

WOOD®

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Fast, Easy Finishing with Shellac

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Super-simple Seating

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- Max. cutting height: 6"
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- Precision-ground cast-iron table with wings measures 40" W x 27" D
- Table height: 34"
- Arbor: 5/8" • Arbor speed: 3850 RPM
- Capacity @ 90°: 3½"
- Capacity @ 45°: 2¾"
- Cutting capacity: 30" right, 12" left
- Overall size: 62" W x 39" D x 48" H
- Footprint: 20½" L x 19½" W
- Approx. shipping weight: 416 lbs.



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[†]115V operation requires part T23999 circuit breaker and wiring procedures that must be completed by an electrician or other qualified service personnel.

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- Motor: 3 HP, 230V, single-phase
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- Cutterhead diameter: 3½"
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- Table size: 76" x 8"
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WITH SPIRAL CUTTERHEAD & MOBILE BASE

G0858 ONLY \$1725⁰⁰

1½ HP PORTABLE CYCLONE DUST COLLECTOR

- Motor: 1½ HP, 110V, single-phase, 3450 RPM, 15A
- Intake hole size: 6"
- Impeller: 12¾" welded steel
- Collection drum size: 35 gallons, max. capacity: 20 gallons
- Suction capacity: 868 CFM @ 2.6" SP
- Max. airflow: 868 CFM
- Max. static pressure: 9.7"
- Approx. shipping weight: 375 lbs.



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- Motor: 2 HP, 110V/220V, prewired 220V, single-phase, TEFC capacitor start induction, 60 Hz, 1725 RPM
- Amps: 20A at 110V, 10A at 220V • Power transfer: belt drive
- Precision-ground cast-iron table size: 17" x 17" x 1½"
- Table tilt: 10° left, 45° right • Floor-to-table height: 37½"
- Cutting capacity/throat: 16¼" L of blade
- Max. cutting height: 12½" • Blade size: 131½" long
- Blade width range: ½"–1" wide • Footprint: 27" W x 17¼" D
- Blade speeds: 1700 and 3500 FPM
- Fully-balanced cast aluminum wheels
- Overall size: 32" W x 73" H x 32" D
- Approx. shipping weight: 342 lbs.

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9001 FACTORY



G0513ANV ONLY \$925⁰⁰



10" LEFT-TILTING TABLE SAW WITH RIVING KNIVES & CAST-IRON ROUTER TABLE

MADE IN AN
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FACTORY

- Motor: 3 HP, 240V, single-phase
- Precision-ground cast-iron table size with wings: 48" W x 27" D
- Arbor: 5/8"
- Cutting capacity: 26" R, 8" L
- Max. depth of cut: 3" @ 90°, 2½" @ 45°
- Approx. shipping weight: 550 lbs.



G1023RLW ONLY \$1550⁰⁰



15" PLANERS

- Motor: 3 HP, 220 V, single-phase
- Max. cutting width: 14½"
- Max. cutting height: 6½"
- Max. cutting depth: 1/8"
- Rate of feed: 16 FPM & 20 FPM
- Cutterhead speed: 5000 RPM
- Approx. shipping weight: 540 lbs. (G1021Z), 581 lbs. (G1021X2)

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WITH SPIRAL CUTTERHEAD

G1021X2 ONLY \$1995⁰⁰

G1021X2
SHOWN



2 HP PORTABLE CYCLONE DUST COLLECTOR

- Motor: 2 HP, 220V, single-phase, 3450 RPM, 9A
- Intake hole size: 7"
- Impeller: 13" welded steel
- Collection drum size: 35 gallons, max. capacity: 20 gallons
- Suction capacity: 1023 CFM @ 2.6" SP
- Max. airflow: 1023 CFM
- Max. static pressure: 10.9"
- Approx. shipping weight: 397 lbs.

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Saw subs

Ask any group of woodworkers what tool they consider to be the most important one in their shop, and the vast majority will probably say “tablesaw.” (I would argue for “brain,” but let’s not get into semantics.) Perhaps not coincidentally, your tablesaw is also likely the most expensive tool you own, especially when you add up the multitude of accessories that help make it an important, versatile contributor. That cumulative cost—and the space-hogging footprint of a tablesaw—can be a big obstacle to folks trying to get started in woodworking.

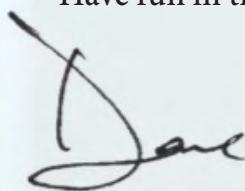
Although a tablesaw makes many cutting and machining operations a breeze, you could still make fine furniture with efficiency and accuracy even if all of the tablesaws suddenly vanished from the earth in some kind of weird power-tool rapture. After all, people were working wood long before the tablesaw was invented 250 years ago.

Now, I’m not suggesting that any of us need to embrace our inner Neanderthal and start ripping sheets of plywood for cabinet carcasses with a hand saw. But if you don’t have the room (or budget) for a tablesaw, you have solid options with smaller, more portable, power and hand tools.

To that end, check out Craig Ruegsegger’s “No Tablesaw, No Problem” article on *page 28* that provides alternative methods to get the job done. Even if your shop is a hyper-equipped Garage Mahal, you’ll find great techniques you can use to tackle any typical tablesaw task without disturbing that delicate dado setup.

One sawing solution we greeted with skepticism when it was introduced ten years or so ago is the rail-guided tracksaw. But now we wouldn’t want a shop without one, especially since competition and improved technology has made them more affordable than ever. In keeping with the “no table-saw” theme, we shop-tested 9 of those tracksaws and you’ll find the results of those tests on *page 48*.

Have fun in the shop!



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Hundreds of woodworking videos

At *WOOD*, we may have “faces for radio and voices for print” as one video reviewer commented (thanks a lot, Mom), but you’re sure to find solid woodworking instruction in the hours upon hours of how-to footage we’ve produced over the years. Binge-watch our woodworking videos for days on end at woodmagazine.com/videos or check out these favorites.



Head to woodmagazine.com/jointerbasics to learn the proper technique and the terminology associated with jointer operation.



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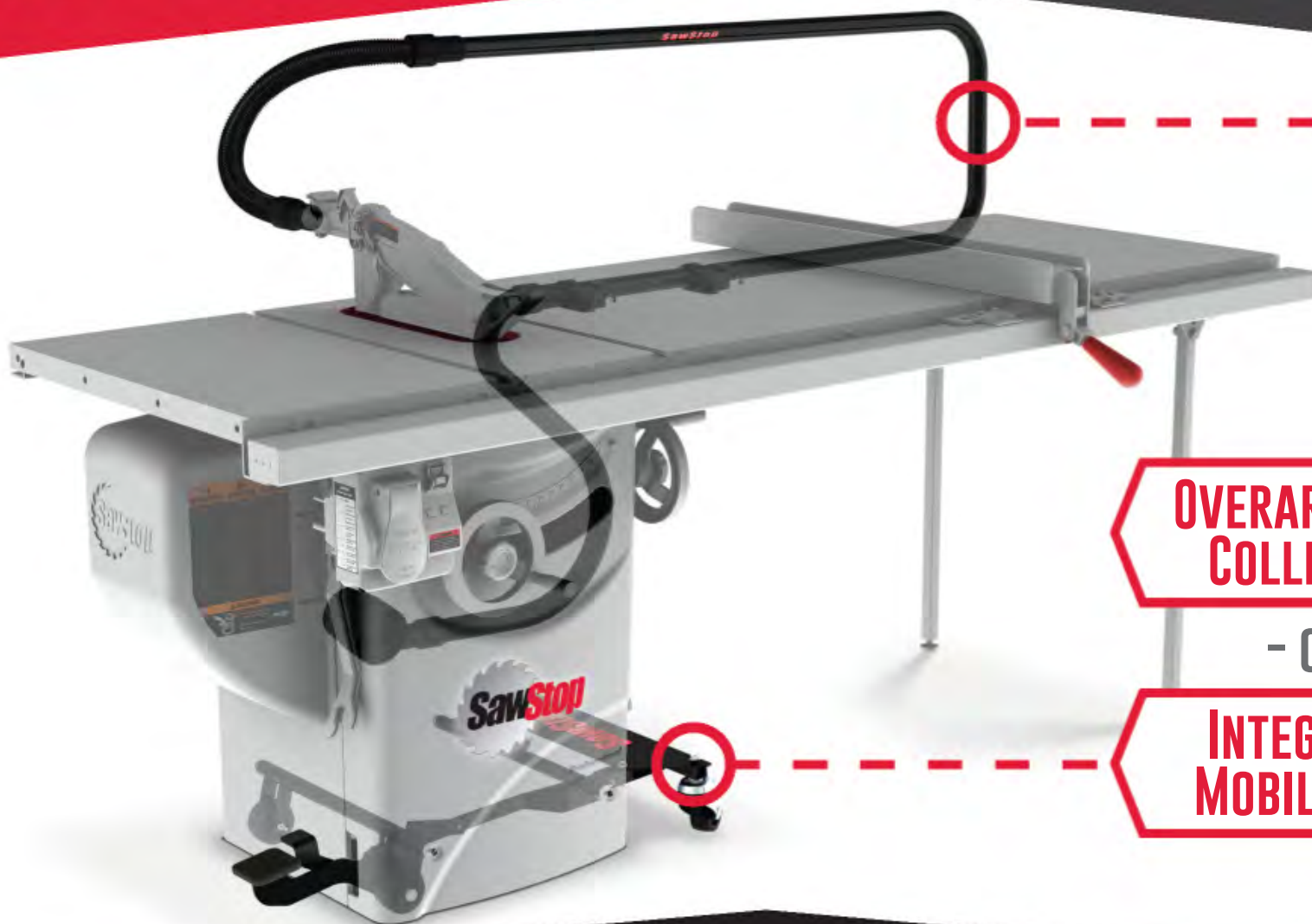


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Use your superpowers for good

Recently, I stumbled across a copy of issue 66 (December 1993) of WOOD® magazine, which included an item about Allyson, my wheelchair-bound daughter, and how woodworkers can use their skills to help those with disabilities. I have always been grateful for that, and thought you might like an update.

Allyson recently completed her reign as Ms. Wheelchair Virginia when she also competed in the Ms. Wheelchair America pageant. She's now a student at Roanoke College in Salem, Va., and is able to live on her own. I'm very proud of her.

And yes, 25 years later, woodworkers are still needed to help make things for disabled folk. Each disabled person has unique needs and, like a woodworking project, the "jig" is unique to the need. There are common items— floor seats, standing tables, etc.—sized to match the person. Or it could be something as simple as a ramp to get a wheelchair up a few steps, or (as my last project for Allyson) creating a desk high enough to get her wheelchair arms under so she can study.

Function is the criterion; aesthetics is a bonus. The most important thing is to use our tools and talents to put something together that helps.

To find need, contact physical therapy and/or occupational therapy providers in your area: Easter Seals, Shriner hospitals, medical schools, and, of course, rehabilitation departments in hospitals. They'll have catalogs with pictures of devices they need; many will have access to drawings on how to make them.

—Ross Hart
Salem, Va.



High chair for big kids

Just had to share with you a photo of my dad, Charles Kerekes, sitting in this amazing oversize chair, which he built using the Tall Adirondack Chair & Table plans in issue 254 (July 2018). Of course, he had to upsize the parts and he added a few modifications from another Adirondack he saw at a local ice cream stand.

A retired shop teacher, he made the chair for my business, and it is a huge hit with my customers. I'm an extremely proud and grateful daughter!

—Aimee Snelbaker
Hobby House Retreat
Middletown, Pa.



Ross Hart's daughter, Allyson, makes daily use of the painted plywood wheelchair tray her daddy made for her.

Difference' spot in Finishing

Come on back to the crib

There's an error in the dimensioning of the toddler panel in issue 255 (September 2018). In Drawing 3 on page 58, the top hole on the panel should be only 1" from the top. I also found it

safer to do all my measuring from the bottom of the panels: That eliminates any differences in the overall heights of the panels.

—Howard Frischman
Livonia, Mich.



Carpenter John lives on

Dave Campbell's column about Carpenter John in issue 258 (Taking Measure, Dec/Jan 2018/2019) really hit home with me and my impatience with my kids, trying to show them stuff and expecting perfection. It made me slow down and appreciate what really matters: time together, humor, and the fact that they'll come back to visit!

—Dan Hendricks
Green Bay, Wis.

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Bespoke jig is the wheel deal

While building the wheels for the Rocking Motorcycle (issue 258), it was a struggle keeping all seven layers aligned while gluing them together. So I traced the inner diameter of the wheels on a scrap of plywood and inset dowels as shown to hold the wheel alignment.

—**Grant Howard**
Sudbury, Ont.



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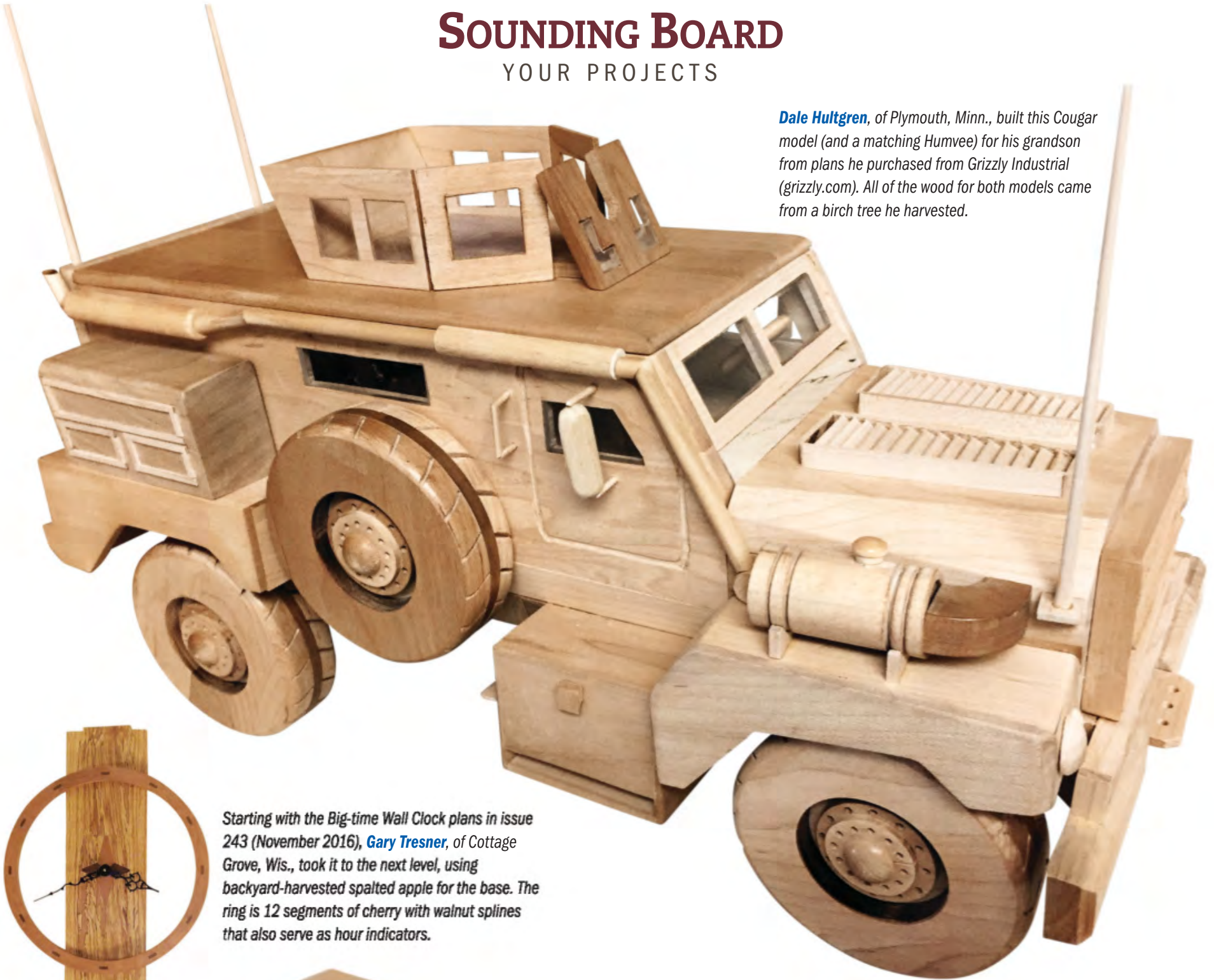
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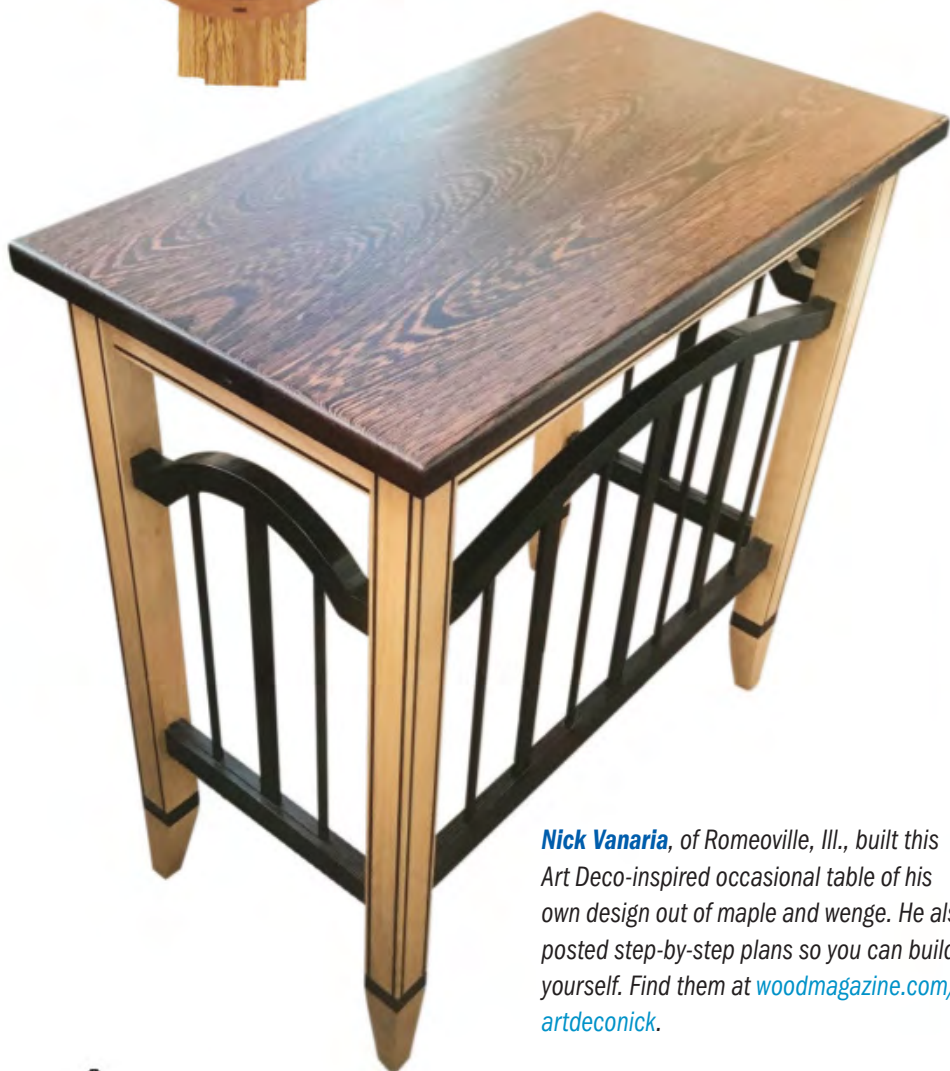
SOUNDING BOARD

YOUR PROJECTS

Dale Hultgren, of Plymouth, Minn., built this Cougar model (and a matching Humvee) for his grandson from plans he purchased from Grizzly Industrial (grizzly.com). All of the wood for both models came from a birch tree he harvested.



Starting with the Big-time Wall Clock plans in issue 243 (November 2016), **Gary Tresner**, of Cottage Grove, Wis., took it to the next level, using backyard-harvested spalted apple for the base. The ring is 12 segments of cherry with walnut splines that also serve as hour indicators.



Nick Vanaria, of Romeoville, Ill., built this Art Deco-inspired occasional table of his own design out of maple and wenge. He also posted step-by-step plans so you can build it yourself. Find them at woodmagazine.com/artdeconick.

Jerry Chervony, of Teaneck, N.J., mashed up state-of-the-art technologies from two drastically different eras to create this very cool icebox-themed media console.



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SOUNDING BOARD

YOUR PROJECTS



Ron Mantynen, of New Baltimore, N.Y., used 12 different species of wood, including persimmon, canary wood, ebony, and 100-year-dried Brazilian cherry, in the making of this double-sided game board. It took him about 45 hours to build.



Working from memories of a childhood game, **Robert Gatchell**, of Oak Bluffs, Mass., created this 75"-long freestanding bowling lane from Baltic birch plywood and South American mahogany. Rare-earth magnets embedded in the ball return keep the 1½" steel balls from straying.

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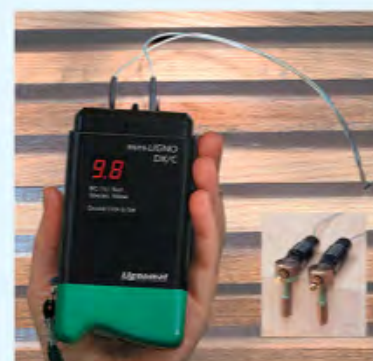
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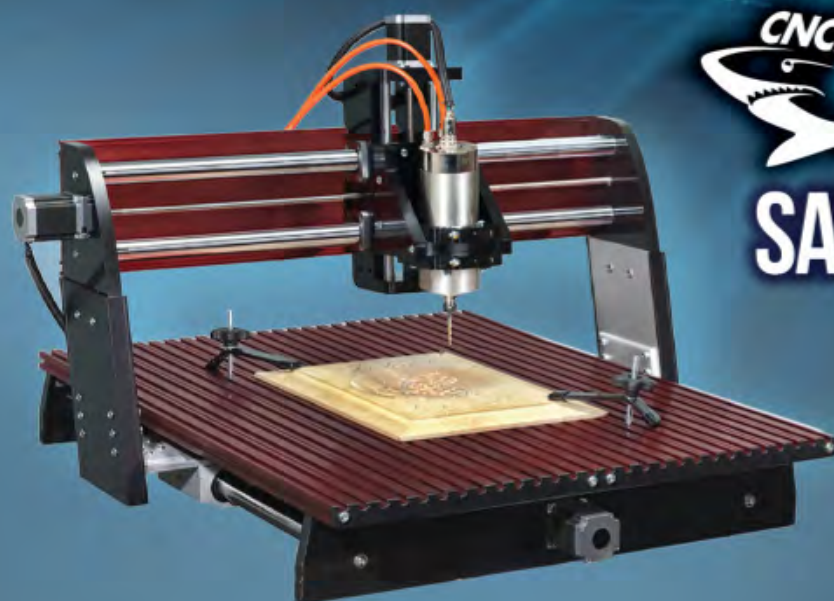
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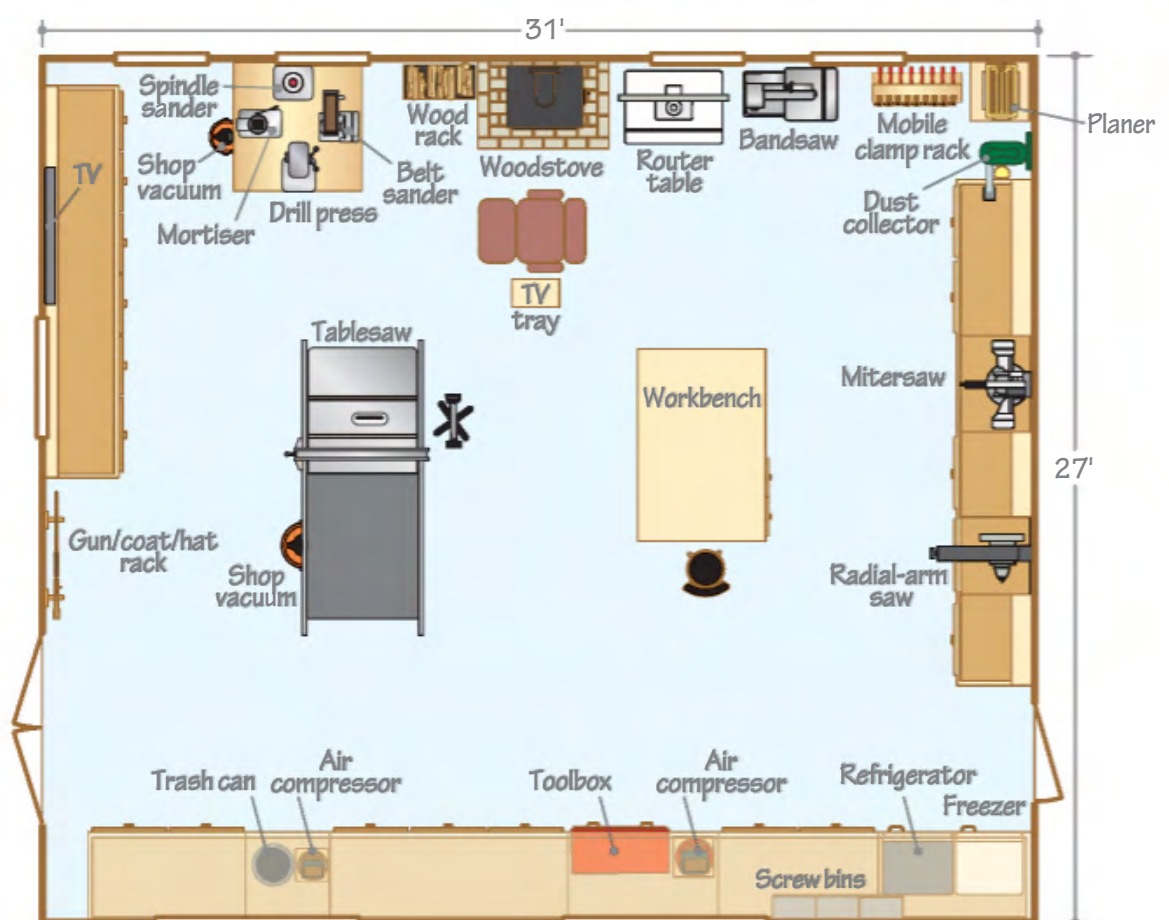
Man-cave Workshop

Making his bandsaw, router table, benchtop-planer stand, and clamp rack mobile allows Gary to roll them out of the way when not in use.

Walking into Gary Toles's out-building, you might be confused as to whether you're in his shop or his den. The recliner, flat-screen TV, mini-fridges, and woodstove within spitting distance of his tablesaw and workbench could throw you off.

Gary's shop is the culmination of 30 years of woodworking and construction experience. Cabinets he built from *New Yankee Workshop* plans house hand and portable power tools. Besides providing plenty of countertop space to work on—and plan—projects, the cabinets incorporate a fence shared by the radial-arm saw and miter saw.

Gary hid dust-collection ductwork in a hollow backsplash on his cabinets, with the top of the backsplash serving as shelf space. He piped two auxiliary dust-collection ports to the front faces of the cabinets so he can roll his router table and other tools up to one and plug in a flex hose.



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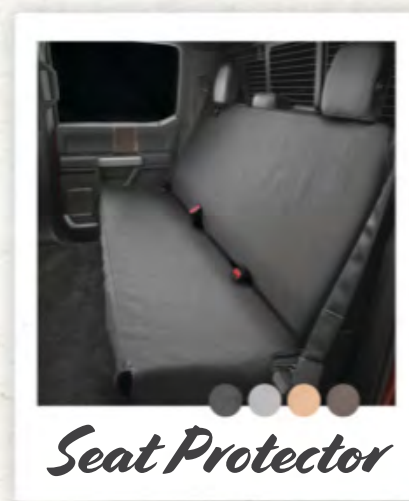
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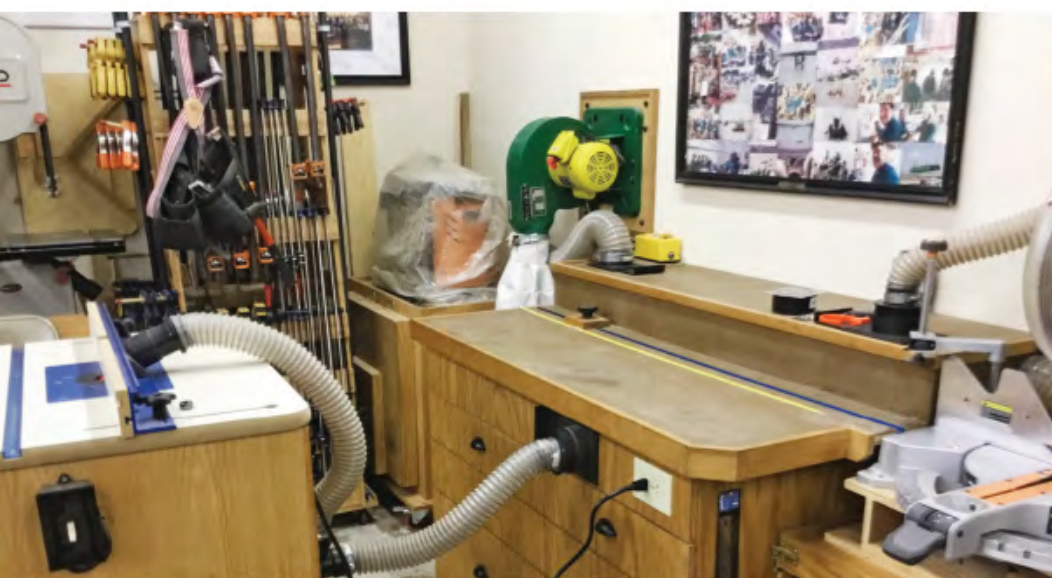
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Gary built all of his shop cabinets to maximize storage space. Even his pancake air compressor rolls on a mobile base to tuck under the countertop. Wall-mounted parts cabinets keep hardware close at hand. Electrical outlets on the fronts of the cabinets add extra convenience for power tools.



Gary's shop also serves as a hideaway, where he can relax in his leather recliner while watching sports on a flat-screen TV. A woodstove keeps the shop toasty warm in the winter.



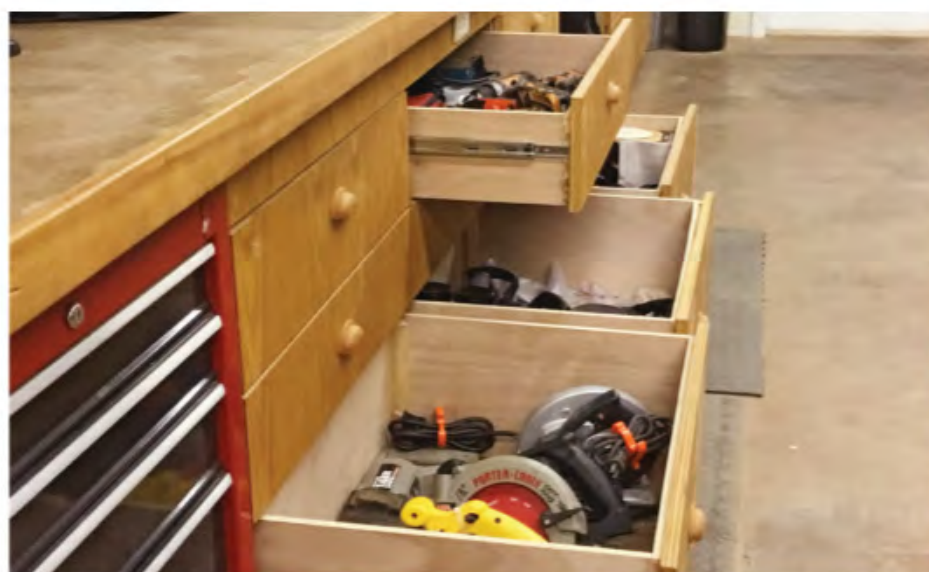
Ductwork and blast gates built into the shop cabinets make dust-collection hook-up easy. The wall-mounted dust collector saves floor space.

The main workbench features a replaceable worksurface and more drawers, and rides on casters for mobility. The tablesaw stands in the middle of the shop, away from the main dust-collection system. So a shop vacuum, operated by a switch at the front of the saw, extracts chips and dust.

Because Gary doesn't like clutter, he takes the time to clean up between projects and puts tools in their respective storage locations.



A 6'-wide double entry door makes it easy to move material and projects in and out. Large windows on three walls provide plenty of natural light.



To keep dust off tools and accessories, Gary built large, deep drawers into his shop cabinets. Full-extension drawer slides make them easy to access.



The main workbench in Gary's shop features a large, replaceable worksurface, drawers for storage, and casters for mobility. In the background, his mitersaw and radial-arm saw share a fence system on his custom-built cabinets.



A retired construction manager, Gary Toles has been woodworking for about 30 years, starting with a Craftsman tablesaw and a Black & Decker router. Over the years, he's outfitted his home and yard with projects he designed and built.

Show us your shop

Send high-resolution digital photos of your shop to woodmail@woodmagazine.com and we may showcase it in the magazine!

How has this shop/living-room combination worked out? "Life is not all woodworking," Gary quips. When the blades and bits aren't spinning, he loves watching baseball games from the comfort of his backyard hideaway. 🌲



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Brad nailer nose

Pinner nose

Brad

Pin

A head-to-no-head comparison. Brads have small heads that leave a noticeable hole but offer more holding power than pins. Because pins don't have heads, they nearly disappear into the grain of most woods, especially after the application of stain.

Choosing brads or pins: a tale of holes and holding

Q My pneumatic brad nailer has served me well, but I'm curious about pin nailers that shoot pins even finer than brads. When would I benefit from using such a tool?

—Bob Pruefer, Plymouth, Mass.

A Pin nailers offer several advantages—and drawbacks—compared with brad nailers, Bob. Unlike 18-gauge brads, 23-gauge pins don't have heads, so they leave miniscule holes that typically don't require filling. Besides the cosmetic advantage, not having to fill holes can result in significant time saving when attaching a lot of trim. But the lack of a head gives a pin little holding power. So for most applications, use pins in conjunction with an adhesive such as wood glue. In the *WOOD*® shop we often use pins to hold glass stops because there's little risk of shattering glass. That's one of the few pin applications that don't require adhesives.

Because of its thinner profile, a pin won't likely split thin, delicate trim or veneer, the way a brad could. And because a pin nailer

doesn't have a nose-mounted safety with large plastic pad, as shown *above*, you can precisely position a pin in tight spots. (For safety purposes, a pin nailer has two triggers in place of the nose-mounted safety.)

Brads typically range $\frac{5}{8}$ "–2" long, and pins come $\frac{3}{8}$ "–2" long. But guns capable of shooting pins longer than 1" can be pricey, with those shooting 2-inchers costing upwards of \$200. Despite their thinner gauge, pins penetrate the hardest of woods as easily as brads. But be warned: A pin more likely will deflect off course as it hits denser bands of latewood.

You can buy either type of nailer in its most common pneumatic form (cordless versions are also available) for less than \$100. But if you can afford just one, a brad nailer will prove more versatile. And if you think you might like a compromise between a typical brad and pin, consider a 21-gauge nailer, now available from several manufacturers. Technically brads because they have slight heads, those slim fasteners can be harder to find and require nailers priced close to \$200. 🌲

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SHOP TIPS

WORK FASTER, SMARTER, SAFER

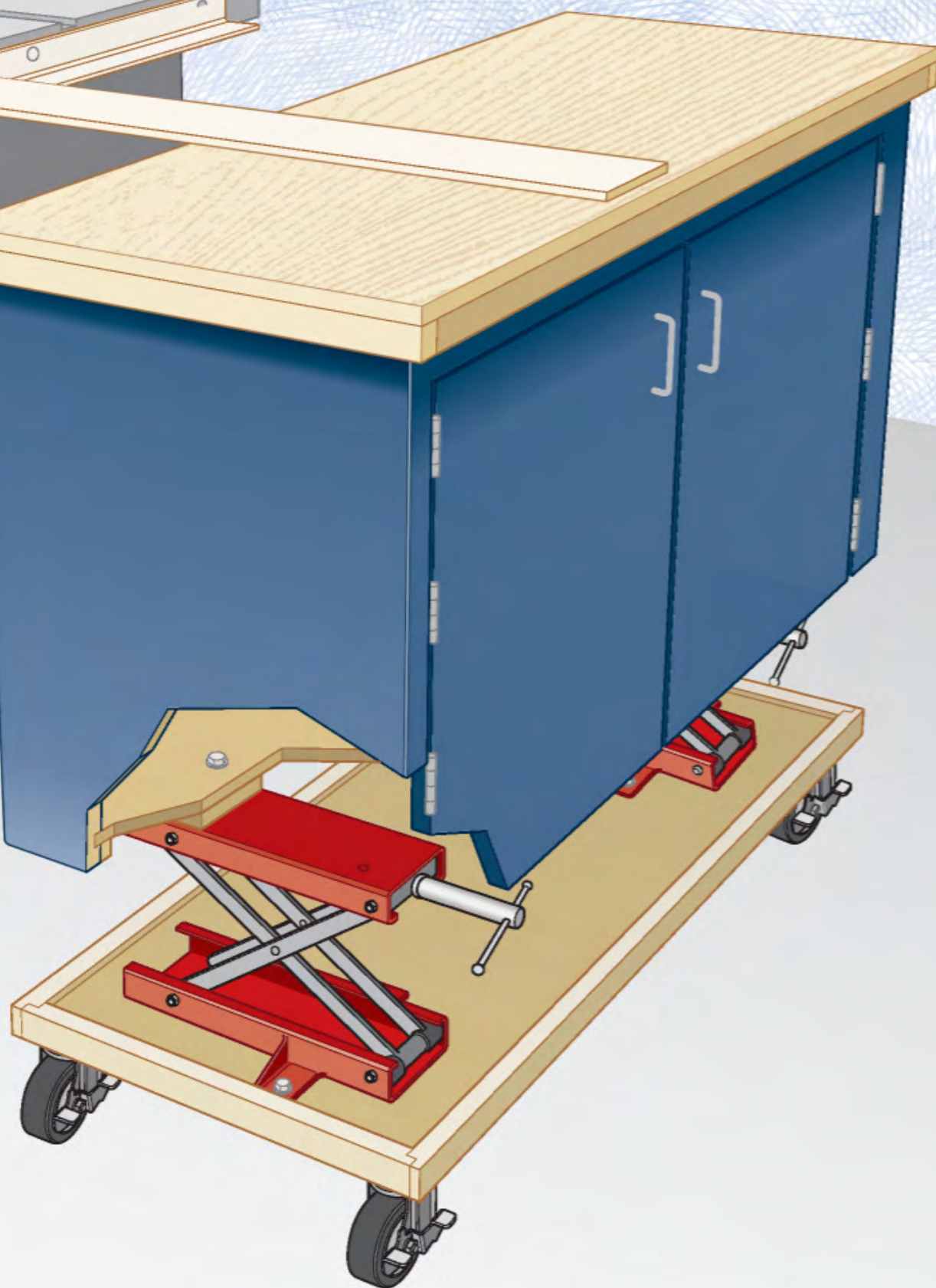


Jack up saw storage for outfeed support

In my small garage shop, tools serve multiple purposes, most are mobile, and storage space is created wherever possible. That thinking drove the design of this mobile storage cabinet/outfeed table.

It consists of a shop-made base cabinet bolted to a pair of motorcycle lifts (available at amazon.com). The lifts sit on a shop-made mobile base. With the lifts fully lowered, the cabinet stores beneath the saw's extension table. To put it to work I roll it behind the saw and crank up the lifts to bring the cabinet top level with the tablesaw top. It also makes a great assembly table.

—Kelly Churchill, Medford, Ore.



Tips earn up to \$150.

If your tip is the best of the issue, it wins **Top Shop Tip** honors, and you receive a **tool prize** worth at least **\$300**.

Send your tip, photos or drawings, and contact info to shoptips@woodmagazine.com

Because we try to publish original tips, please send yours only to **WOOD** magazine.



For sending this issue's **Top Shop Tip**, Kelly receives Triton belt, geared eccentric orbital, random-orbit, and spindle sanders worth \$730.



Cat Pen Kit

Dog Pen Kit

Baseball Pen Kit

Crochet Hook Kit



Fun and Easy to make on a lathe



Aromatherapy
Necklace Kit



Measuring Spoon Kits

“Wow! You Made Those?”

Cat Twist Pen Kit A great gift for cat lovers! Features a tail clip, sleeping cat on top, cat silhouettes on the center band and paws on the tip.

3 Cat Twist Pen Kit Starter Package

You get one of each Cat pen kit in Chrome (shown above), 24kt Gold and Antique Pewter. Plus, you get the bushings and drill bit you need to make the pens.

#PKCATSS **SAVE \$13 Only \$58.50**

Dog Click Pen Kit Create a dog themed pen that features a casted dog bowl on top, biscuit clip, engraved paw prints on the top and tip as well as “I LOVE MY DOG” engraved below the tip’s paw prints.

3 Dog Click Pen Kit Starter Package

You get one of each Dog pen kit in Chrome (shown above), 24kt Gold and Antique Pewter. Plus, you get the bushing and drill bit you need to make the pens.

#PKDOGSS **SAVE \$12 Only \$47.75**

Baseball Pen Kit Features a batter casted into the pen end, baseball bat pen clip, baseball stadium and field casted on the pen top, baseball on the pen tip and a “Curveball” Bolt Action mechanism.

3 Baseball Pen Kit Starter Set

You get one of each pen kit in Antique Pewter (shown above), Antique Brass and Chrome. Plus, you get the bushing and drill bit you need to make the pens.

#PKBASESS **SAVE \$14 Only \$59.95**

Crochet Hook Kit Set With this tool your recipient can make loops in thread or yarn and to interlock them into crochet stitches. The interchangeable handle lets you quickly swap out the included hooks. And you can flip the hooks to easily store into its handle. The set includes hardware to make 1 handle and 6 interchangeable metal crochet hooks. Sizes; C/2 - 2.75mm; D3 - 3.25mm; E4 - 3.5mm; F5 - 3.75mm; G/6 - 4mm and H/8 - 5mm. Includes a convenient travel box to hold the handle and 6 hooks.

#PKCROCHET **Only \$24.95**

Aromatherapy Necklace Kit Enjoy the benefits of Aromatherapy everywhere you go. Just add a few drops of your favorite essential oil to the cotton wick to absorb the oil. Unscrew the top of the kit and add the wick inside. Each kit Includes 5 wicks, a 28” chain, gift pouch and an empty 2ml sample jar (essential oil not included).

5 Aromatherapy Necklace Kit Starter Set

You get one of each Aromatherapy Necklace Kit in Satin Chrome (shown above), Chrome, 24kt gold, Rose Gold and Raw Brass. Plus, the bushings and drill bit to make the kits.

#PKATHNSS **SAVE \$10 Only \$56.75**

Measuring Spoon Kits - Set of 4 Create these must-have kitchen essentials for a fun and useful gift. Spoon set includes four of the most common measuring spoon sizes; 1/4-tsp, 1/2-tsp, 1-tsp and 1-Tbs. They sit on a handy chrome ring and you can detach them for individual use. Plated with durable, food safe chrome

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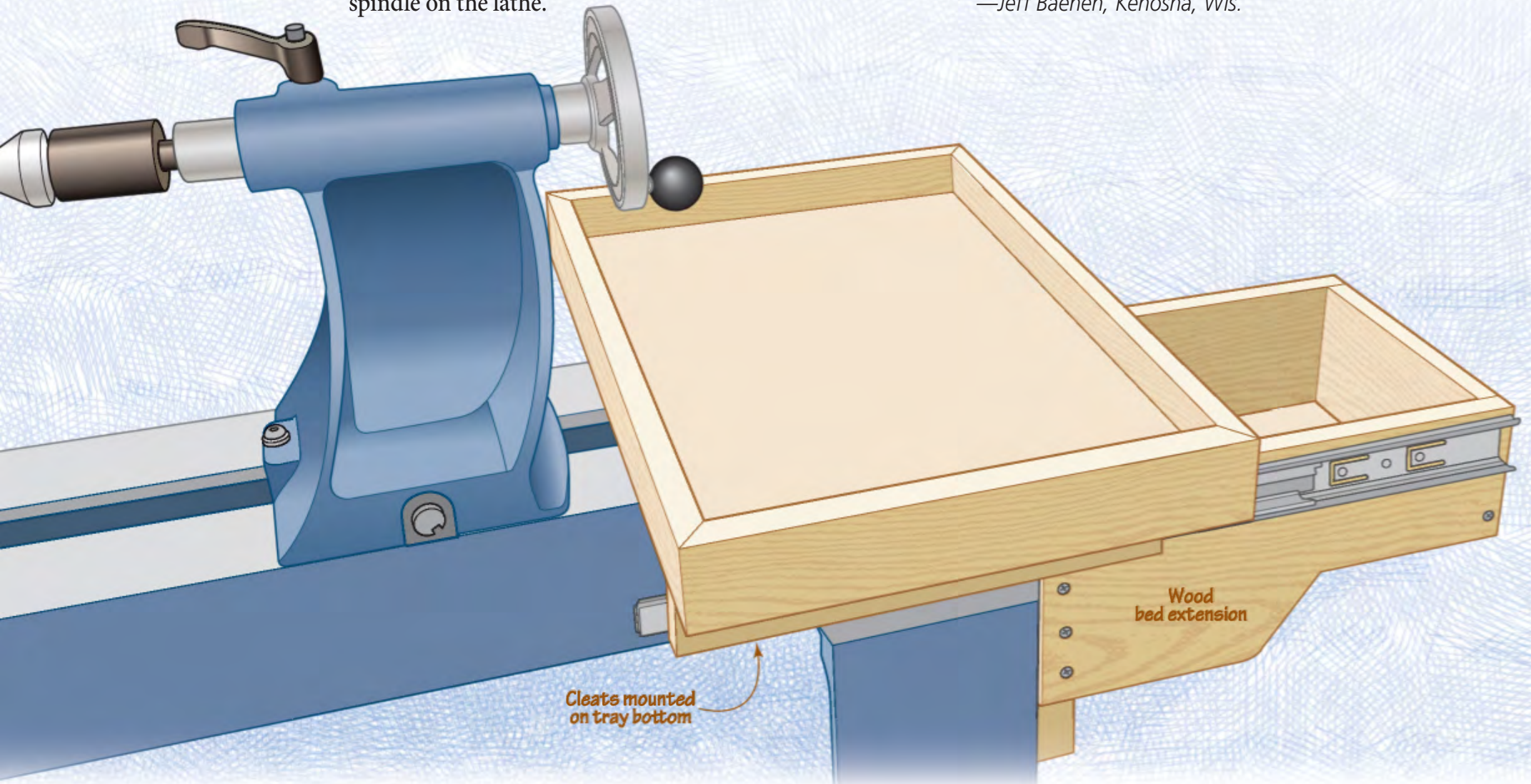
SHOP TIPS

Sliding lathe tool tray

After struggling to find a safe and convenient place to set my turning tools while working at the lathe, I designed this sliding tray. It puts the tools within easy reach no matter if there's a small bowl blank or long spindle on the lathe.

To build it, bolt a wood extension to the lathe's tail end. Mount full-extension drawer slides to the extension and a wood tray. Size the parts so the tray slides clear of the lathe bed. Position the slides so the tray glides about $\frac{1}{4}$ " above the bed.

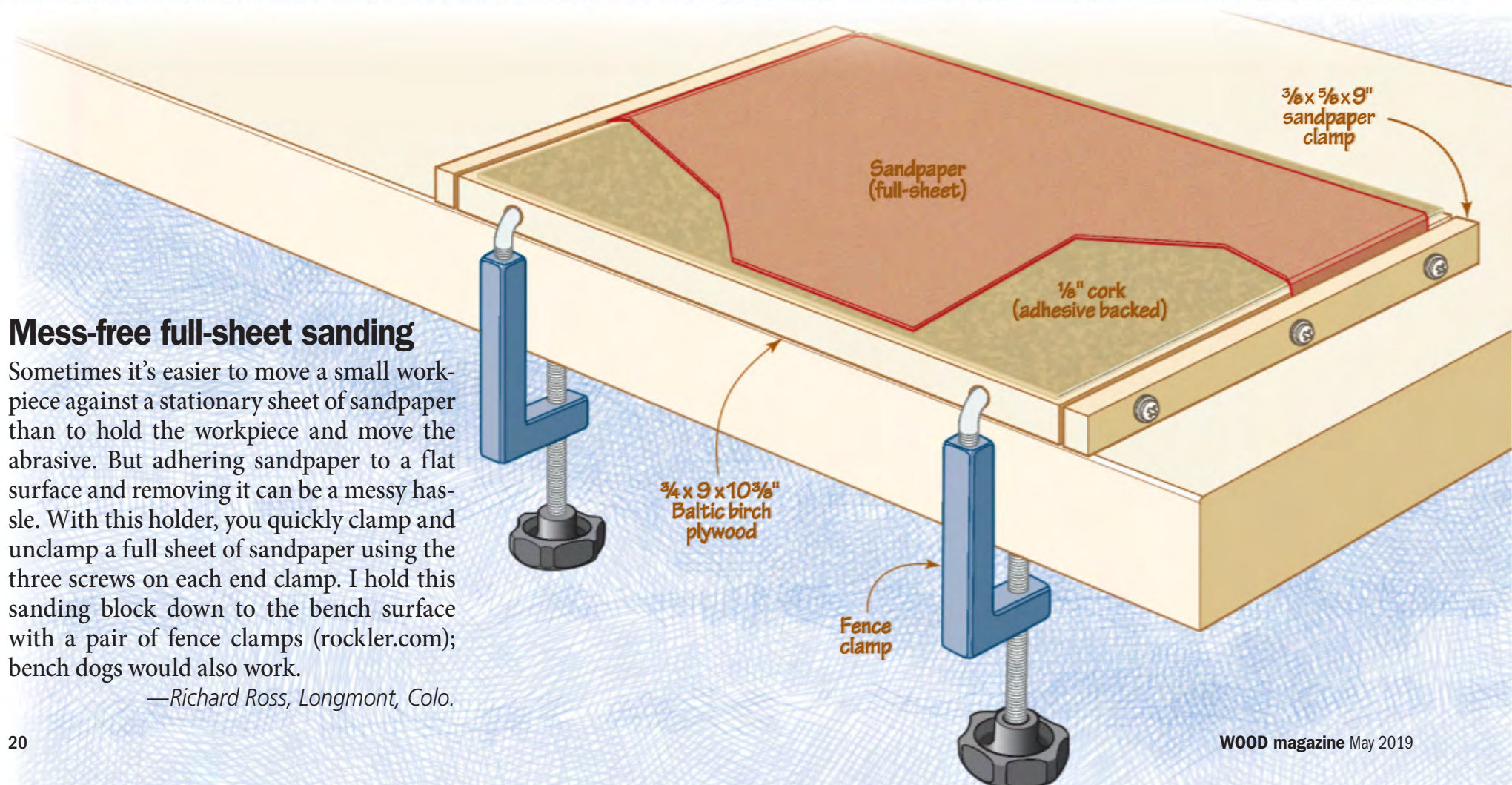
—Jeff Baenen, Kenosha, Wis.



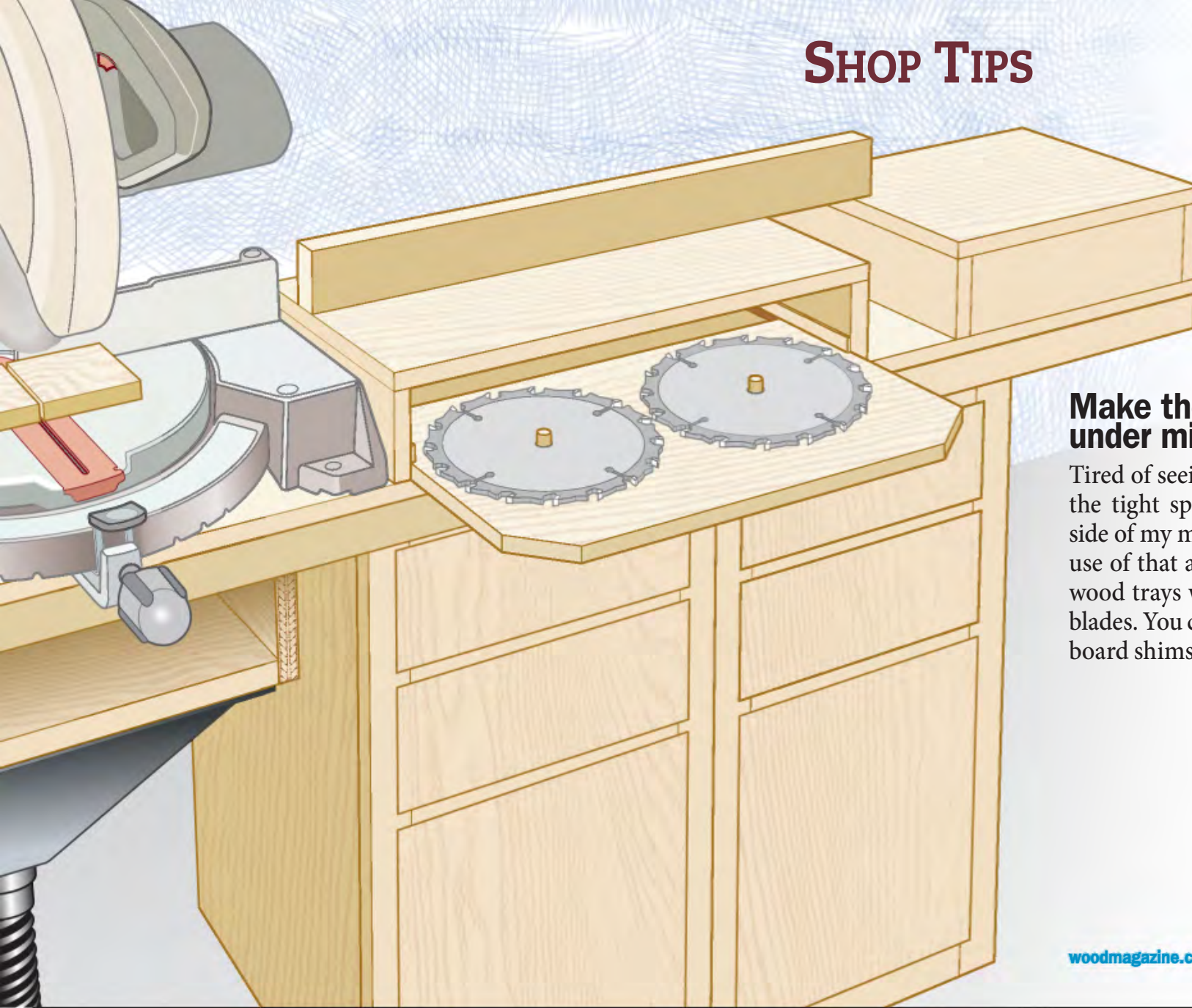
Mess-free full-sheet sanding

Sometimes it's easier to move a small workpiece against a stationary sheet of sandpaper than to hold the workpiece and move the abrasive. But adhering sandpaper to a flat surface and removing it can be a messy hassle. With this holder, you quickly clamp and unclamp a full sheet of sandpaper using the three screws on each end clamp. I hold this sanding block down to the bench surface with a pair of fence clamps (rockler.com); bench dogs would also work.

—Richard Ross, Longmont, Colo.



SHOP TIPS



Make the most of space under miter saw extensions

Tired of seeing only debris find its way into the tight space under the tables on either side of my miter saw, I vowed to make better use of that area. The solution: pull-out plywood trays with $\frac{5}{8}$ " dowels for holding saw blades. You can stack blades by placing cardboard shims between them. 🌲

—Wade Heidmann, Austin, Texas

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Grand entrance Front Door

Enhance your home's curb appeal with warm, welcoming wood tones.

If you consider making a custom entry door above your pay grade, reconsider. We designed this door with simple, easy-to-fit floating tenons and routed mortises, doubled for strength, made with simple, foolproof jigs. The applied panel and glass stops eliminate the need for an expensive rail-and-stile bit set and finicky setups.

D I M E N S I O N S :
1 3/4" T x 36" W x 79 1/2" L

Approximate materials cost:

\$500

Lumber and hardware

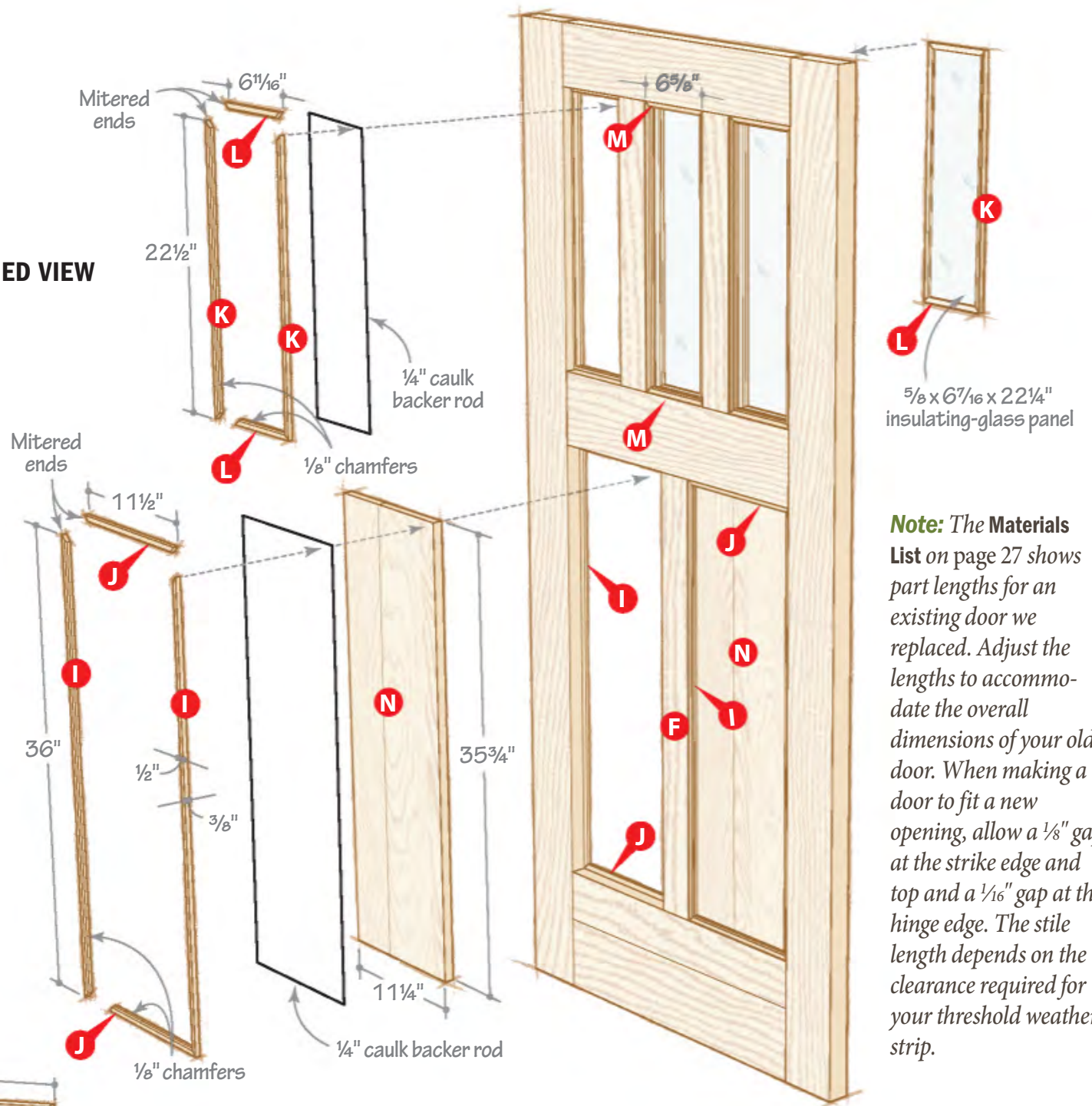
3
windows

2
panels

1
great-looking door

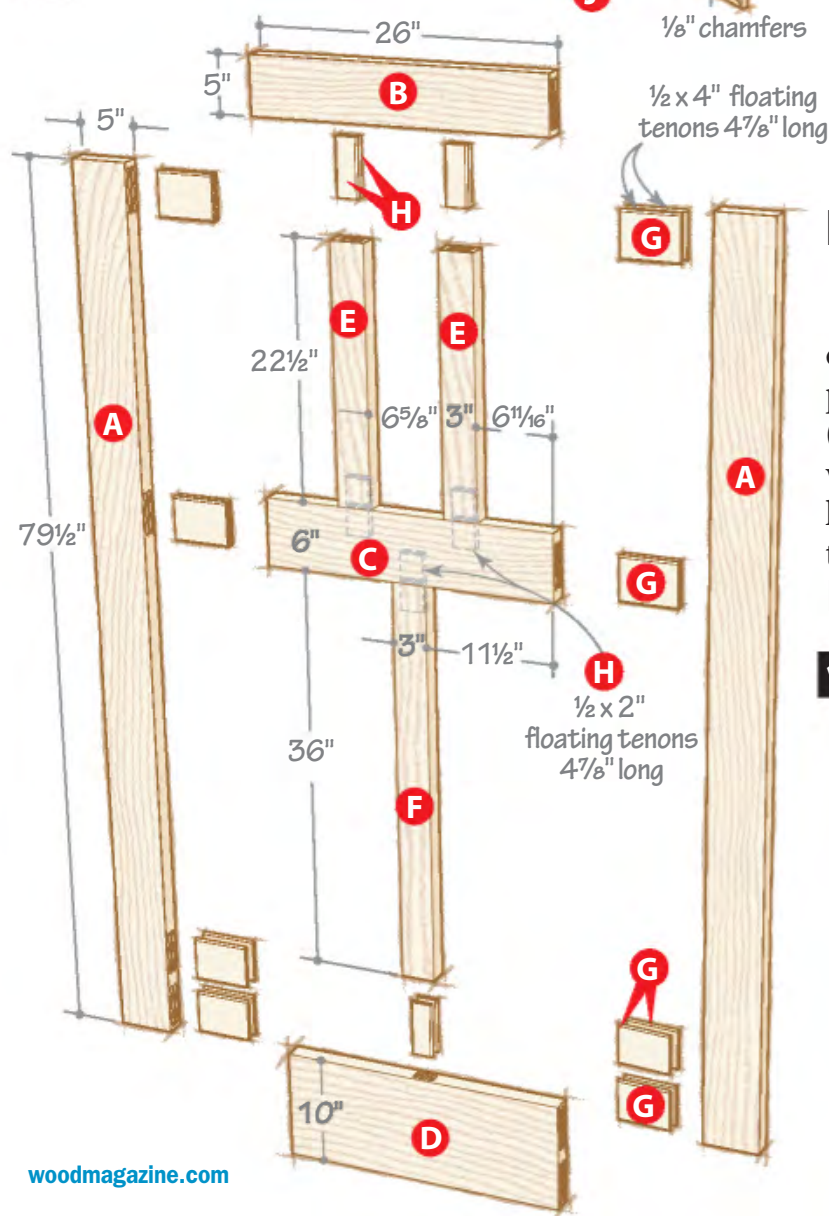
► Build sidelight panels using the same techniques as for the door.

EXPLODED VIEW



Note: The Materials List on page 27 shows part lengths for an existing door we replaced. Adjust the lengths to accommodate the overall dimensions of your old door. When making a door to fit a new opening, allow a 1/8" gap at the strike edge and top and a 1/16" gap at the hinge edge. The stile length depends on the clearance required for your threshold weather strip.

1 DOOR ASSEMBLY



Build a sturdy frame

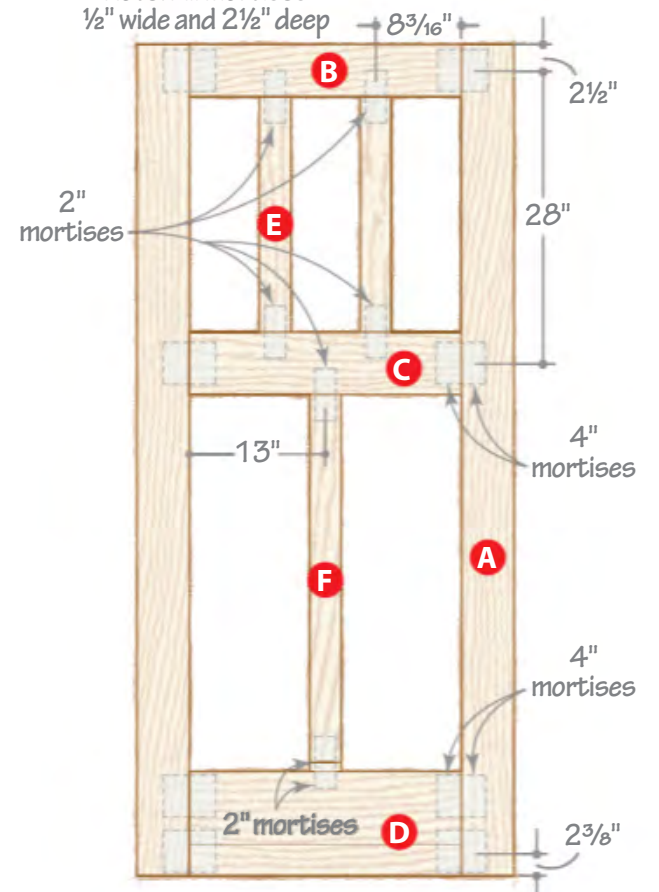
1 Cut door-frame parts A–F [Materials List, Drawing 1], and dry-clamp them together. Mark part letters and orientation (right, left) on the outside faces with chalk. Mark mortise centerlines on all parts [Drawing 2] and transfer them to the parts' edges [Drawing 1a].

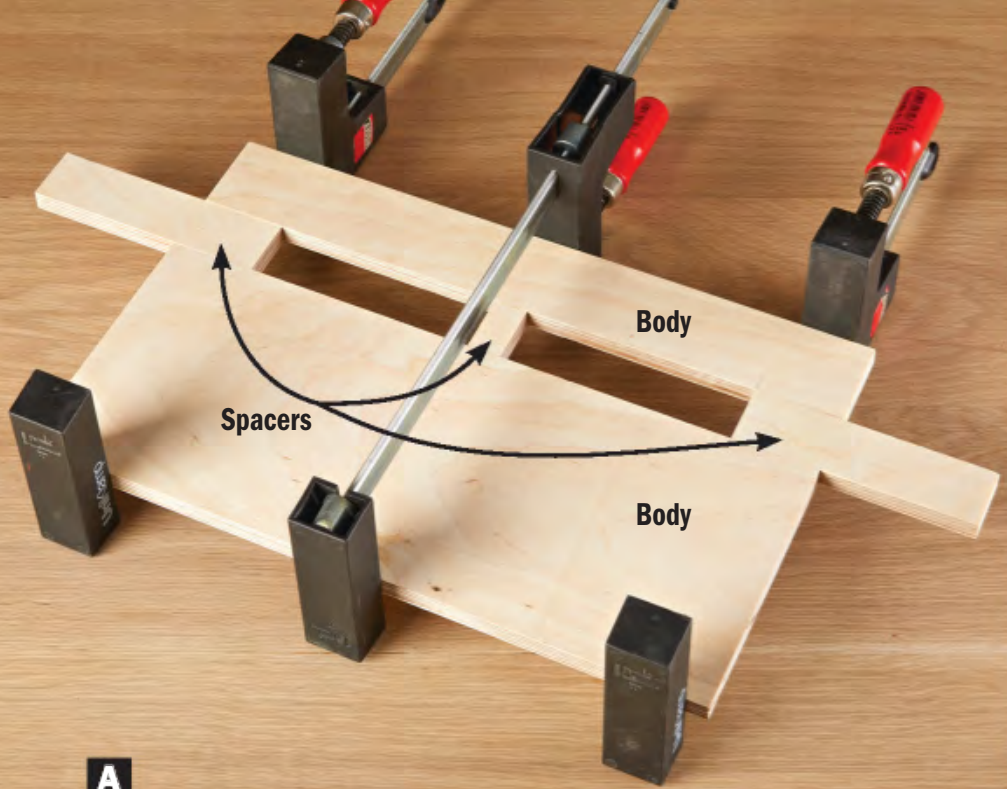
1a TYPICAL DOUBLE MORTISE (lower stile shown)



2 MORTISE CENTERLINE LOCATIONS

Note: All mortises 1/2" wide and 2 1/2" deep





Glue spacers slightly wider than 1 3/8" between the jig body parts. The resulting slots should allow free movement of the guide bushing without play.

► Buy this router bit.
[woodmagazine.com/
2.5straight](http://woodmagazine.com/2.5straight)

Note: The large-diameter guide bushing allows for efficient chip removal, critical when routing deep mortises.

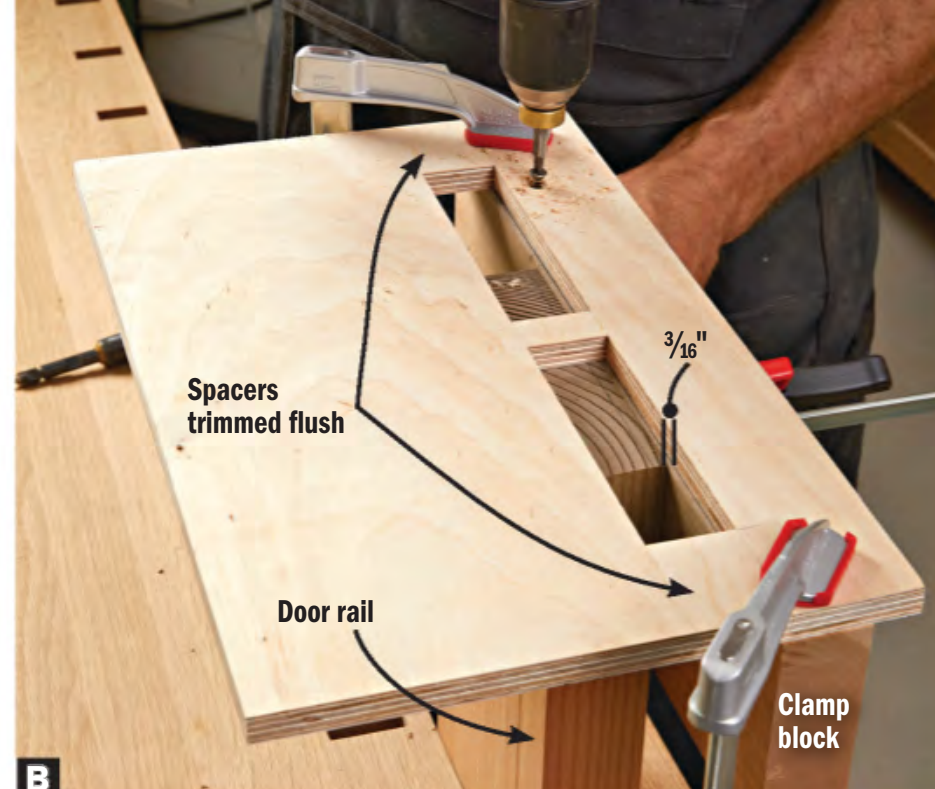
Note: Use the double-mortise jig for all 4"-wide mortises.

2 Install a ½"-diameter, 2½"-cut-length straight bit and a 1⅜"-outside-diameter guide bushing in a plunge router equipped with good chip collection. Build the mortising jigs [**Drawing 3, Photos A and B**], marking the mortise centerlines on the jigs.

3 Clamp each door-frame part in a vise and plunge-rout the mortises [**Drawing 1a**, **Photo C**].

4 Cut a blank 84" long for the large tenons (G) and a 64"-long blank for the small tenons (H), test-fitting the blanks in a mortise as you plane the material to thickness. To allow room for glue, the tenons should slide into the mortises with little resistance. Rout 1/4" round-overs along the stock edges and cut the tenons to length.

5 Glue the upper mullions (E) between the upper rail (B) and middle rail (C) [**Drawing 1**]. Add one stile (A) and then the lower mullion (F), lower rail (D), and second stile. Clamp the frame and remove any excess glue. Finish-sand the frame.

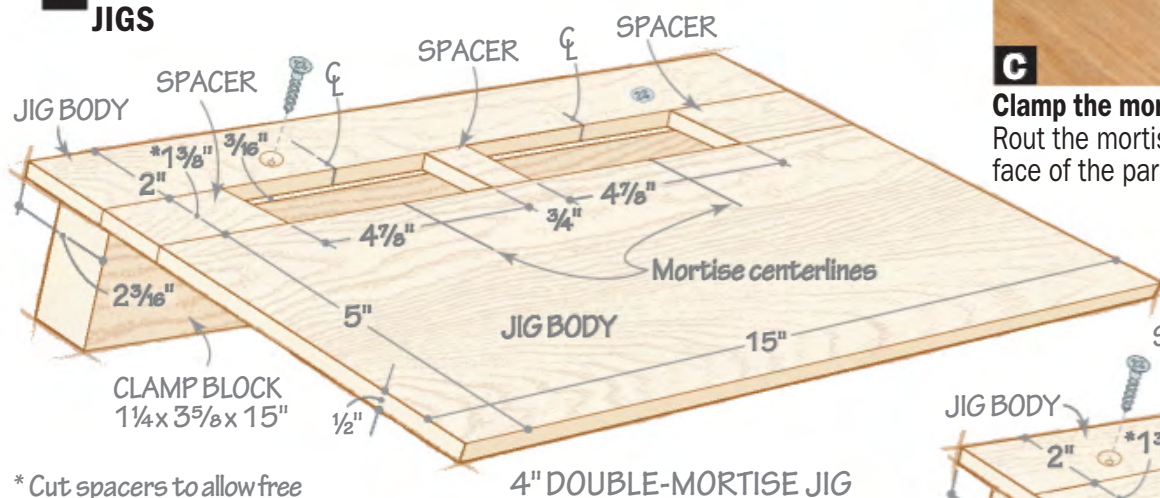


Clamp the clamp block to a door rail, and the jig body to the clamp block, so the block protrudes $\frac{3}{16}$ " into the jig-body opening. Screw the body to the block.

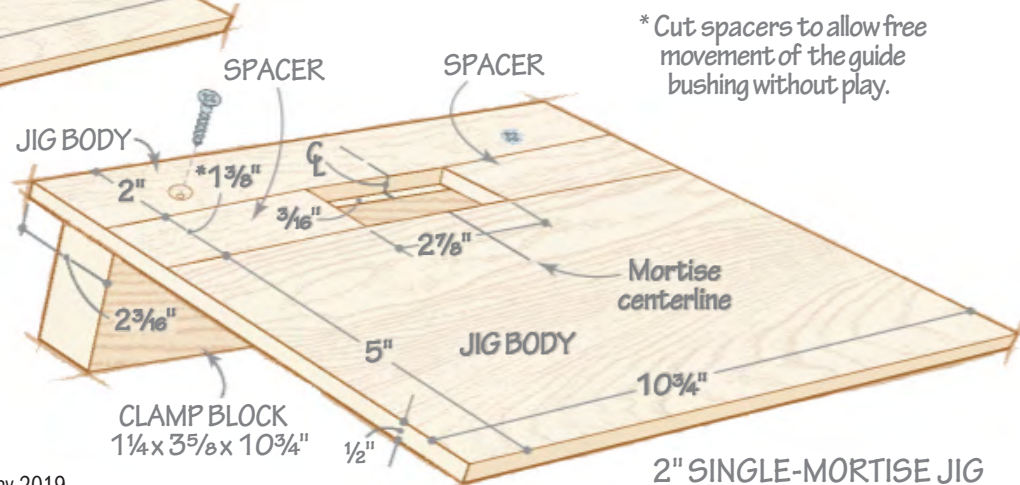


Clamp the mortise jig to one face of each part, aligning jig and part centerlines. Rout the mortises in successive 1/8"-deep passes. Switch the jig to the opposite face of the part and repeat.

3 MORTISING JIGS



* Cut spacers to allow free movement of the guide bushing without play.



* Cut spacers to allow free movement of the guide bushing without play.



D Ensure uniform panel- and glass-stop inset using a positioning block with a $\frac{1}{8}$ "-deep rabbet.



E Position the old door, hinges attached and lockset removed, on the new one with edges flush all around. Transfer the hinge locations to the new door.

Make the stops and panels

1 Cut the stops (I–M) 1" longer than listed [Exploded View]. Chamfer one edge of each stop [Drawing 4] and finish-sand them. Miter-cut the exterior stops to length and glue them into the door-frame openings set $\frac{1}{8}$ " back from the outside face [Photo D]. Set the remaining stops aside.

2 Cut the panels (N) and finish-sand them. Set the panels aside.

3 From a glass shop, order low-E, tempered, $\frac{5}{8}$ "-thick insulating-glass panels $\frac{1}{4}$ " smaller in width and length than the window openings. (Lead times for these panels vary from a few days to a week.)

Tip! To allow for wood movement and room for backer rod, cut solid-wood panels $\frac{1}{4}$ " smaller in length and width than the opening.

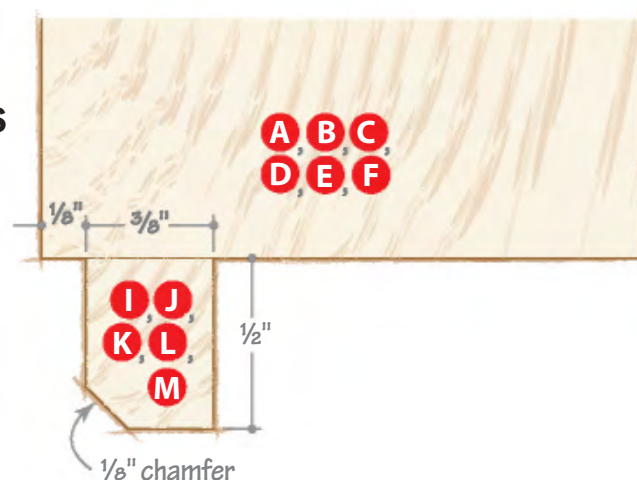
Install the hardware

1 Transfer the hinge locations [Photo E] and the lockset latch and bolt centerlines from the old door to the new one and bore lockset holes. Mortise the latch and bolt plates [Photo F].



F Place the latch and bolt in the lockset holes and mark the mortises. Rout the mortises close to the marks with a trim router and mortise bit. Clean up the edges with a chisel.

4 STOPS





G

Align the inside edges of the template with the hinge marks on the edge of the door and clamp it in place.



H

Rout the hinge mortises using a top-bearing pattern bit.

2 Make a routing template to match a hinge leaf, and attach a clamp block to position the hinge mortises with the same backset as on the old door. Rout the mortises [Photos G and H].

3 Install the threshold weather strip and hang the door in the opening to check the fit and alignment of the hardware. Remove the door from the opening.

Apply finish and assemble

We used reclaimed Douglas fir joists for our door. But the checks, nail holes, and chipped and missing knots that give this lumber its distinct charm must be filled before finishing. We prefer the quick and easy method shown in the **Skill Builder**, next page.

1 Remove all hardware. Inspect all parts and finish-sand where necessary. Apply a finish to the door frame, uninstalled stops, and panels. (We applied Danish oil to bring out the color and then top-coated with an exterior water-based satin polyurethane after the oil fully cured.)

2 Place the door, inside face up, on your workbench or sawhorses and install the panels (N) [Photo I]. Miter-cut the panel stops to length and install them. (We used a 23-gauge pinner to secure the stops.)

3 Install the insulating-glass panels in the window openings in the same manner as the panels (N).

Note: To avoid ongoing maintenance problems, use a clear finish only for doors protected from direct sun by a porch roof, recessed entry, or northern orientation. We recommend painting a door exposed to direct sunlight.



I

Insert ¼" caulk-backer rod between the panels and frame all around to prevent air infiltration and keep the panels from rattling due to seasonal shrinkage.

4 Reinstall all the hardware and hang the door in the opening. Take a walk out to the curb, turn around, and soak in the new look.

SKILL BUILDER

Quickly turn fissures into features

To fill knots and other nonstructural defects in wood we often use colored epoxy. But here's a way that avoids the expense, mess, multiple applications, and downtime waiting for epoxy to cure: brown hot glue sticks (available in other colors) from Surebonder [Source]. The photos

show the two simple steps. A glue gun fitted with a long tip [Source] ensures complete fill of deep voids. With the glue trimmed flush, finish-sand as usual, taking care not to pause the sander over the filled areas.



Even careful layout of parts leaves a few imperfections in workpieces cut from reclaimed Douglas fir joists.



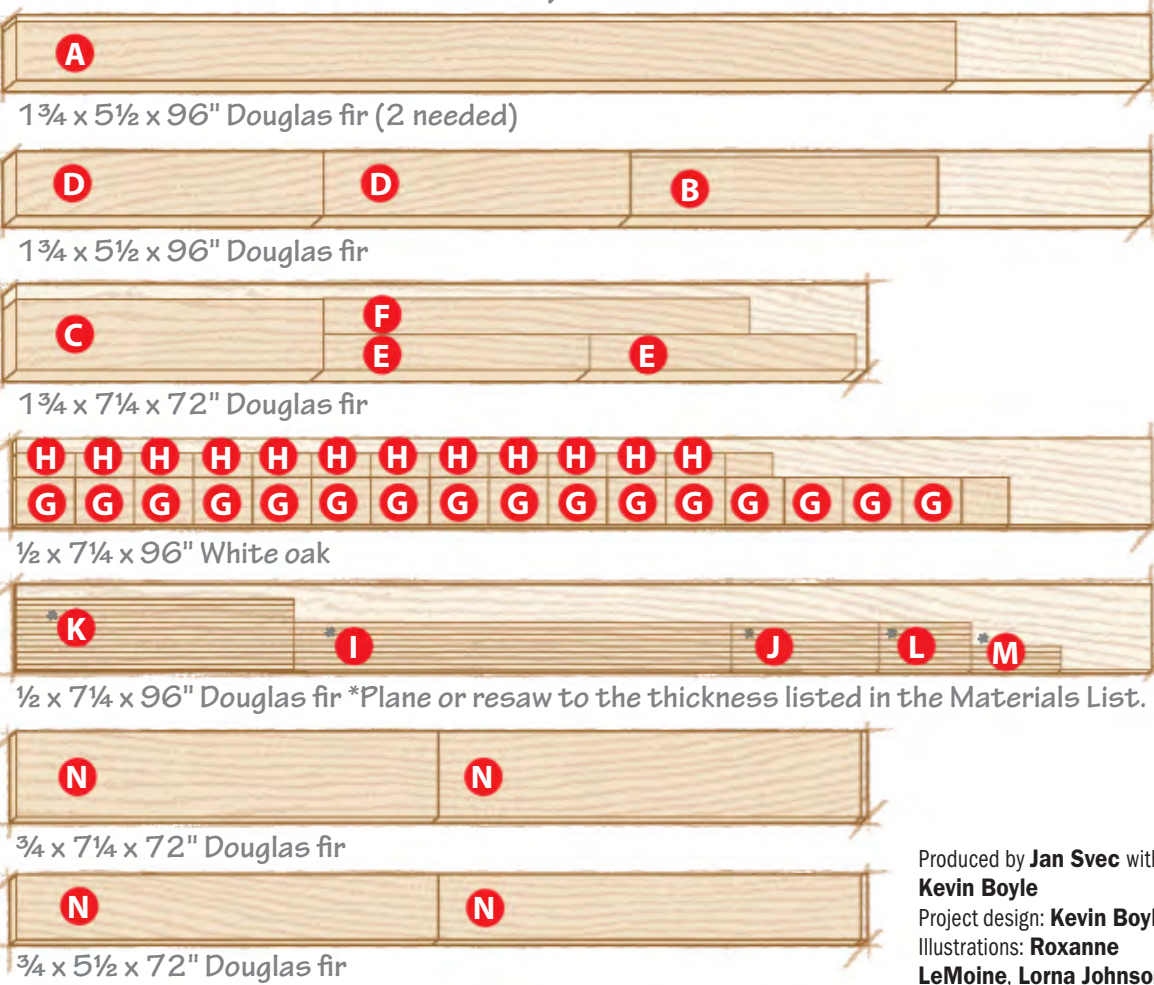
Inject hot glue into cracks and voids, gradually overfilling them. Allow the glue to cool fully.



Pare excess glue flush with the surface. Do not remove excess glue with heavy sanding. The heat of sanding softens and smears the glue.

Cutting Diagram

This project requires 32 board feet of 8/4 Douglas fir, 7 board feet of 4/4 Douglas fir, 5 square feet of 1/2" Douglas fir, and 5 square feet of 1/2" white oak.



Materials List

Part		FINISHED SIZE				Qty.
		T	W	L	Matl.	
A	stiles	1 3/4"	5"	79 1/2"	DF	2
B	upper rail	1 3/4"	5"	26"	DF	1
C	middle rail	1 3/4"	6"	26"	DF	1
D	lower rail	1 3/4"	10"	26"	DF	1
E	upper mullions	1 3/4"	3"	22 1/2"	DF	2
F	lower mullion	1 3/4"	3"	36"	DF	1
G*	large tenons	1/2"	4"	4 7/8"	WO	16
H*	small tenons	1/2"	2"	4 7/8"	WO	12
I*	vertical panel stops	3/8"	1/2"	36"	DF	8
J*	horizontal panel stops	3/8"	1/2"	11 1/2"	DF	8
K*	vertical glass stops	3/8"	1/2"	22 1/2"	DF	12
L*	outer horizontal glass stops	3/8"	1/2"	6 1 1/16"	DF	8
M*	center horizontal glass stops	3/8"	1/2"	6 5/8"	DF	4
N	panels	3/4"	11 1/4"	35 3/4"	DF	2

*Parts initially cut oversize. See the instructions.
Materials key: DF-Douglas fir, WO-white oak.
Supplies: 1/4" caulk-backer rod (34'); **5/8x6 7/16x22 1/4" low-E, tempered, insulating-glass panels (3); 1" micro pins.
**Glass dimensions depend on the dimensions of your window openings.
Bits: Two-flute, 1/2"-shank, 1/2"-diameter, 2 1/2"-cut-length, straight; 1/4" round-over; 45° chamfer; 1/2" mortise; and top-bearing pattern router bits.
Source: Brown hot-glue sticks, 5/16x4", 12 pack no. CO-12BRWN, \$2.99 pk.; 7/16x4", 6 pack no. CO-6BRWN, \$2.99 pk.; professional 100-watt, high-temperature, full-size glue gun no. PRO2-100, \$37.49; needle extension nozzle no. 103N, \$5.99. Surebonder, 800-860-3838, surebonder.com.

Produced by Jan Svec with Kevin Boyle
Project design: Kevin Boyle
Illustrations: Roxanne LeMoine, Lorna Johnson

No Tablesaw? No Problem

Woodworking existed long before tablesaws. And although today's shops tend to center on a tablesaw, you can still do superb woodworking without one. Here's how.



A

An edge guide attached to a circular saw helps you rip pieces to identical width.

Ripping

For cutting a board lengthwise, if the board has no true edge to begin with, turn to a tracksaw, or a circ saw with a straightedge guide. If the workpiece has a straight “factory” edge already, as sheet goods do, an edge guide may be a better choice [Photo A].

A well-tuned bandsaw with a fence can turn out straight rips as well, but the sawn edge typically needs cleanup [Photo B]. To cut several pieces of identical width, rip each one over-width, then joint one edge and plane their opposite edges as a group [Photo C].

► Joint edges on the router table.

woodmagazine.com/rtjointer



B

Ripped with a 5-tpi blade, this bandsawn edge needs jointing or planing before it is ready for glue-up.

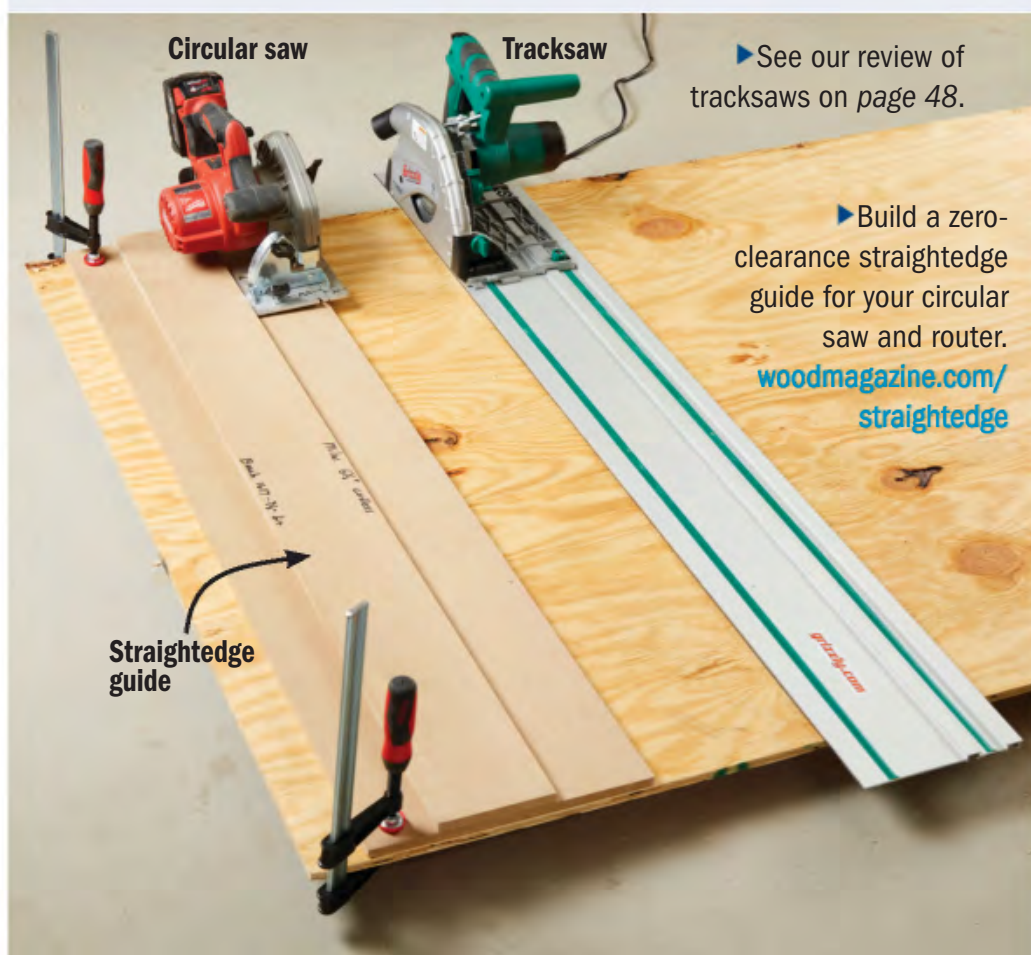


C

Stack several workpieces face to face to stabilize the group and run them on edge through a planer.

A circular saw or tracksaw?

Two tools discussed in this article work similarly: a circular saw guided by a shop-made straightedge, and a tracksaw. Which you choose may come down to budget. Find circular saws for as little as \$40, then construct a straightedge guide from scrap sheet goods. Spend a \$300 minimum for a tracksaw and you'll get a saw with plunge action, a blade that tilts for bevels while still aligning with the guide's cutline indicator, the accuracy of a saw mated to a guide, better dust collection, and in some instances, clamp-free operation.



Circular saw

Tracksaw

► See our review of tracksaws on page 48.

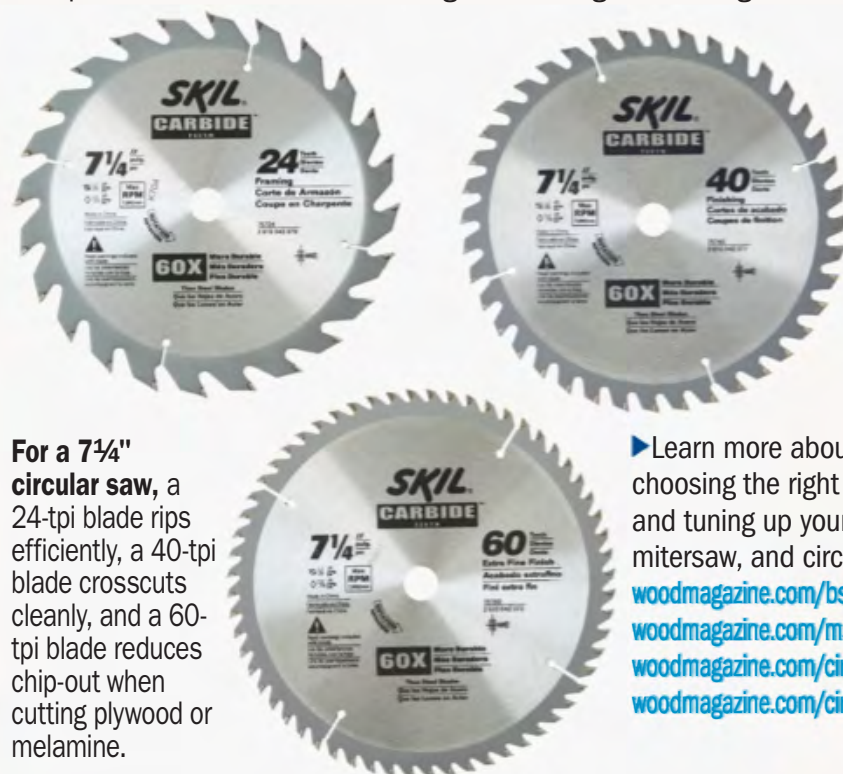
► Build a zero-clearance straightedge guide for your circular saw and router.

woodmagazine.com/straightedge

Straightedge guide

Pick the right blade for the job at hand

When choosing a saw, equip it with the right blade. For crosscuts, higher tooth counts (teeth per inch, or tpi) produce smoother sawn surfaces. Ripping requires fewer tpi to allow space between them to carry away the sawdust. Even the best blade dulls with use, so sharpen or replace it as soon as it shows signs of having lost its edge.



For a 7¼" circular saw, a 24-tpi blade rips efficiently, a 40-tpi blade crosscuts cleanly, and a 60-tpi blade reduces chip-out when cutting plywood or melamine.

► Learn more about choosing the right blades and tuning up your bandsaw, miter saw, and circular saw.

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D An auxiliary fence prevents chip-out on the rear edge of the workpiece. Adding a stopblock simplifies cutting identical-length boards.

Crosscutting

► Learn basic miter saw operations. woodmagazine.com/mitersawbasics

Cutting boards across the grain is best accomplished with a well-set-up miter saw [Photo D]. For boards wider than the miter saw's capacity, reach for a handsaw, circular saw [Photo E], or tracksaw.

You can also use the bandsaw for boards narrow enough to fit between the blade and front edge of the table, and short enough to feed steadily [Photo F].



E A rafter square provides an accurate guide for crosscutting with a circular saw. Adding an extension and a stop helps you cut pieces to identical length.

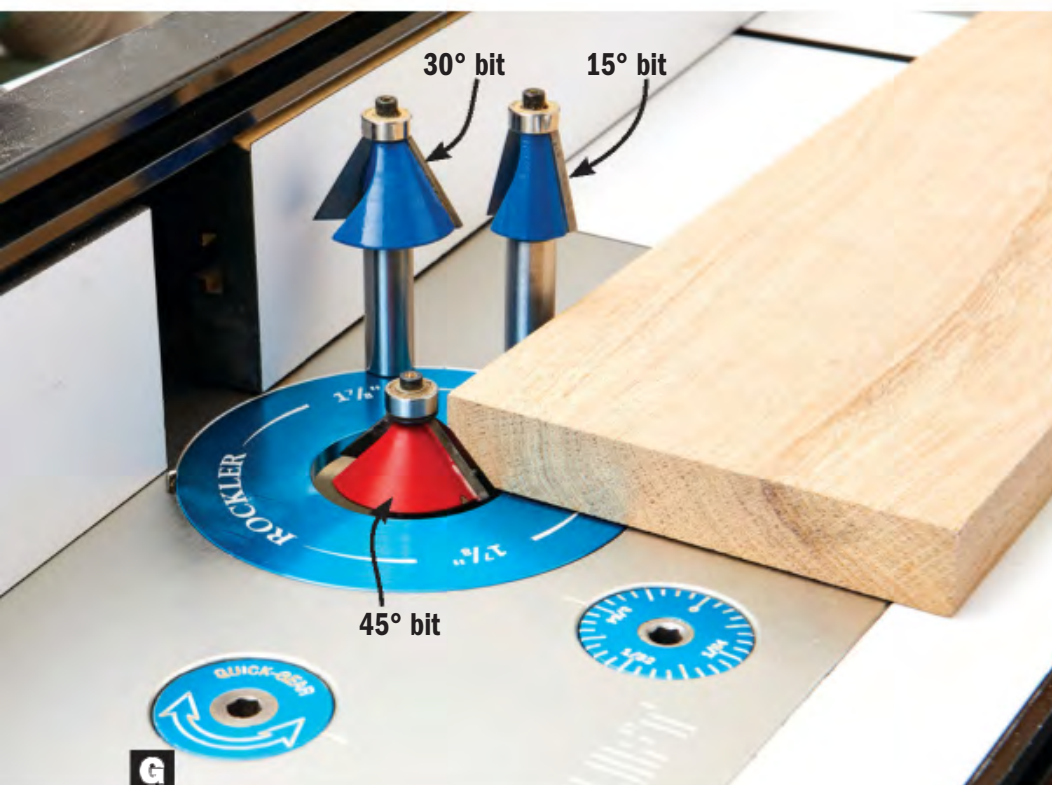


F Guide a workpiece with a miter gauge when crosscutting on the bandsaw. A stand to the side helps support long workpieces.

Bevels

To bevel or chamfer stock up to $\frac{3}{4}$ " thick, choose a chamfer bit [Photo G] in either a handheld or table-mounted router. For other angles, or for wider bevels, turn to a

guided circ saw or tracksaw. You can also tilt the bandsaw table, guide the workpiece with a fence [Photo H], and clean up the cut with a few passes from a hand plane.



G Find chamfer bits in standard angles of 15°, 22.5°, 30°, 45°, and 60°.



H For best workpiece stability, place the fence below the blade and bevel the edge opposite the fence. This scrapwood fence accommodates a wider workpiece than the factory-supplied fence.

Dadoes, grooves, and rabbets

Use a straight bit in the router table or a handheld router to cut dadoes (a U-shape channel cut *across* the grain) [Photo I]; grooves (a U-shape channel cut *with* the grain) [Photo J]; and rabbets (an L-shape cut along the edge or end of a board) [Photo K].

► Get free instructions for the dado jig.
woodmagazine.com/dadojig



J

This jig adjusts to match the thickness of the piece being seated in the groove. Using a straight bit and guide bushing to guide the cut allows for routing shallow grooves and dadoes.



I

Guide a handheld router with a straight bit along a zero-clearance straightedge. The same technique cleans up rough edges for edge-to-edge glue joints.

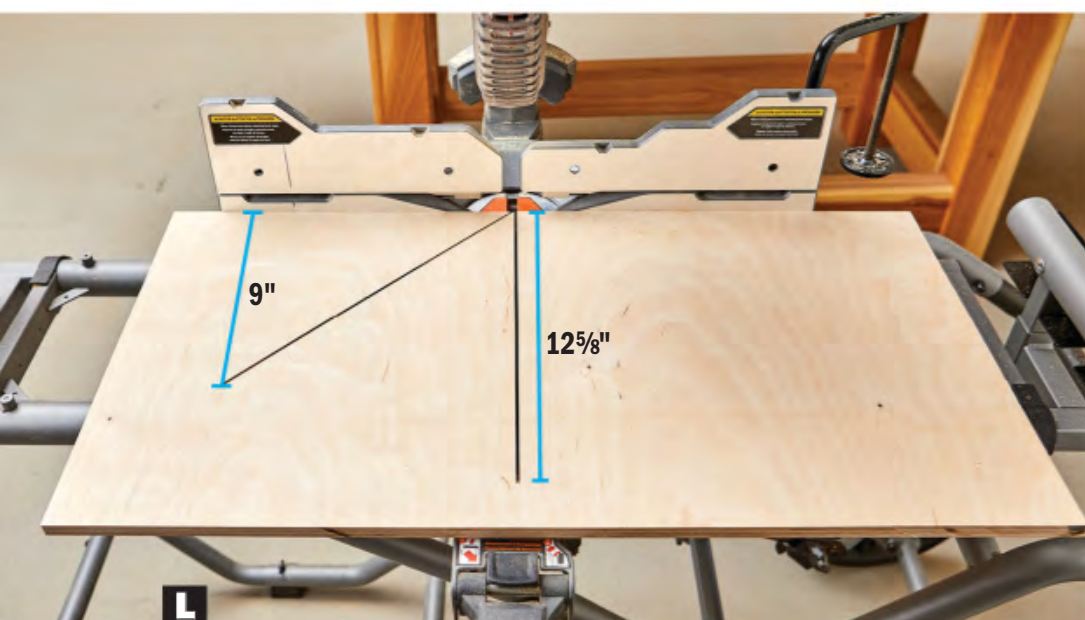


K

A sharp rabbeting bit cuts a smooth wall and bottom. Swap out the bearing to cut rabbets of different widths.

Miters and beveled crosscuts

A miter saw makes easy work of crosscutting a board at an angle across its face (a miter) or through its thickness (a bevel), although crosscut capacity decreases as the miter angle increases [Photo L]. Detents lock the blade at common angles, such as $22\frac{1}{2}^\circ$, 30° , and 45° . Sliding miter-saws provide the most capacity, with 12" sliders maxing out around 13" at 90° , when cutting $1\frac{1}{2}$ "-thick stock. For wider boards or panels, tilt the shoe of a circ saw or tracksaw.



L

At 90° , this 10" sliding miter saw cuts $12\frac{5}{8}$ ". Turned to a 45° miter, the capacity falls to 9".

Tapers

Cut tapers at the bandsaw [Photo M], and clean up the sawn face with a few strokes from a hand plane.



M

Mark the taper on the workpiece, then cut just along the waste side of the line. Smooth the cut edge to the line using a jack plane.



3 stacked workpieces

N

Align clean-cut edges, if possible, then trim the opposite edges. A 7¼" circular saw will cut 2½" deep.



Finished-size workpiece

Rough-cut workpiece

O

Stack and clamp a template or properly sized piece on a rough-cut piece. A flush-trim router bit mills the oversize panel for a perfect match.

Sheet goods and panels

Size sheet goods and glued-up panels with a circ saw and straightedge, or a tracksaw. To create identical-size parts, cut them slightly oversize, then stack several, clamp them or

apply double-faced tape between them, and cut all to final size at the same time [Photo N]. Create additional matched parts using a router and flush-trim bit [Photo O].

Joinery

The tablesaw cuts clean, accurate tenons, half-laps, box joints, and more. But these joints and others can be accomplished by other methods.

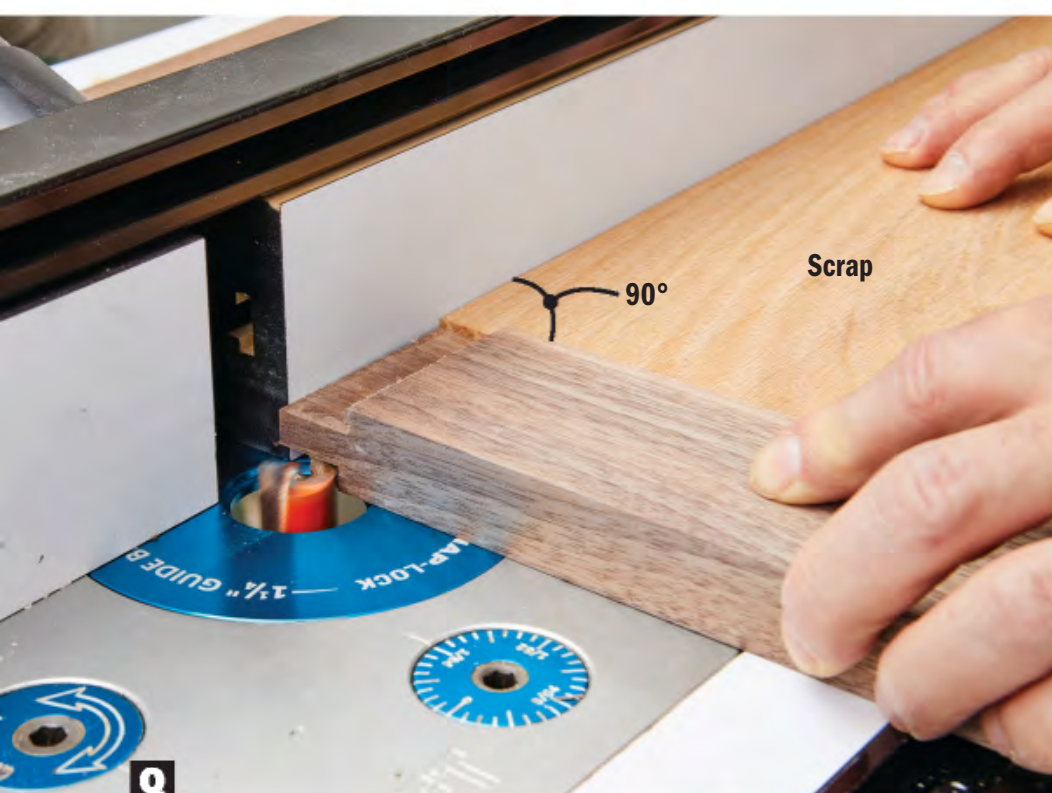
► Cut both the mortise and tenon on the router table. woodmagazine.com/routermortisetenon

Tenons: Set up your bandsaw with a fence and stopblock [Photo P], use a straight bit in the router table [Photo Q], or cut them with a handsaw [Photo R].



P

Measure from the fence to the opposite face of the blade to determine the thickness you'll remove from the cheek. A stop sets the tenon length. Bandsaw or handsaw the shoulder.



Q

Adjust the fence to set the tenon length, measuring to the far side of the bit. Guide the workpiece with a miter gauge or scrap with a square corner. Raise the bit height in small increments to sneak up on the fit.



R

The reinforced spine of a backsaw resists flexing, helping the blade track true. Practice cutting to a line on scrap to hone your skills.



S Set up the same as for cutting a tenon, sneaking up on the bit height until the faces of the dry-fit workpieces rest flush.

Half-laps: A straight bit in the router table allows fine-tuning the joint as you work for a flush fit on both faces [Photo S].

► Buy plans for the box-joint jig.
woodmagazine.com/boxjointjig

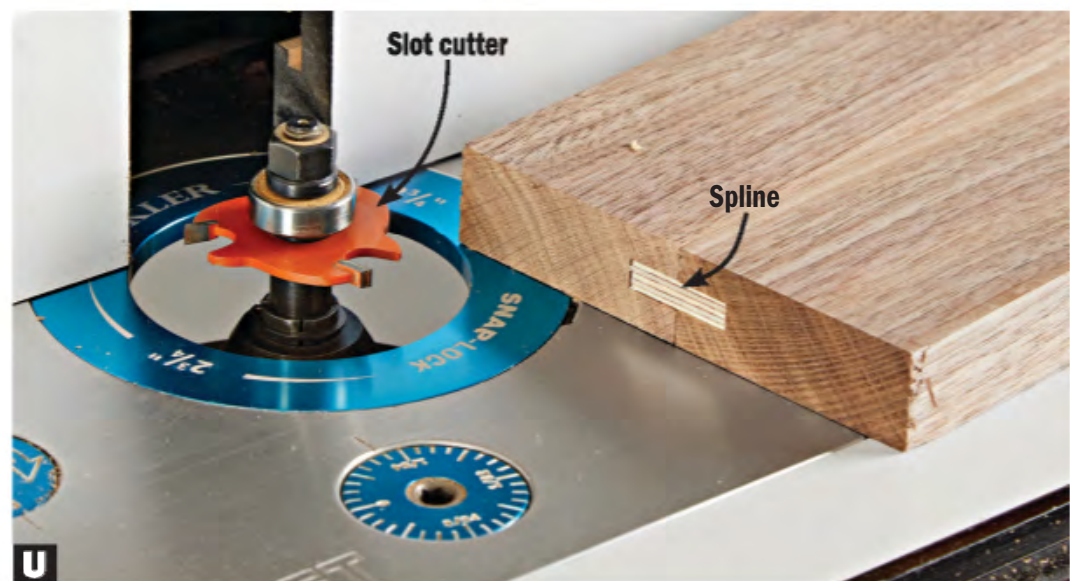
Box joints: A box-joint jig works just as well on a router table as on a tablesaw [Photo T]. Fingers must match the width of a router bit.

Splines: Cut a groove the length of an edge at the router table [Photo U]. Strengthen and dress up miter joints by routing slots through them [Photos V, W], then gluing in splines. 🌲

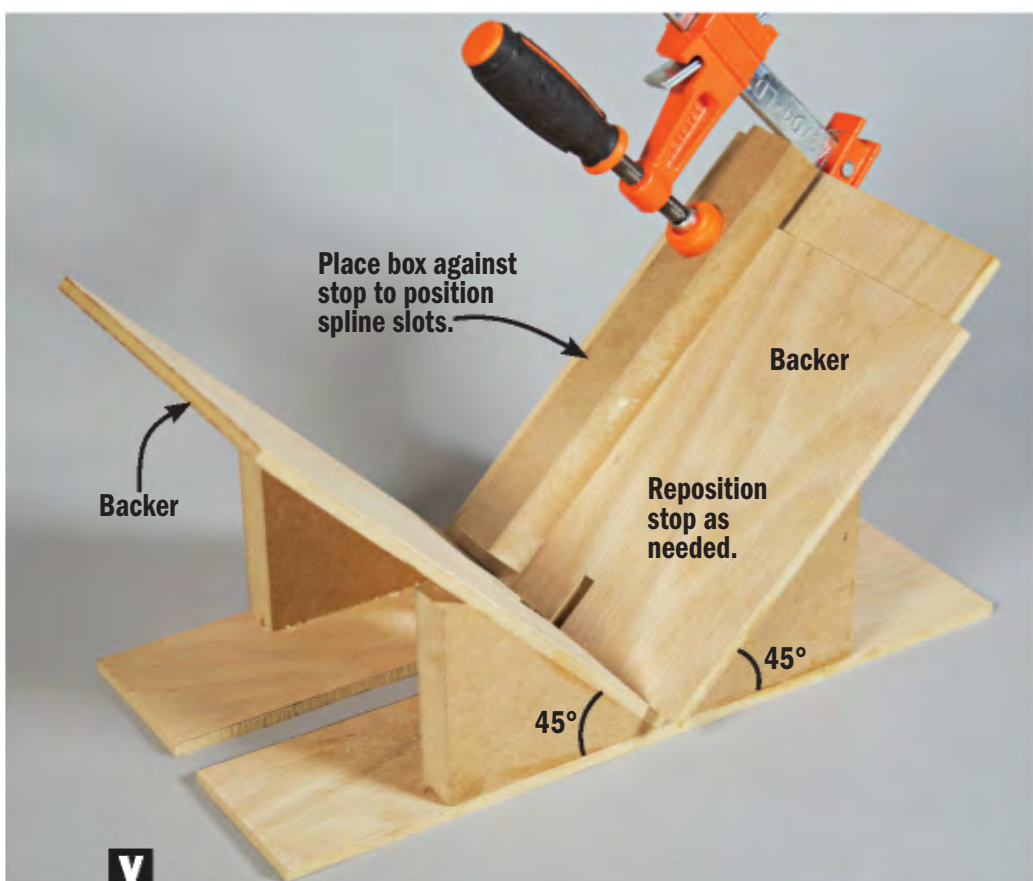
Produced by **Craig Ruegsegger**



T This self-guided jig clamps to the router table, so it works on tables that don't have a miter-gauge slot.



U A slot cutter mills mating grooves that accept a spline to help align boards during glue-up.



V To reinforce mitered box corners, build a cradle from scrap plywood or MDF to fit your project. Ensure that the two backers rest square so the box won't shift as you rout the slots.

woodmagazine.com



W Register the jig against the router-table fence. A straight bit cuts the spline slots. Move the stop on the jig to reposition the box to rout additional slots at each corner.

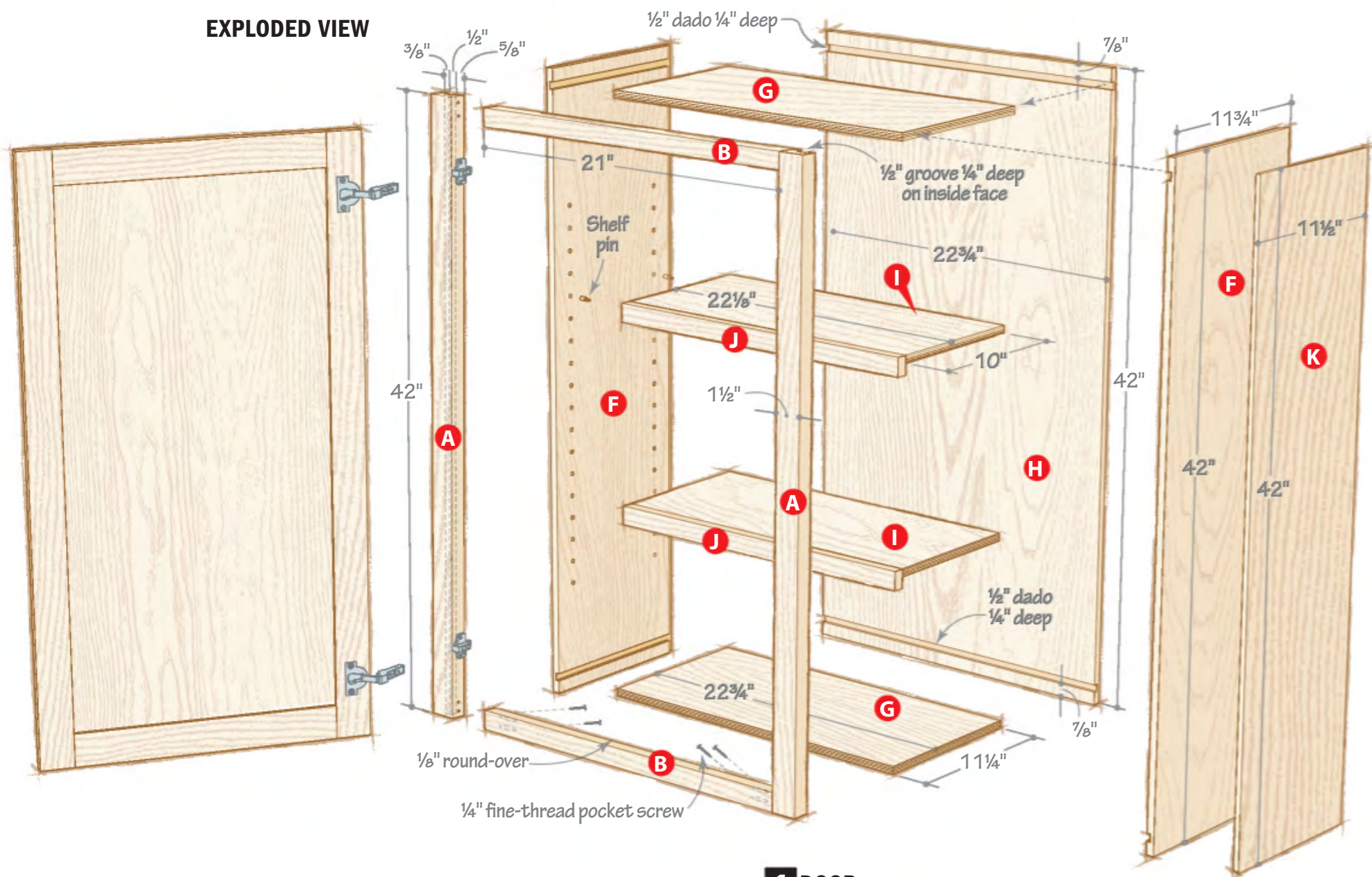
Upper Cabinets Made Easy

Many woodworkers dream of building a shop's or a kitchen's worth of cabinets but find the scope of the project intimidating. Don't panic. Cabinets are just boxes, made especially simple with the method shown here. Together with the article "The Fastest Cabinet You'll Ever Build" (issue 251, Dec./Jan. 2017/2018), you can build and install as many upper and lower cabinets as you need.

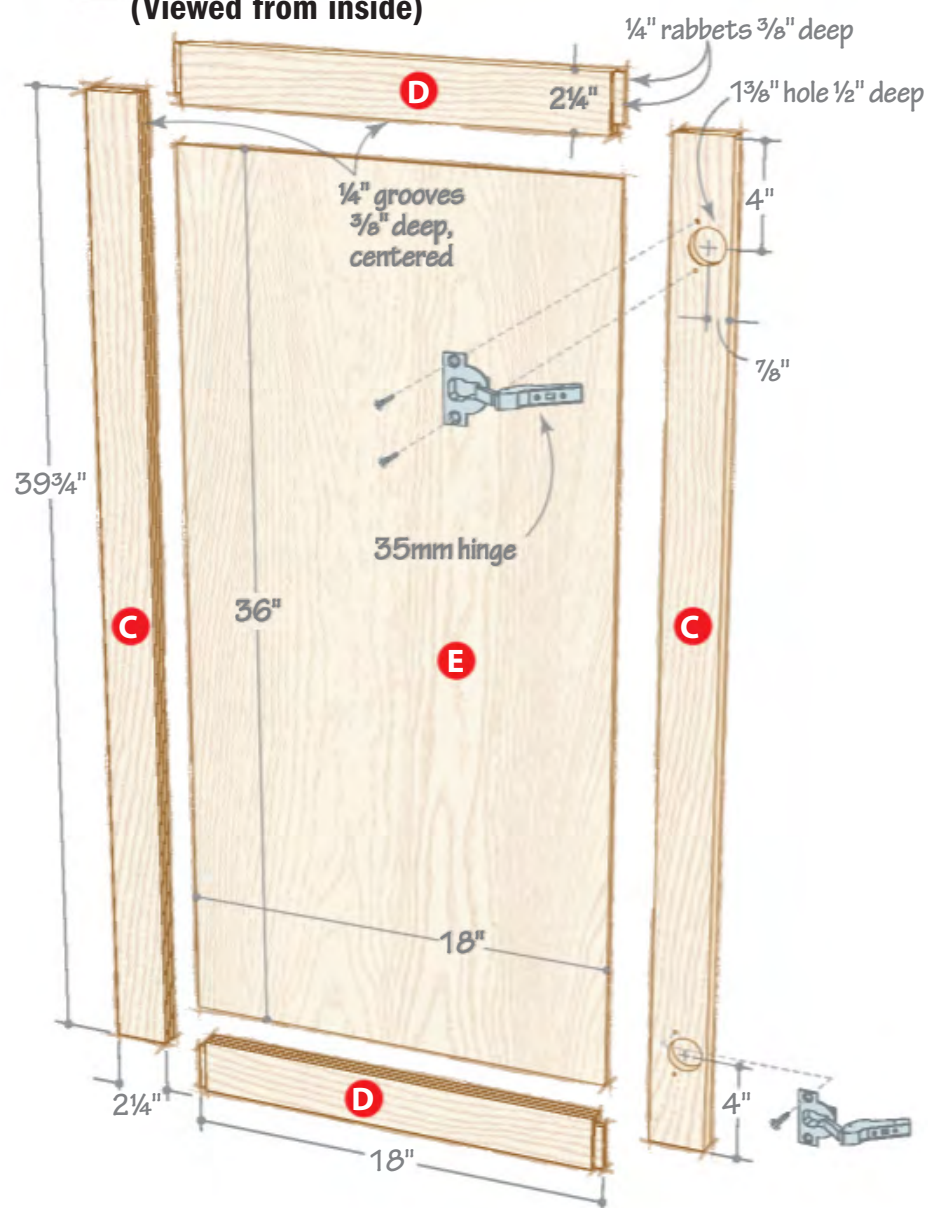
The upper cabinet shown measures 42" tall, allowing installation against an 8'-high ceiling. Adjust the height and 24" width as needed for your purposes. We used solid maple for the face frame and door frame, but any hardwood will do. Using prefinished $\frac{1}{2}$ " maple or birch plywood for the carcass reduces finishing time and improves visibility inside the cabinet. Place the finished face to the inside, then cover any exposed exterior face with a $\frac{1}{4}$ "-plywood show panel to match the door and face frame.



EXPLODED VIEW



1 DOOR (Viewed from inside)



Join four pieces for the face frame

Tip! When building several cabinets, save shop space by building all of the face frames and doors first, and the bulkier carcasses last.

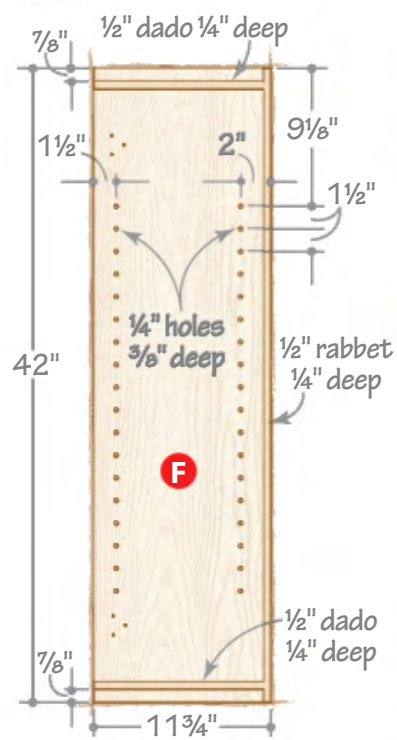
Cut the face frame stiles and rails (A, B) to size [Materials List, page 37], and round over the inside edge of the bottom rail only [Exploded View]. Assemble the face frame with pocket screws, and finish-sand it. You'll cut the grooves in the stiles later.

Make another frame and a panel for the door

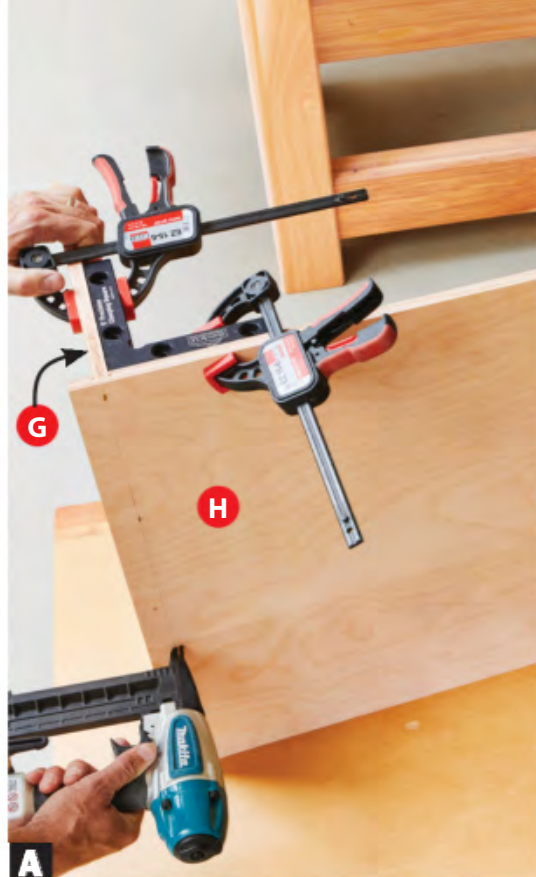
Cut the door stiles and rails (C, D) to size [Drawing 1] and cut the grooves to match the thickness of the plywood for the door panel (E). Rabbet the ends of the rails to create centered tongues to fit the grooves. Cut the panel to fit the dry-assembled door, finish-sand it, then glue up the door. Drill the hinge holes using a Forstner bit, finish-sand the frame, and apply a finish to the face frame and door.

► If you resize the cabinet, make the door 3/4" wider and taller than the face-frame opening.

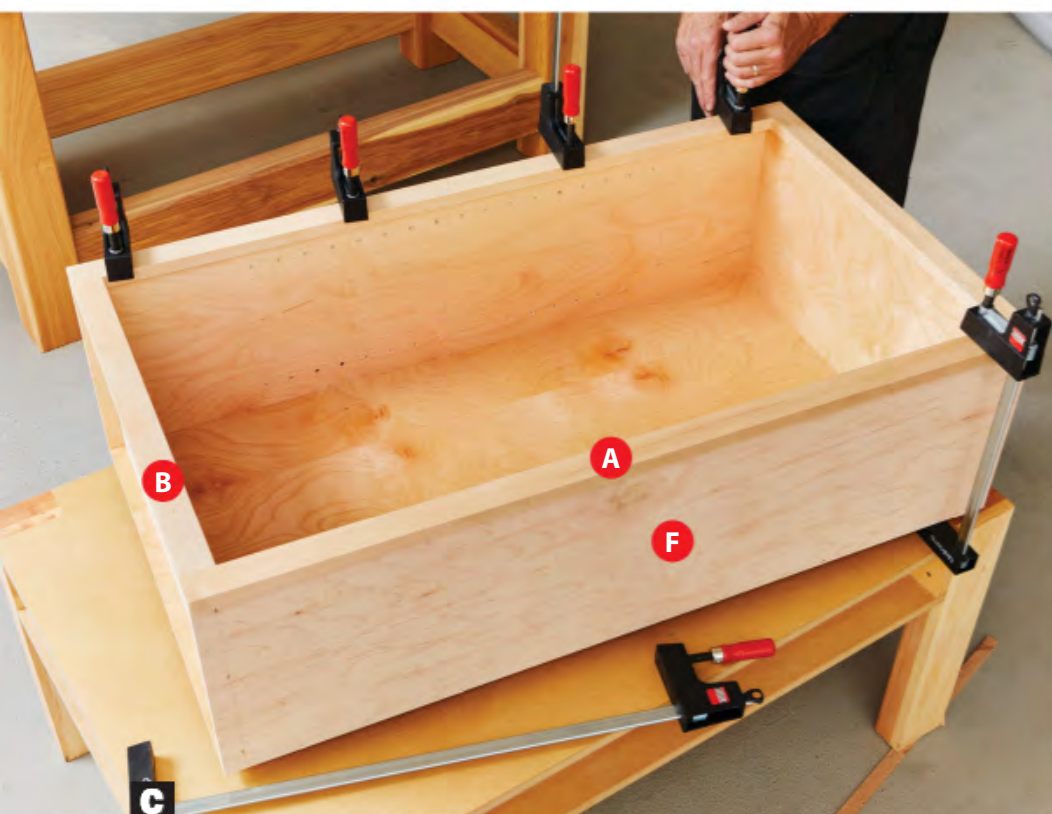
2 SIDE DETAIL



SIDE
(Left side shown, right side is a mirror image)



Glue the top and bottom (G) to the back (H), and secure with 1" narrow-crown staples, or #6 screws. A clamping square helps align the pieces while you work. Then glue and staple each side (F) to this assembly.



Glue the face frame to the carcass, seating the sides (F) in the grooves in the stiles (A). To avoid unsightly holes, do not nail or staple the face frame.

Dadoed panels make the carcass

► Get perfect dados in just two cuts.
woodmagazine.com/perfectdadovid

► Make a simple shelf-pin-hole jig.
woodmagazine.com/shelfpinjig

Cut the cabinet parts (F–J) to size [Exploded View]. Set up your dado blade to match the thickness of your 1/2" plywood. Groove the inside faces of the face-frame stiles (A); dado the cabinet sides and back (F, H); and rabbet the sides (F) [Exploded View, Drawing 2]. Drill the shelf-pin holes.

Put it all together

Assemble the cabinet as shown in Photos A–D. Then, glue the shelf trim (J) to each shelf (I) [Exploded View]. Apply a finish to the shelves and any show panels (K) needed for the visible cabinet sides, then set them aside while you hang your new cabinet.

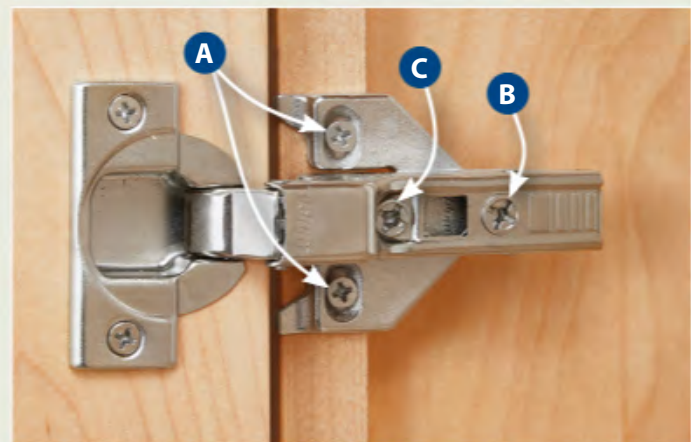


To position the door, clamp a scrap to the face frame, 3/8" below the top edge of the rail (B). Rest the door on the scrap, and screw the hinge plates to the face frame.

SKILL BUILDER

Three-way adjustable hinges align doors perfectly

European (35mm) hinges adjust in three axes, making it easy to fit doors. Loosen screws **A** to shift the door up or down; adjust screw **B** to move the door toward or away from the face frame; and use screw **C** for side-to-side adjustments.





E

A shop-made stand supports the upper cabinet at the desired height while you level it and drive the screws into studs.

SKILL BUILDER

Installing above a counter

If the base cabinet already has a countertop, adjust the height of the stand accordingly, then subtract $\frac{1}{4}$ " from that height. When installing the upper cabinet, rest the stand on a $\frac{1}{4}$ "-thick spacer. Removing the spacer creates room to pull out the stand when the job is done.

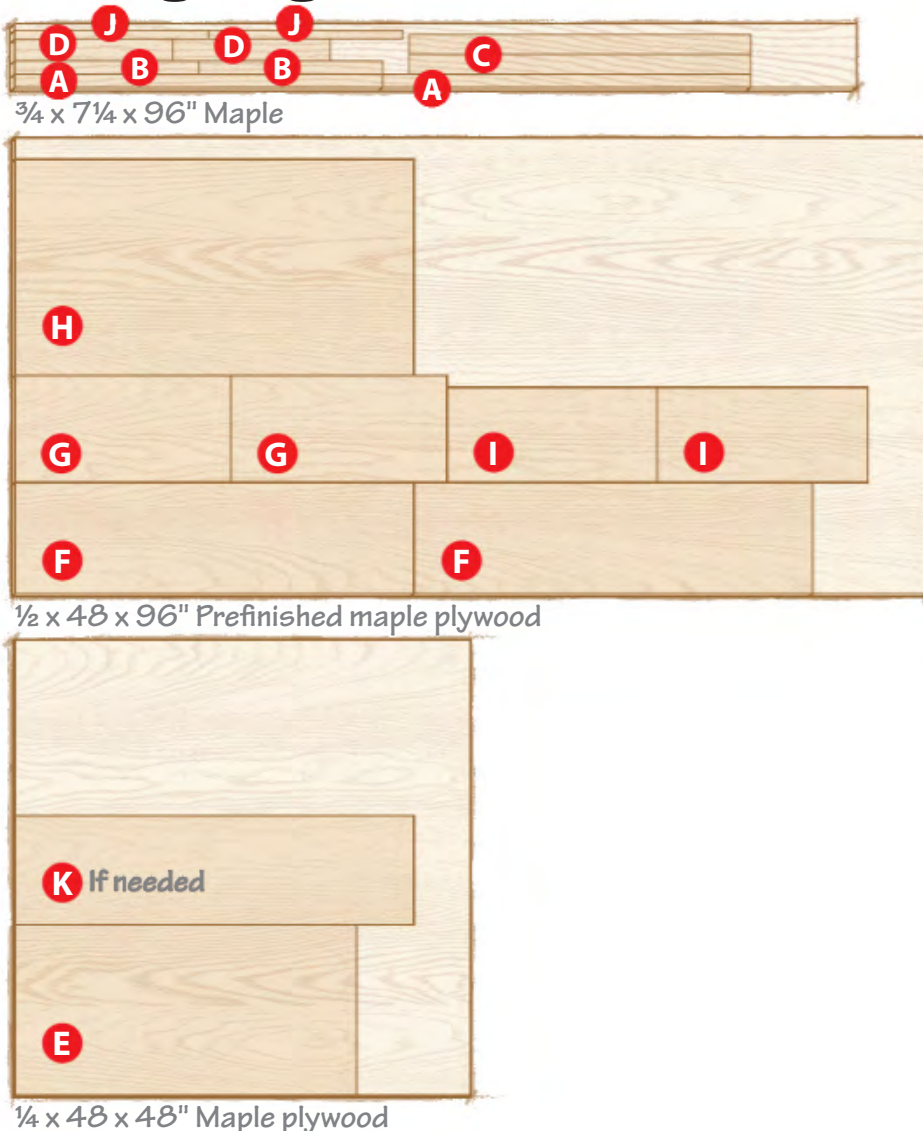


Tip! Avoid marks on the wall by marking stud locations on painter's tape below the upper cabinet.

Hanging the cabinets

Remove the door by unclipping the halves of the hinges. Install any base cabinets first; you'll use them to help install the upper cabinets. If you have no base cabinet, hang the upper cabinet at a comfortable height above the floor—54" is standard.

Cutting Diagram



woodmagazine.com

To install an upper cabinet above a base cabinet, build a $19\frac{7}{8}$ "-tall stand [Photo E], and rest it on the brace of the base cabinet. (If the base cabinet already has a countertop, see the **Skill Builder**, above.) Place the upper cabinet on the stand. Screw the back to the wall studs with 3" screws, then slide the stand out. Snap the door hinges onto the cabinet-half of the hinges, and adjust the door as needed [Skill Builder, previous page]. Glue the show panels to the cabinet and install the shelf pins and shelves. 🌲

Tip! Coat the tips of the screws in wax so they install easier.

Materials List

(for one cabinet 42" tall and 24" wide)

Part	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A face-frame stiles	$\frac{3}{4}$ "	$1\frac{1}{2}$ "	42"	M	2
B face-frame rails	$\frac{3}{4}$ "	$1\frac{1}{2}$ "	21"	M	2
C door stiles	$\frac{3}{4}$ "	$2\frac{1}{4}$ "	$39\frac{3}{4}$ "	M	2
D door rail	$\frac{3}{4}$ "	$2\frac{1}{4}$ "	18"	M	2
E door panel	$\frac{1}{4}$ "	18"	36"	MP	1
F side	$\frac{1}{2}$ "	$11\frac{3}{4}$ "	42"	PMP	2
G top/bottom	$\frac{1}{2}$ "	$11\frac{1}{4}$ "	$22\frac{3}{4}$ "	PMP	2
H back	$\frac{1}{2}$ "	$22\frac{3}{4}$ "	42"	PMP	1
I shelf	$\frac{1}{2}$ "	10"	$22\frac{1}{8}$ "	PMP	2
J shelf trim	$\frac{3}{4}$ "	1"	$22\frac{1}{8}$ "	M	2
K* show panel	$\frac{1}{4}$ "	$11\frac{1}{2}$ "	42"	MP	1

*If needed.

Materials key: M-maple, MP-maple plywood, PMP-prefinished maple plywood.

Supplies: $1\frac{1}{4}$ " fine-thread pocket screws, door pull, $\frac{1}{4}$ " shelf pins (8), #8x3" panhead screws.

Blade and bits: Dado set; $1\frac{3}{8}$ " (35mm) Forstner bit; $\frac{1}{8}$ " round-over bit.

Sources: Blum 110° soft-close hinges (2), no B071B3650, \$5.62 each, Woodworker's Hardware, 800-383-0130, wwhardware.com.

Produced by **Craig Ruegsegger** with **Kevin Boyle**
Project design: **Kevin Boyle**
Illustrations: **Roxanne LeMoine, Lorna Johnson**

Applying a Shellac Finish



by Jim Heavey

Exaggeration: We're bombarded by it. Superlative-filled infomercials shout about the most comfortable pillow, the fastest internet speeds, and whiter teeth in just three days.

But what if I told you of an age-old wood-working finish that imparts a beautiful luster to any wood; builds and dries quickly; creates a strong bond for topcoats; eliminates blotching; and blocks smoky or musty odors from cherished antiques. Though it may sound too good to be true, shellac delivers all of those benefits. But wait...there's more!



A Find shellac in flake or button form. Button shellac creates a more mar-resistant finish than flakes but comes only in darker hues.



B The finish on this sample of figured bubinga veneer shows how well shellac (orange, in this case) enhances the look of any wood by adding color and depth.

The secret ingredient

► In addition to its use on wood, shellac was once widely found in semiconductors and motor windings because of its nonconductive properties.

Shellac originates with the lac beetle, mainly in India and Thailand. Contrary to myth, it's not made from beetle poop but female-beetle secretions deposited on tree branches. Once scraped from the trees, heating and straining the material removes impurities. It's then rolled out into sheets to cool and dry. Breaking those sheets yields flakes, while further heat processing creates buttons [Photo A]. Each form dissolves in denatured alcohol, creating a liquid finish.

Depending on the type of tree upon which the beetles feast, natural shellac colors range from a dark garnet through brown, red, orange, and yellow. Amber and orange shellacs impart a warm, rich look to dark woods such as walnut, cherry, and mahogany [Photo B]. Bleached shellac imparts clear, light-

blonde and super-blonde shades. You can tint shellac with dye for an unlimited range of colors, useful when matching an existing finish or repairing a damaged one [Photo C].

Though not as durable as polyurethane or varnish, shellac proves much easier to repair. All shellac products produce a gloss sheen.

Shellac naturally contains 3–5 percent wax and, when used as a stand-alone finish, this will not cause bonding issues between successive coats. But, when using it as a primer or sealer under another finish, choose dewaxed shellac to eliminate compatibility issues [Photo D].

Tip! Buff with 0000 steel wool to create a satin sheen.

So simple, anyone can mix it

Shellac is mixed in “cuts” which refer to the proportion of shellac flakes (measured in



C Measure carefully when using powdered and liquid dyes or universal tinting colors (UTCs), and make more solution than you need. It can be difficult to precisely replicate a color in subsequent batches.



D Wax-free shellac works for any application because it bonds to nearly everything and nearly everything bonds to it.



E **Pulverizing shellac flakes** or buttons in a coffee grinder reduces dissolve time to about 6 hours.

- ▶ Don't need a gallon of shellac? Mix 1, 2, or 3 oz of flakes with 8 oz of alcohol for a 1-, 2-, or 3-pound cut.

pounds) to solvent (measured in gallons). So, 1 pound of flakes mixed in 1 gallon of alcohol makes a 1-pound cut. A 2-pound cut would be slightly thicker and provide a quicker build. Very seldom does a mixture go beyond a 4-pound cut.

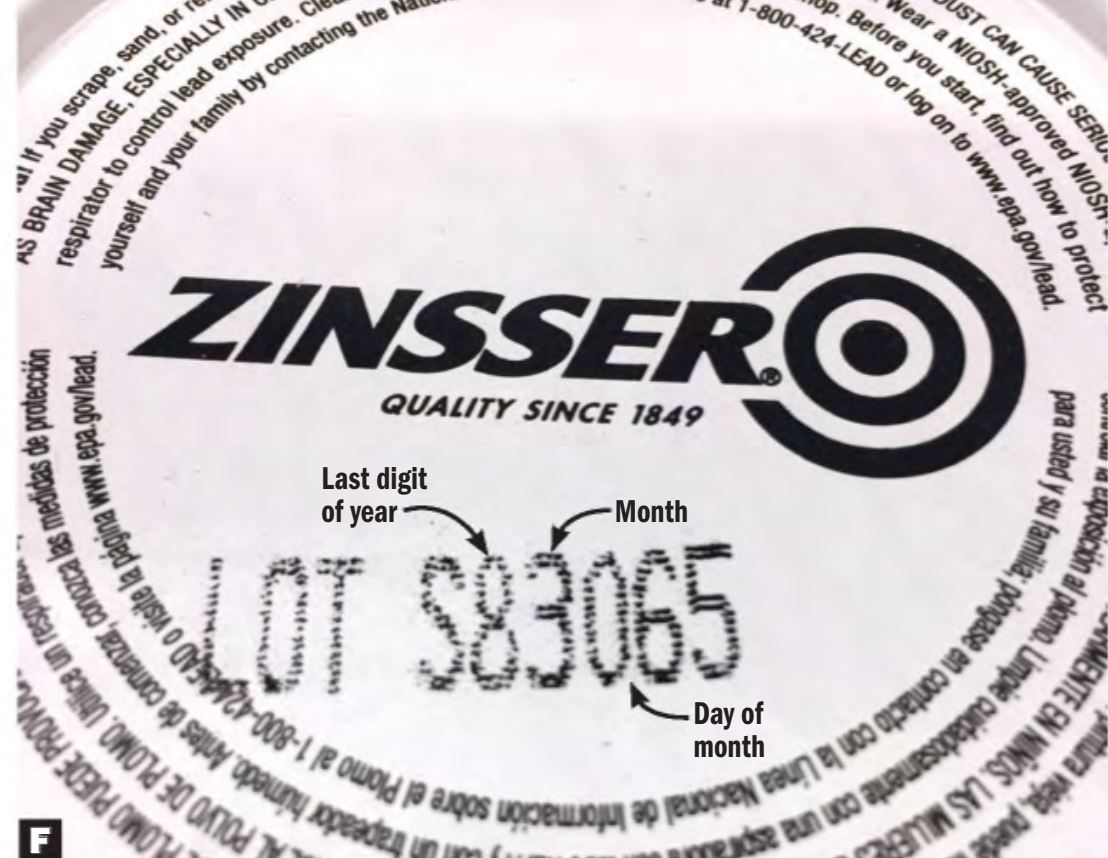
Making your own solution from flakes provides a fresh finish in your preferred consistency, and you can choose between wax and dewaxed solutions. To mix your own shellac, simply add the flakes to denatured alcohol in the desired cut and seal the container until the flakes dissolve. This usually takes about 24 hours. Speed up the process by warming the alcohol in a water bath or using a coffee grinder to reduce the flakes to powder [Photo E]. Strain the finished solution to remove any undissolved material.

The cut found in premixed shellac may vary, so check with the manufacturer for information on its formulation. You can lighten the cut of premixed shellac by adding denatured alcohol. Premixed shellac lasts about 3 years on the shelf. Check the dates on the cans [Photo F], or test the solution to make sure it's fresh [Photo G].

Ultra-easy application

Whether sprayed, brushed, or padded on, shellac dries quickly at optimal conditions of 70°F and 50–70 percent humidity. Though it dries to the touch in about 30 minutes, allow 1 hour between coats. Each coat dissolves into the previous one, creating a single, thicker coat, so don't sand between coats to enhance bonding, as with varnish or urethane finishes.

An aerosol can of shellac provides the simplest application method [Photo H].



F **The first number in the code** on top of a can of Zinsser shellac indicates the year of manufacture. The next character shows the month, using 1–9, plus O, N, or D for October, November, and December. The next two numbers indicate the day of the month. This batch was created on March 6, 2018.

Choose it for intricate projects where brushing would be difficult. Spray on multiple light coats rather than one heavy coat.

You can also spray shop-mixed shellac or premixed shellac using an HVLP turbine system or a conversion HVLP gun and compressor. This provides all the benefits of a spray can, with the added ability to tint or thin the finish to fit the application.



G **Check the freshness of pre-mixed shellac** by placing a drop of a well-stirred finish on a piece of glass. Within 30 minutes, the shellac should dry to a hard finish. If it stays tacky, discard the batch.



H

Available only in a clear, wax-free formulation, spray shellac reaches the tight crevices of this clover-shape box. Shellac's quick dry time reduces runs.

You also can brush on shellac [Photo I]. Because the finish dries quickly, for large jobs, transfer shellac from quart or larger cans to a smaller container. Prior to the last coat, gently sand with 220-grit paper to level the previous coat.

► Learn French polishing in this free video.
woodmagazine.com/frenchpolish

Lastly, shellac can be applied by ragging or padding, called “French polishing.” Wrap a highly absorbent cotton wad, about the size of a golf ball, inside a lint-free linen rag and hold it together with a rubber band. (It resembles a badminton birdie when complete.) Add shellac to the rounded end using a squeeze bottle, and move the pad in light side-to-side or figure-eight strokes over the surface of the project [Opening photo]. As the pad dries, it will begin to drag rather than glide across the workpiece. Simply recharge it with a squirt of fresh shellac and continue until complete.

Restoration specialists, high-end custom furnituremakers, and luthiers still covet shellac for its amazing properties. Go ahead and try it on that special heirloom project you have in mind. 🌲



I

Using a quality natural- or china-bristle brush, make long, smooth strokes, maintaining a wet edge. Do not overbrush. Clean brushes with denatured alcohol.



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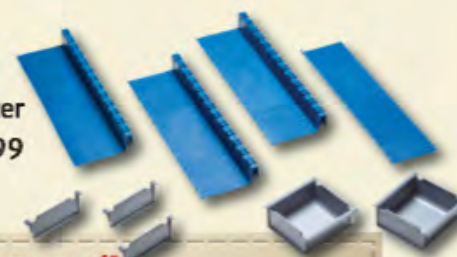


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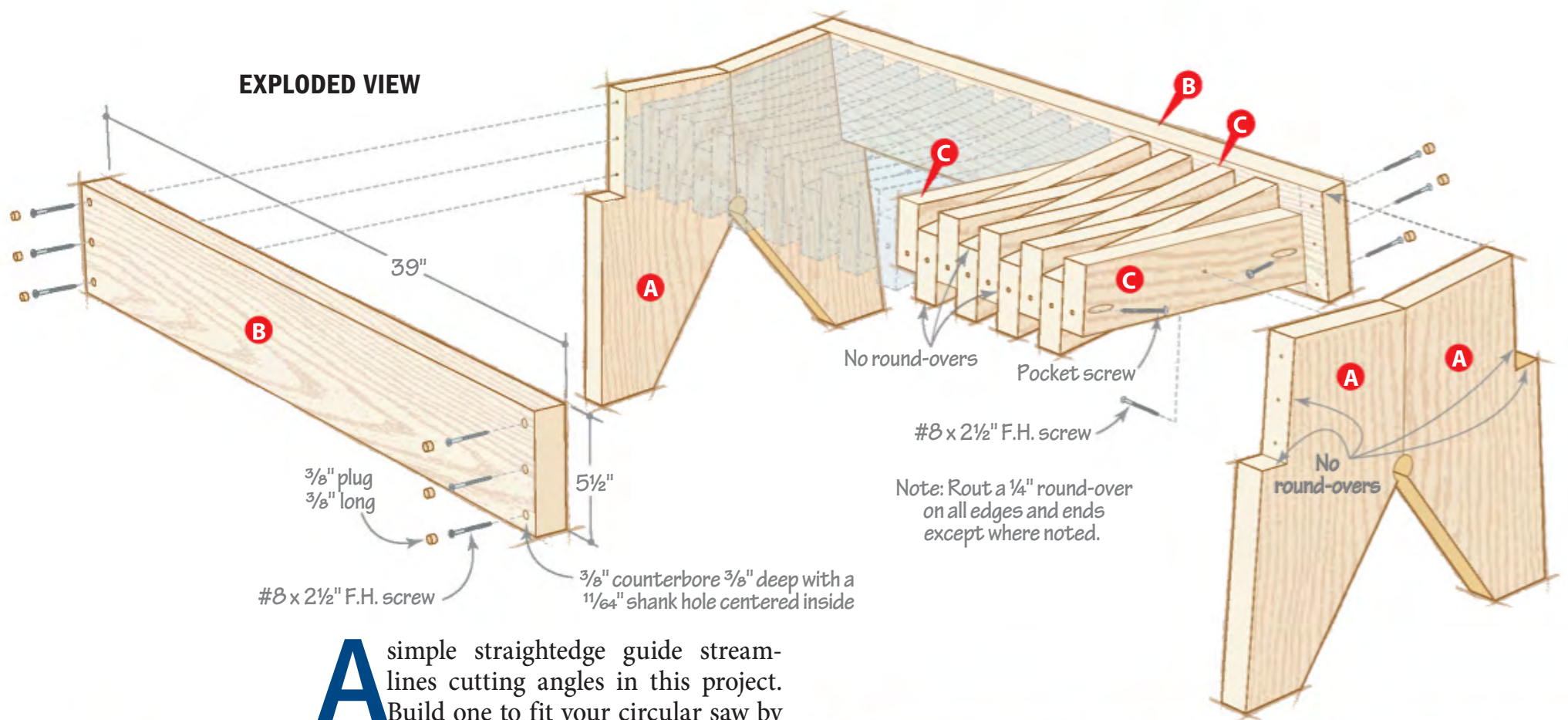


D I M E N S I O N S :
39" W x 19" D x 17" H

Approximate materials cost:

\$40

24
slats
form the
seat



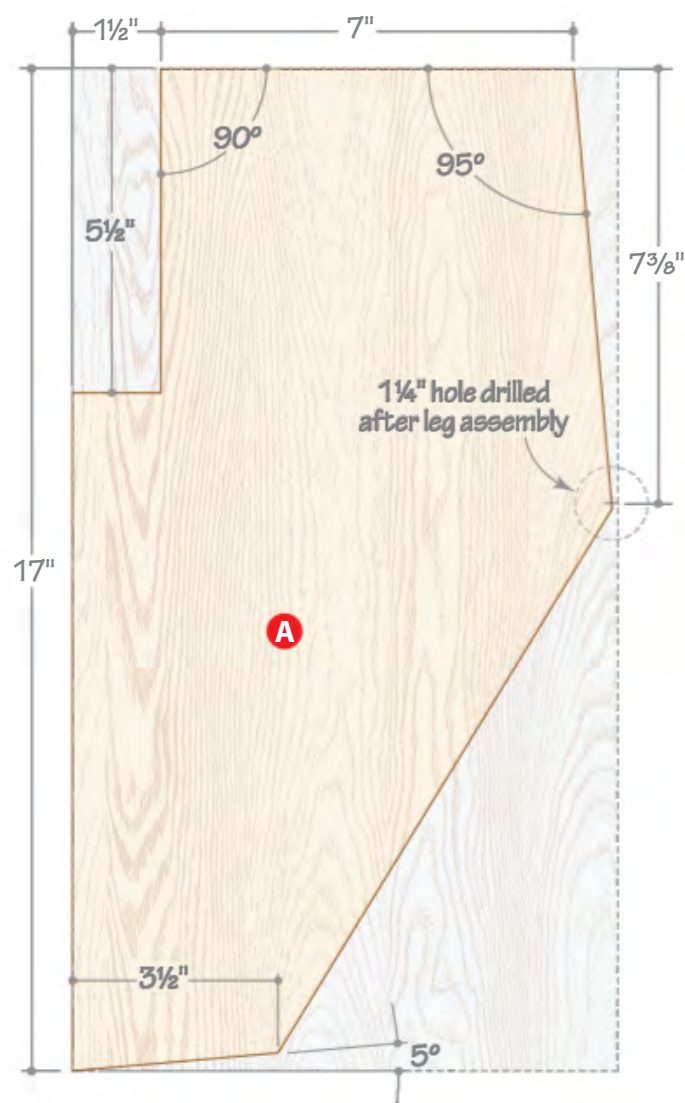
► Watch a video on making a straightedge. woodmagazine.com/straightedge

A simple straightedge guide streamlines cutting angles in this project. Build one to fit your circular saw by first making a 10x30" base from 1/4" plywood or hardboard. Glue on a strip of the same material to serve as a fence, positioned slightly farther from one edge than your saw's blade from its inner shoe edge. Press the saw against the fence and trim the base to form a zero-clearance edge.

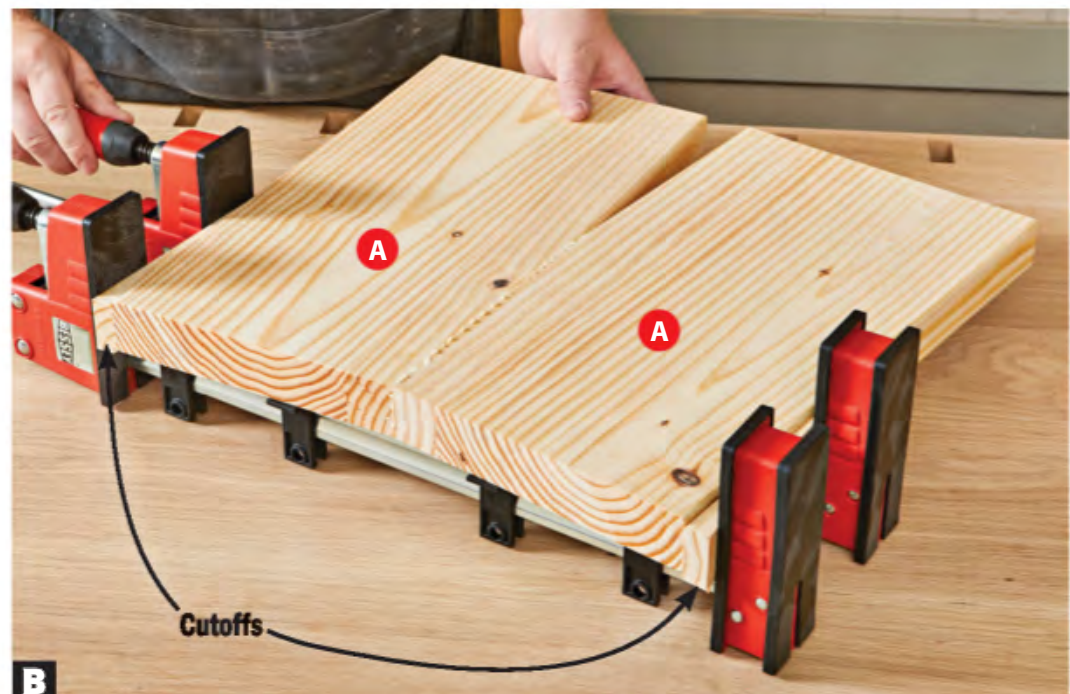
Start with the legs

1 Cut four leg blanks (A) to size [Materials List]. Lay out and cut the 95° angle on each blank [Drawing 1, Photo A], and glue them together [Photo B].

1 LEG (Left leg shown, right leg is a mirror image)



Align the cutoff jig with the angled layout line, clamp the jig to the leg blank (A), and cut the angle.



Glue two leg blanks together at the angled edges, using the cutoffs as clamping cauls to provide parallel edges for the clamps. Repeat for the other legs.



C Clamp the cutoff jig across the bottom of each leg assembly aligned at the outer corners. Cut to provide straight ends that will sit flat on the floor.



D Use a 1 1/4" Forstner bit to drill the hole. Support the back side with a piece of scrapwood to prevent tear-out.



E Use the circular saw and cutoff jig to make the diagonal cuts, stopping when the top of the kerf intersects the hole. Cut away the remainder with a jigsaw.



F Use a jigsaw to cut the notches on each leg assembly. Clean up the cuts as needed with chisels and sandpaper.

2 After the glue dries, crosscut the bottom of each leg assembly [Photo C].

3 Lay out the diagonal lines on each leg assembly [Drawing 1], and drill the holes where the diagonals intersect [Photo D]. Cut along these lines in each assembly [Photo E].

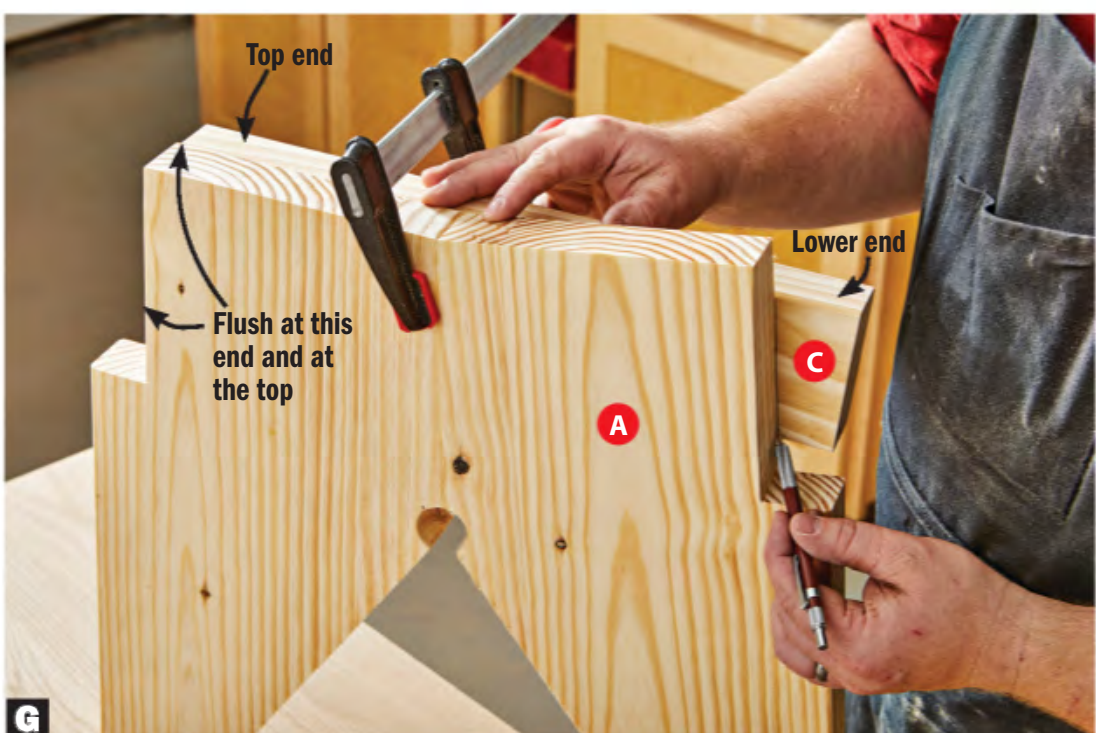
4 Lay out and cut the notches for the rails (B) [Drawing 1, Exploded View, Photo F].

Now add the rails

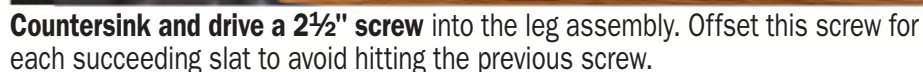
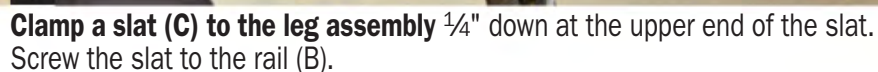
1 Cut the rails (B) to size, and set them aside. Cut the seat slats (C) 16" long with square ends.

2 Scribe a slat to match the leg assemblies [Photo G]. Transfer this angle to your miter saw, and cut one end of all the slats to final length.

3 Drill the pocket holes on one face at each end of all slats [Photos H and I].



G Clamp a slat (C) to a leg flush at one end. Scribe the other end to match the angle where the slat will connect to the side rail.



5 Screw one rail (B) into the notch in a leg assembly [**Exploded View**]. Pocket-screw a slat (C) to the leg assembly [**Photos J and K**]. Add the other rail, and then the remaining slats and leg assembly.

7 Apply finish to the completed bench. We wiped on three coats of Watco Danish Oil (natural finish), sanding between coats with a 320-grit sanding sponge. Now, take a seat and rest! 🌲

Produced by **Bob Hunter** with
John Olson
Project design: **John Olson**
Illustrations: **Roxanne LeMoine,**
Lorna Johnson

1 1/2 x 9 1/4 x 96" Pine

1 1/2 x 5 1/2 x 96" Pine

1 1/2 x 3 1/2 x 96" Pine (4 needed)

Part	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A legs	1½"	9¼"	17"	P	4
B rails	1½"	5½"	39"	P	2
C* slats	1½"	3½"	14¾"	P	24

*Parts cut to fit base assembly. See the instructions.

Materials key: P-southern yellow pine.

Supplies: #8×2½" flathead screws, 2½" pocket-hole screws.

Bits: 1 1/4" Forstner bit; 3/8" plug cutter; 1/4" round-over router bit.

SHOP TEST

Tracksaws

Get the precision of a tablesaw with the portability of a circular saw.





Makita's cordless saw allows plenty of hand room at the handle with the batteries installed. The other cordless saws' batteries get in the way.

If you struggle to cut bulky sheet goods on your tablesaw—or lack the necessary infeed and outfeed space to do so—then consider getting a tracksaw. These saws work much like a sidewinder-style circular saw, but use a plunge-cutting action that allows you to more easily and safely create cutouts with no entry or exit points. Riding on aluminum tracks, they make precise, straight, furniture-quality cuts, even at an angle. Try that on a tablesaw!

These saws will never completely replace your tablesaw—although you can make one work that way—because it's difficult to rip boards narrower than 8–10" without additional support.

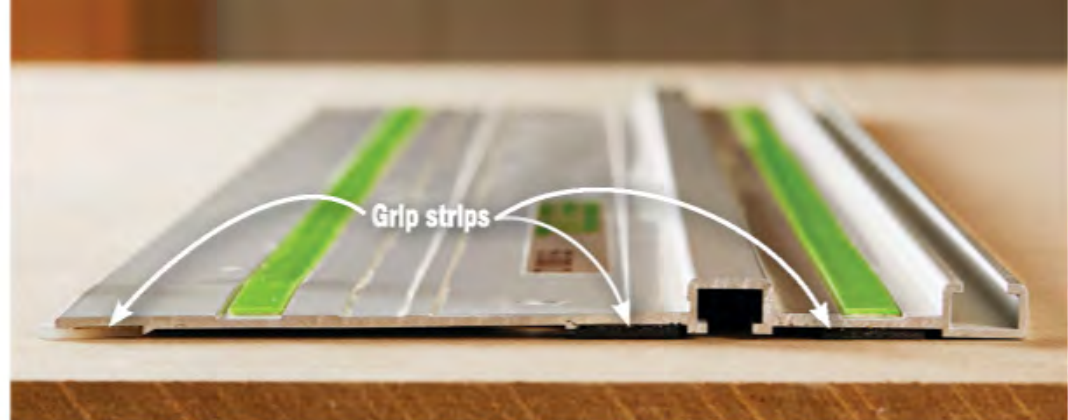
To find out the true capabilities of these saws, we tested nine models, including three battery-powered versions, head-to-head in the WOOD® shop. All of them performed well, but a few stood out.

First: corded or cordless?

With advancements in lithium-ion battery technology, you can go cordless with few concessions. Although battery-powered saws can't currently equal the power of the best corded models, the difference in most models is negligible. And if you already own cordless tools of a brand and voltage of those in our test, you can save money by buying the saw bare (without batteries). And the obvious benefit of cordless: no cord to catch on the track or workpiece.

In testing, we cut all types of sheet goods, as well as 4/4 and 8/4 red oak. Each saw sailed through sheet goods with ease, and only the Festool 36-volt saw had difficulty with the hardwood.

► In 1980, Festool, then known as Festo, created the first plunge-cut saw that rode on an aluminum track.



Tracks that lie flat on the workpiece, such as this Festool (top), didn't slip in use, even without clamps. DeWalt's slightly crowned track reduced the grip strips' effectiveness, requiring clamps. (A DeWalt representative said crowned tracks would be replaced under the company's warranty program.)

To gauge the runtime of the three cordless saws, we measured how far each could cut per charge. (See the chart below.) The Makita 36-volt saw (*above left*) doubled the output of the other battery saws. But if you'll only make a few cuts at a time, any of the saws will do the job.

Now, get your saw on track

All of the saws can be used without a track, just like a regular circ saw. But guiding them with a track guarantees dead-straight cuts. All the tracks work similarly: The saw straddles a raised rib that maintains a straight cutting line, and rubber grip strips on the bottom prevent the track from scooting during a cut. These grip strips held well enough that we didn't need to clamp the track to the workpiece in most cases, even on slick melamine-coated particleboard. The DeWalt tracks, shown *above*, worked better when we clamped them to the workpiece. We recommend always clamping your track in place, regardless of the brand, to avoid potential miscuts, especially as dust builds up on the strips and lessens the grip.

You can buy each saw by itself, and then buy the lengths of track you want separately,

Tip! Whenever possible, buy your tracks at a store, or have them shipped to a store, rather than having them shipped to you. Many of the tracks we received for testing, including several over 8' long, shipped in simple cardboard packaging. These aluminum tracks can be easily damaged, so limit the chances.

Cordless saws cut hundreds of feet per charge

Model	Battery voltage	Battery amp-hours	Linear feet of ¾" melamine particleboard cut per charge*	Battery recharge time (minutes, per battery)*
DeWalt	60	6.0	268	50
Festool	36 (18×2)	5.2	282	30
Makita	36 (18×2)	5.0	580	64

* Average of three tests

Saw and track costs to crosscut and rip 4×8' sheet goods

Model	Price to cut 4' material*	Additional cost to cut 8' material*
CORDED SAWS		
DeWalt DWS520K	\$505	\$85
Festool TS 55 REQ-F-PLUS	\$795	\$165
Festool TS 75 EQ-F-PLUS	\$865	\$165
Grizzly T10687	\$335	\$72
Makita SP6000J	\$475	\$100
Triton TTS1400	\$400	\$105
CORDLESS SAWS (including batteries and chargers)		
DeWalt DCS520B	\$605	\$85
Festool TSC 55 REB	\$880	\$165
Makita XPS01Z	\$605	\$100

* Includes some optional accessories.

or in saw/track kits. To help you make a fair price comparison, the chart *above* shows the minimum investment needed to crosscut and rip 4×8' sheet goods (the most common use for tracksaws). You can buy single tracks that span these dimensions, or shorter tracks that link end to end.

Maximizing the cut

All the saws use “snuggers” on the footplate to eliminate a sloppy fit on the track’s rib. The Grizzly, both Makitas, and the Triton have slotted guides and stabilizers on the saw’s footplate—similar to the T-shaped slots and bars (or washers) on a tablesaw miter gauge—that keep the plate flat on the track when making beveled cuts, shown *above right*.

The track itself provides kickback protection by virtually eliminating the risk of veering off course and binding the blade in a cut, making these saws safer than a standard circular saw. In addition, most of the saws incorporate either a riving knife (Grizzly, shown at *right*), a rib-riding antikickback/backslide mechanism (Triton), or both (DeWalt and Festool). Only the Makitas lack any secondary antikickback protection.

Each of the tracks has a flexible plastic edging that—after you trim it to fit your saw’s blade—helps prevent chip-out of surface fibers when cutting. DeWalt’s track, with a centered rib, has this edging on both sides, the only one like this in our test. This lets you run the saw in either direction, or



Makita’s slide-out stabilizer slips into a groove to prevent the saw from lifting off the track during beveled cuts.

dedicate one side of the track to 90° cuts and the other to beveled cuts. (With some tracks, bevel-cutting reduces this edging’s effectiveness on 90° cuts.) Each of the saws created less chip-out in maple-veneered plywood than in melamine-coated particleboard (*next page*), so we give credit to those saws that cut melamine cleanly. The Festool, Makita, and Triton saws earned the highest marks for clean cuts. Also, Festool’s saw-mounted chip guard (*next page*) prevents chip-out along the offcut side of the blade.



A riving knife follows the blade, and keeps the kerf open to prevent kickback resulting from the workpiece touching the back edge of the blade.



Makita's corded tracksaw made the cleanest cuts, as shown here in melamine-coated particleboard.



The Grizzly saw created more chip-out in the same material.



Like a zero-clearance insert on a tablesaw, Festool's replaceable chip guard prevents chip-out by holding down surface fibers at the point of cut.

More tracksaw tidbits

■ **Dust collection.** The Festool and Makita saws earned the highest marks here when used in conjunction with a shop vacuum. Only the cordless Festool comes with a dust bag; Triton offers one as an accessory.

■ **Variable speed.** All but one of the saws (Grizzly) have variable-speed motors. (See the chart on *page 54*.) But we don't see this as a significant advantage for cutting wood and sheet goods.

■ **Depth scale.** Each saw's cutting-depth scale is calibrated for using the saw on wood without a track. So when you use the track, you have to also account for its thickness. Other than being able to set a depth stop to avoid overexposing the blade beneath the workpiece—not an act that requires great precision—we don't see the scale as a big deal.

■ **Noise.** All these saws measured loud enough that you should always wear hearing protection when using them.

Corded models

DeWalt DWS520K

800-433-9258, dewalt.com

High Points

- ▲ The DeWalt tracks, with a centered rib, allow you to run the saw on either side with equal effectiveness.
- ▲ An antikickback device on the saw prevents the tool from backsliding if the blade binds.
- ▲ 3-year warranty.

Low Points

- ▼ The aluminum tracks were slightly crowned, reducing the grip on workpiece surfaces enough to require clamping the track in place.
- ▼ It takes just one connector to join tracks, but often required fussing with the fit to get the saw to glide smoothly over the transition.
- ▼ Dust collection was only fair when connected to a vacuum.

More Points

- Changing blades was cumbersome, but once you get used to the process, it's okay.



Festool TS 55 REQ-F-PLUS

888-337-8600, festoolusa.com

High Points

- ▲ A splinter guard prevents chip-out on the side of the cut not covered by the track's antisplinter edging.
- ▲ A slip-clutch and riving knife prevent kickback should the blade bind.
- ▲ Easiest blade changes among the test group.
- ▲ Dust collection was excellent when connected to a shop vacuum.
- ▲ Festool's tracks tie with Makita's as our favorites.
- ▲ 3-year warranty.

More Points

- ▶ This saw tripped a thermal overload switch when ripping 8/4 red oak—a function meant to protect the motor. To avoid this, use a blade better suited for ripping hardwood than the provided 48-tooth blade.
- ▶ The power cord detaches from the saw for easier storage in the stackable plastic case.



Festool TS 75 EQ-F-PLUS

High Points

- ▲ With the largest motor in the group, this saw demonstrated the most power in testing, yet still feels nimble.
- ▲ Its 8¼" blade provides the deepest cut capacity at just over 2¾".
- ▲ Like the Festool TS 55, this model has excellent chip-out prevention, antikickback protection, easy blade changes, excellent dust collection, detachable cord, excellent tracks, and 3-year warranty.



Grizzly T10687

800-523-4777, grizzly.com

High Points

- ▲ A stabilizer holds the saw securely to the track when tilting the saw for beveled cuts.
- ▲ A detachable stop provides a reliable endpoint for stopped cuts.
- ▲ Its low price provides a great entry point for a tracksaw.

Low Points

- ▼ This saw demonstrated the most chip-out, especially in melamine-coated particleboard.
- ▼ Although it never stalled, this saw labored when ripping 8/4 oak.
- ▼ You can't lock the saw in the plunge position, making blade changes more difficult.
- ▼ This saw does not come with a storage case or bag.

More Points

- ▶ Grizzly offers only 28" and 55" tracks. So to make 8' cuts, you must join together a combination of tracks. The good news: It's the lowest-priced unit when doing this.



Makita SP6000J

800-462-5482, makitatools.com

High Points

▲ A built-in depth stop lets you make a shallow scoring pass that eliminates chip-out before making the full-depth parting cut. However, the blade cut so well (when new and sharp), we didn't need to do this, even with delicate veneers and melamine.

▲ A stabilizer holds the saw base flat on the track when tilting the blade to make beveled cuts.

▲ Makita's tracks tie with the Festool tracks as our favorites.

Low Points

▼ No antikickback protection.



Triton TTS1400

855-227-3478, tritontools.com

High Points

▲ Antikickback protection is built into the saw.

▲ A stabilizer prevents the saw from tipping off the track when making beveled cuts.

▲ 3-year warranty.

Low Points

▼ The soft-start motor can be annoyingly slow to get up to speed.

▼ The saw's footplate required some filing to remove metal burrs in order to make it glide smoothly on the tracks.

More Points

► Dust collection was good when using a vacuum, but the dust port points inward rather than outward, putting the hose in the way of the operator's hand.

► Triton offers only 28" and 59" tracks. So to make 8' cuts, you must join together a combination of tracks. The good news: It's the second-lowest-priced unit when doing this.



Cordless models

DeWalt DCS520B

High Points

▲ The most powerful saw of the three cordless models.

▲ It shares the same advantages of dual-edge tracks as the corded DeWalt.

▲ 3-year warranty.

Low Points

▼ This saw's tracks share the same crowning and connection problems as the corded DeWalt.

▼ The antikickback device requires you to slide the saw onto the track from the end, rather than setting it down onto the track—a fussy task.

More Points

► Plunging this saw requires more of a forward-and-down push than the primarily downward push with other saws. It's not bad, but takes getting used to.

► The battery pack creates a pinch-point when operating the saw left-handed. That's not the case with the right hand.



Tracksaws cut as straight as a rail

MODEL	PERFORMANCE RATINGS (1)							SAW				AVAILABLE TRACK LENGTHS, INCHES	
	OVERALL EASE OF USE	OBSERVED POWER IN 4/4 STOCK	OBSERVED POWER IN 8/4 STOCK	ABSENCE OF SURFACE TEAR-OUT	DUST COLLECTION (WITH SHOP VACUUM)	EASE OF CHANGING BLADES	EASE OF TILTING SAW	BLADE DIAMETER, INCHES	MAX. DEPTH OF CUT, INCHES (ON TRACK)	MOTOR SPEED, MIN.—MAX. (RPM)	BLADE BEVEL RANGE, DEGREES		
CORDED SAWS													
DEWALT DWS520K	B	B+	B	B–	C+	B	A–	6½	2⅞	1,750–4,200	0–47	46, 59, 102	
FESTOOL TS 55 REQ-F-PLUS	A	B	C	A–	A–	A	A–	6¼	2⅞	2,000–5,200	-1–47	32, 42, 55, 75, 95, 106, 118, 197	
FESTOOL TS 75 EQ-F-PLUS	A	A	B+	A–	A–	A	A–	8¼	2 ²⁵ / ₃₂	1,350–3,550	0–45	32, 42, 55, 75, 95, 106, 118, 197	
GRIZZLY T10687	C	B–	C	C+	B	C	A	6¼	2 ⁵ / ₃₂	5,500	0–45	28, 55	
MAKITA SP6000J	A	B+	B–	A	A	A–	A	6½	2 ³ / ₁₆	2,000–5,200	-1–48	39, 55, 118	
TRITON TTS1400	B–	B+	C+	A–	B+	B	A	6½	2⅞	2,000–5,000	0–48	28, 59	
CORDLESS SAWS													
DEWALT DCS520B	B	B	B–	B-	C+	B	A–	6½	2⅞	1,750–4,000	0–47	46, 59, 102	
FESTOOL TSC 55 REB	B–	C+	D	A–	A–	A	A–	6¼	2⅞	2,650–5,200	-1–47	32, 42, 55, 75, 95, 106, 118, 197	
MAKITA XPS01Z	A	B	C	A–	A	A–	A	6½	2 ³ / ₁₆	2,500–6,300	-1–48	39, 55, 118	

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

2. (A) Track router adapter
(B) Canvas saw-storage bag
(C) Track clamps
(D) Dust-collection bag
(G) Track miter gauge
(P) Parallel edge guide
(R) Track connector
(S) Stackable saw-storage case
(T) Track T-square
(V) Canvas track-storage case

3. (C) China
(G) Germany
(Z) Czech Republic

4. Prices current at time of article production and do not include shipping, where applicable.
(*) Does not include batteries or charger

Festool TSC 55 REB

High Points

- ▲ Like the other Festool saws, it has an effective splinter guard, antikickback measures, easy blade changes, excellent tracks, and 3-year warranty.
- ▲ Its battery packs charged fastest (30 minutes).
- ▲ Excellent dust collection when using either the included dust bag or a vacuum.
- ▲ A fine-adjustment knob on the plunge-depth stop lets you easily calibrate the depth of cut.

Low Points

- ▼ This saw struggled to cut 4/4 oak, and stalled after cutting just a few inches of 8/4 oak. Its runtime was half that of the Makita cordless saw.
- ▼ Poor ergonomics make this saw uncomfortable to hold and use, primarily because the battery packs crowd into the handle area.

More Points

- You can run this saw on just one 18-volt battery, but it cuts faster and longer with two.



ACCESSORIES (2)		NOISE LEVEL, DECIBELS (WHILE CUTTING 4/4 OAK)	SAW WEIGHT, LBS (BATTERIES INCLUDED FOR CORDLESS MODELS)	CORD LENGTH, FEET	WARRANTY, YEARS	COUNTRY OF ASSEMBLY (3)	SELLING PRICE, SAW ONLY (4)	
STANDARD	OPTIONAL							
S	A,C,G,R,T	114	11.5	13.5	3	Z	\$400	
S	C,G,P,R	107	9.9	13	3	G	\$590	
S	C,G,P,R	107	13.6	13	3	G	\$660	
—	C,R	116	11	8	1	C	\$215	
S	C,G,P,R,V	107	9.7	8	1	C	\$370	
—	B,C,D,G,P,R,T,V	112	12	10	3	C	\$315	
—	A,C,G,R,S,T	98	12.5	N/A	3	Z	\$380*	
D,S	C,G,P,R	109	11.7	N/A	3	G	\$490*	
—	C,G,P,R,S,V	106	11.2	N/A	1	C	\$350*	

Makita XPS01Z

High Points

- ▲ Using two 18-volt battery packs, this saw dominated the other cordless saws by cutting more than twice as much material per charge.
- ▲ It proved well-balanced and easy to hold and use—best among the cordless models.
- ▲ This saw has the same scoring-pass capability as the corded Makita, and it also made excellent cuts without using this feature. It also has the same effective tilt-lock system, and the same excellent tracks.

Low Points

- ▼ Like its sibling, this saw lacks antikickback devices and a riving knife.
- ▼ The battery packs take just over an hour to charge. So if you don't have extras, you'll have to wait on these.
- ▼ This saw does not come with a storage case or bag. However, if you buy a kit including batteries and charger, you also get a storage case.

More Points

- Although the saw never stalled during demanding 8/4-oak ripcuts, it did get hot to the touch.
- Makita offers a version of this saw (no. XPS01PTJ, \$500) with wireless Bluetooth connectivity to a similarly equipped 36-volt vacuum (no. XCV08Z, \$460 without batteries). This combination worked well and required no power cords.



Tracking down a winner

After running all of the saws through rigorous testing, the powerful Festool TS 75 EQ-F-PLUS emerged as the Top Tool overall.

If you prefer a cordless model, go for the Makita XPS01Z, our Top Tool in that subcategory. Not only did it outperform the other battery-powered saws, but we also prefer it to some of the corded models.

Is your tool budget more limited? Then consider the Makita SP6000J, a great corded saw for about half the price of the Festool TS 75. It's our Top Value. 🌲

Produced by **Bob Hunter** with **Bob Saunders**

One-wall Workshop

Whether you're new to woodworking, downsizing, or want a secondary shop, this fold-up workbench and miter saw station pack full-size features into a compact footprint.

MITERSAW STAND

D I M E N S I O N S :
28½" W × 28½" D × 19" H

Approximate materials cost:

\$90

Cleats let you relocate this saw table as your shop grows.

WORKBENCH

DIMENSIONS:
60" W x 25 3/4" D x 25 1/2" H

Approximate materials cost:

\$205

plus wall cleats as needed

The benchtop provides 10.7 square feet of work space.



Build a smart space

Not every woodworker starts out in a roomy basement, garage, or freestanding building. If space is a luxury where you live, make the most of it. The projects in this series fit along a single wall 12' wide—about the width of a single garage bay—but you can fit any one project into even tighter spaces. Start with the anchor of any workshop: a workbench that folds away when you're finished. Then add a sliding-compound mitersaw table that also tucks away. In the issues ahead, look for the storage and organizer ideas *below* to make your workspace even more efficient.

► You don't need an existing shop to create a new one. See *No Tablesaw? No Problem* on page 28 for tips on working without a tablesaw.



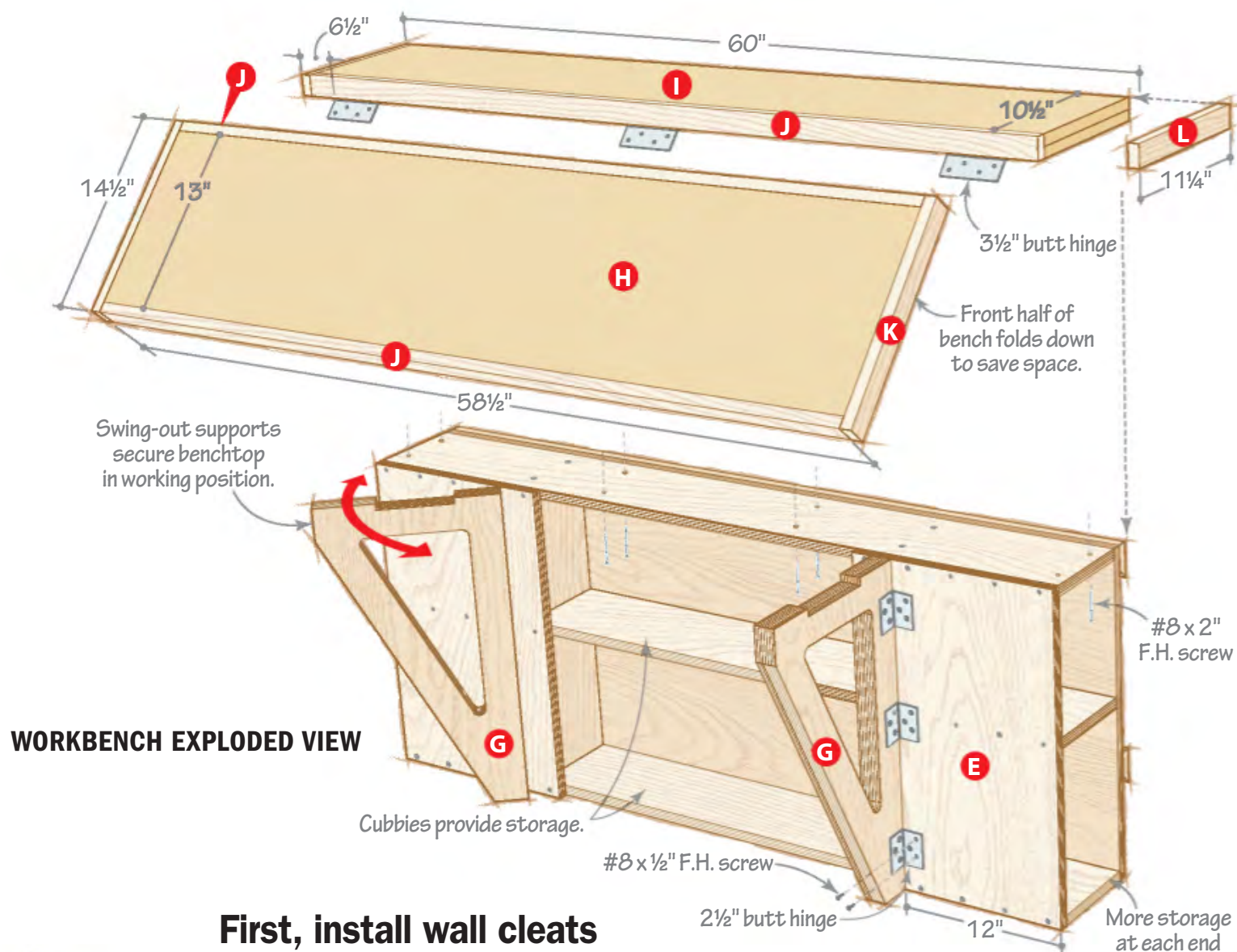
There's more to come

Find these One-Wall Workshop projects in upcoming issues:

- ① Open cabinets
- ② Cordless-tool charging station
- ③ Clamp rack
- ④ Cordless-drill holder
- ⑤ Hand-tool storage rack
- ⑥ Shop-towel holder
- ⑦ Hardware storage shelf



Build a workhorse workbench



First, install wall cleats

► **French cleats:** Beveled strips that interlock to hang an item on a wall.

Wall-mounted French cleats provide the flexibility to add and reposition the components we'll present here and in future issues. We designed everything to fit a 12' span, but you can customize the length to suit your space.

1 Cut eight 3/4 x 2 1/2" maple boards 6' long for the wall cleats. Use double-faced tape to fasten one of the boards to a sheet of Baltic birch plywood with the edges flush. Rout a 45° chamfer on the cleat edge [Photo A]. Repeat for each cleat. Sand the cleats and

apply finish. (We wiped on three coats of polyurethane.)

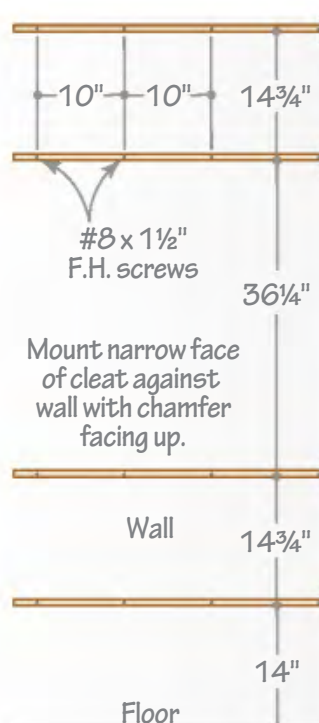
2 Screw three sheets of 3/4" birch or Baltic birch plywood vertically to the wall studs. (We painted the plywood to match the wall.)

3 Mark the locations for the four cleats along the plywood using a level [Drawing 1]. Drill mounting holes in the cleats. Starting from the bottom, have a helper support each cleat while you screw them in place.

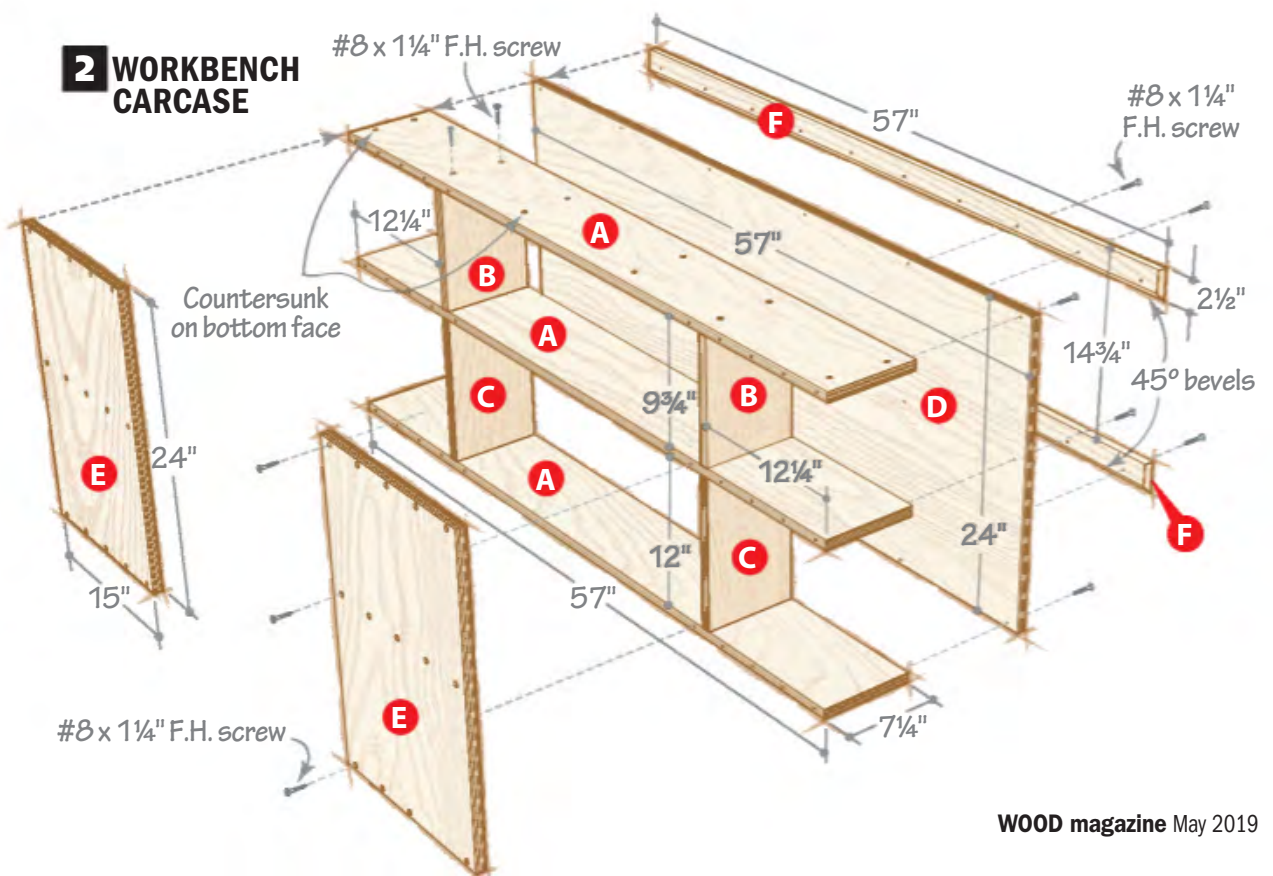
► Avoid scorching routed edges. woodmagazine.com/routerburn

► Drill and countersink 1/8" pilot holes for the #8 screws used in this project.

1 WALL CLEAT SPACING



2 WORKBENCH CARCASE





A Ride the bearing along the plywood edge to chamfer a wall-cleat edge in two passes.



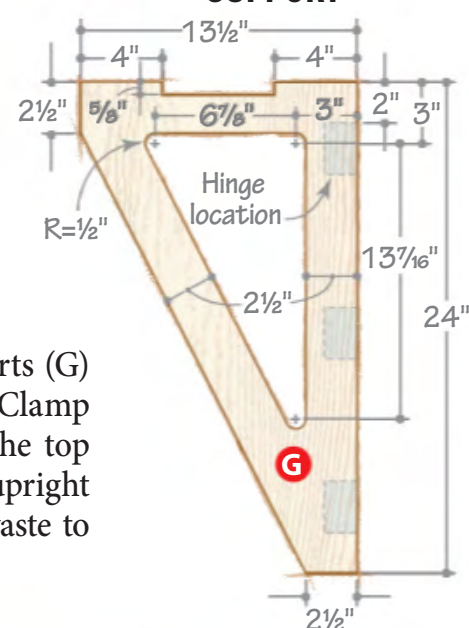
B Hold a 1" Forstner bit at the inside corners of the template and press down to mark hole locations.



C Jigsaw on the waste side of the lines connecting the corner holes in the supports (G).

Tip! Use a backer board beneath the support (G) when drilling corner holes to prevent tear-out.

3 TABLETOP SUPPORT



Begin with a hanging case

1 Cut parts A–E [Materials List, page 60]. Glue and screw the upper shelf dividers (B) to the top and middle shelves (A) [Drawing 2].

2 Glue and screw the lower shelf dividers (C) to the bottom shelf (A). Then glue and clamp the upper assembly (A/B) to the lower assembly (A/C).

3 Fasten the back (D) to the shelves (A–C) with the ends and edges flush.

4 Glue and screw the front panels (E) to the A–D assembly with the edges flush.

5 Cut the hanging cleats (F) and rout them the same as the wall cleats. Glue and screw the narrow face to the back (D) with the beveled edges down [Drawing 2].

Laminate the supports

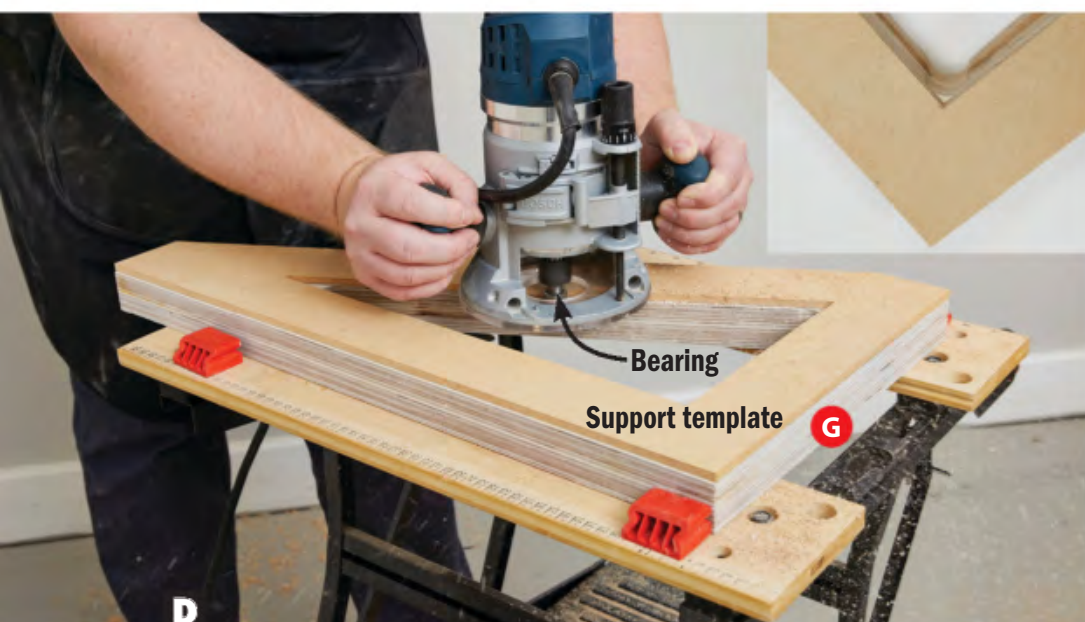
1 Cut four tabletop support blanks (G) [Materials List] and laminate two blanks for each support. From 1/4" hardboard, cut a sup-

port template to shape [Drawing 3]. Trace the template onto each blank and cut the outside shape, but wait to cut the top notches.

2 Use the template to mark the inside cut-out and hole locations at each corner [Photo B]. Drill holes at the corners and jigsaw the openings in the supports [Photo C].

3 Attach the template to a support (G) with double-faced tape. Use a top-bearing flush-trim bit to clean up the inside edges of the supports in two passes [Photo D], then remove the template. Repeat for the other support.

4 Lay out the notches on the supports (G) [Drawing 3]. Saw 5/8"-deep notch ends. Clamp a scrap 2x4 to a support (G) with the top edges flush, and stand the support upright [Photo E]. Rout away the rest of the waste to form each notch.



D Press the bit bearing against the template for the first pass around the inside of a support (G). For the second pass, lower the bit and press the bearing against the first cut.

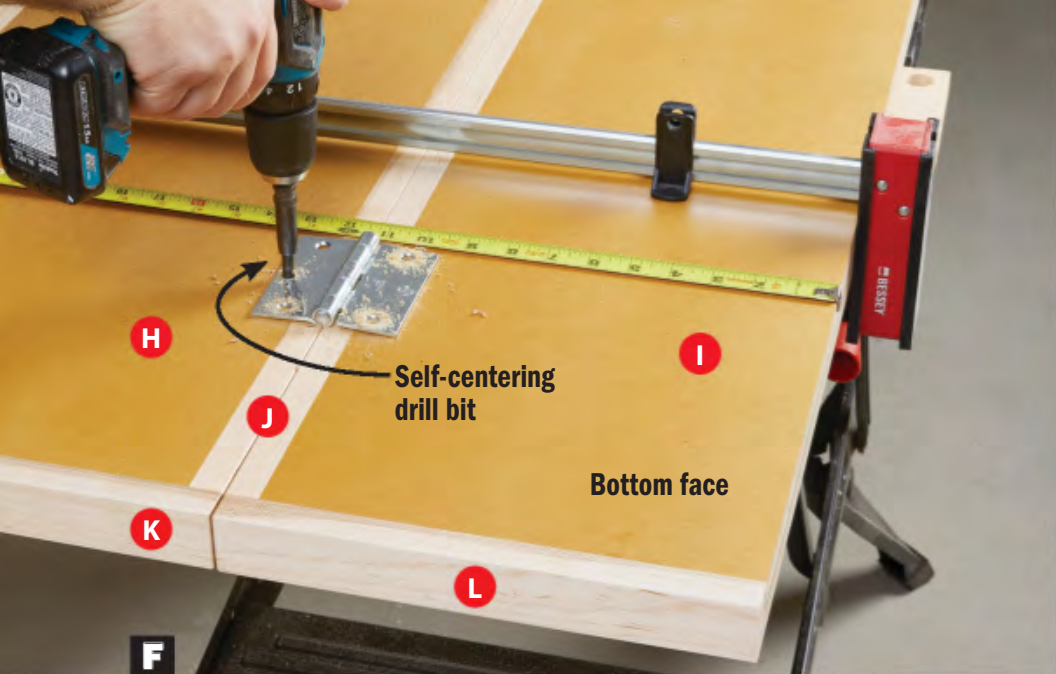


E Clamp a 2x4 to the support (G) to reduce tear-out and provide a wide surface for steadying the router. You can use the flush-trim bit or a straight bit.

► Make tablesaw-quality cuts with a circular saw.
woodmagazine.com/circsaw

Tip! If you plan to build the mitersaw stand, too, cut and chamfer the stand cleats (Q) at the same time.

► Laminate: Face-gluing pieces of the same size to create a thicker blank.



Center the hinge barrel between the folding (H) and mounted (I) tabletops. All three hinges should be the same distance from the mounted tabletop edge.



Install only the center-hole hinge screws, then check that the support swings smoothly before driving the remaining screws.

Make tough tabletops

- 1 Laminate and cut the tabletops (H, I) to size. Cut the front and back tabletop trim (J) and glue the pieces to the tabletops (H, I) [Workbench Exploded View]. Cut and glue on the end trim pieces (K, L).
- 2 Sand the trim flush with the tabletops and ease the edges. Apply three coats of wipe-on polyurethane to the tabletops, supports (G), and case.
- 3 Clamp the folding and fixed tabletops together facedown with the ends flush. Install the hinges [Photo F].
- 4 With the tabletops still facedown, center the upside-down case on the fixed tabletop (I/J/L) with its back edge flush with the outside face of the cleat (F) [Workbench Exploded View]. Screw the case to the tabletop.
- 5 Screw three hinges to a tabletop support (G), aligning the barrel edges with the support edge. Hold the support in position on

Tip! A self-centering drill bit helps you bore precise hinge-screw pilot holes. Purchase a set. woodmagazine.com/selfcenterbits

Materials List

Part	FINISHED SIZE			Matl.	Qty.	
	T	W	L			
Workbench						
A	shelves	¾"	7¼"	57"	BB	3
B	upper shelf dividers	¾"	7¼"	9¾"	BB	2
C	lower shelf dividers	¾"	7¼"	12"	BB	2
D	back	¾"	24"	57"	BB	1
E	front panels	¾"	15"	24"	BB	2
F	hanging cleats	¾"	2½"	57"	M	2
G	tabletop supports	1½"	13½"	24"	LBB	2
H	folding tabletop	1½"	13"	58½"	LMDF	1
I	mounted tabletop	1½"	10½"	58½"	LMDF	1
J	front/back table trim	¾"	1½"	58½"	M	3
K	folding-table ends	¾"	1½"	14½"	M	2
L	mounted-table ends	¾"	1½"	11¼"	M	2

Materials key: BB-Baltic birch plywood, M-maple, LBB-laminated Baltic birch plywood, LMDF-laminated medium-density fiberboard.

Supplies: 2½" butt hinges (6), 3½" butt hinges (3), #8×2" flathead screws, #8×1¼" flathead screws, #8×½" flathead screws.

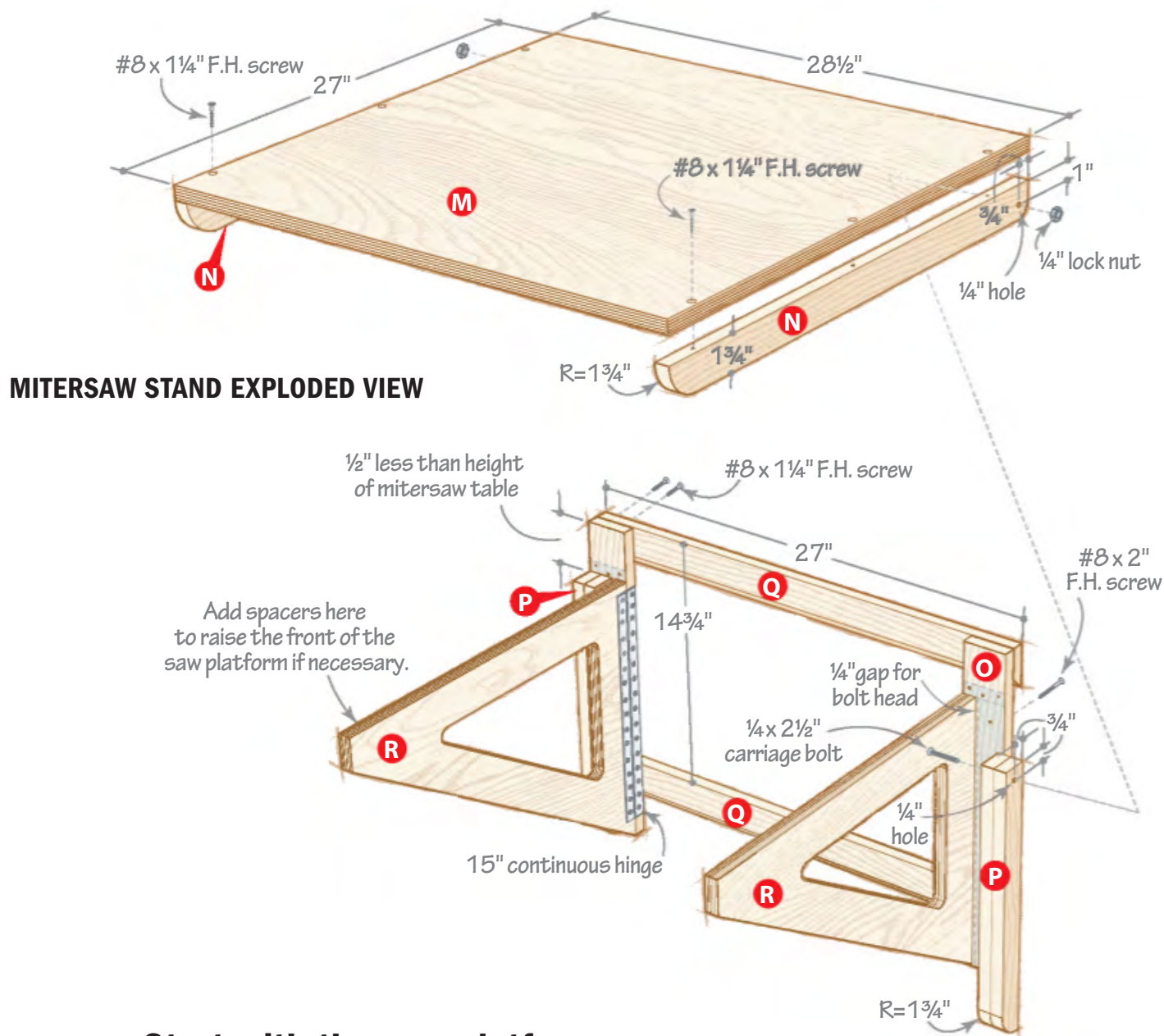
Blade and bits: 1" Forstner bit; ¾"-dia. top-bearing flush-trim and 45° chamfer router bits.

a front panel (E) and ensure that the notch clears the tabletop hinges [Workbench Exploded View]. Drill and drive the hinge screws [Photo G]. Repeat for the second support. Have an assistant help you flip the assembly and hang it on the wall cleats.

Workbench Cutting Diagram



Add a space-saving miter saw stand



MITERSAW STAND EXPLODED VIEW

Start with the saw platform

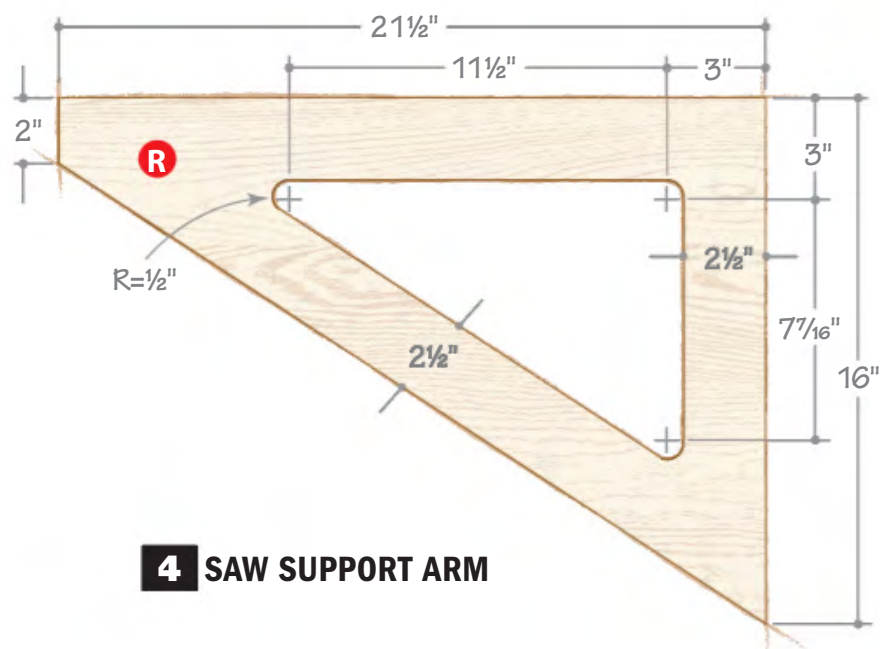
Note: For comparison to your miter saw, the model shown measures 20" wide by 25" deep.

Before you begin, check that your miter saw base will fit on the saw platform (M) [Miter Saw Stand Exploded View]. If you have a sliding compound miter saw, check that the rails will not extend past the back of the platform.

- 1 Cut the saw platform (M) and arms (N) to size [Materials List, page 62; Miter Saw Stand Exploded View]. Jigsaw and sand rounded corners on each arm. Drill the hole in each arm.
- 2 Glue and screw the platform arms (N) to the platform (M) flush with the edges.
- 3 Cut the cleat connectors (O), hinge blocks (P), and hanging cleats (Q). Laminate the hinge blocks. Chamfer the hanging cleats.
- 4 Glue and screw the hanging cleats (Q), bevel down, to the cleat connectors (O) [Miter Saw Stand Exploded View].
- 5 Round the bottom ends of the hinge blocks (P) and drill the holes [Miter Saw Stand Exploded View]. Glue and screw the hinge blocks to the cleat connectors (O).
- 6 Sand the platform (M/N) and mounting assembly (O-Q), and apply three coats of finish to both.
- 7 Bolt the platform (M/N) to the hinge blocks (P) [Photo H].



Ensure that the saw platform (M/N) swings freely and ease any corners that bind before tapping the carriage bolt to seat it in the hinge block (P).



4 SAW SUPPORT ARM



I If the saw-base mounting screws break through the platform (M), raise them slightly using washers beneath the screwheads.

Add saw supports

►Saw shopping? Check our review of 10" sliding mitersaws in issue 256 (October 2018), or go online for mitersaw reviews. woodmagazine.com/mitersaws

1 From 1/4" hardboard, make a template for the saw supports (R) [Drawing 4]. Cut the saw supports.

2 Drill, jigsaw, and shape the inside opening of each support as with the tabletop supports (G). Sand and apply three coats of wipe-on polyurethane finish.

3 Cut 15" continuous hinges and fasten them to the saw supports (R). Then screw

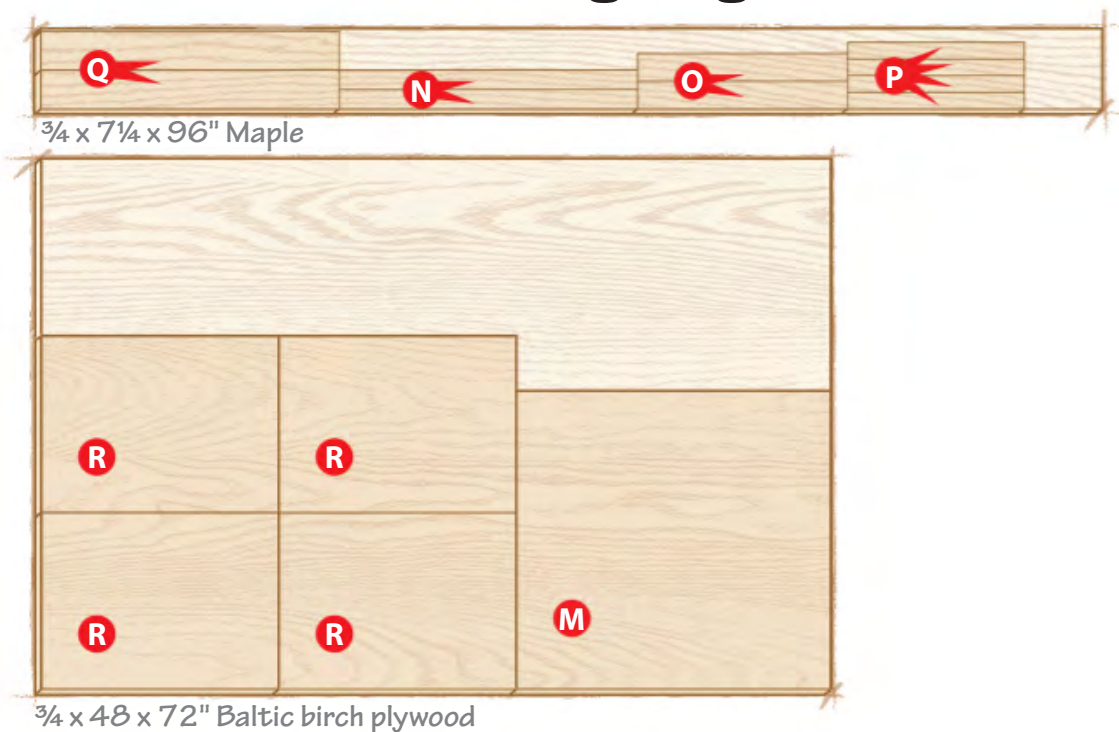
the hinges to the inside edges of the cleat connectors (O) [Mittersaw Stand Exploded View].

4 Position your mitersaw on the table and mark the mounting-screw locations. Drill pilot holes and mount the saw to the base [Photo I]. 🌳

►Remember to lock the blade carriage on your sliding mitersaw before lowering the table.

Produced by **Robert Wilson** with **John Olson**
Project design: **John Olson**
Illustrations: **Roxanne LeMoine, Lorna Johnson**

Mittersaw Stand Cutting Diagram



Materials List

Part	FINISHED SIZE			Matl.	Qty.	
	T	W	L			
Mittersaw stand						
M	saw platform	¾"	27"	28½"	BB	1
N	platform arms	¾"	1¾"	27"	M	2
O	cleat connectors	¾"	2½"	19"	M	2
P	hinge blocks	1½"	1½"	16"	LM	2
Q	hanging cleats	¾"	3½"	27"	M	2
R	saw supports	¾"	16"	21½"	BB	2

Materials key: BB-Baltic birch plywood, M-maple, LM-laminated maple.

Supplies: 1 1/2"x30" continuous hinge, #8x2" flathead screws, #8x1 1/4" flathead screws, 1/4"x2 1/2" carriage bolts (2), 1/4" lock nuts (2).

Blade and bits: 1" Forstner bit; 3/4"-dia. top-bearing flush-trim and 45° chamfer router bits.



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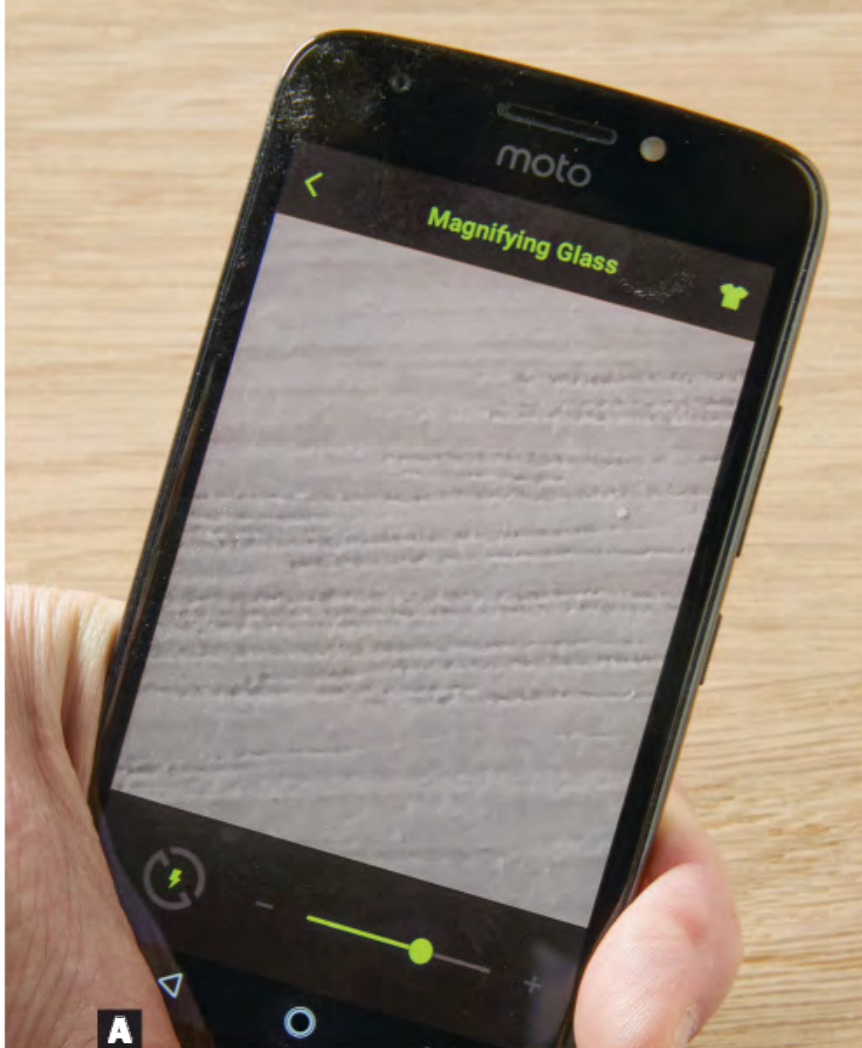
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Going Along With the Grain

Beautiful grain that makes wood so appealing to the eye can also make it difficult to work. Tear-out from planing, or splintery saw cuts, for instance, will spoil the look of any project. Taking time to read and understand the grain of a board before you start making project parts from it will help you machine it for top-quality cuts.



A **Magnification can help determine grain orientation.** Knowing it helps you lay out project parts for best appearance and joint strength.



B **Going with the grain feels smooth** because the ends of the fibers at the surface point in the same direction as the movement of the rag.

► Learn more about trees and lumber.
woodmagazine.com/upclose
woodmagazine.com/knowwoodgrain

Why does wood have grain?

As trees grow they produce cells, which arrange themselves as fibers and water-conducting vessels. Some run vertically, others form radial structures (rays) outward from the center of the tree. Each year's cells create a cylinder of fibers—a growth ring—around the tree, from bottom to top.

Wood fibers resemble a package of uncooked spaghetti. But because we're talking about nature, things aren't neat and linear: Those fibers may twist and turn, growth rings vary in thickness from year to year, branches grow and create knots. Even the way the sawmill operator cuts a log into lumber directly affects a board's grain.

5 ways to follow the grain

To avoid tear-out, pay attention to the grain direction in relation to the cutting edge. Always move the tool along the wood or the wood across a cutter (such as when using a jointer) so the cutting edge doesn't dig under

the fibers and lift them up. Here are five ways to judge grain direction.

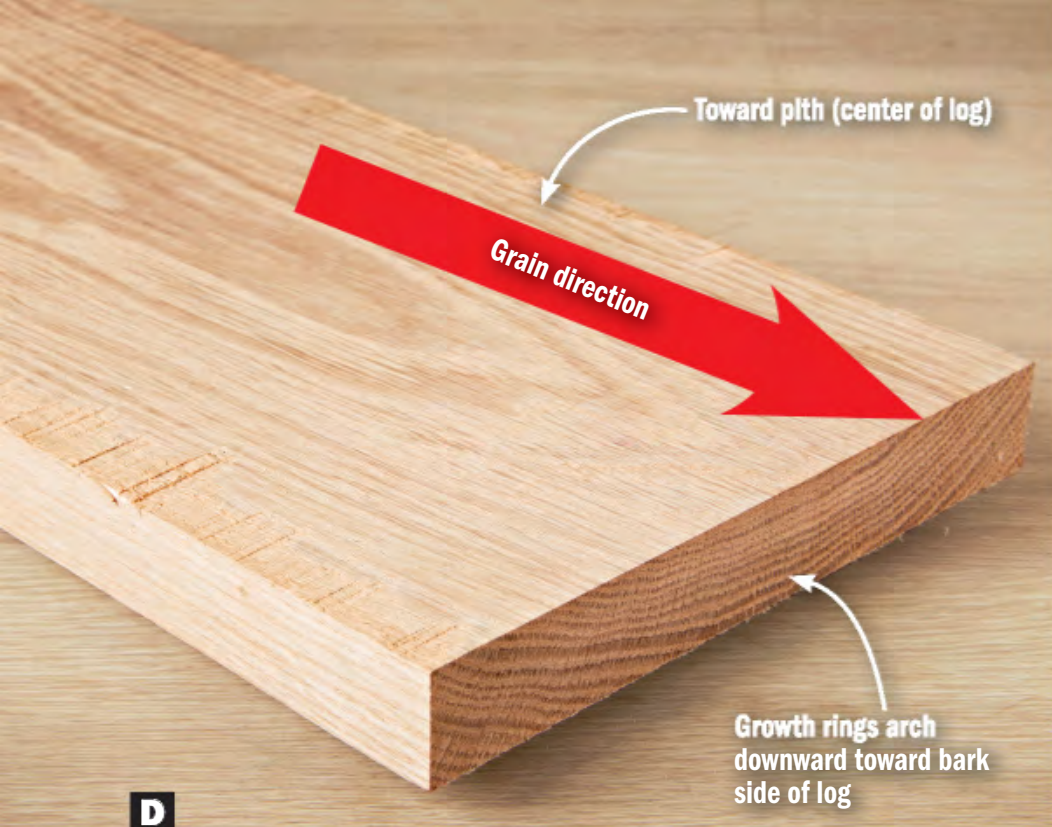
1. Check the face grain and figure. You can usually determine grain orientation—the alignment of the grain along the board's surface—just by looking. (It's obvious in some species, such as walnut, oak, and mahogany.) Figure—the grain pattern—shows orientation, too. But even with magnification, it's difficult to judge the *direction* the grain runs in the board just by looking at the surface [Photo A]. Rely on other methods to be sure.

2. Feel the face. Find the grain direction simply by running your gloved hand or a shop rag along the board surface, following the grain orientation [Photo B]. If you feel snags and splinters, then you're moving against the grain.

3. Look around the corner. For a quick and accurate determination, check the grain orientation on the surface adjacent to the one you want to work [Photo C].



C **Upward trending grain lines on the edge** point in the direction the grain runs on the adjacent top face of this board. It runs opposite on the other face.



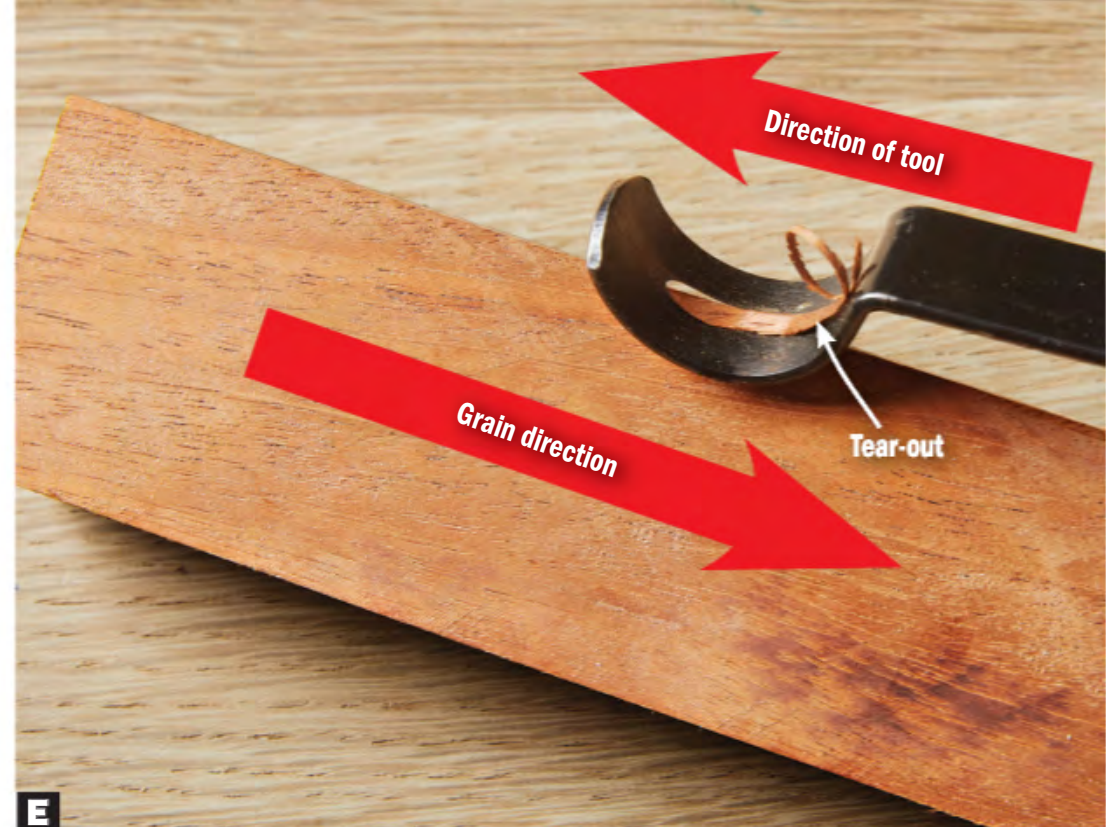
D Growth rings that arch downward indicate grain that runs the same way as the cathedral points. An upward arch shows that the grain runs against them.

Note: A cornering tool forms round-overs more quickly and precisely than sanding and without the need to set up a router. It never mars the edge or face, either. Set of two for 1/16" to 1/4" round-overs with honing jig, no. 05K50.30, \$36.50, leevalley.com.

4. Check the end grain. Looking at a cathedral pattern in the grain, you might assume that the grain runs toward the point. That isn't always true; check the end grain to make sure [Photo D].

5. Try a cut. Slide a cornering tool, chisel, or even a sharp knife along a corner of the board. Watch for splinters, a sign you're going against the grain [Photo E].

Remember, the cutting edge of a router, planer, or jointer turns against the direction of feed, and it can lift up and tear out a splinter when moving against the grain. When grain runs to an edge at a sharp angle [Photo B], tear-out becomes more likely. Visualize



E The big splinter lifted by the cornering tool indicates that the grain on this piece runs opposite the tool's movement.

the cutting-edge movement in relation to the grain when it contacts the wood.

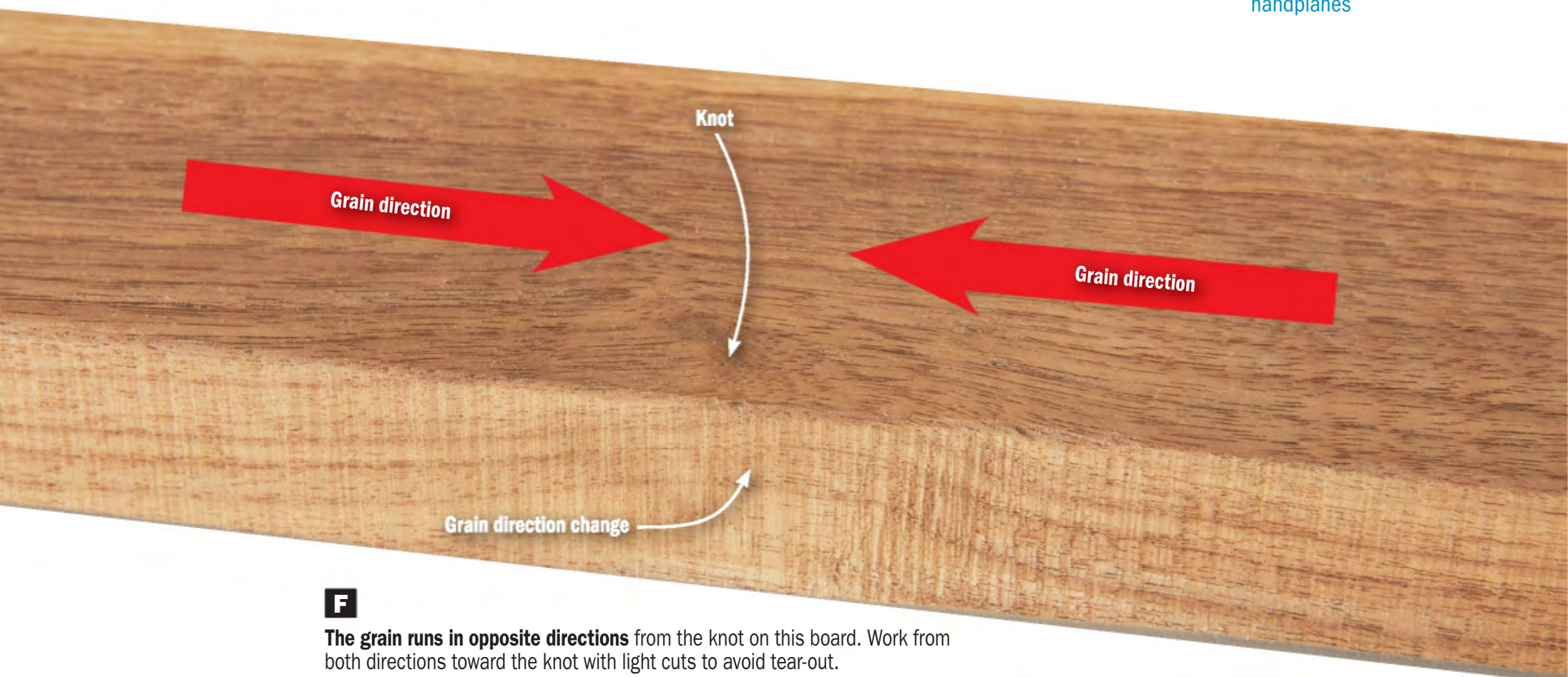
Dealing with difficult grain

Sometimes the grain runs different directions on the same board [Photo F]. Highly figured boards may defy finding a consistent grain direction.

When the grain runs in two directions, hand-plane or rout to or from each end of the board to or from the point where the grain changes. Then, work that area with light cuts. Take a final light cut in the predominant grain direction. Angling the plane across the surface produces a shear cut that may provide some relief.

Tip! When planing tears up your figured lumber, try a card scraper with a sharp burr edge instead. woodmagazine.com/scraper

► Find out more about using hand planes. woodmagazine.com/handplanes



F The grain runs in opposite directions from the knot on this board. Work from both directions toward the knot with light cuts to avoid tear-out.



G A zero-clearance tablesaw insert and a high-quality crosscut blade will give you practically splinter-free cuts across the grain.



H A miter-gauge extension with a blade kerf supports the board on both sides of the cutline and reduces splintering on the trailing edge.

► Bring zero-clearance cutting to your shop. woodmagazine.com/zeroclearance

Tip! Keep your jointer and planer knives and saw blades clean and sharp; they will cut better and last longer.

Tip! Make a simple crosscut sled that combines the clean-cutting benefits of a zero-clearance insert and a miter-gauge extension. woodmagazine.com/simplesled

► Build an adjustable zero-clearance fence for your miter saw. woodmagazine.com/mitersawzcfence

► Minimize router tear-out. woodmagazine.com/routertearout

Planer and jointer techniques

Sharpen your jointer and planer knives to minimize tear-out. Take light cuts (about 1/64") in the principal grain direction the full length of the board, watching the results closely; turning the board end-for-end may give better results. Feed as slowly as you can without burning. If possible, run the workpiece through the machine at a slight angle.

A jointer or planer with a true helical or spiral cutterhead makes the cleanest cuts because it shears the wood at a skewed angle, compared to the head-on hit from straight knives. Although no benchtop planers come with such cutters, many 15" or larger planers do. Jointers 6" and larger often feature these cutters, and some manufacturers sell them to retrofit straight-knife jointers.

Support those fibers

Avoid splintered crosscuts and miter-cuts by supporting the fibers right up to the blade. Start with a zero-clearance throat insert in your tablesaw [Photo G]. (You can make a zero-clearance baseplate for a circular saw, too.) Another approach is to score the cutting line [Skill Builder].

To prevent edge tear-out on the tablesaw, attach an extension to your miter gauge, overhanging the end beyond the blade, and saw through it for a zero-clearance miter gauge [Photo H]. As a bonus, the kerf through the fence makes it easy to precisely line up your cut. Follow a similar strategy on the miter saw [Photo I].

Similarly, installing a zero-clearance fence on your router table results in cleaner cuts, especially on complex profiles. 🌲

Produced by **Larry Johnston**



I Add an auxiliary table and fence to keep a miter saw cut clean. Buy or make a zero-clearance table insert and fence for a permanent all-angle solution.

SKILL BUILDER

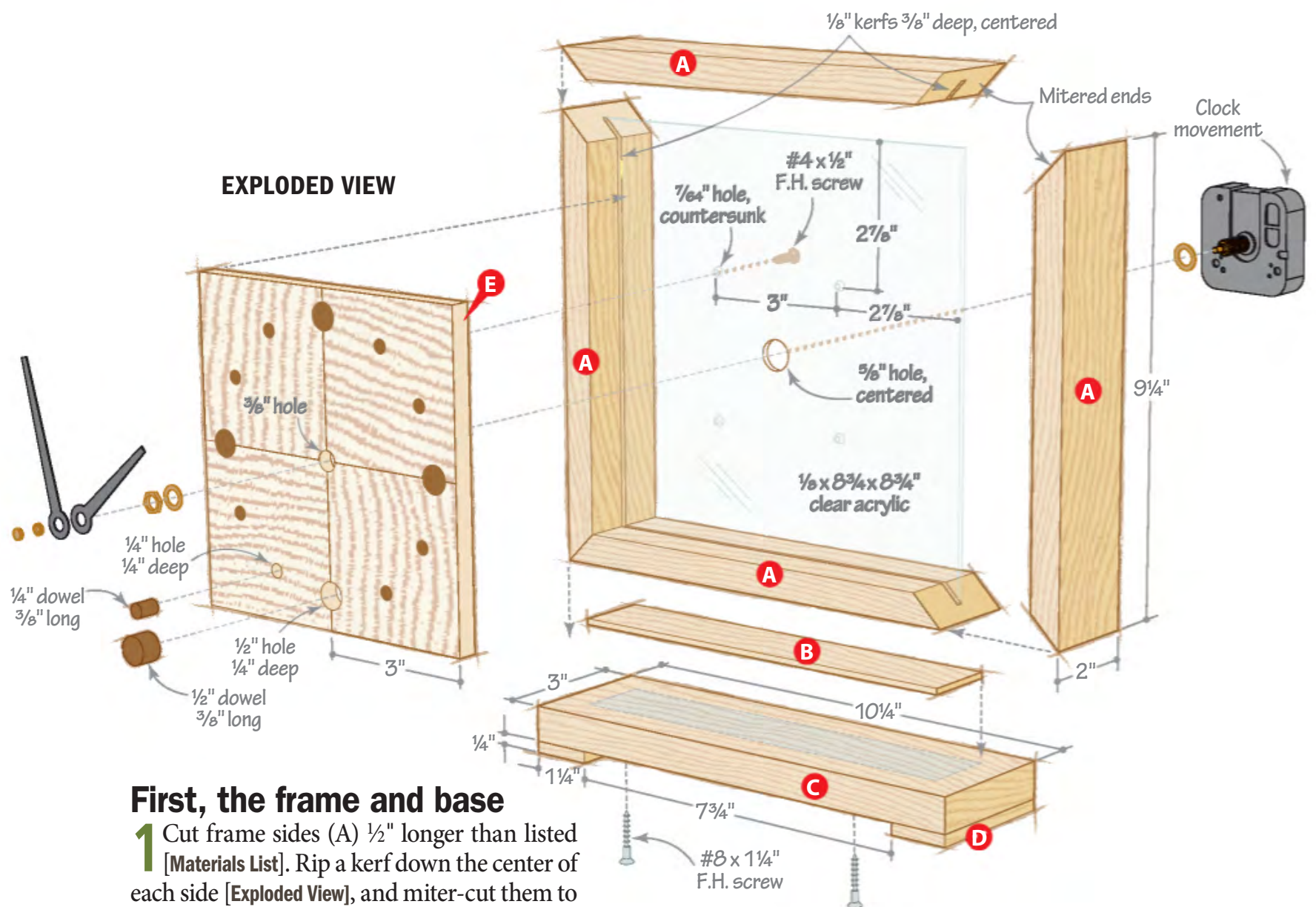
Scribe the cutting line for splinter-free sawing

Before making a crosscut or miter-cut, scribe with a marking knife the cutline on the bottom face and back edge (for a tablesaw; when using a circular saw, scribe the top face and front edge). By cutting the fibers right at the line, you'll prevent them from splintering back past the line as the blade breaks out of the board.



Time Suspended Floating-face Clock





First, the frame and base

1 Cut frame sides (A) $\frac{1}{2}$ " longer than listed [Materials List]. Rip a kerf down the center of each side [Exploded View], and miter-cut them to final length. Finish-sand the inside faces.

2 Glue together three of the frame sides and place those and the unglued side into a band clamp. After the glue dries, sand the outside faces. Mask off the unglued miters and set aside.

3 Cut the base spacer (B), base (C), and risers (D) to size. Glue the spacer (centered) and risers to the base. Finish-sand the assembly.

Make a face

1 Cut the clock-face backer (E) $\frac{1}{2}$ " wider and longer than listed. (We used a scrap

of maple-veneered MDF; any plain or veneered MDF will do, as will Baltic birch plywood.)

2 Cut a strip of veneer $3\frac{1}{4}$ " wide by 15" long. (We used zebrawood; any straight-grained veneer will look good.) From the strip cut four $3\frac{1}{4}$ " lengths [Photo A].

3 Tape together two squares with their grain aligned 90° to one another. Repeat for the other two squares. Tape together those two assemblies [Photo B].



A

Use a scrap backer and square to make 90° crosscuts with a sharp knife. Cut from both edges toward the center to avoid tear-out.



B

Stack the veneer assemblies face-to-face, with one long edge aligned, and tape them together at top and bottom.



C Align the two clamping blocks flush and sand the veneer edges flush to the blocks using 100-grit sandpaper.



D Tape together the two long edges you just straightened, with the grain of adjoining squares 90° to each other.



E To attach the veneer to the backer (E), apply a uniform layer of glue to the backer, place the veneer assembly (tape side up) onto the glued surface, place a sheet of waxed paper on top of that, add a caul sized to match the backer, and apply clamping pressure.

Tip! To ensure four veneer squares of the same size, measure from the center intersection of the squares to the edge of the glue-up when determining where to set your saw's fence for the trim cuts.

4 Clamp the veneer between two blocks of wood with the aligned long edge protruding [Photo C]. Sand the exposed veneer straight. Tape the four squares [Photo D].

5 Glue and clamp the veneer assembly to the backer [Photo E].

6 After the glue dries, cut the clock face to the final size shown for the backer [Materials List]. Trim all sides to ensure each veneer square measures 3" square.

7 Lay out a 5"-diameter centered circle and hour positions on the veneer [Photos F, G].

8 With Forstner bits, drill holes at each of the marks and seams along the circle [Exploded View]. Glue in dowel plugs (we used walnut) and trim them flush with a flush-cutting saw. Finish-sand the face, drill the clock-movement hole, and set the face aside.

Finish it up

1 Apply finish to the wood parts—we sprayed three coats of satin aerosol lacquer.

2 Cut and drill the piece of acrylic. Screw the acrylic backer to the clock face, and slide the backer into the groove in the frame. Glue on the remaining frame side (A).

3 Screw the base assembly to the bottom of the frame. Install the movement and hands [Source].

Materials List

Part	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A* frame sides	5/8"	2"	9 1/4"	W	4
B base spacer	1/8"	1 1/2"	8 3/4"	W	1
C base	1"	3"	10 1/4"	W	1
D risers	1/4"	3"	1 1/4"	W	2
E* clock-face backer	1/2"	6"	6"	MDF	1

*Parts initially cut oversize. See the instructions.

Materials key: W=walnut, MDF=medium-density fiberboard.

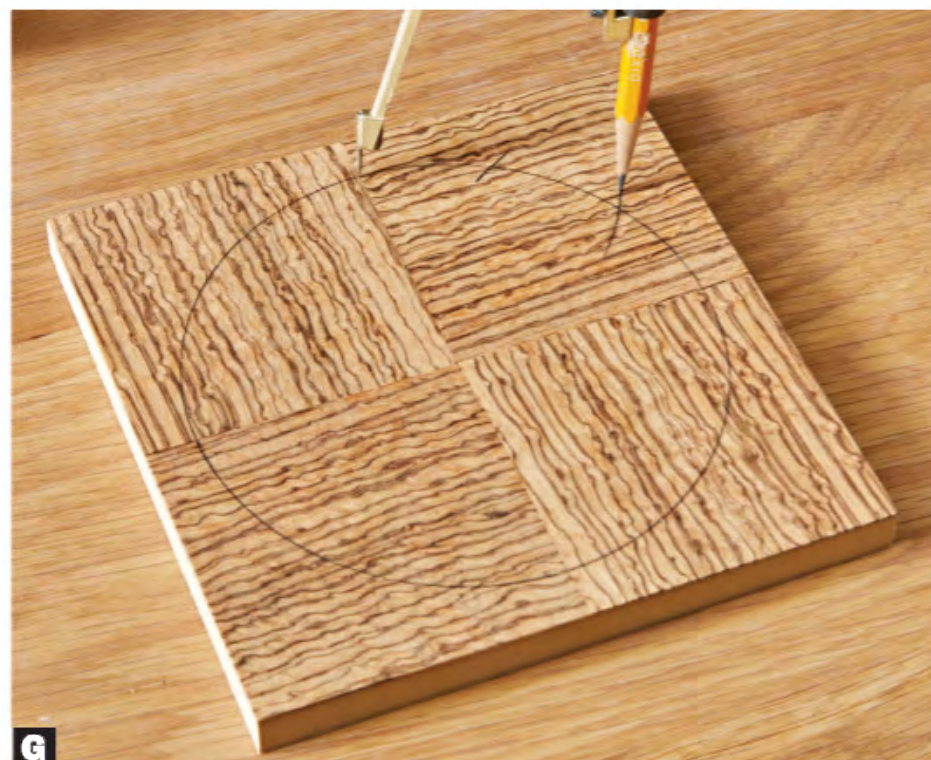
Supplies: 1/8x8 3/4x8 3/4" acrylic, 1/4" and 1/2" walnut dowel, #8x1 1/4" flathead screws (2), #4x1/2" flathead screws (4), veneer.

Bits: 1/4" and 1/2" Forstner bits.

Source: Order the clock movement and hands. Kit no. RS-01215, \$6.95, 888-636-4478, woodmagazine.com/floatingclock.



F To mark the 1 o'clock position on the face, leave the compass set at 2 1/2" and place its point at the intersection of the marked circle and a veneer seam.



G Mark the 2 o'clock position by moving the compass point to the intersection of the marked circle and the veneer seam at the 12 o'clock position. Strike another short arc. Repeat these steps to mark the remaining hour positions.

Produced by **Bill Krier** with
Kevin Boyle
Project design: **Kevin Boyle**
Illustrations: **Roxanne LeMoine**,
Lorna Johnson

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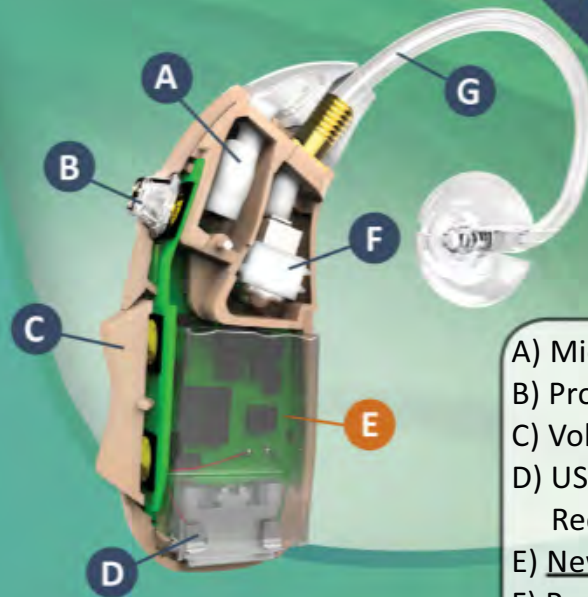


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These planes share DNA from the Stanley Bedrock line of a century ago, so they feel similar in hand, and the adjustments work similarly. Their 6-lb mass helps the blade slice through material once you get the tool moving, but can be tiring after extended use. The softer steel of the Wood River blade required honing (and will need more frequent sharpening) to bring it to the out-of-the-box sharpness of the Lie-Nielsen blade, but that's a small investment of elbow grease to get near-equal performance.

Tighter tolerances on the Lie-Nielsen make fine blade adjustments easy. On both models, closing up the blade in the mouth requires a

Wood River no. 4½, \$175

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screwdriver to move the frog forward. The Lie-Nielsen provides easy access to the frog screws; the tote on the Wood River partially obstructs one.

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Veritas Low-angle Smooth Plane, \$217

► Lightweight favorite for smoothing panels or shooting miters.

Veritas lets you choose the frog angle, type of blade steel, and tote and knob shapes, so you can put together a tool that fits your hands and style of working. The one shown has a 45° bed, a wear-resistant PM-V11 blade, traditional tote (which we found quite comfortable), and standard knob, better suited to larger hands. The knurled-knob Norris-style blade adjuster turns easily with negligible backlash. The easily adjustable mouth accommodates heavy or paper-thin cuts.

For lighter work, when you don't want to muscle a heavy plane, this 3½-lb bevel-up tool works beautifully. (Bevel-up planes don't require chipbreakers so you can quickly swap blades to change the cutting angle.) The lower cutting angle—37° vs. 45° in smoothing planes—often cuts cleaner, especially across end grain. Toolless blade and mouth adjustments make fine-tuning cutting depth a snap. Choose a blade from one of three steel hardnesses.

no. 06P04.71A, 800-871-8158, leevalley.com

no. 05P25.51



Plant Faster, Easier With **NEW SUPER PLUGS!**

Pre-cut
plugs
are 10x
bigger!



OR... Plant Your Way With **FREESTYLE PLUGS!**

Cut any
size plugs
from
sheets!

THE ONE TIME, LIFETIME LAWN SOLUTION!



SAVE
OVER
50%

**NEW PRE-CUT
SUPER PLUGS
now available!**

Stays
lush and
green in
summer

Mow your Zoysia lawn once a month – or less! It rewards you with weed-free beauty all summer long.

7 Ways Our Amazoy™ Zoysia Lawn Saves You Time, Work and Money!

1 CUTS WATER BILLS AND MOWING BY AS MUCH AS 2/3

Would you believe a lawn could look perfect when watered just once? In Iowa, the state's biggest Men's Garden club picked a Zoysia lawn as "top lawn – nearly perfect." Yet, this lawn had been watered only once all summer to August!

In PA, Mrs. M.R. Mitter wrote, "I've never watered it, only when I put the plugs in...Last summer we had it mowed 2 times...When everybody's lawns here are brown from drought, ours stays as green as ever." *That's how Amazoy Zoysia lawns cut water bills and mowing! Now read on!*

2 NO NEED TO DIG UP OLD GRASS

Plant Amazoy *your way* in an old lawn or new ground. Set plugs into holes in the soil checkerboard style. Plugs spread to create a lush, thick lawn, driving out weeds and unwanted growth. Easy instructions included with every order.

3 ENVIRONMENTALLY FRIENDLY

No weeding means no costly chemicals. Since Amazoy Zoysia lawns naturally resist insects, you'll save money, while helping to protect the environment. You'll never have to expose your family and pets to the risk of weed killers and pesticide poisons.

4 FOR SLOPES, PLAY AREAS, BARE SPOTS AND PARTIAL SHADE

You can't beat Amazoy Zoysia as the low-cost answer for hard-to-cover spots, play-worn areas, places that have partial shade and erosion on slopes.

Meyer Zoysia Grass was perfected by the U.S. Gov't, released in cooperation with the U.S. Golf Association as a superior grass.

5 IT STAYS GREEN IN SPITE OF HEAT AND DROUGHT

"The hotter it gets, the better it grows!" Plug-in Zoysia thrives in blistering heat, yet it won't winter-kill to 30° below zero. It just goes off its green color after killing frosts, and begins regaining its green color as temperatures in the spring are consistently warm.



Thrives from partial
shade to full sun.



Plant it from
plugs.

6 CHOKES OUT CRABGRASS AND WEEDS ALL SUMMER

Your established Amazoy Zoysia lawn grows so thick, it simply stops crabgrass and most summer weeds from germinating!

7 NOW 3 WAYS TO START YOUR AMAZOY ZOYSIA LAWN!

1) **Freestyle plugs** come in uncut sheets containing a maximum of 150 - 1" plugs that can be planted up to 1 ft. apart. Freestyle plugs allow you to make each plug bigger and plant further apart – less cutting and planting – you decide.

2) **New Super Plugs** come pre-cut into individual 3"x3" plugs ready-to-plant (minimum 1 per 4 sq. ft.). They arrive in easy to handle trays of 15 Super Plugs. Save more time and get your new lawn even faster!

3) **Amazoy Approved Seed-As** The Zoysia 6SHFIDWIRU \ HDV Z HÄQDÖ KQYHD Zoysia seed available that meets our standards and homeowners expectations.

Learn why at zoysiafarms.com/mag or by phone at 410-756-2311.

**ORDER TODAY – GET UP TO
1000 FREESTYLE
PLUGS – FREE!**

Dept. 5364

Your Assurance of Lawn **SUCCESS**
**Each Order for Amazoy Zoysia is
GUARANTEED**

Guaranteed to grow new green shoots within 45-60 days or we'll replace it **FREE** – for up to 1 year – just call us. We **ONLY** ship you living genuine Amazoy Zoysia grass harvested direct from our farms. Easy planting and watering instructions are included with each order. Every **Reorder** assumes success of previous orders (plantings), voiding any previous guarantees, but initiating a **new** one-year guarantee.

©2019 Zoysia Farm Nurseries, 3617 Old Taneytown Rd, Taneytown, MD 21787

Plugs only shipped to Continental USA & not to WA or OR.

Freestyle Plugs You decide how big to cut the plugs. Each grass sheet can produce up to 150-1 in. plugs. Plant minimum 1 plug per sq. ft.

Max Plugs*	Free Plugs	Grass Sheets*	Your PRICE	+ Shipping	SAVINGS
300	—	2	\$29.95	\$14.50	—
500	+100	4	\$50.00	\$16.00	25%
750	+150	6	\$66.00	\$19.50	36%
1100	+400	10	\$95.00	\$30.00	43%
2000	+1000	20	\$165.00	\$45.00	52%

Super Plugs Precut plugs 3 inches by 3 inches. **READY TO PLANT**
Packed in trays of 15 Super Plugs. Plant minimum 1 plug per 4 sq. ft.

Super Plugs	Free Plugs	Trays	Your PRICE	+ Shipping	SAVINGS
15	—	1	\$24.95	\$8.50	—
60	+15	5	\$90.00	\$20.00	34%
95	+25	8	\$110.00	\$30.00	47%
120	+30	10	\$125.00	\$35.00	50%
180	+45	15	\$180.00	\$50.00	54%

EVERYTHING YOU NEED TO START AND MAINTAIN A CAREFREE BEAUTIFUL ZOYSIA LAWN

PLANTING TOOLS * PLANT FOOD * WEED AND PEST CONTROLS * ORGANIC PRODUCTS * SOIL TESTS * GARDEN GLOVES * EDGING AND MORE

All Available Exclusively at www.ZoysiaFarms.com/mag or 410-756-2311

ZOYSIA FARM NURSERIES, 3617 OLD TANEYTOWN ROAD TANEYTOWN MD 21787

AMAZOY IS THE TRADEMARK REGISTERED U.S. PATENT OFFICE for our Meyer Zoysia grass.

We ship all orders the same day the plugs are packed and at the earliest planting time in your state.

DOWELMAX

PRECISION ENGINEERED JOINING SYSTEM

JOINT STRENGTH IS DIRECTLY PROPORTIONAL TO ACCURACY



Mitered Drawer Corner with Exposed Dowels on Chess Table Built In House by Dowelmax with 100% Dowel Construction

Full System Not Shown-Main Unit Only

OUR GUARANTEE: Joints Made with Dowelmax are Test Proven Stronger and More Accurate than Comparable M&T or Domino Joints.



Call 1.877.986.9400 or visit dowelmax.com

Jig Plan Super Bundle



25 Downloadable Jig Plans for \$25

This is it: The greatest collection of woodworking jig plans ever assembled. Increase your efficiency, amp up your accuracy, and crank up your confidence with must-have jigs for the tablesaw, bandsaw, router, and more.

Download today at woodstore.net/jigbundle



Prepare Your Garden the **EASY WAY** with Dual Rotating Tines!

HUGE TILLER SALE!
Starting at just \$199⁹⁹



DRrototiller.com

OUR PRO XL ROTOTILLER lets you choose forward rotation for cultivating, or counter-rotation for deep soil tilling or sod busting.

ONE-HAND OPERATION! Self-propulsion lets you walk to one side while you easily steer with one hand, leaving no footprints in the freshly tilled bed!

8 TILLER MODELS! No matter how big or small the job, we've got one for you!

19871A © 2019

SIMPLER STRONGER FASTER

...than any Hydraulic Log Splitter!

DR[®] KINETIC LOG SPLITTER

SO SIMPLE it's practically maintenance free. There are no hydraulic pumps, valves, pistons, hoses, or fluids to leak or replace—EVER.

SO STRONG its cast iron flywheel and hardened steel components show almost no wear after splitting hundreds of cords.

SO FAST it is the world's fastest splitter. Splits anything a hydraulic splitter will—but in one-sixth the time!



Starting at just \$499⁹⁹

ELECTRIC MODELS TOO!

Split wood indoors!



DRlogsplitters.com

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Go Online or Call for **FREE Info Kit!**

Includes product specifications and factory-direct offers.

TOLL FREE 888-213-2037



Compact router table

Convertible benchtop router table, no. 58147, \$200

Confession time: I love router tables. Anytime I can do a task on the router table rather than with a handheld router or tablesaw, I'm doing it. And this Rockler compact router table intrigued me from the moment I saw it.

It's available in three configurations: one for 1¼-hp compact routers, another for 1½–2¼-hp midsize routers, and a third with insert plates for both router types. I prefer the compact-router version for two reasons. First, the small size of the table suits small-to medium-size project parts well. And a compact router, though limited to ¼"-shank bits, still provides lots of options for edge-forming and joinery bits. Also, you can easily lift out a compact router and use it handheld without removing the insert plate. (With a midsize router, you have to remove one of the handles to fit it through the plate opening.) But if you dedicate a midsize router to this table, you'll get along great and be able to use ½"-shank bits.

The 18½×16⅜" top has a slick melamine coating and a good split-panel fence with 2½" dust port. A miter slot provides options for jigs and accessories. You can mount this to a wall (where it folds flat if you remove the router), clamp it to a workbench, or fold it up and take it to a job.

—Tested by Bob Hunter, Tools Editor

Rockler Woodworking and Hardware
800-279-4441, rockler.com



A respirator you'll be glad to wear

Air Stealth half-mask vented respirator, \$32

I've used a lot of dust masks and respirators over the years, but they almost always share the same flaws: They're uncomfortable, and lead to fogged glasses. This Air Stealth respirator's soft rubber seal comfortably fits around my nose and mouth while also sealing off air that normally vents up and under my glasses. Instead, the air moves in and out of the replaceable filters, as it should. The adjustable straps connect easily for quick on and off. All of that adds up to a respirator that I'm able to wear comfortably for long periods in the shop.

—Tested by Bob Baker

Trend Routing Technologies
877-918-7363, trend-usa.com



PITTSBURGH WITH **ANY** PURCHASE

4-IN-1 SCREWDRIVER

- Soft-Grip Handle
- Stores Bits
- 2 Slotted
- 2 Phillips Head

LIFETIME WARRANTY

ITEM 39631
69470/98899/61988 shows

COMPARE TO
HDX
\$3.97

MODEL: 120S012

51633784

Cannot be used with other discounts or prior purchases.
Original coupon must be presented. Valid through 7/1
while supplies last. Limit 1 FREE GIFT per customer per d

Customer Rating
★★★★★
★★★★★

Blade sold separately.

NOW
~~14.99~~
12.99

COMPARE TO
PORTER-CABLE
\$59.98
MODEL: PCE266

**SAVE
66%**

\$19.99
~~\$28.99~~

ITEM 65570/61884/62370 shown

51916998

**16" VARIABLE SPEED
SCROLL SAW**

Customer Rating
★★★★★

**NOW
\$169.99**

COMPARE TO
PORTER-CABLE
\$199
MODEL: PC8375SS

**SAVE
\$129**

~~\$94.99~~

ITEM # 69510/82292/02012

51918708

Customer Rating
★★★★★

LIFETIME WARRANTY

NOW \$10.99

COMPARE TO
SHOP FOX
\$47.95
MODEL: 02468

SAVE
77%
ITEM: 92490/50673 change

70%
\$16.99

51925044

• 1000 lb. capacity

COMPARE TO BUFFALO

NOW

BUFFALO TOOLS
\$17.65
MODEL: HOFDOLLY

SAVE 54%

~~\$10.99~~

NOW \$7.99

ITEM 63008/60497/61899/63095/63096/63097/93888 shown

51928175

**RECIPROCATING SAW
WITH ROTATING HANDLE**

Customer Rating
★★★★★

Blade sold separately.

NOW \$129

51631281

Limit 1 coupon per customer per day. Save 20% on any 1 item purchased. *Cannot be used with other discount, coupon or any of the following items or brands: Inside Track Club membership, Extended Service Plan, gift card, open box item, 3 day Parking Lot Sale item, compressors, floor jacks, sales, saw mills, storage cabinets, chests or carts, trailers, trencher, backhoe, welders, Admiral, Ames, Bauer, Cobra, CoverPro, Daytona, Diamondback, Earthquake, Fischer, Hercules, Icon, Juphrat, Lynx, Poulan, Predator, Tailgator, Viking, Vulcan, Zurich. Not valid on prior purchases. Non-transferable. Original coupon must be presented. Valid through 7/1/19.

COMPARE TO
PORTER-CABLE
\$59.98
MODEL: PCE360

**SAVE
66%**

\$19.97
~~\$28.99~~

ITEM 65570/61884/62370 shown

Pierce  **SUPER COUPON**
Customer Rating


18 GAUGE BRAD NAILER

HAF
MECHAN

5 1916998

LIMIT 6 - Coupon valid through 7/1/19*

NEW

SCISSOR SUPER COUPON

16" VARIABLE SPEED SCROLL SAW

Customer Rating

★★★★☆

NOW


COMPARE TO PORTER-CABLE \$199
 MODEL: PC6375SS
SAVE \$129
 ITEM 62510/62992/63012


COMPARE TO BOSTITCH \$89
 MODEL: BTFFP12233
SAVE 55%
NOW \$39.99
 ITEM 64255

COMPARETO SHOP FOX \$47.95 MODEL: D2468
 SAVE 77% ITEM: 02400/60673 ~~change~~
 \$10.99
 COMPARETO MAKITA \$99 MODEL: RT0701C
 SAVE \$79 ITEM: 61626 ~~change~~
 62659 ~~change~~

BUFFALO TOOLS
\$17.65
MODEL: HDFOOLLY

SAVE 54%

~~\$10.99~~

NEW \$7.99

ITEM: 63008/60497/61809/63005/63006/63007/03888

SAVE 28%

~~\$39.99~~

COMPARE TO \$41.99

CRAFTSMAN MODEL: 22205

ITEM: 60000

A barcode with the number 51930044 printed below it.

Customer Rating

YOUR CHOICE OF COLOR

\$18999

64030
64033 shows
RED
ITEM 64061
64059
64060 shows
GREEN

- 15,000 cu. in. of storage
- 700 lb. capacity
- Weighs 139 lbs.



51916777

LIMIT 3 - Coupon valid through 7/1/15*

COMPARE TO
Snap-on
BLUE-POINT
\$810
 MODEL: MRBC10T/BPES

MULTI-TASK LADDER

NOW
\$109⁹⁹

Customer Rating

~~\$139⁹⁹~~




★★★★★
SAVE \$189
 COMPARE TO
 LITTLE GIANT
\$298.99
MSRP

SAVE 54%

ITEM 62434, 62426, 62433, 62432, 62419, 64178, 64179, 62428 shown.

A barcode with the number 51919699 below it. To the right, the text "ISSUE 4 - December 1994 through 7/1/95" is printed.

ALL PURPOSE/WEATHER RESISTANT TARP

Customer Rating: ★★★★★

NOW \$2.99

COMPARE TO
BLUE HAWK **MODEL 80SK10-Y** **\$998**
ITEM 60115/60121/60120/60137/60240/877 **SAVE 70%**
900lb. capacity

51926693

197
4867H **SAVE 66%**

COMPARE TO
RYOBI
\$229

Stand sold
separately.

SAVE \$119

\$139⁹⁹

1585/6238/4/25 shown

MODEL: M32Z ITEM 97896/6882/6311/64459/63118 shown

51933837

52052439

GOOD
CHICAGO ELECTRIC
POWER TOOLS

SCISSOR SUPER COUPON

12" DUAL-BEVEL SLIDING COMPOUND MITER SAW

Customer Rating **★★★★★**

Blade sold separately.
ITEM 69684
61970/61969 shown



3-1/2" VERTICAL CROWN MOLDING CAPACITY

2-5/8" TALL SLIDING FENCES

LASER GUIDE LIGHT

\$139⁹⁹

SAVE \$85 COMPARE TO **\$225**
PROFESSIONAL WOODWORKER MODEL: 3637

51935100

LIMIT 5 - Coupon valid through 7/1/19*

BETTER
ADMIRAL

SCISSOR SUPER COUPON

12" DUAL-BEVEL SLIDING COMPOUND MITER SAW

Customer Rating **★★★★★**

Blade included.

ITEM 64686



6-1/2" VERTICAL CROWN MOLDING CAPACITY

4-1/2" TALL SLIDING FENCES

LASER GUIDE LIGHT & LED WORK LIGHT

\$179

SAVE \$90 COMPARE TO **\$269**
RYOBI MODEL: TSS12GL

51935926

LIMIT 5 - Coupon valid through 7/1/19*

BEST
HERCULES

SCISSOR SUPER COUPON

PROFESSIONAL 12" DUAL-BEVEL SLIDING COMPOUND MITER SAW

Customer Rating **★★★★★**

Blade included.

ITEM 63978



7-1/2" VERTICAL CROWN MOLDING CAPACITY

4-3/4" TALL SLIDING FENCES

LED PRECISION SHADOW GUIDE LIGHT

\$299

SAVE \$300 COMPARE TO **\$599**
DEWALT MODEL: DW5780

51936004

LIMIT 4 - Coupon valid through 7/1/19*

SCISSOR SUPER COUPON

PITTSBURGH WITH ANY PURCHASE

1" x 25 FT. TAPE MEASURE

LIFETIME WARRANTY

COMPARE TO **\$6.98**
MODEL: LAR25HV

• Thumb Lock
• Rubber Wrapped Case

ITEM 69030
69080/69031 shown



51582277

Cannot be used with other discounts or prior purchases. Original coupon must be presented. Valid through 7/1/19 while supplies last. Limit 1 FREE GIFT per customer per day.

CENTRAL MACHINERY **SCISSOR SUPER COUPON**

14" OSCILLATING SPINDLE SANDER

Customer Rating **★★★★★**

NOW \$109⁹⁹
~~\$144⁹⁹~~

ITEM 62146/69257 shown



COMPARE TO \$165⁷¹ **SAVE \$55**
TRITON TOOLS MODEL: TSPS450

51939083

LIMIT 5 - Coupon valid through 7/1/19*

CENTRAL PNEUMATIC **SCISSOR SUPER COUPON**

3/8" x 50 FT. RETRACTABLE AIR HOSE REEL

Customer Rating **★★★★★**

NOW \$59⁹⁹
~~\$77⁹⁹~~

ITEM 69265/62344/64685/93897 shown



COMPARE TO \$99 **SAVE \$39**
KOBALT MODEL: SBY-AIR184

51940158

LIMIT 4 - Coupon valid through 7/1/19*

WARRIOR **SCISSOR SUPER COUPON**

18 VOLT LITHIUM CORDLESS 3/8" DRILL/DRIVER KIT

Customer Rating **★★★★★**

NOW \$29⁹⁹
~~\$39⁹⁹~~

• 199 in. lbs. of torque

COMPARE TO **\$69** **SAVE \$39**
RYOBI MODEL: P1810

ITEM 64118



51942298

LIMIT 3 - Coupon valid through 7/1/19*

BRAUN **SCISSOR SUPER COUPON**

5000 LUMENS LED HANGING SHOP LIGHT

Customer Rating **★★★★★**

NOW \$19⁹⁹
~~\$29⁹⁹~~

SAVE 17%

COMPARE TO **\$24²⁴**
STONEPOINT MODEL: SLAA-3200N

ITEM 64410



51946893

LIMIT 5 - Coupon valid through 7/1/19*

PITTSBURGH **SCISSOR SUPER COUPON**

4 PIECE WOOD CHISEL SET WITH CLEAR PVC HANDLE

LIFETIME WARRANTY

Customer Rating **★★★★★**

NOW \$4⁹⁹
~~\$7⁹⁹~~

SAVE 83%

COMPARE TO **\$29⁹⁷**
DEWALT MODEL: DWHT16063

ITEM 42429/69471 shown



52046321

LIMIT 5 - Coupon valid through 7/1/19*

CENTRAL MACHINERY **SCISSOR SUPER COUPON**

350 LB. CAPACITY FOLDABLE SAWHORSE

Customer Rating **★★★★★**

NOW \$8⁹⁹
~~\$12⁹⁹~~

SAVE 50%

COMPARE TO **\$17⁹⁹**
STANLEY MODEL: STS111200

ITEM 61979/60710/69446 shown



51947902

LIMIT 5 - Coupon valid through 7/1/19*

CHICAGO ELECTRIC **SCISSOR SUPER COUPON**

4" BISCUIT PLATE JOINER

Customer Rating **★★★★★**

NOW \$44⁹⁹
~~\$62⁹⁹~~

SAVE \$184

COMPARE TO **\$179**
MAKITA MODEL: PJ7000

ITEM 68987



51947944

LIMIT 4 - Coupon valid through 7/1/19*

SCISSOR SUPER COUPON

200 LUMENS LED SUPER BRIGHT FLIP LIGHT

• Wireless, tool-free and easy installation

Customer Rating **★★★★★**

NOW \$2⁹⁹
~~\$4⁹⁹~~

SAVE 50%

COMPARE TO **\$6**
PREMIER MODEL: SW-SWITCH-12/24

ITEM 64189/64723/63922 shown



51951932

LIMIT 5 - Coupon valid through 7/1/19*

PITTSBURGH **SCISSOR SUPER COUPON**

50" CLAMP AND CUT EDGE GUIDE

LIFETIME WARRANTY

Customer Rating **★★★★★**

NOW \$14⁹⁹
~~\$22⁹⁹~~

SAVE 62%

COMPARE TO **\$39⁹⁸**
BORA MODEL: S43050

ITEM 66581



51952358

LIMIT 5 - Coupon valid through 7/1/19*

WARRIOR **SCISSOR SUPER COUPON**

18 PIECE, 3/4" - 5" CARBON STEEL HOLE SAW SET

Customer Rating **★★★★★**

NOW \$9⁹⁹
~~\$16⁹⁹~~

SAVE 87%

COMPARE TO **\$83⁰⁵**
KOBALT MODEL: 9224

ITEM 69073/68115 shown



51952521

LIMIT 5 - Coupon valid through 7/1/19*

SCISSOR SUPER COUPON

4 PIECE ANTI-FATIGUE FOAM MAT SET

• Each pad measures 25" x 25"

Customer Rating **★★★★★**

NOW \$6⁹⁹
~~\$8⁹⁹~~

SAVE 65%

COMPARE TO **\$19⁹⁹**
NORSK MODEL: DG1119346

ITEM 40187/61607/62389/94635 shown



51954906

LIMIT 5 - Coupon valid through 7/1/19*

HERCULES **SCISSOR SUPER COUPON**

12", 80 TOOTH ULTRA FINISH CARBIDE TIP SAW BLADE

Customer Rating **★★★★★**

NOW \$49⁹⁹
~~\$59⁹⁸~~

SAVE 16%

COMPARE TO **\$59⁹⁸**
DEWALT MODEL: DW3232PT X

ITEM 63802



51956261

LIMIT 5 - Coupon valid through 7/1/19*

*Original coupon only. No use on prior purchases after 30 days from original purchase or without original receipt. Valid through 7/1/19.

At Harbor Freight Tools, the "Compare to" price means that the specified comparison, which is an item with the same or similar function, was advertised for sale at or above the "Compare to" price by another national retailer in the U.S. within the past 90 days. Prices advertised by others may vary by location. No other meaning of "Compare to" should be implied. For more information, go to HarborFreight.com or see store associate.

SUPER COUPON

FREE

WITH ANY PURCHASE

CENTECH

7 FUNCTION DIGITAL MULTIMETER

- 3.5" LCD Display
- Battery Included

ITEM 98025/30756/63604
63758/63759/69096/90899 shown

COMPARE TO PROSKIT \$1672
MODEL: MT-1210

51956431

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PITTSBURGH SUPER COUPON

9 PIECE FULLY POLISHED COMBINATION WRENCH SETS

Customer Rating ★★★★★

LIFETIME WARRANTY

Item 42305 shown

YOUR CHOICE

\$5.99

SAVE 66% ~~\$7.99~~

COMPARE TO HUSKY \$17.97
MODEL: HCW10PCSAE

TYPE ITEM
SAE 69043/63282/42304
METRIC 69044/63171/42305

51957456

LIMIT 4 - Coupon valid through 7/1/19

KRAUSE & BECKER SUPER COUPON

AIRLESS PAINT SPRAYER KIT

Customer Rating ★★★★★

NOW \$169.99

SAVE \$214.99

COMPARE TO GRACO \$299
MODEL: 262800

SAVE \$129

ITEM 68001/62915/60800 shown

51957598

LIMIT 4 - Coupon valid through 7/1/19

CHICAGO ELECTRIC POWER TOOLS SUPER COUPON

MOBILE MITER SAW STAND

Customer Rating ★★★★★

Supports 16 ft.

SAVE \$39

COMPARE TO HITACHI \$139
MODEL: UJ240F

NOW \$99.99

ITEM 63409/62750 shown

51984376

LIMIT 4 - Coupon valid through 7/1/19

CENTRAL PNEUMATIC SUPER COUPON

3 GALLON, 100 PSI OIL-FREE AIR COMPRESSORS

Customer Rating ★★★★★

A. HOT DOG
ITEM 69269/97080 shown

B. PANCAKE
ITEM 61615/60637
95275 shown

YOUR CHOICE

\$39.99

SAVE 59% ~~\$98.62~~

COMPARE TO PORTER-CABLE \$98.62
MODEL: PCF02003

51985414

LIMIT 2 - Coupon valid through 7/1/19

SUPER COUPON

TILTING FLAT PANEL TV MOUNT

Customer Rating ★★★★★

• 176 lb. capacity

NOW \$14.99

SAVE \$85 ~~\$99.99~~

COMPARE TO ROCKETFISH \$99.99
MODEL: RF-TVMPTG3

ITEM 62289/61807 shown

51986014

LIMIT 7 - Coupon valid through 7/1/19

WINDSOR DESIGN SUPER COUPON

60" HARDWOOD WORKBENCH WITH 4 DRAWERS

Customer Rating ★★★★★

NOW \$119.99

SAVE \$305 ~~\$425~~

COMPARE TO GRIZZLY \$425
MODEL: H722

ITEM 93454/69054/63395/62603 shown

51986834

LIMIT 6 - Coupon valid through 7/1/19

Grant's GARAGE SUPER COUPON

SHOP TOWELS PACK OF 50

Customer Rating ★★★★★

Mechanic's Choice

NOW \$9.99

SAVE 44% ~~\$17.98~~

COMPARE TO VIKING \$17.98
MODEL: 874900

ITEM 63365/64730/56119/63360 shown

51988752

LIMIT 4 - Coupon valid through 7/1/19

drillmaster SUPER COUPON

80 PIECE ROTARY TOOL KIT

Customer Rating ★★★★★

NOW \$6.99

SAVE 73% ~~\$26.35~~

COMPARE TO PROFESSIONAL WOODWORKER \$26.35
MODEL: 51832

ITEM 68986/63235/63292/97626 shown

51988790

LIMIT 6 - Coupon valid through 7/1/19

PITTSBURGH #1 SELLING JACKS IN AMERICA SUPER COUPON

RAPID PUMP® 1.5 TON LIGHTWEIGHT ALUMINUM FLOOR JACK

Customer Rating ★★★★★

• 3-1/2 pumps lifts most vehicles

• Lifts from 3-1/2" to 14-1/8"

• Weighs 34 lbs.

NOW \$59.99

SAVE \$65 ~~\$125.68~~

COMPARE TO K TOOL \$125.68
MODEL: KTJ3094

ITEM 64545/64552/64832
68053/62160/62496/62516/60569 shown

51991100

LIMIT 4 - Coupon valid through 7/1/19

drillmaster SUPER COUPON

2 HP, FIXED BASE ROUTER

Customer Rating ★★★★★

NOW \$44.99

SAVE \$134 ~~\$179~~

COMPARE TO HITACHI \$179
MODEL: KM12VC

ITEM 68341

51994838

LIMIT 4 - Coupon valid through 7/1/19

SUPER COUPON

16" x 30" TWO SHELF STEEL SERVICE CART

Customer Rating ★★★★★

• 220 lb. capacity

NOW \$29.99

SAVE 61% ~~\$78.43~~

COMPARE TO EDSAL \$78.43
MODEL: SC2016

ITEM 60390/5107 shown

51996243

LIMIT 5 - Coupon valid through 7/1/19

CENTRAL MACHINERY SUPER COUPON

10", 12 SPEED BENCHTOP DRILL PRESS

Customer Rating ★★★★★

NOW \$99.99

SAVE \$87 ~~\$187.92~~

COMPARE TO WEN \$187.92
MODEL: 4212

ITEM 63471/60237 shown

51996559

LIMIT 4 - Coupon valid through 7/1/19

SUPER COUPON

FOLDABLE EAR MUFFS

Customer Rating ★★★★★

NOW \$3.99

SAVE 75% ~~\$16.06~~

COMPARE TO MORRIS PRODUCTS \$16.06
MODEL: 5216

ITEM 94334

51997039

LIMIT 8 - Coupon valid through 7/1/19

ADMIRAL SUPER COUPON

12" 80 TOOTH FINISHING SAW BLADE

Customer Rating ★★★★★

NOW \$24.99

SAVE 58% ~~\$59.98~~

COMPARE TO DEWALT \$59.98
MODEL: DW3232PT X

ITEM 62725

52001471

LIMIT 8 - Coupon valid through 7/1/19

HYDROSTAR SUPER COUPON

50 FT. ELECTRIC DRAIN CLEANER

Customer Rating ★★★★★

NOW \$199.99

SAVE \$198 ~~\$398.95~~

COMPARE TO COBRA \$398.95
MODEL: 90041

ITEM 61856/68285 shown

52001692

LIMIT 2 - Coupon valid through 7/1/19

CENTRAL PNEUMATIC SUPER COUPON

20 OZ. GRAVITY FEED AIR SPRAY GUN

Customer Rating ★★★★★

• 1.4mm tip included

NOW \$9.99

SAVE 80% ~~\$49.98~~

COMPARE TO KOBALT \$49.98
MODEL: SBY-AIR88TZ

ITEM 67181/62300/47016 shown

52002913

LIMIT 6 - Coupon valid through 7/1/19

BUNKER HILL SECURITY SUPER COUPON

60 LED SOLAR SECURITY LIGHT

Customer Rating ★★★★★

Includes 6V, 900 mAh NiCd battery pack.

NOW \$29.99

SAVE 50% ~~\$59.99~~

COMPARE TO SUNFORCE \$59.99
MODEL: 82123

ITEM 93661/62534/69643 shown

52004535

LIMIT 4 - Coupon valid through 7/1/19

CENTRAL PNEUMATIC SUPER COUPON

3" HIGH SPEED AIR CUT-OFF TOOL

Customer Rating ★★★★★

NOW \$5.99

SAVE 67% ~~\$18.35~~

COMPARE TO SPEEDWAY \$18.35
MODEL: 7625

ITEM 60243/47077/69473/60374 shown

52004682

LIMIT 6 - Coupon valid through 7/1/19

WINDSOR DESIGN SUPER COUPON

DOVETAIL JIG

Customer Rating ★★★★★

NOW \$27.99

SAVE 40% ~~\$46.99~~

COMPARE TO GENERAL TOOLS \$46.99
MODEL: 861

ITEM 34102

52004868

LIMIT 4 - Coupon valid through 7/1/19

SCISSOR SUPER COUPON

FREE

3-1/2" **SUPER BRIGHT ALUMINUM FLASHLIGHT**

• 9 LED
• Compact, Lightweight

COMPARE TO RAYOVAC \$3.50
MODEL: BRASLED-8

ITEM 63599/62522/63875
63884/63886/63888/69111/69052 shown

52009435

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U.S. GENERAL **SCISSOR SUPER COUPON**

26" x 22" SINGLE BANK EXTRA DEEP CABINETS

• Weighs 174 lbs.

YOUR CHOICE OF COLOR **\$249.99**

NEW **\$299.99**

SAVE \$1,415

COMPARE TO SNAP-ON \$1,665
MODEL: KRA4008P80

ITEM 64431 shown
Item 64162 shown
Item 64433 shown

52009547

LIMIT 5 - Coupon valid through 7/1/19

BANKS **SCISSOR SUPER COUPON**

23 GAUGE PIN NAILER

Customer Rating ★★★★★

NEW

NOW **\$249.99**

COMPARE TO PORTER-CABLE \$119
MODEL: PN138

SAVE \$94

52009720

LIMIT 3 - Coupon valid through 7/1/19

PREDATOR **SCISSOR SUPER COUPON**

4000 MAX. STARTING/ 3200 RUNNING WATTS 6.5 HP (212 CC) GAS GENERATOR

• 10 hour run time

NOW **\$289.99**

COMPARE TO HONDA \$1,899
MODEL: EG4000

SAVE \$1,609

ITEM 63080/69729/56172/56174/63079 shown
ITEM 63089/63090, CALIFORNIA ONLY

52032348

LIMIT 4 - Coupon valid through 7/1/19

CENTRAL MACHINERY **SCISSOR SUPER COUPON**

8" 5 SPEED BENCHTOP DRILL PRESS

Customer Rating ★★★★★

NEW **\$54.99**

COMPARE TO BUFFALO BLACK \$110.95
MODEL: BPSUL

ITEM 62520/60238 shown

52032708

LIMIT 5 - Coupon valid through 7/1/19

WINDSOR DESIGN **SCISSOR SUPER COUPON**

11 PIECE WOOD CARVING SET

NEW **\$5.99**

SAVE 33%

ITEM 56186/62673 shown

52033373

LIMIT 4 - Coupon valid through 7/1/19

CHICAGO ELECTRIC WELDING **SCISSOR SUPER COUPON**

125 AMP FLUX-CORE WELDER

Customer Rating ★★★★★

EVERYTHING YOU NEED TO WELD

NOW **\$99.99**

COMPARE TO IRONTON \$149.99
MODEL: 45433

ITEM 63583/63582 shown

52033809

LIMIT 5 - Coupon valid through 7/1/19

PITTSBURGH **SCISSOR SUPER COUPON**

CLICK-TYPE TORQUE WRENCHES

Customer Rating ★★★★★

LIFETIME WARRANTY

• Reversible

DRIVE ITEM

1/4"	61277/63881/2696/94735
3/8"	61275/63880/897/94892
1/2"	62431/63882/239/94850

Item 239 shown

COMPARE TO HUSKY \$84.97
MODEL: H20TWA

SAVE 88% **\$19.99**

YOUR CHOICE **\$9.99**

52033993

LIMIT 5 - Coupon valid through 7/1/19

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2500 LB. ELECTRIC WINCH WITH WIRELESS REMOTE CONTROL

• Weighs 14.3 lbs.
• 11-1/8" L x 4-1/2" H

SAVE \$140

Customer Rating ★★★★★

Voted Best Winches

NOW **\$49.99**

COMPARE TO SUPERWINCH \$189.99
MODEL: 1125220

ITEM 68146/61297/63476/61840 shown

52034711

LIMIT 3 - Coupon valid through 7/1/19

luminar OUTDOOR **SCISSOR SUPER COUPON**

24 FT., 18 BULB, 12 SOCKET OUTDOOR STRING LIGHTS

Customer Rating ★★★★★

NOW **\$19.99**

COMPARE TO PORTFOLIO \$54.98
MODEL: SLC12BK

ITEM 64486/63483 shown

52034895

LIMIT 2 - Coupon valid through 7/1/19

drillmaster **SCISSOR SUPER COUPON**

1/4" SHEET ORBITAL PALM SANDER

Customer Rating ★★★★★

NOW **\$9.99**

COMPARE TO BLACK & DECKER \$29.98
MODEL: BDEQS300

ITEM 61509/61311 shown

52035981

LIMIT 5 - Coupon valid through 7/1/19

Apache **SCISSOR SUPER COUPON**

ULTRA-LIGHT, CRUSH PROOF WEATHER-RESISTANT LOCKABLE CASE

Customer Rating ★★★★★

• 11-7/8" L
• 9" W
• 5-5/16" H

NOW **\$22.99**

COMPARE TO PELICAN \$73.18
MODEL: 1400

ITEM 64551/63926 shown

52037657

LIMIT 3 - Coupon valid through 7/1/19

HaulMaster **SCISSOR SUPER COUPON**

9" x 72" STEEL LOADING RAMPS SET OF TWO

Customer Rating ★★★★★

NOW **\$39.99**

COMPARE TO MAXXTOW \$80.53
MODEL: MT70120

ITEM 69591/69646/44649 shown

52037723

LIMIT 3 - Coupon valid through 7/1/19

CENTECH **SCISSOR SUPER COUPON**

2/10/50 AMP, 12 VOLT BATTERY CHARGER AND ENGINE STARTER

Customer Rating ★★★★★

SAVE 50% **\$52.99**

COMPARE TO SCHUMACHER ELECTRIC \$59.99
MODEL: SE-1250

ITEM 60581/66783/60653 shown

52038755

LIMIT 4 - Coupon valid through 7/1/19

drillmaster **SCISSOR SUPER COUPON**

1500 WATT DUAL TEMPERATURE HEAT GUN (572°/1112°)

Customer Rating ★★★★★

NOW **\$8.99**

COMPARE TO BLACK & DECKER \$28.06
MODEL: H01300

ITEM 62340/62546/63104/96289 shown

52040549

LIMIT 5 - Coupon valid through 7/1/19

SCISSOR SUPER COUPON

TWO TIER EASY-STORE STEP LADDER

• 225 lb. capacity

Customer Rating ★★★★★

NOW **\$19.99**

COMPARE TO WERNER \$33.88
MODEL: S222A-1

ITEM 67514

52042538

LIMIT 7 - Coupon valid through 7/1/19

SCISSOR SUPER COUPON

DUST AND PARTICLE MASKS PACK OF 5

Customer Rating ★★★★★

NOW **99¢**

COMPARE TO ACME UNITED \$7.81
MODEL: ACM12259

ITEM 62606/63723/50027 shown

52043166

LIMIT 8 - Coupon valid through 7/1/19

CHICAGO ELECTRIC WELDING **SCISSOR SUPER COUPON**

MIG/FLUX WELDING CART

Customer Rating ★★★★★

SAVE \$74

NOW **\$299.99**

COMPARE TO FORNEY \$104.19
MODEL: 117535099

Welders, tools & supplies sold separately.

ITEM 61316/90305/60790/69340 shown

52044362

LIMIT 6 - Coupon valid through 7/1/19

HaulMaster **SCISSOR SUPER COUPON**

1000 LB. CAPACITY SWING-BACK TRAILER JACK

Customer Rating ★★★★★

• Height range: 12-1/2" to 24"

SAVE 60% **\$17.99**

COMPARE TO REESE \$45.99
MODEL: 74410

ITEM 69780/41005 shown

52044749

LIMIT 6 - Coupon valid through 7/1/19

PITTSBURGH **SCISSOR SUPER COUPON**

12" RATCHET BAR CLAMP/ SPREADER

Customer Rating ★★★★★

LIFETIME WARRANTY

NOW **\$2.99**

COMPARE TO IRWIN \$19.98
MODEL: 1964718

ITEM 62123/46807/63017/69222 shown

52045452

LIMIT 9 - Coupon valid through 7/1/19

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Wagner's new Orion line features five new pinless meters they say are capable of reading the moisture content of wood from ¼" to 1½" thick. The shallow-depth models measure in wood as thin as ¼", and the deep-depth models measure in wood from ¾" to 1½" thick. All five feature an On-Demand Calibrator, allowing you to recalibrate the meter anytime without returning it to Wagner. All models come with a seven-year warranty.

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