

TAUNTON'S

Fine Woodworking

Teach • Inspire • Connect

October 2023 No. 305

- Block plane rehab
- Carve a spoon
- Closer look at sanding
- Faces of the craft
- Shaker cabinet



*Dress up a table
with veneered aprons, p. 60*

8" X 76" PARALLELOGRAM JOINTER WITH HELICAL CUTTERHEAD & MOBILE BASE

- Motor: 3 HP, 230V, single-phase, 12A
- Maximum width of cut: 8"
- Maximum depth of cut: 1/8"
- Maximum rabbeting depth: 1/2"
- Cutterhead diameter: 3 3/16"
- Cutterhead type: 4-row helical with 36 inserts
- Insert size, type: 15 x 15 x 2.5mm, indexable carbide
- Cutterhead speed: 5500 RPM
- Table size: 8" x 76"
- Fence size: 38" x 4 1/2"
- Minimum stock length: 10"
- Minimum stock thickness: 1/2"
- Dust port size: 4"
- Overall dimensions: 76" W x 25" D x 41 1/2" H



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- Motor: 5 HP, 220V, single-phase, 23A
- Maximum stock width: 20"
- Maximum stock thickness: 8"
- Minimum stock thickness: 1/4"
- Minimum stock length: 7"
- Maximum cutting depth full width: 5/64"
- Cutterhead diameter: 3 1/4"
- Cutterhead type: 4-row helical, 92 inserts
- Insert size, type: 15mm x 15mm x 2.5mm, 30° indexable carbide
- Cutterhead speed: 5000 RPM
- Feed rate: 16, 28 FPM
- Table size: 20" x 56"
- Dust port size: 5"
- Overall dimensions: 39" W x 56" D x 41" H



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- Max. depth of cut @ 45°: 2 3/16"
- 75 3/4" W x 65 3/4" D
- Distance from front of table to center of blade: 14 1/8"
- Floor-to-table height: 34 1/8"
- Arbor diameter: 3/8"
- Arbor speed: 4000 RPM
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- Cutting capacity: 16 1/4" left of blade
- Maximum cutting height: 12 1/8"
- Blade size: 13 1/2" long
- Blade width range: 1/8"–1" wide
- Blade speeds: 1700, 3500 FPM
- Table size: 17" x 17" x 1 1/2" thick
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- Fence size: 6" H x 23" L
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- Spindle length: 5"
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FEATURES

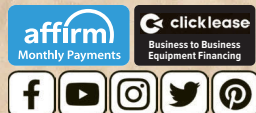
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Steam, a vise, and a handful of edge tools make the process fast and fun

BY CURTIS BUCHANAN



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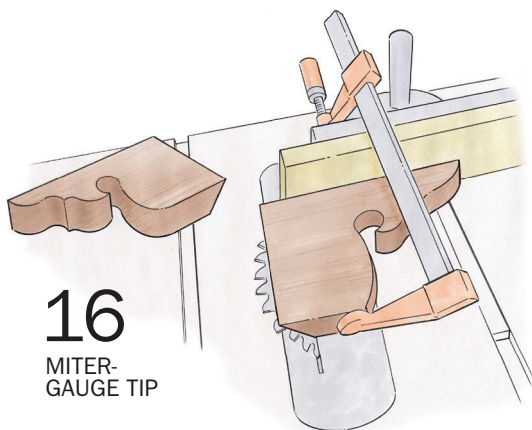
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The silent partner

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Woodworking news updates

Check in with us as we look at new woodworking tools coming to market and exciting industry news.

Our favorite mortising jigs

The *Fine Woodworking* staff shares some of their favorite mortising jigs covered in the magazine and website.

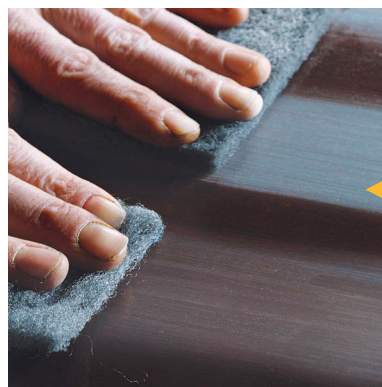
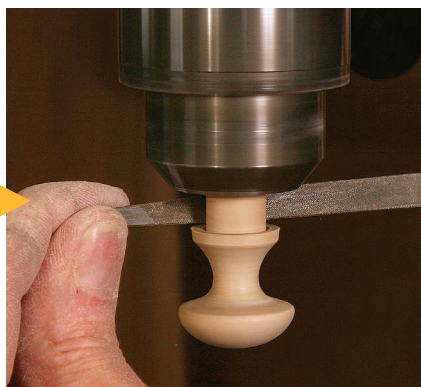
The artistry of toolmaking

Eleanor Rose (p. 46) has refurbished her fair share of tools, but her artistry speaks when she's making her own specialized tools. In this gallery, she shares some of her favorites.

VIDEO

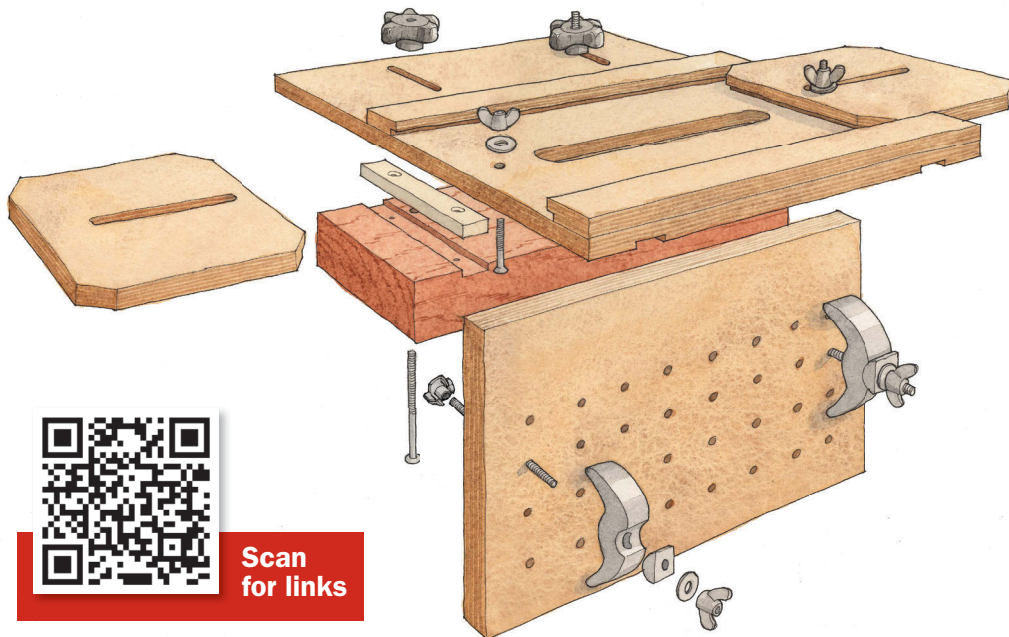
No lathe, no problem

You can make authentic-looking Shaker knobs without a lathe. All it takes is a drill press, a tenon cutter, and a few rasps and files.



Steel wool vs. abrasive pads

On pp. 52–59, we put sandpaper under the microscope. In a related article, Jeff Jewitt uses photos from an optical microscope to reveal the scratch patterns left by steel wool and abrasive pads.



Scan for links

VIDEO WORKSHOP

Replicating a legend's side chair

Dan Faia painstakingly documents and builds a replica of a Queen Anne chair made in the 1980s by one of his mentors, Phil Lowe. In this series, you'll learn how to:

- Extract information from a museum piece and create exacting full-size plans
- Create strong mortise-and-tenon joinery on a complex form
- Shape cabriole legs accurately and repeatably.



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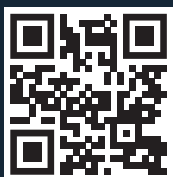


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contributors

Paul Axelsen (“Sanding, Under the Microscope”) has been a member of the Department of Pharmacology at the University of Pennsylvania for 30 years, where he runs a research laboratory that focuses on understanding how drugs work, and how to design new ones. The work requires him to create, modify, and repair machines in the lab, and he carries those skills into his woodworking hobby. He especially enjoys building furniture with uncommon angles, hidden hardware, moving parts, and mixed materials. His work with a scanning electron microscope led him to wonder what it would reveal about the process of sanding. It turned out to be an ideal tool for viewing the texture of a sanded surface and evaluating popular techniques.



Take one look at the hands of **Eleanor Rose** (“Refurbish a Vintage Block Plane”) and you’ll see evidence of the hours she’s spent in wood and metal shops. As she says, “I’m more callus than girl at this point.” After going to college for woodworking and graduate school for metalworking, she’s made a living machining, casting bronze, making furniture, and creating wooden patterns. As this was written, she was working to re-create the Studley chest one tool at a time.



Curtis Buchanan (“Carve Spoons from Pre-bent Blanks”) has been a mentor to many remarkable woodworkers. As these young makers sought a path into the craft, they would invariably hear about Curtis’s own mentor. “Forty years ago this summer,” Curtis said recently, “a serendipitous encounter with Dave Sawyer started me down a lifelong pursuit of chairmaking that continues to this day.” Dave, who died last year at 86, set a high bar, both with his chairmaking skill and his generosity in sharing hard-won knowledge.

Several years ago, **Mike Korsak** (“Elegant Table Comes Together at the Corner”) wrote an article about his renovated workplace in Pittsburgh (“Fine Shop in a Former Garage,” *FWW* #265). Now, having moved to Orford, N.H., he’s turning another garage into an energy-efficient shop. In addition to making custom furniture in the new shop, Mike will be teaching woodworking part-time at Dartmouth College and exhibiting his work as an Invited Artist with the New Hampshire Furniture Masters.



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Editor and Creative Director	Michael Pekovich
Deputy Editor	Jonathan Binzen
Deputy Art Director	John Tetreault
Senior Editor	Anissa Kapsales
Editor-at-Large	Asa Christiana
Associate Editor	Amanda Russell
Managing Editor/Production	Elizabeth Knapp
Administrative Assistant	Betsy Engel
Editor, FineWoodworking.com	Ben Strano fw-web@taunton.com
Assistant Digital Editor	KT Kaminski
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Contributing Editors:	
Christian Becksvoort, Garrett Hack, Roland Johnson, Steve Latta, Michael Fortune, Chris Gochnour, Bob Van Dyke	
FWW Ambassadors:	
Erik Curtis, Larissa Huff, Darryl Jones, Owen Madden, Char Miller-King, Bill Pavlak, Kate Swann, Vic Tesolin, Sarah Watlington	

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Spotlight

ISSUE NO. 303
March/April 2023
p. 39

What if you don't have a Domino?

The floating-top side table was one of the most beautiful and functional pieces you have shown recently and one that I would have tried to duplicate almost immediately. The author readily admitted that the average woodworker probably will never own a Domino joiner, but then proceeded to build the easy way by using it. Some ideas and tips regarding alternative joining techniques ("the variety of ways to make matching mortises for slip tenons") would have been nice because changing the design to make mortise-and-tenon joints easy would just not have the same visual appeal. It's a beautiful table and I hope to build one someday. Maybe that could be addressed in a future article.

—SUSAN GILLILAND, Corsicana, Texas

Editor replies: Your note touches on an important challenge we face on just about every project article we publish. What happens when an author uses a tool or machine that a typical reader may not have? One option is to ask the author if they have another way to go about the task. A second option is to show the author's method, but then reference some other options. On this article we got stuck in the middle. In the project mentioned, the author often used a horizontal mortiser to cut the joinery, but when asked for an alternative, chose to use a Festool Domino instead. While that was a more widely available option, to your point, it is still not a tool commonly found in most shops.

The challenge when building this particular project lies in cutting mortise-and-tenon joinery on curved parts. Using slip tenons is a great solution to the problem, one the Domino or horizontal mortiser handles well. The good news, and what we failed to mention, is that neither are absolutely necessary for making slip tenons. An effective, affordable option is to use a handheld plunge router in combination with a shopmade stand that secures the parts and guides the router. A recent article by Philip Morley (FWW #301) offers one such alternative. A second article by Michael Fortune (#197), no stranger to working with curved parts, offers his solution as well. Both can be found in our online archives or at finewoodworking.com/305.



A smart solution for slip-tenon joinery. Philip Morley's routing jig offers an affordable alternative for cutting fast and accurate mortises in parts of any shape.



Useful article on toxic woods

The article on "Dangerous Chemistry" in FWW #304, by Seri Robinson, was extremely helpful and interesting—a good complement to the usual run of articles on projects and techniques.

—STUART A. ROSS, Davis, Calif.

Stop it with the screw pictures

Is there a total lack of knowledge by beginning woodworkers now on drilling holes and driving screws? Issue #302 had a total of 25 pictures of either drilling holes or driving screws! You've got to be kidding me! Even a master like Christian Becksvoort had four pictures of drilling and driving screws. We really needed a picture of him screwing the shelves to the wall!

I have all 303 issues lined up in my den, but this has to be a new low for the publication. Do new readers refuse to read and need complete hand holding to screw two pieces of wood together? Do you not see the disconnect of showing masters' work in the gallery, then showing the same people how to use a screwdriver all through the magazine?

Please watch the fluff photos in the near future.

— RICHARD COERS, Peoria, Ill.

Editor replies: As a furniture-making student in college, I often worked in the back of the shop where a beginning woodworking class was being taught. For the most part, I was consumed with my own work, but every now and then the instructor would say something that caught my attention. In spite of my confidence at the time that I knew just about everything there was to know about woodworking, there was still a lot to be learned, even at the most basic level. In fact some of those lessons turned out to have had the biggest impact on my work to date. I tend to think of the magazine as a workshop where woodworkers of various experience, skill levels, and perspectives share the space. And, while I don't expect every article to be of interest to every reader, I do hope that in addition to the content you're looking for, there just might be something else there to catch your attention and offer fresh insights as well.

Fine Woodworking®

Associate Publisher, Advertising & Marketing Director
Alex Robertson
203-304-3590
arobertson@taunton.com

Administrative Assistant
Beverly Buonanno
203-304-3834
bbuonanno@taunton.com

Director of Digital Advertising Operations
John Maher

Digital Advertising Operations Specialist
Erin Nikitchyuk

Group Marketing Director
Robina Lewis

Director, Consumer Marketing
Matthew Ulland

Senior Marketing Manager, Customer Acquisition
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E-mail Operations
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To contact us or submit an article:
Fine Woodworking, The Taunton Press
63 South Main St., Newtown, CT 06470
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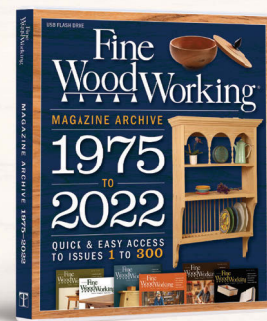
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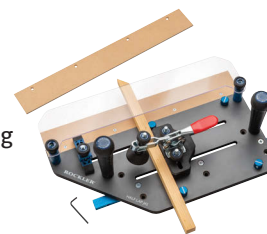
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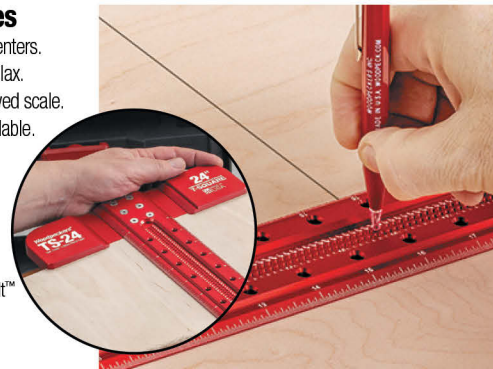
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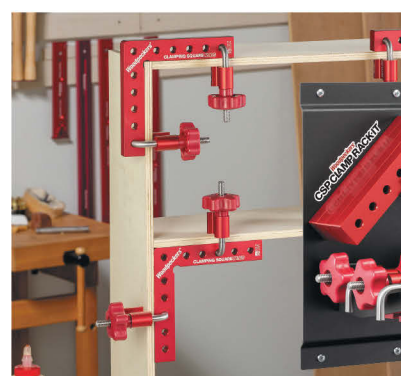
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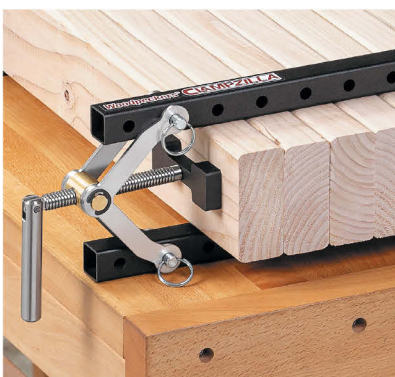
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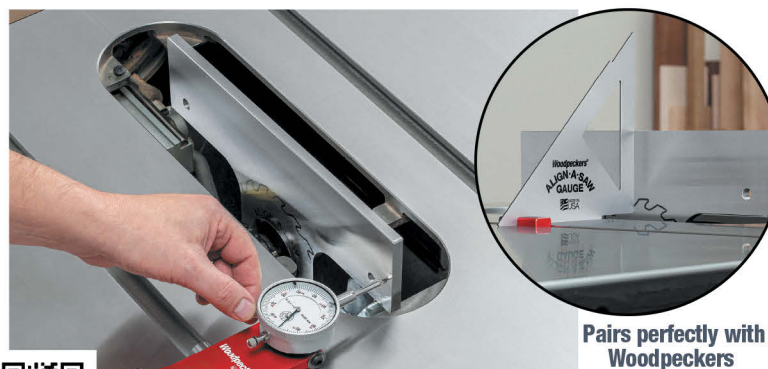
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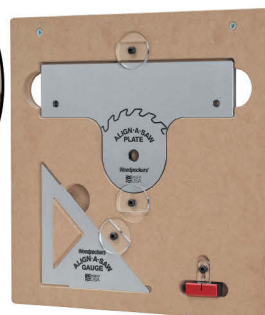
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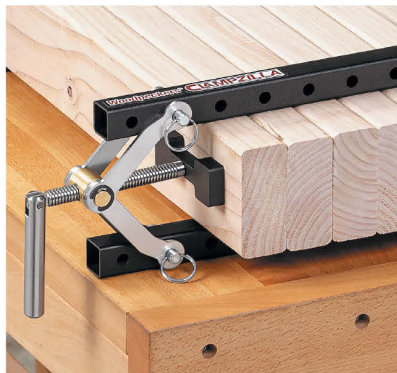
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- Flatter panels faster.

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EZ Edge Corner Plane

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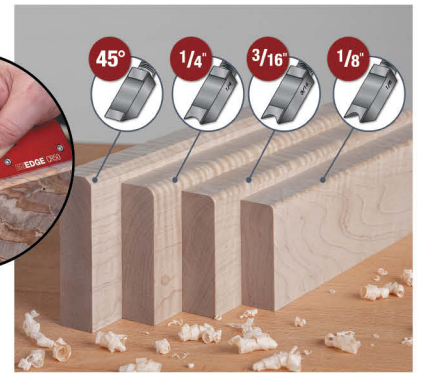
EZ Edge Corner Plane

Includes a wall-mountable Rack-It™

1/8", 3/16", 1/4" Radius

-or- 45° Chamfer....\$159.99

Deluxe Set....\$569.99



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- Gauge measures 90° and 45° accurately.

Align-A-Saw System

Includes a Woodpeckers wall-mountable wooden case

Plate & Gauge Set....\$229.99

Also Available Individually on Woodpeck.com

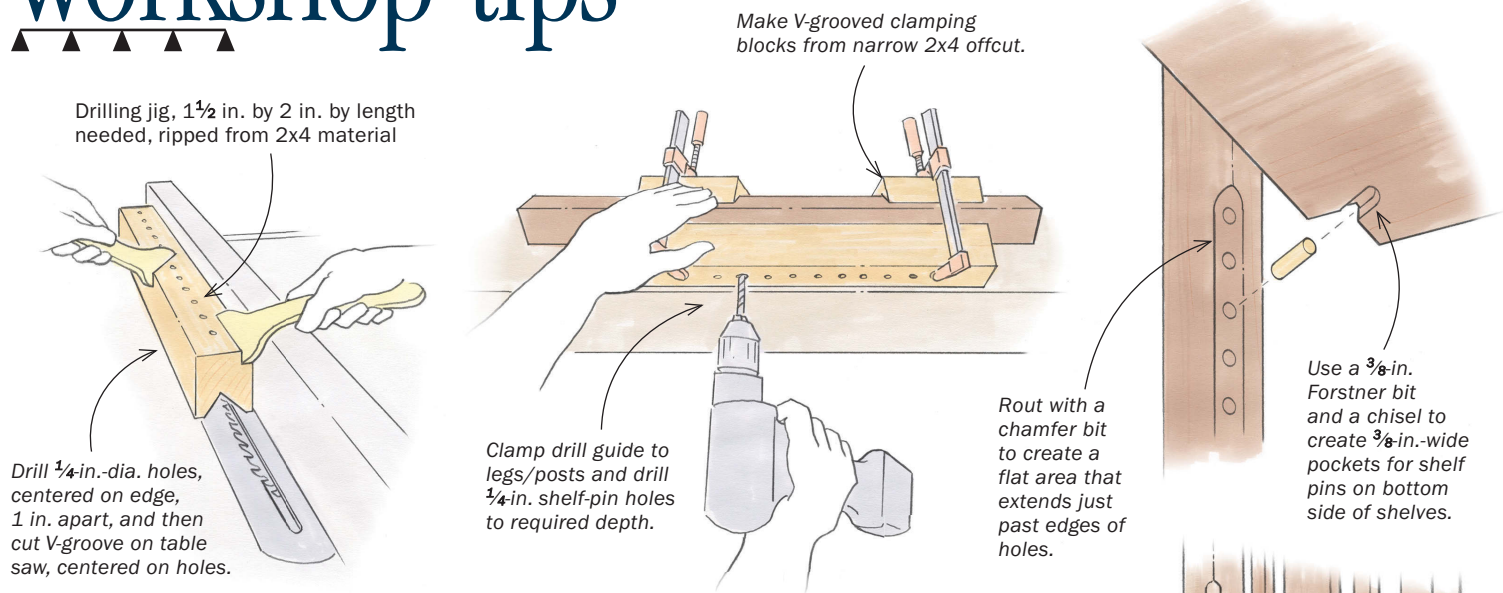
Saw Gauge

Includes a Woodpeckers case

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workshop tips



Hide adjustable shelf pins in post-and-panel furniture

Shelf pins are used most often in flat-sided furniture and cabinets. Here's a way to incorporate them in post-and-panel pieces, whether those have full panels on the ends, or semi-open sides as shown here. With this approach, the pin holes are much harder to detect than usual, helping these pieces maintain their elevated look.

With the help of a notched drilling jig, I bore the shelf-pin holes diagonally into the inside corners of the posts. Then, to help hide the front rows of holes from view, and create a cleaner look all around, I chamfer the posts where the holes are drilled. Last, I cut pockets for the pins in the bottoms of the shelves, hiding the pins there as well.

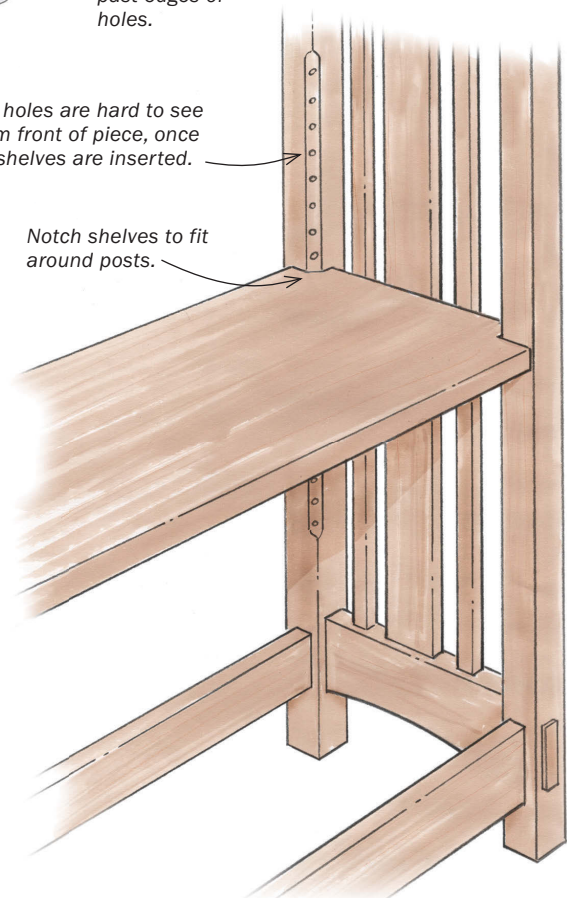
To make the drilling jig, I rip a 2-in.-wide piece from a standard 2x4, and then drill ¼-in.-dia. through-holes along its centerline, 1 in. apart. Then I angle my table-saw blade to 45° and cut a V-shaped notch in one of the drilled edges, so the holes are centered in it. I cut the same V-notch in the narrower offcut from the 2x4, and chop up that piece to create a few clamping blocks.

The drilling jig is clamped to the inside corner of each leg, with the clamping blocks on the opposite corner to keep the clamps stable. Drilling is done with a ¼-in. brad-point bit for clean results.

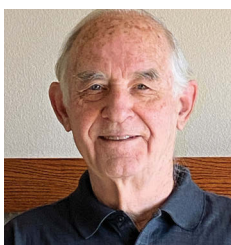
—JIM DINSMORE, Spokane, Wash.

Pin holes are hard to see from front of piece, once all shelves are inserted.

Notch shelves to fit around posts.



Best Tip



Jim Dinsmore was introduced to woodworking at 7 years old, when his grandfather enlisted him to help build birdhouses from apple wood. He took up the craft seriously at 30, with a radial-arm saw and the scrapwood pile behind a nearby cabinet shop. During and after his 50-year career as an electrical engineer, he has built scores of wood projects for family and friends, including boxes, cabinetry, and fine furniture.

A Reward for the Best Tip

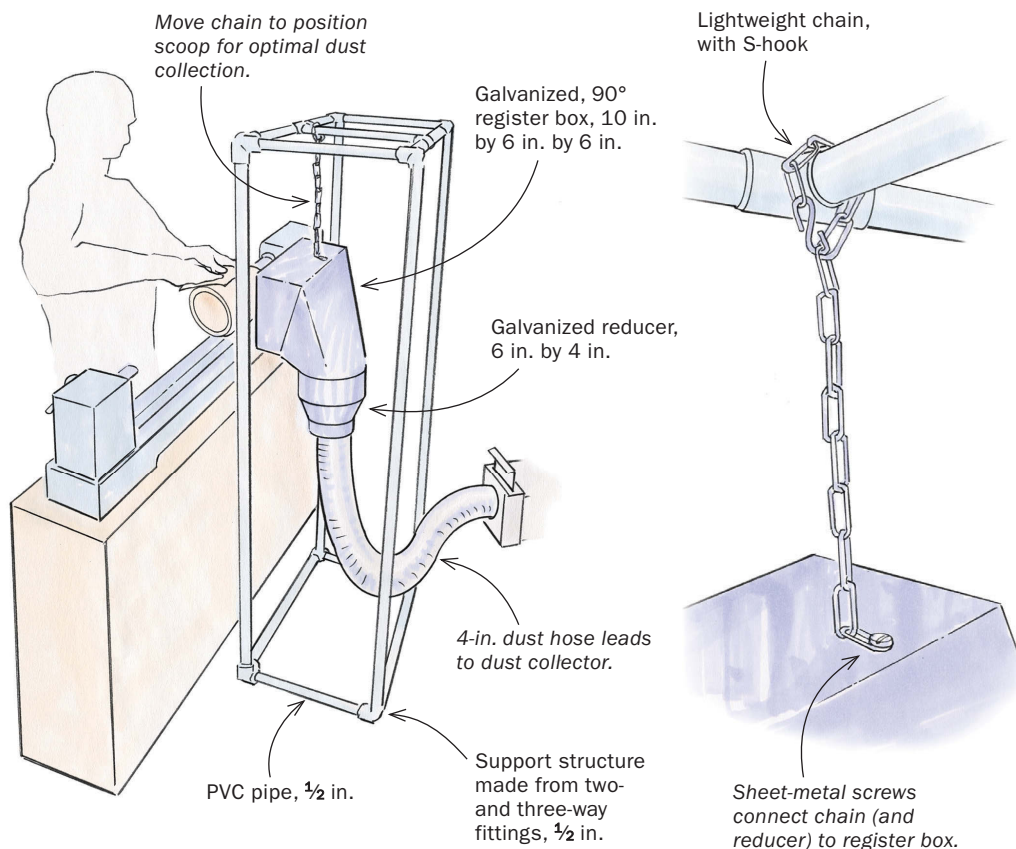
Send your original tips to fwtips@taunton.com. We pay \$100 for a published tip with illustration; \$50 for one without. The prize for this issue's best tip was a Lie-Nielsen Small Bronze Spokeshave.



Build a hanging dust scoop for the lathe

I fell in love with woodturning in junior high school, and I've been pursuing the craft ever since. Until recently, it's been difficult to capture shavings and sanding dust as I turn. So I built a simple framework from ½-in. PVC pipe and associated corner fittings, which allowed me to hang a standard galvanized register box from a section of lightweight chain. The PVC pipe and fittings are tight enough to stay together without solvent cement (a rubber mallet helps with assembly). An S-hook on the chain lets me reposition my improvised dust scoop as needed, though I don't often need to change its position. I've also used this posable dust port on other machines that make dust collection difficult.

—DAN RICH, Kennett Square, Pa.



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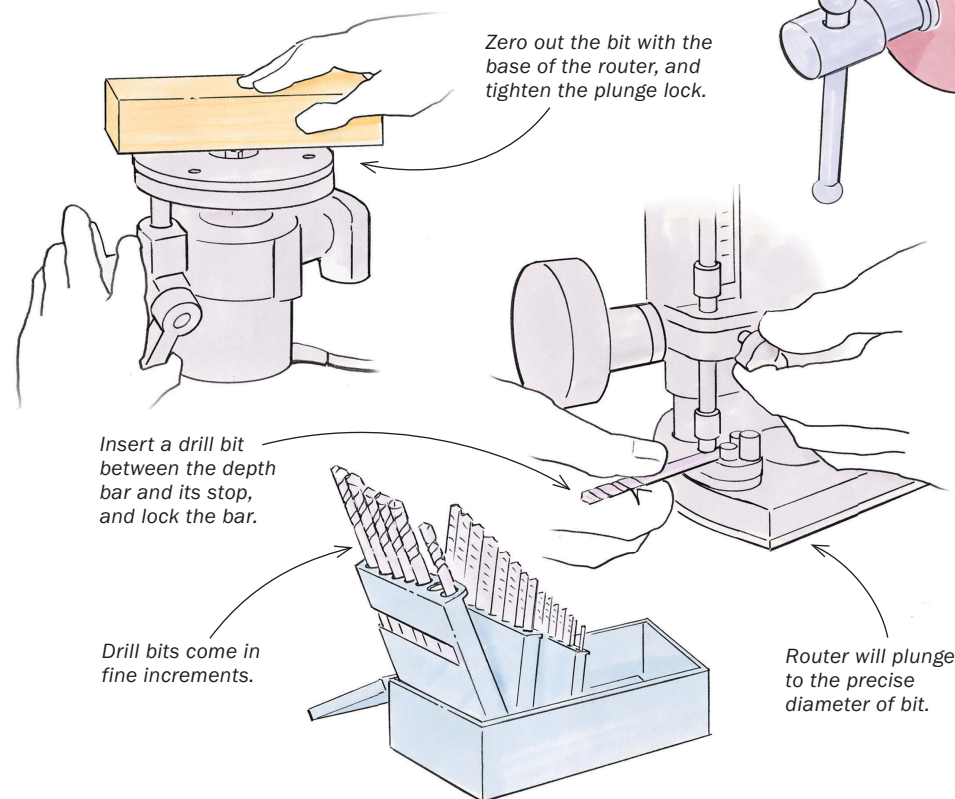
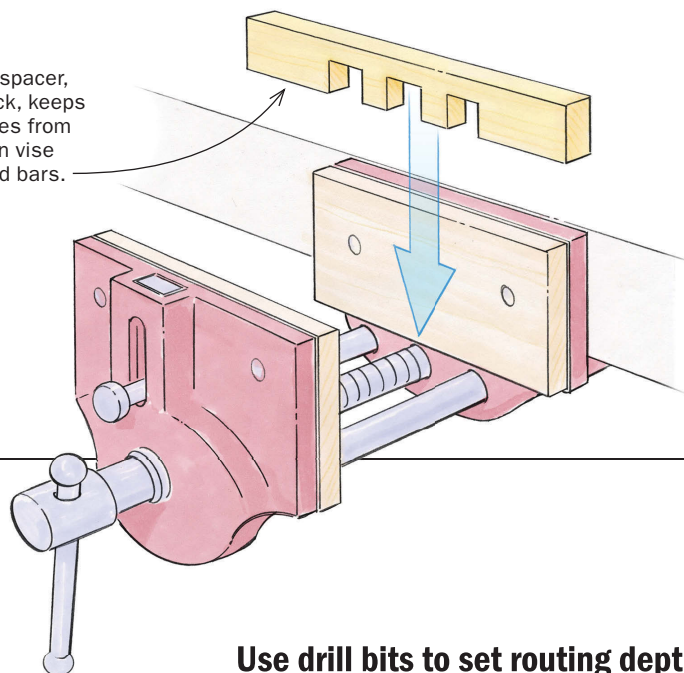
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Vise insert protects workpieces

To protect the bottom edges of boards from the screw and bars at the bottom of my bench vise, I made this simple notched spacer. I made it slightly narrower than $\frac{3}{4}$ in. so it won't prevent the jaws from clamping most workpieces. If you have a board jack along the front of your bench, make it level with the top of the spacer.

—RICK LOMBARDI, Dublin, Ohio

Notched spacer, $\frac{5}{8}$ in. thick, keeps workpieces from resting on vise screw and bars.



Zero out the bit with the base of the router, and tighten the plunge lock.

Insert a drill bit between the depth bar and its stop, and lock the bar.

Drill bits come in fine increments.

Router will plunge to the precise diameter of bit.

Use drill bits to set routing depth

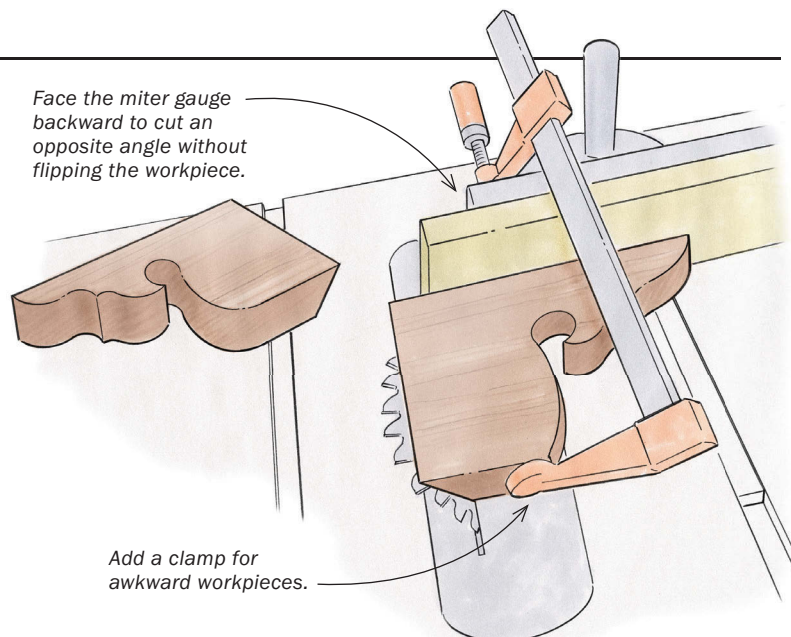
To set routing depth precisely, you can zero out the bit with the base of the router, and then place a dimensioned spacer under the router's depth stop, as Bob Van Dyke did in *FWW* #299 (p. 38). Rather than buy a set of gauge blocks to use as spacers, however, most woodworkers can find a better option in their shops already: a big box of drills, sized in $\frac{1}{64}$ -in. (or 0.5mm) increments. Just be aware that the shanks on larger or cheaper bits can be a little smaller than the bore size, so double-check them with your dial calipers.

—BOB HULLEY, Sonning on Thames, England

Reverse the miter gauge to reverse the angle

After mistakenly shaping the halves of four bracket feet before cutting their miters, I ran into a common problem: The table-saw blade only tilts one way. When that doesn't match the angle you need, you have to flip the workpiece, which doesn't always work for the task at hand. This was the case with the shaped bracket-foot parts, which only had one straight edge left to rest against the miter fence. It comes up in other mitering situations too. It dawned on me that reversing the miter gauge in its slot—with the fence facing toward me instead of away—would solve the problem. The gauge works just as well this way, but you might need to change the position of its fence.

—JIM MURTHA, Lancaster, Ohio



Face the miter gauge backward to cut an opposite angle without flipping the workpiece.

Add a clamp for awkward workpieces.

Little pins stabilize floating panels

Woodworkers use a variety of methods to keep floating, solid-wood panels from shifting or rattling in their frames, whether in a door, bed frame, cabinet side, or wherever. This method is the easiest and most secure I've found. Working from the back of the assembly, I drill small holes through the top and bottom edges of the frame, continuing through the edges of the panel without poking through the front of the frame. Then I glue small dowels into the holes. The dowels only show on the backs of the frames, but I make them out of the same wood as the frame when possible, so they blend in. The small pins keep the panels from rattling, sagging downward, or shifting sideways, while allowing them to expand and contract sideways (across the grain).

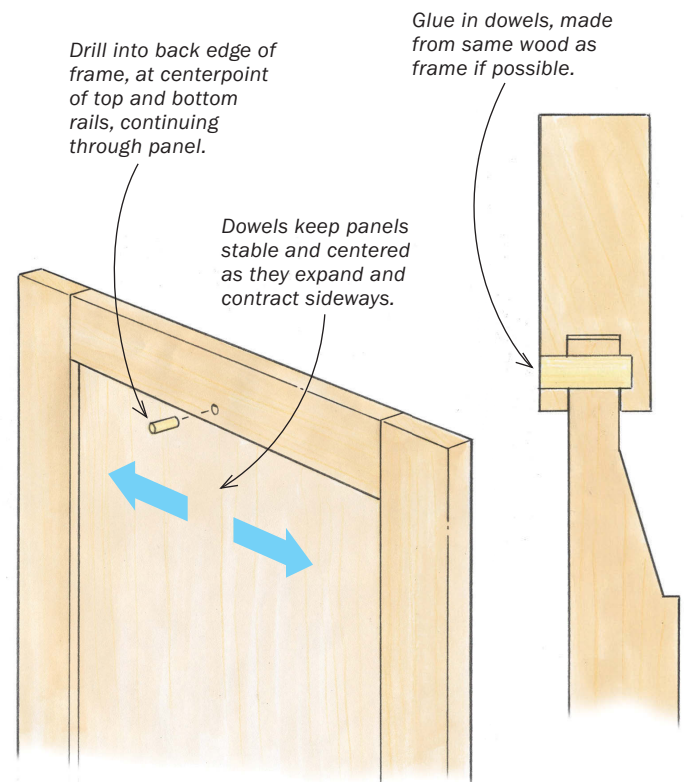
—CHARLIE JAMES, Williston Park, N.Y.

Quick Tip

Sawdust makes it easier to put on gloves

To help put on latex, vinyl, or nitrile gloves, especially when re-using them, try running your hand through a pile of sawdust first. A light film of wood dust is a great lubricant for sweaty hands and sticky gloves.

—TOM COLEMAN, Spartanburg, S.C.



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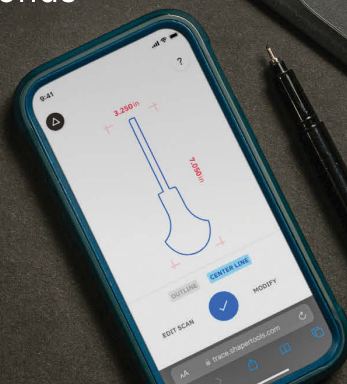
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SHAPER TRACE

From Sketch to Vector in Seconds

Turn pencil sketches
into CNC files,
using your smartphone



How it works. Draw anything on paper, place the Trace frame over it, point your phone at the frame, and the Trace app turns your analog drawing into a digital cutting file. The app includes tools for smoothing lines and deleting parts you don't need, and sends files to any digital tool with a single click, including Shaper's Origin router.

While most woodworkers can easily grasp the speed, precision, and repeatability that CNC delivers, digital design remains a mystery for many, preventing them from adopting new tools like Shaper's handheld CNC router, Origin.

To eliminate that point of hesitation for potential customers, Shaper Tools began rolling out simplified CAD applications that work on computers, tablets, and phones, beginning in 2022 with Studio, an intuitive, 2-D design tool that makes it easy to produce basic cutting paths, and then automatically sync to Origin.

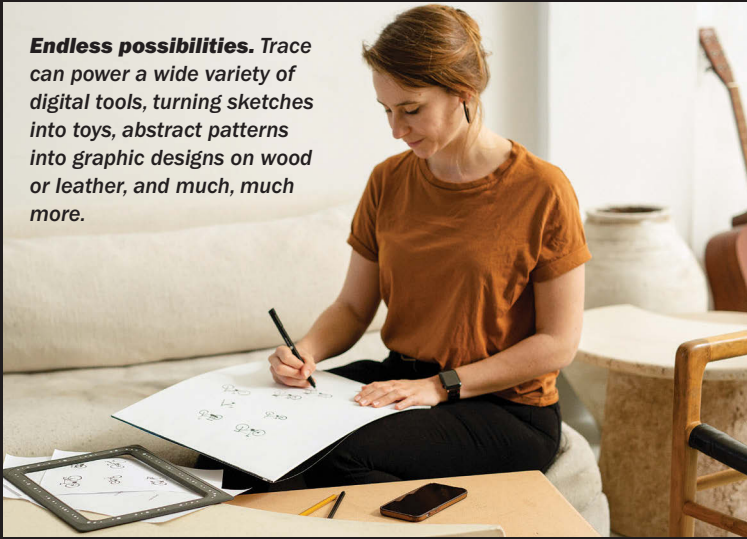
Shaper's latest design debut, Trace, completes the company's user-friendly on-ramp to digital design, letting woodworkers design with pencil and paper, and then convert those drawings in seconds into CNC-ready files.

But Trace isn't only for the Origin router. The SVG files it produces are optimized for all types of digital tools—laser cutters, vinyl cutters, full-scale CNC, and more—inviting woodworkers into the full world of digital fabrication, and a wide array of new materials and projects.

How you create sketches is up to you: Draw them freehand, trace around an object, or use drafting tools. Trace does the rest. Place the frame over your signature, for example, open the app on your phone, point the phone camera at the frame, and Trace converts your drawing into a usable vector graphic. Save the file for the future, send it to Origin with a single click, and you can rout that same perfect signature into your work for decades to come.

What's unique about the app is how it orients itself to the edges of the frame, and then flattens your sketch into a 2-D file of the

Endless possibilities. Trace can power a wide variety of digital tools, turning sketches into toys, abstract patterns into graphic designs on wood or leather, and much, much more.



exact same shape and size, no matter how you hold your phone. It also includes tools for smoothing jagged parts of your lines and deleting the parts you don't need. Then it lets you choose either the centerline or the edges of your lines as the path (important for different types of cutting procedures). When you like what you see, Trace sends the SVG file wherever you need it.

While the Trace frame is roughly the size of letter paper, sketches can be scaled to any size. Pull the SVG file into Studio, and you can combine shapes and add to them in myriad ways.

The woodworking possibilities are boundless: Make French-fit pockets for your hand tools, rout perfect mortises for custom hardware, create flawless inlays of any shape, make unique signs and art pieces, and much more.

Better yet, Trace is priced at just \$99, with no ongoing subscription fees, and it works with any Android or Apple devices. Learn more about this exciting new design tool at ShaperTools.com/Trace.

Then explore ShaperTools.com to explore Shaper's accessories for easy setup and work-holding, as well Shaper's massive library of verified hardware shapes, design files, and user projects.



■ MACHINES

Segmented-head jointer-planer for less

GRIZZLY RECENTLY DEBUTED two surprisingly affordable benchtop jointer-planer combo machines boasting high-end segmented cutterheads. The larger G0959, with a 12-in. width capacity, comes in under \$1,200, while its smaller 8-in. sibling (G0958) is just \$690. Both have helical, carbide-toothed cutterheads similar to those found on machines costing thousands more.

After using the 12-in. G0959 for a month, I'm very impressed, considering the price. The helical, segmented head is the star of the show. Cutting with a shearing action similar to its pricier rivals, it produced amazing surfaces in my testing. Whether jointing or planing, the G0959 left zero tearout on all sorts of woods, from vertical-grain fir and knotty pine to tough hardwoods with alternating grain. The segmented head also keeps noise to a minimum.

Each tough carbide cutter has four sharp edges, and the teeth can be rotated to expose fresh edges, which is a simple process. So it will be many years before most woodworkers will need to replace the cutters completely. Another thing I like is how the cutterhead and feed

rollers are closely spaced, which let me plane shorter pieces than usual.

Don't get me wrong: There are compromises to be made at this price point. But none get in the way of good work. The motor has adequate power for the planer's single feed rate, but to avoid bogging it down the depth of cut will be limited to $\frac{1}{32}$ in. with most hardwoods. The transition between jointer and planer modes takes longer than it does on higher-end jointer-planers—about 3 minutes for the G0959. Making the switch requires rotating the jointer fence back to 45° and removing it from its bracket, moving the planer bed some distance, and re-installing the dust shroud in a different position. When reattached, the jointer fence must be re-squared to the outfeed table. In jointer mode, the tables are a bit short for longer, heavier workpieces, requiring the use of support stands at the front and back end of the jointer.

I recommend this machine for those who want to mill full-width stock but are short on space, cash, or both.

—Mike Farrington is a professional woodworker in Aurora, Colo.



Compact combo machine. The Grizzly G0959 is a benchtop jointer-planer with a 1½-hp motor.

Grizzly G0959
\$1,175 (12-in.-wide model)



Top-notch cutterhead. The helical cutterhead has two spiraling rows of four-edged carbide teeth, which produce amazing surfaces on the toughest woods.



Planer mode. The jointer tables stay in place in planing mode, so you'll have to reach under them to feed and retrieve short workpieces. The planer's effective depth of cut is limited to roughly $\frac{1}{32}$ in. on hardwoods.



Jointer mode. Switching to jointer mode requires remounting and resquaring the fence, lowering the planer bed, and relocating the dust shroud. Dust collection is very good with a shop vacuum (shown), and even better with a full-size collector.

■ MARKING AND MEASURING

Innovative combination squares

IN MANY OF ITS SQUARES AND RULES Woodpeckers has included scribing notches that let you drop your pencil into a fixed position to scribe an accurate mark or a full line parallel to an edge. When attempting to integrate this feature into a sliding combo square, the product developers realized they would need to index the rule at regular intervals to make the scribing system work.

That's just what they did, adding a spring-activated pin that locates the head at every inch mark. Then they created a versatile set of squares based on that system, including a standard head, a double-square head, and a protractor head with a pin system that positions the fence precisely at common angles, with a fine scale for every angle in between.

Various rules fit into each of the heads, and you can buy the components in almost any combination.



Unique features. A retractable tab keeps the square level, a spring-loaded pin indexes the head at every inch mark, and there are scribing notches at every $\frac{1}{16}$ -in. mark.

While these squares are a bit pricier than Starrett squares, for example, their unique features add considerable value.

Aside from the scribing system, I love the small tab that slides out at the base of the heads, keeping each square level with the edge for easier use.

—Asa Christiana is editor-at-large.



Full system. Four types of heads, and rules of various lengths, are available in this high-quality system. Components can be purchased separately or in combination.

Woodpeckers In-Dexable Square System
\$150 for 12-in. rule with standard head

■ HAND TOOLS

Burnish scrapers more easily

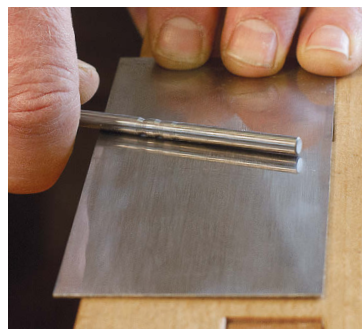
THE ACCU-BURR BURNISHER makes it easier to turn consistent cutting burrs (or “hooks”) on scrapers. What makes it unique are its V-grooves, which form two burrs at once, one on each corner of an edge. There are three grooves, which produce three different burr angles, for varying levels of aggressiveness. The V-grooves let you simply keep the burnisher level as you push it along the edge, instead of guessing at the correct angle and maintaining it as you push, as you must with a standard burnisher.

After smoothing and squaring a scraper's edge with a file and stones, I used the 5° groove to produce sharp, even burrs on each side of the edge. The process was quick and easy, and the scraper produced beautiful, feathery shavings on quartersawn white oak.

The Accu-Burr is available as a bare rod, as well as with two brass handles pre-attached. I recommend buying the rod only and attaching a single handle of your own, or one of the pre-made handles available from Heartwood. That's

because burnishing actually involves two steps: After forming the initial burrs on the edge and using them for a bit, you refresh them by drawing them upward and then bending them downward again as you did at the beginning. The drawing step requires that the burnisher lie flat against the face of the scraper, which you can't do with two handles attached.

—Chris Gochnour is a contributing editor.



Accu-Burr Burnisher
\$40 (rod only)
HeartwoodTools.com

With or without handles. If you don't yet own a burnisher, buy just the Accu-Burr bar and attach only one handle (also available from Heartwood Tools), so you can roll burrs flat before refreshing them.

Choose your angle. The V-shaped grooves turn two burrs at once, along both corners of an edge, at 5°, 10°, or 15°.

Two steps. Hold the Accu-Burr level to form perfect burrs along both corners of an edge (far left). Leaving one handle off lets you lay it flat to pull burrs upward (left), a key part of the burnishing process.

■ DUST COLLECTION

Cordless vac is a cleanup champ



Bosch GAS18V-3
\$180 (without battery)

Reach everywhere. This light, powerful, cordless shop vacuum is easy to handle and comes with a range of handy attachments.

THE POWER CORD ON A STANDARD shop vacuum is a troublesome tether, forcing you to switch outlets in order to reach all four corners of your shop. Bosch's new battery-powered vacuum solves this problem without sacrificing suction.

The clear 2.6-gal. canister lets you see at a glance when it needs emptying, and the whole unit weighs just 12 lb., making it easy to carry with one hand.

The 18-volt battery provides excellent power, with suction rated at 51 cfm and run time at up to 30 minutes on a single charge. Inside the canister, rotational airflow creates a mini-cyclone, allowing dust and debris to fall to the bottom, keeping it away from the washable, HEPA-rated filter. The vac also comes with various nozzles and connectable wands to let you reach the floor without stooping.

I found this compact, cordless vacuum to be incredibly convenient for cleaning up my shop, and my vehicles as well.

—Roland Johnson is a contributing editor.



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FujiSpraySystems.com/DIY-PRO-series

■ NEW TO MARKET

Tools to look out for

Separator lid promises better airflow

Oneida's new Low-Pro Lid Separator attaches to any 5-gal. bucket to capture 99% of the chips and dust that would otherwise fill the bag or clog the filter in your shop vacuum, according to the manufacturer. Better yet, it promises up to 50% more airflow than other lid-style separators, which means it will steal less suction from your vacuum. The DIY kit (lid and hardware only) is just \$60 at Oneida-Air.com. The deluxe kit (\$140) includes a wheeled bucket with a tether and an extra length of hose for connecting to your vacuum.



Smart table saw adds speed and accuracy



The new General 10-in. Automated Table Saw (\$6,000–\$6,500) is a heavy-duty machine available in a variety of configurations, including 3- and 5-hp motors and 36-in. and 52-in. fence systems. What sets it apart are automated, touch-control adjustments for blade height, blade angle, and rip-fence position (cutting width). While these features might not be critical for a hobbyist, they could pay off quickly for small-shop cabinetmakers. Go to GeneralToolsUSA.com for more info.

Versatile router sled works on table saw, too

Infinity's VRS-200 Professional Vertical Router Sled (\$280 at InfinityTools.com) is a heavy-duty jig with a variety of uses on the table saw and router table. With a sliding miter bar below and a large, pivoting face above, it can cut tenons and other joinery at any angle. The pivoting face has positive stops at common angles,

adjustable fences, and a large, built-in toggle clamp. The adjustable miter bar, which allows compound-angled cuts, is not automatically squared to the sled, but it can be squared easily on the table saw by pushing the rip fence against the back of the sled. Two large handles keep hands out of harm's way.





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Sharpen odd shapes

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AND WOOD SCRAPS SOLVE
UNIQUE SHARPENING
CHALLENGES

BY CHRISTOPHER
SCHWARZ



L-shaped router-plane blade

Router planes are handy tools to have in your arsenal, but the shape of the blade can make sharpening a head-scratcher. Schwarz upends the sharpening process to make the procedure easy and stable.



How do you sharpen an L-shaped blade? A router plane is very useful for trimming tenon cheeks and refining hinge mortises or dadoes. Its L-shaped blade makes these tasks possible, but sharpening the blade is counterintuitive. Instead of starting with the bevel, Schwarz focuses first on the flat bottom face of the blade. He takes it through the grits holding the shaft of the iron vertical, as shown above, which makes it easy to keep the bottom flat on the stone. This process creates the burr. He moves on to removing the burr with one pass on a fine stone (right).

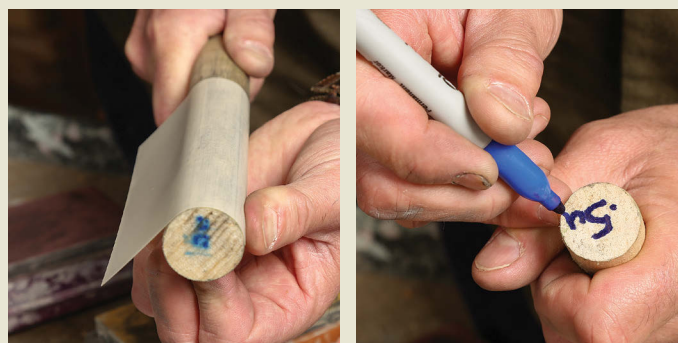


Sharpening kit for oddball blades

Along with your sharpening stones, a few items such as dowels wrapped in sandpaper, cylindrical sharpening stones, and honing compound used in creative ways will help you sharpen blades that aren't straight and flat.



A new way to use abrasives. To reach into tight curves and rounds, use dowels in different sizes. You can wrap wooden dowels with diamond lapping film or sandpaper, or buy a pack of dowel-shaped sharpening stones in different diameters.



Sanding dowels. Adhere diamond lapping film to a sanded dowel and mark the grit on the end.



Honing compound. Charge a dowel with honing compound by simply rubbing the compound onto the dowel.

Creating a wicked edge on a straight chisel or plane blade is something a woodworker can learn in less than an hour. But many despair when it comes to sharpening curved or odd-shaped tools. It seems like you need lots of practice or expensive gear.

The truth is you just need sharpening stones, some dowels, scrap wood, sandpaper, and a slightly different mindset for your sharpening process.

When working with odd-shaped tools, it is always best to touch up their edges frequently, a practice common among carvers. When I finish carving a seat with my travisher, I always touch up its edge before putting it away. After a decade of this practice I have never had to grind the bevel.

Make sense of abrasives

Comparing different abrasives can be difficult. The United States and Europe have different ways of grading sandpaper. And one manufacturer's 1,000-grit stone might not be the same as another's. One simple and reliable way to compare abrasives is to look up their particle size in microns. One micron is one-millionth of a meter. When you compare microns to microns, you get an idea how fine or coarse an abrasive is. For example, 80-grit sandpaper (in the U.S.) uses particles that are 192 microns across; 220-grit paper is 66 microns across. A typical 1,000-grit sharpening stone has particles that are 14–16 microns. And honing compound is 1 micron. The micron size of any sharpening medium is available online from manufacturers.

The trick is to know which grit to buy

For initial edge shaping, most people use a soft Arkansas stone or a 1,000-grit waterstone. In the U.S., that equates to sandpaper that's about 400- to 700-grit.

For polishing, a translucent Arkansas or 5,000-grit waterstone has a particle size of 3 to 6 microns. In the U.S., that's 4,000- to 8,000-grit micromesh sandpaper. For additional polish, you can use sandpaper with a 2-micron size particle—or 12,000-grit micromesh sandpaper.

For some tools, I'll rub honing compound directly on a dowel. Most honing compounds claim to have a 1-micron particle size, so they are ideal for the final polish.

Move the burr on router planes

Many beginners struggle with sharpening the L-shaped blade of the router plane, particularly working the bevel without rounding it over or creating a skewed edge. The solution is to reverse your sharpening process.

With most tools you first sharpen the bevel with coarse and then fine grits. Then you remove the burr on the flat face with your finest polishing medium. On router plane blades, I reverse the procedure. I first work the flat face with coarse and then fine grits. It's simple work to rub the flat face on your stone. Then I remove the burr by swiping the bevel across my finest stone once.



I use this same procedure on other tools such as block planes with skewed irons (the skew has to be perfect, or the tool won't function) and swan-neck chisels. It's also a handy trick to know when you get into tools that have a simple curve.

The simple curve of the travisher

Simple curves bend only in one dimension. Compound curves curve in two dimensions, the way a turner's fingernail spindle gouge does. Sharpening simple curves is easy. Begin by stoning the flat face, just like with the router plane. Rock the flat side of the blade along the stone and move up the grits.

To remove the burr on the bevel side of the tool, you need to learn a new trick. For years I made slipstones from old, broken sharpening stones, which are easy to shape with a stationary belt or disc sander. Then I started using sticky-back sandpaper adhered to dowels. I mostly use 1¼-in.-diameter dowels, but small dowels come in handy

Scorp

A scorp is a great tool for roughing out bowls, spoons, chair seats, and other concave shapes. It's similar to a travisher in that way, but it is for rougher work and its curve is compound, not simple.



Inside and outside the curves. For inside curves, Schwarz uses abrasives adhered to a dowel. On the outside of the curve, a flat stick with an abrasive adhered to it does the trick. Always hold the handle of the tool like the neck of a violin and move the abrasive like the bow. Don't let your hand get in front of or near the cutting edge.



Online Extra

To watch a video of Schwarz sharpening at the table saw, go to FineWoodworking.com/305.



A table saw alternative. A metal plate designed to convert a table saw to a disc sander can be used to sharpen odd-shaped tools. One face has 200-grit sandpaper for grinding. The other face has MDF paper for polishing. Tilt the plate to match the tool's bevel. Charge the MDF with polishing compound. Turn on the saw and gently touch the blade to the spinning wheel.

for tools with tight curves. You can use fancy diamond film (Lee Valley Tools sells a set designed for sharpening woodworking tools) or you can use sandpaper from the hardware store. A swipe or two with the sanding dowel removes the burr and continues to polish the bevel.

Hand screws lend a helping hand

Sometimes you can't hold a tool well enough to sharpen it. A traditional spokeshave or travisher with forged tangs or a small hatchet are typical examples. A solution is to find some way to hold the tool and then bring the abrasive to the tool. Often, I grab the tool with hand-screw clamps, then I clamp the hand screws in a vise and move things around until I can sharpen the edge.

Sharpening molding planes

Molding planes cut complex shapes, but maintaining the edge of their irons is straightforward. To keep a beading plane or square ovolo molder working, polish the flat back between each major project and then strop the bevel using dowels either wrapped in fine abrasive or charged with honing compound. This maintains the edge for a good while. After repeated work on the iron's back, the profile of the tool might change slightly. Sight the iron against the plane's sole to look for differences between them. Make adjustments to the iron by working the bevel with a more aggressive abrasive. Then polish the bevel with finer abrasives.

Regrinding a badly mismatched edge to correspond to its sole requires a more involved approach. Larry Williams's video "Sharpening Profiled Hand Tools" (available from Lie-Nielsen Toolworks) is an excellent place to learn that skill.

TIP

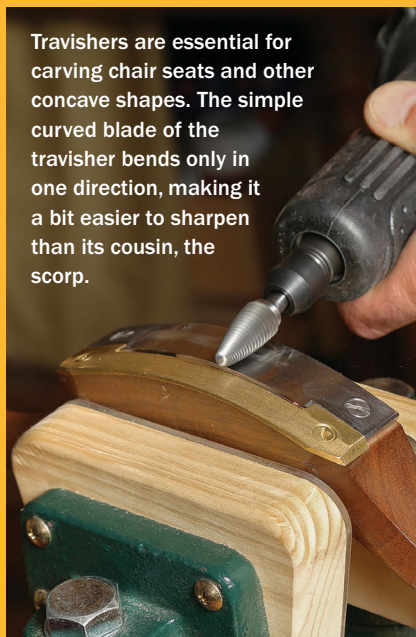


Hand screws are an extra set of hands. Sometimes a blade, like this travisher blade from Crown Tools, is difficult to hold for sharpening. With the blade held in a hand screw in your bench vise, you can abrade the bevel easily.



Travisher

Travishers are essential for carving chair seats and other concave shapes. The simple curved blade of the travisher bends only in one direction, making it a bit easier to sharpen than its cousin, the scorp.



A little relief. You can speed things along a bit if you relieve some material behind the cutting edge on the flat side of the blade using a die grinder. This produces an effect like the hollows on the flat back of a Japanese chisel.



Rock and roll. Rock the flat side of the blade along the stone, and move your way up the grits. Remove the burr on the bevel using a dowel wrapped with fine sandpaper or diamond lapping film.



The compound curves of the scorp

Many tools with curved edges also have curved bevels or curved backs. It's typical of scorps and handmade adzes. As with molding planes, I try to maintain the edge with regular polishing. I don't want the edge to degrade to the point of using a coarse stone or a grinder to bring it back to sharp.

For inside curves, I use abrasives adhered to a dowel. To maintain the edge I use my two finest abrasives (3 micron and ½ micron) to keep the bevel sharp and polished. On the outside curve, I adhere some of the diamond film to a flat stick.

I also have a table-saw method for sharpening the scorp. I use a metal disc-sanding plate for the table saw. I charge the face of the disc that has paper for polishing with polishing compound. I set the plate to the same bevel as the tool, turn on the saw, and lightly pivot and touch the blade to the wheel. Safety note: Empty all sawdust from the saw cabinet beforehand to eliminate the small chance of a fire.

Curved card scrapers



Sometimes you need a curved card scraper to fair curves and shape rounds. Sharpening a curved scraper isn't more difficult than a straight scraper, and a scrap of wood gives you all the help you need to do the job.

A simple block. A squared block of wood, about the same height as the scraper and a bit longer, keeps the scraper 90° to the stone. Plane a small chamfer on the block where the scraper meets the stone to keep debris from affecting the angle. Rock the scraper while holding it against the block.



Burnish the faces. After stoning the edge, burnish the flat faces of the scraper to polish the face and draw up the small hook of steel that will become the cutting edge. About 10 strokes on each face is sufficient.



Turn the burr. First stroke the scraper's edge with the burnisher parallel to the floor. Then tilt the burnisher about 7° to 10° and slide the burnisher across the scraper's edge, repeating until you can feel a hook with your fingernail. You don't have to create a hook along the entire edge, just in the area you need to do the job.

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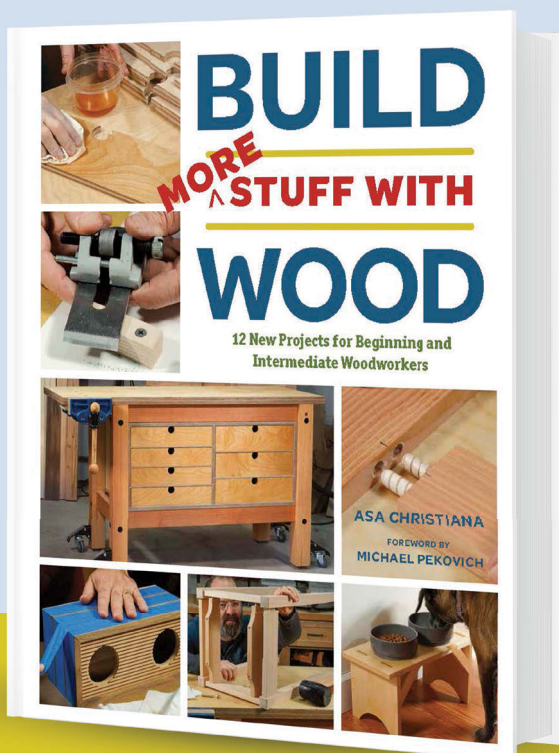
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Curved scrapers

Card scrapers with a curved or gooseneck profile seem difficult to sharpen. Again, you just need some scraps of wood to get it done. To stone the curved edge of the scraper, place a block of wood on your sharpening stone. The block acts as a fence, holding your scraper at 90°. Move the block around as you work to avoid making a groove in the stone. Cut a small chamfer on the block to prevent wood fibers from getting between the scraper and the stone.

Turning a curved scraper's hook is no different than with a straight scraper. Secure the scraper in a vise and stroke it with a burnisher, slightly tilted. You don't have to create a hook along the entire edge, especially with gooseneck scrapers. Just turn a hook in the area you'll use to do the job. □

Christopher Schwarz is a furniture maker and writer in Covington, Ky.

Complex shapes of molding planes

Since molding planes are used to make complex shapes, it stands to reason that their blades have unique and complex shapes as well. Dowels are a unique but not complex way of maintaining these blades.



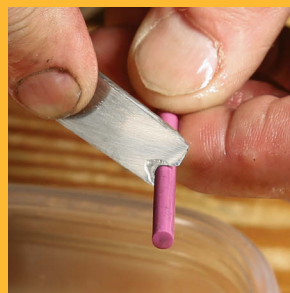
Tap it out. A quick tap on the end of your bench will release the blade from the plane.



Polish the back. Polishing the flat back of a molding plane regularly keeps it sharp for a long time.



Strop the bevel with dowels. Schwarz either uses sharpening stone dowels or wooden dowels wrapped with sandpaper to strop the bevel. Match the diameter of dowel to the curve you're working.



Site the iron against the sole. If the iron and sole don't match exactly you can use an aggressive abrasive on the bevel to correct the shape.

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Jeremy Tritchler: The adventure continues

BY ASA CHRISTIANA



After majoring in geology at the University of Wyoming, Jeremy Tritchler landed a contract job in a Utah copper mine, examining drilled cores, which are used to explore potential tunneling directions. After looking at 15 miles of cores over four years, he felt like “there was no end in sight,” he said. “I had a strong desire to be creative. I wanted to see the beginning, middle, and end of a project.”

Reflecting back on his youth, he remembered using his father’s hammer, nails, and wood scraps to bang together simple boxes and toy cars in the garage, and working with his grandfather, who helped him build his first toolbox from an old ammo crate.

He also happened to meet an experienced woodworker at the mine, a fellow geologist and longtime *FWW* subscriber, who was retiring soon to pursue the craft in earnest. Tritchler learned a few basics from his friend and caught the woodworking bug, finding the sense of accomplishment he was missing. When his friend confided, “I wish I had started doing this 30 years ago,” Jeremy took it to heart.

When his contract was terminated in 2012, a delayed casualty of the 2008 economic crash, Tritchler was unable to find another job as a geologist, so he took one building laminated countertops and desktops. It wasn’t fine woodworking, but it was a step in the door. “I worked with my hands every day, and felt the satisfaction of seeing a finished product,” he said. “You know when it’s good, and you know when you’ve made a mistake. It’s a rewarding feeling that’s hard to describe.”

When another friend invited Tritchler to join him as a handyman and remodeler, he accepted the offer, taking on the fine finish work. On nights and weekends, he took woodworking classes at nearby Salt Lake

Community College (SLCC), where he met the most influential figure in his journey, *FWW* contributing editor Chris Gochnour.

One great teacher can change everything

In Gochnour's classes on the fundamentals of fine woodworking, Tritchler made his first real furniture joints and his first solid-wood project, a beautiful tool box. "It was my first time picking out nice lumber. When the oil and the hardware were on, I thought, 'Wow, this is really something to be proud of.'"

Next Tritchler made a pair of sofa tables with his new teacher, and then a slant-top desk of his own design.

Aside from the hows and whys of the craft, Gochnour taught Tritchler that woodworking was a viable career. "Chris talked to us about why he became a woodworker," Tritchler said. "He was around 30 when he made furniture making his career. He took the plunge and made it work. I was in my 30s then, deciding what I wanted to do with my life, and I was inspired to take the same chance."

When Tritchler told his teacher he wanted a career as a furniture maker, Gochnour recommended North Bennet Street School (NBSS) in Boston.

Formal training at North Bennet

Tritchler was accepted into NBSS's Cabinet & Furniture Making program in the fall of 2016, and made the most of his two years there, completing 16 or 17 projects in the time some students complete five or six. Many were smaller projects, designed to teach him something new.

"I absolutely loved NBSS," he said. "They don't hand you all the knowledge. They give you enough instruction to point you in a direction, then they let you work it out yourself with trial and error—hands on. When you get hung up, they get you back on track."

After graduating in 2018 he landed a job at a small cabinetry and millwork shop in Boston that focused on commercial construction and remodeling. As "the custom guy for oddball jobs,"

Tritchler worked on kitchen cabinets, restaurant bars, and common areas in apartment complexes, dressing up one with big wall-hung shadow boxes for plant life.

Opportunity of a lifetime

Scanning Instagram one day, Tritchler ran across a post that changed his life again. The post came from Bill Pavlak, supervisor of the historical Hay Cabinet Shop at Colonial Williamsburg (CW). Tritchler was no stranger to the Hay shop, having visited it two years earlier and spoken with apprentice cabinetmaker Brian Weldy, also an NBSS grad.

Weldy suggested what Tritchler might highlight in his cover letter, and told his boss to look out for his application. Tritchler was hired, his wife got

approval to work remotely, and they moved with their young daughter to Williamsburg.

He started in January 2020, working at a massive workbench, in a wash of natural light from a nearby window (electric lights are not allowed in the shop). His job, like those of the shop veterans around him, was reproducing antique furniture from tidewater Virginia—drawing from the deep institutional knowledge at the living-history museum, as well as tapping its world-class archives and collections.

"There aren't a lot of written records of woodworking techniques in the 18th century," he said. "We worked closely with Colonial Williamsburg's [museum] curators and tradespeople to help each other better understand how things may have been done."



I worked with my hands every day, and felt the satisfaction of seeing a finished product. You know when it's good, and you know when you've made a mistake. It's a rewarding feeling that's hard to describe.



"I was in a euphoric state," he said. It felt like "an extended vacation," like he would soon have to pack up his bags and leave. Then, after just three years at his job-of-a-lifetime, his premonition came true.

A new chapter unfolds

Early in 2023, with a second child on the way and a big upsurge in child-care costs looming, Tritchler and his wife, Shaun, were facing some tough math. Her job as a financial analyst paid considerably more than his, so he made the decision to leave the job he thought he would retire from someday, to be at home with the kids and build up an independent furniture-making and teaching career. Once again, he received encouragement from Gochnour, who had balanced his own woodworking career with child care, for similar reasons.

I came to the Hay Cabinet Shop with a good understanding of how to use hand tools, but I left with them feeling more like an extension of myself.

"My resignation letter to Bill [Pavlak] was very hard to write," Tritchler said. "I gained a lot of confidence in my work and my abilities at CW. I came to the shop with a good understanding of how to use hand tools, but I left with them feeling more like an extension of myself."

The first reproduction he built at CW (shown above) was of a small tea table with cabriole legs, believed to have been built in Williamsburg in the 1720s. The table was relatively simple in design, but had a tricky piece of curbed molding that wrapped around the aprons and legs. "It was a good chance to stretch my brain and build my skills," he said.

Tritchler left CW in June of this year, and is working on bringing his garage workshop up to speed. Commissions have begun to roll in, which he should be able to juggle with his duties as a dad. As the kids grow, however, and begin spending more time at school, Tritchler is mulling bigger plans.

At NBSS and CW, Tritchler learned that he "thrives on camaraderie and collaboration with other makers." While he would be perfectly happy building commissions in the garage, he says, he is thinking about buying a large warehouse or factory space where he can set up a larger shop for working and teaching, and rent space to others as well.

"There are a lot of makers in the [Williamsburg] area, and I picture the co-op as a community-oriented place," he said. "Some of my friends at NBSS were veterans with PTSD. Focusing on a trade helped them adjust to civilian life, gave them purpose."

He pictures a lot of young people also being drawn to the co-op. "Not everyone has to go to college to be successful," he said.

Credit where credit is due

At each of his life transitions, Tritchler received unflinching support from his wife, who began her career in the arts, as a ballerina. She encouraged him to leave his career as a geologist to pursue his true passion, including the daunting move from Salt Lake City to pricier Boston. For the move to Williamsburg, she convinced her bosses at an environmental consulting firm to let her work remotely in Virginia. "I'm the one who gets cold feet," he said. "She always says, 'We'll make it work—we'll get there.'"

Follow Tritchler's journey on Instagram, @jtritchler.

—Asa Christiana is FWW's editor-at-large.





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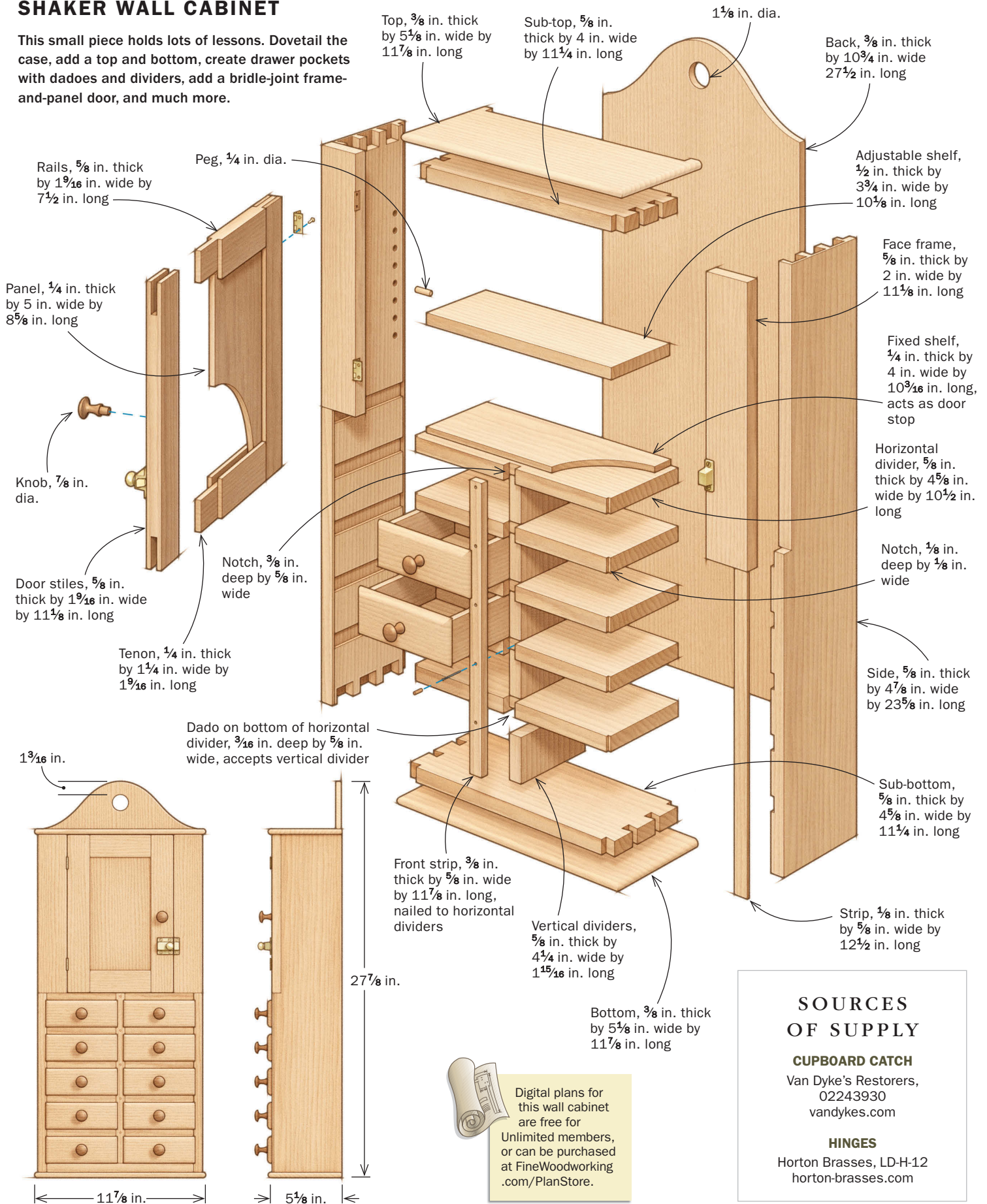
**BY CHRISTIAN
BECKSVOORT**

I first saw this little Shaker wall cabinet on the cover of the book *Shaker Design: Out of This World* by Jean Burks back in 2009. It was reportedly made in Canterbury, N.H., somewhere between 1860 and 1880. There is no indication of what its intended use was. Years later, I tracked down the owner, who graciously gave me the overall dimensions. He also mentioned that the small drawers were nailed. That and the photo were all I had to go on when I started building. When working from a photo to decide how to build a piece, it's always a toss-up between best practices and a guesstimate of how the original was actually made. For this project, I used a combination of both.

Its manageable size and variety of techniques make this cabinet a great project for learning new skills and honing old ones. In one small piece you will cut dovetails, tackle case construction, add drawer dividers and face frames, build drawers, and construct a frame-and-panel door with bridle joints.

SHAKER WALL CABINET

This small piece holds lots of lessons. Dovetail the case, add a top and bottom, create drawer pockets with dados and dividers, add a bridle-joint frame-and-panel door, and much more.



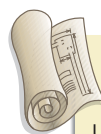
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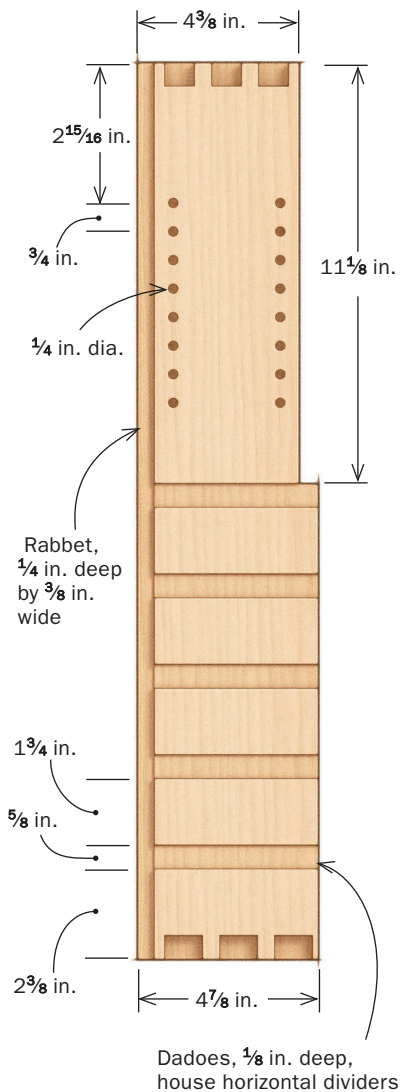
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Case work

The infrastructure of this carcass is a sub-top and sub-bottom dovetailed to the sides, with a notch and dadoes cut into the sides.



Connecting two sides to a sub-top and sub-bottom

After I milled the two sides and the sub-top and sub-bottom to size, I cut the notch in the sides to hold the upper face frame. Then I cut a rabbet in the sides to hold the back. I moved on to the half-blind dovetails that secure the sides to the sub-top and bottom. The last thing I did before I glued up the case was cut the dadoes for the drawer dividers. I did this on the table saw with a dado blade.



Notch it off. The notches at the top of the sides house the vertical face frames that flank the door. Create the notch with two cuts on the table saw, one ripcut and one crosscut.



Rabbet for the back. Two more ripcuts on the table saw yield the rabbets in the sides that the back will be set into.



Half-blind dovetails. Connect the sides to the top and bottom with half-blind dovetails. Becksvoort cuts tails first on the top and bottom, and then transfers that pattern to the sides and cuts the pins.

Dadoes galore. With the dado stack in the table saw use a miter gauge to cut five dadoes in each side for the horizontal dividers. Cut straight through the front of the sides; you'll cover the front of the dadoes later.



Finally, I glued the carcase together and glued thin face-frame strips on the lower half of the sides to cover the dadoes.

Five horizontal and five vertical dividers

After sanding and assembling the case, I milled the five horizontal dividers (taking final dimensions directly from the case), dadoed them for the vertical dividers, and notched them for the front strip. On all five, both front corners were notched for the face-frame strip. I slid the horizontal dividers into position and installed the front strip over them.

Next, I measured for the five short vertical dividers. Then I cut and installed them from the back. For both the horizontal and vertical dividers I used a friction fit. Feel free to use glue if the parts are a bit loose. I drilled and pinned the horizontal divider to the verticals. Then I glued on the two wider, upper face frames, and planed and sanded the entire front.

Add the top and bottom

The actual top and bottom both get a roundover profile on the front and sides. I shaped the profile by hand with a block plane and sandpaper. You also could cut the profile at the router table with a roundover bit. Glue the top and bottom onto the sub-top and sub-bottom. The way the cabinet is built, the sub-top acts as a door



Glue up the box. Glue the sub-top and sub-bottom to the sides. Be sure to check for square by measuring corner to corner. Both measurements should match. If they don't, adjust, reclamp, and recheck.



Cover the dadoes. Glue a thin strip of wood to the front of the sides where the dadoes ran through the front edge. Use stretchy green tape to apply pressure to the edging while the glue dries.



Glue in the face frame. The door attaches to a face frame, two vertical pieces that fit into the long notch at the top of the sides. Glue and clamp those in place.

Divider and conquer

Five vertical dividers slide into dados in the five horizontal dividers to create 10 drawer pockets. A front strip locks the horizontal dividers together; the vertical dividers butt up against the strip.

Horizontal dividers

first. Take the side-to-side measurements from the case. From the back, slide the horizontal dividers into dados in the sides. Each horizontal divider has a centered dado to accept the vertical divider below it, a notch in front to receive the continuous front strip, and notched front corners to fit around the thin face-frame strip.



Front strip. From the front of the case, measure, cut, and pin or nail and plug the front strip that locks all the horizontal dividers together.



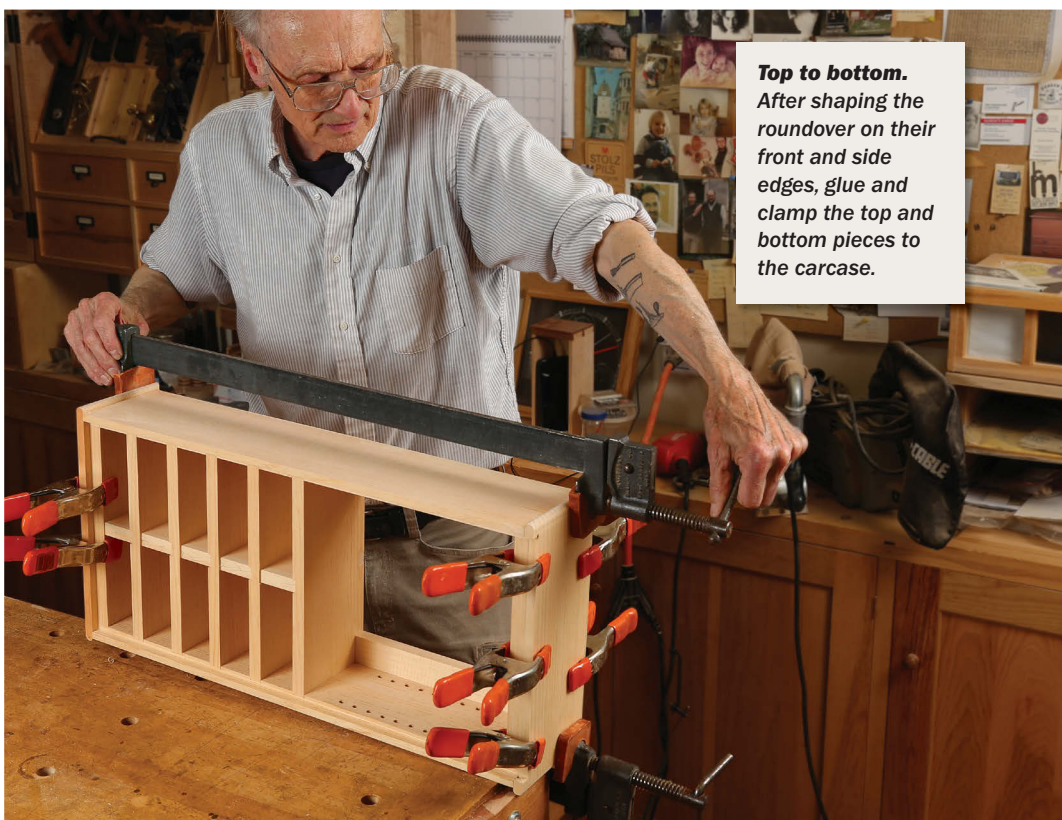
stop. For the bottom door stop, I glue a fixed “shelf” to the top of the top horizontal divider.

Bridle joint your way to a frame-and-panel door

The small door at the top of the cabinet is frame-and-panel. I decided on full bridle joints in all four corners and cut them on the table saw. Once the door was glued, fitted, sanded, and hinged (Horton Brasses, LD-H-12), I added the small cupboard catch (Van Dyke's Restorers, 02243930). I had to remove the clear coat finish on the catch, and, as I did with the hinges, darken it with Antiquing Solution (Constantine's Wood Center).



Add vertical dividers. From the back of the case, slide the vertical dividers into place in the dados in the horizontal dividers. Be sure the vertical dividers butt tightly up to the front strip.



Top to bottom. After shaping the roundover on their front and side edges, glue and clamp the top and bottom pieces to the carcass.

A petite door

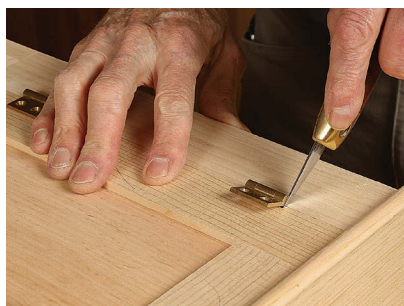
Becksvoort used bridle joints and a flat panel to create the door at the top of the cabinet.

Easy bridle joints.

At the table saw, Becksvoort cuts the shoulders of the rail tenons with a miter gauge, then cuts their cheeks with the workpiece held upright in an over-the-fence jig. He uses the same jig to cut the slots in the stiles that receive those tenons. He rips the panel grooves on the table saw also. Once all the joinery is cut, he'll glue up the frame with the panel in place.



Hinge the door. Locate the hinges where you want them on the door, score the location with a knife, and cut the mortise.



The original cabinet had a small metal hanger. I decided on a more traditional approach, making a curved wood hanger that is incorporated into the back with a hole for hanging on a peg. I used quartersawn pine for the back. I installed the back into the rabbets in the sides, and attached it with screws.

Lock in the drawers

As I mentioned previously, the original drawers were merely nailed together. I prefer lock corner



Transfer the hinge location. Set the hinged door in place on the case. Transfer the hinge location to the face frame. Cut the mortise and screw the hinged door in place.

Back panel does double duty

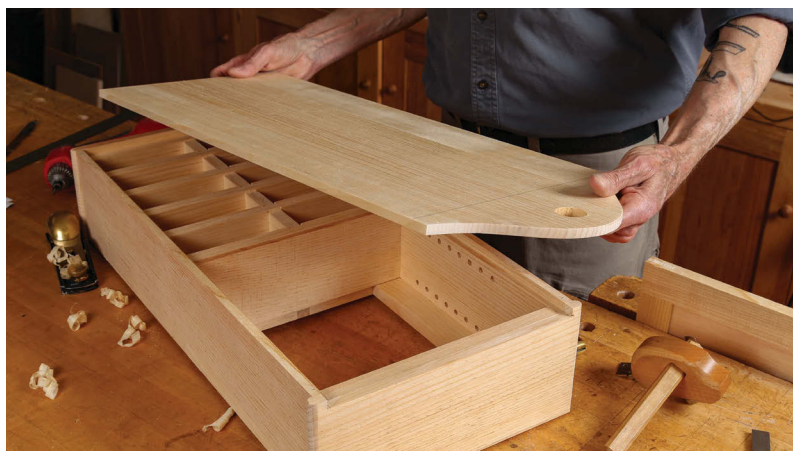
The back panel sits in the rabbet in the sides, top, and bottom. A curved top with a hole protrudes above the case and is used to hang the cabinet on a peg board.



Cut the curve. Becksvoort uses a template to trace the curved top shape onto the quartersawn pine back panel. After he cuts the shape on the bandsaw, he drills the hanging hole on the drill press.

Install the back.

Fit the back into the case, hand planing to sneak up on the fit if necessary. Then predrill and screw the back to the case.



sawkerf joints, using $\frac{5}{16}$ -in. stock for all four pieces. The sides have a sawkerf, while the front and back are rabbeted to create a tongue that fits the kerf. It takes a bit of figuring and adjusting at the table saw but it works well and looks good.

For the drawer bottoms, I ran a $\frac{1}{8}$ -in. groove along the inside lower edges of the sides and fronts. Instead of grooving the back and trapping the bottom in the glue-up, I reduced the height of the back so it stops where the groove in the sides and front start. This allows me to slide the bottom in from behind and tack it in place with a bit of glue. Once the drawers were glued and fitted, I added false fronts with quarter-round edges and an overhang on the top and both sides.

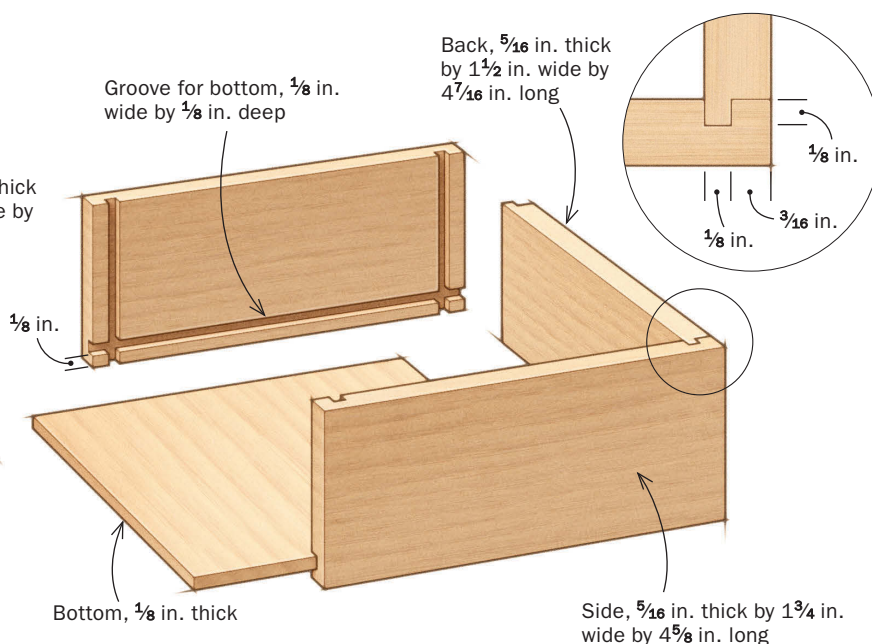
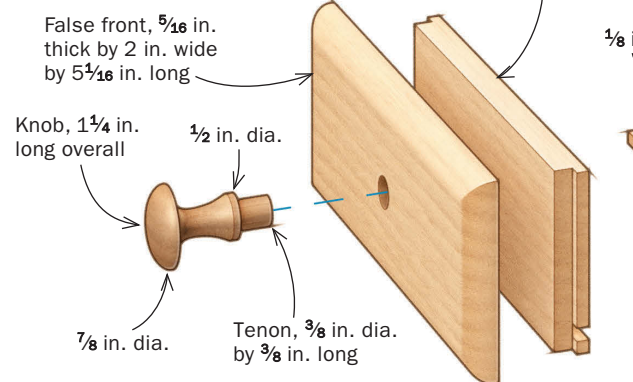
After turning eleven $\frac{7}{8}$ -in.-dia. cherry knobs, drilling and installing them, I finished the entire exterior with Tried & True Varnish Oil. A few months in the sun, and the pine will begin to darken. □

Christian Becksvoort is a longtime contributing editor and expert in Shaker furniture.



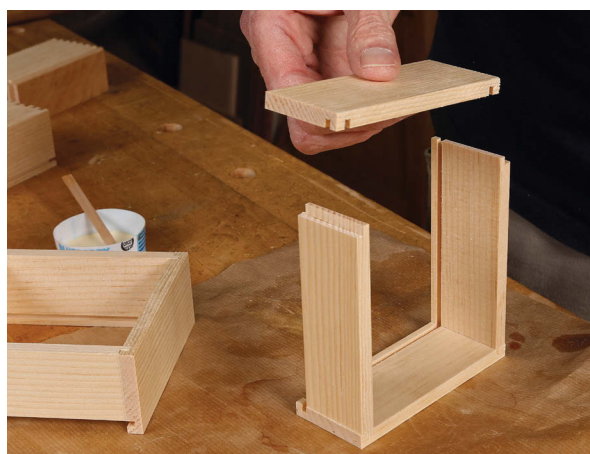
Ten tiny drawers

While the drawers in the original Shaker piece were nailed together, these drawers employ lock corner sawkerf joints, using $\frac{5}{16}$ -in. stock for all four pieces.



Online Extra

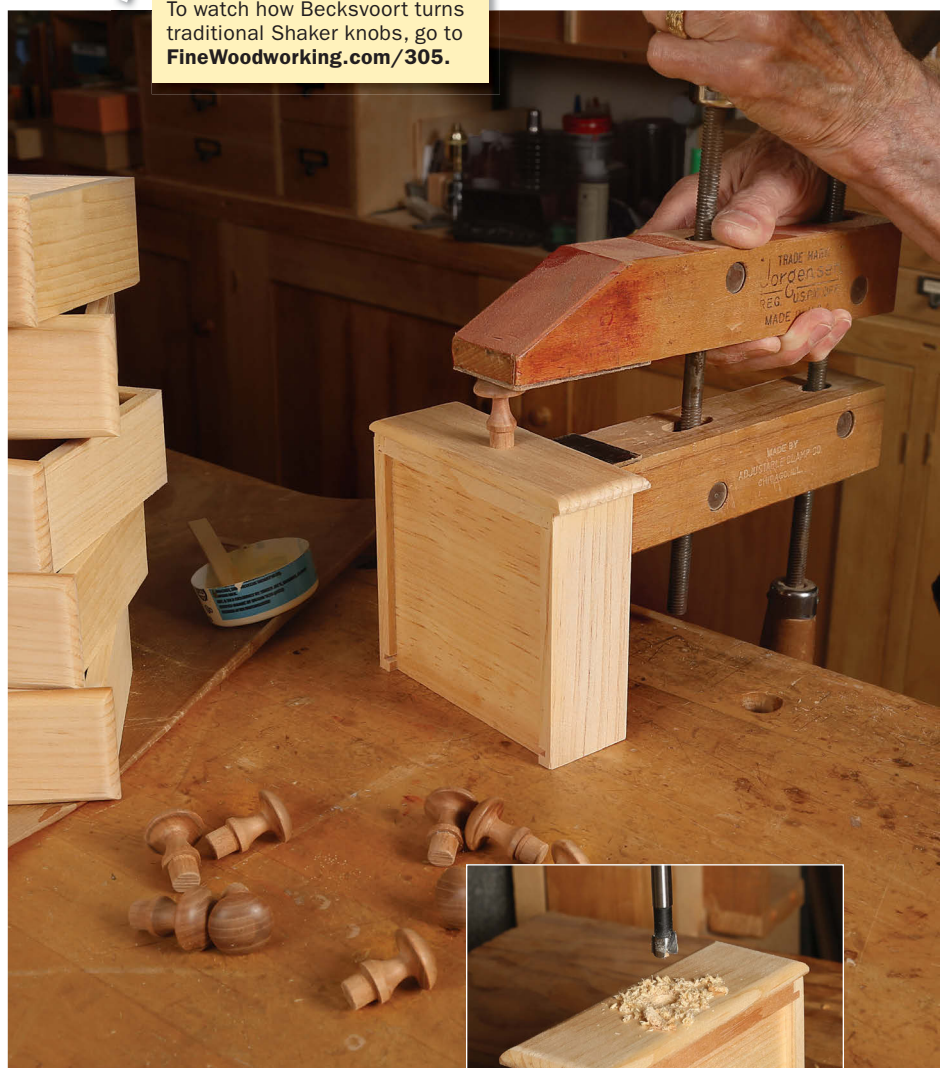
To watch how Becksvoort turns traditional Shaker knobs, go to FineWoodworking.com/305.



Sawcuts galore. The drawer sides have a sawkerf, while the front and back are rabbeted to create a tongue that fits the kerf. This system, once you have it down, makes easy work of building 10 drawers.



Add false fronts. After the glue has dried on the drawer box assemblies, glue the drawer fronts to the boxes. Your clamps can do double duty if you gang up two boxes at a time and clamp them face to face.



Attach the knobs. Use a Forstner bit at the drill press to drill the mortise for the drawer knobs (right). Glue and clamp a knob onto each drawer (above).

Refurbish a Vintage Block Plane



A toolmaker's tips
for rejuvenating
this workhorse

BY ELEANOR ROSE



I'm a toolmaker, but I fully believe in refurbishing. It is the most accessible way into an often expensive craft. Almost without fail I opt for old when building my own tool collection—and that's despite being able to make my own versions. I prefer to give something a second or maybe even a third life. Take it from someone who spends more time on eBay than she should: There are enough antique tools to go around. It's just up to us to get them back into working order.

Block planes are a good choice for refurbishment. They're plentiful, meaning you can find a solid user at an affordable price. Plus, they're a workshop staple, so even if you already have one, buying another is easy to justify. You can set them up for

separate tasks, like one for shooting small parts square and the other for rough shaping. All it takes is \$25 to \$40, some time, and the tips I'll share here.

What to buy

Luckily, because so many vintage models are available, you can be picky. I recommend a Stanley 9½, which has lateral and depth adjusters and an adjustable throat. If you can't find one, look for another Stanley or a block plane from Ohio Tools, distinguishable by their maroon japanning. I recommend avoiding vintage planes with a wheel and a threaded post to tighten the cap iron. These are too prone to failure after decades of use, and existing damage can be hard to see. Finally, opt for steel

and cast-iron tools. These are always superior to aluminum and plastic.

Clean, disassemble, and derust

Now you have your plane in hand. It's probably rusty, dirty, or even hiding spiders, like a recent purchase of mine was.

I start off with a good degreaser. My favorite is CMT 2050, which is nontoxic and pretty environmentally friendly. It's technically a blade and bit cleaner, but if it can cut through pitch it must be good. It also acts as a rust preventative if you do not rinse it off, helpful if you have to step away for a day or two between refurbishing steps. However, in place of a dedicated degreaser, dish soap and water with some extra elbow grease also works just fine,

Buying vintage? Here's what to look for...



A lateral adjust and depth adjust add convenience. This Stanley 9½, a common plane, uses a lever to adjust the blade from side to side and a knob to advance or retract it—two nice improvements to tapping with a hammer. Finding one with the wooden handle on the end is uncommon, so don't agonize over it.



An adjustable throat helps with cut quality. With the 9½, you can open the throat wide for heavy, coarse cuts or close it down to control tearout and take finer shavings.

... and what to avoid

as does Simple Green. Typically I scrub, rinse, then repeat at least twice.

Once you scrub the exterior of oils, grime, and eight-legged beasts, you can start disassembly. This step is mostly about patience and discovery. I wish every tool was similar enough to have a perfect how-to list, but sometimes screws are reverse-threaded, sometimes a tool has been altered by a previous owner, and sometimes you find one that's damaged. Every time I take an antique apart there is a hidden screw, a pin hidden under dirt, or something unexpectedly ground flush.

I have two major points of advice when disassembling: WD-40 won't solve anything no matter how much you want it to, and if a screw won't turn, don't force it. I made both mistakes when I started out, and each caused tears.

If your plane is particularly rusted and you cannot get a screw, threaded rod, or knob to budge, then try heat. Use either a quick, light touch with a propane or butane torch, or pop the plane in an oven at 350° for 20 minutes. The heat expands the metal ever so slightly. It will shrink as it cools, breaking the rust bonds to allow for removal. This process can warp the



A threaded rod for tightening the lever cap and a cross-pin are weak points on vintage planes. These experience too much tension to make them long-lasting. The wheel-tightening mechanisms are often stripped after years of use and abuse. And over time pressure against the pin can lead to hard-to-see cracks in the casting above it.



Clean and disassemble

Give the plane an initial cleaning with a good degreaser.

Scrubbing down the plane now removes dirt, grease, and grime, letting you better see parts when you disassemble it.



Disassembly is about patience.

Don't force components apart. They may be reverse-threaded, like this lever cap screw on the 9½ (others on the 9½ are standard threaded). Some parts may be secured with a pin, which should be gently tapped out.



Protect threaded rods.

Pliers can damage threading, rendering the part useless. To prevent this, Rose uses silicone thread covers made for powder coating. A few wraps of masking or electrical tape will also work.



plane, but you'll address that later. Be sure to take out the blade for either step, as the heat can ruin a blade's temper. When heat doesn't work, I use a lubricant. If that doesn't do the job, I look for a hidden pin or weld/braze. If those fail, I have another trick up my sleeve: Evaporust.

Evaporust is truly a magic potion. I'm convinced wizards make it. It does exactly what it says it does: It removes rust completely. Plus, it's reusable. I submerge all the plane parts after disassembly and another degreasing and let them sit for 3 to 24 hours, enough time for the liquid to break up any lingering rust bonds. Nearly instantaneous flash rust is possible when you remove the parts, so wear gloves and protect the fresh metal with oil or more CMT 2050. If you do get any flash rust, it's a breeze to remove with a Scotch-Brite

Remove rust and protect with oil



Soak rusty parts in Evapo-Rust. With all the parts separated, you can thoroughly clean them. Then submerge rusty components completely to avoid unsightly discolored etching lines where the product doesn't reach. Evapo-Rust usually takes 3–24 hours to work. It will also often loosen parts that are still stuck.

pad, or give it another soak in Evapo-Rust.

Next, remove any old paint or lacquer with a stripper for marine paint and lacquer, or with acetone. I've also heard good things about Citristrip. Be sure to check for lead in any paint, and wear a respirator. Protect the parts from rust after this step, too, and then reassemble the plane.

Stripper will not remove japanning. That needs to be sandblasted away, which I fully discourage unless you know exactly what you are doing. Fortunately, I rarely find it necessary to remove japanning. Touch-ups, which I perform at the end of a refurb (if at all), do just fine.

Joint the sole

Until now, much of the work has been on cosmetics and basic functions, like getting rusted knobs to turn. But to turn the plane into a reliable user, you'll want to joint the sole with sandpaper affixed to a flat surface.

The preferred surfaces to achieve flat are granite or machined steel. There are a few other options, too, like thick glass panels (¼ in. or more) and melamine. Plywood cannot typically be trusted but might serve in a pinch. Be sure to check any of these surfaces for flat and true by placing a rule longitudinally at each end and in the middle, latitudinally at each edge and in the



Scotch-Brite knocks off loose rust. Any rust left after soaking is easily rubbed off with an abrasive pad. However, this freshly exposed metal is prone to flash rust. Quickly coat the parts in a rust-resistor, like camellia oil, to stop this. If rust does happen, it's easily managed with Scotch-Brite before oiling.



Flatten, square, and polish

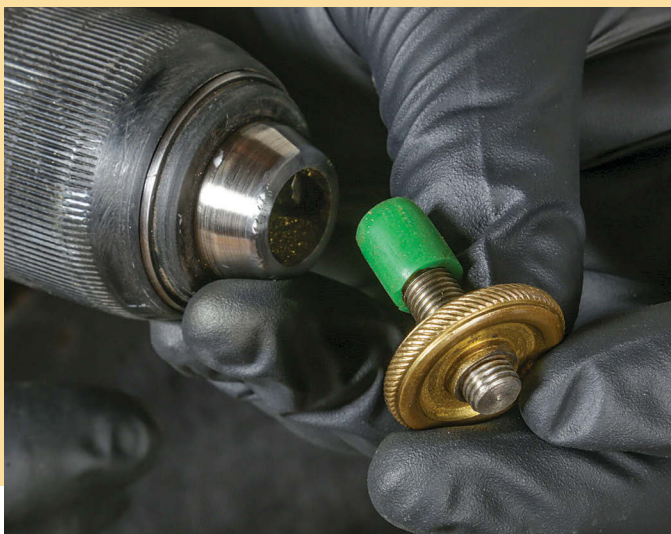


Start flattening the sole. Rose secures sandpaper to a flat, milled metal surface using strong magnets so it doesn't bunch or crimp. Flatten with the blade installed (but fully retracted) to keep the plane body in tension. The shiny areas show the high spots (above). This plane still needs work ahead of its mouth, the most critical area.

Square up a side if you want to shoot with the plane. True only the side you'll use on your shooting board. Rose guides the plane against a squared block that has strong magnets in its base. This block is your reference, so concentrate on holding your newly flattened sole against it.



Polish round parts in a drill. Protect threads with thread covers or electrical tape. While holding the drill's trigger, polish the parts with fine sandpaper or a Scotch-Brite pad. Dirtier parts may require initial cleaning with a brass wire brush.



middle, and diagonally both ways. If you see no light between the surface and the rule, you can safely use it.

I flatten on a machined surface, so I can use strong magnets to attach my sandpaper. They allow me to quickly and easily change out worn paper, or reuse sheets that still have life. I recommend sticky-back sandpaper if magnets aren't an option. Its thickness is controlled, so it's preferable to a spray adhesive, which you can easily overspray, creating lumps. You can also use double-stick tape if you are careful to apply it edge to edge with no overlap, or you can clamp cauls over your abrasive.

Step up the grits as you fix the sole. Start with 80 or 100 if your sole is scratched or particularly wonky. Stop at 220 grit. Going all the way to a polish is unnecessary and will be undone the minute the plane touches wood. If you want to use the plane for shooting, square a side too.

During flattening, the plane should be assembled, including the blade and cap iron with the same tension on the iron as it will have in use. However, retract the iron into the plane so it doesn't project; otherwise you'll grind the cutting edge. You want to save that edge for when you flatten the back, hone the bevel, and get to work. □

Eleanor Rose is a metalsmith and an artist-in-residence at Tennessee's Appalachian Center for Craft. She's @off_artisan on Instagram.

Japanning is easy to touch up

That black glossy finish on some of your hand planes and other tools is japanning. It started out as a furniture finish imitating Japanese lacquerware, but its uses expanded to protecting metal tools as well. Depending on how far you want to refurbish a tool, you may consider refreshing the japanning. My recipe is easy to make and apply, and it cures to a shiny brownish black, a correct antique look, so you won't ruin your plane's old charm with its new paint job. Just be sure to apply it somewhere with good ventilation, or even outside.

The steps are simple. First, strip off old paint, residual grease, grime, and oil, and old, flaky japanning. Next, apply the japanning. I make mine by combining one part linseed oil and one part thinner, then I mix in lamp black until the finish is opaque. Feel free to experiment with your own ratios.

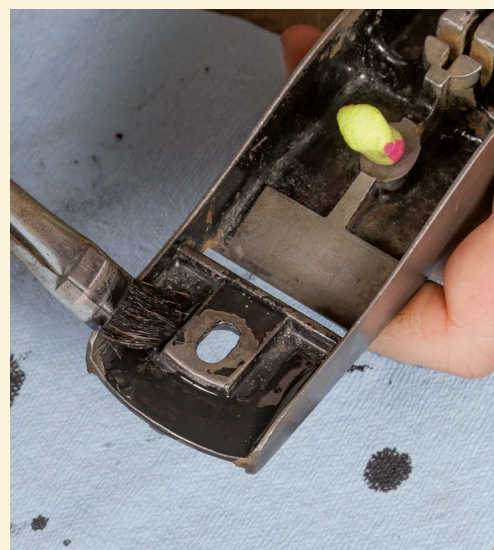
My technique only touches up the old japanning. It's more about filling in cracks and gaps instead of doing a whole overhaul. To completely reapply japanning, you have to first sandblast the casting—and sandblasting is something I don't recommend to anyone except those who know exactly what they are doing and can take the proper precautions against lead paint and damaging the tool.



Strip and clean to prep for japanning. To ready the surface, Rose brushes on acetone to strip any paint from previous owners and remove any remaining grease. For stubborn spots, she breaks out a wire brush, which also scratches off old japanning that's loose.



Brush on the japanning mixture. Protect any holes with rolled-up earplugs, and avoid the sole and sides of the block plane. If japanning inadvertently gets on these surfaces, scrape it off with a razor blade and follow with sandpaper.



Bake three times to cure the finish. Rose's sequence is 300°F for an hour or two, then let it cool. Repeat at 350°F, cool, and then heat one final time at 400°F. A toaster oven works fine.



Sanding, Under the Microscope

Scanning electron
microscope
reveals secrets
of success

BY PAUL H. AXELSEN

Whether you view sanding as a tedious chore or a labor of love, a closer look at the process will help you give your next project a beautiful look and feel. In this case, I mean a *much* closer look, with a scanning electron microscope (SEM).

As a scientist, I use an SEM quite often, to examine everything from microorganisms to medical devices. As a woodworker, I decided to use this powerful tool to an-

swer a long-standing question I've had: If cross-grain sanding makes a mess of a wood surface, why is it that a random-orbit (RO) sander—with scratches going in every direction—doesn't do the same?

When I sent my initial results and conclusions to *Fine Woodworking*, the editors suggested a number of related questions to explore with SEM photography. Among the questions were how hand-sanding differs from random-orbit sanding, how



Scores of samples

We prepared many samples for micro-photography, in a wide range of woods using a random-orbit sander, sanding by hand, and surfacing with a hand plane.

hand-planed surfaces differ from sanded ones, and how fine a grit one should sand to for best finishing results.

Prepping samples

My editor, Asa Christiana, and I sanded a number of hardwoods with an RO sander, keeping a shop vacuum attached, and applying gentle, even pressure to the sander. The surfaces were brush-vacuumed and rubbed lightly with a tack cloth after each grit, to make sure that the SEM images would reveal the surface of the wood, not loose sanding dust.

To create samples that would fit in the microscope, I punched out small chips (see photos, above right), and then coated them with an ultrathin layer of gold and palladium, which plays an important role in how the SEM works.

The SEM scans the surface with an electron beam much like those in old cathode-ray television tubes, and the super-thin metal layer reflects the beam back to a detector to create a crisp, black-and-white image. Although an SEM can easily magnify to 1,000,000x, the effects of sanding were best seen at magnifications between



A sliver of each. Axelsen used a round punch and a chisel to create samples small enough to fit into the scanning electron microscope (SEM).

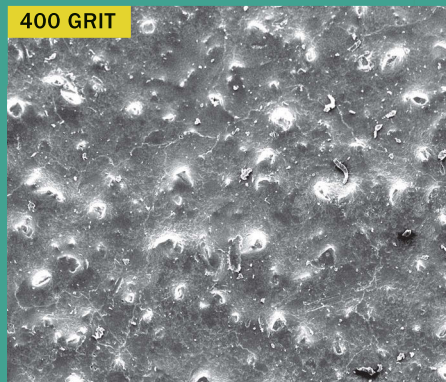
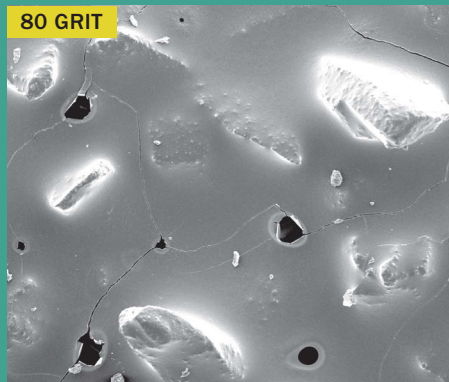


Into the scope. After applying an ultrathin metallic coating to each sample—required by the SEM—Axelsen loaded each into the microscope and examined its entire surface. He then chose the most representative area and best degree of magnification for each photograph.

The mechanics of random-orbit sanding

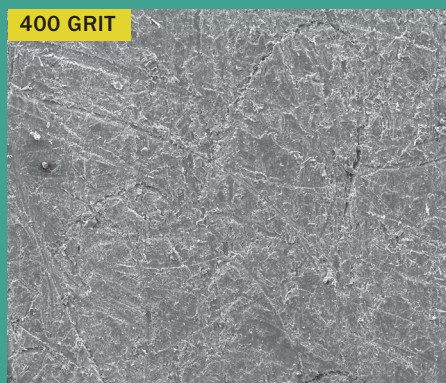
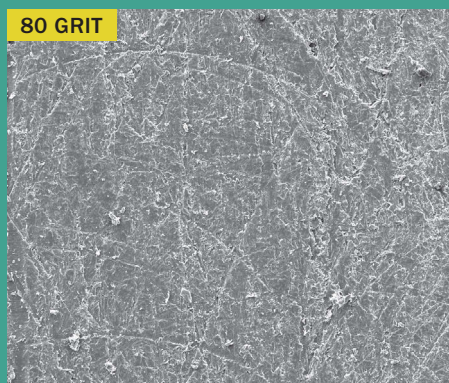
A close examination of random-orbit sanding disks and the surfaces they produce offers a number of revelations.

SANDING DISKS

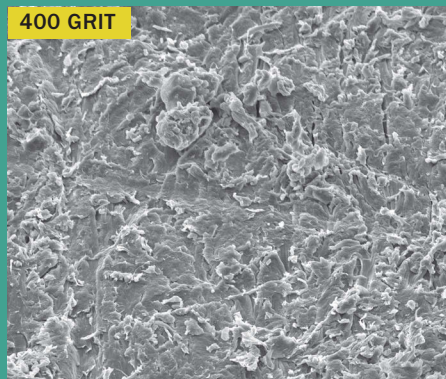
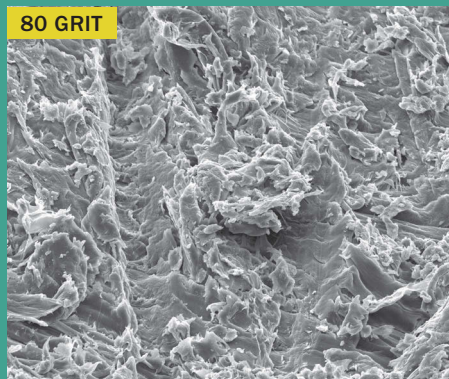


Consistently sized abrasives. Photos of sanding disks at 50x magnification show that the grains of zirconia-alumina are compact in shape and roughly uniform in size, with sharp edges.

SANDED SURFACES



Thousands of tiny arcs. In these photos of sanded surfaces, taken at the same 50x magnification, we can see that individual grains cut more effectively in some directions than others, producing small arcs rather than full loops. The disk rotates as it moves eccentrically, which makes the scratch pattern even more complex. Note also that the scratches are much smaller than the abrasive grains that created them.



Finer is smoother. Viewed at 500x magnification, these samples of sanded surfaces show how progressively finer grits leave a progressively smoother surface, as expected.

20x and 500x.

While we weren't able to reach definitive answers to each question we explored, our efforts yielded very instructive results. Aside from examining the SEM images, we also learned a lot simply by sanding, touching, and viewing so many samples.

How RO sanders work

The SEM revealed that the abrasive grains in RO sanding disks are compact in shape and relatively uniform in size, with sharp edges, and are partially embedded in a layer of adhesive. It also enabled me to measure the size of various abrasive grains.

Then I began looking at samples of random-orbit-sanded wood, viewing them at a wide variety of magnifications.

Thousands of tiny arcs—One of the most important things I noticed is that the gouges created by random-orbit sanding tend to be tiny arcs, not complete loops, likely because the chiseling action of each grain tends to be more effective in some directions than in others.

As expected, the radius of each arc corresponds to the radius of the eccentric bearing in the sander, which causes the disk to oscillate 12,000 times per minute. The disk also rotates at the same time—much more slowly than it oscillates—which is why each grain creates a new gouge, in a new location, with every oscillation.

Another thing I learned is that the gouges made by a random-orbit sander are much smaller than the grains that create them. This is obvious when you compare the size of the grains on a sanding disk with the size of the scratches they make in wood, at the same magnification. The relatively small size of the gouges is also confirmed by SEM images of sanding disks after use, in which each speck of dust left on the disk is much smaller than the nearby abrasive grains.

Number of grains determines depth of the scratches, not grit size—Interestingly, and somewhat counter-intuitively, the cutting depth of different abrasive

grains is determined primarily by the number of grains in contact with the wood, and the pressure applied to the sander (or hand-sanding block), as opposed to the size of the grains.

I know this because the width of the scratches didn't change in SEM images of wood sanded with different grits. Variations in pressure could have changed the width of the scratches, but I kept consistently light pressure on the sander when prepping sample boards, eliminating that as a factor.

In short, the reason finer sandpaper leaves shallower scratches is that finer grains are closer together on the disk (or sandpaper), which translates to lower pressure on each individual grain.

Pores are packed with dust—As I looked through hundreds of SEM images, I noticed that the gouges left by RO and hand sanding were packed with fine dust even after vacuuming. You can see this clearly in the side-by-side images of sanded and hand-planed samples on p. 59. Both were taken after the surfaces had been vacuumed thoroughly.

The SEM shows that hand-planing produces a cleanly cut surface that is largely dust-free, with wide-open pores. Sanding, on the other hand, whether by hand or machine, packs those pores with dust that cannot be removed by vacuuming or wiping with a tack cloth. Also, the finer the grit used and dust created, the more packed the pores remained.

Initial revelations

Many of these discoveries confirm popular wisdom, but confirmation can be a benefit in itself.

Move the sander slowly, in straight paths—The goal when sanding, regardless of method, is twofold. First, you want to completely remove machine marks, or the larger scratches left by the previous grit. Second, you want to remove a uniform layer of wood, leaving the surface as level as possible, avoiding depressions that will be obvious after applying a finish, when light reflects off the surface.

SEM images highlight the mechanics of random-orbit sanding. First, the disk oscillates extremely rapidly, so users who rub the sander back and forth like a sanding block are wasting their efforts. Worse, they are making it very hard to track their progress and remove wood in a uniform layer.

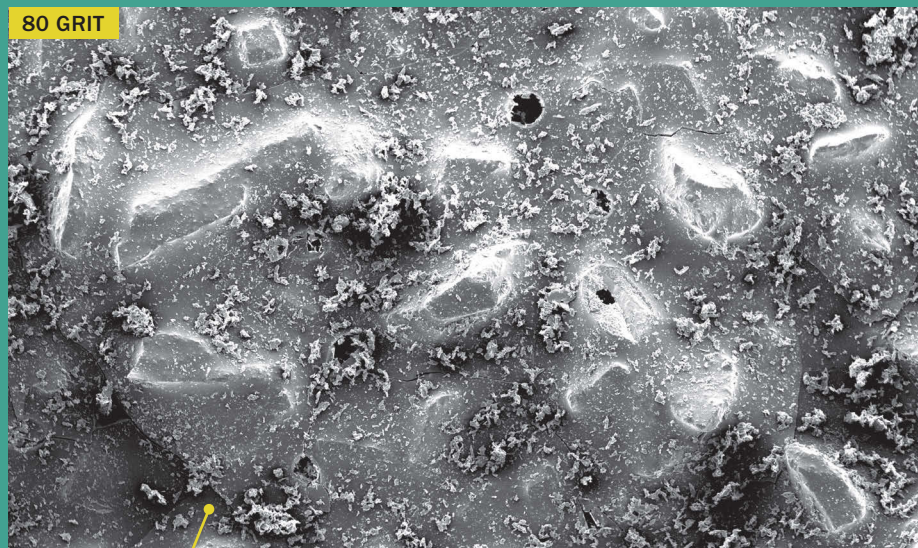
Instead, you should move a random-orbit sander slowly and gradually across

the surface in straight, slightly overlapping paths, which will remove a uniform layer of wood. If your first series of passes hasn't removed the marks from milling, or a specific defect, or the scratches from the last sanding grit, avoid bearing down in any one area; instead, make a new series of passes over the entire surface.

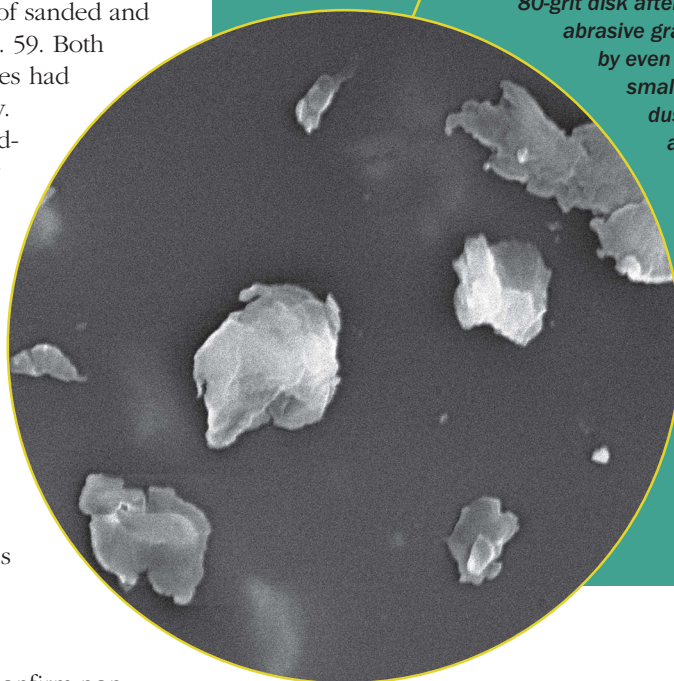
Light pressure—A random-orbit sander's cutting action changes when you bear

Collect the dust with active suction

Fine sanding dust is dangerous.



Dust is much finer than expected. The 50x image above, of an 80-grit disk after sanding, shows the difference in size between abrasive grains and the dust they generate. Particles produced by even the coarsest random-orbit sanding can be as small as 1 micron or less (see image at left). These fine dust particles are the most dangerous to lungs and airways, so HEPA-level filtration is a must for your shop vacuum and dust collector.



Expert advice confirmed

SEM photos, plus our experience prepping and finishing so many samples, confirmed a number of expert tips for successful sanding, by power and hand.

EFFECTIVE SANDING

Light grip and a steady path. Because a sander moves thousands of times a minute, you don't need to rub it back and forth like a sanding block. Instead, move it in straight, slightly overlapping passes to ensure that you are removing wood evenly. A light grip is best, as pushing down hard or tipping the sander will impede its proper operation.

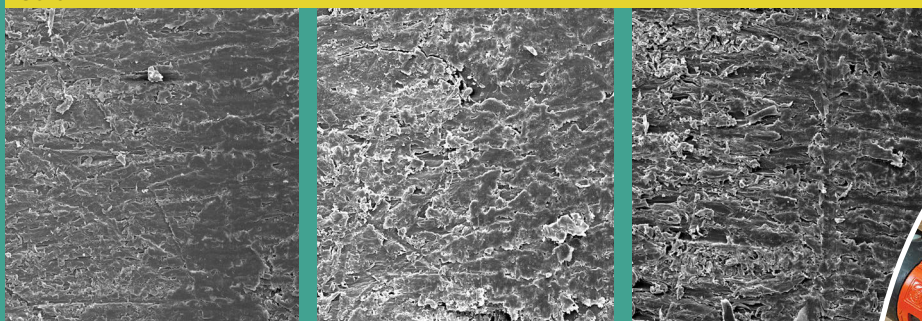


Vacuum between grits. Although connecting your sander to a shop vac will capture most of the dust created by random-orbit sanding, it's also important to vacuum the surface between grits, using a brush attachment. The goal here is to collect loose abrasive grains from the previous disk, which will cause problems during the next sanding pass.



PENCIL LINE GUIDES THE WAY

80 GRIT



Trust the pencil test. After being sanded with an 80-grit disk, these (from left) oak, cherry, and walnut samples were marked with a soft lead pencil, a common method for tracking progress with the next sanding grit. The dark area on the right side of each 200x image is a small portion of a pencil mark, showing how the graphite dust fills the sanding scratches, leaving a smoother surface on top. When the marks are no longer visible, you've reached the bottom of those scratches with your next grit.

down hard on the sander, or worse, tip it sideways to push down harder on the edge of the disk.

Those methods can create deep gouges, which are much harder to remove with the next finer grit. Pausing along your path and bearing down on the sander will also create those hollows we are trying to prevent.

Best practice is to keep the sander level and apply light pressure, relying on the weight of the unit to produce the downward force.

Vacuum the surface—The SEM shows us that random-orbit sanding dust is not only smaller than the grains that create it, but also smaller than the next finest sanding grit in any series. So there is little danger of leftover dust creating overly deep scratches if you leave it behind. Instead, it's rogue abrasive grains you should worry about. These are grains that have broken free from the disk, and can roll around under the next one, creating deep, corkscrew scratches that will be very hard to remove. So it is important to vacuum the surface between grits using a brush attachment.

As a physician, I must also point out that the very fine wood dust created by sanding, and especially random-orbit sanding, is the most dangerous to your health, hanging the longest in the air and penetrating deepest into your lungs and airways, where it can both irritate and damage your lungs; exacerbate asthma, emphysema, or chronic bronchitis; and even cause cancer. So it's important to trap sanding dust in a HEPA-rated vacuum or dust collector.





HAND-SAND WITH THE GRAIN



Same grit, different results. Sanding by hand across the grain not only leaves more visible scratches, it also tears fibers and pulls them upward (above left), leaving the surface rougher to the touch. Sanding with the grain, on the other hand, leaves fibers lying down (above right), creating scratches that blend in with the grain lines.

Pencil marks track progress—It's difficult to know when you've sanded enough to remove the gouges left by the previous grit. To make that clearer, some woodworkers make light marks on the surface with a soft pencil and sand until the marks are gone before moving on to the next grit.

So I made some pencil marks on sanded wood, sanded those away to various degrees, and viewed the marks with the SEM. It's clear in SEM images (see facing page) that the pencil graphite fills the gouges to the brim, making marked areas look much smoother than nearby ones. These images, along with practical experience, suggest that the pencil marks will remain visible until the next sanding grit has reached the bottom of those scratches.

Therefore, pencil marks are likely a very effective way to track your progress when sanding. They can also be a guide to which grit is needed for a particular workpiece: If the marks are lasting longer than your patience, that's a sign that you need a coarser grit.

Raise the grain before water-based finishes—Water-based stains, dyes, and finishes can “raise the grain” of bare, sanded wood, forcing woodworkers to re-sand, which can remove color from the raised fibers, creating an uneven look.

So woodworkers often raise the grain before applying water-based finishes, by dampening the surface with a wet sponge, allowing it to dry, and then re-sanding with the same final grit. The SEM

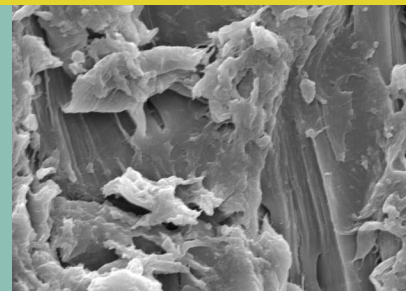
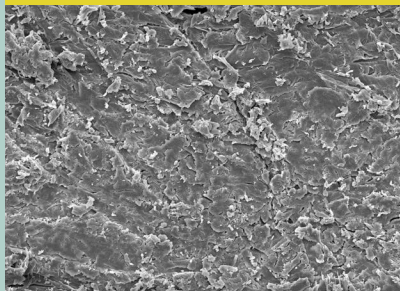
RAISE THE GRAIN BEFORE WATERBORNE FINISHES

Taken at 200x and 2,000x magnification, these SEM photos show how wetting (with water) and drying causes fibers to rise from the surface, and how re-sanding smooths them again.

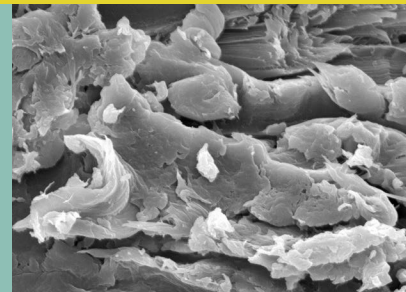
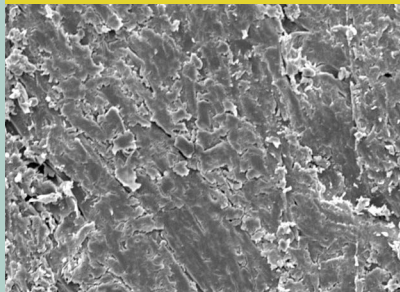
200X

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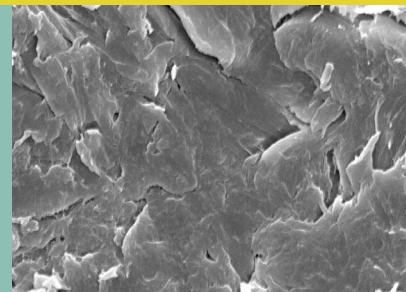
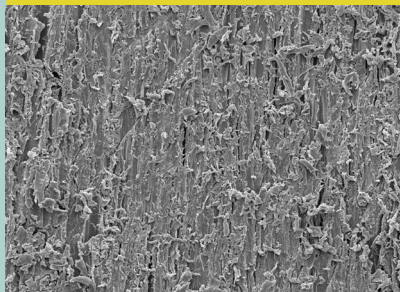
RO-SANDED TO 320



DAMPENED AND DRIED



RE-SANDED WITH 320

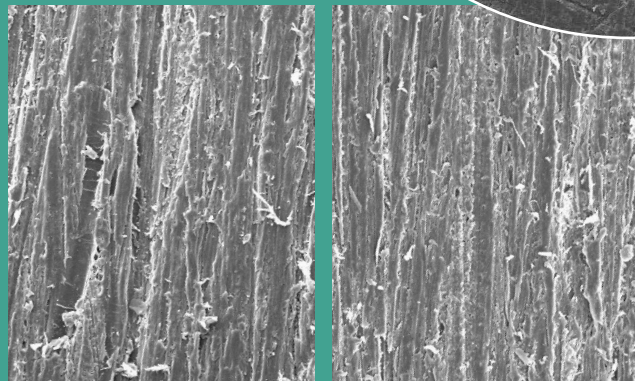


New info emerges

Our investigation uncovered some relatively surprising information, and a number of helpful tips.

SKIP A STEP WHEN SWITCHING TO HAND-SANDING

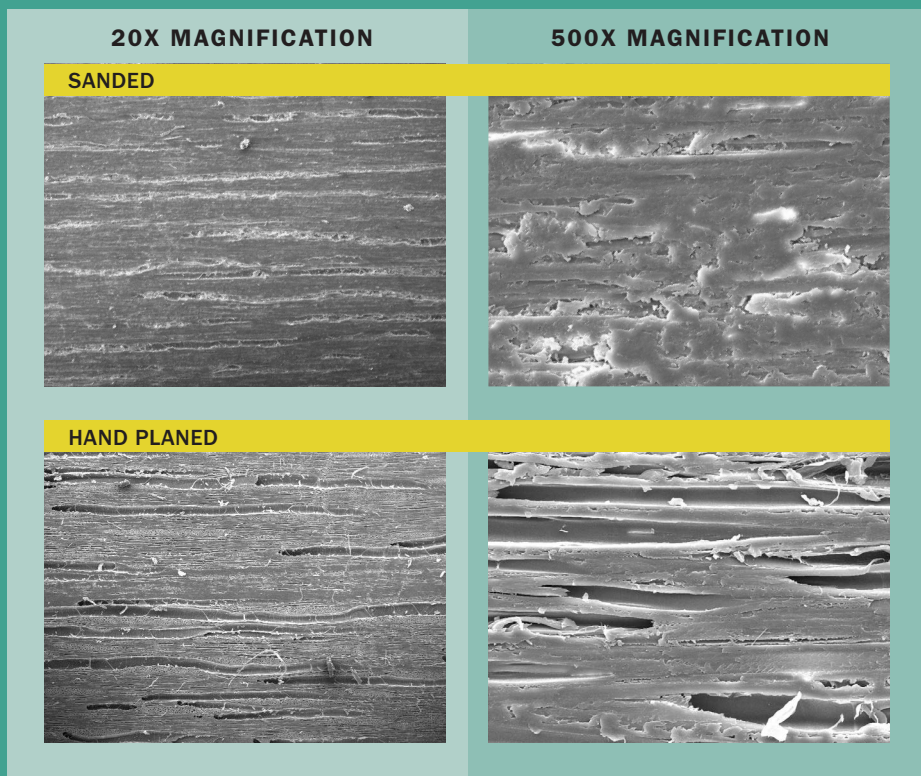
Conventional wisdom dictates that you follow RO sanding with hand-sanding, beginning with the last grit you used in the random-orbit sander. SEM photos suggest a shorter path.



Two paths tested. We random-orbit sanded two cherry sample boards to 220 (top). Then we hand-sanded one (left) with 220 paper and the other (right) with 320 paper. Both grits were equally effective at removing all traces of random-orbit sanding, suggesting that woodworkers can skip the repeated grit when switching over to hand-sanding, and go right to the next one.

PLANING VS SANDING

A sharp hand plane shears the fibers cleanly while sandpaper leaves ragged, feathered edges (and packed pores). This offers a clue as to why many woodworkers find that there is reduced grain-raising when a finish is applied to a planed surface rather than a sanded surface.



Sanded vs. planed. The SEM photos at top show a hand-sanded surface, with fine dust still packed into the pores after vacuuming. The surfaces in the bottom row were shaved cleanly by a hand plane, leaving their pores wide open. Both are cherry.

confirms the effectiveness of this practice, showing how wetting the surface and letting it dry causes surface fibers, damaged and stressed by sanding, to loosen and curl upward. It also shows that re-sanding makes the surface smooth again.

Hand-sanding and more

Experts widely recommend hand-sanding after random-orbit sanding. While we weren't able to confirm that this step is absolutely necessary, we were able to compare a variety of random-orbit-sanded, hand-sanded, and hand-planed samples and reach a number of conclusions.

Hand-sanding vs. RO sanding—When I compared random-orbit and hand-sanded surfaces (both sanded to 220) in the SEM, it was easy to see how different the scratch patterns were. To the naked eye, however, those same surfaces, whether finished with a coat of oil or not, showed no easily discernible differences.

It would require much more extensive testing to tell whether hand-sanding delivers better finishing results than random-orbit. Practically speaking, of course, smaller and narrower surfaces should only be sanded by hand with a block, as a sander will round them over.

More efficient hand-sanding—Another question we explored is which grit to jump to when switching from random-orbit sanding to hand-sanding. While experts usually recommend repeating the last RO-sanding grit with the first round of hand-sanding, before switching to finer grits, SEM images showed that hand-sanding with 320-grit paper was just as effective at removing the 220 random-orbit scratches as hand-sanding with 220.

That's good news for woodworkers, who, after random-orbit sanding up to 220 grit, for example, can likely jump straight to hand-sanding at 320.

Higher grits for penetrating finishes—The editors also wanted to know if the SEM could tell us which grit to stop at when hand-sanding. So we prepped three more sets of samples, in three woods, cherry, maple, and oak, with one of each species hand-sanded to 220, another set hand-sanded to 320, and a third set sanded through 400, 600, and 800 grit.

Differences between the boards sanded to 220, 320, and 800 were easily appreciated by touch: The most finely sanded boards had an almost glasslike feel to them. Visually, the pores on the 800-grit boards were much less prominent, and finer sanding created boards that reflected light beautifully—after just one coat of linseed oil—while the finished boards sanded to 220 had a matte look. The oil finish on the most finely sanded cherry boards also seemed less blotchy.

Overall, these results confirm popular wisdom that higher grits are better when prepping wood for penetrating oil finishes.

Why cross-grain sanding is so problematic—You don't need the SEM to see and feel the difference between hand-sanding with the grain and hand-sanding across it. But the SEM makes subtle features look as tall as bushes and trees.

SEM images show that hand-sanding across the grain not only leaves more visible scratches, but also a field of torn fibers. The scratches created when sanding parallel to the grain, on the other hand, blend in with the grain lines and leave surface fibers flat and smooth.

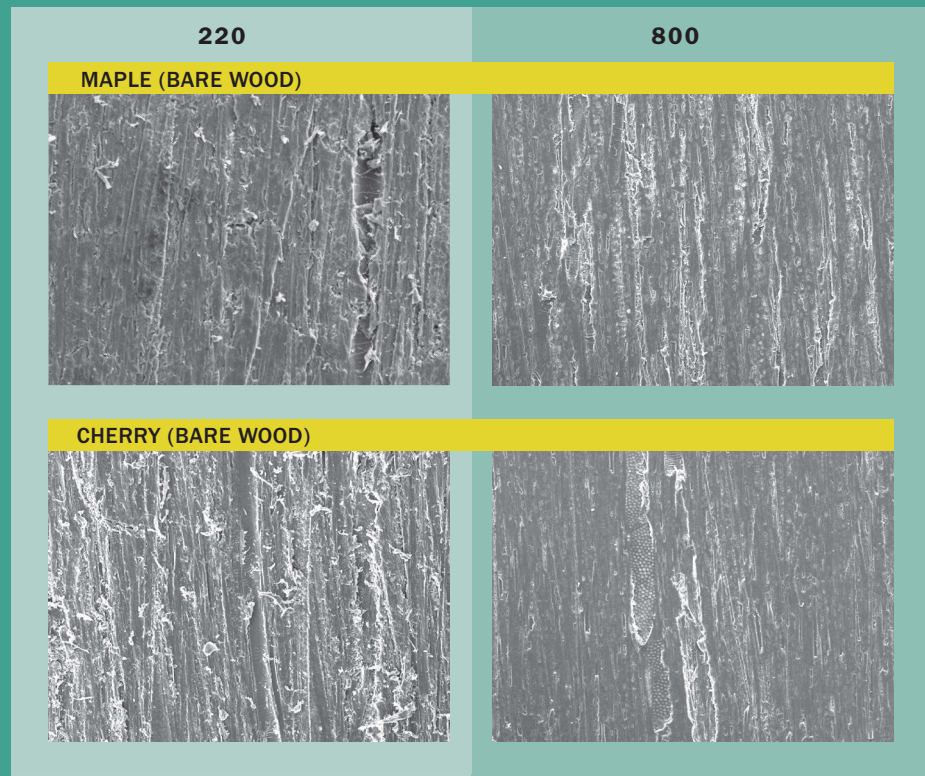
The answer to my initial question

After all my testing, I had the most likely answer to my initial question: Why are the cross-grain scratches made by a random-orbit sander virtually invisible to the naked eye, while cross-grain scratches from hand-sanding are so obvious? The mechanics of wood sanding are complex, but I believe the answer depends on a combination of the following factors.

First, during random-orbit sanding, the curved shape and random direction of each sanding scratch means that there are just as many scratches made in line with the grain as directly across it, and many, many more that are oblique to some degree. Second, the small size of each scratch means that no single one has a chance to do much damage, compared to the long, linear scratches made when hand-sanding. Third, the relatively high number of scratches made by random-orbit sanding—roughly 100-to-1 compared to hand-sanding during any given time frame—means that any minor cross-grain damage is smoothed milliseconds later

Sand to a finer grit before a penetrating finish

Film-forming finishes fill sanding scratches in the wood surface, so you can save the finest grits for leveling the finish between coats. Penetrating oil finishes, on the other hand, do not fully level the wood surface, so it's important to make the bare wood smoother before finishing.



Reflected light tells the tale. Both of these cherry sample boards were given a single coat of boiled linseed oil. The board at left was sanded to 220 grit, and looks matte in reflected light. The sample at right was sanded to 800, and reflects the same light with a buttery sheen.

by sanding actions in a variety of other directions.

Last, when you follow one random-orbit sanding pass with another, the abrasive grains are not contacting linear wood fibers or linear sanding scratches, but rather a surface that is filled with curved gouges from the previous grit. This also minimizes cross-grain damage, I believe.

These factors give random-orbit sanding a number of practical advantages over hand-sanding, including neutrality when wood grain changes directions, at joint junctions, for example. □

Woodworker Paul Axelsen is a professor of medicine, pharmacology, biochemistry, and biophysics at the University of Pennsylvania.

Elegant Table Comes Together at the Corner

Where veneered aprons meet
a gunstock-miter leg

BY MIKE KORSAK



Boring furniture makes for a bored furniture maker.

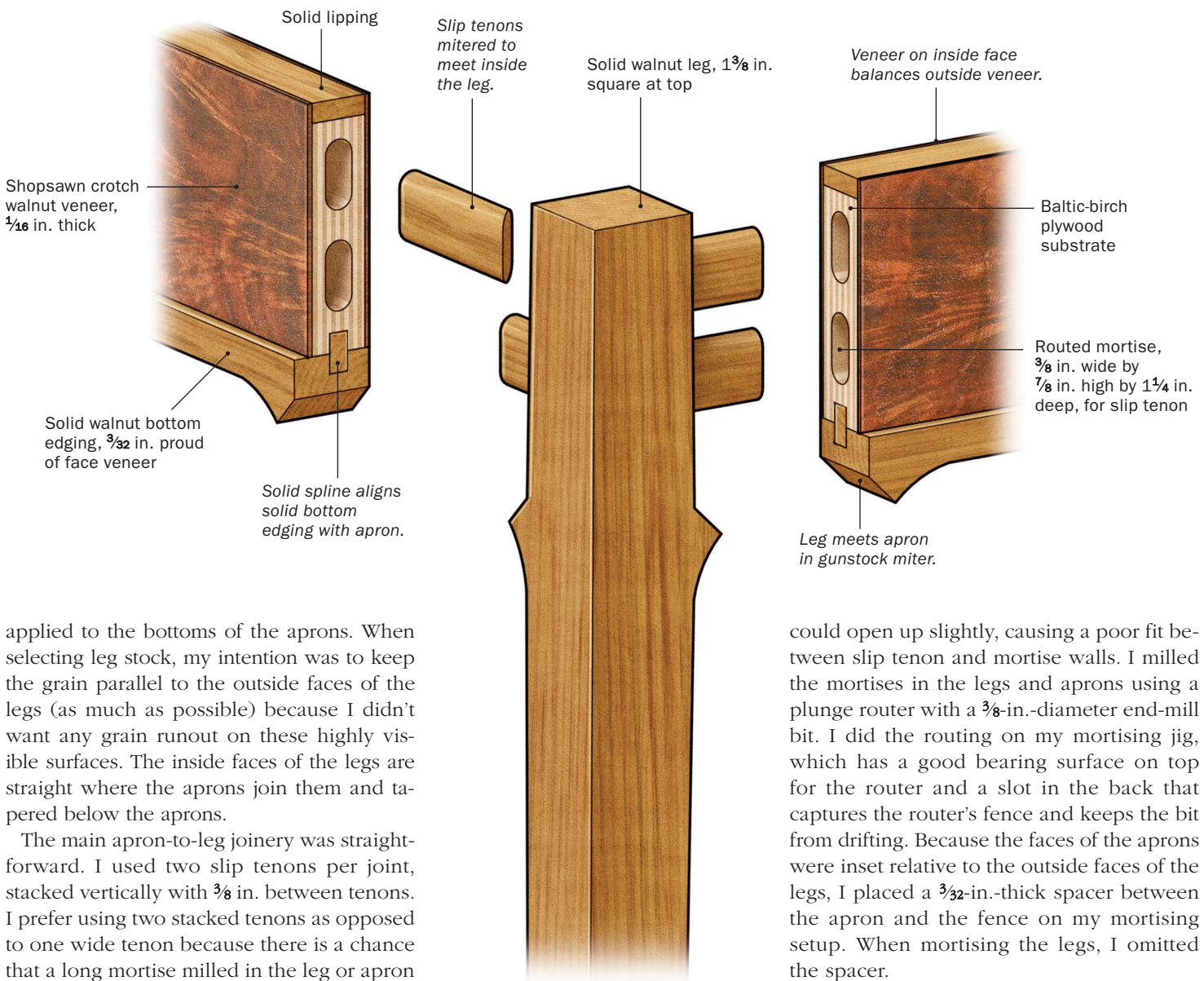
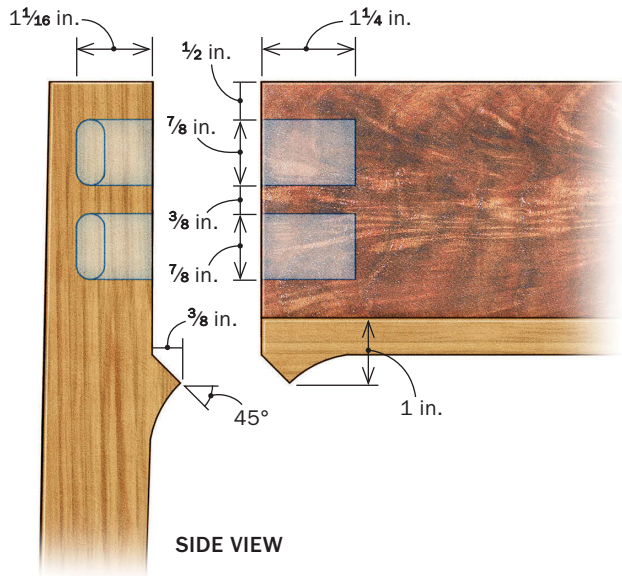
One of my pleasures in making furniture is figuring out how to detail a piece in such a way that a common form is translated into something that dazzles me, that takes on a life of its own. I delight in developing the details that serve this purpose, and in the technical challenges that often accompany those details.

When I was approached to build a dining table for two, I jumped at the opportunity to design a simple table that would stand out, with just the right amount of dazzle. I chose solid walnut with a rippled figure for the top and straight-grained walnut for the legs. I put the real pizzazz in the aprons, gluing shop-sawn crotch-walnut veneers over Baltic-birch plywood. To help frame the crotch veneer, I gave the apron a bottom edging that is proud of the veneer but flush with the face of the leg. And I used a gunstock miter joint so the inner line of the leg would flow right into that bottom edging of the apron. Twin slip tenons provide the muscle connecting the aprons and legs. I'll focus in this article on the cluster of technical and aesthetic details involved where the aprons meet the legs.

Taking stock and cutting leg joints

My first step was to select and rough out stock for the legs and for the edging that would be

GUNSTOCK MITERED LEG AND APRONS

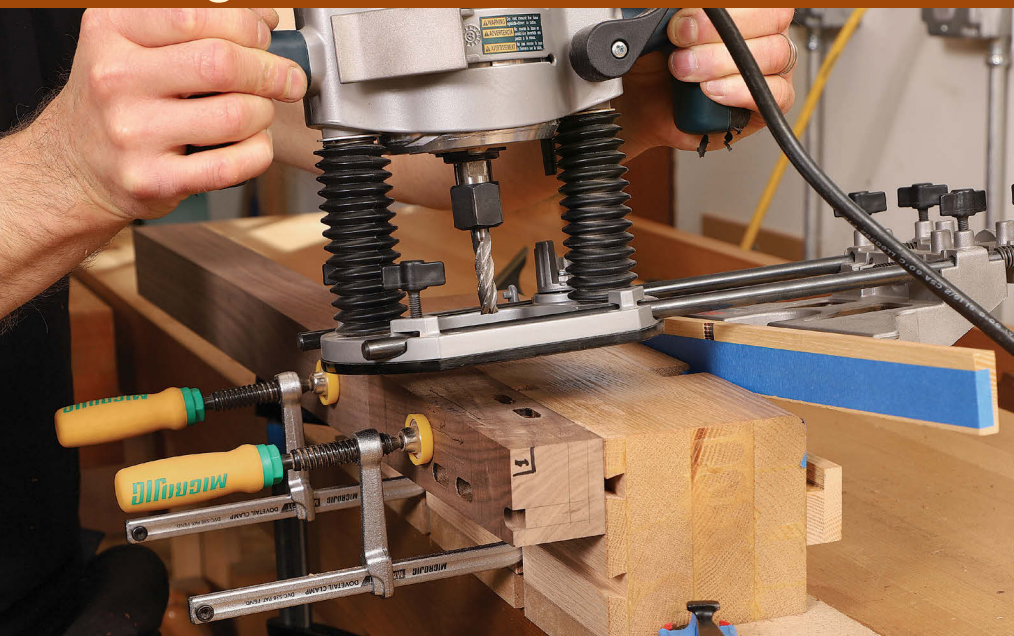


applied to the bottoms of the aprons. When selecting leg stock, my intention was to keep the grain parallel to the outside faces of the legs (as much as possible) because I didn't want any grain runout on these highly visible surfaces. The inside faces of the legs are straight where the aprons join them and tapered below the aprons.

The main apron-to-leg joinery was straightforward. I used two slip tenons per joint, stacked vertically with 3/8 in. between tenons. I prefer using two stacked tenons as opposed to one wide tenon because there is a chance that a long mortise milled in the leg or apron

could open up slightly, causing a poor fit between slip tenon and mortise walls. I milled the mortises in the legs and aprons using a plunge router with a 3/8-in.-diameter end-mill bit. I did the routing on my mortising jig, which has a good bearing surface on top for the router and a slot in the back that captures the router's fence and keeps the bit from drifting. Because the faces of the aprons were inset relative to the outside faces of the legs, I placed a 3/32-in.-thick spacer between the apron and the fence on my mortising setup. When mortising the legs, I omitted the spacer.

Legwork



Double dip. Using a plunge router and a shopmade mortising fixture with a slot at the back to capture the router fence, Korsak cuts twin mortises in the leg for slip tenons. The two pairs of mortises intersect inside the leg, so Korsak will miter one end of each slip tenon.

Beginning the gunstock. Before cutting the 45° portion of the leg's gunstock, Korsak nibbles away waste above it, making a series of passes with the leg against the miter gauge. He leaves some waste at the top end uncut; it will provide support before being removed later at the bandsaw.



Gunstock miters on legs and aprons

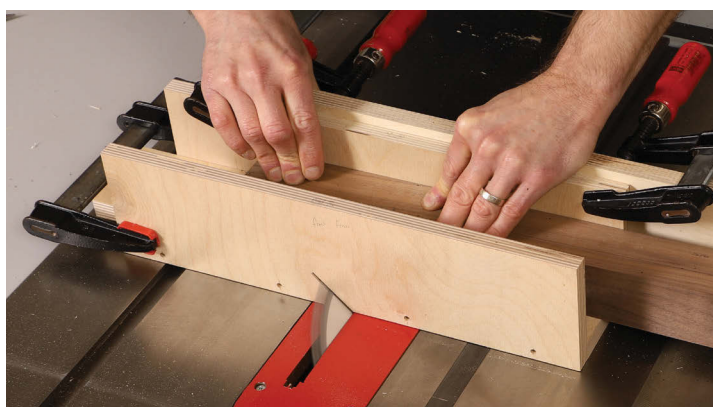
Next, it was time for the gunstock miters. The first step in forming the gunstock joint on the legs was to remove the material between the miter cut and the top end of the leg. You can use a router and end mill for this, or multiple passes on the table saw. I used the saw. I left some stock at the top end to remove later; it would help support the legs during mitering.

To make the miter cuts on the legs, I used a dedicated zero-clearance mitering sled clamped to the miter gauge on my table saw. With the sawblade tilted to 45°, I made the two miter cuts on each leg, rotating the leg 90° after making the first cut. A stop block clamped to the sled allowed for registration of the top end of the leg, ensuring consistent placement of the miters.

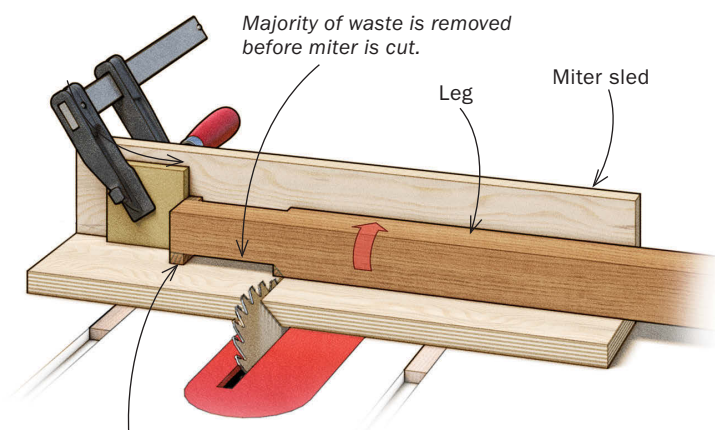


Clever crosscut. Having left the leg overlong at the top end to make the mortising easier, Korsak now cuts it to final length.

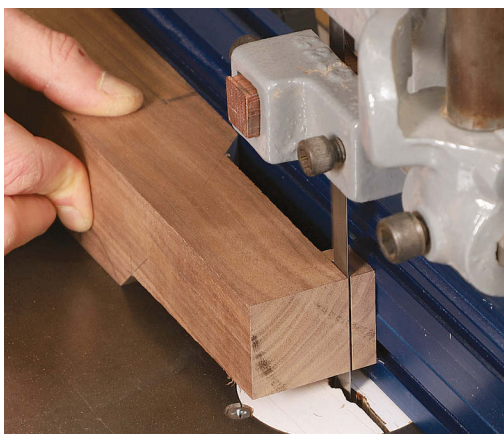
TABLE SAW MITER SLED



Clean cut miter sled. Korsak's zero-clearance miter sled with fences front and rear works like a one-fence sled, as in the drawing at right. But, when needed, the workpiece can be referenced off the front fence.



Last section of waste, which helps support leg properly on sled, is sawn away after miter is cut.



Nip the last waste. With the leg's gunstock miters cut, Korsak now bandsaws off the bit of waste at the top end.



Safe tapers. A wedge-shaped piece of MDF with a stop attached at the trailing end serves as a simple taper jig. Afterward, a couple of passes with a hand plane will smooth the sawn surface.

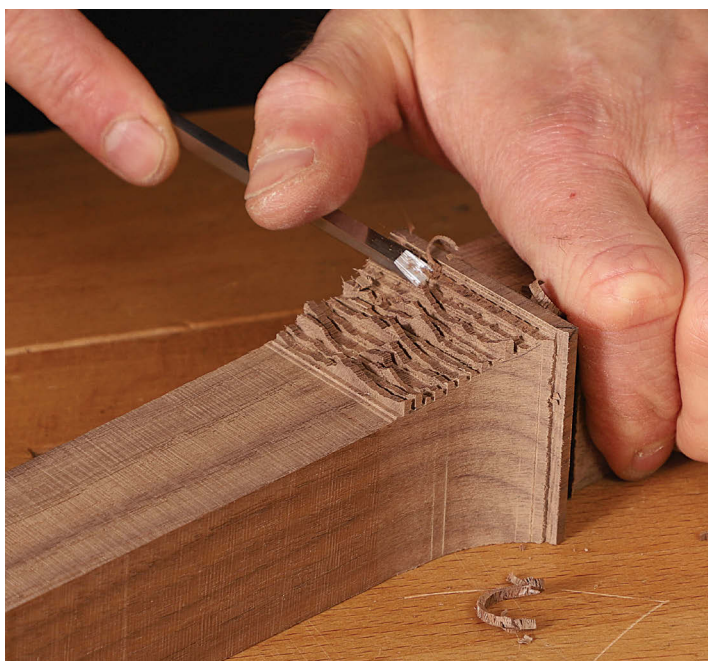
With the miters cut, I used the bandsaw to remove the last bit of waste at the top of the leg. Final cleanup was done with chisels, rabbit plane, and files.

I shaped the inside faces of the legs next. These needed to be tapered, and that taper then also curved up and flowed into the edging on the aprons. At the bandsaw, I used a simple taper jig made from a wedge-shaped piece of MDF with a stop at the back end. With the taper cuts made, I bandsawed, chiseled, and spindle-sanded the curved portion of the gunstock. I followed up with hand tools to smooth all the sawn surfaces.

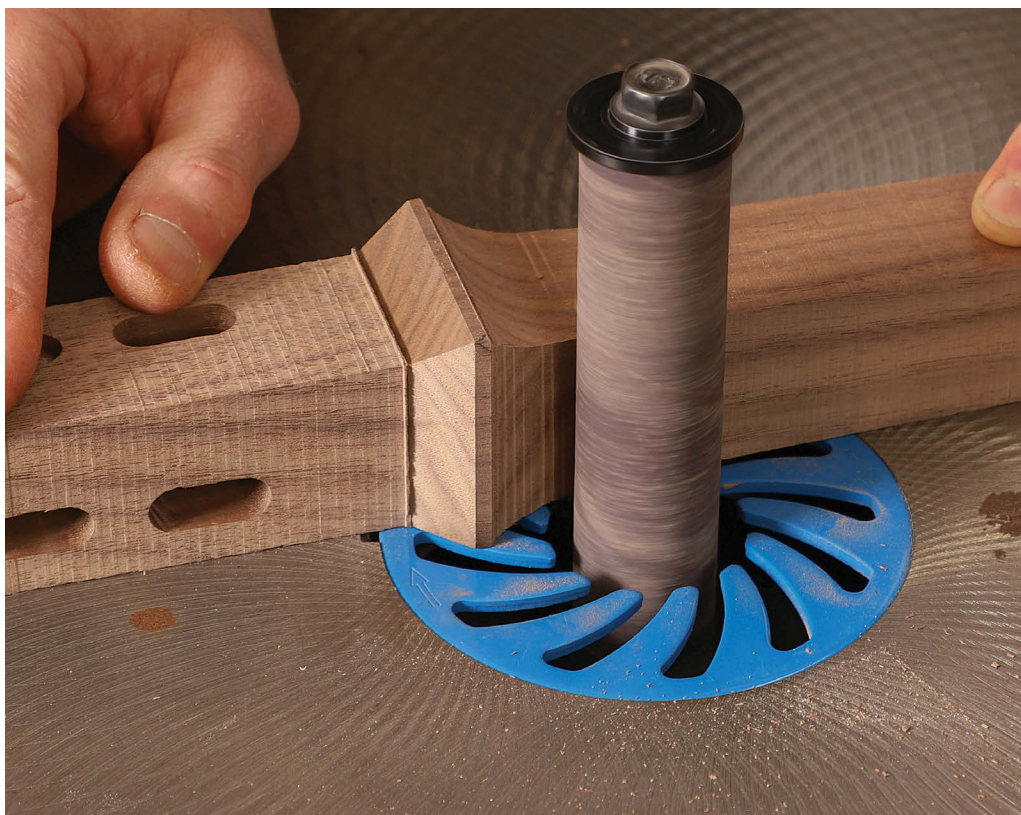
Before moving on to mitering the aprons, I



Creating the curve below the miter. After laying out the curves, Korsak kerfs nearly to the line with the bandsaw.



Chiseling the fins. The thin wafers of wood left between the kerfs are quickly removed with a narrow chisel.

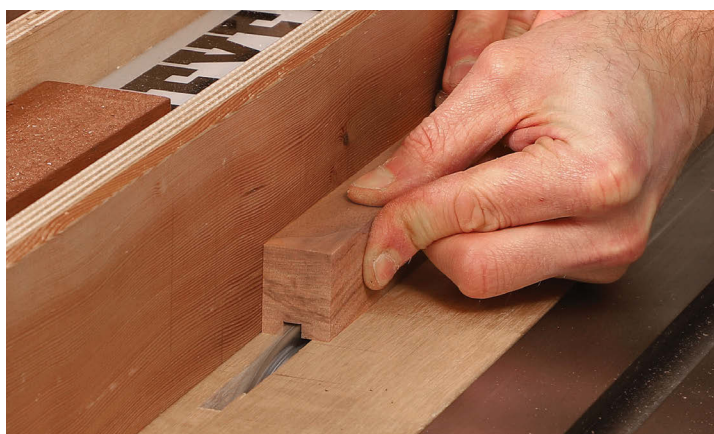


Clean the curves. After chiseling the curves to shape, Korsak smooths and fairs them in a minute or two at a spindle sander.

Assembling the apron



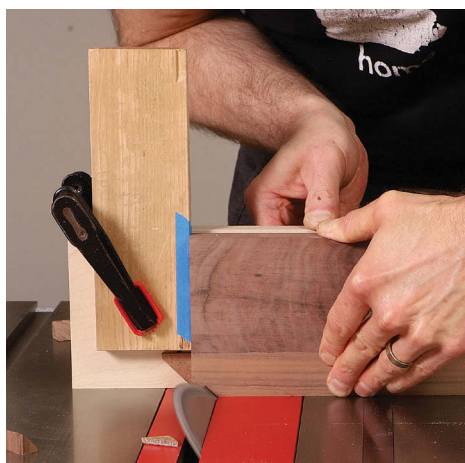
Lamination. With cauls top and bottom to spread the clamping pressure, Korsak glues sheets of shopsawn veneer to both faces of the apron's Baltic-birch substrate. Blue tape keeps the veneer from shifting before the glue tacks.



Spline story. Korsak cuts a groove in the wide walnut edging and a mating groove in the bottom edge of the apron.



On with the edging. Korsak glues the spline and edging to the apron. The edging is flush to the inside of the apron and proud of the outside.



Apron gets angled. After trimming the edging and spline to length, Korsak cuts the gunstock miter in the edging.



Relieving the edging. Once the miters at both ends of the apron edging are cut, Korsak bandsaws away the waste between them.

glued the slip tenons into the leg mortises; this would let me do some partial dry-fitting of the apron as I dialed in its miters. I like to miter the slip tenons to each other where they meet inside the leg. I glue them in one leg at a time, applying glue to the mortise and half of the tenon and ensuring that the mitered ends of the slip tenons make solid contact inside the leg. Once the glue cures, I clean up any foam that works its way out of the joint.

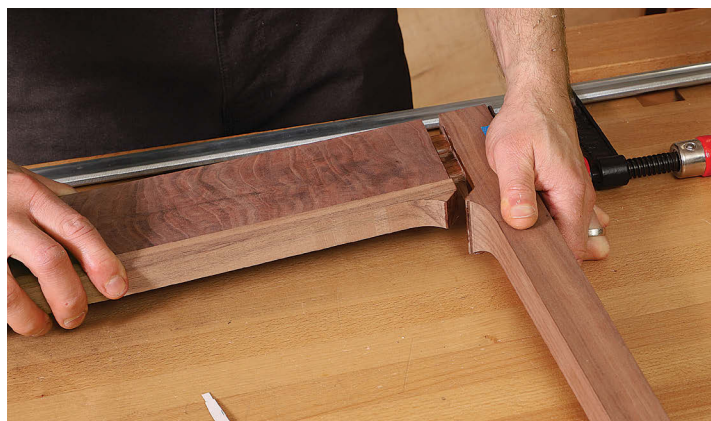
Next, to miter the bottom edging on the aprons, I used the miter gauge on the table saw, with the blade tilted to 45°. I left a slight amount of extra material at this step, which allowed for some fine-tuning of the fit of each apron's miter with a block plane.

With the miters complete, I could fully assemble each joint, mark the aprons where they would be ripped flush with the tops of the legs, and finish shaping the bottom edging on the aprons. In order to bandsaw away the long center section of the edging, I first made relief

■ The corners come together



Securing the slip tenons. After spreading glue in the mortises and on the mitered end of the slip tenons, Korsak glues them in place, making sure he gets contact between the miters.



Leg meets apron. Korsak prefers to glue one joint at a time for maximum control of the process.

cuts a couple of inches from the ends of the edging. I made them with crosscuts on the tablesaw, using a flat-bottom rip blade. The relief cuts defined the finished depth of the apron and provided starting and stopping spaces for the bandsaw. After making the bandsaw cuts, including the curves behind the miters, I cleaned up with block plane, spokeshave, scraper, and files.

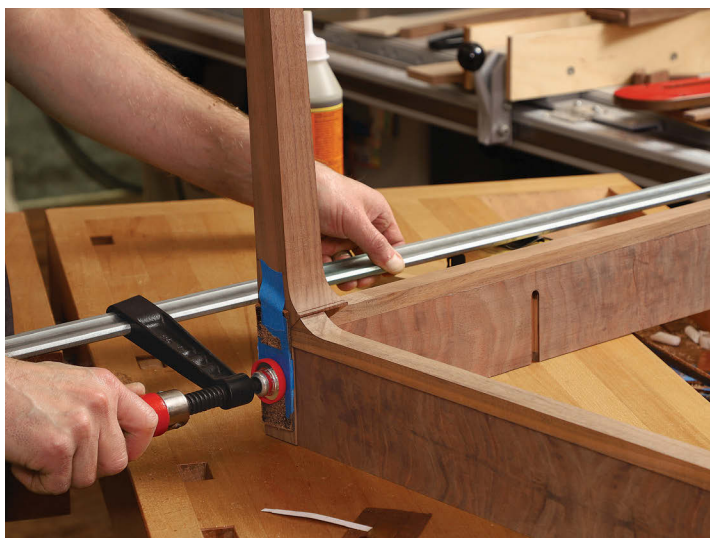
On to assembly and the end

I attacked the assembly one joint at time, gluing one leg to one short apron, then gluing the second leg to the same short apron, etc., until the very last step, when I needed to glue two joints at once. For all the glue-ups I used scraps of leather beneath the clamps to protect the legs. After final assembly, I used a block plane to flush the top edges of the aprons to the tops of the legs.

With the table base fully assembled, I tackled the final shaping of the leg-to-apron joints, using files, spokeshave, scraper, and sandpaper to create smooth, fair transitions from the leg to the apron edging. At this time I also did all other cleanup, hand planing the apron edging and legs, and finally sanding all surfaces with 320- and then 400-grit sandpaper.

I then applied finish to all table parts. For this piece, I used Osmo Poly-x oil, applied with a white abrasive pad. After two coats on the base and three coats on the tabletop, I installed the top. □

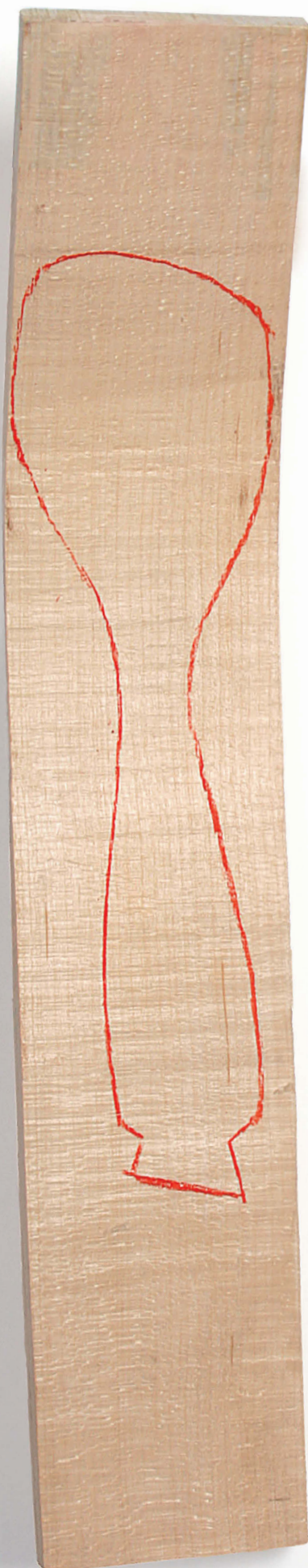
Mike Korsak, after a decade in Pittsburgh, is setting up a new shop in New Hampshire.



Clamping at the corners. With one apron already glued to the leg, Korsak glues up the second apron.

A clean sweep. The curve below the gunstock miter needs to look continuous from the leg to the apron. Korsak fairs it with a curved file and later finesses it with sandpaper.





Carve Spoons from Pre-bent Blanks

Steam, a vise, and a
handful of edge tools make
the process fast and fun

BY CURTIS BUCHANAN

Late one night in 1990 I got a call from Drew Langsner. He was in a panic. The Swedish spoon carver Wille Sundqvist was arriving on a flight from overseas to teach at Country Workshops, the school on Drew's farm in North Carolina, and Drew had driven to the wrong airport to meet him. The airport where Wille was waiting was only 30 minutes from me, and I left right away to pick him up. It was wonderful meeting Wille and having him spend the night at our house before Drew came to get him the next day. And not long after that chance encounter, Wille sent me a copy of his book *Swedish Carving Techniques*; it was from that book that I learned how to carve a spoon.

For many years afterward I carved spoons the traditional way. I liked the minimalism of using just the hatchet, hook knife, and sloyd knife, and I liked not being tied to my workbench. I also enjoyed spending time walking around the forest looking for spoon stock: branches with the perfect natural crook to



A BENT BLANK



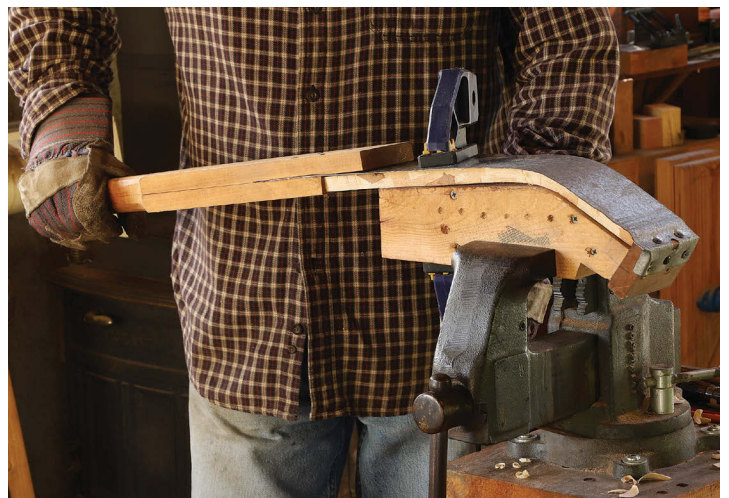
The bent blank starts out flat. Instead of searching in the woods for naturally bent spoon stock, as he used to do, Buchanan splits and shaves a chunk of green sugar maple and steam-bends it to create a curved blank.



Drawing it down. Working the radial planes with a drawknife, Buchanan flattens both wide faces of the blank, bringing it down to a thickness of $\frac{9}{16}$ in.



Steam bends the blank. After an hour in Buchanan's rough-and-ready steambox, the spoon blank is ready to bend.



Bending form in the vise. A steel strap screwed to the bending form and bolted to a long wooden handle helps ensure successful bends. The blank remains on the form for two days.

BEGIN WITH THE BOWL



Trace a paper pattern.

Buchanan has a folder full of spoon patterns scissored from paper; he traces one on the bent blank to start the spoon.

Start scooping. With the blank in a vise, Buchanan uses a deep gooseneck gouge and works mostly across the grain to hollow out the spoon's bowl.

Smoothing the scoop. A gouge with a flatter radius helps blend in the initial tool marks as you smooth the spoon's bowl.



make good spoons. But fast-forward 25 years and I found that I wasn't getting out into the woods, and working with the hook knife inflamed my elbow tendonitis. So, I decided to apply some of my chairmaking techniques and tools to making spoons.

I started riving wood from green log stock, then steam-bending the blanks to just the crook I wanted. Instead of holding the spoon freehand to carve it, I used a vise, and I began using a bandsaw, drawknife, spokeshave, and gouges to shape the spoons before making a few finessing cuts with a sloyd knife at the end. The process became so enjoyable and so fast that I soon found myself carving a spoon to start each day. And I'm still doing that.

A spoon a day

The morning begins with splitting out a piece of sugar maple or cherry, my favorite woods for spoon carving. Then I sit on the shaving horse and, using a drawknife and making sure to follow the long wood fibers perfectly, I shape a blank to $\frac{9}{16}$ in. thick and



To the bandsaw. Once the bowl is shaped, saw along the spoon's outlines. Leaving a few inches of extra material beyond the end of the handle will make it easier to grip in the vise while you carve.

SHAPE THE BACK AND HANDLE



Beneath the bowl. Buchanan uses a drawknife to shape the back of the bowl, echoing its curve and bringing the rim to a narrow bevel.

A ruff at the neck. To shape the neck Buchanan makes a series of drawknife cuts from one direction, then finishes with a series from the opposite direction.



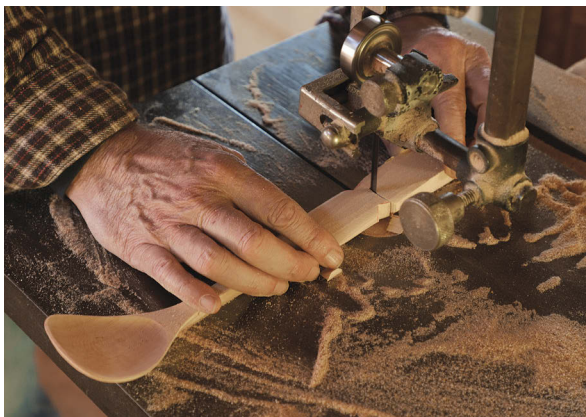
Spokeshave for fine smoothing. Having completed the majority of shaping with the drawknife, Buchanan follows up with a spokeshave set for a fine cut to smooth the convex surfaces.



On to the handle. After rough shaping the handle with a drawknife, use a spokeshave to attain the finished form.

FINE-TUNING THE SPOON

Off with the end. Once the bowl and handle are otherwise completely shaped, zip off the waste at the end of the handle.



3 in. or so wide. After cutting the blank to 10 in. or 12 in. long, I put it in the steambox for an hour, then bend it on a simple form. I'll leave this blank on the form for a couple of days. To get started carving today's spoon, I find the blank I bent two days before and take it off its form.

I've made spoons in a wide variety of shapes, and I keep paper patterns of the various shapes. So now I select a pattern and trace its outline onto the blank. Before doing anything else, I clamp the blank in a vise that sits up above my bench at a comfortable height and carve the spoon's bowl with a gooseneck gouge. After the bowl has been roughed out, I come back with a flatter gouge for the finish cuts.

Now I rough saw the spoon's perimeter shape at the bandsaw. I leave a few inches of waste at the end of the handle for the time being to provide extra purchase for the vise during carving. Clamping the spoon with the inside of the bowl facing down, I carve the outside of the bowl with a drawknife and finish it up with a spokeshave. The handle is then shaped with the drawknife and spokeshave. Often, I'll set the spoon aside at this point and pick it up again that evening—in front of a fire in the winter, or on the porch in the summer—to put the finishing touches on it with a sloyd knife. Back in the shop the next day, I apply milk paint on the handle, and after that dries, I rub the whole spoon with tung oil. Placing the spoon in my 140° light-bulb kiln dries the oil and sets the bend.

I've always tried to keep the fun factor high in my shop, but starting each day with spoon carving before turning to chairmaking has set a new standard. □

Curtis Buchanan makes chairs and spoons in Jonesborough, Tenn.



Next, it's knife work. Following up on the spokeshave, Buchanan refines the neck and other areas with a sloyd knife.



Definition at the end of the handle. Using a sloyd knife, Buchanan creates a finial at the butt of the handle with a pair of V-notches, smoothing slices across the end grain, and chamfers at the edges.



FINISHING UP

Milk paint on the handle. Buchanan applies two colors of milk paint, one on top of the other. Painter's tape wrapped around the neck creates a clean line where the painted portion ends.



Fine abrasion. Using 400-grit sandpaper, Buchanan rubs the surface until the undercoat of milk paint shows through the top coat. Then he burnishes the surface with 0000 steel wool.

Last step. Once the tape is removed, Buchanan treats the whole spoon with several coats of 100% pure tung oil. He puts the spoon in his small light-bulb kiln to dry the tung oil and completely set the bend.



PHILIP A HOUCK

Boston, Mass.

Philip began building these clock cases in 1999. In 2000, he entered the North Bennet Street School and left the unfinished clocks on the back burner. Around 2013 his grown son Paul visited. The two of them worked together in the shop for a few days, moving the clocks along. Paul told his dad, "That was a great time together. We should do it more often." A few months later they did it again, and Philip asked his son what had brought about this wonderful lagniappe. The answer: "Well, I know that someday you are not going to be here, and I never want to say I wish I had spent more time with my dad." Here are the two clocks they worked on together.

WALNUT, MAPLE VENEER, OAK, AND BASSWOOD, 10D X 20W X 93H



JAMES M. MADISEN

Racine, Wis.

James, a firefighter for 34-plus years, is now retired and spending lots of time in his basement woodworking shop, especially in the winter months. When *FWW* #248 came out, he was inspired by Michael Pekovich's article "Stylish Details Enliven a Low Dresser." Turns out his wife Kelly noticed the article, too, and promptly put it on James's to-do list. So he did it.

QUARTERSAWN WHITE OAK, 19 $\frac{3}{4}$ D X 49 $\frac{1}{2}$ W X 34 $\frac{1}{8}$ H



MARCUS DIMAGGIO

San Luis Obispo, Calif.

Made almost entirely of madrone, this cabinet is meant to pay homage to the tree by evoking, with its wavy-edged doors, the madrone's signature peeling bark. It's Marcus's hope that those who interact with this cabinet encounter some of the childlike satisfaction experienced by anyone who has ever peeled a piece of bark from a shedding madrone tree.

MADRONE, MANZANITA, MAPLE, 7D X 13 $\frac{1}{2}$ W X 22H

Photo: Todd Sorenson

Show your best work

For submission instructions and an entry form, go to FineWoodworking.com/rg.



ANDREW GREENE

San Diego, Calif.

Andrew recently built this table, "Ellipse," as a commission. The oval top has an 18° chamfered edge and a slim, tapered base. Engineering the design for the coopered base was the most challenging aspect of this project. It's constructed from 32 individual staves of solid walnut, all cut at their own unique compound angle. He used shellac followed by conversion varnish by General Finishes to bring out the natural luster of the walnut.

WALNUT, 40D X 78W X 30H

Photo: Paige Nelson Photography



WALTER DAVIS

Philadelphia, Pa.

Each year Walter makes holiday gifts for family and friends that he can build in batches. When he found an empty whiskey barrel in the alley behind his studio, he hand-trucked it inside thinking it could make great stock for these gifts. When he finally broke it down into a sweet-smelling pile of staves and a startling amount of loose charcoal, he noticed a familiar shape. On the credenza in his entryway was a Danielle Rose Byrd cherry tray with a blackened interior. That piece inspired this design.

WHITE OAK, 4D X 20W X 1½H



JAKE MAUGHAN

Vancouver, B.C., Canada

To complement the custom speaker cabinets Jake had been making, he designed a console. He had a beautiful walnut board sitting around and knew he could make it into something special. The console has a folding lid to cover the compartment for the turntable, a compartment for the receiver below, space for albums on either side, and two drawers to store LP cleaners, etc. The lid and drawer fronts are from a piece that was riddled with tiny bug holes, reminding him of stars in the night sky.

WALNUT, SAPELE, AND MAPLE,
20½D X 59½W X 32H

Photo: Christopher Cameron



BEN KOTIS

Boston, Mass.

Ben's piece was inspired in part by televisions from the 1950s that looked like pillowed cubes raised several inches off the ground on tapered, turned legs that splayed out. Rather than a rectilinear case he opted for an oval one, and the scale and shape of the project proved to be very challenging. Especially difficult were making the MDF form for the outer shell of the case and also hammer veneering that outer shell. The tambour door slides behind a false back that conceals the door's canvas backer.

CHERRY, ENGLISH OAK, WHITE OAK, WALNUT, BIRD'S-EYE MAPLE, POPLAR, EBONY, PLYWOOD, 18 $\frac{1}{16}$ " D X 24" W X 17" H

Photo: Lance Patterson



STEPHEN PORTER

Baltimore, Md.

This piece was an exercise in iteration. After starting with numerous sketches, Stephen built a half-dozen scale models out of MDF to refine the form. Once that was settled, four custom jigs helped him turn rough-sawn maple into the eight bent-laminated pieces of the base. A CNC machine carved the top, which is curved on the underside in two dimensions to lighten it. The top floats off the base on steel pins. Stephen says, "in profile this table reminds me of Atlas holding up the sky."

MAPLE AND CHERRY, 20" D X 48" W X 15" H

TESSA PETRICH

Fort Bragg, Calif.

This piece is titled Even Keel. The design and process of building the cabinet are aligned with the term's dictionary definition: "noun (nautical) the situation in which a watercraft is floating in a smooth and level manner; the state or characteristic of being in control and balanced." The construction is derived from a boat's analogous parts—the carcass as the hull and the spine that mounts to the wall as the keel. Even Keel is a wall-docked vessel made to celebrate the life of a boat builder, with love from his granddaughter, Tess.

CLARO WALNUT, 7" D X 11" W X 24" H



Photo: Todd Sorensen

DESIGN IN WOOD

Founded in 1982, the San Diego Fine Woodworkers Association presents the Design in Wood Exhibition each year in association with the San Diego County Fair at the Del Mar Fairgrounds. Here are a few of the pieces from the 2022 juried exhibition.

ROBERT G. STEVENSON, JR.

Chula Vista, Calif.

Twenty years ago, the Peabody Essex Museum exhibited the work of John and Thomas Seymour, father-and-son English émigré cabinetmakers who “played a significant role in shaping New England’s artistic heritage during one of the most pivotal chapters in American history.” Robert found the Seymour sewing table he reproduced in the show’s catalog, *The Furniture Masterworks of John & Thomas Seymour* by Robert D. Mussey Jr. (2003, Peabody Essex). The piece is made with solid wood and veneer, silk, gold-embossed leather, and Horton Brasses hardware.

CUBAN MAHOGANY, AVODIRE, WALNUT BURL, SATINWOOD, HOLLY, EBONY,
15 $\frac{7}{8}$ D X 19 $\frac{7}{8}$ W X 29 $\frac{7}{8}$ H



BESTON BARNETT

San Diego, Calif.

This cabinet, called Altajwal (Arabic for “The Wanderings”), is part of a series of pieces illustrating the legends of the biblical King Solomon. This one tells the story of Solomon being tricked out of his homeland by the Prince of Demons, and forced to wander lost in the desert for years. “I’ve taken a traditional Mamluk pattern often found in stonework and carved much of it away to suggest ruins submerged in sand dunes,” Beston says.

ANIGRE, HOLLY, MAPLE, 17D X 44W X 19H

Photos, this page: Andy Patterson and Lynn Rybarczyk



PAUL DUFFIELD

San Diego, Calif.

The Gallery in *Fine Woodworking* #263 featured a piece by David Gasson that Paul says just reached out and grabbed him. Paul built this response to it during the COVID lockdown. He spent three months expanding his woodworking horizons by using mitered boxes and open construction methods that were unfamiliar to him at the time. He named this piece Floating Away because not only were the drawers and top floating, but at the time, he felt as if he were drifting away from meaningful human interactions due to the almost complete shutdown of normal life.

SAPELE, SYCAMORE, ROSEWOOD, CHERRY, BALTIC BIRCH,
17D X 27W X 29H



BRENT BUDSBERG

Milwaukee, Wis.

Inspired by both the Arts and Crafts movement and Japanese furniture, this fumed white oak and leather firewood rack was conceived as a showpiece that would be at home in a well-curated room. Brent chose a traditional ammonia fuming process that darkens and deepens the color of the wood well below the surface and finished it with a penetrating Danish oil. This allows the piece to retain its color and sheen even if it gets dinged or scratched. For the same reasons, he used full-grain, vegetable-tanned leather for the hand-sewn sling, which will darken and develop character with use. The removeable sling can serve as a carrier for retrieving wood from the woodpile.

WHITE OAK AND LEATHER, 15½ D X 36W X 21½H

Photo: Kevin Miyazaki



BILL SCHNECK

Annapolis, Md.

This project started as a series of veneer exercises from Craig Thibodeau's book, *The Craft of Veneering*. Bill started with the parquetry chessboard top, then challenged himself with veneering coves and creating the waterfall effect on the apron. He saw Craig's example of the chess table in the book and was inspired to complete the entire table, not just the board.

POPLAR, EBONY, WALNUT, HOLLY, 23D X 23W X 34H



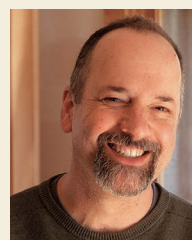
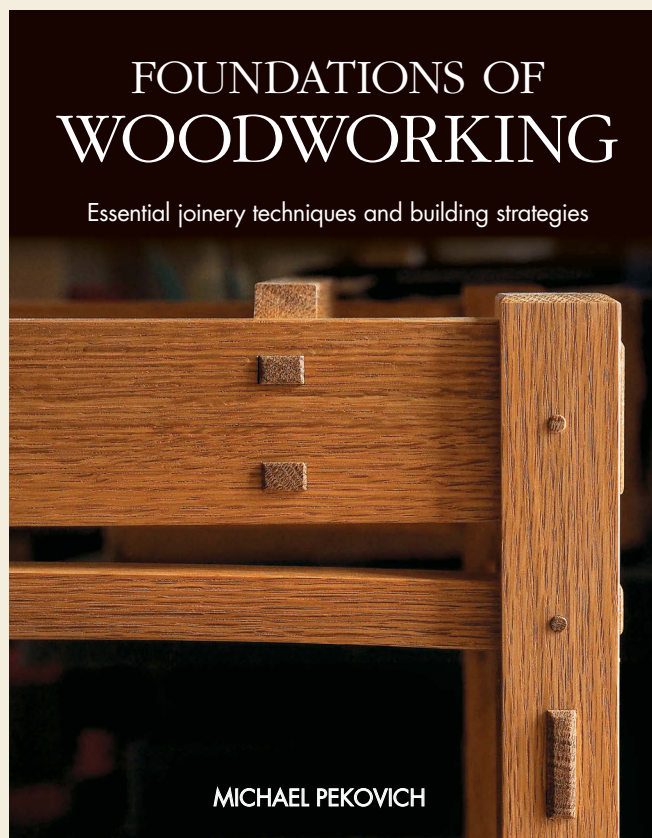
KELLY PARKER

Parkville, M.

This funeral urn was created for a fellow woodworker. To select the material for it, Kelly met the man's wife in his studio and looked through his wood stash. Kelly chose some figured cherry, an offcut from a project he was working on at the time of his death. She could see his layout marks and the notes he had made to himself on both the offcut and the other boards for his project. Kelly loves that his urn is made from the wood he last handled. She wanted to create a safe and sacred interior space to house the ashes, and the urn she created feels like the "comforting shape we make with our hands as we cup them to gently hold something fragile." The sides of the urn are bent laminations. The interior of the box is gilded with copper leaf.

FIGURED CHERRY, EBONIZED CHERRY, COPPER LEAF, COPPER DOWEL, 5D X 17W X 4H

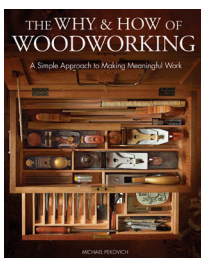
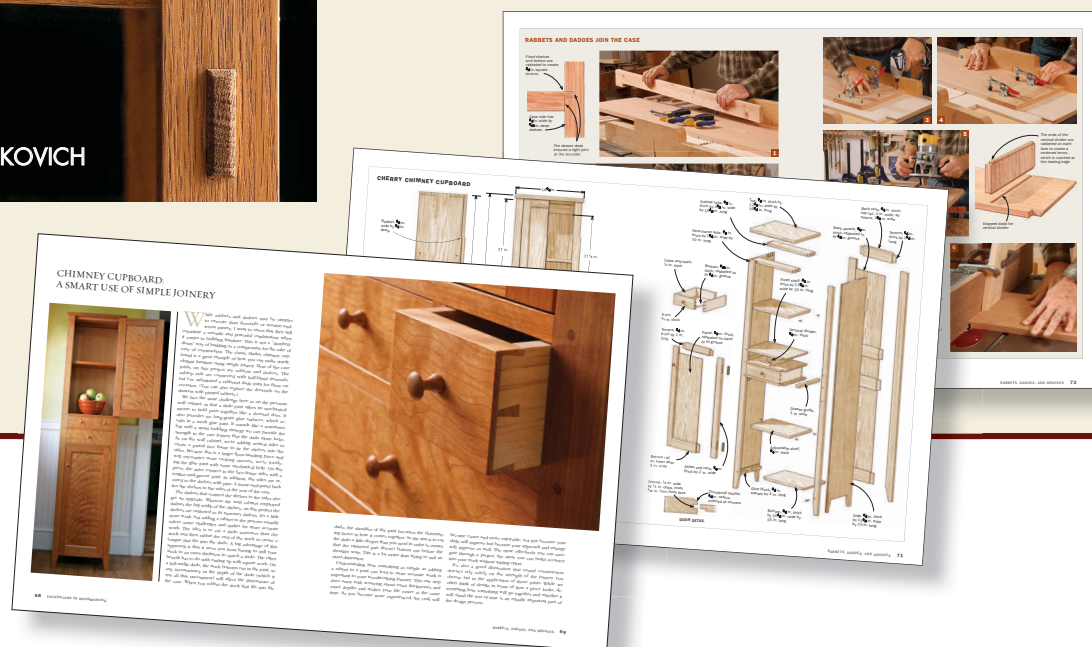
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Shaker design: Unadorned, not unsophisticated

BY CHRISTIAN BECKSVOORT

Many people view Shaker furniture as simple. I built my career making Shaker pieces. It may be unadorned, but it's not simple. The fact that it has few, if any, decorative elements doesn't mean it is rudimentary or lacking in elegance. The joinery, often hidden, is by no means elementary; instead it is frequently quite involved and of complex craftsmanship.

The Shakers were pragmatic and believed that utility was priority number one. That does not mean they ignored design or quality. Their work was incredibly well made. Many original Shaker pieces are over 200 years old and are still in fine

condition. As a friend of mine used to say, "Antiques are old because they were built right." Combining natural materials, superb craftsmanship, and no-frills designs is what made Shaker furniture aesthetically timeless and durable. Hundreds of years after the first Shaker piece was made, the style is still sought after today.

Clean, unadorned lines

When I first started woodworking, I built my share of decorative pieces. I've made a fair number of cabriole legs, carved elements, reeds, and flutes. Although in many cases I

Building in the Shaker way

Becksvoort has a three-pronged approach when copying or adapting Shaker designs. His methods range from building exact replicas, to making subtle changes to originals, to bold borrowing of elements to use in his own designs.

THE ORIGINAL SHAKER DESK

This early Shaker sewing desk was built out of pine and maple with a clear finish. The ogee curves on the base point to either Enfield, Conn., or Canterbury, N.H., as the origin.



NO-WIGGLE-ROOM REPRODUCTIONS

When making an exact reproduction, Becksvoort is as faithful as possible, replicating the dimensions, wood, techniques, and hardware (even if it must be custom made), and using period-appropriate screws, nails, hide glue, and finish. (Linda Coit applied a period finish to one of his reproductions in FWW #203). The two pieces are nearly identical, but the new wood and finish have a different aroma.



admire the craftsmanship involved, superfluous decorations are not my cup of tea. If you think about it, our personal taste determines pretty much all our design decisions from the clothes we wear to the cars we drive, the furniture we have in our homes, and beyond. My individual taste just happens to run closer to the Shaker aesthetic than, say, very ornate period furniture.

To my design sense, a smooth, clean surface is more appealing than one that is interrupted, embellished, or decorated. That's one reason I admire and emulate not only Shaker design, but also Scandinavian and Mid-Century Modern work. They seem to share a design ethic: Keep it

clean, uncluttered, and functional. Adding complex moldings, carvings, intarsia, scrolls, proud joinery, and excess hardware can detract rather than add to the overall design and function. Shaker details come in the form of subtle tapers, very simple moldings (if any at all), asymmetry, and an occasional curve.

It's important to consider grain when you're trying to build a piece with clean lines and subtle details. Nothing catches your eye (and not in a good way) more than flat cathedral grain running out and glued next to straight parallel grain. Your eye instantly notices the interrupted grain and tells you it's a lousy match. I spend an inordinate amount of time grain matching boards when gluing up wider panels, and I'm sure that the

INTERPRETATION WITH MODERN METHODS

When copying Shaker designs, Becksvoort is open to using more modern building practices. His version, at right, of an early tinware cupboard (sometimes called a chimney cupboard) from the Church Family, Mt. Lebanon, N.Y., is mostly identical to the original, but has modern hardware and a different finish. He also gave it a frame-and-panel back, while the original had individual boards.



LEAVING FINGERPRINTS

Becksvoort often blends his DNA into an existing Shaker design, making small changes that can have a big impact. After making his pine interpretation (far left) of the Mt. Lebanon tinware cupboard, he built this version (left) in cherry. Not only did he change the wood species, but he used his preferred flat, flush panel doors. He kept the original dimensions but updated the look with these tweaks.



designer's notebook continued

more experienced Shaker craftsmen did likewise. The idea is to minimize the look of individual boards. Gluing long parallel grain to long parallel grain is the best way to accomplish that.

The practical side of less adornment

As a craftsman, I much prefer to finish a smooth, flat surface than one that is interrupted by moldings, carvings, scrolls, and raised or inset surface decor. I really dislike brushing or wiping into corners, which you'll encounter when finishing almost any piece of furniture, including Shaker. Why make life even more complicated? The only thing worse than finishing is dusting. Trying to get dust, dirt, and grime out of angles, crevices, and complex moldings is a real chore. Unlike finishing, it must be done over and over, year after year. As you may have gathered, I like to make it functional, keep it clean, make it smooth. It's easy on the eye, and ultimately easy on the hand. □

Christian Becksvoort is a longtime contributing editor and expert in Shaker design.

Building in the Shaker way continued

SO LONG SYMMETRY

The original tall cabinet is from Enfield, Conn., and most likely was made by Brother Abner Allen, who favored tapered drawer sides and raised-panel doors. This cupboard was originally a built-in; the top and bottom were added later. The correct orientation is with the big door at the top. But the piece is usually shown upside down, as it is seen here. If you look closely, you can see that the keyhole in the bigger door is upside down.

AN HOMAGE TO SHAKER ASYMMETRY

Becksvoort will often borrow certain design elements (an act he calls clever thievery) and incorporate them in his original pieces. One of his favorite examples is the asymmetrical drawer configuration he used on this sideboard. The original design is from the well-known tall cabinet with four drawers (above). He adopted its off-kilter layout, adding two more drawers to the original pattern.



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The silent partner

BY DICK EVANS

It sat gleaming darkly in the big corner office of the law firm, precisely where it sat for a half century. It dominated the room, regardless of who was also there. It was formal and traditional, of figured cherry, rich with moldings and leather panels on top. It was the senior partner's desk, and it was made by "my old man," as I casually referred to him when I was young (but not after I started at the firm).

Sometime in the '50's Dad had become a partner in the firm and eventually he ascended to a corner office with a breathtaking view. Rather than buy a desk befitting his advancement, he decided to build one. The kind of desk he had in mind would have been improvidently expensive. Besides, he was a marvelously skilled cabinetmaker, an amateur only in the sense that he didn't sell any of the furniture he made in his spare time, although he could well have done so. He could make just about anything of wood, and his output was prodigious. Over the years he'd made most of the furniture for our home, some of it of near museum quality. He'd built a summer cottage and the furniture for it, as well as pieces for me, my sister, and friends. He built a 19-ft. sailboat with me as assistant. (Characteristically, he was interested solely in the building of it. He sailed in it only once.)

How he arrived at the design for the desk I don't know; I was away those years. But whatever the origin of the design, it is magnificent. It is a partners desk of the old style, with drawers on opposite sides. The original idea was that two partners would work facing one another so that each could keep close watch on the other's doings.

He made the desk in his basement shop, working in the evenings and those weekend hours when other men played golf. When it was complete, Dad discovered that the desk was so big it wouldn't fit inside the elevator to get it up to the office. The top, with its shallow drawers, was separable from the end cabinets, but even then the top wouldn't fit in the elevator; it had to be carried on the top of the elevator, next to the cable. Someone had to ride up there holding onto the desktop with one hand and the cable with the other as the elevator was inched up, floor by floor.

Dad made a classic mistake in building the desk: He glued the drawer runners onto the cabinet sides instead of using screws in slots. The grain of the (unusually wide) sides was oriented vertically; the drawer runners were of course horizontal. In the high summer humidity, when the sides swelled, attempting to expand crosswise to the drawer runners, something had to give, and it was the sides. Dramatic cracks appeared in them, accompanied by noises like gunshots. This caused surreptitious hilarity in the office once people figured out the cause. But the cracks only enhanced the desk's appearance, making it seem older and antique.

The desk outlasted Dad. He died prematurely at 61, "with his boots on" as they say of a lawyer who dies in the middle of a law case. After Dad died, I inherited the desk. For a while I had a sort of guilty feeling, sitting behind it. By rights he should have been there, not me. But I suppose using the desk, like driving a Rolls Royce, was too good a feeling not to enjoy, and I loved it. A project just became more important to you when you worked on it at that desk. After some years I developed a smug pleasure in putting my big feet up on it at the end of a long day, to wind down. I used it for 25 years, far longer than Dad had.

Now it has outlasted me, too. It seems to age more slowly than its users. When I retired it was unthinkable to bring the desk home. It was only right that it remain at the office. Eventually it went to our daughter, now a partner at the firm.

I like to think of all that desk has been a silent partner to. It's been privy to endless meetings, interviews, phone calls, and has sat in on occasional big deals. Acres of blueprints have been spread out on it, mountains of documents

stacked around its edges. Champagne has been spilt on it during celebrations of some wins, and bourbon during postmortems after some losses. All of this has given it an "I've been around" patina.

It's nice to imagine that someday, perhaps a hundred years from now, the desk might still be in daily use somewhere. Maybe in a quiet moment the person sitting behind it will wonder who made it and who used it years ago.

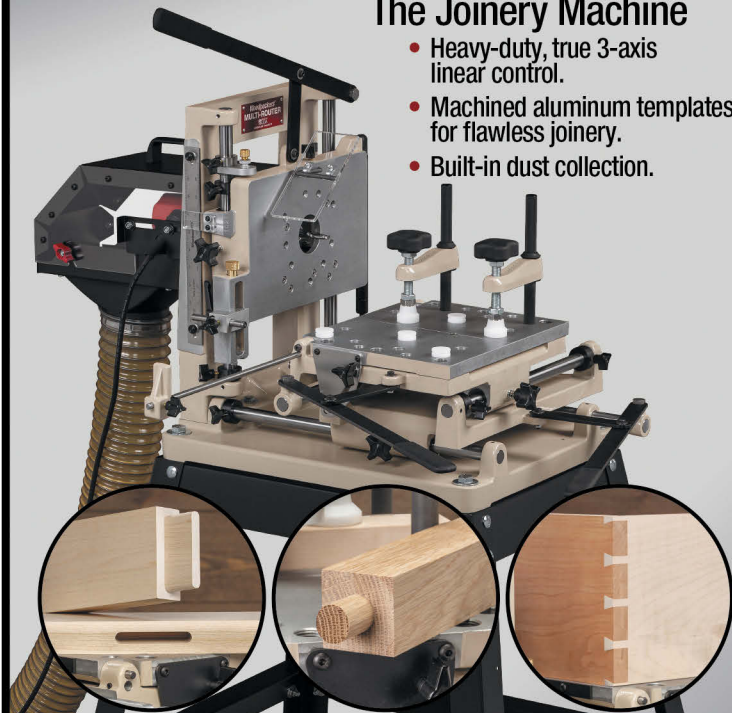


Dick Evans is a retired lawyer living in Chatham, Mass.

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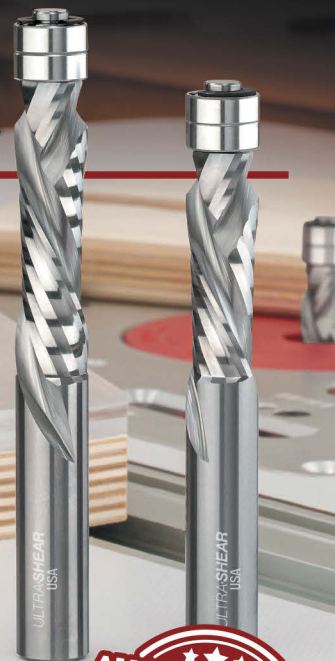


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Small Wonders

It might have been partway through furnishing an entire castle in Scotland—a job that included crafting circular built-ins for the rooms in the turrets—that Englishman Richard Williams began to dream about doing some smaller-scale work. Throughout his 35 years in the craft, Williams has always loved designing individual pieces, but for the last two decades he and his team of craftsmen—as many as 12 at some points—had been tackling increasingly large and challenging commissions all across Europe. So it was a bit of a homecoming when he began designing this collection of modestly sized pieces to be made in small batches in his shop just west of London. His stacking coasters, with their peaked cap, are turned from bog oak and lined with leather. The change trays, utilizing burr oak offcuts from a large job, are, like the rest of these pieces, shaped on machines and finished by hand. The quartersawn oak entry cabinet, with its cargo of keys and its fluted panels, was conceived to make the most of small pieces of stock. The design of the sushi tray was serendipitous: Someone plucked a thin, warped piece of bog oak from the scrap pile and wondered if it could be put on a base. It could. Replicating that lucky shape in batches has involved taking a cue from luthiers and bending the thin stock over a hot pipe.

—Jonathan Binzen

