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A WINNING RECIPE

GET TO KNOW THE COOKS STIRRING UP THIS ISSUE'S MIXTURE.

► **You may know Duff Goldman** as the host of the Food Network's hit show *Ace of Cakes*. We got to know Duff when he called us up excited to work with *WOOD*® magazine on his recent passion: woodworking. Duff already knew his way around a workshop—the elaborate confections coming out of his now-famous Baltimore bakery, Charm City Cakes, often required the construction of inventive armatures and stands to support their whimsical designs.

In the last few years, Duff has turned that necessity into a passionate woodworking hobby. And that newfound passion is contagious, let me tell you firsthand. He built his backyard shop from the ground up (get a tour of it on *page 12*) and is enthusiastically channeling all of the whimsy that he's known for in the world of baking into his woodworking designs. He's cooking up captivating wooden toys for his young daughter. We have a tasty one from him on the menu for our next issue. (See *What's Ahead* on *page 75*.)

If you ever find yourself in a rut in your hobby, seek out someone like Duff who exudes passion for theirs and you will find yourself reinvigorated by proxy.

► **You may know Christopher Mills** as the illustrator of our *Shop Tips* column (*page 18*). Or you may know his superlative work from nearly every magazine title you currently have on your shelf: *Fine Woodworking*, *Fine Homebuilding*, *Woodcraft*, *This Old House*, and *Family Handyman*. He's been illustrating professionally for more than 30 years and has contributed to more than 50 books, as well as for the National Wildlife Federation, the Federal Emergency Management Agency, and the Children's Book Council.

Chris has graciously agreed to additionally take on our project plan illustrations. So, starting with this issue, you'll see his striking work throughout *WOOD* magazine. We couldn't be more excited. See *page 24*'s "Hardware Storage Cabinet" for the first of many project illustrations to come.

► **You may know John Olson** as *WOOD*'s longtime Design Editor. In addition to his decades of experience in woodworking, he is trained as an educator and experienced as a presenter in the 1875-era blacksmith and cabinetmaking shops at Living History Farms in Urbandale, Iowa. Because of that, John is a natural in front of the camera. That's why we've tasked him with taking the reins of our video content production.

Find John's latest design on *page 62*, the "Dream Storage Headboard." And find his latest videos at **youtube.com/user/wood**.

Then get out to the shop and build something. We'll help.

Lucas

LUCAS PETERS
lucas.peters@woodmagazine.com
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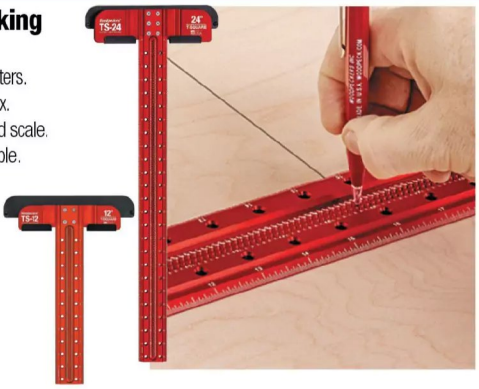

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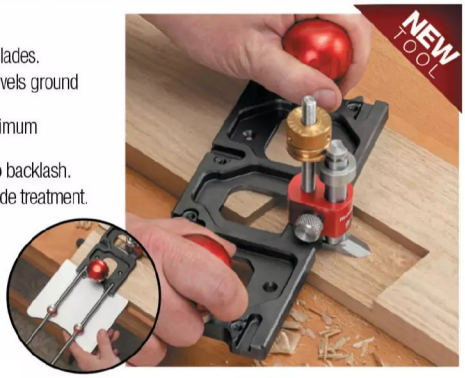

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BUILDING FOR THE FUTURE

Graduating with a Bachelor of Industrial Arts degree in woods and drafting, I discovered *WOOD*® magazine my first day of student teaching. My mentor, Mr. Shell, placed a handful of magazines in my lap and directed me to find a topic for my first lesson. One magazine stood out—*WOOD*, issue 74 (November 1994). It was the impetus for lessons and projects throughout my career as a high school woodshop teacher. Eventually, I assembled my own shop, still relying on *WOOD* for projects, techniques, shop tools, and equipment. Now retired, issue 74 is well-worn and tattered, but my passion for woodworking continues. Until now, I've never realized the impact that *WOOD* has had on my profession and igniting my passion for woodworking.

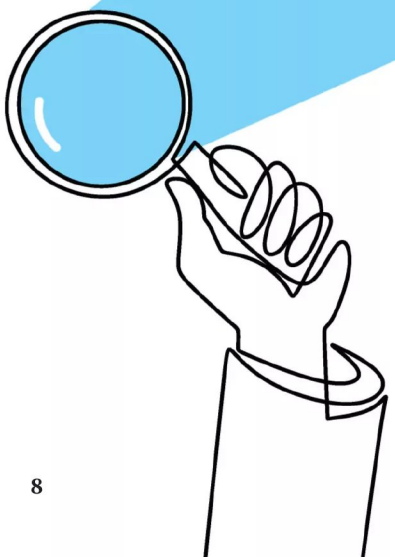
Ruben Presaido
Long Beach, California

Thank you for running the photo of my students with their jewelry boxes in issue 301 (March 2025). My enthusiastic students prove that woodworking has a bright future in careers and hobbies.

For young people considering woodworking careers, I recommend checking out SkillsUSA (**skillsusa.org**). This national career and technical education (CTE) organization offers multiple programs to develop technical and leadership skills in young people, and it hosts cabinetmaking contests at the local, state, and national levels.

James Wickens
Auburn, Washington

DISAPPEARING DYE?



Years ago, my brothers occasionally used J E Moser Aniline Wood Dye at their own similar sounding but unrelated business, J D Moser & Sons Custom Woodworking. Now the youngest brothers want to give these same dyes a try, but we can't find them. I found more information about using dyes on **woodmagazine.com**, but nothing further about where to buy it. Can you help?

Nancy Moser
via email

Learn more about aniline dyes
woodmagazine.com/anilinedye

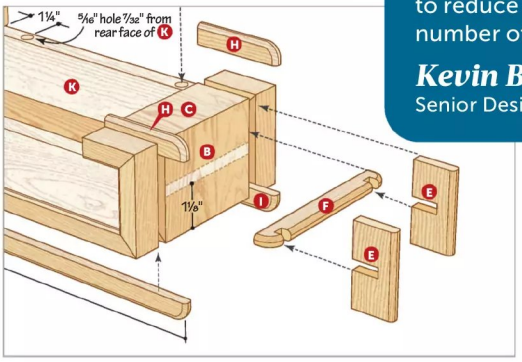
J E Moser dyes are no longer sold under that name, but the company that made them, W D Lockwood, is still going strong. Go to **wdlockwood.com** for more information and to find a chart that lists the current colors that correspond with the old JD Moser dye numbers. You can purchase the dyes through **toolsforworkingwood.com**.

Randy Maxey
Contributing Editor

TAKE IT UP A NOTCH

I enjoyed making this box from issue 300 (December 2024/January 2025) for my daughter's birthday present. It's made from walnut, cherry, and ambrosia maple. I found the most difficult part to be the notch spacing on the two handle pieces (F). I found it much easier to cut the handle blanks to length to match the width of the box. I then cut the notches using the same tablesaw fence and miter-gauge setup used to cut the grooves on the box pieces. This process ensures the grooves and notches precisely match during final assembly.

Jerry Firlik
Elmira, New York



Thanks for the tip, Jerry. Your method does eliminate the need to lay out the locations of the notches on the handles. We're always fans of figuring out ways to reduce the number of setups.

Kevin Boyle
Senior Design Editor

A PREFERENCE FOR PINE

Reading *WOOD-Wide Web* "Pining for Pine" in issue 299 (November 2024) struck a chord with me. Pine was the "perfect path" for my retirement shop. My shop is filled with benches and cabinets made of 4/4 and 8/4 pine boards, some as much as 18" wide. I still have my grandfather's two-man saw used more than 75 years ago to cut logs into some of the lumber I used.

John Whiting
via email

SCRAP IT

I often see suggestions to use scrapwood as a backer for router table, tablesaw, and drilling operations. I have learned (the hard way) that you must be picky about the piece of scrapwood you choose. If it is twisted, warped or otherwise not flat, it will adversely affect the outcome. For example, drilling a hole using a drill press. If you make sure the table is flat and perpendicular to the drill bit but put a warped board under the workpiece, it will no longer be perpendicular to the bit. I now have several pieces of "good scrap" I use under or behind my workpieces.

Brad Salzwedel
Brookfield, Wisconsin

You bring up a valid point, Brad. We often grab the nearest scrap piece of hardwood for the task at hand without giving a thought to whether or not it affects the quality of the operation. For that reason, we've come to prefer cutoffs of MDF or plywood because of their consistently flat and parallel surfaces.

Kevin Boyle
Senior Design Editor

I recently completed a "Keyboard Cutting Board" from issue 244 (December 2016/January 2017) and the "Zigzag Box" from issue 243 (November 2016). The projects were fun to make and challenged my woodworking skills. I enjoy your magazine and encourage you to keep publishing plans like the cutting board and box.

Rodney Lair
Cedar Falls, Iowa

Tickle the ivories by downloading the Keyboard Cutting Board plans.
woodstore.net/piano

KEN SINGLEY of Pottsville, Pennsylvania, (right) repurposed a well-used piano at the request of Lee Ferrier, the choir director (left) at a local church. Lee wanted to convert the baby grand into a bookcase for the choir room. Preserving as much of the original piano as possible, Ken made sure it carries on its musical legacy. It now holds sheet music for the choir.

DOUG HAYES of Amarillo, Texas, built this end table from walnut cut at a steam-powered sawmill in Mankato, Kansas. Doug used wormy spalted hackberry for the contrasting front rails.

SEND US A PHOTO OF YOUR WORK

Want to see your work showcased in *WOOD®* magazine? Send a high-resolution digital photo of your completed project to ***woodmail@woodmagazine.com.***

DAVID LOCKARD of Kingsport, Tennessee, a beginning woodworker, makes barstools and step stools for friends and family. For this barstool, he polished up old trailer boards to make the top and used hickory, cherry, and curly maple for the base.

Using a photo of a pie safe his dad sent as inspiration, **DAVID TARAS** of Parma, Ohio, built his pine version without the benefit of dimensions. David said he used common sense dimensions to complete the 24x13x54" cabinet. The four tapered corbels echo the leg tapers and support the extra-wide top. Joinery consists of splines and dowels. David used patterns he found online to punch the copper panels.

This one-of-a-kind project showcases a slice of a tree trunk that grew around a metal lamp bracket, locking it securely into the wood. **ANDY BEAULE** of Bedford, New Hampshire, turned it into an end table by crafting a sturdy offset base, and then screwing the trunk slice to it using the holes in the metal bracket, creating a clever cantilevered design.

SWEET WORKSHOP RETREAT

A bright and tidy mountainside shop provides a perfect getaway from the kitchen for a celebrity chef to cook up woodworking projects.

WRITER: DAVE STONE
PHOTOGRAPHERS: DUFF GOLDMAN, JOHNNA GOLDMAN
ILLUSTRATOR: ROXANNE LEMOINE

Translucent corrugated panels make up the gently sloped roof, flooding the shop with natural, inviting light. Task lights augment the sun when needed.

How does Duff Goldman, star of *Ace of Cakes* and *Baking Championship*, unwind off set? By building toys for his daughter in his backyard woodshop.

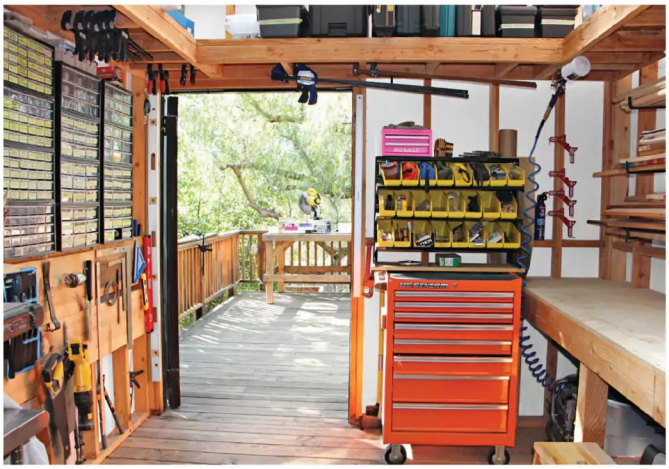
Duff Goldman's shop isn't fancy. And that's just the way he likes it. Tucked alongside his A-frame-style home in the mountains near Los Angeles, the simple shop provides respite from his busy life as a husband, father, and celebrity chef (see *From Baker to Wood Project Maker, page 15*).

To fit the shop into his sloping yard, Duff had a contractor build a heavy-duty, oversize deck and erect the 10×22' building on top. Fiber-cement siding closes in the walls, a material choice Duff was thankful for when recent L.A. wildfires threatened his home. Those walls are unfinished inside, thanks to the southern-California mountainside climate that lets him forgo insulation. That choice retains open stud bays on the inside to support built-in workbenches on two walls and provide generous storage throughout.

Duff built sturdy shelves high up out of the way and added brackets to store the modest supply of lumber he keeps on hand. Hardware and other small items reside in off-the-shelf storage bins and drawers attached to the walls. Workbenches are simple but rock solid, with plywood tops over 2×6 frames and 4×4 posts.

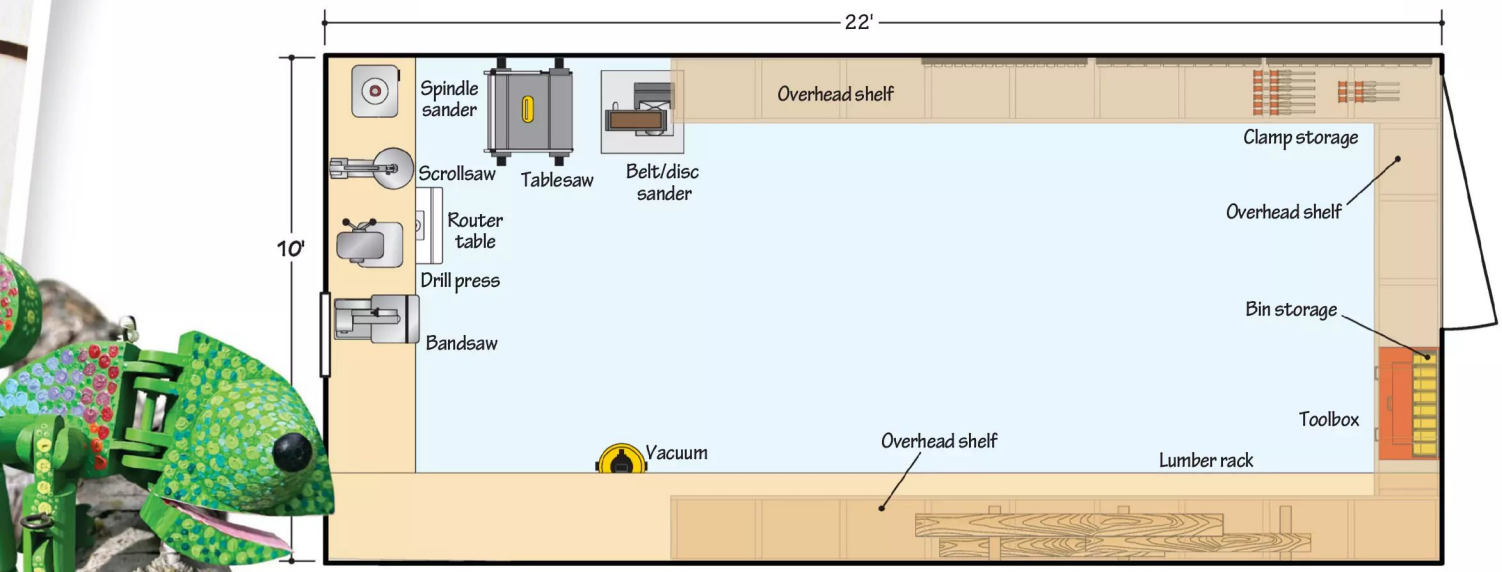
The shop's arid location allowed Duff to install his favorite feature: a roof made from translucent corrugated panels. "I love the natural light in the shop. It's diffuse and very mellow. And I have beautiful pink peppercorn trees overhead that drop their peppercorns onto the roof."

Every project offers a chance to add artistic flair and to learn new skills. Duff cut and painted these colorful wooden blocks, then crafted the custom case.



Plastic drawers tuck into the open stud bays to organize hardware handily just inside the shop entrance. The oversize door opens wide to allow a large work table to move outside for large and messy jobs.

> **"MY SHOP IS SUCH A CALM PLACE. IT'S WHERE I CAN BUILD, WRITE, AND BE CREATIVE—A PLACE I CAN MESS UP. IT'S SUPER CHILL. I LOVE IT AND I WOULDN'T CHANGE A THING."**
>
> ***-DUFF GOLDMAN, SHOP OWNER***



Portable worklights handle task lighting and illuminate the space when he works after dark. An oversize door and single window provide plenty of ventilation, leaving no need for heating or cooling.

Duff kept the shop's power supply simple, as well, with a couple of 20-amp circuits run from the house to outlets in the shop. They provide plenty of power for his assortment of benchtop and portable tools that he uses to pursue his main woodworking passion: building toys for his 4-year-old daughter.

◀ Overhead shelves wrap around three walls to corral tool cases and seldom-used items within reach but out of the way. Wall-mounted brackets hold lumber.

Ready-made storage solutions, such as a mechanic's tool chest and a rack of hardware bins, got the shop up and running quickly and are easily reconfigured as shop and project needs change.

The entire shop is built around benchtop and jobsite tools. Sturdy workbenches, rolling stands, and a stainless steel restaurant cart store them out of the way until needed.

Duff and his wife wanted their daughter to have toys without batteries, he says. Always fascinated with automata and moving objects, he spends his shop time building articulated toys. His go-to tools for these projects include his bandsaw and scrollsaw, as well as his router and router table. A jobsite tablesaw pulls into the center of the space or out to the deck when he needs to cut larger boards, while a belt/disc sander helps contour the toys' often oddly shaped parts. He hasn't needed stationary tools, and he likes the flexibility that benchtop units provide–both for his shop and for his tool budget.

His shop does include one luxury not commonly found in smaller shops: a spray gun that he uses to shoot lacquer. "I built a box for toy blocks and decided I wanted to finish it with lacquer. So I bought a spray gun, hooked it to my compressor, and learned how."

SHOW US YOUR SHOP

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

"Jumping in and learning" perfectly describe Duff's philosophies for both baking and woodworking. "Woodworking is a lot like baking, just with different materials. Measuring miters and figuring out angles are about being exact, just like selecting the exact grams of sugar in a recipe." Both pursuits, he says, are "about doing a lot of small tasks right and in the correct order."

Duff knows his passion for woodworking will keep his shop–along with the tools it contains–evolving. He'd like to add a lathe soon, and take on projects beyond building toys. With his shop setup, he already has a winning recipe.

Wood scraps, dowels, and a healthy dose of imagination combine to create fun toys like this whimsical bird.

FROM BAKER TO WOOD PROJECT MAKER

If there's such a thing as a traditional route, Duff Goldman didn't take it. Today, he's a celebrity chef who rose to fame on Food Network's *Ace of Cakes*, the show that chronicled the behind-the-scenes creative process of his Baltimore bakery, Charm City Cakes. He was recently nominated for Outstanding Children's Personality in the third-annual Children's & Family Emmy Awards for his work on *Kids Baking Championship*.

But Duff, who prefers the label "cake artist" over any moniker that includes "celebrity," didn't set out to get famous. In high school, he worked at McDonald's, took wood shop, helped out on house-framing and roofing jobs, and became a graffiti artist who dabbled in metal sculpture. While earning his bachelor's degree in history and philosophy, he began baking at a well-known Baltimore restaurant. After that, his passion for cooking led him to a degree from the Culinary Institute of America in 1998. He opened Charm City Cakes in 2002, and welcomed the world to watch him and his team create starting in 2006.

At Charm City Cakes, Duff reconnected with his love of tools. "I had to make armatures and other structures to support the cakes, and wood was the right material."

After moving to Los Angeles, he set up shop in his basement while renovating his home. But the birth of his daughter, Josephine, now 4, really ignited his woodworking desire. "My wife and I wanted her to have toys without batteries. I built her a busy board, and as she got older I started making toys. I love it."

As Duff bakes, builds, and does whatever comes next on his nontraditional path, it's easy to follow along. Just search for duffgoldman on Instagram, Facebook, and X, and check out his YouTube channel, @duff-stuff.

Duff's daughter, Josephine, proudly shows off her articulated chameleon toy, one of many Duff has made for her in his workshop.

Q: ALCOHOL PROHIBITION LEAVING YOU HIGH AND DRY?

I recently tried to buy denatured alcohol to mix up some shellac flakes and the clerk at the hardware store told me it was no longer available in California. Do you know of an alternative solvent that I can use?

David Freeman
Jamul, California

A: The clerk you spoke to was correct, David. California banned the sale of denatured alcohol in 2019, forcing woodworkers who live in the Golden State to seek alternatives when preparing their own shellac finishes. (Canada also regulates the sale of denatured alcohol.) But as you'll see, this isn't necessarily all bad news.

Denatured alcohol is really just ethanol (also known as ethyl alcohol) that has a denaturing agent (usually methanol or isopropanol) added to make it unfit for human consumption, thereby excluding it from federal or state liquor taxes.

While denatured alcohol has been the shellac solvent of choice for many woodworkers, it may not be the best choice. That's because the typical hardware-store denatured alcohol contains up to 30 percent water, which can yield inconsistent results in how well the shellac dissolves, dries, and hardens. A better option is to use a shellac reducer **[Sources]** which is essentially a purer form of denatured alcohol. Because it contains less water, it dissolves the shellac more effectively.

You might have heard that you can use high-proof grain alcohol, such as 190-proof Everclear, as a substitute for denatured alcohol. This distilled spirit is 95 percent pure ethanol and works as a shellac solvent. However, many states (including California) ban the sale of 190-proof liquor. And the lower, 151-proof version of Everclear doesn't work well as a shellac solvent. One (legal) way around this high-proof restriction is purchasing food-grade ethanol sold for culinary or laboratory use **[Sources]**. Both of these options will cost more than a can of denatured alcohol would have from the hardware store, but your finishing results will be more consistent.

If you have trouble finding high-proof ethanol, try isopropyl alcohol, also labeled as isopropanol and more commonly known as rubbing alcohol. Like denatured alcohol, the rubbing alcohol you'll find at the corner drugstore contains a high proportion of water. Instead, choose 99 percent pure isopropyl alcohol **[Sources]**.

We tested all three of these options: Everclear 190, food-grade ethanol, and isopropyl alcohol, mixing a two-pound cut of each using the same shellac flakes. We found that they all dissolved the flakes well and the shellac dried quickly to form a hard finish. With either ethanol or isopropyl alcohol, wear gloves and avoid skin contact when mixing and applying the shellac, as they both can be skin irritants. Once the shellac dries, however, there is no issue with either type of alcohol.

TIP!
To prevent shellac flakes from congealing while they are dissolving, stir or shake the mixture periodically.

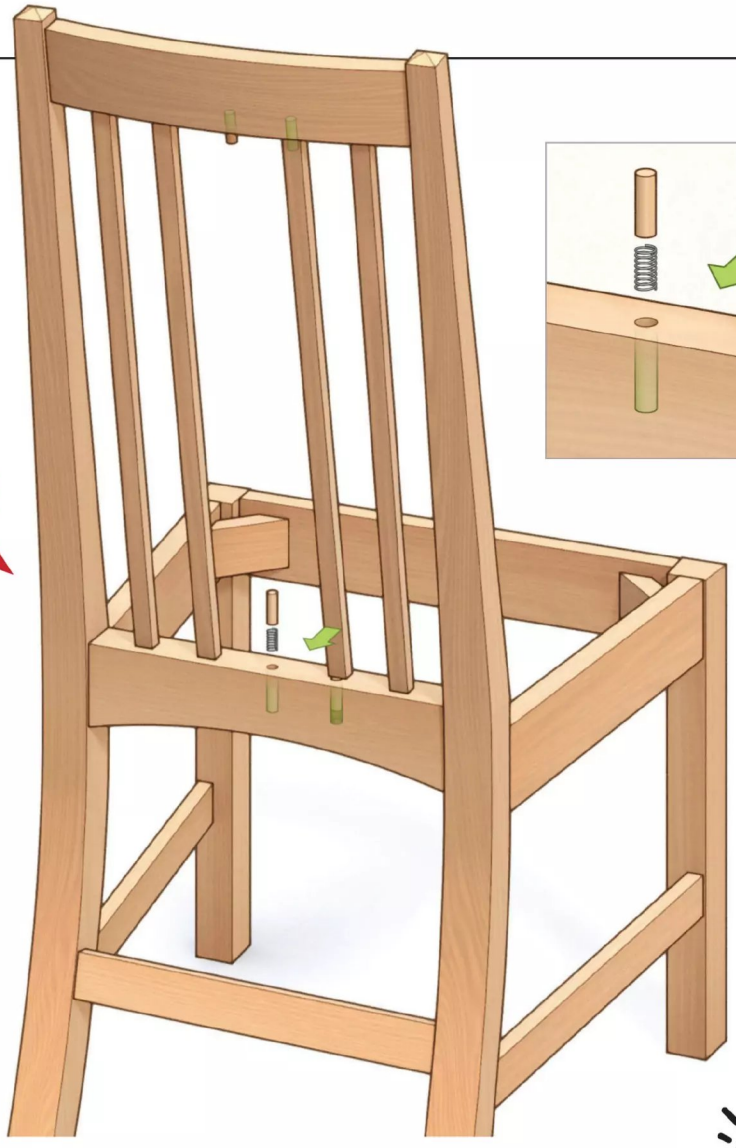
SOURCES:
- Mohawk Finishes Shellac Reducer (quart) no. 167896, $26, Woodcraft, woodcraft.com, 800-535-4482.
- Food-grade ethanol (quart), $44, Culinary Solvent, culinarysolvent.com.
- Isopropyl alcohol 99% (16 fl. oz.) 195515034883, $8, amazon.com.

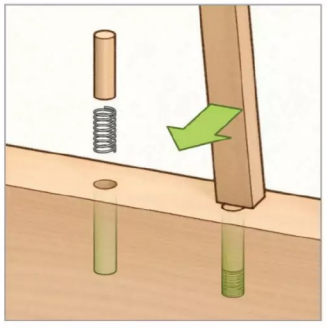
Note: **The use of the term "shellacked" to mean drunkenness entered American slang in the early 1920s, possibly because shellac had a similar odor to prohibition-era bootleg spirits.**

Have a question? Drop us an e-mail.
askwood@woodmagazine.com

TOP SHOP TIP

SPRING INTO ACTION





Faced with the task of replacing a broken slat on an heirloom chair, I dreaded the thought of taking the entire chair apart to create the necessary space to fit the slat's tenons in the chair rail's mortises. My solution was to create a spring-loaded floating tenon.

After removing the broken slat, I cut off the original round tenon at each end and replaced it with a hole drilled to match the diameter of the tenon. I removed any loose remnants of glue and tenon from the chair rails then redrilled the mortise holes to clean them up. I drilled the hole in the bottom rail extra deep to also accommodate a spring.

Next, I cut short sections of dowel to fit into the rails and slat, essentially creating a floating tenon. I glued the dowel into the top chair rail. To create room to install the slat in the already-assembled chair, I added a spring in the bottom rail's mortise. After applying glue in the slat and rail mortises, I placed the lower dowel on top of the spring and pressed it down flush with the chair rail as I slid the slat into place. There is a satisfying "snap" as the dowel pops into the hole at the bottom end of the slat.

Larry Hincker
Blacksburg, Virginia

For his tip, Larry wins a cordless, 2", 21-gauge brad nailer from Grex worth $300.

TIPS EARN UP TO $150.

If your tip is the best submission of the issue, it wins Top Shop Tip honors, and you receive a

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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.

ILLUSTRATOR: CHRISTOPHER MILLS

continued on page 20

Sacred Stone of the Southwest is on the Brink of Extinction

Centuries ago, Persians, Tibetans and Mayans considered turquoise a gemstone of the heavens, believing the striking blue stones were sacred pieces of sky. Today, the rarest and most valuable turquoise is found in the American Southwest— but the future of the blue beauty is unclear.

On a recent trip to Tucson, we spoke with fourth generation turquoise traders who explained that less than five percent of turquoise mined worldwide can be set into jewelry and only about twenty mines in the Southwest supply gem-quality turquoise. Once a thriving industry, many Southwest mines have run dry and are now closed.

We found a limited supply of turquoise from Arizona and purchased it for our ***Sedona Turquoise Collection***. Inspired by the work of those ancient craftsmen and designed to showcase the exceptional blue stone, each stabilized vibrant cabochon features a unique, one-of-a-kind matrix surrounded in Bali metalwork. You could drop over $1,200 on a turquoise pendant, or you could secure 26 carats of genuine Arizona turquoise for **just $99**.

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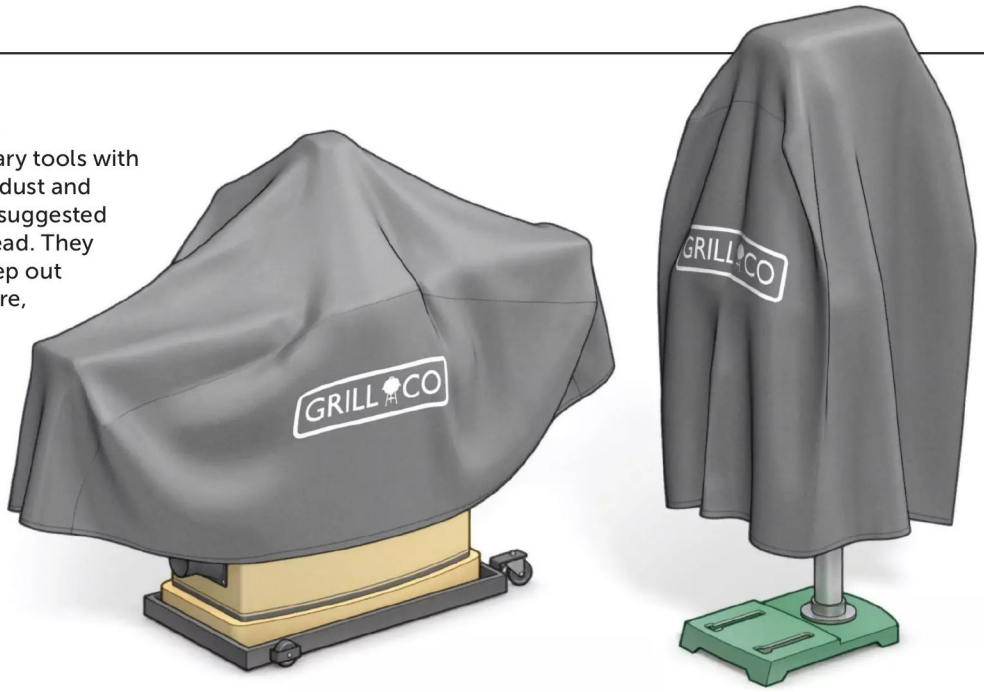
GOING UNDERCOVER

I used to cover my large stationary tools with old towels to keep them free of dust and grime when not in use. My wife suggested using barbecue grill covers instead. They completely cover the tool to keep out dust and they don't hold moisture, which was a problem with the towels. I often find the covers on clearance at the end of the summer. They're available in a variety of sizes to cover most tools.

Bob Meyer
St. Louis, Missouri

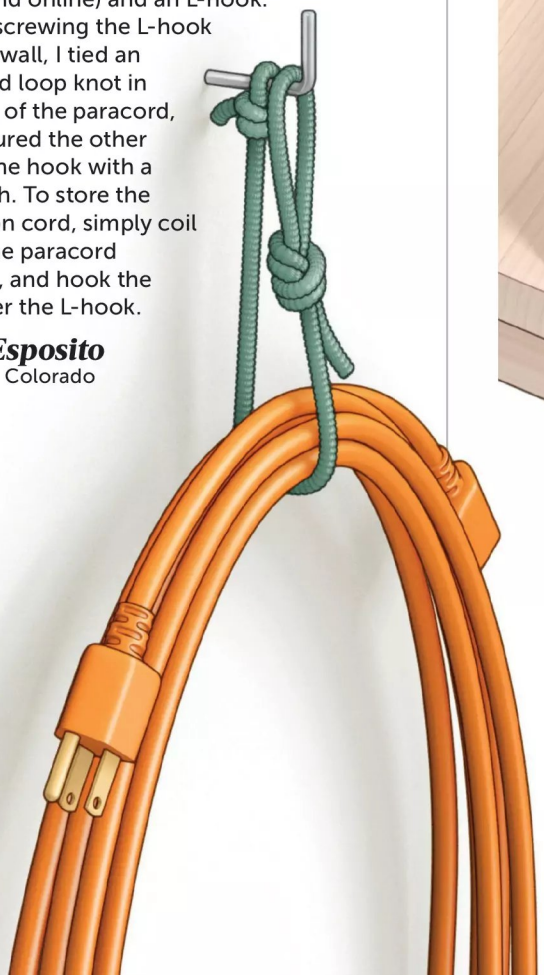


NOT A USUAL KNOT

Keeping extension cords coiled without tangling used to be a problem for me. My solution is a short length of paracord (available in hardware stores and online) and an L-hook.

After screwing the L-hook into the wall, I tied an overhand loop knot in one end of the paracord, and secured the other end to the hook with a half hitch. To store the extension cord, simply coil it, slip the paracord through, and hook the loop over the L-hook.

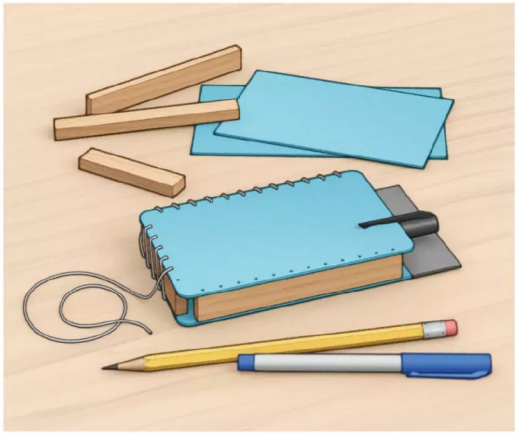
Mike Esposito
Brighton, Colorado



A LONG REACH

I had to glue and clamp a support inside a display case I was making but needed to do it when the cabinet was partially assembled. I used a length of 2×2 between the clamp jaw and the part glued to the case's back. It worked like a charm and didn't cost me a penny.

John Baker
Normal, Illinois

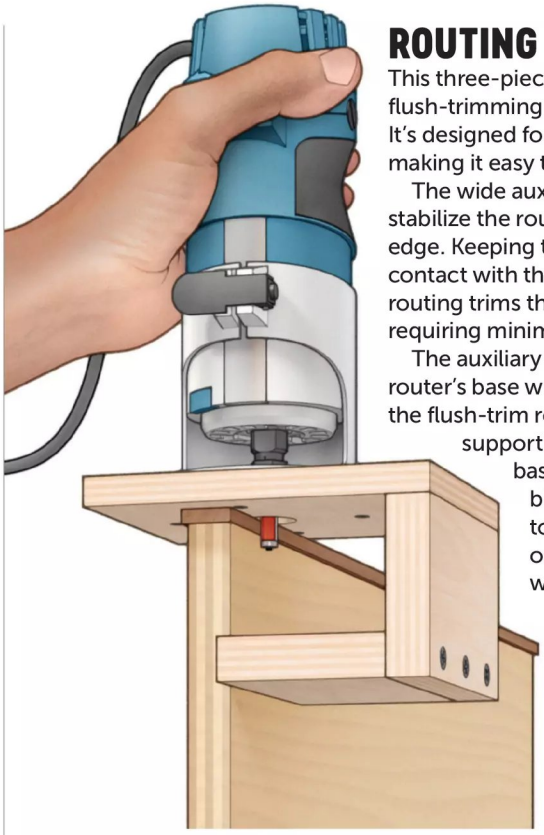


PROTECTED POCKETS

This heavy-duty "pencil pocket" is a sturdy upgrade from my old-school PVC pocket protector from the 1970s. I cut the front and back panels from the lid of a plastic storage tub. The front is 3¼×5⅛"; the back is a little taller at 6". I rounded the corners and sanded the sharp edges.

I made the sides and bottom from strips of ¼×½" wood, leaving a gap at the bottom corners to allow debris to fall out. Double-sided tape held the pieces together while I drilled the holes for the nylon cord lacing.

Jim Imbrogno
Milford Center, Ohio



ROUTING ON THE EDGE

This three-piece plywood jig makes flush-trimming edging a quick task. It's designed for my compact router, making it easy to control.

The wide auxiliary base helps stabilize the router on the workpiece edge. Keeping the guide block in contact with the workpiece while routing trims the edging cleanly, requiring minimal sanding.

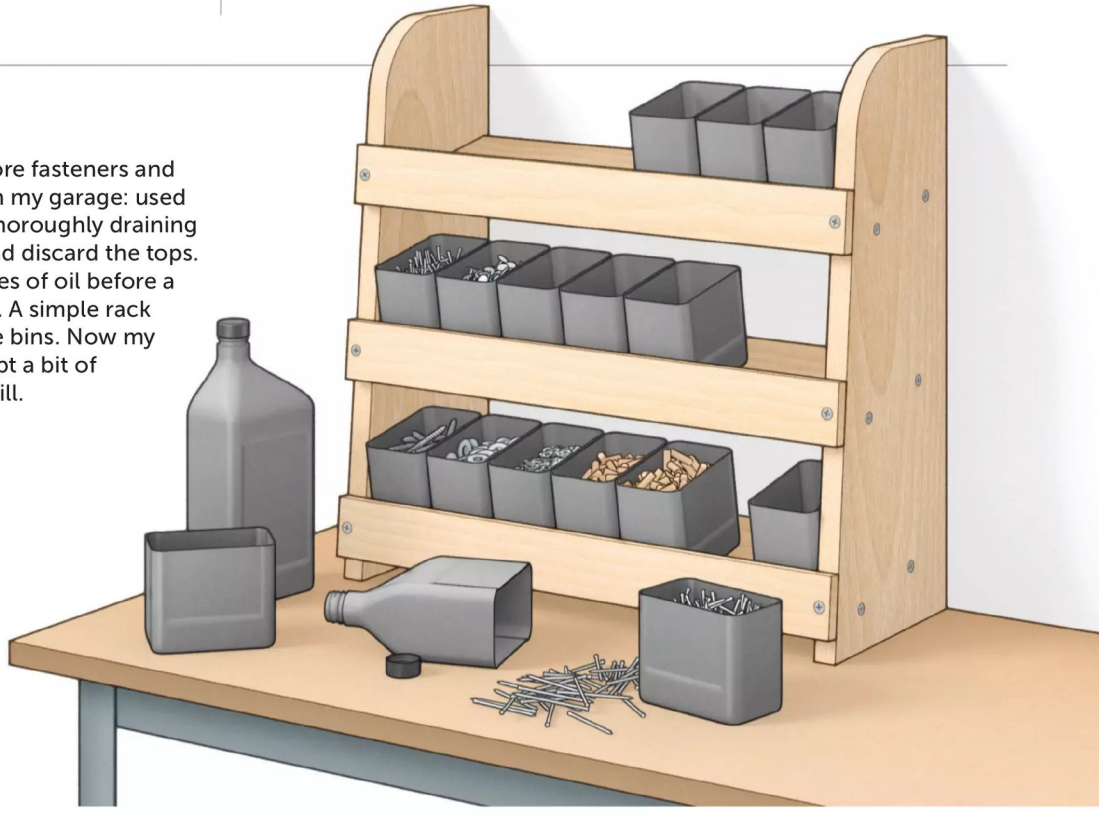
The auxiliary base fastens to the router's base with a clearance hole for the flush-trim router bit. The vertical support connects the auxiliary base to the horizontal guide block below. It's important to ensure the inside edge of the guide block aligns with the inside edge of the router bit.

Bob Hunter
Indianola, Iowa

RECYCLED STORAGE

Searching for a bin system to store fasteners and hardware, I found the solution in my garage: used plastic motor-oil bottles. After thoroughly draining each bottle, I cut them in half and discard the tops. Sawdust absorbs remaining traces of oil before a quick wipe-down to clean them. A simple rack made from scrapwood holds the bins. Now my fasteners are organized and I kept a bit of plastic from going into the landfill.

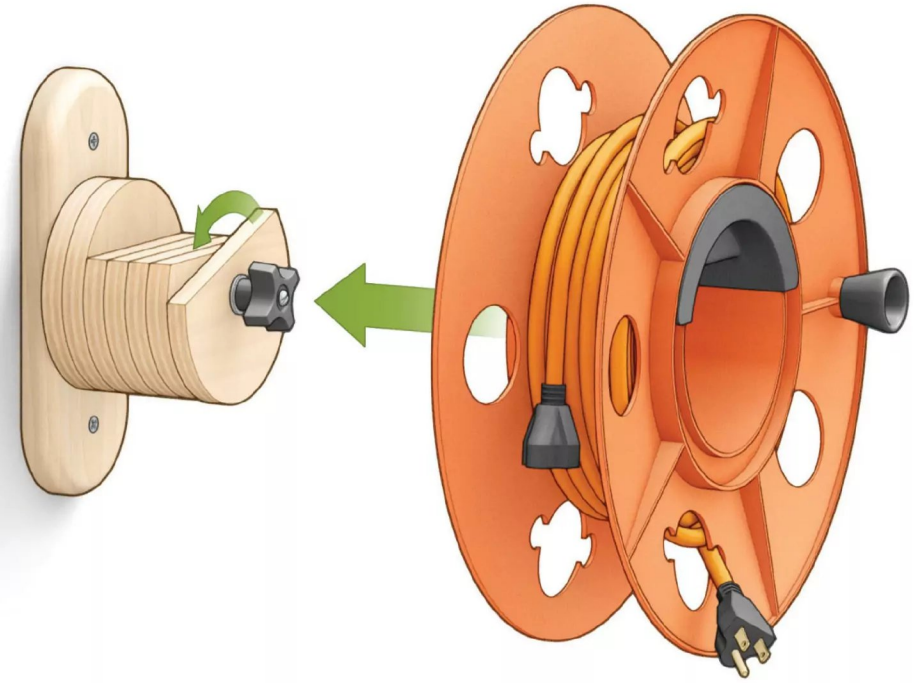
Richard Long
Mound City, Missouri



REAL EASY REELIN'

These shop-made mounts hang my manual cord reels while still allowing them to spin. I made them from scrap plywood, laminating pieces to form a center hub. The last layer rotates to catch only the reel's hand grip without restricting the reel's ability to rotate.

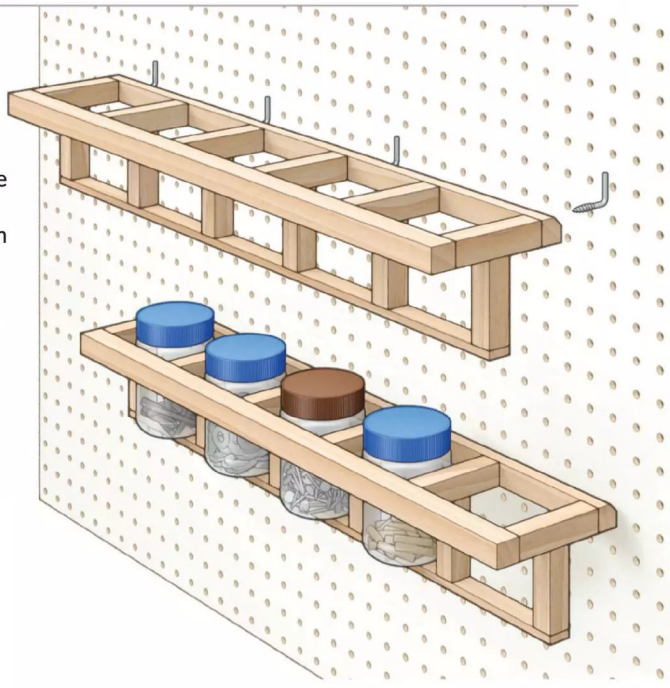
Stephen Martinson
Saint Paul, Minnesota



NUTTY NUT STORAGE

Storing hardware in jars is nothing new, but these easy-to-build pegboard storage racks make them easily accessible. I used small strips cut from scrap, gluing and nailing them together to accommodate plastic peanut butter jars. With a couple of L-hooks screwed into the back, the racks hang securely on my pegboard wall.

David Jenke
DeSoto, Texas



HARDWARE STORAGE CABINET

Unclutter your shop with this handy cabinet that corrals hardware and fasteners within plain view and easy reach.

WRITER: KERRY GIBSON
DESIGNER: KEVIN BOYLE
BUILDER: BRIAN BERGSTROM

OVERALL DIMENSIONS
46¼"W x 10⁷⁄₁₆"D x 32"H

How many times have you searched your shop for screws of a particular size and, failing to find them, run out to buy more, then inevitably later found the ones you couldn't locate? This cabinet offers an end to that frustration by capturing and organizing hardware and small parts [Exploded View]. Doors with clear acrylic panels make it easy to peer inside, where adjustable, shallow shelves each hold up to 10 plastic storage bins [Sources]. If you're short on wall space, you can easily resize the cabinet to fit your needs.

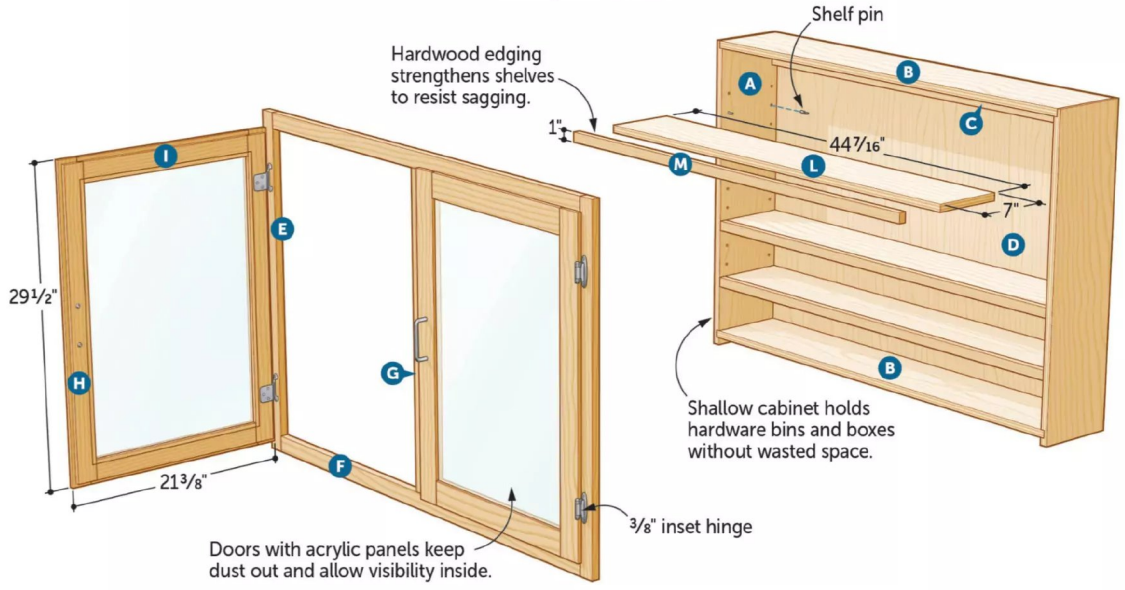
BUILD YOUR CASE

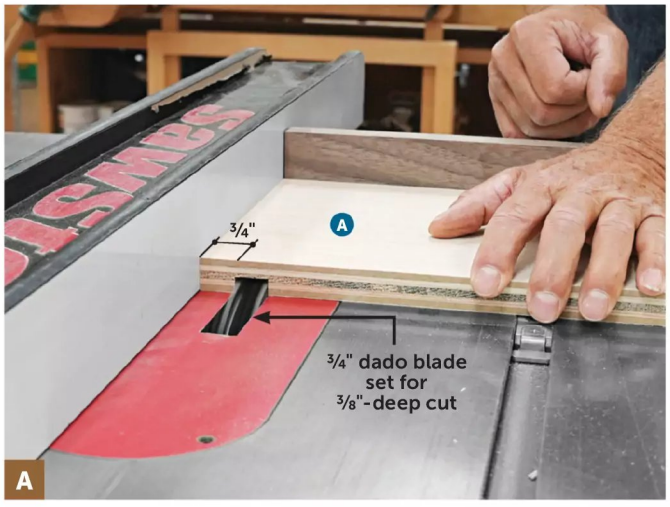
1 From ¾" plywood, cut the sides (A) and top and bottom (B) to size [Parts List, Drawing 1]. Install a dado blade in your tablesaw and cut a dado in the lower end of each side [Photo A]. Install an auxiliary fence and set it so the blade just brushes it. Then rabbet the upper end of each side.

2 Partially bury the dado blade in the auxiliary fence and rabbet the back edge of each side [Photo B], making sure the sides mirror each other.

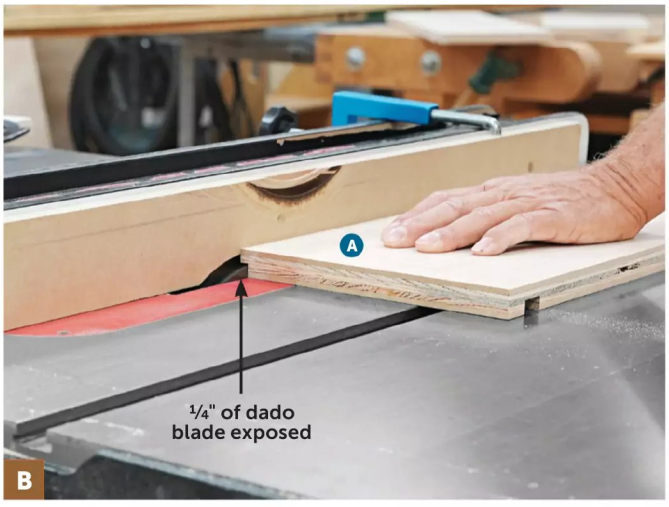
Learn how to create evenly spaced adjustable shelves.
woodmagazine.com/adjustshelves

EXPLODED VIEW



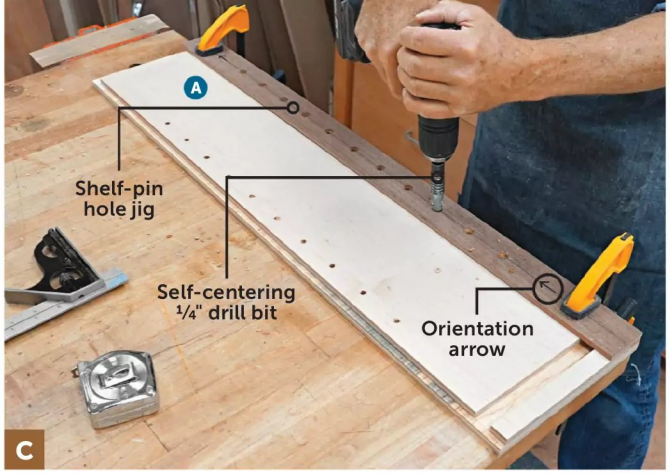


Install a dado blade to match your plywood thickness and set a cutting depth of ⅜". With the fence ¾" from the blade, use your miter gauge as you cut a dado in the lower end of each side (A).

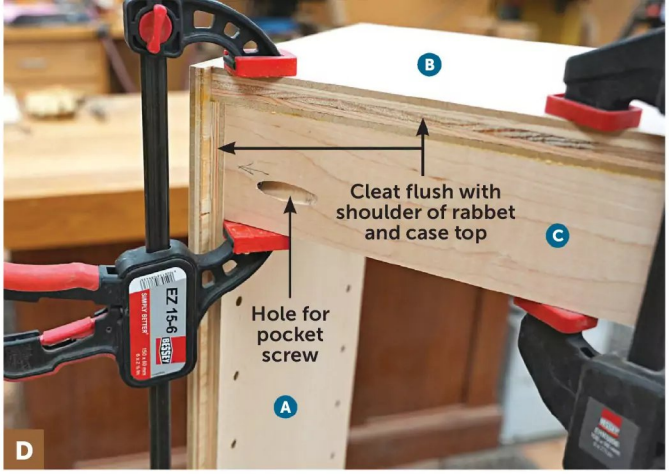


Lower the blade and move the auxiliary fence to leave only ¼" of the blade exposed. Turn the saw on and raise the blade into the auxiliary fence to a height of ⅜" and cut a rabbet in the rear edge of each side.

PHOTOGRAPHER: BRIE GOLDMAN; **ILLUSTRATORS:** ROXANNE LEMOINE, CHRISTOPHER MILLS



Clamp the shelf-pin hole jig to a side (A), flush with the ends and one edge. Drill holes in the side using a self-centering drill bit. Maintaining its orientation, move the jig to the opposite edge and repeat.



Drill a hole for a pocket screw in both ends of the mounting cleat (C). Glue, clamp, and screw the cleat to the case assembly (A/B), keeping the cleat flush with the top (B) and with the rabbet in the side.

3 From 1/4" hardboard or plywood, cut a 2×32" strip to create a shelf-pin jig. Draw a centerline on one face running the length of the strip. Lay out the pin-hole locations along the line **[Drawing 2]** and drill 3/8" holes. Clamp the jig to one case side (A) and drill 1/4" shelf-pin holes **[Photo C]**. Maintain the jig's orientation on the other case side when drilling its shelf-pin holes. Then finish-sand the case parts.

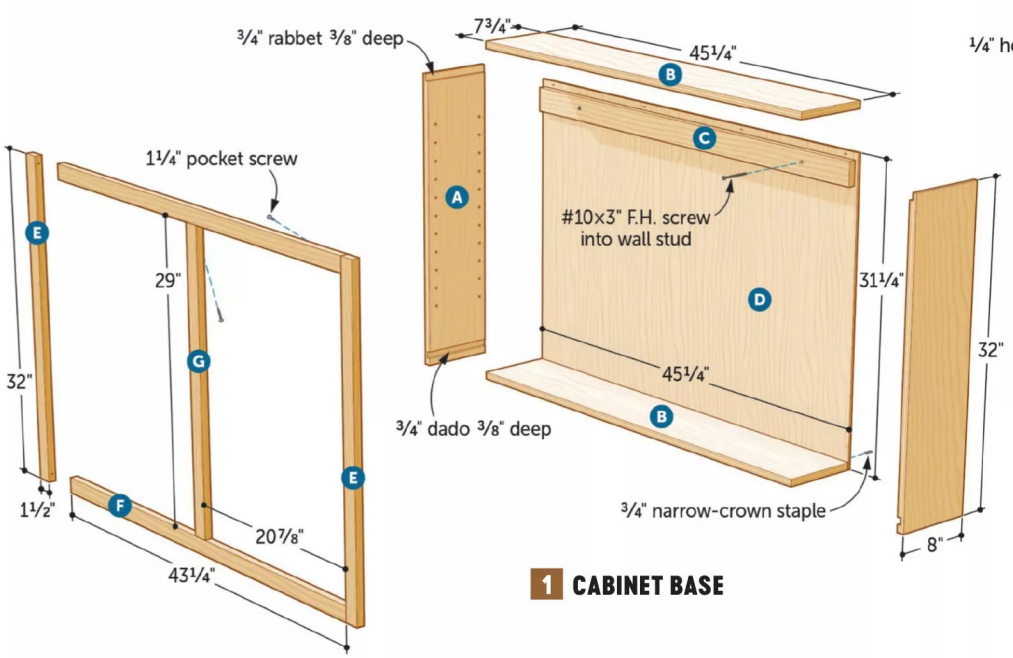
4 Apply glue to the dadoes and rabbets in the sides (A) and clamp the top and bottom (B) between the sides, keeping the front edges flush and the assembly square.

5 Cut the mounting cleat (C) to size from 3/4" plywood **[Parts List]** and drill a pocket hole in each end. Finish-sand the cleat, then attach it to the case **[Photo D]**.

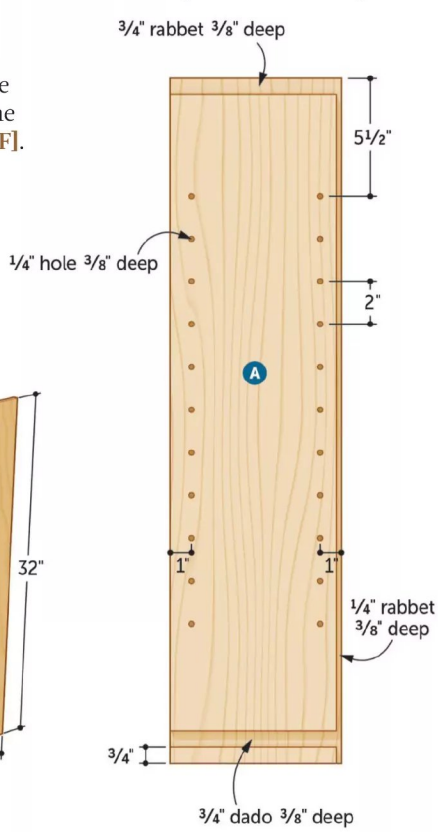
6 Measure for the case back (D). Cut it to size from 1/4" plywood **[Parts List]**. Finish-sand the back and set it aside.

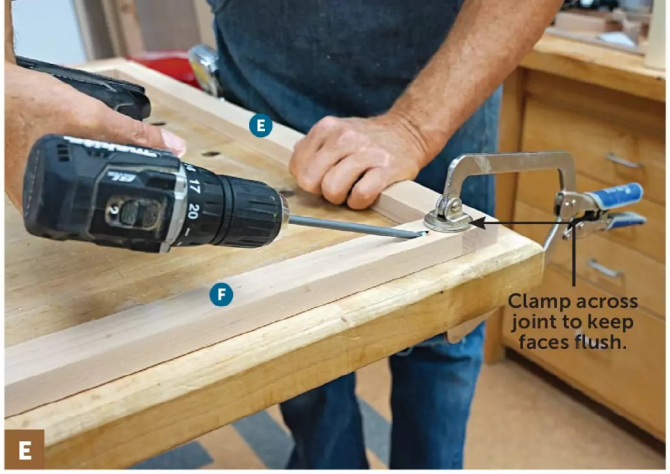
7 From 3/4" stock, cut the face frame outer stiles (E), rails (F), and center stile (G) to size **[Drawing 1]**. Drill pocket holes at the ends of the rails (F), then attach the rails and outer stiles (E) together **[Photo E]**. Drill a pocket hole at each end of the center stile (G), glue it in place centered on the length of the rails, and drive in the screws.

8 After the glue sets, finish-sand the face frame and attach it to the front of the case **[Photo F]**.

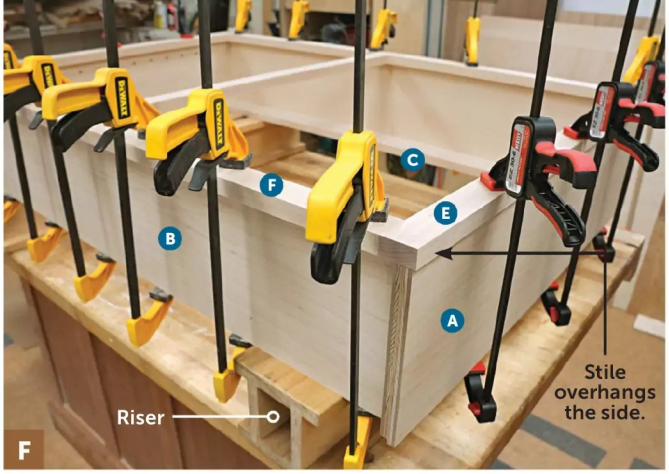


1 CABINET BASE





Apply glue to the end of a rail (F) and clamp the rail to a stile (E), keeping the edge of the rail flush with the end of the stile, then drive the screw. Repeat for the other three corners.

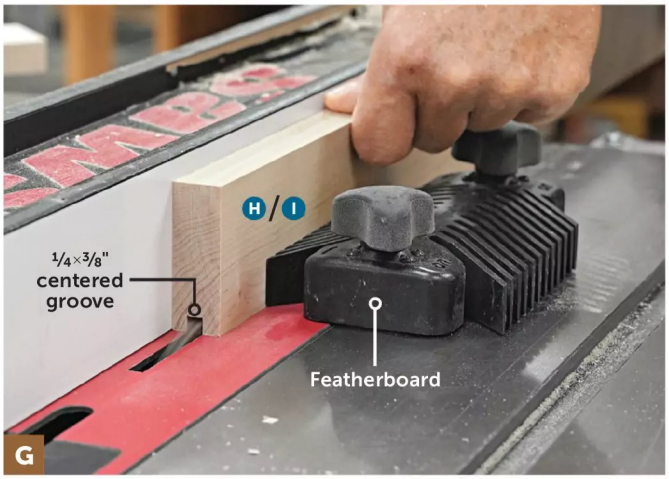


Set the case assembly (A-C) on risers on your bench. Apply glue to the front edges of the case assembly and clamp the face frame (E-G) into place with the stiles equally overhanging the case sides.

CONSTRUCT THE DOORS

1 From ¾" stock, cut the door stiles and rails (H, I) to size **[Drawing 3]**. Using a dado blade, cut a centered groove in one edge of the door rails and stiles **[Photo G]**.

2 Position the rip fence ⅜" from the *outside* edge of the dado blade and set the cutting depth to slightly less than ¼". Using a scrap the same thickness as your door stock, form a cheek on each face, guiding the stock with your miter gauge, to create a centered stub tenon. Test-fit the tenon into the grooves in the stiles (H). Raise the blade slightly, if necessary, make another pass, and check for a snug fit. With the setup dialed in, cut a tenon on each end of all four door rails (I) **[Photo H]**.



With a ¼" dado blade set ⅜" deep, cut a centered groove in one edge of all the door stiles (H) and rails (I). A featherboard pushes the stock firmly against the rip fence.

Form the cheeks of a tenon on one face of each door rail (I) in two passes—first with the workpiece about ¼" from the fence, next with it butted against the fence. Flip the rail and repeat on the other face.

Use a bearing-guided rabbeting bit to rout away stock on the back of the door frame, creating a 3/8×1/2" rabbet to accept the 1/8" clear acrylic and panel stops. Square up the corners using a chisel.

Adjust the router fence, then cut a 3/8×3/8" rabbet around the perimeter on the back face of the door frames. This will allow the doors to fit into the face-frame openings while partially overlapping them.

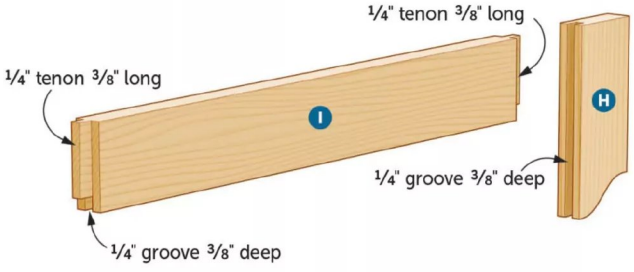
3 Apply glue to the tenons, then clamp the door frames (H/I) together, checking each assembly for square.

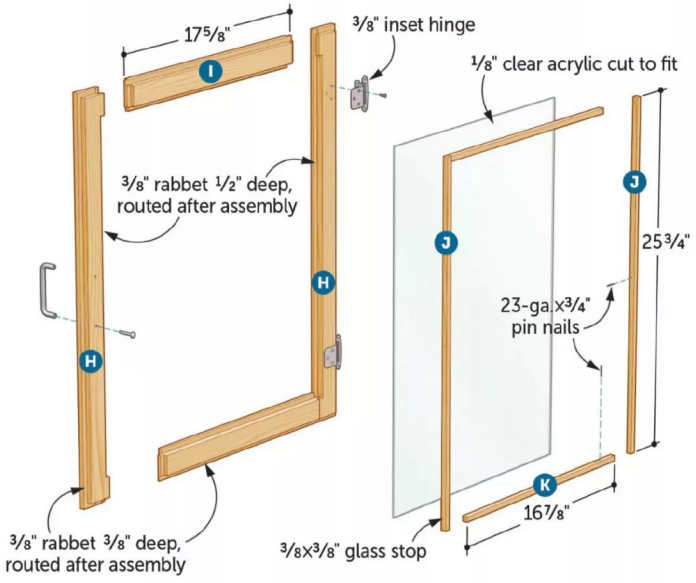
4 After the glue dries, use a rabbeting bit in your router table to cut a rabbet in the rear inside edge of each door **[Photo I]**.

5 Adjust the router-table fence and rout a rabbet around the outside back edge of the door frames **[Photo J]**.

6 Cut the glass stops (J, K) to size **[Drawing 3]**, finish-sand the door parts, and set them aside.

3 DOOR





PARTS LIST

PART		FINISHED SIZE T	W	L	Matl.	Qty.
A	CASE SIDES	3/4"	8"	32"	MP	2
B	TOP/BOTTOM	3/4"	7 3/4"	45 1/4"	MP	2
C	MOUNTING CLEAT	3/4"	2 1/2"	44 1/2"	MP	1
D	CASE BACK	1/4"	45 1/4"	31 1/4"	MP	1
E	OUTER FACE FRAME STILES	3/4"	1 1/2"	32"	M	2
F	FACE FRAME RAILS	3/4"	1 1/2"	43 1/4"	M	2
G	CENTER FACE FRAME STILE	3/4"	1 1/2"	29"	M	1
H	DOOR STILES	3/4"	2 1/4"	29 1/2"	M	4
I	DOOR RAILS	3/4"	2 1/4"	17 5/8"	M	4
J	VERTICAL PANEL STOPS	3/8"	3/8"	25 3/4"	M	4
K	HORIZONTAL PANEL STOPS	3/8"	3/8"	16 7/8"	M	4
L	SHELVES	3/4"	7"	44 7/16"	MP	4
M	SHELF EDGING	3/4"	1"	44 7/16"	M	4

MATERIALS KEY: MP–maple plywood, M–maple.
SUPPLIES: 1 1/4" fine-thread pocket screws, 23-ga.x3/4" pin nails, 3/4" narrow-crown staples, #10x3" cabinet mounting screws,
BLADE AND BITS: Dado blade, rabbeting router bit with bearings, 1/4" self-centering drill bit.
SOURCES: cabinet hinges (2 pairs) no. BK-P243-SN, $5 per pair; door pulls (2) no. HAF-116.07.018, $2 each, cabinetparts.com; 1/8x36x48" clear acrylic sheet no. 865850, $60; 1/4" shelf pins no. 4897499 (pkg of 20), $9, lowes.com; plastic parts bins no. 4666T61, $2 each, mcmaster.com.
PROJECT COST: It cost us about $360 to build this project (including 30 bins). Your cost will vary by region and source.

PULL IT ALL TOGETHER

1 From ¾" plywood, cut the shelves (L) to size **[Parts List]**. Cut the shelf edging (M) and glue and clamp it to the shelves, flush with the upper shelf face.

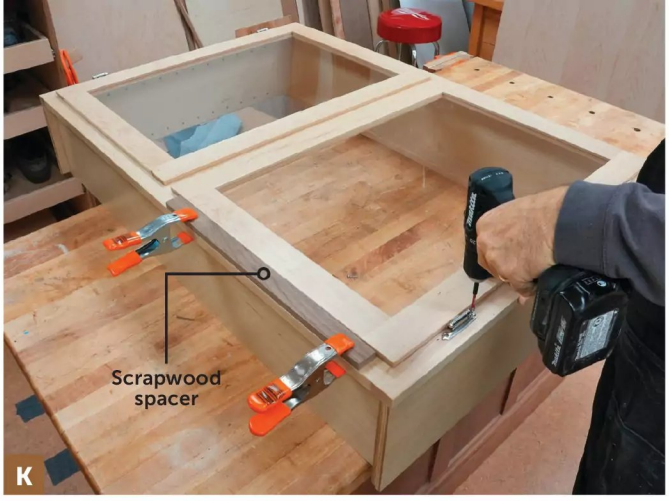
2 Do any necessary touch-up sanding on the entire project and apply the finish of your choice. We used water-based polyurethane.

3 Cut clear ⅛"-thick acrylic to fit the door openings and install the stops (J, K) to hold it in place. We used a pin nailer with ¾" pins to secure the stops.

4 Attach the hinges to the doors. Butt the door against a spacer and the hinge-side stile to position it while you screw the hinges to the face frame **[Photo K]**. Then install the door pulls.

5 Staple or nail the plywood back (D) to the case **[Drawing 1]**. Mount the cabinet by driving 3" screws through the mounting cleat (C) and into wall studs. Slip all the shelves into the case first, stacking them on the bottom. Then lift each shelf up into place and install the shelf pins, working from the top down. Gather and sort your hardware collection into bins **[Sources]** and load the shelves with other boxes, confident that the next time you seek out a screw, the search will start and end in your brand-new hardware cabinet.

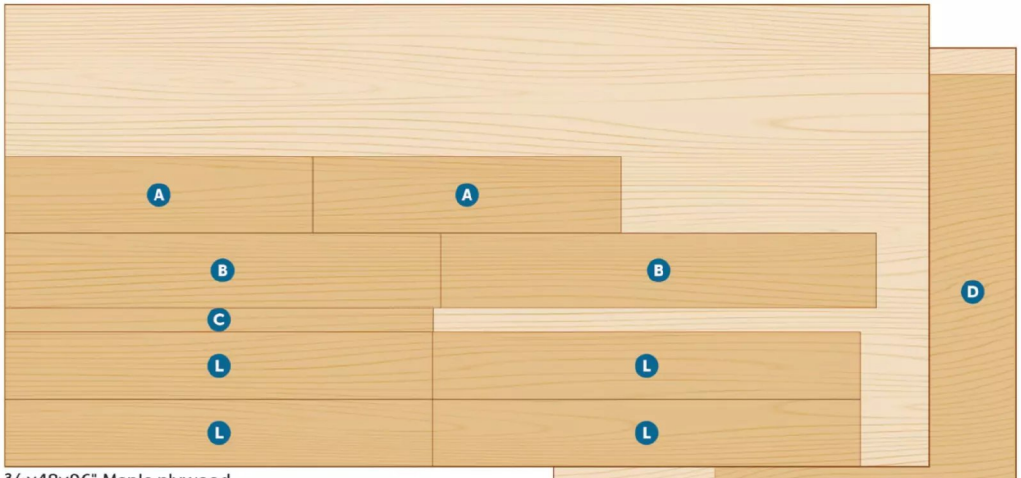
Get our top tips for cutting acrylic.
woodmagazine.com/cutacrylic



Clamp a 1¼"-wide spacer flush with the bottom rail of the face frame to position the door vertically in the opening. Pull the door leaves of the hinge snug against the face frame stile, then screw the frame leaves of the hinge to the stile.

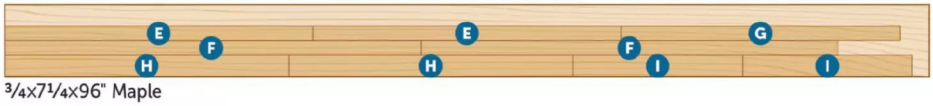
CUTTING DIAGRAM

We purchased 10 board feet of 4/4 maple. Before cutting parts to size, we planed them to the thicknesses shown in these example boards.

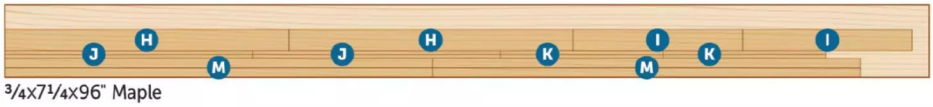


¾x48x96" Maple plywood

¼x48x48" Maple plywood



¾x7¼x96" Maple



¾x7¼x96" Maple

• SHOP TESTED •

COMPACT CORDLESS MITERSAWS

Don't let their size fool you. These scaled-down mitersaws are capable of making full-size cuts, yet are small enough and light enough to be carried from the workbench to a jobsite.

WRITER: VINCE ANCONA
TESTER: STEVE FEENEY

PHOTOGRAPHER: KELSEY HANSEN

Whether you're trimming out a room, miter-cutting the ends of a frame, or just breaking down long boards, a sliding compound mitersaw is a time-saving tool in any shop. With the exception of the tablesaw, we probably use ours more than any other saw we own.

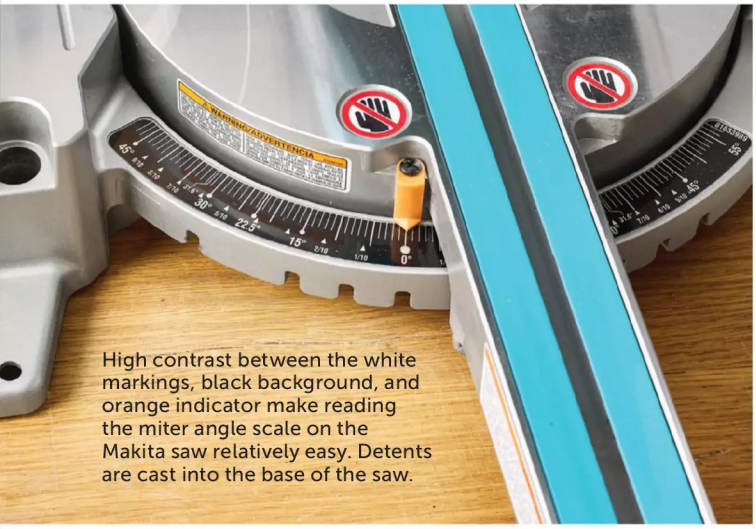
When shopping for a sliding compound mitersaw, conventional wisdom says to choose a 10" or 12" model for their greater capacity–sound advice if you have the space (and budget). But for this test, we chose to focus on compact cordless saws in the 7 1/4" range. Why? Because we find this size hits a sweet spot in terms of portability, functionality, and price. They'll handle most of the woodworking demands you ask of them and still pack away neatly at the end of the day, saving precious shop space.

We evaluated 11 cordless slider models on criteria such as power, accuracy, dust collection, ease of use, and battery life. Read on to learn which ones broke free from the pack and which, if any, were left in the (saw)dust.

The detent plate on the Bosch saw makes adjustment easy. The markings are easy to read, but we'd like to see the wide gap between the scale and the indicator tightened up to facilitate accuracy.

ACCURACY

Making accurate crosscuts and miter cuts is one of the main reasons for owning a mitersaw. All of the saws we looked at can swing a couple of degrees past 45° in either direction. The Festool KSC 60 EB-BASIC and Makita XSL02Z have an even wider range (see *Cordless Mitersaws Flex Their Might, page 37*). All of the saws feature built-in stops, or detents, for commonly used miter angles of 0°, 15°, 22.5°, and 45°, as well as additional stops for task-specific angles, such as those common for crown molding.



High contrast between the white markings, black background, and orange indicator make reading the miter angle scale on the Makita saw relatively easy. Detents are cast into the base of the saw.

To evaluate these detents, we made a number of square and miter cuts with each saw and then used a digital angle gauge to check accuracy.

We were pleasantly surprised to discover that all of the saws cut accurate 90° and 45° miter cuts right out of the box. If adjustment is needed, though, all have a provision for that. The Bosch GCM18V-07SN, DeWalt DCS361B, Kobalt KMS 0724B-03, Milwaukee 2733-20, and Ridgid R48607B feature a steel plate with notches at each detent, *above*. Adjusting these saws for accuracy is a simple matter of loosening a couple of screws that secure the plate and shifting it left or right.

On the other saws, the detents are cast or machined into the saw's base, *left*, so calibration requires loosening and moving the fence. Both methods work, but the saws with detent plates adjust more easily.

In addition to miter cuts, the blades of all these saws also tilt at least 45° to the left to make bevel cuts. And the Festool, Kobalt, Milwaukee, and Ridgid saws tilt at least 45° to the right as well. We made a number of bevel cuts to test the 0° and 45° stops on each saw and again, almost all performed accurately out of the box. The lone exception was the Craftsman CMCS714M1, but even that saw required only a slight adjustment of the stop screw to dial in a perfect 45° bevel cut.

CUT QUALITY

Cut quality ranks right up with accuracy in importance. To test this, we made cuts in softwood, oak, and oak plywood, using the factory blades. Most of the saws come with a 7¼", 40-tooth blade. The Bosch is supplied with a 24-tooth blade, which is more suited to cutting framing lumber, and the Bauer blade is sold separately. Festool and Makita use different size blades than the others, which limits aftermarket blade options. To level the playing field, we also tested all the saws (except the Festool) with 60-tooth Diablo blades.

The Bosch, DeWalt, Festool, Makita, Milwaukee, and Ridgid saws all made smooth cuts in solid wood and exhibited just slight tear-out in plywood using their factory blades. Some of the saws produced markedly better cuts with the Diablo blade, but with others, the difference was negligible. The lesson here is to give the stock blade a chance before deciding you need to upgrade to an aftermarket blade.

Note: **Diablo doesn't offer a blade to fit Festool's nonstandard arbor size, so we used a 60-tooth Festool blade on this saw.**

POWER & BATTERY LIFE

Despite their small size, these saws pack a punch in terms of power, which we tested by cutting 2"-thick hard maple and oak. The Bosch, Festool, Makita, and Milwaukee saws easily sliced through the wood without any hesitation. Most other saws were able to complete the cuts with minimal to moderate slowing of the motor. The Worx WX845L struggled the most; it stalled while trying to make it through the oak.

With any cordless tool, the amp-hour (Ah) rating of the battery greatly affects runtime. For consistency, we chose either 4.0 or 5.0 Ah batteries where possible. Then to test runtime, we started with a fully charged battery in each saw and made as many crosscuts through pine 2×6s as we could before the battery died. Then we repeated the test and averaged the results, which can be found in the chart on *page 37*, along with the Ah rating of the battery used for the test.

The importance of runtime depends on how you'll be using the saw. Large framing projects requiring hours of cutting demand long runtime. If you frequently face tasks like this, consider purchasing an extra battery or one with a higher amp-hour rating. But in a home shop where you're making just a handful of cuts at a time, runtime is rarely an issue, especially when you consider that it takes only 45 to 55 minutes to charge a drained battery for any of the saws in our test.

> **"EVEN THOUGH THEY'RE CORDLESS, I WAS SURPRISED BY THE AMOUNT OF POWER AND TORQUE ALL OF THESE SAWS HAVE."**
>
> ***-VINCE ANCONA, CONTRIBUTING EDITOR***

DUST COLLECTION

Each saw in our test comes with a dust bag and, alternatively, can be hooked up to a shop vacuum or dust collector. To test the efficiency of each option, we set up a small enclosure to corral as much sawdust as possible. After making several cuts with each saw, we gathered the sawdust and weighed it to determine how much escaped collection. We performed this test both with the dust bag and with the saw hooked up to a shop vacuum.

Using the bag alone, the Kobalt, Makita, and Milwaukee saws performed the best, leaving an ounce or less of uncollected sawdust. Performance improved for all the saws when hooked up to a shop vacuum, but the rubber chip deflector on the DeWalt saw had an annoying tendency to collapse shut from the vacuum pressure. The Festool demonstrated the most dramatic change, going from dead last in our bag-only test to number one when paired with a vacuum.

We prefer the D-style grips because they place your hand in a comfortable position whether you're plunging the blade into the workpiece or pushing it forward through the cut.

ERGONOMICS & CONTROLS

If you use any of these saws for a long stretch, ergonomics comes into play. Most of the saws feature a D-handle that is easy to grasp and keeps your hand in a horizontal position as you push or pull the blade, *above right*. The Festool and Makita saws have vertically oriented grips that are comfortable, but put a little more strain on the wrist, *below*.

All of the saws incorporate a trigger-style power switch into the grip, as well as a safety release to avoid accidental starts, typically located on or above the trigger. The Bauer 57921 and the Kobalt saw position the safety release on the outside of the D-handle so that you can depress it with your thumb. This location is easy to reach, but it's also easy to accidentally start the saw if you lift it by the grip.

It's worth noting that all of these saws seem to be designed for right-handers, with the grip and switch on the right side of the blade. However, Makita, Festool, and Bosch at least make an attempt to accommodate left-handers by providing switch releases that operate from the left or right.

The grips on the Makita and Festool saws are comfortable and place the switches in convenient locations, but their vertical orientation puts a little more stress on the wrist in operation.

CUTLINE INDICATOR

If you've used a mitersaw, you know that lining up the blade to your cutline usually involves lowering the blade (before powering up the saw) so it hovers just above the workpiece, then nudging your workpiece back and forth. Eight of the saws simplify this process by adding a small LED light above the blade. The light not only illuminates the cutline, it also creates a shadow of the blade on the workpiece, *right*. The shadowline proved quite accurate in all cases and we found ourselves quickly favoring this feature.

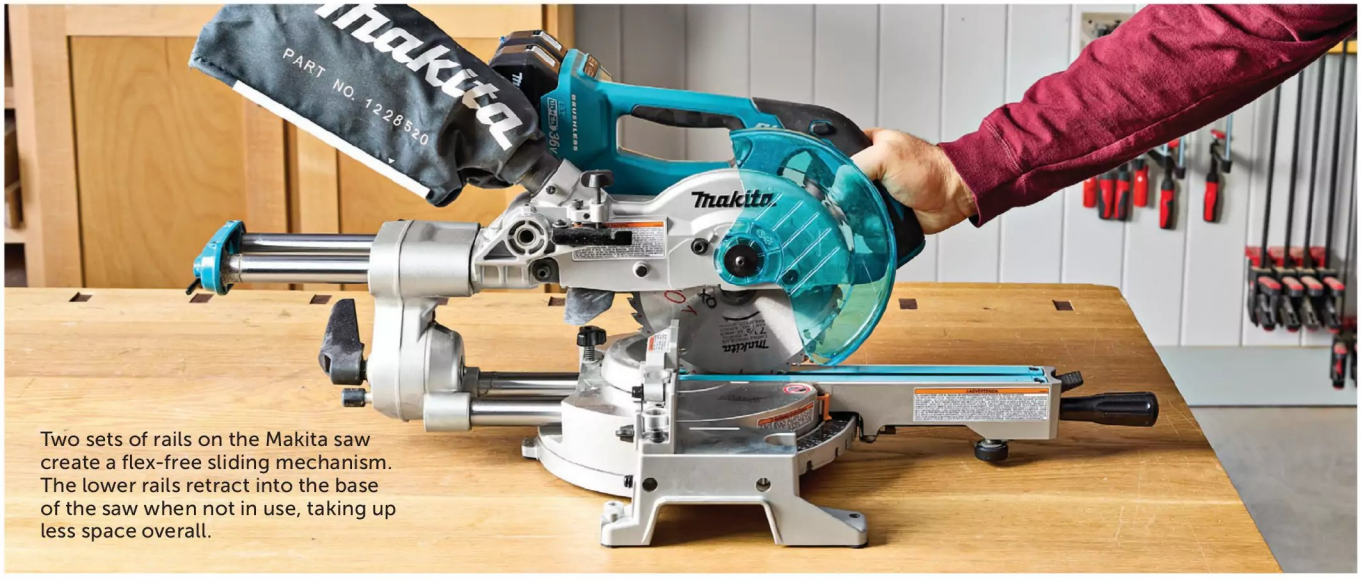
The light on the DeWalt, Kobalt, Milwaukee, and Ridgid saws turns on when you squeeze the trigger and shuts off automatically a few seconds after you release it. The Bosch has a small worklight, but it doesn't show the cutline. A manual on/off switch controls the light on the Bauer, Craftsman, Festool, and Worx saws. The Makita and Ryobi PBT01B mitersaws don't have any type of light.

Better than a laser, a bright LED above the blade, such as this one on the Milwaukee, both illuminates the workspace and creates a shadow to show exactly where the blade will cut.

SLIDE ACTION & CAPACITY

Unlike nonsliding saws, the motor and blade of a sliding mitersaw typically are mounted to a pair of steel rods that pass through a stationary housing. Linear bearings enable the rods to slide in the housing, allowing you to crosscut stock at least 8" wide in this compact class. The downside to this design is that it requires a lot of real estate in front of and behind the saw to accommodate the rod travel.

The Makita and Festool have slightly different designs. The Makita uses two sets of rods that telescope out from the back, each accounting for half of the saw's travel distance, *below*. This makes for a more rigid design as well as a more compact footprint when stowed away. In use, this slide action felt a little odd in comparison to the other saws. But we quickly got used to it.



Two sets of rails on the Makita saw create a flex-free sliding mechanism. The lower rails retract into the base of the saw when not in use, taking up less space overall.

Unlike all the other saws, the Festool's rods are fixed and the motor and blade assembly slide back and forth on them. And because the rods project forward rather than behind the saw, you can place this saw against a wall without concern for rear clearance–a huge advantage in a small shop, *right*.

To compare crosscut capacity, we extended each saw to its maximum reach at 90° and made a plunge cut into a wide piece of 3/4" MDF. Then we measured the kerf length to see how the saws stacked up. (See the results on *page 37*.) Keep in mind that you'll lose some capacity when cutting miters.

An adjustable foot, like the one on the Festool saw, stabilizes the saw when the blade and motor are pulled forward. The Bauer, Craftsman, Makita, Ryobi, and Worx saws also have this feature.

Screw-type hold-downs, such as this one on Bosch's saw, are easy to tighten and offer a secure grip. You can use the hold-down on either side of the blade.

Although there's no limit to how long of a workpiece you can cut on a mitersaw, table and fence extensions on the Festool and Makita saws make dealing with long stock easier. The Worx saw also has table extensions, while the Kobalt, Milwaukee, and Ridgid saws have extendable fences. In addition, all of the saws feature some sort of hold-down clamp to stabilize workpieces to be cut, *above*.

MORE THAN JUST MITERS

With a little ingenuity, you can use a mitersaw for cutting joinery as well as making crosscuts and miters. Most of these saws feature an adjustable stop to control the depth of cut. (The Bosch, DeWalt, and Milwaukee saws are the exceptions.) By setting the stop and then making a series of overlapping cuts, you can create dadoes, rabbets, and even tenons. When making non-through cuts like this, the blade may not be able to travel across the entire width of the board. To remedy this, sandwich a spacer block between the fence and the workpiece.

PORTABILITY

These saws are light enough to easily carry from the workbench to a jobsite, with the possible exception of the Festool. At over 40 pounds, this saw is not one you'll want to haul over long distances. All of the saws have cutouts or recesses in the base to make lifting them easier. The Bosch, DeWalt, Festool, Kobalt, Makita, Milwaukee, and Ridgid saws also have a handle on top to lift the saw one-handed, *right*. This is convenient if you store your mitersaw on a shelf.

A top-mounted handle, such as the one on the DeWalt saw, makes one-handed carrying possible. Alternatively, use the grips on the ends of the table to lift the saw with both hands.

AND THE WINNERS ARE ...

We were pleasantly surprised that all of these saws proved accurate and made good-quality cuts. Picking a winner from such a large field proved challenging, but we chose the Festool KSC 60 EB-BASIC for our top pick. It edged out the others due to its excellent cut quality and incredibly smooth operation. And despite having a larger blade, it fits into one of the smallest footprints thanks to its unique forward-facing rails that let you position it directly against a wall–a huge plus in a space-challenged shop.

The Festool also offers other features that set it apart, such as a variable speed motor for cutting different materials, Bluetooth batteries that automatically power up dust collection when paired with a Festool dust extractor, and an optional mobile stand.

As nice as these features are, they also serve as reminders that Festool products are designed as part of a larger (and pricier) system. For woodworkers outside the Festool bubble, we felt the Milwaukee 2733-20 and Makita XSL02Z performed almost equally in terms of accuracy, power, and quality of cut. The Makita offers greater crosscut capacity. But for us, details such as the handle grip, LED cutline indicator, and standard-size 7¼" blade–even without considering the $300 price difference–tipped the scale in favor of the Milwaukee to share top tool honors.

For our Top Value award, we chose the Bosch GCM18V-07SN. Its overall performance landed it among the top-tier of saws in our test, but at a price that falls in the middle of the pack.

Festool
KSC 60 EB-BASIC

·2025·
WOOD®
TOP TOOLS
COMPACT CORDLESS MITERSAWS

Milwaukee
2733-20

MITERSAWS FLEX THEIR MIGHT

MODEL	PERFORMANCE RATINGS [1]										BLADE DIAMETER	STATED VOLTAGE	AVERAGE NUMBER OF CUTS PER CHARGE [2]	BATTERY AMP HOUR (Ah) RATING [3]	MAXIMUM CROSSCUT CAPACITY @ 90° [4]	MAXIMUM MITER ANGLE (LEFT, RIGHT)	MITER DETENTS (IN ADDITION TO 0, 15, 22.5, 45)	MAXIMUM BEVEL ANGLE (LEFT, RIGHT)	CUTLINE INDICATOR	WEIGHT WITH BATTERY & BLADE (LBS.)	PRICE OF BARE TOOL (NO BATTERY) [5]	PRICE WITH BATTERY & CHARGER
	OBSERVED POWER	QUALITY OF CUT	BATTERY RUNTIME	SLIDE SMOOTHNESS	SCALE READABILITY	PORTABILITY	EASE OF CHANGING BLADE	DUST COLLECTION, WITH BAG	DUST COLLECTION, WITH VACUUM	HANDLES & SWITCH ERGONOMICS												
BAUER 57921	B	B	B	B-	B-	B	C+	C+	B+	B-	7¼"	20	145	5.0	8½"	47, 47	31.6	47, 0	Y	28.1	$150	$250
BOSCH GCM18V-07SN	A	A-	A	A	A-	A-	A-	A-	A	B+	7¼"	18	293	8.0	8¼"	48, 48	31.6	47, 2	N	29.9	$319	$469
CRAFTSMAN CMCS714M1	B+	B	B	C	B-	B-	C+	A-	A-	C+	7¼"	20	154	4.0	8½"	47, 47	31.6	48, 2	Y	23.9	N/A[6]	$249
DEWALT DCS361B	A	A-	B-	B	B+	B+	B	C	B	B+	7¼"	20	129	4.0	8"	48, 48	10, 31.6, 35.3	48, 2	Y	30.3	$296	$449
FESTOOL KSC 60 EB-BASIC	A	A	A	A	A	B	A	C-	A	A-	8½"	18	255	5.0	12"	60, 60	30	47, 46	Y	41.8	$999	$1,298
KOBALT KMS 0724B-03	A	B	B	B+	B+	B+	B	A	A	B+	7¼"	24	163	4.0	9¼"	47, 47	31.6	48, 46	Y	30.2	$279	$379
MAKITA XSL02Z	A	A	A	A-	A	A-	B+	A	A	B+	7½"	36	347	5.0	12½"	47, 57	30	45, 5	N	33.6	$749	$948
MILWAUKEE 2733-20	A	A	A	A	A	A-	A-	A	A	B+	7¼"	18	233	5.0	8⅜"	48, 48	31.6	48, 48	Y	28.7	$449	$549
RIDGID R48607B	B+	A-	B	B	B+	A-	B	A-	A	B+	7¼"	18	171	4.0	8"	48, 48	31.6	48, 48	Y	24.9	$249	$527
RYOBI PBT01B	B	B	B-	B	B	B	B	A-	A-	B	7¼"	18	115	4.0	9⅝"	47, 47	31.6	45, 0	N	24.3	$239	$477
WORX WX845L	C+	B	B	C+	C+	B+	C+	C+	A-	B	7¼"	20	148	4.0	8⅝"	47, 47	31.6	48, 2	Y	25.9	$269	$330

1. A Excellent
   B Good
   C Fair
   D Poor
   N/A Not applicable
2. Number of cuts made in 2×6 pine framing lumber
3. Festool and Makita saws require two batteries.
4. In ¾"-thick stock
5. Prices current at time of article production and do not include shipping.
6. Not available as bare tool only

·2025· WOOD® TOP VALUE
COMPACT CORDLESS MITERSAWS

Bosch
GCM18V-07SN

> "I EXPECTED GREAT PORTABILITY FROM THESE COMPACT MITERSAWS, BUT EVERY ONE OF THEM REALLY IMPRESSED ME WITH THEIR ACCURACY AND CAPABILITY AS WELL."
>
> ***-STEVE FEENEY, TOOL TESTER***

CONTEMPORARY COMPACT CABINET

Add handsome storage to any room and step up your woodworking skills when you build this small cabinet that's packed with intriguing details.

WRITER: ZACH BROWN
DESIGNER/BUILDER: KEVIN BOYLE

OVERALL DIMENSIONS
20"W x 17¼"D x 42"H

PHOTOGRAPHER: CARSON DOWNING; ILLUSTRATOR: CHRISTOPHER MILLS

This striking cabinet rejects the idea that storage projects have to be relegated to run-of-the-mill design. It packs a lot of storage into a small footprint and boasts details that elevate it from a utilitarian project to an elegant piece of fine furniture.

The door pulls you in with its beautiful book-matched veneer. Look closer and you'll discover the three-way mitered corners that join the case frames. A sculpted door pull and feet add the finishing touches. We'll guide you through crafting each of these elements to create this small cabinet that's sure to have a big presence in any room.

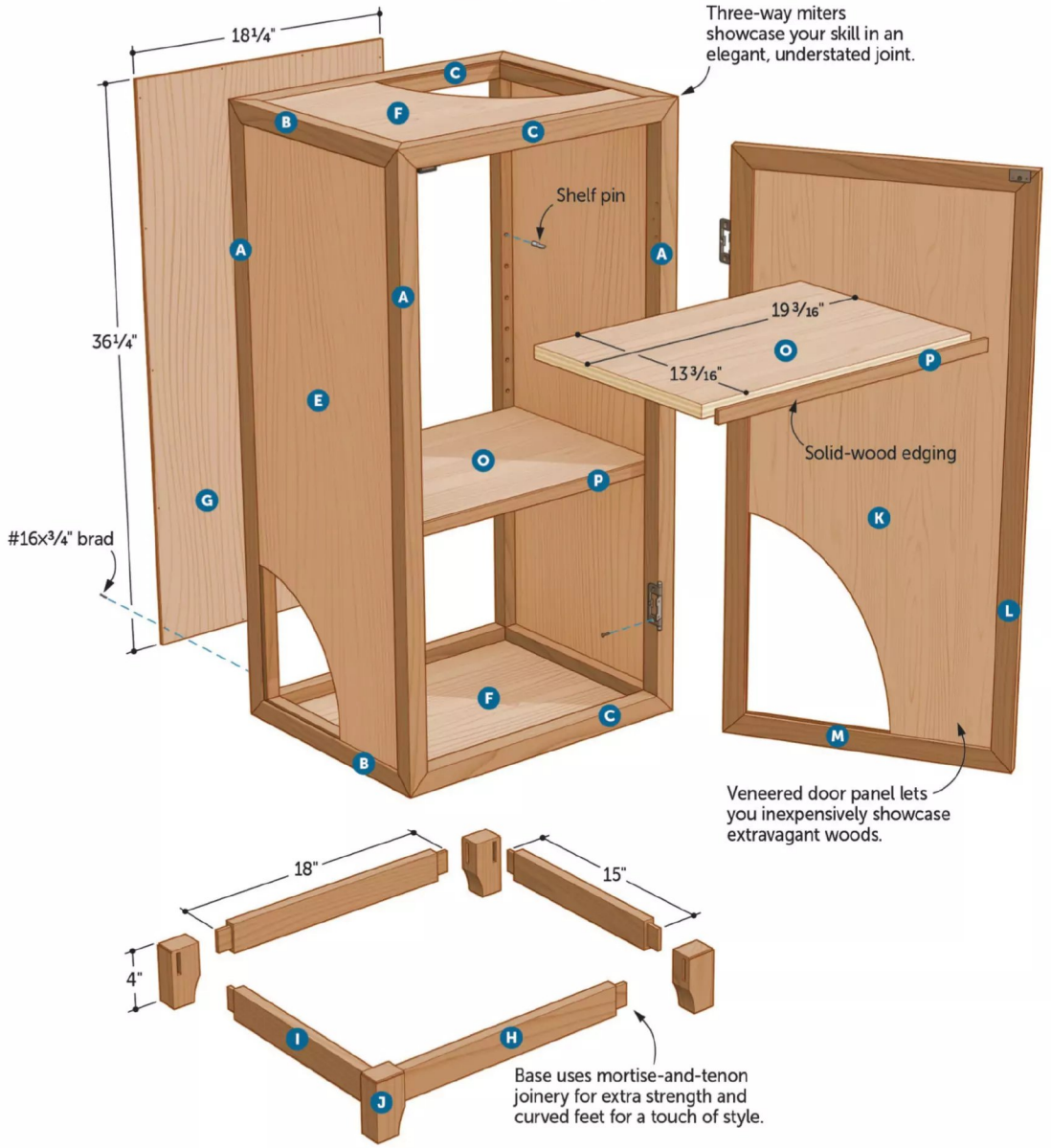
CRAFT THE CASE

1 Machine enough stock to thickness and width for overlength posts and rails (A–C), along with enough extra for three 12"-long pieces you'll use to test your setups for the three-way miters **[Exploded View, Parts List]**. Cut the test pieces to length and the posts and rails 4" longer than listed.

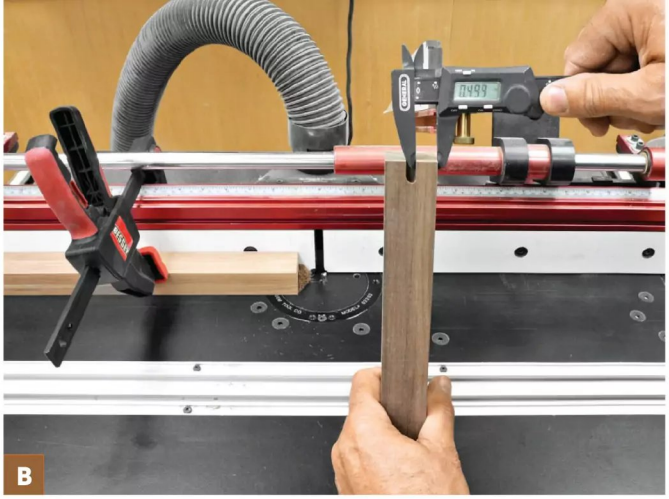
2 Mill an 18"-long blank to thickness and width for the splines (D). Crosscut the splines to length from the blank.

Note: **Make sure the width and thickness of your posts and rails are exactly the same to ensure flush-fitting mitered corners.**

EXPLODED VIEW



Clamp a stopblock to the miter-gauge auxiliary fence and cut the first miter on one end of a test piece. Rotate the piece 90° and cut the second miter. Repeat for the other two test pieces.



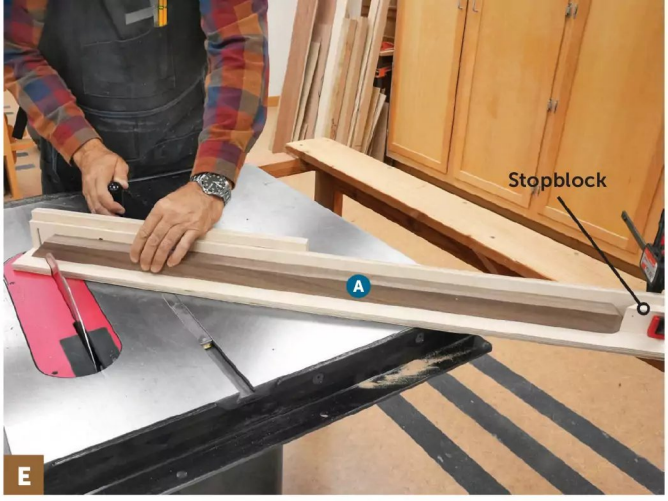
Install a ¼" spiral upcut bit in your router table and adjust the height to ½". Adjust the fence to cut a centered slot on the test pieces. We used calipers to check for equal distance on both sides of the slot.

3 Build the miter-cutting sled (See *One Way for Three-Way Miter Success* on the *next page*). Use the sled to cut the miters on one end of each 12" test piece **[Photo A, Drawing 1]**, then rout the slots in the miters **[Photos B, C]**. Test-fit the joint **[Photo D]**. Retrieve the posts and rails (A-C) and miter-cut them to final length **[Photo E]**. Return to your router-table setup and rout a spline slot in each miter.

Position a stopblock on the fence so the bit falls just short of cutting through the face of the workpiece, then rout a slot in the first miter. Rotate the piece 90° and rout a slot in the second miter (*above*). Repeat for the other two test pieces.

> **“THREE-WAY MITERS CREATE A SEAMLESS LOOK FOR CASEWORK THAT SHOWCASES YOUR WOODWORKING MASTERY IN A MINIMALIST WAY.”**
>
> ***-KEVIN BOYLE, SENIOR DESIGN EDITOR***

With splines (D) dry-fit in the slots, assemble the test joint using masking tape. If the outside faces are not flush, adjust the router-table fence to ensure that the bit is centered.

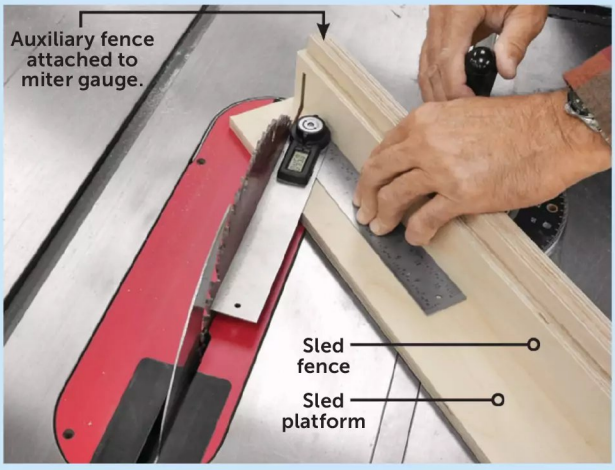


Cut the miters on one end of each post (A). Then, attach a stopblock to the sled and miter-cut each post to length on the same faces as the other end. Repeat with the side rails (B) and front/back rails (C).

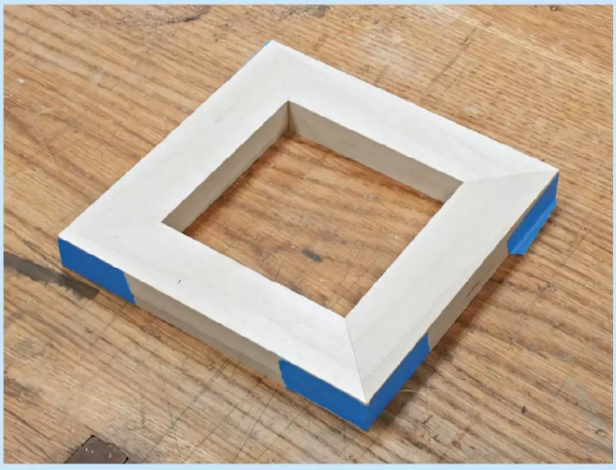
ONE WAY FOR THREE-WAY MITER SUCCESS

For gap-free three-way miters, it's critical that the joints are cut at exactly 45°. We made a simple sled for our tablesaw miter gauge to support the effort. From ½" plywood, build a 42"-long sled with a 3" platform and 2" fence. The sled provides a zero-clearance blade opening below and behind the workpiece, eliminating tear-out. Attach the sled to an auxiliary fence on your miter gauge and adjust it to exactly 45° to the blade (*below left*).

Attach a stopblock to the fence and miter-cut four pieces of scrap to the same length. Fit them together and check for gaps at the corners (*below right*). If you find gaps on the inside of your miters, rotate the sled away from the blade slightly. If gaps appear on the outside, rotate the fence toward the blade. Reposition the stopblock, recut each miter, and check the fit again. Repeat until you have gap-free miters.

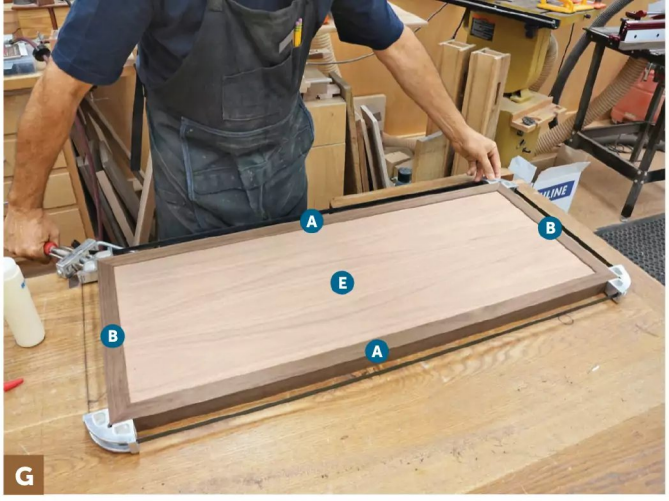


Use a digital protractor or drafting square to adjust the sled fence to exactly 45° to the blade.



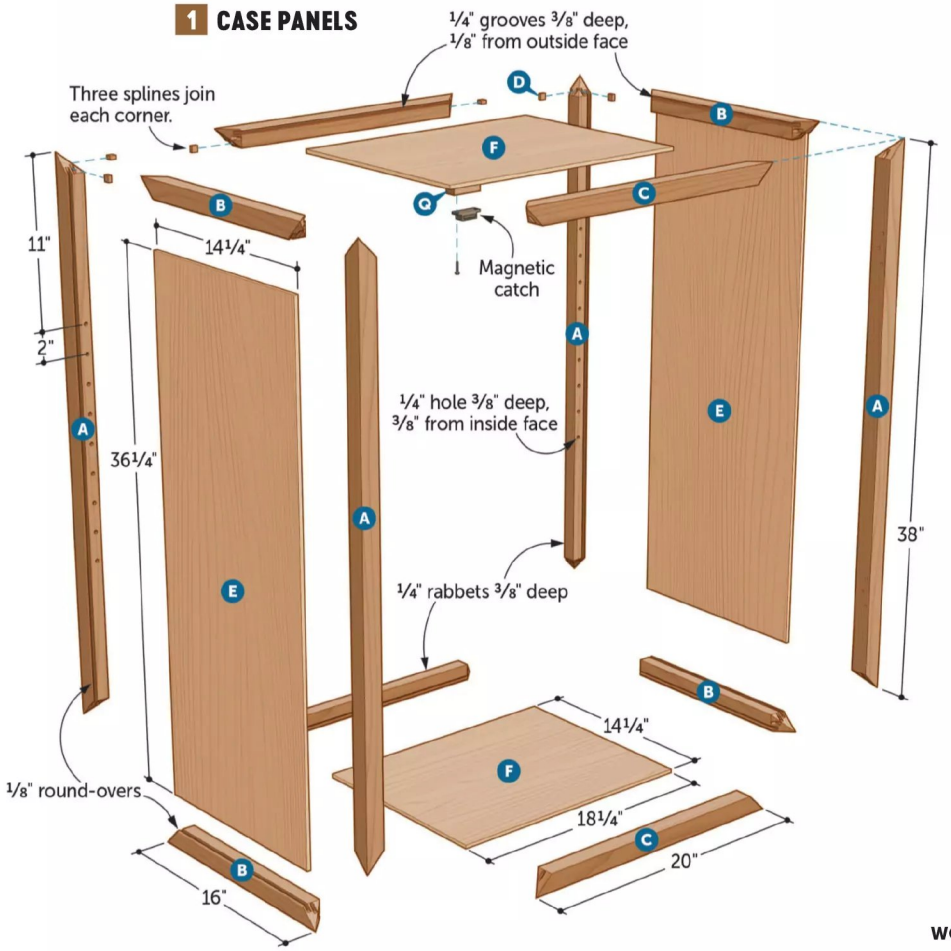
Use masking tape to clamp together the miters on your test pieces as you gauge the joints for tightness.

Attach an auxiliary fence to the tablesaw fence and adjust it until it just touches the dado blade. Rabbet the back face of both rear posts and rear rails.



Apply glue to the splines and miters and clamp each side assembly together using a band clamp, checking for square. Clean any glue squeeze-out off of the inside face of the miters.

4 Next, cut grooves in the posts and rails for the plywood panels **[Drawing 1a]**. We used MDF-core plywood that measured a full 1/4" thick. Check your plywood and install a dado blade set to match its thickness. (If your plywood measures less than 1/4" thick, cut the grooves in two passes using a standard blade, making one pass in all pieces before moving the rip fence to make the second pass.) Adjust the blade for a 3/8"-deep cut, and position the rip fence 1/8" from the blade. Then cut the grooves in the posts and rails for the top, bottom, and side panels **[Drawing 1]**. Rabbet the rear posts (A) and rails (C) for the back panel **[Photo F]**.

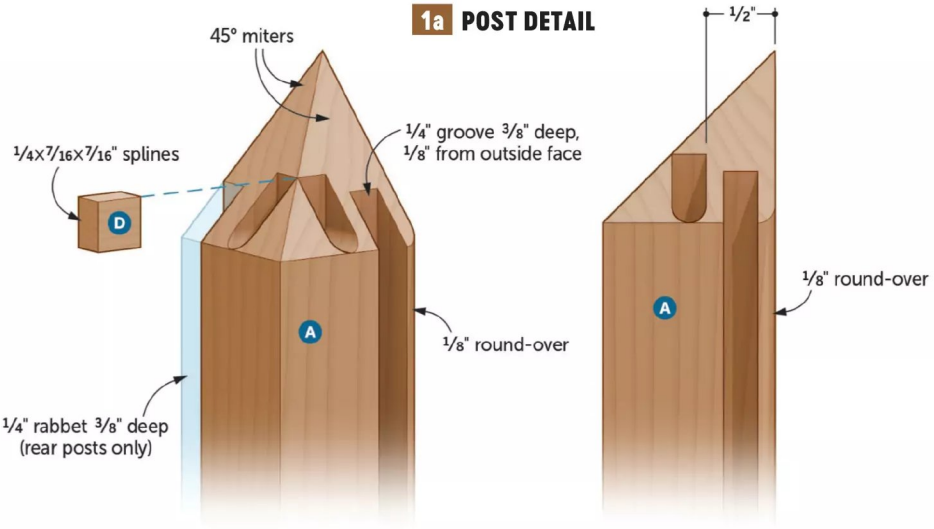


5 Round over the edge of each post and rail nearest to the 1/4" groove [Drawings 1, 1a]. Drill the shelf-pin holes on the grooved face of each post.

6 Cut the side panels (E) to size and finish-sand them. Glue and clamp together both side assemblies (A/B/D/E) [Drawing 1, Photo G].

7 Cut the top and bottom panels (F) to size and finish-sand them. To assemble the case, apply glue to the remaining post and rail miters and splines, then insert the splines and clamp the top/bottom panels and front/back rails between the two side assemblies, checking for square. Cut the back panel (G) to size, finish-sand, and set it aside.

1a POST DETAIL



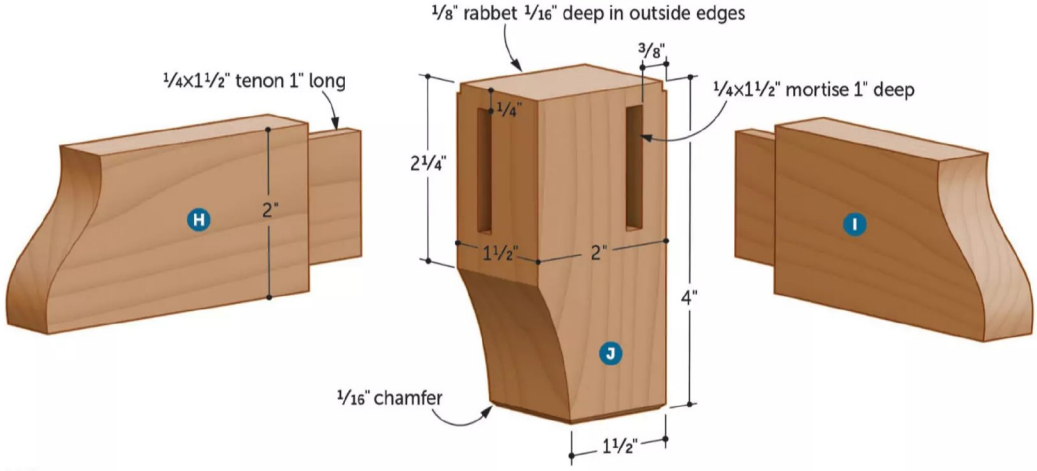
BUST OUT THE BASE

1 From 3/4" walnut, cut the base rails (H, I) to size. Cut the feet (J) to size from 1 1/2" walnut. Mortise the feet, making sure to create mirrored pairs for the front and rear of the cabinet [Drawing 2, Exploded View].

2 Lay out a pleasing arc on one foot [Drawing 2], cut and sand to the line, then transfer the arc to the remaining feet to form them as well. Chamfer around the bottom end of each foot, and rabbet the top end on the outside edges only. Finish-sand the feet.

3 Form tenons on the base rails to fit the mortises in the feet. Glue and clamp the front/back rails (H) between the feet [Exploded View]. Once the glue dries, glue and clamp the side rails (I) between the front and back assemblies. Finish-sand the base and glue it to the bottom of the case.

2 BASE DETAIL



HEAD FOR THE DOOR

The door features a mitered frame that continues the lines of the case corners and surrounds a panel. You can simply cut a panel from 1/4" plywood, if you choose. To give ours a bit more pop, we covered the panel with book-matched walnut veneer. This is a great chance to try vacuum veneering, as detailed in *Veneering Success Is in the Bag, right.*

1 Veneer a door panel (K) or cut one to size from 1/4" walnut plywood.

2 Cut the door stiles and rails (L, M) to thickness and width, and about 1" longer than listed **[Parts List]**.

VENEERING SUCCESS IS IN THE BAG

A vacuum pump and bag setup provides consistent clamping pressure over the entire panel while minimizing the risk of damaging the fragile veneer.

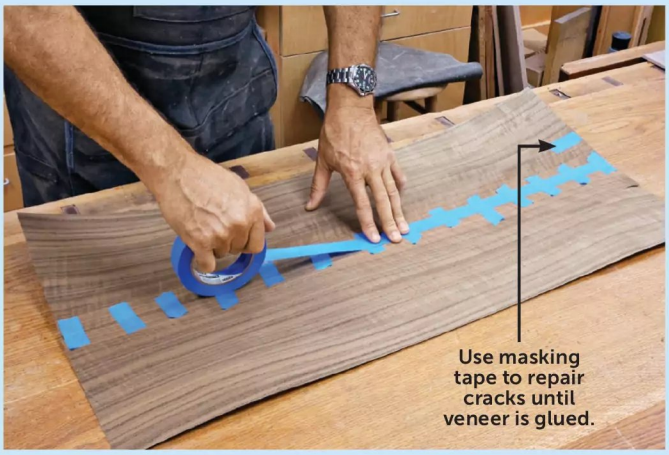
Start by cutting a slightly oversize panel (we made ours 16×36" for this door). We prefer to make veneered panels from MDF because it stays flatter than plywood. Rather than buy an MDF sheet for this project, we used a piece of our leftover MDF-core walnut plywood.

Cut veneer for both faces of the panel (*top left*) just a bit smaller than the width and length of the oversize panel. Stopping the veneer just shy ensures that the fragile edges will be supported when you cut the panel to final size. We joined together two pieces of veneer for each face, selecting a book-matched pair for the front. Use masking tape to join each pair (*top right*). Working quickly, apply a thin coat of glue to one side of the panel (*middle left*) and place the veneer on the glued surface. Flip the panel over and repeat for the other face (*middle right*).

Slide the panel into your veneer bag, add a piece of breather mesh on top, and close up the bag. Attach the pump to the valve and vacuum out the air (*bottom left*). We let our panel sit for three hours in the bag and one hour outside the bag (with the masking tape removed) before cutting it to final dimensions.

Find more details about vacuum-bag veneering at woodmagazine.com/vacuumbag

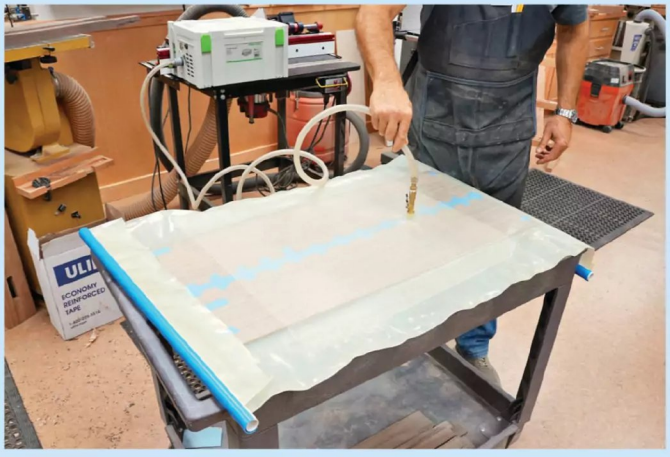
A tracksaw with a 60-tooth blade produces a straight, splinter-free edge that is perfect for joining together two pieces of veneer. Use a piece of plywood under the cut for zero clearance on both sides.



First, stitch together the two pieces with tape across the joint every few inches. Then, apply a piece of tape down the length of the joint. We also used tape to reinforce the cracks on the brittle ends.

Use a glue roller to spread a thin, even coat of glue across the entire surface of the panel. We used Titebond II dark wood glue to best match the walnut veneer.

After gluing veneer on both sides of the panel, use a few pieces of tape to wrap the edges and hold down the veneer, as it tends to curl away from the surface.



> **TAKE THE FEAR OUT OF GLUING VENEER BY GETTING YOUR MATERIALS AND CLAMPING SETUP READY TO GO BEFORE YOU APPLY ANY GLUE. WORK QUICKLY, BUT DON'T RUSH.**
>
> ***-KEVIN BOYLE, SENIOR DESIGN EDITOR***

Form the grooves on the inside edges to match the thickness of your door panel [Drawing 3]. Then, round over the front of the grooved edges.

TIP!

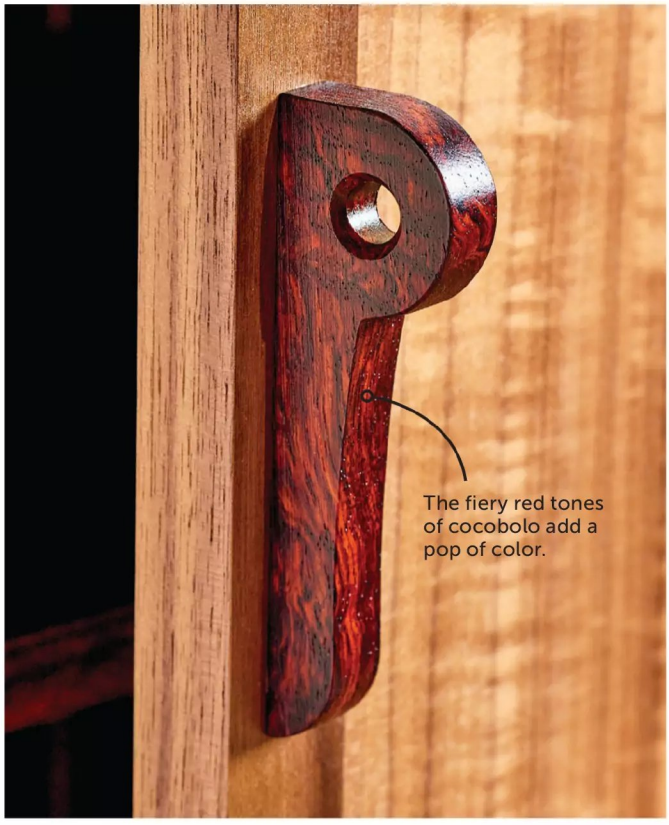
Placing glue in only the backs of the panel grooves minimizes the chance of squeeze-out getting on the outer face of the panel.

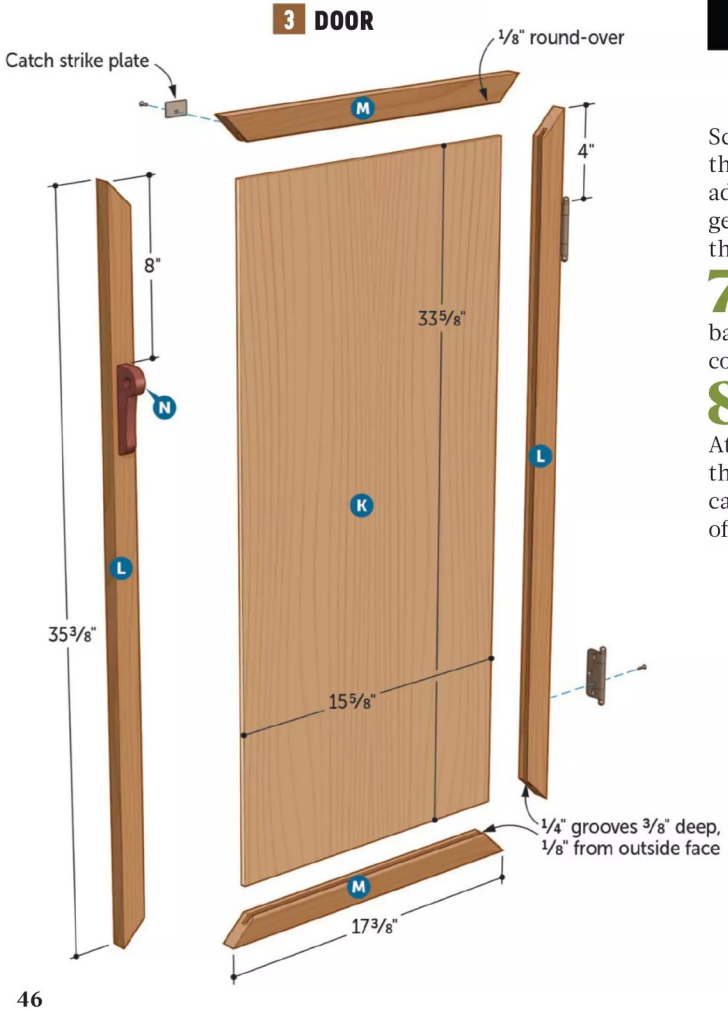
3 Miter-cut the stiles and rails to final length. Apply glue to the miters and the back of the grooves, and clamp together the door assembly (K/L/M) with a band clamp, checking for square.

4 Make a copy of the full-size pattern for the door pull (N) [Drawing 4] and adhere it to a ½"-thick workpiece. We used a scrap of cocobolo for some contrast. Drill and chamfer the hole; then cut the pull to shape. Finish-sand the pull and glue it to the door stile (L).

5 Cut the shelves and shelf trim (O, P) to size, matching the width of the trim to the thickness of your plywood. Glue the trim to the shelves and, once the glue dries, finish-sand each shelf [Exploded View].

6 Cut the catch spacer (Q) to size and glue it to the top panel (F), directly behind the front rail (C) [Drawing 1].



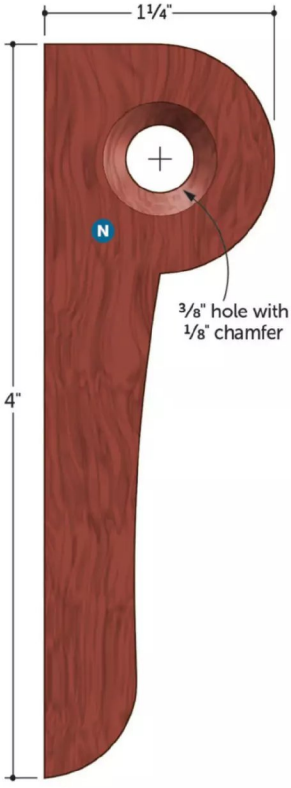


Screw the hinges to the door; then install the door in the case opening. Make adjustments to the door as necessary to get an equal reveal on all sides. Remove the hinges from the case and door.

7 Do any remaining finish-sanding and apply a finish to the case, door, back, and shelves. We sprayed on three coats of matte lacquer.

8 Rehang the door and install the magnetic catch [Exploded View]. Attach the back panel (G) and install the shelves using shelf pins. Fill your cabinet with books, records, or issues of *WOOD*® magazine.

4 PULL FULL-SIZE PATTERN



PARTS LIST

PART		FINISHED SIZE T	W	L	Matl.	Qty.
A*	POSTS	1¼"	1¼"	38"	W	4
B*	SIDE RAILS	1¼"	1¼"	16"	W	4
C*	FRONT/BACK RAILS	1¼"	1¼"	20"	W	4
D	SPLINES	¼"	7/16"	7/16"	W	24
E	SIDE PANELS	¼"	14¼"	36¼"	WP	2
F	TOP/BOTTOM PANELS	¼"	14¼"	18¼"	WP	2
G	BACK PANEL	¼"	18¼"	36¼"	WP	1
H	BASE FRONT/BACK RAILS	¾"	2"	18"	W	2
I	BASE SIDE RAILS	¾"	2"	15"	W	2
J	FEET	1½"	2"	4"	W	4
K	DOOR PANEL	¼"	15⅝"	33⅝"	VWP	1
L*	DOOR STILES	¾"	1¼"	35⅜"	W	2
M*	DOOR RAILS	¾"	1¼"	17⅜"	W	2
N	DOOR PULL	½"	1¼"	4"	C	1
O	SHELVES	¾"	13 3/16"	19 3/16"	WP	2
P	SHELF TRIM	¾"	¼"	19 3/16"	W	2
Q	DOOR CATCH SPACER	¾"	½"	2"	W	1

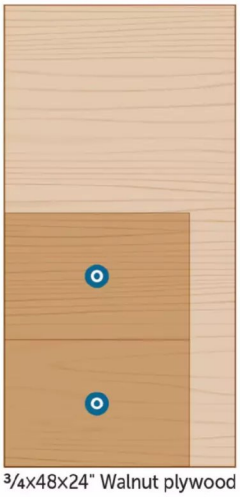
*Parts initially cut oversize. See the instructions.

MATERIALS KEY: W–walnut, WP–walnut plywood, VWP–veneered walnut plywood, C–cocobolo.
SUPPLIES: No-mortise hinges (2), magnetic door catch, ¼" shelf pins (8), #16x¾" brad nails.
BIT: ¼" spiral router bit.
SOURCE: Walnut veneer, certainlywood.com.
PROJECT COST: It cost us about $300 to build this project. Your cost will vary by region and source.

CUTTING DIAGRAM

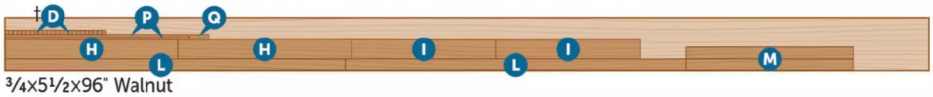
We purchased 8 board feet of 8/4 walnut, 4 board feet of 4/4 walnut, one sheet of ¼" walnut plywood, one quarter-sheet of ¾" walnut plywood, and a scrap of cocobolo. Before cutting parts to size, we planed the boards to the thicknesses shown in these example boards.

¼x48x96" Walnut plywood



¾x48x24" Walnut plywood

1½x5½x96" Walnut †Plane or resaw to the thickness listed in the Parts List.



¾x5½x96" Walnut

5 STEP-UP TABLESAW BLADES

Set your saw up with one of these specialized wood slicers when your combination blade just won't cut it.

WRITER: DEREK RICHMOND with DAVE STONE
PHOTOGRAPHERS: DEREK RICHMOND, BRIE GOLDMAN

The combination blade reigns as the go-to choice for tablesaw blades. It rips and crosscuts well, meaning you can tackle the majority of woodworking tasks without having to swap blades.

When your projects call for specialized tasks, however, you'll get better results faster using a specialized blade. Add these five to your arsenal first.

DADO BLADE

WHAT IT DOES:

Also known as a dado stack or dado set, multiple blades stack on the tablesaw's arbor to cut flat-bottom grooves from ¼" to just shy of 1" wide.

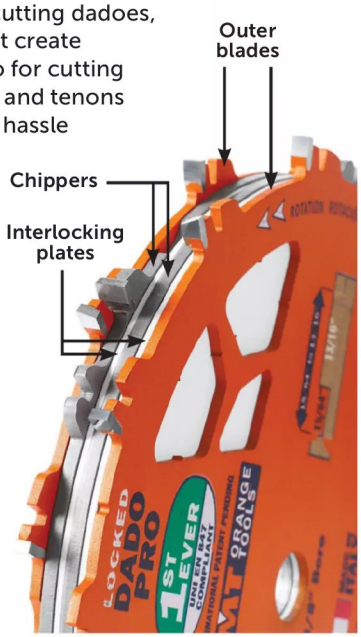
HOW IT WORKS:

Two outer blades (most commonly 8" in diameter) equipped with inward-facing top-bevel teeth cleanly define the edges of the groove. In between, chippers in 1/16" and ⅛" widths, each equipped with flat-ground teeth, hog out the waste. By stacking chippers in different combinations, you can cut a variety of widths. Optional shims fit between the chippers and blades to allow fine-tuning of widths in thousandths of an inch.

Learn the basics of saw blade anatomy.
woodmagazine.com/sawbladebasics

WHY YOU NEED IT:

A dado blade makes quick work of cutting dadoes, along with rabbets and grooves, that create rock-solid joinery. It's also our go-to for cutting half-laps, notches (*below*), tongues, and tenons in a minimum of passes without the hassle of a setting up a tenoning jig.



A BLADE WE RECOMMEND:

The CMT Locked Dado Pro adds a unique upgrade to the standard dado stack: interlocking plastic plates that prevent the other blades from spinning independently on the arbor. While this feature is designed to pass a European safety standard, we appreciate that it holds the blades and chippers together as a unit, simplifying installation and removal. And the blade delivers great results while cutting 19 different dado widths.

Locked Dado Pro, *cmtorangetools.com*, no. 230.312.08, $135

ULTRA-SMOOTH CROSSCUT

WHAT IT DOES:

An ultra-smooth crosscut blade reduces surface tear-out in fragile materials, such as plywood and melamine (*above*).

HOW IT WORKS:

The teeth of an ultra-smooth crosscut blade are arranged in an alternate top bevel (ATB) configuration, which means the tips of the teeth alternate between left- and right-pointing. Those bevels are much steeper—often ranging from 28° to 35°—than the bevels on other ATB blades. This creates a fine point that scores the fragile face as each tooth enters the wood, leaving the rest of the tooth to chop out the core. The blade also has up to 80 teeth that take small bites that shear rather than tear wood fibers, further reducing tear-out.

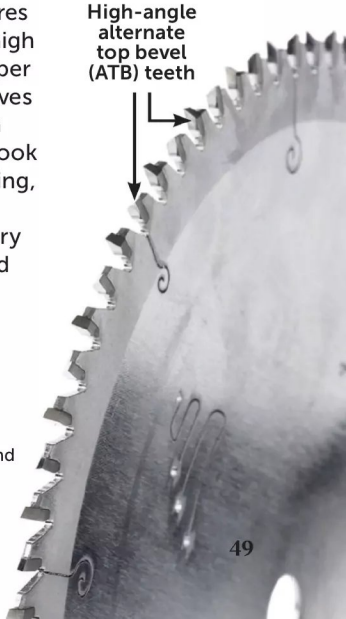
WHY YOU NEED IT:

Hardwood plywood costs have soared in recent years. That makes the idea of rough-cutting them and then making final cuts even less appealing. An ultra-smooth crosscut blade allows you to make one clean cut to maximize your materials. These blades make smooth cuts in laminates, as well.

A BLADE WE RECOMMEND:

This Infinity blade features teeth ground at a very high 40° bevel, creating a super fine scoring cut that leaves impressive results when cutting plywood. A 5° hook angle reduces self-feeding, which allows for slow, controlled cuts necessary when wrestling plywood sheets. It's available in standard and thin-kerf versions.

10"×80-Tooth Ultra-Smooth Crosscutting Saw Blade, *infinitytools.com*, no. 010-080 (standard kerf) and no. 010-180 (thin kerf), $110



THIN-KERF BLADE

WHAT IT DOES:

A thin-kerf blade makes a narrower cut with teeth typically measuring 3/32" wide compared to the 1/8" tooth of a standard-kerf blade (*bottom*).

HOW IT WORKS:

You'll find thin-kerf blades in the same variety of geometries as their standard-kerf counterparts, such as a rip-cut, crosscut, or combination blade. Thin-kerf versions function the same; they simply remove less material.

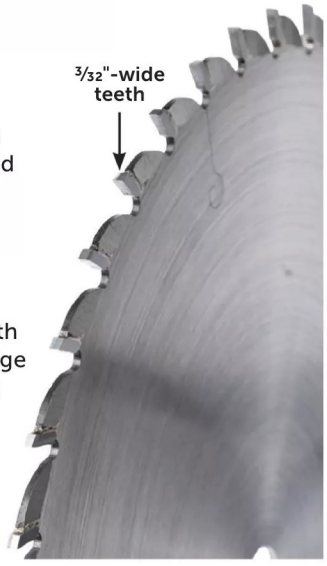
Note: The riving knife or splitter on most tablesaws is compatible with a thin-kerf blade, but compare yours to the blade's teeth to ensure it's not too thick.

WHY YOU NEED IT:

A thin-kerf blade proves ideal for jobsite and contractor-style saws—which are often underpowered—because removing less material creates less waste to pull away and reduces drag. Thin-kerf blades also turn less wood into sawdust, yielding more from every board and sheet. The difference may not seem great, but it adds up, especially for tasks like thin-strip ripping.

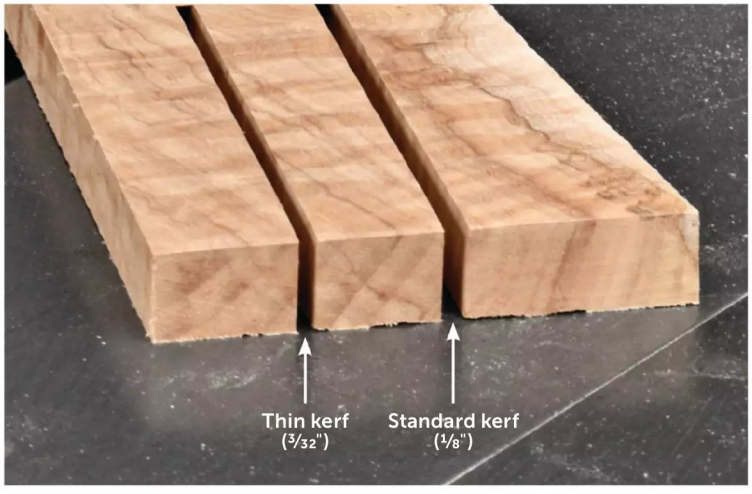
A BLADE WE RECOMMEND:

Forrest makes its Woodworker II Thin Kerf blades in the same variety of tooth geometries as the brand's well-regarded standard-kerf models. We recommend the 40-tooth WW10407100 as a good all-around combination option. We experience negligible difference in vibration versus the company's thicker versions, and we are always pleased with how long these blades retain a keen edge between sharpenings. For a lower-cost option, consider Freud's P410T.



10" Woodworker II Saw Blade - 40 Teeth - Thin Kerf, *forrestblades.com*, no. WW10407100, $234

10" Thin Kerf Next Generation Premier Fusion General Purpose Blade, *freudtools.com*, no. P410T, $80



BOX-JOINT SET

WHAT IT DOES:

A box-joint set cuts sockets for box joints, also known as finger joints (*above*).

HOW IT WORKS:

Resembling a dado blade without the chippers, a box-joint set consists of only two blades with wide, flat-ground teeth. Some box-joint sets feature teeth offset from the blade body, allowing you to reverse the stack order of the blades to create two socket widths.

WHY YOU NEED IT:

Box joints create strong, decorative corners with ample glue surface. The flat-top grind of this blade set cuts a smoother bottom than a dado set's multiple chippers, making it a superior option for the exposed joinery of a box joint. That also makes it useful for plowing small rabbets and flat-bottom grooves.

A BLADE WE RECOMMEND:

Freud's box-joint set features two blades with 7/64"-wide teeth that are offset slightly from the blade plates. Pair the blades with the offsets inward, and they cut 1/4" sockets. Swap the blades to cut sockets that measure 3/8". Either configuration yields smooth, flat sockets that are ready to assemble.

8" Box Joint Cutter Set, *freudtools.com*, no. SBOX8, $100

RIP BLADE

Build a simple rack to store and protect your saw blades. woodstore.net/bladelocker

WHAT IT DOES:

A rip blade makes with-the-grain cuts (ripcuts) that break wide boards down into narrower workpieces (*right*).

HOW IT WORKS:

You'll find rip blades equipped with fewer teeth than a combination or crosscut blade—commonly 24 teeth instead of 40 to 60. The flat-top grind on rip-blade teeth make them work like a series of chisels, paring away small chips of wood. Large gullets between the teeth efficiently carry away those chips that might otherwise bog down the cut and build excess heat that burns the wood.

WHY YOU NEED IT:

If you rip a lot of boards, especially boards measuring 1" thick or more, a rip blade cuts more efficiently and quickly than a combination blade. On a well-tuned tablesaw, a rip blade can leave a cut clean enough to be glued without jointing, or finished with little sanding.

A BLADE WE RECOMMEND:

This Freud Heavy-Duty Rip Blade measures 8" in diameter, making it stiffer than a 10" blade and creating less spinning mass for more saw power. But this blade retains capacity to cut boards up to 2¾" thick. Its 24 teeth are ground at 20°, allowing a rapid feed rate.

8" Heavy-Duty Rip Blade, *freudtools.com*
no. LM72R008, $56

> "SWAPPING SAW BLADES BETWEEN CUTTING TASKS REQUIRES EXTRA TIME BUT PROVES WORTHWHILE FOR SUPERIOR CUTS."
>
> **-DAVE STONE, MANAGING EDITOR**

SAW BLADE CARE & FEEDING

Keep your saw blades performing their best with these simple maintenance tips.

AVOID JUNK FOOD

If you're working with lumber bought from a retailer, you can be pretty confident it's clean. But lumber that's reclaimed or locally milled may be contaminated with dirt, as well as nails and other metals that can dull or damage your blade. Learn how to prep reclaimed wood at **woodmagazine.com/reclaimedlumber**.

BRUSH THEIR TEETH

Pitch and resin that are present in all woods heat up and get sticky as you cut, increasing friction, burning your wood, and dulling your blade. The resins also build up on the blade, compounding the problem. Get rid of buildup on the teeth and blade plate by scrubbing with a bit and blade cleaner. Learn how at **woodmagazine.com/cleanblades**.

DON'T OVERFEED

Get smooth cuts by feeding your wood into the blade at the proper rate. This varies by the type of wood, the blade you're using, and its sharpness. You'll know by sound and feel. Too fast causes chatter or binding and contributes to kickback. Too slow causes excessive heat that burns the wood edges and prematurely dulls your blade.

CHILD'S PLAY PICNIC TABLE

Serve up some childhood fun with this pint-size combination picnic and sensory table. The lift-off top reveals tubs you can pack with tactile goodies like sand, clay, or water.

WRITER: VINCE ANCONA
DESIGNER: KEVIN BOYLE
BUILDER: BRIAN BERGSTROM

Moldable sand that won't make a mess? Yes, please!
woodmagazine.com/kineticsand

PHOTOGRAPHER: KELSEY HANSEN;
ILLUSTRATOR: CHRISTOPHER MILLS

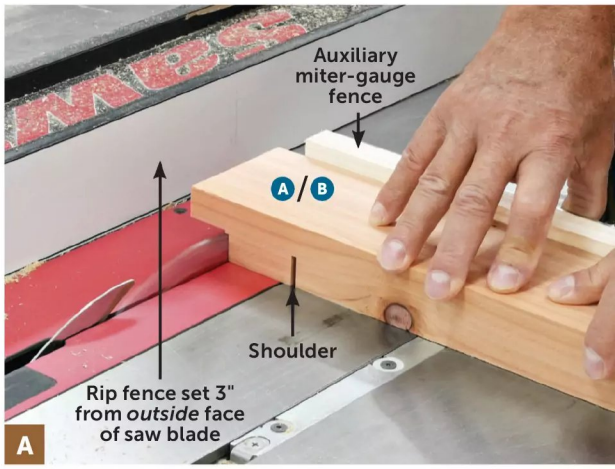
Create the perfect backyard or playroom hangout spot with this scaled-down version of a classic picnic table. Both the height and the seat size are designed to suit tiny tots. Simple construction techniques and dimensional cedar lumber combine to make this a straightforward build that will see plenty of use once it's complete.

BUILD A STABLE BASE

We built this table entirely from dimensional cedar. Cedar is lightweight, making it easier for kids to remove the top. But the main reason for using cedar is that it's naturally weather- and insect-resistant (see *Take It Outside, page 56*).

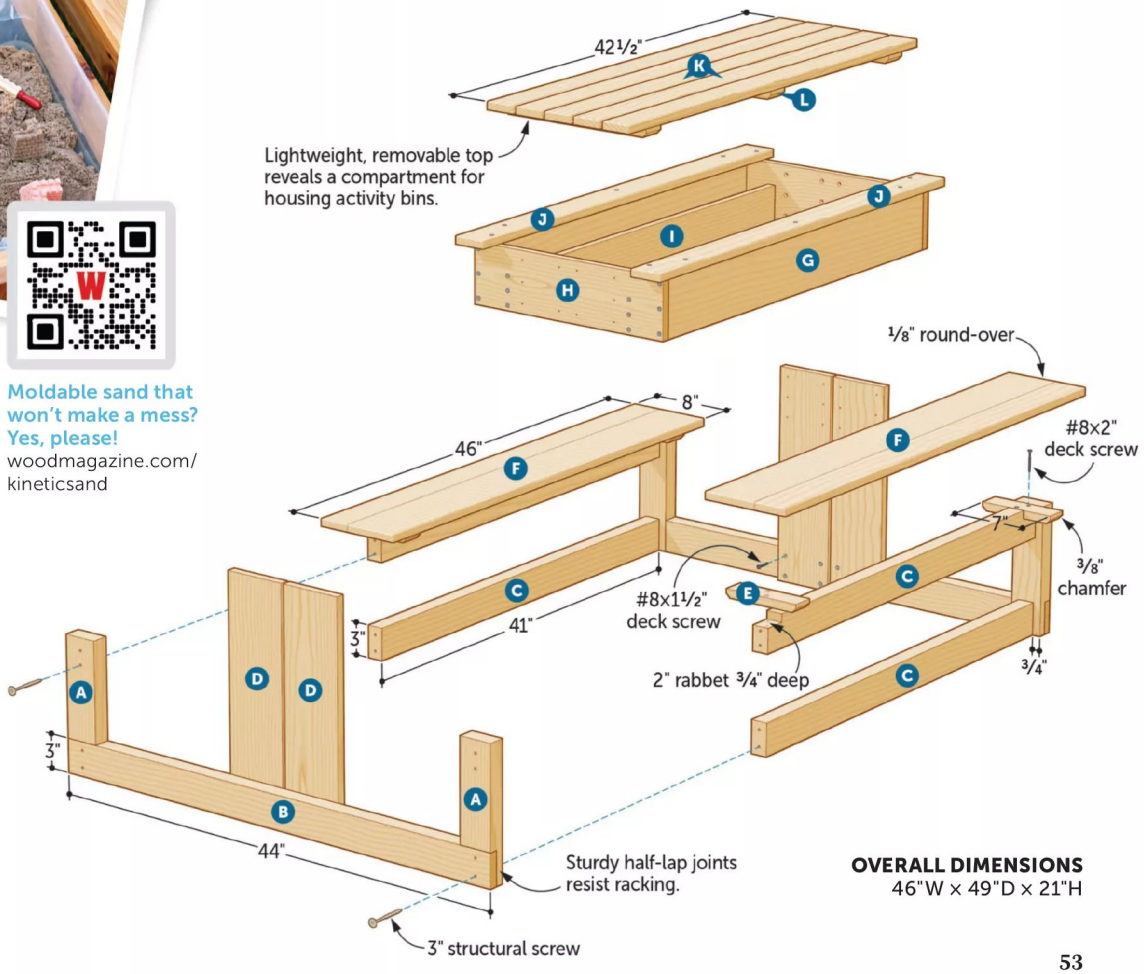
1 From 2-by cedar stock, cut the seat posts (A) and base rails (B) to size **[Drawing 1, Materials List]**.

2 Cut half-laps on the seat posts (A) and base rails (B) **[Exploded View, Photo A]**. (To learn about cutting half-laps, see *Half-Lap Pace Lap, page 54.*)



Using the rip fence as a stop, make shoulder cuts on one end of the seat posts (A) and both ends of the base rails (B). Then nibble away the rest of the waste with repeat passes to form the half-laps.

EXPLODED VIEW



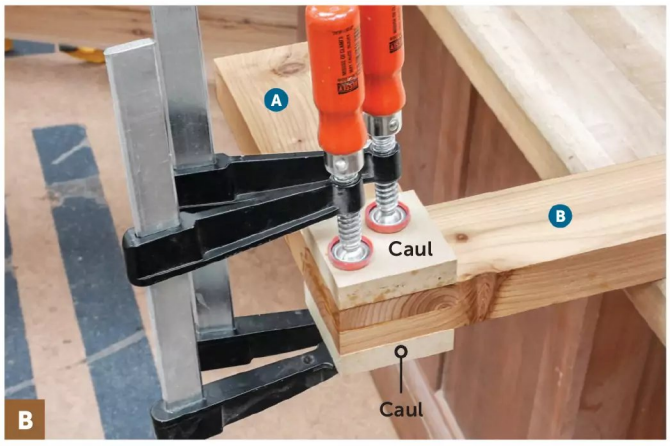
OVERALL DIMENSIONS
46"W × 49"D × 21"H

HALF-LAP
A joint between two equal-thickness pieces, made by removing half the thickness from each piece where they overlap.

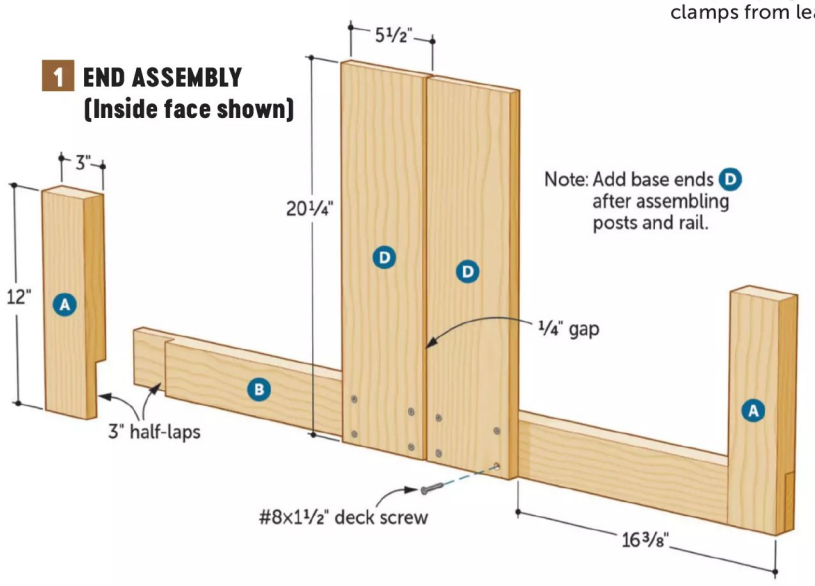
3 Glue and clamp the seat posts to the base rails **[Photo B]**. After the glue dries, finish-sand the post-and-rail assemblies by sanding up to 180 grit and easing the sharp edges.

4 Cut the seat stretchers (C) to size. Set two of the stretchers aside, then cut a rabbet in the upper edge at each end of the other two **[Exploded View]**. Finish-sand the stretchers.

5 Clamp the stretchers (C) between the seat post/base rail assemblies (A/B), centering the stretchers on the posts' widths, and drill pilot holes for 3" structural screws. Screw the stretchers to the assemblies **[Photo C]**.



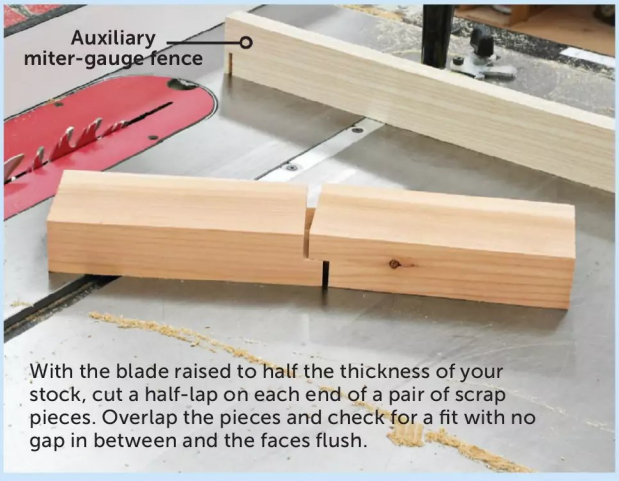
Use waterproof glue to attach the seat posts (A) to the base rails (B). Clamping cauls on both sides of the half-lap joints prevent the clamps from leaving marks in the soft cedar.



> **OVER TIME, CEDAR WILL WEATHER TO A GRAY TONE. IF YOU'RE NOT A FAN OF THIS LOOK, PAINT IS ALWAYS AN OPTION.**
>
> ***-KEVIN BOYLE, SENIOR DESIGN EDITOR***

HALF-LAP PACE LAP

The seat posts connect to the rails with half-lap joints. They're simple to cut, they create strong assemblies thanks to large glue surfaces, and they keep the faces of both mating pieces flush. To dial them in, cut a couple of 8"-long scraps from the same stock you used for the posts and rails. Then set your tablesaw blade height to half the thickness of your workpieces: ¾" high for our 1½" stock. Make several overlapping passes on one end of each scrap piece. Place the scraps on a flat surface to check the fit, *right*. If the pieces fit together with the faces offset, raise the blade slightly and make another set of test passes. If they fit together with a gap between the half-laps, lower the blade slightly and try test cuts on the other end.



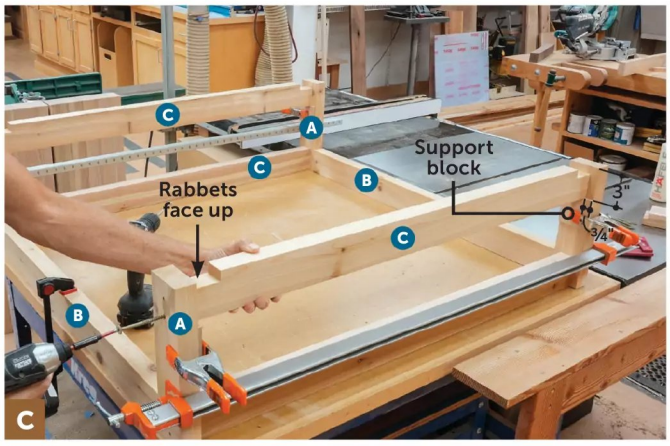
With the blade raised to half the thickness of your stock, cut a half-lap on each end of a pair of scrap pieces. Overlap the pieces and check for a fit with no gap in between and the faces flush.

CHAMFER
A bevel cut on part of the thickness of a board edge or end.

6 Cut the base ends (D) to size and finish-sand them. Glue and screw the base ends to the inside face of the base rails (B), centered along the rail length and with a gap in between **[Drawing 1]**.

7 Cut the seat braces (E) to fit in the rabbets in the seat stretchers (C). Install a 45° chamfer bit in your router and set it for a 3/8"-deep cut, then rout a chamfer on each end of the braces **[Exploded View]**. Finish-sand, then glue and screw them, centered and chamfers facing down, into the rabbets in the upper seat stretchers (C).

8 From 3/4" stock, glue up two panels for the seats (F). After the glue dries, trim these panels to final size and rout a 1/8" round-over on the upper edges and ends. Finish-sand, then set the seat panels aside.



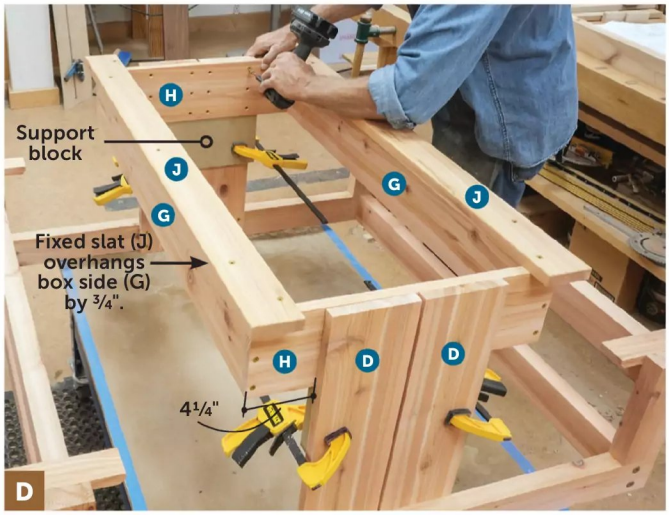
With the upper stretchers (C) resting on support blocks clamped to the seat posts, drill pilot holes and then drive 3" structural screws into the ends of the upper and lower stretchers.

TOP IT OFF

1 Cut the box sides and ends (G, H) and bin supports (I) to size **[Materials List, Drawing 2]**. Set the bin supports aside. Glue and screw the sides and ends to create the box.

2 Cut the fixed tabletop slats and lid slats (J, K) to size. Round over the top edges and ends and ease the corners, then finish-sand. Set the lid slats aside. Screw the fixed slats to the box, centered on the length and overhanging the edges by 3/4".

3 Attach the box assembly to the base ends so the box ends (H) are flush with the top of the base ends (D) **[Photo D]**.



Center the box assembly (G/H/J) on the base ends (D) and rest it on a pair of temporary support blocks. Apply glue and drive 1¼" deck screws through the box ends (H) and into the base ends.


When playtime is over, replace the top to cover the bins and keep the neighborhood cats out of the sand.

4 Retrieve the bin supports (I). To locate the bin supports on the box ends (H), measure the width of your storage bins under the outer lip. (Ours measured 12¼".) Mark this distance, centered on the box ends, then attach the supports to the ends using glue and screws **[Drawing 2]**.

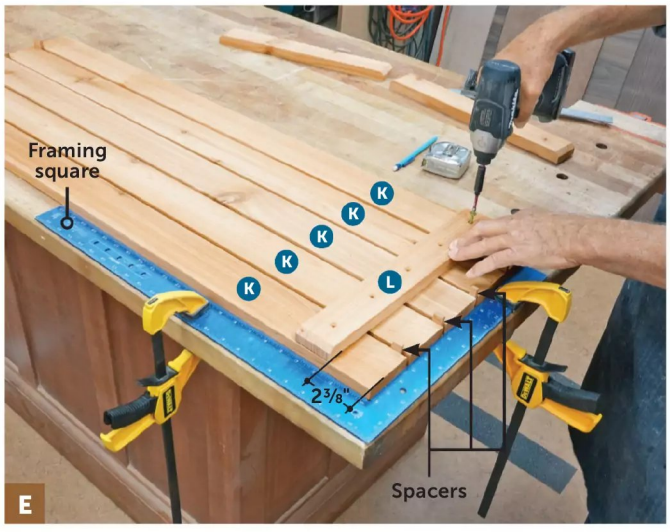
5 Cut the top cleats (L) to size and rout a ⅜" chamfer on the ends. Retrieve the lid slats (K), then glue and screw the cleats to the slats **[Photo E]**.

6 Center the seat panels (F) on the seat braces (E) and stretchers (C), and glue them into place.

7 Finish the table base and top by brushing on three coats of exterior-grade finish. (We used General Finishes Exterior 450 Satin.)

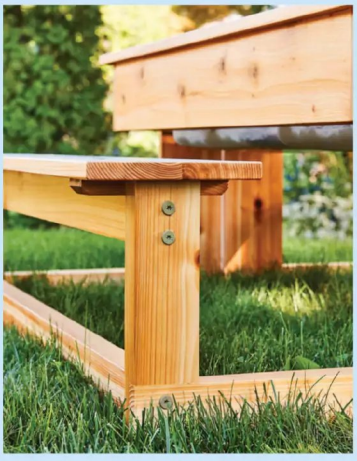
8 After the finish dries, move the table outside and add a pair of plastic storage bins stocked with sensory activities. Set the top into place and call in the kids for some food and outdoor fun.

Note: **Our storage bins came in a pack of six. That makes it easy to load them up with different activities that are ready to go.**



Use a framing square to align and square the lid slats (K). Position the slats with spacers, aligning the outer two slats flush with the ends of the cleats (L), and attach the cleats with glue and screws.

TAKE IT OUTSIDE



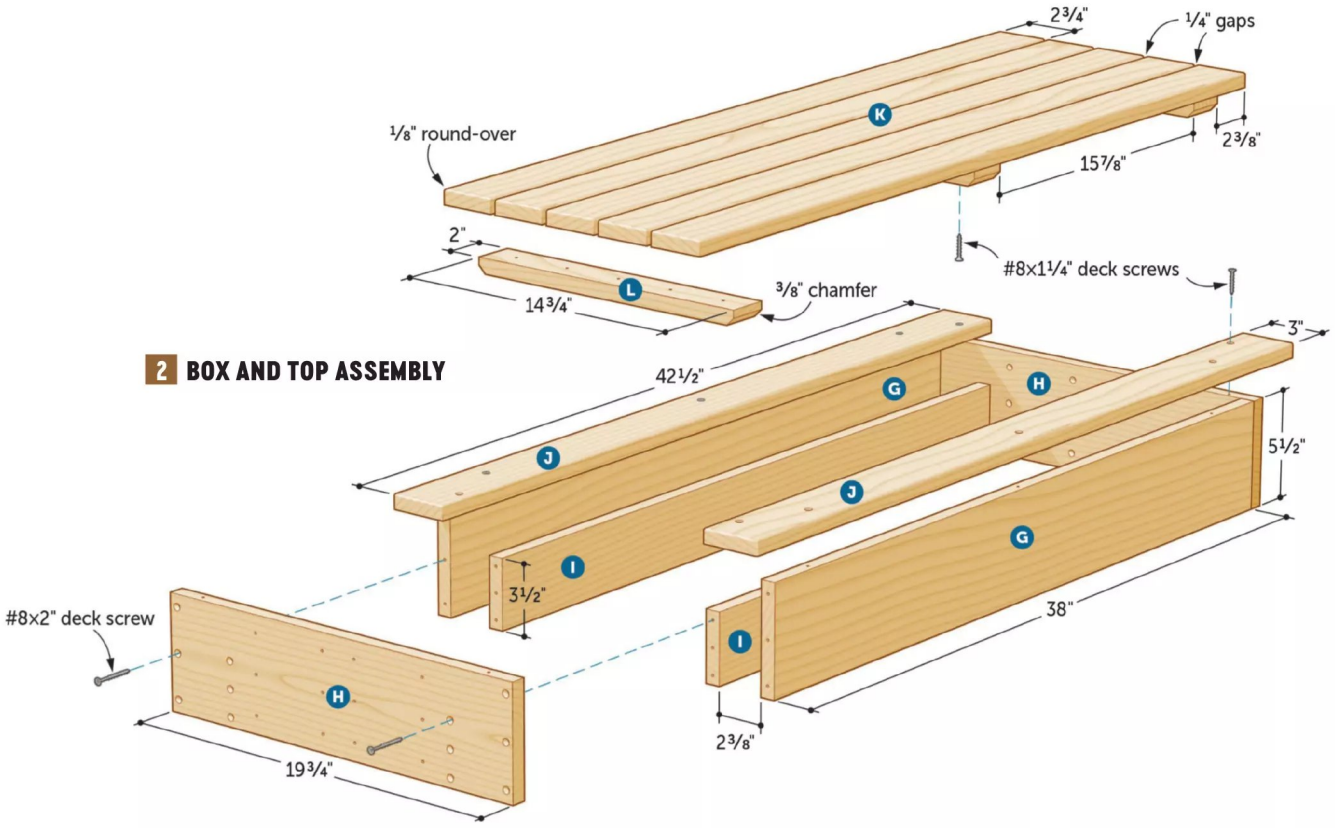
Projects designed to be used in the great outdoors require extra consideration during the building phase to ensure that they can stand up to the elements. Four materials deserve your attention: the wood, glue, hardware, and finish.

Given that all trees grow outdoors, it may seem odd that some wood species fare better outside than others, but certain woods, once cut into lumber, such as cedar, white oak, cypress, and teak, resist rot from moisture or decay from insects, and make superior choices for outdoor furniture. Check to see whether the species you plan to use is suitable by looking it up on a site such as **wood-database.com**.

Many common glues dissolve in water. Water-resistant glues (such as Titebond II) withstand occasional exposure to water. But for projects that will remain outdoors year-round, choose a waterproof adhesive like Titebond III, polyurethane, resorcinol, or epoxy.

Choose hardware and fasteners that are designed for outdoor use. Ordinary steel screws or nails will rust over time, leaving unsightly iron stains on your project. Exterior-grade hardware is galvanized or coated to resist rusting. Other (more expensive) options include stainless steel or nonferrous metal hardware, such as brass, silicon bronze, or copper.

Ultraviolet (UV) rays are the main enemy for an outdoor project, breaking down wood's lignin and causing it to weather and crack. If you apply an indoor film finish, it will simply flake off the fraying wood over several seasons, allowing rot-inducing moisture to enter. The goal, then, is moisture resistance plus UV inhibitors. The opaque pigment of paint is the absolute standard, blocking both completely. But if you prefer to let the beauty of the wood show through, choose an outdoor film finish with UV inhibitors, such as certain spar varnishes or exterior polyurethanes. Or look for a semitransparent stain or penetrating oil that carries some pigmentation into the wood. Both will eventually require refinishing, but the latter will need only a light cleanup sanding rather than complete stripping before reapplication.



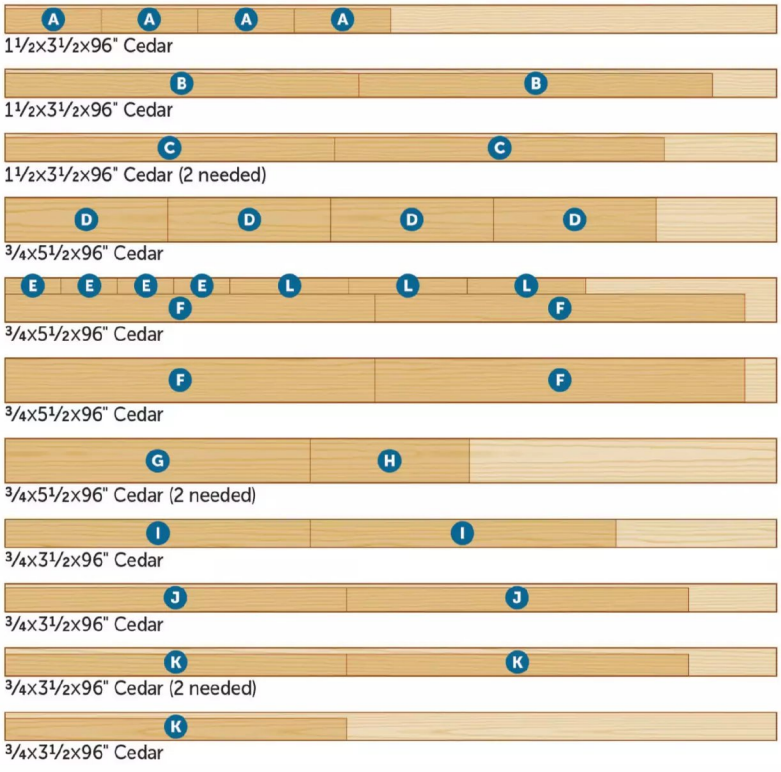
MATERIALS LIST

PART		FINISHED SIZE T	W	L	Matl.	Qty.
A	SEAT POSTS	1½"	3"	12"	C	4
B	BASE RAILS	1½"	3"	44"	C	2
C	SEAT STRETCHERS	1½"	3"	41"	C	4
D	BASE ENDS	¾"	5½"	20¼"	C	4
E	SEAT BRACES	¾"	2"	7"	C	4
F	SEATS	¾"	8"	46"	EGC	2
G	BOX SIDES	¾"	5½"	38"	C	2
H	BOX ENDS	¾"	5½"	19¾"	C	2
I	BIN SUPPORTS	¾"	3½"	38"	C	2
J	TOP FIXED SLATS	¾"	3"	42½"	C	2
K	TOP LID SLATS	¾"	2¾"	42½"	C	5
L	TOP CLEATS	¾"	2"	14¾"	C	3

MATERIALS KEY: C–cedar, EGC–edge-glued cedar.
SUPPLIES: #8x1¼", #8x1½", and #8x2" deck screws; 3" structural screws.
BITS: ⅛" round-over router bit, chamfer bit.
SOURCES: Rubbermaid Cleverstore clear 17-qt. storage bins no. 051596160029, $70 (6-pack), amazon.com.
PROJECT COST: It cost us about $175 to build this project. Your cost will vary by region and source.

CUTTING DIAGRAM

We purchased dimensional cedar boards in the sizes shown. If you're buying rough lumber instead, you'll need 20 board feet of 8/4 cedar and 35 board feet of 4/4 cedar. Before cutting parts to size, plane rough boards to the thicknesses shown in these example boards.



11 STRATEGIES FOR WATER-BASED FINISH SUCCESS

Don't be afraid of water-based finishes. Use these techniques to ensure you'll get great results that protect the wood and let its beauty shine through.

WRITER: DAVE STONE

Water-based finishes have been around for more than two decades, yet many woodworkers still shy away from them. Reasons often include that they raise the grain, they don't lay down smoothly, they're weather sensitive during application, or they don't provide the warm color we're all used to with more-familiar oil- or solvent-based topcoats.

These concerns and others are real, but they're easy to address. And the reality is that these finishes are here to stay. Here are 11 of our top tips to ensure success when working with water-based finishes.

Note: **Water-based finishes are friendlier to the environment, and to you. Plus, they dry crystal clear fast, meaning you can apply multiple coats in a day.**

PHOTOGRAPHER: JACOB FOX

1 UNDERSTAND WHAT WATER-BASED REALLY MEANS

We commonly say water-based, but these finishes are actually waterborne. The solids in the finish mainly consist of resins that interlock to create a protective layer. Those resins are borne (carried) by water, which evaporates to leave the resins behind. That's no different from the way oil-based finishes work.

Using water as the carrier drastically reduces the volatile organic compounds (VOCs) the finishes contain, making them safer to use and better for the environment. Even automotive paints are water-based these days, and they're subjected to conditions our woodworking projects will never face.

Pour your finish through a fine- or medium-mesh paint strainer into a clean container that hasn't been used with solvent-based finishes. No strainers around? Use a coffee filter as a stopgap substitute.

2 STRAIN AS YOU RE-CONTAIN

It's always a good idea to put finish into a separate container instead of dipping your applicator into the can. When you pour your finish, especially from a previously opened can, run it through a strainer (*above*). This will help break up bubbles that may exist, and ensures any dried clumps or contaminants get filtered out.

Sand between coats to knock down raised grain, remove imperfections, and provide tooth for the next coat. Hand-sanding with a 220-grit sanding pad works great and prevents digging in.

3 RAISE THE GRAIN ON BARE WOOD—OR SAND IT AWAY LATER

Water in any form will raise the grain of bare wood, creating a fuzzy surface. That means, with water-based finish, you will have to address it using one of two strategies.

One strategy is to eliminate raised grain while the wood is bare. To do that, sand to your final grit, dampen the wood, let it dry, then sand lightly again with the same grit. Use this strategy if you are staining under your clear finish.

If you're applying clear finish only, with no stain, you can skip the presoak. Apply the first coat of water-based finish and let it raise the grain, then sand after it dries. This can speed the process and be more predictable, especially since you'll be sanding between coats anyway (*left*).

After sanding, wipe dust off the surface. We prefer using a damp cloth, rather than a tack cloth that can leave sticky residue that may inhibit finish adhesion.

TIP!

You'll know the finish is dry when it no longer feels cool to the touch, and when sanding creates fine white powder.

While wet, brush marks and imperfections can be prominent in water-based finish. But more brushing generally makes them worse, not better. Give the finish time to self-level.

4 MESS LESS AND LET IT LEVEL

Use long, straight strokes when brushing on water-based finish, trying as much as possible to avoid brushing over the same area multiple times. Brush marks can be prominent as you apply the finish (*left*), but resist trying to remove them with more brushing. Leave the finish alone and let it flow out. If marks remain after the finish dries, remove them with between-coat sanding and final buffing.

5 BE A SMOOTH APPLICATOR

Natural-bristle brushes that are great for oil-based finishes will absorb water and lose their shape with water-based varieties, which causes the bristles to flex excessively, yielding poor results. Instead, use a synthetic-bristle brush or a foam brush (*left*). For large, flat surfaces, a paint applicator pad works well.

Water-based finishes require synthetic-bristle brushes (*left*), though a foam brush (*right*) works reasonably well. In either case, don't choose the bargain-price option. Good brushes yield better results.

Stir water-based finishes thoroughly to blend in settled solids. Avoid shaking, which introduces bubbles that are hard to get rid of, and may not pop on application before the finish dries.

6 GET STIRRED, NOT SHAKEN

As with all finishes, the resins and binders in water-based finish settle to the bottom of the can and need to be blended back in before application. Be sure to stir them in rather than shaking (*above*). If you use finish often or will be going back to the can multiple times as you complete your project, consider adding a mixing lid (see *Store, Mix, Pour, next page*).

Bare walnut (*left*) maintains its natural color when coated with water-based finish (*center*). Applying amber shellac first, followed by water-based (*right*), adds a warm tone that mimics traditional oil finish.

7 SEAL IT WITH SHELLAC

Applying a seal coat of shellac to the bare wood provides another way to combat raised grain. But it doesn't mean you can skip that first sanding step. You'll still want to scuff the dried shellac with a sanding pad to make sure it's smooth before the finish goes on.

To maintain the natural color of the wood, use super-blonde shellac, also often labeled as seal coat or sanding sealer. To impart the warm tone that water-based finishes lack, choose amber shellac instead (*above*).

8 WATCH THE WINDOWS

To be sure all of your coats go on well and stay put, follow the manufacturer's recommended recoat window times. There's almost always a minimum time you should wait between coats, but many finishes have a maximum as well. So, plan accordingly to have adequate time to apply the number of coats you'll need.

9 START WITH PROPER SANDING

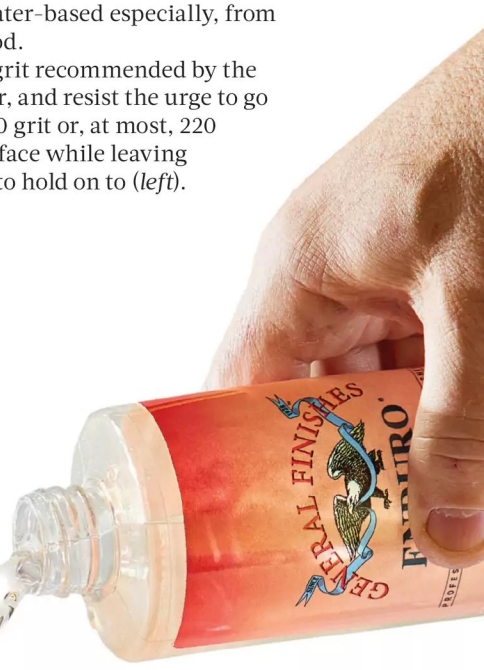
You might be tempted to sand bare woods to 300 or 400 grit before finishing. The finer, the better, right? The truth is that sanding to too fine of a grit can prevent finishes, water-based especially, from adhering to the wood.

Check the finest grit recommended by the finish manufacturer, and resist the urge to go finer. Sanding to 180 grit or, at most, 220 will smooth the surface while leaving tooth for the finish to hold on to (*left*).

Start with a grit that removes mill marks and imperfections. Usually 120 grit will do for surfaced hardwoods. Proceed through finer grits until you reach the final grit the finish manufacturer recommends.

STORE, MIX, POUR

Mixing Mate lids replace the standard lid on your quart can and seal tightly using built-in clamps. Similar to mixing-lid systems for automotive paints, they allow you to easily store, blend, and dispense your finish. Simply turn the handle on top to rotate stirring fins inside the can, then pull back the spring-loaded trigger and pour through the built-in spout. You can clean and reuse the lids. Find them at **rockler.com**.



10 BEAT THE HEAT WITH EXTENDER

Water-based finishes perform best between 70 and 80 degrees and in moderate humidity. Hot, dry conditions accelerate drying time, which can inhibit leveling. In those conditions, use an extender that's compatible with your finish (*above*).

In a pinch, you can thin many water-based finishes by 5-10 percent using distilled water to promote leveling. Be sure to check manufacturer recommendations before adding water.

Adding an extender to water-based finish helps slow dry time and promote leveling. Graduated containers help ensure that you mix in the recommended ratio.

11 PRACTICE TO MAKE PERFECT

After all the work that goes into building a project, it's all too easy to apply finish hastily as you rush to the end. Don't. You're likely to quickly end up in deep water. Wade in to water-based finishing slowly by using scrap to test how much sanding you'll need, whether you want to add a bit of tint with a seal coat, and how best to apply the finish. In no time, you'll be sailing in smooth water.

DREAM-STORAGE HEADBOARD

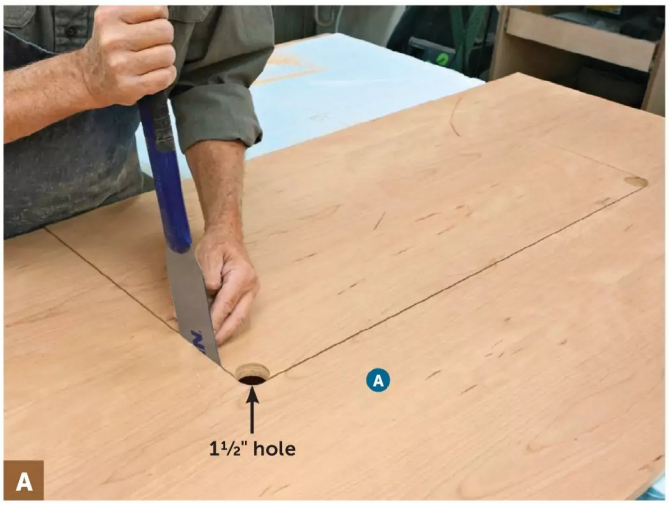
With three easily accessible storage built-ins, this headboard lets you ditch the nightstands to maximize a bedroom's floor space. Rest assured, we've got complete instructions.

WRITER: CRAIG RUEGSEGGER
DESIGNER: JOHN OLSON
BUILDER: BRIAN BERGSTROM

OVERALL DIMENSIONS
55½"W × 11½"D × 42¾"H

Books, phone, eyeglasses, clock, lamp, and more all vie for real estate around your bed. The storage built into this headboard provides plenty of room to keep all of those things close at hand so you can sleep easy.

We built the carcase from cherry plywood, covering exposed edges with solid cherry. Three maple cases slip into the carcase, one along the top and one on each side, providing an attractive contrast to the cherry. The instructions show a headboard for a full-size mattress, but a few simple adjustments size it to accommodate a twin, queen, or king mattress. (See *Size the Headboard to Fit Your Mattress* on *page 65*.)

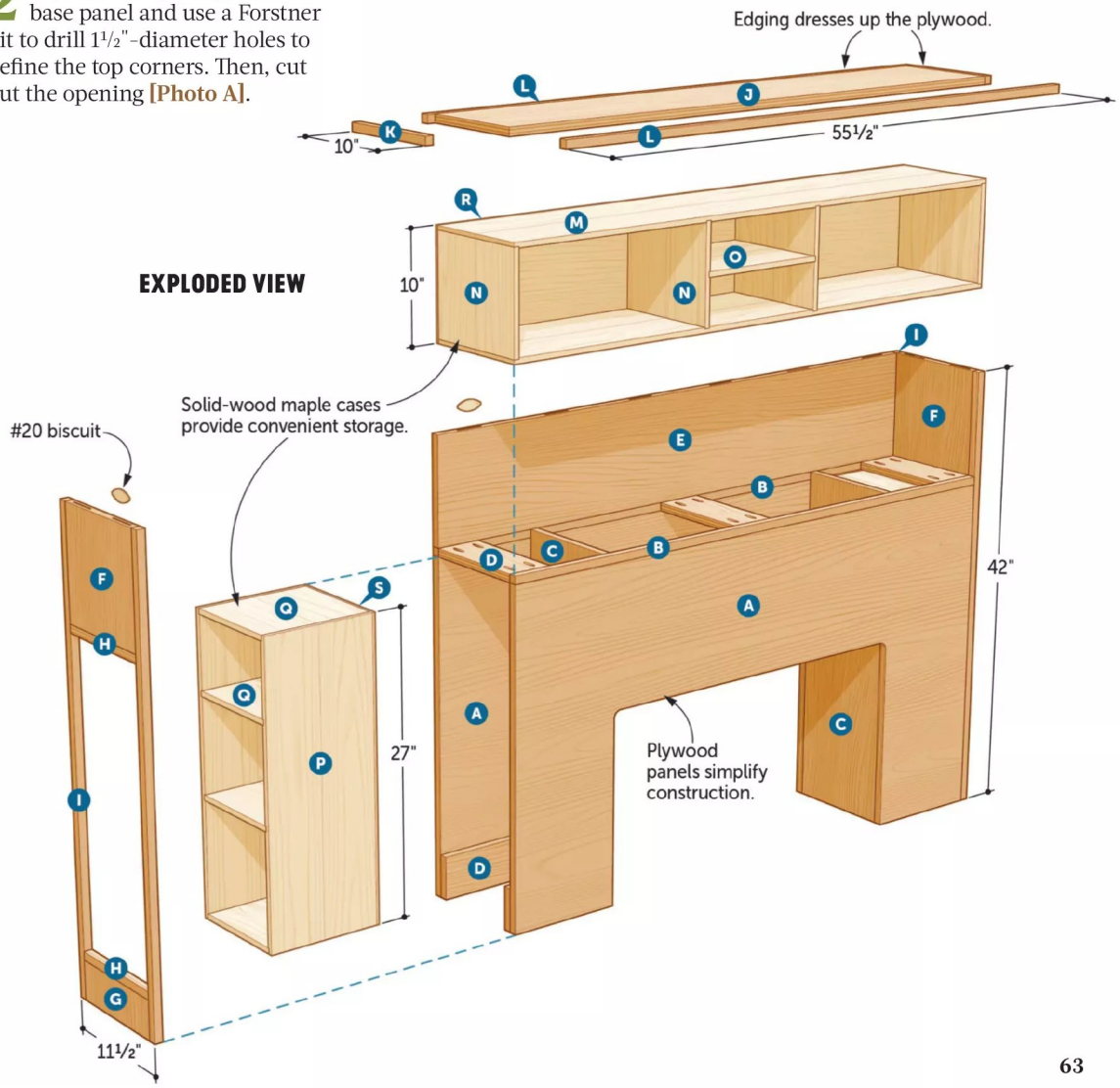


Align a tracksaw with the edges of the holes and cut just short of each hole. Complete the cuts with a handsaw. If you don't have a tracksaw, guide a circular saw or jigsaw with a straightedge.

BUILD A BASE FOR CASES

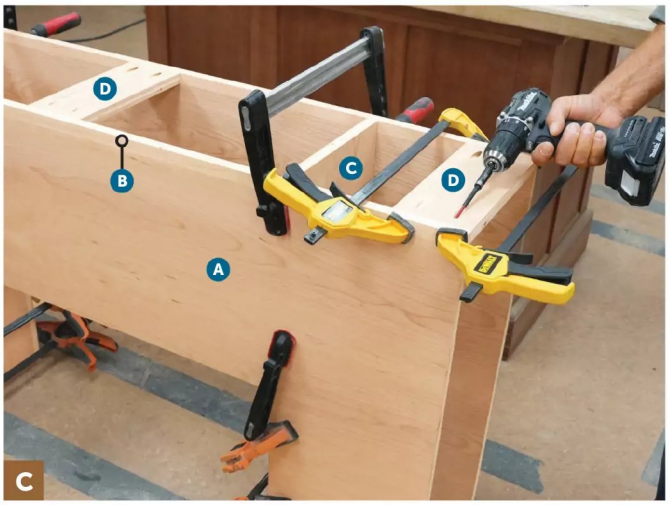
1 From ¾" cherry plywood, cut the base panels (A) to size **[Drawing 1, Parts List]**.

2 Lay out the opening in each base panel and use a Forstner bit to drill 1½"-diameter holes to define the top corners. Then, cut out the opening **[Photo A]**.



PHOTOGRAPHER: BRIE GOLDMAN; **ILLUSTRATORS:** ROXANNE LEMOINE, CHRISTOPHER MILLS

When clamping the base edging (B) in place, make sure it is either flush with one face of the base panel (A) or just proud of it. You will trim it flush later.

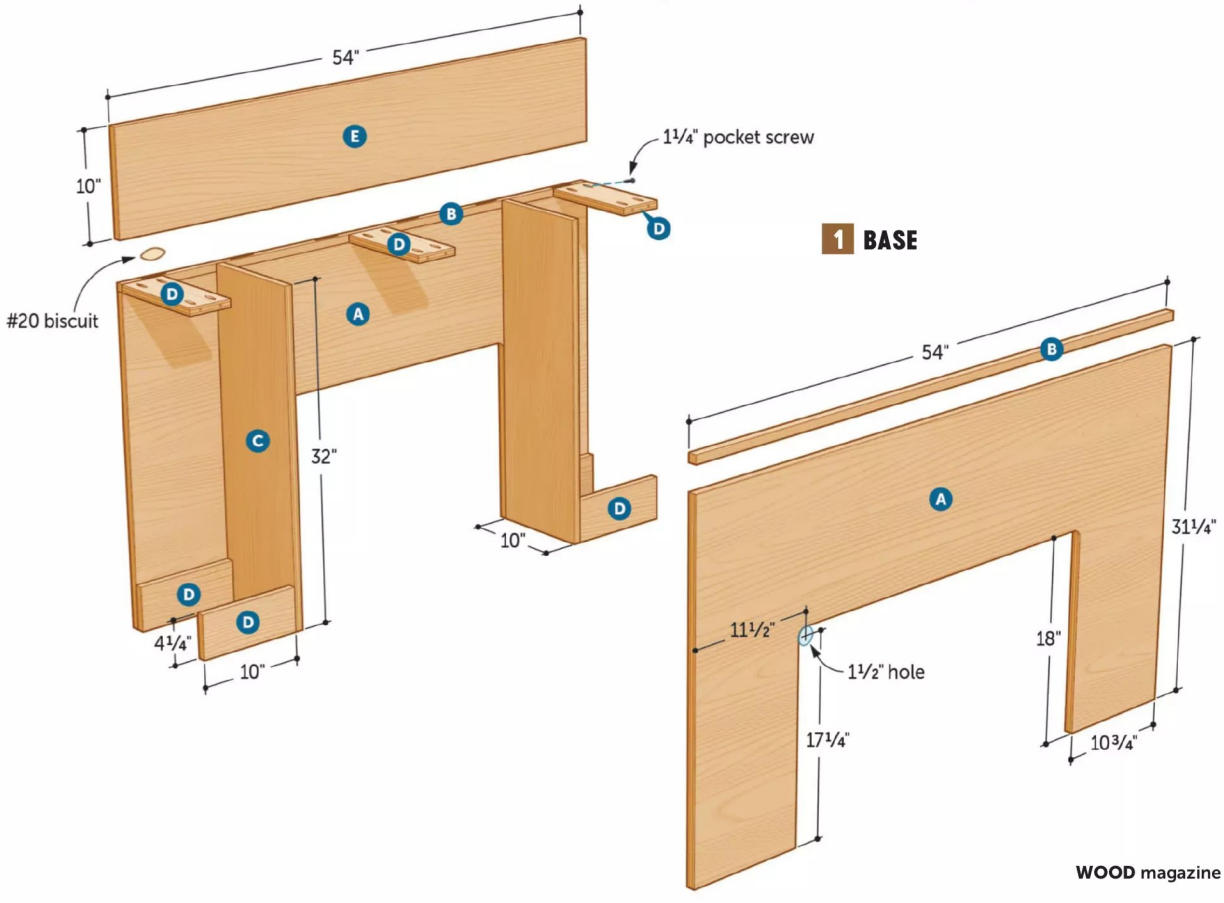


Apply glue to the ends of three cleats (D) and clamp them between the base edging (B), flush with the top of the edging. Drive pocket screws to secure the cleats.

3 Mill all of the edging (B, H, I, K, L) slightly overwidth and to finished thickness, cutting each piece 1/2" overlength. Set all aside except for the base edging (B). Cut it to finished length, then glue and clamp one piece to the top edge of each base panel (A) **[Photo B]**.

4 Build the jig shown in *Take the Edge Off* on *page 67*. Use it to trim the edging (B) flush with both faces of the base panels (A).

5 Cut the base dividers (C) to size **[Drawing 1]**. Glue and clamp the dividers flush with the edges of the opening in one base panel (A). After the glue dries, add the other base panel.



Align the panel extension (E) flush with the rear of the edging (B). Biscuits keep the pieces aligned while clamping. Check that the extension sits square to the cleats (D).

6 Cut the cleats (D) to size. Set four cleats aside and drill pocket holes in the remaining three. Screw the pocket-holed cleats in place **[Photo C]**.

7 Cut the base-panel extension (E) to size. Lay out and cut #20 biscuit slots in one edge of the extension and in one base edging (B). Glue and clamp the extension to the edging **[Photo D]**.

8 After the glue dries, flip the assembly over on your workbench with the extension hanging over the edge. Glue the four remaining cleats (D) in place **[Drawing 1]**.

SIZE THE HEADBOARD TO FIT YOUR MATTRESS

Resizing the headboard to fit a twin, queen-, or king-size mattress is easy. Simply adjust the lengths of parts A, B, E, J, L, M, and R as outlined below.

For a twin mattress, subtract 16" from these parts. For a queen mattress, add 6". For a king mattress, add 22" and install an additional base cleat (D) between the base edgings (B).

Then, change the placement of the upper case dividers (N) and length of the shelf (O).

For a twin mattress, use only one upper case divider centered in the case and eliminate the shelf.

For a queen-size mattress, cut the shelf 14¼" long and cut the dadoes for the dividers 22½" from each end of the upper case top and bottom (M).

Make the shelf for a king-size headboard 22¼" long and lay out the dadoes for the dividers 26½" from each end of the upper case top and bottom.

> **“THIS HEADBOARD DRESSES UP ADJUSTABLE AND FOLDING BED FRAMES, ADDING GREAT LOOKS TO UTILITARIAN PIECES.”**
>
> *-JOHN OLSON, DESIGN EDITOR*

FRAME OUT THE BASE ENDS

Long strips of edging join two plywood panels to frame the space on each end of the base.

1 Cut the end top and bottom panels (F, G) to size and the end edging (H, I) to length **[Drawing 2]**.

2 Glue an end short edging (H) to the lower end of each top panel (F) and the upper end of each bottom panel (G). Trim the edging flush.

3 After the glue dries, form a pair of end frames by gluing a top (F/H) and bottom (G/H) panel between each pair of end long edging (I), flush with the ends. Flush-trim the long edging as far as the router jig will reach, then plane between the two trimmed areas to smooth out the remaining length of the edging.

4 Glue and clamp each frame to an end of the base assembly **[Photo E]**. After the glue dries, trim the long edging flush with the base panels (A) if it protrudes.

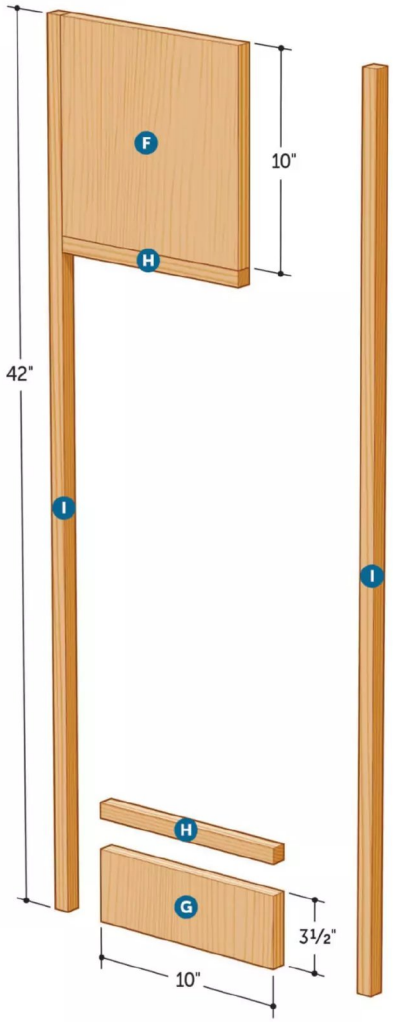
5 Cut the top panel (J) to size and the top edging (K, L) to length **[Exploded View]**. Glue the edging around the top panel and trim it flush.

6 Cut biscuit slots in the base-panel extension (E), end top panels (F), top short edging (K), and one top long edging (L) **[Exploded View]**. Glue the top panel assembly (J–L) in place.

7 Finish-sand the headboard assembly to 180 grit, taking care to avoid sanding through the plywood veneer. Ease the sharp corners of the edging.

With the base assembly upside down on the end of your bench, glue and clamp an end frame (F–I) in place. Allow the glue to set for about 30 minutes, then repeat on the opposite end.

2 END FRAME



Watch a video on gluing up flat panels.
woodmagazine.com/flatglueup

BUILD CONTRASTING CASES

The cases require 1/2"-thick maple panels 10 3/8" wide. Plane sufficient stock for the case parts (M–Q), then glue together blanks for the parts.

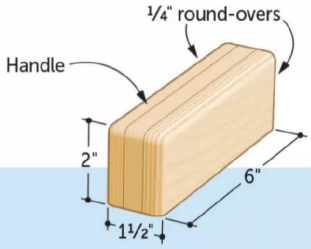
1 Double check the openings in your base, then cut case parts M, N, P, and Q to fit **[Drawings 3, 4]**. Cut the upper case shelf (O) 1/4" longer than listed **[Parts List]**. Lay out the dado locations on the upper case top and bottom (M), the upper dividers (N), and the lower case sides (P).

2 Install a dado set in your tablesaw to match the thickness of the maple panels. Rabbet the upper case top and bottom (M) and the lower case sides (P) **[Photo F]**.

3 Remove the auxiliary fence face, reposition the rip fence, and cut the dadoes in the same panels (M, P) and the upper case dividers (N) **[Drawings 3, 4]**.

4 Dry-fit each case and check its fit in the base assembly. Make any needed adjustments. Then cut the upper case shelf (O) to fit between the dividers (N).

Position an auxiliary fence face so the blade just brushes against it. Rabbet each end of the upper case top and bottom (M) and the lower case sides (P).



TAKE THE EDGE OFF

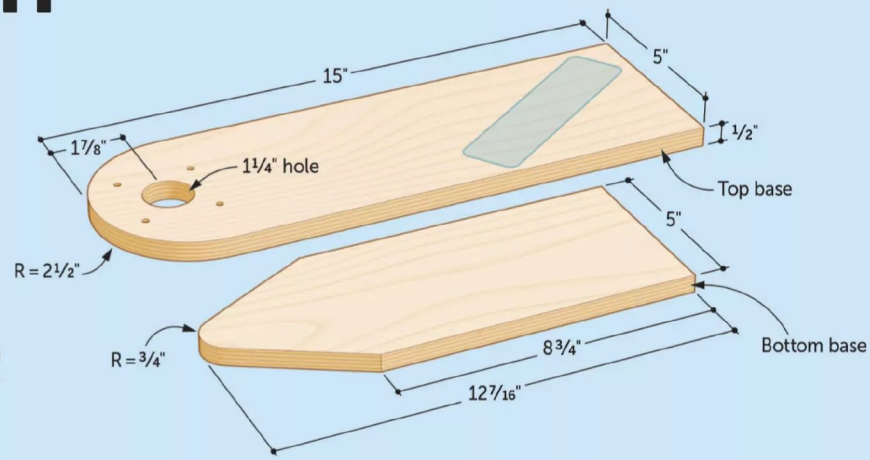
Trimming solid-wood edging flush with the face veneer of plywood requires precision to avoid cutting or sanding away the veneer. With careful setup, this jig trims edging so that all you need is a light finish-sanding to complete a panel. To keep the size and weight down, we built our jig to fit a trim router, *below right*. Adjust the width of the jig and location of the holes to match your router.

From 1/2" plywood, cut the top and bottom bases to size and shape **[Drawing]**. Use your router baseplate to locate and drill the mounting holes in the top base.

Glue the bases together with the ends flush, ensuring the tapered bottom base doesn't interfere with any of the mounting holes. Then add a scrapwood handle.

Mount a 1/2" or 3/4" straight bit in your router and secure the router to the jig.

To use the jig, place it on a flat surface and place a piece of printer paper below the bit. Adjust the bit height until it grazes the paper. Lock the bit in place. Make a test pass on a scrap of plywood. You should not see any swirl marks from the bit. Then trim the edging. Finish up with a light sanding.



When properly adjusted, the bit will trim the edging flush with the plywood without leaving marks in the veneer. To avoid gouging the veneer, do not apply downward pressure on the router.

5 Glue the upper case shelf (O) between the upper case dividers (N), checking for square. Glue this assembly between the upper case top and bottom (M), then add the upper case ends (N).

6 Assemble each lower case by gluing the top, bottom, and shelves (Q) between the sides (P).

7 Cut case backs (R, S) to fit the upper and lower cases. Set them aside.

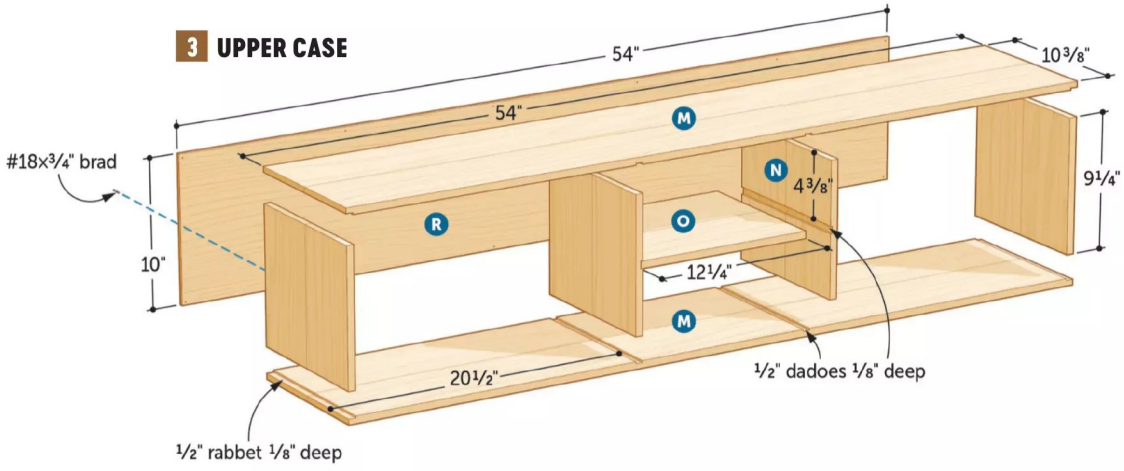
8 Finish-sand the cases and apply a finish to the cases and base. We sprayed on three coats of water-based lacquer. (Avoid oil-based finishes or shellac as they will yellow the maple.)

9 After the finish dries, brad-nail the backs to the cases and slide them into the base. Move the headboard into place and you're probably ready for a well-deserved nap.

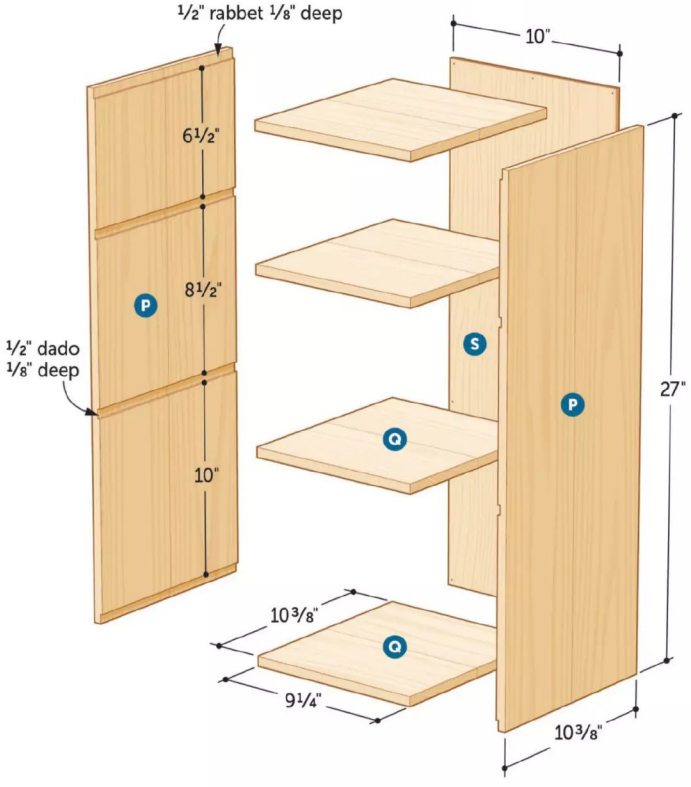
TIP!

If you need to feed electric cords through the cases, drill 1½" holes and install plastic grommets [Source] to dress up the edges of the holes.

3 UPPER CASE



4 LOWER CASE



PARTS LIST

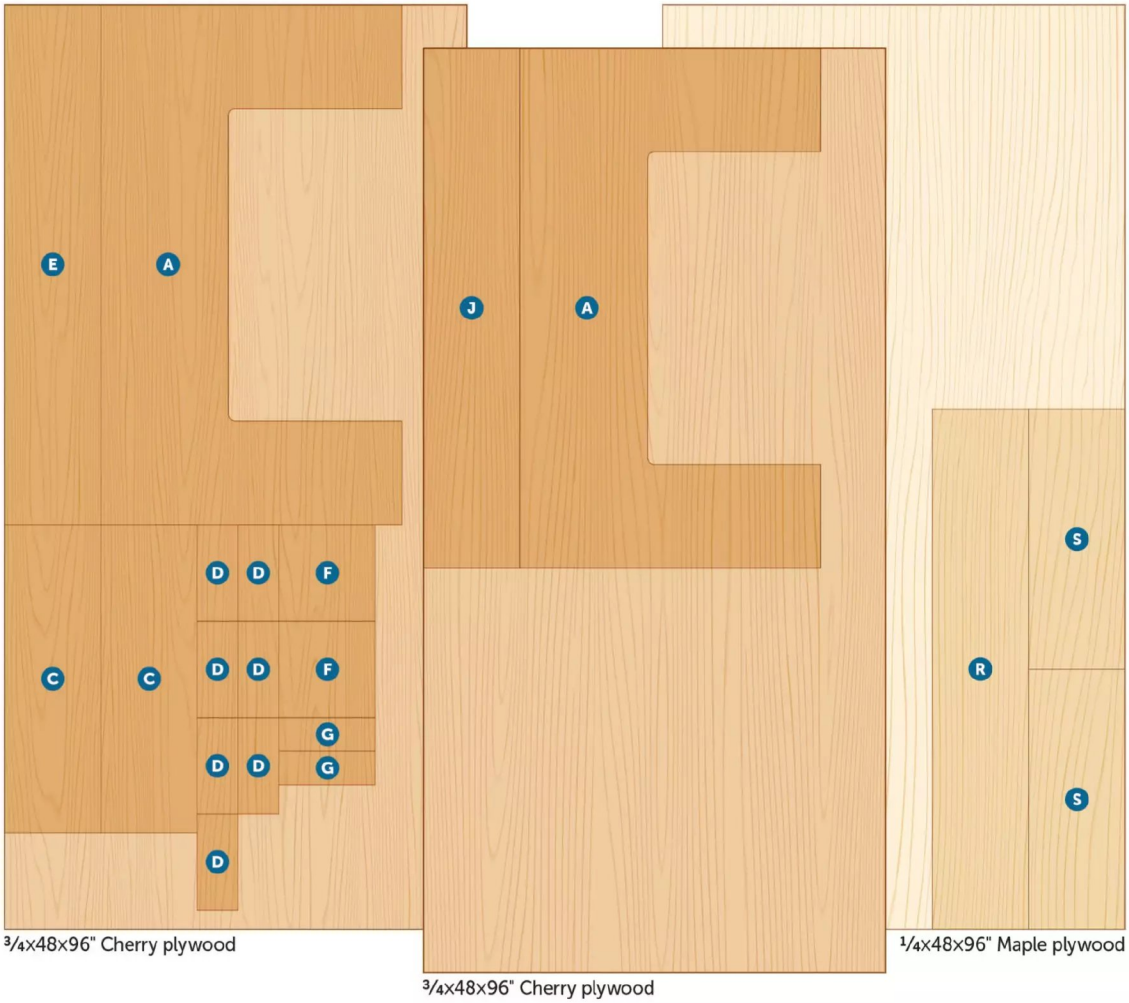
PART		FINISHED SIZE T	W	L	Matl.	Qty.
A	BASE PANELS	¾"	31¼"	54"	CP	2
B*	BASE EDGING	¾"	¾"	54"	C	2
C	BASE DIVIDERS	¾"	10"	32"	CP	2
D	BASE CLEATS	¾"	4¼"	10"	CP	7
E	BASE-PANEL EXTENSION	¾"	10"	54"	CP	1
F	END TOP PANELS	¾"	10"	10"	CP	2
G	END BOTTOM PANELS	¾"	10"	3½"	CP	2
H*	END SHORT EDGING	¾"	¾"	10"	C	4
I*	END LONG EDGING	¾"	¾"	42"	C	4
J	TOP PANEL	¾"	10"	54"	CP	1
K*	TOP SHORT EDGING	¾"	¾"	10"	C	2
L*	TOP LONG EDGING	¾"	¾"	55½"	C	2
M	UPPER CASE TOP/BOTTOM	½"	10⅜"	54"	M	2
N	UPPER CASE ENDS/DIVIDER	½"	10⅜"	9¼"	M	4
O*	UPPER CASE SHELF	½"	10⅜"	12¼"	M	1
P	LOWER CASE SIDES	½"	10⅜"	27"	M	4
Q	LOWER CASE SHELVES/TOP/BOTTOM	½"	10⅜"	9¼"	M	8
R	UPPER CASE BACK	¼"	10"	54"	MP	1
S	LOWER CASE BACKS	¼"	10"	27"	MP	2

*Parts initially cut oversize. See the instructions.

MATERIALS KEY: CP–cherry plywood, C–cherry, M–maple, MP–maple plywood.
SUPPLIES: #20 biscuits, 1¼" coarse-thread pocket screws, 18-ga.x¾" brad nails.
BLADE AND BITS: Dado blade, ½" straight router bit, 1½" drill bit.
SOURCE: 1½" grommets (almond) no. BA-1037AL, $3 each, mycablemart.com.
PROJECT COST: It cost us about $685 to build this project. Your cost will vary by region and source.

CUTTING DIAGRAM

We purchased 4 board feet of 4/4 cherry and 32 board feet of 4/4 maple. Before cutting parts to size, we planed them to the thicknesses shown in these example boards.



¾x48x96" Cherry plywood

¾x48x96" Cherry plywood

¼x48x96" Maple plywood

¾x5½x96" Cherry

½x5½x96" Maple (2 needed)

½x5½x96" Maple (2 needed)

½x5½x96" Maple (2 needed)

½x5½x96" Maple (2 needed)

SHOP-TESTED

NEW JIG FROM KREG SIMPLIFIES CABINET HARDWARE INSTALLS

Tester: Dave Stone

I always rely on a jig when installing knobs and pulls to ensure consistent positioning and alignment. Unlike my shop-made wooden versions, Kreg's aluminum Cabinet Hardware Jig Pro is equipped with three steel 3/16" drill guides: one that's centered, and two that adjust to fit pull mounting-hole spacing from 2" to 12" on center. A fence adjusts to position the drill guides up to 8" from a drawer or door edge. Small knurled knobs lock the drill guides and fence in place. An adjustable stop further simplifies positioning the jig, but adjusts only 6" from the jig's center. For taller drawers, you'll need to draw a centerline on your workpiece and position the jig manually.

I found the jig simple to adjust and align, and the knobs securely hold the drill guides in place. At this price, though, I'd like to see the required 3/16" drill bit included. Instead, you'll have to supply your own.

Kreg, *kregtool.com*
Cabinet Hardware Jig Pro no. KHI-XLPULL, $50

SHOP-TESTED

DRILL, BABY, DRILL! MILESCRAFT DRILLMATEPRO

Tester: Dave Campbell

If cost or space constraints prevent you from owning a drill press, take a look at Milescraft's DrillMatePro. Using your own handheld drill, DrillMatePro offers 7" of travel (less the extension of the drill bit), and its stop sets hole-depth at any point along the way. For boring perfectly perpendicular holes, it rivals a drill press. And it performs many chores a drill press can't, such as boring holes in the middle of a panel, as you might do when drilling a cable access hole in a desktop or entertainment center.

Where this drill guide really shines is aligning centered holes: Alignment pins install above or below the base to self-center on the edge or face of a workpiece up to 4¼" wide; a V-groove on top of the base aligns dowels for drilling centered holes in the circumference; and a removable alignment disc makes it super easy and accurate to hit a marked hole in any flat face. Align the crosshairs on your mark, then pop out the disc to drill a hole up to 3¼" in diameter.

The DrillMatePro has a large, open base for stability and to accommodate large bits. The base also pivots, allowing you to drill angled holes.

Milescraft, *milescraft.com*
DrillMatePro no. 1348, $125

NEW & UNTESTED

IF I HAD A NICKEL ...

Harvey Industries strives to banish rust from cast iron tools with its new "Stain-less" nickel plating available on the company's tablesaws, bandsaws, and router-table top. Autocatalytic plating bonds the nickel chemically with the cast iron to create a water-repelling surface that won't flake off.

While keeping tabletops free from rust is important, Harvey understands that it also forms on cast-iron parts inside the tools. So, the company nickel-plates internal structures, such as tablesaw trunnions, and the wheels and tilting mechanisms on its bandsaws. Stain-less nickel plating will be standard on Harvey tools going forward, and the company offers a replacement plated top for owners of its non-plated tablesaws who wish to upgrade.

Harvey Industries, *harveywoodworking.com*
Alpha Pro Stain-less Cabinet Saw no. HW110LC-36Pro (shown), $3,400

PHOTOGRAPHERS: BRIE GOLDMAN, CRAIG RUEGSEGGER, MARK LANE, RANDY MAXEY, JIM HEAVEY

SHOP-TESTED

SMALL ROUTER TABLE OFFERS BIG FEATURES

Tester: Craig Ruegsegger

The Infinity PRTS-200 router table is designed to work with a compact router, and can accommodate cordless or corded models, with a grommeted port for the cord to pass through.

Bolting together the powder-coated metal base takes some time, but once assembled, you'll find many useful features. For starters, the enclosed base reduces router noise. More importantly, the base contains dust well thanks to dust ports in the rear that provide connection for a 2½" shop vacuum hose or a 4" hose using an optional connector. A provided 2½" flex hose connects the base to the fence, extending dust collection to the bit. I found a shop vacuum more than sufficient for extracting dust. A wide door on the front provides easy router access, though I'd add an external switched outlet to eliminate having to reach inside to start and stop the router.

The "Microdot" coating on the 15×23¼" tabletop provides a low-friction surface that workpieces glide across. A T-track near the front edge allows attaching a featherboard or other accessories, while the fence moves in two other T-tracks that provide up to 4" from the fence to the center of a bit. When sliding the fence back, the fence hold-downs can drop out of the open end of the T-tracks. Due to the stepped interior profile of the T-track, I found it frustrating trying to slide the bolt heads back in.

The 6"-diameter round clear acrylic baseplate is drilled to accept most compact routers, and it allows rotating the router below the table to best position the controls. Its 1³⁄₁₆" opening accepts a Porter-Cable-style guide bushing, but limits the diameter of bits you can use, as does the ¾"-deep cutout in the base of the fixed-face fence. I nicked the aluminum fence base with a ¼" cove bit by aligning the bit bearing just behind the fence face. A ⅜" round-over bit wouldn't fit through the baseplate opening, but that size bit may be asking a lot of a compact router anyway.

At only 28 pounds with a corded router mounted, the table is easily lifted onto and off of a bench. I was impressed that the four rubber feet kept the table anchored on my benchtop, even when routing a 4'-long board.

Infinity Cutting Tools, *infinitytools.com*
Portable Router Table System no. PRTS-200, $350

SHOP-TESTED

COMPACT COLT ROUTER GOES CORDLESS

Tester: Jim Heavey

Bosch's popular Colt compact router is now available in a cordless model that comes in an impressively equipped kit. It includes a router motor, fixed and plunge bases, a 4-Ah, 18-volt battery and charger, an edge guide, and dust hoods in a well-organized case.

The router has a ¼" collet and handles bits up to 1½" in diameter. A brushless motor offers variable speeds from 10,000 to 30,000 rpm, along with soft-start and electronic control to maintain set speed under load.

I tested this router by running it with both bases in poplar. The bit sight lines were very good, especially with the onboard LED light. I found the dust collection particularly impressive. Routing edge profiles and surface grooves left very little dust or chip debris thanks to well-designed dust hoods. The chip shield and finger indents made using the fixed base configuration easy despite the small base diameter. Depth adjustments were easy and precise when using either base, but the variable speed dial was awkward to access on the plunge base.

Compact design, ample power, and impressive performance without excess weight will make this a go-to tool for many routing tasks in my shop.

Bosch Tools, *boschtools.com*
Colt Palm Router Kit no. GKF18V-25PL14, $400

SHOP-TESTED

ROUTER JIG QUICKLY FLATTENS SMALL SLABS

Tester: Mark Lane

Rockler's benchtop board-flattening jig provides a great solution for smoothing out rough-sawn lumber, cutting boards and small slabs. The fixed base rails accept a sliding carriage that has hole patterns for common midsize routers, and allows X- and Y-axis router travel over workpieces up to 18×28" and 1¾" thick (or thicker by placing spacers under the rails).

In my testing, each full face-surfacing run on a 17×21" maple oval took less than 4 minutes, removing up to ⅛" thickness at a time. A 1¼" dish-carving bit handled end grain without tear-out; a 1½" slab-flattening bit is also appropriate. The jig left a smooth surface despite its striated appearance, which sanded out. You'll thank yourself for adding a dust-collection port to your router, and I recommend coating the rails with a dry lubricant, such as Bostik GlideCote, to reduce carriage friction.

Rockler, *rockler.com*
Benchtop Board Flattening Jig no. 60808, $200

NEW & UNTESTED

SPEEDY DUAL-VOLTAGE CHARGER CUTS CLUTTER

A new Ryobi dual-port charger offers consolidated charging for owners of tools on the company's 18- and 40-volt platforms. While it can't charge both batteries simultaneously, it does reduce charging time. One port accepts Ryobi's One+ 18-volt batteries, refreshing them a reported six times faster than the company's basic charger. The other refreshes 40-volt batteries four times faster.

Ryobi, *ryobitools.com*
18/40V Dual Platform Charger no. PCG007, $100

SHOP-TESTED

LEGACY PLANE SPORTS A MODERN LOOK

Tester: Randy Maxey

With its CNC-milled aluminum sides and knob, Grizzly's new smoothing plane at first glance belies the "legacy" in its name. Closer inspection, though, reveals a cast-iron sole and a machined frog, along with a classic iron, chip breaker, and lever-cap setup that mimics traditional Stanley planes. This plane also comes with depth-stop outriggers that mount to the sides for planing narrow workpieces to consistent thicknesses.

The 2"-wide, O1 steel iron required a lot of flattening before sharpening the 45° bevel, and I had to fine-tune the chip breaker. After that, the plane worked well, with enough weight to power through the stroke and make wispy shavings.

Grizzly Industrial, *grizzly.com*
10" Legacy No. 4 Smoothing Plane no. T34066, $225

How to Be Cut Off From Civilization

When it's you against nature, there's only one tool you need: the stainless steel River Canyon Bowie Knife—now ***ONLY $49!***

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This knife boasts a full tang blade, meaning the blade doesn't stop at the handle, it runs the full length of the knife. According to Gear Patrol, a full tang blade is key, saying *"A full tang lends structural strength to the knife, allowing for better leverage ...think one long steel beam versus two."*

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— D., Houston, Texas

Not shown actual size.

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A GLIMPSE INSIDE THE SEPTEMBER ISSUE (ON SALE JULY 18)

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Read about the four blades we always keep on hand in the *WOOD*® shop to ensure we can tackle every jigsaw task.

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What do you get when celebrity pastry chef Duff Goldman steps out of the kitchen and into the workshop? A bundle of bouncing bunnies that you can build.

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THE LITTLE ENGINE THAT'S WOOD

This short-run rail engine is just as good at shunting cars in your Timber Line Express switching yard as it is at hauling logs to the lumber mill.

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