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81
SHOP TIPS INSIDE!

Flip-top Router Table

Build it for
\$43!

More Great Projects!

- ▶ **Cushy Outdoor Seating** p.52
- ▶ **Toy Skid Loader** p.58
- ▶ **Mortiser Table Extension** p.20

SHOP TESTS:

- **6" Random-Orbit Sanders** p.24
- **Benchtop Mortisers** p.47

23 Ways to Bust Shop Dust

p.62

Display until May 8, 2012





Grizzly Industrial

Purveyors of Fine Machinery®, Since 1983



10" HYBRID TABLE SAW

BEAUTIFUL WHITE COLOR!



- Motor: 2 HP, 110V/220V, single-phase
- Precision-ground cast iron table with wings measures: 27" x 40"
- Arbor: 5/8" • Arbor speed: 3850 RPM
- Capacity: 3 1/8" @ 90°, 2 1/8" @ 45°
- Rip capacity: 30" R, 12" L
- Quick change riving knife
- Cast iron trunnions
- Approx. shipping weight: 354 lbs.

INCLUDES BOTH REGULAR & DADO BLADE INSERTS

G0715P ONLY \$795⁰⁰



17" HEAVY-DUTY BANDSAW

BEAUTIFUL WHITE COLOR!



- Motor: 2 HP, 110V/220V, single-phase, TEFC
- Precision-ground cast iron table size: 17" sq.
- Table tilt: 10° L, 45° R
- Cutting capacity/throat: 16 1/4"
- Max. cutting height: 12 1/8"
- Blade size: 131 1/2" L (1 1/8"-1" W)
- Blade speeds: 1700 & 3500 FPM
- Quick release blade tension lever
- Approx. shipping weight: 342 lbs.

MADE IN TAIWAN



INCLUDES DELUXE EXTRUDED ALUMINUM FENCE, MITER GAUGE & 1/2" BLADE

G0513P ONLY \$895⁰⁰



ALSO AVAILABLE

G0513 HEAVY-DUTY 17" BANDSAW ONLY \$950⁰⁰

10" LEFT-TILTING CONTRACTOR-STYLE TABLE SAW with Riving Knife

- Motor: 1 1/2 HP, 110V/220V, single-phase
- Precision-ground cast iron table with wings
- Table size: 25 1/2" x 40" • Arbor: 5/8"
- Arbor speed: 4000 RPM
- Capacity: 3 1/8" @ 90°, 2 1/8" @ 45°
- Rip capacity: 30" R, 12" L
- Approx. shipping weight: 221 lbs.

New!



MADE IN TAIWAN

MADE IN ISO 9001 FACTORY!

G0732 ONLY \$795⁰⁰



10" LEFT-TILTING TABLE SAWS with Riving Knife & Cast Iron Router Table

- Motor: 3 HP or 5 HP, 220V, single-phase
- Precision-ground cast iron table size with wings: 27" x 48"
- Arbor: 5/8"
- Cutting capacity: 25 1/8" R, 8" L
- Max. depth of cut: 3" @ 90°, 2 1/8" @ 45°
- Approx. shipping weight: 546 lbs.

MADE IN TAIWAN



FREE 10" CARBIDE-TIPPED BLADE

G1023RLW 3 HP ONLY \$1250⁰⁰

G1023RLWX 5 HP ONLY \$1350⁰⁰



10" CABINET TABLE SAW with Riving Knife

- Motor: 3 HP, 220V, single-phase
- Precision-ground cast iron table
- Table size with extension: 27" x 40"
- Arbor: 5/8" • Arbor speed: 4300 RPM
- Max. depth of cut: 3 1/8" @ 90°, 2 1/8" @ 45°
- Max. rip capacity: 50"
- Max. dado width: 1 3/16"
- Approx. shipping weight: 542 lbs.

3 HP
LEESON®
MOTOR!

FREE 10" CARBIDE-TIPPED BLADE



G0690 ONLY \$1325⁰⁰



10" CABINET TABLE SAW with Riving Knife & Extension Rails

- Motor: 3 HP, 220V, single-phase
- Precision-ground cast iron table
- Table size with extension: 27" x 74 3/4"
- Arbor: 5/8" • Arbor speed: 4300 RPM
- Max. depth of cut: 3 1/8" @ 90°, 2 1/8" @ 45°
- Max. rip capacity: 50"
- Max. dado width: 1 3/16"
- Approx. shipping weight: 572 lbs.



3 HP
LEESON®
MOTOR!



G0691 ONLY \$1425⁰⁰



FREE 10" CARBIDE-TIPPED BLADE



ULTIMATE 14" BANDSAW

- Motor: 1 HP, 110V/220V, single-phase, TEFC
- Precision-ground cast iron table size: 14" sq.
- Table tilt: 10° L, 45° R
- Cutting capacity/throat: 13 1/2"
- Max. cutting height: 6"
- Blade size: 92 1/2"-93 1/2" L (1 1/8"-3/4" W)
- Blade speeds: 1500 & 3200 FPM
- Approx. shipping weight: 196 lbs.

MADE IN ISO 9001 FACTORY!



MADE IN TAIWAN

G0555P ONLY \$495⁰⁰



MADE IN TAIWAN

19" HEAVY-DUTY BANDSAW

- Motor: 3 HP, 220V, single-phase, TEFC, 60 Hz
- Precision-ground cast iron table size: 26 1/4" x 19"
- Table tilt: 5° L, 45° R
- Cutting capacity/throat: 18 1/4"
- Max. cutting height: 12"
- Blade size: 143" L (1 1/8"-1 1/4" W)
- Blade speeds: 1700 & 3500 FPM
- Approx. shipping weight: 480 lbs.

EXTREME SERIES

DELUXE RE-SAW FENCE INCLUDED



G0514X2 ONLY \$1495⁰⁰



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12" JOINTER/PLANER COMBINATION MACHINE

MADE IN TAIWAN

BEAUTIFUL
WHITE COLOR!

- Motor: 5 HP, 220V, single-phase
- Jointer table size: 14" x 59 1/2"
- Cutterhead dia.: 3 1/4"
- Cutterhead speed: 5034 RPM
- Max. jointer depth of cut: 1/4"
- Max. width of cut: 12"
- Planer feed rate: 22 FPM
- Max. planer depth of cut: 1/4"
- Max. planer cutting height: 8"
- Planer table size: 12 1/4" x 23 1/4"
- Approx. shipping weight: 734 lbs.

NEW END-
MOUNTED
FENCE

CARBIDE INSERT
SPIRAL CUTTERHEAD!



FREE SAFETY
PUSH BLOCKS

G0634XP ONLY \$2195⁰⁰

ALSO AVAILABLE

G0633 JOINTER/PLANER ONLY \$1995⁰⁰

G0634Z SPIRAL CUTTERHEAD MODEL ONLY \$2450⁰⁰



8" JOINTERS

- Motor: 3 HP, 220V, single-phase, TEFC
- Precision-ground cast iron table size: 9" x 72 1/2"
- Max. depth of cut: 1/4"
- Max. rabbeting depth: 1/2"
- Cutterhead dia.: 3"
- Cutterhead speed: 5000 RPM
- Cuts per minute: 20,000
- Approx. shipping weight: 500 lbs.

FREE SAFETY
PUSH BLOCKS

BUILT-IN
MOBILE BASE

CHOOSE EITHER 4 HSS KNIVES OR SPIRAL CUTTERHEAD MODEL

G0656P ONLY \$795⁰⁰

G0656PX ONLY \$1195⁰⁰



20" PLANERS

- Motor: 5 HP, 220V, single-phase
- Precision-ground cast iron table size: 20" x 25 1/4" (20" x 55 1/2" w/ extension)
- Max. cutting height: 8"
- Max. cutting depth: 1/4"
- Feed rate: 16 & 20 FPM
- Cutterhead dia.: 3 1/4"
- Cutterhead knives: 4 HSS (G0454)
- Cutterhead speed: 5000 RPM
- Approx. shipping weight: 920 lbs.

2 SPEEDS!

BUILT-IN
MOBILE BASE

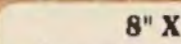
G0454 ONLY \$1575⁰⁰

G0454Z ONLY \$2495⁰⁰



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8" X 76" JOINTERS

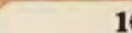
- Motor: 3 HP, 220V, single-phase, TEFC, 3450 RPM
- Precision-ground cast iron table size: 8" x 76 1/4"
- Infeed table size: 8" x 43 1/4"
- Cutterhead knives (G0490): 4 HSS, 8" x 1/4" x 1/4"
- Cutterhead speed: 5350 RPM
- Cutterhead dia.: 3 1/4"
- Max. depth of cut: 1/4"
- Max. rabbeting depth: 1/2"
- Deluxe cast iron fence size: 36" L x 1 1/4" W x 5" H
- Approx. shipping weight: 597 lbs.

FREE SAFETY
PUSH BLOCKS

BUILT-IN
MOBILE BASE

G0490 ONLY \$945⁰⁰

G0490X ONLY \$1250⁰⁰



10" DRUM SANDER

- Motor: 1 1/2 HP, 110V, single-phase
- Conveyor motor: 1/4 HP
- Drum speed: 2300 FPM
- Drum size: 5 1/2" x 10"
- Max. sanding width: 10"
- Max. workpiece height: 2 1/4"
- Min. workpiece height: 3/4"
- Variable feed speeds: 1-10 FPM
- 4" dust port
- Approx. shipping weight: 220 lbs.

WHEELS & STOWABLE
TRANSPORT HANDLES
FOR MOBILITY

G0716 ONLY \$415⁰⁰



CYCLONE DUST COLLECTOR

BEAUTIFUL WHITE COLOR!

- Motor: 1 1/2 HP, 110/220V, single-phase, TEFC, 3450 RPM
- Air suction capacity: 775 CFM
- Static pressure at rated CFM: 1.08"
- Intake port: 6" with included 5" optional port
- Impeller: 13 1/2"
- Height: 68 1/2"
- Built-in remote control switch
- Approx. shipping weight: 210 lbs.

PLEATED FILTER IS
PROTECTED BY A
STEEL CAGE



MADE IN TAIWAN

FULLY MOBILE
WITH BUILT-IN
CASTERS

ONLY 68 1/2" TALL!



G0703P ONLY \$725⁰⁰



15" PLANERS

- Motor: 3 HP, 220V, single-phase
- Precision-ground cast iron table size: 15" x 20"
- Min. stock thickness: 3/16"
- Min. stock length: 8"
- Max. cutting depth: 1/4"
- Feed rate: 16 FPM & 30 FPM
- Cutterhead speed: 5000 RPM
- Approx. shipping weight: 660 lbs.

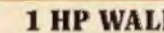
CHOOSE EITHER 3 KNIFE
OR SPIRAL CUTTERHEAD MODEL

G0453P ONLY \$1050⁰⁰

G0453PX ONLY \$1650⁰⁰



BUILT-IN
MOBILE BASE



1 HP WALL MOUNT DUST COLLECTOR

MADE IN TAIWAN

- Motor: 1 HP, 110V/220V, single-phase
- Amps: 14/7 • Intake size: 4"
- Bag size (dia. x depth): 13 1/2" x 24"
- Balanced steel, radial fin impeller
- Air suction capacity: 450 CFM
- Max. static pressure: 7.2"
- Approx. shipping weight: 51 lbs.

SPECIAL
WALL
MOUNT
DESIGN!



EASY MOUNTING
WALL BRACKET &
LOCKING THUMB
SCREW SECURES
DUST COLLECTOR
IN PLACE!



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ONLY
\$174⁹⁵**

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In this Issue



68

PROJECTS

- 20 Shop Project: Mortiser/Mitersaw Supports
- 36 **COVER:** Benchtop Router Table
- 52 Gorgeous Outdoor Seating
- 58 Toy Skid Loader
The "Construction-Grade" series of wood toys continues with this easy-to-build beauty.
- 68 Tabletop Cutlery Caddy
Try your hand at decorative spline joinery.

SKILL BUILDERS

- 18 Get the Most from Your Mortiser
- 30 Restore a Failing Finish
- 62 How to Contain Dust in a Basement Shop
- 65 Flatten Wide Boards on a Narrow Jointer

TOOLS & MATERIALS

- 24 Wise Buys: 6" Random-orbit Sanders
- 26 Overlooked Woods You Should Try
- 47 Shop Test: Benchtop Mortisers
- 66 What Size R.O. Sander Is Best for You?
- 80 Shop-Proven Products
Heavy-duty, lightweight tablesaw; high-pressure air compressors; and more.

DEPARTMENTS

- 6 Editor's Angle: New Tool-review Site
- 8 Sounding Board
- 10 Shop Tips
- 28 Shop Monkey: Keep Woodworking Fun
- 72 Ask WOOD
- 88 What's Ahead



30



52



58





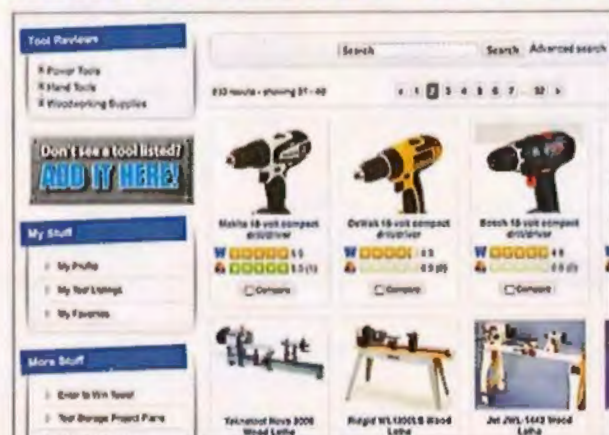
This seal is your assurance that we build every project, verify every fact, and test every reviewed tool in our workshop to guarantee your success and complete satisfaction.



On our Web site

woodmagazine.com

NEW: REVIEWS BY US, REVIEWS BY YOU



Our "Review-A-Tool" Web site, toolreviews.woodmagazine.com, is packed with real-world reviews of more than 500 woodworking tools (and growing daily!). You can add your two cents' worth, too. Get more details on page 6.

SPRING FORWARD FOR FREE PROJECT PLANS!

Jump-start your summertime project to-do list, with free plans for *WOOD* magazine's famous outdoor projects! Check out the Spring Fling Giveaway for new plans every week from March 21 to May 3 at woodmagazine.com/springfling

Download no-cost, no-catch plans for this Garden Arbor Bench March 21–28, 2012.



SHOW THE WORLD YOUR WORK

Snap a few photos of your project—both in progress and after it's finished—and post them in the Photo Galleries at woodmagazine.com/galleries. Or, browse the themed galleries for ideas while you ponder your next project:

- Bedroom Furniture
- Small Projects
- Kids Furniture and Toys
- Kitchen and Dining Room Furniture
- Office, Den, and Living Room Furniture
- Outdoor Furniture and Accessories
- Shops, Shop Tools, and Accessories
- Turnings

Rick Finney of Dresden, Tenn., built this music stand for his church, then posted a photo of it in the Small Projects Gallery.





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10" TABLE SAWS with Riving Knife

- 3 HP, 220V, single-phase motor
- Cast iron table size: 27" x 40 1/4"
- Max. rip capacity: (W1819) 29 1/2", (W1820) 50"



Free 10" Carbide-Tipped Blade

W1819 10" Table Saw

W1820 10" Table Saw w/ Long Ext. Table

SLIDING TABLE and ROUTER TABLE ATTACHMENTS for W1819 & W1820



SAW NOT INCLUDED

W1821 SLIDING TABLE ATTACHMENT

- Industrial grade anodized aluminum table size: 47" x 9"
- Max. cross cut: 48"

W1822 ROUTER TABLE ATTACHMENT

- Precision-ground cast iron table size: 27" x 20"
- Universal router mount

3 HP LOW PROFILE CYCLONE DUST COLLECTOR

- Motor: 3 HP, 220V, single-phase, TEFC class "F", 3450 RPM
- Air suction capacity: 1489 CFM
- Filter: 0.2-2 microns
- 55 gal. steel collection drum with casters



Only 80" Tall!

W1816 Cyclone Dust Collector

VARIABLE SPEED PLANER/MOULDER with Stand

- Motor: 2 HP, 220V, single-phase
- Precision ground cast iron table with wings: 36 1/4" L x 10" W
- Max. cutting width: 7"
- Max. planing height: 7 1/2"
- Max. moulding depth: 3/4"



We also carry an extensive selection of moulding knives for this machine!

W1812 Planer/Moulder

10" HYBRID TABLE SAW with Extension Table

New



Free 10" Carbide-Tipped Blade

- 2 HP, 110V/220V, single-phase motor
- Precision ground cast iron table measures 27" x 55" with phenolic extension
- Rip capacity 30" right, 12" left

W1824 10" Table Saw w/Extension Table

8" JOINTER with Parallelogram Adjustable Beds

- 3 HP, 220V, single-phase, TEFC motor
- Precision ground cast iron parallelogram design table measures 8" x 76 1/16"
- Cutterheads: (W1741) 4 HSS knives (W1741S) spiral



Built-in Mobile Base

W1741 8" Jointer
W1741S with Spiral Cutterhead

OUTSTANDING SHOP FOX® ACCESSORIES



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STRONGER FRAME WITH IMPROVED WHEELS AND GUSSETED SUPPORTS!

D2260A Mini Mobile Base
600 lb. capacity

D2057A Heavy-Duty Mobile Base
700 lb. capacity

D2058A Super Heavy-Duty Mobile Base
1300 lb. capacity

D2259A Extension Kit (fits all models)

D2246A 36" Extension Bars (fits all models)



TENONING JIG

- Heavy cast iron construction
- Precision adjustment points
- Adjusts for angled tenon cutting set-ups
- Standard 3/8" x 3/4" miller bar fits all miller gauge slots including T-slots



Produces perfect tenons for mortise and tenon joinery.

D3246 Tenoning Jig

Aluma-Classic® FENCE

Extruded Aluminum & Steel Construction
Precision Right Angle Design

W1716 Aluma-Classic® Fence w/ standard 57" rails

W1720 Aluma-Classic® Fence w/ long 79" rails & legs (50" cutting capacity)

W1721 79" rails & legs (fence not included)

W1722 Set of 3 powder coated steel metal wings



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WOOD

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What is your favorite part of working at WOOD?

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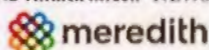
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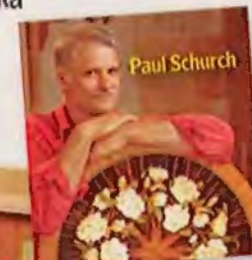
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Editor's Angle

Buying the right tool just got a lot easier

Arm yourself with the information that will put the top-performing, best-priced product in your hands.

For as long as there has been WOOD® magazine—27 years and counting—we've done our level best to help you make informed purchasing decisions by publishing unbiased tool reviews in every issue. Of course, those articles come in handy if you're about to purchase a tool we've covered recently. But if you're considering a tool we've never reviewed or last tested several years ago, then you may not have the solid guidance you need.



Well, things have changed—you'll never again go lacking for up-to-date buying recommendations. The

solution: our brand-new, absolutely free service called "Review-a-Tool" at toolreviews.woodmagazine.com. There you get no-nonsense analysis and 0–5 star ratings on just about every woodworking tool out there, written by our staff as well as your fellow readers. (See sample below.) Many tool categories include a summary of the pertinent review that originally appeared in WOOD, along with our specific buying recommendation. You can even compare multiple tools side-by-side.

In no time, you'll pinpoint the tool that best suits your needs and budget. And, you will find links to retailers selling the tool you want. Compare their prices and delivery times to determine your best deal. Or go to a nearby brick-and-mortar store. Either way, you'll enter the purchasing process fully informed, and come away with a tool that will put a smile on your face for many years.

While you're at the site, please take the time to leave feedback on tools you currently own. Good or bad, the woodworking community wants to know how well those products performed for you. We will all be smarter consumers for it.

Now rest assured that we'll still publish hard-hitting tool reviews in WOOD magazine—no change there. Just remember to always check out Review-a-Tool before you make a significant purchase. I guarantee the advice you find there will help put better tools in your shop! 🌲

Bill Krier



Reviewed by Matt Sailer November 29, 2011
#1 Reviewer - View all my reviews

A CONVENTIONAL DETAIL CUP GUN YOU CAN LIVE WITH.

I've got a suite of conventional cup guns for my compressor, including some \$5pricy models. But I always come back to the Ex-Cell ES2 for most of my spraying.

Overall rating	5.0
Performance	5.0
Features	5.0
Ease of Use	5.0
Value	5.0

It's politely sized, easy to clean and easy to live with. It has a 7.5 ounce cup, which is plenty of capacity to spray about four by five feet's worth of area.

To spray lacquers and shellacs I dial the compressor down to about 35-38 PSI and the gun performs from there.

Cleanup is a breeze compared to some of my more complicated quart-sized guns.

This conventional gun wins the Mike Likes It award from my shop.

Comments (0)

Was this review helpful to you? 9 1 0

A sample reader-written online review



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Sounding Board

Our bulletin board for letters, comments, and timely updates

Walking sticks for the wounded

Though retired from the Navy, I still exercise at the Balboa Naval Hospital gym here in San Diego and often share exercise equipment with leg amputees: some in the earliest stages of rehabilitation. Impressed by their "let's get on with life" approach to learning to walk with a new prosthesis, I set out to help them regain their autonomy.

It seemed to me that these young men would be more apt to use a walking stick than a cane. So I crafted a batch from hardwood scraps. They were an instant success.

I've since made several dozen more, and see them being used all over the hospital grounds. Thanks to a generous donation from a local hardwood store, I have enough stock to keep me making them for some time. Please consider doing something similar for the veterans in your state.

—Bill Collins, San Diego, Calif.

For plans to build a walking stick, visit woodmagazine.com/walkingstick.

—WOOD Editors

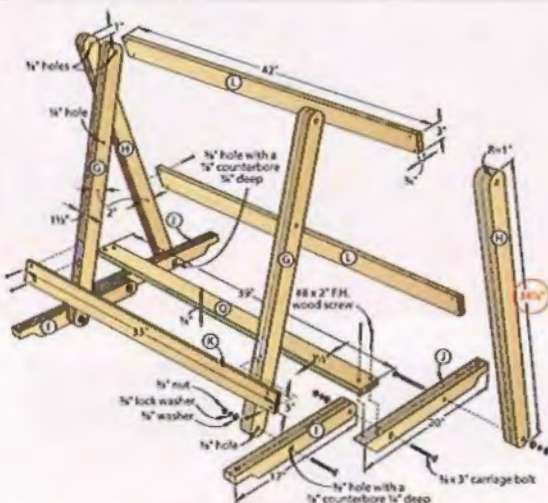


Bill Collins holds a batch of walking sticks. After applying finish, he installs a "Minute Man" Massachusetts quarter in the top—imparting the symbolism of the first American volunteer soldier.

Article Updates

Issue 210 (March 2011)

► An incorrect dimension was printed for the front legs (G) and rear legs (H) in the Fold-Flat Sheet-Goods Carrier in issue 210 (March 2012). In Drawing 3 on page 40 and in the Materials List on page 42, these parts should have a length of 34 $\frac{1}{4}$ ", not 39". The corrected dimension appears in the drawing at right. We apologize for any confusion or inconvenience this may have caused.



HOW TO REACH US

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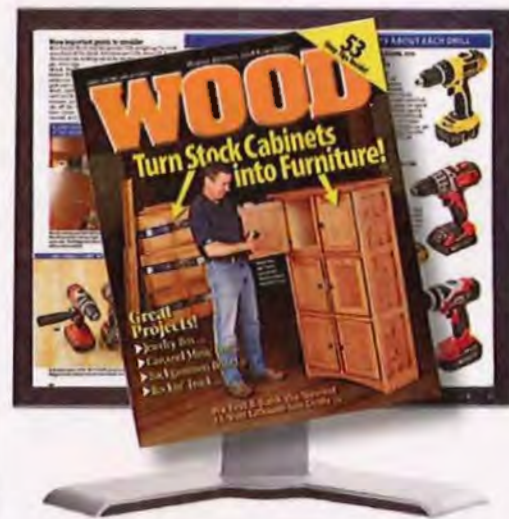
Digital subscription perfect for expatriate

With my upcoming move to Mexico, where the mail service can be inconsistent (or nonexistent), I was pleased to discover the digital edition of the magazine. As a subscriber to WOOD magazine since issue 3 (Feb. 1985), it's good to know I won't miss an issue. Other magazines and newspapers should follow your example.

—Norm Whelpdale, Lantzville, B.C.

To subscribe to WOOD magazine's digital edition, visit woodmagazine.com/zinio.

—WOOD Editors



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—WOOD editors

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sawstop.com/upgrade

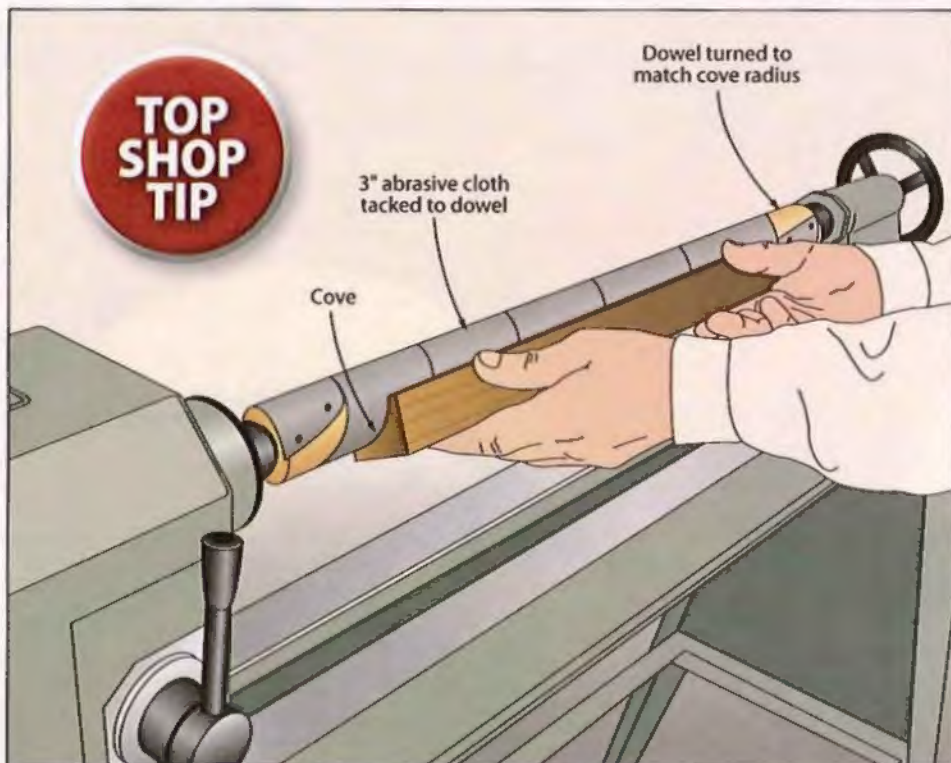
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Turn to your lathe for quick cove cleanup

After using my tablesaw to make cove molding for a grandmother clock, the curved surface needed serious sanding. After a few minutes of sanding by hand—using a dowel wrapped in sandpaper, I figured there had to be a better way; so I turned to the lathe.

After turning down a piece of stock to match the cove, I wrapped it with 3"-wide abrasive cloth (available in rolls at many home centers), and fastened it with carpet tacks on both ends. With the lathe at its slowest speed setting, I effortlessly sanded the cove smooth.

—Ron Stump, Goshen, Ind.



Bryan Chris Photography



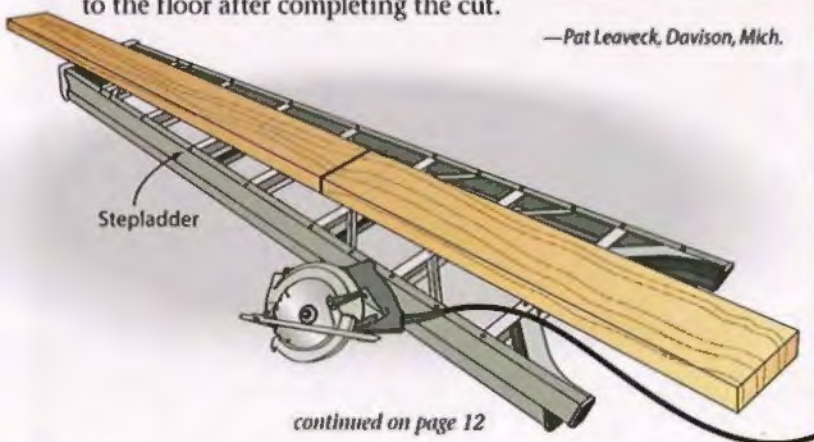
For sending this issue's Top Shop Tip, Ron receives RIKON's 30-251 34" Radial Drill Press.

Substitute sawhorses with a stepladder

A recent project required making several crosscuts to a thick 12'-long oak plank. Lifting the heavy and unwieldy board onto a pair of sawhorses by myself was out of the question.

Instead, I laid the board atop a stepladder, as shown, and cut between the rungs. The fully supported pieces didn't fall to the floor after completing the cut.

—Pat Leaveck, Davison, Mich.



continued on page 12

YOUR TIPS EARN CA\$H, TOOLS!

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Include your contact info in the e-mail.

Because we try to publish original tips, please send your tips only to WOOD® magazine. Sorry, submitted materials can't be returned.



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Shop Tips

Fresh finish: it's in the bag

I started using polyurethane paint a couple of years ago for high-gloss color coats on toys. Unfortunately, the expensive finish cures quickly in a sealed but partially full can. After many unsuccessful attempts at preserving the leftover paint, I struck on this method.

Tuck a zipper-type freezer bag into a glass jar and pour the leftover finish into the bag. Squeeze as much air as possible out of the bag before zipping it tight. Then, leave the bag in the jar to protect it. When you're ready to use the finish again, cut a small opening in a corner of the bag and pour the finish into a container for use.

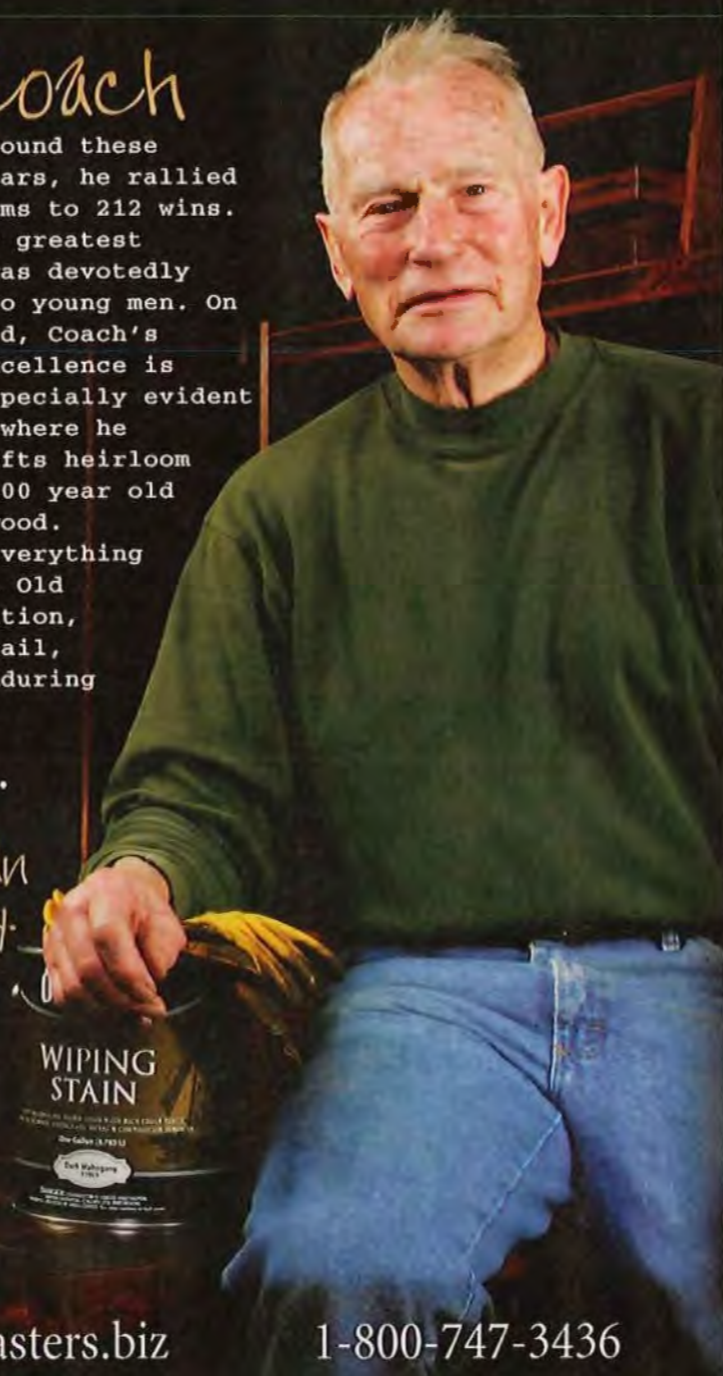
—Bill Wells, Olympia, Wash.



Meet Coach

He's a legend around these parts. For 27 years, he rallied his football teams to 212 wins. However, Coach's greatest accomplishment was devotedly shaping boys into young men. On and off the field, Coach's commitment to excellence is visible. It's especially evident in his workshop where he meticulously crafts heirloom furniture from 100 year old reclaimed barn wood. Coach embodies everything we believe in at Old Masters...Dedication, Attention to Detail, Integrity and Enduring Craftsmanship.

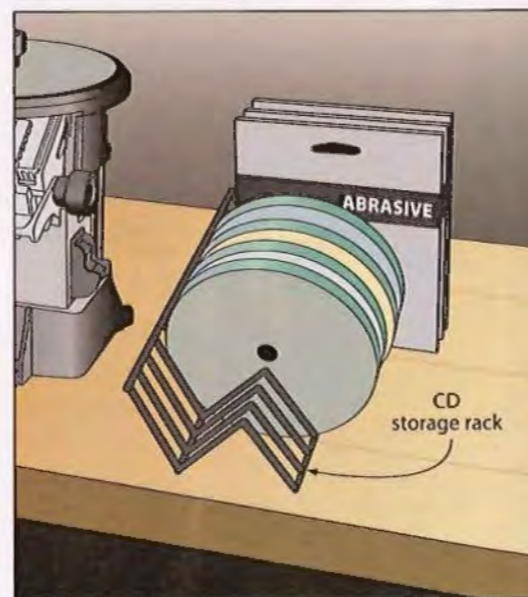
Old Masters...
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Sharpening-disc storage

I bought a motorized sharpener that uses discs of plate glass to hold the abrasive media. The tool works great, but sorting the piles of discs and abrasives in the drawer quickly became tiring. The solution came from the dollar store. A simple CD storage rack keeps the discs from banging against each other and puts the right disc in plain sight and within easy reach.

—Serge Duclos, Delson, Que.



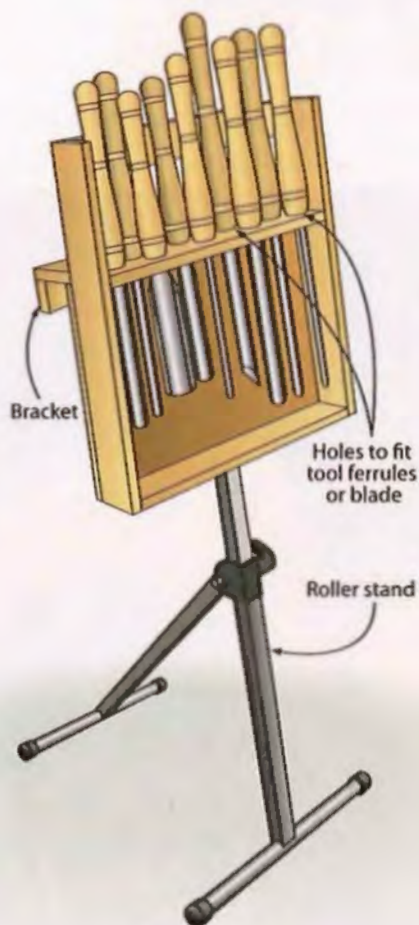
Stowable stand keeps lathe tools on hand

Constantly switching tools while working at the lathe can make it difficult to track down the right one, especially with tools piled up amid shavings and clutter. With no extra shop space to devote to a large, permanent tool stand, I developed this solution.

Build a holder box like the one shown to accommodate your lathe tools. A simple bracket on the back side fits over the roller on an adjustable stand.

In use, the stand sets up within reach and adjusts to a comfortable working height. When done working, the holder box mounts securely to the wall with a cleat.

—Matt Seiler, Tinley Park, Ill.



continued on page 14

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Shop Tips

Punch perfect plastic washers

To keep toy wheels spinning smoothly, I like to insert plastic washers between them and the toy's body. But making the washers can be tricky, particularly centering the washers' inside holes. Here's an inexpensive and simple jig for punching out perfect plastic washers. You'll need two hollow punches (like those used in leatherworking): one that matches the outside diameter of the washer and another to match the diameter of the center hole. Ideally, these also will match (or be slightly smaller than) commonly available dowel diameters.

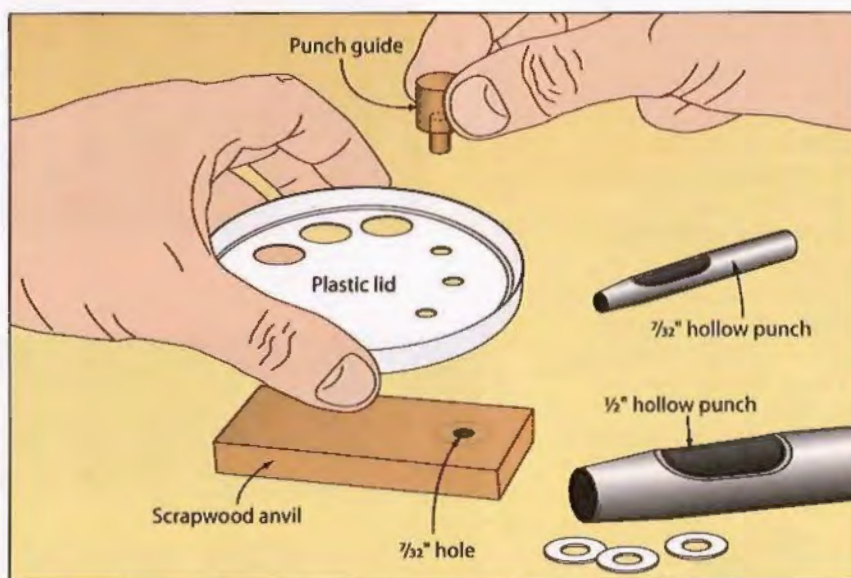
To make the punch guide shown at right, sand one end of the larger-diameter dowel as necessary until an inch of the dowel slides easily in and out of the large punch without being sloppy. Then, center in the end of the guide a $\frac{1}{4}$ "-deep hole the same size as the smaller dowel using a dowel drilling jig (#40935, \$13.99, 800-279-4441, rockler.com). Cut a $\frac{1}{2}$ " length of the

small dowel and glue it into the hole. Then cut the large dowel to about $\frac{3}{4}$ " long and set it aside. Now, fashion an "anvil" from a scrap of hardwood. Drill a hole in the scrapwood anvil that fits the small dowel.

To make washers, use the smaller punch and a mallet to poke a hole in the washer blank. (I like to use lids

from butter or cottage-cheese tubs.) Insert the smaller end of the punch guide through the hole you just made and into the recess in the anvil. Finally, slip the large hollow punch over the large end of the punch guide and give it a tap with a mallet to cut the outside diameter of the washer.

—Melvin Rhodes, Jackson, Mo.



A Natural Progression to...



Router subbase adds radiused corners to panel doors

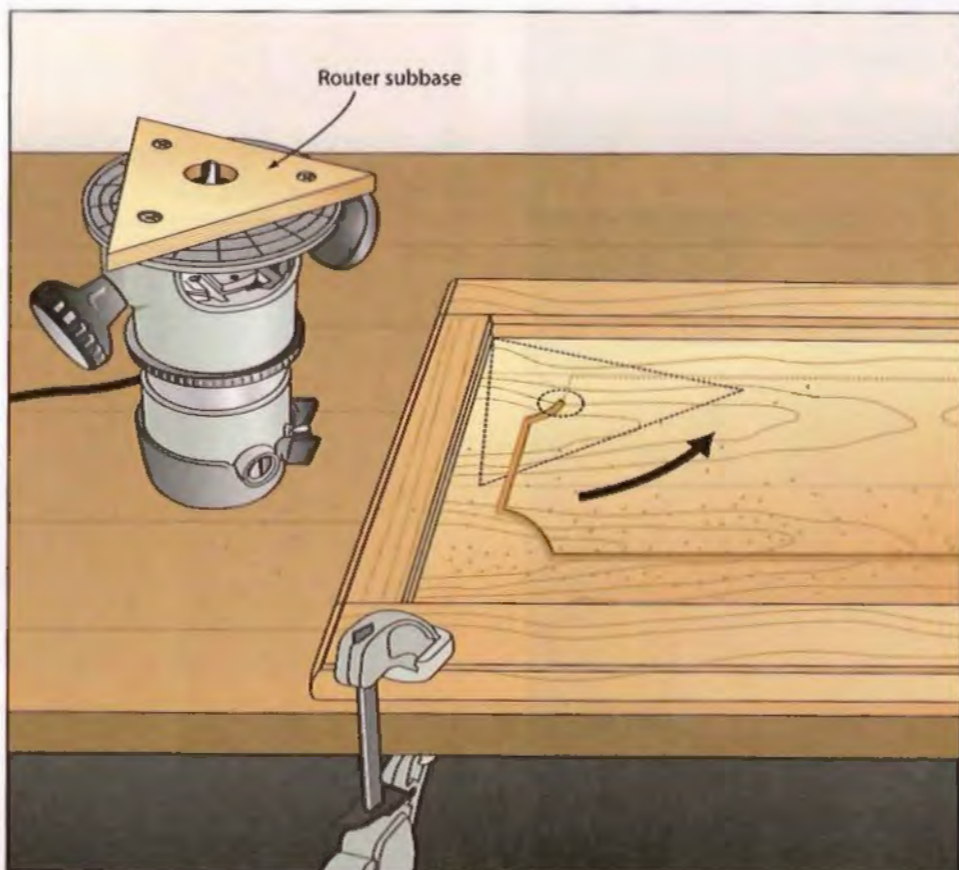
A routed groove adds interest to flat-panel doors, but finding a way to radius the corners was a mystery to me. This router subbase changes that.

First, build a router subbase from $\frac{1}{4}$ " Baltic birch plywood in the shape of an equilateral triangle (one with three equal-length sides). Keep in mind, the distance between the router's bit and the triangle's sides equals that between the door's rails and stiles and the decorative groove.

Use the door's rails and stiles as guides for the subbase. Begin routing from a corner, move the router in a clockwise direction, and when one of the guide's points touches the opposite corner, simply rotate the router to the door's adjacent side. Continue this all the way around the panel.

This works best on doors with solid wood or MDF panels. If they're made of plywood, the plies will be exposed in the groove, which is not a problem if the plywood has no voids and you intend to paint the door.

—Charles Barr, Waltham, Mass.



continued on page 16

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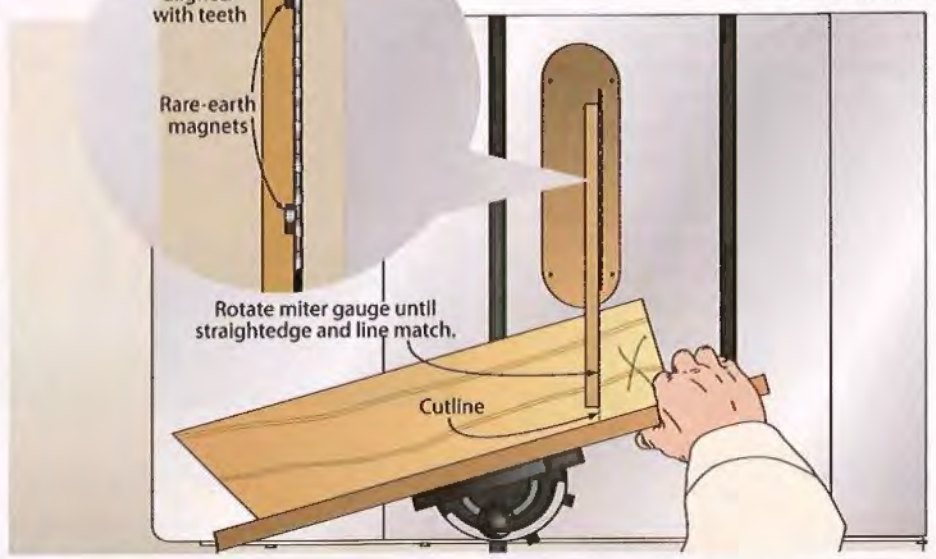
Shop Tips

Magnetic straightedge lines up tricky crosscuts

A miter gauge works great for cutting an angle measured in degrees, but what about when only a marked line represents the angle? Aligning the cut by eye gets you close, but to find the angle precisely, try this straightedge.

To build one, drill counterbores for two rare-earth magnets (#37554, \$20.49, 800-279-4441, rockler.com) in a straight piece of scrap and epoxy them in place, leaving them a hair proud. Mount the straightedge onto the tablesaw's blade, flush with the blade's teeth. Then adjust the miter gauge until the cutline and the straightedge's inside edge align.

—Charles Mak, Calgary, Alta.



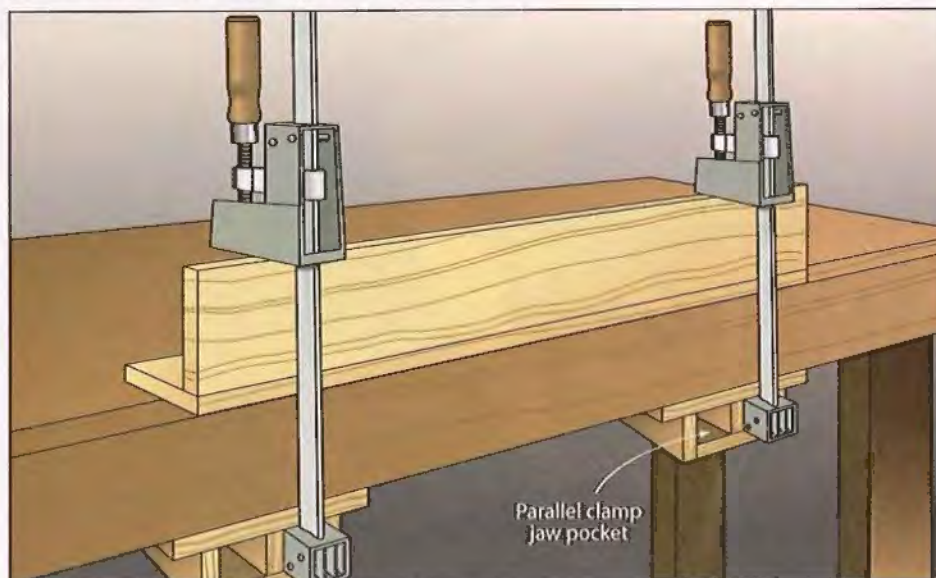
Jaw pocket holds parallel clamps upright

Using a parallel clamp to hold workpieces at a 90° angle can be difficult when it takes two hands to operate the clamp. To reduce the number of hands required for this process, I designed this parallel-clamp jaw pocket.

Mounting easily to the underside of your workbench, the jaw pocket should

fit a clamp's jaw without wiggle room. With one jaw of the clamp held in place, you can adjust the other with one hand and steady the assembly with the other. And the benchtop serves as a clamping caul—expanding the clamp's pressure over a wider area.

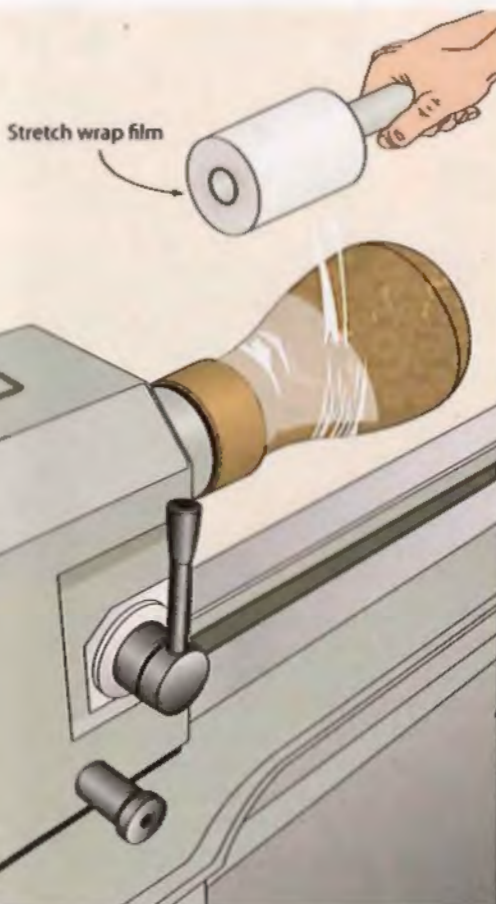
—Gary Scoggins, Hayward, Calif.



Keep unstable turnings under wraps

Burls, spalted maple, and other unstable materials can fly apart when spinning on the lathe, especially during the hollowing. To avoid calamities, I wrap my turnings securely in stretch-wrap film purchased from a local office-supply store, securing the end with a piece of tape. This applies enough pressure to maintain the integrity of the piece as I hollow it. Wrap the film against the direction of spin so it won't unwind during turning.

—Tony Kahn, Westfield, N.C.



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Get More From Your Mortiser

These 4 tips will increase accuracy and decrease working time

If you plan to do a lot of mortising, a benchtop mortiser, like those reviewed on *page 47*, saves time by boring square holes. But they're not always the easiest machines to operate—especially for first-time users—so apply these helpful hints for best results.

1. Get the right offset between the bit and chisel

The mortiser's square hollow chisel and the drill bit inside it work in tandem: The bit removes most of the waste while the chisel pares away the edges and corners. Proper spacing between the chisel tips and bit ensures

the bit clears a path for the chisel. Here's how to install them: Slide the chisel (with the bit inside) into the



mortiser collar, inserting a dime as shown *far left* to keep it from fully seating, and snug the setscrew. Next, raise the drill bit into the chuck until it seats against the chisel, and tighten the chuck. Finally, loosen the setscrew, remove the dime, and seat the chisel tightly against the collar while simultaneously squaring it to the mortiser fence, as shown *near left*. Tighten the setscrew, and you're ready to cut.

2. Add a quick hold-in

High-end mortisers use built-in rollers to hold a workpiece tight against the fence. You can add that workholding ability using a couple of Magswitch MagJigs [Sources, *page 19*]. Simply secure two MagJigs on the cast-iron base as shown *above*. The magnets' rounded ends hold the workpiece against the fence without marring.



3. Lubricate the column

Most benchtop mortiser heads slide up and down on a dovetailed column. To minimize metal-on-metal friction, apply a lubricant that dries without leaving a residue, such as Bostik TopCote or Empire Dri-Tool [Sources]. A lubricant that leaves a greasy or oily residue will attract dust, requiring more frequent cleaning and relubricating.



Dovetailed column

4. Cut mortises deeper than needed

Because of the cutting geometry of the drill bit and chisel, they won't leave a perfectly flat-bottomed mortise (below). To avoid time-consuming clean-up of the bottom with a chisel, set the depth stop to bore $\frac{1}{8}$ " deeper than the length of the tenon. This way, the extra wood will not interfere with full insertion of the tenon. 🌱



Sources

Bostik TopCote: 10 oz aerosol can, \$17.95, amazon.com.

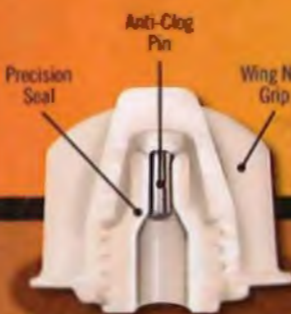
Empire Dri-Tool: 2 oz pump-spray bottle, #EMMOCDS2B, \$9.99, International Tool, 800-338-3384, internationaltool.com.

MagSwitch MagJigs: 20mm (diameter) jig, #21910, \$26.99; 30 mm jig, #28844, \$36.99, Rockler Woodworking & Hardware, 800-279-4441, rockler.com

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Mortising Table Extensions

Working with long stock, such as furniture legs, on a small metal mortising table can be dicey at best. The stock doesn't want to lie flat, and trying to precisely match mortise start-and-stop locations from piece to piece by "eyeballing" is nearly impos-

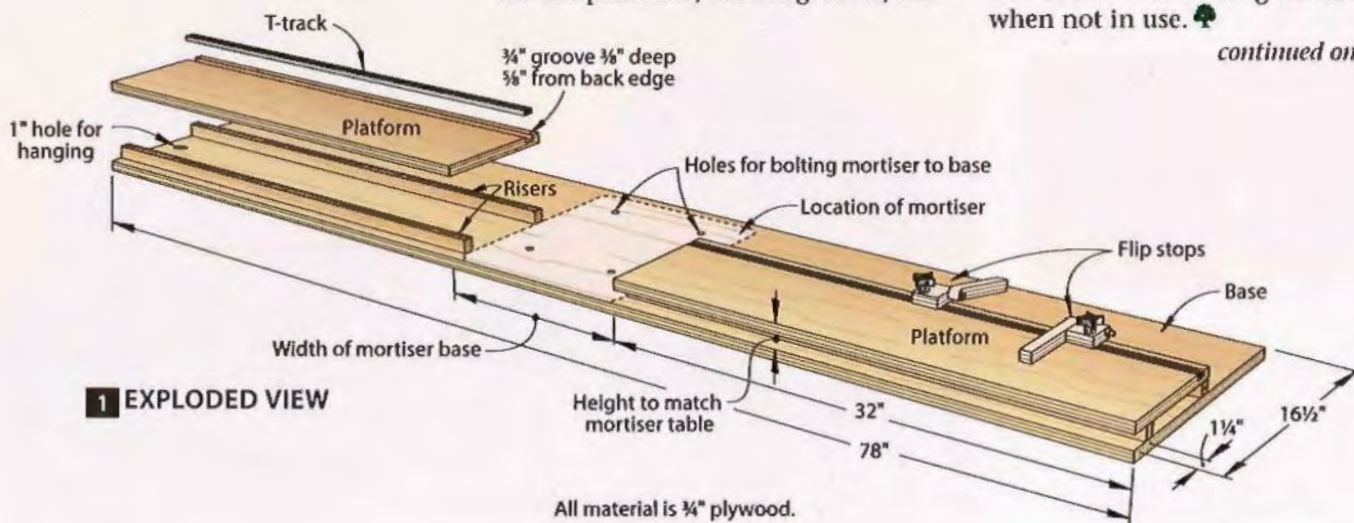
sible. To solve these problems, build this plywood table and two flip stops. The stops provide repeatable start and stop locations to ensure all mortises will be identical.

When making the flip stops (see *page 23*), size the wood key $\frac{1}{16}$ " narrower than the opening in your T-track. Next, cut the platforms, cut the grooves, and

epoxy or screw the T-track in place. Cut the risers so the platforms keep the stock level and flush with the top of the mortiser table.

To secure your mortiser to the base, mark and drill counterbored holes through the base. Bolt the mortiser to the base. Then bore a 1" hole in one end of the base to hang the table when not in use. ♣

continued on page 23



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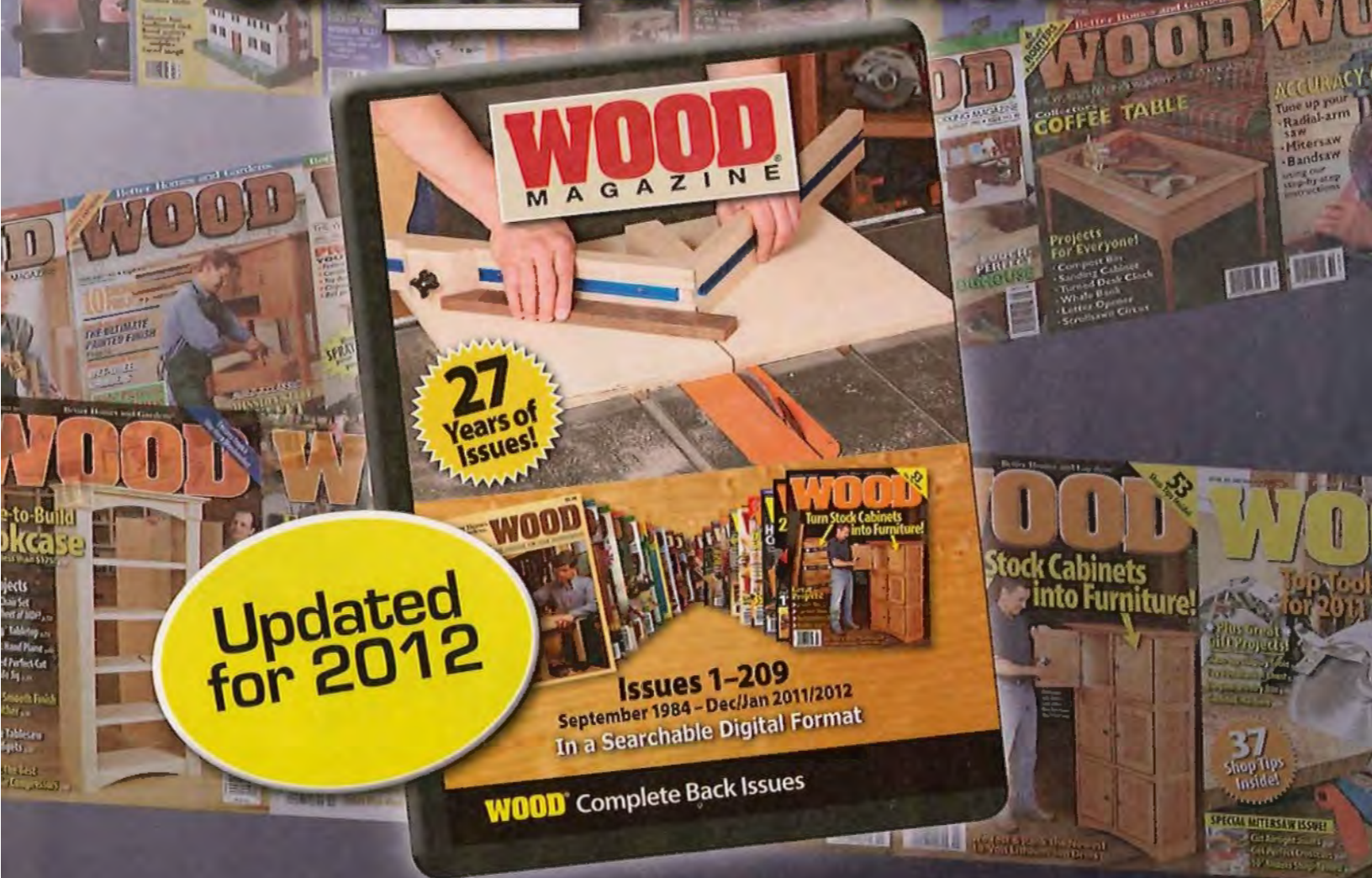
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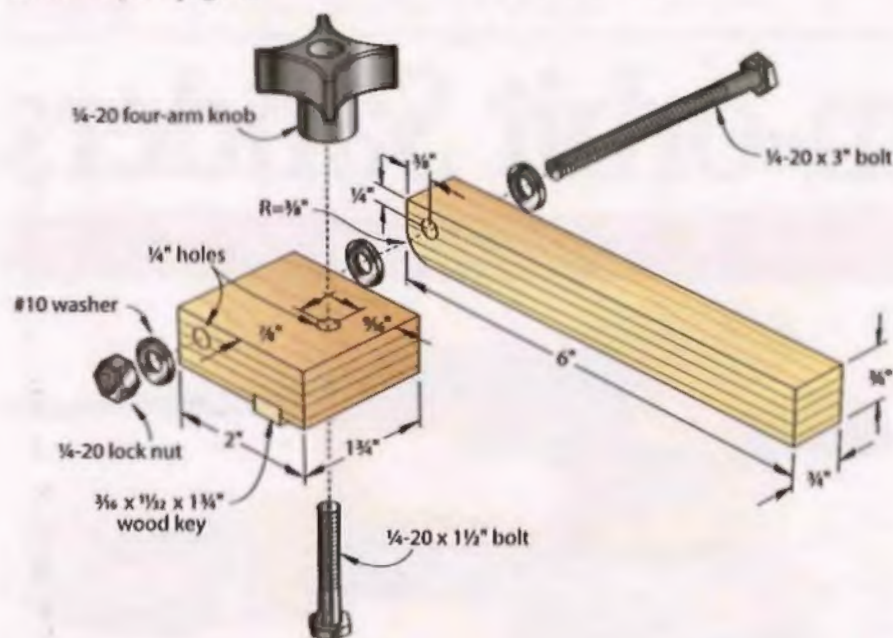
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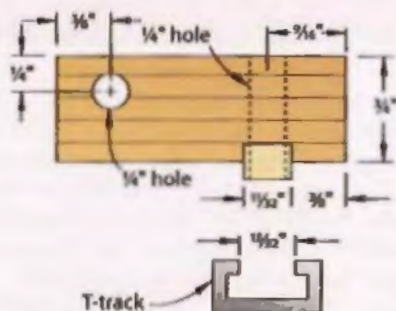
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2 FLIP STOP EXPLODED VIEW



3 FLIP STOP BASE END VIEW



Project design: Kevin Boyle
Illustrations: Lorna Johnson



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Why Buy?

You may already have a 5" random-orbit sander in your shop, but have you ever wondered if it makes sense to upgrade to a 6" model? As you'll see in the article on page 66, some woodworkers benefit from going big. If you fall into that group, here are three good 6-inchers that Tools Editor Bob Hunter recently tested.



Our Tools Editor Tests

6" Random-orbit Sanders

RIDGID R2611, \$114, 866/539-1710, ridgid.com

This sander offers two modes—a 1/4" orbit for aggressive material removal and an 1/8" orbit that left a swirl- and scratch-free finish after sanding to 220 grit. The port for hooking the sander to a vacuum fits 1 1/4" and 2 1/4" hoses, but the included cloth dust-collection bag performed well on its own, keeping most of the dust contained. The Ridgid R2611 vibrated a bit more than the other sanders and it doesn't come with any kind of storage bag or container. But at half the price of the other recommended models, that's definitely something I can live with.



BOSCH ROS65VC, \$239, 877/267-2499, boschtools.com

Slightly more aggressive than the Ridgid sander set for a 1/8" orbit setting, Bosch's ROS65VC displayed far less vibration while still delivering a quality finish after sanding to 220 grit. This sander also had the best onboard dust-collection of the sanders I tested; the pleated-paper filter inside a plastic canister with screw-off end cap captured the highest percentage of dust and was the simplest and most mess-free to empty. If you prefer to add a dust-collection hose to this sander, it comes with an adaptor to fit 1 1/4" and 1 1/2" vacuum hoses.



FESTOOL ETS150, \$295, 888/337-8600, festoolusa.com

Although not as aggressive as the Ridgid or Bosch sanders—it took about 50 percent longer to remove the same amount of wood—the Festool ETS150 produced a scratch-free finish after sanding to only 180 grit. Cutting out that extra grit saved me from having to buy and use 220-grit discs. I give a thumbs-up for vibration—the least noticeable of any of the sanders tested—but thumbs-down for the on-board dust collection. The airflow from the sander actually blew the paper filtration bag off the port several times during my testing.





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Bridesmaid Woods

Like a bride on her wedding day, oak, cherry, walnut, and maple tend to get all the attention. But in the background you'll often find a few bridesmaids every bit as appealing, though maybe less attention-grabbing. You'll have

to look beyond the easy confines of a home center to score these wallflower woods. But walk down the lumber aisle of a nearby hardwood retailer, and you'll be rewarded with distinctive and affordable project stock.

Red Alder: The low-cost, high-end chameleon

Inexpensive, light weight, and easily workable, red alder has been the unheralded preference for mass-produced furniture manufacturers for years. Lately, it's been showing up as trimwork, cabinetry, and doors in high-end homes. Why the excitement?

Red alder (*Alnus rubra*) takes stain well, so it can be matched to a wide variety of woods. Its close grain, pinkish hue, and subtle figuring makes it a dead-ringer for cherry (at about half the cost). Just as with cherry, a quick, initial seal-coat with shellac controls minor blotchiness that might show up when dyeing or staining. Red alder also matches red birch plywood, cementing its usefulness in bookcases, cabinets, and other casework.

Thriving in moist conditions, red alder grows abundantly in the coastal Pacific Northwest. Availability diminishes as you track east, but most specialty hardwood stores and online wood retailers stock it. Graded under a proprietary grading system, "Superior" generally translates to the National Hardwood Lumber Association's Select and Better grade, while "Cabinet" and "Frame" grades equate to No. 1 Common and No. 2 Common, respectively.

Hickory: An easy choice when you need a hard wood

Long famed for its hardness and shock resistance, hickory goods claimed valuable cargo-space in the horse-drawn convoys of westward-bound settlers who used it in everything from axe handles to wagon wheels.

In more recent times, hickory's distinct appearance has earned it a place outside of the smokehouse and barbecue pit. With a pronounced contrast between its nearly white sapwood and tan heartwood, sprinkled liberally with dark brown streaks and inclusions, hickory displays a dizzying randomness treasured in flooring, cabinetry, and furniture.

Ranging throughout the Midwest, South, and Northeast, hickory enjoys an ample supply and a price on par with inexpensive red oak. Difficult to dry, you'll seldom find hickory in thicknesses over 4/4.

Be prepared: Hickory's toughness comes hand-in-hand with brittleness and chipout when machining it. Slow your feed rate, back up all cuts, plane at a slight angle, and predrill for screws.

Sycamore: Exotic figure made in America

Much of the world's most gorgeously figured wood comes from tropical forests, but you'll also find it in those giant sycamore trees in neighborhoods across the South and Midwest. When quartersawn, sycamore's heavily rayed grain displays a spectacular flecked pattern that rivals lacewood and leopardwood. Use it in decorative projects, such as jewelry boxes, that call for striking figure. In stark contrast, plainsawn sycamore's grain looks disappointingly plain and proves prone to warping when hastily kiln-dried. Properly processed, though, plainsawn sycamore becomes serviceable as a secondary wood in drawer sides, dust partitions, and cabinet nailer cleats.

Prices for quartersawn sycamore hover in the walnut range, making it an inexpensive choice for such a distinctly figured wood. 🌳



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Punch Out Before You Hit the Shop

Everything in life seems so harried. Kind of like traveling at warp factor nine—"and the engines are barely holding together, Captain!" Wake, shower, and shave. Race to an early-morning work meeting. Beat those all-important deadlines. Rustle up dinner. Chase kids from one activity to another. Then, try to wind down, snag a handful of Zs and get ready to do it all over again the next day. It's enough to make your head swim. That's why I relish the shop as a place to relax and enjoy some "me" time.

Lately, though, it seems I'm not alone in the shop. That go-go-go spirit that propels me through my workday doesn't go away. Instead of relaxing into a become-one-with-the-wood mindset, thoughts turn to time frames and must-dos. "If I can get all of the components for these drawers cut and glued up tonight, then tomorrow..."

It doesn't make any sense. I'm not a woodworking professional trying to earn a living behind the bench, so hitting production deadlines shouldn't be a concern. I have to keep reminding myself: This is what I do for *fun*.

Besides, blasting your way through a project leads to miscuts, wasted material, and—worst-case scenario—an accident. Ouch.



If you find yourself tracking project progress on spreadsheets, or building a PowerPoint presentation to show the family how you completed a tricky joint, here are some tips to help keep your mind on the *play* aspects of working in the shop:

► **Communicate.** Sounds strange, but letting those close to you know how long you plan to spend in the shop does wonders. This way, they know whether to expect you for lunch (or dinner) and can give you the uninterrupted shop time you crave.

► Unplug.

Though it's tempting to bring the laptop into the shop—you know, to refer back to online plans and answer a few e-mails—you leave yourself open to distractions that can gnaw into precious project time. People got along for a long time without the Internet, smartphones, and other devices. You can, too!



► **Set realistic goals.** Depending on the size of the project, pad your expected completion dates by a few weeks. That means planning well in advance for event-specific projects such as birthday presents. Overestimate how long it will take to complete the next step of the project. If you get that task done, either clean up and call it a day or try to tackle another simple task. Perhaps touching up those chisels that have gotten a little dull.



You'll be amazed how making a few simple adjustments can lead to a lot less stress in your shop. Who knows? Maybe you will discover a way to keep those warp-drive engines in your head set to "Park" long enough to relax and enjoy yourself. 🍌

—*The Shop Monkey* (aka Tom Iovino of Tampa, Fla.) blogs prolifically at woodmagazine.com/shopmonkey.

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How to Revive a Worn Finish

When your furniture goes from having a patina to being pathetic, bring its finish back to life with these quick fixes.

A scratch here, a scuff there, and your eye soon sees the blemishes more than the furniture beneath. Worn doesn't always mean worn-out, though. Anything from a thorough cleaning to a fresh topcoat could cure the problem a lot easier than starting over from bare wood.

Before you treat the problem, though, determine the type of finish you're fixing. First, dab an inconspicuous location with denatured alcohol [Photo A]. Shellac finish will come

off. If it doesn't, try the same thing using lacquer thinner, which will dissolve a lacquer finish. Neither will affect a catalyzed lacquer factory finish or a varnish.

On newer furniture, you may also have to contend with tinted topcoat finishes. Check damaged areas of the finish: If a scratch changes color without revealing bare wood, plan to refinish from bare wood.

Before you go that far, though, let's try the easier fixes first:

Fix 1: Start with a good cleaning

For light wear and a dingy surface, begin by stripping off old wax, oil, and grime. Wipe the surface using a towel and

continued on page 32

FIRST, DETERMINE THE FINISH



A The underside of a drawer provides an ideal place to test for the type of finish using alcohol first and then lacquer thinner.

START SIMPLE: CLEAN A DINGY FINISH



B What looks like a worn finish may only be dirt. Wipe away grime with a soapy towel for a good start toward reviving a finish.

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BUFF WAX WITH A RANDOM-ORBIT SANDER



C To make a random orbit sander buffing pad, attach the pad to the grit side of a sanding disc using adhesive strips. (See Sources.)

waterless hand cleaner, such as Gojo or Permatex DL. Dry the surface immediately after cleaning [Photo B]. Then remove old wax and oil by wiping the surface with mineral spirits.

Now apply a coat of paste wax, such as SC Johnson Paste Wax, to fill in tiny scratches and leave an even sheen. Allow the wax to dry to a haze before buffing it by hand, with an inexpensive car buffer, or with a random-orbit sander and a buffing pad [Photo C]. To avoid damaging the wax finish, don't use spray polishes or "lemon oil" (scented mineral oil and mineral spirits) that will dissolve wax.

Fix 2: Next option: re-rub

If cleaning and waxing don't do the trick, you may need to rub out the finish—a polishing technique. That's only if the existing finish is thick enough, though, because you'll remove some finish during this process. How do you know if it's thick enough? If no scratches penetrate to bare wood, that's a good sign you have enough finish to work with.

Rubbing out an existing finish works much like the final stages of rubbing out a new finish. First, make a polishing pad by attaching a white, non-woven cleaning pad to a sanding disc using adhesive strips. (See Sources.) Spread a small amount of polishing compound (Sources) on the surface, and polish the finish with the polishing pad and a random-orbit sander using slow, overlapping passes [Photo D]. Work slowly and stop when it reaches an even sheen. Then apply a coat of paste wax.

Fix 3: Add fresh topcoats

Badly scratched and dented wood can't be repaired without sanding down to bare wood. But in lightly scratched wood, you can achieve a finish that looks aged, rather than abused, by adding topcoats and then sanding those down for an even sheen and smoother surface. Use satin or semi-gloss topcoats

RUB THE FINISH TO A SMOOTH, EVEN SHEEN



D Remove sanding scratches using Finesse-It II Machine Polish and a white, non-woven cleaning pad. Check the finish often as you work.

THERE'S SOMETHING FISHY ABOUT THIS FINISH



E Silicone from some furniture polishes causes additional coats of finish to bead up like water drops on a waxed car, an effect called fish-eye.

on less-than-flawless surfaces. A high-gloss finish requires more polishing, and that gloss highlights surface flaws.

Begin with a thorough cleaning with waterless soap followed by mineral spirits to remove grime, wax, and furniture polish, which can produce fish-eye in the new topcoats [Photo E]. Then hand-sand the surface to 320 grit to prepare it for the new coats.

continued on page 34

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Finishing School

To minimize small scratches that go down to bare wood, dab a matching stain on the damaged area [Photo F], and allow it to dry for at least 24 hours. Then apply three coats of wipe-on film finish such as Watco Wipe-On Poly, sanding with 320 grit between coats.

If minor dings and missing finish telegraph up through the added topcoats, sand them with 320 grit until you achieve a flat surface. This may produce "ghosting" on the surface from partially sanding through a layer [Photo G], but you'll cover that with additional topcoats. Then set aside the project for at least a week in a well-ventilated area while the finish cures completely. It's ready to rub out when you no longer smell solvent fumes at the surface.

To rub out the finish, first spread a small amount of mineral oil on the surface and hand-sand with 400- and 600-grit wet/dry abrasive to level the surface. Check abrasive sheets frequently to make sure they're not clogged with clumps of finish. Wipe the surface clean with mineral spirits after each grit. Follow the sanding by buffing with a mechanical buffer or random-orbit sander and white non-woven cleaning pad. (See **Sources** below.) Then polish the surface using a polishing compound and soft cloth on a buffer. Stop when you achieve an even sheen. 🌲

Sources

White non-woven cleaning pads: Package of 10, \$9, ptreeusa.com.
Polishing compound: 3M Finesse-It II Machine Polish, \$14, Amazon.com.
Adhesive strips: U-Glu 1x3" strips, \$9 for eight, Amazon.com.

A LITTLE DAB WILL DO IT FOR MINOR DAMAGE



F A dab of stain provides an economical way to cover up light damage. You can also buy scratch cover-up pens at many home centers.

SPOOKY: SANDING REVEALS FINISH LAYERS



G When leveling a finish on uneven wood, sanding through one finish layer and into the next can create an effect called "ghosting."



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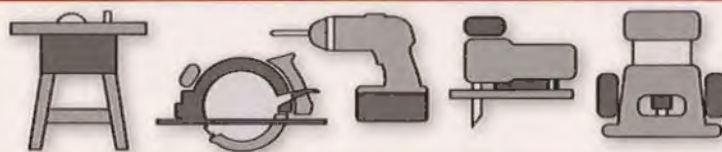
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First, build a beefy base

1 Because many of the parts in the base share a 16" dimension, start by cutting a 16½" x 96" strip from a sheet of ¾" plywood, using your circular saw and a straightedge. (See **More Resources** for a video on safely handling sheet goods.)

From this strip, cut a piece 25½" long for the top (A) and set it aside. Cut the

Project Highlights

- ▶ Overall dimensions: 27" wide x 17½" deep x 16¾" high.
- ▶ Materials needed: Birch plywood.
- ▶ Approximate cost: \$43 for a half sheet of ¾" plywood and 2x2' sheet of ½" plywood.

Skill Builders

- ▶ See how to save your time and back by breaking down plywood parts efficiently.
- ▶ Learn to use project pieces as marking/cutting gauges for perfect-fitting parts.
- ▶ Discover a simple way to mount any router in your table.

remaining piece in half and rip each half to 16" wide. Cut the legs (B) from one half [Drawing 1; Materials List and Cutting Diagram, page 40] and parts C-H from the other, marking them with their part letters and setting them aside.

2 Glue and screw the right foot (C) [Drawing 1] to a leg (B). Set the assembly aside. Cut the table aprons (I) to size. Then, cut notches in the center leg for the table aprons. See the **Shop Tip**, next page, to learn how to cut the notch precisely.

MARK PARTS WITH PARTS FOR PRECISION FITTING



A Align one end of the upper drawer divider (F) flush with a notch, then mark its width using the opposite notch as a guide.

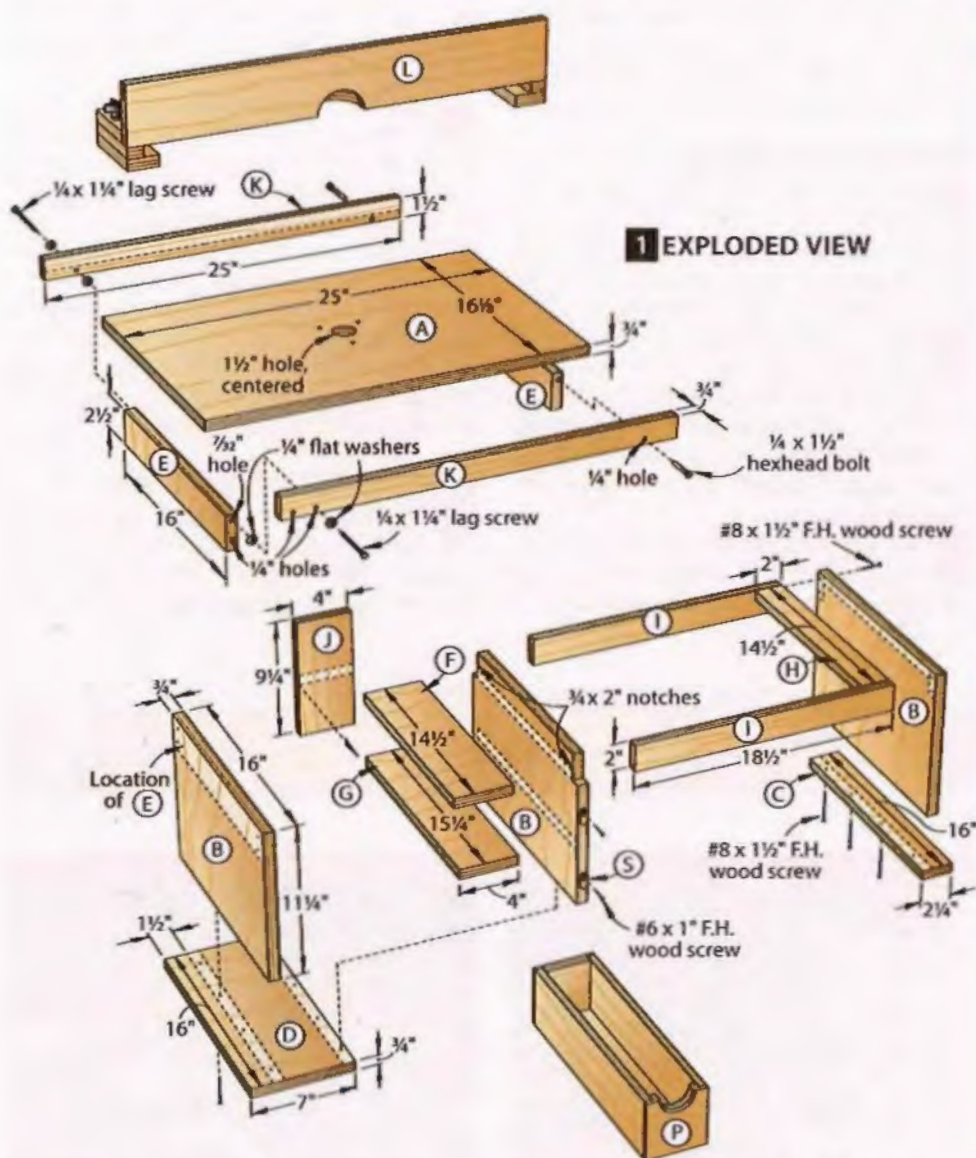


B Stack the lower drawer divider (G) on the center leg (B), aligning the edges. Use the notch as a guide to mark the divider's width.

USE SPACERS TO GUIDE ASSEMBLY



C Cut two 4 1/4" scrapwood spacers to position, glue, and clamp the lower drawer divider (G) to the center leg (B).



3 Retrieve the upper drawer divider (F) and use the notches in the center leg (B) to help mark drawer divider's width [Photo A], then cut it. Next, mark and cut the lower drawer divider (G) to width as shown [Photo B].

4 Glue and clamp the upper drawer divider (F) to the center leg (B), aligning the bottom face of the divider with the top of the notches [Photo C]. After the glue dries, glue and clamp the lower drawer divider (G) as shown.

SHOP TIP

No-slop tablesawn notches

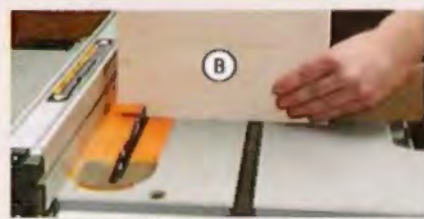
Measuring and marking a project part using a tape measure or steel rule can be hit-or-miss, especially with undersized plywood. Instead, use project parts, scrap material, and direct measurement on the cutting tools themselves to increase accuracy. Then, follow these steps to precisely cut the notches in the center leg (B) to fit the table aprons (I).



To set up for the notch's width, cut into a scrap of your plywood. Raise the blade until it just leaves splinters of veneer.



To set the notch depth, measure from the fence to the outside edge of a tooth on the saw blade.



Using an auxiliary fence on your miter gauge, cut the notch in repeated passes. The fence acts as a stop for the final cut.

PREDRILL, GLUE, AND SCREW THE FOOT



A combo drill/countersink bit reduces the bit changes necessary for predrilling and countersinking for screws.

5 Predrill, glue, and screw the left foot (D) to the drawer assembly (B/F/G) [Photo D].

Quick Tip! Several base parts can be attached using glue and screws that get covered up later. Screws speed assembly because you don't have to wait for glue to dry before moving on to the next step.

Cut the drawer-box back (J) to size, dry-fitting it to ensure the top edge aligns with the notch in the center leg (B) before gluing and clamping it in place.

6 Retrieve the table aprons (I), and glue and clamp them in place [Photo E]. Glue and screw the remaining leg (B) in place. After the glue dries, retrieve the top cleat (H). Mark it as shown [Photo F], and glue and clamp it in place [Drawing 1].

7 Retrieve the right leg assembly (B/C). Glue and screw it to the left leg assembly (B/D/F-J) [Drawing 1]. Retrieve

ADD THE APRONS



Glue, then clamp, the table aprons (I) into the notches and flush with the upper divider (F). Then glue and screw the left leg (B) in place.

the pivot cleats (E) and glue and clamp them to the left and right legs (B). Sand a $\frac{1}{8}$ " round-over on the top outer edge of the left pivot cleat with a sanding block.

Tackle the tabletop

1 Retrieve the top (A) and use a straightedge to mark diagonal lines from corner to corner, forming an X in the center. Drill a $1\frac{1}{2}$ " hole centered on the X using a holesaw [Photo G].

2 Remove the subbase from the router you intend to mount in the table and use the holes in it to help mark the location of the mounting holes [Photo H]. Drill and countersink holes sized for your router's mounting screws at the marked locations.

3 Cut the top aprons (K) to size. Lay out the locations of the three holes on one of the aprons [Drawing 2] and

MARK, DON'T MEASURE, THE CLEAT



To ensure the aprons (I) remain parallel along their length, mark the top cleat (H) for cutting by holding it near the left leg assembly.

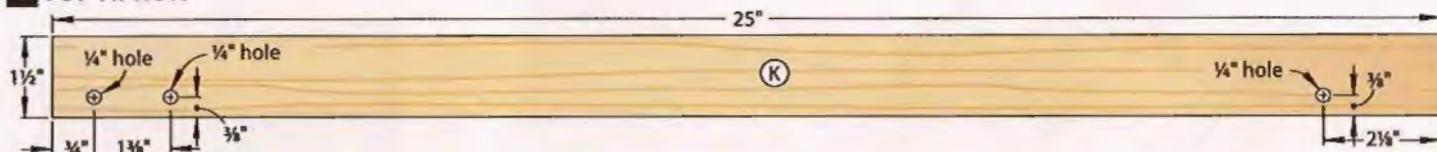
drill them with a $\frac{1}{4}$ " bit as shown in Photo I. Glue and clamp the top aprons to the top (A).

4 Clamp the top (A/K) to the base, centering the pivot hole on the end of the pivot cleat (E). (Use the center ply of the plywood as a gauge to line up the hole.) Then use the holes in the top apron (K) as a guide for drilling a $\frac{3}{32}$ " hole for the pivot screw and a $\frac{1}{4}$ " hole for the right linchpin bolt [Drawing 1, Photo J]. Add washers and snug the $\frac{1}{4} \times 1\frac{1}{4}$ " lag screws in the pivot hole. Raise the top and use the left linchpin hole as a guide to drill a $\frac{1}{4}$ " hole for the linchpin bolt.

Finish the full-size fence

1 Cut the fence face and base (L) to size. Lay out the identical radiused cutouts [Drawing 3]. Then, use the method in the Shop Tip, next page, to

2 TOP APRON



BORE THE BIT OPENING



Clamp the top (A) to a work surface with a scrap backer board underneath to prevent tear-out. Then drill the bit-access hole.

TRACE THE SUBBASE SCREW HOLES



Center the subbase on the top (A), oriented so that the router's controls may be easily accessed from the front of the table.

DRILL A TWO-FER TOP APRON



To ensure that the holes match, stack and secure the top aprons (K) to your bench, with a scrap backer board underneath.

ADD THE "DOWN" LINCHPIN HOLE



Drill a $\frac{1}{32}$ " hole through the pivot hole and a $\frac{1}{4}$ " hole through the right guide hole. Match the depths to the hardware length.

ADD THE "UP" LINCHPIN HOLE



Now, raise the top all the way. The location of the left guide hole marks the location for the "up" linchpin hole. Drill with a $\frac{1}{8}$ " bit.

BACK, STACK, AND DRILL THE FENCE



On a backer board, line up and stack the fence (L/L) on top of the cleat assembly (M/N). Clamp, drill, and repeat on the other end.

jigsaw the curves. Now, glue and clamp the face to the base.

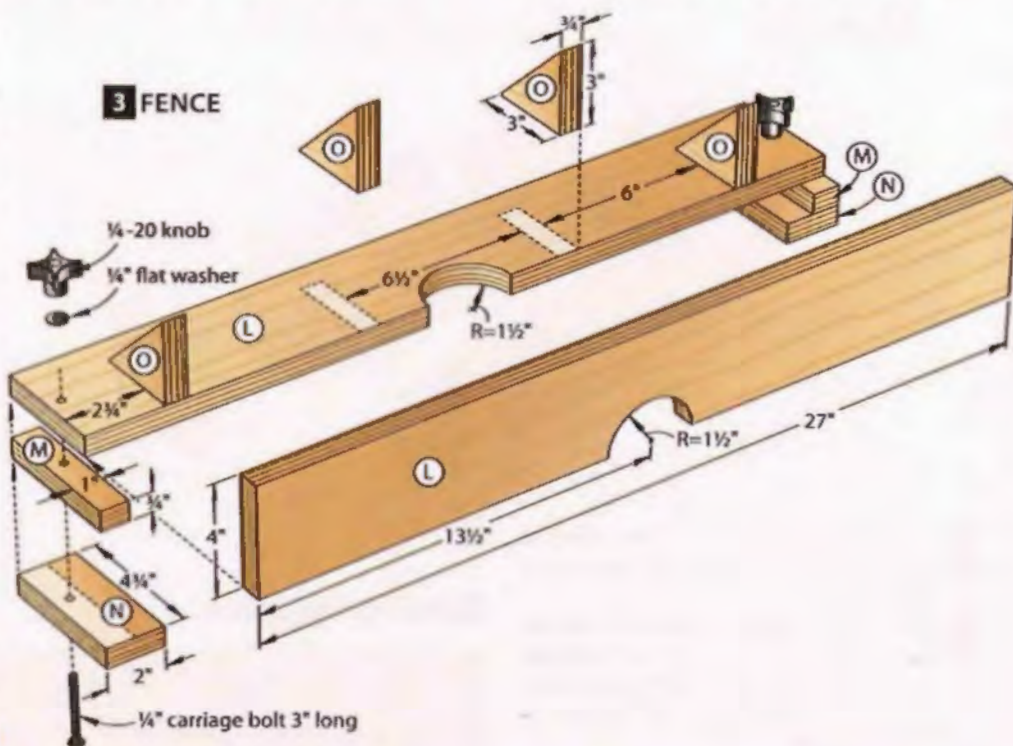
2 Cut the fence spacers (M) and fence cleats (N) to size. Glue and clamp the spacers to the cleats. After the glue dries, stack and clamp the fence assembly (L/L) onto the cleat assembly (M/N), and drill $\frac{1}{4}$ " holes through the stacked plywood [Drawing 3 and Photo L].

3 From a $\frac{3}{4}$ "x3"x12" strip of plywood, cut the fence braces (O) [Photo M]. Glue and clamp the braces to the fence assembly [Drawing 3].

Devise some heavy-duty drawers

1 From $\frac{3}{4}$ " plywood, cut two blanks $3\frac{1}{2}$ "x10" for the drawer fronts and backs (P). From one blank, cut two drawer backs to length and set aside. On the other blank, lay out the drawer-front finger pulls on each end [Drawing 4], and cut out the pulls [Shop Tip, below right] before cutting the fronts to length.

Quick Tip! Cutting the radius before cutting the blanks apart leaves you plenty of space for clamping without interfering with the jigsaw baseplate.



CUT BRACES EFFICIENTLY



Set your miter gauge to 45° to cut a brace from either end of the strip. Reset to 90° to cut the remaining two braces.

SHOP TIP

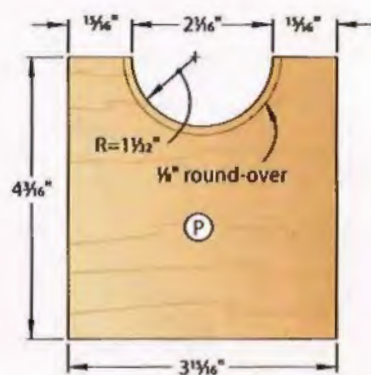
A trick for tackling tight jigsaw turns

Even with a fine-toothed wood blade (10 tpi or greater) in your jigsaw, cutting around tight curves can be a tricky proposition, causing the blade to bind, bend, and burn.

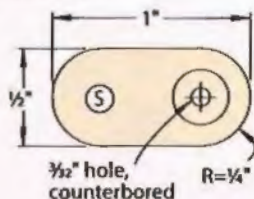
Try this trick: Before you start in on the curve, cut multiple straight relief cuts, right. Then cut the curve within $\frac{1}{16}$ " of the line. As you cut your way around the curve, the waste pieces fall away one by one, relieving pressure on the blade, and providing space to back the tool up should you need to change your angle of attack slightly. Sand to the line of the curve using a short section of sandpaper-wrapped PVC.



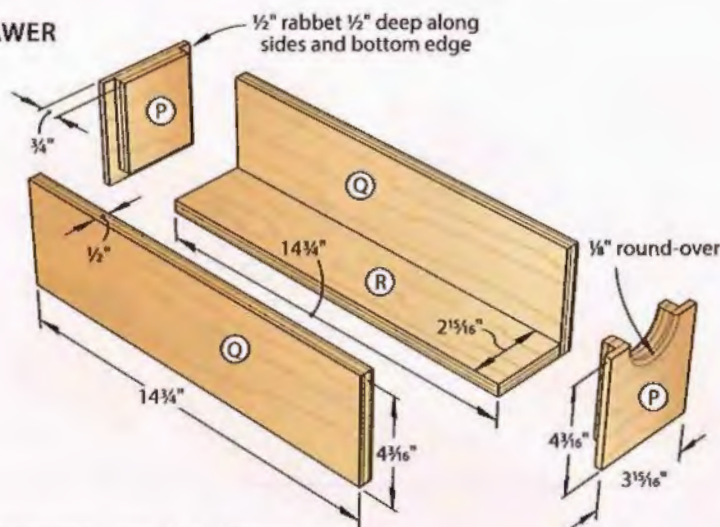
4 DRAWER FRONT



6 FULL-SIZE DRAWER CATCH
(2 needed)



5 DRAWER



2 From 1/2" plywood, cut the drawer sides (Q) and bottoms (R) to size and set them aside.

3 Mount your router onto the underside of the top (A). (If the original faceplate screws don't reach, purchase longer machine screws of the same size and thread count.)

4 Chuck a $\frac{3}{4}$ " rabbeting bit in the router. Attach the fence as shown in **Drawing 3**. Rout $\frac{1}{2}$ "-deep rabbets the same thickness as the drawer sides (Q) on three sides of the drawer fronts and backs (P). Now, switch bits and rout $\frac{1}{8}$ " round-overs on the finger pulls of the drawer fronts.

5 Glue and clamp the drawers together [Drawing 5]. From scrap 1/4" stock (we used plywood), cut the drawer catches (S) to size. Sand 1/4" radii on the corners [Drawing 6] with a sanding block. Drill, counterbore, and attach the catches to the front edge of the center leg (B) [Drawing 1]. Now, insert the drawers, fill them to the brim with bits, and get ready for some routin'. 🌲

Produced by **Lucas Peters** with **John Olson**
Project design: **Kevin Boyle**
Illustrations: **Lorna Johnson**

Materials List

Table	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A* top	¾"	16½"	25"	B	1
B* legs	¾"	16"	11¼"	B	3
C* right foot	¾"	16"	2¼"	B	1
D* left foot	¾"	16"	7"	B	1
E* pivot cleats	¾"	16"	2½"	B	2
F* upper drawer divider	¾"	14½"	4"	B	1
G* lower drawer divider	¾"	15¼"	4"	B	1
H* top cleat	¾"	14½"	2"	B	1
I table aprons	¾"	2"	18½"	B	2
J drawer-box back	¾"	4"	9¼"	B	1
K top aprons	¾"	1½"	25"	B	2
Fence					
L face/base	¾"	4"	27"	B	2
M spacers	¾"	1"	4¾"	B	2
N cleats	¾"	2"	4¾"	B	2
O* braces	¾"	3"	3"	B	4
Drawers					
P* drawer fronts/back	¾"	4¾ ¹⁶ / ₁₆ "	3 ¹⁵ / ₁₆ "	B	4
Q drawer sides	½"	4 ³ / ₁₆ "	14¾"	B	4
R drawer bottoms	½"	2 ¹⁵ / ₁₆ "	14¾"	B	2
S drawer catches	¼"	½"	1"	B	2

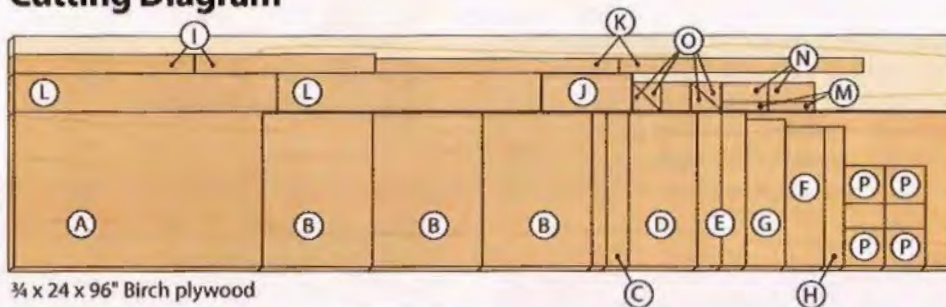
*Parts initially cut oversize. See the instructions.

Materials key: B–birch plywood.

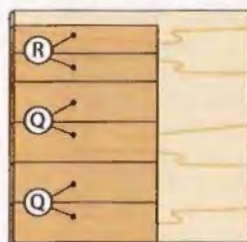
Supplies: #6x1" flathead wood screws (2), #8x1½" flathead wood screws (20), ¼x1¼" lag screws (2), ¼" flat washers (6), ¼x1½" hexhead bolts (2), ¼-20x3" carriage bolts (2), ¼-20 star knobs (2).

Blade and bits: Drill/countersink bit; ¼" and ⅜" drill bits; ⅜" rabbeting and ⅜" round-over router bits; 1 ½" holesaw.

Cutting Diagram



3/4 x 24 x 96" Birch plywood



1/2 x 24 x 24" Birch plywood



¼ x 6 x 12"
Birch plywood

More Resources

■ For a video on safely handling sheet goods, go to woodmagazine.com/sheetgoods.

■ For a free plan for modular, in-drawer router-bit storage, go to woodmagazine.com/bitstorage.

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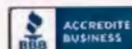
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May 2012

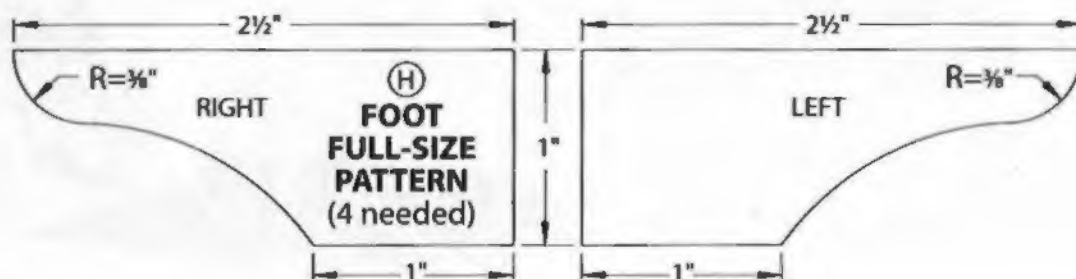
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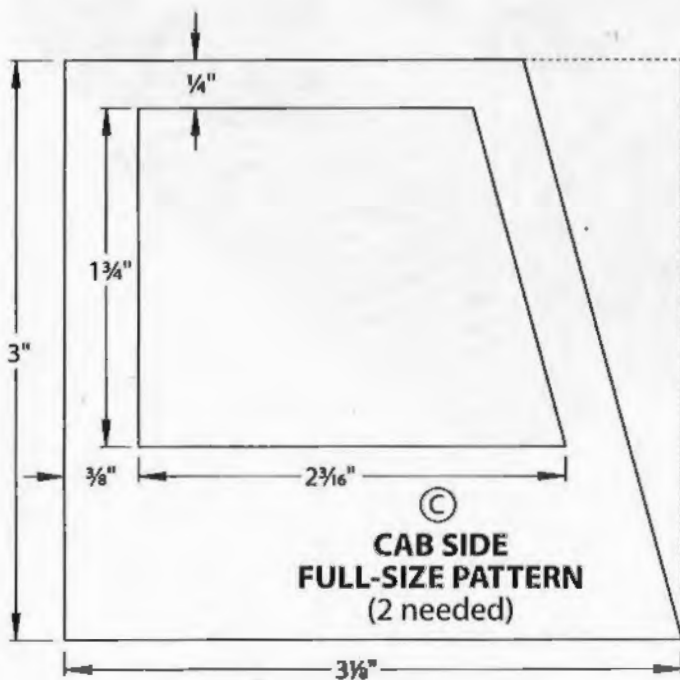
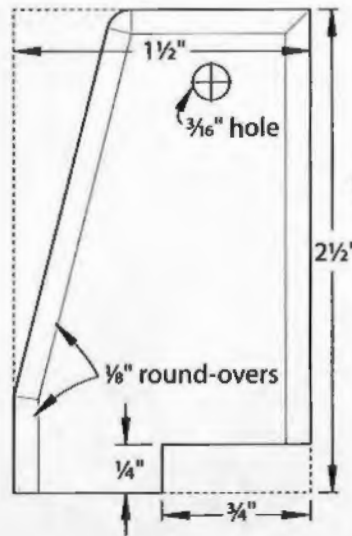
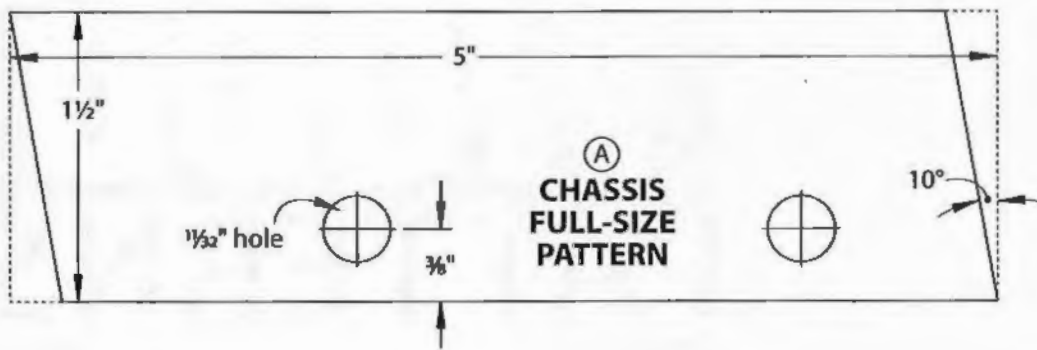
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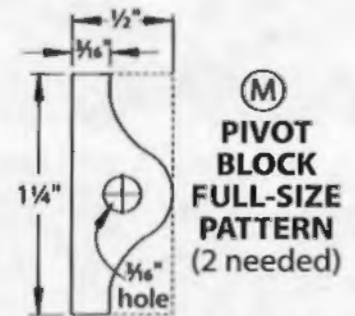
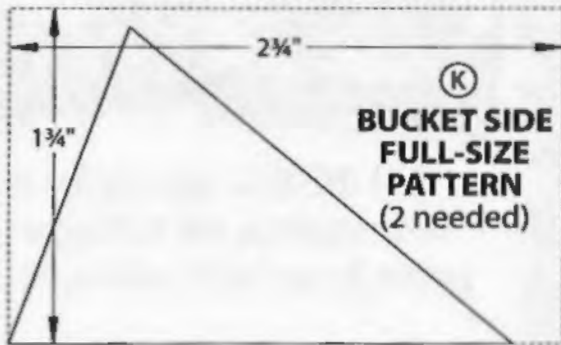
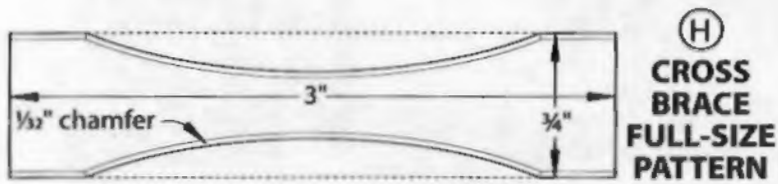
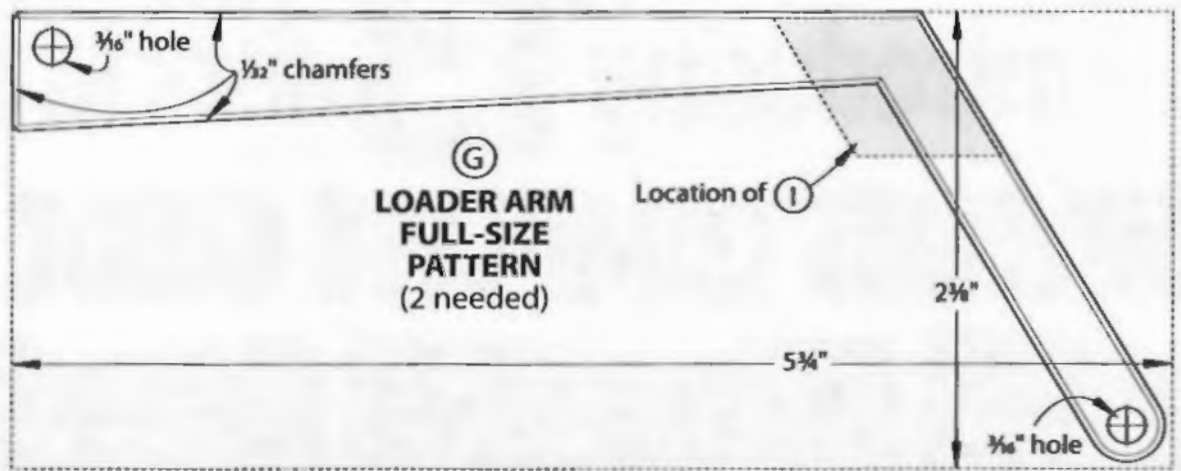
Silverware Caddy
Page 68





Construction-Grade Skid Loader Page 58





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SHOP TESTED

POWER

Benchtop Mortisers

There's no easier, faster, or more accurate way to bore rectangular mortises than with one of these machines. We tested 10 affordable models priced from \$245 to \$600 to find out which one's right for you.

A mortiser helps you pull off one of the niftiest tricks in woodworking: boring a square hole with a round bit. That's possible because the bit sits inside a square chisel that shears the walls of the mortise as the rotating bit evacuates the waste through a slot cut in one side of the chisel. By plunging the chisel multiple times you create a series of overlapping square holes to form a rectangular mortise. Throughout this process, the machine holds the workpiece square and rock-steady for can't-miss results. Read on to learn which mortisers perform best.

Whether you're in the market for a mortiser or any other tool, read more reviews from *WOOD*® magazine editors as well as your fellow woodworkers at toolreviews.woodmagazine.com. You can also post reviews of your own and find links to compare tool pricing.

3 reasons to own a benchtop mortiser

1 Most models, when equipped with a sharp chisel and bit, cut clean-walled mortises. (With a couple of machines you'll be wise to buy better chisels.)

2 Some save you space by easily storing under a workbench. However, most weigh 70 lbs or more, so make sure you have a helper before lifting those.

3 A benchtop mortiser has all the capacity you'll likely ever need, and costs considerably less than a floor-model mortiser, which starts around \$900.

The best mortisers have these features to make the job easy on you

All of the machines we tested had the power to punch mortises up to ½" wide (some up to ¾") in most hardwoods; look for the following qualities to make it easier on yourself.

► **Bulk and a broad base.** Most of these mortisers proved top-heavy and should be bolted to a workbench (or secured to a piece of plywood clamped to the bench). However, models weighing more than 80 lbs with broad bases (Powermatic 701PM, General International 75-040 M1, and WoodRiver 151223) prove stable without being secured.

► **Long-arm leverage.** The longer the handle, the greater your leverage for plunging the chisel into wood. All but the two General International machines provide adjustable hubs, shown *below*, with at least six different settings to position the handle for maximum leverage.

► **Fine fence adjustments.** We prefer rack-and-pinion fences (where you turn a knob to move the fence forward or back with precision) to sliding fences—even those with microadjusters. We like the rack-and-pinion systems' smooth operation and fine adjustability.

► **Easy tool changes.** You'll change bits and chisels often, so it should be easy. With three tested models (both General Internationals and the Powermatic), you secure chisels with built-in handles. The others require a hex wrench to tighten a setscrew. Of those, we give the Delta

14-651, Grizzly G0645, and Rikon 34-250 bonus points for having that wrench on the chuck key handle.

► **Beefy vertical-stroke stops.** You'll need a solid-locking stop to prevent boring mortises too deep, and the best ones wrap around the dovetail ways the head slides on (*bottom right photo*) or tighten against it tool-free. Both General International models and the Powermatic have such stops. Another adjustable stop above the head (only on the General Internationals) limits upward travel, decreasing arm fatigue because you don't have to pull the head from its highest position on each stroke.

► **Ample collar and shank capacity.** Premium mortising chisels typically have ¼"-diameter shanks, but only six tested mortisers have ¼" collars for accepting them. (See the chart on *page 50*.)

Most bits have ⅜" shanks—especially those for ½" or smaller chisels—but for ⅝" and larger mortises many bits have ½" shanks. So buy one of the four machines listed in the chart with a ½" chuck if you want the flexibility to buy ½"-shank bits.

► **Extra height.** Five tested models (both General Internationals, Jet JBM-5, Powermatic, and WoodRiver) have at least a 4½" vertical stroke out of the box. (You can add 3" of height to the General International 75-050T M1 tool-free with a built-in extension of the column.)

With four of the remaining units, you can extend the stroke nearly 2" by adding a riser block to the column or repositioning the gas strut, *below*. However, leaving the machine set for one extreme (high or low) limits your ability to mortise the other. Adding a riser block to a mortiser with a rack-and-pinion fence disables that adjustment.

MATCH THE STROKE TO THE BOARD



ADJUST THE HANDLE FOR BEST PULL



Multiposition handle hubs let you set the most comfortable starting point for the plunge, increasing your leverage and decreasing arm fatigue.

NO-TOOL ADJUSTMENTS WORK BEST



You make all routine adjustments (depth stop, fence, hold-down, hold-ins) on the Powermatic 701PM without tools.

Your mortiser is only as good as its chisels and bits

After boring dozens of mortises with each machine's chisels, it was clear that some performed better than others. Powermatic's chisels (not included with the machine) and those that came with the General International 75-050T M1 bored the cleanest, fastest mortises and

stayed sharp longer than the others. The chisels that came with the Craftsman 21907 and WoodRiver units left ragged mortise walls, *below left*. We recommend upgrading those to a better set of cutters. (Craftsman's Gene Kulig and Woodcraft's Andrew Bondi assured us

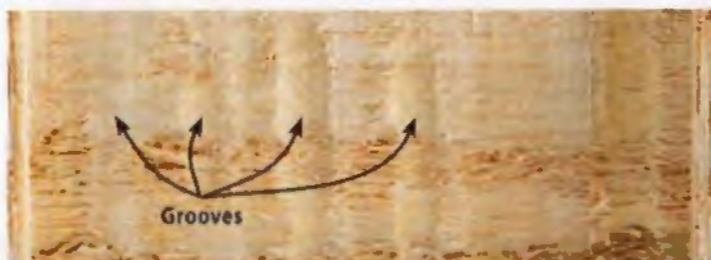
they will make changes to the chisels and bits for their respective models.)

To sharpen chisels, use a diamond cone. We like Rockler's sharpener (shown *below*; to buy, see *Source*, page 51) because it's simple to use and comes with coarse- and fine-grit cones.

CHISEL AND BIT QUALITY SHOWS IN THE MORTISE WALLS



The General International 75-050T M1's cutters made this mortise, with near-perfect sidewalls and plenty of smooth gluing surface.



The factory-supplied drill bits and chisels on two mortisers left vertical grooves in the mortise walls, decreasing the amount of good glue surface.

HOW TO SHARPEN A MORTISING CHISEL



Step 1: Spin the diamond cone tool to hone the inside hollow point of the chisel. Follow up with a finer-grit cone for best results.



Step 2: After honing the inside, remove the burr on the outside of the chisel by rubbing it lightly a few strokes on 800-grit sandpaper.

THE BREAKDOWN ON 10 BENCHTOP MORTISERS

Craftsman 21907, \$300

800-266-9079, craftsman.com

+Pluses: Most woodworkers can lift the 68-lb Craftsman onto a workbench. When secured to a workbench, you get good leverage from the short, right-angle-grip handle, and can position that handle in six starting points on either the right or left side of the machine. Adding a 2½" riser block to the column doubles the stroke, giving you greater workpiece capacity.

-Minuses: This machine stalled when mortising ¾" and larger mortises in hard maple, but handled red oak, ash, and pine just fine. The included chisels and bits left mortise sidewalls more ragged than most other models and heated up quickly, turning blue. (Craftsman will replace these cutters with a new set at no charge through December 2012; call the number above.) Despite a micro-adjuster, the manual-slide fence was our least favorite.



Delta 14-651, \$330

deltamachinery.com

+Pluses: It makes accurate mortises and it's easy to use, but not flashy. The 14-651's rack-and-pinion fence provides smooth, quick adjustments, and we like its multiposition handle hub. A wraparound door opens wide for easy access to the chuck. The included riser block adds 1¼" to the 3¼" stroke for mortising taller stock. Although the hold-down and chisel lock in place with setscrews, the hex wrench for the job is conveniently machined onto the end of the chuck-key handle.

-Minuses: We found the Delta's inline handle grip less comfortable to use than right-angle grips—requiring greater exertion to force chisels into the wood.



General International 75-040 M1, \$400

888-949-1161, general.ca

+Pluses: With the largest table in the test (14¼" wide by 11¼" deep), extension wings reaching 10" on both sides, rubber rollers for holding stock against the fence, and an adjustable stop (that attaches to the fence) for ensuring mortises are the same length, this heavyweight machine provides the best horizontal workpiece support in the test. The depth stop locks solidly, and a top stop limits upward travel. The tool-free chisel lock is nice, but you have to fully remove one thumbscrew and loosen another on the chuck-access panel to change bits.

-Minuses: For a mortiser in this price range we expected an easier-adjusting fence: There's no rack-and-pinion mechanism, and the tall, skinny locks seem flimsy. The 22"-long handle provides great leverage, but with just four positions on the hub—only three of which prove practical—it can be awkward to use at times.



THE BREAKDOWN ON 10 BENCHTOP MORTISERS (cont.)

General International 75-050T M1, \$600

888-949-1161, general.ca

+Pluses: The heaviest machine in the test at 106 lbs, the 75-050T M1 is also the only one with a tilting head—up to 30° each side—for making angled mortises, such as you'd do for chairs or stools. A robust front-mounted clamp holds workpieces tightly against the fence, especially important when making angled mortises. Except for the chuck, all routine adjustments (fence, hold-down, chisel, top and bottom depth stops, and base-mounted length stop) require no tools.

-Minuses: Other than the 30° stops for angled mortises, we found the tilting scale and pointer unreliable for setting angles in between. Like the 75-040 M1, it has a manual-slide fence—although it's a step-up version—and only three practical handle positions. It lacks a tool storage tray, but has a clip for the chuck key.



Grizzly G0645, \$245

800-523-4777, grizzly.com

+Pluses: Similar to the Delta and Rikon models, the G0645 has a nice rack-and-pinion fence and six-position handle, and comes with a riser block to add 1 3/4" stroke to the column. Although the hold-down and chisel lock in place with setscrews, the hex wrench for the job is conveniently machined onto the end of the chuck-key handle.

-Minuses: The smallish fence-adjustment knob could be bigger for easier use, and we just didn't like the grip of the inline handle and short length of its bar.



Jet JBM-5, \$350 (with 3 chisels & bits)

800-274-6848, jettools.com

+Pluses: The lightest and easiest-to-stow-away machine in the test at 44 lbs, this bare-bones mortiser performs as well as several machines better equipped. Because the head slides up and down on a single cylinder instead of the more traditional dovetailed column, you'll never have to adjust the tensioning gibs as you do on eight of the 10 mortisers we tested.

-Minuses: It's one of four machines with a short 16" handle and uncomfortable grip, but its smooth-gliding cylinder helps make up for that deficiency. The small cast-iron base—topped with an MDF table—contributes to this machine's top-heaviness. It doesn't come with a 5/8" chisel and bit (a \$38 option), standard equipment in four-piece sets on seven machines we tested. And you'll need a slot-head screwdriver to tighten the brass chisel-mounting screw.



BENCHTOP MORTISERS: MIGHTY MITES FOR HOLLOW BORING

BRAND	MODEL	PERFORMANCE RATINGS (1)								CAPACITY, INCHES						TABLE			
		PRIMARY	SECONDARY							WORKPIECE CAPACITY UNDER HOLD-DOWN		MAXIMUM DISTANCE, FENCE TO CHISEL CENTER	STROKE		BIT CHUCK	CHISEL COLLAR	SIZE (WxD), INCHES		MATERIAL (4)
			OVERALL EASE OF USE	POWER/CUTTING SPEED	QUALITY OF MORTISE WALLS (2)	EASE OF CHANGING CHISELS & BITS	DEPTH-STOP EFFECTIVENESS	HOLD-DOWN EFFECTIVENESS	EASE OF ADJUSTING FENCE				ABSENCE OF CHISEL DEFLECTION	HELPFULNESS OF OWNER'S MANUAL					
										MINIMUM	MAXIMUM								
CRAFTSMAN	21907	C-	C	C	b	a	c+	c	b	a-	7/8	4 1/4	3 3/8	2 1/4	4 3/4*	3/8	3/8	13 3/4x8	C
DELTA	14-651	B+	B	B	b+	b	b+	a	a	b	3/4	4 1/2	3 3/4	3 3/4	5*	3/8	3/8	12x8 1/4	C
GENERAL	75-040 M1	A-	B	B+	b	a	b	b	a	a-	7/8	4 1/4	4	5 3/4		1/2	5/8, 3/4	14 1/4x11 1/2	C
INTERNATIONAL	75-050T M1	A-	A	A	a	a	a	b	a	a-	3/4	9 1/2	4	6	9#	1/2	5/8, 3/4	13 1/2x9	C
GRIZZLY	G0645	B	B	B	b+	b	b	a	a	a	1 1/8	4 1/2	4	3 3/4	5*	3/8	5/8	12 1/4x10 1/2	C
JET	JBM-5	A-	B+	B+	b	a	a-	b	a	b	1 3/4	4 1/2	3 1/2	4 3/4		3/8	5/8, 3/4	13 1/2x6	M
POWERMATIC	701PM	A	A	A	a	a	a	a	a	a	1/2	5 1/4	4 3/8	5 3/4		1/2	3/4	11x13	C
RIKON	34-250	B	B	B+	b+	b	b	a	a	a-	1 1/4	4 1/2	4	3 3/4	5*	3/8	5/8, 3/4	12 1/4x12	C
SHOP FOX	W1671	B-	B+	A-	b	a	a-	b+	a	a	2 1/4	6 1/2	3	3 1/2	5^	1/2	5/8, 3/4	16x6	M
WOODRIVER	151223	B-	B	C-	b-	b	c-	b+	b	b	1	4 1/2	4 1/2	4 1/2	5*	3/8	5/8	14x10 1/2	C

1. **A** Excellent
B Good
C Fair

2. (*) When using manufacturer's optional chisels and bits.
3. (*) Riser block must be installed to achieve maximum stroke.
(B) Support column must be extended 3" to achieve maximum stroke.
(A) Must reposition gas strut to achieve maximum stroke.

4. (C) Cast iron
(M) MDF (on cast-iron base)
5. (R) Rack & pinion
(S) Slide
(*) Slide with microadjuster

6. (B) Collar for 3/4"-shank chisels
(C) Chisels and bits
(E) Chuck extension
(R) Riser block for column
(T) Tool holder
(W) Workpiece length stop

Powermatic 701PM, \$480 (no chisels/bits)

800-274-6848, powermatic.com

+Pluses: This well-engineered machine produced flawless mortise walls the fastest of any tested unit. It has rack-and-pinion fence-adjustment knobs on each side of the column and cam-action locks that engage faster than threaded locks. The right-angle handle moves to any of 10 positions, the depth stop locks solidly, rubber hold-ins keep boards tight to the fence, and you make all adjustments without tools except the chuck key. It has built-in spacers to set the gap between the chisel and bit, and also comes with a diamond sharpening cone.

-Minuses: This machine does not come with a set of chisels and bits. Powermatic's optional, but test-best chisels cost \$165 for a set of four. Or you can buy other brands of chisel sets—including some reviewed here—for about half that.



Rikon 34-250, \$280

877-884-5167, rikontools.com

+Pluses: Similar to the Delta and Grizzly models, the 34-250 has a nice rack-and-pinion fence, six-position handle, and riser block for the column. The included chisel set cut clean mortises. Although the hold-down and chisel lock in place with setscrews, the hex wrench for the job is machined onto the end of the chuck-key handle for user convenience.

-Minuses: As with the similar Grizzly, we wish it had a larger fence-adjustment knob and a better handle for greater leverage.



Shop Fox W1671, \$300 (with 1 chisel & bit)

800-840-8420, shopfox.biz

+Pluses: With the longest six-position handle (23") and a head that slides smoothly on twin cylinders, the W1671 punched mortises with ease. The spring-loaded, manual-adjusting fence has a microadjuster for fine-tuning mortise locations.

-Minuses: It comes with only a ½" chisel and bit; you'll spend another \$15–25 apiece to buy additional Shop Fox chisels and bits. You move the gas strut to one of three column settings to adjust the stroke for different-size workpieces—an inconvenient task that, over time, could weaken the ball-and-socket connections. Because the fence lacks a cutout in the center for the hold-down, you can't stop workpieces less than 2¼" tall from lifting when you lift the chisel from a mortise. And you need to keep track of three hex wrenches for making adjustments.



WoodRiver 151223, \$290

800-225-1153, woodcraft.com

+Pluses: This mortiser features a microadjuster that improves the performance of its manual-slide fence. It also has rubber hold-in rollers for keeping stock tight to the fence, and extensions that add 8" of workpiece support on each side of the 14x10½" cast-iron table. Its multiposition handle mounts on either the left or right side.

-Minuses: The mortise-wall quality (too ragged for optimum glue bonds) ranked at the bottom of the test. Its hold-down kept working loose during operation. And three of the four chisels did not fit into the mortiser's collar: We had to file the shanks slightly until they fit.



Now you choose...

The Top Tool Powermatic 701PM proved itself superior to the other mortisers in this test. It has more features than any other tested machine, operates smoothly, has tool-free adjustments, and it's stable without needing to be anchored. You'll spend \$645 after adding Powermatic's four chisels and bits.

For less than half that price, budget-conscious woodworkers will be well-served by the Grizzly G0645, our Top Value. It's a bare-bones but solid-performing unit with four good chisels and bits.

DIMENSIONS, INCHES		HANDLE		ACCESSORIES (6)		CORD LENGTH	WEIGHT, LBS	WARRANTY, YEARS	COUNTRY OF ASSEMBLY (7)	SELLING PRICE (8)
OVERALL HEIGHT	BASE FOOTPRINT (WxD)	FENCE ADJUSTMENT TYPE (5)	NUMBER OF HANDLE POSITIONS	LENGTH, INCHES	CHISELS INCLUDED, INCHES	STANDARD	OPTIONAL			
31	14x14½	S*	6	16½	¼, ⅜, ½, ⅝	C, R, T		6'	68	1 C \$300
30	16½x13½	R	6	16	¼, ⅜, ½, ⅝	C, R, T		6'	70	2 C 330
24½	15½x17½	S	4	22	¼, ⅜, ½, ⅝	B, C, T, W		6'	99	2 C 400
29	14½x10½	S	4	21½	¼, ⅜, ½, ⅝	B, C, W		6'	106	2 T 600
29	13½x16¼	R	6	16	¼, ⅜, ½, ⅝	C, R, T		6'	70	1 C 245
30	12x7½	S	6	16	¼, ⅜, ½	B, C, E	C	6'	44	3 T 350
33½	16½x13¼	R	10	19		B, E, T	C	6'	93	5 T 480
30	29x13¼	R	6	16	¼, ⅜, ½, ⅝	B, C, R, T		6'9"	70	5 C 280
40½	11x15½	S*	6	23	½	B, C, T	C	9'8"	90	2 C 300
30½	15x17	S*	6	17½	¼, ⅜, ½, ⅝	C, T		5'6"	81	1 C 290

7. (C) China
(T) Taiwan

8. Prices current at time of article production and do not include shipping, where applicable.

Source

Mortise-chisel sharpening set: part #24727, \$32, Rockler Woodworking and Hardware, 800-279-4441, rockler.com.

Outdoor Settee

Create a patio parking spot as comfortable as any in your living room.

Materials cost: Lumber—\$228; Cushions—\$200
Dimensions: 42½"H × 56¼"W × 42½"D

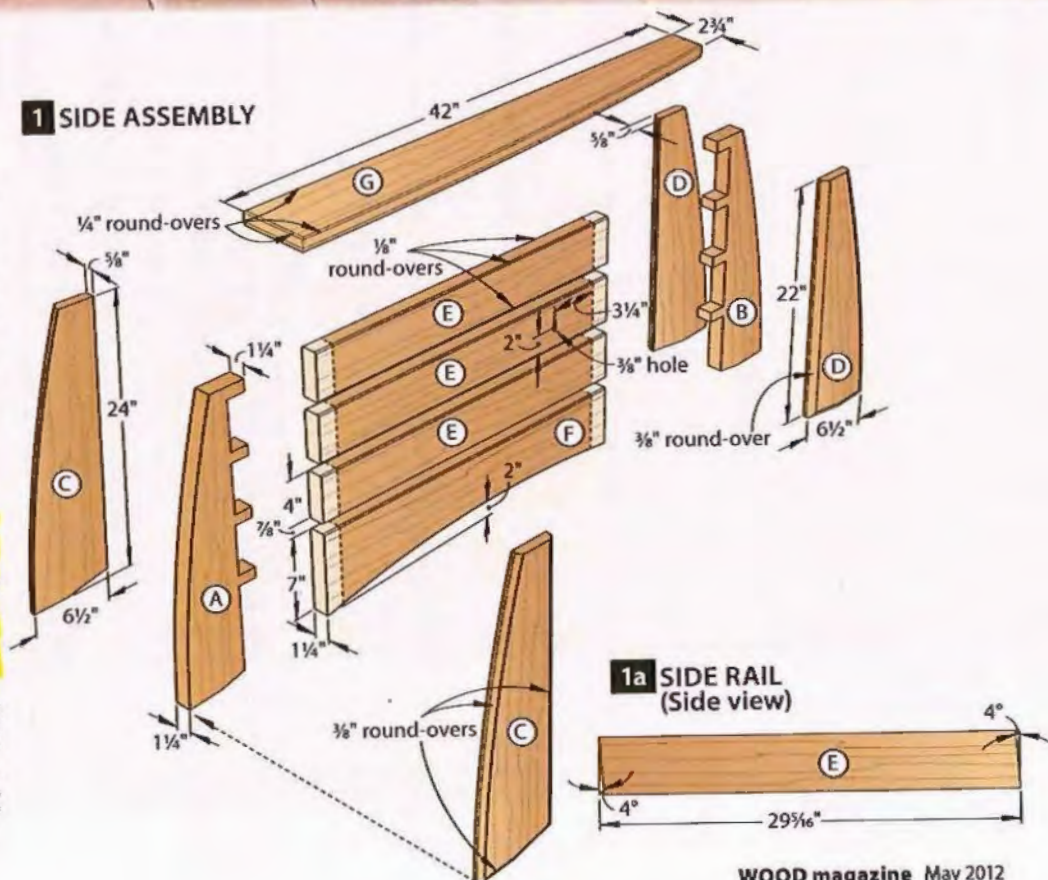
Relax, settle deep into this settee, and enjoy a conversation with a friend. Perhaps you can relate how the simple glue-and-screw joinery made building it a breeze. Or describe the notches in the middle layer of the graceful, but sturdy, laminated legs that trap the side rails for joints as strong as mortises and tenons. But be prepared: Friends may well ask if you can build one for them.

Build up beefy sides

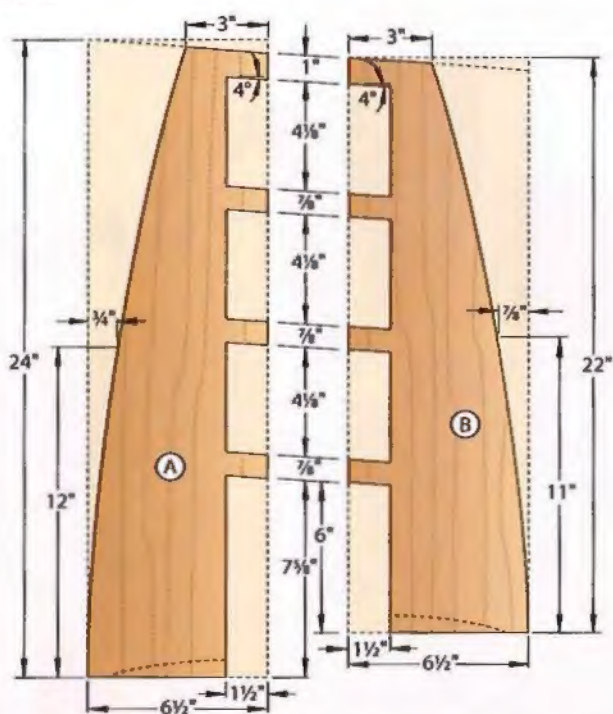
Note: For outdoor durability, we used 1× and 2× cedar lumber, Type 3 yellow glue, and outdoor-grade fasteners. You will need to purchase cushions before beginning construction so you can adjust dimensions if needed. (See *Enjoy a cushy job*, page 57.)

1 Cut the front leg cores (A), back leg cores (B), front leg skins (C), and back leg skins (D) to size [Materials List, page 57; Drawings 1 and 2]. Set the leg skins aside for now.

1 SIDE ASSEMBLY



2 FRONT AND BACK LEG CORES



2 Lay out the bottom notches in the front and back leg cores (A, B) [Drawing 2]. Cut a template from $\frac{1}{4}$ " hardboard or plywood to help lay out the top three notches [Photo A]. Jigsaw the notches.

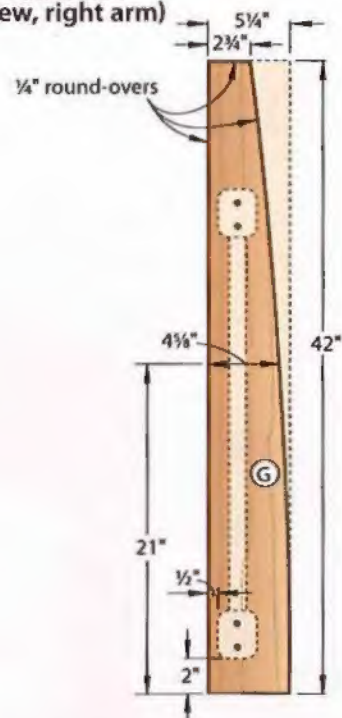
3 Cut eight side rails (E) and two side bottom rails (F) to size, mitering each end as shown [Drawings 1, 1a]. Set two side rails aside for the center armrest

assembly. Dry-fit a side bottom rail and side rail between a front and back leg core (A, B). Flex a piece of $\frac{1}{4}$ " material and trace along it to lay out the arch on the side bottom rail and the leg cores [Drawings 1, 2; Photo B]. Repeat for the other side assembly, then cut and sand the cores and side bottom rails to shape.

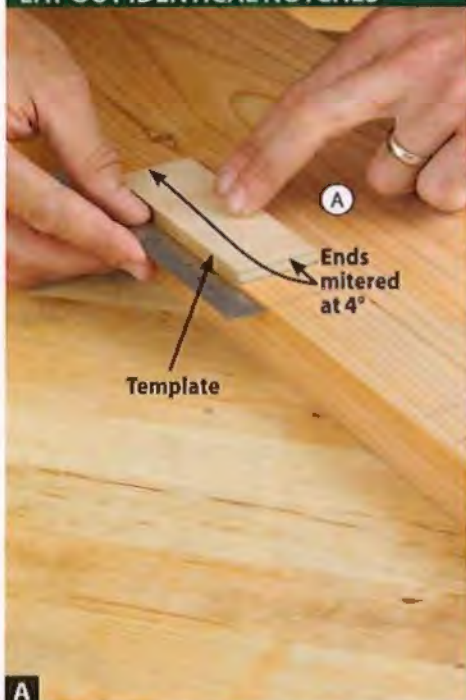
4 Using the flexible $\frac{1}{4}$ " material, lay out the curve on the front of one

front leg core (A) and the back of one back leg core (B) [Drawing 2]. Jigsaw and sand the two cores to shape, then use them as templates to transfer the curve to the other cores, and cut and sand them to shape. Dry-fit a core and a side bottom rail (F) to transfer the curves on the front and bottom to the leg skins (C, D) [Photo C]. Cut the skins to shape, staying $\frac{1}{16}$ " outside the lines.

3 OUTER ARMREST (Top view, right arm)



LAY OUT IDENTICAL NOTCHES



A Make a template from $\frac{1}{4}$ " material with parallel 4° miters on each end to help lay out the notches in the front and back leg cores (A, B).

LAY OUT ARCHES WITH A STRIP



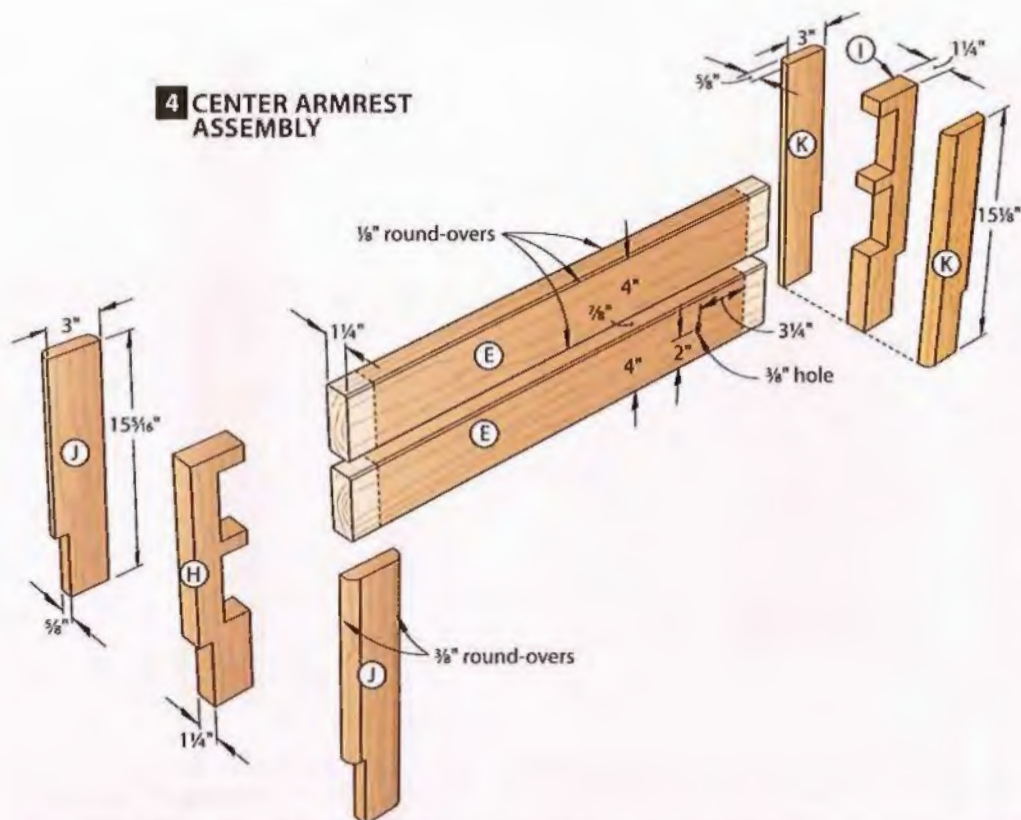
B Flex a $\frac{1}{4}$ "-thick strip between two clamps. A metal rule or scrap clamped in place holds the strip 2" in at the centerpoint of the arch.

TRACE THE ARCH TO OTHER PARTS

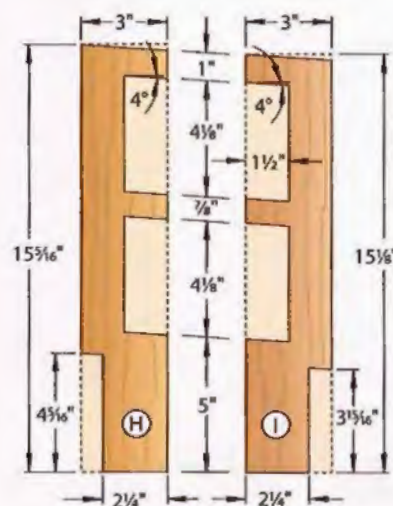


C Align the ends and notched edges of the leg cores (A, B) with the edge and ends of the leg skins (C, D), then trace the curves.

4 CENTER ARMREST ASSEMBLY



4a CENTER ARMREST CORES



5 Glue the leg skins (C, D) to the cores (A, B), keeping the edges of the skins flush at the notches and slightly proud of the core on the opposite edge. Rout the edges and ends flush after the glue dries [Photo D].

6 Rout round-overs where shown on the leg assemblies (A/C, B/D), side rails (E), and side bottom rails (F) [Drawing 1], then sand these parts to 150 grit. Apply glue in the notches in each core and clamp the side rails and side bottom rails between them [Photo E]. Lay out and drill the 3/8" hole in the middle side rail (E) [Drawing 1].

7 Cut the outer armrests (G) to size [Drawing 3], lay out the curve, and cut and sand it to shape. Rout 1/4" round-

overs around the top and bottom edges, then set the armrests aside.

8 Cut the parts for the center armrest assembly (H-K) to size [Drawings 4, 4a]. Build the center armrest assembly (E/H-K) using the same methods used to build the end assemblies (A-F). Use the same template to lay out the notches in the front and back post cores (H, I). Do not cut the vertical notches in the bottom ends of parts H, I, J, or K until the base is assembled later.

A basic base joins the sides

1 Cut the base front and back (M) and base sides (N) to size [Drawings 5, 5a]. Lay out the arches on the front and back and bandsaw and sand them to shape.

2 Dry-fit the base pieces (M, N) upside down on your bench. Drill pilot holes through the front and back pieces [Photo F], screw the base together, then sand it to 150 grit.

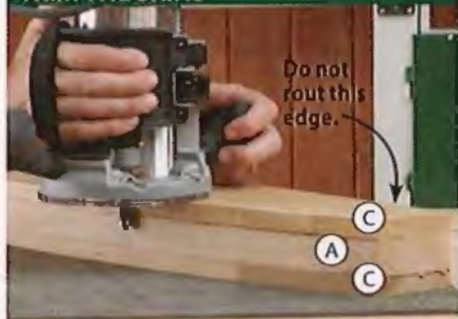
3 Bandsaw equal-width notches in the posts (H/J, I/K) of the center armrest assembly (E/H-K) so it fits between the base front and back (M) [Drawings 4a, 5].

Quick Tip! Steady the armrest assembly while cutting the notches by using an outfeed support beside your bandsaw.

Set the armrest assembly aside.

4 Clamp the base (M/N) to the side assemblies (A-F) with the top edge of the base flush with the top edges of the lowest side rails (E) [Drawing 5]. Screw the base sides (N) to the side rails (E).

TRIM THE SKINS



D Use a flush-trim bit in your router to complete shaping the front leg and back leg skins (C, D). Don't rout the notched edge.

CLAMP THE SIDE ASSEMBLIES



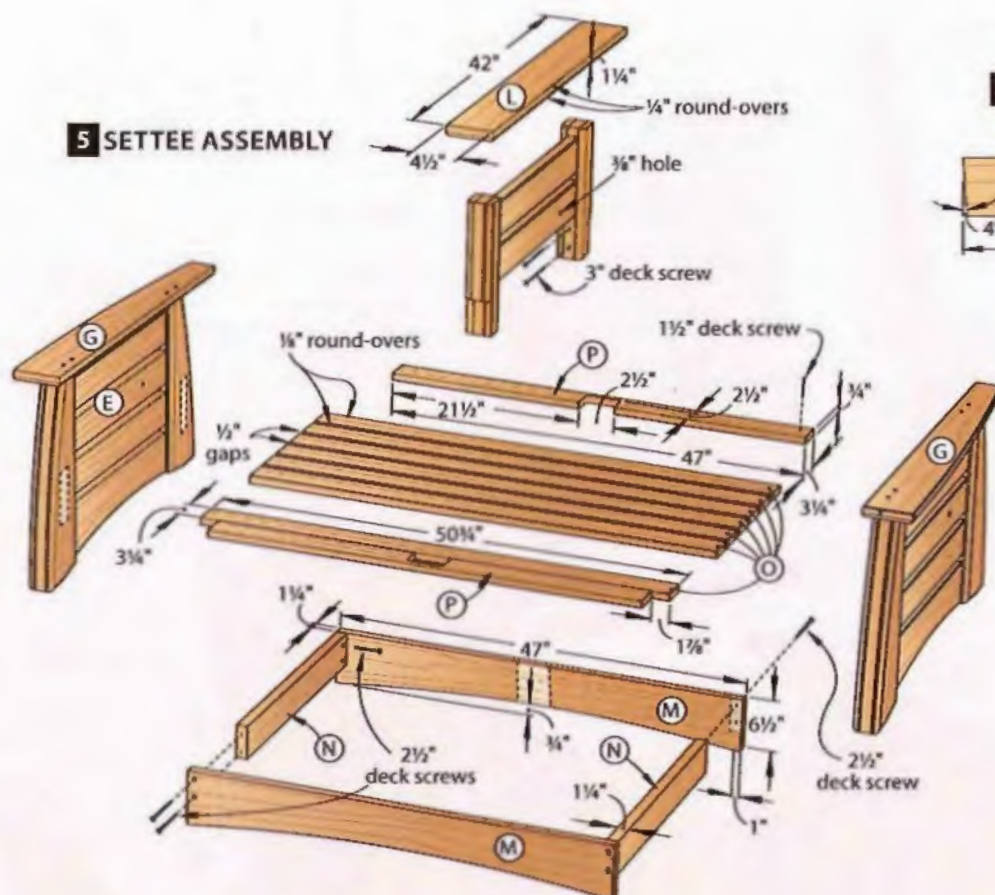
E Glue the side rails (E) and side bottom rail (F) into a front leg assembly (A/C), then clamp the back leg assembly (B/D) to the rails.

DRILL TO PREVENT SPLITTING

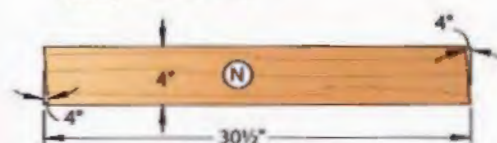


F A counterbore/pilot bit drills the pilot hole and countersink in one step. Clamp the mating pieces together so the holes align.

5 SETTEE ASSEMBLY



5a BASE SIDE



SUPPORT THE ARMREST ON SLATS



G Rest the center armrest assembly (E/H-K) on several inner seat slats (O), centered on the base (M/N) width, then screw the assembly in place.

Have a seat

1 Measure between the outside edges of the side rails (E) to determine the length of the inner slats (O), and measure between the legs (A/C, B/D) to determine the length of the outer slats (P). Cut the slats to size [Drawing 5], rout $\frac{1}{4}$ " round-overs along their edges, and sand them to 150 grit.

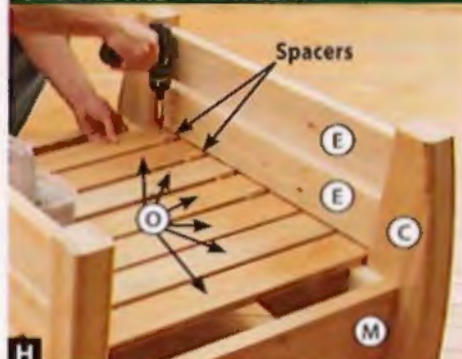
2 Space three inner slats (O) across the base (M/N) to support the center armrest assembly (E/H-K) [Photo G]. Screw the front and back post cores to the base front and back (M).

3 Retrieve the remaining inner slats (O), space the slats evenly across the

base (M/N), drill countersunk pilot holes, and screw the slats down [Photo H]. Position the outer slats (P) between the legs (A/C, B/D) and mark the location of the posts (H/J or I/K) onto them [Photo I]. Cut the notches deep enough to leave a $\frac{1}{2}$ " gap between the slats, then screw the outer slats in place.

4 Cut the center armrest (L) to size and round over the edges where shown in Drawing 5. Retrieve the outer armrests (G) and position them as dimensioned in Drawing 3, then screw them in place. Center the center armrest on the center assembly (E/H-K), with a 2" overhang at the front, and screw it in place.

SECURE THE INNER SLATS



H Cut $\frac{1}{2}$ " spacers to position the inner slats (O). Keep the ends of the slats flush with the outside faces of the side rails (E).

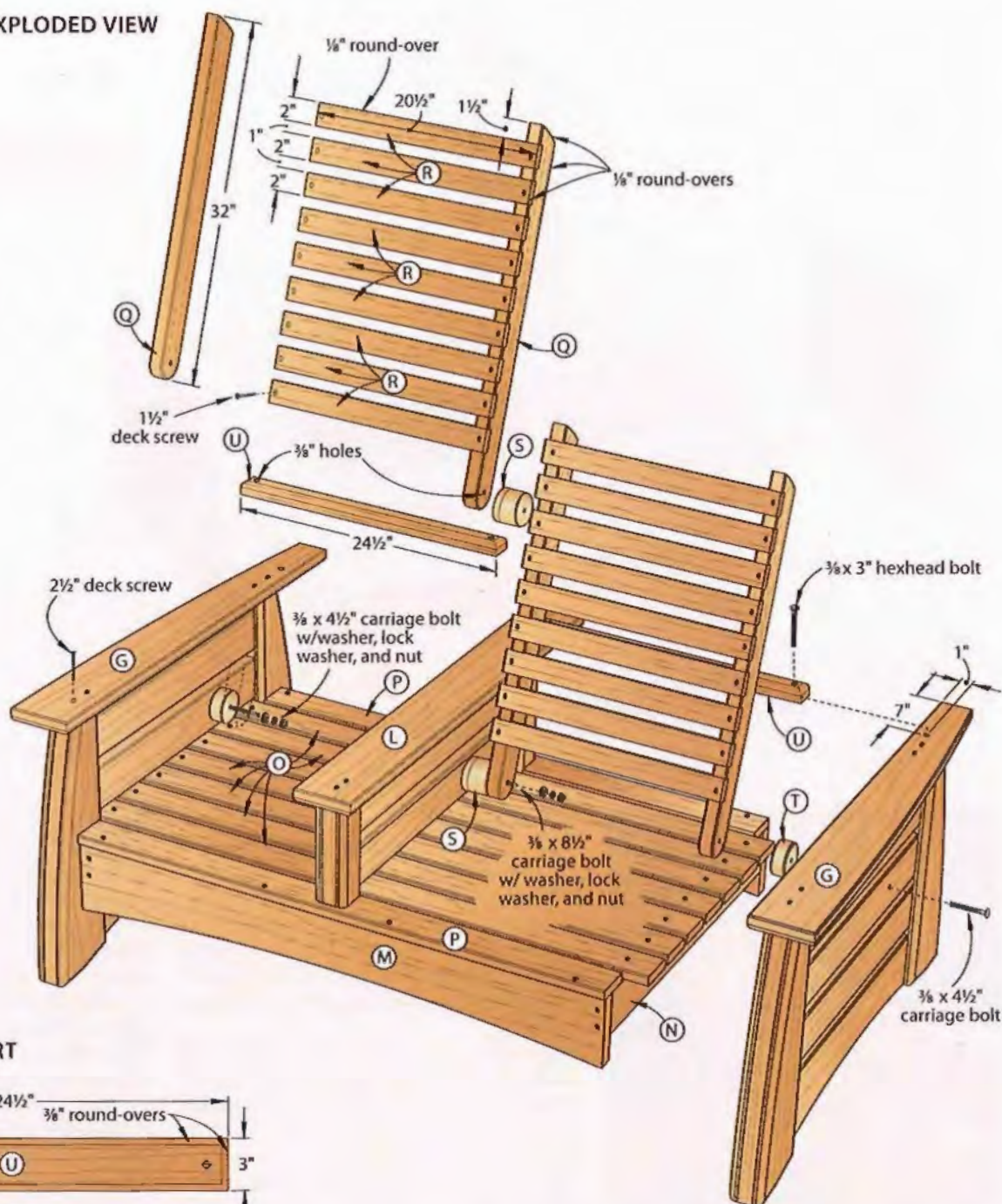
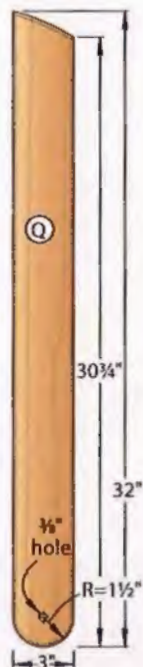
MARK THE NOTCH PERFECTLY



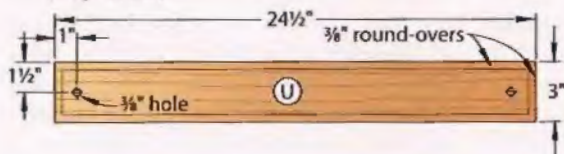
I Use a combination square to transfer the location of the post (H/J) to the outer slats (P). Bandsaw and file the notch to shape.

6 EXPLODED VIEW

6a BACKREST STILE



6b BACKREST SUPPORT (Top view)



5 Cut the backrest stiles (Q) and rails (R) to size [Drawings 6, 6a] and drill the hole in each stile where shown. Rout round-overs where shown, then screw the rails to the stiles [Photo J].

6 Laminate 3 1/2 x 7 inch layers of 3/4- and 1 1/2-inch-thick stock to make a blank for the inner discs (S), then resaw or plane the blank to 1 3/4 inch thick. Bandsaw the inner discs to size [Drawing 6] and sand them smooth. From 1 1/4-inch-thick stock, bandsaw and sand the outer discs (T) to size. Drill a 3/8 inch hole centered in each inner and outer disc. Position the backrests (Q/R) and the discs as shown in Drawing 6 and secure the parts with

carriage bolts, washers, lock washers, and nuts.

7 Cut the backrest supports (U) to size, round over the top edges, and drill 3/8 inch holes where shown [Drawing 6b]. Place a cushion on the chair and have a friend sit down while you adjust the back to a comfortable position [Photo K]. Clamp a backrest support to the armrests (G, L) and against the back stiles (Q), tilt the back forward, and drill through the armrests using the holes in the backrest supports as a guide.

Quick Tip! Don't settle for just one position for the back; find several comfortable angles and drill a set of holes at each spot.

Secure the backrest supports by dropping a 3/8 inch hexhead bolt through the hole at each end. (No nuts required.)

8 Finish-sand any areas needing it to 150 grit, then remove the backrests (Q/R) and apply a finish to all pieces. (We brushed on two coats of Olympic no. 716 Cedar Naturaltone oil-based stain.) Allow the stain to dry 72 hours before reassembling the settee, tying the cushions in place, and having a seat to enjoy the results of your efforts. 🌿

Produced by Craig Ruegsegger
with Kevin Boyle
Project design: John Olson
Illustrations: Lorna Johnson

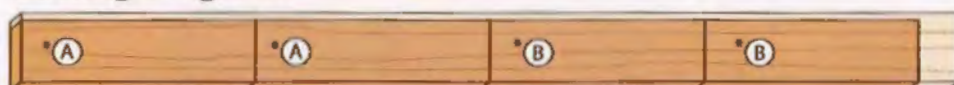


J Position the first rail (R) 1 1/2" from the top of the stiles (Q). Work your way down, using 1" spacers to position the remaining rails.

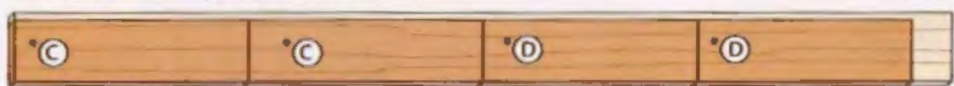


K With the back at the desired angle, clamp the back supports (U) in place. Tilt the back forward to provide room for drilling.

Cutting Diagram



1 1/2 x 7 1/4 x 96" Cedar (2x8) (10.7 bd. ft.)



1/4 x 7 1/4 x 96" Cedar (1x8) (5.3 bd. ft.) (2 needed)



1 1/2 x 7 1/4 x 60" Cedar (2x8) (6.7 bd. ft.)



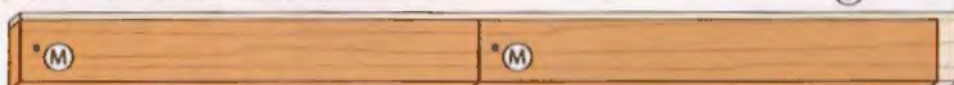
1 1/2 x 5 1/2 x 96" Cedar (2x6) (8 bd. ft.) (2 needed)



1 1/2 x 7 1/4 x 96" Cedar (2x8) (10.7 bd. ft.) (2 needed)



1 1/2 x 5 1/2 x 96" Cedar (2x6) (8 bd. ft.)



1 1/2 x 7 1/4 x 96" Cedar (2x8) (10.7 bd. ft.)



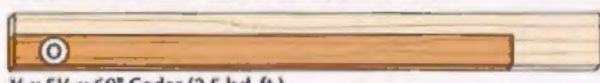
1 1/2 x 5 1/2 x 48" Cedar (2x6) (4 bd. ft.)



1/4 x 7 1/4 x 96" Cedar (1x8) (5.3 bd. ft.)



1/4 x 7 1/4 x 96" Cedar (1x8) (5.3 bd. ft.) (3 needed)



1/4 x 5 1/2 x 60" Cedar (2.5 bd. ft.)

*Plane or resaw to thickness. See the instructions.

Enjoy a cushy job

We ordered custom-made seat pads with outdoor-grade fabric from cushion.com. Specify one-piece chair cushions with a waterfall edge and square corners. Select 4" thickness, a 30" back, 20" seat, and 21" width, with ties at the hinge and sides of the back. We chose Sky Blue for the color.

Materials List

Part	FINISHED SIZE			Matl.	Qty
	T	W	L		
Arm assemblies					
A front leg cores	1¼"	6½"	24"	C	2
B back leg cores	1¼"	6½"	22"	C	2
C front leg skins	¾"	6½"	24"	C	4
D back leg skins	¾"	6½"	22"	C	4
E side rails	1¼"	4"	29½"	C	8
F side bottom rails	1¼"	7"	29½"	C	2
G outer armrests	1¼"	5¼"	42"	C	2
H front post core	1¼"	3"	15½"	C	1
I back post core	1¼"	3"	15½"	C	1
J front post skins	¾"	3"	15½"	C	2
K back post skins	¾"	3"	15½"	C	2
L center armrest	1¼"	4½"	42"	C	1
Base					
M front and back	1¼"	6½"	47"	C	2
N sides	1¼"	4"	30½"	C	2
Seat					
O inner slats	¾"	3¼"	50¾"	C	7
P outer slats	¾"	3¼"	47"	C	2
Q backrest stiles	1¼"	3"	32"	C	4
R backrest rails	½"	2"	20½"	C	18
S inner discs	1¼"	3" diam.		LC	2
T outer discs	1¼"	3" diam.		C	2
U backrest supports	1¼"	3"	24½"	C	2

Materials key: C—cedar, LC—laminated cedar.

Supplies: 1 1/2", 2 1/2", and 3" deck screws; 3/8 x 4 1/2" carriage bolts (2), 3/8 x 8 1/2" carriage bolt (1), 1/4" washers (3), 3/8" lock washers (3), 3/8" nuts (3), 3/8 x 3" hexhead bolts (4).

Bits: 1/8", 1/4", 3/8", and 1/2" round-over, flush-trim router bits; 3/8" drill bit.



Construction-Grade Skid Loader

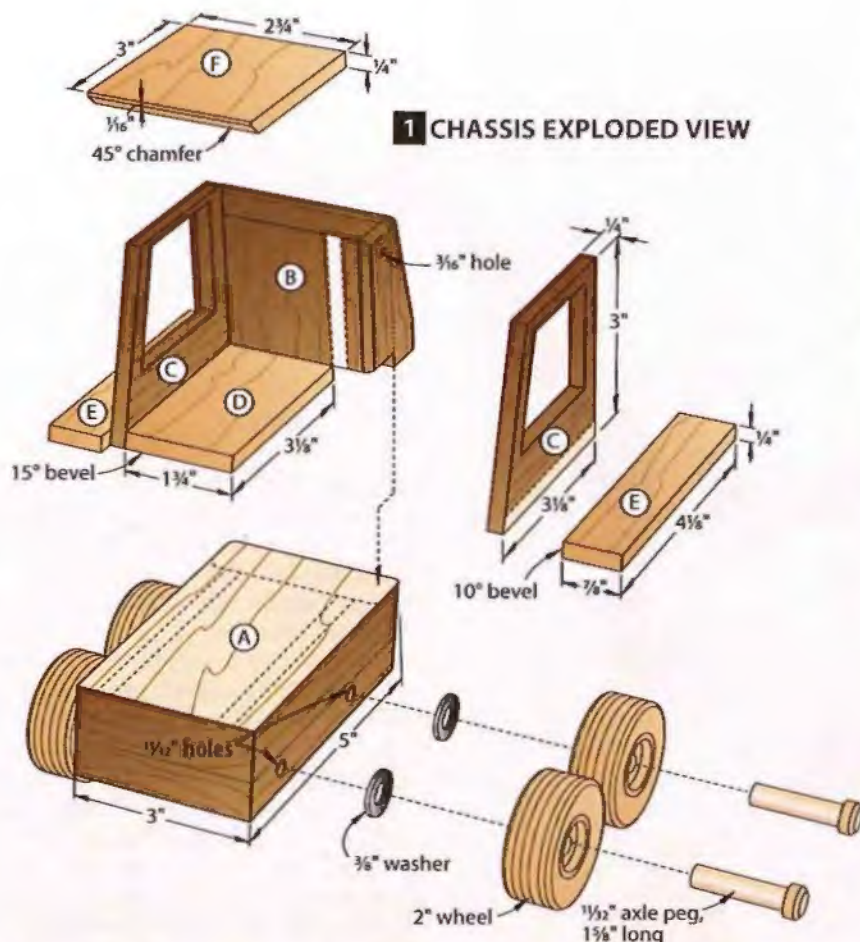
Dimensions: 8"L x 4 1/4"D x 5 3/4"H

From farmyards to building sites, a nimble skid loader squeezes into small spaces for all sorts of jobs: digging dirt, scooping snow, and moving all manner of materials. Just like on the real-life machine, the arms of this tabletop version raise and lower a tilting bucket. If you haven't built any of the toys in our Construction-Grade series (see *page 61*), this would be a good place to start. A kit [Source, *page 61*] provides the wheels and the hardware.

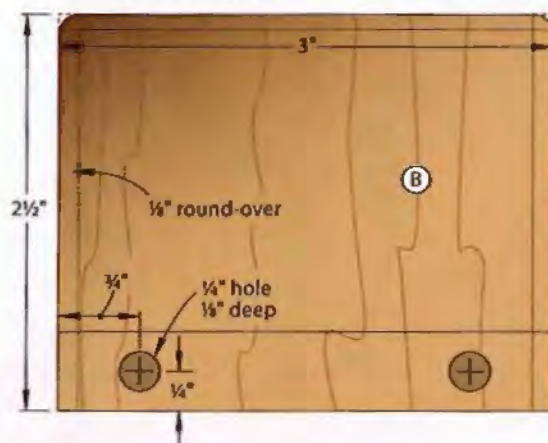
Build the body

1 Laminate two layers of 3/4" walnut to prepare a 1 1/2 x 3 x 12" blank. Along the edge of the blank, spray-adhere photocopies of the **Chassis Pattern** and **Engine Compartment Side-View Pattern** from the *WOOD Patterns*® insert on *page 44*. Drill the 1 1/32" and 3/16" holes where shown, then crosscut the chassis (A) and engine compartment (B) from the blank. Miter each end of the chassis at 10°, following the lines on the pattern.

2 With a 1/4" Forstner bit, drill two holes 1/8" deep in the rear face of the engine compartment (B) [Drawing 1a]. Set your tablesaw blade 3/4" above the table and, with several passes, cut a notch in the engine compartment where shown on the pattern. Then bandsaw the taper along the rear face, and rout 1/8" round-overs where shown. Remove the patterns from the chassis (A) and engine compartment, sand the parts to 220 grit, then glue the parts together [Drawing 1].



1a ENGINE COMPARTMENT (Back view)



Get a load of the arms

1 Prepare two $\frac{1}{4} \times 2\frac{1}{2} \times 5\frac{1}{8}$ " maple blanks for the loader arms (G). Spray-adhere a **Loader-Arm Pattern** to one blank, stack them together, and drill the $\frac{3}{16}$ " holes where shown. Scrollsaw, or bandsaw, and sand the arms to shape.

2 Cut the cross brace (H) to size, adhere the **Cross-Brace Pattern** to it, and scrollsaw and sand it to shape. Rout the chamfers on the loader arms (G) and cross brace where indicated, then sand the parts to 220 grit.

3 For the joint plates (I), prepare two $\frac{1}{8} \times \frac{3}{4} \times 6$ " walnut blanks and stack them together with double-faced tape, keeping their ends and edges flush. Spray-adhere two copies of the **Joint-Plate Pattern** to the stack and scrollsaw the joint plates to shape. Remove the patterns and separate the plates. Finish-sand them to 220 grit, then glue them to the loader arms (G), with the upper edge of the joint plates aligned with the lower edge of the chamfer [Drawing 2].

3 From $\frac{1}{4}$ " stock, cut the cab sides (C) to size [Drawing 1]. Spray-adhere a copy of the **Cab-Side Pattern** to a blank [Shop Tip, below], and scrollsaw and sand the cab sides to shape. Drill a starter hole in the cab-side window and scrollsaw the window. Then remove the pattern and finish-sand the cab sides to 220 grit.

SHOP TIP

Stack-cut identical parts in no time

To make identical parts, such as the cab sides (C), loader arms (G), joint plates (I), and bucket sides (K), stack the blanks together with double-faced tape. Then cut and sand them to shape at the same time. Before separating the parts, dribble lacquer thinner into the seam to dissolve the tape adhesive.



4 Cut the cab base (D) and fenders (E) to size, beveling their front ends [Drawing 1]. Glue the cab base between the cab sides (C). When this assembly has dried, glue it to the chassis (A), centered side-to-side [Photo A]. Then glue the fenders (E) to the chassis, butted against the cab sides and seated in the engine-compartment (B) notch.

5 Cut the roof (F) to size and chamfer the front end [Drawing 1]. Sand the roof to 220 grit, then set it aside.

GLUE THE CAB TO THE CHASSIS

No glue on ends of (C).



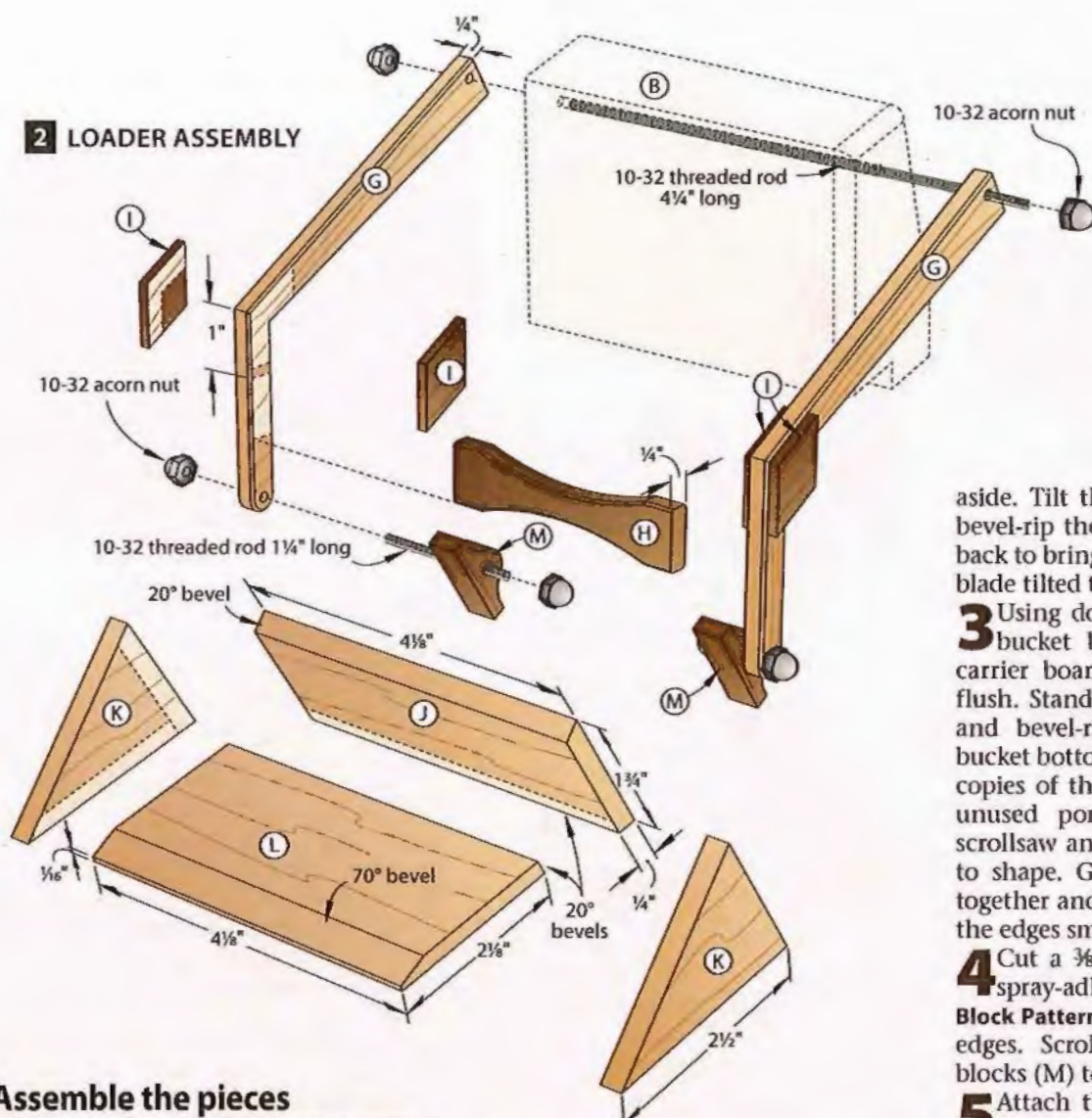
Apply glue to the bottom of the cab (C/D) but not the ends of the cab sides (C) to allow the engine compartment (B) to expand and contract.

INSTALL THE CROSS BRACE



Glue the cross brace (H) 1" below the corner of the arms (G). After clamping, lower the arms to rest on the bench to keep them even.

2 LOADER ASSEMBLY



Assemble the pieces

1 Dry-fit the wheels and axle pegs to the chassis (A) [Drawing 1]. Cut a $4\frac{1}{4}"$ length of 10-32 threaded rod and attach the loader arms (G) to the engine compartment (B) [Drawings 2, 3]. Secure the rod with acorn nuts. Glue the cross brace (H) between the arms [Photo B].

2 To make the bucket back (J), sides (K), and bottom (L), bevel-rip at 20° one edge of a $\frac{1}{4} \times 2\frac{1}{4} \times 14"$ maple blank. Return the blade to 90°, crosscut the bucket back and bottom to length [Drawing 2], and set the rest of the blank

aside. Tilt the blade to 20° again, and bevel-rip the square edge of the bucket back to bring it to final width. Leave the blade tilted to 20° for the next step.

3 Using double-faced tape, attach the bucket bottom (L) to a $\frac{3}{4} \times 3 \times 12"$ carrier board with their square edges flush. Stand the carrier board on edge, and bevel-rip the front edge of the bucket bottom [Drawing 2]. Spray-adhere copies of the **Bucket-Side Pattern** to the unused portion of the blank; then scrollsaw and sand the bucket sides (K) to shape. Glue and clamp the bucket together and, when the glue dries, sand the edges smooth and flush [Photo C].

4 Cut a $\frac{3}{8} \times 1\frac{1}{2} \times 2"$ walnut blank and spray-adhere two copies of the **Pivot-Block Pattern** to it, aligned on opposite edges. Scrollsaw and sand the pivot blocks (M) to shape.

5 Attach the pivot blocks (M) to the arms (G) with threaded rod and acorn nuts [Drawings 2, 3]. Apply glue to the flat faces of the pivot blocks, and press the bucket (J/K/L) against them, centered [Photo D].

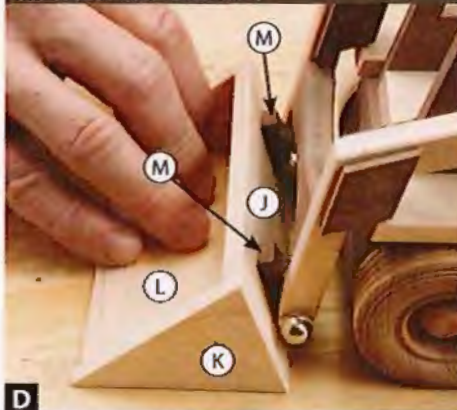
6 Retrieve the roof (F) and glue it to the cab sides (C), centered [Photo E].

SAND THE WHOLE BUCKET



C Lay a piece of 220-grit sandpaper on your bench and sand the edges of the bucket sides (K) flush with the faces of the back (J) and bottom (L).

ATTACH THE BUCKET



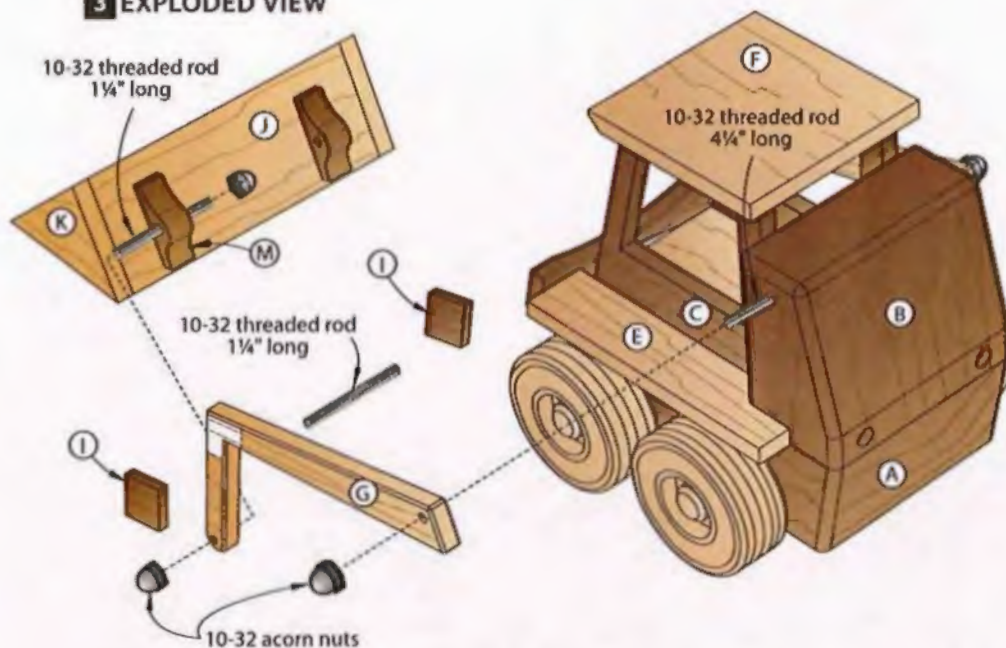
D Hold the bucket (J/K/L) against the pivot blocks (M) for 2 minutes, then let the assembly sit undisturbed while the glue dries.

RAISE THE ROOF



E After gluing the roof (F) in place, raise and lower the loader arms (G) to ensure they clear the sides of the roof.

3 EXPLODED VIEW



7 After the glue dries, remove the hardware, tape off the tapered ends of the axle pegs, and apply a finish. (We sprayed on three coats of satin polyurethane, buffing lightly between coats with a 320-grit sanding sponge.) After the finish dries, remove the tape

and reassemble the skid loader, gluing the axle pegs in place. Use a drop of blue thread locker on each acorn nut. 🌲

Produced by **Craig Rueggeger** with **Kevin Boyle**
Project design: **Kevin Boyle**
Illustrations: **Lorna Johnson**

Build the whole set

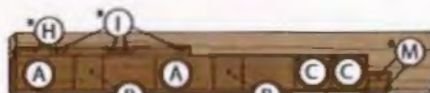
With this skid loader, the Construction-Grade toy collection, shown below, expands to eight pieces. The crane (issue 185, September 2008) lifts and lowers its bucket and spins. Reach and scoop with the articulated boom of the excavator (issue 194, November 2009). Move dirt around with both the bulldozer (issue 199, September 2010) and motor grader (issue 208, November 2011). For heavy hauling, the tractor pulls both

the side-dump and lowboy trailers. (Find all three pieces in Issue 205, July 2011.) The bulldozer, excavator, motor grader, and skid loader each fit on the lowboy.

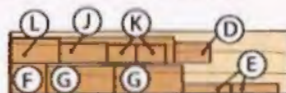
If you don't own these issues, you can download plans for these projects for a small fee at woodmagazine.com/cgtoys.

And there's more: Look for plans for a dump truck in a future issue.

Cutting Diagram



3/4 x 5 1/2 x 36" Walnut (1.5 bd. ft.)
*Plane or resaw to the thicknesses listed in the Materials List.



1/4 x 5 1/2 x 24" Maple (.5 bd. ft.)

Materials List

Part	FINISHED SIZE			Matl.	Qty.
	T	W	L		
Chassis and cab					
A* chassis	1½"	3"	5"	LW	1
B* engine compartment	1½"	3"	2½"	LW	1
C cab sides	¼"	3"	3½"	W	2
D cab base	¼"	1¼"	3½"	M	1
E fenders	¼"	⅝"	4½"	M	2
F roof	¼"	2¾"	3"	M	1
Loader/bucket assembly					
G* arms	¼"	2⅞"	5¾"	M	2
H cross brace	¼"	¾"	3"	W	1
I* joint plates	⅛"	¾"	1¼"	W	4
J* bucket back	¼"	1¼"	4½"	M	1
K* bucket sides	¼"	1⅝"	2½"	M	2
L* bucket bottom	¼"	2⅞"	4½"	M	1
M* pivot blocks	⅜"	½"	1¼"	W	2

*Parts initially cut oversize. See the instructions.

Materials key: LW—laminated walnut, W—walnut, M—maple.

Supplies: Double-faced tape, spray adhesive, blue thread locker.

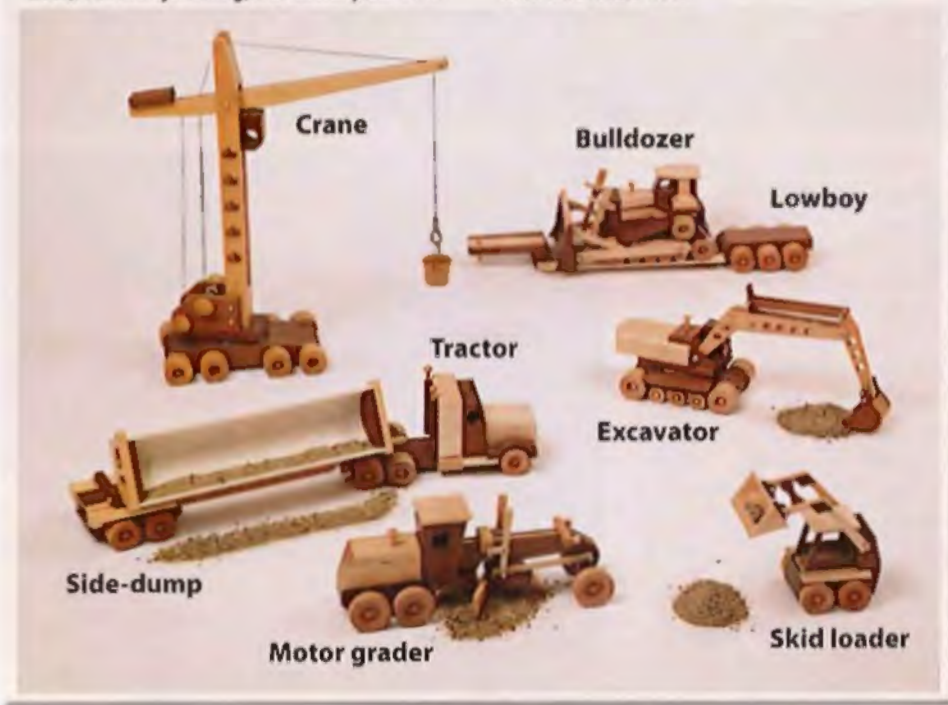
Bits: 45° chamfer, 1/8" round-over router bits; 3/16", 1/32" drill bits; 1/4" Forstner bit.

Source

Hardware kit: Each kit contains 2" wheels (4), 1 1/8" axle pegs (4), 3/8" washers (4), 10-32 x 12" threaded rod, 10-32 acorn nuts (6), no. 2265, \$7.95, Meisel Hardware Specialties, 800-441-9870, meiselwoodhobby.com.

More Resources

- ▶ Get a free plan for a jig to help rout small parts safely on the router table: woodmagazine.com/routsmall
- ▶ Cut small parts safely on the tablesaw with these free tips: woodmagazine.com/sawsmall



Busting Dust in a Basement Shop

Put an end to dust migration from your shop to the house.

While basement woodworkers enjoy steady shop temperatures year-round and all the household amenities just a few steps away, they've probably had at least one spirited conversation with their spouses about keeping dust out of living spaces. If that sounds familiar, follow these simple strategies to keep the upstairs cleaner and your workspace tidier, while maintaining domestic tranquility.

First, reduce and capture dust

You can eliminate a lot of dust by adopting more hand-tool techniques. Planes, chisels, and scrapers create chips and shavings that clean up with a broom and dustpan, with zero chance of dust floating upstairs.

To capture dust from stationary and benchtop tools, connect a sufficiently sized dust collector outfitted with a filter that traps 1-micron particles with 99.9 percent or better efficiency. (Find articles with more information about this in **More Resources** on page 64).

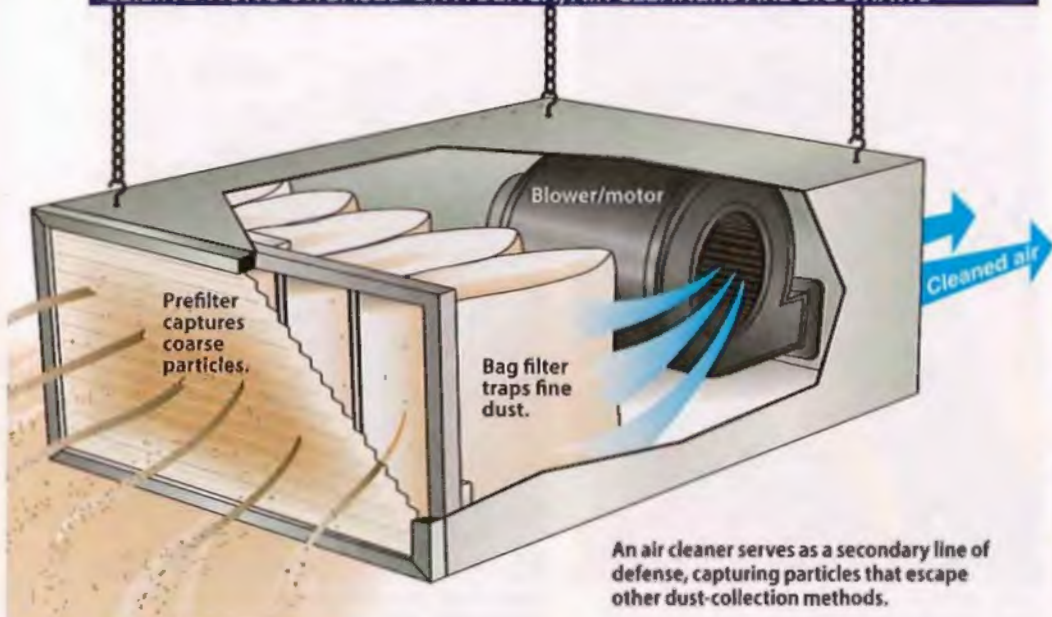
Handheld power tools, such as sanders, routers, and jigsaws, pose a bigger challenge. Whenever possible, choose a tool with a dust-collection port [Photo A], and hook it to a shop vacuum equipped with a HEPA filter. (See **What the heck are**

COLLECT DUST AT THE SOURCE



A Tools with dust-collection ports make it easy to capture dust before it scatters across the shop or becomes airborne.

CEILING-HUNG OR BASED ON A BENCH, AIR CLEANERS ARE BIG DRAWS



An air cleaner serves as a secondary line of defense, capturing particles that escape other dust-collection methods.

HEPA and MERV? below.) These filters cost about three times more than disposable ones, but last up to five times longer. And as long as your vacuum has a good seal between the motor and tub, almost no dust ends up in the air.

An air cleaner, *above*, filters out airborne dust particles that escape up-close collection. When sanding, place the unit on the benchtop next to your work. Connect it to a timer and, to clean the air, let the unit run for 15 minutes after you leave the shop.

Finally, when you stop for the day, take a few minutes to clean up before leaving. Sweep up chips with a broom and throw them in the trash; then vacuum up sawdust on the floor, especially around the door and paths to it.

Seal the exits

Even the best dust-collection system can't capture every speck of dust. To keep it

from migrating to other parts of the house, plug any gaps where it could escape.

Start with the door that separates your shop from the rest of the house. Seal around the top and sides of the door with weatherstripping and install a sweep or threshold along the bottom. If you're installing a new door, choose an exterior-grade prehung door [Photo B]. It seals on all four edges.

To find small leaks where dust can escape, turn on the lights in the rooms on the other side of the walls and ceiling, cover any windows in the shop (or do this test at night), and then turn off the shop lights. Give your eyes a minute to adjust to the dark, then look for light showing around doors; above and below walls; in corners; and around pipes, wires, and ducts [Photo C]. Move to different spots in the shop, look around again and make note of the areas where you see light.

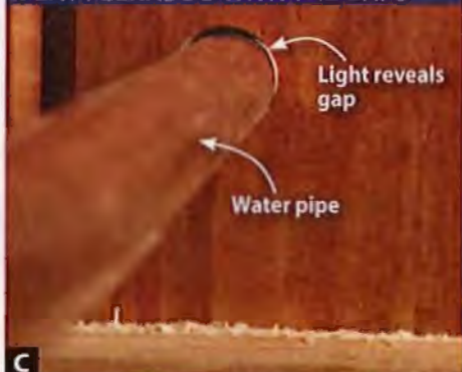
USE AN OUTDOOR DOOR INDOORS



Weatherstripping

An exterior door's weatherstripping creates a tight seal against dust. This full-view model lets the homeowner's kids see into the shop.

PLAY PEEKABOO WITH THE GAPS



Make gaps visible by looking for leaks of light around wall or ceiling penetrations, between floorboards, and around doors.

What the heck are HEPA and MERV?

You can find aftermarket high-efficiency particulate air (HEPA) filters for shop vacuums at home centers and online. These filters remove 99.97 percent of particles down to .3 microns. Avoid filters labeled "HEPA-type" or "HEPA-style"—these do not provide the same level of filtration.

The MERV (minimum-efficiency reporting value) system measures the efficiency of filters installed in the ductwork of heating, ventilation, and air-conditioning (HVAC) systems. Filters with higher MERV ratings capture smaller particles than those with lower MERV ratings.

Filters up to MERV 12 are typically used in residential applications, *right*.

3M uses a proprietary microparticle performance rating (MPR) system for its Filtrete-brand filters. The MPR numbers translate approximately as MPR 600=MERV 8; MPR 1000=MERV 11; MPR 1500=MERV 12, MPR 1900=MERV 13.

If living spaces become dusty quickly or if shop sessions aggravate someone's allergies, switching to a filter with a higher MERV rating may help. But have a professional evaluate your HVAC system first because a high-efficiency filter may reduce airflow and strain the blower motor.



CAULK THE CRACKS



D Seal gaps where heating ducts, water pipes, or other items penetrate walls and ceilings shared with living spaces.

After locating the gaps, fill them. Apply caulk in gaps narrower than $\frac{1}{8}$ " [Photo D]. For wider areas, use bits from a batt of insulation, or an expanding foam spray. Around steam pipes, use fiberglass pipe insulation (different from the insulation used in walls or attics), available from heating contractors.

A forced-air system that runs through your shop can send dust throughout the house, so check air ducts. Seal seams between metal duct sections with foil

FOIL DUST'S ENTRY INTO DUCTS



E Apply self-adhesive foil tape along joints in duct-work. Wipe the duct clean so the tape sticks, and smooth the edges to the metal.

tape [Photo E]. If the cold-air returns consist of sheet metal nailed between floor joists, seal between the metal and wood with caulk [Photo F]. Also, apply a bead of caulk along the top outside edges of the same joists where they meet the subfloor.

If the furnace itself lies within your shop space, wall it off to isolate it from dust. If possible, upgrade to a filter with a higher MERV rating to capture dust that gets into the ventilation system

TIGHTEN UP COLD-AIR RETURNS



F Caulk the seam where the sheet metal meets the bottom of the joist, and where the top edge of the joist meets the subfloor.

despite your best efforts. Water heaters or other appliances with pilot lights should also be walled off from your workshop.

Dress to egress

Dust inevitably clings to you and your clothes as you work. Follow the tips in the photo below to make a clean exit. 🍀

Produced by Craig Ruegsegger

More Resources

For additional help on assembling an efficient dust-collection system, refer to the following:

- ▶ "Figure Dust-Collection Needs" Issue 119 (December 1999) or online at woodmagazine.com/spcalc
- ▶ "Guide to Workshop Dust Control" Issue 143 (September 2002) \$
- ▶ "Dust Collection that Evolves With Your Shop" Issue 198 (July 2010)
- ▶ "Clearing the Air: How to Buy a Dust Collector" Issue 207 (October 2011)
- ▶ "Dust-Defying Cyclone" Issue 100 (November 1997) \$
- ▶ Visit our forums to learn more about reader modifications to the cyclone in issue 100: woodmagazine.com/cyclonemods

\$=Download these articles for a small fee at woodmagazine.com/plans. Type the article title in the search box.

JUST SAY "NO" TO DUST-COVERED CLOTHES



Wear an apron and leave it (and the dust) in the shop at the end of the day. It keeps your clothes cleaner, and holds frequently used tools while you work.

Attach a blow gun to your air compressor and blast air over yourself to dislodge stubborn chips and dust from your clothes. Do this away from the door so any dust you raise won't follow you out.

Dedicate a pair of shoes to the shop. Leave your "house" shoes outside the door, and slip on your "shop" shoes when you step in.

Flatten Wide Boards On a Narrow Jointer



The best way to make a really wide board flat is to rip it into narrow boards first, face-joint them, and then glue them back together. Not only does this solve the jointer-capacity concern, but it also results in a more stable panel because the rip-joint-reglue process relaxes tension in the wood. And, if you're careful, the joint line blends almost seamlessly in the grain.

But, what if you want to flatten the face of a highly figured board without a ripline interrupting the figure? Or what if the board is just a little too wide, and not worth the hassle of rip-joint-reglue? Here's a quick way to joint it that requires only a strip of scrap plywood and your planer.

Note: This technique will work on boards up to about twice the jointer's capacity, but we suggest no more than one-third of the board's width be unsupported or overhanging the jointer table—any more and the board may tip as you pass it over the cutterhead.

Changing of the (cutterhead) guard

After jointing one edge of the board, replace your jointer's cutterhead guard, which will interfere with a wide board, with a shop-made guard of $\frac{3}{4}$ " plywood like the one above. It

should cover the length and width of the cutterhead entirely. Clamp the guard securely to the jointer's fence.

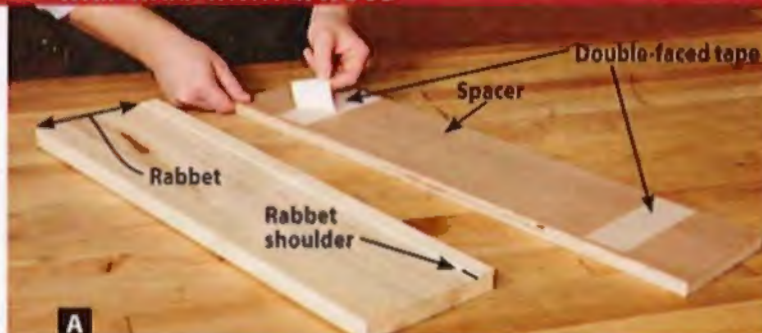
Next, set the jointer to take a $\frac{1}{16}$ "-deep or less cut, depending on how much extra thickness you have to work with. Keep the jointed edge against the fence as you make a pass. This will produce a wide rabbet in the face of the workpiece.

Because the rabbet is the full width of the jointer's cutterhead and infeed table, an attempt at another pass will leave the rabbet resting flat on the infeed table while the unrabbeted edge overhangs. Depending on the design of your jointer, that edge may catch on the rabbeting ledge. The good news: You only need two flat points on the rabbet for this technique to work. One pass should be adequate.

Cut a 6"-wide spacer from $\frac{1}{4}$ " or thicker plywood an inch or two longer than your board. Secure the spacer to the workpiece using double-faced tape, one edge abutting the rabbet shoulder [Photo A]. Then run the stack through the planer [Photo B].

With one side now flat, remove the spacer; then run the board through the planer with the just-planed face down to remove the rabbet. 🌲

WHIP WARP WITH PLYWOOD



A

Use a piece of plywood instead of hardwood for your spacer. Less prone to warp, plywood provides a reliably flat mounting surface.

PLANE THE NO-RABBET SIDE FLAT



B

Adjust the planer for a $\frac{1}{32}$ " cut and feed the workpiece, spacer down, into the planer. Make additional passes as necessary to flatten the top.



Get the Right-size Random-orbit Sander

Can't decide between a 5" and 6" model? Here's what each does best.

To get to the bottom of the issue, we put nearly a dozen tools through extensive head-to-head testing in the *WOOD* magazine shop.

For starters, don't expect the more expensive 6" sanders to deliver a finer finish. All of the sanders, regardless of

size, left a scratch-free surface on wood when sanded to 220 grit. (We tested each model with Klingspor's PS33 and Mirka Abranet hook-and-loop sanding discs on pine, red oak, and cherry.)

Likewise, larger sanders have no inherent advantage when it comes to

dust collection. In fact, the 5" sanders did a better job when sanding narrow parts, such as face frames, because the dust-collection holes sit closer to the center of the pad, as shown *above*, staying on or nearer the wood. So how do they differ? Read on to find out.

5" models: Lean, light, effective



Size and shape: Nimble and with its center of gravity directly over the pad, a typical 5" sander weighs 2–3 lbs less than a 6" model, making it easy to control with one hand. No wonder few models have handles for two-hand use.

Sanding speed: As a rule, these models just can't match the fast stock-removal rate of 6" sanders. So expect to spend 30–50 percent more time using a 5" machine versus a 6" model for the same job.

What it will cost you: Good news here—you can get a top-performing 5" random-orbit sander for \$60 to \$90. Plus, 5" sanding discs cost 10–25 cents less per disc than 6" ones, and you can buy them just about anywhere.

Where it shines: Because of its top-side palm grip and lighter weight, you'll tire less using a 5" random-orbit sander, especially on vertical surfaces. (On flat horizontal surfaces, you simply guide the tool while its weight rests on the wood.) And, the more-effective dust collection when sanding narrow pieces will leave you breathing easier.

6" sanders: Brawny, fast, pricey



Size and shape: Most 6" sanders have larger motors than 5" models, adding weight, but not necessarily vibration. All have pistol-grip handles with triggers and stubby front handles for two-handed use. Using it one-handed feels more awkward than with a 5" sander.

Sanding speed: At maximum speed, the pads on 6" sanders spin about 2,000 rpm slower than 5" models. Nevertheless, the 30-percent-larger pad size gives 6" sanders a decided advantage in removing stock quickly.

What it will cost you: Electric 6" sanders sell for \$115 to nearly \$300. Because you'll use fewer discs to do the same work, disc costs over time should be about the same as for a 5" sander. You'll likely have to go to woodworking or tool specialty stores, catalog retailers, or online to buy them.

Where it shines: Bigger is better when it comes to sanding broad surfaces, such as tabletops, cabinet sides, and doors. If you opt to buy a 6" sander, consider one of the three we recommend on page 24. 🌲



A BIG ASS FAN FOR MY SHOP?

ABSOLUTELY!

You've got this great shop with high ceilings. It's too hot in the summer (sweat dripping on a new project is NOT good) and too cool in the winter (why do knuckle-busters hurt more in the cold?). The solution is the all new ShopFan® from the Big Ass Fan Company®, engineered with our patented airfoil technology to improve conditions in workshops up to 5000 square feet.

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6,939,108; 7,252,478; 7,284,960; D587,799; D607,988 and other patents pending.

Silverware Caddy

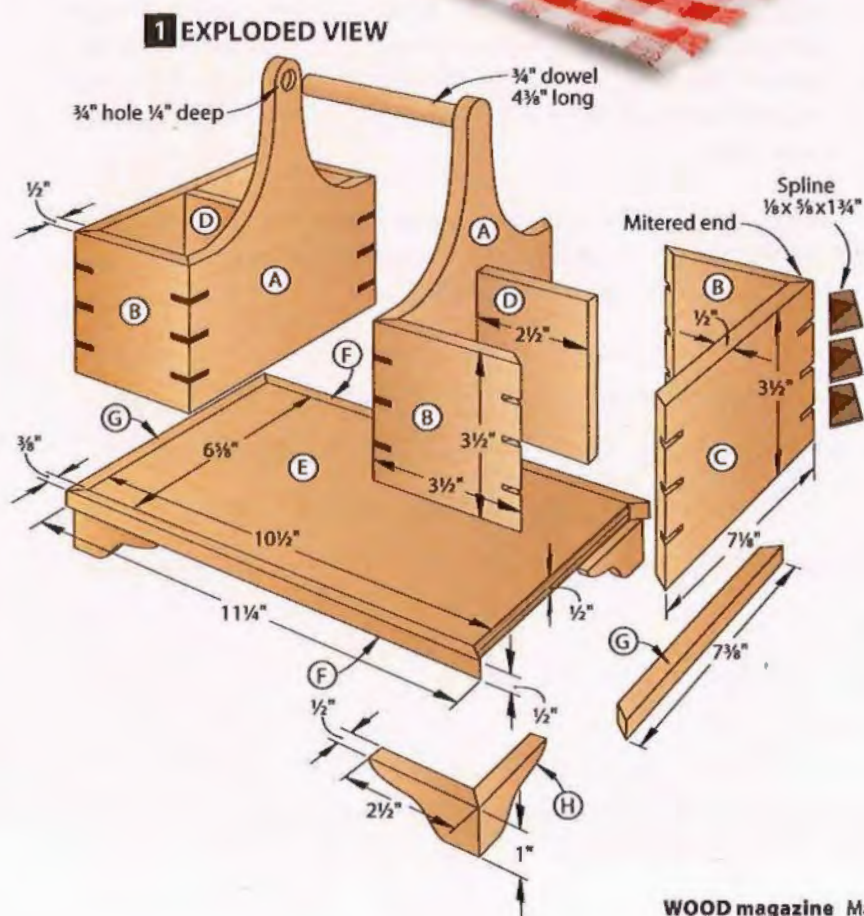
Build this handy hardware hauler in half a day.

Begin by building boxes

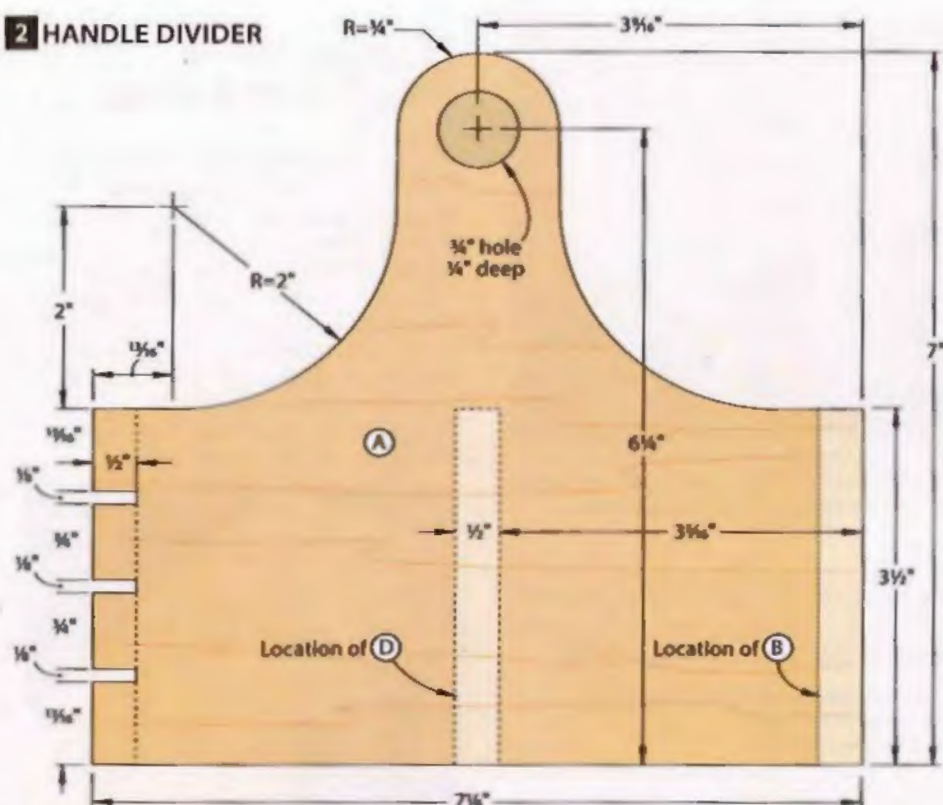
1 Bevel-cut two handle divider blanks (A) to size [Materials List]. Jigsaw or bandsaw them to shape and bore the $\frac{1}{4}$ "-deep hole for the handle [Drawing 2].

2 From $\frac{1}{2}$ " stock, cut a $3\frac{1}{2} \times 36$ " blank. Bevel-cut the blank to make four sides (B) and two ends (C) [Drawing 1, Materials List]. Set aside the remaining blank stock for cutting the center dividers (D) later.

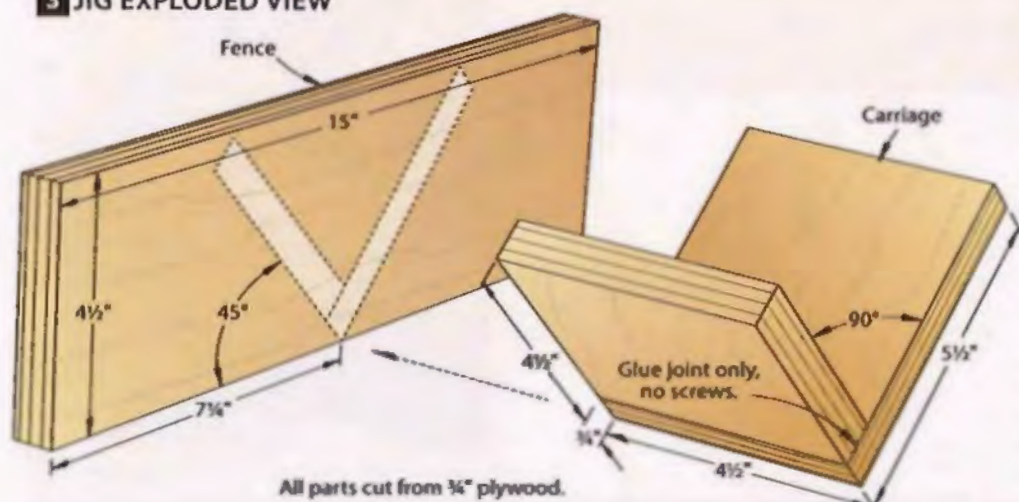
3 Apply an even bead of glue to the bevels on one handle divider (A), two sides (B) and one end (C); then assemble the silverware holder [Photo A], ensuring it's square. Repeat for the other silverware holder. After the glue dries, sand the assemblies.



2 HANDLE DIVIDER



3 JIG EXPLODED VIEW



A fine time for splines

1 To create recesses for the corner splines, build the slot-cutting jig [Drawing 3]. Raise the blade on your tablesaw to $1\frac{1}{16}$ " to cut $\frac{1}{2}$ "-deep kerfs in the corners of the silverware holders (A/B/C) [Photo B, Drawing 2].

2 If you used a full-kerf blade in your tablesaw to cut the spline slots, plane a $1\frac{1}{2}$ "-wide by 24"-long piece of contrasting stock to slightly thicker than $\frac{1}{8}$ ". (We used walnut for our cherry caddy.) Sand the stock so it fits snugly in

the slots. Cut two $\frac{5}{8}$ "x24" strips from your spline stock to make 24 splines $1\frac{1}{4}$ " long. Apply glue in the silverware holder kerfs and slip the splines into place.

3 Use a handsaw or bandsaw to cut off the excess spline material, leaving them about $\frac{1}{16}$ " proud. Sand flush with the sides. Finish-sand both silverware holders (A/B/C).

Let your feet touch bottom

1 Laminate two layers of $\frac{1}{4}$ " cherry plywood ($\frac{1}{2}$ " cherry plywood can be

USE TAPE TO CLAMP SMALL PARTS



A Lay painter's tape sticky side up and butt the silverware holder's parts (A,B,C) so the miters join tightly. Apply glue and roll up the assembly.

ONE SPLINE AT A TIME



B Cut all four corners of both silverware holders (A/B/C) before resetting your saw's rip fence to cut the next spline slot.

difficult to find, but works, too) and cut the base (E) to size [Materials List]. Miter the side edging (F) and end edging (G) to length, then fit and glue it around the base [Drawing 1].

2 Cut a $\frac{1}{2}$ "x1x24" blank for the feet (H). Make four copies of the **Foot Pattern** from the **WOOD Patterns**® insert on page 43 and spray-adhere them to the blank.

Quick Tip! To simplify the cleanup process, cover the blank with painter's tape before applying patterns with spray adhesive. Leave adequate space between patterns to cut each piece free. Miter one end of each foot [Drawing 1], being sure to make four mirrored pairs of feet. Bandsaw just outside the pattern lines and sand each foot to shape.

3 Apply glue to the miters and use tape to clamp each pair of feet (H)

together [Photo C]. Sand the foot assemblies smooth, and then glue them to the bottom of the base (E) $\frac{1}{4}$ " from the outside edges.

Apply a fitting finish

1 Cut and glue a $\frac{3}{4}$ " dowel (see "Make your own dowels in any wood") into the hole of each handle divider (A) [Drawing 2]; then apply glue to the bottom edges of both silverware holders (A/B/C) and clamp them in place on the base (E). Leave a $\frac{1}{8}$ " reveal on the ends and sides.

2 Measure and cut the center dividers (D) to fit snugly between the handle dividers (A) and ends (C) of both silverware holders (A/B/C). Apply glue to the bottom edges only of the center dividers, center them in the opening [Drawing 1], and clamp them in place.

3 Finish-sand all parts up to 220 grit and apply a clear finish of your choice. (We sprayed on three coats of General Finishes Satin Arm-R-Seal

A FOOT WRAP THAT HOLDS TIGHT

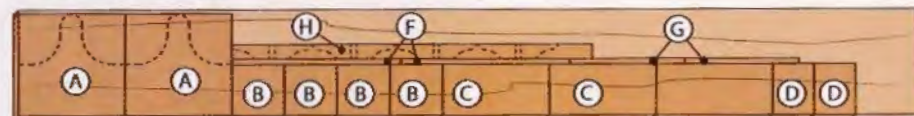


Gluing up the feet (H) requires force on both sides to hold the halves together—apply painter's tape along the inside and outside for a tight joint.

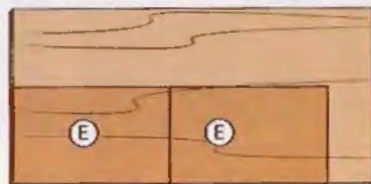
#56598, \$11.49 per pint, 800-279-4441, rockler.com, sanding between coats with a 320-grit sanding sponge.)

Produced by Nate Granzow with Kevin Boyle
Project design: Kevin Boyle
Illustrations: Lorna Johnson

Cutting Diagram



$\frac{1}{2}$ x $7\frac{1}{4}$ x 60" Cherry (1.7 bd. ft.)



$\frac{1}{4}$ x 12 x 24" Cherry plywood

Materials List

Part	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A handle divider	$\frac{1}{2}$ "	7"	$7\frac{1}{8}$ "	C	2
B* sides	$\frac{1}{2}$ "	$3\frac{1}{2}$ "	$3\frac{1}{2}$ "	C	4
C* ends	$\frac{1}{2}$ "	$3\frac{1}{2}$ "	$7\frac{1}{8}$ "	C	2
D center dividers	$\frac{1}{2}$ "	$3\frac{1}{2}$ "	$2\frac{1}{2}$ "	C	2
E base	$\frac{1}{2}$ "	$6\frac{1}{8}$ "	$10\frac{1}{2}$ "	CP	1
F side edging	$\frac{1}{2}$ "	$\frac{3}{8}$ "	$11\frac{1}{4}$ "	C	2
G end edging	$\frac{1}{2}$ "	$\frac{3}{8}$ "	$7\frac{3}{8}$ "	C	2
H* feet	$\frac{1}{2}$ "	1"	$2\frac{1}{2}$ "	C	8

*Parts initially cut oversize. See the instructions.

Materials key: C—cherry, CP—cherry plywood.

Supplies: $\frac{3}{4}$ " cherry dowel.

Blade and bit: $\frac{3}{8}$ " round-over router bit.

Make your own dowels in any wood

If you don't have a dowel in the right species to match your project, make one from scrap stock. For a $\frac{3}{4}$ "-diameter dowel, cut a rectangular blank that measures $\frac{3}{4}$ x $\frac{3}{4}$ " and cut it to the length you need plus an additional 4" or more. Set up your router table with a $\frac{3}{8}$ " round-over-bit and align the fence flush with the bit's bearing. Apply tape to the router table's fence 2" from either side of the bit. The tape will mark the stopping point of your round-over, which should be 2" from the ends of the blank. Rout all four sides, then cut off the square ends.



More Resources

► Learn how to add a decorative angle to your spline joinery at woodmagazine.com/anglespline.



► For a video to help you achieve a perfect finish on your caddy, see woodmagazine.com/nodripfinish.



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A black finish won't darken your woodworking rep

Though it pains me to hide all that beautiful grain, I've got a honey-do request for painted black furniture. I'm thinking of using an open-pored wood, like ash, to ensure that the wood grain (and therefore proof of my handiwork) shows through. Is there a traditional ebonizing formula that might let me salvage some woodworking credibility?

—Marshall Greer, Roseville, Calif.

Black furniture fills furniture stores these days, Marshall, so we empathize with your situation. Here are two ways to go about it:

The traditional way (with a modern twist). Start by dissolving a pad of steel wool (historically iron nails) in a quart jar of white vinegar. The iron ions produced by the breakdown of the steel wool react with tannins in wood to produce a black coloration. Stir the brew occasionally over the course of about a week. To avoid a buildup of pressure (the mixture produces a small amount of hydrogen gas), don't cap the jar until the steel wool completely dissolves. Strain the mixture through a

coffee filter to remove any undissolved particles.

Alone, this formula works well on oak due to that wood's high tannin content. For other woods, such as ash, you'll get deeper blacks if you artificially crank up the tannin content. First acquire some tannic acid powder from a winery supply company. (We got ours from E.C. Kraus Home Wine & Beer Making Supplies, 2 oz.-jar for \$7.35, Item No. TAN110, 800-353-1906, ECKraus.com). Stir a teaspoon of the powder into a cup of warm water and apply a wash coat before and after the vinegar/steel-wool coat. That will give your wood a deep blue/black that will turn a dark ebony upon applying a clear finish.

The quick-and-easy way. Simply apply a coat of India ink from an art supply store with a foam brush, as if you were painting it on. (We used Blick Art Materials' Black Cat India Ink, \$8/pint, Item no. 21101-2006, 800-828-4548, dickblick.com). It turns the wood a deep black with little mixing, money, or mess while still showcasing ash's prominent grain.

A wash-coat of a tannic-acid solution before and after the vinegar/steel-wool solution creates a deep ebony look.

The traditional, boast-worthy ebonizing method includes a week-long chemistry session followed by a three-step color coat.



India ink proved to be the easiest to apply—simply brush it on—and also created the truest shade of black.



You can find waterproof India ink in pint and quart sizes. Normally used as pen ink, a little of this thin liquid goes a long way on wood.

Working out the weight of wood

I'm planning to use torsion hinges for the lid of an oak chest I'm designing. They're rated for the weight of the lid. So before I buy the hardware, how do I estimate the weight of wood?

—Mike Jackson, St. Louis

Calculate weight, Mike, using the formula: density $\times$ volume. Well-dried, seasoned oak has a density of about 3.6 pounds per board foot.

Now find the board footage of your lid by multiplying its length, width, and thickness, and dividing by 144. For example, a lid measuring $\frac{3}{4} \times 18 \times 48$ " contains a volume of $4\frac{1}{2}$ board feet. Multiply that volume by the density, and you find that the oak lid weighs about 16.2 pounds. Use this number along with the manufacturer recommendations to arrive at the weight rating and number of hinges.

Here are the densities of some other common wood species:

- ▶ Pine: 2.5 lbs/board foot
- ▶ Cherry: 3 lbs/board foot
- ▶ Walnut: 3.3 lbs/board foot
- ▶ Hard Maple: 3.75 lbs/board foot

Find the densities of many more woods at woodworkerssource.com/wood_library.php. Listed in pounds per cubic foot, you should divide by 12 to discover the weight of a single board foot.



Torsion hinges hold a lid open at any point in its travel. But only if you choose hinges rated for the lid's weight.

continued on page 74

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Ask WOOD

Turn photos and drawings into scrollsaw patterns

I do a lot of scrollsawing and I'm always trying to find new patterns. I'm also interested in making my own scrollsaw patterns. Could you help me get started?

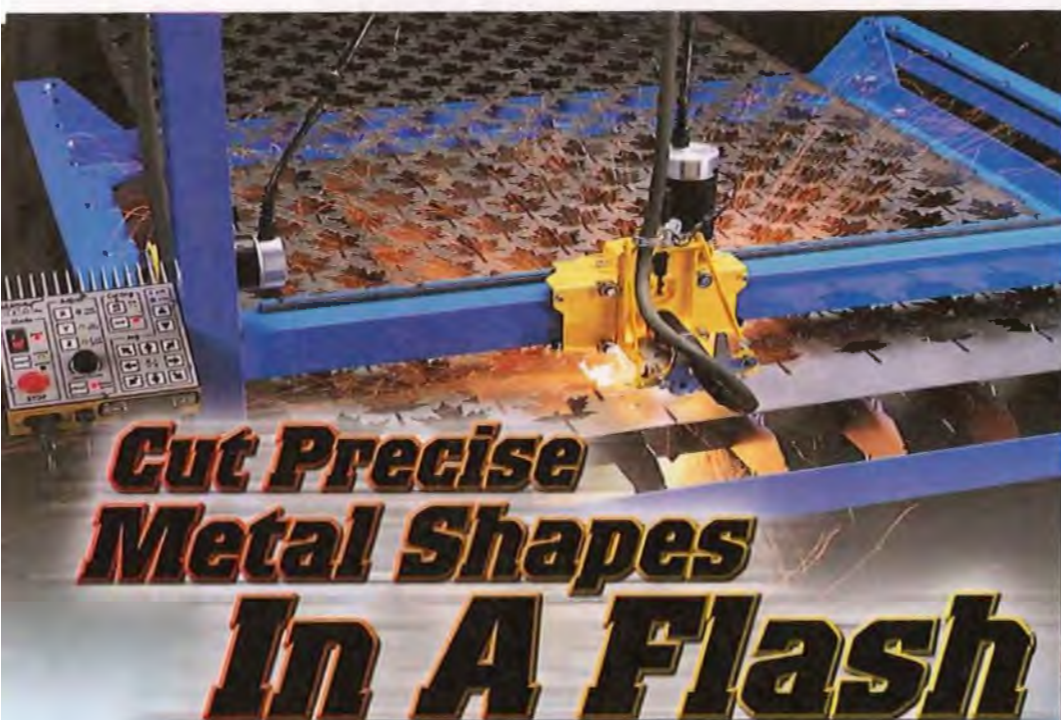
—Jim Farrell, Elliot Lake, Ont.

Fortunately, Jim, scrollsaw patterns surround you. After you've exhausted all the woodworking resources—specialty scrollsawing magazines, books, and Web sites—start looking

elsewhere for fresh ideas. Browse the stenciling and quilting sections of a craft store for patterns that can be adapted to scrollsawing. Run a Google search on “papercraft” for some intricate cutout designs that double as wood cutouts.

As for making your own, remember that scrollsaw patterns are essentially black (cutout) and white (wood) images. Train your eye to look for high-contrast photos, scenes, signs, and patterns in the world around you. Carry a camera wherever you go and learn which settings and lighting conditions provide high-contrast photos.

For a low-tech way to convert those high-contrast photographs into patterns, tweak them on a photocopier using the brightness and contrast settings until they resemble silhouettes. When you're satisfied, overlay a fresh sheet of paper on the pattern and begin tracing with a pencil before using a black, fine-point, felt-tip pen to fill in large fields of black where the wood will be cut away. Connect any unsupported “islands” of white by filling in with “bridges” using correction fluid as shown, below.



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A new home for an old blade?

Is it okay to use the old tablesaw blade—which was fairly new itself—to replace my worn out miter saw blade? It appears to fit, but I don't want to do anything unsafe.

—John Green, Russellville, Ky.

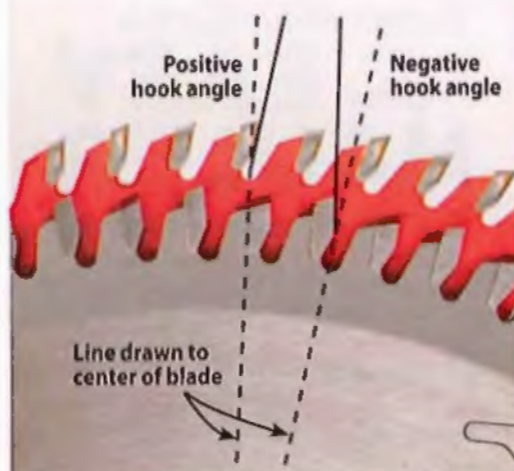
Check the old blade or packaging for the words "tooth count," and "hook angle," and "kerf thickness," John. These will determine whether your blade can safely make the switch between jobs.

The first thing to check is the tooth-count. A 24-tooth ripping blade powers through rip cuts, but tends to shred or tear out on the crosscut. Even a 40- or 50- tooth combination blade can be too aggressive for a miter saw. But a blade with 60 teeth or more will make finer, smoother cuts.

Hook angle describes the tooth's angle of attack and aggressiveness. Ripping blades typically have an aggressive, forward-leaning hook angle. But on a miter saw—especially a sliding miter saw—the aggressiveness could dangerously lift the workpiece or yank the blade through the wood too fast. Cross-cutting blades, on the other hand, use a less-aggressive hook angle, sometimes even a backward-leaning (or negative) hook angle. As a rule of thumb, a blade with a hook angle less than 7° can be used on your miter saw.

Finally, because your miter saw has less power than your tablesaw, kerf thickness is going to be a factor. Many miter saws bog down with a full-kerf ($\frac{1}{8}$ ") blade. So take this into consideration as well.

Your best bet: Contact the blade and miter saw manufacturers. If either recommends against using the blade in a miter saw, follow their suggestions. Store the blade and use it for rough-cutting tablesaw jobs. Then buy a fresh miter saw blade or have your old one sharpened.



The positive hook angle of the top blade makes it more aggressive. The negative hook angle of the bottom blade makes it safer for use in a miter saw.



Some blade manufacturers, such as Freud, make blades that can be used on both the tablesaw and miter saw, such as this model D1080X.

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continued on page 77



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Ask WOOD

Guidelines for kosher casket construction

A dear friend asked me to build a casket for his dying father. Of course, I agreed, but because his father is an orthodox Jew, the casket must be kosher. This means no metal fasteners—only pegs and glue. But which glues are kosher?

—Phillip Lawson, Southfield, Mich.

Interesting question, Phillip. We posed it to Don Guillard, product manager at Batesville Casket Company, which manufactures a line of all-wood caskets designed specifically for orthodox Jewish burials. Here's what we learned.

Because Jewish law requires that the body of the deceased be returned to the earth as soon as possible, much of the construction of a kosher casket is intended to ensure that it is quickly and completely biodegradable. This means you should avoid glues with preservative or water-resistant properties. (This eliminates formaldehyde-glue-infused plywoods as well; stick to soft woods, such as pine.) To meet kosher standards, you'll also want to avoid glue with animal by-products, such as traditional hide glues. Fortunately, many yellow wood glues are both synthetic and water-soluble, so you won't have any problems with these polyvinyl acetate (PVA) glues.

But glue is just the start of it. For kosher caskets, there are more standards to meet besides eschewing metal fasteners and components. The bottom of the casket should be constructed from slats with $\frac{1}{8}$ – $\frac{1}{4}$ " gaps between them (or the bottom must have multiple holes drilled through it) to hasten decomposition. All of the internal components must be biodegradable as well, so only natural linings and paddings, such as cotton and straw, may be used. And these should be fastened with double-faced paper tape (again with no animal by-products in the adhesive) rather than metal or plastic staples.

Additionally, the casket should be of simple design, signifying equality in death. And it must not be constructed on the Sabbath, meaning you'll have to avoid working on it from sundown Friday through one hour past sundown on Saturday.

Finally, because belief systems vary even within a larger religion, it would be wise to discuss the specific interment requirements with the rabbi that oversees the orthodox Jewish cemetery that will be used. And because it is also an intensely personal project for your friend, discuss all the details of the construction with him, both during the design period and as you build. 🌱



Some modern hide glues, such as Titebond's liquid hide glue, right, are made out of synthetic ingredients. To meet kosher standards, avoid traditional hide glues, left, made from animal by-products.

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LOT NO. 46007/68975/69221

\$1.99 REG. PRICE \$5.49
Item 46007 shown
SAVE 63%

HARBOR FREIGHT TOOLS - LIMIT 1: This valuable coupon is good anywhere you shop Harbor Freight Tools (retail stores, online, or 800 number). Cannot be used with any other discount or coupon. Coupon not valid on prior purchases after 30 days from original purchase date with receipt. Offer good while supplies last. Coupon cannot be bought, sold, or transferred. Original coupon must be presented in-store, or with your order form, or entered online in order to receive the coupon discount. Valid through 7/13/12. Limit one coupon per customer and one coupon per day.



47518675

SUPER COUPON!



4 PIECE CHISEL SET
LOT NO. 42429

\$3.99 REG. PRICE \$7.99
Includes 1/4", 1/2", 3/4", and 1" chisels.
SAVE 50%

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65200046

SUPER COUPON!



OSCILLATING MULTIFUNCTION POWER TOOL
LOT NO. 68303/68861
\$19.99 REG. PRICE \$59.99
Item 68303 shown
SAVE 66%

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42021915

SUPER COUPON!



16" x 30" STEEL SERVICE CART
LOT NO. 5107

\$27.99 REG. PRICE \$44.99
220 LB. CAPACITY
SAVE 37%

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42207103

SUPER COUPON!



OSCILLATING SPINDLE SANDER
LOT NO. 95088
\$89.99 REG. PRICE \$149.99
SAVE \$60

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12568821

SUPER COUPON!



PITTSBURGH
3-1/2 TON PUMPS LIFTS MOST VEHICLES
SAVE \$70

\$69.99 REG. PRICE \$139.99
RAPID PUMP® 3 TON HEAVY DUTY FLOOR JACK
LOT NO. 68048/69227
Item 68048 shown

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73049320

SUPER COUPON!



1/2" PROFESSIONAL VARIABLE SPEED REVERSIBLE HAMMER DRILL
CHICAGO ELECTRIC POWER TOOLS
LOT NO. 68169
\$24.99 REG. PRICE \$49.99
SAVE 50%

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12200910

SUPER COUPON!



CENTRAL MACHINERY
4" x 36" BELT/6" DISC SANDER
LOT NO. 93981/97161

\$54.99 REG. PRICE \$99.99
Item 93981 shown
SAVE \$45

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881192240

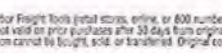
SUPER COUPON!



29 PIECE TITANIUM NITRIDE COATED DRILL BIT SET
drillmaster
LOT NO. 5889

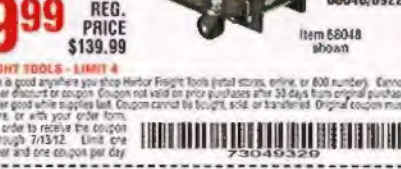
\$9.99 REG. PRICE \$24.99
SAVE 60%

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67476814

SUPER COUPON!



ALUMINUM OXIDE SANDING SPONGES - PACK OF 10
Lifetime
COARSE LOT NO. 46751
MEDIUM LOT NO. 46752
FINE LOT NO. 46753
YOUR CHOICE! \$1.99 REG. PRICE \$5.99
SAVE 66%

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60838043

SUPER COUPON!

CENTECH
12" COMBINATION SQUARE SET
 LOT NO. 92471

SAVE 60%
\$399 REG. PRICE \$9.99

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80366462

SUPER COUPON!

drillmaster
ORBITAL PALM SANDER
 LOT NO. 40070

SAVE 55%
\$899 REG. PRICE \$19.99

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402634424

SUPER COUPON!

PITTSBURGH
24" CLAMP AND CUT EDGE GUIDE
 LOT NO. 66126

SAVE 46%
\$699 REG. PRICE \$12.99

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33159730

SUPER COUPON!

drillmaster
1500 WATT DUAL TEMPERATURE HEAT GUN
(572°/1112°)
 LOT NO. 56289

SAVE 60%
\$799 REG. PRICE \$19.99

HARBOR FREIGHT TOOLS - LIMIT 7
 This valuable coupon is good anywhere you shop Harbor Freight Tools (retail stores, online, or 800 number). Cannot be used with any other discount or coupon. Coupon not valid on prior purchases after 30 days from original purchase date with receipt. Offer good while supplies last. Coupon cannot be bought, sold, or transferred. Original coupon must be presented in-store, or with your order form, or entered online in order to receive the coupon discount. Valid through 7/13/12. Limit one coupon per customer and one coupon per day.

80167430

SUPER COUPON!

CENTRALPNEUMATIC
18 GAUGE 2-IN-1 NAILER/STAPLER
 LOT NO. 68019

SAVE 46%
\$1599 REG. PRICE \$29.99

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32439577

SUPER COUPON!

10/2/55 AMP, 6/12 VOLT BATTERY CHARGER/ENGINE STARTER
CHICAGO POWER ELECTRIC SYSTEMS
 LOT NO. 66783

SAVE 43%
\$3399 REG. PRICE \$59.99

HARBOR FREIGHT TOOLS - LIMIT 4
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80460685

SUPER COUPON!

Bunker Hill Security*
WIRELESS DRIVEWAY ALERT SYSTEM
 LOT NO. 93058

Requires one 9V and three C batteries (sold separately).

SAVE 53%
\$1399 REG. PRICE \$29.99

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37416625

SUPER COUPON!

MECHANIC'S GLOVES
LARGE
 LOT NO. 93640
X-LARGE
 LOT NO. 93641

SAVE 50%
\$399 REG. PRICE \$7.99

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53610967

SUPER COUPON!

CENTRALPNEUMATIC
3 GALLON, 100 PSI OILLESS PANCAKE AIR COMPRESSOR
 LOT NO. 95275

SAVE 50%
\$3999 REG. PRICE \$79.99

HARBOR FREIGHT TOOLS - LIMIT 5
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56026680

SUPER COUPON!

CHICAGO ELECTRIC
90 AMP FLUX WIRE WELDER
 LOT NO. 68857/95871

SAVE \$60
\$8999 REG. PRICE \$149.99

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17004242

SUPER COUPON!

THUNDERBOLT solar
45 WATT SOLAR PANEL KIT
 LOT NO. 90599

SAVE \$80
\$14999 REG. PRICE \$229.99

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96765064

SUPER COUPON!

CENTRAL MACHINERY
12 SPEED BENCHTOP DRILL PRESS
 LOT NO. 44835

SAVE \$70
\$9999 REG. PRICE \$169.99

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86650102

SUPER COUPON!

CENTRAL MACHINERY
2 HP INDUSTRIAL 5 MICRON DUST COLLECTOR
 LOT NO. 97869

SAVE \$100
\$14999 REG. PRICE \$249.99

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44147552

SUPER COUPON!

12" SLIDING COMPOUND MITER SAW WITH LASER GUIDE
CHICAGO ELECTRIC
 LOT NO. 98194

SAVE \$80
\$11999 REG. PRICE \$199.99

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76763177

SUPER COUPON!

60" HARDWOOD WORKBENCH
WINDSOR DESIGN
 LOT NO. 93454/69054

SAVE \$85
\$14499 REG. PRICE \$229.99

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Compact tablesaw cuts like bigger, pricier saws

I've been using a Bosch 4100 portable tablesaw for years with great results, but the \$500-plus price pushes it close to the cost of a traditional contractor-style saw. Bosch's new GTS1031 provides nearly the same performance as the 4100 in a smaller package—and with a smaller price tag.

Bosch engineers cut the weight to 50 lbs by building the saw with a roll-cage-type frame rather than a closed cabinet. It's easy to carry one-handed like a suitcase, even going up and down stairs. But it's no toy. This saw's robust motor powered the thin-kerf blade through 2"-thick red oak without bogging down. The GTS1031 is accurate, compact, and solidly built, and I found myself using the three-position riving knife and blade guard because they're easy to use and remove. Plus, all the accessories store underneath the saw, keeping them protected during transport.

One sacrifice you have to make with this saw: the 18" maximum rip capacity measures 7" less than the 4100, meaning you can't rip to the midpoint of sheet goods.

—Tested by Dave Fish,
a trim carpenter and cabinetmaker



10" benchtop tablesaw, #GTS1031

Performance ★★★★★
Price \$399

Bosch Power Tools
877-267-2499; boschtools.com



High-pressure compressors keep you working longer

Campbell Hausfeld's new line of compressors gives you about one-third more usable air per gallon of tank capacity than most portable compressors by jacking the maximum pressure up to 200 psi. Available in 8-, 15-, and 20-gallon sizes, these compressors have oil-free pumps, which means they generate noise in the 85–92 decibel range. So be sure to wear hearing

protection when the pumps engage to refill the tanks.

I tested these units with a number of tools, and they performed admirably. Because the motor and pump sit on the base just above the axle, the compressors feel less top-heavy than other tall-tank units I've used. They each have the same easy-to-read gauges and easy-to-adjust regulator.

Although the two smaller models come with no accessories, the 20-gallon model comes with a 3/8"×25' air hose, 3/8" ratchet, 1/2" impact wrench, 3/4" butterfly impact wrench, spray gun, tire-inflation gun, and assorted accessories.

—Tested by Jan Svec,
a former WOOD® magazine project
designer, builder, and editor



Model	Tank size (gal.)	Recycle time	Fill from empty	Price
HG300000DI	8	1:45	5:35	\$179
HJ300100DI	15	3:00	9:30	\$229
HJ300299DI	20	3:24	10:43	\$329

200-psi air compressors

Performance ★★★★★

Campbell Hausfeld
800-543-6400; chpower.com



continued on page 82



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In 2012, global demand for silver will surpass supply. That's why banks around the world are buying millions of ounces, snatching up silver faster than mining companies can pull it out of the ground. That voracious appetite for silver guarantees fierce competition for the brand new 2012 U.S. Silver Eagles. Millions of collectors, investors and dealers from Europe, China and India are ready to strike. If you want to claim absolutely pristine examples of America's newest Silver Dollar before they do, this is your chance.

Our *first ever* release of one of the most beautiful coins in the world today, gives you one full troy ounce of silver (featuring Miss Liberty draped in a U.S. flag) at our lowest price. Remember, the U.S. Mint *does not sell uncirculated Silver Eagle Dollars direct to the public*. You can only obtain them through an authorized distributor. And the clock is ticking.

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Winter 2011 / 12

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Multitasking screws don't need a pilot hole

Few screws bore their own pilot holes, and those that do usually have a pan or hex head that stands proud of the wood surface. Quickscrews' Spiral-Point Funnel-Head screws not only bore a slim pilot hole with a self-tapping point, but they also have flat heads (with square-drive sockets) that make their own counterbores. And they do this without splitting the wood!

We tested the screws in solid pine, oak, maple, and cherry, and they never split the wood. (They will split out MDF, though.) Available in #8 (1-3" lengths) and #10 (3½-4") sizes, these screws sell in packs ranging from 25 to 10,000 screws. 📌

—Tested by Bob Hunter,
Tools Editor



Spiral-Point Funnel-Head wood screws

Performance	★★★★★
Price	50-packs \$2-4 100-packs \$3-5

Quickscrews
800-743-6916; quickscrews.com



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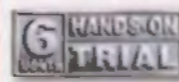
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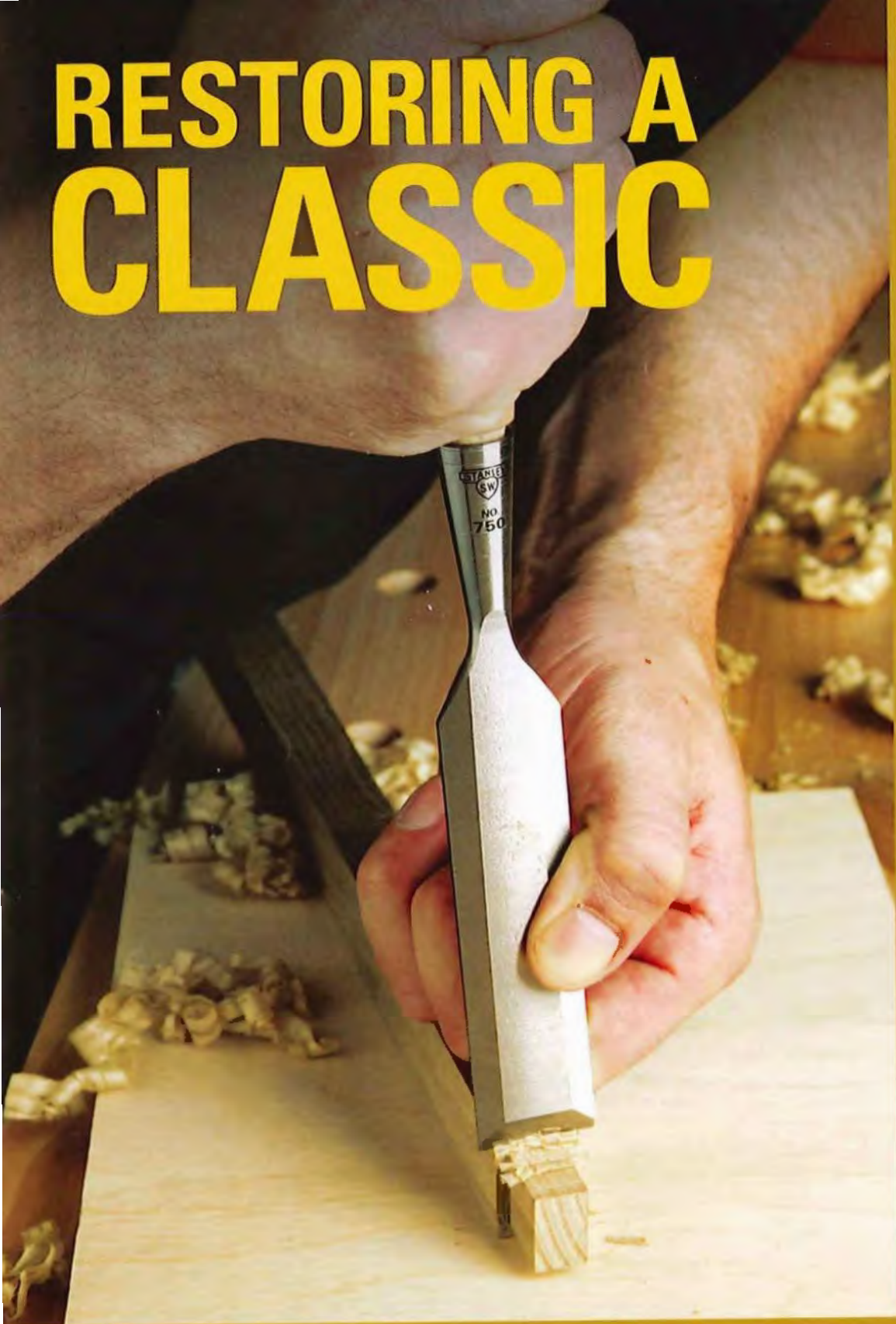
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