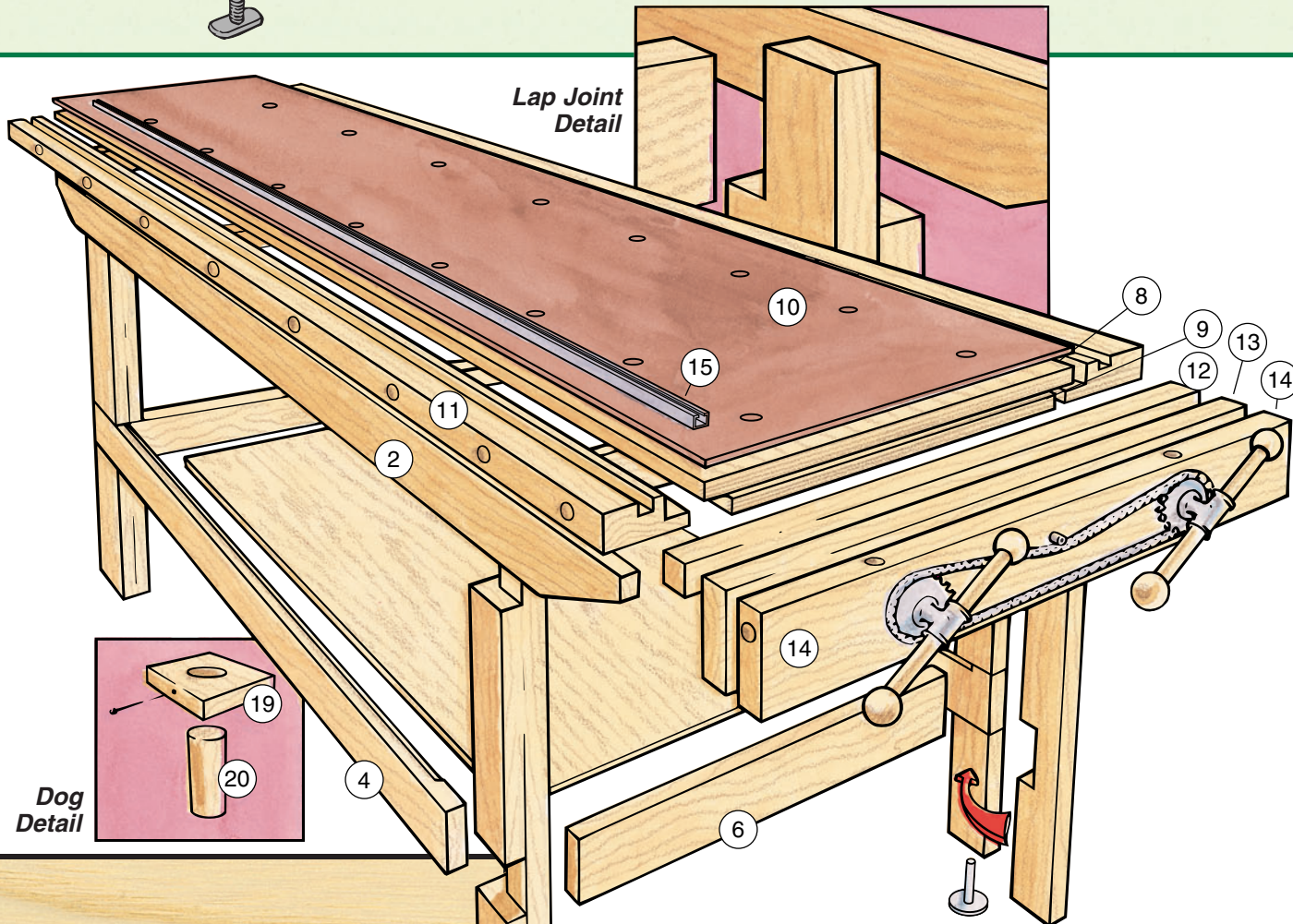
I have two sets of toggle clamps. One set clamps in line with the T-slots and the other set at right angles to the slots. Between them I can hold projects going across the bench or parallel with its length.



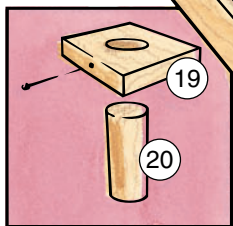
When sanding panels, regular clamps often get in the way. To avoid this problem I made a set of cam dogs and a T-slot bar. Since the bar is adjustable, it can make up the distance between the dog holes.



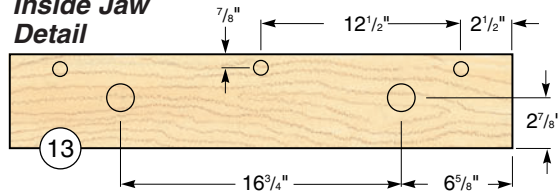
Lap Joint Detail



Dog Detail



Inside Jaw Detail



	T x W x L
11 Maple Rails (2)	1 3/4" x 6" x 80"
12 Endcap (1)	1 3/4" x 1 3/4" x 30"
13 Inside Vise Jaw (1)	1 3/4" x 5 3/4" x 30"
14 Outside Vise Jaw (1)	2" x 5 3/4" x 30"
15 T-slot Tracks (4)	13/32" x 13/16" x 40"
16 Screws (30)	#6-1" panhead
17 Lag Bolts/Washers (3)	3/8" x 2 1/2"
18 Screws (15)	#12-2 1/2"
19 Dog Heads (4)	1/2" x 2" x 2"
20 Dog Dowels (4)	1" Dia. x 1 1/2" long

pre-cut a bunch of curved batten boards to apply pressure in the middle of the panels (see *Figure 1*, previous page).

Rip and crosscut your maple to size for the rails, then drill 1½" deep holes in one edge of each piece following the *Dog Hole Locations Drawing* on page 65. After drilling the 1" holes, install a ¾" dado blade in your table saw to cut a 1" deep by 2" wide rabbet in the other edge of each rail (see the *Exploded View Drawing* on page 67). Make several passes to complete each rabbet, being sure to clamp your protective wood face to the saw fence.

The maple rails should now be glued and screwed to the upper plywood panel. I recommend clamping the rails without glue to the plywood first, and drilling countersunk pilot holes through the plywood into the rail — I drilled seven evenly spaced holes along each rail. This way, the glue won't cause the rails to slip out of alignment during clamping if you can drive the screws in at the same time. When you've finished drilling, release the clamps, spread glue in the rail rabbets, and reclamp the assembly. With everything in place, drive the screws, then clean up any glue squeeze-out, especially along the inside edge of the rail.

The final piece to fit into the top is the tempered hardboard. Cut the sheet to fit between the rails as snugly as possible, then drill countersunk pilot holes along its edges for the screws that will hold it to the plywood.

As I mentioned earlier, one of the most important features on this bench is the T-slot system. The efficient use of this bench really revolves around jigs made with a T-

bolt and a knob clamp. The T-bolt slides in a metal track that has been secured to the bench with screws, then the knob on the bolt is tightened to hold the jig in place. The aluminum track will last through a lifetime of constant use. You can buy the T-slot track, T-bolts and knobs from many different woodworking suppliers these days, including Rockler (800-279-4441, www.rockler.com).

Installing the metal track requires a simple 13/16" wide by 3/8" deep groove. Make sure the groove depth is accurate; if it's too shallow the track will stick up into the work surface, and if it's too deep the accessories will pull the track out of the groove.

Lay out the track grooves on the maple rails as shown in the *End View Detail*, page 66, then chuck a 1/2" straight bit in your router and attach a straightedge guide. Now rout one 3/8" deep pass for each track, then reset the edge guide to make a second pass, widening the grooves to 13/16".

Since the track comes in 40" lengths, this bench requires four pieces to make up the two parallel slots. To secure the tracks, set them into the grooves and drill 5/32" diameter holes every six inches. Next, drive a #6 - 1"

panhead screw (pieces 16) into each hole. If the track overhangs the end of the bench, cut the excess off with a hacksaw.

Benchtop Details

Drilling dog holes in the benchtop requires a great deal of accuracy, so I made a jig to help me during this operation (see *Figure 2*, above). The idea behind the jig is to use one dog hole to establish the position of the next hole. To ensure accuracy I incorporated a portable drilling guide into my jig. Since the jig is guided by the maple rails, I have two fence positions, one for the right-hand row of holes and one for the left-hand row.

Build the jig, then set it against the bench top to drill the first hole as shown in the *Dog Hole Location Drawing* on page 65. Drill the hole, then use a center punch and the forward hole on the jig to locate the next hole.

Now move the jig forward until you can slip a 1" dowel through the rear jig hole and into the first bench hole. Lower the drill bit to the second hole location to make sure the bit spur goes right into the punch mark. Drill the second hole and use the center punch to mark the third hole. Continue this procedure for the rest of the dog

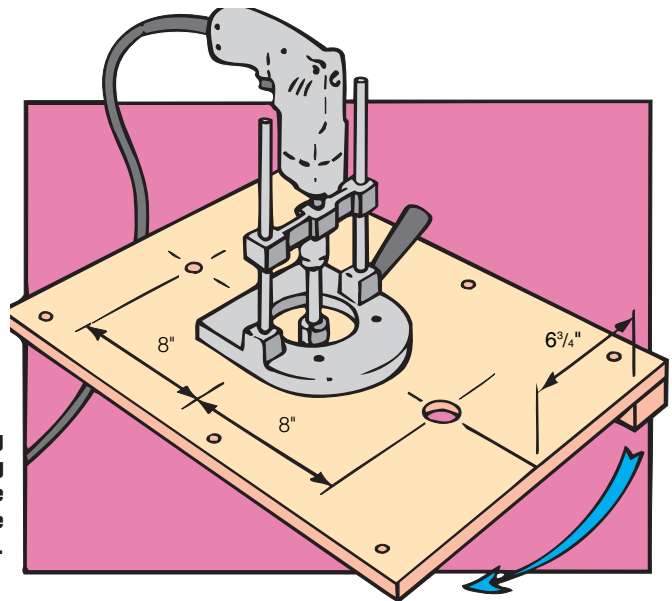
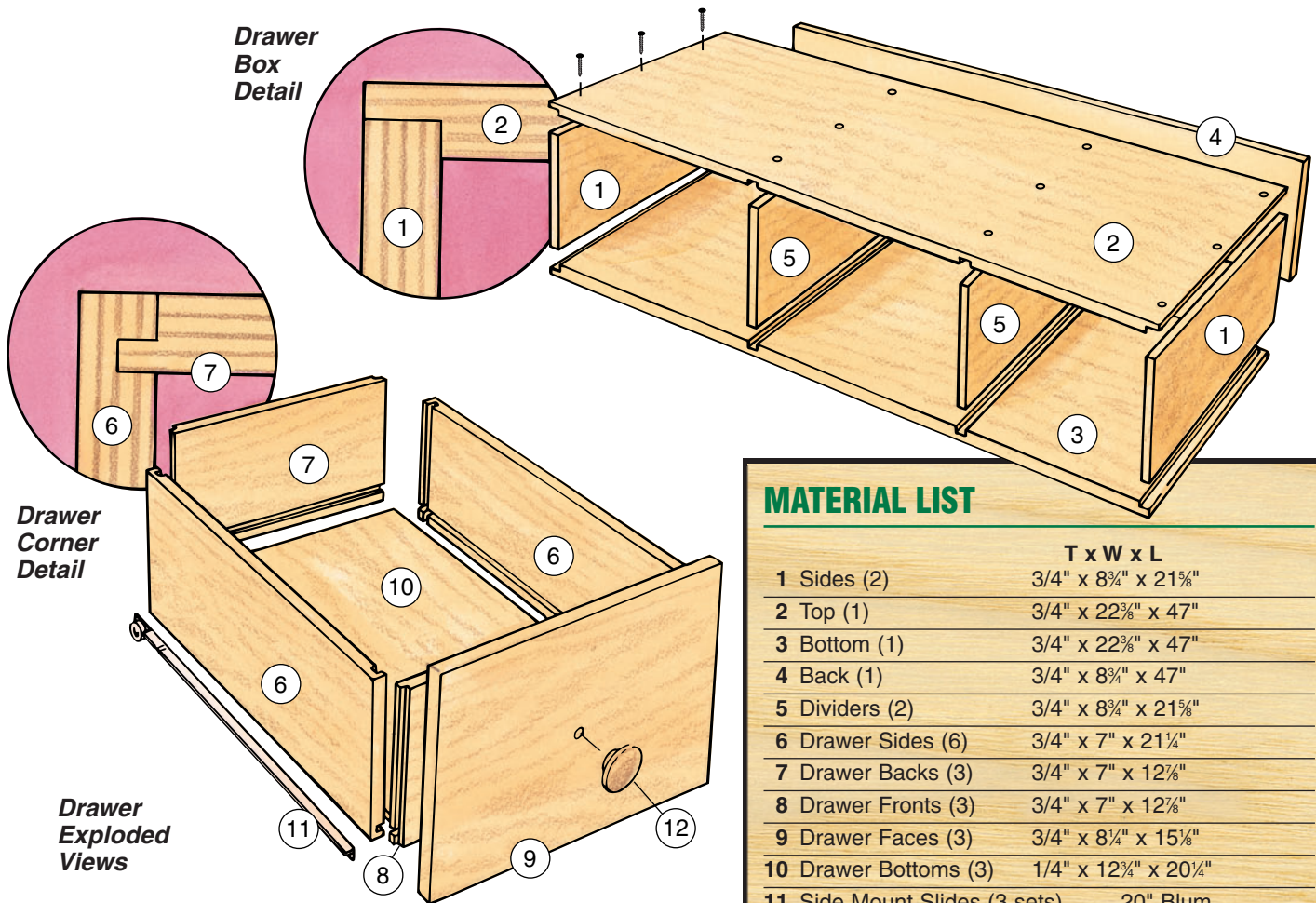


Figure 2: A drilling jig ensures accurate dog holes; just be sure to switch the fence for each row.



MATERIAL LIST

	T x W x L
1 Sides (2)	3/4" x 8 3/4" x 21 1/2"
2 Top (1)	3/4" x 22 3/8" x 47"
3 Bottom (1)	3/4" x 22 3/8" x 47"
4 Back (1)	3/4" x 8 3/4" x 47"
5 Dividers (2)	3/4" x 8 3/4" x 21 1/2"
6 Drawer Sides (6)	3/4" x 7" x 21 1/4"
7 Drawer Backs (3)	3/4" x 7" x 12 7/8"
8 Drawer Fronts (3)	3/4" x 7" x 12 7/8"
9 Drawer Faces (3)	3/4" x 8 1/4" x 15 1/8"
10 Drawer Bottoms (3)	1/4" x 12 3/4" x 20 1/4"
11 Side Mount Slides (3 sets)	20" Blum
12 Knobs (3)	1 1/2" Dia.

* Three sets required.

holes. When you're done with the right-hand row, switch the fence and drill the left-hand row of holes. The more accurate your dog holes are, the better off you'll be when using your bench jigs.

On the back end of the benchtop, the T-slots are left exposed so you can slip your fixtures and jigs in and out. On the front end of the bench, however, you must install an endcap. Cut the endcap (piece 12) and the vise jaws (pieces 13 and 14) to size, then follow the *Inside Jaw Detail* on page 67 to drill their mounting and vise screw holes. Clamp the endcap into position against the benchtop and extend the pilot holes into the maple rails and the plywood lamination. Now secure the endcap to the bench with glue and screws (pieces 18), extend the pilot holes for the inside vise jaw

and secure it with lag bolts and washers (pieces 17).

At this point, the benchtop and the base are ready for assembly. Square the top on the base, then clamp the two together. Now reach under the bench to extend the pilot holes in the aprons and supports. Use #12 - 2 1/2" screws (pieces 18) to secure the assembly.

Some Final Thoughts

Make the bench dogs (pieces 19 and 20) as shown in the *Dog Detail Drawing* on page 67. If you don't plan to build the drawer cabinet, cut a plywood panel to fit between the side stretchers in the base for a storage shelf. If you plan to build the drawer cabinet, follow the drawings shown above.

The Veritas vise comes with instructions, so I won't go into the steps for its installation. To order it, contact Lee Valley Tools at 800-871-8158; www.leevalley.com.

The jigs I developed for the T-slot system are shown across the tops of pages 66 and 67. These are a small sampling of what's possible with this system, and I'm sure that with time I'll have many more. Once the jigs were made, I sprayed the bench with lacquer and went to work. So far I'd say my moderately priced bench is paying off. My checkbook isn't as light as it would have been if I had built a European type bench, and I've gained a lot more flexibility for holding my work.

Build it your way.

We have what you need — hardware, wood, tools and know-how.



Win a PT Cruiser Woody!

Register online to win a 2005 PT Cruiser Woody!



Visit: Rockler.com/go/pt70

PROXXON

TOOLS WITH CHARACTER

The perfect table saw - quiet, precise and powerful!

For model-building, picture-framing and other intricate projects. With electronically adjustable speeds for working on various materials, all wood types, non-ferrous metals, plastics, rubber, cork and much more.



Table saw
FKS/E

The powerful motor allows for accurate straight cuts and miter cuts up to 45°. It comes equipped with a TCT blade.

The PROXXON line is the assortment for the serious model builder. Every machine one could wish for the delicate project. More

than 50 tools, all in a compact size, thus lightweight and easy manageable without ever compromising performance.

High quality German engineered power tools – no matter which project is next on your list, we have the right tool for you!

More information on the line and PROXXON dealers:

— www.proxxon.com/us —

PROX-Tech, Inc., P.O. Box 1909, Hickory, NC, 28603-1909
Toll free 1-877-PROXXON, sales@prox-tech.com



WOODWORKER'S JOURNAL presents

Two Great New Issues

OUTDOOR PROJECTS & ARTS & CRAFTS FURNITURE

Ten classic backyard projects from the archives of *Woodworker's Journal*. Enjoy your favorite hobby all year long ... just bring your tools to the backyard and keep right on building.

Here's a preview of the projects:

- Redwood Arbor
- Gardener's Bench
- Spanish Cedar Picnic Table and Benches
- Child's Adirondack
- Outdoor Chairs
- Croquet Set
- Birdhouse
- Patio Planter
- Folding Bench



Item #25177... \$5.99

Order today to get both special issues for only

\$8.99!

Just mention code W4128.

The Arts & Crafts style of furniture is featured regularly in *Woodworker's Journal*. Our new compilation "Arts & Crafts Furniture," pulls together the best projects from the archives of *Woodworker's Journal* and *Today's Woodworker* magazines.

Here's a preview of the projects:

- Fern Table
- Coat Tree
- Slatted Bookcase
- Dining Room Chairs
- Dining Room Table
- Leather-top Desk
- Spice Rack
- Greene & Greene Wall Mirror
- Greene & Greene Dining Table



Item #32208 ... \$5.99

To order, call:

1-800-610-0883 Or order online: www.woodworkersjournal.com

Precision Crosscutting Jig

Spend a day or two making this classic workshop project and the results will improve your woodworking accuracy for years to come.

By Chris Inman

Woodworking is an exercise in precision. A fine joint that crisply mates two pieces of wood into a single, strong unit depends on a craftsman's ability to make the cuts accurately. It's possible to carry this to ridiculous limits (as when people talk about tolerances in thousandths of an inch), but in woodworking, differences under 1/64" are generally acceptable. Trimming a board to the correct length with square ends lays the foundation for all subsequent layout and joint cutting steps. It's essential, therefore, to make these first cuts as perfect as possible, and there's no better tool for getting this done than a crosscutting jig for your table saw.

While 90° cuts are the first priority of a crosscutting jig, it's a bonus if it handles miters as well. This jig has a mitering accessory for cuts from 0° to 65°, with positive stops at 22½° and 45°.

Building the Jig Base

The core of the crosscutting jig is a piece of 1/2" thick Baltic birch plywood (piece 1). The jig described here was made for a Delta Unisaw. You should size your jig for your saw — a good rule of thumb is to cut the plywood the same size as the saw table. Make sure the plywood is perfectly flat, then cover both faces with plastic laminate (pieces 2) for a durable,

long-lasting surface. Choose a light color that allows you to see any pencil marks drawn on the jig.

Trim the laminate with a flush-cutting router bit, then lay out the entry holes and the pivot hole for the miter fence accessory (see the *Jig Base Elevation Drawing* on the next page). Use a drill press and a 3/4" Forstner bit to bore 3/8" deep entry holes for the T-bolt slot, then flip the panel over to drill a 1/4" deep counterbore at the pivot hole location. Now switch to a 5/16" bit to complete the pivot hole.

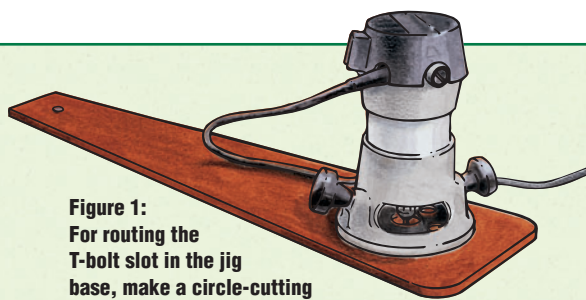
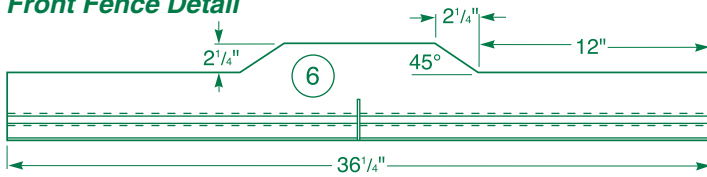


Figure 1:
For routing the T-bolt slot in the jig base, make a circle-cutting jig from 1/4" plywood.

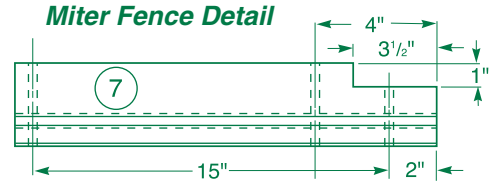
This jig works great for trimming all kinds of panels, including the raised door panel shown here.



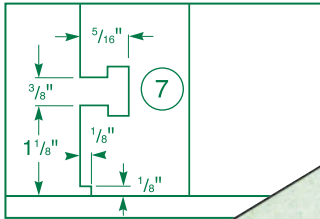
Front Fence Detail



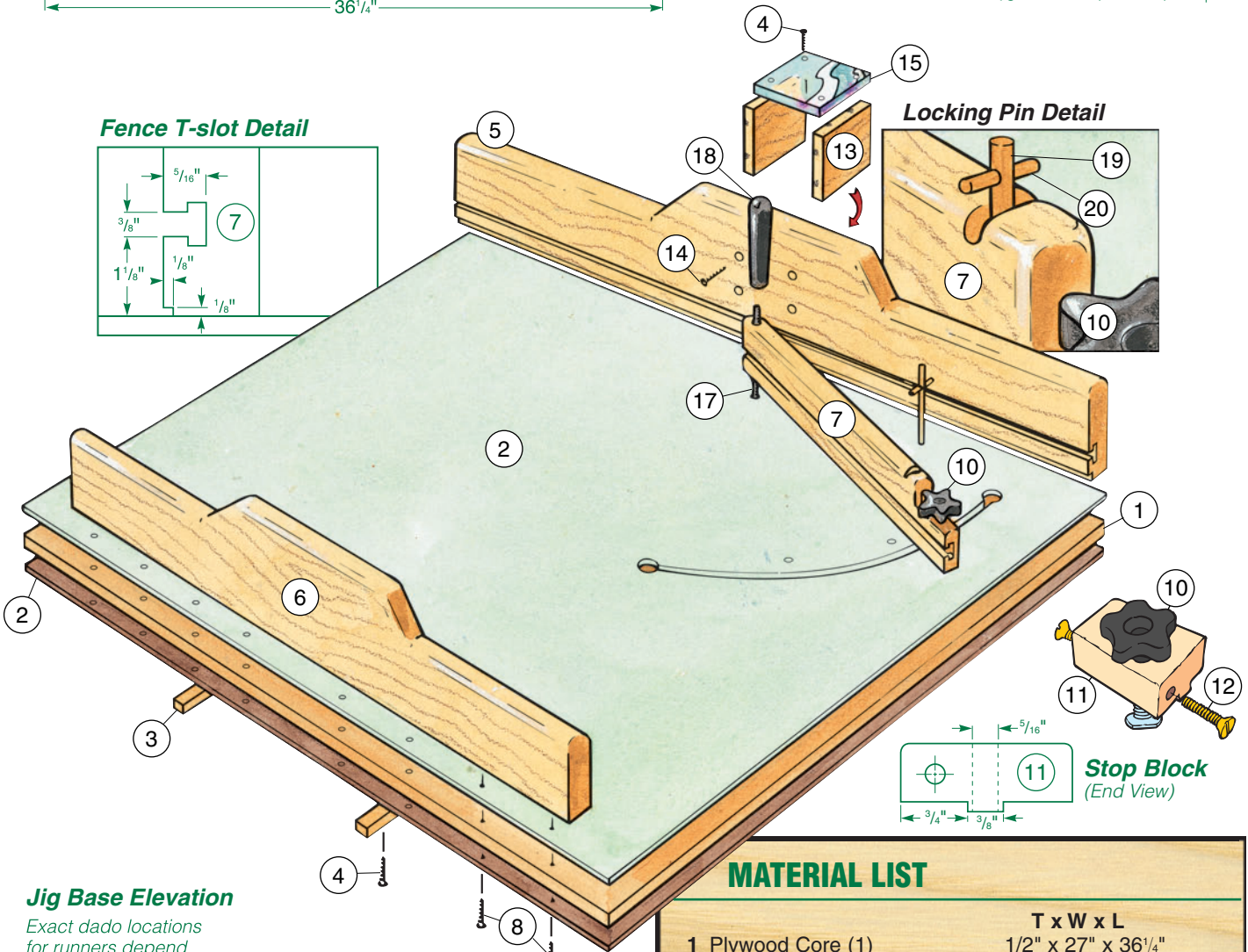
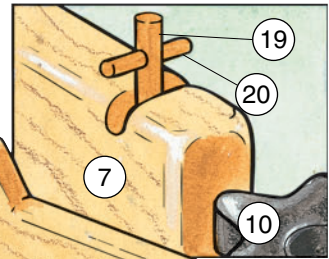
Miter Fence Detail



Fence T-slot Detail

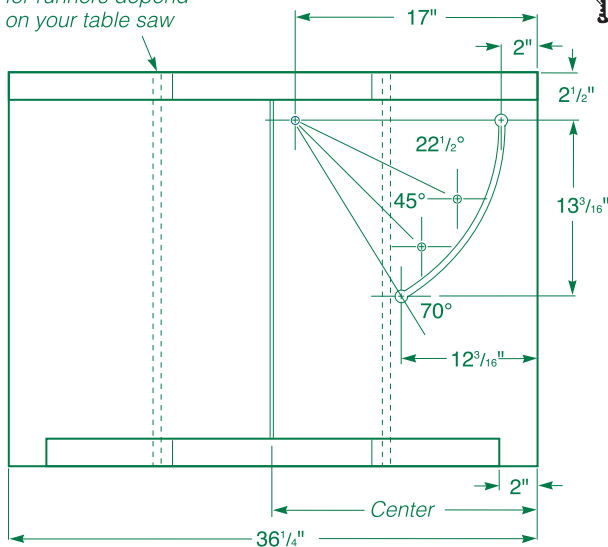


Locking Pin Detail



Jig Base Elevation

Exact dado locations for runners depend on your table saw



MATERIAL LIST

	T x W x L
1 Plywood Core (1)	1/2" x 27" x 36 1/4"
2 Plastic Laminate (2)	1/16" x 27" x 36 1/4"
3 Runners (2)	3/8" x 3/4" x 27"
4 Flathead Screws (16)	#8 - 3/4"
5 Front Fence (1)	1 1/2" x 5 5/8" x 36 1/4"
6 Rear Fence (1)	1 1/16" x 5 5/8" x 32 1/4"
7 Miter Fence (1)	1 1/16" x 3 1/2" x 17 3/4"
8 Flathead Screws (16)	#8 - 1 1/2"
9 Short T-bolts (2)	5/16" x 1 3/4" - 18
10 Hold-down Knobs (3)	5/16" - 18
11 Wood Block (1)	3/4" x 1 3/4" x 5"
12 Micro-adjust Bolts (2)	1/4" x 1 1/2" - 20
13 Guard Walls (2)	3/4" x 4" x 4"
14 Flathead Screws (4)	#8 - 2 1/2"
15 Plastic Shield (1)	1/4" x 4" x 4"
16 Long T-bolt (1)	5/16" x 3 1/2"
17 Carriage Bolt (1)	5/16" x 4" - 18
18 Post Handle (1)	5/16" - 18
19 Locking Pin (1)	3/8" x 5"
20 Cross Dowel (1)	1/8" x 1"
21 Wood Block (1)	3/4" x 2" x 2"
22 Toggle Clamp (1)	Right-angle type

Cutting the curved T-bolt slot in the base requires a simple circle routing jig (see *Figure 1*). Make the jig and attach it to your plunge router. Chuck a 3/8" straight bit in the collet and align the pivot hole in the jig with the pivot hole in the crosscutting jig base. Press a 5/16" bolt through the holes and adjust the bit so it touches the bottom of the entry holes. Now rout a slot to connect the two entry holes, then switch to your T-slot cutter, adjust its cutting depth, and complete the slot.

The runners (pieces 3) must fit the miter gauge slots in your saw table yet not be so tight that the jig binds. Using wood runners is common, but wood changes with airborne moisture. A better choice is to use a stable, self-lubricating plastic, like polyethylene.

To install the runners, first cut shallow dados in the underside of the base so they're laid out just like the miter gauge slots in your saw table. Clamp the jig base squarely on your saw table and mark the miter gauge slots, then measure the width of your slots and install a dado blade of matching size. Now set your rip fence to align each set of marks with the blade and cut 1/16" deep dados. These cuts must be as accurate as possible to keep the jig runners from binding on the miter slots.

Rip your plastic stock to the exact

width of your dados, then place the two runners in the dados and drill 5/32" countersunk pilot holes. Use #8-3/4" screws (pieces 4) to secure the runners. Test the jig base on the table saw and, if the runners bind in the slots, use a cabinet scraper to shave them until they operate smoothly.

accuracy of your crosscutting jig. Clamp the back fence so it's aligned with the edge of the base and drill countersunk pilot holes to secure the assembly with #8-1 1/2" screws (pieces 8). Clamp the front fence to the base and drill one countersunk pilot hole to secure the right end of the fence (leave the left end free for now).

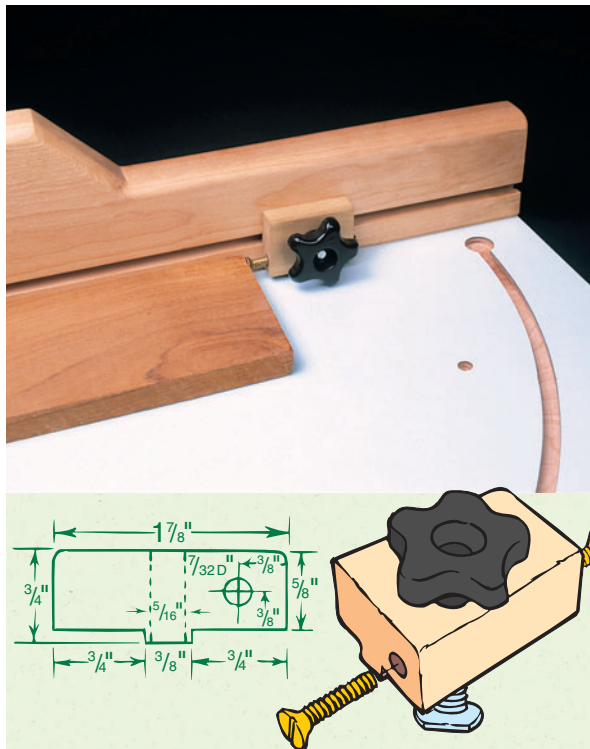


Figure 3: The micro-adjustable stop block brings great precision to your jig, especially when cutting many pieces to the same length.

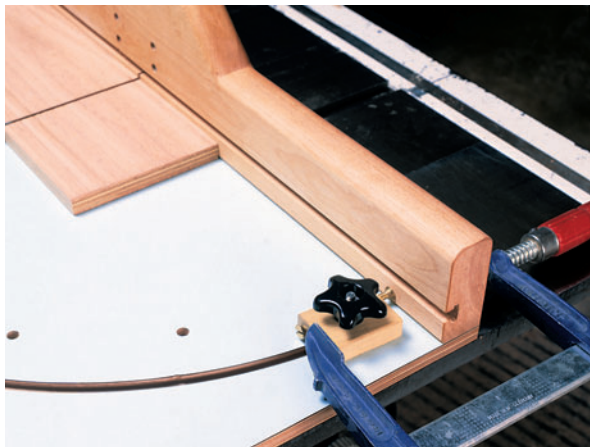


Figure 4: When you're ready to install the front fence, use your new stop block and a clamp for making fine adjustments to get perfect 90° cuts.

Installing the Fences

Now that the jig base is constructed build the three fences (pieces 5, 6 and 7). Cut your stock to size and shape following the *Material List* and *Elevation Drawings* on page 73, then set the rear fence aside so you can rout T-bolt slots in the front fence and miter fence for mounting the stop block.

For each slot, make your first pass with a 3/8" straight bit routing 5/16" deep, then follow with the T-slot cutter routing to the same depth. After routing the slots, rip a 1/8" x 1/8" rabbet along the bottom inside edge of both fences for dust relief. Next, drill the three holes in the miter fence for the hold-down bolts and pin lock, and pass the fence over the table saw blade to cut a 3/8" deep kerf at the pin hole lock location (see *Miter Fence Detail* on page 73). Finally, rout the top edges of all three fences, as well as the pivot hole end of the miter fence, with a 1/2" roundover bit.

Installing the back fence to the base isn't that critical, but mounting the front fence requires great care to ensure the

The micro adjustable stop block (pieces 9, 10, 11, and 12) is really great for accurately setting repeat crosscuts (see *Figure 3*), but it also comes in handy for precisely setting the front fence. Make the jig and slip it into the T-slot in the jig base, then use a framing square to adjust the fence square to the blade. Now slide the stop block up to the fence and tighten the hold-down knob. Clamp the fence to the stop block (see *Figure 4*) and make your first pass completely through the crosscutting jig.

Test the accuracy of the front fence by crosscutting a scrap piece that has perfectly parallel edges. After cutting the scrap, flip one piece over and slide the freshly cut ends of the two pieces together, holding both pieces firmly against the jig fence. If the ends don't match perfectly, loosen the clamp to turn the micro adjustment bolt a tiny bit, then reclamp the fence and cut another piece of scrap material. Continue this process until the cut ends match perfectly, at which point you can drill countersunk pilot holes and screw the front fence in place.

Completing the Jig Accessories

The guard on the front fence helps protect you as the jig passes beyond the blade. Cut the material and clamp the walls (pieces 13) to the front fence $1\frac{1}{4}$ " from the blade kerf, then drill $\frac{5}{32}$ " counterbored pilot holes. Secure the walls with long screws (pieces 14), and complete the guard by drilling pilot holes and screwing down the plastic shield (pieces 4 and 15).

Now install the miter fence to the base with a long T-bolt (piece 16) and a carriage bolt (piece 17). Slip the miter fence onto the bolts and spin on the hold-down knob and post handle (pieces 10 and 18).

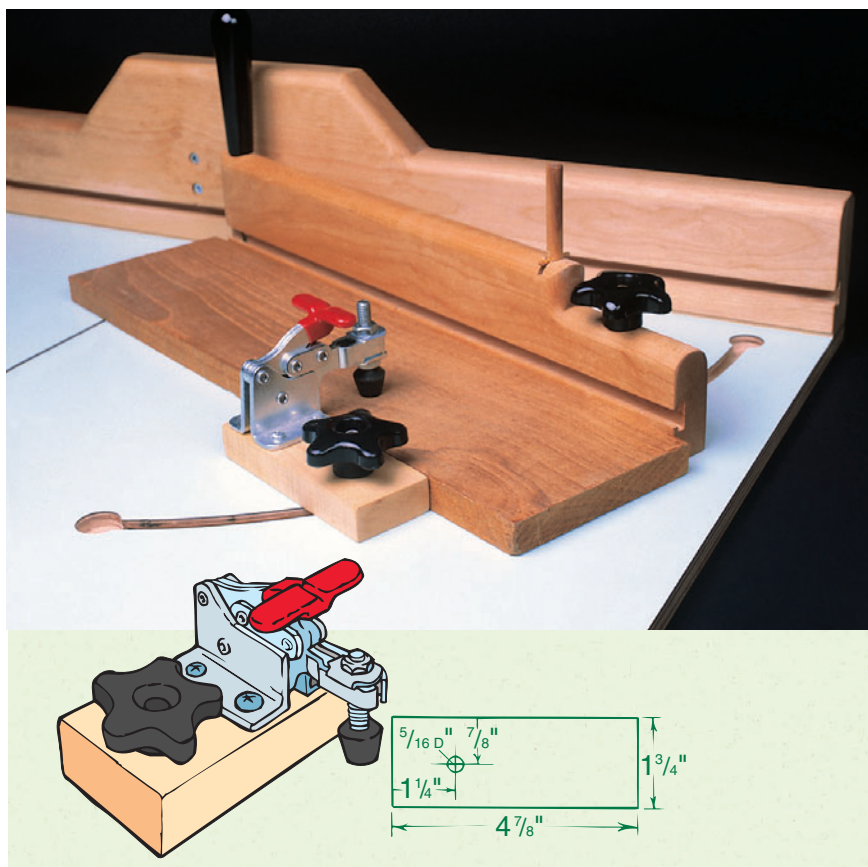


Figure 5: While mitering, boards sometimes creep along the fence and spoil the cut. Using the hold-down jig solves the problem entirely.

Setting the miter fence lock positions at $22\frac{1}{2}^\circ$ and 45° requires the help of an artist's adjustable triangle (available at art supply stores). First set the triangle to 45° and slip it between the front fence and the miter fence. When you have the angle dead-on, slip a $\frac{3}{8}$ " brad point bit in the miter fence pin lock hole and use a hammer to tap it lightly against the laminate. Next, move the miter fence out of the way and drill a $\frac{3}{8}$ " deep hole at the mark with the $\frac{3}{8}$ " bit. Reset the triangle to $22\frac{1}{2}^\circ$ and follow the same procedure for marking and drilling this hole.

Make a locking pin (pieces 19 and 20) by cross drilling a $\frac{3}{8}$ " dowel with a $\frac{1}{8}$ " bit (see *Locking Pin Detail*, page 73), then glue a short piece of $\frac{1}{8}$ " dowel in the pin. Sand the pin so it slips through the hole. When you insert the pin and align the cross dowel with the saw kerf you cut earlier, the pin will reach into the locking holes in the base.

To use the stop block you've already made, slide it into a fence slot and use a tape measure to set it a particular distance from the saw kerf. If the length is off, just give the stop block bolt a turn and make another cut.

The hold down jig (pieces 9, 10, 21 and 22) is designed to lock a workpiece onto the jig base during a cut. It's especially effective at preventing creep while mitering. Make the jig shown in *Figure 5*, above, and install it in the T-bolt slot in the jig base. Adjust the toggle clamp to work on $\frac{3}{4}$ " thick stock, since that's probably what you'll cut most often. If you frequently cut thicker stock, you may want to make a second hold-down jig suited for this material.

Now that the crosscut box is complete, oil all the wood parts to keep them free of glue and dirt. Or apply a clear hard finish of your choice for even greater durability.

Craftsman's Toolbox

Carry everything you could possibly need, from an awl to zinc screws, in this handsome oak tool case.

By Rick White

Not too many years ago, building a joiner's toolbox was an important rite of passage for apprentice woodworkers. Skills developed through years of training had to be expertly executed and displayed in order to become a journeyman woodworker, and the resulting toolbox usually stayed with the craftsman for the rest of his life.

The toolbox I've made isn't quite as intricate as those made for the journeyman's test, but it is a design that every woodworker would be proud to own. It is primarily a carrying case for the basic hand tools I use when I leave the shop for doing jobs around the house or while installing cabinets at another location. I keep planes, handsaws, chisels and layout tools handy, as well as common woodworking tools like screwdrivers, a hammer, a palm sander and a portable

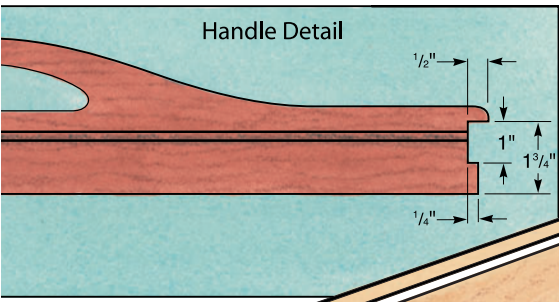
drill. Everyone will have different tool preferences, especially when choosing the ones they want secured in the toolbox lid.

Building the toolbox took me 25 hours of shop time and about 12 board feet of 1/2" thick oak. I also used a quarter sheet each of 1/4" and 1/2" thick oak plywood, and one board foot of 3/4" thick padauk. You can buy the specialty hardware from many woodworking suppliers including Rockler (800-279-4441; www.rockler.com), while the broom holders,

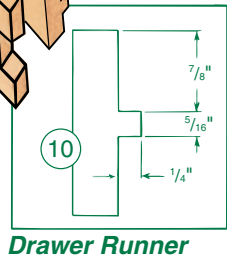
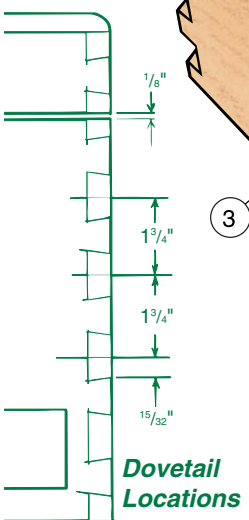
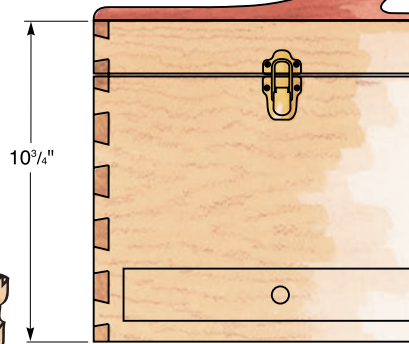
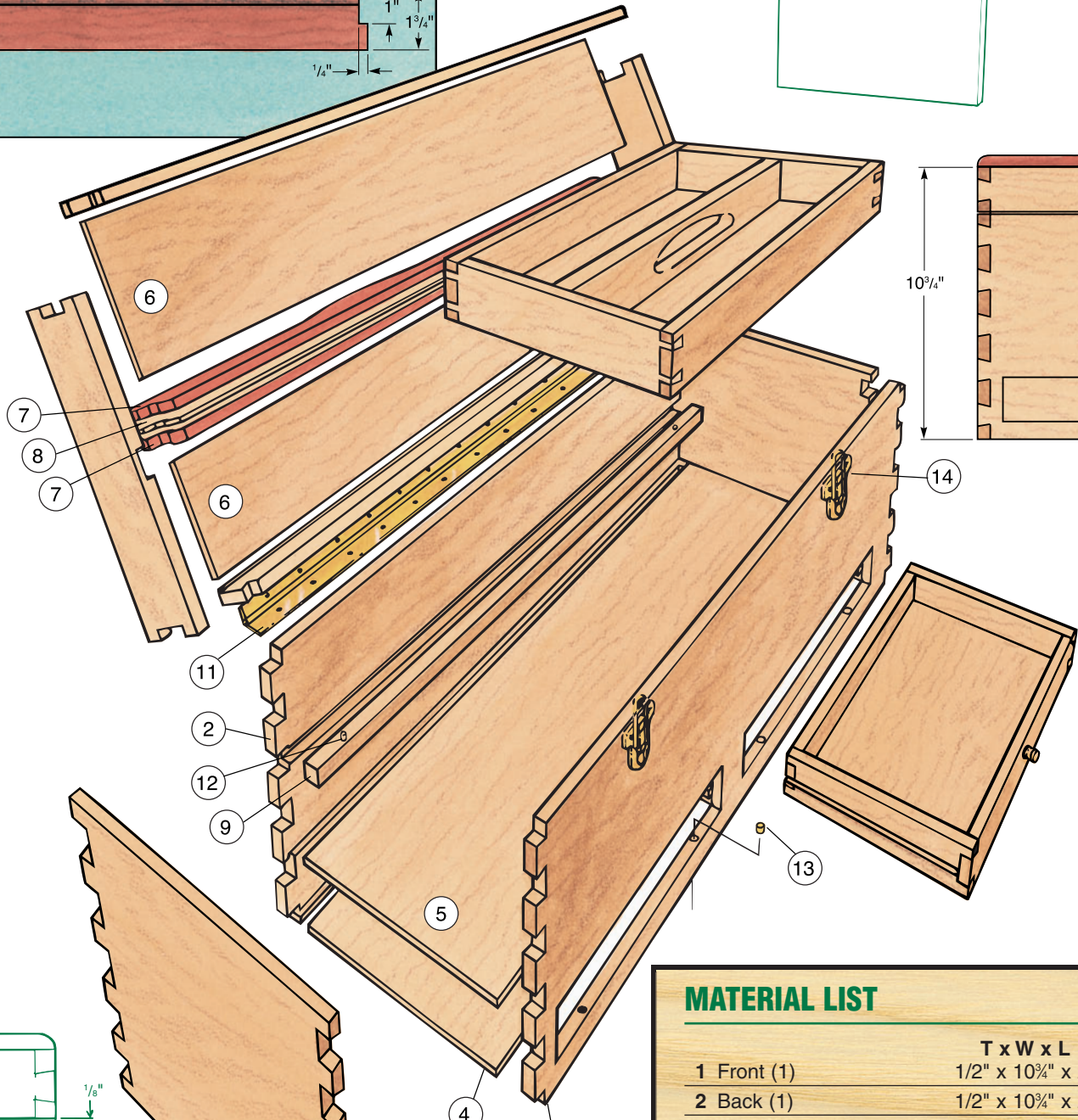
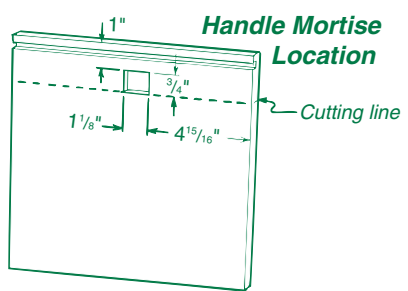


If at first glance the craftsman's toolbox appears a little too small, the photos here should help dismiss that notion. First we loaded it up and then we spread all the tools out to give you an idea of what kind of workhorse this box really is.





Exploded View

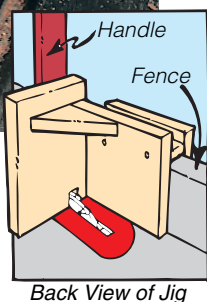


MATERIAL LIST

	T x W x L
1 Front (1)	1/2" x 10 3/4" x 24"
2 Back (1)	1/2" x 10 3/4" x 24"
3 Sides (2)	1/2" x 10 3/4" x 11"
4 Bottom (1)	1/4" x 10 3/4" x 23 1/2"
5 Divider (1)	1/4" x 10 3/4" x 23 1/2"
6 Top Panels (2)	1/2" x 4 15/16" x 23 1/2"
7 Handles (2)	1/2" x 3 3/4" x 24"
8 Handle Center (1)	1/8" x 3 3/4" x 24"
9 Tray Supports (2)	3/4" x 3/4" x 23"
10 Drawer Runners (4)	3/4" x 2 1/16" x 10"
11 Piano Hinge (1)	Brass Finish - 1" x 24"
12 Tray Pins (4)	1/4" Dia. x 1/2" L
13 Bullet Catches (4)	Brass - 1/4" Dia.
14 Hasps (2)	Brass Finish



Figure 1: Make the jig at right to wrap your table saw fence and stabilize the tall handle blank during the joint-cutting operation. To limit the chance of making a mistake during cutting, shade in the waste area first with a pencil.



Back View of Jig

Velcro™ strips and other fasteners are available at most hardware stores and home centers.

I chose to dovetail all the corner joints in the toolbox. This joint is strong and attractive, and it lets everyone know that this is a custom piece made by a woodworker. I used a Leigh jig to rout all my dovetails, but you could also cut them by hand if you like.

Starting with the Box

The box and lid are built as a single unit, then, after the piece is permanently assembled, the lid is cut away from the box. This ensures a perfect fit between the two sections and makes cutting the dovetails easier.

Joint and glue 1/2" thick oak boards into panels for the front, back and sides of the box (pieces 1, 2 and 3). Make two panels 10 3/4" wide by 24" long for the front and back, and two panels 10 3/4" wide by 11" long for the sides. Remember that these sizes include the box and lid, plus 1/8" extra for the blade kerf that will result when you separate the two sections.

Set up your dovetail jig for routing evenly spaced tails and

pins, making sure to center a pin on the dividing line between the lid and box. I routed my pins on the sides and tails on the front and back. This

way the more decorative pins face forward on my toolbox. For strength and visual balance, each set of dovetails should end with a half pin at the top and bottom corners.

Grooving the Walls

Each wall must be grooved for the plywood bottom (piece 4), the divider (piece 5) and the top assembly (pieces 6, 7 and 8). All the grooves must stop 1/4" before the ends of the panels, otherwise they will show through on the outside.

To drop-dado the grooves, install a 3/16" straight bit in your router table set up. Raise the bit 1/4", then clamp your fence 11/32" from the center of the bit to rout the top and bottom grooves. Make a mark on your workpieces 3/8" from each end and mark the fence at the center of the bit. Start and stop your dados when the lines on the piece meet the line on the fence. Make your first passes, then reset the fence a hair's breadth further from the bit and make a second series of passes. This routine is necessary to get a good fit as 1/4" plywood isn't a full 1/4" thick.

Follow the same procedure for routing the center divider grooves 2 5/8" from the bottom edge of the toolbox walls. While you're at it, it's helpful to rout grooves for the tray support strips too (pieces 9), not so much for strength but for positioning. Replace the 3/16" bit with a 3/4" diameter straight bit

and mark your two panels 5/8" from each end for your stop-dado locations. Rout a 1/4" deep dado in the front and back panels, 6 1/8" from the bottom, as shown in the *Front Elevation Drawing*, page 80.

Square the ends of all the routed grooves with a 1/4" chisel, then cut the bottom (piece 4) and divider (piece 5) to size from 1/4" plywood. Be sure to check the fit of the panels in the grooves before moving on.

Now mark out the notch positions in the sides that will receive the tenon on the ends of the handle (see *Handle Mortise Location Detail*, page 77). Chuck a 1/2" bit in your drill and bore out most of the waste in the notches, using a drill bit stop to limit the depth to 1/4". Square the holes with a sharp chisel.

Lay out the two drawer openings on the front panel and drill 1/2" diameter access holes inside the eight corners. Now use your jigsaw with a fine-cutting blade to remove the rectangles from the panel.



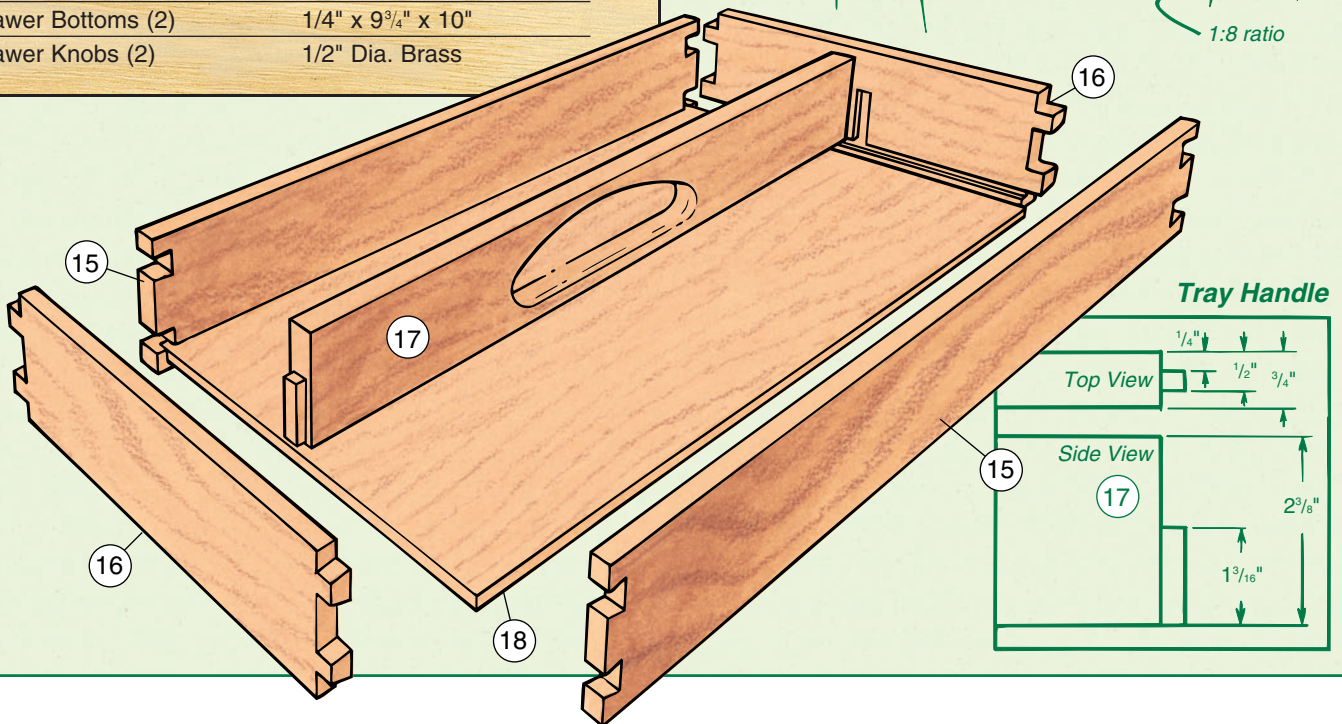
Figure 2: Cut three sides of the box to separate the lid, then slip 1/8" thick shims into the kerfs, holding them in position with masking tape to make the final pass.

Smooth the edges with a cabinetmaker's file and sandpaper. Be sure to back up the paper with a block in order to keep the edges straight and square.

Cut four strips for making the drawer runners (pieces 10), then

MATERIAL LIST

	T x W x L
15 Tray Front and Back (2)	1/2" x 2 ³ / ₈ " x 14"
16 Tray Sides (2)	1/2" x 2 ³ / ₈ " x 9 ⁷ / ₈ "
17 Tray Handle (1)	3/4" x 2" x 13 ¹ / ₂ "
18 Tray Bottom (1)	1/4" x 9 ³ / ₈ " x 13 ¹ / ₂ "
19 Drawer Fronts and Backs (2)	1/2" x 1 ³ / ₄ " x 10 ¹ / ₂ "
20 Drawer Sides (2)	1/2" x 1 ³ / ₄ " x 10 ¹ / ₄ "
21 Drawer Bottoms (2)	1/4" x 9 ³ / ₄ " x 10"
22 Drawer Knobs (2)	1/2" Dia. Brass



form the centered tongues on their long edges with a 1/4" dado blade (see *Drawer Runner Detail*, page 77). Attach an auxiliary fence to your saw's fence and move this assembly toward the blade until the two just make contact, then lock the fence. Raise the blade 7/8" to remove the waste below the tongues first, then, when these have been cut, flip the piece over to remove the waste above the tongues. Glue two runners back-to-back for the middle track and use the other two pieces for the outside tracks.

Making the Top

The top is actually made with five pieces — two 1/2" thick oak plywood panels (pieces 6), the padauk handles (pieces 7) and an oak accent strip (piece 8). Cut the plywood panels to size and set up your saw to rabbet their edges. Install a 1/4" dado blade in your table saw and clamp a long piece of

scrap to the fence. Raise the blade slightly over 1/4" (so the tongue fits the grooves), and cut the end and edge rabbets.

Begin making the handle by gluing 1/2" thick padauk (pieces 7) to both sides of a 1/8" thick strip of oak (piece 8), then cut the sandwich to an overall size of 4¹/₂" wide by 24" long (this is intentionally left extra wide to make the next dado cuts safer).

Making the joint on the ends of the handle is really a simple matter of cutting several dados on the table saw. First make a simple jig for wrapping the table saw fence (see *Figure 1*), then install a 7/32" dado blade in the saw and raise it 1/4". Now make a series of cuts to remove the waste (see *Handle Detail*, page 77), but don't cut into the extra 1/2" of material along the bottom of the handle (this little bit is meant to stabilize the wood during the cuts). Next, raise the

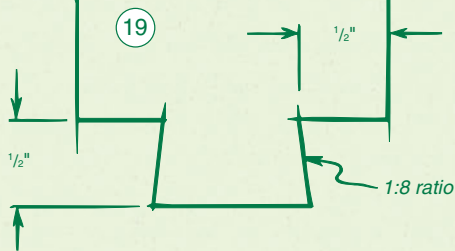
blade to 1/2" and remove the deeper segments of the joint. Make sure the top edge of the handle rides against the fence for all the cuts. Then lower the blade back to 1/4" and plow the grooves in the sides of the handle to fit the tongues on the panels.

Rip the extra 1/2" off the bottom edge of the handle, then trace the full-size pattern on the *Pinup Shop Drawings*, starting on page 39, onto the stock. Using a band saw, cut the outside shape of the handle, then use a jigsaw to remove the grip waste. Sand the edges smooth and rout the top edge and the grip with a 1/2" roundover bit.

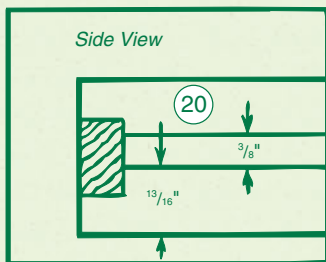
Time for Assembly

By now you should have tested the fit of all the parts, especially those in the top. If you're satisfied, get the project ready for final assembly. I prefer using white glue for complicated assemblies like this

Drawer Front
(Front View)

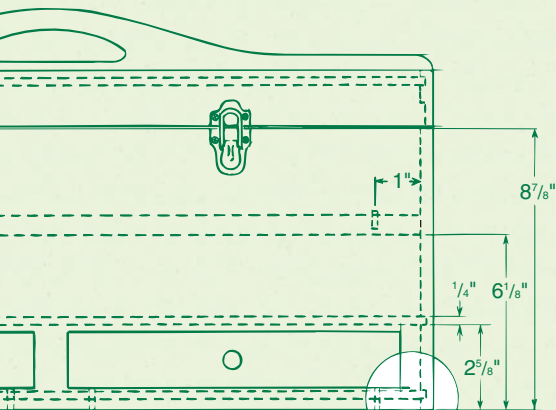


Side View

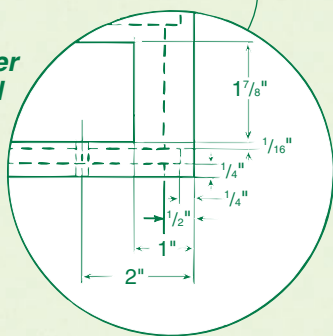


Drawer Sides

Front Elevation



Corner Detail



one because it has a longer setting time than yellow glue. Squirt a bead of glue in the handle grooves and then insert the top panels. Next, put glue in the grooves, on the pins and in the handle joint notches of the sides. Draw the sides partially onto

the top assembly and onto the 1/4" plywood panels, then put glue on the back of the outside runners and press them into place against the walls. For the middle drawer track, put glue on its top and bottom and slip it into place. Now draw the sides tightly onto the panels. Finally, spread glue in the grooves in the front and back pieces, as well as on the tails, and assemble these parts.

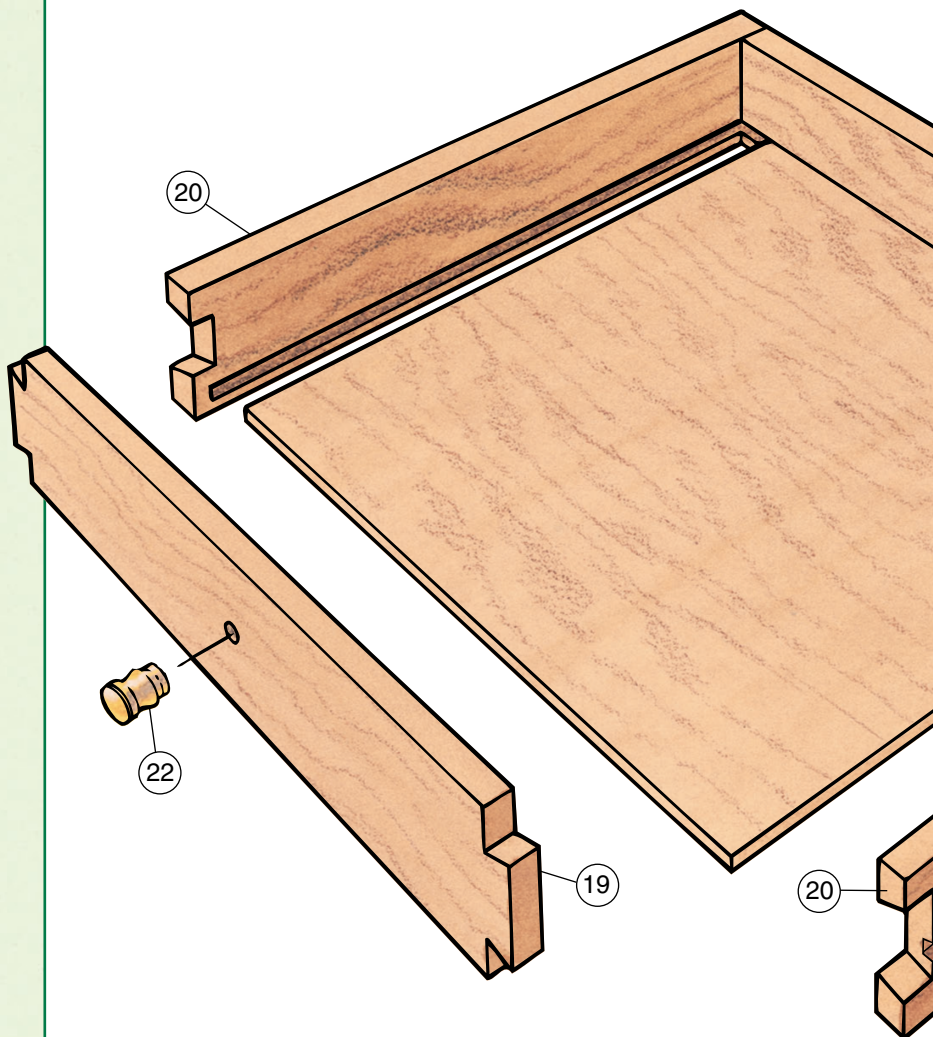
Getting Inside the Box

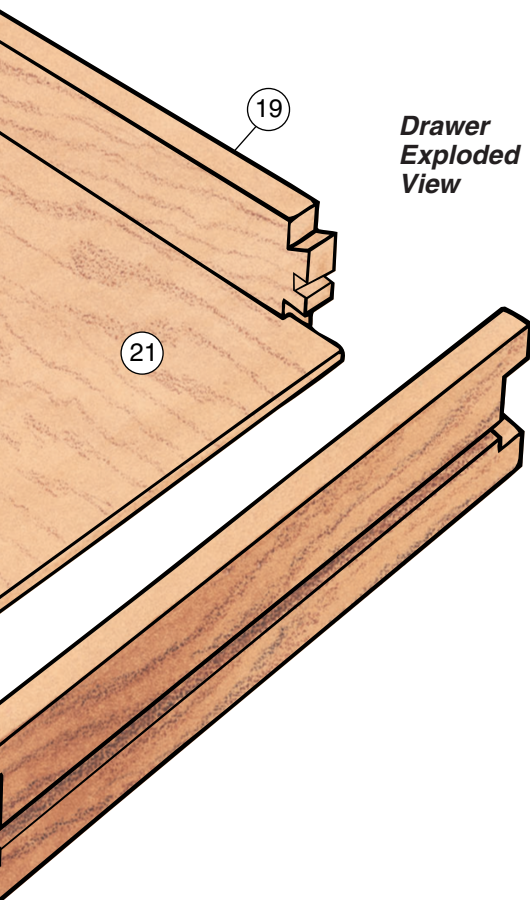
Let the glue dry, then belt-sand the dovetail joints flush with the walls. Also, plane any high spots on the bottom edges of the box so they all line up. Now it's time to separate the lid from the box.

Install your finest-tooth blade in

your table saw and raise it just 5/8" (any higher and you'll get a coarser chopping action during the cut). Clamp the fence 8" from the blade. Push the toolbox through the blade, running the bottom edges against the fence (see *Figure 2*). After you cut the first three walls put 1/8" thick slips of wood in the kerfs and hold them tight with masking tape to keep the lid square to the box during your final cut. Plane and smooth the cut edges.

The top edge of the back now needs to be lowered by 3/16" so you can fit in the piano hinge (piece 11). Move the table saw fence 3/16" closer to the blade and drop-cut the back wall of the box, being careful not to cut into either side wall. Use a handsaw and chisel to clean up the ends of the cut. Temporarily secure the lid to the box with the piano hinge, and drill the pilot holes for the hasps (pieces 14).





**Drawer
Exploded
View**



Figure 3: Rout the grooves in the drawer sides after the units are assembled. Be sure to stop the grooves 1/2" from the face of the drawers.

of the space, and you'll want to do the same with your own particular tool selection. Use the hold-down ideas of my box as examples and adapt your own as the need arises. There may be tools you want to store in the lid that won't work with these options, so modify the tool holding system as necessary.

Making the Drawers and Tray

The drawers and tray are constructed in much the same way as the toolbox, with dovetailed corners and grooves for holding the bottom. Cut your fronts, backs and sides for each subassembly (pieces 15, 16, 19 and 20) and set up your dovetail jig for making one tail at each joint on the drawer and two at each joint on the tray. Rout these to fit snugly, then follow the same procedure you used earlier for routing the grooves in the sides for holding the bottom pieces. Chisel the ends of the grooves square.

The tray handle (piece 17) will slip into a notch in each side (pieces 16) much like the toolbox handle fits into the box sides. Drill out the waste and square the notches with a chisel following the *Exploded View* on page 79.

Cut 1/4" thick plywood panels for the drawer and tray bottoms (pieces

Cut the tray support strips (pieces 9) to size and drill the 1/4" diameter by 1/4" deep hole near each end of both pieces for gluing in the tray pins (pieces 12). Cut four 1/2" long pieces of dowel and glue them into the holes in the strips, then slightly round over their top ends. These dowels will prevent the tray from sliding around while you carry the toolbox. Glue the strips into the grooves in the front and back walls.

When the drawers are closed they will be held in the toolbox with bullet catches (pieces 13). In order to install the catches you must drill 1/4" diameter holes through the bottom edge of the front into the drawer openings (see *Front Elevation*, previous page). Press in the part of each catch containing the ball bearing.

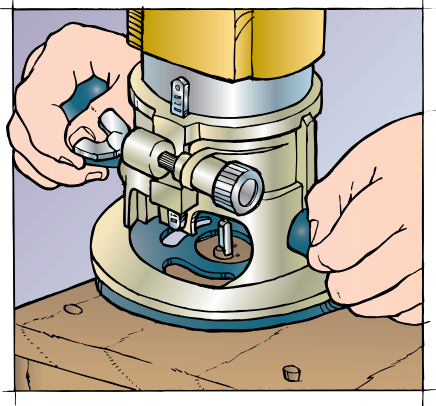
The tools in the lid are held in place with broom holders and Velcro®. I arranged my tools to make full use

18 and 21), and test their fit in the assemblies. Next, transfer the handle shape shown in the full-size pattern on the *Pinup Shop Drawings* onto the tray handle stock and cut out the grip area with a jigsaw. Check the fit of the handle in the tray assembly and, if you're satisfied, round over the grip area and glue all the tray pieces together. After you sand the joints flush, flip the tray over and drill 1/4" diameter by 1/4" deep holes for matching the pins in the support strips (see *Front Elevation Drawing*, page 80).

The sides of the drawers must be grooved to work with the drawer runner tongues that were installed earlier. Glue the drawer bodies together, then, after sanding the dovetails flush, rout a 3/8" wide by 1/4" deep groove on each side piece (see *Figure 3*). Square the stopped ends of the grooves with a chisel. The drawers should slide easily. Wrap up the drawer construction by drilling the holes for the knobs (pieces 22) and for the other half of the bullet catches (pieces 13).

Sand the tray and drawers to 150 grit, and coat all the parts of the toolbox with sanding sealer. After your final sanding, apply a coat of varnish. Install the hinge, the knobs and hasps onto the box. Then, load up your toolbox for the next on-the-go woodworking task.

Shop Tricks

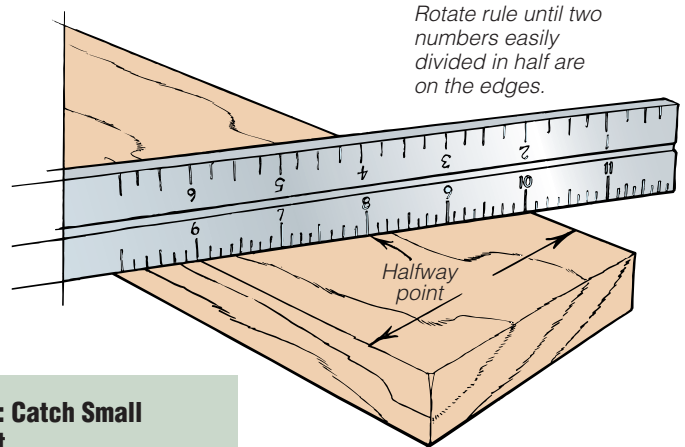


Flush-trimming Plugs with a Router

Here's an easy way to trim seamless plugs without marring the surrounding wood. Once the plug is glued and inserted, you'll need a flat-ended router bit and about five pieces of paper trimmed to fit inside the opening on the base of your router (3M Post-it® notes work great). Stack the paper and adjust bit height so the cutters just touch the top sheet. Lock the setting.

Now remove the paper and run the router over the plug, moving slowly in a circular motion to trim the plug. If the bit is still too high, reset the router using fewer sheets of paper. Finish off with a light sanding.

*James A. Johnson
Brunswick, Ohio*



Rotate rule until two numbers easily divided in half are on the edges.

Halfway point

It's in the Bag: Catch Small Parts and Dust

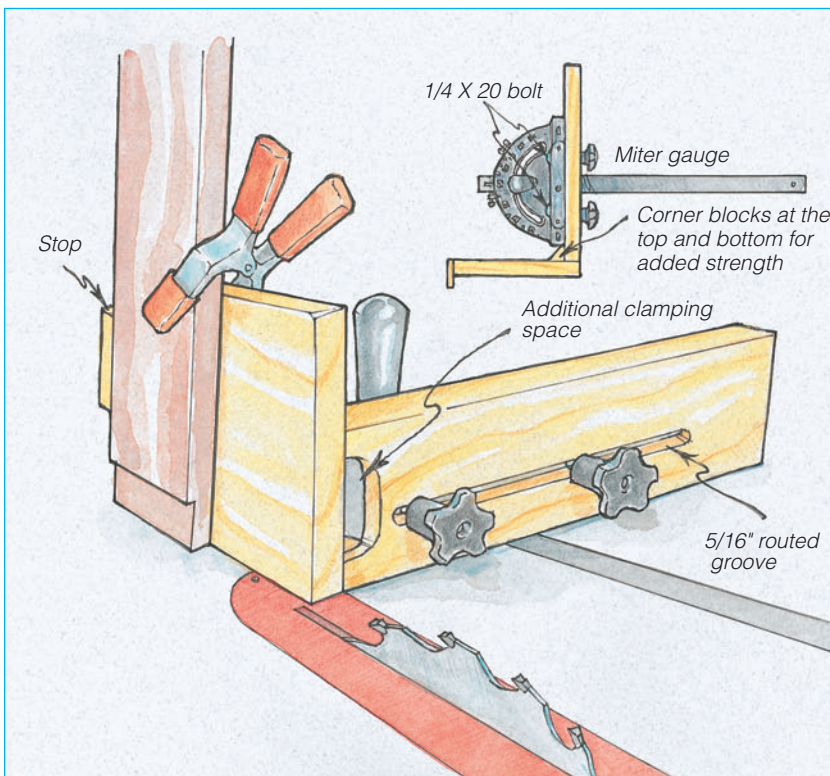
When cutting several small pieces on my miter saw, I put a mesh bag in the body of my shop vac and hold it in place with one end of the hose. I position the other end close to my saw blade. When I turn on the vacuum and the saw, the vacuum draws away the sawdust, and the mesh bag traps the small parts. I can cut all the pieces I need without stopping the saw to clear away the parts between cuts.

*Stanley H. Pulaski
Cedar Springs, Michigan*

Short Cut to the Center

Here's a common woodworking problem: Find the center of a 5^{9/16}" board. My solution: Hold a square or steel rule at an angle on the board and on-edge, with the inch marks touching the board face. Rotate the rule until two numbers easily divided in half are on the edges. In the illustration above, the number 8 marks the board's middle.

*Walter Keller
Fritch, Texas*



Jig Produces Terrific Tenons

Recently I needed to cut lots of tenons for a project. Lacking a good dado blade, much less a tenoning attachment, I created a tenoning jig from scrap that mounts on my miter gauge. My jig design is adjustable so I can make tenons on stock up to 3" thick by moving and locking the jig body.

Here's how to use it: Clamp the stock to be cut against the stop on the jig. Then loosen the knobs and slide the jig back and forth until the stock is correctly positioned relative to the blade. Tighten the knobs and make the cut. Then flip and clamp the stock to cut the other tenon cheek. It works slick!

*R.B. Himes
Vienna, Ohio*

More power. More torque. More jealousy on the job site.



www.ridgid.com

The new RIDGID three-year limited service warranty. The best in the business.

You'll work smarter and more efficiently with RIDGID, heavy-duty tools that are heavy on the features professionals want. Like Exactline™ laser precision. And batteries that fully charge in half the time. Plus, free battery replacement for the first three years. RIDGID tools do things other tools can't. So you can do things other pros can't.

RIDGID

Powerful. Durable. Professional.



Available at The Home Depot.®

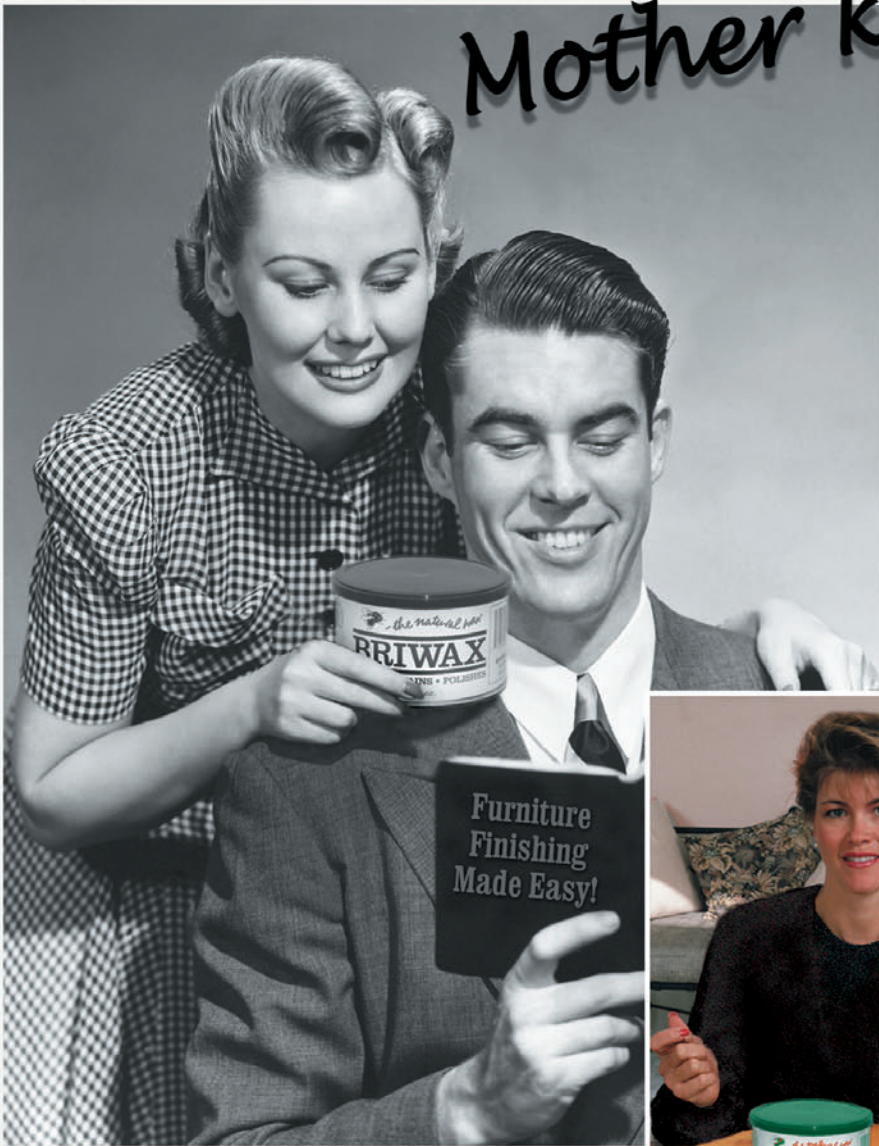
© 2004, RIDGID, INC. All Rights Reserved.



BY APPOINTMENT TO
H.M. QUEEN ELIZABETH II
MANUFACTURERS OF POLISHES
AND FIRE PROTECTIVE COATINGS
J.W. BOLLUM & CO LTD T/A HENRY FLACK (1860) LTD

~~Father knows best!~~

Mother knew



“Even though Father knew best most of the time, Mother introduced him to **BRIWAX**. She had used it for years to polish her furnishings long before Father ever started “refinishing” what are now my antiques. Like Father, I too, am a “Do-It-Yourselfer.” I use **BRIWAX** to restore all my wood surfaces, for faux finishing, marble refurbishing, and more. Restoration and refurbishing of wood flooring and cabinets are made simple with **BRIWAX**’s time-tested blend of the finest beeswax and selected Carnauba waxes. Because it cleans, polishes, and protects in one easy application, **BRIWAX** is also great for granite, plaster, stucco, concrete and untreated metals. Now with seven shades from which to choose, Mother would be jealous!”



- * Wood Cabinets
- * Wood Paneling
- * Wood Flooring
- * Concrete
- * Marble & Granite
- * Untreated Metals
- * Plaster
- * Stucco
- * Faux Finishes



For More Information about BRIWAX:

www.briwax.com or Call: 1-800-5BRIWAX

Now Available in Clear & 7 Great Colors:



CLEAR



GOLDEN OAK



LIGHT BROWN



RUSTIC PINE



ANTIQUE MAHOGANY



TUDOR BROWN



DARK BROWN



EBONY