

ISSUE 312 NOVEMBER 2026

DUEL
OF THE
LOOSE-TENON
TOOLS
p.72

CORNER CURIO

CLEVER DESIGN MEETS
CONCEALED JOINERY IN
THIS DASHING DISPLAY
p.28

The World's
MOST
TRUSTED
Woodworking
Resource

GREAT PLANS

- Transforming Coffee Table p.38
- Scrapwood Stash Box p.54
- Timber Line Train Caboose p.58

**SHOP-MADE
ROUTER SLED
FLATTENS
OVERSIZE
SLABS**
p.34

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Handle big cuts in your home shop

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- 40" Cast-iron table
- Cast-iron handwheel and trunnions
- Deluxe 2-position aluminum rip fence
- Footprint: 19½" x 20½"
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FREIGHT

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Resaw with perfect control

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- 12½" Resaw capacity
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- Precision-ground cast-iron table
- Footprint: 20½" x 12½"
- Shipping weight: ≈ 153 lbs.



MADE IN AN ISO 9001 FACTORY

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FREIGHT

TABLESIDE TRADITION

WOOD IS A SOLID FOUNDATION ON WHICH TO BUILD MEMORIES.

If you were to peek through the windows of the Peters household on nearly any Friday evening, you'd see my son standing at the stove making popcorn, my wife cutting up apples and cheese, and me running around gathering bowls, carrying chips to the living room coffee table, and powering up the television for a movie. We've oh-so-creatively dubbed our exciting Friday evenings as "Popcorn, Apple, Cheese Night."

Snack night, movie night, fend-for-yourself night—whatever you call it in your family—in ours, it has become enshrined as a precious ritual. My wife inherited this tradition from her family, and we've continued it for the first 25 years of our marriage. After an exhausting week going our separate ways to work, school, and chores, we've protected this time to come back together as a family and unwind our way into the weekend with low-effort meal prep and lowbrow entertainment.

My son has participated since he was old enough to digest popcorn. And he's dutifully helped make that popcorn since he was tall enough to stand at the stove. The signs are all there that the tradition has embedded in his psyche just as strongly as it is in ours: He joined a movie club his first semester of college. He's taking a film class as an elective this semester. He even works at a movie theater, part-time, where he—you guessed it—makes popcorn.

And while the movies that we watch with him have changed quite a bit over the years—from every Pixar cartoon ever released, back then, to critically acclaimed cinematic classics that he insists on, nowadays—there are two central items that have stayed the same from long before his birth: the now-beat-up old stovetop popcorn popper we received as a shiny wedding gift and the oversized, solid-wood coffee table that we spread the snacks out on.

Now that he's on the precipice of launching his own new traditions, I think I'll send him along with a couple of nudging gifts to keep this old one going: a popcorn popper of his own and a coffee table to gather his friends and family around. The one on page 38 would be perfectly suited for another generation or two of Popcorn, Apple, Cheese Nights. Maybe we'll build it together.

Do you have a project you've built that's steeped in memories? If so, let me know about it—with pictures if you have them. If not, get out to the shop and build one. We'll help. 🍿

Lucas

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WOOD

Issue No. 312 | November 2026

PLANS

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Floating shelves folded into an angle use concealed joinery to convert an unused corner into a captivating curio.
- 36 SLICK SLAB FLATTENER**
A quick and easy rail-and-sled combo speeds you toward flattening oversized lumber.
- 38 CONVERTIBLE COFFEE TABLE**
Living room centerpiece? Dining room server? Office desk? This lift-top table does it all with bonus storage aplenty.
- 54 STAMP AND SUPPLIES BOX**
Build this scrapwood desk accessory for less than the cost of a book of stamps.
- 58 TIMBER LINE CABOOSE**
All good trains must come to an end—in this case, with a caboose that reveals playful detail under a lift-off roof.



ON THE COVER

TOOL TEST: TABLESAWS! WE PICK A WINNER FROM SIX STEP-UP MODELS...

DUEL
WIDE-TOOTH
TOOTH



SHOP-MADE
ROUTER-SLED
FLATTENS
OVERSIZED
SLABS

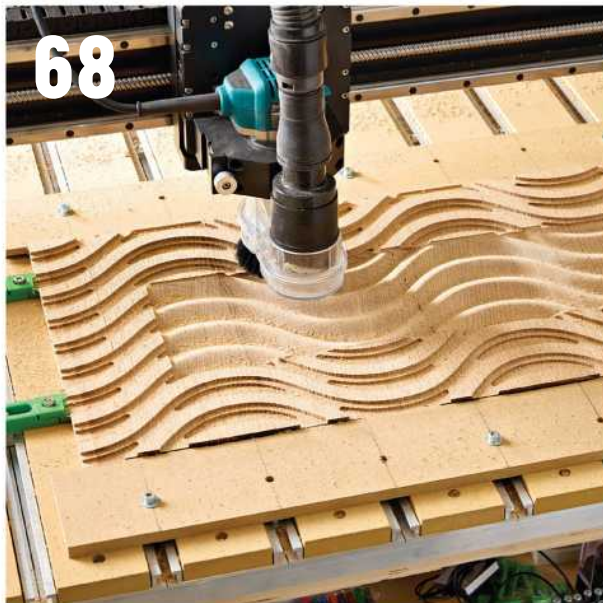
GREAT PLANS
Transforming Coffee Table
Unconquered Bookshelf
Timber Line Train Caboose

28

Using only two parts and straightforward joinery, this eye-catching curio dresses up an otherwise awkward space with clever floating shelves, making this project right around your corner.

TOOLS & TECHNIQUES

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Choose one of these three methods to keep edge joints aligned during tricky glue-ups.
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Flatten boards of any width armed only with your router, sawhorses, and scrapwood.
- 41 UPLIFTING HARDWARE**
Piston-powered mechanisms help you lift a tableful without the top-popping install.
- 46 SHOP TEST: TABLESAWS**
We pushed a half-dozen midrange saws to their limits. See which met the challenge.
- 68 CNC-CARVED TAMBOUR**
Add a dynamic texture to your next tambour-door project for an animated appearance.
- 72 TOOLS & MATERIALS**
Cordless loose-tenon competitors, a space-saving dust collector, and more



DEPARTMENTS

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A table serves up tradition.

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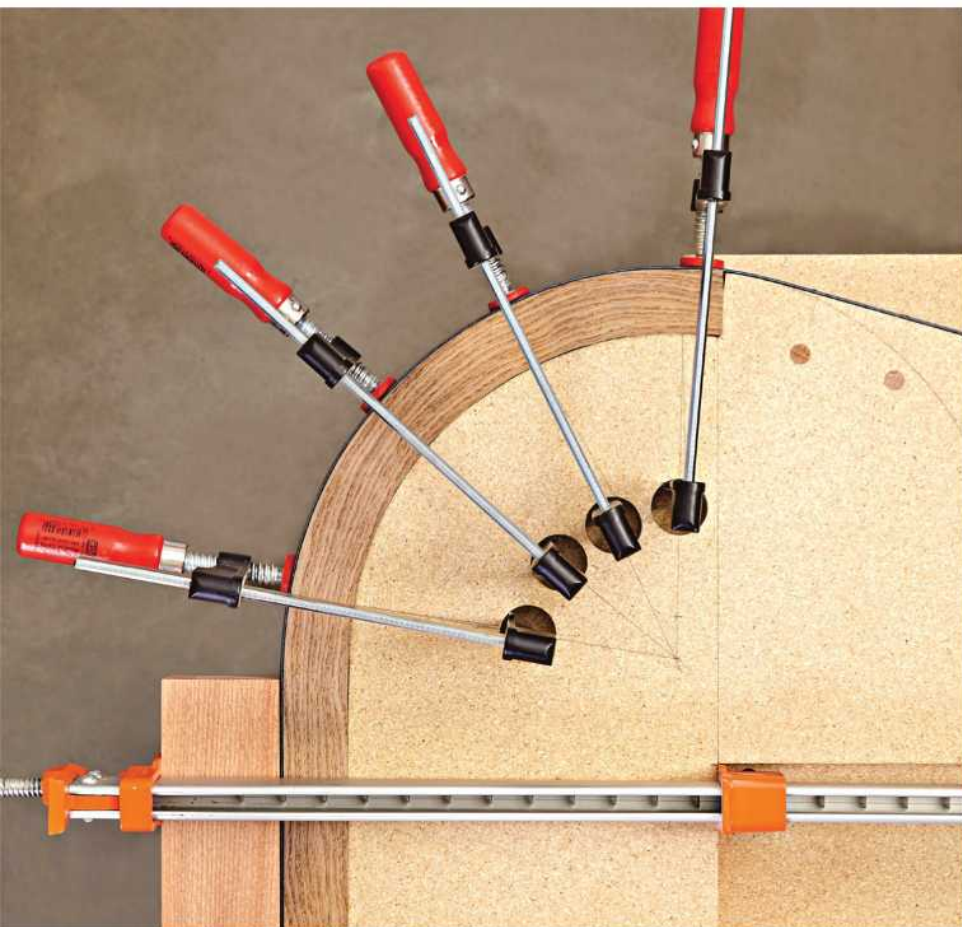
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WE KNEW YOU'D COME A-ROUND

Much of woodworking is straight lines and angles,
from obtuse to right to acute.
But don't get bent out of shape when a project has curves,
these tips render most worries moot.



Learn four ways to bend wood like a yoga instructor.

• **This method is hot and steamy...**
woodmagazine.com/hotyoga

• **...and this method is cool.**
(Well, room temperature.)
woodmagazine.com/coldbend

• **Bendy plywood? Yep, it's a thing.**
woodmagazine.com/pliableply

• **A bunch of tablesaw cuts yield a flexible panel.**
woodmagazine.com/kerfingfit

We've lined up straightforward advice for laying out curves.

• **If you skipped geometry class, start with a refresher on the magic of circles.**
woodmagazine.com/thisisacircle

• **Now draw a simple arc and build from there.**
woodmagazine.com/arctriumph



Let's circle back and round up ways to make round things.

• **Create dowels from scrap stock.**
woodmagazine.com/roundfromfound

• **Cut circles on the tablesaw? Are you crazy?**
woodmagazine.com/notcrazy

• **Small circular gauges you create help you then turn a perfect sphere.**
woodmagazine.com/sphere

FREE PLANS

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Hang a hammock wherever you like.
woodmagazine.com/hammockstand



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woodmagazine.com/nolathe



Light up a table.
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F1 FUSION TABLESAW



DC:15 DUST COLLECTOR



V:10 BANDSAW



LX:III ROUTER LIFT

IT'S ALL YOUR FAULT...

In issue 12 (August 1986), the article on making an intarsia parrot magnet by Karen and August Caryl caught my attention. Well, I made that parrot...then an elephant ... and then it kind of got out of hand (in a good way). I now make and sell more than 30 intarsia magnets of my own design, a few of which are shown here. In the process, I've learned the working properties of more than 100 species of wood and veneer. And I even traveled to Sorrento, Italy, to learn from three intarsia masters. Thank you to you and your staff for starting me on a wonderful path that changed my life.

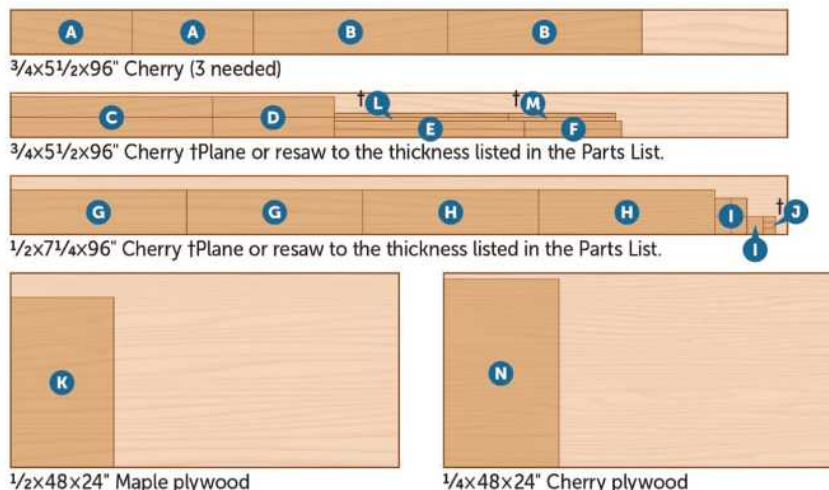
Alan Rich

Chicago, Illinois

Thanks for sending samples of your magnets, Alan. Everyone who sees them is impressed with the craftsmanship and wood choices. We're honored that *WOOD*® inspired you and pleased to see how you made the idea your own.

Lucas Peters

Editor-in-Chief



IN DEFENSE OF CUTTING DIAGRAM

In issue 309 (May 2026), Mark Harvis stated his appreciation for the cutting diagrams we include with our project plans. We asked you to email your thoughts—do you find cutting diagrams useful or a waste of space? The readers have spoken and it looks like cutting diagrams are here to stay.

Please keep including cutting diagrams. I find them extremely useful, even though they depict idealized boards.

Bob Finn

via email

Thank you for including the cutting diagrams! They help me interpret the parts list and plan how I might cut the material. I love your magazine not only for the content but also because of how you present the details of a project.

Carol Masters

via email

When considering a plan, I always depend on and expect a cutting diagram with it. I find them to be pretty accurate and very useful. Please continue to include them.

Dan Teich

via email

I find the cutting diagrams very helpful for understanding the plans. When I design my own projects, I always generate a cutting diagram.

Larry Banks

Woburn, Massachusetts



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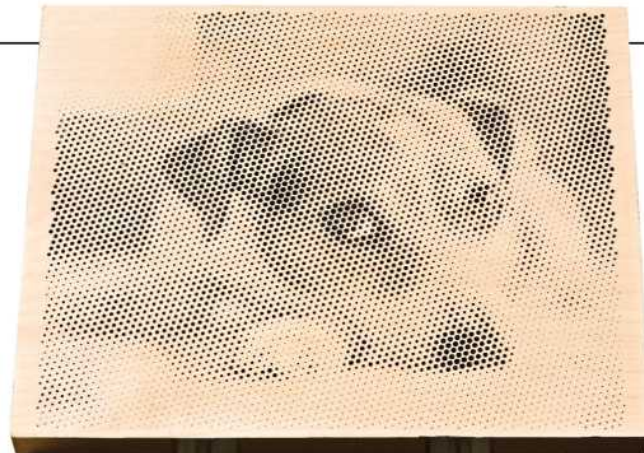
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THIS CNC COMMUNICATION HAS MERIT

We are scouts in the San Antonio area and we are working on our communication merit badge. We have several issues of your magazine at home and we enjoyed reading "CNC Halftone Pop Art" in issue 307 (December 2025/January 2026). Our dad has a CNC router and we plan to try this dot technique of reproducing photos in the near future.

Isaac and Jehmon

via email



I'VE MADE MY BED...

I just completed the "Casual Contemporary Sleigh Bed" from Issue 135 (September 2001). I built it according to the plans with two wood species, but reversed them from the original design. Mine has cherry frames with stained maple panels.

James Tipton

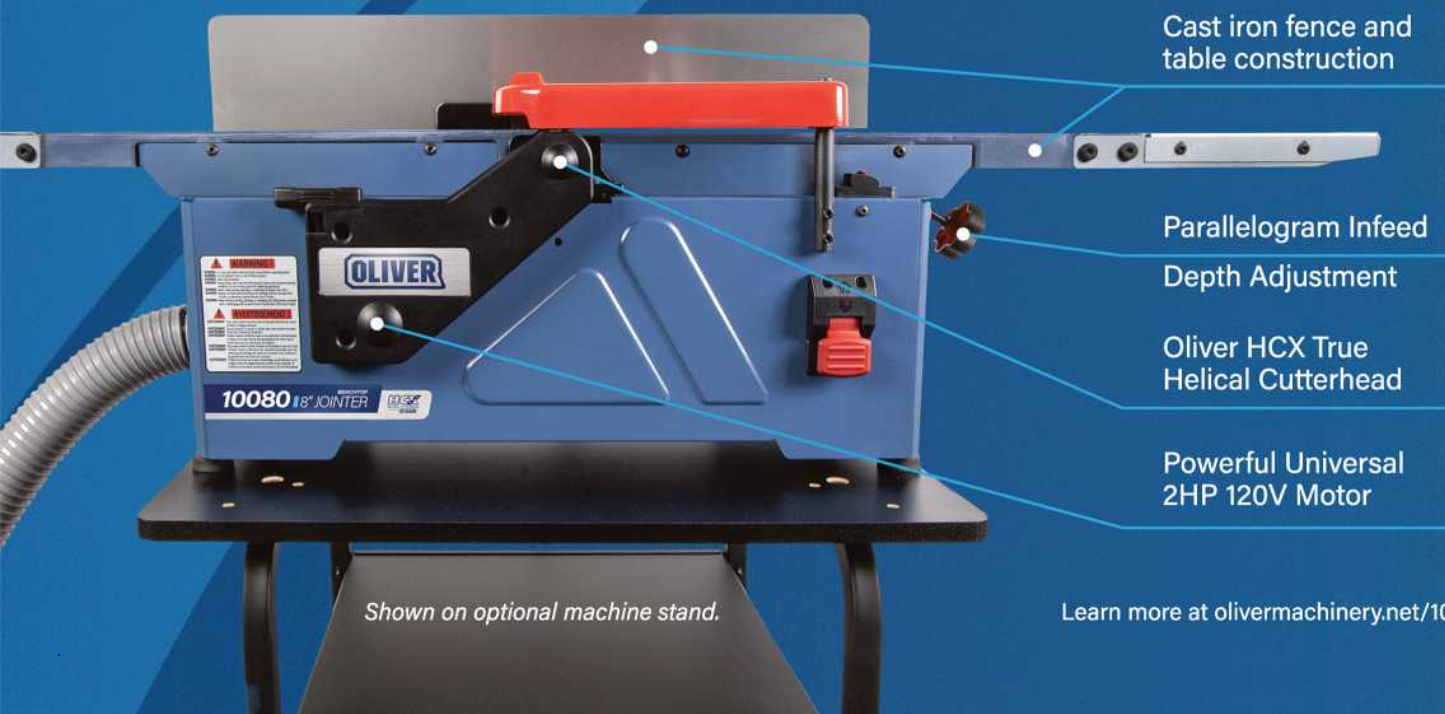
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OCT. 10

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OCT. 12

McFeely's
Washer-head
Screw Kit,
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OCT. 13

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Ionic Drive Wet/Dry
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OCT. 14

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OCT. 15

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• **RICK GRAVES** of Owensboro, Kentucky, built this pint-sized bike for his great-granddaughters. They call it their "Hardly-Davidson." Rick used a variety of woods including walnut, hickory, red cedar, oak, poplar, and hemlock. An olivewood gas cap tops off the pine gas tank.



• **STEPHEN STOLL** of Wenatchee, Washington, made these small trucks for his grandsons out of scrapwood. Each measures 3" long and 1½" tall. Stephen notes that the toys are small enough to turn into heirloom Christmas tree ornaments when their playing days are done.



• To help his young granddaughter join in activities while testing her independence, **DANIEL LENDER** of Chesterfield, Missouri, built a walnut step stool. She likes elephants, so Daniel personalized the stool with maple inlays.



• Using spalted maple and ebony, **BILL MCNEIL** of Bandon, Oregon, made this coping saw. He cut slots in stainless steel machine screws to receive the blade, then added wood knobs for tensioning. The result is a saw that is surprisingly easy and effective to use.



• Inspired by Greene & Greene styling, **GERALD SMITH** of Mannford, Oklahoma, built this hexagonal Christmas tree stand. It features walnut plugs, as well as leg splines from recycled antique yellow pine. A removable top reveals two levels of storage. Outside of the holiday season, guests use the stand for additional seating.



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● Making this box as a gift for a family member, **JOHN SCHNEIDER** of Nottingham, Maryland, used hickory, walnut, white oak, and maple. He chose leopardwood for the pivoting lid.



For his Masonic Lodge, Port Washington #202 in Gnadenhutten, Ohio, **ERIC HOVAN** of Dover, Ohio, made this "blazing star" and altar. The star measures 12' across and is crafted from red oak. He made the altar from cherry with red oak raised panels and walnut accents. The altar also features a 1¾"-thick granite inlay on the top. The three 41"-tall tapers consist of 18 separate pieces of oak, cherry, and walnut. The total project took 234 hours to complete, from the initial cuts to the final installation.



● About 20 years ago, **GENE KONIAK** of Benld, Illinois, built this majestic oak wall unit. It features a fireplace insert with room for a small TV. Gene hand-crafted all of the molding, including the keystone accent that sits front and center.



● **JOHN ADAMS** of Knoxville, Tennessee, built this keepsake box for his wife's birthday. The octagon features continuous-grain cherry with wenge accents. John used the "Small-Parts Tablesaw Jig" featured in issue 291 (October 2023) to cut the wenge pieces around the base. He used tung oil as a finish with a topcoat of spray lacquer hand-rubbed to a semi-gloss luster.

The Answer to the Perfect Gift? It's in the Stars

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LOFTY SHOP, VINTAGE VIBE

With an eclectic collection of acquired tools and a uniquely finished interior in a newly constructed building, this shop presents a timeworn vibe when you step inside.

WRITER: RANDY MAXEY

Walling off a finishing room and adding a ceiling over the assembly area created loft space. Stairs make access easy.



Retired from the horticulture business, Paul worked with his wife, Marion Laster, to finish out the workshop. You can often find them working on projects side-by-side.



SHOW US YOUR SHOP

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

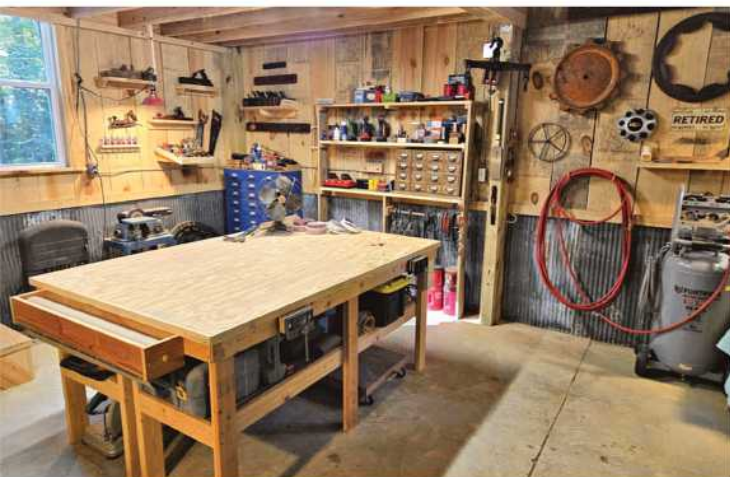
For a quarter of a century, Paul Chappell's workshop resided in a storage area under his western-Georgia home. That 16×20' room with a 6' ceiling proved challenging at best, especially when working with sheet goods. When he finally had the opportunity to design a larger workspace, he opted for a pole barn. The open floor plan of a 30×50' building with 15' ceilings offered almost twelve times the cubic feet of work area.

Paul hired a contractor to construct the building shell, including the metal roof and siding. Paul insulated between the posts and purlins with 1/2" rigid foam. He didn't add heating or cooling.

Instead, two exhaust fans in the gable draw out hot air in the summer. A 48" mobile floor fan creates a nice breeze. In warm weather, he works during the cooler morning hours. After that, he says, "It just gets too hot for an old, retired guy." In the winter, Paul relies on an 80,000-BTU kerosene heater. He hopes someday to spray insulating foam under the roof to make the shop more comfortable year-round.

Before finishing the interior, Paul hired an electrician to install a 100-amp subpanel. Paul eventually added a half dozen 120-volt, 20-amp circuits and two 220-volt circuits.

PHOTOGRAPHER: PAUL CHAPPELL; ILLUSTRATOR: ROXANNE LEMOINE

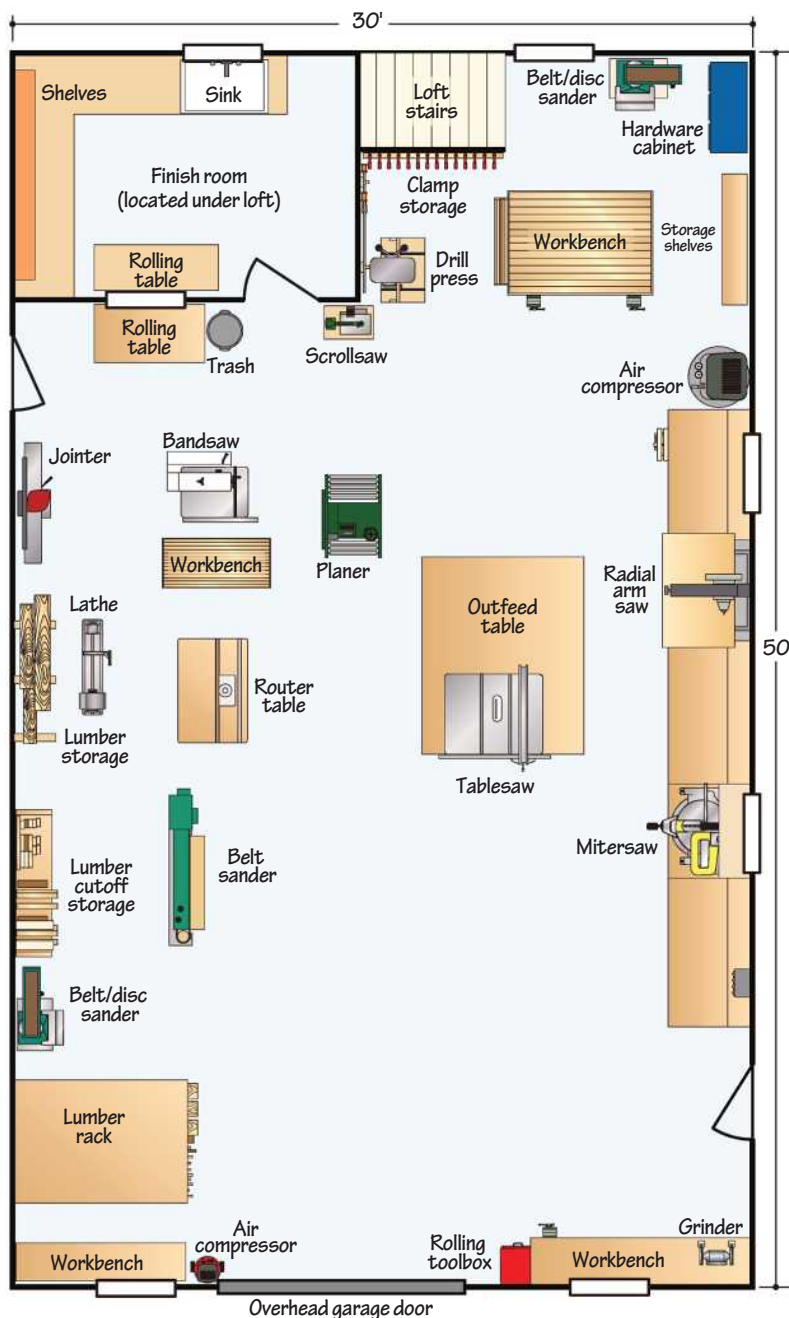


Construction-grade lumber and plywood make up all the benches in the shop. The materials were inexpensive, went together quickly, and created reliably flat worksurfaces.

To create a rustic look, Paul purchased rough-sawn $\frac{7}{8}$ "-thick 10'- to 12'-long pine boards from a local sawmill to line the walls. Rather than frame between the posts to fasten the boards horizontally, he nailed the boards vertically to the purlins, flush with the top eave. The boards didn't reach to the floor, so he fastened a pressure-treated 2x4 nailing strip to the floor to attach corrugated tin wainscoting he got free from a friend. A 1x4 trim strip finishes off the top edge. The wood and tin combination created Paul's desired aesthetic.



Paul still uses his radial-arm saw for wide crosscuts and dados in certain applications. When it comes to tools, he prefers the durability and functionality many older tools offer compared to newer ones.



Over a 24'-long workbench along one wall, Paul framed in an awning from old deck boards and added a tin roof. The awning complements the rustic shop walls and helps direct task lighting onto the bench below.

The workbench serves as a cutting station for long boards. A vintage Craftsman radial-arm saw, bought at an estate sale, sits near one end. A mitersaw near the other end shares a long fence that runs the length of the bench to easily accommodate long boards.



A side benefit to using rough-sawn lumber to line the walls is the rock-solid anchoring surface it provides for mounting custom storage racks.



Paul surrounded his tablesaw with additional workpiece support, particularly for cutting sheet goods. The space underneath provides storage for jigs and accessories.

One corner of the building features a finishing room. It's the only portion of the building that is fully insulated. A space heater keeps the room toasty in cold months. This room includes a sink that was originally in the house where Paul grew up. "I have an old black-and-white photo of me getting a bath in that sink when I was about two years old," he remembers.

Above the finishing room and across the end of the building, Paul built a storage loft, accessible via stairs as well as by a gate in the loft's safety rail. He uses the loft to store extra lumber but admits, "It's a great place for the grand-kids to explore when they come to visit."

Almost all of the task lighting fixtures are inexpensive portable clamp lights with reflectors, purchased for around \$10 each at a home center. Paul didn't care for the look of the metallic reflectors, so he painted the outside of each one with red paint and installed a 60-watt-equivalent LED bulb.

When it comes to outfitting his shop with tools, Paul possesses a bit of luck at finding bargains. His Grizzly 80" upright belt sander, 9" disc sander, and scrollsaw were purchased from a friend. After a little TLC, they work perfectly.

Estate sales are a favorite haunt for Paul. He picks up many larger tools for pennies on the dollar compared to new. In fact, his tablesaw and bandsaw are the only tools he purchased new.

After hiring a company to erect his pole barn, Paul finished out the interior, then took the time to carefully plan his shop layout and workbenches before moving tools inside.



After finding this vintage, heavy-duty Christiansen bench vise at a junk store, Paul restored it to usable condition and figured out how to mount it to his workbench. It's now his favorite go-to vise.

Paul acquired the 15" Grizzly planer after his close friend passed away. The friend's daughter wanted him to build a dining table. In exchange for his labor and time, she offered the planer to him, still in the original packing crate.

His wife shares Paul's love for a good deal. She bought a lathe for \$300 from a fellow woodturner who retired. 🌲



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Q: HOW CAN I MAKE MY DUST COLLECTOR SUCK?

I have a 1-horsepower, single-stage dust collector in my garage shop. I don't have the budget for a larger dust collector so I was wondering if there is anything I can do to improve the performance of the one I already own?

Chuck Jarman
La Mesa, California

A: You're not alone, Chuck. Those 1- to 1½-hp single-stage dust collectors are workhorses in thousands of shops. They're perfect for connecting to one or two tools. And while most work acceptably right out of the box, there are some things you can do to tweak their performance.

The key to efficient dust collection is maximizing airflow, both into the dust collector and out of it, while capturing as much dust as possible in between. Those goals can often be at odds with each other.

Airflow starts with the dust collector's fan. For small single-stage collectors, manufacturers claim airflow rates between 700 and 1,100 cubic feet per minute (CFM). That rating, however, is generally based on the machine running independently. Adding ducts, hoses, and tools immediately reduces the airflow coming into the collector.

To maximize airflow, avoid long hose or duct runs and limit the number of bends, as these sap airflow rates. You'll get better performance by moving your dust collector from tool to tool, keeping the hose as short as possible. Sealing joints between fittings with foil duct tape will minimize air leaks.

Airflow into the dust collector is directly affected by the airflow coming out of the collector. The outflow side is restricted by filters and dust bags, creating back pressure that can reduce suction at the tool. Some manufacturers make a tradeoff, relying on a looser weave in the filter and containment bag—up to 30 microns—to maintain a higher airflow. However, this allows fine dust to escape back into your shop.

An alternative approach—increasing the bag size—increases the surface area of the filter material, allowing more air to flow out of the bag even while using a finer weave, such as 3 microns. One manufacturer, American Fabric Filter [\[Sources\]](#) will custom-size a bag to fit your specific dust collector and shop space.



Another method to increase the filter surface area is to upgrade to a canister filter. Canisters use pleated filters to capture dust [\[Sources\]](#). These have much greater surface area than bags, allowing air to flow through them more easily so suction isn't reduced. Better canister filters include an internal paddle to manually dislodge dust that builds up on the inside of the filter. Canister filters can be fitted to most dust collectors in place of the original bag filter. (If you can't find an exact fit for your collector, buy one slightly larger and make an adapter from built-up plywood layers.)

Finally, if space and budget restrictions allow, you may want to add a cyclone separator, either shop-made or purchased, to your dust collector. A cyclone separates chips and dust from the air before they reach the impeller. This prevents your filter from clogging as quickly, ensuring air continues to flow freely through the system. 🌱

Sources:

• Filter Bags

[American Fabric Filter](#)
americanfabricfilter.com

• Canister Filters

[Wynn Environmental](#)
wynnenv.com



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The TRA is equipped with a safety lock-out cover, which not only protects the rocker switch from dust, but also locks the power switch OFF when the automatic spindle lock is engaged for bit changing.



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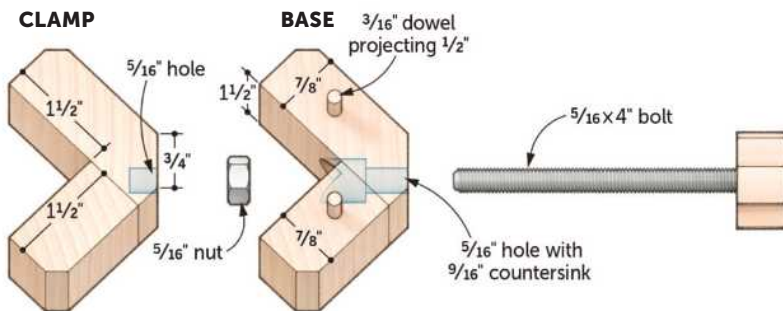
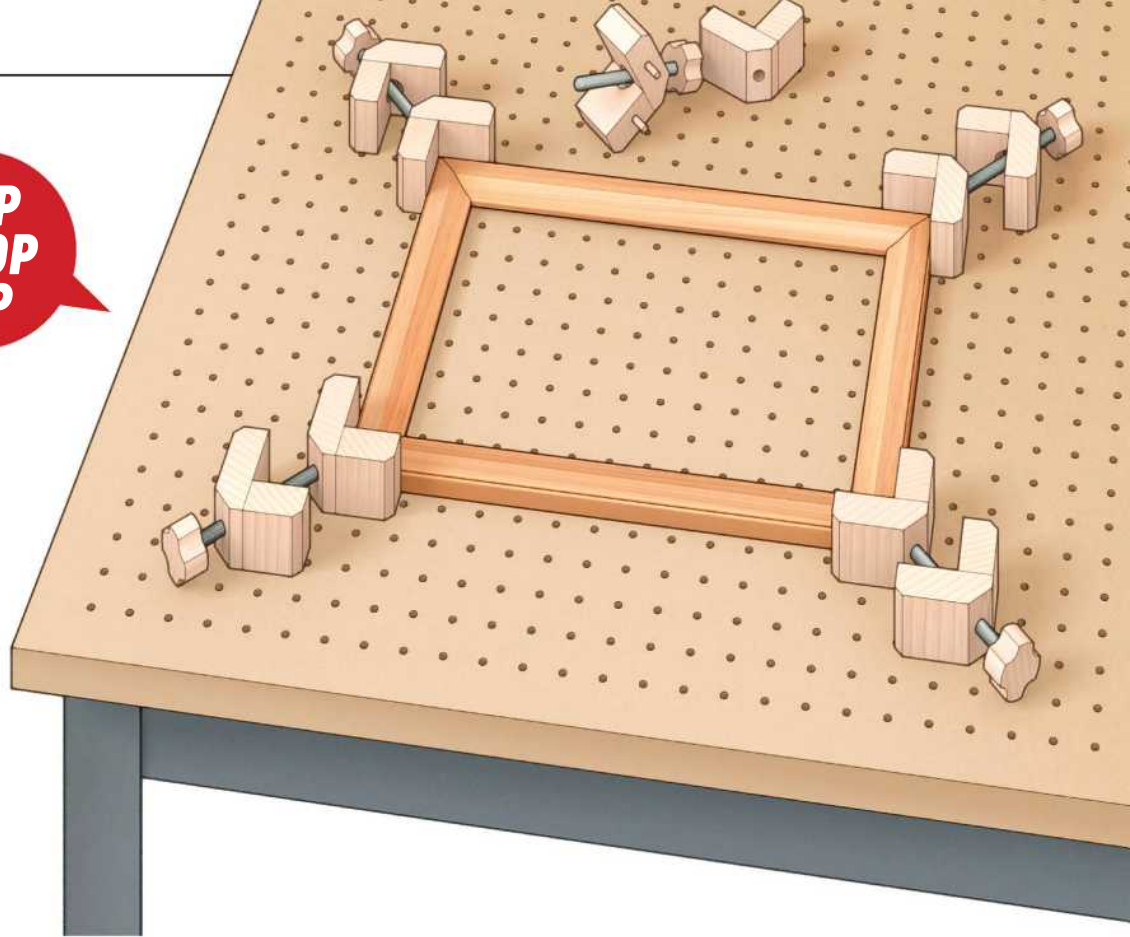
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TOP
SHOP
TIP



THE BIG FRAME-UP

I make a lot of picture frames so I made my own corner clamps for quick, secure glue-ups. I started by gluing two lengths of $\frac{7}{8}$ " stock at a right angle, then crosscutting it into eight pieces to create a base and clamp for each corner. A bolt with a shop-made knob passes through a nut in each base and contacts a recess in the clamp to apply pressure. Wax on the clamps keeps glue from sticking to them. Dowels in each base lock into holes, which I drilled in my tablesaw outfeed table using pegboard as a template.

Using the clamps is easy. Just place the clamps against the frame, position the bases just outside the clamps, and tighten each corner evenly, checking the frame for square as you go.

Kent Merkley
Everett, Washington



▲ For his tip, Kent wins a collection of workshop accessories from Rockler worth \$595.



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ILLUSTRATOR: CHRISTOPHER MILLS

Survival of the Sharpest

When it's you against nature, there's only one tool you need:
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That first crack of thunder sounded like a bomb just fell on Ramshorn Peak. Black clouds rolled in and the wind shook the trees. I had ventured off the trail on my own, gambled with the weather and now I was trapped in the forest. Miles from camp. Surrounded by wilderness and watching eyes. I knew that if I was going to make it through the night I needed to find shelter and build a fire... fast. As the first raindrops fell, I reached for my **Stag Hunter Knife**.

Forget about smartphones and GPS, because when it comes to taking on Mother Nature, there's only one tool you really need. Our stunning **Stag Hunter** is the ultimate sidekick for surviving and thriving in the great outdoors. Priced at \$149, the **Stag Hunter** can be yours today for an unbelievable **\$59!** Call now and we'll include a bonus leather sheath!

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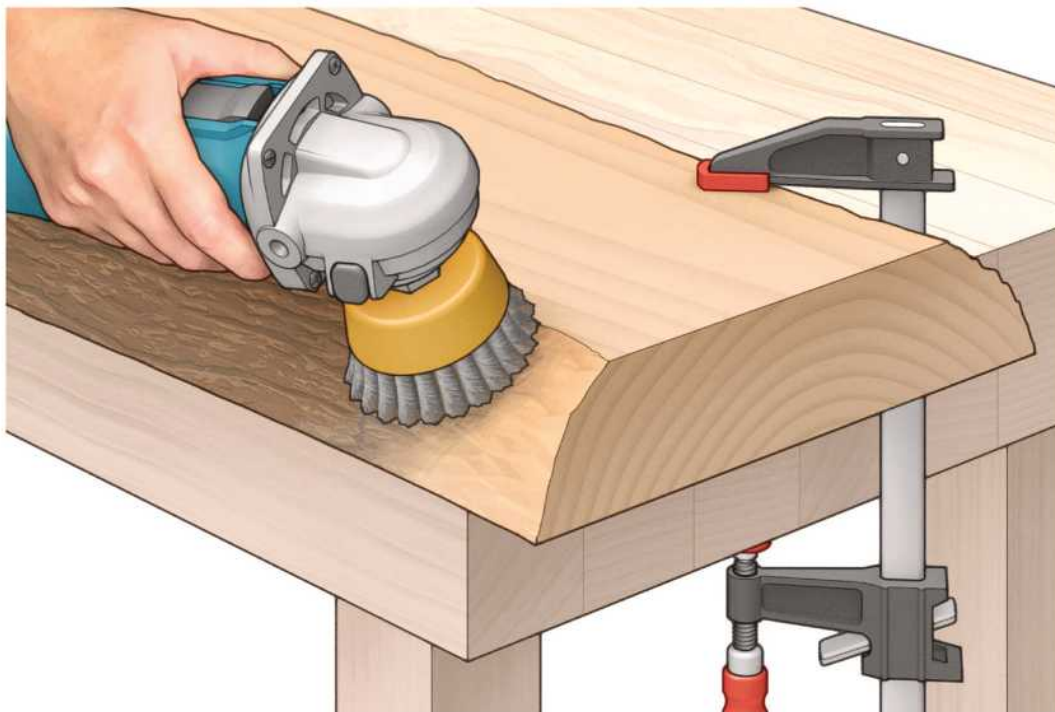
"This knife is beautiful!"

— J., La Crescent, MN

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"The feel of this knife is unbelievable... this an incredibly fine instrument."

— H., Arvada, CO



CUP BRUSH DEBARKING

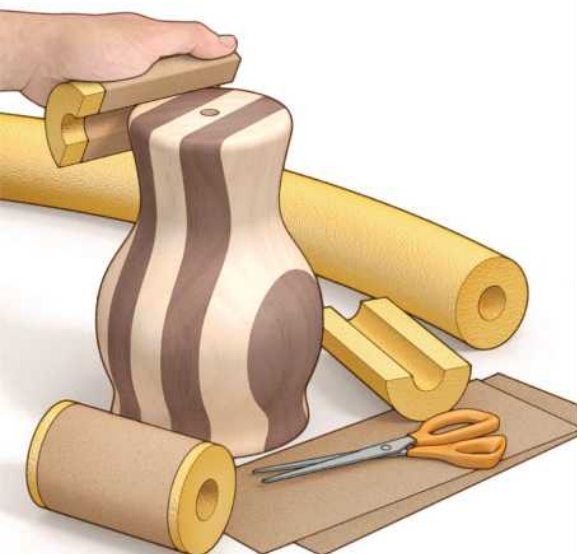
I've read about using a drawknife or hatchet to strip the bark on live-edge slabs, but I've found the easiest way is to use a coarse cup brush on my handheld grinder. It strips the bark off easily and cleans up irregular surfaces.

William French
Spring Hill, Florida

USE YOUR NOODLE

A short length of a pool noodle makes a great flexible sanding pad for smoothing curves. Wrap a piece of sandpaper around the outside to sand concave surfaces. Cut a length of noodle down the center and apply sandpaper to the inner portion to easily sand convex shapes.

Marcus Steenhoven
Ramsey, Minnesota



THEATER SEATING

To make aerosol spray cans and finishes identifiable and accessible in the back of a cabinet, I made stepped risers using scraps of 2x4. Now I can easily see the caps of the spray paints and labels on finishes.

Sam Slaughter
Madison, Alabama



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SHOP TIPS

DELICATE DEPTH DRILLING

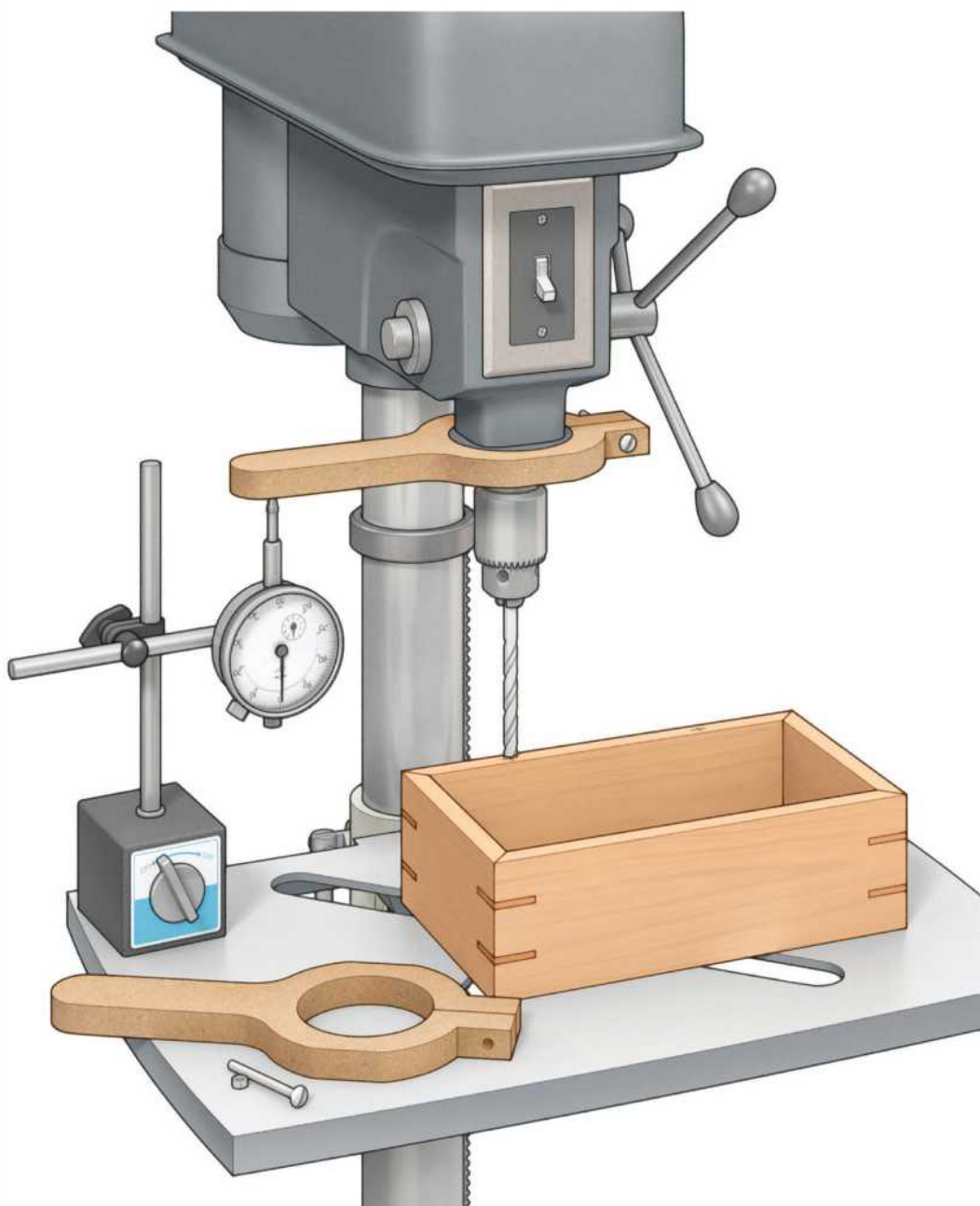
One of my projects required very precise hole depths for proper fit and function of specialty hardware. My solution uses a dial indicator with a magnetic base to measure the hole depth.

The setup starts with a "depth arm" for the quill of the drill press to engage the dial indicator's plunger. I made the arm out of $\frac{1}{2}$ " MDF and fastened it to the lower end of the quill using a machine screw, washer, and wing nut.

To use the setup, lower the drill bit to just contact the workpiece, then zero the indicator. Remove the workpiece, lower the drill bit to the required depth, then set the drill press depth stop. As you drill, the dial indicator shows the current hole depth. I find this setup robust and stable.

Dwayne Smyth

West Springfield, Massachusetts



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—Blake Loree, TX
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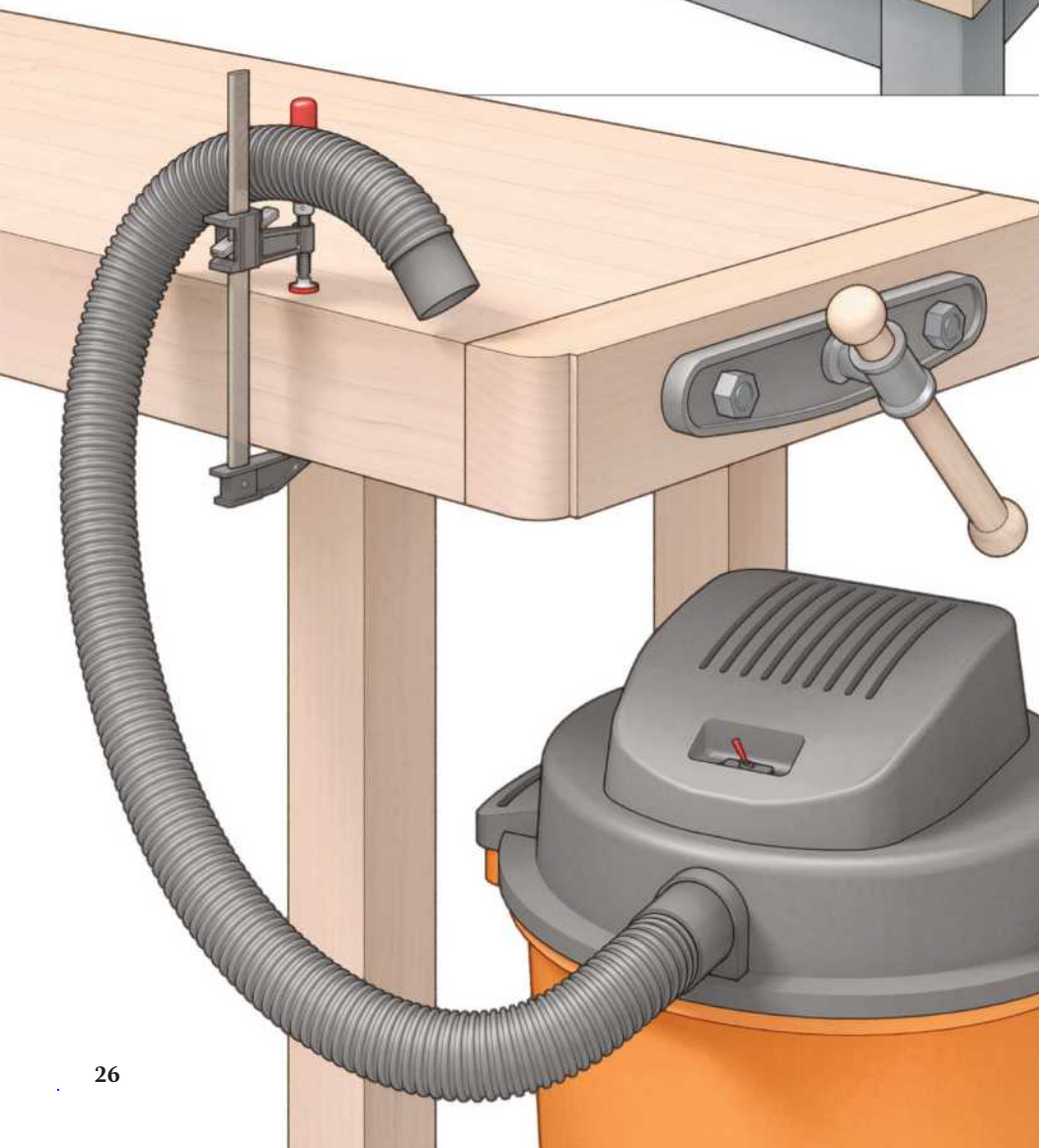
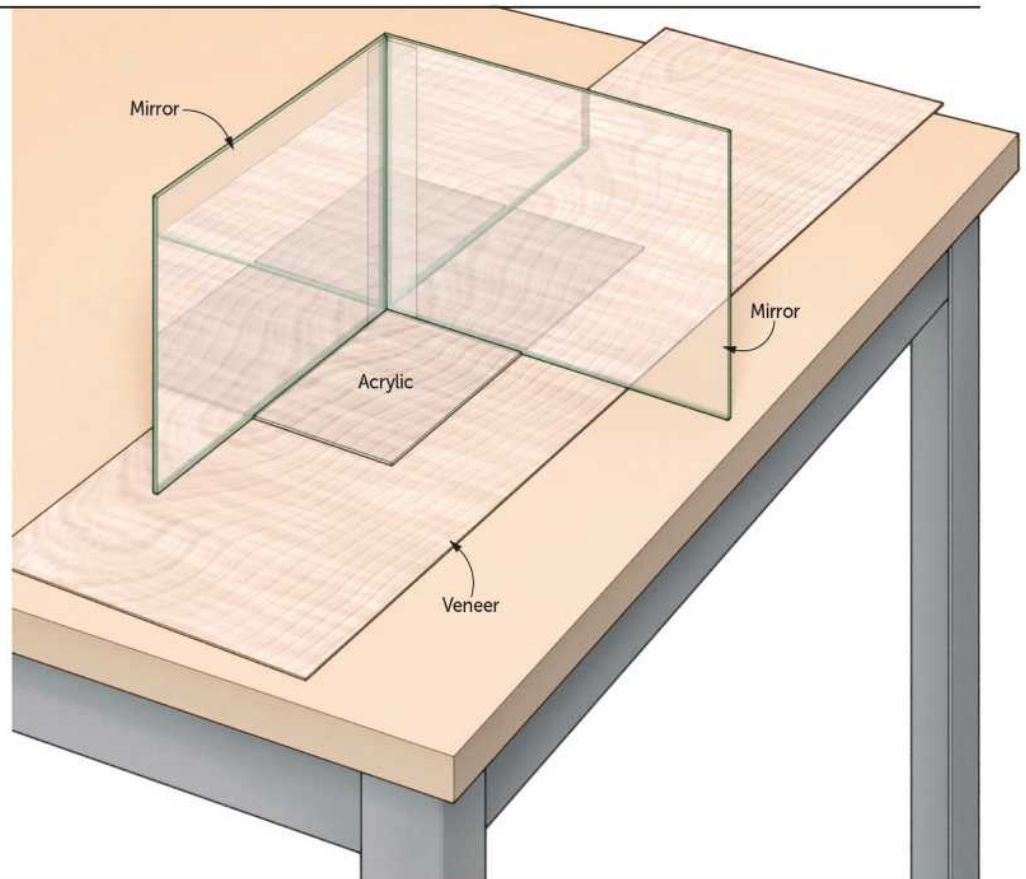
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MIRRORED MATCHMAKER

To help visualize a four-way, book-matched veneer pattern, join two mirrors together with clear packing tape. Then place the mirrors at a right angle on your veneer and you'll be able to preview potential patterns. To make visualizing even easier, I cut a piece of scrap acrylic to half the width and length of the panel I needed and placed it on the veneer along with the mirrors. That made it easy to see what grain patterns would be included in the finished panel and what areas fell outside. The acrylic also makes it easy to keep the mirrors at a 90° angle as I move them around.

Craig Ruegsegger
Altoona, Iowa



HANDY HOSE HOLDER

To keep the hose from my shop vacuum handy without letting it fall to the floor, I rest it between the bar and handle on a bar clamp fastened to the workbench. If the hose is too large, form a loop with a stout rubber band around the hose to hang on the clamp's bar. 🌳

Steve Hopkins
Boone, North Carolina

For the Man Who Gives Everything and Expects Nothing

If you're anything like my dad, you give your family everything. Your name, your time, your values — the people in your life know they can depend on you for practically anything. In exchange for imparting all of this energy and experience, you expect nothing in return.

The point? You deserve to treat yourself once in a while. You do so much for the people you care about. Now it's time to focus on you for just a few minutes. That's where the Men's Due Volta Watch comes in. This astonishing innovation provides a digital readout that's powered by a precise quartz engine, combining both analog and digital timekeeping.

Outfitted with a stopwatch, alarm, a.m./p.m. settings, and day, date and month complications, this timepiece stands out from the crowd. With its large face and handsome, masculine design, this watch is perfect for the back nine and the happy hour afterwards. Water-resistant up to 3 ATM, this timepiece won't wimp out if you have a run-in with a water hazard.

Other hybrid watches can sell for thousands of dollars, but because we've built more than 1 million watches, we know how to create real value. That's why we can offer this timepiece for just \$59! If you're not completely satisfied with this watch, return it for a full refund.

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DESIGNER: KEVIN BOYLE

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PHOTOGRAPHER: ADAM ALBRIGHT; ILLUSTRATOR: CHRISTOPHER MILLS

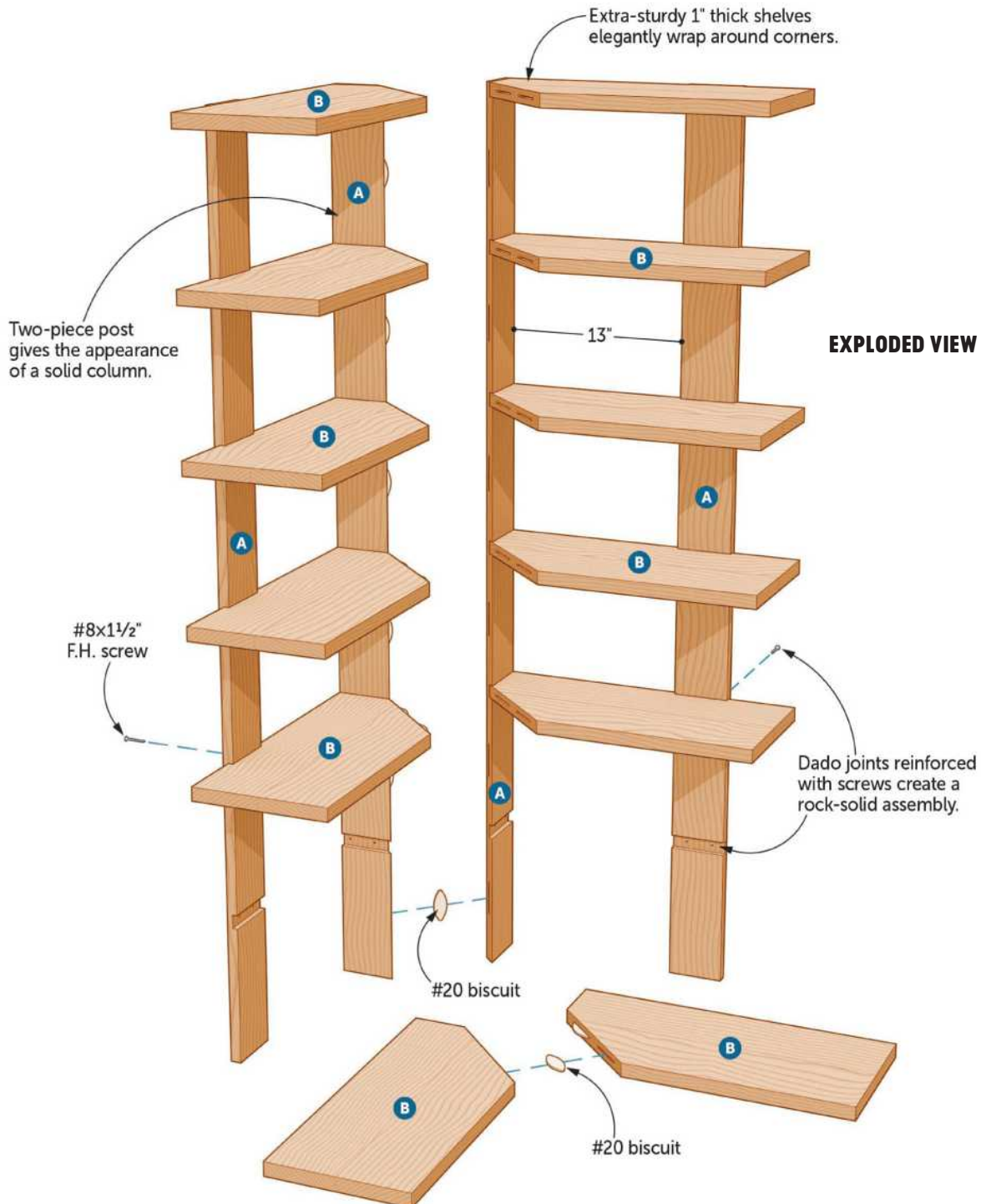
These shelves seemingly levitate in the corner of a room, transforming an often awkward space into an eye-catching spot for display. Your guests will ask, "How'd you do that?"

Tell them not to be fooled by the fact that this project uses only two unique parts; miters, bevels, and dadoses must come together and align perfectly to produce these seamless and sturdy wonders. We chose biscuits for that task, but we outline a couple of other alignment options on page 33.

POSTS

1 From $\frac{3}{4}$ " stock, cut the posts (A) to length and to $4\frac{1}{4}$ " wide [Parts List, Drawing 1]. From 1" stock, cut the shelves (B) to width and length [Drawing 2]. You will use the shelves to accurately size the dadoses in the next step.

2 Build the dado routing jig and use it to rout the dadoses in the posts. See *Router Jig Makes Dead-on Dadoses* on page 31.



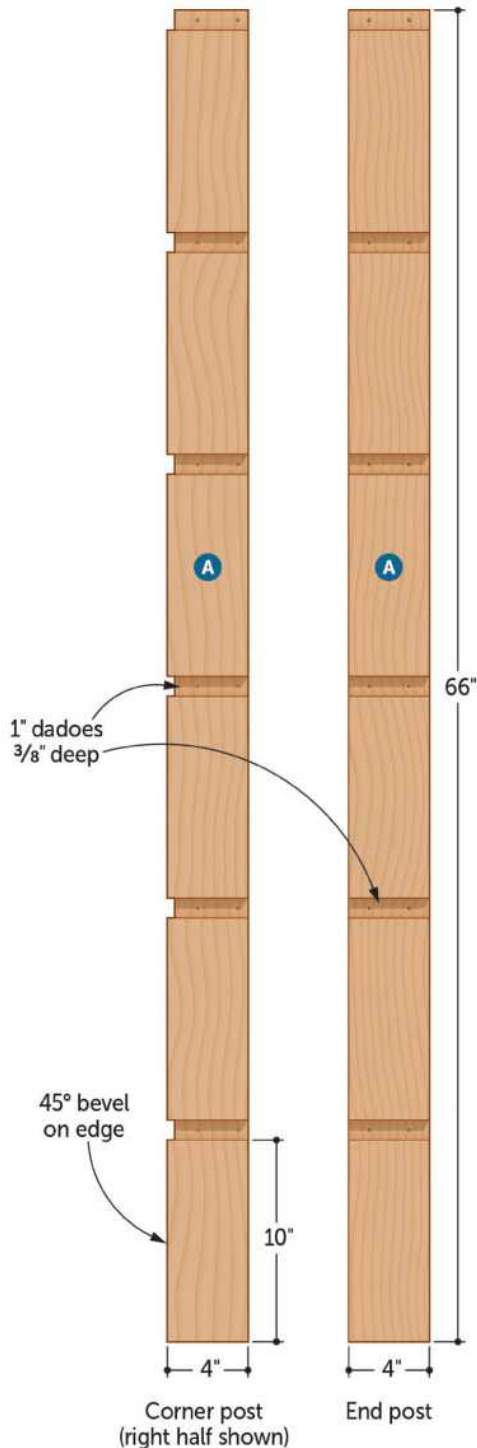
3 Select two posts with well-matched grain for the corner [Exploded View]; then bevel-cut them to width, making sure to create a mirrored pair. Ripcut the end posts to width.

TIP!

Use assembly squares to hold the corner post square and to draw the miter joint tight.

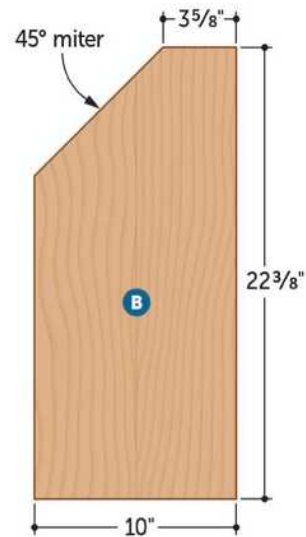
4 Cut the biscuit slots in each post half; then glue and clamp them together using biscuits to keep the faces aligned [Photo A].

1 POSTS



Set the fence on your biscuit joiner to 45° to cut the slots in the corner posts (A). Add glue to the slots and edge, insert the biscuits, and clamp the assembly in both directions.

2 SHELF



“

PAY CLOSE ATTENTION TO GRAIN PATTERN AND WOOD COLOR TO HELP MAKE THE CORNER POST LOOK LIKE ONE SOLID PIECE.

-ZACHARY BROWN, CONTRIBUTING EDITOR

”

ROUTER JIG MAKES DEAD-ON DADOES

The jig ensures that the dado width perfectly matches the thickness of the shelf material and that the dados are square and aligned across the posts.

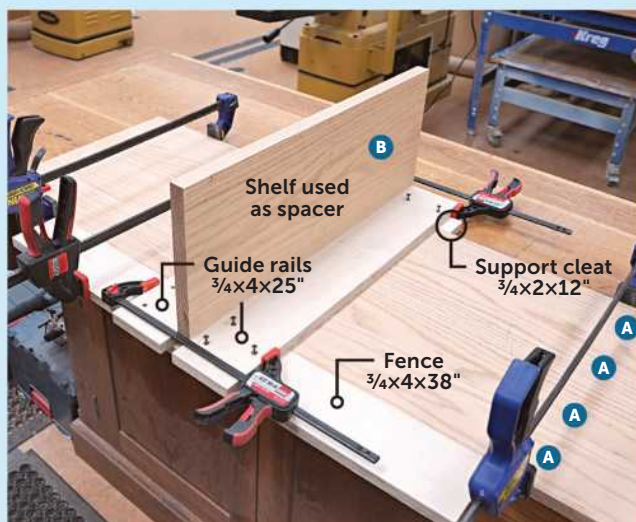
We used a shop-made jig with our plunge router and a $\frac{5}{8}$ " dado clean-out bit, *right*, to rout the shelf dados for our corner bookshelf.

To build the jig, *below*, glue and screw the left guide rail to the fence, using a large square to make sure they're perpendicular. Clamp your posts (A) edge to edge with their ends aligned; then screw the opposite end of the guide rail to the support cleat with it tight against the edge of the posts. Last, clamp the right guide rail in place using one of your shelves (or an offcut of equal thickness) as a spacer, and screw it to the fence and support cleat.

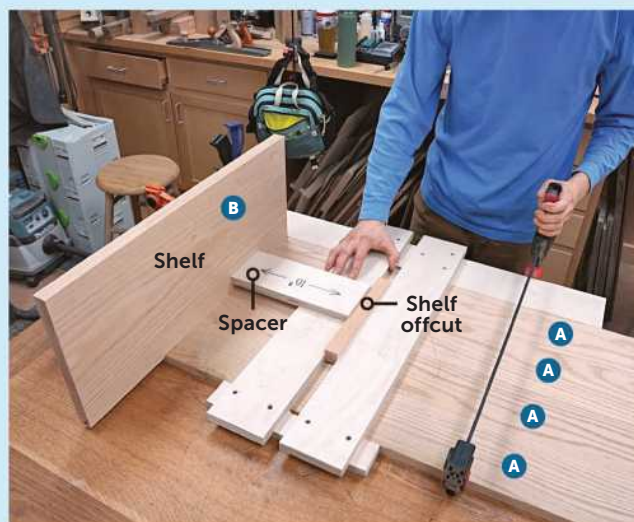
Position the jig on the posts at the lowest dado position [**Drawing 1**] and clamp it in place. Install the dado clean-out bit and set the cutting depth to about half of the dado depth. Rout the dado across all four posts, pushing the bit down one guide rail and pulling it back on the opposite rail. Lower the bit to final depth and repeat to complete that dado row. Reposition the jig and repeat for each row of dados, *below right*.



The bearing at the top of a dado clean-out bit matches the diameter of the cutter and rides along the guide rails of the jig.



Make the guide rails wide enough to support your router base and long enough to span across the posts (A), plus the jig's fence and support cleat.



Use a 10" spacer and two shelves (or offcuts of equal thickness) to position the jig for each remaining row of dados. Clamp the jig in place at each location.



“

LIKE ALL TALL PIECES OF FURNITURE, THESE SHELVES NEED TO BE ANCHORED TO THE WALL TO PREVENT TIPPING. WE CONCEALED MOUNTING BLOCKS BEHIND THE POSTS.

-KEVIN BOYLE, SENIOR DESIGN EDITOR

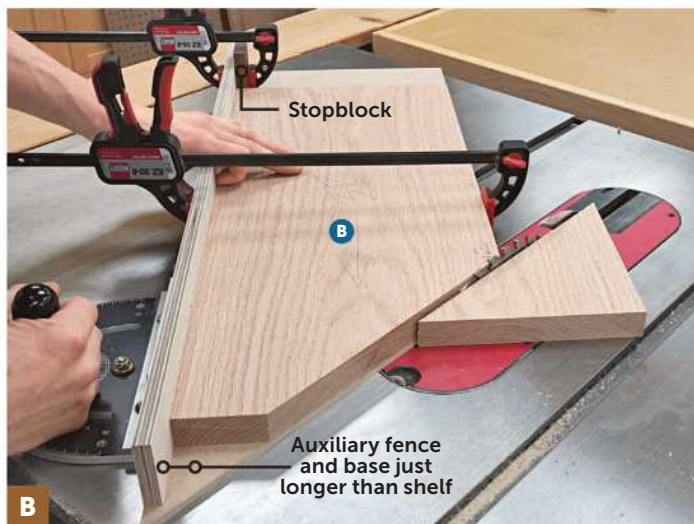
”

PAIR UP THE SHELVES

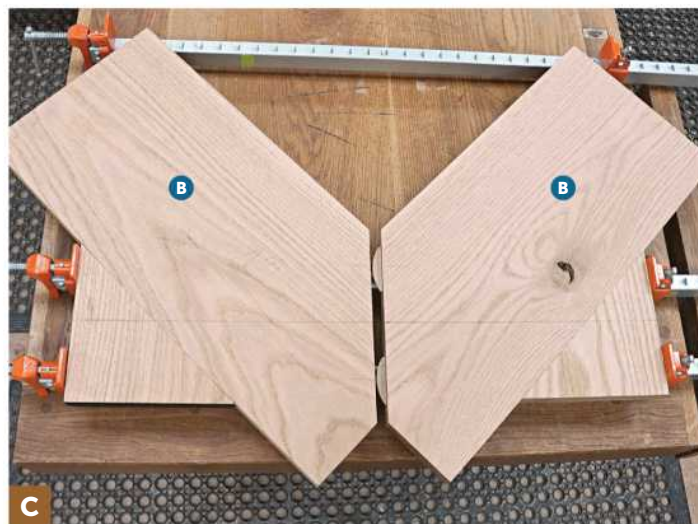
1 Pair together your shelves (B), selecting for good grain match [Exploded View]. Label each pair and their top faces.

2 Lay out the miter on one of the shelves [Drawing 2]. Attach an auxiliary fence and base to your tablesaw miter gauge, set it to 45°, and miter-cut each shelf [Photo B]. Save the offcuts to aid with assembly.

3 We used biscuits to align the mitered shelf joints [Exploded View] but there are other methods. See *Aids for Alignment*, next page, for a few great options. Cut the biscuit slots in the shelf miters; then glue and clamp each shelf pair together, using the biscuits to keep the faces aligned [Photo C].



Align the layout line on the shelf (B) with the blade; then clamp the shelf to the fence. Add a stopblock. Miter-cut the right shelves face up and the left shelves face down.



Use double-faced tape to attach a miter offcut to the edge of each shelf (B), creating clamping blocks. Apply glue to the mating edges, biscuits, and slots, and clamp the assembly together.

AIDS FOR ALIGNMENT

Use one of these time-tested methods to keep the faces of the parts aligned when gluing up an edge joint; this is especially helpful for a tricky clamping situation like the wide miter joint on the shelves. Choose dowels, biscuits, or loose tenons, whichever method accommodates your tools and setup.



Dowels add a bit of strength to the joint, but require precise alignment between the holes in the mating edges. Using a doweling jig ensures the holes are perpendicular to each edge.



A biscuit joiner cuts a slot in the edge at a set distance from the face of the work. Biscuits align the faces of the work, but allow for some side-to-side movement during assembly.



Our shop-made loose tenon routing jig centers the mortise on the edge and accommodates a range of thicknesses (woodmagazine.com/loosetenonjig). Similar to a traditional tenon, loose tenons add considerable glue area and strength.

FINISH AND ASSEMBLY

1 Finish-sand the corner post, end posts, and shelves. Avoid oversanding, which could loosen the fit of the shelves. You want a snug fit, but not so tight that you need a mallet.

2 Dry-fit and clamp together the bookshelf assembly. Number the shelves to keep them in order. Drill two countersunk screw holes through the back of the posts at each dado joint for each shelf [**Exploded View**].

3 Remove the clamps, pull the shelves from their dados, and apply a finish to each part. We wiped on two coats of Osmo hard-wax oil no. 3031. Use a white or gray synthetic steel wool pad to apply the finish in very thin coats. Once you've applied finish in a section, go back over it with a clean pad to ensure a thin, even layer.

4 After the finish dries to the touch, glue and screw together the bookshelf. To install the shelf over your room's baseboard, use wall anchors to mount spacer blocks behind the end posts just below a shelf; then drill and drive trim-head screws into the blocks. To install the shelf flat against the wall, use a flush-cut blade on an oscillating multitool to trim the baseboard. Attach 1-by ledgers in the corner of the room and screw the corner posts to them. Screw the end posts to studs or use wall anchors. 🌱

Note: Mask off the glue surface of each shelf, as well as the dados, to protect them from finish and ensure a strong glue joint.

PARTS LIST

PART	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A* POSTS	3/4"	4"	66"	RO	4
B SHELVES	1"	10"	22 3/8"	RO	12

*Parts initially cut oversize. See the instructions.

MATERIALS KEY: RO—red oak.

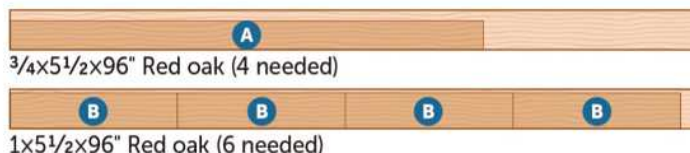
SUPPLIES: #20 biscuits, #8x1 1/2" flathead screws, 1 1/2" trim-head screws.

BIT: 5/8" dado clean-out router bit.

PROJECT COST: It cost us about \$280 to build this project. Your cost will vary by region and source.

CUTTING DIAGRAM

We purchased 16 board feet of 4/4 red oak and 36 board feet of 6/4 red oak. Before cutting parts to size, we planed them to the thicknesses shown in these example boards.



FLATTENING — WITH A — ROUTER

Turn slabs and wide stock into flat boards without industrial-size equipment. All you need is a router and this shop-made sled.

WRITER: KEN BURTON



PHOTOGRAPHER: KEN BURTON

Oversized (and often overpriced) machinery can make short work of oversized lumber such as live-edge slabs. If you're mass-producing natural-edge furniture, that's a viable solution. But for one-off slab work—or even for those planks that you wish you could face-joint at your planer's capacity rather than your jointer's—reach for your scrap bin rather than your checkbook.

Your first step is to create a shop-made slab-flattening solution. See *Beam Up and Build a Sled*, next page. It's easy to build, works well, and adapts to nearly any size piece of wood you're likely to come up against, *previous page*. Best of all, the setup works with any full-size router. We prefer a plunge router for easy adjustment between passes, but a fixed-base model works, as well. See *Flattening Bit Options*, page 37, for help selecting the best router bit for the job.

TIP!

Place spacers under thin slabs to elevate them high enough for the I-beams, or place them under the I-beams to work with thicker slabs.

LEVEL UP

When you're ready to flatten a slab, set up your system atop a pair of sawhorses in an area that offers easy access from all sides. Flattening creates a lot of chips, so setting up outside prevents scattering them all over the shop. Choosing a flat and level surface simplifies setup.

To ensure the slab comes out flat, both I-beams need to sit in the same plane. So, set up the sawhorses to create a level surface, *right*.

Place the slab on the sawhorses. Slabs are often cupped, so start with the convex side facing upward for a more stable footing. Check that the top face is close to level across its width and length, *below*. Doing this ensures you won't remove more material than necessary to flatten this face. Place shims under the slab where necessary for solid support.

Clamp the slab to the sawhorses, making sure the force doesn't twist the



After positioning sawhorses at an appropriate distance, shim the first one level, making sure it's well supported. Then span between the sawhorses with a long level and shim the second one to be coplanar.



Place the slab on the sawhorses and level it using shims to bring the top surface as parallel to the sawhorse tops as possible. Make sure the slab is well supported before clamping it down.



Plywood spacer under beam at each contact point raises height for thicker slabs.

Position the I-beams about 1 1/2" away from the slab's widest point along each edge. Measure to set the beams parallel to each other, then clamp the lower flange to each sawhorse crossbar.

slab or raise any corner off of the shims. F-style clamps, with their lower-profile heads, stay out of the way better but any clamps will work. You may have to move

them temporarily to provide sled clearance. Cut the exposed portion off of each shim. Place the I-beams alongside the slab and clamp them in place, *above*.

BEAM UP AND BUILD A SLED

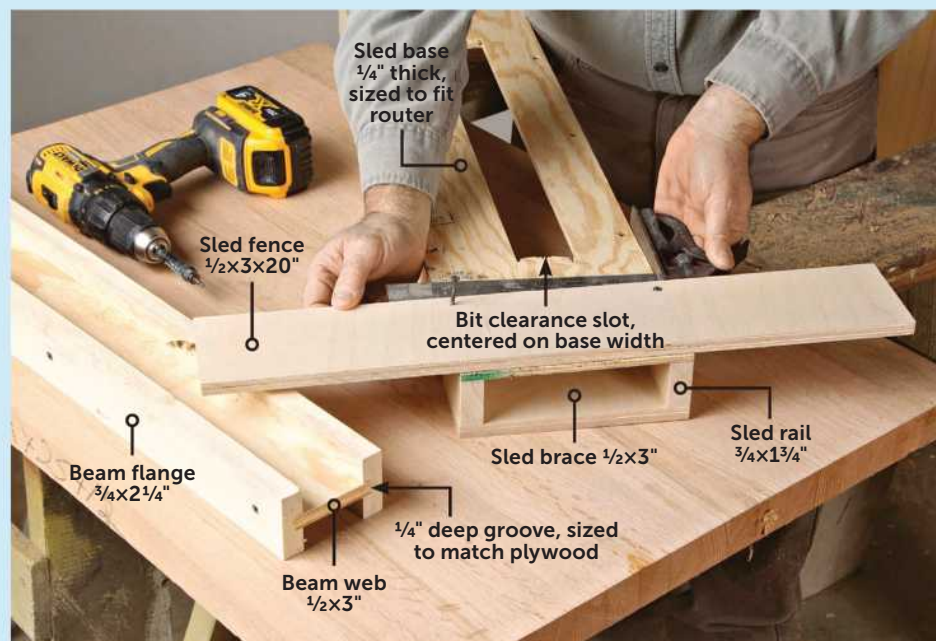
This slab-flattening setup is simple to build. Its centerpiece is a sled that captures the router as you guide it back and forth across the slab. Two I-beams, clamped in place flanking the slab, support the sled to ensure you rout flat surfaces.

Start by ripping four beam flanges to width, making them at least 12" longer than the slab you want to flatten. Then cut two I-beam webs to size. We used 1/2" plywood. Ours are 3" wide, which makes the finished I-beams tall enough to handle slabs up to about 3" thick. Cut or rout a centered groove, sized to match the plywood, in one face of each flange. Then glue and screw the webs between them.

To make the sled, measure your router base diameter and add 19/16" to accommodate the sled rails plus a bit of clearance, then rip a blank for the sled's base to that width from 1/4" plywood. Crosscut it 18" longer than the width of your slab. From 1-by lumber, cut a pair of sled rails and glue and screw them flush with the edges of the base. Then add braces to the rails at each end to stiffen the sled.

You'll need to cut an opening in the sled base for the router bit you choose. Once you've decided on your bit, cut a centered clearance slot, stopping it 3-4" from each end.

For our 2"-diameter bit, we made the slot 2 1/4" wide. Complete the base by attaching a fence at one end, making sure it sits square to the sled's edges.



Size your I-beams and sled to suit your slab and your router. Scrap plywood and 1-by material are all you need.

FLATTENING BIT OPTIONS

You can flatten a slab with nearly any straight router bit and, if you're just doing it one time or on a relatively small slab, you can get by with a standard straight bit, *near right*. Because you have to overlap each pass, though, a $\frac{3}{4}$ " straight bit will remove only about $\frac{5}{8}$ " of material per pass across the slab. That means 77 passes across a 4'-long slab to remove a single layer of material. Plus, the cutters often aren't flat across the bottom, so only a small amount contacts the wood, requiring shallow, slow passes that build a lot of heat.

A surfacing bit like this 2"-diameter version, *far right*, has four thick cutters with flat bottoms that cut more aggressively while leaving a smoother surface. With a $\frac{1}{8}$ " overlap, that same 4'-long slab requires only 26 passes.

Whiteside, woodcraft.com, 2" surfacing bit no. 868312, \$87



TAKE THE FLAT ROUT

Place the sled atop the beams with its fence against one beam flange. Move it over the slab and measure through the bit-clearance slot to locate the highest point on the slab. Chuck the bit you'll be using into the router and place the router in the track. With the router turned off, lower the bit against the high spot.

To prevent bit chatter and bogging the router down, set the cutting depth for a shallow pass; $\frac{3}{32}$ " proves a good compromise with a large-diameter surfacing bit, though you don't have to be exact.

TIP!

Set your router to match the bit manufacturer's recommendation (14,000 rpm in our case) to ensure the large-diameter bit doesn't spin too quickly.

Move the router away from the high spot, or lift it slightly so the bit can spin freely. Turn the router on and rout slowly across the slab to begin removing material. After each pass, move the sled as you work from one end of the slab to the other. You can skip over low areas that the bit doesn't touch. If any clamp holding the slab interferes, remove no more than one at a time as you rout that area. Then reattach the clamp.

From here, it's a step-and-repeat process: Lower the bit, rout away any material the bit touches, lower the bit, then rout again. Marking one I-beam simplifies moving the sled for each pass, *right*. Make repeated passes across the slab, concentrating on the highest spots first. Then make a series of passes at a final, consistent depth to flatten the entire surface.



Draw lines across one I-beam, spacing them at 80-90% of the bit's diameter. Each time you move the sled, align one edge with the next pencil line to maximize material removal on each pass.

With one face flattened, flip the slab over and clamp it down again, without leveling shims this time, and flatten the other face in the same way. Once both faces are flattened, you can make more passes, if necessary, to bring the entire slab to your desired final thickness. 🌲

COUCH-POTATO COFFEE TABLE

Whether you're working at a laptop computer or enjoying a meal, this coffee table rises to the occasion.

WRITER: VINCE ANCONA
DESIGNER/BUILDER: KEVIN BOYLE



OVERALL DIMENSIONS

45"W x 25½"D x 18¼"H (closed)

45"W x 32¾"D x 26¼"H (open)

PHOTOGRAPHER: ADAM ALBRIGHT; ILLUSTRATOR: CHRISTOPHER MILLS

According to one study, 63 percent of Americans watch TV while eating dinner. Approximately the same number report using a secondary screen, such as a laptop, tablet, or phone, while watching TV. Whether you're dining or watching dual screens, this coffee table has you covered. A gas-shock mechanism (see *Going Up* on page 41) lifts the top up and forward to a comfortable position, so you can accomplish all of these tasks without bending awkwardly over a low table to consume your meal or your media.

WORK FROM THE INSIDE OUT

The coffee table consists of a plywood inner case supported by a framework of legs, rails, and stretchers. When raised, the top rests at a convenient and comfortable 26 $\frac{1}{4}$ " height.

1 From $\frac{3}{4}$ " plywood, cut the end panels (A), upper panel (B), and aprons (C) to size [Drawing 1, Parts List].

2 Apply iron-on edge banding to the top edges of the end panels (A) and aprons (C). Trim the edging flush.

3 Install a $\frac{1}{2}$ " straight bit in your router table and raise it to $\frac{3}{8}$ ". Position the router-table fence to rout a dado across each end panel (A) [Drawing 1a]. Reposition the fence farther away from the bit for a second pass, widening the dado to match the thickness of the plywood.

4 Move the fence forward to cut a stopped rabbet in each end panel that ends at the dado [Drawing 1a]. As with the dados, cut these rabbets in two passes, moving the fence back before the second pass to match the thickness of the plywood.

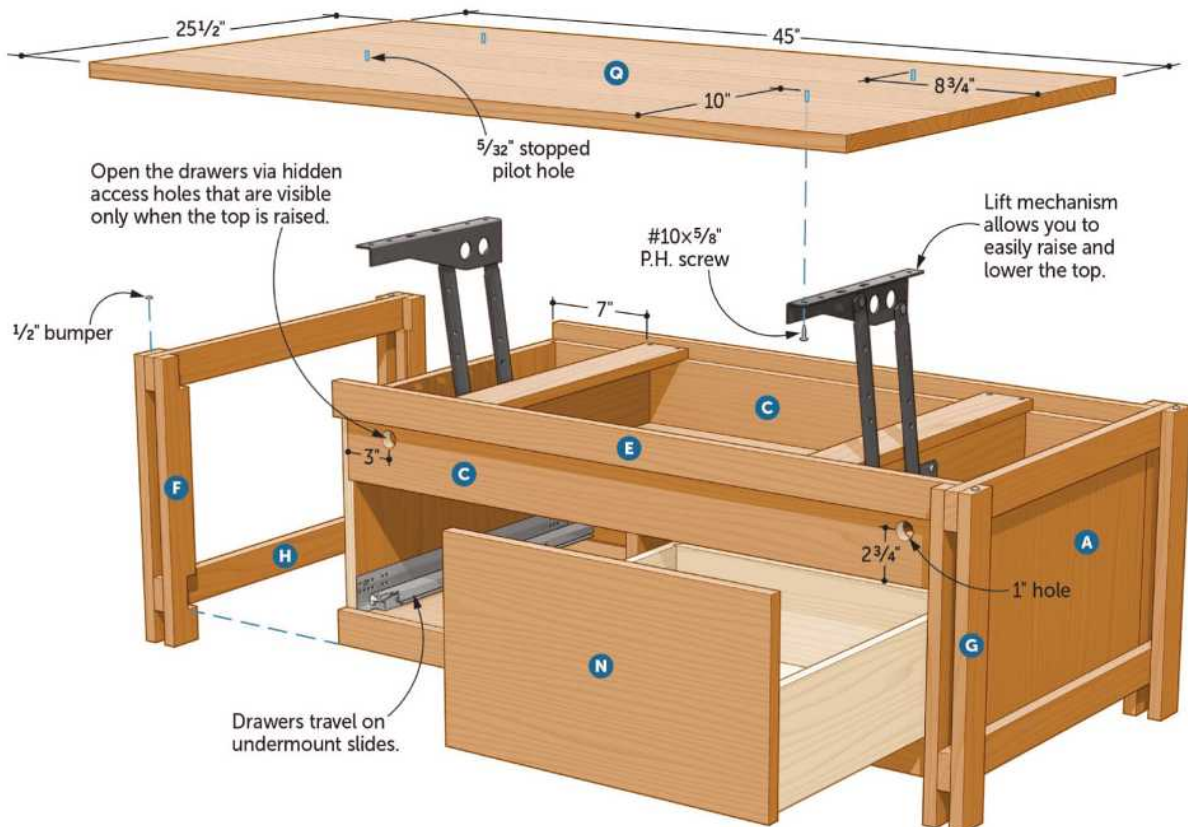


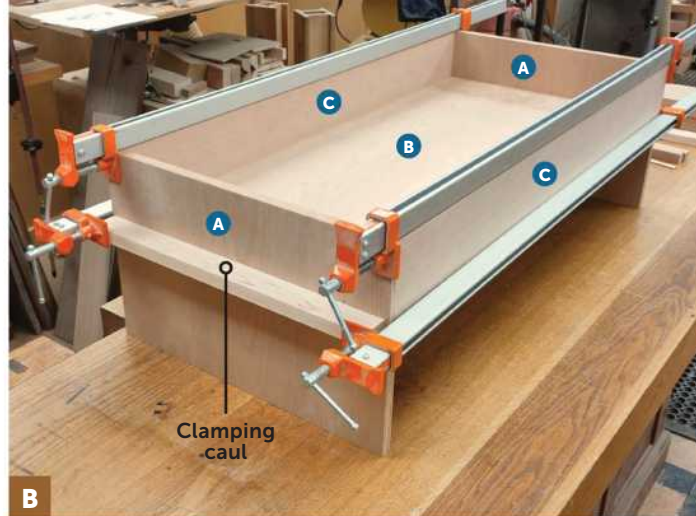
Watch a video on applying edge banding
woodmagazine.com/
edge-banding



◀ With the top lowered, this furniture piece takes on the appearance of just another mild-mannered coffee table.

EXPLODED VIEW





After gluing one of the end panels (A) to the upper panel (B), add the first apron (C). Use the second end panel, without glue for now, to aid with alignment and to protect the end of the apron from damage.

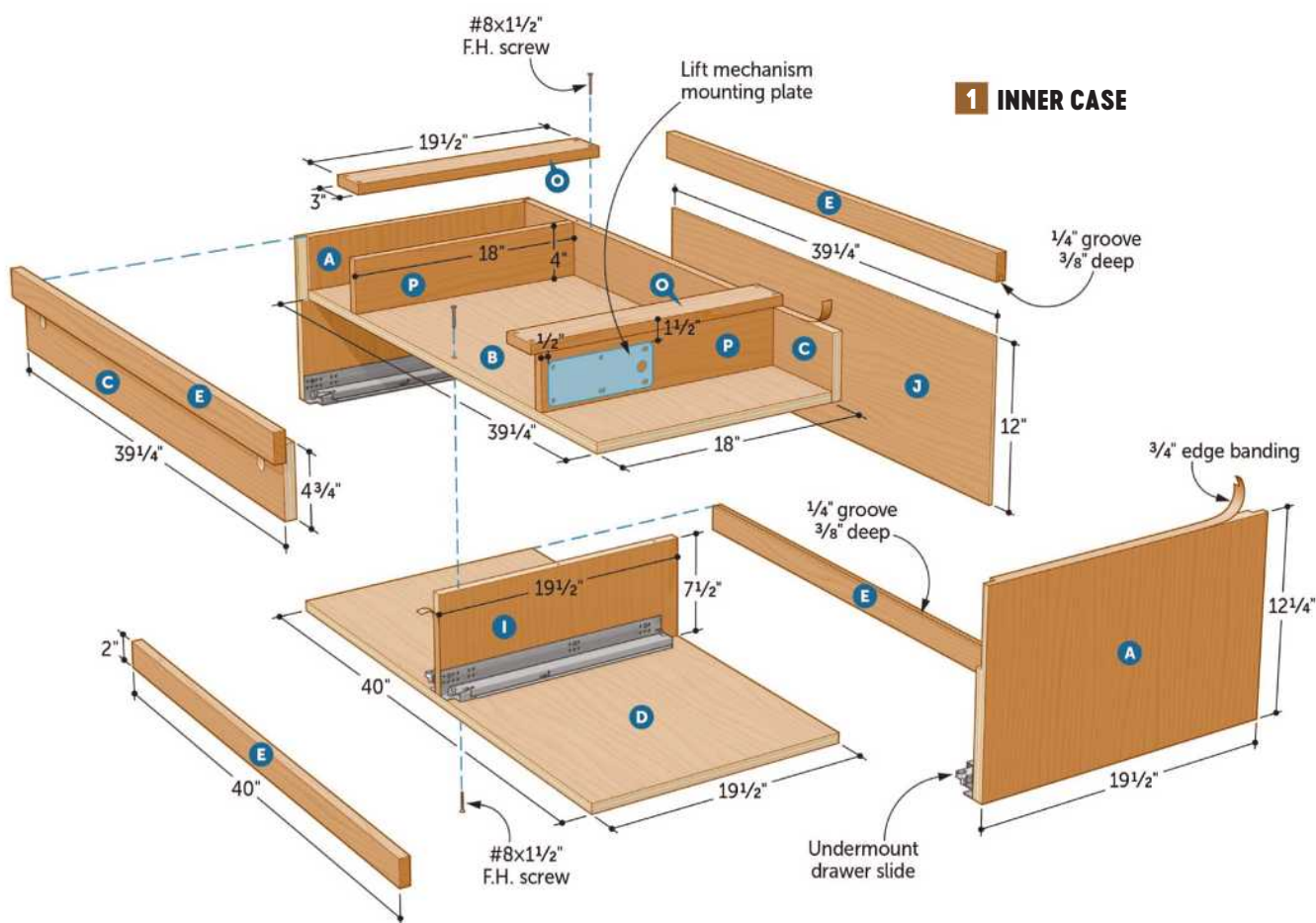
Apply glue and add the second apron (C), then attach the second end panel (A) with glue. A clamping caul distributes pressure evenly across the width of the panel when gluing it in place.

5 Glue one of the end panels (A) to the upper panel (B), making sure the assembly remains square as you apply clamp pressure.

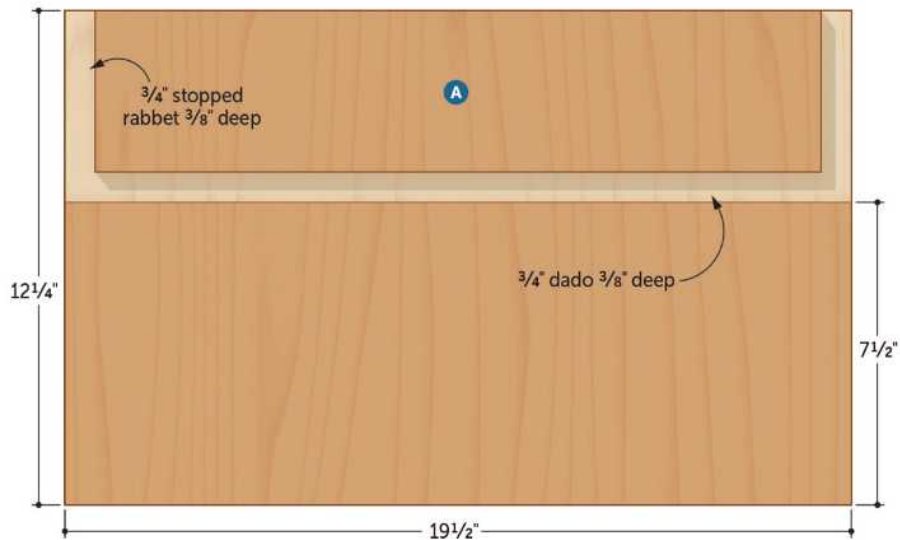
6 Glue the first apron (C) to the end panel/upper panel assembly (A/B). Dry-fit the second end panel to help align the assembly and to protect the end of the apron [Photo A].

7 Add the second apron and then the second end panel. Use a clamping caul to apply pressure to the center of the panel [Photo B].

8 Measure the assembly (A-C) to determine the length of the bottom panel (D). Cut the bottom panel to size and set it aside while you work on the outer frame.



1a END PANEL



GOING UP

The secret behind this coffee table is the table lift mechanism. The mechanism consists of a right and left lift, each with a gas-filled piston. Working together, the pair of lifts raise and support the tabletop. (The mechanism is designed to support the tabletop plus approximately 50 lbs in the open position.)

To install the lifts, mount them to the supports on the table base first. Then measure the distance from the edges of the table aprons and end rails to the mounting holes in the top of the hardware. Transfer those measurements to the underside of the tabletop, while also factoring in the overhang of the top.

“

TO AVOID RACKING THE TOP (AND POSSIBLY DAMAGING THE HARDWARE), USE TWO HANDS WHEN RAISING AND LOWERING IT.

-KEVIN BOYLE, SENIOR DESIGN EDITOR

”





Turn the case upside down and glue the bottom assembly (D/E) to the end panels (A), ensuring that the stretchers (E) overhang equally and the bottom panel (D) is flush with the end panels.



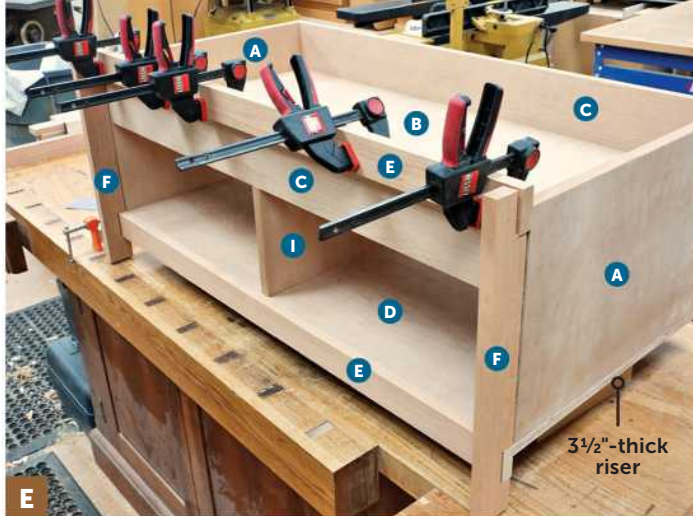
Working two at a time, notch the inner legs (F) with a dado blade. Use the rip fence as a stop to establish one shoulder on all four legs, reposition it for the opposite, then hog away the waste between.

Secret access holes in the front apron allow you to push the drawers open from the inside with the top raised.

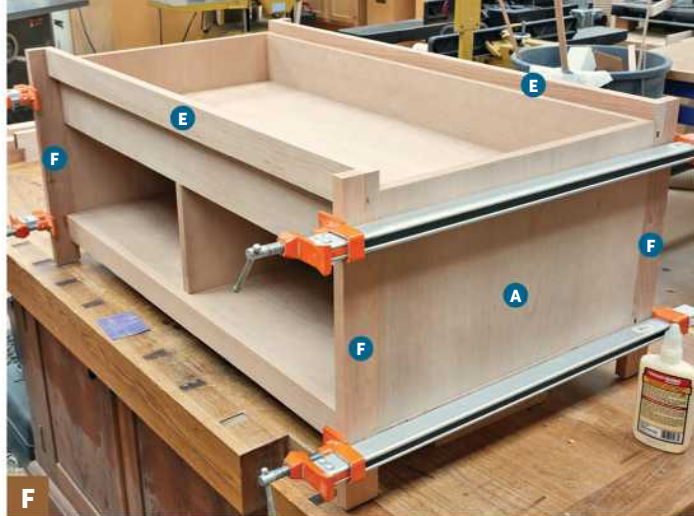


FRAME THE CASE

- 1** Cut the stretchers (E), inner legs (F), and outer legs (G) to size [Drawings 1 and 2, Parts List]. Cut the end rails (H) to width but leave them about $\frac{1}{2}$ " overlength.
- 2** On the two rear stretchers (E), cut a $\frac{1}{4}$ "-deep, centered groove, sized to match the thickness of the plywood you'll be using for the back panel.
- 3** Glue the two lower stretchers (E) to the edges of the bottom panel (D), flush with the top face and ends [Drawing 2a].
- 4** Apply glue to the bottom edges of the end panels (A) and clamp the bottom assembly (D/E) in place so it's centered front to back and flush with the end panels [Photo C].
- 5** Cut the center divider (I) to size to fit between the upper panel and bottom panel. Apply edge banding to the front edge and trim the edging flush. Slide the divider into the opening, centering it end to end, and screw it in place.
- 6** Using a dado blade, notch the inner legs (F) [Photo D, Drawing 2].
- 7** Install a $\frac{1}{4}$ " straight bit in your router table and rout a groove on the inside face of the rear two inner legs, creating a mirrored right and left pair.
- 8** Set the coffee table assembly on $3\frac{1}{2}$ " risers and dry-fit the front inner legs over the lower stretcher. Use them as a gauge to glue the front upper stretcher (E) into place [Photo E]. Repeat for the rear.

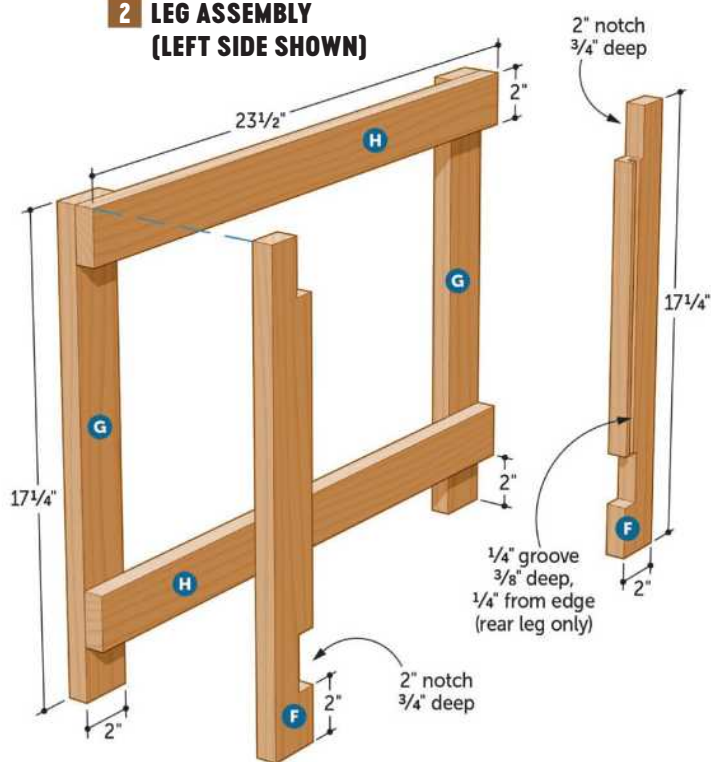


Dry-fit the inner legs (F) over the front stretcher (E). Glue the upper front stretcher (E) to the case, ensuring that the ends are flush and it rests on the bottom of the notches in the inner legs.

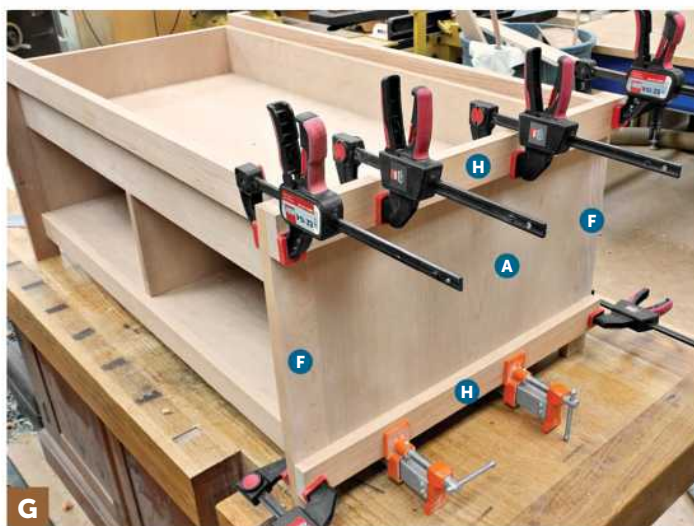
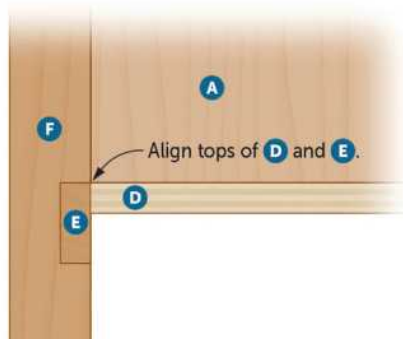


Glue the front inner legs (F) to the case, ensuring they are flush with the end panels (A). Use the rear inner legs as clamping blocks to avoid damaging the end panels. Repeat with the rear inner legs.

2 LEG ASSEMBLY (LEFT SIDE SHOWN)



2a CROSS SECTION



Glue and clamp the end rails (H) to the ends of the case, making sure they are flush with the edges of the inner legs (F) and aligned with the notches.

9 Cut the back panel (J) to size and slide it into the grooves in the rear stretchers (E). Glue and clamp the front inner legs (F) to the case, flush with the end panels (A) [Photo F, Drawing 2a]. Then glue and clamp the rear inner legs. Sand the end panels and inner legs flush.

10 Retrieve one pair of the end rails (H) and hold them against an end to mark them for length. Cut them to final length, then glue and clamp them to the assembly [Photo G]. Repeat for the other end.

11 Glue and clamp the outer legs (G) to the assembly [Drawing 2].

12 Drill 1 inch holes in the front apron (C). Ease the edges of the holes with sandpaper.

TIP!

Most undermount drawer slides call for $\frac{5}{8}$ " drawer stock for an optimal fit.

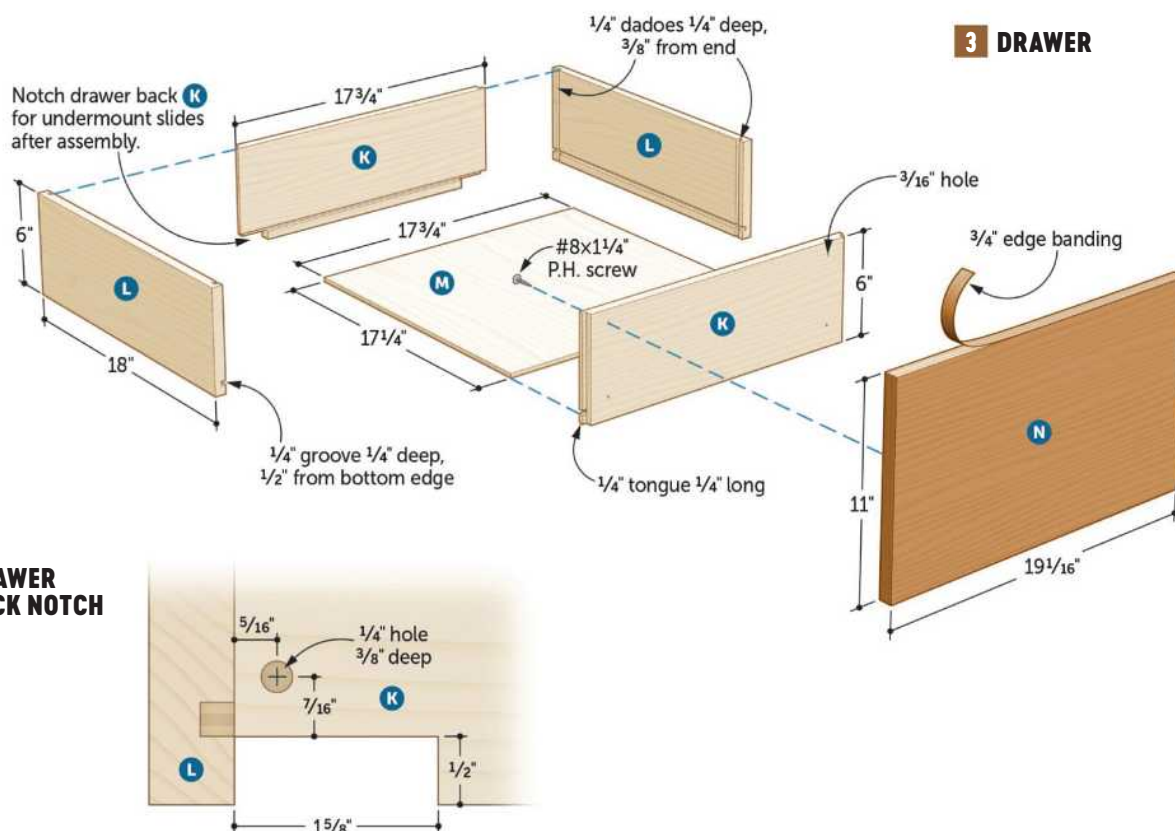
ADD A PAIR OF DRAWERS

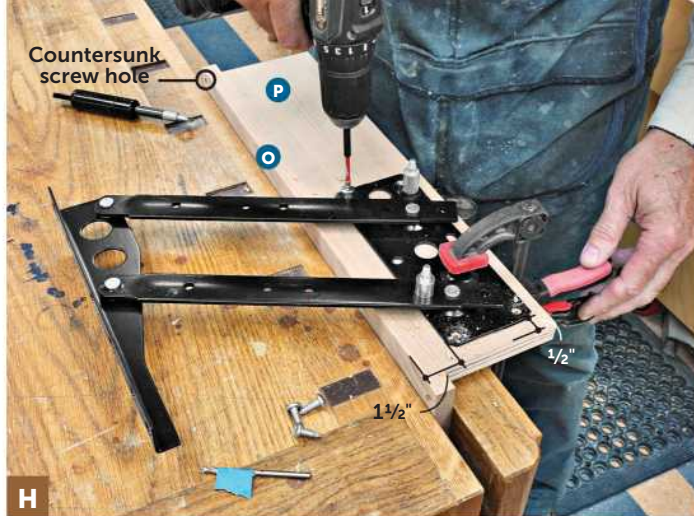
- 1 From $\frac{5}{8}$ " stock, cut the drawer fronts/back (K) and sides (L) to size [Parts List].
- 2 Using a $\frac{1}{4}$ " dado blade, cut a dado near each end of the drawer sides [Drawing 3]. Cut a groove on the drawer sides, fronts, and backs for the bottom.
- 3 Rabbet the ends of the drawer fronts and backs to leave tongues that fit in the dados in the drawer sides.
- 4 Cut the drawer bottoms (M) to size and glue up the drawer boxes. After the glue dries, cut notches and drill holes in the drawer backs for the drawer slides [Drawing 3a].
- 5 Drill shank holes in the drawer fronts (K) for attaching the false fronts. Attach the mounting clips to the underside of the drawers and attach the slides to the sides of the case.
- 6 Cut the drawer false fronts (N) to size and apply banding to the edges. Cut blocks of scrap to $1\frac{7}{8}$ " wide and place them at the back of the case to serve as temporary spacers, then install the drawers. Apply double-faced tape to each drawer front and press each false front onto a drawer, leaving a $\frac{1}{16}$ " gap at the top and side of the case. Push the drawer out of the case using the 1" access hole in the front apron and drive screws into the false fronts.

Note: We chose finger holes for opening the drawers to create a seamless, hidden look (and to avoid a knee knocker). If you'd prefer traditional pulls, drill the holes for them after attaching the false fronts.

TOP IT ALL OFF

- 1 Cut the lift support blocks (O) and uprights (P) to size. Create a left and right support assembly (O/P) by gluing the uprights to the underside of the support blocks, flush with the outside edge and centered front to back [Drawing 1].
- 2 Drill countersunk screw holes at each end of the support blocks (O) just beyond the uprights (P). Mount the lift mechanisms to the lift support assemblies (O/P) [Photo H] and glue and screw the assemblies to the case [Exploded View].
- 3 Glue up an oversize panel for the top (Q). After the glue dries, cut the top to size. See *Going Up* on page 41 for tips on how to lay out and drill four screw holes in the underside of the top for the lift mechanism [Exploded View, Photo I]. Raise the mechanism and attach the top with screws.
- 4 Remove the drawers, slides, top, and lift hardware for finishing. Finish-sand the drawers and all assemblies before applying a finish. We applied three coats of Sherwin-Williams dull rubbed lacquer, buffing lightly between coats with a 400-grit sanding sponge. After the finish dries, reinstall the hardware and add self-adhesive rubber bumpers to the top of the outer legs. Pop your favorite TV dinner into the oven and sit down while you wait for it to heat up. 🌲

**3 DRAWER****3a DRAWER BACK NOTCH**



H Clamp the lift mechanism to the lift support assembly (O/P) and drill holes for the mounting screws using a self-centering bit. Screw the mechanism to the support assembly.



I Lay out and drill pilot holes in the underside of the top (Q) for screws to attach the lift hardware, taking care to avoid drilling completely through the top.

PARTS LIST

PART	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A END PANELS	3/4"	19 1/2"	12 1/4"	CP	2
B UPPER PANEL	3/4"	18"	39 1/4"	CP	1
C APRONS	3/4"	4 3/4"	39 1/4"	CP	2
D BOTTOM PANEL	3/4"	19 1/2"	40"	CP	1
E STRETCHERS	3/4"	2"	40"	C	4
F INNER LEGS	3/4"	2"	17 1/4"	C	4
G OUTER LEGS	3/4"	2"	17 1/4"	C	4
H* END RAILS	3/4"	2"	23 1/2"	C	4
I CENTER DIVIDER	3/4"	19 1/2"	7 1/2"	CP	1
J BACK PANEL	1/4"	12"	39 1/4"	CP	1
K DRAWER FRONTS/BACKS	5/8"	6"	17 3/4"	M	4
L DRAWER SIDES	5/8"	6"	18"	M	4
M DRAWER BOTTOMS	1/4"	17 3/4"	17 1/4"	MP	2

PART	FINISHED SIZE			Matl.	Qty.
	T	W	L		
N DRAWER FALSE FRONTS	3/4"	11"	19 1/16"	CP	2
O LIFT SUPPORT BLOCKS	3/4"	3"	19 1/2"	C	2
P LIFT SUPPORT UPRIGHTS	3/4"	4"	18"	CP	2
Q* TOP	3/4"	25 1/2"	45"	EGC	1

*Parts initially cut oversize. See the instructions.

MATERIALS KEY: CP—cherry plywood, C—cherry, M—maple, MP—maple plywood, EGC—edge-glued cherry.

SUPPLIES: #8x1 1/4" panhead screws, #8x1 1/2" flathead screws, #10x5/8" panhead wood screws.

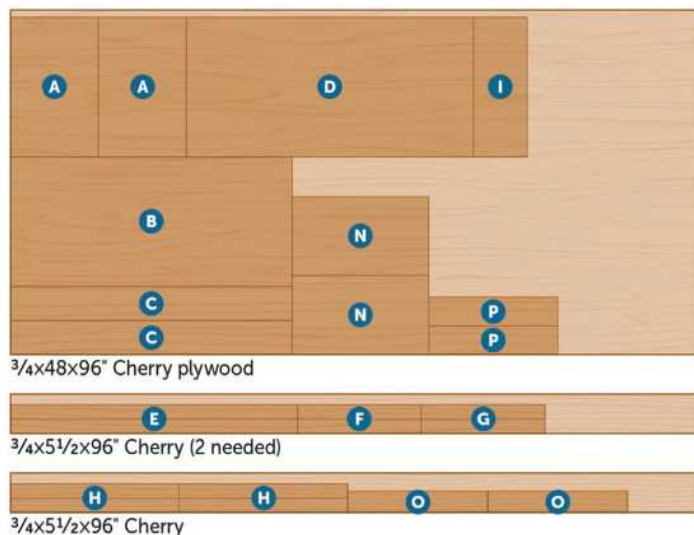
BLADE AND BITS: Dado blade, 1/4" and 1/2" straight router bits, 1" Forstner bit.

SOURCES: 18" undermount drawer slides (2 pairs) no. VLS2-U18-SC, \$20/pair, drawer mounting clips (2 pairs) no. VLS2-U-FBKT, \$3/pair, cabinetparts.com; table lift mechanism no. 651043030, \$164; 1/2" PVC round bumper pads, (pack of 24) no. 23199, \$5; 3/4" cherry edge banding (25 ft.) no. Band-It 34240, \$11, dkhardware.com.

PROJECT COST: It cost us about \$640 to build this project. Your cost will vary by region and source.

CUTTING DIAGRAM

We purchased 22 board feet of 4/4 cherry and 12 board feet of 4/4 maple. Before cutting parts to size, we planed them to the thicknesses shown in these example boards.



• SHOP TESTED •

TWEENER TABLESAWS

We tested six hybrid/contractor saws to see which one hits the sweet spot between jobsite and cabinet models.

WRITER: VINCE ANCONA
TESTER: STEVE FEENEY

A lot of woodworkers start off with a benchtop, or jobsite, tablesaw. They're capable cutters, but if you use lots of sheet goods or thicker hardwoods, chances are you'll soon be itching for an upgrade.

While cabinet saws continue to be the gold standard of woodworking, they come with steep price tags and high voltage demands. Another option is a contractor saw or a hybrid saw, see *A Tale of Three Saws*, page 48. Hitting the sweet spot between price and performance, these saws feature 10" blades, full-size tables, and integrated stands. They come equipped with beefier induction motors rated between 1.5 and 2 horsepower that are capable of more demanding cuts, while still plugging into a standard household 20-amp, 120-volt outlet.

To see how these saws perform, we put six to the test. We set a \$2,000 price limit because if you go much beyond this threshold, you're in cabinet-saw territory.

PHOTOGRAPHER: JACOB FOX

START WITH ASSEMBLY

We started our test by unpacking and assembling each saw. All of the saws came in two main boxes—one for the saw and one for the fence. Assembly involved mounting the extension wings, *bottom left* and *bottom right*, fence rails, and fence and, depending on the type of saw, bolting the stand together, *right*. It took from 60 to 90 minutes to assemble most of the saws.

The SawStop CNS175-PFA30 had the best assembly instructions of the group—three books plus two large posters that walk you through every step. Additionally, all the



Open stands on the Delta, *pictured*, and SawStop cut down on weight but aren't as effective at containing sawdust and noise.



The Grizzly G0771Z has a fully enclosed base, similar to cabinet saws. (Mobile base pictured is not included.)

hardware and parts were clearly labeled in separate packaging. On the other hand, we found the instructions for the Laguna F1 Fusion lacking. Pictures show the parts to be used, but none of the hardware bags were labeled. It took us two hours to assemble this saw.

After assembly, we checked the alignment of the blade with the miter gauge slots and the rip fence. All of the saws were accurate out of the box.



The Grizzly G0771Z is the only saw in our test to include cast-iron extension wings as standard equipment. Delta, Jet, and SawStop offer cast-iron wings as an optional upgrade at an additional cost.



All of the saws (except for the Grizzly G0771Z) feature stamped steel wings like those on the Jet, *pictured*. Steel wings cut down on weight but lack the vibration-dampening qualities of cast iron.



Even the most ham-fisted of woodworkers will find blade changes a breeze with SawStop's large blade opening. Two beefy, angled wrenches prevent knuckle busting as you loosen the arbor nut.



The Jet JPS-10, *pictured*, Laguna, and Delta use a single wrench and an arbor lock for blade changes. We found the arbor-lock system to be less convenient than a pair of wrenches.

THE IMPORTANCE OF POWER

Note: All of the saws except the Delta 36-5000T2 and the Jet JPS-10 can be wired to run on 240 volts. Jet also makes a 240-volt version of the JPS-10.

TIP!

Using a thin-kerf blade can prevent your saw from slowing down or stalling during taxing cuts.

Once all the saws were assembled, we put them to work. The most important feature of any saw is its cutting power. To test this in real world conditions, we ripcut and crosscut 4/4 and 8/4 red oak. To take the stock blades out of the equation, we equipped each saw with a new Diablo general-purpose blade. We rated the saws on how well they handled the cuts and the quality of the cut edge, see *Midrange Tablesaws*, page 53.

All of the saws were able to make 90° ripcuts and 45° bevel ripcuts in 4/4 stock without any major issues. Ripping 8/4 stock was another matter. The Jet JPS-10 and the Grizzly G0771Z stood out from the pack here, each powering through the thicker stock at a normal cutting rate. With the other saws, we had to slow our feed rate to avoid overtaxing the motor. This was especially noticeable with the Delta

and SawStop. With the Delta, we also experienced some burning along the cut edges, possibly due to the slower feed rate.

To really tax these saws' cutting power, we next equipped each with a 3/4" dado stack and cut 1/2"-deep dadoes in red oak. Such a cut is pushing the extremes of what we expected these saws to handle, but several passed the test without the need for multiple passes at a decreased depth. We had to back off the feed rate considerably to avoid bogging down the motors on the Delta, Grizzly G0962, Laguna, and SawStop. The SawStop actually stalled during some of the dado cuts.

The Laguna lists a 3/4" dado capacity, while the others in the test claim at least 13/16". We found that a 13/16" dado stack on the Delta left only two or three threads for the arbor nut, a setup we wouldn't recommend.

TIP!

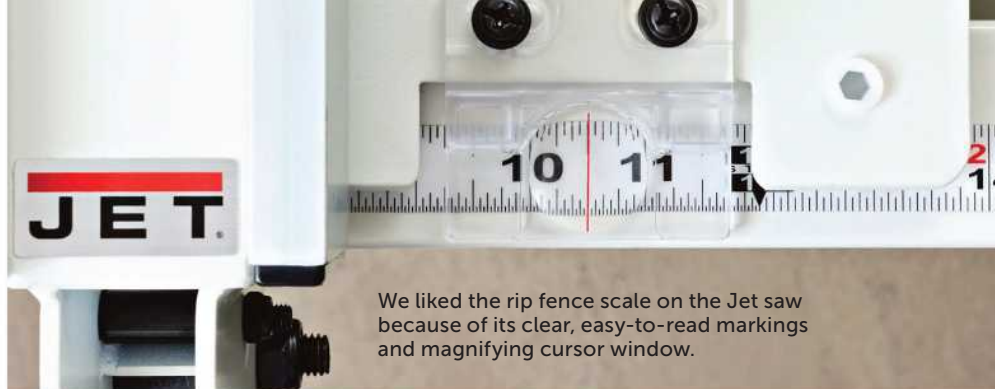
With saws of this class, a dedicated rip blade is a good investment if you rip thick stock on a regular basis.

A TALE OF THREE SAWS

If you were shopping for a tablesaw 30 years ago, you could choose a contractor saw or a cabinet saw. Contractor saws had open stands, table-mounted trunnions, and a motor hanging off the back of the saw with a V-belt to drive the saw arbor. Cabinet saws employ trunnion systems mounted directly to an enclosed base, with a motor tucked inside. Today's hybrid saws fall in between. They tuck their motors inside an enclosed base but usually have trunnions mounted to the underside of the table. Contractor and hybrid saws also use smaller motors than cabinet saws, generally between 1½- and 2-horsepower.



The SawStop saw is the only saw in our test that hangs its motor off the back. This configuration requires more space behind the saw but keeps the motor out of the dust.



We liked the rip fence scale on the Jet saw because of its clear, easy-to-read markings and magnifying cursor window.

RIP FENCE ROUNDUP

After power, we rank the rip fence as the second most important consideration when choosing a saw. A rip fence that fails to lock parallel to the blade requires measuring before every cut and easily leads to inaccurate results.

All the saws in our test were equipped with a T-square-style rip fence with a 30" capacity to the right of the blade and a scale and cursor to allow precise positioning of the fence, *above*. For an increased cost, the Delta, Grizzly G0771Z, Jet, and SawStop are also available with longer fence rails that increase the rip capacity to 50" or 52", allowing you to crosscut 8-foot plywood sheets in half. All of the saws except the Laguna allow using the fence on either side of the blade, *right*.



The Delta, Grizzly, and SawStop saws have dual cursors that provide easy measurements when using the rip fence on either side of the blade.



A flip-down extension on the Delta rip fence allows positioning the rip fence close to the blade for ripping thin strips without having to remove the blade guard.

All of the rip fences locked down firmly and repeatedly square, without deflection, which are the primary requirements of a rip fence. We particularly liked the smooth-sliding fences on the Jet, Laguna, and SawStop saws. These fences were easy to position. One minor annoyance with the Jet fence is that we had to move the handle until it was pointing straight down to get it to lock securely.

The Delta saw features a flip-down low fence to use when cutting thin materials like laminate or when ripping narrow strips where the blade guard would interfere with the standard fence, *left*. It's a good idea but, oddly, using this feature requires moving the fence to the left side of the blade.

MEET THE MITER GAUGES

The miter gauges included with these saws are basic, no-frills versions. They all have stops for making 90° and 45° cuts. The Delta and Grizzly miter gauges have additional stops for 30°, 60°, and 75° cuts. (The miter gauges for both Grizzly saws are identical.)

All of the saws feature T-shaped miter slots, but they will accept $\frac{3}{8} \times \frac{3}{4}$ " miter bars, meaning you can use upgraded aftermarket miter gauges if you choose. The miter gauges on the Delta, both Grizzly saws, and the SawStop use a washer on the end of the bar to fit in the T-slots, while the Jet and Laguna bars have flanges, *right*.

With the washer-style, you can remove the washer if you don't want to use the T-slots. This allows you to lift the miter gauge directly out of the slot instead of having to slide it out from the end.

The accuracy of a miter gauge depends on how well the bar fits the slots. Ideally, the bar should slide smoothly, without any side-to-side play. The Delta and Jet allow you to adjust the fit.

The miter gauges on the Delta, Jet, Laguna, and SawStop have slots or holes for attaching an auxiliary fence, something we do quite often in our shop. The Grizzly miter gauges lack this feature.



▲ Flanges along the edges of the Jet, *left*, and Laguna miter gauges fit in the miter gauge T-slots. Delta, Grizzly, and SawStop use an oversize washer, *right*, to retain the bar in the T-slots.



Laguna incorporates dust collection into the blade guard, which noticeably cut down the amount of above-the-table sawdust compared to other saws in our test. SawStop offers this feature as an optional accessory.

CLEARING THE AIR

All of the saws in our test have ports for connecting a dust collector or shop vacuum. But that doesn't mean they all perform the same. A shroud surrounds the blade beneath the tables of the Delta, Jet, Laguna, and SawStop saws to contain the sawdust so it can be evacuated by the dust collector. With the two Grizzly saws, any dust that isn't pulled into the dust collector falls to the bottom of the cabinet. Saws with a shroud seemed to handle dust collection better than those without one.

The Laguna is the only saw that collects sawdust from above the table as well as below, *left*. While the other saws all left at least some dust on top of the saw, the Laguna managed to capture nearly all the dust, making it the most efficient of our tested saws.

If you connect your dust collector to your saw each time you use it, the location of the dust port becomes important. Ports on the Delta, Grizzly G0771Z, and Laguna are on the side or back, making them easily accessible, *far left*. Connecting a hose to the other saws requires getting down onto the floor to reach underneath, *near left*.

While on the topic of dust collection, Delta deserves a shout-out for including a dust collector with its saw at no additional cost, *right*.



The Laguna, *pictured*, Delta, and Grizzly G0771Z locate the dust port on the side or back of the saw, making it easy to connect a dust collector as needed.



Saws with dust ports located on the bottom, like the Jet, *pictured*, SawStop, and Grizzly G0962 are more difficult to connect to a dust collector without a 90° elbow or a short connector hose.



Manufacturers like to stress the importance of using adequate dust collection, but Delta goes one step further by including a dust collector with its saw.

ONBOARD STORAGE

The Delta, Jet, and Laguna all offer convenient storage on the side of the saw for both the rip fence and miter gauge, as well as dedicated spots for accessories such as push sticks, insert plates, and wrenches, *right*. The SawStop is equipped with hooks for storing the rip fence and a couple of additional smaller hooks that can be used for the wrenches or riving knife. The Grizzly saws have the least amount of onboard storage—just a couple of small hooks for the wrenches.



Jet, pictured, Delta, and Laguna offer onboard storage for the rip fence, miter gauge, and accessories. The other saws offer fewer storage options. Note: Mobile base not included.

PLAYING IT SAFE

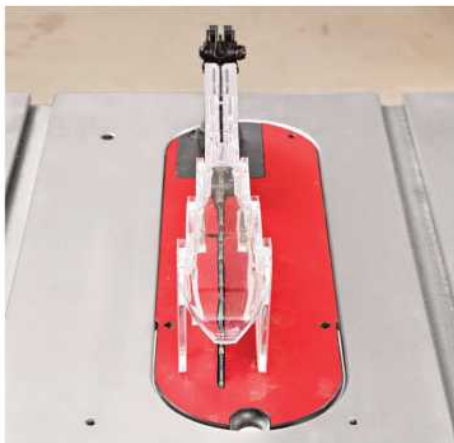
All of the saws come equipped with basic safety features required in the US: riving knives, anti-kickback pawls, and blade guards. The differences come down to how easy it is to install and remove the guard assemblies and the visibility of the blade with the guard in place. The Delta and Grizzly saws combine the riving knife, anti-kickback pawls, and guard into one unit. To make non-through cuts, you have to remove the guard and pawls from the riving knife. The Jet, Laguna, and SawStop saws include a separate riving knife that you swap out for the entire guard assembly when making non-through cuts. We prefer this arrangement rather than having to remove the guard from the riving knife and then reattach it afterward.

The guard on the SawStop provided the clearest view of the blade, *below left*, closely followed by the Jet and Laguna saws. The guards on both Grizzly saws

partially obstructed the view of the blade (which is one of the main reasons people tend not to use guards) *below, center*.

All of the saws have paddle-style safety switches that allow you to quickly turn off the saw by hitting the paddle, *below right*. The switches are all magnetic as well, so they automatically switch off in the event of a tripped circuit breaker or power outage while using the saw. This way, the saw won't start back up unexpectedly when the power is restored.

Of course, only the SawStop comes equipped with the company's proprietary flesh-sensing technology. If any part of your body accidentally contacts the blade while the saw is running, a cartridge below the saw table fires a brake to stop the blade within milliseconds, while at the same time dropping the blade below the table. For woodworkers who prioritize safety, this saw is in a class by itself.



A large, clear viewing window on the SawStop blade guard offers the best blade visibility of all the saws in our test, meaning you're more likely to use the guard.



The blade guards on both Grizzly saws obscure the blade, making it difficult to see where you're cutting unless you're standing directly in line with the blade.



All the saws have large, paddle-style magnetic power switches. The Jet and Laguna switches also have a motor overload reset button above the switch.



The insert plates on the Laguna, *pictured*, and Jet saws are made from cast metal and held in place with a locking knob. Leveling screws allow you to adjust the plate flush with the top of the saw.



Identical insert plates on the Grizzly G0962, *pictured*, and G0771Z are stamped from thin steel. Because the back of the blade slot is closed, you must remove the blade guard to remove the insert plate.

GET INTO THE INSERT PLATES

The insert plate that encloses the opening around the blade may seem like a minor factor. However, a plate that wobbles or doesn't fit flush with the table is more than just an annoyance; it can also be a safety hazard if your workpiece catches on the plate as you feed it through the saw. All the saws we tested have leveling screws that allow you to raise or lower the plate so it sits perfectly flush with the top.

The insert plate on the SawStop stood out among these saws. It's made of dense, flat phenolic and provides a zero-clearance opening around the blade, which minimizes tear-out. The plate also has a locking lever that holds it securely in place and makes removal easy.

The insert plates on the Jet, Laguna, and Delta saws are made from die-cast metal

and have slightly wider openings for the blade. They all have a clip or lock to hold the insert in place, *above left*.

The plates on both Grizzly saws were our least favorite. Made from stamped steel, they're thinner than the plates on the other saws, making it difficult to make your own zero-clearance inserts, *above right*.

If you plan to use a dado blade with your saw, you'll also need a separate dado insert plate. Both Grizzly saws come with one, but the one that arrived with the Grizzly G0962 was bent and we had to straighten it to sit flat in the saw's throat opening. For the other saws, you'll have to purchase dado inserts separately. And in the case of the SawStop, you also have to purchase a separate blade brake cartridge that's sized to fit smaller-diameter dado blades.



Three locking swivel casters arranged in a triangular layout allow the Grizzly G0962 to spin on a dime, making it easy to maneuver the saw in and out of tight spaces.

SAWS ON THE MOVE

The saws we tested all weigh between 195 and 286 pounds, so you won't be able to pick them up and move them around the shop like a jobsite saw. The Grizzly G0962 and the Delta come with casters that, once properly adjusted, allow you to roll the saw around the shop fairly easily, *left*. Laguna, SawStop, and Jet offer casters or mobile bases at an additional cost.

While the casters on the Delta and Grizzly are fine for occasional use, we found they had a tendency to pop out of position and drag when we moved the saws over long distances. If you're going to be rolling your saw out every time you use it, our advice is to ditch the casters and invest in a quality mobile base.

MIDRANGE TABLESAWS: FINDING THE SWEET SPOT

MODEL	PERFORMANCE RATINGS (1)										OVERALL DIMENSIONS, H×D×W	TABLETOP DIMENSIONS (INCLUDING WINGS)	MAXIMUM CROSSCUT (2)	RIP CAPACITY TO RIGHT OF BLADE	RIP CAPACITY TO LEFT OF BLADE	MAX. DEPTH OF CUT @ 90°	MAX. DEPTH OF CUT @ 45°	MOTOR HORSEPOWER	MITER GAUGE STOPS	INCLUDED ACCESSORIES (3)	WEIGHT (LBS)	PRICE (4)
	PRIMARY					SECONDARY																
	RIPPING 4/4 STOCK	RIPPING 8/4 STOCK	DADO CUTS	RIP FENCE ACCURACY/EASE OF USE	MITER GAUGE EASE OF USE	DUST COLLECTION	EFFECTIVENESS OF BLADE GUARD	THROAT INSERT PLATE	EASE OF CHANGING BLADES	EASE OF ASSEMBLY												
DELTA 36-5000T2	B+	B+	B+	A	B+	A-	B	B+	B-	A-	43×40×621/2"	27×50"	12"	30"	15"	31/8"	21/4"	1.75	9	A, B, C, P	198	\$1,599
GRIZZLY G0771Z	A	A	A	A-	A-	B+	B+	C	C+	A-	36×401/4×64"	27×401/2"	111/2"	30"	15"	31/4"	21/4"	2	9	A, D, P	286	\$1,275
GRIZZLY G0962	A	A-	B+	A-	A-	B	B+	C	C+	A-	36×401/2×64"	27×401/4"	111/2"	30"	15"	31/4"	21/4"	2	9	A, C, D, P	243	\$1,195
JET JPS-10	A	A	A	A	A	B	A-	A-	B+	A-	43×40×60"	27×44"	813/16"	30"	131/2"	31/8"	21/8"	1.75	3	A, P	236	\$1,828
LAGUNA F1 FUSION	A-	A-	B	A	A	A	A-	A-	B+	C+	38×393/4×651/2"	27×44"	813/16"	30"	0"	31/8"	21/8"	1.5	3	A, P	195	\$1,399
SAWSTOP CNS175-PFA30	A	B	B-	A	A	B-	A	A	A	A	343/4×401/2×613/4"	27×44"	105/8"	30"	12"	31/8"	21/4"	1.75	3	A, P, S	256	\$1,999

WHICH SAW IS A CUT ABOVE?

All of the tested saws deliver what we'd expect: more power, capacity, and capability than a benchtop or jobsite saw. But in our evaluation, two saws rise to the top. For all-around power and performance, we chose the Jet JPS-10 as our Top Tool. Despite a few minor quirks, it edged out the other saws in cutting power and overall operation.

Our Top Value award goes to the Grizzly G0771Z. While it lacks some of the bells and whistles of the other saws, its overall performance was nearly on par with the Jet, and it's priced significantly lower. 🌳

- A** Excellent
B Good
C Fair
D Poor
N/A Not applicable

- Measured from front of blade at maximum height to front edge of table.
- (A)** 10" general-purpose or rip blade
(B) Dust collector
(C) Casters
(D) Dado throat plate
(P) Push stick
(S) 10" blade brake cartridge
- Prices current at time of article production and do not include shipping, where applicable.



FOREVER STAMP BOX

Designed to be as long-lasting and reliable as the modern miracle of mail delivery, this simple lidded box is a fitting home for your valuable (\$0.78!) stamp collection.

WRITER/BUILDER: ZACHARY BROWN
DESIGNER: JOHN OLSON



OVERALL DIMENSIONS
4¼"W × 5"D × 1⅞"H

PHOTOGRAPHER: CARSON DOWNING; ILLUSTRATOR: CHRISTOPHER MILLS

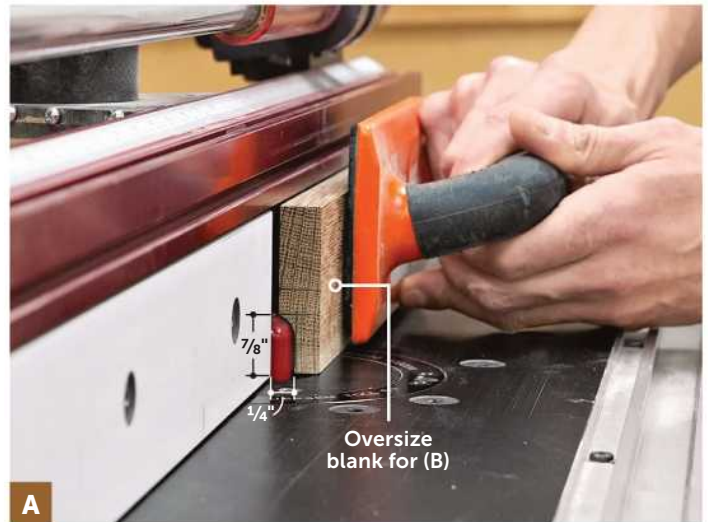
Inspired by an early 20th century stamp box by American Arts & Crafts furnituremaker Charles Rohlfs, this petite box is fun to build and perfect for good-looking offcuts from your scrap bin. (We chose a bit of quartersawn white oak.) Rohlfs's design used decorative wood pegs to reinforce the sides and hinge the lid; we opted for copper pins.

An included full-size pattern simplifies shaping the box sides, so you have more time for sorting out your stamp collection.

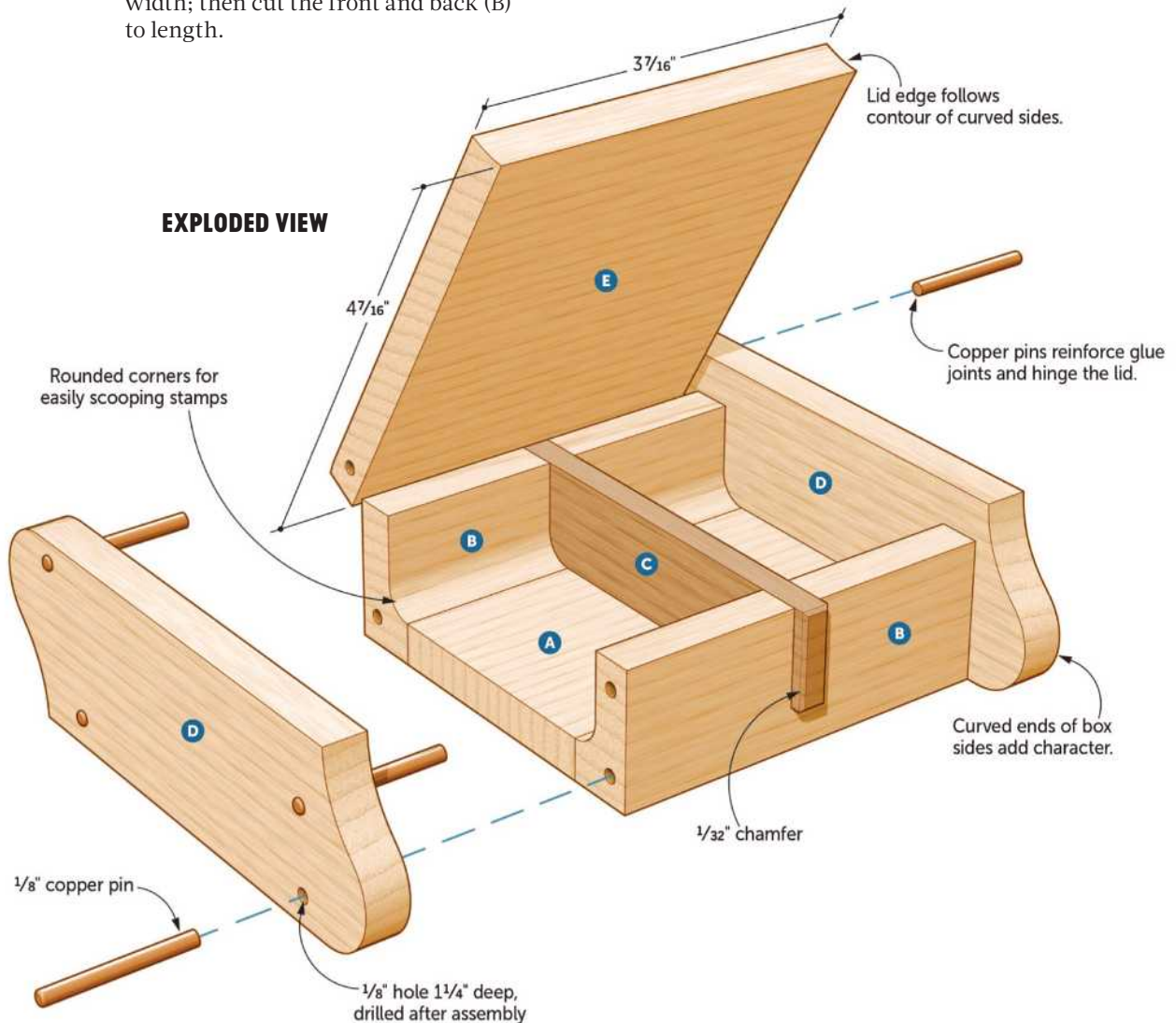
BODY BUILDING

1 From $\frac{3}{8}$ " stock, cut the bottom (A) to size [Parts List, Drawing 1]. To safely rout the interior profiles on the front and back (B), start with a 2×8" blank from $\frac{5}{8}$ " stock.

2 Rout the profile on the front/back blank [Photo A]. Ripcut the blank to width; then cut the front and back (B) to length.



A Install a $\frac{3}{8}$ "-radius roundnose bit in your router, set the bit height to $\frac{7}{8}$ ", and position the fence to rout a $\frac{1}{4}$ "-wide profile in your blank.

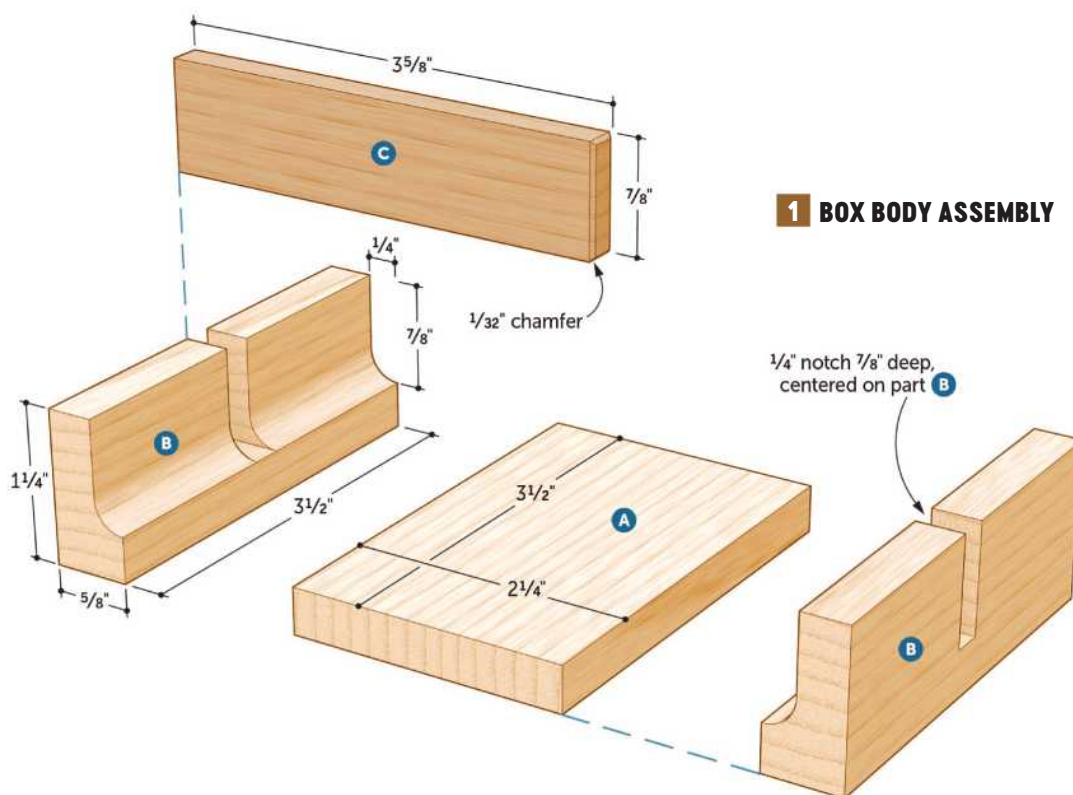




Line up and clamp a front/back (B) to cut one side of the notch. Add a stopblock and make the cut on both pieces. Adjust the stopblock and repeat to widen each notch.



Keep the sides (D) taped face to face after bandsawing the curved shape close to your layout lines while you finish shaping with a spindle sander or a dowel wrapped in sandpaper.



1 BOX BODY ASSEMBLY

3 Lay out the notch in the front and back for the divider (C). Install an auxiliary fence on your tablesaw miter gauge and set the blade to just under $\frac{7}{8}$ ". Cut the notches [Photo B]; then square up the bottom of each notch with a chisel. Glue and clamp the bottom (A) between the front and back.

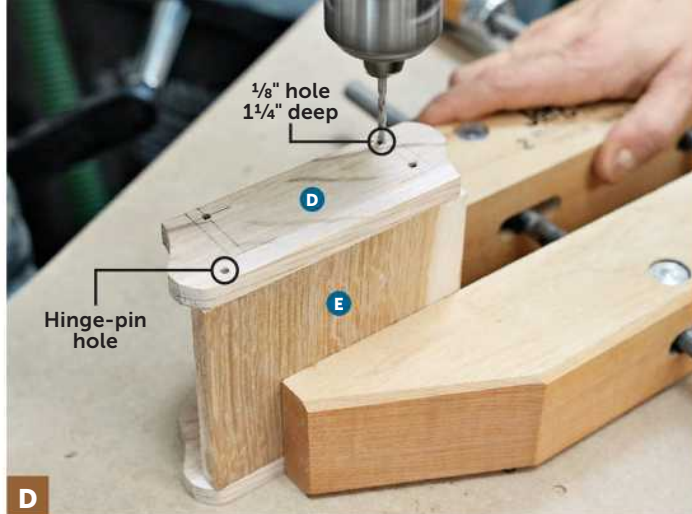
4 Plane stock to fit in the notches and cut the divider (C) to size [Parts List]. Finish-sand the divider and the interior of the box assembly (A/B), and sand a slight chamfer on the divider's front end. Glue and clamp the divider into the notches, flush with the back of the box.

5 From $\frac{3}{8}$ " stock, cut the sides (D) to width and slightly overlength [Parts List]. Use double-faced tape to secure the blanks in a stack with their edges flush. Lay out the shape on one face using the full-size pattern [Drawing 2]. Bandsaw and sand the side stack to shape [Photo C].

6 Make an alignment mark on the bottom edge of the stacked sides, $\frac{3}{8}$ " from the rear corner, for the box back (B) [Drawing 2]. Separate the sides, finish-sand their interior faces, and glue and clamp them to the box assembly, flush with the bottom and aligned with your marks.



Purchase plans for a low-cost drill-press drum sander at woodstore.net/drumsander

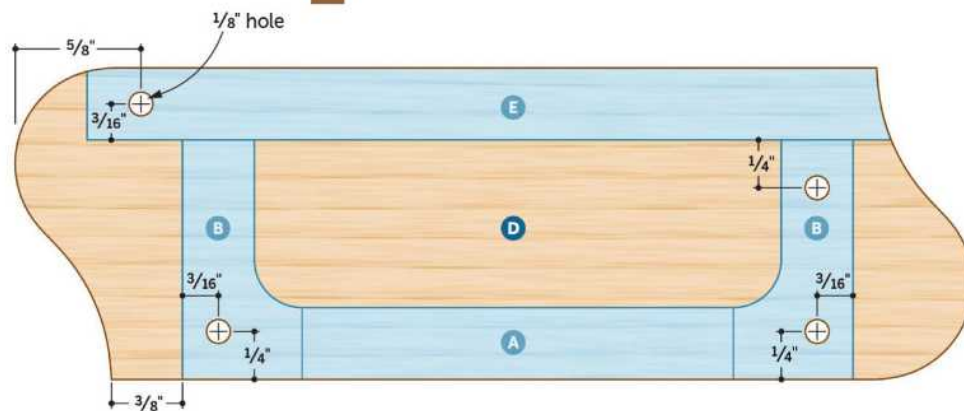


Install a $\frac{1}{8}$ " brad-point bit in your drill press. Clamp the lid (E) in place with a handscrew to stabilize the box while you drill four pin holes in each side (D), including one for the hinge pin.



Tape a $\frac{1}{4}$ " plywood handle to the box, shy of the front end. Hold the lid (E) closed while you sand its front edge flush with the sides (D). Alternatively, shape the lid with a sandpaper-wrapped dowel.

2 BOX SIDE FULL-SIZE PATTERN



LIFTING THE LID

1 Measure between the sides and cut the lid (E) for a snug fit [Exploded View]. Lay out the hole locations for the copper pins on both sides of the box [Drawing 2]. Position the lid in the box with the front lower edge flush with the sides (D). The upper edge will protrude for now. Drill the pin holes in the sides [Photo D].

2 Cut eight $\frac{1}{8}$ " copper pins to $1\frac{7}{16}$ " long, and sand or file chamfers on one end. Secure the lid in the box temporarily with hinge pins, leaving enough exposed to remove with pliers. Shape the front edge of the lid [Photo E]. Shape the rear edge with a block plane or sanding block.

3 Remove the hinge pins and trim the lid length by about $\frac{1}{16}$ " to create a slight reveal on each side. Finish-sand the lid.

4 Apply a small drop of cyanoacrylate (CA) glue into each hole in the lid, position it in the box, and drive in the hinge pins. Glue in the remaining pins; then cut and sand them all flush.

5 Finish-sand the box, easing sharp edges. Apply a finish to the exterior and interior. We wiped on a single coat of hard-wax oil. Once it cures, fill your box with stamps or other small keepsakes. 🌲

PARTS LIST

PART		FINISHED SIZE			Matl.	Qty.
		T	W	L		
A	BOTTOM	$\frac{3}{8}$ "	$2\frac{1}{4}$ "	$3\frac{1}{2}$ "	WO	1
B*	FRONT/BACK	$\frac{5}{8}$ "	$1\frac{1}{4}$ "	$3\frac{1}{2}$ "	WO	2
C	DIVIDER	$\frac{1}{4}$ "	$\frac{7}{8}$ "	$3\frac{5}{8}$ "	WO	1
D*	SIDES	$\frac{3}{8}$ "	$1\frac{5}{8}$ "	5"	WO	2
E*	LID	$\frac{3}{8}$ "	$4\frac{7}{16}$ "	$3\frac{7}{16}$ "	WO	1

*Parts initially cut oversize. See the instructions.

MATERIALS KEY: WO—white oak.

BITS: $\frac{3}{8}$ "-radius roundnose router bit (Freud 18-122 or similar), $\frac{1}{8}$ " brad-point drill bit.

SOURCE: $\frac{1}{8}$ "x12" copper rod no. 8966K71, \$4, mcmaster.com.

PROJECT COST: It cost us about \$5 to build this project, plus a few white oak scraps. Your cost will vary by region and source.



RAISE-THE-ROOF CABOOSE

No car captures the romance of the railroad quite like a caboose. Long gone in real life, this one will stir up memories of seeing the last train car roll by.

WRITER: CRAIG RUEGSEGGER
DESIGNER/BUILDER: JOHN OLSON

Before being replaced by small electronic boxes, cabooses served as a lookout post for the crew to monitor train cars for potential problems, as an office for the conductor, and even as rudimentary living quarters.

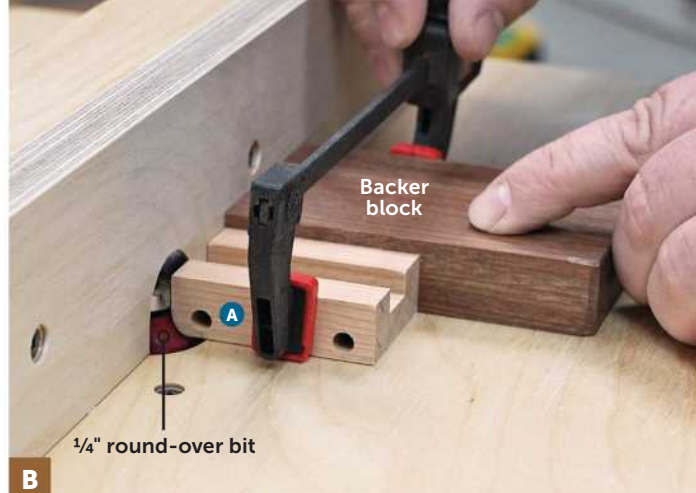
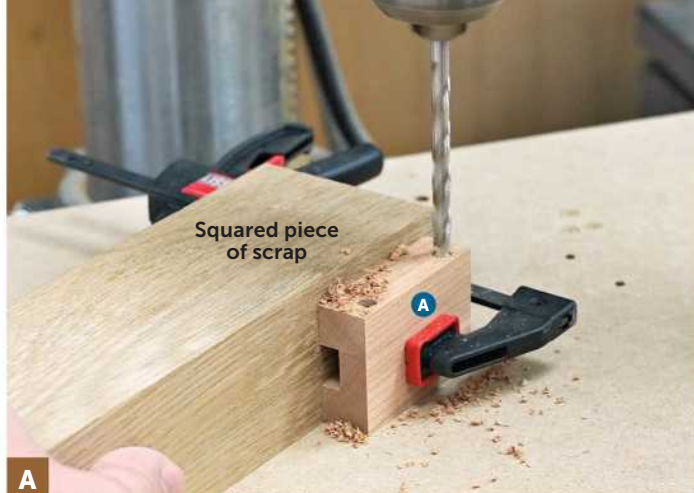
Lift off the roof of this caboose to reveal the ladders leading to seating in the expanded-vision cupola and the stove for heat and perhaps

warming a pot of coffee. As always, we've collected the specialty parts such as wheels, axle pegs, and more into a kit [\[Source\]](#). And to address the implied question: Yes, the caboose signals the end of the line for our selection of rolling stock on the Timber Line Express. But that shouldn't stop you from creating your own cars. See the *next page* for details.



OVERALL DIMENSIONS
3¼"W × 9¾"D × 4⅞"H

PHOTOGRAPHER: CARSON DOWNING; ILLUSTRATOR: CHRISTOPHER MILLS



Clamp each truck frame (A) to a larger block to steady it while drilling the holes for the axle pegs. Use a brad-point bit to place the holes accurately.

Clamp each truck frame (A) and side frame (B) to a backer block to steady it against the router-table fence and to prevent tear-out on the back edge of the workpiece.

STILL TRUCKING

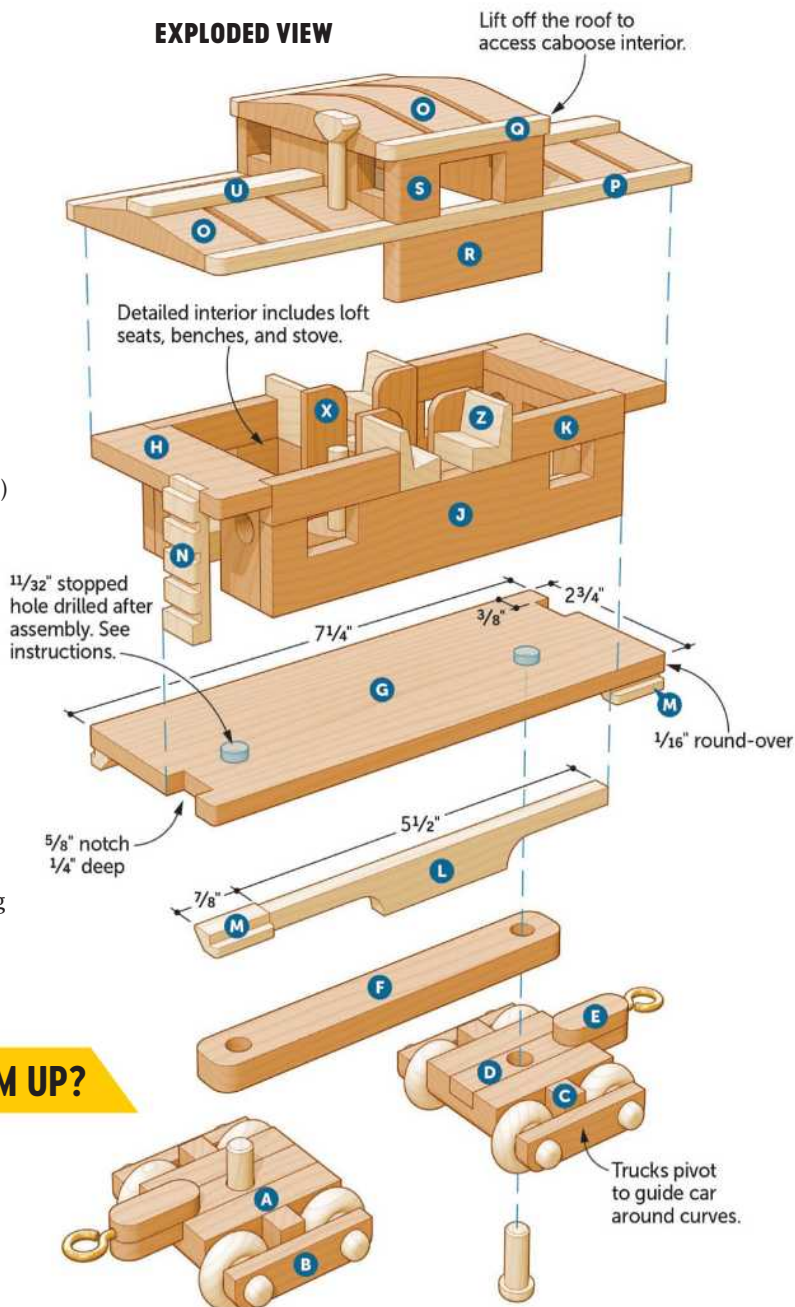
The caboose truck assemblies are essentially the same as the trucks used on most of the other Timber Line Express rolling stock. However, the caboose has identical trucks at either end, each with an eye screw rather than one with a dowel to connect cars. After all, nothing gets connected behind a caboose. The trucks pivot on pegs to allow navigating curves in the track.

1 Cut the truck frames and truck side frames (A, B) to size [Parts List, Drawing 1]. Form the centered $\frac{1}{2}$ " groove on the top of each truck frame (A) [Drawing 2]. Drill $\frac{7}{32}$ " holes $\frac{1}{2}$ " deep in the edges of each truck frame and through the faces of the side frames [Photo A]. Round over the lower ends of the frames [Photo B].

2 Cut the spring groups (C) to size and glue the $\frac{3}{8}$ "-wide face to the side of each truck frame (A), centered front to back and flush at the top and bottom [Drawing 2].

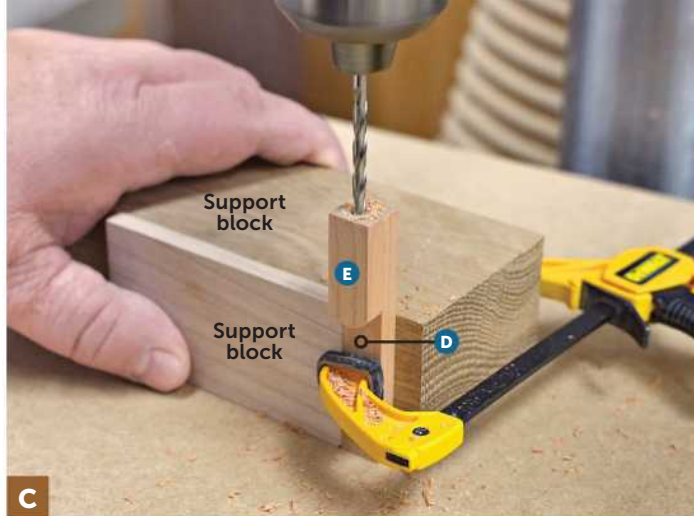
3 Cut the tongues (D) and tongue extensions (E) to size [Drawing 2]. Round over both corners on the inner end of each tongue extension (E), leaving the outer end square for now.

EXPLODED VIEW

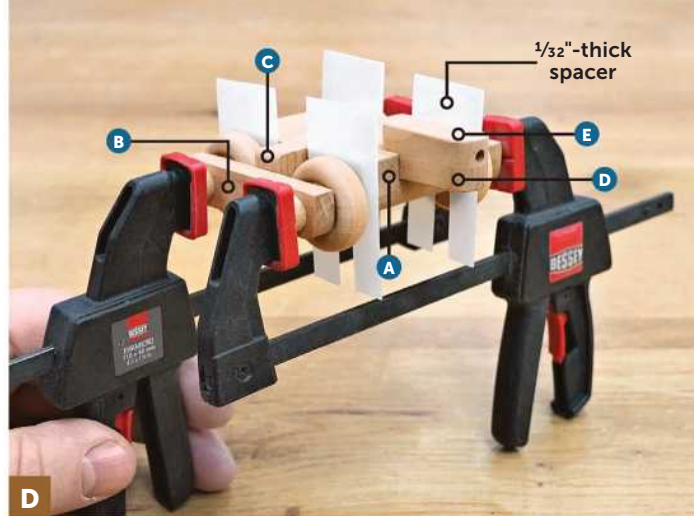


WHAT KIND OF TRAIN CAR CAN YOU DREAM UP?

Car hauler? Circus train? Flatcar? Rail maintenance? Build a set of standard trucks, adjust the length of the frame rail (F), and create what you want on top. Use our design-your-own-car kit, no. RS-01380E (\$10, woodstore.net/dreamcar), then send us photos at woodmail@woodmagazine.com.



C Before drilling the pilot hole for the eye screw, support the tongue assembly (D/E) with a pair of scrapwood support blocks to hold it perpendicular to the table.



D The parts kit [Source] includes plastic material to use as spacers when assembling the trucks. (You can cut your own from plastic detergent bottles.) Notch the plastic to fit around the axle pegs.

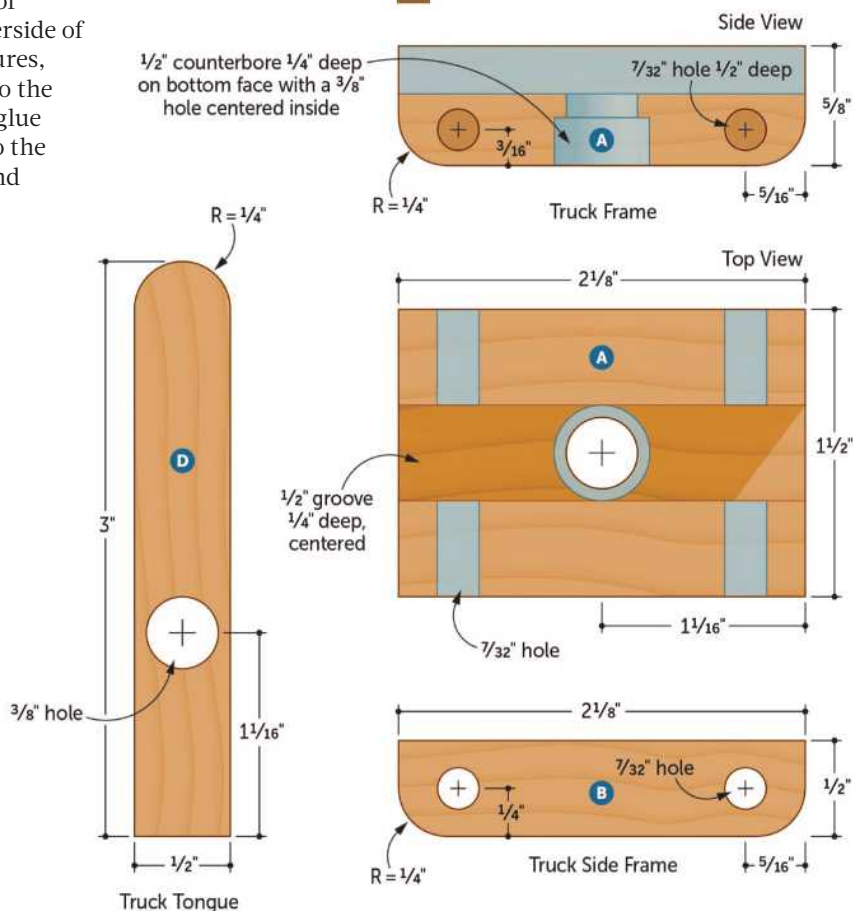
4 Glue and clamp a tongue extension (E) to the top of each tongue (D), flush at the outer end. Once the glue dries, drill the $\frac{9}{64}$ " hole in the outer end of each tongue extension [Drawing 2, Photo C]. Round over the drilled end.

5 Glue the tongue assemblies (D/E) into the grooves in the truck frames (A), flush at one end [Drawing 2].

6 Next, glue a $\frac{7}{32}$ " axle peg into each hole in the truck side frames (B) [Drawing 2] using a few drops of cyanoacrylate glue on the underside of the peg heads. Once the glue cures, slip the wheels and spacers onto the axle pegs [Photo D]. Use wood glue to glue the ends of the pegs into the holes in the truck frames (A) and the side frame (B) to the spring groups (C) [Drawing 2].

7 To form a recess for the truck connector pins, use a $\frac{1}{2}$ " Forstner bit to drill a counterbore $\frac{1}{4}$ " deep, centered on the bottom face of each truck frame (A) [Drawing 1]. Then drill a $\frac{3}{8}$ " hole through each truck assembly, centered in that counterbore. Install an eye screw in the tongue extension (E) in each truck [Drawing 2]. Finish-sand the trucks.

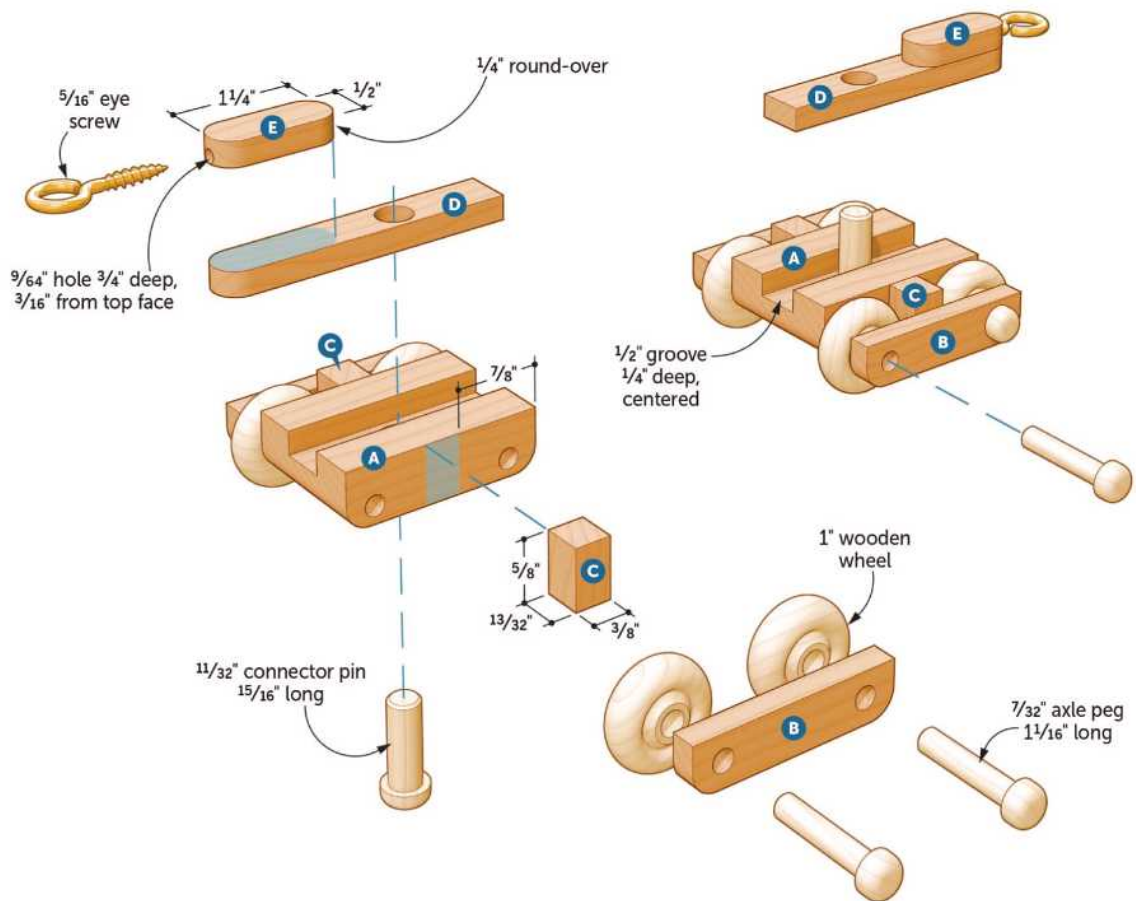
1 TRUCK PARTS

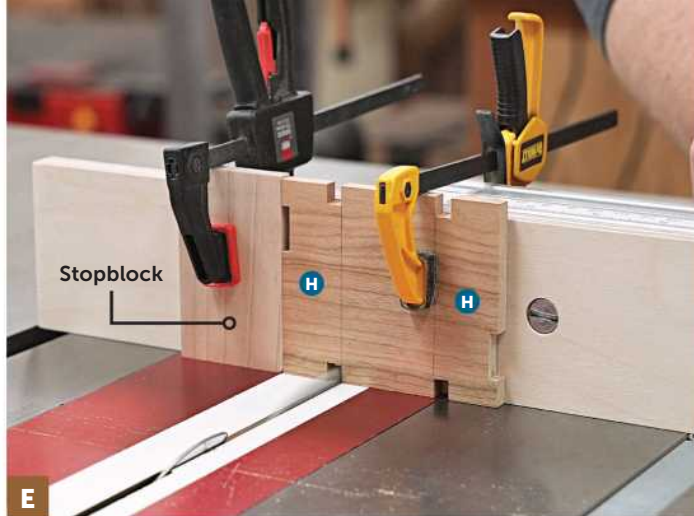


“
CABOOSES CAME INTO USE
AROUND 1863 AND LASTED
THROUGH THE 1980S, WHEN
THEY WERE REPLACED BY
ELECTRONIC END-OF-TRAIN
DEVICES THAT ARE CHEAPER
TO OPERATE THAN A
CABOOSE AND ITS CREW.
”

-JOHN OLSON, DESIGN EDITOR

2 TRUCK ASSEMBLIES





To position the notches in the headliners (H), attach a stopblock to your auxiliary miter-gauge fence. Make the first cut for all four notches, then reposition the stopblock to widen the notches.



Use a stopblock clamped to your auxiliary miter-gauge fence to establish the edges of the doorway on each end of the ends (I) blank. Then make additional cuts to remove the waste between them.

CRAFT THE CABIN

To create identical headliners and ends for the cabin, you'll cut oversized blanks, then use your miter gauge and a stopblock, *above*, to form identical notches on each end before cutting the parts to size from the blanks. But first you'll notch and assemble the structure that supports the walls.

1 Cut the frame rail (F) to size and rout a $\frac{1}{4}$ " round-over on each corner [Parts List, Drawing 3]. Mark the centerpoints for the $\frac{11}{32}$ " holes on the bottom face of the frame rail, but don't drill them yet.

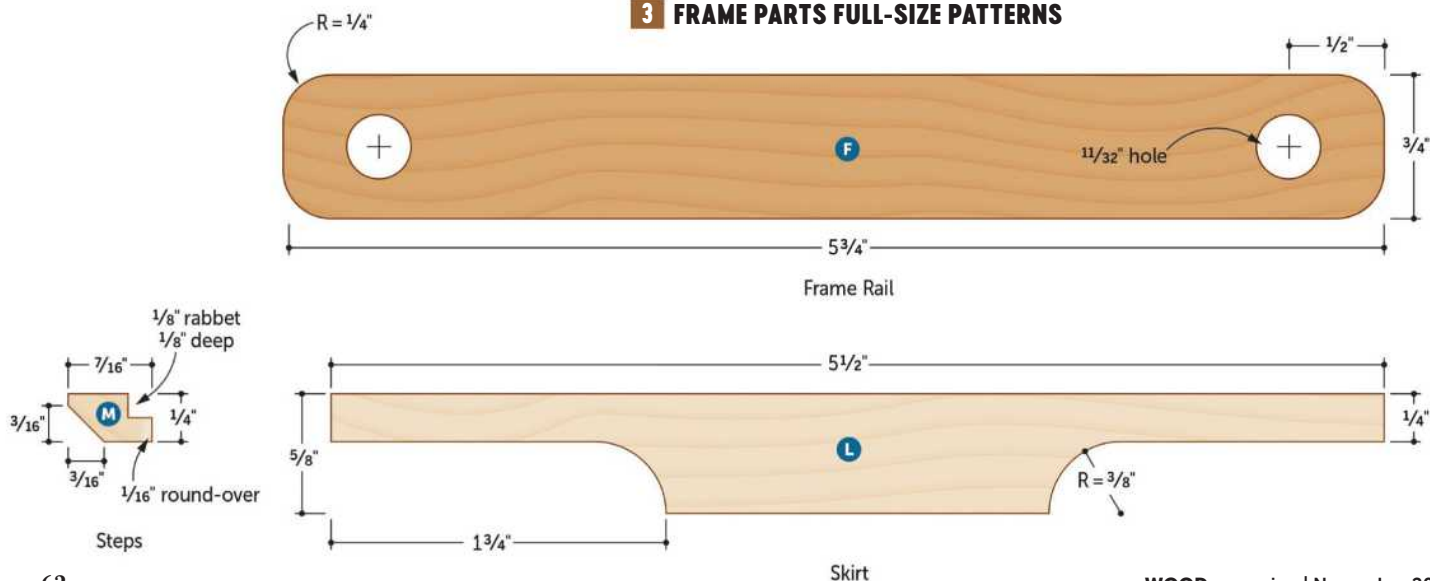
2 From $\frac{1}{4}$ " cherry, cut the platform (G) to size, then cut a $\frac{5}{8}$ "-wide notch $\frac{1}{4}$ " deep at each end to accept the ladder later [Exploded View]. Dry-fit the frame rail (F), centered, on the underside

of the platform and mark its location. Apply glue to the frame rail and glue it in place. After the glue dries, drill the $\frac{11}{32}$ " holes $\frac{1}{2}$ " deep.

3 Cut a $\frac{1}{4} \times 2\frac{3}{4} \times 3\frac{1}{2}$ " cherry blank for the headliners (H). Cut a $\frac{5}{8}$ "-wide notch $\frac{1}{8}$ " deep on each end of the blank to accept the ladders and cut the $\frac{1}{4} \times \frac{1}{4}$ " notches that will later accept the headers (K) [Drawing 4, Photo E]. Then crosscut the headliners to length from the blank.

4 From $\frac{1}{4}$ " cherry, cut a $2\frac{1}{4} \times 3\frac{1}{2}$ " blank for the ends (I). Drill the portholes in each end [Drawing 4a], then cut out the doorways [Photo F]. Crosscut the ends to length from the blank. Glue a headliner (H) to each end (I) [Drawing 4].

3 FRAME PARTS FULL-SIZE PATTERNS



5 Cut the sidewalls (J) and headers (K) to size [Drawing 4]. Notch the sidewalls to create window openings, then glue two headers to the edge of each sidewall, flush at the ends.

TIP!

Use a piece of straight scrap to align the ladder notches in the cabin (H-K) and platform (F/G) during glue-up.

6 Glue and clamp the headliner assemblies (H/I) between the sidewall assemblies (J/K). Check carefully for square. After the glue dries, glue this assembly to the platform assembly (F/G), centered on its length [Exploded View].

7 From $\frac{1}{4}$ " maple, cut the skirts (L) to size [Drawing 3]. Mark out the wheel openings, then bandsaw and sand the skirts to shape. Glue the skirts to the underside of the platform (G), inset $\frac{1}{8}$ " from the edges and centered on the platform's length.

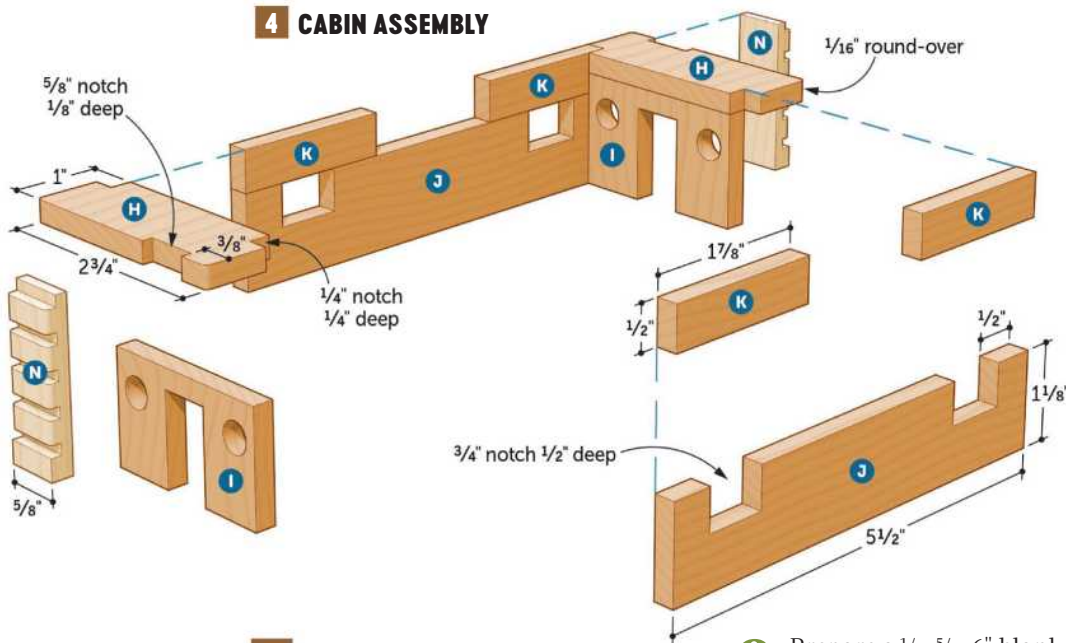
8 To make the steps (M), prepare a $\frac{1}{4} \times \frac{7}{16} \times 6$ " maple blank. At your router table, rout a $\frac{3}{16}$ " chamfer along one edge. Then rout a $\frac{1}{8} \times \frac{1}{8}$ " rabbet on the opposite corner to complete the profile



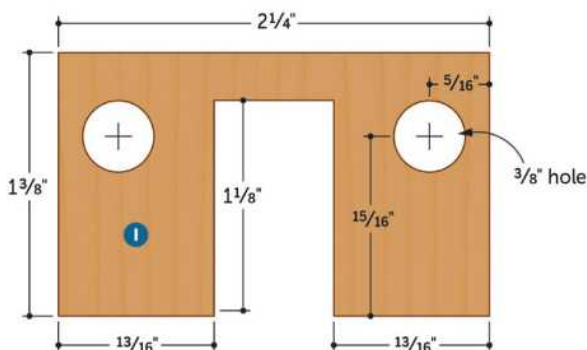
Use a push pad to guide the steps (M) blank past the router bit. If your router table has adjustable fence faces, move them as close to the bit as possible to keep the blank stable.

[Drawing 3, Photo G]. Crosscut four steps from the blank. Round the outer corners of each with a sanding block, then glue the steps to the platform (G) against the ends of the skirts (L) [Exploded View].

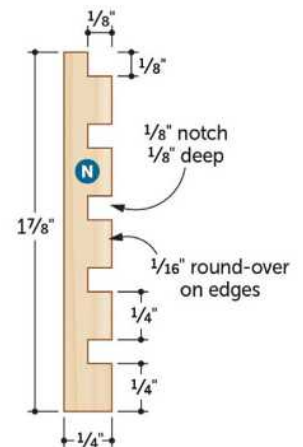
4 CABIN ASSEMBLY



4a END DETAIL



4b END LADDER



9 Prepare a $\frac{1}{4} \times \frac{5}{8} \times 6$ " blank for the end ladders (N). Working from each end of the blank, mark the locations of the rungs along the edge to make two ladders [Drawing 4b]. Cut a $\frac{1}{8}$ "-deep kerf at each location, then crosscut the ladders to length. Finish-sand the ladders, rounding the outside edges slightly. Glue the ladders in place.

10 Finish-sand the cabin assembly to 180-grit. Round over the corners of the platform (G) and headliners (H) to match the steps (M), then ease any sharp corners.

RAISE THE ROOF

The roof is a self-contained assembly that rests on the caboose walls, allowing you to remove it to show off the interior.

1 Cut two $\frac{3}{8} \times 2\frac{3}{4} \times 6$ " cherry blanks for the roof panels (O). At the bandsaw, bevel-rip both edges at 9° , leaving a flat ridge down the middle [Drawing 5a], then sand the bevels smooth. At the tablesaw, cut the $\frac{1}{16}$ "-deep kerfs for the roof ribs [Drawing 5, Photo H]. Cut three roof panels to finished length.

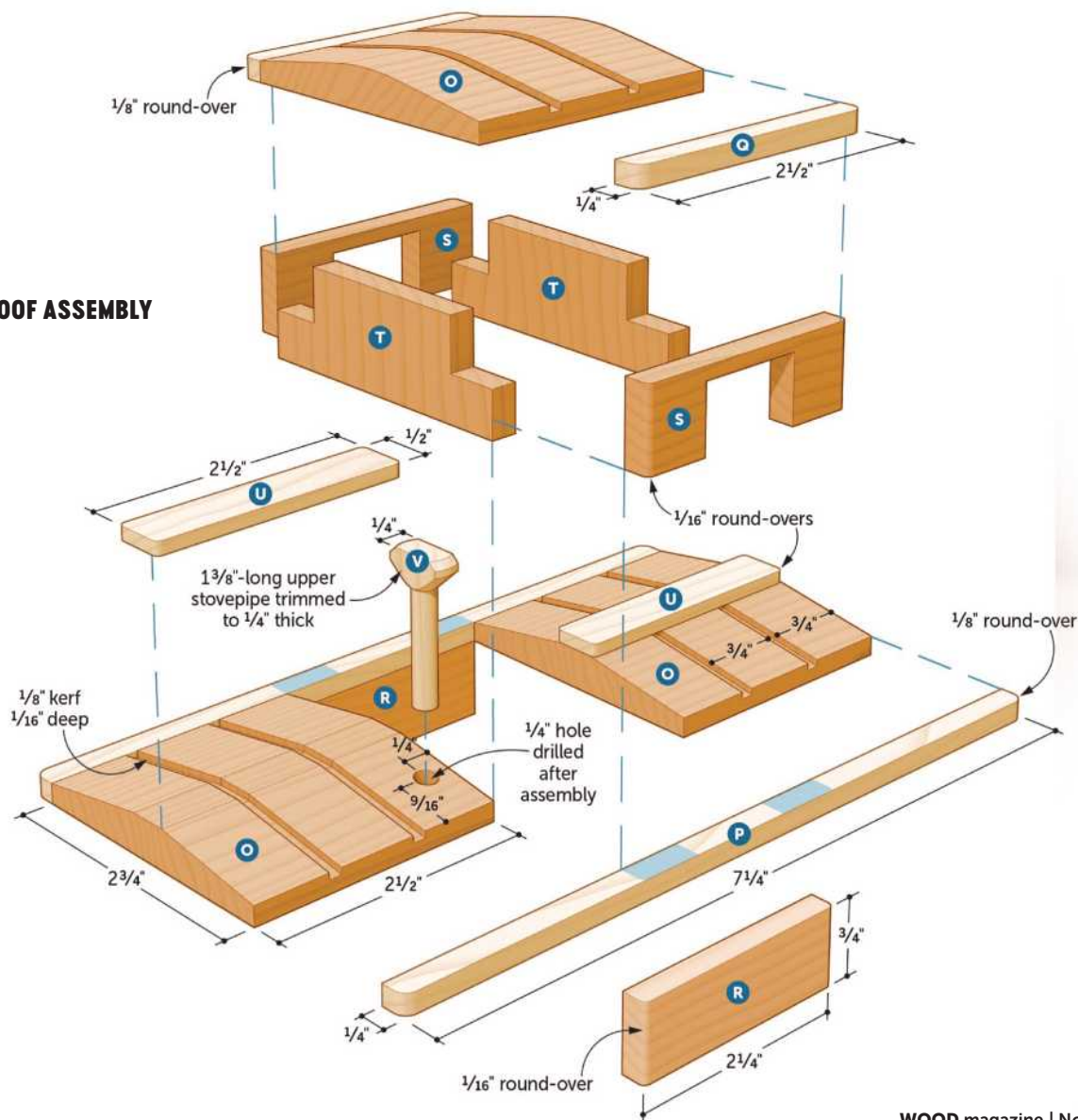
2 From $\frac{3}{16}$ "-thick maple, cut the long and short edging (P, Q) to size [Drawing 5]. Glue two roof panels (O) between the long edgings, flush at the ends. Glue the short edgings to the third roof panel. After the glue dries, sand round-overs on the corners of the edging and gently round the flat center area on the center roof panel only.



H

Position a stopblock to cut each kerf. Press one beveled face to the saw table and make a cut, then press the other bevel to the saw table and repeat. Make a third pass with the center section pressed flat.

5 ROOF ASSEMBLY



Note: Cut the R/S blank length to match the length of the opening between the roof panels (O). Size the width of the cupola front/back (T) blank to fit between the long edgings (P).

Note: Make sure the top of the front and back (T) align with the top of the window frames (S).

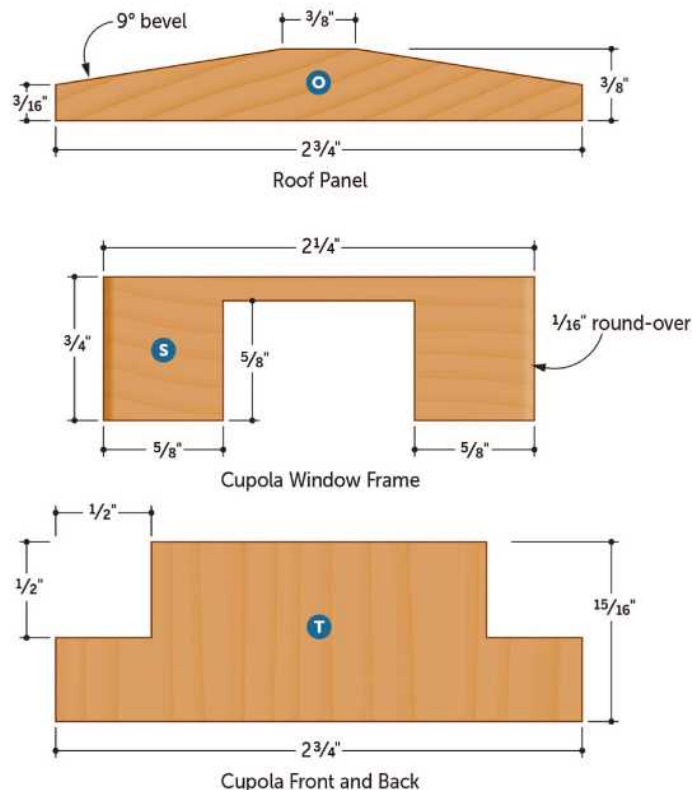
3 From $\frac{1}{4}$ " cherry, cut a $3\frac{1}{2} \times 2\frac{1}{4}$ " blank for the cupola sides (R) and window frames (S), and a $2\frac{3}{4} \times 3$ " blank for the front and back (T). To create window openings, notch the edges of the R/S blank and the ends of the front and back blank [Drawing 5a]. Then rip the sides and window frames to width and crosscut the front and back to length.

4 Glue the cupola window frames (S) to the top of the long edging (P) [Drawing 5]. After the glue dries, glue the cupola front and back (T) to the outer roof panels (O). Let the glue dry, then glue the cupola sides (R) to the underside of the long edging (P), aligned with the window frames above. Then glue the center roof assembly (O/Q) to the top of the cupola, centered.

5 From $\frac{1}{8}$ "-thick maple, cut the catwalks (U) to size. Round the corners with a sanding block, then glue the catwalks to the tops of the two outside roof panels, centered from side to side [Drawing 5].

6 To make the upper stovepipe (V), retrieve the stovepipe included in the parts kit [Source]. Sand opposite sides of the bell until they are flat and flush with the diameter of the dowel [Drawing 5]. Drill the $\frac{1}{4}$ " hole to accept the stovepipe but don't glue it in yet.

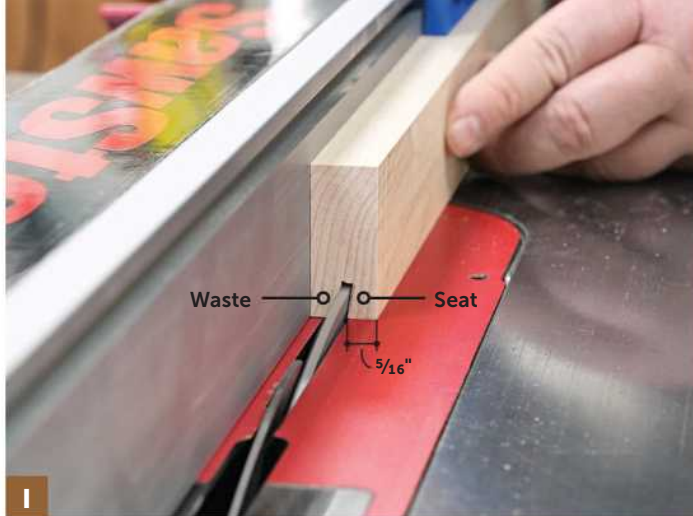
5a CUPOLA DETAILS



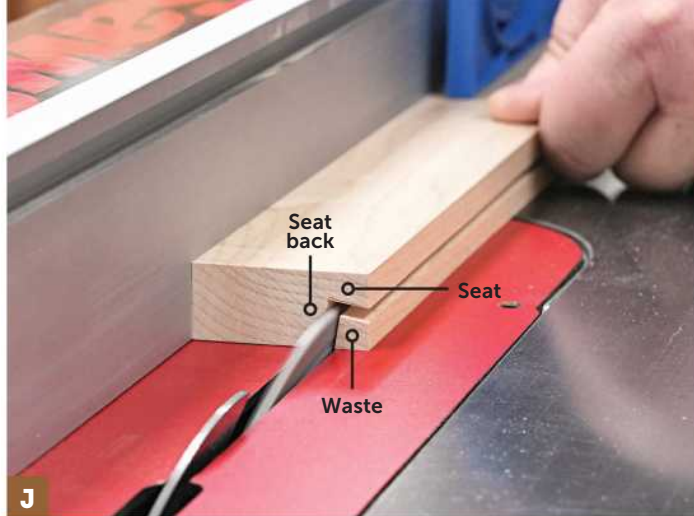
“
AN EXPANDED-VISION
CUPOLA BUMPS OUT AT
THE SIDES, ALLOWING
THE CREW TO SEE BOTH
ABOVE AND TO THE
SIDES OF THE TRAIN.

-JOHN OLSON, DESIGN EDITOR

”



Tilt the tablesaw blade to 10° and raise it so the highest point is not quite $\frac{7}{16}$ " above the table. Position the rip fence to cut a $\frac{5}{16}$ "-thick seat at the thickest portion.



Leave the blade at 10°. Reposition the rip fence and adjust the blade height so the cut for the seat back just intersects the first cut. You can raise the blade slightly to clean out the corner or use a chisel.

DETAIL THE INTERIOR

1 Cut the loft bases (W) and loft sides (X) to size [Drawing 6]. Rout a $\frac{1}{4}$ " round-over on one corner of each loft side, then glue a loft side flush with each end of each loft base.

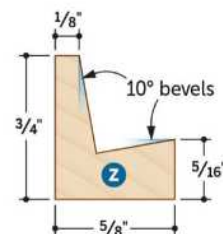
2 For the loft ladders (Y), cut a $\frac{1}{4} \times \frac{1}{2} \times 6$ " maple blank. Lay out and cut the rungs as you did for the end ladders (N) [Drawing 6b], then crosscut the ladders to length. Sand round-overs on the outer edges of each ladder, then glue them into place.

3 Test-fit the loft assemblies (W–Y) inside the cupola and cabin. Trim the lofts if needed. Then glue them to the sidewalls (J) and platform (G).

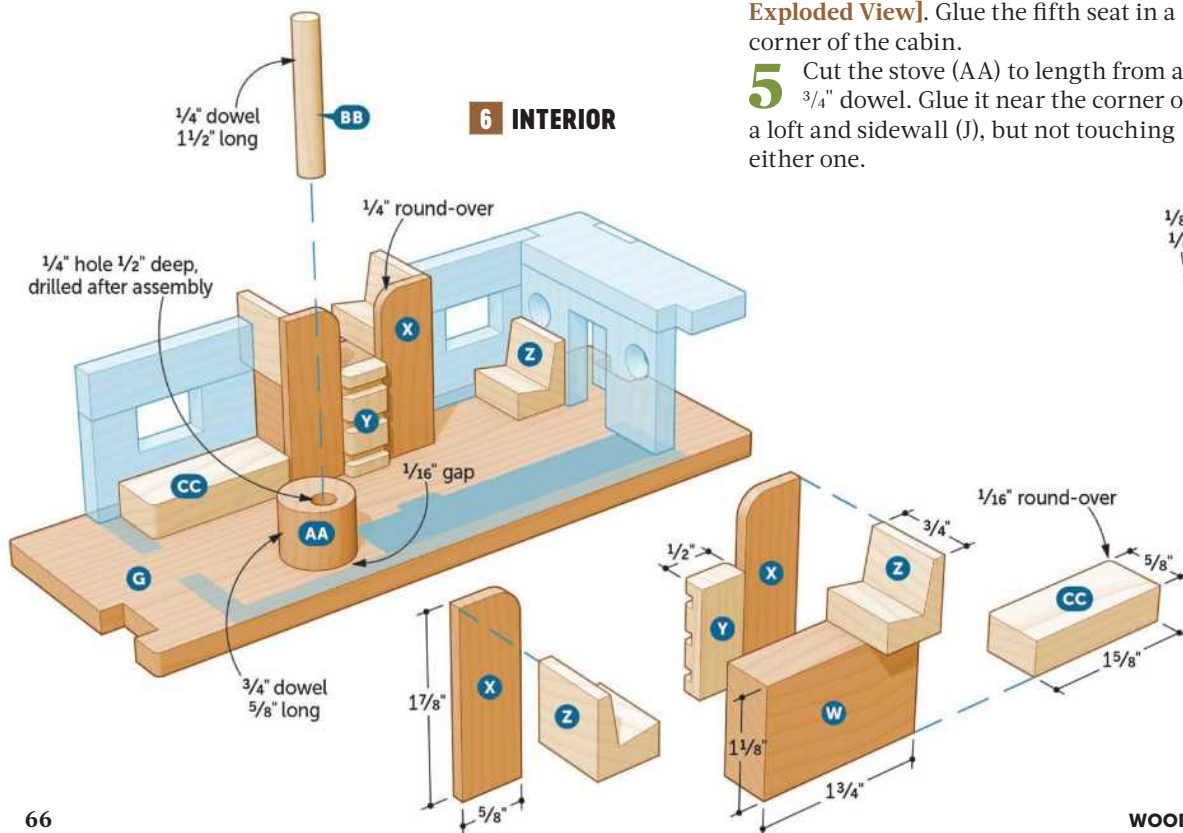
4 For the seats (Z), prepare a $\frac{3}{4} \times 3 \times 12$ " maple blank. Tilt your tablesaw blade to 10° and cut the angled rabbet on the edge of the blank to match the seat shape [Drawing 6a, Photos I and J]. Return the blade to 90° and rip the seat strip from the blank [Photo K]. Crosscut the seats to length and glue two in each loft flush with the outside faces of the sidewalls (J) and headers (K) [Drawing 6, Exploded View]. Glue the fifth seat in a corner of the cabin.

5 Cut the stove (AA) to length from a $\frac{3}{4}$ " dowel. Glue it near the corner of a loft and sidewall (J), but not touching either one.

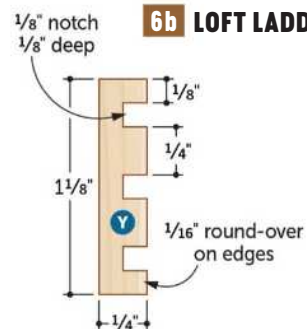
6a SEAT DETAIL



6 INTERIOR



6b LOFT LADDER





Return the blade back to 90° and raise it to cut through the thickness of the blank. Reposition the fence to rip a 5/8"-wide seat blank to the outside face of the blade.



Insert a 1/4" brad-point bit through the hole in the roof until it contacts the stove (AA). Keep the bit vertical and give it a light tap to mark the stove for drilling for the lower stovepipe (BB).

6 Place the roof assembly on the cabin and mark the lower stovepipe (BB) location on the stove [Photo L]. Remove the roof and drill a 1/4" hole 1/2" deep in the stove where marked. Cut the lower stovepipe to length from a 1/4" dowel and glue it into the hole in the stove. Glue the upper stovepipe (V) into the hole in the roof, flush with the bottom face [Drawing 5].

7 Cut the benches (CC) to size and ease the outside corners with sandpaper. Glue the benches to the platform (G) in opposite corners [Drawing 6].

PARTS LIST

PART		FINISHED SIZE			Matl.	Qty.
		T	W	L		
A	TRUCK FRAMES	5/8"	1½"	2¼"	C	2
B	TRUCK SIDE FRAMES	¼"	½"	2⅛"	C	4
C	SPRING GROUPS	⅜"	1⅜"	⅝"	C	4
D	TONGUES	¼"	½"	3"	C	2
E	TONGUE EXTENSIONS	¼"	½"	1¼"	C	2
F	FRAME RAIL	⅜"	¾"	5¾"	C	1
G	PLATFORM	¼"	2¾"	7¼"	C	1
H*	HEADLINERS	¼"	2¾"	1"	C	2
I*	ENDS	¼"	2¼"	1⅜"	C	2
J	SIDEWALLS	¼"	1⅛"	5½"	C	2
K	HEADERS	¼"	½"	1⅞"	C	4
L	SKIRTS	¼"	⅝"	5½"	M	2
M*	STEPS	¼"	7/16"	7/8"	M	4
N*	END LADDERS	¼"	⅝"	1⅞"	M	2
O*	ROOF PANELS	⅜"	2¾"	2½"	C	3
P	LONG EDGING	3/16"	¼"	7¼"	M	2
Q	SHORT EDGING	3/16"	¼"	2½"	M	2
R*	CUPOLA SIDES	¼"	¾"	2¼"	C	2
S*	CUPOLA WINDOW FRAMES	¼"	¾"	2¼"	C	2
T*	CUPOLA FRONT/BACK	¼"	2¾"	1⅝"	C	2

BRING IT INTO THE YARD

1 Separate the roof from the cabin. Touch up any areas that need finish-sanding. Apply a finish to the cabin assembly, roof assembly, and trucks. We sprayed on three coats of aerosol satin lacquer, buffing between coats with 0000 steel wool.

2 Cut two 11/32" connector pins to hold the trucks to the frame rail (F) without bottoming out in the holes [Drawing 2]. Place a couple drops of glue into the frame rail holes, then press the connector pins through each truck and into the holes. Make sure no glue gets on the trucks so that they will turn freely. Leave the assembly upside down while the glue dries.

3 Place the roof on the cabin, hook the caboose to the last car in your Timber Line Express, and signal the engineer it's time to roll. All aboard! 🚂



From steam engine to caboose, find plans for all of the Timber Line rolling stock, as well as track and a wall-mounted display shelf at woodstore.net/allaboard

PART		FINISHED SIZE			Matl.	Qty.
		T	W	L		
U	CATWALKS	1/8"	1/2"	2 1/2"	M	2
V	UPPER STOVEPIPE	1/4"	5/8"	1 3/8"	M	1
W	LOFT BASES	1/2"	1 1/8"	1 3/4"	C	2
X	LOFT SIDES	1/8"	5/8"	1 7/8"	C	4
Y*	LOFT LADDERS	1/4"	1/2"	1 1/8"	M	2
Z*	SEATS	3/4"	5/8"	3/4"	M	5
AA	STOVE	3/4" dia.		5/8"	C	1
BB	LOWER STOVEPIPE	1/4" dia.		1 1/2"	M	1
CC	BENCHES	3/8"	5/8"	1 5/8"	M	2

*Parts initially cut oversize. See the instructions.

MATERIALS KEY: C—cherry, M—maple.

BITS: 1/8" round-over, 1/4" round-over, 1/4" straight, 45° chamfer router bits; 9/64" brad-point drill bit, 1/2" Forstner bit.

SOURCE: Caboose kit no. RS-01486, \$13, woodstore.net/caboosekit.

PROJECT COST: It cost us about \$25 to build this project. Your cost will vary by region and source.

TAMBOUR WAVES IN GRAIN

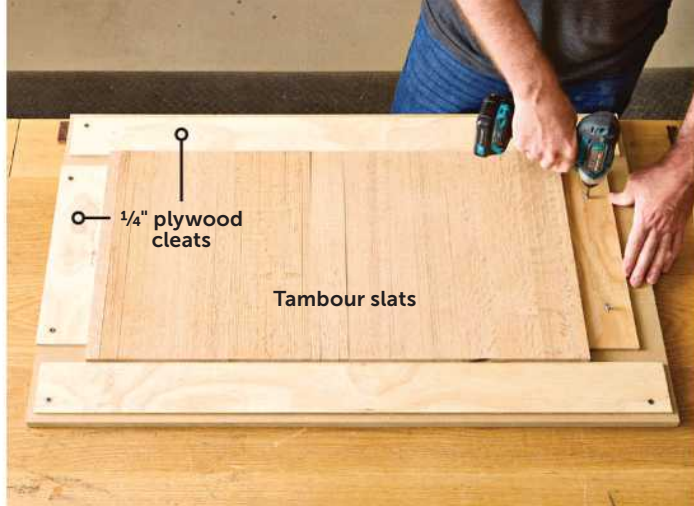
Turn to the CNC to add an extra wrinkle of motion to a project's already animated tambour door. The trick? Create the tambour first.

WRITER: LUCAS PETERS

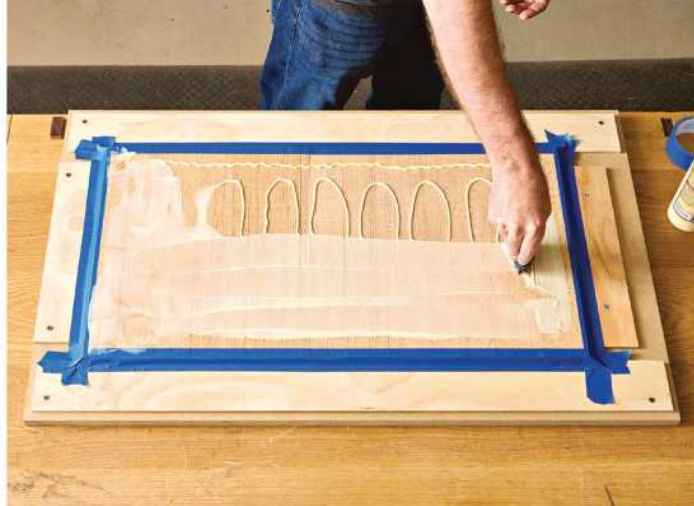
Sliding, curving curtains of wood first prompt curiosity, then scrutiny, then an impulse to touch and test. What more reaction could you ask of your rolltop desk, appliance garage, or console project? Just this: the extra Oohs and Aahs when that tambour door comes alive with the addition of a moving, carved design.

Cut the slats and build out the tambour first to ensure your carved design will be continuous across the door, then use your CNC machine's relief- or V-carving capabilities to add the motion-activated design of your choice.

PHOTOGRAPHERS: BRIE GOLDMAN & ADAM ALBRIGHT



Sort and position the slats in the assembly frame with the best face down, pressing them tightly together before securing them with the final cleat. Tamp the slats down with a mallet and scrap.



Use a silicone spreader, a glue roller, or a maxed-out credit card to coat the surface of the tambour in a thin, even coat of wood glue. Work quickly enough to keep a wet surface for the cloth backer.



We upgraded the doors from our Tambour-door Cabinet in the October 2022 issue (Issue 284). Find the free plan at woodmagazine.com/tambourcabinet

TACKLE THE TAMBOUR

A tambour panel consists of narrow slats held together by a flexible backing—canvas duck cloth for ours. The conjoined slats ride in a parallel pair of grooves, or tracks, while the backing allows them to bend and form around curves in the track.

For this article, we replaced the two tambour panels in an existing project (see link, *left*). We kept the slats at $\frac{1}{2}$ " wide but, to provide more depth to accommodate our carved design, we thickened them to $\frac{11}{16}$ ". Then we cut them to length matching the distance between the bottoms of the tracks they'll ride in.

A straight-grained wood works best. Be sure to cut a few more slats than you need for your door's width so you can choose the best ones. Our design also calls for a $\frac{3}{4}$ "-wide leader strip that houses the pull.

To glue up your tambour panel, first create a scrapwood assembly frame which starts with a plywood or MDF base. Square and attach strips of $\frac{1}{4}$ " plywood as cleats in a U-shaped configuration sized to tightly contain your panel's slats. Secure the slats in the frame with a fourth strip, *top left*.

Add tape to the ends and edges of the tambour assembly to prevent glue and the fabric backing from interfering with the track or sticking to the assembly frame. Then cut your fabric backing to match the size of the exposed slats before adding a coat of glue, *top right*, then the cloth backing, *middle*. Remove the tambour from the frame before the glue dries entirely, *bottom*.



Carefully line up the fabric backing and press it into place, making sure it reaches the outermost slats. Smooth away any wrinkles. If edges or corners lift, add a bit of glue underneath to secure them.



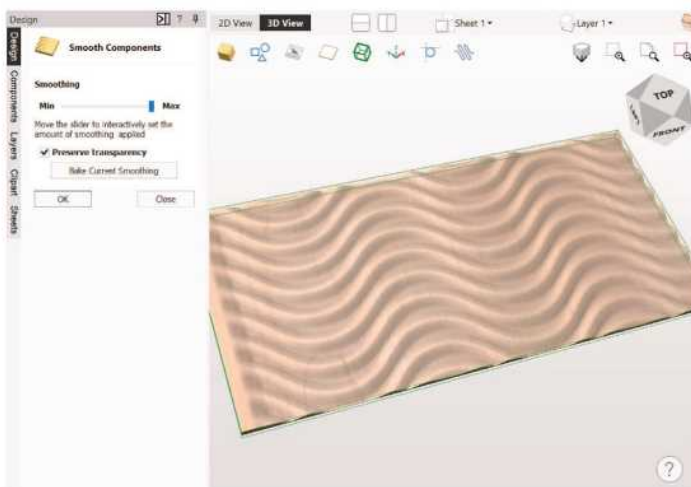
About an hour after the glue-up, remove the tambour from the assembly frame. Flex each slat to make sure that its edges don't stick to its neighbors. Then roll it up loosely and set it aside to fully dry.

From scraps of plywood or MDF, cut two strips about 4" wide and 6" longer than your tambour panels to be used as hold-downs on the CNC.

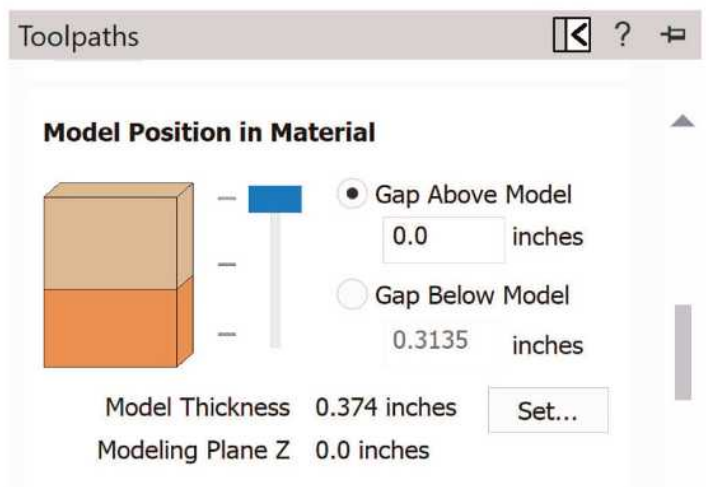
Install a dado set and an auxiliary face on your rip fence. Set them to rabbet both ends of the tambour assemblies, leaving a tongue with about $\frac{1}{16}$ " clearance inside the tambour's track and elevating the rabbet's shoulder $\frac{1}{16}$ " above the project face, *right*. Lower the blade until it is about $\frac{1}{16}$ " below the thickness of the tongue. Then cut a rabbet in one edge of each of the hold-down strips. Drill holes sized and spaced to match the track in your CNC's bed.



With the canvas facing up, rabbet the ends of the tambour assembly to form a tongue to ride in the track. Use a push pad over the blade to hold the tambour flat and keep the tongue thickness consistent.



The ridges on the file we imported were a bit severe. The *Smooth Components* function offers a way to ease the details of a design, making it a more feasible carving for your machine.



We zeroed out the *Gap Above Model*, making the highest point of our carving tangent with the tambour's face. With a model thickness of $\frac{3}{8}$ ", this avoided carving into the tongue in the low spots.

TIME TO CARVE

For our design, we chose a pattern of smooth waves that undulate as the tambour is drawn around a curve. The design lends itself well to a CNC's relief-carving capabilities and to tambour's movement. The starting point for this type of pattern is a heightmap—a grayscale image in which lighter colors represent shallower cuts and darker colors represent deeper cuts.

You can create your own image in your favorite software or find a clipart version online. Once you have a grayscale image, you can use a website such as imagetostl.com to convert it into an STL file that most CNC design software, such as Vectric's VCarve, can import.

After defining your workpiece thickness, width, length, and origin

(or zero) point, choose the *Import a component* or *3D model* icon in VCarve and select your STL file.

Place and scale your component to your liking. Stretching it slightly beyond the edges of the workpiece ensures that the carving doesn't stop short of the tambour's edges. We also chose to use the *Smooth Components* filter, *above left*.

Switch to the *Toolpaths* pane and choose *Material Setup* to double-check the *Model Position in Material*, *above*. Then create a *Roughing Toolpath* and a *Smoothing Toolpath* and export them. We selected a $\frac{1}{4}$ " straight bit for roughing and a $\frac{1}{4}$ " ballnose bit for smoothing. (See *The Bit Where We Talk Bits*, next page.)

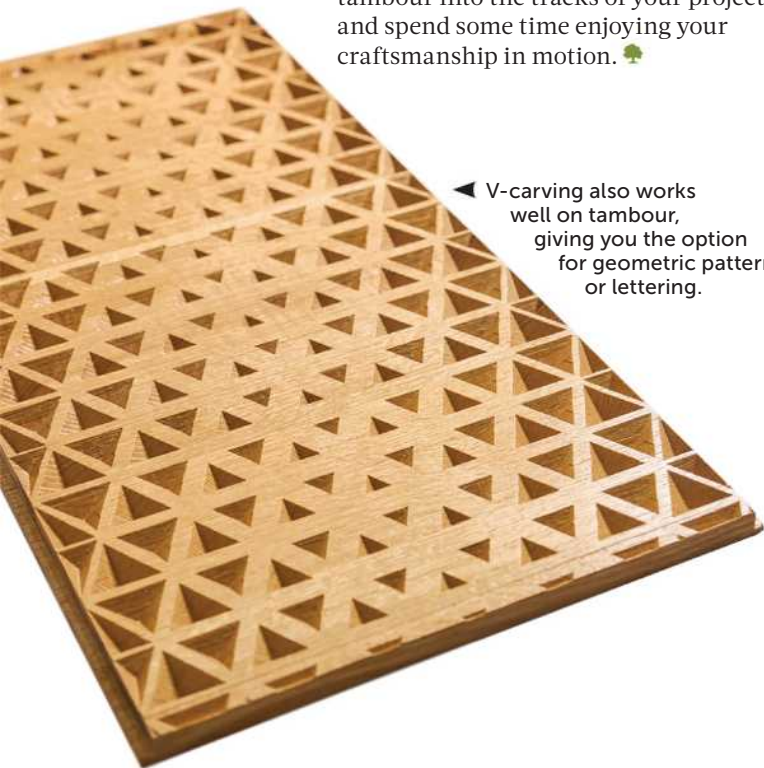
Position the tambour on your CNC machine's bed, square with the Y-axis,

and use clamps and the hold-down strips you cut earlier to secure it, *right*.

Zero your bit in all axes and run the roughing toolpath, then the smoothing toolpath, *bottom left*.

Sand away any routing marks before finishing, *bottom right*. We sprayed two coats of satin lacquer, standing the tambour in a slightly bent position to reach the edges of the slats. Avoid applying finish to the cloth backing.

When the finish is dry, slide the tambour into the tracks of your project and spend some time enjoying your craftsmanship in motion. 🌿



◀ V-carving also works well on tambour, giving you the option for geometric patterns or lettering.



The rabbet on the hold-down strip engaging the tongue of the tambour ensures that all of the strips stay flat during carving. Multiple holes aligned with the bed's T-track secure the entire length.

THE BIT WHERE WE TALK BITS

For your roughing pass, choose a spiral bit, *below*, to hog away most of the waste material. A downcut bit presses the material downward as it cuts rather than pulling fibers up or to the side, which can cause tear-out.

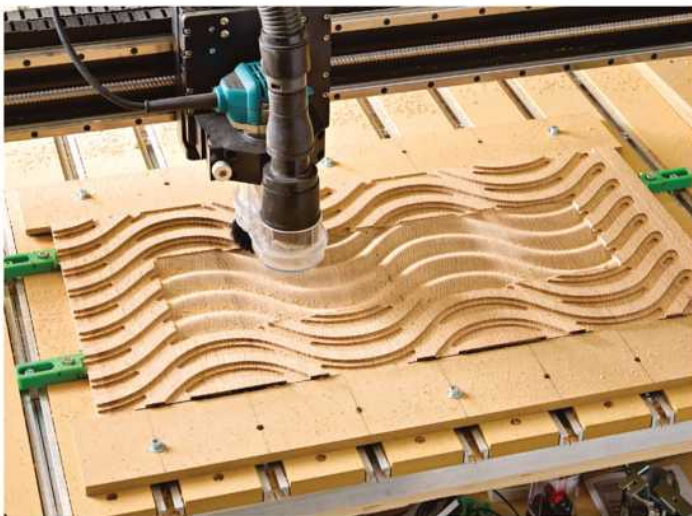
Your choice of ballnose bit for the smoothing pass comes down to bit size. A smaller bit creates finer detail but can greatly lengthen cut time. A larger bit is faster but can't create intricate designs.



1/4" SPIRAL DOWNCUT BIT



1/4" BALLNOSE BIT



The roughing pass uses a straight bit to quickly hog away the bulk of the carving, creating topographical troughs that the ballnose bit refines into a flowing design during the much longer smoothing pass.



Sweeping designs can be sanded with a flap sander or a contour sanding pad on your detail or random-orbit sander. For more intricate designs, hand sanding may be required to retain detail.

LOOSE-TENON CONTENDERS

Festool cuts the cord on its latest Domino, and Kreg enters the market with a cordless loose-tenon tool of its own. Do these tools hold their own in the shop? Can the lower-priced newcomer compete for a previously uncontested crown? We tried both to see.

PHOTOGRAPHER: BRIE GOLDMAN



New Domino cuts the cord

The new DFC 500 is Festool's first battery-powered Domino. It offers plenty of power, easily cutting 10mm mortises in hard maple with speed that feels equal to the company's corded models. While we appreciate the convenience of cordless power, the tool doesn't leave you untethered. You'll still need to connect it to a vacuum hose to extract the large number of chips that mortising creates.

This model also sports a new feature we liked from the first use: a vertical D-style handle instead of the usual barrel grip. This handle places your arm in great position to plunge into the cut and offers a firm grip for sawdust-covered hands. We like it so much that we'd vote for rolling it out across the Domino line. Beyond the new power source and handle, this new model looks and operates like any of this tool's recent iterations, meaning it accomplishes its highly specific job very well. But that capability comes at a cost that may not faze professionals but that might be hard for many hobbyist woodworkers to swallow: close to \$1,300 for the bare tool. Add \$160 for a battery and charger if you're not already on Festool's cordless platform.

Festool, festoolusa.com
Domino Joiner DFC 500 E-Basic
no. 578121, \$1,279 (bare tool)



Festool's D-handle puts your hand in a natural position to plunge the cutter into the wood while also making it easier to support the weight of the tool, most of which hangs off the workpiece.



Kreg comes into the game looking for an edge

Kreg is well known for making wood joinery easier with its pocket-hole jigs. Despite that history, we were surprised on a recent visit to the company's headquarters when we were handed the Edge: the first loose-tenon tool to take on the Festool Domino in a similar form factor. When we learned it sells for \$500, we jumped at the chance to give a preproduction model a try.

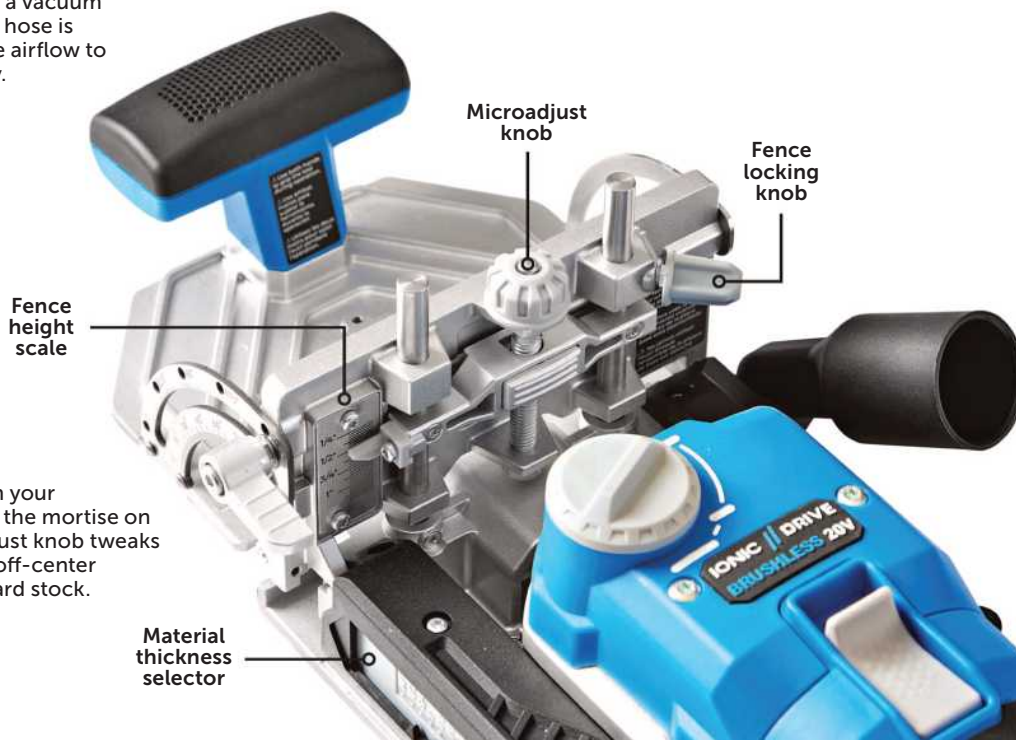
The Edge is powered by Kreg's 20-volt cordless platform and comes with a 4.0 amp hour (Ah) battery and charger. A bare tool is also available. The Edge offers plenty of power to bore 10mm mortises in hard maple. We appreciate, especially on a cordless tool, slots in the base that provide excellent chip ejection when you don't want to be tethered to a vacuum hose. There's also a vacuum port when you want it. A microadjust for fence height also proves a thoughtful feature, allowing exact positioning of mortises in your material thickness beyond the built-in presets.

Priced at \$499 (or \$449 for the bare tool), the Edge performs very well, which makes it a whole lot easier for an average woodworker to justify adding a loose-tenon joiner to the woodshop.

Kreg, kregtool.com

Edge Loose-Tenon Joiner no. KPTEDGE100B, \$450 (bare tool);
no. KPTBEDGE100B, \$500 (with battery and charger)

Slots in the underside of the Kreg Edge eject chips without requiring a vacuum connection. When a vacuum hose is connected, the slots increase airflow to collect chips more efficiently.



Setting the selector to match your workpiece thickness centers the mortise on that thickness. The microadjust knob tweaks the position up or down for off-center placement or for non-standard stock.



NEW & UNTESTED HORIZONTAL DUST COLLECTOR TUCKS IN TIGHT

Grizzly's Bear Trap dust collector offers multiple space-saving mounting options. It can sit under a workbench on its included casters, hang from a benchtop or ceiling, or mount to a wall. It's equipped with a 1-hp, 7-amp motor that drives a 10" impeller to deliver 442 CFM of airflow at 2.5" of static pressure. Chips collect in an 11-gallon, 30-micron bag that sits inside, while a 5-micron filter captures finer dust from the outlet air. The collector measures 40½" W x 18½" D x 19" H and weighs 89 pounds. An included remote makes powering on and off easy wherever the collector is mounted.

Grizzly, grizzly.com

Bear Trap Undermount Dust Collector no. G0405, \$560

NEW & UNTESTED A PAIR OF HICKORY-HANDLED HAMMERS

Two new hammers from Milwaukee are designed to drive nails without fatigue-inducing vibration. Both feature handles made from strong, shock-absorbing hickory and have axe-style curved grips. The 16-oz version has a smooth face, while the 23-oz framing hammer has a waffle face. Each is equipped with a magnetic nail set and "anti-ring" claws—a uniquely shaped design that reduces ringing and vibration. 🌿

Milwaukee, milwaukeetool.com

16-oz Hickory Hammer no. 48-22-9517, \$27;

23-oz Hickory Hammer no. 48-22-9418, \$36



NEW & UNTESTED SPAR VARNISH RESISTS MOLD & MILDEW

Minwax reformulated its water-based spar urethane finish to better inhibit ultraviolet (UV) light absorption and to reduce mold and mildew growth, both of which contribute significantly to exterior finish failure. Like all spar varnishes, the finish is also designed with flexibility to resist cracking as wood shrinks and swells, preventing water from getting under the built-up film. The finish can be recoated after only two hours, allowing you to add the recommended three to four coats in one day, and it dries fully in 24-72 hours.

Minwax, minwax.com

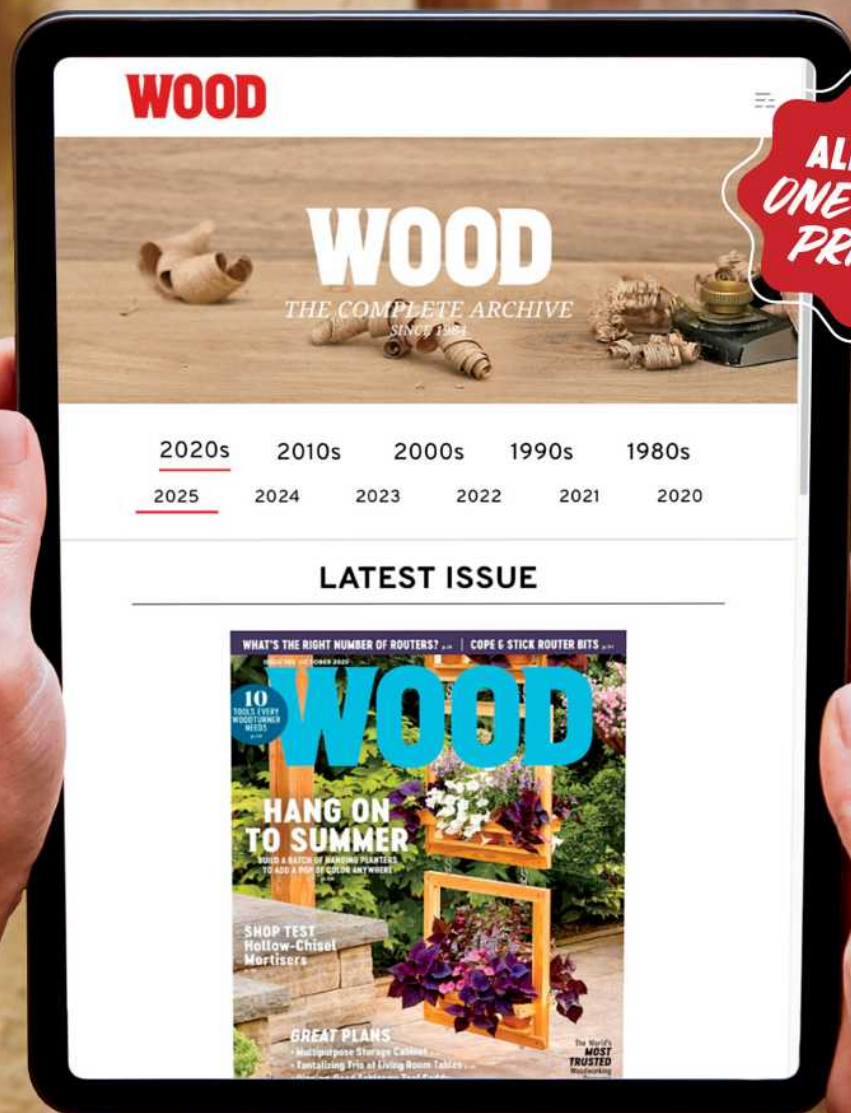
Helmsman Spar Urethane quart no. 640520444, \$30



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WHAT'S AHEAD

A SNEAK PEEK AT WHAT WE'RE WORKING ON FOR UPCOMING ISSUES OF WOOD® MAGAZINE.

MUST-HAVE DRILL ADD-ONS

A multifunction tool deserves a multitude of accessories. Take a look at these upgrades that elevate your drill beyond boring.



DOUBLE-LIGHT LAMP

A warmly glowing base, a room-brightening shade, or both. We source the fixtures, and you decide your light level when you build this multitasking lamp.



MULTI-QUILT CABINET

Craft a display worthy of your quilted artwork. Adjustable-height hangers show off your collection, with room for reserves below.

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