Making Good with Salvaged Wood p.32

WOODCRAFT® magazine

Projects, Techniques, and Products

Build this

High-Styled Corner Table p.38

Learn a ton of techniques!

FUN HOME PROJECTS

- *Croquet Set*
- *Bandsawn Bow Box*
- *Cap-Catching Bottle Opener*

SKILL-BUILDER

- *Sharpening Turning Tools*

VOL. 11/NO. 65 JUNE/JULY 15

$6.99

07>

0 71486 02222 0

Display until July 28, 2015

PLUS... 3 SHOP PROJECTS!

Introducing the Next Generation Premier Fusion

with Radical New Fusion Trio Tooth Design

Now the most technologically advanced general purpose blade on the market includes an one-of-a-kind tooth geometry with 30 degree Hi-ATB, a double side grind design, and an Axial Shear Face Grind to produce the ultimate polished finish with minimal resistance! Whether you're ripping or crosscutting, the next generation Premier Fusion blade is the best for flawless cuts in laminates, melamine, veneered plywoods, hardwoods, softwoods, and thick stock lumber.

Item# P410

NEW FUSION TRIO TOOTH GEOMETRY

DOUBLE SIDE GRIND
design for delivering polished cross cuts

30° Hi-ATB
for slicing through plywood and melamine

AXIAL SHEAR FACE GRIND
that glides through wood and sheet goods with minimal resistance

ANOTHER INDUSTRY 1st BY FREUD

freud® Premier FUSION

For more information visit: www.freudtools.com/premierfusion

To find a Freud Certified Sharpener near you visit: www.freudtools.com/sharpen

MIRKA

Introducing Mirka® DEROS

Unequaled Performance. Brushless DC Power.

Mirka® DEROS is the first random orbital electric sander using advanced brushless DC motor technology, without the need for an external power transformer. Performance unequaled by any competitive electric tool can now be found within reach of any standard 110 volt outlet.

Mirka's Abranet® mesh abrasive offers unparalleled dust extraction across the entire abrasive surface and virtually dust-free sanding when used with the Mirka® DEROS sanders and the MV-912 dust extractor!

Mirka Dust-Free System

Mirka® DEROS Sander

+

Abranet® Mesh Abrasives

+

Vacuum Hose

+

Dust Extractor

mirkawoodworking.us • mirka.com • mirkaderos.us

Mirka Abrasives, Inc. • 7950 Bavaria Road, Twinsburg, Ohio 44087 • tel 800-843-3904 • fax 800-626-6970

Contents: Projects

WOODCRAFT magazine
June/July 2015

Cover photo: David Crosby

WHITESIDE

"American Made for the American Woodworker"

2-Piece Stile & Rail Door Sets

Proven design allows you to make full-sized stile and rail frames on your router table for raised panels, plywood panels, even glass panel doors.

- Interlocking Profile And Panel Groove Cut In One Pass
- Simply Switch Bits To Change From Cutting Stiles To Cutting Rails
- No Extra Components Are Required For Glass Panel Doors
- Conversion Kit Available For Undersized Plywood Panels
- Choose From Six Distinct Profiles To Match Your Personal Style

6001	Roundover	6004	Straight
6002	Ogee	6005	Traditional
6003	Bead	6006	Classical

6000X 7/32" Plywood Conversion Kit

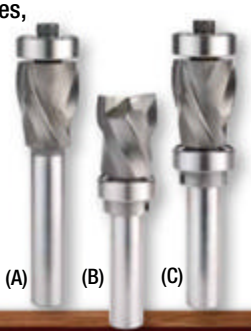
Two Great Items Available at WOODCRAFT • Visit woodcraft.com Or Call 800-225-1153

"ULTIMATE" Flush Trim/Pattern Router Bits

"ULTIMATE" Trim Bits are perfect when working with templates or when using a router to flush trim matching wood surfaces. Whiteside's compression spiral design, along with a ball bearing guide, makes this bit easy to use in the router and produces a superior quality trimmed edge. The "ULTIMATE" Trim series brings industrial engineered bits, previously manufactured for CNC machines, right into your shop.

⅞" Diameter x 1⅛" Cut Length x ½" Shank

UDFT9112 (A) Flush Trim
UDP9112 (B) Pattern/Plunge
UPC9112 (C) Combination



Whiteside Machine Co., Claremont, North Carolina
800-225-3982 • whitesiderouterbits.com

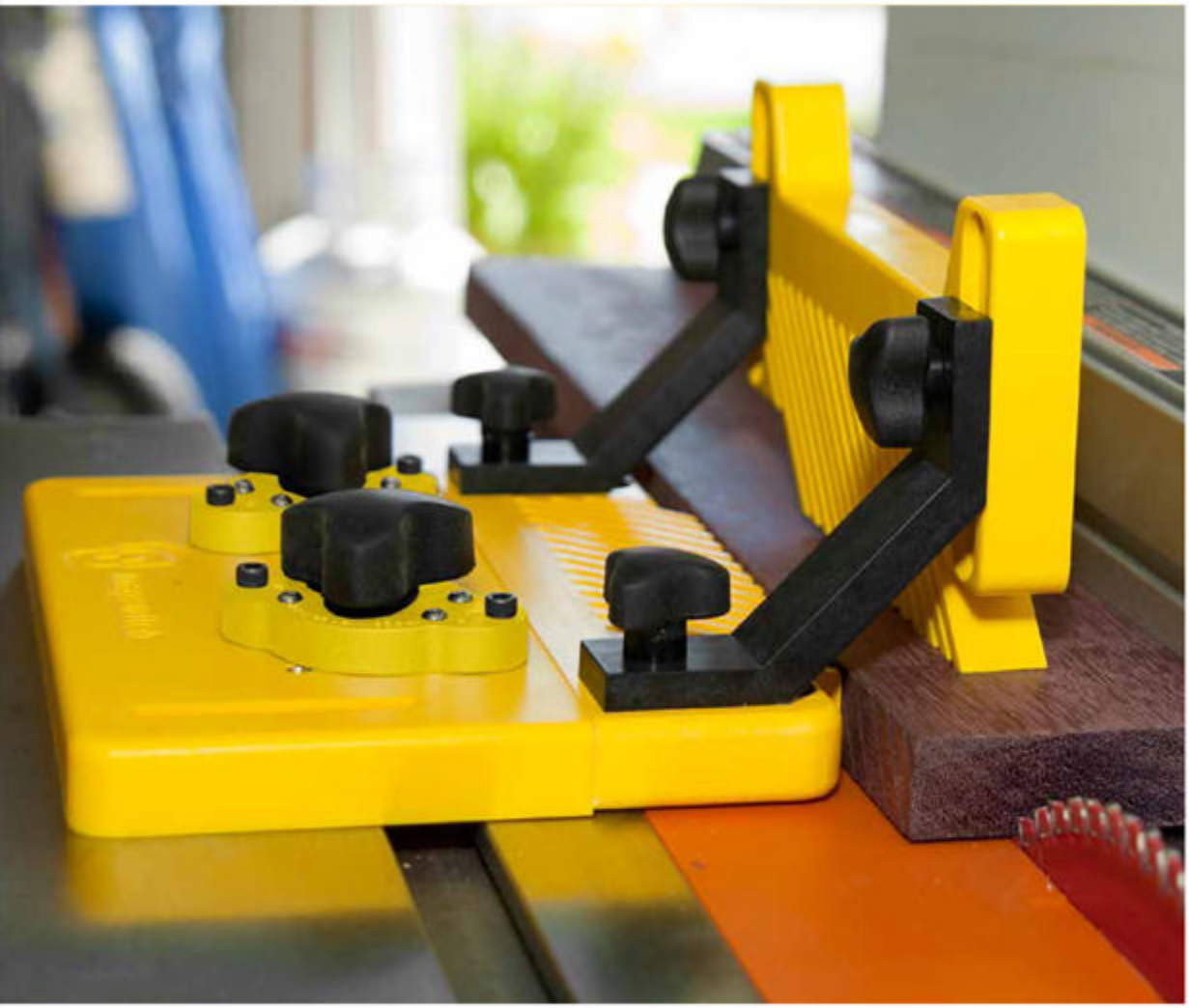
Contents: Projects

Contents: Tools & Techniques

Departments

magswitch™

WORKHOLDING TOOLS



Prevent accidents before they happen- Keep fingers away from the saw blade!

INVALUABLE TOOLS FOR ANY WOODWORKER

safety™

Versatility
A simple half-turn locks the tool into place with unprecedented holding power. Never again will you be limited to slots or tracks.

Safety
Avoid saw-related accidents before they happen - Reduce kickback and keep your fingers out of harms way.

Control
Easy and precise positioning - Better control of your work piece allows for a higher quality cut.

+1 303 468 0662 PHONE

magswitch.com.au

The "Official" Passing of the Broom

For the past eight years, I've plied my passion for woodworking and journalism serving as the editor of *Woodcraft Magazine*–a job I have truly loved. During this time, my talented staff and I have watched the publication grow and prosper while many other woodworking publications struggled. Some even disappeared. Having worked in this unique career for 35 years, creating stories of all sorts and countless piles of sawdust, I've decided that it's time to pass on the shop broom to an extremely well-qualified and seasoned editor, Tim Snyder.

Tim, I know, will dedicate himself to your woodworking interests every working day (and many weekends as well). He comes to the magazine with a long and varied history that combines publishing with a penchant for good craftsmanship. He's coauthored two *New Yankee Workshop* books with Norm Abram and served as the editor of *American Woodworker* and *Fine Homebuilding* magazines. He's also done a great deal of writing for different websites devoted to home improvement, energy efficiency, and sustainability. Between writing assignments, Tim has worked as a professional finish carpenter and undertaken major home renovation projects with his wife, Barbara.

I'll continue to serve as the editor through issue 66–our planned home workshop issue–but after that, the new master and commander will officially grip the helm. Currently, Tim is overhauling the magazine's website, making it a top go-to woodworking source. Me ... I plan to slow down a little–a day or two–and then pursue yet a few more woodworking goals. In any case, I'd like to thank my bosses at Woodcraft for their incredible support, my staff members for their unwavering dedication, and you, our readers, for your belief in *Woodcraft Magazine*.

Let's together welcome Tim and wish him the very best of luck.

Photo: Larry Hamel-Lambert

WOODCRAFT magazine

June/July 2015
Volume 11, Issue 65

Editor In Chief	Jim Harrold
Deputy Editor	Tim Snyder
Senior Editors	Paul Anthony
	Joe Hurst-Wajszczuk
Art Director	Chad McClung
Graphic Designer	Shayne Hiles

Copy Editor, Proofreader
Sharon Hambrick

Contributing Consultants/ Craftsmen/Project Designers
Kyle Camp, Nick Cook, Marlen Kemmet, Larry Osborn, Andy Rae, Robert J. Settich, Tom Whalley

Publisher	Gary Lombard
Advertising Sales Manager	Vic Lombard
Circulation Support	Kim McLaughlin
Advertising/Administrative Coordinator	Kiah Harpool

Circulation
Circulation Specialists, Inc.

Subscriptions
U.S. and Canada, $19.97 for one year
Single copy, $6.99
customer_service@woodcraftmagazine.com
(800) 542-9125

Contact Us
Woodcraft Magazine
4420 Emerson Avenue, Suite A
P.O. Box 7020
Parkersburg, WV 26102-7020
(800) 542-9125 Fax: (304) 420-9840
Email: *editor@woodcraftmagazine.com*
Online: *woodcraftmagazine.com*

Woodcraft Magazine (ISSN: 1553.2461, USPS 024-953) is published in January, March, May, July, September and November and printed in the United States by Woodcraft Supply, LLC, 4420 Emerson Ave., Suite A, Parkersburg, WV 26104. Tel: (304) 485-2647. Periodical Postage paid at Parkersburg, WV, and at additional mailing offices. POSTMASTER: Send address changes to *Woodcraft Magazine*, P.O. Box 7020, Parkersburg, WV 26102-7020. Canada Post: Publications Mail Agreement #40612608
Canada Returns to be sent to Pitney Bowes, P.O. Box 25542, London, ON N6C 6B2

Printed in the USA

Safety First! Working wood can be dangerous. Always make shop safety your first priority by reading and following the recommendations of your machine owner's manuals, using appropriate guards and safety devices, and maintaining all your tools properly. Use adequate sight and hearing protection. Please note that for purposes of illustrative clarity, guards and other safety devices may be removed from tools shown in photographs and illustrations in this publication.

What's More Precious Than Silver or Gold?

BRIWAX
METAL
& Multi-Surface Restorer!

For All of Your Projects that Need Restoration!

Most Precious Antiques

Treasured Acrylics

Heirloom Silverware

Finest Jewelry

Antique Copper

Glass & Brass

BEFORE... AFTER!
The Difference Will Truly Amaze You!

Fiberglass & Chrome

Metal Polishes & Multi-Surface Restorers
Restores, cleans and polishes most all surfaces. **The Gold Standard Liquid Polish** contains a finer grade of jeweler's rouge and is safe even for your finest jewelry and plated metals.

For Best Result with These Polishes...

Ultra-Magic Microfiber Detailing Cloth is the highest quality available.

BRIWAX
From the Makers of

For the Quality-Conscious Craftsmen & Do-It-Yourselfers!

Also the Finest Antique Restoration Wax in the World!

To Order or Find a Retailer:
Briwax International, Inc.
1-800-5BRIWAX

For More Information:
BRIWAX.com

Available ONLY Through
Fine Woodworking Distributors & Exclusive Retailers

At home in the Morris chair

Bob and Julie Beanblossom, winners of Woodcraft Magazine's "$10,000 Blockbuster Sweepstakes," show off the grand prize in their Eagle Point, Oregon, home. The JD Lohr Morris chair and matching ottoman are a nice fit for the couple's Arts & Crafts furniture interests. Big congrats, Bob and Julie.
—*The staff at* Woodcraft Magazine

A little clarity on the Cobra

Our efforts in the April/May 2015 issue to describe Oneida's Dust Cobra–a hybrid shop vac/dust collector–left some readers with a few questions. Hopefully, these facts will help clear the air: The pint-sized cyclone provides a max suction of 70" of static pressure, twice the suction of premium dust extractors. The Cobra's max CFM is 245; in comparison, the CFM ratings of 1-2 HP dust collectors range from 650-1,250. The Cobra's total height, with the dolly and 17-gallon drum, is 56".

Specs aside, the Cobra is an interesting double-duty solution for woodworkers needing a vac and a dust collector. If you plan on keeping the Cobra close to a jointer or planer, consider stepping up to the 35-gallon drum.
—*Joe Hurst-Wajszczuk, Senior Editor*

Morris chair photo: Joe Essin

After 30 years in the travel industry, it was time to move on. So, I turned my passion for woodworking into a second career.

In Texas, you either go big or you go home. And Mike is living proof. After 30 years in the travel industry, he took a swing at improving his golf game. But when that didn't go as planned, he turned all his attention to his other love – woodworking. An energetic entrepreneur, Mike quickly realized he could turn his hobby into a second career. So when he saw franchise opportunities with Woodcraft, one of the most trusted names in woodworking, he knew he was about to carve out a whole new future for himself. No wonder. From demographic research for a store location to a detailed operations manual coupled with ongoing technical and marketing support, Woodcraft provides a complete franchise system backed by the most recognized brand in the industry. If you talked to him, Mike would tell you that thanks to Woodcraft and a lot of seven-day weeks owning and operating *six* Woodcraft stores, he is truly living his dream. Which makes you stop and think, when are you going to start living yours?

Mike Sauder
Multiple Woodcraft Store Owner
Texas

WOODCRAFT®
RETAIL / FRANCHISE DEVELOPMENT GROUP

FOR FRANCHISE INFORMATION, CALL
1.855.923.7326

www.woodcraftfranchise.com

P.O. Box 245, Parkersburg, WV 26102

F15WD07P

They're everywhere... or should be

I just opened the latest *Woodcraft Magazine* [April/May 2015 issue], and, to my surprise, saw a Little Free Library (LFL) like the one I recently made for Bardstown, Kentucky (left). I built my LFL using reclaimed materials. The crowning piece is the slate roof made from a chalkboard I salvaged from a local elementary school.

The Neighborhood Library Builders Guild is a great organization, and I love the LFL idea. Thanks for spreading the word to your readers. Hopefully, more such libraries will be built.
—Fred Hagan,
Bardstown, Kentucky

A couple of months ago I built the library (above) for a friend. I hope you enjoy seeing it. I got the placard at *littlefreelibrary.org.*
—Mike Marcus,
Sarasota, New York

www.woodcraftmagazine.com

RE-LAUNCH

- Tool & product features
- Free articles & downloads
- Videos, blogs & woodworking adventures
- Special offers on plans, tools, supplies & more
- Tips from Tommy Mac & Scott Phillips
- Projects, techniques & expert advice

Coming in JULY!

WOODCRAFT® magazine

Sweet Little Shaver

WoodRiver No. 1 Bench Hand Plane V3

This pint-sized plane is patterned after the Stanley No. 1, the smallest (and hardest to find) bench plane made by the Stanley Tool Works in the 70 years prior to World War II. Considerable debate exists about its original intended use, but I've discovered that this little shaver can serve as a handy problem solver for all sorts of small scale projects. At 5¾" long and 1½" wide, the 1.3-pound flyweight fits into tight places that larger planes can't.

While some woodworkers are likely to purchase this plane simply to complete their Stanley lineup, it is more than just a collector's item. Like WoodRiver's other V3 planes, this one sports a crack-resistant ductile iron casting, a nicely machined body and frog, a bubinga knob and tote, a brass blade-adjustment knob, and a high-carbon steel blade. Give the blade a quick honing, and this plane is ready to start shaving.

#159005, **$119.99**
Tester: Kent Harpool

Featured products available from Woodcraft Supply unless otherwise noted.

K.I.S.S. Finishes

Doctor's Woodshop Finishes

Considering that finish formulas rank among the most closely-guarded secrets in the woodworking industry, a line of finishes made of nothing other than walnut oil, wax, and shellac sounds almost too good to be true. To see if less is best, I tested the entire line of Doctor's Woodshop Finishes on a set of turned bowls and was pleasantly surprised to discover that the products deliver as promised.

The various blends offer a range of sheens and protection. Doctor's Walnut Finishing Oil works as both a low-luster finish and sanding lubricant. Adding a few drops while sanding speeds up the finishing process. The Microcrystal Wax Bowl Finish (a combination of walnut oil and wax) creates more sheen yet and offers protection against fingerprints. For a general purpose finish, I recommend the High Build Friction Polish. This drier-free finish sets up as quickly as other friction polishes, and imparts a nice shine with good depth after just three coats. Pens Plus (a blend of walnut oil, shellac, and wax) produces a slightly higher sheen than the High Build and seems more resistant to fingerprints. However, because it requires a little more work to achieve an even sheen, I'd save it for smaller-scale projects.

I look forward to using these products on future projects–not just because of their performance, but because the solvent- and petroleum-free formulations mean that I don't need to take extreme safety precautions. As a premium, after using the oil and bowl finishes, my hands felt as if I had treated them to some pricey hand cream.

#847674, Walnut Finishing Oil, **$13.99**
#855500, Microcrystal Wax Bowl Finish, **$13.99**
#843051, High Build Friction Polish, **$19.99**
#855499, Pens Plus, **$20.99**
Tester: Mike Kehs

WoodRiver photo: Bob Etter; Doctor's Woodshop photo: Paul Anthony

"In the Bag" Clamping

WoodRiver Vacuum Pump Kit

Clamping cauls and veneer presses certainly have their place in the shop, but when you get serious about laminating or veneering curved forms, you'll want to consider stepping up to a vacuum press. Clamp-ups don't get much easier: just slide the project into the bag and turn on the pump. As the air inside gets sucked out, the air outside presses down and molds the bag tightly around the project. Unlike standard caul-clamping, the vacuum distributes pressure evenly across the entire surface, so you're less likely to wind up with a bubble under the veneer or lamination.

This WoodRiver starter kit comes with a 2 × 2' vacuum bag and a pump. (Larger bags are optional.) To use, slide your project into the bag, zip it closed, and then attach the bag to the pump using the supplied polyurethane hose. (An in-line filter prevents sucking dust and debris into the pump.) Next, turn on the pump, and allow the glue to cure under clamping pressure for about three hours before removing the project from the bag.

The continuous-operation 1/8 HP pump is small enough to sit on the bench. The bag features a full-width open end for easy access in and out of the bag and a zipper closure as a seal. Five spring clamps are included to help fold the bag to a smaller size to suit the project.

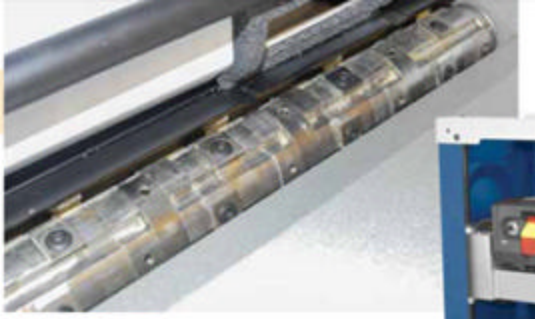
#159773, **$299.99**
#412372 54 × 85" 20 mil Vinyl Bag with Zip Closure, **$134.99**
Tester: George Snyder

Featured products available from Woodcraft Supply unless otherwise noted.

Photo: Manufacturer

Smooth Operator

Rikon 25-130H 13" Portable Planer with Helical Cutterhead



Compared to standard straight-knife cutterheads whose knives hammer stock two or three times per revolution, the short, segmented cutters on a helical cutterhead are in almost constant contact with the wood. These easily replaceable "insert cutters" take slightly smaller bites than standard blades, but because each works in concert with adjacent cutters, they can thickness stock with less noise and reduced tear-out.

Now, Rikon has incorporated a helical head into a fully-functional 15-amp planer for about $200 more than the price of a high-end segmented cutterhead upgrade. The 25-130H employs 26 two-sided high-speed steel cutters arranged in an alternating pattern that produces a helical-style cutting action.

The high-speed steel (HSS) cutters should last as long as standard knives. And when you get a nick, simply rotate the offending inserts to expose fresh edges, and you're back in business. (For longer planing life without the hassle of rotating and/or replacing inserts, consider stepping up to carbide. According to the manufacturer, it lasts four times longer than HSS.)

#863179, **$649.99**
#160868, **$59.99** 2-Edge HSS Replacement inserts (pack of 10)
#160689, **$99.99** 2-Edge Carbide Replacement inserts (pack of 10)
Tester: Andrew Bondi

Featured products available from Woodcraft Supply unless otherwise noted.

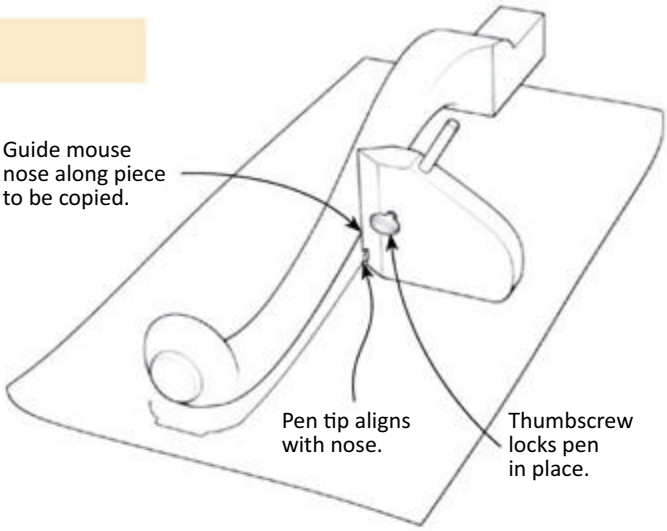
Photos: Manufacturer

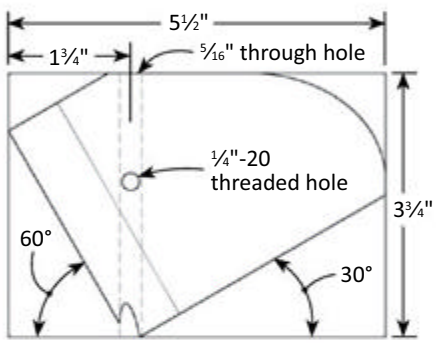
TOP TIP

Tracing Mouse

In my furniture restoration work, I often have to reproduce missing or broken parts, tracing their shapes from the originals. Tracing around flat work is easy, but sculptural parts like cabriole legs present a problem that I solved by devising this tracing "mouse." To make one, start with a 1 × 4 × 5½" hardwood block. Next, drill a 5/16"-diameter hole through the block to fit a commonly available straight-sided ballpoint pen. Center the hole across the thickness, about 1¾" back from one end. Then make the profile cuts as shown in the drawing. Next, use a disc sander to form a 60° point on the nose–tweaking and sanding until the point aligns with the tip of the inserted pen. Then sand a comfortable radius for a hand on the opposite end of the block. Finally, tap a ¼"- 20 hole in the middle of the body, and install a thumbscrew to secure the pen. To use the mouse, push the pen down until it contacts the paper, lock the thumbscrew, butt the knife-edge against the part, and trace your pattern.

—Craig Bentzley, Chalfont, Pennsylvania





Share a Slick Tip. Win Cash or a Prize!

Here's your chance to help someone become a better woodworker and get rewarded for the effort. The winner of next issue's **Top Tip** award will receive a **Woodcraft Gift Card worth $250**. All others will receive **$125** for a published illustrated tip, or **$75** for a non-illustrated tip. Published tips become the property of *Woodcraft Magazine*. Send your ideas to:

Tips & Tricks, *Woodcraft Magazine*, P.O. Box 7020, Parkersburg, WV 26102-7020 or visit *woodcraftmagazine.com*, and click on "Submit Tips." Important: Please include your phone number, as an editor may need to call you if your trick is considered for publication.

Illustrations: Christopher Mills

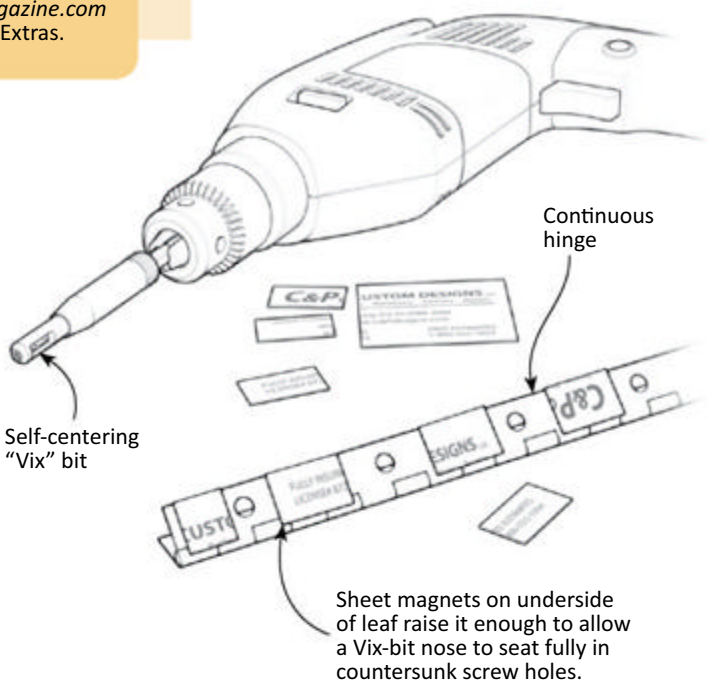
To see the **video** of this tip, visit *www.woodcraftmagazine.com* and click on Online Extras.

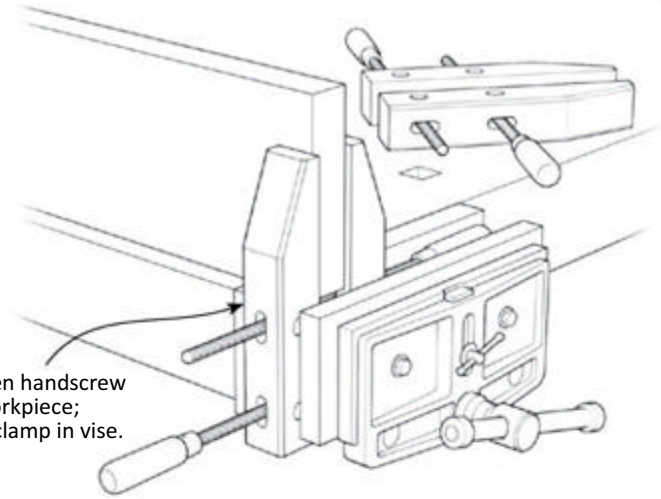
Piloting for Continuous Hinges

Self-centering drill bits (also called "Vix bits") are great for quick, accurate drilling of pilot holes for hinges. Unfortunately, they don't work very well for continuous ("piano") hinges. That's because the leaves on continuous hinges are too thin to allow the beveled nose of the spring-loaded bit housing to fully seat in the countersunk hinge holes.

When faced with installing about 10 feet of continuous hinges for my tool cabinet doors, I came up with a great solution. I went to my refrigerator door and pulled off a couple of business card sheet magnets to use as risers. I knifed them into small pieces that I stuck on the underside of a hinge leaf between each pair of screw holes. After clamping the hinge to the cabinet, it was now raised enough to allow the nose of the bit housing to seat fully in each hinge hole. When done drilling the pilot holes for one hinge leaf, I switched the magnets to the next one. It really sped up the work and ensured perfect alignment of the hinges.

—Paul Anthony, senior editor





Handscrew vise helper

Sometimes you need to clamp a long board on edge on your benchtop. There are several ways to do this, but one of the easiest is to lock the board in a handscrew clamp held in a bench vise as shown. The most secure approach is to clamp the handscrew to the board before locking it in the vise.

—Frank Burnside, Miami, Florida

Picnic-Perfect Croquet Set

Turn the mallets and stakes; then build the bonus storage box.

Designed and built by Tom Whalley
Written by Marlen Kemmet

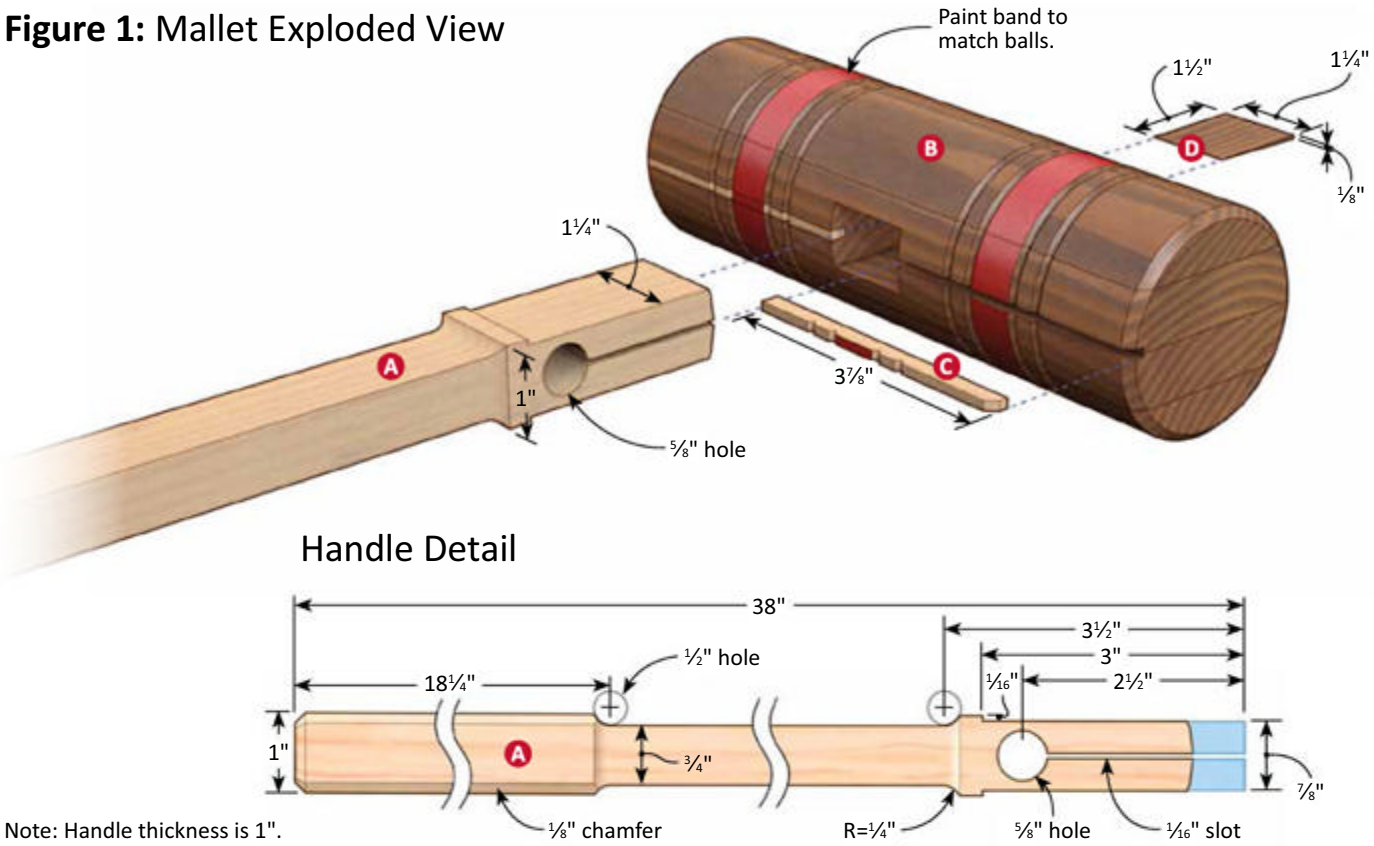
Overall dimensions: Mallet 2¾" dia. × 9"w × 37"l; Stake 1⅜" dia. × 18" long; Box 14⅝"w × 16"h × 47⅝"l

It's unclear if the lawn game paille-maille or pall mall, which evolved into croquet, originated in France or Ireland, or stemmed from related games dating back to Roman times. Regardless, in the 1860s, the game as we know it took England by storm and later spread overseas. Today, whether played for fun or competition, croquet has become a welcomed friends and family activity.

While mass-produced croquet sets are available, it's not likely you'll find a deluxe set on par with this one. Lathe-turned mallet heads, held fast to the handles with wedge-pin joinery, include alignment strips for aiming ball strikes. And, like the mallet heads, shaping the simple stakes serves as an exercise in duplicate turning. I did both using a roughing gouge and Easy Wood turning tools, which have carbide cutters that don't require sharpening. I purchased the hard plastic colored balls and metal wickets that complement the set from our **Convenience-PLUS Buying Guide** sources. And as a bonus, I offer plans for a croquet set storage box. Its handle and wheels let you cart the set around the yard or from a vehicle to the playing field.

Note: For the court setup and rules for nine-wicket croquet, go to croquetamerica.com/croquet/rules/ninewicket/index.php.

Figure 1: Mallet Exploded View



Note: Handle thickness is 1".

Start with the mallet handles

1 From milled ¾"-thick white ash, cut two 1½ × 38" pieces for each handle blank (A). The croquet set includes six mallets so we cut 12 pieces. Glue and clamp six sets of two pieces together face-to-face with the ends and edges flush. (You also can go with thicker stock and cut and plane it to the needed square size in **Step 2**.)

2 Square each handle blank lamination to 1¼", taking an equal amount from each surface to keep the joint line centered.

3 To create ¼" radii where shown on **Figure 1**, start by clamping two handles together, and mark centerlines for the ½" hole centerpoints down from the ends of the laminations. Using a Forstner bit at the drill press, drill the holes where marked, centering the point of the bit over the joint line. After drilling a hole, unclamp the handles (A), rotate them against each other, and drill another hole to create the next pair of mating radii, as shown in **Photo A**. Repeat until all eight radii on each handle have been drilled. Repeat for the remaining paired handle blanks.

Widen the resulting radius cuts below the shoulders at the scrollsaw to accommodate the bandsaw blade used in **Step 4**.

4 Make a simple right-angle carrier jig to fully support an entire handle (A) when sawing. (My jig measures 65" long with a centered 4"-long notch that is

With the paired handle blanks aligned and clamped in place, drill ½" holes to form the ¼" radii.

Opening photo: Larry Hamel-Lambert; Project photos: Caleb Rizzuti

Bandsaw between the radii on each handle edge by moving the jig and handle along the saw's fence to remove the waste.

⅛" shy of the vertical member.) Cut a notch on the outside edge of the jig's base (see **Photo B Inset**) to accommodate a ½" bandsaw blade. Now, place a handle blank in the jig, fitting the blade into a radius cut. With the bandsaw's fence adjusted and the jig against the fence, move the jig and handle to cut between the top and bottom radii, as shown in **Photo B** to form the ¾"-thick portion of the handle. This requires cutting all four edges of the handles in the same manner.

5 At the tablesaw, rip ⅛" off opposite surfaces for a handle (A) with a final thickness of 1" and width of 1¼". (See **Figure 1**.) Sand the handles smooth.

6 At the router table, cut a ⅛" chamfer along the four corners and around the top ends of the handles (A), where shown in the **Handle Detail** in **Figure 1**.

7 At the tablesaw, crosscut a 1/16"-deep kerf 3" from the bottom ends on two opposite surfaces of the handle bottoms, where shown in **Figure 1** to create shoulders for the mallet heads to seat against later (**Photo C**).

8 Set the fence, and then bandsaw a 1/16" centered slot 2¾" long into the bottom end of each handle (A) for housing the wedge (D) later.

9 Mark a pair of cutlines 1/16" in from the edges, adjust the fence, and then bandsaw the shoulders on the bottom ends (**Photo D**). Feed the stock slowly through the blade so as not to cut off the shoulder. The dimensions of the handle tenon at this point should measure ⅞ × 1¼ × 3" for a snug fit into the mallet head mortise later.

10 Using a ⅝" Forstner bit, drill a hole in the tenoned end of each handle (A), centered on the slot where shown in **Figure 1**. This allows you to flex the tenons slightly for fitting tightly into the mallet head's mortises. Finish-sand each handle, removing any saw marks.

Create the laminated mallet heads

1 Cut four pieces of ¾"-thick walnut (or two 1½"-thick pieces) to 3 × 10" for each mallet head blank (B). Measure the width of the handle tenons, and cut a pair of centered mating dadoes 7/16"-deep on two mating walnut pieces to fit snugly around a tenon (**Figure 1**). (The mallet heads in the set shown required 1¼"-wide dadoes in the mating pieces.) Now, clamp the head blank pieces for each mallet head together, and dry-fit the handle tenons in the mortises. Adjust if needed.

2 Glue and clamp the four pieces for each head blank

Use a miter gauge for support when cutting the kerfs on opposite surfaces of the bottom ends of the handles for the mallet heads to seat against.

Cut shoulders on the handle bottom, guiding off the fence and marked cutlines. Stop at the kerfs.

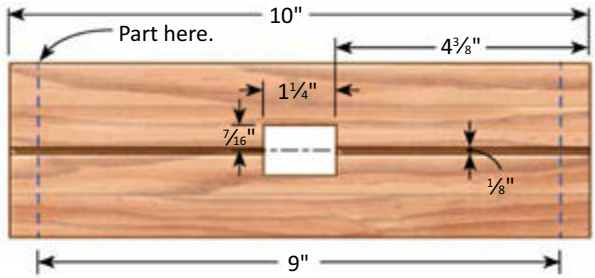
(B) together, making sure the dadoes align to receive the handle tenons. To keep the mortised edges flush, use a piece of wood to align the mortise edges. Remove any glue squeeze-out from the mortises.

3 Cut a ⅛" groove, ¼" deep, centered on the mortise and along the length of each head blank (B), where shown in **Figures 1** and **2**. Cut two pieces of maple to ⅛ × ¼ × 4⅜" for each head to fit into the grooves and serve as alignment strips (C). Glue the strips in place, flushing the inside ends with the mortise. Later, when attaching the handles (A), the strips in the mallet head should face up to help with aiming and striking the ball squarely.

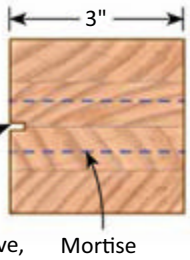
4 Mark the centers of the mallet head blanks (B/C), and mount a blank onto the lathe using a spur drive and live center. With the lathe running at 1,000 rpm, round a mallet head blank (B/C) with a roughing gouge, working the bevel back and forth along the tool rest. Maintain even light cuts, being careful to not catch the tool's cutting edge on the mortise. Finish-turn to 2¾" diameter (**Photo E**). (Here, I switched to an Easy Wood Rougher for a smooth, sandable cylinder.)

Figure 2: Mallet Head Details

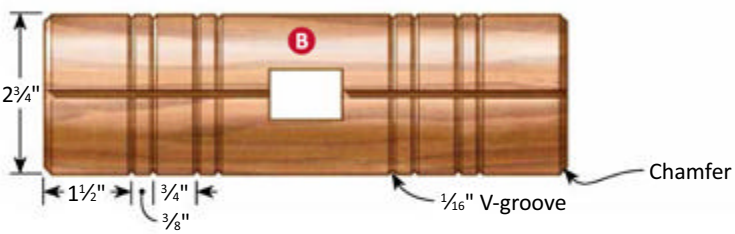
Mallet Head Blank Top View



Head Blank End View



Mallet Head with V-Grooves



5 Referencing **Figure 2**, make a cardboard storyboard, and mark on it the locations for the V-grooves and parting cuts on the mallet head (B/C). This ensures that the mallet heads will be alike. Now, turn the V-grooves in the head (**Photo F**). We used the Easy Tool Detailer with its V-shaped carbide cutter.

6 Using a parting tool, start cuts to eventually take ½" off both ends of the mallet head (B/C), where previously marked. Turn a slight chamfer on the ends of the head.

7 Finish-sand the mallet head (B/C) through 150 grit. Buy six small containers of outdoor acrylic paints that match the colors of the six croquet balls. (I purchased two-ounce bottles at a local crafts store.) Use a stiff bristle brush and one of the colors to carefully paint two stripes on the mallet head. If paint gets in the grooves, sand them with a bit of folded sandpaper to remove it. Let dry.

8 At 1,500 rpm, use a parting tool to turn both ends of the mallet head (B/C) to the 9" finished


E

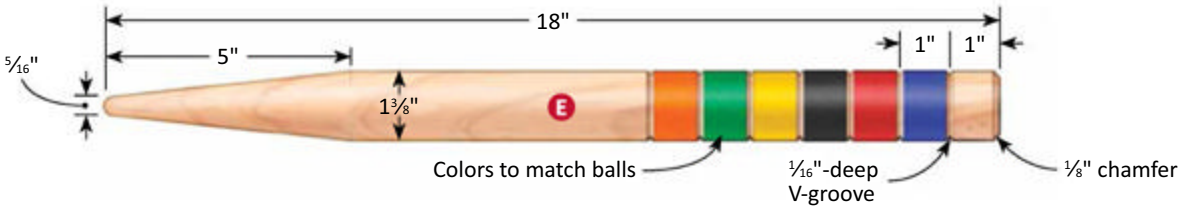
With the tool rest parallel to the cylinder, guide off your index finger to keep the cutter at the same depth while reducing the diameter.


F

Press the V-shaped cutter straight into the mallet head to cut 1/16" deep and back it straight out.

Illustrations: John Hartman

Figure 3: Stake Detail



length until the tenon at each end of the head measures ½" in diameter. Stop the lathe and finish the parting cuts with a handsaw. Repeat steps 4-9 to complete the remaining five mallet heads, using a different color for each.

Join the handles to the heads

1 Fit the tenoned end of each handle (A) through a colored head (B/C), and mark the extended portion of the tenon. Mark and trim the waste at the bandsaw, making the handle end replicate the curvature of the mallet head.

2 Cut the walnut wedge blank (D) to the size in the **Cut List**. Shape each individual wedge, as shown in **Figure 1** at the bandsaw and sander.

3 Apply exterior glue to all four sides of the bottom end of a handle. (I used Titebond III.) Insert the handle into the mallet head until the shoulder of the handle makes contact with the head.

4 Apply glue to the walnut wedge, and insert it into the split bottom end of the handle. Use a small hammer to tap the wedge firmly into place. Allow the glue to dry, and saw off the excess. Sand the handle and wedge flush with curvature of the head.

5 Apply an exterior-grade finish to the handles and heads. (I applied three coats of Spar Urethane, sanding lightly with 320-grit sandpaper between coats.)

Turn the stakes

1 Cut four pieces of ¾"-thick white ash to 1½" wide by 20" long for the two stake blanks (E). Glue and clamp two pieces together face-to-face with the ends and edges flush for each stake blank. If you have thicker 6/4 (1½") stock, use it to save time.

2 Mark diagonal lines on the ends of the stake blanks to find the centers. Mount a blank onto the lathe using a spur drive and live center. (Transferring the dimensions to a cardboard storyboard can ensure accuracy here as well.)

3 Round the stake blank using a roughing gouge, and finish-turn it to 1⅜" diameter. Referencing **Figure 4**, mark the V-grooves and turn them to shape. Turn a ⅛" chamfer at the top end of the stake. Finally, mark and turn the tapered end. Sand the stake smooth, and paint between the grooves. Remove the stake from the lathe, and repeat for the second stake. Add an exterior finish to the stakes.

Build the mobile storage box

1 From ¾" plywood (I used Baltic birch), cut the box front end (F), back end (G), and sides (H) to size. Cut a ¾" rabbet ⅜" deep along the bottom inside edge of (F), (G), and (H) to house the box bottom (I) later, where shown on **Figures 4** and **5**. Cut the same size rabbets along the ends of each side piece. Cut a ¾" groove ⅛" deep ⅞" from the top edge of the two side pieces.

2 Drill the countersunk screw holes in the end pieces (F, G), where shown in **Figure 5**.

3 Dry-clamp the plywood pieces to check the fit, and then glue the ends (F, G) to both side pieces (H), as shown in **Photo G**, checking for alignment of the pieces along the bottom rabbeted edge. Elevate the box on blocks to provide clearance for the clamps. Later, remove the clamps, and sand the box smooth.

4 Measure the rabbeted opening, and cut the box bottom (I) to fit. Mark the locations for the pair of dadoes on the inside face of the bottom, where shown in **Figure 4**. Cut the dadoes where marked.

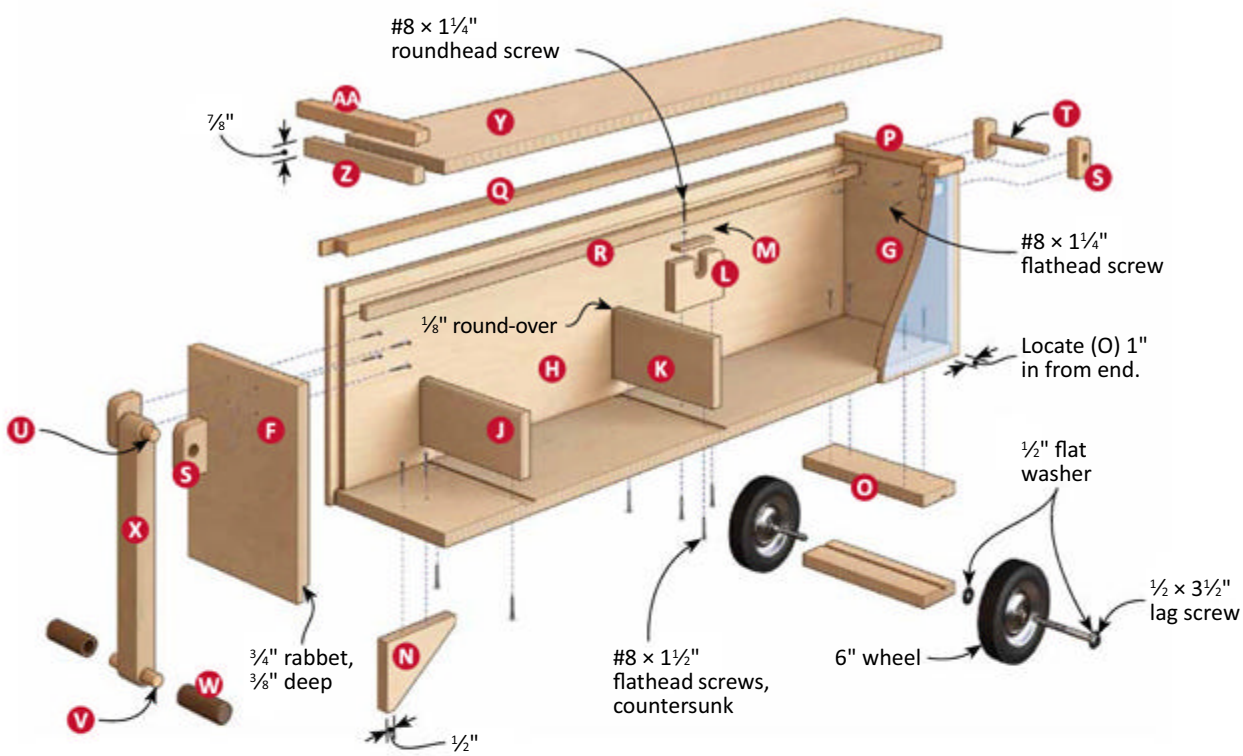
5 Mark the locations and drill the 12 countersunk screw holes through the bottom face of the bottom (I). Be sure to center the four holes drilled in the dadoes.

6 From ¾" plywood, cut the ball divider (J), mallets support (K), and wickets support (L) to size. Mark the location and cut the slot in the wickets support. Rout a ⅛" round-over along the top

Tip Alert

Before cutting the rabbets and dadoes in the box parts, measure the exact thickness of the plywood you'll be using. Adjust the width of the rabbets and dadoes to snugly fit the mating plywood pieces.

Figure 4: Box Exploded View



edges of the ball divider, mallets support, and wickets support. Glue the mallets support to the wickets support with the bottom edges offset ⅛", allowing for the mallets support to seat in the ⅛" dado. Now, screw the parts to the inside face of the box bottom (I), centering them between the bottom's edges.

7 Cut the wickets lock (M) to size. Drill a pivot hole through it, and drill a mating hole into the top edge of the wicket support (L). Screw the piece in place.

8 Cut the box front support (N) to shape, and screw it to the box bottom.

9 Cut the two pieces making up the wheels support (O) to size. Cut a ⅜" groove, 3/16" deep, 1⅞" from one edge of each piece, where shown in **Figure 5**, for creating a starting channel for the lag screw pilot holes. Glue and clamp the pieces together face-to-face, aligning the grooves.

10 Drill a 27/64" hole, 3" deep, centered in each end of the channel of the support (O). Using a socket set, tap the holes with a ½" lag screw, as shown in **Photo H**.

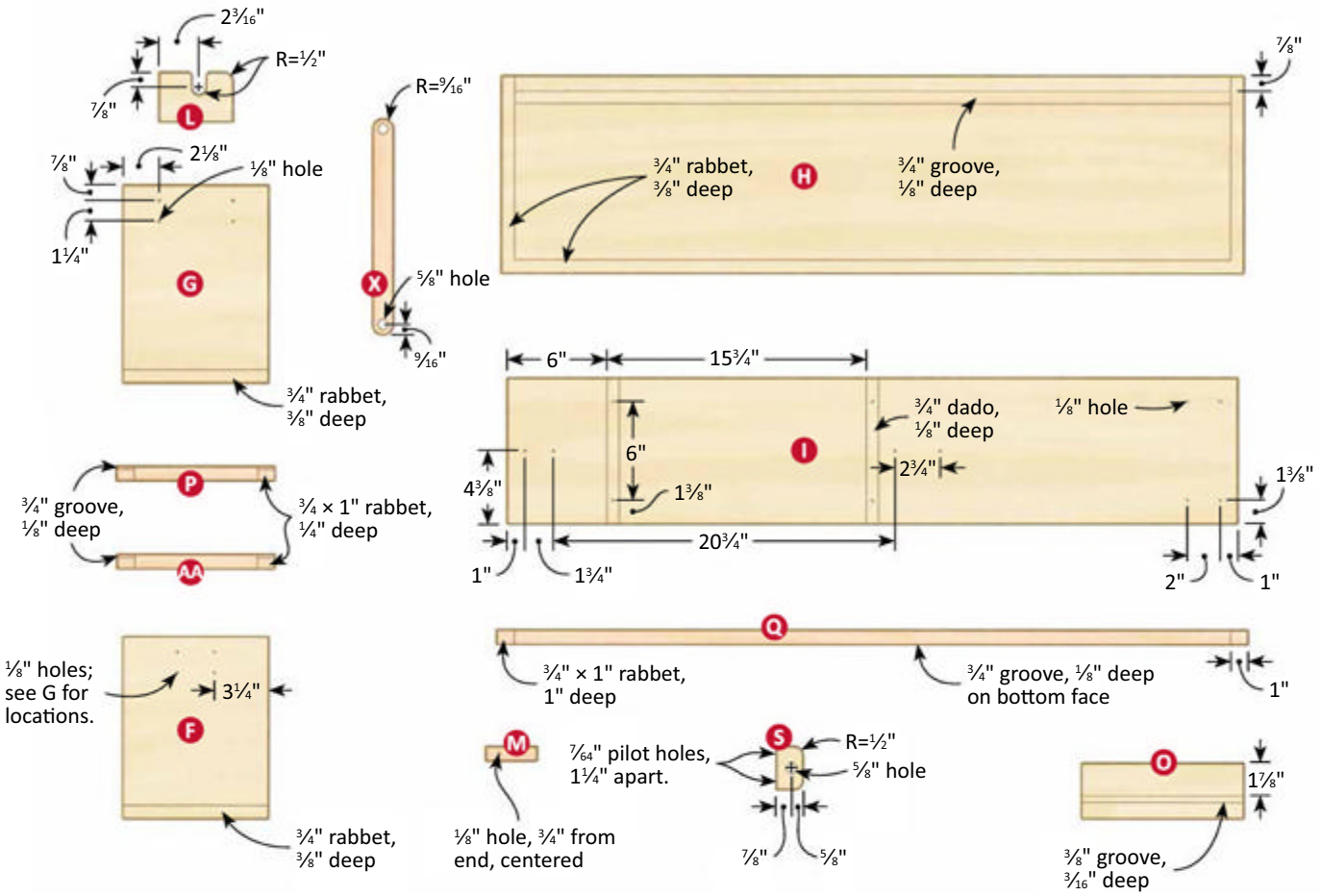
11 Center, glue, and screw the laminated wheel support (O) to the box bottom 1" from the end.

12 Finish-sand and apply finish to the assemblies (F–O). Do not apply finish to the edges of box bottom (I). Glue and clamp the bottom assembly into the rabbeted opening in the box assembly (F/G/H), as shown in **Photo I**.

Clamp square angle braces in the box corners when gluing and assembling the box ends and sides.

Figure 5: Box Parts Detail

Note: See the **Cut List** for overall dimensions.



13 Cut the end trim (P) and side trim (Q) to size from ¾" maple. Cut a ¾" groove, ⅛" deep, centered along the bottom side of the trim pieces so they fit snugly onto the plywood back end (G) and sides (H). Notch the trim pieces where shown in **Figures 4** and **5**.

14 Glue and clamp the trim pieces (P, Q) to the box top.

15 Cut the two top track pieces (R) to size. Sand them smooth, and glue them in place. Apply finish where needed.

Tap the holes in the laminated support for the lag screws that will hold the wheels in place.

Apply glue, and then fit the box bottom assembly into the rabbeted opening in the box. Clamp the assembly all around for a good bond.

Add the box handles and top

1 Referring to **Figure 5**, mark the outline of four handle brackets (S) on a piece of ¾" stock 1½" wide. Mark a center point on each piece, and drill a ⅝" hole where marked. Cut the four brackets to shape.

2 Cut the back handle (T), pivot pin (U), and handle connector (V) to length from ⅝" dowel stock. Cut the handle ends (W) to length from 1" dowel stock.

3 Drill a ⅝" hole, 1⅛" deep, centered in one end of each handle (W). To do this, I used a handscrew to secure the pieces vertically and then drilled the centered holes.

4 Laminate two pieces of ¾" maple. From this lamination, cut the arm (X) to size. Radius the ends, and then drill the ⅝" holes (**Figure 5**).

5 Sand the parts smooth and finish. Assemble the handle assemblies (S-X) in the configuration shown (**Figure 4**). Screw the handle brackets to the box ends (F, G).

6 Cut the plywood top (Y) to slide smoothly in the box top grooves.

7 Cut the top end (Z) and handle top trim (AA) to size. With the top (Y) inserted into the box, fit, clamp and glue (Z) and (AA) in place. Remove the lid assembly, and then sand and finish it. ■

About the Project Team

With more than 70 combined years of woodworking, Iowans Tom Whalley and Marlen Kemmet serve as frequent contributors to *Woodcraft Magazine*. They collaborate on the designing, building, and writing of each magazine assignment.

Croquet Set Cut List

	Part	Thickness	Width	Length	Qty.	Mat'l
A*	Handle blanks	1½"	1½"	38"	6	LA
B*	Mallet head blanks	3"	3"	10"	6	LW
C*	Alignment strips	⅛"	¼"	4⅜"	12	M
D*	Wedge blank	⅛"	1¼"	12"	1	W
E*	Stake blanks	1½"	1½"	20"	2	LA
Storage Box Cut List						
F	Front end	¾"	10 15/16"	8¾"	1	BP
G	Back end	¾"	11⅞"	8¾"	1	BP
H	Sides	¾"	11⅞"	45"	2	BP
I	Bottom	¾"	8¾"	44¼"	1	BP
J	Ball divider	¾"	3⅝"	8"	1	M
K	Mallets support	¾"	4⅛"	8"	1	M
L	Wickets support	¾"	2⅞"	4⅜"	1	M
M	Wickets lock	¼"	¾"	3"	1	M
N	Box front support	¾"	3¾"	5"	1	M
O	Wheel support	1½"	3¼"	9¾"	1	M
P	End trim	¾"	1¼"	9½"	1	M
Q	Side trim	¾"	1¼"	45½"	2	M
R	Top tracks	¾"	½"	43½"	2	M
S	Handle brackets	¾"	1½"	2½"	4	M
T	Back handle	⅝" dia.	dowel	5¼"	1	M
U	Pivot pin	⅝" dia.	dowel	3"	1	M
V	Handle connector	⅝" dia.	dowel	3½"	1	M
W	Handle ends	1" dia.	dowel	3"	2	W
X	Arm	1⅛"	1½"	13"	1	LM
Y	Top	¾"	7⅞"	43⅜"	1	BP
Z	Top end	¾"	⅞"	8¾"	1	M
AA	Handle top trim	¾"	1¼"	9 7/16"	1	M

* Indicates parts that are initially cut oversized. See instructions.

Materials: LA=Laminated Ash, LW=Laminated Walnut, M=Maple, W=Walnut, BP=Birch Plywood, LM=Laminated Maple

Hardware/Supplies: (2) 1½ × 6"-diameter steel wheels; (2) ½" lag screws 3½" long; (4) ½" flat washers; (8) #8 × 1¼" flathead wood screws; (12) #8 × 1½" flathead wood screws; (1) #8 × 1¼" roundhead wood screw; exterior acrylic craft paints to match colors of balls (2 oz. bottles).

Convenience-*PLUS* BUYING GUIDE

☐ 1.	Easy Wood Tools Easy Rougher, Mini (16")	#845506	$89.99
☐ 2.	Easy Wood Tools Easy Finisher, Mini (16")	#845746	$89.99
☐ 3.	Easy Wood Tools Easy Detailer, Mini (16")	#150886	$89.99
Above items are available at Woodcraft stores, *woodcraft.com* or by calling (800) 225-1153. Prices subject to change without notice.			
☐ 4.	Oakley Woods Croquet Regulation Size Balls	B001MQ2STW	$84.95
Above item is available at *Amazon.com*. Price subject to change without notice.			
☐ 5.	Broken Arrow Leather Croquet Wickets, (9) galvanized wire set		$19.99
Above item is available at *brokenarrowleather.com/croquet*. Price subject to change without notice.			

Making Good with Salvaged Wood

Give new life to old boards, and reap the rewards.

By Tim Snyder

From beams to boards to beautiful furniture. After harvesting large timbers from our industrial "forests," reclaimed lumber specialists transform old beams into stock that's suitable for fine furniture–like the heart pine cabinet shown here.

Today, more and more woodworkers are interested in using salvaged wood. Some are building furniture that combines "reclaimed wood" with new material, while others complete entire projects using boards rescued from the dumpster. Even the high-end home furnishing catalogs tout this trend, showing off expensive wooden tables with nail holes, rust stains, and old paint as prominent features.

While the general public sees salvaged wood as a design feature that adds character and green value, woodworkers have more practical concerns–like how to deal with hidden nails, moisture content, lead paint, workability, and (last but not least) cost. That's right: We actually have to find reliable sources for salvaged wood, select the material we want to use, and hope that our finished projects justify the extra time and trouble involved. The information ahead will explain how different woodworkers have met these challenges successfully. You'll also find more about salvaged wood on our website, *woodcraftmagazine.com.*

Can old wood be "greener" than lumber from a freshly felled log?

You bet. Our growing environmental prudence continues to spur the development of "green" products, including eco-friendly, low-VOC (volatile organic compound) finishes that woodworkers use every day. Many of us place a high value on "sustainably sourced" wood that comes from well-managed forests. But salvaged wood is even more ecologically responsible. "Embodied energy" factors (and carbon emissions) associated with salvaged wood are very low because you don't have to harvest the tree, transport it to the mill, process logs into lumber, and ship the product across the country. Just as importantly, reclaiming lumber from the waste stream lightens the load on landfills.

For woodworkers, the benefits of using salvaged wood go beyond green value. If you love wood, the universe of salvaged lumber is worth exploring because you'll come across material that isn't available at a typical sawmill or lumber dealer. Quality varies greatly, but this is where you'll find species like wormy chestnut, longleaf pine, and cypress, in dimensions that range from narrow moldings to 20"-wide floorboards. It's also worth noting that wood salvaged from older buildings may have come from old-growth timber, providing you with density, hardness, and tight grain characteristics that are difficult or impossible to find in new lumber (see photo, above).

Which 2x6 do you want to use? New framing lumber isn't normally considered suitable for making fine furniture. But salvaged structural lumber like the Douglas fir 2x6 shown here can yield high-quality wood. Rescued from a demolished porch, the old board shows off the clear grain and dense growth ring pattern of old-growth timber.

Profile: Appalachian Woods • Stuarts Draft, Virginia • *appalachianwoods.com*

Old wood of all kinds

A family-owned business that began in 1976, Appalachian Woods is a major supplier of antique lumber in many forms. The company's selection of salvaged beams, flooring, and barn siding comes from a large network of deconstruction contractors. Appalachian Woods sometimes sells old beams and other large-dimension lumber to timber-frame builders. But most often, they resaw this material into 4/4 lumber that can be milled into flooring or sold to furnituremakers. Kiln drying is another available service. When time allows, the shop crew makes farmhouse tables and benches from wormy chestnut and heart pine–two antique wood specialties.

Because small orders can be difficult to fill, owner Raymond Hochstetler recommends that local woodworkers put together a group purchase. "We'd prefer not to cut reclaimed lumber to set lengths and widths," he says. "We like customers to tell us what they want to build–like a table or cabinet, for example. Let us know what species you want and give us an idea about wood condition, too. We'll look through our stock and make sure you've got good material to work with."

A farm table with a top made from reclaimed pine has a patina and figure that you don't get from new wood.

2×6 photo: Larry Hamel-Lambert; Other photos this spread: Appalachian Woods

Sources for salvaged wood

- **Reclaimed lumber merchants.** These specialized lumber yards have the best supply of reclaimed lumber. Small-scale operations stock different types of reclaimed wood from local sources–like old floorboards and barn siding. Larger dealers (like Appalachian Woods, on page 33) are equipped to resaw large timbers, kiln-dry lumber, and do custom milling. They regularly produce limited runs of custom flooring and furniture-grade lumber for woodworkers to use.
- **Local remodeling contractors.** Tapping into a network of local building contractors can give you access to jobsite waste that may contain valuable old wood.
- **Building deconstruction specialists.** When old buildings get torn down, wrecking balls and bulldozers tend to turn old wood into splinters. But these days, deconstruction specialists often come in ahead of time to remove structural timbers, wood flooring, and architectural details. You'll be lucky to find a deconstruction company that sells direct to the general public. Most prefer to wholesale their salvage to reclaimed lumber merchants and architectural salvage stores.
- **Architectural salvage companies.** These businesses stock a wide range of reclaimed building materials, but don't expect a well-organized selection of reclaimed wood. Locate nearby outlets by typing "architectural salvage" and your location into your Internet browser. Since you can't count on finding what you need, it's smart to call first.
- **Habitat ReStore outlets.** There are over 800 Restores in the U.S. and over 70 in Canada. At any given outlet, you'll find a variety of salvaged materials. Old wood is not as common as other items like plumbing fixtures, doors, and cabinets. Go to *habitat.org/restores* to locate your nearest ReStore.

Salvaged wood PROS & CONS

Finding the right reclaimed lumber for a special project will depend on dimension requirements, wood species preferences, and the finished appearance you're aiming for. Cost is important, too, along with the amount of work required to make your salvaged lumber usable. The salvaged lumber types below are listed from least to most expensive. As you might expect, less-expensive types often have more significant disadvantages.

Jobsite waste

The dumpster or discard pile at a construction site can contain a large amount of new offcuts (plywood and framing lumber), which will have limited value for furniture and fine woodworking. But old framing, flooring, and trim can provide you with valuable material.
PROS: Free (if you know the right contractors) and local. If the wood has been indoors, it probably won't require kiln-drying.

Profile: Salem Board & Beam • Northampton, Massachusetts • *salemboard.com*

Using barn beams to build fine furniture

Before founding the Salem Board & Beam Co. in 1997, Ken Salem worked as an investment advisor. His passion for creating furniture from reclaimed lumber was awakened when he took a break from banking to help transform a 1705 farmhouse into a restaurant. "It may sound strange," Salem explains, "but when I put my hands on a timber that was last touched by a craftsman over 200 years ago, I feel a powerful connection to the woodworkers who came before me. Building furniture from this wood is my way of honoring the tradition as well as the challenges of fine craftsmanship."

"If I saw an old barn," Salem recalls, "I'd find the owner and ask if I could take it down in order to salvage some of the lumber." Salem even bought a portable bandsaw mill so that he could transform beams into boards. Many of Salem's pieces are made from salvaged chestnut, a species that vanished from the American landscape as a result of the chestnut

CONS: Availability depends on remodeling activity in your area and your relationship with local contractors. Quantity and quality can vary greatly. Disassembly and denailing required. Lead paint may be present on older material.

Pallet wood

These plentiful platforms have inspired many DIY projects.
PROS: Low or no cost. No lead paint or other finish to remove. Locally available. Nearly unlimited supply. Exotic wood from imported pallets is sometimes available.
CONS: Disassembly and denailing required. Boards are short, narrow, and usually no more than ¾" thick. Splits, nail holes, and oil stains are common.

Structural timbers

Most large-dimension stock comes from old barns, industrial buildings, and other structures. Douglas fir and longleaf pine (aka heart pine) are the two most common species in this category.
PROS: Best source for large-dimension stock.
CONS: Expensive and difficult to transport. Resawing is usually necessary. Kiln-drying may be necessary. Some reclaimed lumber dealers decline to fill small orders.

Doors, cabinetry and millwork

Architectural salvage outlets have an ample supply of these elements.
PROS: Items like old doors and antique wainscot paneling can yield straight, clear, high-quality lumber. Doors, molding, and paneling may be reusable with little or no alteration. You just size your project to fit these architectural artifacts.
CONS: High waste factor and added labor if you plan to cut usable lumber from doors or millwork. Lead paint is possible. Limited dimension choices can limit design options.

Sunken logs

A small number of companies specialize in milling lumber and flooring from "sinker" logs rescued from lake and river bottoms. The Goodwin Company (*heartpine.com*) has excellent historical and product information on this special category of salvaged wood.
PROS: Beautiful, premium-quality lumber is available. Custom-milling is sometimes possible, if you need special dimensions. Wood is kiln-dried and ready to work.
CONS: Limited availability. High delivered cost.

Expect imperfections. This selection of salvaged oak boards shows why extra stock preparation time is necessary when working with reclaimed lumber. Nail holes, old paint, cracks, and warping are common defects.

blight of the early 1900s.

If you're planning a project with reclaimed lumber, Salem recommends starting with an ample supply. "You don't want to be halfway through a project and realize that you're running out of suitable stock," he says. But there are also ways to make the most of a small amount of salvaged material.

"Antique lumber can be used in combination with newer wood if you design a piece of furniture to highlight the old material," Salem advises. For example, you could use salvaged wood for drawer fronts in a case made of new wood, or as door panels surrounded by stiles and rails cut from new material.

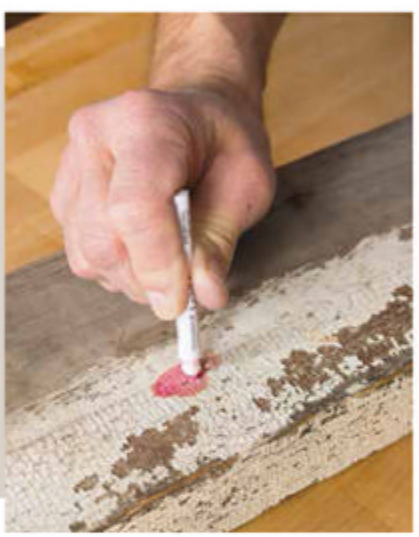
Ken Salem's armoire (at right) is made entirely from salvaged chestnut. His tall chest (opposite) combines chestnut with spalted maple.

Profile photos: Ken Salem; Top photo: Appalachian Woods

How to work with salvaged wood

If you want to incorporate salvaged wood into a woodworking project, it's important to know what to expect and how to deal with issues that don't come up with new lumber. The guidelines below will help you work safely, and get the best results when putting old wood to new uses.

Combine protection with dust collection. When sanding old paint, wear a toxic dust respirator and connect your sander to a HEPA-rated vacuum. Cover the floor with a plastic drop cloth to contain and dispose of dust and paint flakes. Make sure to wash your work clothes after a sanding session.



Red = lead. Always test old paint for lead content, using a test kit that's available at home centers and paint stores. Chemicals in the test swab will turn red if lead is present. A darker shade means greater contamination. If your material has multiple coats of paint, scrape top layers away in order to test more thoroughly.

Start with more than you need

Add at least another 15% to your stock requirement estimate when working with salvaged lumber. Increase the overage factor if your reclaimed lumber has lead paint, oil stains, mold, excessive cracking, or other undesirable characteristics.

Check for rot & insects

Old wood can attract insects like powder post beetles, as well as mold that can develop into wood rot. Remove surface mold by scrubbing with a mild bleach solution. If you find wood rot, it's best to cut away the punky wood or simply discard the board. As for insects, these pests can be killed by kiln-drying or by fumigating the wood with appropriate pesticide. Some pest control companies will perform this service.

Work safe

Use a toxic-dust respirator when sanding and cutting dirty or painted salvaged wood. When removing paint or dirt, make sure to use a dust-capturing sander in combination with a tool-triggered dust collector or shop vac equipped with a HEPA (high-efficiency particulate arrestance) filter.

Remove lead paint safely

Any paint applied before 1977 is likely to contain lead, which can cause serious medical problems if paint flakes or dust are ingested. If you plan to use salvaged lumber that has paint on it, test for lead content before you work the wood. This is easy to do with a test kit available at home centers, hardware stores, and paint stores. If your reclaimed lumber tests positive for lead paint, one option is to simply resaw your lumber to remove a thin layer of painted wood. Seal the scrap material in a thick plastic bag, and contact your local health department for safe disposal instructions. Lead paint can be scraped and sanded off, provided that you work safely as described earlier, and use a plastic drop cloth to capture (and dispose of) any dust or flakes that fall onto the floor of your work area.

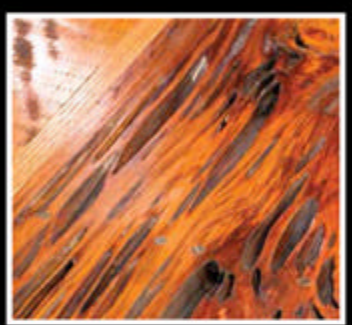
Test for metal

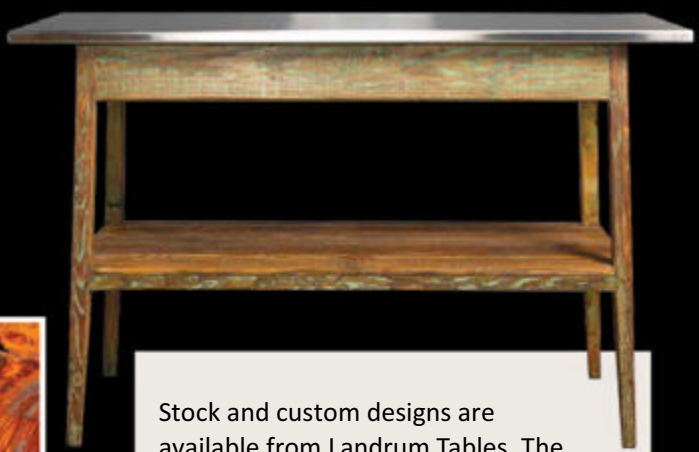
A visual inspection is the first step in identifying nails and other metal that shouldn't be put in the

Profile: Landrum Tables • Charleston, South Carolina • *landrumtables.com*

Modern tables, made from antique wood

A native of Charleston, South Carolina, Capers Cauthen grew up surrounded by historic buildings and schooled in the value of art and architecture by his father, a noted preservationist. In the aftermath of Hurricane Hugo in 1989, Cauthen worked as a carpenter restoring damaged buildings. Disturbed by the huge volume of antique lumber that was being sent to landfills, he decided to do something about it. Cauthen built his first two tables using salvaged lumber from a collapsed garage on his grandmother's property. Six years later, tables remain a specialty, although other custom woodworking projects are also undertaken from time to time.





Stock and custom designs are available from Landrum Tables. The inset photo shows part of a dining tabletop made from pecky cypress. The irregular channels are created by fungus that attacks the wood fibers.

"Our aim is to please our clients while accentuating the inherent beauty and history of every piece of wood we use," says employee Jim Pagel.

Cauthen's connection to historic preservation groups in his region often gives him early notice whenever an old building is slated for demolition. "Preserving an historic structure is always the top priority," he explains. "But when that can't happen, at least we can salvage some of the best wood and give it new life in the furniture we build."

path of cutting tools. It's smarter still to double-check your wood with a metal detector. Be ready to excavate around embedded fasteners that don't respond to a hammer claw. A couple of cat's paws are useful tools for this work, along with end-cutting pliers to grab headless nails.

Pay attention to moisture content

Many larger reclaimed lumber dealers offer stock that has been kiln-dried and ready for furniture construction. But in most other cases, you'll need a moisture meter to evaluate salvaged material. Any wood that measures above 20% MC will be prone to warping and cracking as it dries out in your shop or storage shed. A moisture meter will tell you when salvaged wood is at the same equilibrium moisture content (EMC) as the new wood in your shop.

Sand before you plane

Even if there's no metal in the wood, grit and dirt will quickly dull planer and jointer knives. Rough-sanding and scraping will remove this grime and expose a clean wood surface that you can confidently machine.

Locate blemishes with care

The orientation of grain patterns is an important consideration when designing furniture that will be stained or clear-finished. So are the markings on salvaged lumber. Some woodworkers choose to exclude features like nail holes, rust stains, and paint patches, while others incorporate this historic evidence into their designs. Either way, you'll need to decide how these details are handled. For example, don't locate a nail hole where it might weaken or interfere with a structural joint.

Record historic details

Does your salvaged wood have a story? If so, write it down. Some woodworkers create a "certificate" for furniture or other projects made from salvaged lumber. This historical record is a nice way to pass on details that make a project special. ■

Photos facing page: Larry Hamel-Lambert; Photos above: Landrum Tables

Curvaceous Corner Table

With simplified curved drawers and shop-made veneers

By Andy Rae

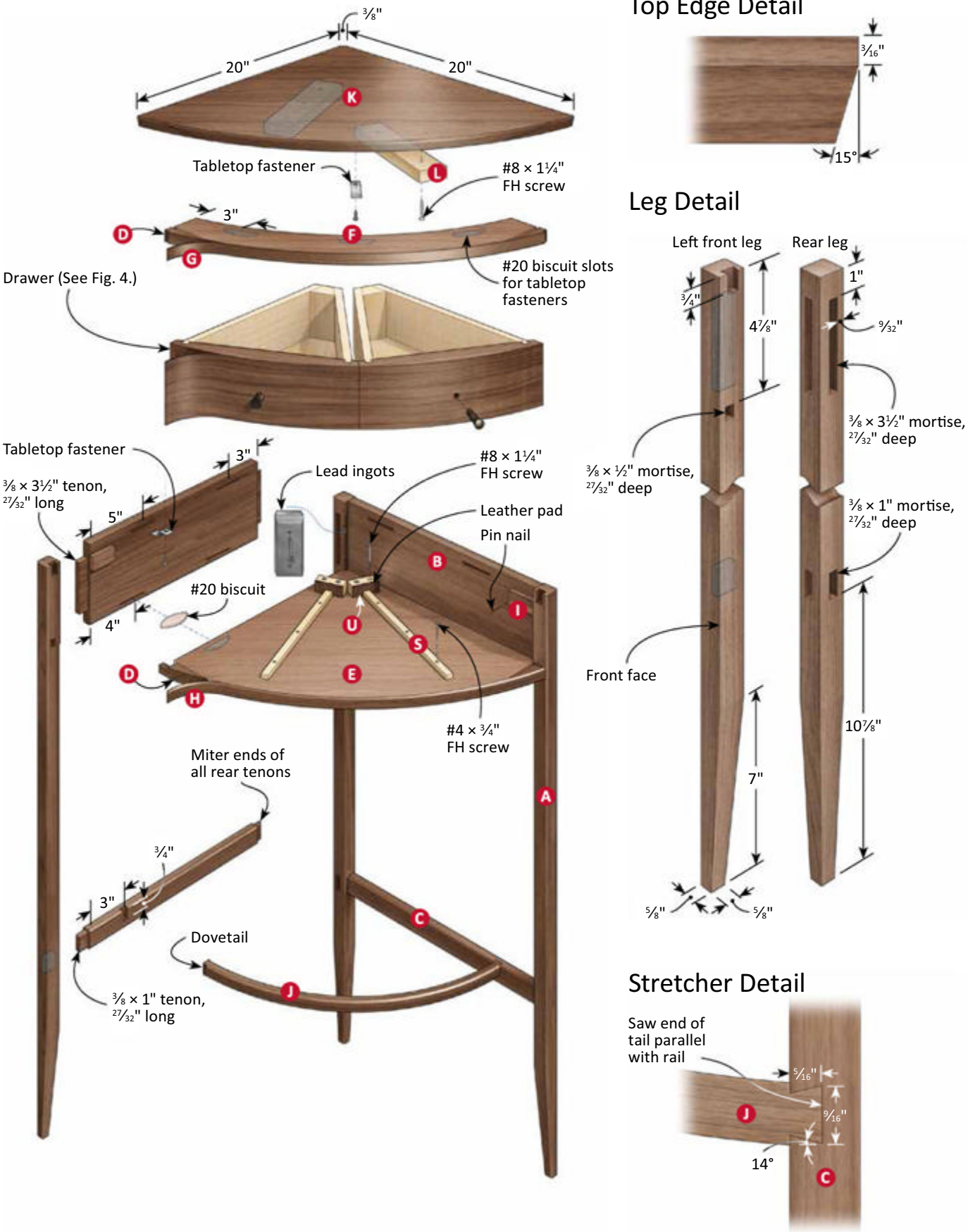
Based on a design I made many moons ago for my folks, this diminutive table will dress up any room, oozing charm with its curved front and tapered feet. The grain-matched, wedge-shaped drawers track smoothly on wooden runners, and present an undeniable "cool factor" when opened. The tapered legs connect at the front via a slender, bent-laminated stretcher that provides strength while keeping the design light and airy.

This table is flush with skill-building exercises. You'll learn how to cut precise arcs on the bandsaw, veneer curved surfaces, and create bent-laminated parts. I'll also show you how to make an unusual "hybrid joint" that combines the strength of solid wood joinery with the convenience and stability of a plywood panel. And then there's the angled sliding dovetail drawer joints! You'll be surprised at how easy they are to make with a simple shop-built router table jig.

The table shown is made from figured walnut for the body, maple for the drawer parts, and rosewood for the pulls. But feel free to use any favorite combination of hardwoods. And prepare to have fun building this. It's certain to impress.

Overall dimensions: 28⅜"w × 20"d × 38¹¹⁄₁₆"h

Figure 1: Corner Table Exploded View



When using a hollow-chisel mortiser to cut the leg mortises, register each outside face of the leg against the fence.

After fine-tuning the cutter height for tight-fitting tenons, nibble away the cheeks on the aprons and lower rails.

Make the legs

1 Mill the legs (A) to the dimensions shown in the **Cut List**, checking that all surfaces are square to each other.

2 Lay out the mortises in the legs, where shown in **Figure 1**, **Leg Detail**. I cut them using a hollow-chisel mortiser (**Photo A**), but you could rout them instead, and then chisel the corners square. (You'll cut the dovetail sockets later.)

3 Lay out the tapers on the inner sides of the leg, where shown in the **Figure 1**, **Leg Detail**. Bandsaw them, and then clean up the saw marks with a plane.

Make the aprons, lower rails, and stub rails

1 Cut the aprons (B), lower rails (C), and stub rail blanks (D) to the dimensions in the **Cut List**. Mill some extra stock to the same thickness and widths for machine setup.

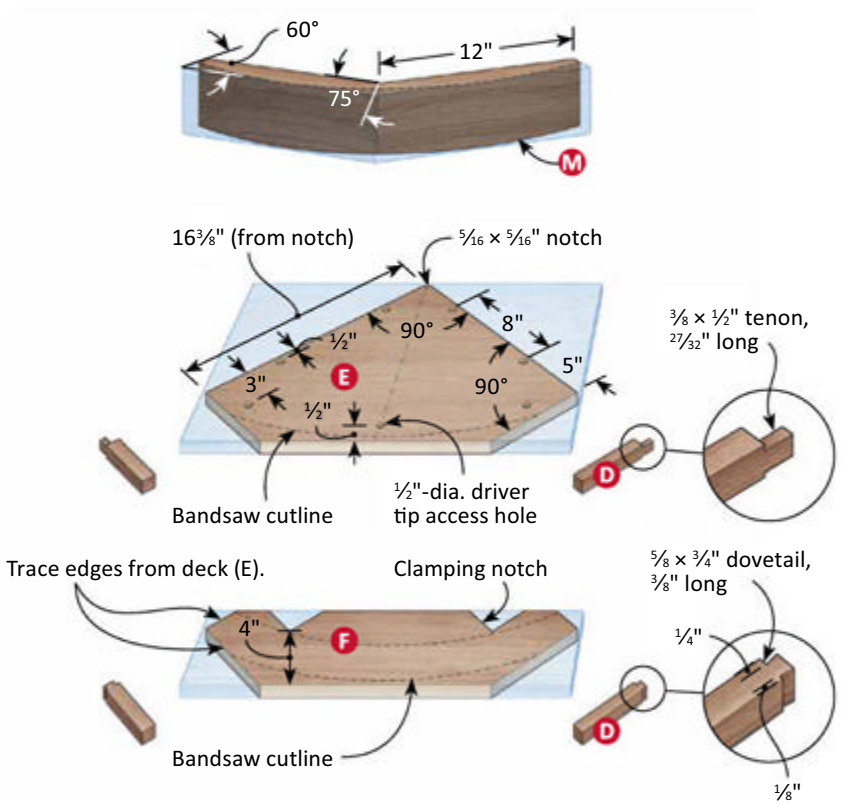
2 Cut the tenons on the aprons (**Photo B**) and lower rails, after setting up the cut with scrap and testing the fit in a mortise.

3 Cut a ⅜ × ½ × 27/32" tenon on each end of one of the two stub rail blanks (D), offsetting them, as shown in **Figure 2**. After checking the fit of each in its mortise, crosscut the blank in half. Then set it and the uncut stub rail blank aside for now.

4 Miter the rear tenons on the aprons (B) and lower rails (C), where shown in **Figure 1**. In the process, trim each about 1/32" shorter to leave room for the opposing tenon in the rear leg.

5 Referring to **Figure 2**, lay out the dovetail on each end of the uncut stub rail blank (D). Cut the dovetails, and then crosscut the blank in half.

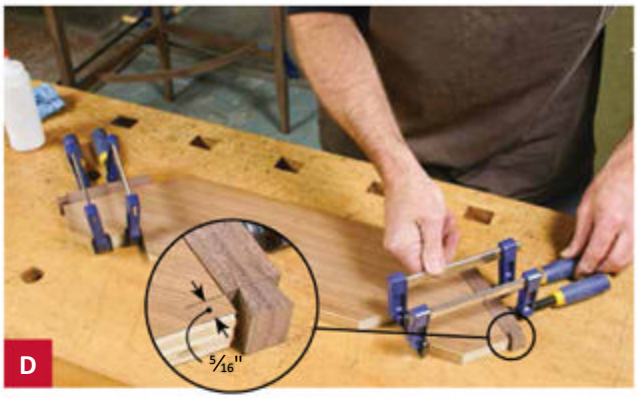
Figure 2: Drawer Fronts, Deck and Curved Rail



Make the sawn-curved parts

1 Glue up the top (K) from two or more 11/16"-thick boards to produce a panel that's 19" wide by at least 30" long.

Clamp or nail the deck to a crosscut sled, and saw the second deck edge 90° to the first.



Glue the stub rails to the curved rail, aligning their shoulders with a mark 5/16" back from each edge of the rail.

Joint one long edge, and then from that edge lay out the two perpendicular edges of the top, leaving a 3/8"-wide flat at the back, where shown in **Figure 1**.

2 Bandsaw just shy of your layout lines, and then joint or hand-plane to the lines. Set the top aside for now.

3 Mill the drawer fronts (M) to the dimensions in the **Cut List**, and then lay out the 75° and 60° miters on the ends of each front, where shown in **Figure 2**. Cut the miters on the tablesaw using a long fence attached to the miter gauge, and then set the fronts aside.

4 Cut the deck (E) blank to the dimensions in the **Cut List**, and lay out the 90° cuts, as shown in **Figure 2**. Saw and joint one of the edges, and then cut the opposite edge using a tablesaw sled, as shown in **Photo C**.

5 Referring to the deck layout in **Figure 2**, mark out the rear notch and the two front corner cuts. Bandsaw the notch, and then cut the front corners on the mitersaw.

6 Cut the curved rail (F) to the dimensions in the **Cut List**. Then trace the shape of the deck onto the rail, with the front edges of the two pieces aligned, where shown in **Figure 2**. Cut to your lines, compare the parts and, if necessary, trim any errant edges until the deck and rail match perfectly.

7 Mark the deck (E) and aprons (B) for #20 biscuit slots, where shown in **Figure 1**. Then cut the slots and dry-assemble the parts to make sure everything fits well.

8 Cut the clamping notches in the curved rail (F), as shown in **Figure 2**. Then glue the stub rails (D) to the deck (E) and curved rail, locating the joint shoulders 5/16" back from the edge (**Photo D**). Once the glue has dried, plane or sand the stub rails flush with the deck and curved rail.

Tip Alert

A 23-gauge headless pin nailer provides a great way to temporarily secure workpieces to sleds and other jigs while leaving hardly a trace.

Saw the veneers

1 Slice the veneers (G,H, and N) for the deck (E), curved rail (F), and drawer fronts (N) from the same face of a single board at least 6" wide × 28" long. Bandsaw the piece to about 3/16" thick for now. (I use a 1/2"-wide × 3 TPI, hook-tooth blade.)

2 Thickness-plane the veneer to 1/8". To prevent tear-out on planers with bed rollers, or if your planer can't cut thin enough, use a riser panel on the bed of your planer. (See "Planer riser for thin stock," page 18, *Woodraft Magazine*, #60.)

3 Rip the veneer into three strips, each about 1/16" wider than their dimensions in the **Cut List**. Mark the pieces for reassembly later in their original orientation, and then set them aside for now.

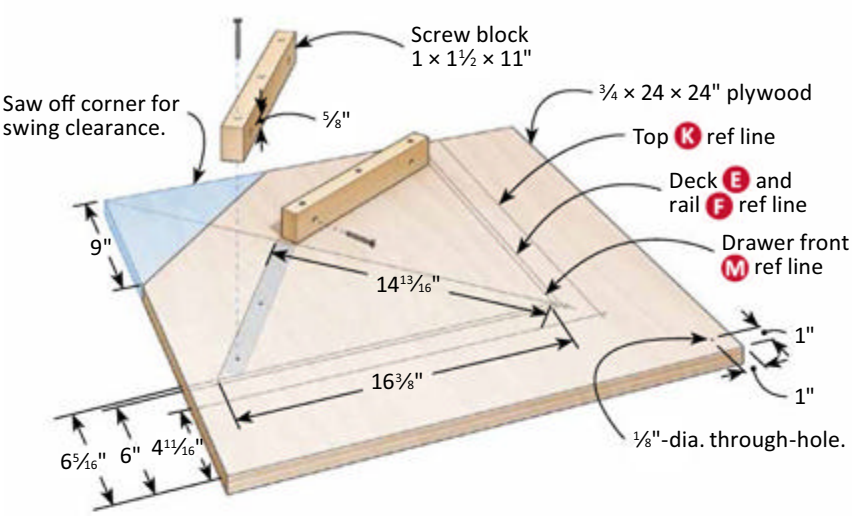
Shape the top and drawer fronts

1 Make the arc-cutting platform in **Figure 3**, and mark out the layout lines where shown. You'll use this platform to bandsaw the curves in the top (K), drawer fronts (M), deck (E), and curved rail (F).

2 Set up your bandsaw for cutting arcs by installing an auxiliary support table that will accept a pivot pin for guiding the workpiece. I use the Bandsaw Circle-Cutting Jig featured on page 50, which includes a sled with an adjustable pin block. Instead, you could just drill holes for your various pivot pin locations in a stationary support board clamped to your saw table.

3 In preparation for sawing the arc on the top (K), locate the

Figure 3: Arc-cutting platform



center of the pivot pin 24" from the blade, and at a right angle to the blade's path at the front of the teeth. (I use ⅛"-diameter brass rod for the pin.) Mark out the lines for the edge of the top, where shown in **Figure 3**. Also, nip the corners of the top as noted on **Photo E** to provide clearance for clamps or other hold-downs.

4 Secure the top (K) to the platform with double-faced tape, aligning the platform with the appropriate lines, where shown in **Figure 3**. Then saw the arc (**Photo E**).

5 Make the screw blocks shown in **Figure 3**, and fasten them to the platform. Attach the drawer fronts (M) with screws, making sure that their mitered ends butt together perfectly. Locate the center of your pivot pin 23" from the blade, and then saw the arc in the drawer fronts (**Photo F**).

Veneer the drawer fronts

1 With the drawer fronts (M) still attached to the platform, smooth the sawn surfaces with 180-grit sandpaper wrapped around a flat block.

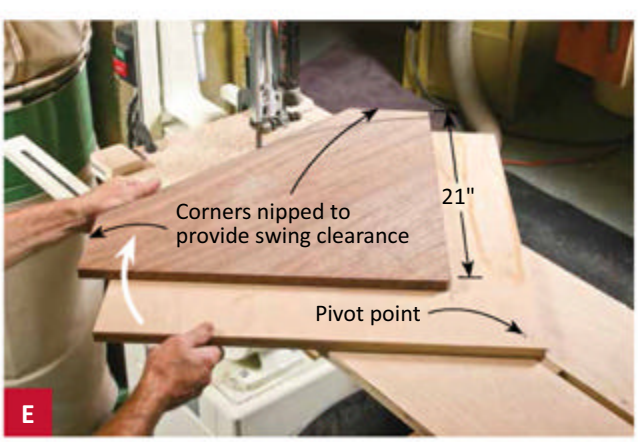
2 Unscrew the drawer fronts (M) from their screw blocks, locate the jig's pivot pin 22¼" from the blade, and then swing the platform (with screw blocks attached) past the blade to saw away ¾" of material from the edge. (This allows increased clamp pressure for the taping procedure that follows.)

3 Reattach the drawer fronts (M) to the platform, and clamp the assembly in a bench vise. Glue the front veneer (N) to the drawer fronts, clamping it in place with several layers of tightly stretched packing tape, as shown in **Photo G**.

4 Once the glue has dried, use a square and a knife to separate the drawer fronts at the centerline. Then detach them and the blocks from the platform.

Shape the deck and curved rail, and cut the sockets

1 Use double-faced tape to attach the deck (E) to the arc-cutting platform, placing it against the appropriate reference lines, as shown in **Figure 3**. Then tape the curved rail (F) atop the deck, aligning their edges. Locate the pivot pin center 23⅛" from the blade, and then saw the curve (**Photo H**).



Secure the top to the platform with double-faced tape, slip the platform onto the pivot pin, and rotate the assembly through the blade.

With the drawer fronts butted together at their inner ends and attached to the screw blocks, rotate the platform past the blade to shape the fronts.

Clamp the drawer front veneer from the center out, first taping across the middle and ends, then fully along the length, and finally across the entire surface.

Saw both the deck and rail at the same time. With a properly aligned jig, the blade should start cutting right at the outer dovetail and tenon shoulders (inset).

2 Relocate the center of the pivot pin 20¼" from the blade. Tape the curved rail (F) to the platform with its edge extended ⅛" and its ends aligned with the appropriate lines shown in **Figure 3**. Then saw the interior rail curve (**Photo I**).

3 Smooth the sawn edges of the deck (E) and curved rail (F) just enough to remove any bumps or irregularities while keeping the edges square.

4 Dry-assemble the table, using plywood to allow cross-clamping the side assemblies (A,B,C) to the deck (E) and to support the curved rail (F), as shown in **Photo J**. (It helps to weigh the rail down with a hand plane or other heavy object.) Then knife around the curved rail dovetails to trace their shape onto the tops of the legs.

5 Disassemble the table, and mark out the rest of each dovetail socket on the face of its leg. Then cut the sockets using a handsaw and chisel.

Complete the deck and curved rail

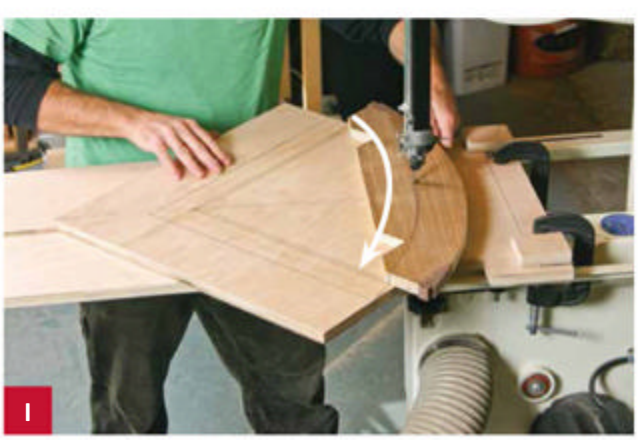
1 Mark the center of the deck (E) and curved rail (F), as well as the centers of their respective veneers (G, H). Apply glue to the edges and veneers, and then tape the veneers in place, working outward from the center as you did when veneering the drawer fronts. (I use white glue for its longer "open time.")

2 After the glue cures, plane or sand the edges of the veneer flush to the faces of the deck and curved rail, and then saw and chisel the excess from the ends.

3 Lay out and cut the #20 biscuit slots in the curved rail (F) and aprons (B) for tabletop fasteners, where shown in **Figure 1**.

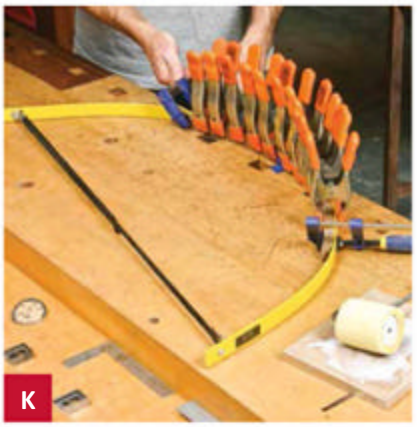
4 If you don't have a right-angle drill or air wrench (**See Photo T**), lay out and drill ½"-diameter driver tip access holes through the deck, where shown in **Figure 2**.

5 Cut the curved-rail supports (I) to the dimensions shown in the **Cut List**.



When sawing the interior edge of the curved rail, you'll be cutting through the platform as well. Be ready to catch both freed pieces.

With the table dry-clamped, use a combination square to align the curved rail with the deck for laying out the dovetail sockets on the legs.



Glue and clamp the stretcher laminates to a drawing bow, resting the assembly on a flat surface to prevent twist.

Make the laminated stretcher

1 Mill five ⅛ × ⅞ × 22" strips of wood to make the laminated stretcher (J). Cut them in succession from a single blank, marking them for reassembly later in their original orientation.

2 Set a symmetric drawing bow (see **Buyer's Guide**) to a distance of 14" from the center of the adjustment strap to the center of the bow. Apply glue to the laminates, and clamp them to the bow (**Photo K**).

3 Once the glue has dried thoroughly, joint one edge of the stretcher, and then thickness-plane the piece to ¾".

4 Dry-assemble the table, and locate the stretcher on the lower rails (C), where shown in **Figure 1**. Then mark the dovetail shoulders where the stretcher meets the rails. Referencing the shoulder marks, lay out the dovetails on the ends of the stretcher, and then saw them out.

5 Clamp the stretcher onto the lower rails, and knife around the tails. Unclamp the stretcher, lay out the ¾" socket depth on the rails, and then saw and chisel out the sockets.

Assemble the table

1 In preparation for glue-up, rout a ⅛"-wide 45° chamfer on all part edges except the top edges of the aprons (B) and curved rail (F). Stop the chamfers short of the dovetail sockets on the lower rails (C); you'll finish them up with a chisel after assembly. Also stop about 1¼" below the apron mortises in the back leg (A) on the innermost corner only, and ½" below the deck mortise on the innermost corner of each front leg (A). Again, finish the chamfers in these areas with a chisel after assembly.

2 Start by joining the back leg and one front leg to an apron (B) and a lower rail (C), as shown in **Photo L**.

3 Add the opposing leg, apron, and rail to the first side assembly. Then, glue the biscuits into their deck slots, and add the deck (E) to the assembly (**Photo M**).

4 Clamp the legs (A) to the lower rails (C) using your heavier clamps to keep the weight down low. Then clamp the aprons (B), orienting the main weight of the clamp to the rear when possible.

5 Clamp your plywood scrap panel to the deck (E) as before, and draw the deck tight to the aprons (**Photo N**).

6 Glue the curved rail (F) into the dovetail sockets in the legs, and then glue and pin-nail the curved-rail supports (I) to the aprons (B) below the curved rail. Finally, add the stretcher (J), gluing and tapping it into the dovetail sockets in the lower rails.

Tip Alert

With a complicated glue-up that must come together all at the same time like this, it's wise to enlist the aid of a helper, and be sure to practice a dry run before spreading any glue.

Begin by gluing together one side assembly, and use a cushioned block to tap the joints all the way home. Don't clamp yet.

After slipping one deck tenon into its mortise, carefully spread the assembly and push the remaining deck tenon into its mortise.

Clamp the lower rails first, then the aprons, and then use a plywood panel to clamp the deck to the legs and aprons.

7 To counter the table's tendency to tip when the drawers are opened, you'll need to install weight at the rear. The simplest approach is to buy a 5-lb. lead ingot (see the buying guide), hacksaw it in two, and then drill two 3/16" screw-mounting holes in each bar. (Because lead tends to load bits, use a hand-held power drill at low speed instead of a drill press.) Mount the stacked bars to the back leg with two #8 × 3" screws, where shown in **Figure 1**. Then dismount the weights to make the following steps easier. *Note: Wear gloves when handling lead, don a dust mask during cutting, and dispose of any dust, chips and filings thoroughly.*

Build the drawers

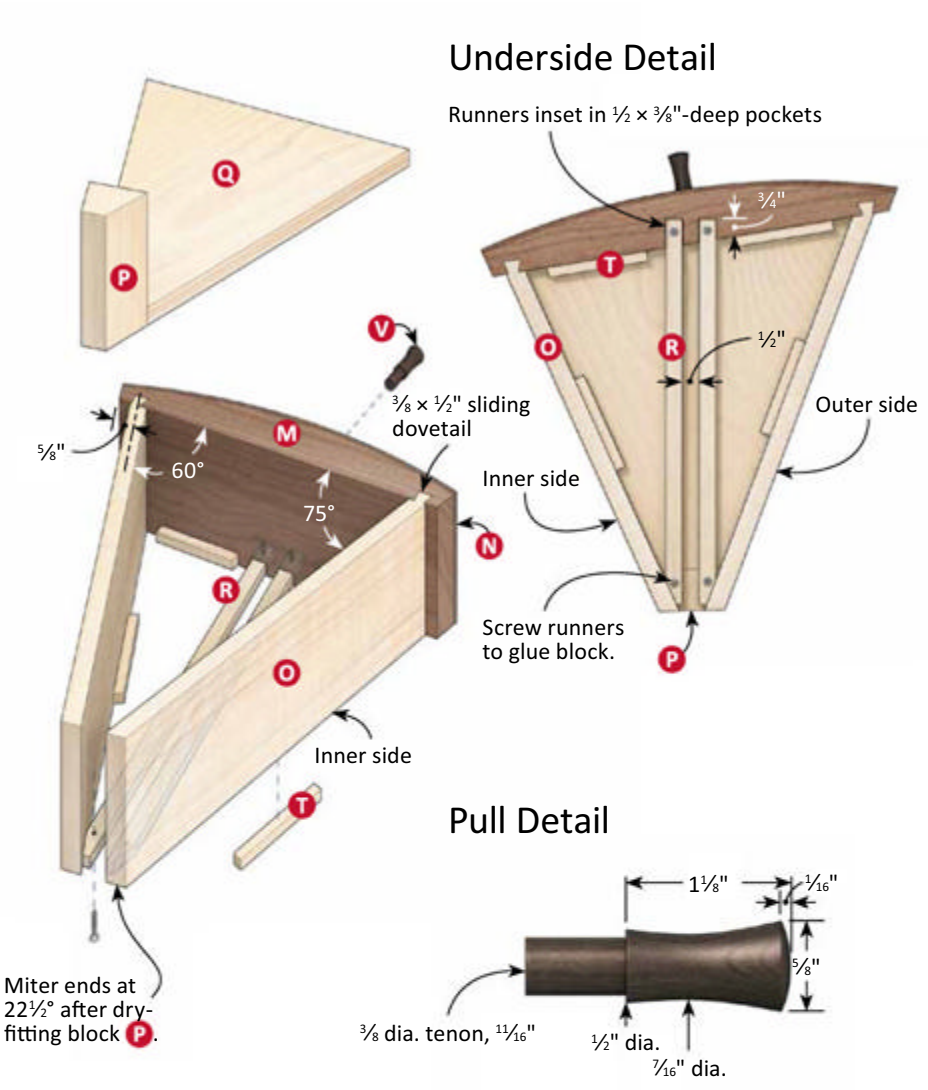
1 Trim the overhanging veneer on the ends of the drawer fronts (M), and then rip them to 4" wide on the tablesaw.

2 Fit the veneered drawer fronts (M, N) in their opening, planing the top and bottom edges as necessary to create a 1/16" gap under the curved rail (F). The fronts should be inset 1/8" from the front of the rail and deck.

3 Drill a 3/8" hole 11/16" deep in each drawer front for the pull, centering it along the length of the drawer and 1 3/4" up from the bottom edge.

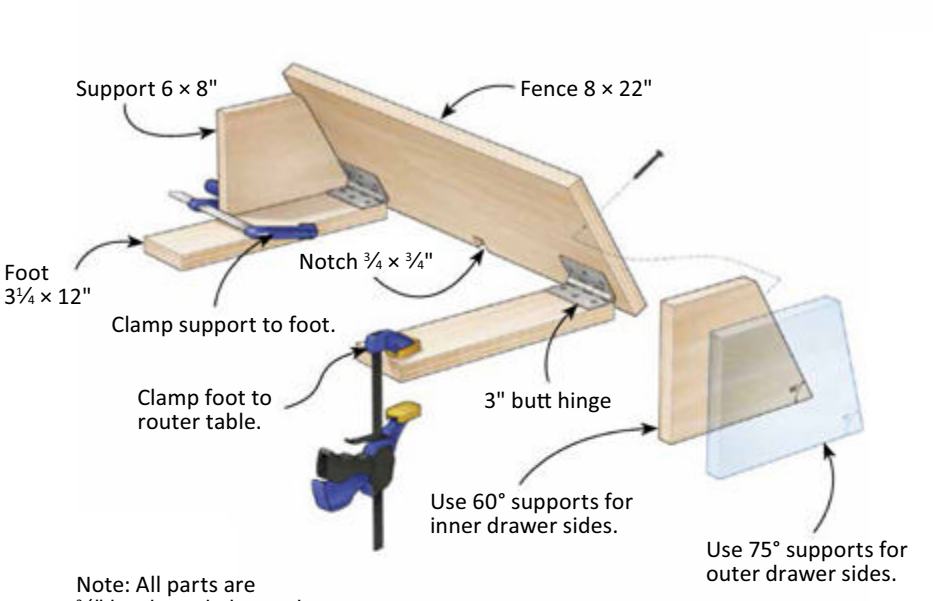
4 Lay out the dovetail sockets on each drawer front, where shown in **Figure 4**. Saw a 3/16 × 5/16"-deep relief cut on the tablesaw, and then rout the 3/8"-deep sockets using a 1/2" dovetail bit (**Photo O**). (Note: In the photo, I'm using the fence

Figure 4: Drawer Construction



Rout the dovetail slot, centering it on the relief cut. Use a backup block to keep the stock square to the fence as you rout.

Figure 5: Two-Sided, Angled Router Fence



Note: All parts are ¾" hardwood plywood.

in **Figure 5**, set up at a 90° angle, but any fence will do.)

5 Mill the sides (O) to the dimensions in the **Cut List**, mitering two front ends to 60° and two front ends to 75°, where shown in **Figure 4**. (You'll trim the four rear ends to length later.)

6 With the dovetail bit still set for a ⅜"-deep cut, use the angled router fence shown in **Figure 5** to cut the dovetails in the drawer sides. First, with the jig's 60° supports in place and using scrap stock, adjust the fence to produce a sharp point on the tail without cutting any deeper than necessary (**Photo P**). Then cut the inner dovetail cheeks on the two inner drawer sides. Next, position the fence so that feeding against the inside face (**Photo Q**) produces a tail that fits with light hammer taps into its drawer front socket.

7 Replace the 60° jig supports with the 75° supports, and repeat the procedure to cut the dovetails on the outer drawer sides.

8 Rip the sides to 4" wide. Then trim the inner sides to 12" long and the outer sides to 14" long. Dry-fit them into their sockets in the drawer fronts.

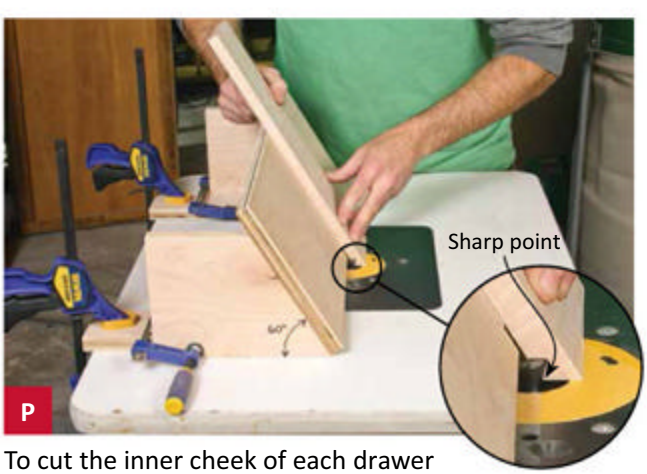
9 To make the glue blocks (P), begin with a single, oversized blank measuring 1¼" × 2" × 12", and bevel its edges, as shown in **Figure 6**. Then crosscut it into two 3⅝"-long glue blocks. Also, crosscut the thicker of the two offcuts into two 3⅝"-long pieces for complementary clamping blocks.

10 Disc-sand or hand-plane the blocks (P) to mate well with the dry-assembled sides (O). Then, with each block in place, mark the sides to length, and then cut them at a 22½°.

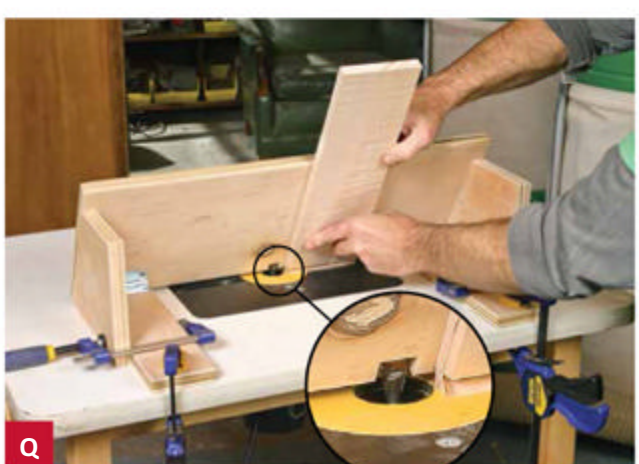
11 In preparation for gluing up the drawers, make a ⅜ × ⅝" spacer strip, and a ¾ × 2¾ × 3⅝" backer block.

12 Glue the sides (O) into the drawer fronts (M). Then glue on the blocks, as shown in **Photo R** using the complementary clamping blocks you made in **Step 9**.

13 Cut the drawer bottoms (Q) to the size in the **Cut List**. Mark them to shape by tracing around the inside of each drawer, and then cut them out on the bandsaw. Test the fit by pushing them into the drawer box from above, and then set them aside.



To cut the inner cheek of each drawer side dovetail, locate the fence so that the cut produces a sharp tail tip.



Relocate the fence, and feed against its rear face to rout the outer cheek of each dovetail.

Fit the drawers

1 Mill the runners (R) and runner supports (S) to the dimensions in the **Cut List**.

2 To help lay out the drawer runners as shown in **Figure 4**, first clamp each runner support (S) in place to the underside of its drawer's front (M) and glue block (P). Bandsaw the rear tapers on the runners to fit against the drawer sides while terminating in a ⅛"-wide flat tip. Then cut the runners to length so that their front ends extend ¾" onto the underside of the drawer front. Knife around the runners, and then cut the ½ × ¾ × ⅜"-deep pockets in the underside of each drawer front (M).

3 Referring to **Figure 4**, drill and countersink the runners and the runner supports for #4 × ¾" screws. Clamp the runner support back in position, and then glue and screw the runners into the pockets in the front (M) and onto the glue block (P).

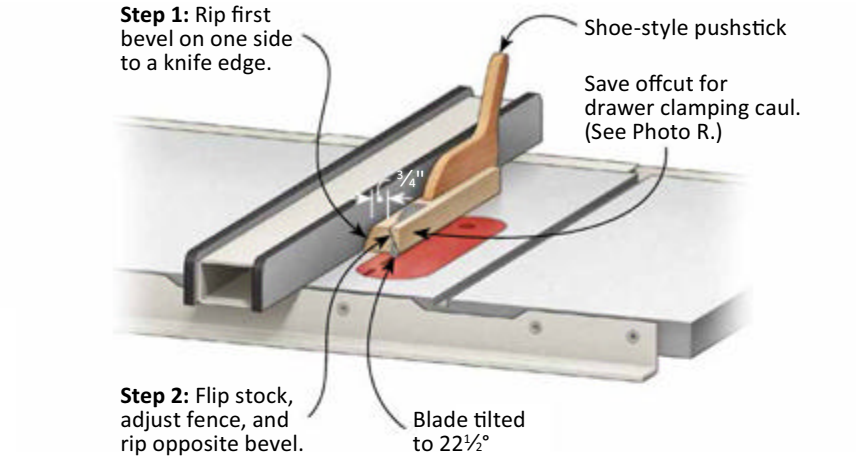
4 Position both drawers inside the case, with their fronts aligned with each other and recessed ⅛" from the edge of the deck. Then attach the runner supports (**Photo S**).

5 Make the two ¾ × ¾ × 2" stopblocks (U), face them with leather, and countersink and drill them for two #8 flathead screws. Glue and screw the blocks to the deck with the leather face pressed against the drawer backs.

6 Mill the drawer slips (T) (see the **Cut List**). Apply a bead of glue to the top of the runners and along each drawer side ⅝" up from the bottom. Then tap the drawer bottom (Q) down onto the runners. After the glue dries, spread glue on the slips, and then rub them onto the drawer bottom and sides, where shown in **Figure 4**.

7 Turn the pulls (V) to the profile shown in **Figure 4**, and glue them in place.

Figure 6: Beveling The Glue Block

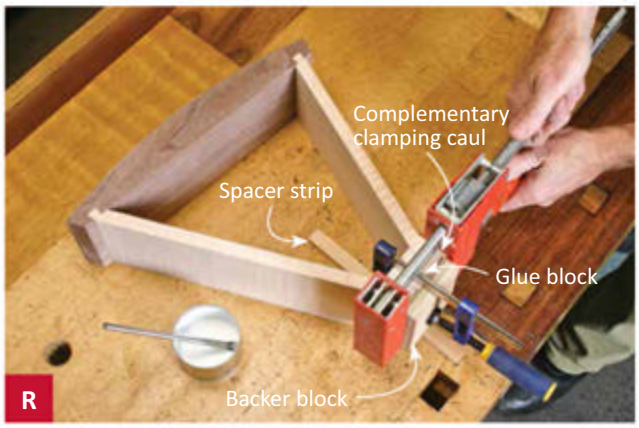


Bevel and attach the top

1 Scrape the bandsawn edge of the top (K), and sand it through 220 grit until the curve feels fair. Then use a 15° chamfer bit at the router table to bevel the edges of the top, avoiding the small flat at the back.

2 Remount the lead bars, and then up-end the table onto its inverted top (K) with the front extended ¾" from the curved rail (F). Clamp the parts to the bench.

3 Secure the top with tabletop fasteners, using #8 × ½" sharp-point screws with washer-heads that don't require pilot holes. If you didn't drill access holes earlier, your best option will be to use a pneumatic right-angle



Clamp the backer block to the glue block (with both sitting on the spacer), and then glue and clamp the sides to the glue block between complementary cauls.

With the drawers shimmed and clamped in position, glue and screw each runner support to the deck between its runners.

You can drive the tabletop fastener screws in the restricted space using an air-powered ratchet wrench outfitted with a ¼" socket and driver bit.

ratchet wrench (**Photo T**). The tool is available at auto and home supply stores for as little as $30.

4 Mill the kickers (L) to the size in the **Cut List**, and then drill and countersink them for #8 × 1¼" self-tapping screws, where shown in **Figure 1**. Elongate the middle and rear holes to allow for wood movement. Position them ⅛" from the curved rail (F), and screw them to the top, centering them by eye.

5 Finish-sand everything through 220 grit, and apply finish. (I wiped 3 coats of shellac inside the drawers, and 3 or 4 coats of wiping varnish on the rest of the table, rubbing between dried coats with 0000 steel wool. I finished up with a thin coat of an oil-polyurethane blend.) ■

About Our author

Andy Rae is an award-winning furnituremaker who has authored a number of books on woodworking, including *Furniture and Cabinet Construction* and *Working Wood* (Taunton Press). He lives in western North Carolina.

Corner Table Cut List

	Part	Thickness	Width	Length	Qty.	Mat'l
A	Legs	1⅛"	1⅛"	38"	3	W
B**	Aprons	1$\frac{1}{16}$"	5½"	18⅜"	2	W
C**	Lower rails	1$\frac{1}{16}$"	1¼"	18⅜"	2	W
D*	Stub rails	¾"	2$\frac{7}{32}$"	10"	2	W
E*	Deck	¾"	16½"	24"	1	WP
F*	Curved rail	¾"	6¼"	24"	2	WP
G*	Curved rail veneer	⅛"	¾"	27"	1	W
H*	Deck veneer	⅛"	¾"	27"	1	W
I	Curved-rail supports	$\frac{5}{16}$"	1"	2"	2	W
J***	Stretcher	⅝"	¾"	22"	1	W
Top						
K*	Top	1$\frac{1}{16}$"	19"	30"	1	W
L	Kickers	¾"	2"	9"	2	M
Drawers						
M*	Fronts	1½"	4⅛"	14"	2	W
N*	Front veneer	⅛"	4$\frac{1}{16}$"	28"	1	W
O*	Sides	$\frac{9}{16}$"	4⅛"	15"	4	M
P	Glue blocks	1¼"	2"	3⅝"	2	M
Q*	Bottoms	½"	10"	10"	2	MP
R*	Runners	$\frac{5}{16}$"	½"	12"	4	M
S*	Runner supports	$\frac{5}{16}$"	½"	12"	2	M
T	Slips	$\frac{5}{16}$"	$\frac{5}{16}$"	3"	8	M
U	Stop blocks	¾"	¾"	2"	2	M
V*	Pulls	⅝" dia.		1⅞"	2	R

*Indicates parts are initially cut oversized. See instructions.

**Indicates parts include two $\frac{27}{32}$" tenons.

***Thickness built up from five ⅛"-thick laminates

Materials: W=Walnut, WP=Walnut Plywood, M=Hard Maple, MP=Maple Plywood, R=Rosewood

Convenience-*PLUS* BUYING GUIDE

☐ 1.	Whiteside Chamfer Router Bit ¼" shank, 45° cutting angle	#149227	$27.99
☐ 2.	CMT Chamfer Router Bit ½" shank, 15° cutting angle	#823072	$29.99
☐ 3.	Tabletop Fasteners 8-piece	#159301	$2.99
Above items are available at Woodcraft stores, *woodcraft.com* or by calling (800) 225-1153. Prices subject to change without notice.			
☐ 4.	Symmetric Drawing Bow	#05N55.01	$ 28.50
Above item is available at *leevalley.com*, or by calling (800) 871-8158. Price subject to change without notice.			
☐ 5.	Antimonial Lead Ingot, 5 lb.		$12.65
Above item is available at *rotometals.com*, or by calling (800) 779-1102.			

NEW

KREG® Precision Router Table System

Newly redesigned KREG® Precision Router Table System features a large, durable router table top, a one-of-a-kind T-square style fence, and a heavy-gauge steel stand designed for easy accessory mounting that all work together to create a router table to meet all a woodworker's precision routing needs. Optional casters add mobility.

- **Router Insert Plate With Level-Loc Reducing Rings Easily Mounts To Most Routers**
- **T-Square Style Adjustment System Keeps Fence Parallel To Miter-Gauge Slot**
- **Innovative Micro-Adjust Wheel Ensures Accurate, Precision Fence Setup**

"0" Fence Setting

Fence Moved 0.015-Inches To "015" Setting

160628 Complete Router Table
160625 (A) Router Table Top
160626 (B) Router Table Fence
160627 Multi-Purpose Steel Stand
148166 Kreg Casters Set (4)

Bandsaw Circle-Cutting Jig

Cut perfect circles and arcs with this simple setup.

By Andy Rae

Consisting of a platform with an adjustable pivot pin and control bar, this jig can be used to saw perfect circles (left) up to 6' in diameter. Outfitted with an auxiliary carrier platform, arced pieces, including curved rails (above), can be sawn with accuracy and ease.

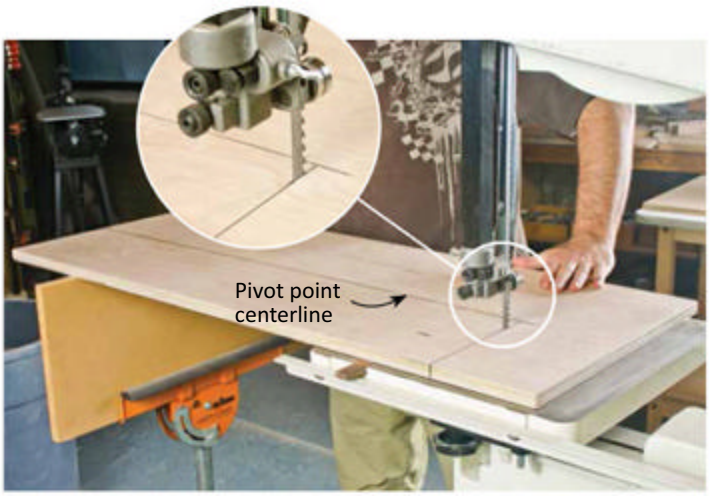
Make perfect bandsawn circles and arcs with this jig, thanks to an adjustable pivot pin that guides the work as you rotate it through the blade. This jig can tackle circles up to 6 ft. in diameter–a nice size for a tabletop. The sled lets you move the workpiece straight into the blade as you begin sawing a circle–a distinct advantage over other jigs that require you to first notch the work at the cutline to provide entry clearance for the blade. As a bonus, the jig accepts a platform for sawing arcs, allowing you to shape all sorts of items, ranging from curved rails and corner panels to custom trim.

Make the jig

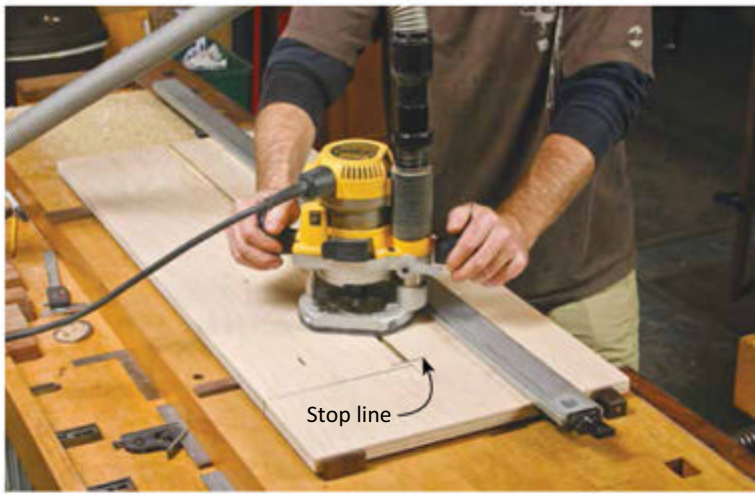
Referring to **Figure 1,** cut the parts to suit your saw table. Then glue and screw the runner in place, locating it so that the left end of the sled sits 2" from the inner edge of the saw table, with the runner's front end aligned with the edge of the sled.

Install a bandsaw blade dedicated for use with the jig. Now, lay out the pivot point centerline. To determine its offset from the front of the sled, measure from the front of your saw table to the front of the blade, and add ½". Next, supporting the cantilevered end of the sled on a stand, cut the kerf as shown in the photo (Page 51, top left). Then clamp the control bar to the table against the sled.

Remove the sled, and mark the pivot point centerline ½" from the saw kerf, where shown in **Figure 1**. Attach a straightedge so that, when a router is placed



With its runner attached, feed the sled into the blade, stopping when the tip of the teeth reach the pivot point centerline.



Rout the dovetail slot in two subsequently wider passes, relocating the straightedge between cuts.

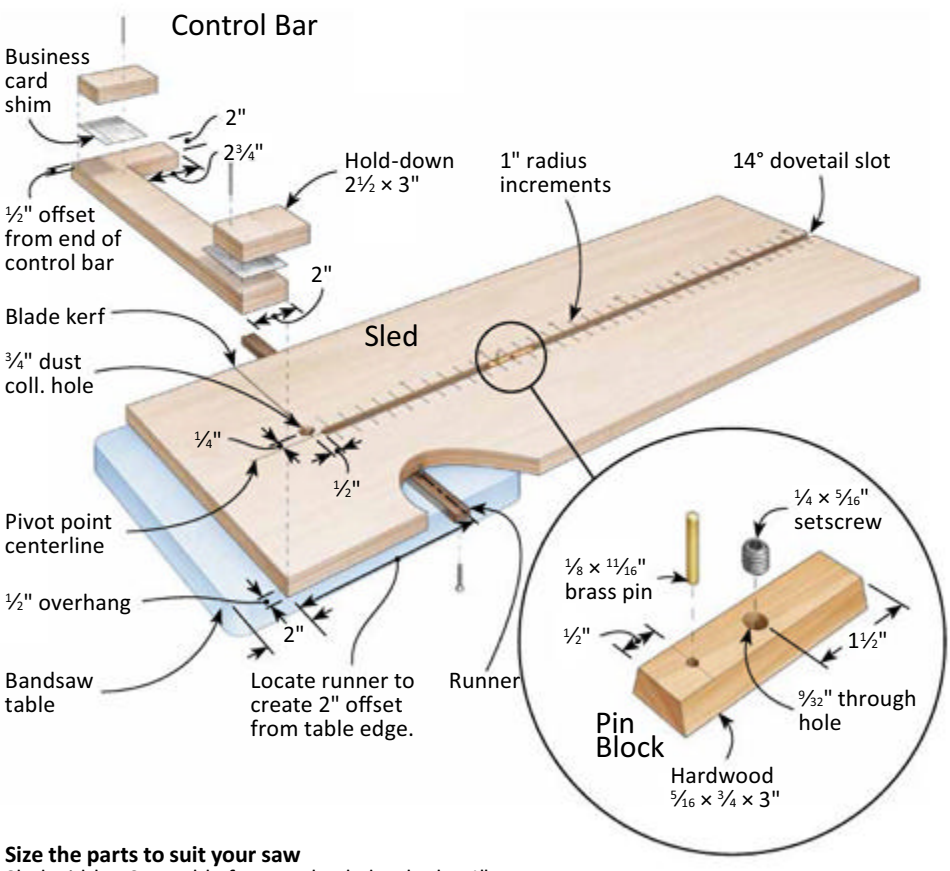
against the straightedge, the center of its collet is offset ⅛" to the opposite side of the pivot point centerline.

Outfit your router with a 14° × ½" dovetail bit set for a ⅜"-deep cut. Then, guiding the router against the straightedge, cut a dovetail slot that terminates at your stop line. Shift the straightedge ¼" further from the centerline, and make a second pass to widen the slot to ¾". (See photo above right.)

Make the 14° dovetail pin block to fit snugly, but move freely, in its slot. Tap the brass pivot pin into its hole, along with a drop of super glue. Thread the setscrew into its hole and make sure the block locks securely when the setscrew is wrenched against the bottom of the slot.

Bandsaw Circle-Cutting Jig

The runner-guided sled includes a dovetail slot that houses an adjustable pivot pin block on which the workpiece rotates. As the sled is pushed, it's held down by a control bar that also stops its forward travel at the appropriate point. All components except the runner and pin block are made from ¾" hardwood plywood.



Size the parts to suit your saw
Sled width = Saw table front-to-back depth plus 1"
Sled length = 36" plus the distance from the inner edge of the saw table to the blade, minus 2"
Sled runner length = Sled width plus 4"
Control bar length = Sled width plus 2"

A Blade/Jig Partnership

A ½" blade nicely handles circles over 5" in diameter. A 3-4 TPI blade with hook-style teeth works well, but carbide teeth cut even smoother. Whatever blade you choose, always pair it with your jig.

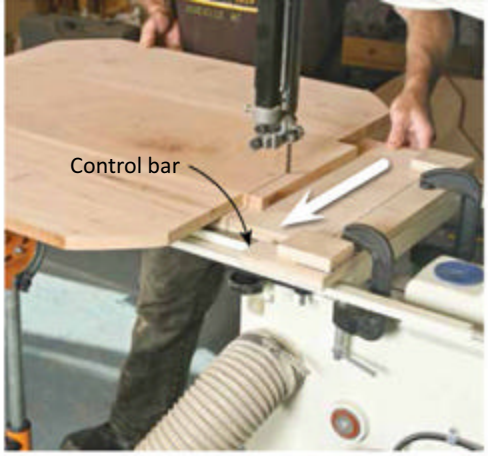
Photos: Andy Rae; Illustrations: Christopher Mills

Cutting circles

To cut a circle, first size the workpiece panel to about 1" wider and longer than the desired circle diameter. Then drill a ⅛ × ⅜"-deep centered hole in the underside. For large work, you'll first need to nip off the corners of the panel in order for them to clear the hold-downs. To do this, set the pin block for a radius 1" larger than the final radius. Then rotate the workpiece into the blade. Alternatively, use a jigsaw.

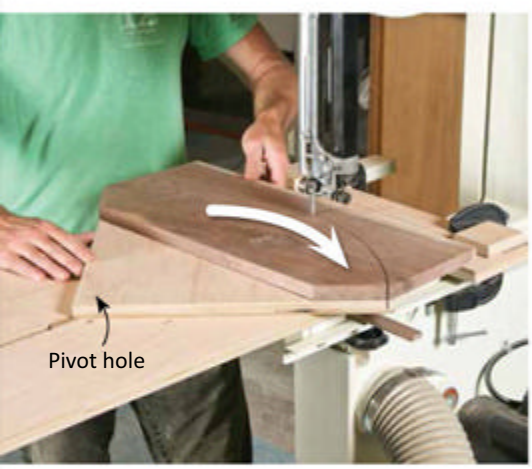
Reset the pin block to the desired radius, remount the work, and then begin the cut as shown in the photo at right.

When the sled stops against the end of the control bar, begin steadily rotating the work into the blade, as shown in the main photo on page 50. Slow down when the blade starts to skim the edge at the end of the cut. Then let the blade stop before lifting your perfect circle off the jig.



To begin the cut, push the sled up against the end of the control bar without rotating the workpiece, which brings the blade right up to the cutline.

Cutting arcs

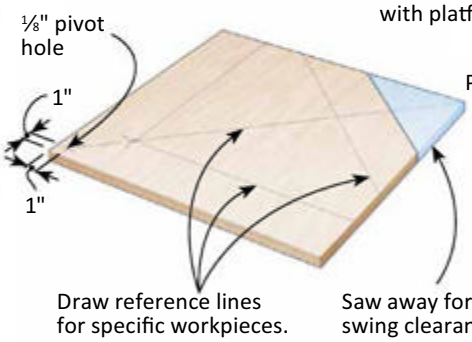


To cut arcs, tape the workpiece to a pivoting platform mounted on the sled.

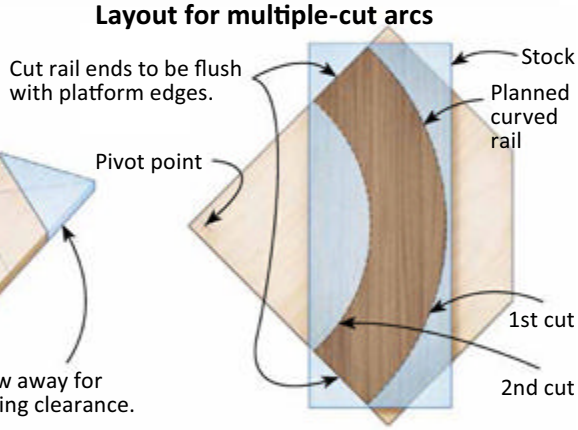
Arc-Cutting Platforms

Mount a pivoting carrier platform on the sled to make curved rails, shelves, trim, and other arced cuts. The ¾"-thick plywood platform can be reusable or sacrificial, depending on the job. Size it to suit the dimensions of your workpiece.

Layout for single-cut arcs



Layout for multiple-cut arcs



Cutting a curved rail

For an example of cutting arcs, let's look at making a curved rail like the one shown in the drawing at far right.

Tip Alert

To create a gentle curve, make the radius longer than the panel is wide. For example, setting a radius of 24" for an 18"-wide panel produces a flatter curve that's more elegant for the edge of a corner tabletop.

First, make a platform to an appropriate size, and drill a pivot hole in the corner. Mark the panel with any reference lines necessary to orient your rail blank symmetrically. This produces an attractive appearance while minimizing weak short grain.

Prepare the blank by mitering its ends to finished length. Then secure it to the platform with double-faced tape applied to both the rail area and the inner waste section. Set the pivot pin location for the desired radius, position the sled against the control bar in its final stopped position, and slip the platform onto the pin. Turn on the saw, and swing the assembly steadily through the blade, as shown in the photo at upper left.

Readjust the pin block to make the inner cut on the rail, and then repeat the sawing procedure, cutting through both the rail and the platform this time. (See right-hand photo on page 50.) Be ready to catch the freed parts as they come off the blade. ■

Sharpening Turning Tools Made Simple

Fast and easy strategies for safer, smoother cuts

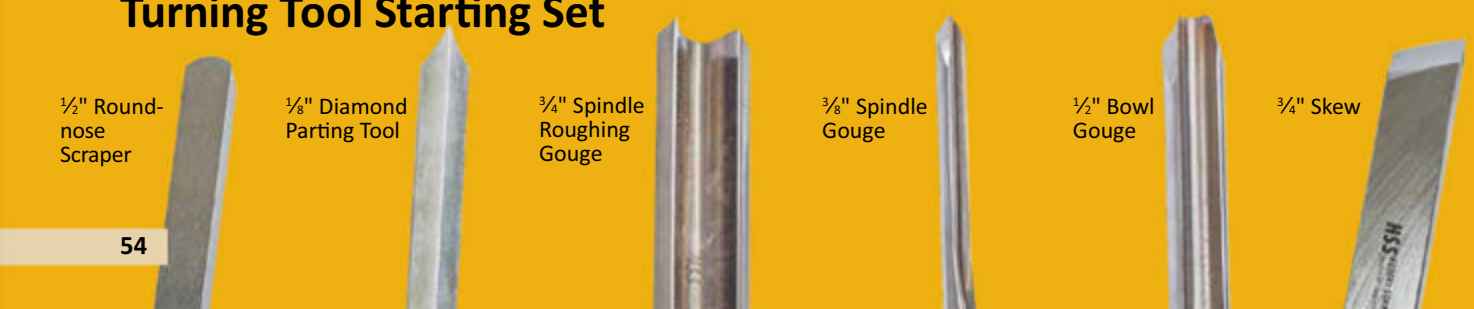
By Nick Cook

Many pieces of furniture require turned elements, such as legs, spindles, columns, and pulls. So, learning to turn is a natural (and often necessary) next step for many woodworkers. In addition, there are hundreds of useful and satisfying projects that can be accomplished with little more than a lathe, a small collection of turning tools, and a few scraps of wood. That said, the fun can't start until your tools are properly shaped and sharpened. Woodworkers have come to expect that store-bought tools require some honing before use. The surprising thing is that some new turning tools aren't sharpened properly. That can make learning to turn way more frustrating than it should be.

Here, I'll demonstrate how to quickly sharpen six of my most-used tools so that you can focus more attention on turning.

I generally prefer freehand sharpening. For me, freehand sharpening is akin to riding a bike without training wheels. Once your hands learn that sharpening is the same as turning, you'll find that shifting from the grinder to the lathe can be quick and seamless. And when you can touch up an edge in less time than it would take to set up a jig, you're likely to sharpen more often.

Turning Tool Starting Set



Sharpening Setup

Keeping a few accessories close to your lathe will encourage you to keep an edge on your tools. If you don't already own these items, it's time to stock up.

Slow-speed grinder (6" or 8" wheel)

There are other machines for sharpening and shaping, but a slow-speed grinder is a great starting point. If you don't already own one, this machine will set you back $150 to $250.

Tool rests

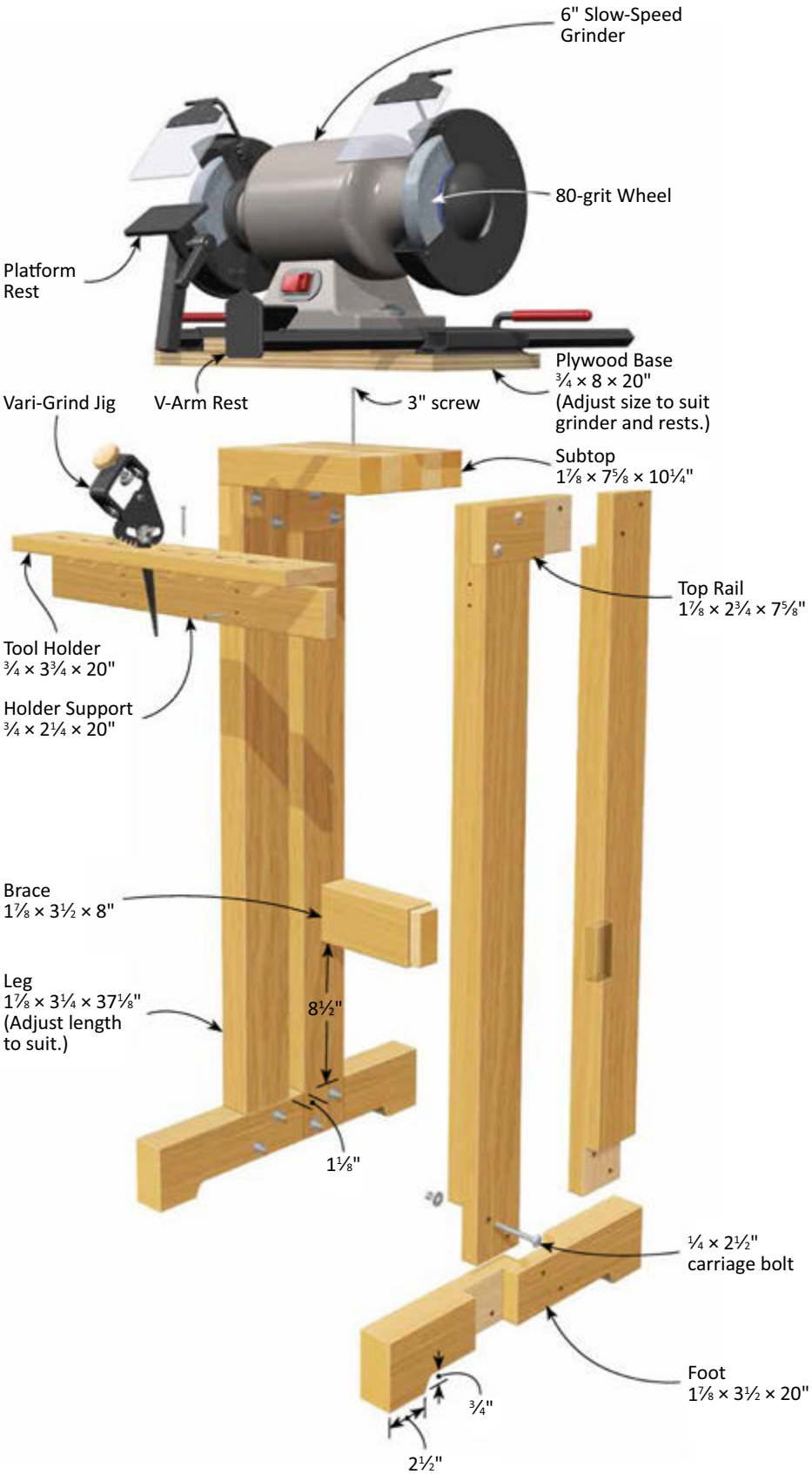
You owe it to your tools to invest in decent aftermarket rests, like the Wolverine sharpening system (#125676, **$89.99**). The platform and V-rests are easy to adjust and rock-solid when locked in place. If your budget allows, consider treating yourself to a Vari-Grind jig (#125677, **$55.99**) for spindle and bowl gouges.

Grinder stand

My dad built this stand (at right) for me 30 years ago. I like that it's rock-solid, but still light enough to move alongside whichever lathe I'm using. (Sharpening should require as few steps as possible.) Adjust the legs so that the tool rests are at the same height as your lathe's tool rest.

Grinding wheels

Both sides of my grinder are outfitted with 80-grit Norton 3x wheels. I find that these wheels remove material quickly and produce an edge that I can use without additional honing. A 6" wheel runs around $45; an 8" wheel costs $55.



Photos: Stan Kaady; Illustration: Trevor Johnston

With the rest horizontal at the height of the wheel axis, touch the tool against the wheel and slide it sideways to flatten and clean the surface.

Diamond Truing Tool

Grinding wheels require frequent dressing. A light pass with a truing tool (#158522, **$17.99**), as shown above, flattens the face of the wheel, removes metal buildup, and exposes fresh abrasive.

Protractor

You may start with factory-set tool angles, but in time, you'll find a metal protractor (#85045, **$20.99)** handy for checking an angle or establishing a new one.

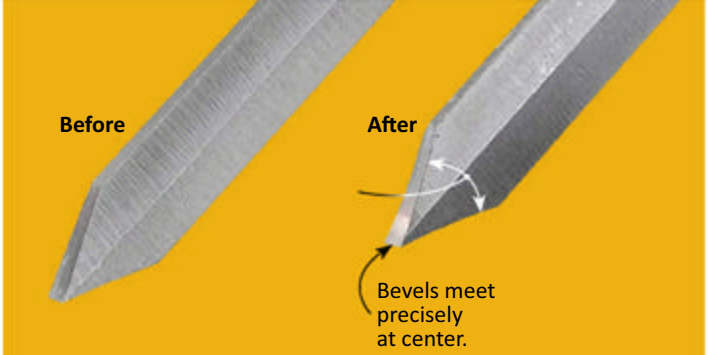
Felt-tipped marker

A marker offers the easiest way to set a tool rest to match an existing angle. Color the edge of the tool and then touch it to the stone. When the grind mark erases the ink on the center of the bevel, you're set.

Sharpening stones

Skew chisels require honing. An oilstone (#149103, **$31.99**) is an effective and affordable solution. I also keep a diamond paddle (#415700, **$37.99**) in my pocket for tool-side touch-ups.

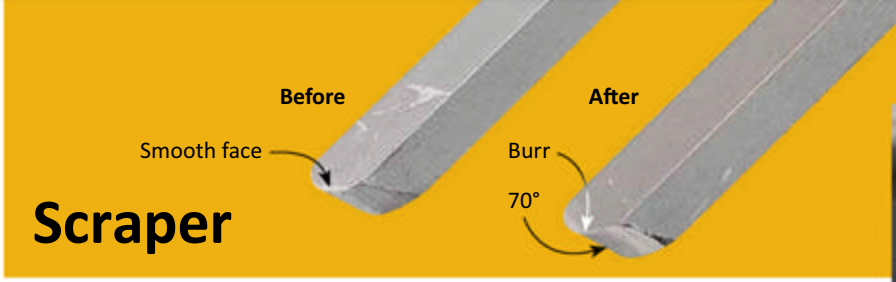
Handy Sharpening Accessories



Diamond Parting Tool

Designed for cutting straight, accurate diameters and for separating a turning from the waste portion of a blank, a parting tool is a cross between a cutting tool and a scraper. When the edge is held tangent to the workpiece with the bevel rubbing, it's cutting. When the tip is fed straight into the workpiece at or slightly above the centerline, it's scraping. Parting tools come in several varieties: flat, diamond, and "fluted." You'll want to purchase other parting tools eventually, but the diamond is a good tool to start with because it's easy to use. Because the tip is at the thickest part of the shaft, a diamond parting tool can take deep cuts without the sides binding in the kerf.

Typically, the factory-established bevels meet at a 50° angle, so this tool should be ready to go with just a quick touch-up. (Note: A lower angle will produce a cleaner cut, but it tends to break down quickly when used for scraping.) To sharpen, adjust the flat tool rest so that the tool's bevel angle matches the wheel. Then, gently push the edge against the wheel. Focus on removing an equal amount from both faces so that the point remains centered on the tool. Stop as soon as the edge is square and you feel a burr. (I don't worry about polishing or honing off the burr. It'll get knocked off as soon as the tip touches the blank.)

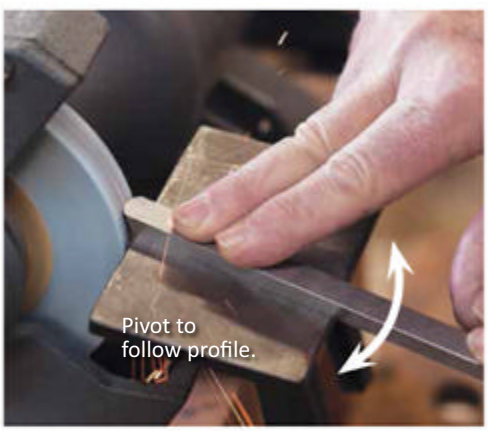


Scraper

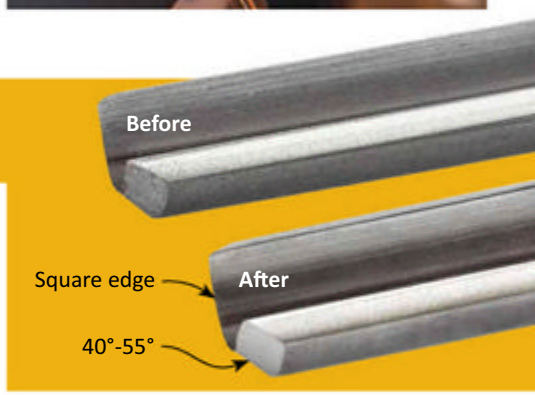
It's difficult to see a difference between the "Before" and "After" images, but if you were to run your finger across the top face of both tools, you'd immediately notice the wire edge, or *burr*, on the properly prepared scraper. This burr is what gives scrapers the ability to produce glassy smooth surfaces. Burrs don't last long, but they can be reestablished in seconds.

Adjust the tool rest so that the face of the bevel meets the contour of the wheel. To ensure that the angles match, color the tip of the tool with a marker and touch it against the wheel. Adjust the platform until the wheel touches the middle of the bevel. Now, with the tool flat on the rest, gently press the scraper's tip into the wheel and follow the shape of the edge. With a round scraper, this means swinging the tool's handle back and forth. When sparks start landing on the top face of the tool, and you can feel the burr, you're done.

Note: Some turners polish off the burr on a buffing wheel, and then use a burnisher to draw a burr. A drawn burr may be a little tougher, but I don't think the performance warrants this extra step. I find that more frequent grinding is faster and easier than hand-drawing a burr.



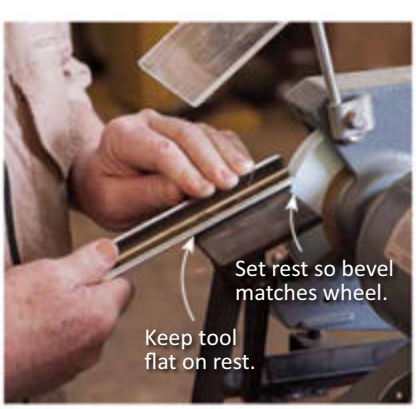
Spindle Roughing Gouge

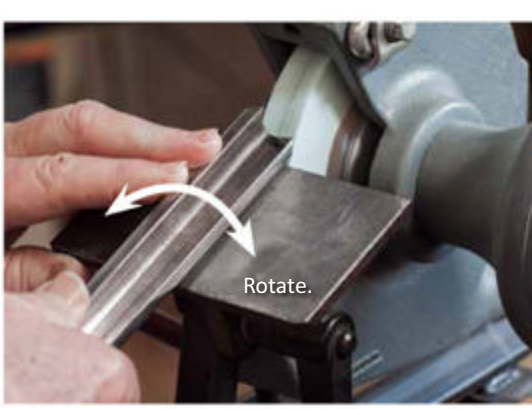


A spindle roughing gouge turns blanks into cylinders; it can also turn basic shapes, such as tapers. Note that this tool is for spindles only. It is not intended for bowl turning.

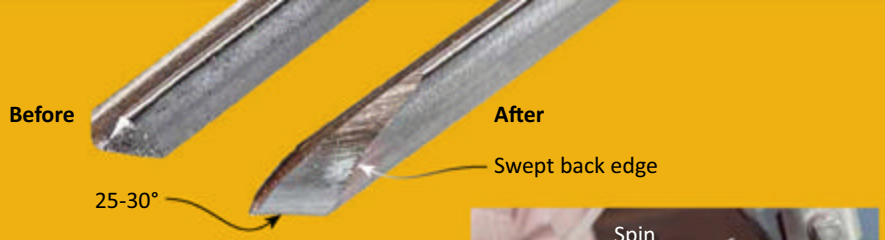
Any bevel angle from 40°-55° works; so the factory-ground angle is a good starting point. Adjust the angle of a flat rest so that the tool bevel rides against the stone. Now turn on the grinder, and with the tool parallel to the wheel, touch the tip of the tool. Lay the tool on the rest, and slowly push the gouge toward the wheel. When the tip contacts the wheel, use one hand to keep the tool against the table and rotate the gouge until you reach the other side, and then reverse direction. As you grind, focus on holding the gouge firmly on the rest and keeping its end square to the wheel. When sparks come over the top of the tool, you should be done.

Note: Some turners suggest resting the handle's butt in a V-arm rest, but I think this procedure is unnecessarily time consuming, and potentially dangerous. If the edge should catch, the grinder's rotation would jam the tool into the wheel. In my opinion, freehand grinding is safer and just as accurate.





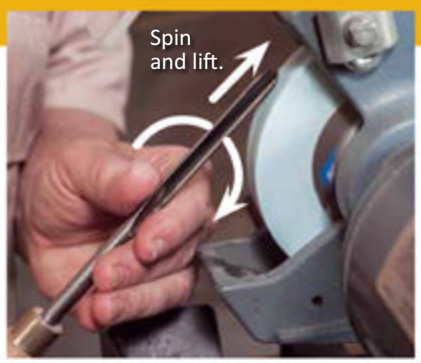
Spindle Gouge



The spindle gouge is designed to cut curves, coves, and other detailed profiles on spindles and bowls. These shapes are easier to do if you lengthen and curve the bevel to create a "fingernail grind," as shown above. Unlike a roughing gouge, this profile has a longer, tapered point, with cut-back shoulders designed to stay clear of the cut.

Sharpening a spindle gouge requires more practice than other tools because the tool is rolled against the grinding wheel while simultaneously being slid up higher on the wheel to grind the wings. Unlike a basic gouge, you cannot simply set the tool on the rest. To facilitate this two-step process, I set my resting hand on the V-rest as shown above left. (I think this method keeps your hand a safer distance from the wheel.)

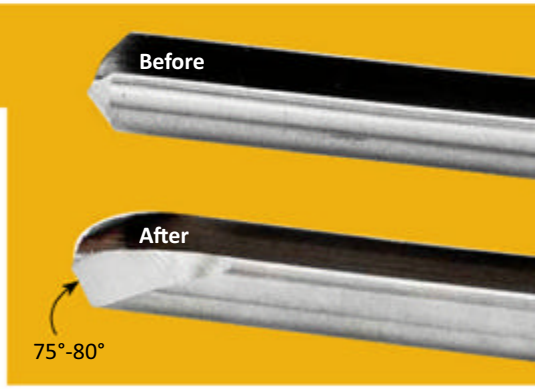
With the grinder off, set the gouge on your resting hand and slide it forward until the middle section of the bevel touches the upper half of the wheel, and then allow it to tip away from the wheel. Now with the grinder on, raise the handle until the full bevel touches the wheel. As you rotate the tool, simultaneously push it up on the grinding wheel, as shown. Repeat this process on one side until sparks come over the edge and inside the flute. Then repeat the procedure on the other side of the bevel. As a final step, rotate outward in both directions from the middle of the gouge's cutting edges to make a uniform, continuous bevel.



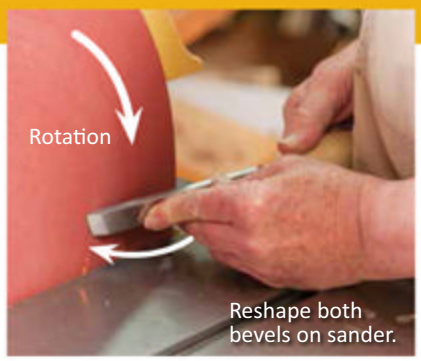
Bowl Gouge

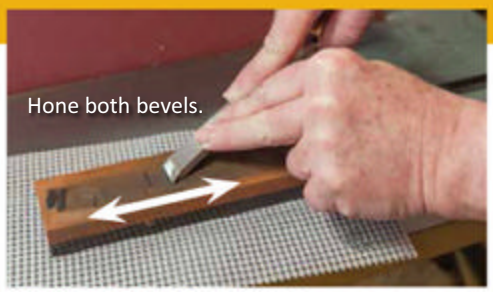
I grind bowl gouges in the same manner as my spindle gouges; however, I do grind a higher bevel angle (around 75°-80°) in order to provide more mass under the cutting edge. This gouge can also be sharpened freehand, but when establishing a brand-new bevel on a larger gouge, I appreciate help from the Vari-Grind jig.

To use the jig, first employ the stop so that the tip projects about 2" from the front of the jig as shown. Adjust the jig's leg per the manufacturer's instructions, set it in the V-rest and then slide the rest out so that the center of the bevel rests on the center of the wheel. Now, turn the grinder on, and lower the tool onto the wheel. Grind the tip first, and then pivot and swing the jig in each direction, as shown to create an even grind. (As you can see in the photo, it helps to stand to one side the grinder in order to stay clear of handle.)



Skew Chisel





The skew chisel is my go-to tool for most spindle turning. It can be used not only to shape, but also to finish cylinders, V-grooves, beads, and long concave curves. Although it's regarded as the most difficult tool to use, once mastered, it can produce finished surfaces as smooth as the finest grit sandpaper, in a fraction of the time.

Since it is a finish-surface tool, a skew must be razor (literally, hair-shaving) sharp. Fortunately, getting a surgical edge isn't that much harder than sharpening a standard bench chisel.

Rather than using a grinder, I prefer shaping the bevels on either a disc or belt sander outfitted with 80-grit abrasive. Unlike a wheel, these machines maintain the flat bevel. (Note: To avoid any chance of fire, remove sawdust from the sander and surrounding area.)

Using the factory-established bevel as a guide, rest one hand on the sander's table, and then swing the tip against the disc or belt, as shown. As you do this, be mindful not to catch the tool's top corner. To avoid a catch, let the skew's bottom edge touch the abrasive before fully registering the bevel against the disc. Repeat this procedure on the opposite face. After grinding both faces, check the bevels, and then make any necessary adjustments so that both bevels are the same length.

After grinding, you'll need to hone the edge. While I'm still at the machine, I'll set up an oilstone. Simply register the bevel against the stone, and slide the tool back and forth as shown until you've achieved a mirror surface. A few passes on each side should do the trick. These days, I also keep a diamond paddle in my apron pocket. This accessory provides a handy way to touch up an edge before making a finishing cut. I find that I can re-hone an edge several times before needing to regrind it. ■

About Our Author
Nick Cook is a founding member of the American Association of Woodturners, and conducts woodturning workshops across the country. He just completed 1,219 napkin rings from Auburn University's famed Toomer's Corner Oak.

Is it Sharp, or Not?

If you've tried using a turning tool brand new, or attempted to turn too long without going back to the grinder, then you already know how a dull tool will pull or tear at your turning, leaving a surface that can be impossible to sand smooth. The trick is knowing when a tool needs a touch-up, before the damage is done. The ability to tell the difference requires a certain amount of experience, especially since some woods are harder to turn than others.

One quick way to determine whether a tool is sharp or not is by dragging its edge across your thumbnail. If the edge catches and creates a curl, you're set.

The best advice I've heard is, "When in doubt, sharpen."

As sharp as my tools are, I still make a habit of touching up an edge before making a final cut.

Bow-tiful Keepsake Box

Make this hollow heart an expression of love.

By Kyle Camp

Overall dimensions: 3⅞"w × 2½"h × 3⅛"l

It's one thing to give a small gift in a cardboard box that's wrapped in fancy paper. It's something else when the presentation box is equal to or better than the item inside. With this endearing bandsawn box design, you can make the most of your choice scrap, and top the heart with a scrollsawn bow and ribbon tails cut from laminations of contrasting woods. Use the full-sized patterns to save time.

Bandsaw and assemble the box

1 Cut a 3½ × 4" blank from 2"-thick stock. (I used cherry.) If you don't have a solid block at that thickness, laminate two or more pieces together.

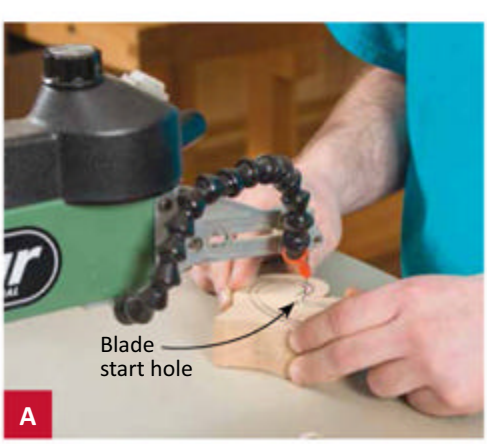
2 At the bandsaw, resaw a ⅜" slab from one face of the blank using a ½" × 4 TPI blade. Now, resaw a second ⅜" slab off the opposite face.

3 Make an enlarged copy of the exterior heart pattern in **Figure 2**, affix it to a piece of stiff cardboard or poster board, and cut it out. (If you intend to only make one box, you can just affix it directly to the workpiece.) Since I'm making several boxes, I'll use the cardboard shape for a tracing template.

4 Double-face tape the three pieces back together. Place the heart template on the stack and trace the shape on the top.

5 Using a ¼" × 6 TPI blade, bandsaw the blank in the shape of the heart, cutting on the line. (The narrower blade lets me navigate the sharp curves better.)

6 Make a copy of the interior heart pattern in



A

Begin at the blade start hole, and scrollsaw the outside walls of the lid support, following the pattern line.

Using a pushstick, fence, and a ½" resaw blade, bandsaw the hollow box into two equal halves.

Figure 2, apply it to cardboard, and cut the template to shape using a crafts knife.

7 Center the interior heart template between the sides of the core blank to establish walls of equal thickness and trace around it. Drill a ⅛" blade-start hole within the interior heart shape. Next, using a #5 reverse-tooth scrollsaw blade, slip the blade through the start hole and scrollsaw the outside walls of the lid support as shown in **Photo A** and **Figure 2**. Loosen the blade and remove the box core. Then, scrollsaw along the inside walls of the lid support to separate it from the core.

8 Sand the inside surface of the lid support to remove saw marks. (I used a spindle sander.) *Note: If you intend to line the box with felt, use the box core interior walls to lay out and cut a cardboard backer to size at this time. Later, you can use the backer to size the felt for a perfect fit. For more, see page 64.*

9 Glue the top and bottom to the box core, flushing the edges all around. (I used medium 2500M Nexabond adhesive to take advantage of the glue's short set time.)

10 Set up your bandsaw fence 1" from the blade. Now, saw the box in half, separating the lid from the box base as shown in **Photo B**.

11 Apply glue to the inside walls of the lid. Now, fully insert the lid support. Let dry. Note that when the box halves will be together, the lid support registers the lid to the box base.

12 At the bandsaw, place the lid against the fence and resaw the attached lid support so that only 3/16" of it protrudes below the edge of the lid. Sand the edges smooth and even by rubbing the lid support portion on a flat piece of sandpaper.

Figure 1: Exploded View of Heart Box

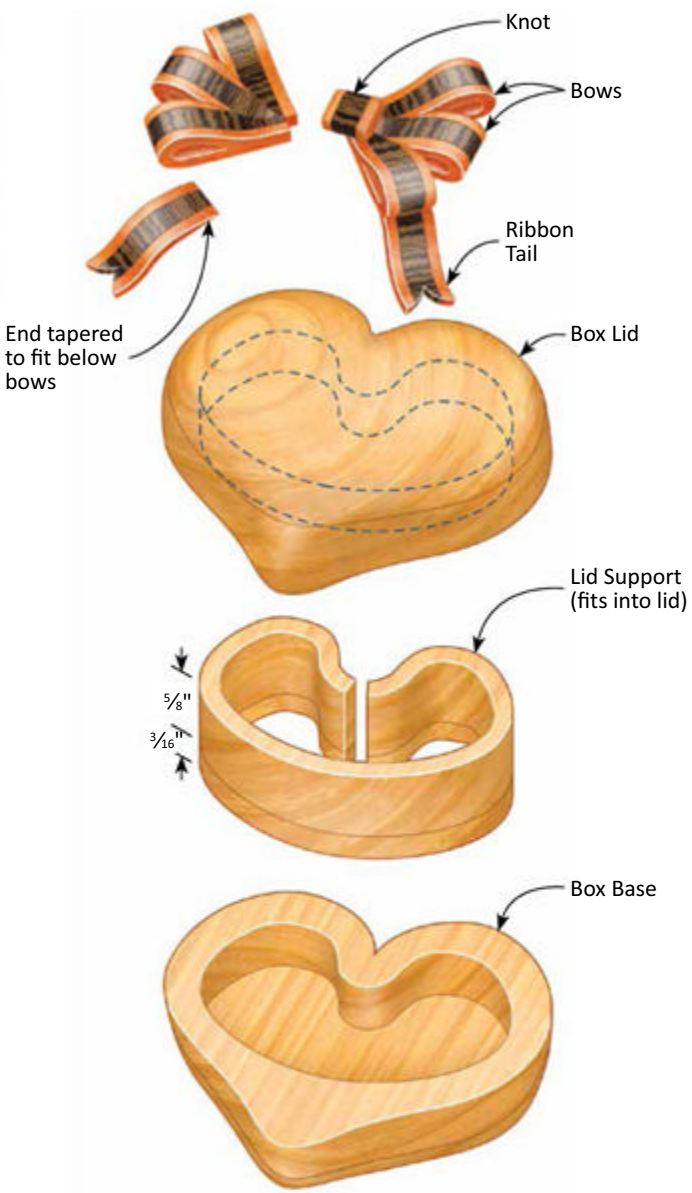
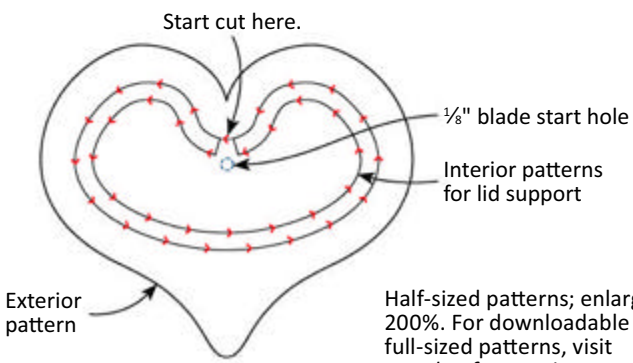


Figure 2: Half-Sized Heart Exterior and Interior Patterns



Half-sized patterns; enlarge 200%. For downloadable full-sized patterns, visit *woodcraftmagazine.com* and click on Magazine Patterns.

Photos: Larry Hamel-Lambert; Illustrations: Frank Rohrbach III

Hold the box base and lid together as you sand the general contours along the sides, rotating the box to avoid burning and creating facets.

Blend in the contours by constantly rotating the box against the drum sander, working with the grain when possible.

Sand the box and lid

1 Fit the lid onto the box, and, using a drum sander at the drill press or an oscillating spinder sander, true up the sides or edges of the box base and lid to remove saw marks and flush the surfaces of the mating parts.

2 Using **Figure 3**, scribe on the contour lines for a sanding reference. (Expect to redraw the lines a few times as you work through the sanding/contouring process.)

3 At a stationary belt sander, sand off the bulk of the waste, as shown in **Photo C**. Redraw and reestablish the contour lines as needed. Aim for smooth rounded surfaces and equal waste removal on each side of the box for ideal symmetry.

4 Install an inflatable drum sander in your drill press with an 80-grit sleeve. Now, ease the curves and contours of the box further, as shown in **Photo D**. Switch to 120-grit through 220-grit sleeves to complete sanding the box. Hand-sand the difficult-to-reach crevice area, blending its surfaces with the rest of the box.

Make and add the bows

1 Plane and cut one piece of stock to ¼ × 1½ × 18"; plane and cut two pieces of contrasting stock to ⅛ × 1½ × 18". (To safely plane ⅛"-thick stock, adhere thicker stock with double-faced tape to a flat carrier board such as ¾" MDF and run it through the planer.) Face-laminate the pieces together, placing the ¼"-thick piece in the middle. Flush the edges, clamp, and let dry.

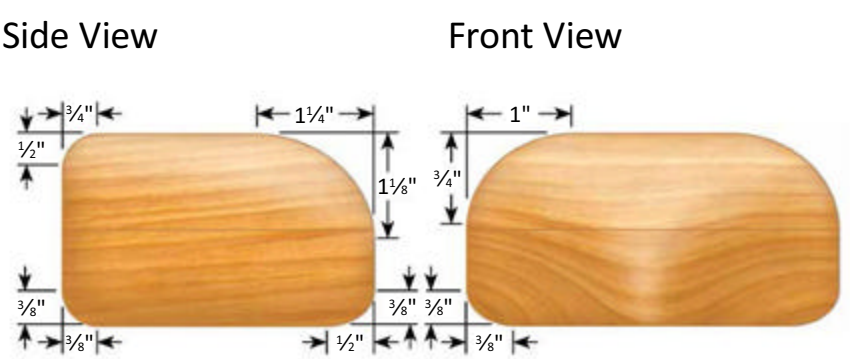
2 Make a copy of **Bow** and **Ribbon Tail** patterns in **Figure 4**. Adhere them to thin cardboard as before, and cut the templates out with a craft knife.

3 Using the bow template, lay out the six bows on the laminated blank, as shown in **Photo E**.

4 Following the cutting sequence in **Figure 4**, drill blade start holes in the bow openings. Now, thread a #5 reverse-tooth scrollsaw blade through a hole, and cut out the waste in a bow, as shown in **Photo F**, using a medium speed. (I make my cuts in the sequence shown in **Figure 4** in order to have more wood to safely hold on to.) Repeat for the remaining bows. Cut the bows from the blank.

5 Use the ribbon template to scribe two ribbon tails side by side on the face of the laminated blank. Scrollsaw the tails as shown in **Photo G**. Following the sequence in **Figure 4,**

Figure 3: Sanding Contours



make cut 1, stop the machine at the end of the cut, and back the blade out. Repeat for cuts 2 and 3, referring to **Figure 4**. Keep the pieces in the blank for **Step 6** and **Step 7**.

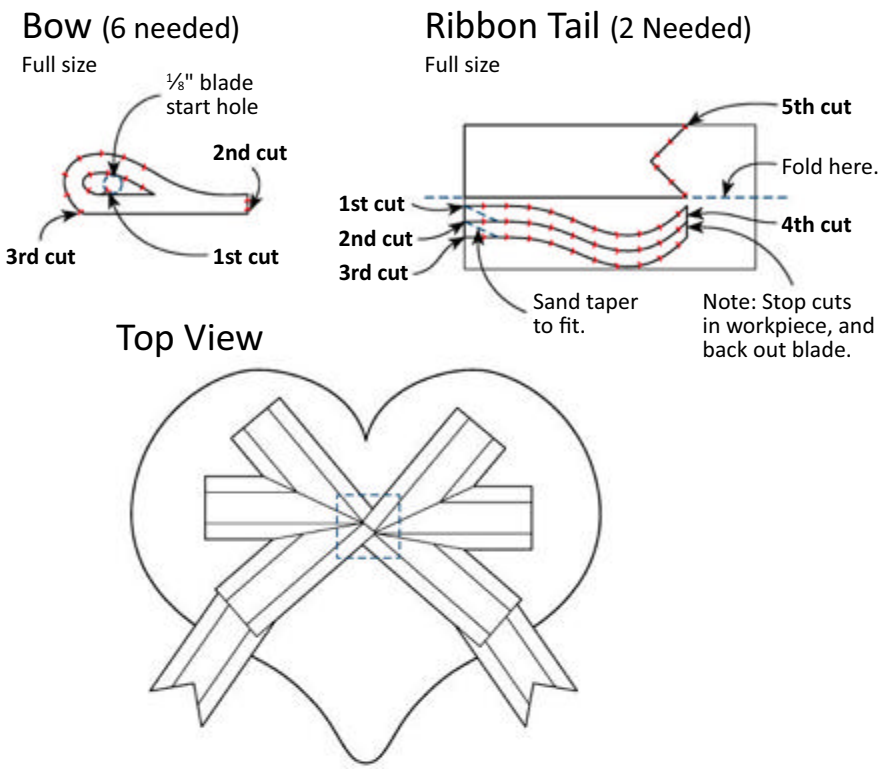
6 Fold the ribbon tail pattern on the dotted line and place it on the blank, aligning it with the V end of the tails. Mark the V at the end of the tails on the edge of the blank.

7 Now, with the blank on its edge, cut the V in the ribbon tails, as shown in **Photo H**, following the sequence for cuts 4 and 5 in **Figure 4**.

8 Cut the ¼ × ½ × ½" knot from the remaining blank material.

9 Lay out the lines for the tapered bow ends, referring the **Top View** in **Figure 4**.

Figure 4: Bow and Ribbon Tail Patterns



E

Place the template on the face of the lamination and scribe six bows.

F

After drilling the ⅛" blade start holes in the blank, insert the blade and scrollsaw out the waste area in each bow.

G

Carefully cut on the lines to create two curved ribbon tails of equal thickness, stopping where cut line ends.

H

With the tails still in the blank, cut the V notch in the lower ends.

Box Lining Option

Consider dressing up the box bottom with felt. To do this, cut out a cardboard backer as described in the note following **Step 8** under Bandsaw and Assemble the Box. Test-fit the cardboard in the box and, once satisfied, apply an oversized piece of adhesive-backed felt to the backer. Trim it to final size. Finally, insert the backer and felt into the box, pressing it against the bottom.

I

With the center of the lid established, mark the locations of the bow cluster and tail.

Making an Acrylic Box

If you're feeling ambitious, consider making a bow-topped keepsake box or just the bows out of acrylic. To do this, I cut my blanks close to final size. I then wrapped the solid acrylic bow and ribbon blank with packing tape top and bottom to clean the blade and prevent the plastic from melting. Then I applied the templates as with a wood box. Cut out the parts using the same blade and speed as the wood box.

To sand the acrylic bow and tail parts, use Micro-Mesh sanding pads, and wet-sand the surfaces through 12,000 grit. Glue the parts together using CA glue. Finish with clear lacquer (it helps cover up any minor scratches that fail to buff out.)

Convenience-*PLUS* BUYING GUIDE

☐ 1.	#852653	$3.99
	Pegas 90.429 No.5R Skip Reverse, 12/9R TPI, Scrollsaw Blade	
☐ 2.	#147541	$44.99
	Guinevere Inflatable Drum Sander	
☐ 3.	#147547	$12.59
	Guinevere Hand Pump	
☐ 4.	#159187	$7.99
	Nexabond Adhesive, 2500M, 1 oz.	
☐ 5.	#142216	$31.50
	Hafele Felt Sheets, Maroon, Peel and Stick, 23 × 35¾"	

Above items are available at Woodcraft stores, *woodcraft.com* or by calling (800) 225-1153. Prices subject to change without notice.

About Our Author

Native of Parkersburg, West Virginia, Kyle Camp has been woodworking for some 16 years. His favorite projects include fretwork, scrollsawn projects of all kinds, woodturning, and furniture pieces. He is the assistant manager of the Parkersburg Woodcraft store where he teaches classes from beginning scrollsawing to basic woodworking.

At the belt/disc sander, sand to the lines to create straight joining edges of the bow parts. Test-fit the parts as needed.

10 Using 150-grit sandpaper, sand the bows, ribbon tails, and knot. (I sometimes clean out the bow holes with a craft knife to remove the fuzzies.)

Assemble the bows and ribbons

1 Glue one center ribbon and two outside ribbons edge to edge. Do the same for the opposing ribbon group. Let dry.

2 Starting at the center of the box lid, eyeing between the heart's point and V, place a glued-up bow cluster to one side. Fit a ribbon tail beneath it, allowing its curve to flow over the rounded-over edge. Mark its location. Do the same for the other cluster and ribbon tail, as shown in **Photo I**.

3 Slightly taper-sand the inside ends of the ribbon tails. Dry-fit both bow clusters and tails onto the box top in alignment with the marks. Once satisfied with the fit, glue the clusters and tails to the lid. Let dry. Erase any pencil marks and finish-sand.

4 Apply a finish. (I sprayed on three coats of Watco's clear gloss lacquer.) ■

Adjustable Dovetail Gauge

Two quick-set angles and everything in between

By Andy Rae

Overall dimensions: 9/16"w × 5¼"d × 6¼"h

I use a lot of hand-cut dovetails for my furniture, and for two good reasons: they're strong and, when the joinery is exposed, they're beautiful. To make laying out easier, I designed this shop-made dovetail gauge that ensures accuracy and speeds up the process of marking tails or pins. As a bonus, it's a beautiful addition to any hand-tool collection.

This gauge is made with a mahogany head and a rosewood blade. An angled mortise in the head registers the blade at one of two favorite dovetail angles (in my case 5° and 14°), or it can be set to any angle in between. A friction-fit allows pivoting the blade without tools. The head provides bearing on both sides of the blade, so the tool can be flipped to mark out complementary angles.

The long blade allows marking out dovetails for everything from typical drawers and cases to wooden vises for a workbench, and other thick pieces that demand long tails and pins.

Construction of the gauge is simple, as there's no fussy mortising involved in making the head. Instead, you simply laminate four strips of wood together, mitering the two in the middle and leaving space between them to create the mortise. For the critical friction-fit of the blade, all you need are a few swipes with a sharp plane.

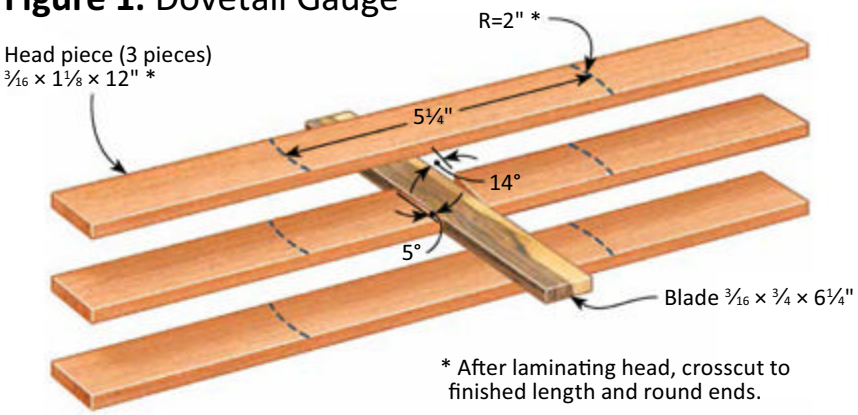
Make the head and blade

1 Select straight-grained stock for the head. I used mahogany, but any favorite hardwood will suffice. Starting with an oversized blank roughly 1 × 1¼ × 12" long, resaw it into three pieces about ¼" thick, and mark them for reassembly in the same orientation later.

2 Pick an even denser wood for the blade, such as rosewood, wenge, or even a dense domestic wood such as hard maple or

Photos: Andy Rae; Illustrations: Frank Rohrbach III

Figure 1: Dovetail Gauge



beech, again selecting straight grained stock. Mill the blade to about ¼ × ⅞ × 12" long for now.

3 Thickness-plane the head pieces and the blade, taking very fine passes and planing the head pieces to 3/16" thick. Stop planing the blade on the last few passes, leaving it thicker than the head pieces by 1/32" or so for now. You'll hand plane it to final thickness later.

When mitering the end of the gauge blade, use a hold-down board, resting its far end on a shim of equal thickness to the workpiece. MDF underneath prevents tear-out.

4 Joint, rip, and crosscut the blade to the final width and length shown in **Figure 1**.

5 Sand the ends and narrow edges of the blade through 320 grit, keeping the edges square. Don't touch the faces for now.

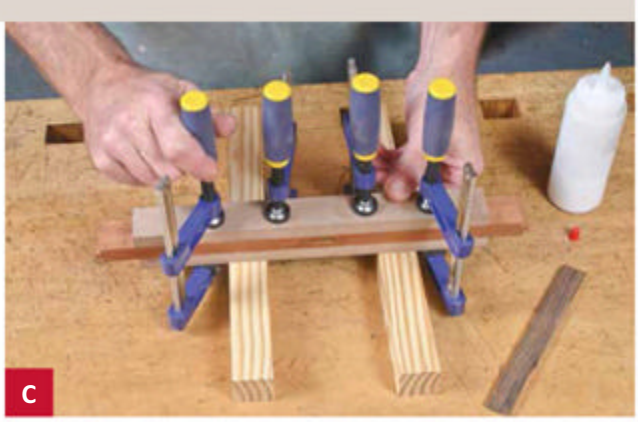
6 Separate the middle head stock piece in two, using a mitersaw to cut the two different miters at the center of the piece (**Photo A**). *Note: Dovetail angles ranging from 7° to 14° are traditional, but I used a 5°/14° combination because I prefer 5° for thicker casework, and 14° for small drawers and boxes.*

7 Make four clamping blocks from ½" MDF or plywood sized to the width of the head pieces. Make two of the blocks an inch or so shorter than the outer head pieces, and two blocks an inch shorter than the middle pieces. (The shorter lengths allow better visibility during glue-up.)

8 Spread a thin film of glue on one face of the inner head piece that has the more acute miter. Place it on an outer head piece with the mitered end near the center, and the long edges aligned. Then clamp the pieces together between a long and a short clamping block.

Gluing up the head

Glue and clamp the middle piece with the more acute miter first, and then butt the blade against it and attach the opposing middle piece with its tip touching the blade.



After the glue cures, cap the assembly with the remaining head piece, using both full-length clamping blocks and checking for edge alignment.

9 Place the blade against the miter on the attached piece, and then glue the opposite inner head piece in place with the tip of its miter touching the blade. Clamp it as shown in **Photo B**, remove the blade, and set the assembly aside for at least an hour.

10 Remove the clamps and spread glue on the middle head pieces. Add the second outer piece, and clamp the parts together as before, but use both long clamping blocks this time (**Photo C**).

11 Once the glue has dried, pare away any squeeze-out from inside the mortise using a narrow chisel, and then plane or joint the long edges flush. Be careful not to remove too much material or you'll widen the mouth of the mortise.

12 Lay out the curved ends on the head, as shown in **Figure 1**, keeping the mortise centered. Bandsaw the ends just shy of your layout lines, and then sand to them.

13 Finally, round over any sharp edges and smooth all the surfaces by sanding through 320 grit. I sanded small 1/16" chamfers on the ends of the head using 320-grit sandpaper wrapped around a hard block.

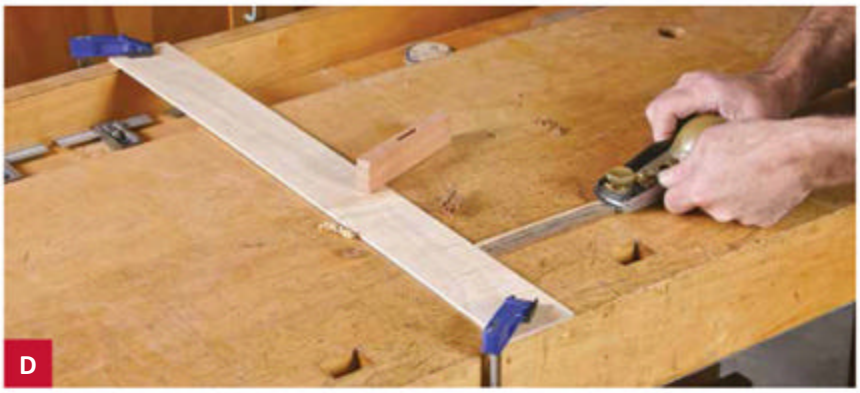
Fit the blade and finish up

1 Use a sharp block plane to finesse the thickness of the blade for a solid friction-fit in the head. As shown in **Figure 2**, first adjust the plane for a very light cut, and take a full-length shaving from each face of the blade (**Photo D**). Check the fit, and keep taking full-length shavings until both ends *almost* enter the longer end of the mortise, or do so with a fair amount of force.

2 Starting about 2" in from each end and on both sides of the blade, take a single very fine shaving outward. Check the fit and, if necessary, repeat the process until each end of the blade slides easily into the mortise and the blade snugs up tight at its center.

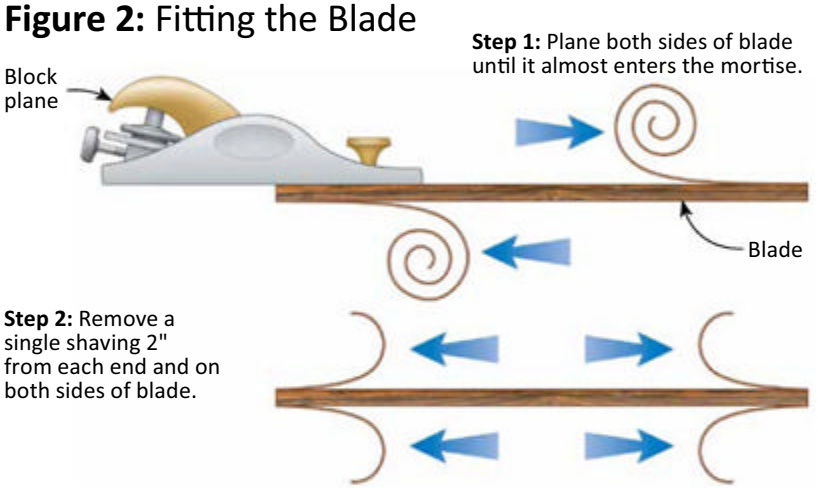
3 Sand the planed faces of the blade with 320 grit, touching the center only lightly to avoid altering its fit. Sand the edges, but not too much, as they need to remain crisp for accurate marking. Finally, sand a 1/16" bevel on the ends of the blade.

4 Finish the blade and head, applying a couple coats of a penetrating finish such as oil or thinned wiping varnish, letting it soak in before wiping off the excess. Smooth between dried coats with 0000 steel wool, apply wax, and buff it out.



Planing against a stop strip thinner than 3/16", take fine, full-length shavings from each face of the blade in turn until you achieve a friction fit in the mortise.

Figure 2: Fitting the Blade



5 To set the gauge to one of the two fixed angles, grasp the ends of the blade with both hands, wrapping your thumbs around the appropriate end of the head, and squeeze the blade against the end of the mortise. ■

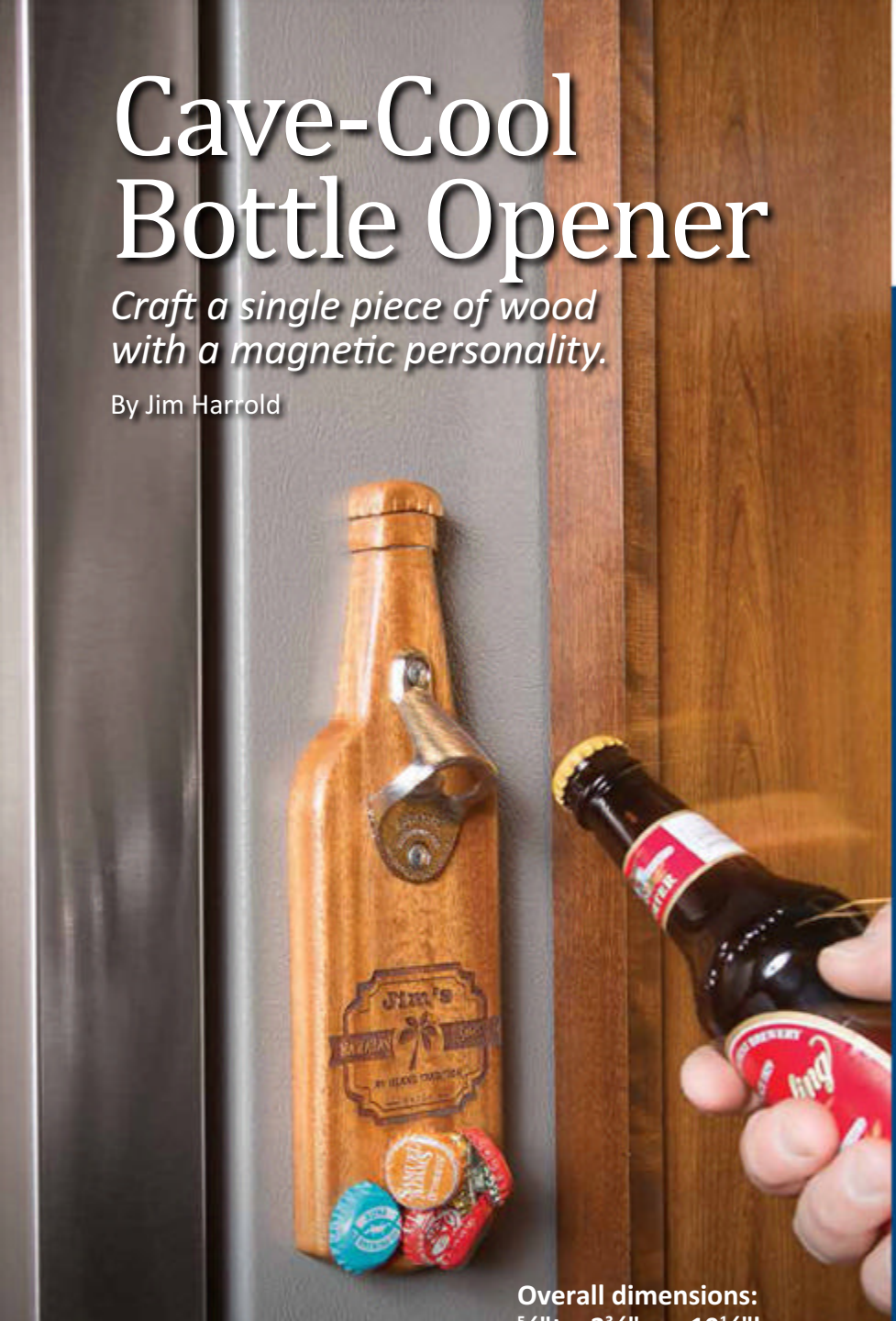
About Our Author

Andy Rae is an award-winning furnituremaker whose career spans several decades. He has authored a number of books on woodworking, including *Choosing & Using Hand Tools* (Sterling Publishing) and *Furniture and Cabinet Construction* (Taunton Press). He lives in the mountains of western North Carolina.

Cave-Cool Bottle Opener

Craft a single piece of wood with a magnetic personality.

By Jim Harrold



Overall dimensions:
⅝"t × 3⅜"w × 10½"l

Looking for a project with a "catchy" design? Cut from a single piece of wood and shaped like a beer bottle, this ultimate opener contains four rare-earth magnets in its back face–two in shallow holes for adhering the piece to a metal surface like a refrigerator, and two in deep holes for catching falling bottle caps.

Simple steps and a full-sized pattern speed the work. Consider making multiples for all of your cap-popping buddies. As an added design element, opt to laser-engrave a label. (See "Customize Your Cap Popper," at right.)

Note: *For the full-sized bottle pattern, go to woodcraftmagazine.com/magpatterns.html.*

Photos: Larry Hamel-Lambert

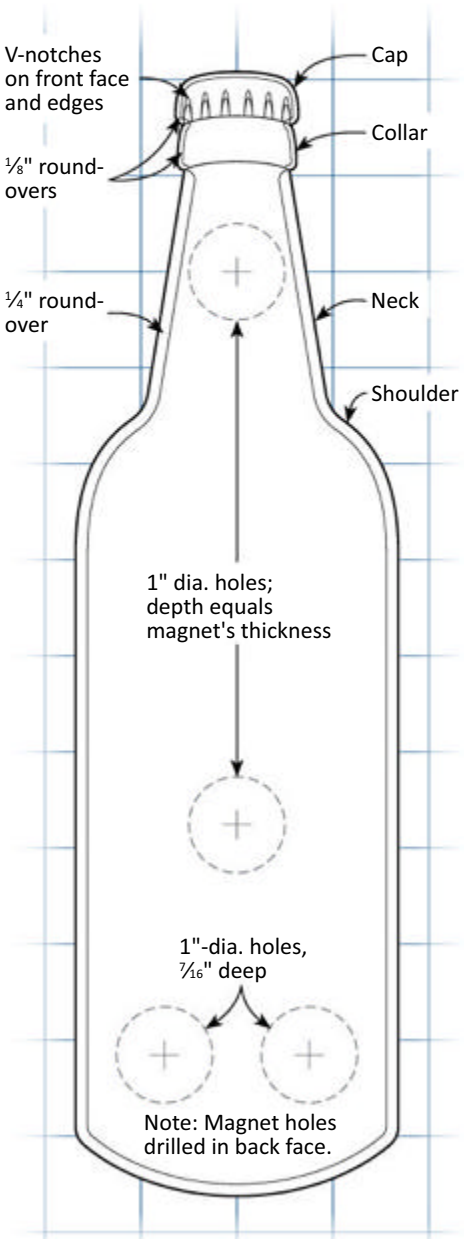
Customize your Cap Popper

If magically catching bottle caps makes 'em smile, make 'em laugh with a clever laser-engraved label. I hooked up with Epilog Laser to gin up labels for bottles made of walnut, cherry, and African mahogany. After you create the words and art idea for your label, go to *www.epiloglaser.com/resources/industry-links-services.htm* to find an engraver nearby. Costs should run around $10 per label for an original design; $3 to $4 for multiples of the same design. If a local engraver is not available, send your unfinished wood bottle (minus the magnets) and label idea to the Woodcraft laser-engraving service by calling 1-800-535-4482 or going to *woodcraft.com/static/engraving.aspx*. They'll work with you on the type and basic stock image you want to keep the cost around $10. Here, factor in shipping, in addition to the engraving costs.

Shape the bottle

1 Plane a length of ¾" stock to ⅝" thick, and rip it to 3⅜" wide. (I choose walnut for its dark brown beer bottle color when finished.) Cut it to 12" long for one bottle; cut several pieces to that size for multiple bottles. If adding a laser-engraved label, avoid open-grained woods such as oak.

Figure 1: Bottle Pattern



1 square = 1"
Half-sized pattern; enlarge 200%.
For a downloadable full-sized pattern, visit *woodcraftmagazine.com* and click on Magazine Patterns.

2 Make a full-sized copy of the beer bottle pattern and spray-adhere it to the blank, flushing the edges of the pattern with the blank. Now, bandsaw the bottle to shape.

3 Remove the bottle's saw marks along the shoulders and neck at an oscillating spindle sander while sanding to the line. Change drum diameters as needed for the inside corners, keeping the workpiece moving to avoid gouging. Use a sanding block to further achieve straight, clean lines along the neck edges.

4 Install a ¼" round-over bit in your table-mounted router. Flip your bottle blank pattern side down on the router table, and mark at the top of the bottle's neck where to start and stop routing so as not to cut into the swollen collar. Rout the round-over along the edges of the neck, shoulder, and body to give the bottle a realistic look (**Photo A**). Do not rout the collar.

5 Clamp the bottle in a bench vise, pattern side up, so that you can further detail the neck, collar, and cap. Use a utility knife or carving knife to sharply define the edges between the collar and neck and between the cap and collar, following the pattern lines. Scribe 1/16" to ⅛" deep dividing lines with the cutting blade held at a right angle to the wood. Then, angle-cut at 30° just below the dividing lines to remove a thin wedge of wood across the grain. You want to create a tapering relief below the collar, and also the cap.

6 To speed the work, use a rotary tool and sanding disc to finish-shape the neck up to the collar dividing line, rounding over the portion of the neck you could not round over at the router table (**Photo B**). Round over the corners of the collar and bottle cap. Do not round over the blank's back edges. Hand-sand with the grain to remove any facets. If you don't own a rotary tool, a file and 150-grit sandpaper will achieve the same result. Also, note how the paper pattern helps you determine that you've removed equal amount of wood along both front edges of the neck, collar, and cap.

With a pushpad, round over the bottle edges at the start mark, feeding the piece clockwise against the bearing; stop at the stop mark.

7 Using the pattern as a guide, cut the V-grooves in the cap to give it the crenulated or crimped look (**Photo C**). (I used a small V-groove carving tool for this, but a carving knife or file could work as well.)

8 Referencing the pattern on the bottle's front face, transfer the hole locations to the back face. Now, peel up the pattern.

9 Install a 1" Forstner bit in a drill press and bore two ⅛"-deep holes in the back face of the bottle where marked. Test the depth with a 1"-diameter rare-earth magnet. You want

Tip Alert

A good way to clean up the transition areas between the neck, collar, and cap is to use an assortment of riffler files.

Carefully disc-sand or file the neck to round over the edges leading into the collar. Round over the edges of the collar and cap.

Center a V-groove carving gouge at the notch locations on the pattern, and cut no more than 1/16" deep.

Clamp the bottle in place to prevent it from moving during the drilling operation.

Spread epoxy in the hole bottom, insert a magnet, and clamp it in place before moving to the next hole.

its surface flush or a hair under flush with the bottle's back face to allow for the epoxy. Bore the two deeper magnet holes where marked (**Photo D**). Ensure that the bit's spur does not come within 1/8" of the bottle's front face.

10 Mix a batch of two-part epoxy and glue in the magnets. To do this while keeping the magnets from jumping on top of each other in the deeper holes, use a small clamp to press each magnet in place after you insert it (**Photo E**).

11 Finish-sand the bottle through 220, being careful to maintain the bottle cap and collar details. Center and locate the metal bottle cap opener between the shoulders, and onto the base of the neck. Drill pilot holes and install the opener with screws. Remove the hardware and apply a finish of your choice. (I used three coats of spray lacquer, sanding between coats.) Let dry, reattach the hardware, and start drinking ... away from any sharp tools, of course. ■

Tip Alert

To avoid drilling through the front of the workpiece, lower the bit onto a 1/8"-thick spacer, touching it with the point of the Forstner bit's spur. Now, set the drill press stop and remove the spacer.

Convenience-*PLUS* BUYING GUIDE

☐ 1.	System Three Quick Cure Epoxy, 1.8 oz.	#159190	$12.99
☐ 2.	Rare Earth Magnets, 1" dia. × 1/8" thick, 6 pcs.	#150952	$31.50
☐ 3.	Starr Small Stationary Bottle Opener	#160386	$7.99
☐ 4.	Watco Lacquer Gloss Spray, 11¼ oz.	#146946	$9.99
☐ 5.*	Dremel 3000 Rotary Tool, 24 Accessories	#853497	$69.99
☐ 6.*	Dremel EZ Lock Mandrel	#856719	$9.99
☐ 7.*	Dremel Carbide Shaping Wheel	#158858	$19.99

Above items are available at Woodcraft stores, *woodcraft.com* or by calling (800) 225-1153.
Prices subject to change without notice.
*Optional items used to save time when making multiple bottles and for detail work.

Illustration: Greg Maxson

Spotlight on Osage-Orange

An oft-forgotten wood with historical roots

By Robert J. Settich
Technical Consultant: Larry Osborn

Osage-orange (*Maclura pomifera*) may have played more significant roles at pivotal points in North American history than any other single tree species. In fact, the saga of this one tree intertwines with westward expansion and its aftermath.

Before Europeans arrived, Native Americans harvested Osage-orange for archery bows that proved powerful enough to kill bison. The tree was virtually unknown to white settlers until 1804 when Meriwether Lewis enthused about it in a letter to President Jefferson, and even enclosed planting slips.

Later, as the Midwest underwent settling through the 1800s, farmers and ranchers planted hedgerows of Osage-orange to establish property lines. These thorny barriers more than met the settlers' needs, serving to contain livestock as well.

Some claim that the wickedly sharp thorns of the Osage-orange thicket may well have inspired the invention of barbed wire. And when that product became available (around 1880), settlers stapled it to Osage-orange posts, chosen for the heartwood's resistance to rot and insects.

Later still, when widespread mechanized farming in the Midwest led to the Dust Bowl, the situation was made less severe through the plantings of millions of Osage-orange trees that served as windbreaks and shelterbelts.

History in woodworking

Some Native Americans in Osage-orange's original range were full-time bow makers, exporting finished weapons to tribes hundreds of miles away through an elaborate network. Many modern bowyers (bow makers) still turn to Osage-orange to keep the tradition alive.

Osage-orange did not emerge as a woodworking wood until the 20th century. But any woodworker who has seen the vibrant orange to bright yellow tones of Osage-orange heartwood may find it hard to forget. It's an excellent choice for small specialty projects, including knife handles, jewelry, inlays for boxes, plane soles, musical instruments, pens, bottle stoppers, bowls, and more. Woodworkers interested in making rustic furniture have used the limbs and shoots to fashion outdoor chairs and tables.

Where it comes from

Osage-orange originated in Arkansas, southeastern Oklahoma, and east Texas, but its current range includes most states east of the Rocky Mountains and up into Ontario. If you're inclined to help the species spread on your property, you can buy seedlings online.

The tree itself is exceptionally unruly and requires trimming. A mature Osage-orange can reach 40' to 60', but the branches can twist, interlace, and curl crazily, producing a plant nearly as wide as it is tall. Individual trunks generally don't exceed 1½' in diameter, but several shoots can clump together to produce a tree of truly impressive size.

Osage-orange is not a mainstream wood, so you may need to seek out an online source or a local supplier or sawyer to get some. Woodworking clubs and turning guilds are other great sources.

Be aware, too, that Osage-orange has many aliases. It's also

It's a fact that...
After the F5 tornado leveled much of downtown Joplin, Missouri, in 2011, the only thing left standing in the half-mile swath of destruction was a massive Osage-orange–a testimony to the tree's resiliency and toughness.

known as bois d'arc (French for bow wood), and the derivative "bodark." Other variations include hedge and horse apple.

An alternative to American-grown Osage-orange is a look-alike from Argentina, *Maclura tinctoria*. Its color and working properties are remarkably similar to the domestic version.

What you'll pay

Given its cantankerous growth habits (trunks are usually small, crooked, and susceptible to splitting), Osage-orange is not widely harvested as lumber. Accordingly, you'll usually purchase boards or turning blanks on a per piece basis.

Here are a few examples from online suppliers. For pen blanks, expect to pay a dollar or two each. Turning blanks 1½" square × 12" long are in the range of $10.00, but when the square is 2", the price can double. Move up to 3" and the price can double again to about $40.00 for a 12" length. Prices from local suppliers may vary considerably.

Select the best stock

Hands-on inspection is always best, but not always practical. If you're buying from photos, make sure that they're clear and comprehensive. Have an understanding of the seller's return policy.

Be aware that Osage-orange is subject to shake damage, a tangential separation along the wood's annular rings generated by wind, growing stresses in the living plant, or by poor felling practices at harvest. Unfortunately, this defect is not always readily visible, and may appear only after you've begun work on a piece.

Some Osage-orange may have dark streaks, attributed to localized spalting at live edges. Sellers often regard this condition as an aesthetic benefit, not a price-reducing defect.

If purchasing hand-split staves for an archery bow, note that this is very specialized Osage-orange stock. In such cases, buy from an accomplished bowyer for good wood.

Working Osage-orange in the shop

Osage-orange works well with ordinary hand or power equipment, but the density of the wood requires sharp tools. Dulling of tools is not beyond what you'd reasonably expect from any very hard wood. Some of the wood may have mineral deposits that could accelerate tool wear. Hence, you'll find that carving the wood takes longer.

Because of the wood's density, you can sand it to a good polish even before applying finish. For the same reason, take care gluing up pieces. You may need to scuff mating surfaces for a better bond. When routing, keep the bit moving to avoid burning. When turning, you'll have better luck working with green Osage-orange, as dried wood is always harder.

Osage-orange quick take

Cost	Moderate/high (limited availability)
Weight	Very heavy
Hardness	Slightly harder than mesquite; 50% harder than hickory
Stability	Very stable when dry. (Mill the wood promptly, and seal the ends to minimize drying stresses.)
Strength	High
Durability	High
Toxicity	Use normal precautions when working dried wood. Fresh-cut wood and fruit can emit a milky fluid that may cause skin irritation.
Tool Type	Sharp hand and power tools.
Common Uses	Turning projects such as pens, stoppers, handles, and bowls. Also good for bows, knife handles, jewelry, inlays, plane soles, musical instruments, and rustic furniture.

Screws hold well in Osage-orange, but you may want to drill pilot holes at least 1/64" over standard recommendations due to the wood's density. Nailing will probably be a futile effort unless you drill pilot holes.

Use a water-borne rather than oil-based finish to reduce the tinting effect of petroleum products. All the same, normal exposure to air and light will eventually turn the wood a golden brown. ■

Photos: Bob Hawks

Wood River®

Take Your Workbench With You!

Wouldn't it be nice to have your workbench where you need it? Now you can with the four-piece WoodRiver® Workbench Caster Set! Rugged steel construction gives these casters 110-lb. capacity (440 lbs. per set). The casters swivel 360°, giving you the ability to move to any position in the shop. Tough 2⅜" urethane wheels won't mar the floor or flatten due to the weight. Each foot pedal allows you to lift the bench ¾" off the floor.

- **Foot Activated Lift**
- **Black Satin Finish**
- **Includes All Mounting Screws And Instructions**

158547

WOODCRAFT® **HELPING YOU MAKE WOOD WORK®**

For A Free Catalog Or To Find Your Local Woodcraft Store, Visit woodcraft.com Or Call 800-225-1153.
For Information On Woodcraft Retail Franchise Opportunities, visit woodcraftfranchise.com 15WD07P2

Ad Index

WOODCRAFT®

Since 1928, Woodcraft has been committed to providing quality tools, supplies and advice to our customers. From providing in-store classes and demonstrations to funding educational woodworking programming, Woodcraft has remained steadfast in our commitment to the beginner, intermediate and experienced woodworker for over 80 years running.

The American Woodshop

www.wbgu.org/americanwoodshop

Woodcraft is pleased to continue sponsorship of *The American Woodshop* with Scott and Suzy Phillips, now in its 22nd season on PBS.

Season 22 – "Scott And Suzy – Bringing It Home" Fantastic Home Accents – Hand Skill Builders 13 episodes with woodworking tips for every skill level.

Techniques include: turning, joinery, tool tune-ups, making jigs, bench building, furnituremaking and cabinetmaking! It's Tool Time!!!

Join Scott and Suzy to get the most out of your woodshop tools!

ROUGH CUT
WOODWORKING WITH TOMMY MAC

www.thomasjmacdonald.com

We are also proud to provide major funding for the two-time Daytime Emmy® Award-nominated public television series and recipient of four Telly Awards, *Rough Cut – Woodworking with Tommy Mac.*

Season Five projects include: Patio Prep Station, Arts & Crafts Rocking Chair, Pencil Post Bed, Windsor Chair, Simple Shaker Night Stand And Finishes, Linen Press, Pt. 1 And Pt. 2, Hall Tree And Bench, Queen Anne Table, Shaker Style Clock,Gate Leg Table, Frank Lloyd Wright-Inspired Light Pendants and China Cabinet.

Photo © Anthony Tieuli for WGBH Educational Foundation

ROB COSMAN
"YOUR HAND TOOL COACH"

www.RobsWorkshop.com

Woodcraft is privileged to partner with Rob Cosman, "Your Hand Tool Coach," featured on the educational RobsWorkshop.com.

Rob Cosman's daily online episodes teach the proper use of hand tools and power tools in a motivational and educational way. Hand-tool demonstrations are Tuesdays and Thursdays, and power tools are demonstrated Mondays, Wednesdays and Fridays.

Purchase any WoodRiver® Hand Plane and get A FREE 3 Month Subscription to Rob Cosmans Interactive Online Hand & Power Tool Workshops! The Subscription is Seventy-Five 30-Minute Sessions As Well As Access to Over 800 Previous Episodes... Plus Access to Hand Plane 101 – A $120 Value!

Woodcraft® And Tool Box℠ By Woodcraft® Stores In Your Area:

Alabama
Birmingham/Pelham: 205-988-3600

Arizona
Phoenix/Chandler: 480-539-9663
Tucson: 520-742-9663

California
Orange County/ Fountain Valley: 714-963-9663
Sacramento: 916-362-9664
San Carlos: 650-631-9663
Ventura: 805-658-9663

Colorado
Colorado Springs: 719-266-9889
Denver: 303-290-0007
Loveland: 970-292-5940

Connecticut
Hartford/Manchester: 860-647-0303
Norwalk: Woodworker's Club 203-847-9663

Delaware
Wilmington/New Castle: 302-323-0400

Florida
Jacksonville: 904-721-9796
Orlando: 407-260-5002
Tampa/Clearwater: 727-532-6888

Georgia
Atlanta: 770-587-3372

Hawaii
Honolulu: 808-841-9876

Idaho
Boise: 208-338-1190

Illinois
Woodridge: 630-435-9663

Indiana
Indianapolis: 317-578-3400

Kansas
Kansas City/Lenexa: 913-599-2800

Kentucky
Lexington: 859-231-9663
Louisville: 502-671-0900

Maryland
Rockville: Woodworker's Club 301-984-9033

Massachusetts
Boston/Woburn: 781-935-6414
Boston – Walpole: 508-668-2413
West Springfield: 413-827-0244

Michigan
Detroit Area: Canton: 734-981-6808
Sterling Heights: 586-268-1919
Grand Rapids: 616-957-9663
Saginaw: 989-249-6662

Minnesota
Minneapolis/ Bloomington: 952-884-3634

Missouri
St. Louis/ Maryland Heights: 314-993-0413

New Hampshire
Portsmouth/Newington: 603-433-6116

New York
Rochester: 585-292-9690

North Carolina
Charlotte/Matthews: 704-847-8300
Raleigh: 919-781-1911

Ohio
Cincinnati: 513-407-8371
Cleveland/ Oakwood: 440-232-7979
Columbus: 614-273-0488
Dayton: 937-438-1282
Toledo: 419-389-0560

Oklahoma
Oklahoma City: 405-748-8844
Tulsa: 918-384-0100

Oregon
Eugene: 541-685-0677
Portland/Tigard: 503-684-1428

Pennsylvania
Allentown: 610-351-2966
Harrisburg: 717-409-8173
Philadelphia/ Downingtown: 610-873-5660

South Carolina
Greenville: 864-627-8760

Tennessee
Chattanooga: 423-710-8001
Knoxville: 865-539-9330
Nashville: 615-599-9638

Texas
We've Moved
Austin: 512-407-8787
Dallas/Addison: 972-422-2732
Fort Worth: 682-334-1025
Houston: 281-880-0045
South West Houston: 281-988-9449
San Antonio: 210-545-5885

Utah
Salt Lake City/ South Jordan: 801-566-5652

Virginia
Leesburg: 703-737-7880
Norfolk: 757-466-1166
Richmond: 804-355-3945
Roanoke: 540-366-7144
Springfield: 703-912-6727

Washington
Seattle: 206-767-6394
Spokane: 509-892-9663

West Virginia
Parkersburg: 304-485-4050

Wisconsin
Appleton/Fox Cities: 920-730-9663
Madison: 608-273-8868
Milwaukee/New Berlin: 262-785-6770

QUALITY WOODWORKING TOOLS • SUPPLIES • ADVICE®

For A Free Catalog Or To Find Your Local Woodcraft Store, Visit woodcraft.com Or Call 800-225-1153. 15WD07P

RIKON

Pro Tools for Tool Pros

12" x 16" Mini Lathe

- Powerful 1/2 HP Motor
- 12" Swing
- 16" Distance Between Centers
- 9-1/2" Swing Over Tool Rest Base
- 12 Position Indexing Head
- 6 Speed Ranges 430 - 3,900
- 2-1/2" RAM Travel
- Easy Access Speed Change
- Ability to Add Extensions
- 5 Year Warranty

70-100

8" Low Speed Grinder

NEW

- Powerful 1 HP Motor
- Motor (No Load) 1,750 RPM
- Adjustable Tool Rests
- Adjustable Safety Eye Shields
- 8" Wheel Diameter
- 1" Wheel Width
- 60 and 120 Grit Wheels
- Protective Spark Resistors
- Adjustable LED Worklight
- 5 Year Warranty

www.rikontools.com

80-808

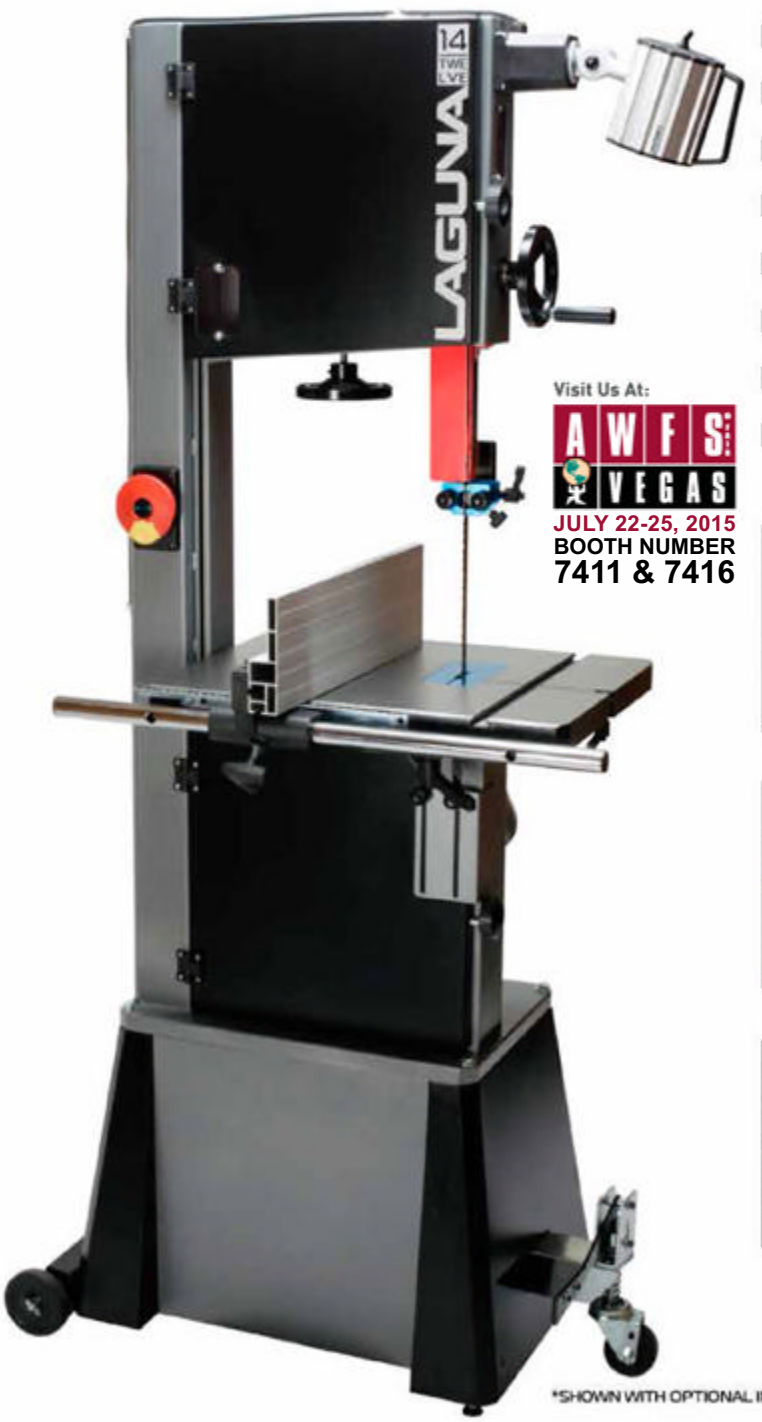
$1,097

EDITORS' CHOICE BEST OVERALL TAUNTON'S 2015 TOOL GUIDE

EDITORS' CHOICE BEST VALUE TAUNTON'S 2015 TOOL GUIDE

INTRODUCING THE UNEXPECTED 14|TWELVE

Go to your Woodcraft dealer today to see why everyone is raving about the 14|Twelve bandsaw



- 115 Volt, 1¾HP
- Oversized Cast Trunnion
- Laguna Ceramic Guides
- World Class Fit & Finish
- Worm Gear Rack & Pinion
- Dynamically Balanced Cast Wheels
- Enclosed Stand, Hi/Low Rip Fence
- Optional Wheel System & Blades

WOODWORKER'S JOURNAL BEST BET

Visit Us At:

AWFS VEGAS

JULY 22-25, 2015

BOOTH NUMBER

7411 & 7416

*SHOWN WITH OPTIONAL INDUSTRIAL FLOOD LIGHT

LAGUNA

LAGUNATOOLS.COM