

WOOD

The World's Leading Woodworking Resource

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10" Cabinet Table Saws with Riving Knife

- Motor: 3 HP, 220V, single-phase
- Table size with extension: G0690 - 27" x 40", G0691 - 27" x 74 3/4"
- Blade tilt: left • Arbor: 5/8"
- Arbor speed: 4300 RPM
- Max. dado width: 1 3/16"
- Max. rip capacity: G0690 - 29 1/2", G0691 - 50"
- Max. depth of cut: 3 1/8" @ 90°, 2 3/16" @ 45°
- Approx. shipping weight: G0690 - 542 lbs., G0691 - 572 lbs.



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G0691 WITH EXTENSION RAILS **ONLY \$1350⁰⁰**

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- Static pressure at rated CFM: 2.08"
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- Approx. shipping weight: 210 lbs.



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10" Left Tilting Super Heavy-Duty Table Saw with Riving Knife

- Motor: 3 HP, 220V, single-phase, 3450 RPM
- Precision ground solid cast iron table
- Table size with extension wings: 40" x 27"
- Arbor: 5/8" • Max. dado width: 7/8"
- Cutting capacity: 8" L, 26" R
- Max. depth of cut: 3" @ 90°, 2 1/2" @ 45°
- Approx. shipping weight: 514 lbs.



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- Universal router mount
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12" Left-Tilting Extreme Series® Table Saw with Riving Knife Feature

- Motor: 5 HP, 220V, single-phase
- Table size with extension: 30 3/4" x 48 3/8"
- Arbor speed: 3600 RPM
- Arbor: 5/8" & 1"
- Max. dado width: 3/4"
- Max. rip capacity: 36"
- Max. depth of cut: 4" @ 90°, 2 3/4" @ 45°
- Approx. shipping weight: 756 lbs.



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- Max. cutting height: 12"
- Blade size: 131 1/2" L (1/4" - 1" W)
- 2 blade speeds: 1700 & 3500 FPM
- Approx. shipping weight: 418 lbs.



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- Table tilt: 5° L, 45° R
- Max. cutting height: 12"
- Cutting capacity/throat: 18 1/4"
- Blade size: 143" L (1/8" - 1 1/4" W)
- Blade speeds: 1700 & 3500 FPM
- Approx. shipping weight: 480 lbs.



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- Max. depth of cut: 1/8"
- Rabbeting capacity: 1/2"
- Cutterhead diameter: 2 1/2"
- Cutterhead speed: 4800 RPM
- Approx. shipping weight: 270 lbs.

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8" x 76" Parallelogram Jointers

- Motor: 3 HP, 220V, single-phase, TEFC, 3450 RPM
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- Precision ground cast iron table size: 12 3/4" x 83 1/2"
- Cutterhead speed: 4950 RPM
- Max. depth of cut: 1/8"
- Max. rabbeting capacity: 3/4"
- Approx. shipping weight: 1059 lbs.

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15" Planer/Moulder

- Motor: 2 1/2 HP, 110V, single-phase
- Max. cutting width: 15"
- Max. cutting height: 6"
- Min. stock thickness: 1/8"
- Min. stock length: 17"
- Max. planer cutting depth: 3/32"
- Feed rate: 11 FPM & 22 FPM
- Cutterhead dia.: 3 15/16"
- Cutterhead speed: 5500 RPM
- Cuts per minute: 11,000
- Table size: 15" x 16"
- Approx. shipping weight: 181 lbs.

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15" Planer

- Motor: 3 HP, 220V, single-phase
- Max. stock thickness: 8"
- Min. stock thickness: 3/16"
- Min. stock length: 8"
- Max. cutting depth: 1/8"
- Feed rate: 16 & 30 FPM
- Cutterhead dia.: 3"
- Number of knives: 3
- Knife size: 15" x 1" x 1/8"
- Cutterhead speed: 5000 RPM
- Table size: 15" x 20"
- Approx. shipping weight: 675 lbs.

**PRECISION GROUND
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20" Planers

- Motor: 5 HP, 220V, single-phase
- Table size: 20" x 25 3/4" (20" x 55 1/2" with extension)
- Max. stock thickness: 8"
- Min. stock thickness: 3/16"
- Min. stock length: 7 1/2"
- Max. cutting depth: 1/8"
- Cutterhead speed: 5000 RPM
- Feed rate: 16 & 20 FPM
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**PRECISION GROUND
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12 Speed Heavy-Duty 14" Floor Drill Press

- Motor: 3/4 HP, 110V, single-phase
- Precision ground cast iron table
- Table size: 11 3/8" sq.
- Table swing: 360°
- Table tilts: 90° L & R
- Swing: 14"
- Drill chuck: 1/8" - 5/8"
- Drilling capacity: 3/4" steel
- Spindle taper: MT #2
- Spindle travel: 3 1/4"
- Collar size: 2.595"
- Approx. shipping weight: 171 lbs.

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- Motor: 2 HP, 110V, single-phase
- Precision milled cast iron bed
- Dist. between centers: 43"
- Swing over bed: 16" • Spindle bore: 3/8"
- Spindle & tailstock tapers: MT#2
- 10 speeds: 600- 2400 RPM
- Approx. shipping weight: 372 lbs.

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& SPUR CENTER**

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2 HP Dust Collector w/2.5 Micron Bag

- Motor: 2 HP, 220V, single-phase, 3450 RPM
- Motor amp draw: 12 Amps
- Air suction capacity: 1550 CFM
- Static pressure: 11"
- Bag capacity: 5.7 cu. ft.
- Impeller: 12 1/2" balanced steel, radial fin
- Height w/bags inflated 78"
- Portable base: 21 1/4" x 33 1/2"
- Approx. shipping weight: 126 lbs.

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70

This seal is your assurance that we build every project, verify every fact, and test every reviewed tool in our workshop to guarantee your success and complete satisfaction.



66

on the web

woodmagazine.com

POST OR PERUSE PROJECT PICTURES

Show off photos of your recent projects in the Photo Galleries at woodmagazine.com/galleries. Or see what other woodworkers are building for your next project inspiration.

Bedroom Furniture



Small Projects



Kids Furniture and Toys



Office, Den and Living Room Fur

SEE TITANIC TOYS IN ACTION

Fred Heim's models (page 66) are so meticulously detailed, some actually operate. Watch Fred drive the Peterbilt and the Cat Loader (below), plus see hundreds of in-progress photos of his models in a free video at woodmagazine.com/fredheim.



THE BEST PROJECT PLANS ON THE INTERNET

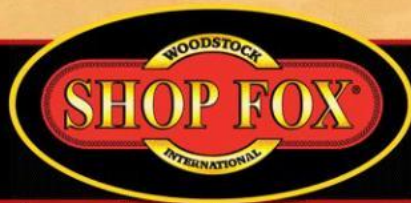
Start your Web search for project plans at woodmagazine.com/plans. There, you'll find more than 1,100 detailed, step-by-step projects, all searchable and neatly categorized for easy browsing. Many are free, including this bird feeder.



LEARN FROM YOUR FELLOW WOODWORKERS

At WOODTube (woodmagazine.com/woodtube), woodworkers just like you share their love of the craft in more than 250 shop-made videos. In one video, Steve Ramsey (aka Steve in Marin) shows how to make a labyrinth game, below.





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12" TABLE SAW

with Riving Knife & Extension Table

- 5 HP, 220V, single-phase motor
- Precision ground cast iron table size: 30¾" x 78¾"
- Arbor size: 1" • Arbor speed: 3600 RPM
- Blade tilt: left • Max. rip capacity: 52"
- Max. depth of cut: 4" @ 90°, 2¼" @ 45°



W1761 5 HP, 12" Table Saw

VARIABLE SPEED PLANER/MOULDER with STAND

- Motor: 2 HP, 220V, single-phase
- Precision ground cast iron table & wings
- Table size with wings: 36¼" L x 10" W
- Max. cutting width: 7"
- Max. planing height: 7½"
- Max. planing depth: ½"
- Max. moulding depth: ¾"
- Knife size: 7½" x 1½" x ¼" HSS
- Cutterhead speed: 7000 RPM
- 4" dust port
- Rubberized steel feed rollers
- Approx. shipping weight: 330 lbs.

We also carry an extensive selection of moulding knives for this machine!

PATENTED

Precision Ground Cast Iron Table
Heavy-Duty Cabinet Stand



Table Wings Have T-slots for Easy Guide Rail Adjustment

W1812

Planer/Moulder



8" JOINTER

with Parallelogram Adjustable Beds

- 3 HP, 220V, single-phase, TEFC motor
- Precision ground cast iron parallelogram design table measures 8" x 76½"
- 4 knife, 5350 RPM cutterhead
- Large center mounted cast iron fence
- Rabbeting capacity: ⅝"

Built-in Mobile Base

W1741
8" Jointer



SPIRAL CUTTERHEAD PLANERS

with Built-in Mobile Base

- 3 HP or 5 HP, 220V, single-phase motor
- Precision ground cast iron table & extension wings
- 2 speed gear box
- 2 adjustable bed rollers
- German-made carbide insert spiral cutterhead
- Pedestal mounted thermal overload magnetic safety switch
- Built-in locking mobile base

W1742S 15" Planer
W1754S 20" Planer



10" SLIDING TABLE SAW

with Scoring Blade & Riving Knife

- 5 HP, 220V, single-phase, TEFC motor
- Table size with extension wings: 40" W x 47" L
- Sliding table size: 12¼" W x 63" L
- Scoring blade diameter: 3⅝"
- Scoring blade arbor speed: 8,000 RPM
- Main blade arbor speed: 4,000 RPM
- Single lever locking fence

W1811 10" Sliding Table Saw



OUTSTANDING SHOP FOX® ACCESSORIES

ADJUSTABLE MOBILE BASES

STRONGER FRAME WITH IMPROVED WHEELS AND GUSSETED SUPPORTS!

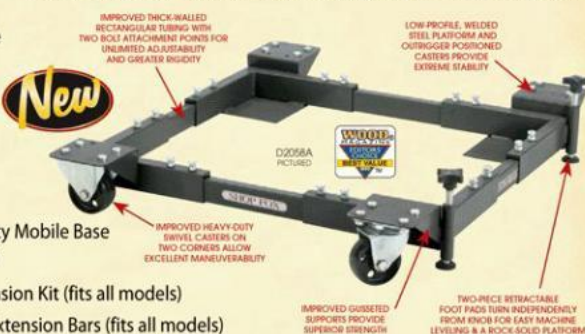
D2260A
Mini Mobile Base
600 lb. capacity

D2057A
Heavy-Duty Mobile Base
700 lb. capacity

D2058A
Super Heavy-Duty Mobile Base
1300 lb. capacity

D2259A Extension Kit (fits all models)

D2246A 36" Extension Bars (fits all models)



RIGHT ANGLE JIG

Cut tenons, dados, rail ends and finger joints safely & with complete accuracy. The SHOP FOX® Right Angle Jig is constructed using top quality aluminum castings & plates which are machined to exacting tolerances.

- Solid aluminum
- Extended depth: 13"
- Closed depth: 7½"
- Height: 8"
- Max. horiz. opening: 1¼" x 8"



ADJUSTABLE ROLLER STAND

- Stand length is adjustable from 19½" to 54"
- Number of rollers: 9
- Stand height adjusts from 24½" to 38"
- Roller diameter: 2"
- Two-way locking swivel casters: 4¼" diameter
- 300 lb. capacity



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My best tip for accurate woodworking is:

Use stops of every description and function—far more precise than measuring and cutting.

Spend the money for a truly accurate square.

When something is "good enough," it's just that—don't mess it up striving for perfection.

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Measure only when you must. Instead, use the actual workpieces to mark the mating workpiece.

Don't rely strictly on plan dimensions. Take measurements from the project as you go and cut to fit.

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Sounding Board

Our bulletin board for letters, comments, and timely updates

Frugal woodworkers share salvage stories

The article on finding and using pre-owned lumber in issue 193 (October 2009, p. 72)

apparently struck a nerve with readers. Read on:

—WOOD® magazine editors



Found wood yields a family heirloom

I made this high chair using the plan from issue 51 (April 1992, p. 56), and all the wood was reclaimed from old pallets. Although it can be tough to combat the frequent defects and nails—and I've gone through a few throw-away saw blades—projects like this don't require a lot of long wood, so pallets work well for me. All five of my grandchildren have eaten from this chair, adding to its special significance to our family.

—Terrence McMillan, Maple Valley, Wash.

Check out auctions and garage sales for gems

Auctions and garage sales are great sources of reuseable materials, but sometimes you have to look beyond a stack of lumber. I've bought beds and other damaged furniture for as little as \$5. If they're too damaged to restore, I dismantle them and use the wood. Headboards usually consist of lots of good, thick wood. One \$10 banged-up chest of drawers netted nice white pine boards that became an excellent table.

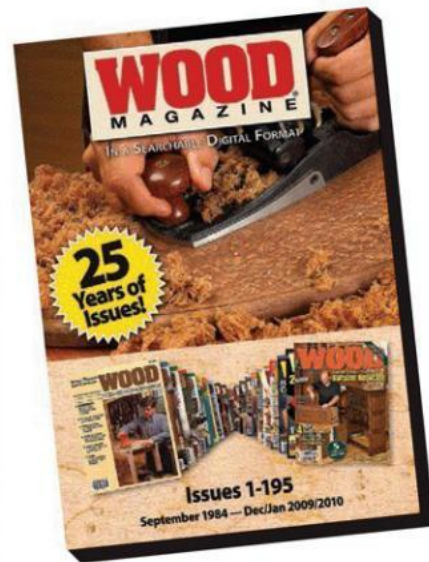
—James Adams, Monmouth, Maine



From the trash heap to a treasure chest

After reading the article on salvaging lumber, I had to share this photo of a jewelry box I made of wood reclaimed from a beat-up pallet. My co-workers laughed when I saved this wood from the trash bin, but their jaws dropped when I showed them the finished project. The only wood not from that scrap was the walnut splines.

—Rick Stopher, Fulton, Ill.



Now, a FREE single index for the back-issue DVD

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—WOOD magazine editors

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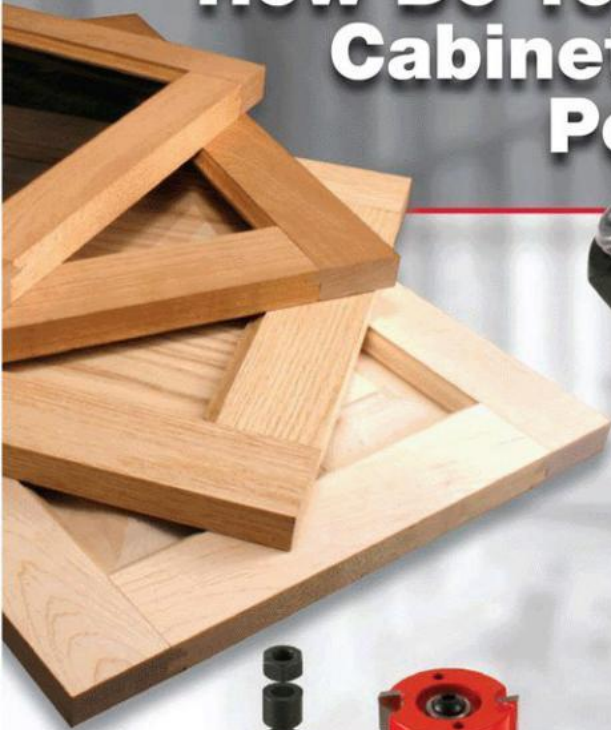
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Shop Tips

Helping you work faster, smarter, and safer

Lateral thinking lands a horizontal router

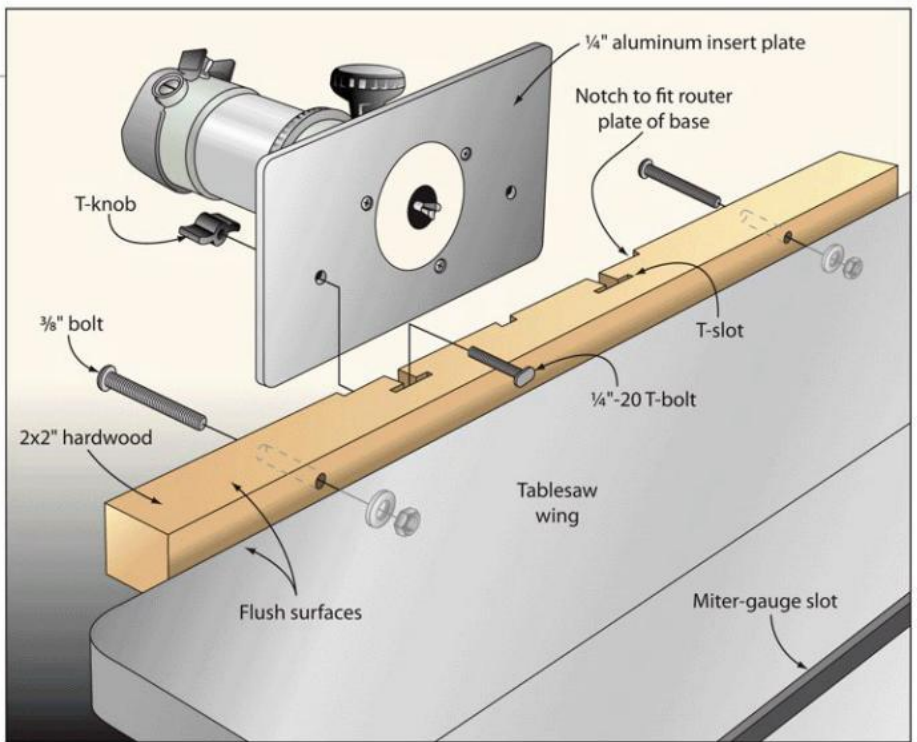
Home-remodeling projects were my "gateway drug" into furnituremaking. But when I asked a trim-carpenter friend how to create traditional dovetail joints to connect the apron to the sides of the 7'-long dresser I designed, he said, "You're an engineer; you'll figure it out." So that's what I did.

Because the apron was far too long and unwieldy to rout the joints on the ends with the typical router table. I needed a long, flat surface for stock support. So I combined my router table and tablesaw into a big horizontal router table. Here's how I did it.

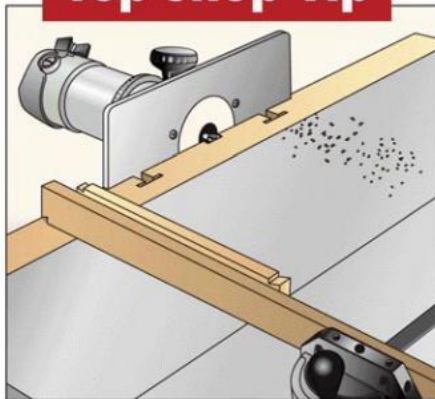
I started by cutting a 2x2" hardwood mounting board to fit the end of my tablesaw table wing, and made a notch in one face wide enough to fit my router table's insert plate, as shown at top. After removing the router and insert plate from my router table, I drilled a pair of 1/4" holes in the plate, 2" from the bit opening on either side.

I used these holes to locate T-slots on the mounting board, and then routed the slots 1/4" deep using a T-slot cutting bit. Next, I marked and drilled 7/16" holes to mount the board to the wing, steering clear of the webbing under the wing. I then clamped the mounting board flush to the wing, and used those holes to guide the bit while drilling two 7/16" holes through the edge of the wing. Finally, I bolted the board to the wing.

I reattached the router to the insert plate, installed the dovetail bit, and mounted the plate to the board using T-bolts, as shown. With the T-bolts snug, but loose enough to allow movement of the plate, I turned on the



Top Shop Tip



router and lowered the dovetail bit into the mounting board.

I made test cuts in scrap and adjusted the height of the insert to perfect the fit of the dovetail. Then, I used my miter gauge with a long extension and pushed the aprons across the table to rout the dovetails.

—Roger Franzel, Brookfield, Wis.



Photo: Jennifer Brindley of JBe Photography

For sending in this issue's Top Shop Tip, Roger receives a Shop Fox W1668 oscillating drill press. Right on, Roger!



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Shorten the "Journey to the Center of Gravity"

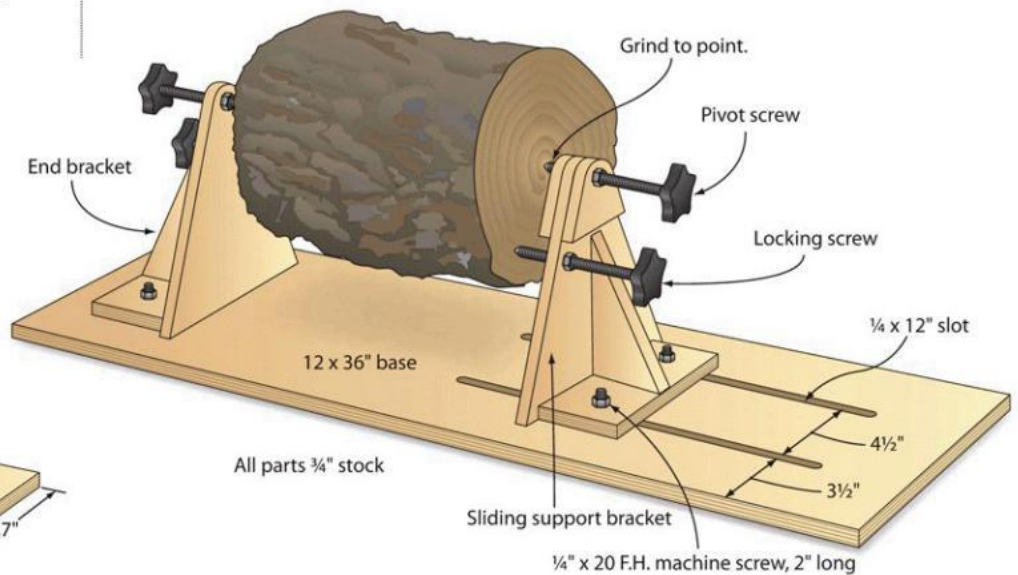
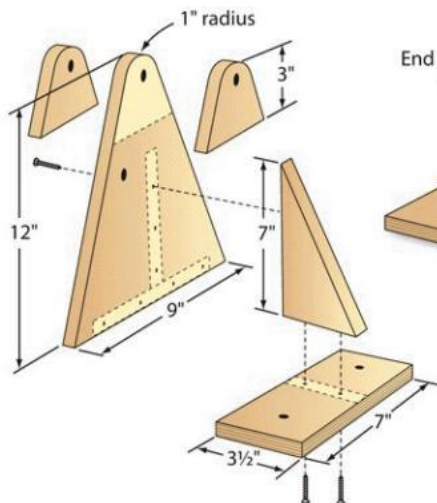
Finding the center of gravity of an oversized, irregular log or turning blank often involves chucking, testing, and rechucking dozens of times. To speed up the process, I came up with this jig that mimics the headstock and tailstock of a lathe.

First, you chuck the blank into the jig as you would in your lathe. Then, simply let the blank rotate. The heaviest section will settle at the bottom.

Rotate the blank 180°, lock it in place with the locking screws and use your

chainsaw to nibble away material on the heavy edge. Release the locking screws and repeat the process until the blank is balanced and ready to turn on your lathe.

—Philip Olsen, Kaslo, B.C.



continued on page 10

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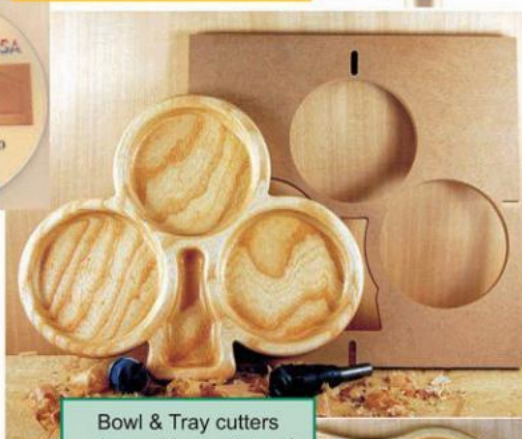


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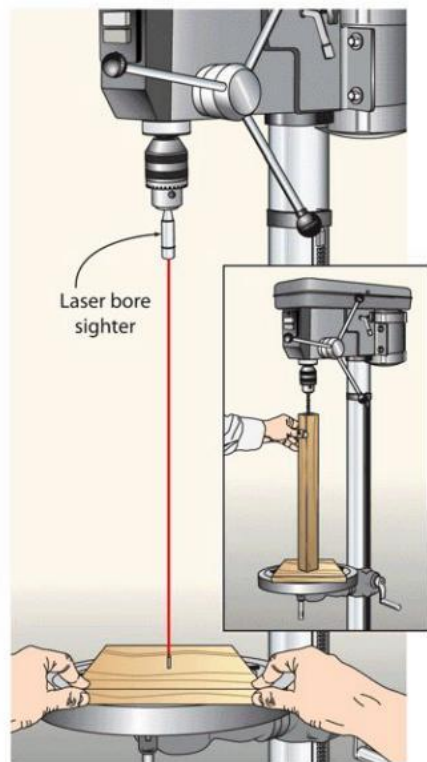
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Shop Tips

Sighting in on centered spindle holes

To align the legs on a set of bunk beds, I came up with this method to precisely center a hole using a laser bore sighter for rifles (Bushnell item 740100C, \$25, 800-423-3537, bushnell.com). First make a plywood base with a nail or screw sticking up through it. Mount the bore sighter in your drill press chuck. Then position the base so the laser points straight into the point of the nail, and clamp the base securely in place. Replace the bore sighter with the correct drill bit. Mark the centers on both ends of the spindle and press one end, centered, onto the nail point. Now, by drilling into the top center mark, you drill precisely on axis and down the center of the spindle.

—Mark Lutz, The Dalles, Ore.



continued on page 12

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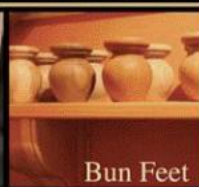


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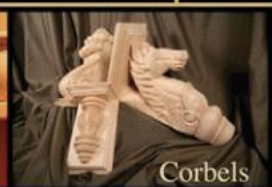
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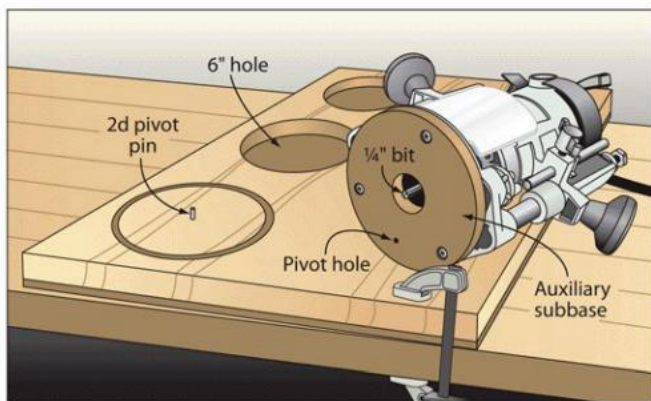
Mini-trammel for mini-circles

I recently completed a project that required several 6" holes. I quickly discovered the 3" radius was too small for most router trammels. Here's one solution you can use.

Lay out your circle using a compass, drill a $\frac{5}{64}$ " hole in the center, and fit a 2d nail in the hole. Make an auxiliary subbase for your plunge router out of $\frac{1}{2}$ " MDF, and drill a $\frac{5}{64}$ " pivot hole $2\frac{7}{8}$ " from the center of the bit hole (3" for the radius, minus the radius of a $\frac{1}{4}$ " straight bit). Install the subbase, and clamp the workpiece to your bench on top of a backer board. Fit the hole in the router base over the nail and rout the hole by plunging and swinging the router around the nail.

To make 6" discs rather than holes, change the distance of the pivot hole from the base center to $3\frac{1}{8}$ " (the distance of the 3" radius plus half the radius of the $\frac{1}{4}$ " straight bit).

—George Noeth, Fort Mill, S.C.

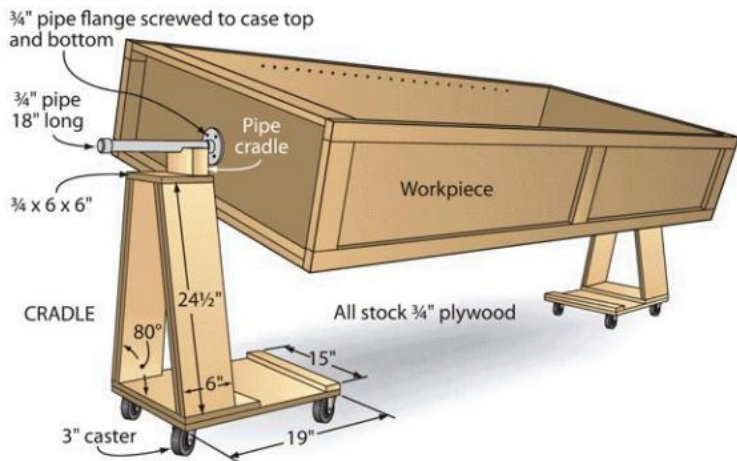


Ready-to-roll cradles provide easy finishing access

This large-project "rotisserie" has come in handy a few times in my small shop. With it I can rotate projects by myself in order to access all sides for finishing. It acts as a drying rack after finishing, and I can roll the project out of the way if I need extra shop space between coats of finish.

Just screw the pipe flanges to the top and bottom of the case where the holes won't be seen. Thread in the $\frac{3}{4}$ " pipe and rest each end in one of the cradles.

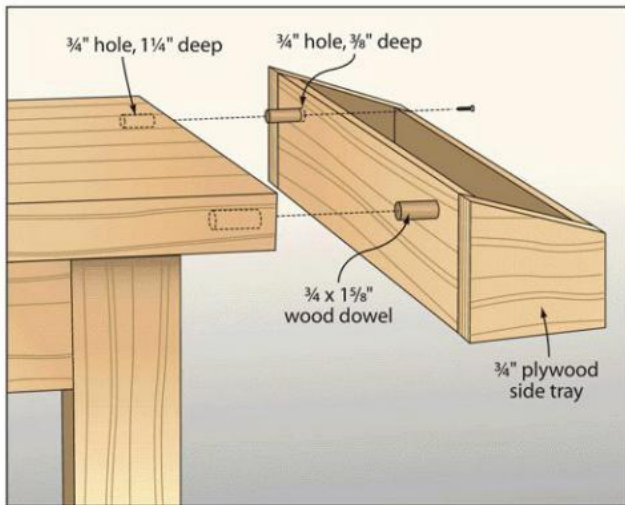
—Dave Gruenhagen, Boise, Idaho



Tool storage is a real cliffhanger

I came up with this tray that mounts to the edge of my workbench to provide extra storage for hand tools, preserving valuable benchtop real estate. If I need it out of my way, the tray slides right out. To mount your own tray, simply bore $\frac{3}{4}$ " holes $1\frac{1}{4}$ " deep to accommodate the dowels in the back of the tray.

—Mark Thiel, Coral Springs, Fla.



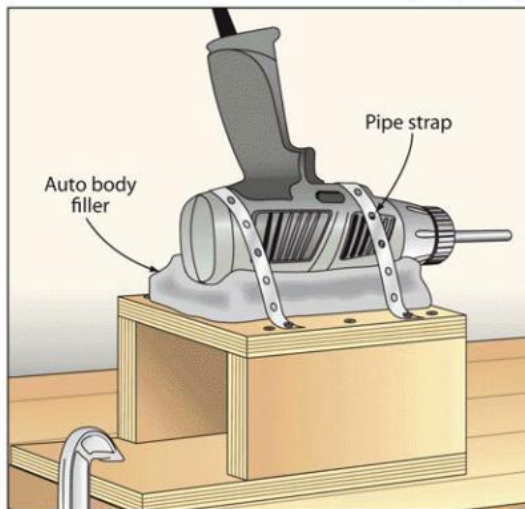
Mounting method for the uneven tool

I needed to use my portable drill as a temporary, poor-man's lathe, but its irregular shape made it difficult to clamp down. So I made a custom tool holder shown *below*.

Start by making a scrapwood base to raise the tool above bench height. Next, wrap the tool in kitchen plastic wrap to protect it temporarily, place a generous blob of auto body filler (such as Bondo, 3M.com, 888-364-3577) on the base, and press the tool into the body filler taking care to not block controls and ventilation holes. While the filler is still pliable, level or adjust the tool position as needed.

After the filler hardens, remove the tool and discard the plastic wrap. And finally, secure the tool to the stand with pipe strap. You can use this method for other odd-shaped tools, such as a belt- or random-orbit sander. 🌱

—Tod Jervey, Powell, Ohio



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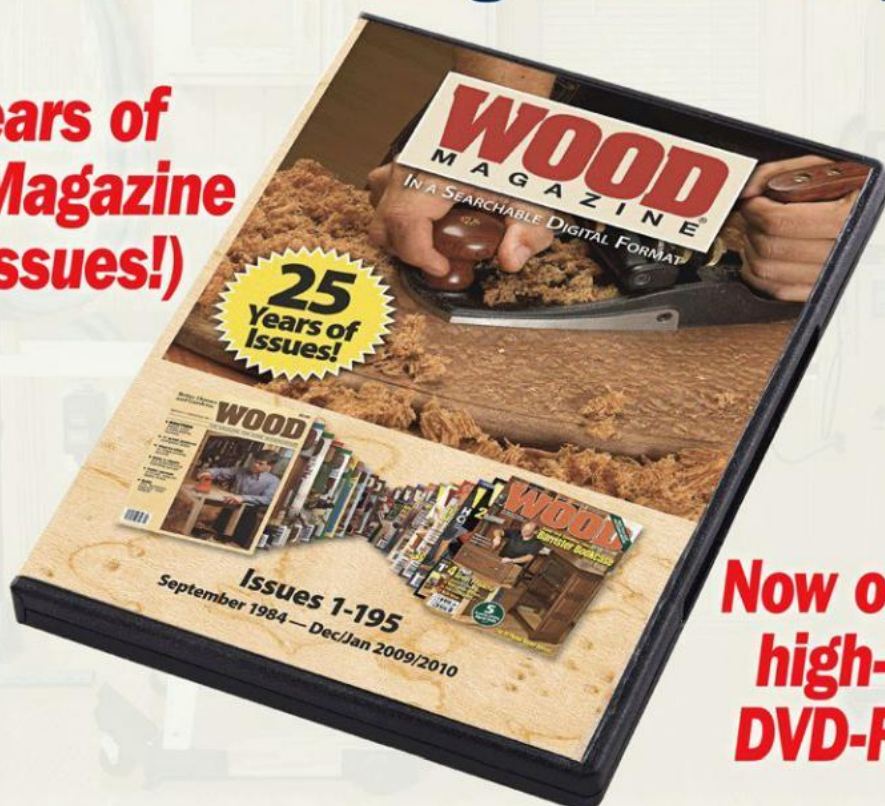
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Drawer-pull Jig

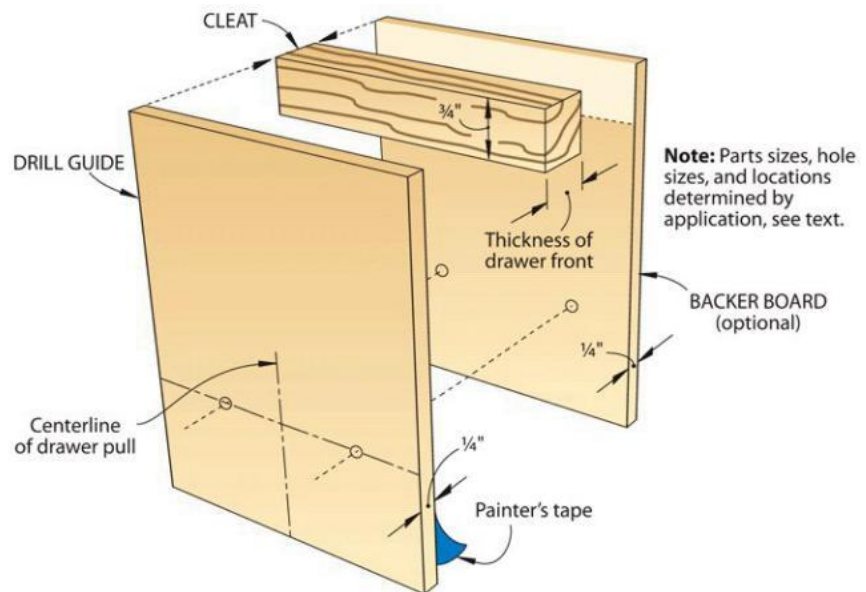
Mount every type of pull precisely with this quick-to-make drilling guide.

Installing a drawer pull or two is no problem: A couple of measurements take care of it. But for a project with lots of drawers, such as the Media Cabinet on *page 70*, an out-of-line pull would stick out like a Hummer in a lot full of hybrids. Positioning the pull mounting holes with a jig custom-made for the project guarantees uniform placement every time.

Sizing your jig

The jig consists of only three parts—and for some applications, just two [drawing]. Make the cleat from solid wood to match the thickness of the drawer fronts. For the drill guide and optional backer board, 1/4" plywood or hardboard works well. Cover the back face of the drill guide with painter's tape to prevent marring the finish on the drawer.

The size of the drawer front determines the sizes of the drill guide and backer board. For the Media Cabinet,



we matched the drill guide to the width of the drawers. That made it easy to align by matching the edges of the jig to the ends of the drawer fronts, *top*. For

wider drawers, like the ones on *page 18*, size the jig just an inch or so wider than the screw holes in the pull.

continued on page 18



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Quick & Easy Jig

To ready the jig for use, draw a centerline on the drill guide and lay out the pull's screw locations from this centerline. Place a piece of painter's tape on the drawer front and mark on it the centerline of the pull. Slip the cleat onto the top of the drawer front and align the centerlines.

There are three types of drawer fronts; each requires a slightly different set of holes in the jig. Let's look at each of these variations of the jig.

For screwed-on pulls

For pulls that require pilot holes for wood screws (such as those on the Media Cabinet, **opening photo**), build the jig without the backer board. Lay out the locations of the pilot holes. Then, to prevent drilling through the drawer face, wrap a tape flag around your drill bit to act as a depth stop.

For through holes

Pulls secured from the back by a machine screw require a jig with all three parts. The backer board prevents chip-out as the bit exits the hole. After laying out the shank-hole locations on the jig, clamp or hold the jig securely to the drawer front [**Photo A**] and drill the shank holes.

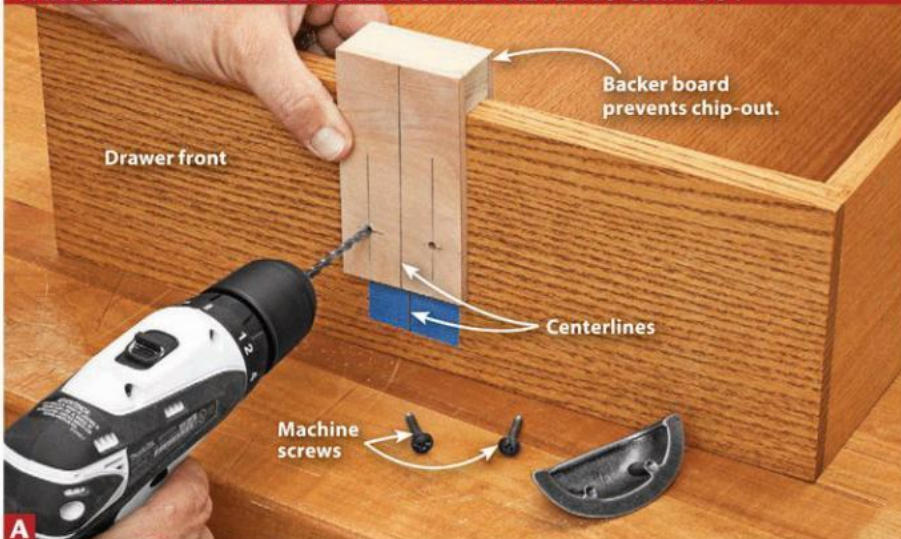
For false fronts with counterbores

When using pulls secured from the rear of a false drawer front, the head of the machine screw must rest in a counterbore so the false front can be screwed flush to the front of the drawer box. In this situation, you'll need a jig with a counterbore-size hole in the backer board and a screw-shank-size hole in the drill guide.

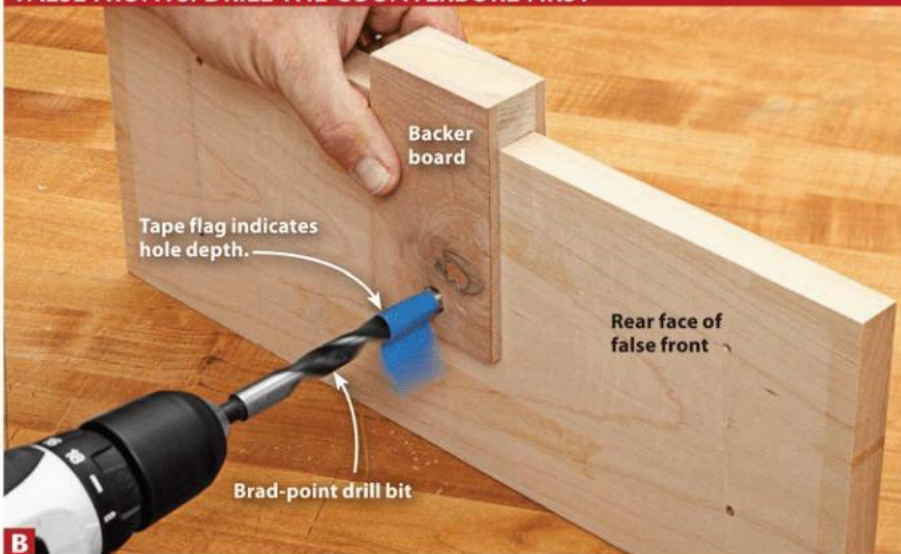
Lay out the location of the shank holes on the drill guide. But before drilling them, place a scrap between the drill guide and backer board and bore completely through the jig with a $\frac{1}{16}$ " bit. Then switch to the shank-hole-diameter bit and enlarge the hole in the drill guide only. Next, change to a Forstner or brad-point bit the diameter of the counterbores. Place the spur of the bit on the $\frac{1}{16}$ " hole in the backer board, drill through the backer only, then toss the scrap away.

To use the jig, place it over the drawer front and drill the holes as shown in **Photos B and C**. 🌿

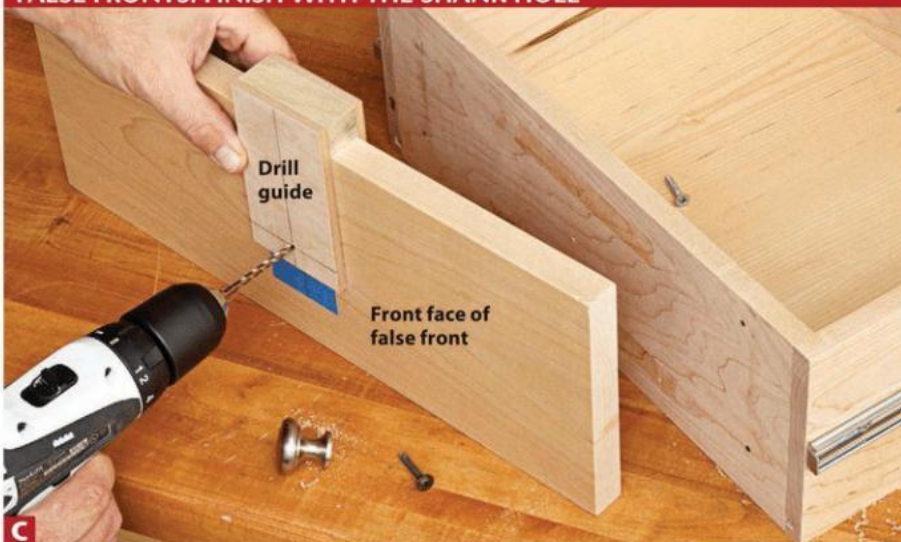
THROUGH HOLES: THE BACKER BOARD PREVENTS CHIP-OUT



FALSE FRONTS: DRILL THE COUNTERBORE FIRST



FALSE FRONTS: FINISH WITH THE SHANK HOLE



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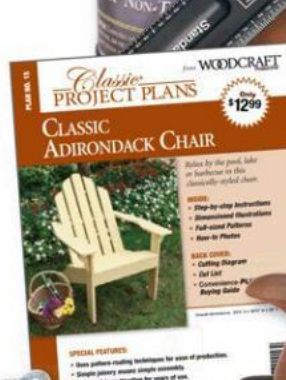
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Monkey Business

I love family vacations. My wife and sons and I talk about the adventures we'll experience when we get to our destination. To make the most of our travel time, we sometimes enlist a trip planner to give us turn-by-turn directions and include suggestions for interesting side trips and attractions.

In the same way, I appreciate the help offered in woodworking plans, which serve as a road map for completing a project and offer tips for getting the best results. So, when I stumbled across a Web site offering me more than 14,000 plans for \$49, well... they had my attention! Skeptical, but curious, I took a deep breath and ponied up the money to see what 50 bucks would get me.

The site was nice, but downloading all of those plans was going to choke my Internet bandwidth. For an extra \$10, the site said, I could get a CD of the plans mailed to my home. So I did.

When the CD arrived, I popped it into my computer and found an impressive list of folders with PDF plans thoughtfully categorized by project types. Bedroom sets. Workshop stuff. Outdoor projects. The works. Each folder was chock-full of plans. They even threw in software so I could read and print the plans without having to download anything.

Great deal, right?

Not so fast. First of all, there are only about 6,300 plans on the disc, and many of them were simply repeated—without explanation. And, about half of the “plans” I looked at were merely measured drawings. Not a word about technique or any project tips. Some woodworkers might be able to

build it from a bare-bones drawing, but for most of us, that'd be like trying to drive from Tampa to Des Moines without a road map or GPS unit. It might be fun, but expect to make a lot of wrong turns along the way, and plan to spend twice as much.

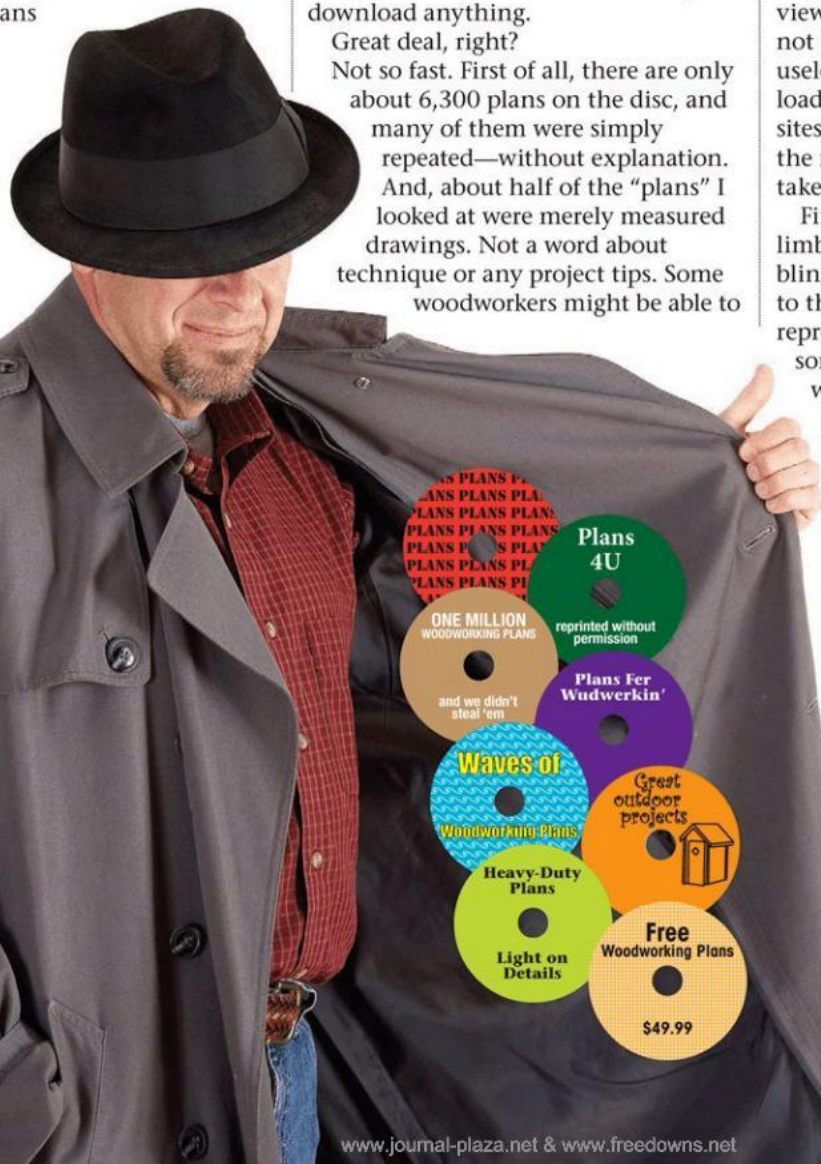
Often, it appeared that the CD maker literally ripped plans from woodworking magazines or books and just scanned them, and at such low quality that it was often difficult to make heads or tails out of them. In others, important details—such as exploded-view drawings and cut lists—are simply not there. Or they were so poor as to be useless. Others were obviously downloaded from well-known magazine sites, still branded with the name of the magazine or Web site they were taken from.

Finally, I'm going to go way out on a limb and guess that the people assembling these discs haven't actually gone to the sources to get permission to reproduce the plans. The whole idea of someone making money off the hard work of others really doesn't sit right with me.

The best way to find woodworking plans is to go to the source. Either buy the books or borrow them from the library, subscribe to the magazines, or download the plans from the owner's Web site. Not only will you get the fully detailed, step-by-step instructions, you also support the woodworkers who painstakingly designed the project.

Bottom line: Whether you're buying plans or road-tripping with a GPS, heed that little voice that's guiding you to do the smart thing. 🌿

The Shop Monkey (aka Tom Iovino of Tampa, Fla.) blogs prolifically at woodmagazine.com/shopmonkey.



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Glue comparison

What woodworkers need to know!

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Exterior Use - Waterproof	✓	
Easy Water Cleanup	✓	
Much Safer To Use	✓	
Shorter Clamp Time	✓	
No Foam - Less Mess	✓	
Shorter Open Time	✓	✓
Doesn't Stain Skin	✓	✓
Bonds Most Materials	✓	
Bonds Oily / Exotic Woods	✓	
Lower Cost - Better Value	✓	
Longer Usable Shelf Life	✓	

Woodworking Handbook 2007



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Add Storage to Stands

Fill in the blanks on your splayed-leg tool stand with a pair of space-efficient cabinets.

Open-leg stands save money, go together fast, and provide a sturdy base. But in space-starved shops, those flared legs also eat up precious square footage. Don't waste that space; maximize it by turning the stand into storage.

We sized cabinets to fit the tool stand shown. (See **Sources** at end of article.) For cabinets that fit your tool stand, see the three-step worksheet on *page 24*.

First, cut a shelf to rest on the stand stretchers between all four legs. Then size cases to fit between the legs above and below the shelf using Step 1 on *page 24*. Allow for the shelf thickness when figuring the height of the upper case sides.



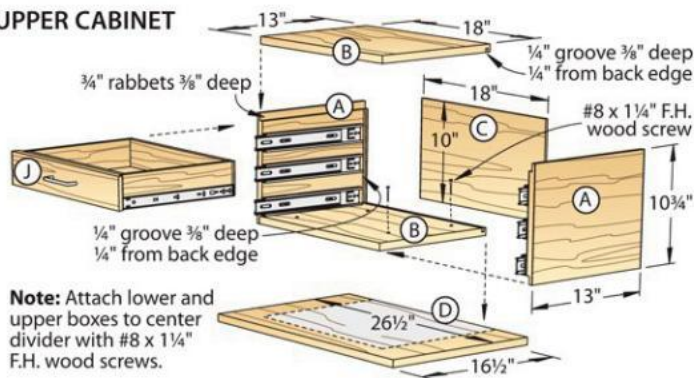
Next, cut the upper cabinet [Drawing 1] and lower cabinet [Drawing 2] parts to size except for the backs. Cut those about 1" oversize. Dry-assemble the bottom, sides, and top, and measure for the back. Then cut the back to size and assemble the case. Now repeat for the upper cabinet.

To fit doors to a lower case you've customized, measure the opening in your finished cabinet and cut door panels $\frac{1}{16}$ " shorter than the case-opening height and $\frac{1}{16}$ " narrower than half the case-opening width.

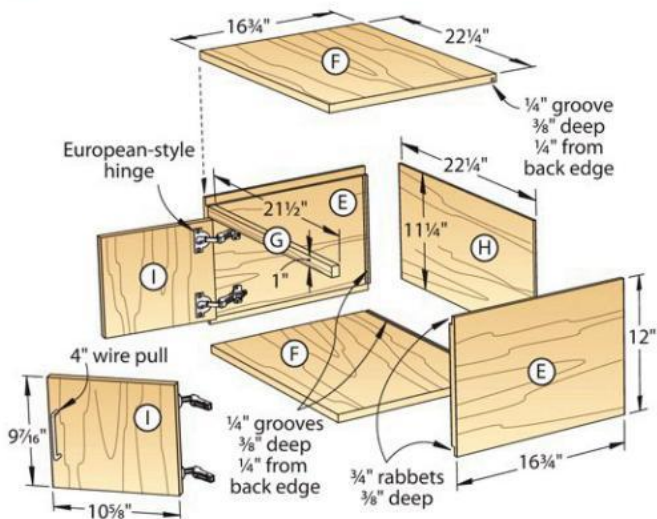
Mount European-style hinges by first drilling 35mm ($1\frac{3}{8}$ ") holes $\frac{1}{2}$ " deep 2" from the top and bottom. Space the holes in from the door edge according to the manufacturer's instructions. Drill and screw two hinges to each door. Center a door in the opening. Then drill and screw the hinges to the case sides. Repeat for the other door. Finally, use the hinge adjustment screws to fine-tune the door position.

continued on page 24

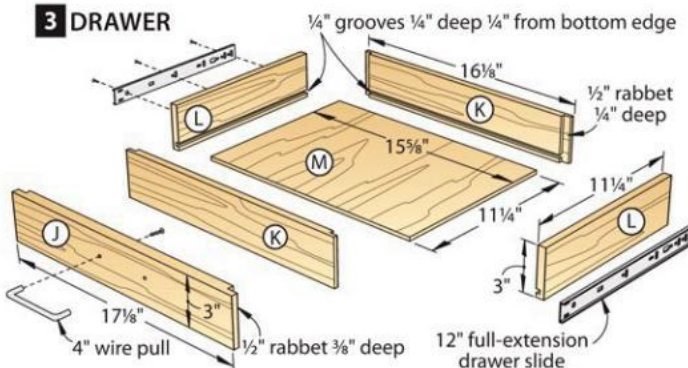
1 UPPER CABINET



2 LOWER CABINET



3 DRAWER



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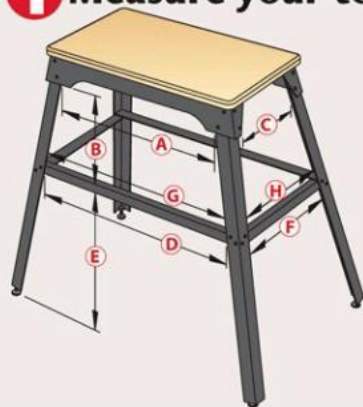


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Plan Custom Storage in 3 Easy Steps

1 Measure your tool stand



	Our Stand	Your Stand	+/- Difference
A	19¼"		
B	11¾"		
C	9¼"		
D	23¾"		
E	13¾"		
F	14"		
G	26½"		
H	16¾"		

We sized our storage cases to fit a stand with the openings shown *above left*. To adapt cases to your stand, measure it at the narrowest points, (A) and (C), for example. Measure between the outside edges of the stretchers (G) and (H) for the shelf. Then write the differences between our dimensions and yours (Step 2) along with a plus or minus sign in the right column of the table *above*. Transfer those numbers to the **Materials List** in the third step.

2 Do the math (but just a little)

Part	T	W	L	DIFFERENCE FOR YOUR STAND W± L ±	PART SIZE FOR YOUR STAND W (new) L (new)	Matl.	Qty.
Upper cabinet							
A sides	¾"	10¼"	13"	B +1¼" C -1¾"	12" 11¼"	BB	2

Step A
If your stand measures 13" for dimension (B), calculate the difference from our stand (13" - 11¾" = 1¼").

Step B
If your stand measures 8" for dimension (C), calculate the difference (9¼" - 8" = 1¾").

Step C
Cross out the original dimension.

Step D
Add or subtract the difference between part sizes and write in the new part dimensions.

3 Size parts for your stand

Materials List

Part	T	W	L	DIFFERENCE FOR YOUR STAND W± L ±	PART SIZE FOR YOUR STAND W (new) L (new)	Matl.	Qty.
Upper cabinet							
A sides	¾"	10¼"	13"	B C		BB	2
B top/bottom	¾"	13"	18"	C A		BB	2
C* back	¼"	10"	18"	** **		BB	1
Lower cabinet							
D shelf	¾"	26½"	16½"	G H		BB	1
E sides	¾"	12"	16¾"	E F		BB	2
F top/bottom	¾"	16¼"	22¼"	F D		BB	2
G front rail	¾"	1"	21½"	D		BB	1
H* back	¼"	11¼"	22¼"	** **		BB	1
I doors	¾"	10½"	9¼"	** **		BB	2
Drawers							
J faces	¾"	3"	17½"	** **		BB	3
K fronts/back	½"	3"	16½"	** **		BB	6
L sides	½"	3"	11¼"	** **		BB	6
M bottoms	¼"	15½"	11¼"	** **		BB	3

*Parts initially cut oversize. See the instructions. ** Cut to fit the partially finished case. See the instructions.

Materials key: BB—Baltic birch plywood.

Supplies: 12" full-extension slides (3 pairs), 107° offset European-style hinges (2 pairs); 4" wire pulls (5).

Blades and bit: ¼" and ¾" dado sets, 35mm or 1¼" Forstner bit.

Source

Tool stand: Shop Fox no. G7313 with a 13x23" top, \$45, Grizzly Industrial, 800-523-4777 or grizzly.com.

Build custom drawers

For the upper-case drawers, size the drawer box depth to suit your needs and case opening. The assembled drawer box should be 1" narrower than the case opening width to allow for drawer slides, and no deeper than the inside case depth minus ¼" to allow for the drawer front.

Next, cut the drawer parts to size and rabbet the fronts and backs as shown. For each drawer, glue and clamp together the front and back to the sides with the bottom in the grooves [Drawing 3]. Use the longest slides that fit your drawer sides, even if that requires modifying the drawer front faces, as shown *below*. Mark drawer slide centerlines to space the drawers evenly within the case, allowing a ⅛" reveal at the top and bottom and ⅛" between drawers.

Attach the drawer-mounted portions of the slides centered on the drawer sides. Center the case-mounted slide parts on the case centerlines, screw them in place, and test fit the drawer in the case. Attach the drawer faces to the fronts with double-faced tape and install the drawer pulls.

To install the cabinets on your stand, glue or screw the lower cabinet to the center shelf. Loosen the bolts holding the legs to the stretchers enough to slide the shelf and lower cabinet in place, and reassemble the stand. Then screw the shelf to the stand stretchers.

Now slide in the upper cabinet centered on the shelf and screw it in position. With the doors and drawers in place, your stand has the storage to earn its floor space in your shop. 🌱

MAKE ROOM FOR THE SLIDES



Sizing drawers to the stand left the sides ½" too short to accept the 12" slides. Rabbeting the drawer-face ends solved the problem.

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Finishing School

Now you see it...

...now you don't

3 Ways to Patch a Scratch

Try these techniques to fix everything from a small scratch to an ugly wood wound.

Begin your repair by assessing whether only the film layer is damaged, or both the film and stain, exposing the wood. To test, wipe the damaged area with mineral spirits, as shown *below*, or just a dab of spit. Then choose a repair based on the following:

■ No change in color. Good news, the film finish wasn't penetrated down to the wood fibers. Go to **Fix #1**.

■ The color changes to match the undamaged area. More good news. Scratches penetrated the film finish, but the wood underneath either wasn't stained or no wood fibers broke. Go to **Fix #2**.

■ The damaged area turns darker than the surrounding finish. This deep scratch broke wood fibers. Go to **Fix #3** after reading the rest of this section.

Before starting the second or third fix, determine which type of film finish was used. Perhaps you recall this for projects you built. If not, check whether it's a lacquer finish by dabbing a hidden spot with lacquer thinner. If the finish softens, it's lacquer. If denatured

alcohol softens the finish, it's shellac. If there's no change and the piece is fairly new, you likely have a water-based or polyurethane finish.

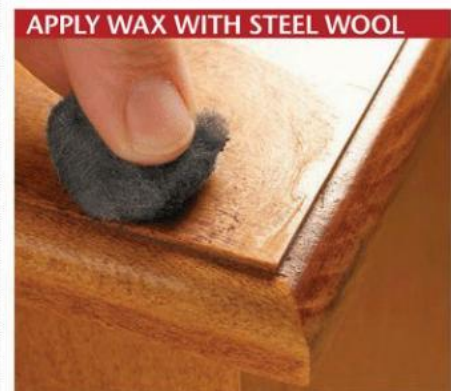
If you don't know the stain, apply comparable colors to scraps of the same wood species until they match. Before starting all repairs, liberally apply mineral spirits with clean cloths to remove any built-up wax or spray polish.

Fix #1: Paste wax for scuffs and shallow scratches

Cover up minor marring or scratches on a film finish using paste wax tinted about the same color as your project. (See **Sources**.) For a light scuff, use a soft cloth to apply the wax. For deeper scuffing, gently apply the wax with 0000 steel wool, as shown at *right*. Allow the wax to harden, and buff it with a soft cloth to the even sheen shown *above, right*. If this produces a sheen that's different from the surrounding area (see "What is sheen?" on the *page 28*), wax the entire surface with a soft cloth.

This method has one drawback: It doesn't repair the damaged area so much as cover it up. Should you later decide to repair the surface by dabbing

on finish as in **Fix #2** or applying another coat of finish, you'll first need to wipe away all traces of the wax with generous amounts of mineral spirits and soft, clean cloths.



continued on page 28

MOISTURE REVEALS DAMAGE



Rag soaked with mineral spirits

Damaged area turns dark



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Finishing School

Fix #2: Fill in a film finish

Some film-finish dings are too deep for paste wax to cover, but they still don't break the wood's surface, as shown at *near right*. Using a fine-tip applicator (see **Sources**), dab a small amount of matching finish only on the damaged area, as shown at *far right*. Lacquer and shellac patch easily with this method because the freshly applied finish partially dissolves and bonds with the topcoat. Continue dabbing on layers of finish until the patched area becomes level with the surrounding finish.

Use a similar method to touch up dinged polyurethane and water-based finishes, which don't redissolve earlier coats and level themselves. Dab on additional finish and allow it to dry. If

DINGS LEAVE DIPS IN THE FINISH



there's still a slight depression after the finish dries, gently wipe the patch with 0000 steel wool and apply a second coat. If the patch stands proud of the surface, lightly sand it flush with 400- and 600-grit abrasives. Then

LEVEL OFF THE DIP WITH FINISH



restore the sheen of the patched area to that of the surrounding surface by sanding with progressively higher grits and, if necessary, rubbing compounds. A coat of paste wax also can help blend the patch with the rest of the surface.

What is sheen?

Sheen refers to how much light reflects off a surface. To hide your repairs, you'll need to match the sheen of patched areas to the surrounding finish as carefully as you match stain color to the rest of the surface.

A glossy finish, like the one *below*, bounces more light back to your eyes than a flat finish, which disperses the light. You can control sheen by choosing a flat, satin, semigloss, or gloss finish, each containing different amounts of flattening agent.

That's not the only method, though. You also adjust surface sheen by how smoothly you rub out a film finish with abrasives, and that's what complicates repairs. During the repair, if you rub the damaged area with sandpaper or steel wool and alter the surface sheen, that calls as much attention to itself as an off-color patch.

Avoid inconsistent sheen by using the same abrasive on the patched area as you used to finish the surface when the project was built. Paste wax can offset minor sheen differences, but extensive repairs may require refinishing the entire surface around the damaged area.

SHEEN SHOWS SCRATCHES



Fix #3: Rebuild the finish from bare wood

If the mineral spirits wipe test turned the scratch into a dark streak, the wood fibers have been severed and the severed ends are soaking up the mineral spirits. Deep damage requires extensive repairs.

If there's only one scratch and fibers don't protrude from the surface, first seal the damaged area by dabbing on a 50-50 mix of film finish and the appropriate solvent. Then restore color to the scratch by dabbing on the

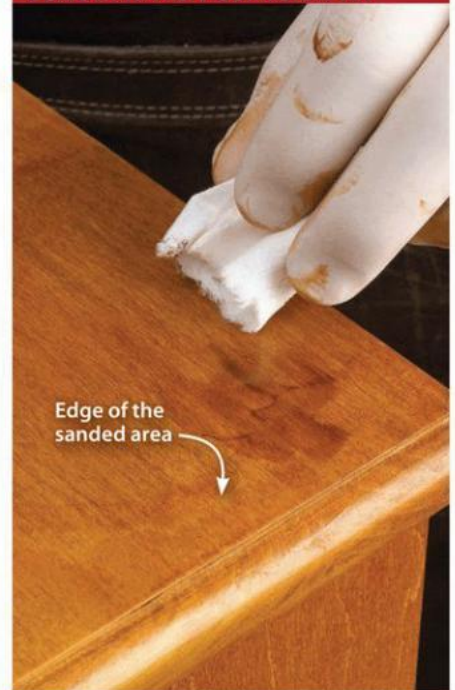
original or a matching stain using a fine-tip applicator until you match the color. Allow the stain to dry thoroughly; then seal it by dabbing on topcoat as in **Fix #2**.

For multiple moderate scratches, as shown *below left*, consider sanding the damage down to bare wood using 120-grit abrasive. Sanding with a finer grit may produce a lighter surface when restained. Avoid sanding too much over the damaged area and creating a visible depression in the wood. For extensive damage, sand the entire damaged

AFTER ALL THAT WORK...OUCH



COLOR MATCH USING STAIN



surface to bare wood and refinish it to match.

For smaller repairs, though, begin restoring the color by wiping the bare wood with stain. Carefully wipe the stain to the edge of the sanded area. Avoid staining the feathered edge where the film finish meets bare wood, or you'll leave a darkened halo around the patch.

GOOD PATCHES BLEND IN



If the stain wipes on too light and the pores are not being filled to match the surrounding wood, scrape a small amount of pigment from the bottom of the stain can. Pigment colors may vary from the dye in the stain (dye color doesn't settle as pigment particles do), so add pigment carefully to a cloth moistened with stain. Then wipe this mixture over the previously stained area to darken it.

Using a back-and-forth motion, add and then partially wipe off enough coats of stain that the color—while still moist—matches the undamaged surface. If you apply too much stain, wipe it off immediately with mineral spirits and allow the surface to dry. Build color gradually rather than deposit too much at one time.

Allow the stain to dry completely before spraying or brushing on a topcoat to blend the sheen of the patch with the surrounding surface, as shown *above*. If necessary, recoat the entire surface for an even sheen. 🌳

Sources

Tinted wax: Briwax in nine shades, \$16 for 16 oz, Woodcraft, 800-225-1153 or woodcraft.com.

Fine-tip applicators: Microbrushes ranging from superfine to small brush sizes, \$2.40 for 10, Lee Valley Tools, 800-871-8158 or leevalley.com.

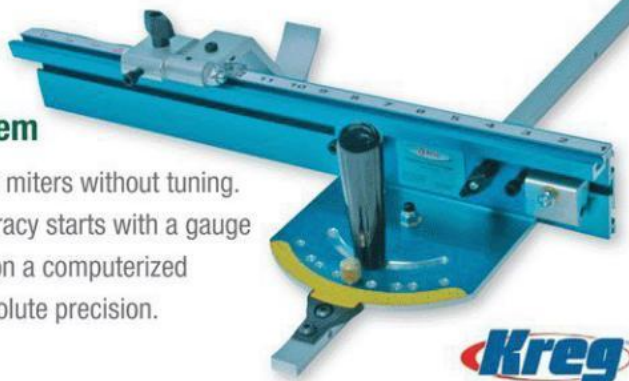
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Does it make sense to measure to $\frac{1}{64}$ ”, and then mark a line with a pencil point that’s twice that width? Even a fine mechanical pencil proves no match for the precision of a marking knife. Here’s what you need to know before buying one.

■ We show a dedicated marking knife in these photos, but you can, in most cases, get good results using a utility or craft knife. However, beware that those knives’ thin blades might flex and stray from your intended layout.

■ You can buy individual left- and right-handed knives, as shown *top right*, or a knife with a dual-bevel blade (*inset*). All have a flat face on the blade opposite the bevel, letting you place it tightly against a straightedge or mating workpiece for a precise mark. The left- and right-handed knives tend to have larger handles, making them easier to grasp if you have large hands.

Learn the basics first

■ Sharpen your knives on a fine-grit stone or sandpaper by simply pressing

DUAL-BEVEL KNIFE



the bevel against the surface and dragging back and forth a few times. Remove the burr from the flat side by making a couple of passes on the abrasive. It won’t take long to put a keen edge on the knife.

■ You don’t need to score deeply, just enough that a chisel or handsaw will seat in the kerf. With coarse-grained woods, such as oak or ash, the marking knife might follow the grain rather than your straightedge. To avoid this, make the first scoring pass lightly, and follow with successively greater pressure, deepening the kerf.

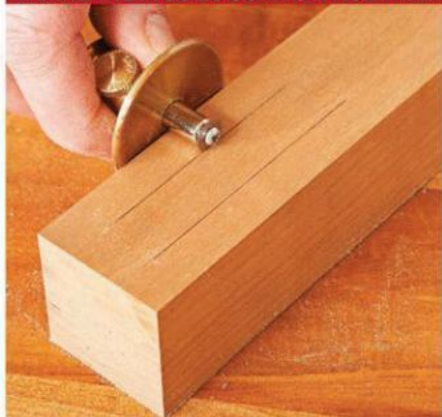
Here are some examples of when a keen marking knife will leave a pencil looking dull.

Locating mortises

A mortise-and-tenon joint requires a precise fit to be strong and attractive. To lay out a mortise, as shown on the table legs *below*, first mark the mortise sides with a marking gauge. Next, mark the top and bottom of the mortise with a marking knife and a square. Once you’ve got a mortise located on one table leg, use it to lay out the mortise ends for the other legs. Simply clamp the legs together and grab a square to transfer the lines. You can also use your marking gauge or knife to mark the shoulders for the tenons on the mating workpieces.

continued on page 32

MAKE METICULOUS MORTISE MARKS



A marking gauge ensures the mortise-wall layout lines run perfectly parallel to the workpiece sides.



Mark mortise-end lines a little past each of the sidewall lines. The wayward marks will be concealed by the tenon shoulders.



With the knife in the mortise-end line of the first leg, slide the square up against it, and then mark the other leg for an exact match.

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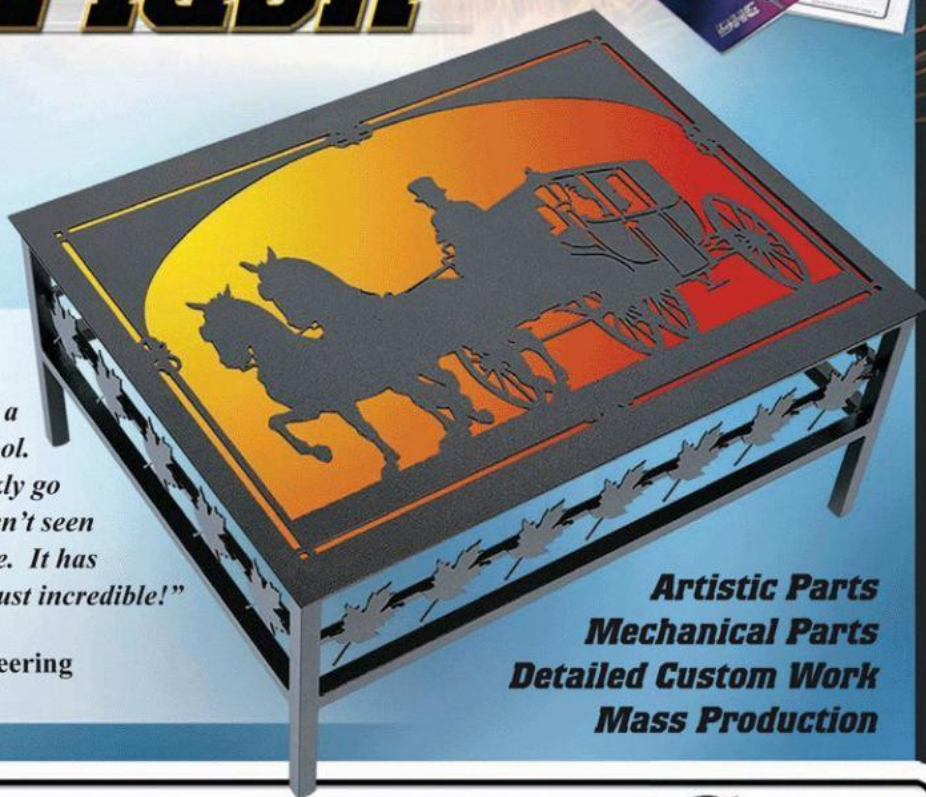
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Develop Your **Shop Skills**

MARK CUTOFF LINES EXACTLY



Hold solid-wood edging tight against the panel; then use a marking knife to score it for the exact length needed.

Sizing up project parts

Marking knives help you precisely transfer measurements when marking parts to size. For example, marking a piece of solid-wood edging to match a veneered panel, as shown *above*, gives you an exact fit. You can do this with any project part that must be cut to fit an existing opening or when making story sticks, templates used for marking and transferring measurements.

SCORE ULTRA-PRECISE DOVETAILS AND PINS



After scoring the pin-socket depth with a marking gauge, use a knife to define the tails.



Use your already-cut tail board to now mark the locations for the mating pins.

Marking dovetails

You enjoy two advantages when laying out dovetails with a marking knife, as shown *above*. First, you get the greater precision of the knife's keen edge, resulting in a better fit. And when you begin cutting the pins and tails, your chisel or handsaw slips into the knife-cut kerf for straighter, cleaner cuts. 🌲

Sources

Single-bevel marking knives: part #33N07.01 (right-hand bevel); #33N07.02 (left-hand bevel); \$31.50 each, Lee Valley, 800-871-8158, leevalley.com.
Dual-bevel marking knife: part #885-2154, \$50, Traditional Woodworker, 800-509-0081, traditionalwoodworker.com.
Dovetail markers: part #05N61.04 (6"); #05N61.05 (8"); #05N61.08 (14"); \$12.95 each, Lee Valley, 800-871-8158, leevalley.com.



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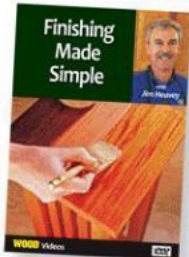
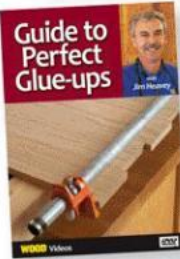
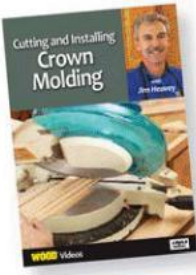
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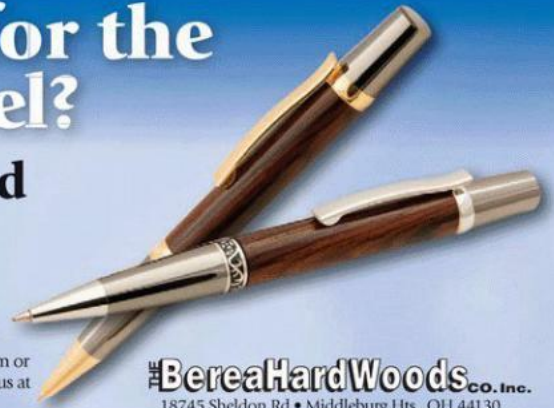
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Floating Wall Shelves



With attractive shelves this easy to make, you'll soon fill rooms with decorative displays.



WHAT YOU'LL NEED



■ **Materials:** 3/4" oak plywood, 3/4x3" oak, 2 1/4"-wide oak crown molding, 1 1/8" oak plywood cap molding.

Friends who see these shelves will ask you two questions: "How are they supported?" (cleats) and "Can you make one for me?" (no problem). For variety, try the version on page 37.

Cut and assemble the shelf

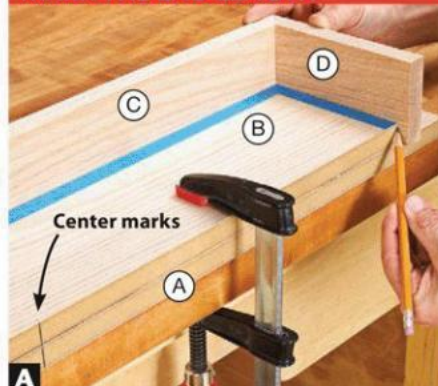
1 Cut the top (A) and bottom (B) to size [Materials List, page 36] from 3/4" plywood. Then, from 3/4" oak, cut the face (C) 2" longer than shown, and ends (D) 1" longer than shown. Miter one end of the front and each end piece.

2 Apply painter's tape to the front edge and both ends of the bottom (B) to keep glue from sticking to it later. Mark centers of the untaped edge on the bottom and one edge of the top (A). Align

the center marks with the edges flush and clamp both parts to your workbench [Photo A].

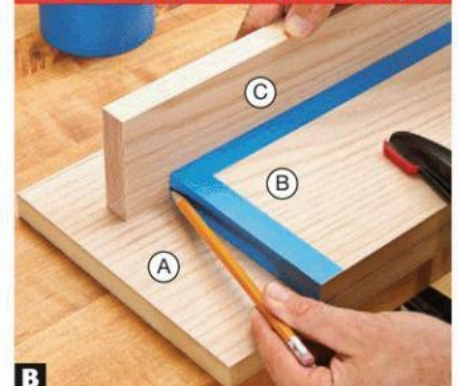
3 Hold the face (C) against the taped edge of the bottom (B) and one end

MARK THE END LENGTH



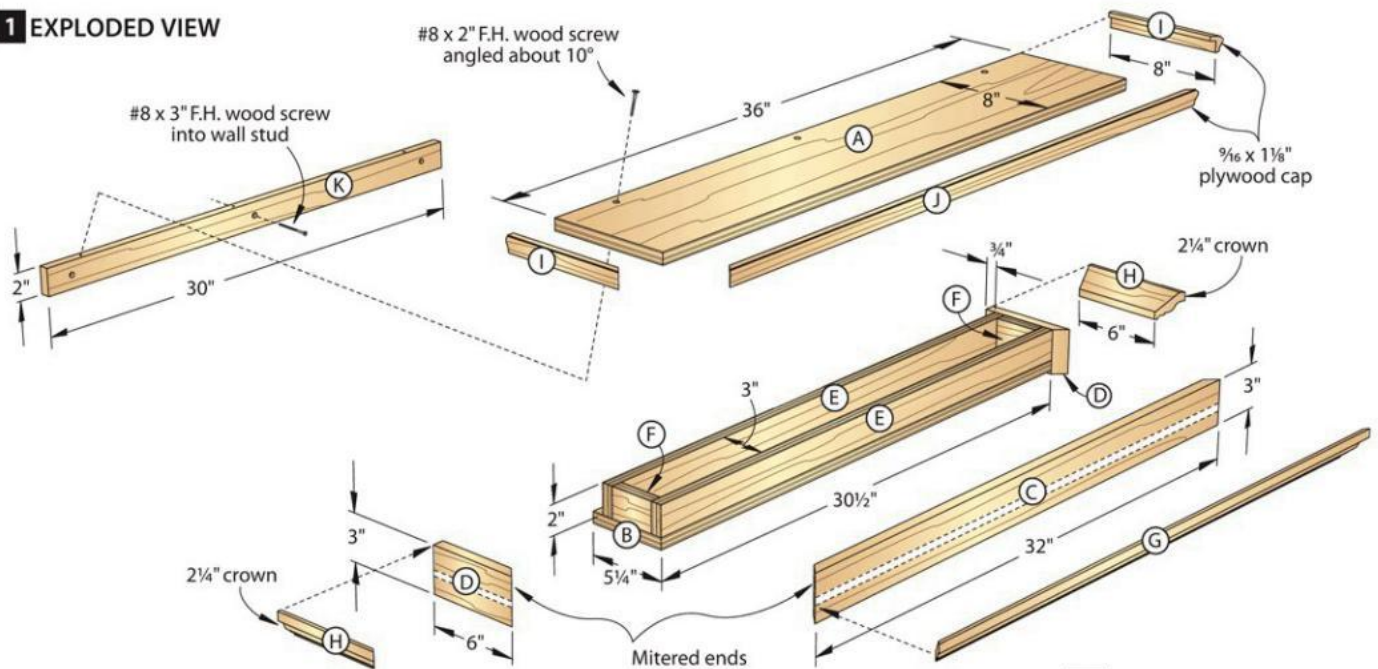
A Squeeze the miters together while you mark where to cut the end (D) even with the back edge of the bottom (B).

MARK THE LENGTH OF THE FRONT



B Place the mitered end of the face (C) against the opposite corner of the bottom (B) while marking the second miter's location.

1 EXPLODED VIEW



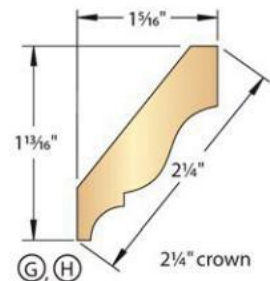
SHOP TIP

Give your pencil point knife-edge precision

When the width of your pencil line makes a difference between tight and not-so-tight miters, don't settle for heavy pencil marks. Mount 180-grit sandpaper on a flat surface and quickly sand the point to a chisel shape.



1a END PROFILE OF MOLDING



(D) against a taped end of the bottom with their miters together. Mark and cut it flush with the bottom edge [Photo A]. (See the **Shop Tip** above for how to draw ultrafine marks.)

4 With the face (C) and end (D) miters tight, mark the miter location at the other end of the face [Photo B] and miter-cut it to length. Now hold the miter on the oversize end piece against the front miter, mark it at the edge of the bottom (B) and cut it to length.

5 Sand the face (C) and ends (D) to 180 grit. Glue and clamp them to the top (A) [Drawing 1], using the bottom (B) as a guide. After the glue dries, pull out the bottom and peel off the tape.

6 Cut long spacers (E) and short spacers (F) to size; then glue and clamp them to the bottom (B) and ends (D). After the glue dries, glue, center, and clamp the top (A) to the edges of the face (C), ends, long spacers, and short spacers to complete the shelf assembly.

Add the crowning touch

1 Compare the dimensions of the crown molding with the dimensions

shown [Drawing 1a]. Cut the front crown (G) and end crowns (H) about 4" over-long and miter one end of each. (Note the left and right end crowns.) For help mitering moldings, see "Cut safe, simple miters" on page 36.

2 With the shelf assembly (A-F) upside down on your bench, tape the mitered ends of the front crown (G) and one end crown (H) [Photo C]. Then mark the end crown where it's flush with the end (D). Cut the end crown to length.

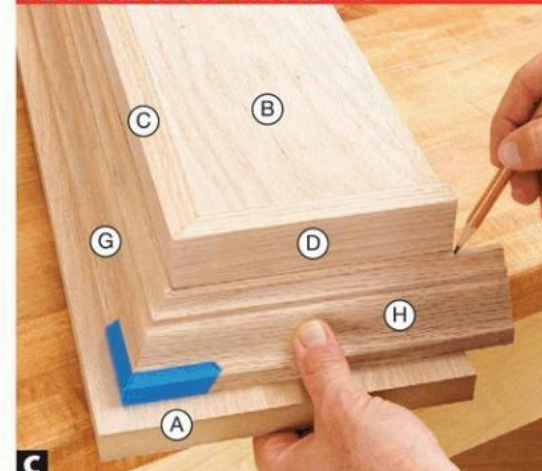
3 As you did with the face (C) and end (D), mark and cut the front crown (G) and other end crown (H) to length. Glue and clamp the front crown and end crowns in position.

4 Cut the end caps (I) and front cap (J) about 2" longer than shown. Then make a cap-mitering jig to fit your miter-saw. To do this, cut two 16"-long strips from 3/4" plywood scraps, one 1 1/2" wide and the other 1 1/4" wide. Stack and glue the strips between their edges and ends flush, then cut miters on both ends.

5 With the mitering jig on your saw [Photo D], miter one end of the left and right end caps (I) and the front cap

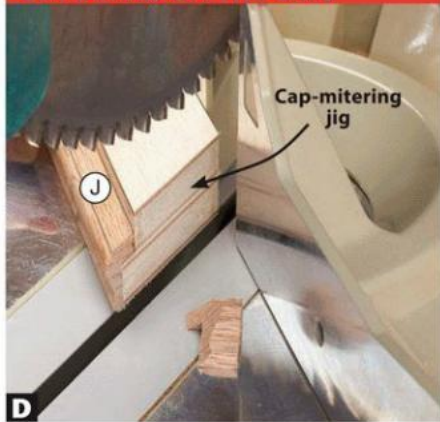
(J). Butt the miters on one end cap and front cap, then mark the front cap length [Photo E]. Cut the front cap to length on the mitering jig [Photo F]. Now mark the end caps and cut them to length. Glue and clamp the end caps and front cap in position on the top (A).

ADD THE CROWN MOLDING



C After mitering the front crown (G) to length, butt that against the end-crown (H) miter and mark the end crown length.

CUT BEVELS ON THE CAPS



The two-piece jig holds the molding blank and backs up miter cuts. Alter the jig dimensions as needed to fit your molding.

MARK THE CAP TO WRAP THE TOP



Hold the mitered opposite end of the front cap (J) flush with a corner of the top (A) and mark the wide portion of the cap.

LINE UP THE MARK FOR YOUR CUT



Line up the cut mark with the end of the cap-mitering jig, and rotate the workpiece onto the jig before making a cut.

Mount the shelf

1 After the glue dries, finish-sand parts to 180 grit. We applied Varathane Dark Walnut stain and two coats of satin wipe-on polyurethane.

2 Cut a hanger cleat (K) to size, and mount it level on a wall using #8x3"

screws reaching into studs. (Substitute drywall anchors, if necessary.)

3 Temporarily hold the completed shelf against the wall-mounted hanger cleat (K) and drill three countersunk 1/8" pilot holes through the top (A) and into the wall cleat (K). Angle the

drill bit slightly to help the chuck clear the wall. Touch up the stain and finish around the countersinks as needed. Then drive screws to install the shelf on the hanger cleat. Now gather up your display items and show them off along with your new shelf.

Cut safe, simple miters

This method for cutting crown molding works as easy as 1-2-3 with no tricky miter saw setups.

1 Cut a 3"-wide piece of 1/2" MDF long enough to span your miter saw table. Then apply pieces of double-faced tape to the underside of this support strip.

2 With the crown molding angled upside down and its mounting edges against the miter saw table and fence, attach a support strip to hold the crown molding in position (below left).

3 Cut kerfs in the support strip at both 45° angle settings and remove the center section. Lay the crown molding in position with the cut marks about 1/8" from the support-strip miters to allow for the kerf width. Cut parts to size (below right). **Note:** When using a miter saw this way, start the saw with the blade up, make the cut, then switch off the motor and allow it to stop before lifting the blade. This prevents a spinning blade from tossing small cutoffs.

Materials List

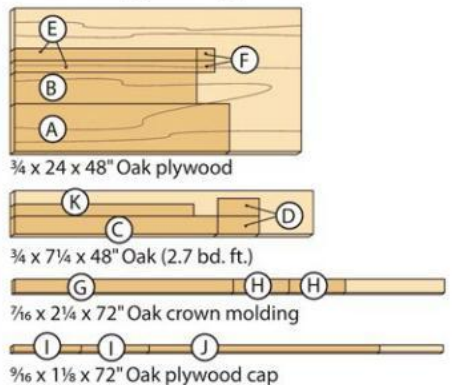
Part	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A top	3/4"	8"	36"	OP	1
B bottom	3/4"	5 1/4"	30 1/2"	OP	1
C* face	3/4"	3"	32"	O	1
D* ends	3/4"	3"	6"	O	2
E long spacers	3/4"	2"	30 1/2"	OP	2
F short spacers	3/4"	2"	3"	OP	2
G* front crown	7/16"	2 1/4"	34 3/8"	OC	1
H* end crowns	7/16"	2 1/4"	7 1/16"	OC	2
I* end caps	9/16"	1 1/8"	8 5/16"	OPC	2
J* front cap	9/16"	1 1/8"	36 5/8"	OPC	1
K hanger cleat	3/4"	2"	30"	O	1

*Parts initially cut oversize. See the instructions.

Materials key: OP—oak plywood, O—oak, OC—oak crown molding, OPC—oak plywood cap

Supplies: #8x2" flathead wood screws (3), #8x3" flathead wood screws (3).

Cutting Diagram



ATTACH A SUPPORT STRIP

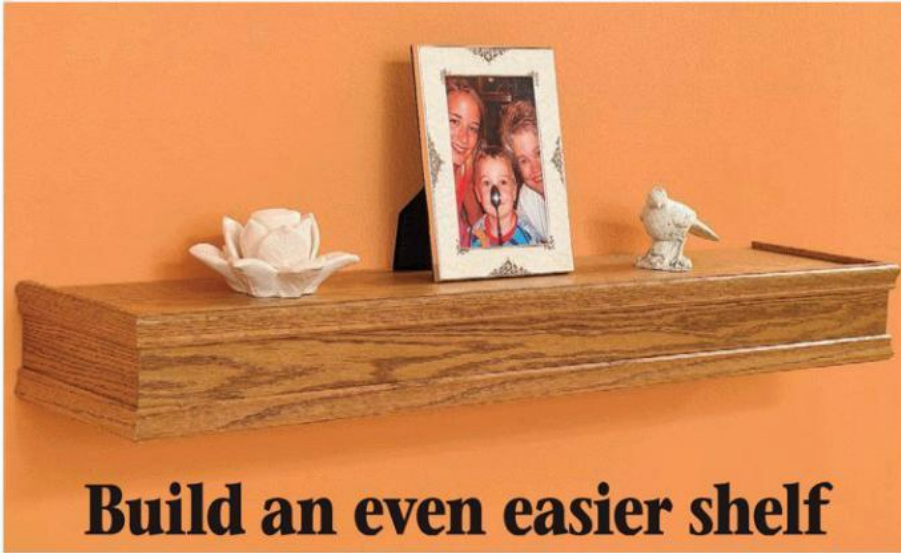


When attaching the crown molding stop strip, apply double-faced tape so it adheres to the fixed outside edges of the miter saw table, not the rotating part.

CUT CROWN CONSISTENTLY

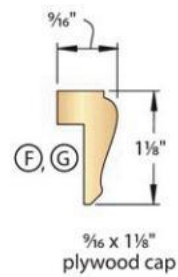


When the crown molding doesn't extend along one side of the crown molding stop, add a spacer there to keep the spinning blade from moving the stop.

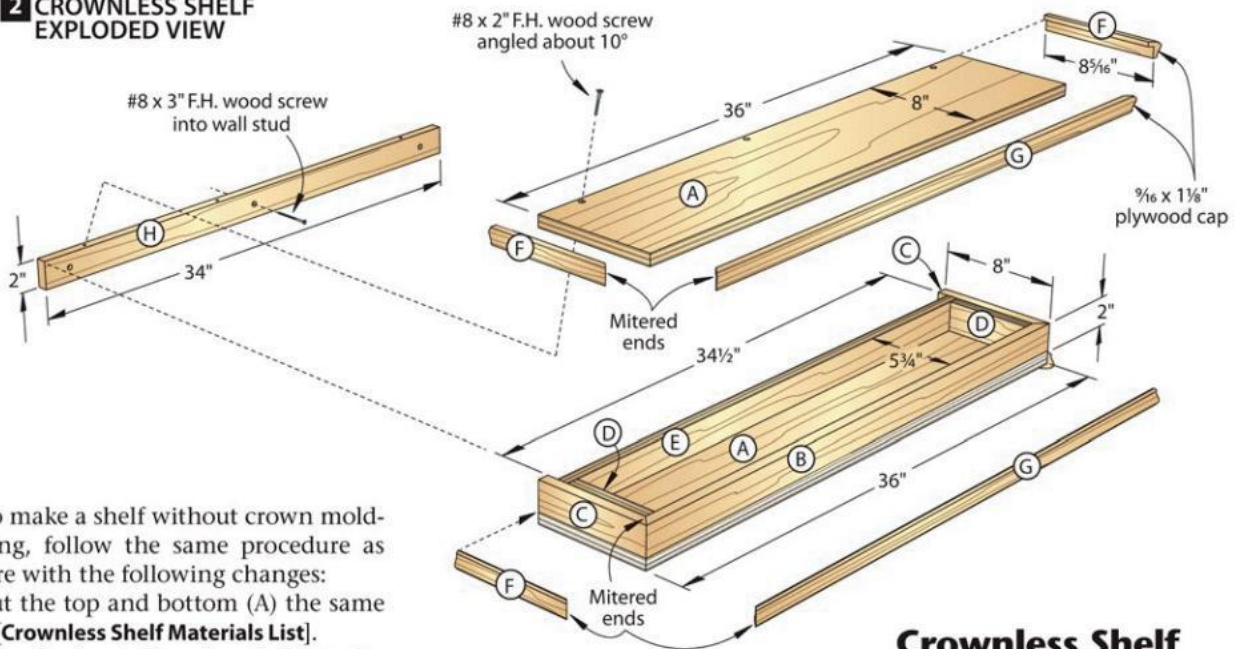


Build an even easier shelf

2a END PROFILE OF MOLDING



2 CROWNLESS SHELF EXPLODED VIEW



To make a shelf without crown molding, follow the same procedure as before with the following changes:

- Cut the top and bottom (A) the same size [Crownless Shelf Materials List].
- Glue the front (B) and ends (C) to the bottom (A) [Photo G], then add the back spacers (D) and back (E) before gluing the top (A) in place [Drawing 2].
- Glue and clamp end and front plywood caps (F, G) to the edges of both the top and bottom (A).

Crownless Shelf Materials List

Part	FINISHED SIZE			Matl.	Qty.
	T	W	L		
A top/bottom	3/4"	8"	36"	OP	2
B* front	3/4"	2"	36"	O	1
C* ends	3/4"	2"	8"	O	2
D back spacers	3/4"	2"	5 3/4"	OP	2
E back	3/4"	2"	34 1/2"	OP	1
F* end caps	1/16"	1 1/8"	8 5/16"	OPC	4
G* front caps	1/16"	1 1/8"	36 5/8"	OPC	2
H hanger cleat	3/4"	2"	34"	O	1

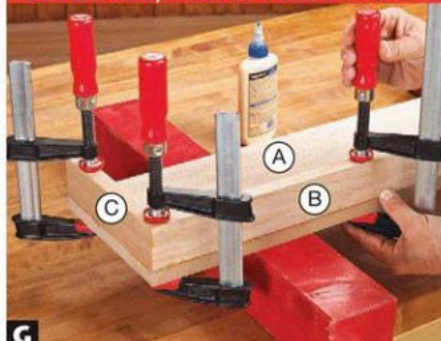
*Parts initially cut oversize. See the instructions.

Materials key: O—oak, OP—oak plywood, OPC—oak plywood cap.

Supplies: #8x2" flathead wood screws (3), #8x3" flathead wood screws (3).

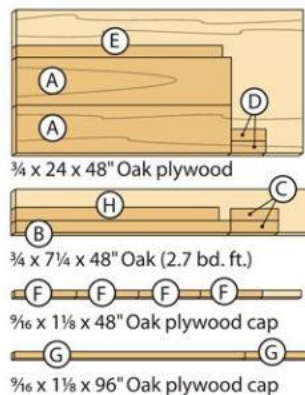
In the opening photo: Better Homes and Gardens® Candle Holders and Better Homes and Gardens® Frames sold at Walmart®.

GLUE ENDS, FRONT TO BOTTOM



Both the front (B) and ends (C) mount flush with the top/bottom (A). Plywood caps (F, G) later will hide the exposed plywood edges.

Cutting Diagram

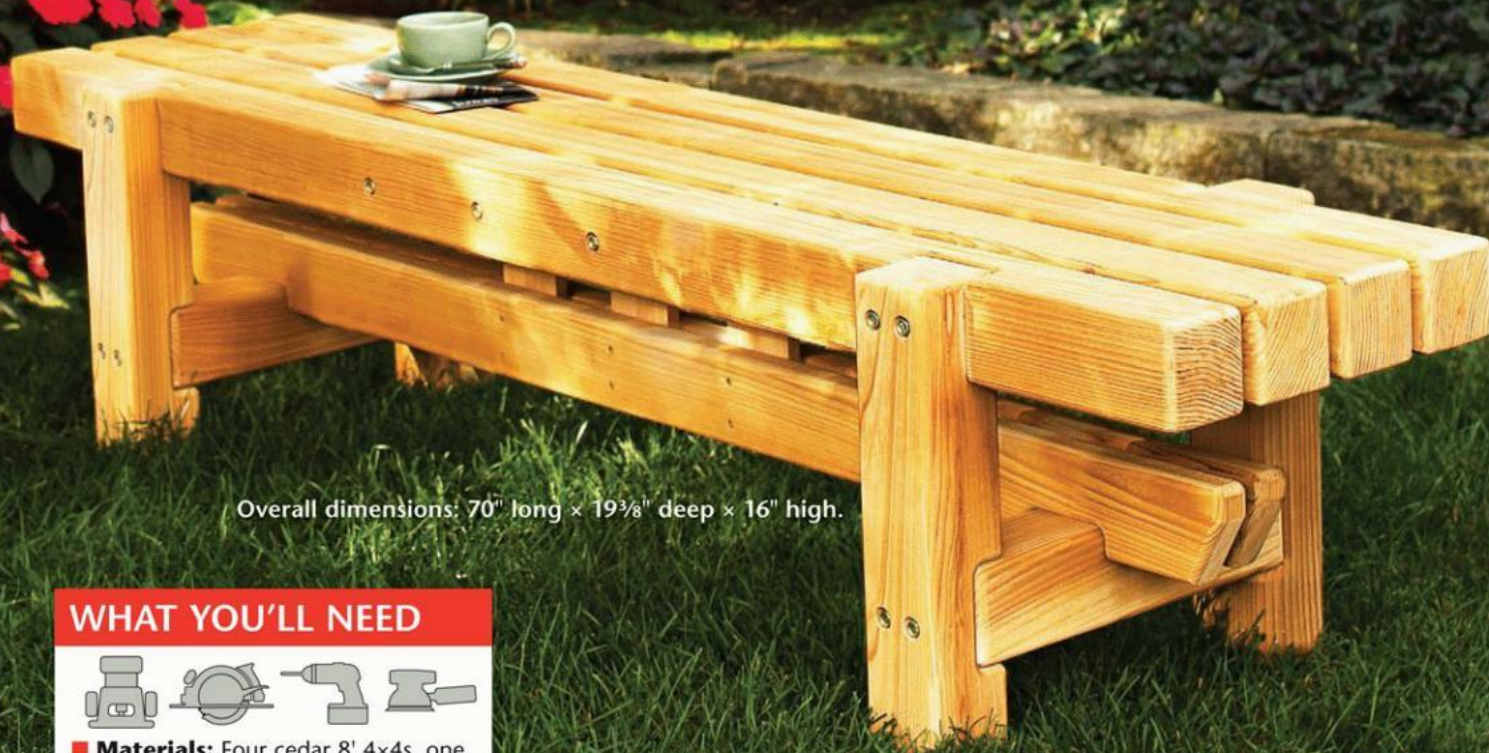


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BASIC-BUILT

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Overall dimensions: 70" long × 19³/₈" deep × 16" high.

WHAT YOU'LL NEED



- **Materials:** Four cedar 8' 4×4s, one 4' 4×4, two 8' 2×4s, and two 6' fence pickets. (See **Shop Tip**, page 41.)
- **Bits:** ³/₈" round-over router bit and ³/₄" spade bit.

Shop for easy-to-find materials on Saturday, and by Sunday you'll be sitting on your own bench that's built to last for years.

Dado with a circular saw

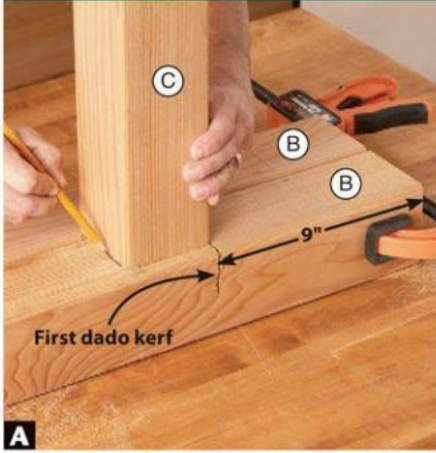
1 Cut the inside seat slats (A), outside seat slats (B), and legs (C) to size [Materials List, page 41]. **Quick Tip:** *Cut yourself some slack.* You can cut two inside or outside seat slats

from one 12'-long 4×4, but a little extra money for two 8' 4×4s gives you more flexibility to trim checked material off the ends and work around knots. Clamp the inside seat slats together with the ends and faces flush to reduce wood movement; then set them aside.

2 Clamp together the outside seat slats (B) with the faces and ends flush. Measure and mark 9" from each end where you'll begin dados for the legs

[Drawing 1]. **Quick Tip:** *Put your best face forward.* Before notching and assembling the slats, take a moment to study the grain and turn the most attractive faces to the top and outside edges of the bench. Set your circular saw to make a 1³/₄"-deep cut and saw the first dado cuts where marked. Place a leg (C) on the first kerfs and mark the opposite ends of the dados on the outside slats [Photo A].

MARK DADOES TO FIT THE LEGS



A Instead of measuring the leg (C) width to mark the outside seat-slat (B) dado sizes, use the leg itself for a perfect fit.

TWO KERFS DEFINE THE DADO

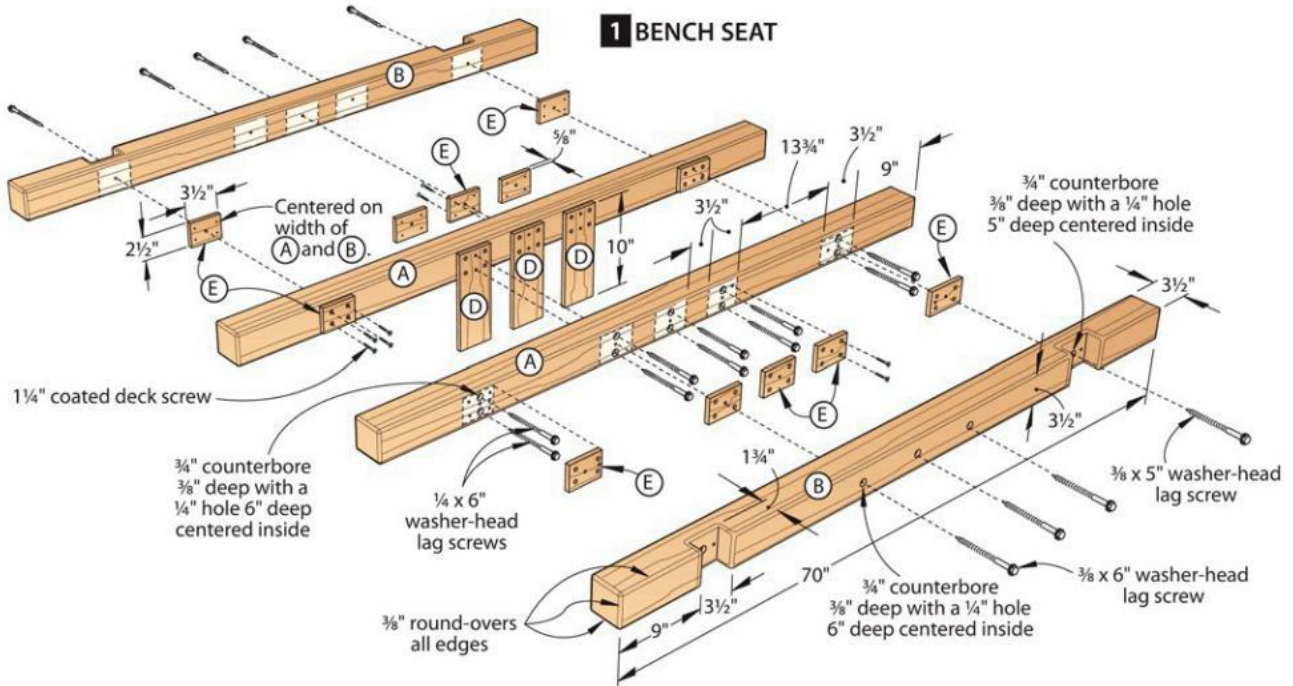


B Using a square to guide your circular saw, cut the second kerf where marked in Photo A to establish the width of your dados.

CLEAN UP THE DADO BOTTOMS



C After breaking off most of the waste between kerfs, press the flat face of a chisel against the dado bottom and shave it flat.



1 BENCH SEAT

3 Cut a second saw kerf in each outside seat slat (B) [Photo B]. Then saw kerfs about $\frac{1}{4}$ " apart between the two outside kerfs. Break off the waste between the kerfs and smooth the dado bottom [Photo C]. Use the same method to dado the legs (C) for the leg rails (F).

4 Rout $\frac{3}{8}$ " round-overs on all edges of each seat slat (A, B) and leg (C) and around the dados. Sand the seat slats and legs to 120 grit.

Assemble a seat slat by slat

1 Cut the long spacers (D) and spacers (E) to size. Sand spacers to 120 grit. **Note:** Sanding a $\frac{3}{8}$ "-thick fence picket may thin it to about $\frac{5}{16}$ " thick, creating a slightly narrower seat-slat (A, B) spacing.

2 Drill and screw the long spacers (D) and spacers (E) to an inside seat slat (A) [Drawing 1, Photo D]. (For the $\frac{1}{4}$ " deck screws in this project, we drilled $\frac{7}{64}$ " countersunk pilot holes.) **Note:** Drive the screws about $\frac{3}{4}$ " from the ends and edges of the long spacers and spacers to leave room for lag screws joining the inside and outside (B) seat slats.

3 Clamp the second inside seat slat (A) to the first one with the spacers (D, E) sandwiched between [Drawing 1]. Use a spade bit to drill $\frac{3}{4}$ " counterbores and $\frac{1}{4}$ " pilot holes [Photo E]. **Note:** Use the centered hole created by the spade bit spur to position your $\frac{1}{4}$ " bit.

4 Drive washer-head lag screws through an inside seat slat (A) and

SCREW SPACERS TO A SEAT SLAT



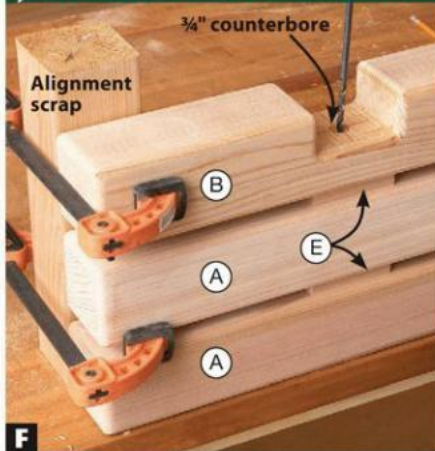
D Drill and drive one screw to secure a long spacer (D). Then hold it against a square while you drill and drive the other screws.

COUNTERBORE SCREWHEADS



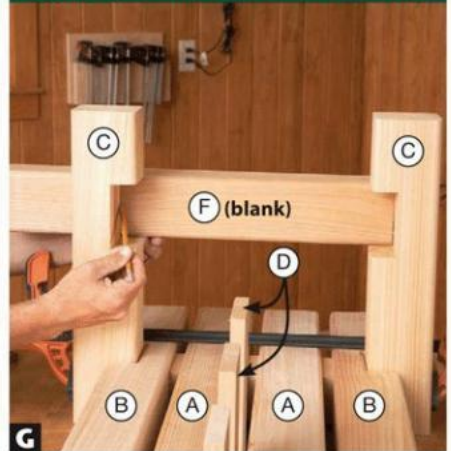
E Attach a depth indicator $\frac{3}{8}$ " from the cutting edge of a $\frac{3}{4}$ " spade bit and counterbore the inside seat slat (A) for the lag-screw heads.

JOIN INSIDE AND OUTSIDE SLATS



F To align an outside seat slat (B) with the inside seat slats (A), clamp both to a scrap. Then drill $\frac{3}{4}$ " counterbores and $\frac{1}{4}$ " pilot holes.

CUT LEG RAILS TO FIT OPENINGS



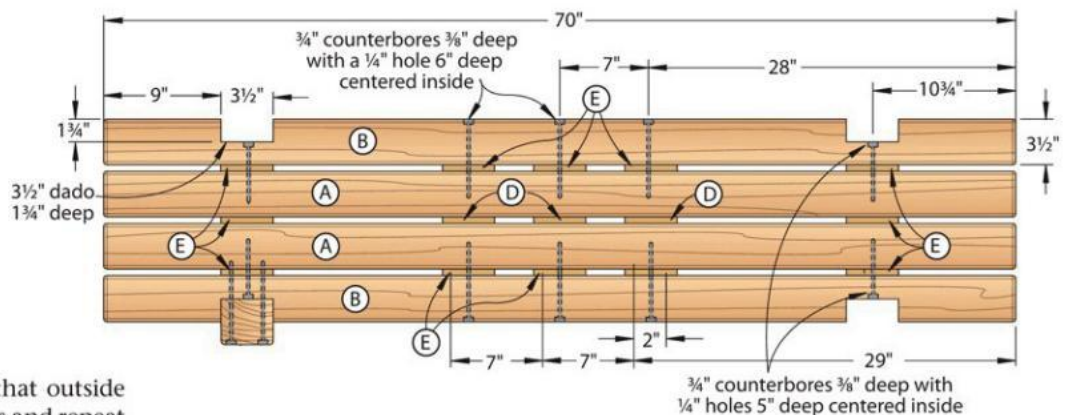
G Hold the leg rail (F) blank with one end flush with a leg (C) dado bottom and mark the blank at the other leg dado bottom.

the spacers (D, E), and into the second inside seat slat [Drawing 1]. Make certain the screw-heads don't stand proud of the inside seat slat surface.

5 On the outside faces, drill and screw the spacers (E) to both inside seat slats (A). Clamp an outside seat slat (B) to the inside seat slats and spacers; then drill counterbores and pilot holes

[Drawing 2, Photo F]. Screw that outside seat slat to the inside seat slats and repeat for the other outside seat slat.

2 OUTSIDE SEAT-SLAT FASTENER PLACEMENT



Turn the seat into a bench

1 Flip the assembled seat (A/B/D/E) upside down and clamp the legs (C) into the dados with their ends flush with the top face of the seat slats. Mark and cut a leg rail (F) to fit between two leg dados [Drawing 3, Photo G]. Repeat

for the other leg rail and unclamp the legs. Sand the leg rails to 120 grit.

2 Drill and screw two legs (C) to one outside seat slat (B). Drill and screw leg rails (F) to those legs. Then drill and screw the other pair of legs to the opposite outside seat slat and leg rails.

3 Cut the lower stretchers (G) to size. Rout $\frac{3}{8}$ " round-overs where shown and sand to 120 grit [Drawing 3].

4 Center a lower stretcher (G) between the leg rails (F) and mark the stretcher dado locations. Clamp both stretchers together and cut dados as you did for the outside seat slats (B) and legs (C).

5 Center and clamp the lower stretchers (G) to the leg rails (F) and long spacers (D). Drill and screw the stretchers to the leg rails and long spacers.

6 Finish-sand the completed bench to 120 grit as needed. For a natural look, apply clear water sealer to reduce checking and allow the wood to weather to a light gray. For added protection, apply two coats of oil-based transparent or semitransparent stain. 🌲

SHOP TIP

Dry wood first; then build

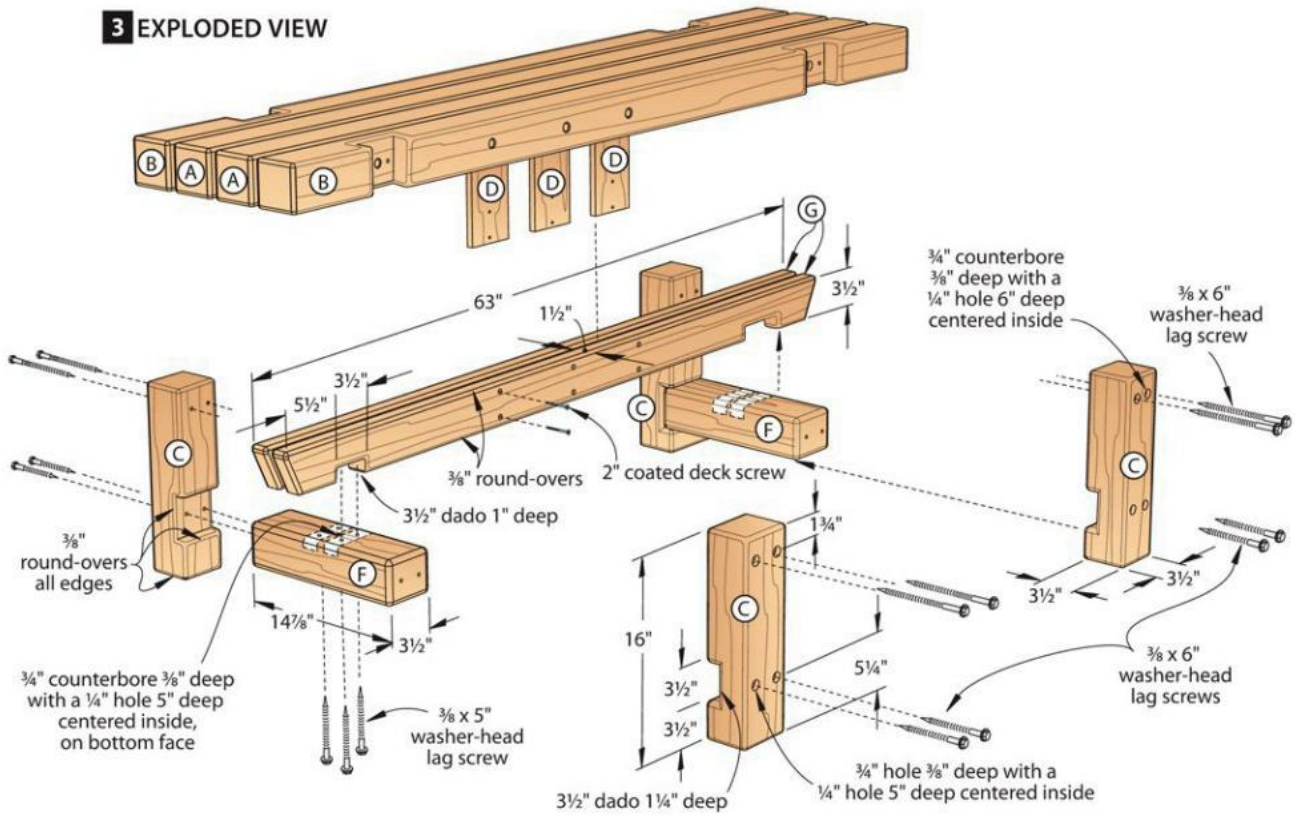
There's no denying the benefits of pressure-treated lumber: It's strong, reasonably priced, and long-lasting. But it's typically soaking wet when you buy it. No wonder, then, that our air-conditioned shop quickly dried the wet, treated-lumber version until it twisted and cracked, as shown right. The lesson: Allow treated lumber to dry in a sheltered area outdoors for six weeks, with stickers between the pieces. Or check the Southern Pine Council Web site (southernpine.com)



for local suppliers of treated lumber that's been kiln-dried after treatment.

Written by **Bob Wilson** with **Jeff Mertz**
Project design: **Jeff Mertz**
Illustrations: **Roxanne LeMoine; Lorna Johnson**

3 EXPLODED VIEW



SHOP TIP

Match the fasteners to the lumber

You may pay more for cedar than pressure-treated lumber, but using cedar saves you money on fasteners. That's because treated lumber requires fasteners with coatings or galvanizing to resist the corrosive chemicals in the wood. Here's what we paid for lumber and washer-head lag screws (you may substitute separate lag screws and washers) to build cedar and treated-lumber versions of the bench:

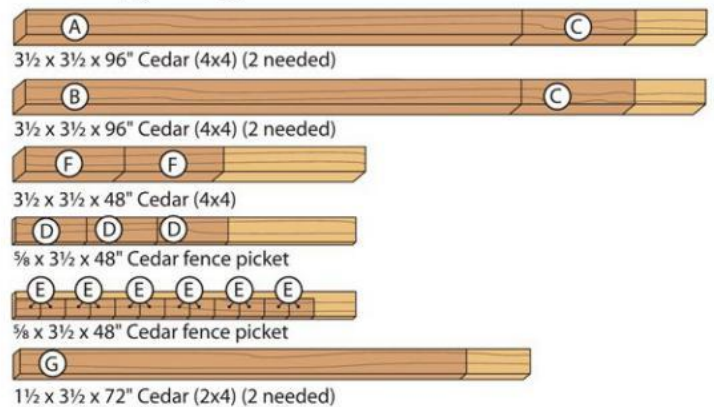
Lumber	Wood Cost	Lag Screws	Total Cost
Cedar	\$134	\$61	\$195
Treated	\$36	\$127	\$163

Zinc-plated screws for cedar

Screws for treated lumber



Cutting Diagram



Materials List

Part	Description	FINISHED SIZE			Matl.	Qty.
		T	W	L		
A	inside seat slats	3 1/2"	3 1/2"	70"	C	2
B	outside seat slats	3 1/2"	3 1/2"	70"	C	2
C	legs	3 1/2"	3 1/2"	16"	C	4
D	long spacers	3/8"	3 1/2"	10"	C	3
E	spacers	3/8"	2 1/2"	3 1/2"	C	12
F*	leg rails	3 1/2"	3 1/2"	14 7/8"	C	2
G	lower stretchers	1 1/2"	3 1/2"	63"	C	2

*Parts initially cut oversize. See the instructions.

Material key: C—cedar.

Supplies: 1/4x6" washer-head lag screws (10), 3/8x6" washer-head lag screws (22), 3/8x5" washer-head lag screws (12), 1 1/4" and 2" coated deck screws.

Bits: 3/8" round-over router bit, 3/4" spade bit.

Miters with Muscle

When your project calls for mitered joints, make them stronger with these proven techniques.

A mitered corner is one of the weaker joints in woodworking because it relies on gluing end grain to end grain. But there are good reasons to make a mitered corner. For one thing, it hides unsightly end grain. And wood grain can be made to wrap continuously around a mitered corner. Here are some ideas to help you make mightier mitered corners.

Glue it right

End grain looks and acts like the end of a bundle of tubes—some solid areas among a lot of openings—so it sucks up glue. Improve your chances of making a strong mitered joint with woodworking glue by generously brushing glue sizing—one part glue mixed with three parts water—onto the joint faces [Photo A] to seal them. After the sizing dries, glue the joint, as usual.



A Woodworking glue diluted with water seals the open pores in end grain. This increases gluing area and strengthens the joint.

Epoxy works well for gluing mitered joints and doesn't require sizing. Beware of quick-setting epoxy if you are gluing several joints at once; allow enough open time for assembly.

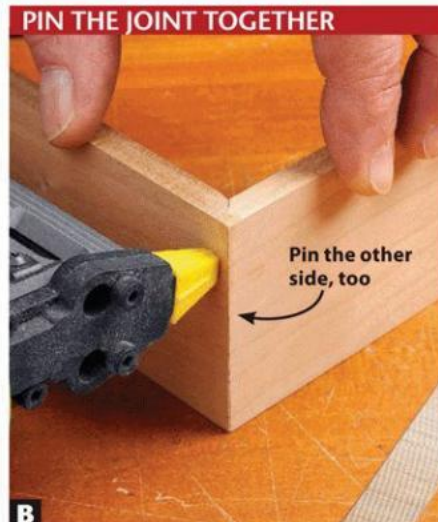
Whichever adhesive you choose, always clamp mitered joints for the full cure time recommended by the glue manufacturer. Remember that cool temperatures increase cure times.

Pop in a pin

Reinforce a mitered joint quickly and easily with a pneumatic brad nailer or pinner. Nail reinforcement works equally well on frames or boxes.

But beware one major drawback: The thin nail might follow the grain and break out through the surface of smaller pieces. Prevent that by avoiding overly long fasteners and driving them as far from an edge as practical. Pinner, which drive a smaller, headless fastener, are ideal for thin, narrow parts [Photo B]. For the most secure joint, drive a brad or pin into the joint from each side.

Another benefit: You can pop these fasteners into the joint while the glue is still wet so the brads or pins hold the joint together without the need for clamps. Still, allow the adhesive to cure fully before handling the assembly.



B Short, thin (23-gauge) pins reinforce joints in thin stock with less risk of splitting. A brad nailer works well in heavier stock.

Do some splinin'

Splines add face-grain gluing surfaces as well as mechanical reinforcement to strengthen a mitered joint. Outside splines serve as decorative elements, too, especially if you use a contrasting wood species. The grain for inside or outside splines must run across the joint for maximum strength.

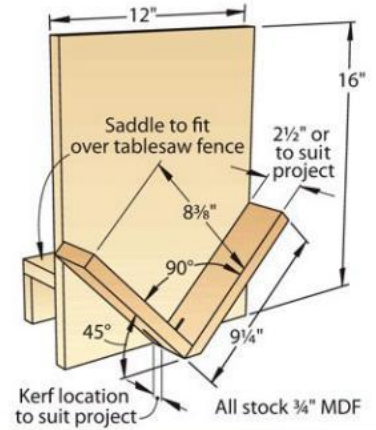
■ Outside splines

Add visible splines to a frame corner after assembling the joint and letting its glue cure. Cut the spline slots using a

simple jig, like the one shown at *right*, with a tablesaw [Photo C]. Center the spline slots on the thickness of the frame, cutting them to a depth of about two-thirds of the frame-side width. Glue the spline in the slot with its grain running across the joint [Photo D], and clamp. Trim the spline flush with the frame after the glue dries.

You can reinforce and decorate box corners with outside splines the same way, modifying the jig dimensions and spline locations as necessary.

SPLINE-SLOT JIG



SLOT THE CORNER



C Clamp the frame to the jig for accuracy and safety when you cut a spline slot. For splines, rip thin strips of stock to snugly fit the slots.

GLUE IN THE SPLINE



D Apply glue to both sides of the spline, and slide it into the slot. Apply the clamp pads to the top and bottom faces of the mitered corner.

■ Inside splines

Unlike outside splines, you cut slots for hidden splines in a frame before you assemble the joint. Start by setting your tablesaw fence to center the blade exactly on the thickness of the stock. That's vital because you will slot one side of each corner with the front face against the fence and the other side with the back against the fence. Adjust the cutting depth to about two-thirds the width of the part.

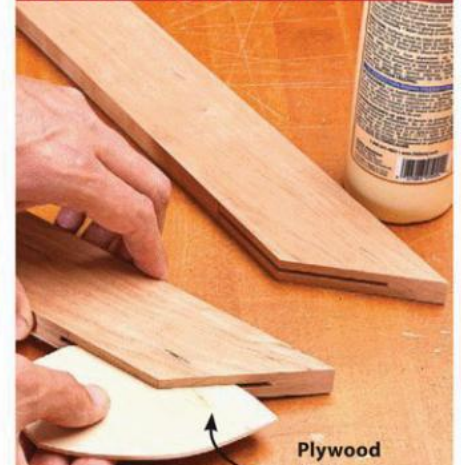
Cut each slot with the short edge of the miter cut against the saw table [Photo E]. Make the length of the slot about equal to the width of the stock. Cut a spline from material the same thickness as the saw kerf. Assemble the joint, and glue in the spline with the grain running across the joint [Photo F]. Cut the spline flush after the glue dries.

SLOT THE JOINT SIDES



E Precisely center the slots on the mitered joint sides to ensure that both faces will be flush when you assemble the joint.

FIT THE SPLINE TO THE SLOT



F Jigsaw or scrollsaw a spline to fit the rounded kerf and test-fit before gluing. Plywood and hardboard are good for unseen splines.

How about a nice biscuit with that mitered joint?

Biscuits are as effective as splines in adding gluing surface and reinforcement to mitered joints. And, putting biscuits into a joint can be easier and quicker. However, the stock may be too narrow or thin to add them to some joints.

To make a gauge that will aid in choosing the right-size biscuit for a joint, cut biscuit slots of different sizes at the middle of each edge of a 6×6" square of MDF or scrapwood.

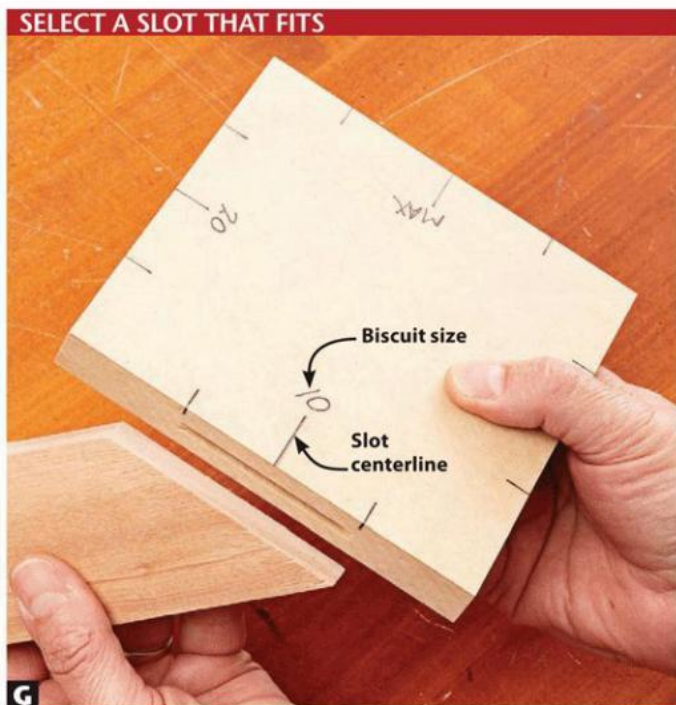
Label each slot for its biscuit size, and mark the centerline and ends for each slot on the face of the gauge. Hold the gauge against the joint parts to determine the biscuit sizes that will fit. Choose the largest biscuit that you can put in the joint.

■ **Frame biscuits**

Determine the biscuit size, using the slot gauge [Photo G]. Center the slot in the

gauge on one face of each joint, and mark the biscuit centerline on the part. Hold the joint parts together, and transfer the biscuit centerline to the mating part of the joint.

Set the biscuit-joiner fence to 90°, and adjust it to center the slot on the edge of the workpiece. Plunge a slot at each biscuit location [Photo H]. Apply glue to the slots and miter faces, insert the biscuits, and clamp.



G Gauge slot sizes against your project parts to determine the correct biscuit. Mark biscuit locations at the slot centerline on the gauge.



H Align the biscuit joiner on the biscuit location marked on the part. Cut the slots for both sides of the joint from the same face.

■ **Box biscuits**

Determine the biscuit size and location, using the slot gauge [Photo I]. Mark the biscuit centerlines on the short face of one joint side; then hold the joint together and transfer the marks to the other part.

Adjust the biscuit-joiner fence to 45°, and set the distance from the fence to the center of the blade at one-third of the thickness of the part. Test-cut slots in miter-cut stock the same thickness as the joint parts to make sure the slots don't break through the face. Then, plunge the slots [Photo J], apply glue to the slots and joint face, insert the biscuits, and clamp. 🌱



I A wider joint may have room for more than one biscuit. Space the slots evenly across the face of the joint.



J The cutter plunges the slots straight into the face of the miter cut, allowing easy assembly and gluing of the biscuit joints.

Written by **Larry Johnston**

Illustrations: **Roxanne LeMoine; Lorna Johnson**



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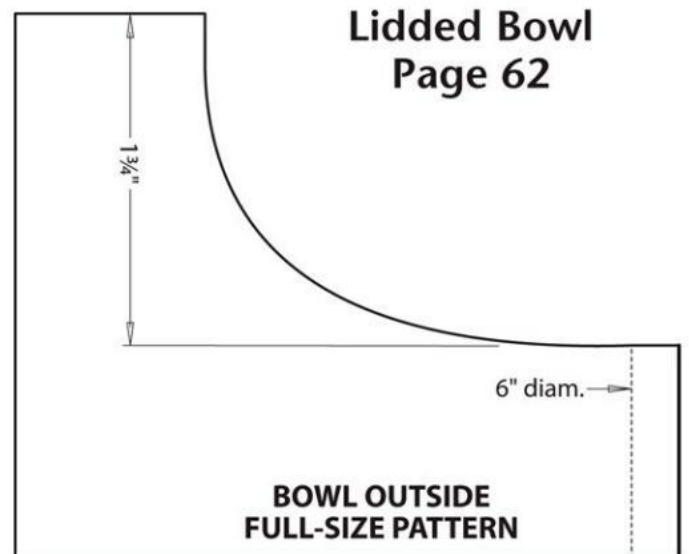
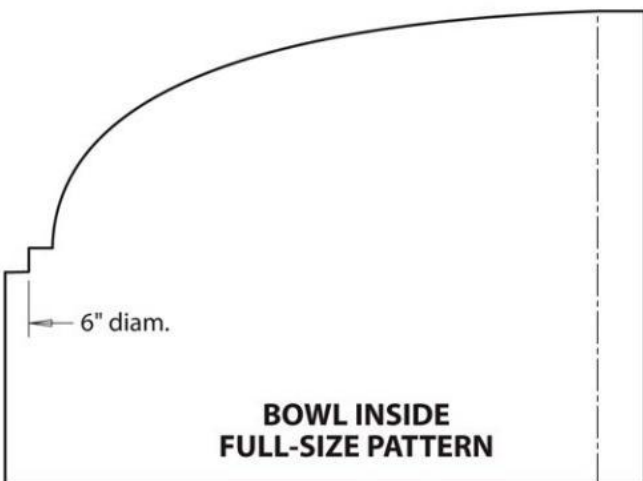
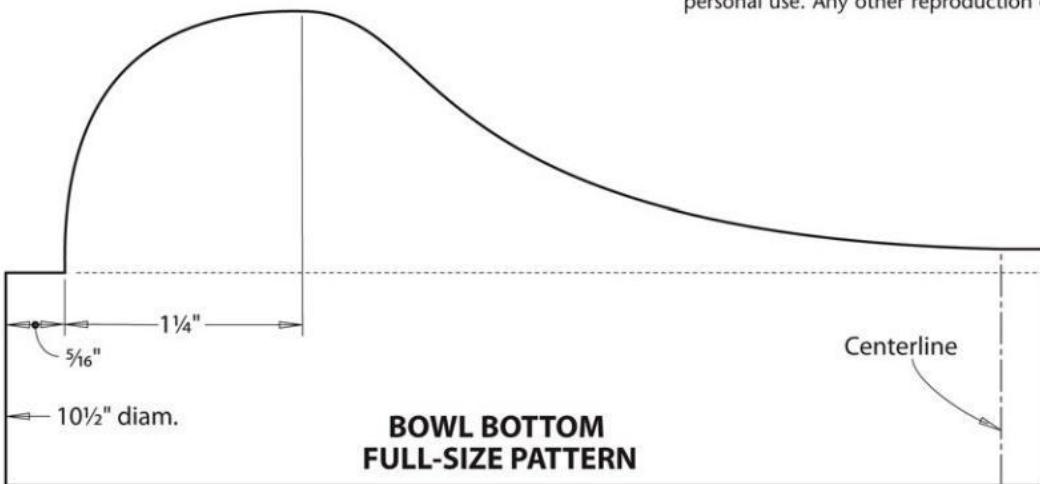
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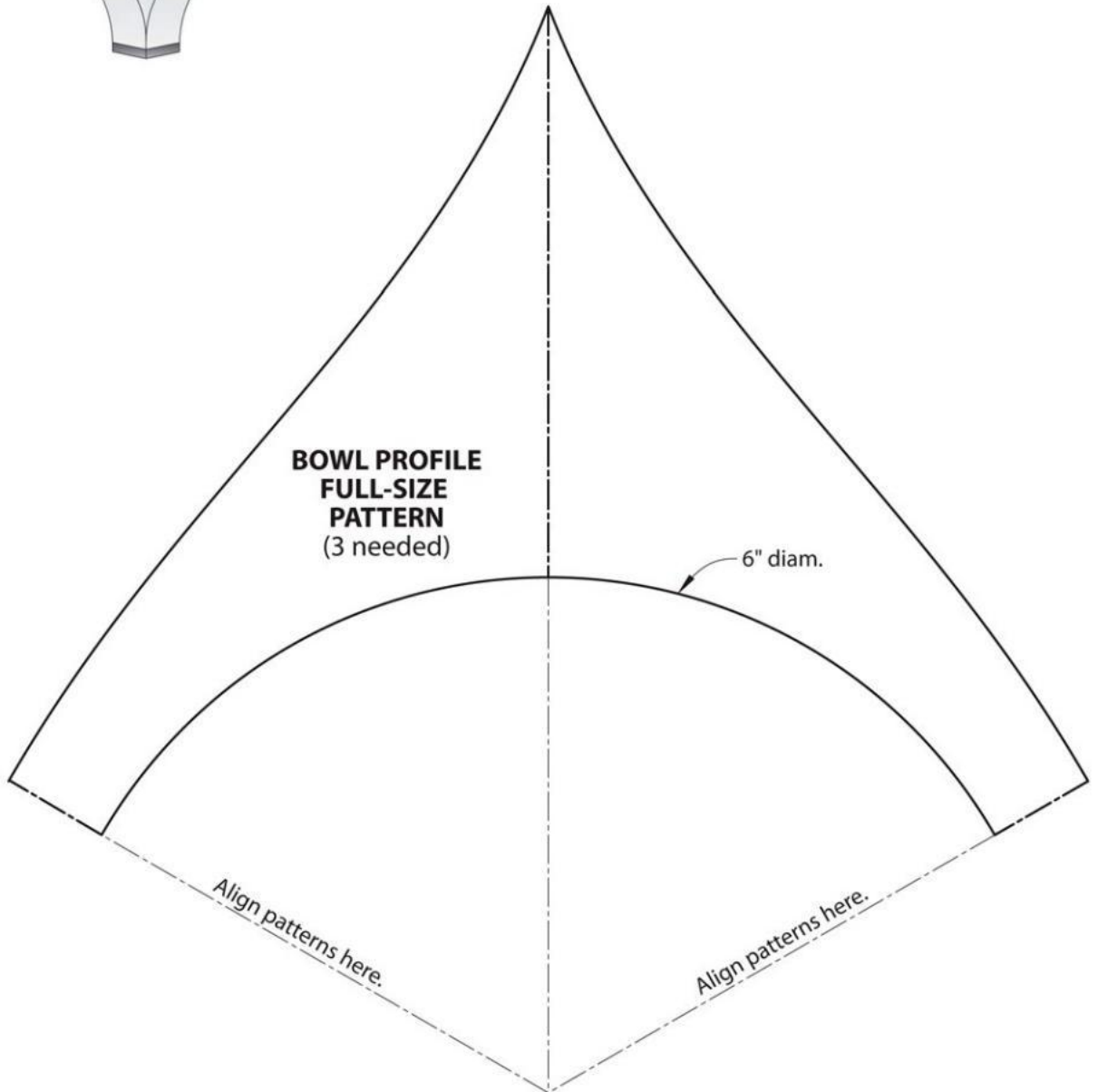
Dear Reader: As a service to you, we've included full-size patterns on this insert for irregular-shaped and intricate project parts. You can machine all other project parts using the Materials List and the drawings accompanying the project you're building.

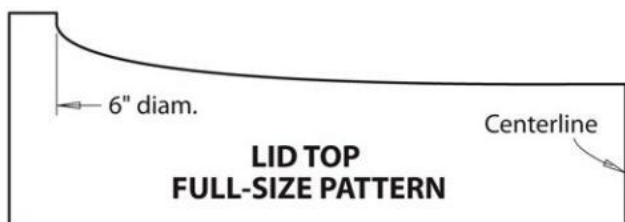
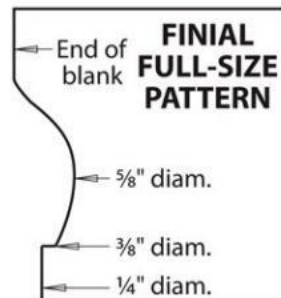
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Lidded Bowl
Page 62





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WD0510

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WD0510

SHOP TESTED

3-HP Tablesaws

With riving knives now required to earn approval by Underwriters Laboratories, manufacturers took the opportunity to freshen up their saws. We tested 9 of them.

According to the old joke, every tablesaw made in the last 50 years came with a free dust collector: the combination blade guard/splitter that sits on a shelf collecting dust. That's because most of us reason that we're smart enough not to stick our fingers into a moving blade. However, kickback can surprise even the most seasoned woodworkers, and many tablesaw injuries caused by kickback could have been thwarted by a riving knife, a steel fin located immediately behind the blade that goes up and down with it and prevents a board from contacting the teeth at the back of the blade.

Our test of today's riving-knife-equipped cabinet saws reveals that you'll be glad to have most of them in your shop. As we discovered, it's the subtle differences and helpful features that separate the top performers from the pack.

WOOD® magazine tool tester Bob Baker uses a power feeder to drive 2"-thick red oak at a consistent rate through this tablesaw.

You'll like a riving knife—when you must work without the blade guard

We're all familiar with the traditional tablesaw splitter, with blade guard and antikickback pawls attached, that's been standard equipment for decades. Mounted to the trunnion assembly at the back of the saw, it tilts with the blade, but does not move up and down. A riving knife, as defined by UL, differs from a splitter in that it mounts immediately behind the blade, moves up and down with the blade, and stands no taller than the top arc of the blade.

This allows you to remove the guard and pawls yet keep this safety device in place to make non-through cuts such as tenons and rabbets. Although a riving knife won't protect your hands from contacting the blade, it greatly reduces the chance of kickback. Seven of the

nine tablesaws, when tested with standard equipment, qualify as riving-knife saws, based on the UL standard. Six of those come with a separate riving knife that swaps with the blade guard/splitter assembly [Photo A]. Of these, we found the changeover easiest on the Grizzly G0691, which has a quick-release sliding mechanism accessible through a cutout in the throat insert. The others require removing the insert to access the tool-free mechanism [Photo B], or, as on the Grizzly G0651 and Laguna MTS0300-0180, a wrench to remove the guard assembly. (Both manufacturers told us future models will have tool-free quick-releases for their riving-knives.)

Delta's 36-L352 Unisaw has our favorite riving-knife system. Instead of trad-

ing the splitter/guard for the knife, the guard and pawls come off the splitter without tools [Photo C], which then drops down to below the blade arc to make it a true riving knife.

As it comes from the factory, neither the Jet JTAS-10XL50-1PK nor Powermatic PM2000 meet UL's definition of a riving-knife saw. Instead, each has a splitter/knife that mounts right behind the blade and moves up and down with it. But when you remove the guard and pawls, the splitter/knife remains taller than the blade [Photo D], so you cannot make non-through cuts with it in place. Both manufacturers offer full- and thin-kerf riving knives as optional equipment (\$30-\$40), but, in our opinion, one should be included as standard gear.

STRAIGHT-OUT RIVING-KNIFE SWAP

AVAILABLE ON:

- General 650R-T50
- General International 50-300 M1
- Grizzly G0651 (shown)
- Grizzly G0691
- Laguna MTS0300-0180
- SawStop Professional



On most of the tested saws, the blade-guard assembly pops out completely, and you insert a riving knife in its place. The best systems, available on all but the Grizzly G0651 and Laguna, require no tools.

CLOSED-KERF INSERTS CAN BE TRICKY

FOUND ON:

- General 650R-T50
- General Int'l 50-300 M1 (shown)
- Jet JTAS10XL50-1PK
- Powermatic PM2000



On saws with closed-kerf throat inserts, you have to reach below the insert or remove the guard and pawls to remove the guard assembly. This also makes blade changes more difficult.

REMOVE THE GUARD AND PAWLS TO CONVERT

AVAILABLE ON:

- Delta Unisaw



Strip the Delta Unisaw of its guard and pawls to reveal its tall splitter. You then lower the splitter, using the front-mounted quick-release lever, to make it a true below-blade-height riving knife.

IT'S CLOSE, BUT NOT A RIVING KNIFE

AVAILABLE ON:

- Jet JTAS-10XL50-1PK
- Powermatic PM2000 (shown)



After removing the blade guard and pawls from the Jet and Powermatic, the splitter/knife remains taller than the blade. This splitter/knife must still be removed for partial-depth cuts.

All pack plenty of power

Equipped with identical, sharp, 40-tooth blades, these 220-volt, 3-hp saws cut through all thick hardwoods at a hand-fed rate with no trouble. Even when we hooked up a power feeder, shown on page 49, to provide constant feed rates, only the Laguna stalled—and that wasn't until ripping 3"-thick red oak at a faster-than-we'd-feed-it-by-hand rate of 13 feet per minute (fpm). Just to see how much power these saws possess, we progressively jacked the feed rate to 48 fpm—almost 10" per second! At that rate, the 3"-thick oak finally stalled all the saws except the Grizzly G0651.

Don't fret over the fences

All nine saws come standard with T-square-style rip fences that work about equally well. Whether covered with sideboards made of laminate-covered plywood, high-density plastic, or aluminum, they all proved smooth and straight. None have built-in T-track slots for mounting jigs or accessories.

All of the fences lock on the front rails only, so we measured deflection at the back end with a dial indicator while applying sideways force with hanging weights, and also by ripping different sizes of wood and plywood. Seven of the nine demonstrated such minuscule deflection, it would never be noticed. (And kudos to the SawStop fence, the only one not to budge even .001".) The Grizzly G0691 and the Laguna deflected slightly more, but the only evidence of it was a bit of blade scoring.

We found most of the rip-fence scales to be accurate. But the Grizzly G0691 and Laguna scales measured $\frac{1}{64}$ " short every 12". (Grizzly's Bill Crofutt said future models will have a metallic scale rather than this plastic one.) Although all the fences work on each side of the blade, only Delta, Grizzly's G0651, and SawStop include a scale and indicator for the left side.

3 miter gauges stand out

Here we saw real differences. The Jet and General come with ho-hum miter gauges with three miter stops and no frills. Four saws (General International, both Grizzlies, and SawStop) have similar gauges, but with width adjusters on the bars to remedy a sloppy fit in the miter slot.

Our favorites are on the Delta [Photo E] and Powermatic [Photo F]. Delta's has nine miter stops on three adjustable plates, width adjusters on the bar, and a



THESE MITER GAUGES STAND OUT FROM THE FIELD

Delta's miter gauge has a spring-loaded lever with a pin that slips into nine detent notches to accurately set common angles.



Besides having five miter detents, Powermatic's miter gauge features a rack-and-pinion microadjuster for fine-tuning.

large comfortable handle. The Powermatic has five stops, a microadjuster, a width-adjustable bar, large handle, and a 10"-long fence with T-track.

Laguna's miter gauge also has a fence (with flip-stop) and bar-width adjusters, but it has only three stops, and the fence and flip-stop require a not-included hex wrench to adjust. (Laguna's Torben Helshoj said future gauges will have thumbscrews instead of hex bolts.)

Other points of interest

• **Finger saver.** SawStop's blade-brake safety system works to minimize injury should your hand ever contact the spinning blade [Photo G]. A brake cartridge mounted below the blade triggers when skin touches the blade, immediately stopping it and leaving you with nothing more than a small nick. You need separate cartridges for 10" blades (standard) and 8" dado sets (optional), costing about \$75 apiece. Triggering the brake requires replacing the cartridge and blade, but could well save your fingers.

SPLIT-SECOND SAFETY



A triggered SawStop cartridge (left), with the blade's teeth entrenched in the aluminum brake pawl; a new one (right) ready for use.

• **Cut quality.** An expensive saw won't make a bad blade cut better, so it makes sense to outfit the saw with a high-quality blade. Four machines (Delta, both Grizzlies, and SawStop) come with a blade, but of these only Delta's 50-tooth blade made furniture-quality cuts in our tests. When we outfitted the Grizzlies and SawStop with a new, premium blade, we saw improvement with each one.

• **Dust collection.** These saws fall into three categories for gathering dust: those with only a dust port at the bottom of the cabinet (Grizzly G0691 and Laguna); those with a blade shroud that connects directly to the dust port; and those with a blade shroud and a blade-guard mounted dust port (General International and SawStop [Photo H]). SawStop's collection proved best in the test.

• **Blade changes.** We found changing blades on the Delta easiest, thanks to its test-best 5"-wide throat opening, one-piece arbor nut and washer, and a large, beefy wrench to go along with an easy-to-use arbor lock.

DUST CAN'T ESCAPE



SawStop's blade guard hooks up to a small included hose that effectively sucks up all the dust that normally would spew out the top.

An in-depth look at riving-knife cabinet saws



Delta Unisaw 36-L352, \$3,300 800-223-7278, deltaportercable.com

High Points:

- ◆ Our favorite riving-knife system. Quick-release two-piece blade guard and antikickback pawls pop off and the splitter lowers below the blade arc to become a true riving knife.
- ◆ The 5"-wide throat opening, largest in the test, makes it easy to change blades.
- ◆ We like the convenient front-mounted blade-bevel handwheel, easy-to-read bevel gauge, and easily accessible bevel-stop adjustments.
- ◆ The miter gauge has nine adjustable stops, the most in the test.

◆ Loaded with nice features, such as a one-piece arbor nut and flange; a high-quality blade; built-in setscrews for leveling the extension wings to the top; a storage drawer for blades and accessories; and a large "off" power switch that proved easy to use.

More Points:

- ◆ Although the dust port is 4" in diameter, it comes with an adapter for 5" hose.
- ◆ An arbor lock makes for one-wrench blade changes.



General 650R-T50, \$2,900 888-949-1161, general.ca

High Points:

- ◆ At 42¼", its rip fence is longest in the test.
- ◆ Shark-fin-style riving knife swaps easily with blade guard. You can also buy a thin-kerf riving knife (#657-21T, \$85).

Low Points:

- ◆ It does not come with a power cord or blade.
- ◆ The aluminum blade guard blocked our view of the blade.
- ◆ Difficult blade changes: At 3½", its throat

opening is narrowest in the test. It also requires two wrenches to change blades, but only comes with one.

More Points:

- ◆ Although the rip-fence scale proved accurate, its clear plastic indicator has a noncolored, scribed hairline cursor that's difficult to read.
- ◆ Blade-guard assembly features a tool-free quick-release, but it's tough to access because the throat insert can't be removed before the splitter.



General International 50-300, \$2,400 888-949-1161, general.ca

High Points:

- ◆ At 42¼", its rip fence is longest in the test.
- ◆ Shark-fin-style riving knife swaps easily with blade guard.
- ◆ Built-in mobile base, engaged via a large handwheel near the base of the saw, makes it easy to relocate.

Low Points:

- ◆ It does not come with a power cord, blade, extension table, or support legs.
- ◆ The bevel handwheel exhibited ¼ turn of backlash, and its digital gauge with .1° readout kept losing calibration. We finally ignored it and used the regular scale and pointer.

More Points:

- ◆ Although the rip-fence scale proved accurate, its clear plastic indicator has a noncolored, scribed hairline cursor that's difficult to read.
- ◆ The miter gauge features width adjusters on the bar, but only three miter stops.
- ◆ Blade-guard assembly features a tool-free quick-release, but it's tough to access because the throat insert can't be removed before the splitter.
- ◆ Although the blade guard has a 1¼" dust port that proved a benefit at collecting dust, the thin guard frequently slipped into the kerf opening at the rear of the throat insert.
- ◆ An arbor lock makes for one-wrench blade changes.



Grizzly G0651, \$1,995 800-523-4777, grizzly.com

High Points:

- ◆ The best power in the test.
- ◆ The power switch with large "off" paddle proved easy to use.
- ◆ With digital readout and insignificant backlash, blade-bevel adjustments proved accurate within .1°.
- ◆ This mid-priced cabinet saw comes with large outfeed and extension tables and two storage shelves as standard equipment.
- ◆ With only three table-mounting bolts, the top

is easier to align than the tops on the other saws, which have four bolts.

Low Points:

- ◆ Requires a wrench to change to the riving knife. (Grizzly is changing to a tool-free design on future models.)

More Points:

- ◆ The miter gauge features width adjusters on the bar, but only three miter stops.
- ◆ It comes with a power cord, but no plug.

Grizzly G0691, \$1,350 800-523-4777, grizzly.com



High Points:

- ◆ One of the best saws for swapping the blade guard and riving knife thanks to a quick-release that's accessible through an opening in the throat plate. It comes with a separate riving knife.
- ◆ Its rip fence was one of the easiest to adjust.

Low Points:

- ◆ The plastic rip-fence scale proved inaccurate, coming up $\frac{1}{64}$ " short every 12". (Grizzly's Bill Crofutt said future models will have a different, metal scale.)

- ◆ With no blade shroud or sloped cabinet bottom, dust collection proved only fair.

More Points:

- ◆ The miter gauge features width adjusters on the bar, but they're difficult to use.
- ◆ It comes with a power cord, but no plug.

Jet JTAS-10XL50-1PK, \$1,700 888-804-7129, jettools.com



High Points:

- ◆ Its rip-fence scale with magnified red hairline cursor proved easiest to read and use.
- ◆ Built-in storage drawer holds blades and other accessories.

Low Points:

- ◆ It does not come with a power cord or blade.
- ◆ The splitter/knife stands higher than the blade, and so it must be removed for partial-depth cuts, such as rabbets and tenons. An optional riving knife costs \$30-\$40.

- ◆ The miter gauge fits sloppily in the miter slot and includes no adjustment.

- ◆ We were unable to activate the small "off" switch with a leg bump.

More Points:

- ◆ To change blades, you must first remove the blade guard and pawls to remove the throat insert.
- ◆ An arbor lock makes for one-wrench blade changes.

Laguna Platinum MTS0300-0180, \$1,995 800-234-1976, lagunatools.com



High Points:

- ◆ When raising or lowering the blade, the trunnion assembly moves smoothly up and down on cast-iron dovetailed ways.
- ◆ The blade-bevel handwheel is located on the left side of the cabinet, providing better access than those saws with right-side handwheels.
- ◆ Its rip fence was one of the easiest to adjust.

Low Points:

- ◆ The rip-fence scale proved inaccurate, coming up $\frac{1}{64}$ " short every 12". (Laguna's Torben Helshoj said he will investigate this and find a replacement scale for models affected.)

- ◆ Requires a not-included wrench to change to the riving knife. (Laguna is changing to a tool-free design on future models.)

- ◆ It does not come with a blade.

- ◆ Holes in the fence rails did not align with holes in the support legs; we had to drill to fit.

More Points:

- ◆ The miter gauge features width adjusters on the bar as well as a 15"-long fence with flip-stop, but you must use a not-included metric wrench to loosen and reposition the fence and flip-stop. (Helshoj said future models will use thumbscrews.)

Powermatic PM2000, \$2,600 800-274-6848, powermatic.com



High Points:

- ◆ This miter gauge is one of our favorites, with five miter stops, a microadjuster, and a fence with T-track.
- ◆ Same easy-to-read rip-fence scale with magnified red hairline cursor as on the Jet tablesaw.
- ◆ Large "off" button proved easy to use.

Low Points:

- ◆ It does not come with a blade.
- ◆ The hybrid splitter/knife stands higher than the blade, and so it must be removed for partial-depth

- cuts, such as rabbets and tenons. An optional riving knife costs \$30-\$40.

More Points:

- ◆ To change blades you must first remove the blade guard and pawls to remove the throat insert.
- ◆ Its built-in mobile base has four swiveling casters, but the saw raises only about $\frac{1}{4}$ ", making it tough to maneuver across uneven floors.
- ◆ An arbor lock makes for one-wrench blade changes.
- ◆ It comes with a power cord, but no plug.

An in-depth look at riving-knife cabinet saws



SawStop Professional, \$3,000 866-729-7867, sawstop.com

High Points:

- ◆ With its unique blade-brake safety system, this saw protects your fingers like no other.
- ◆ Its rip fence did not deflect at all in our testing.
- ◆ The power switch with large “off” paddle proved easy to use.
- ◆ Outstanding dust collection, thanks to a blade shroud and effective port on the blade guard. Hose support, mounting hardware, and 1/4” hose come with the saw.
- ◆ Tool-free, quick-release throat insert and riving knife make for easy changes between the blade guard and riving knife.

- ◆ Built-in mobile base makes it easy to relocate.
- ◆ It has the best owner’s manual and assembly instructions, and all hardware is labeled and sorted in blister packs for easy identification.

More Points:

- ◆ Its rip fence is the shortest in the test at 35” long, but it’s the tallest at 2 3/4”.
- ◆ The miter gauge has width adjusters on the bar, but only three miter stops.

TREAT YOURSELF TO THE BEST:

BRAND	MODEL	DIMENSIONS, INCHES		CAPACITIES, INCHES						RIP-FENCE SIDEBOARD MATERIAL (2)	BLADE CHANGES: 1 OR 2 WRENCHES	TYPE OF DRIVE BELTS (3)	NUMBER OF MITER-GAUGE ANGLE STOPS	DUST-PORT DIAMETER, INCHES
		OVERALL, H×D×L	TABLETOP, D×L	MAX. CROSSCUT (1)	MAX. RIP, LEFT OF BLADE	MAX. RIP, RIGHT OF BLADE	MAX. BLADE HEIGHT AT 90° BEVEL	MAX. BLADE HEIGHT AT 45° BEVEL						
DELTA	36-L352	41×47×87	31×82½	13¾	14¾	52¾	3½	2½	L	1	T	9	4	
GENERAL	650R-T50	39×47×84	28×72¼	12¾	13½	50	3½	2½	L	2	2	3	4	
GENERAL INTERNATIONAL	50-300 M1	41×47×84	29×42	10¾	12¾	50	3	2½	L	1	F	3	4	
GRIZZLY	G0651	41×76×91	27×76	10¼	18	52	3¾	2¾	A	2	F	3	4	
	G0691	39×45×82	27×73½	12¾	13¾	49½	3½	2¾	P	2	3	3	4	
JET	JTAS-10XL50-1PK	38×43×84	29×78¼	10¾	14¾	51½	3	2½	P	1	F	3	4	
LAGUNA PLATINUM	MTS0300-0180	47×45×82	27×73½	12½	13¾	50	3½	2½	P	2	F	3	4	
POWERMATIC	PM2000	40×45×84	30½×75	11¼	14	51	3½	2½	P	1	F	5	4	
SAWSTOP	PROFESSIONAL	34×33×85	27¼×84¼	10¼	13	52	3½	2¼	L	2	F	3	4	

1. Measured from front edge of table to blade at full height.
2. (A) Aluminum
(L) Laminate-covered plywood
(P) High-density plastic
3. (2) Two V-belts
(3) Three V-belts
(F) Single flat ribbed belt
(T) Two toothed, ribbed V-belts

4.

A
B
C

 Excellent
Good
Fair

5. Using 1½-hp dust collector with 4” flex-hose.

If we had to write the check...

Because of the wide price range with these table-saws, from \$1,350 to \$3,300, your budget might be the primary factor in choosing one. If you can afford them, the feature-packed SawStop Professional and Delta Unisaw rise above the field and share Top Tool honors. The SawStop has the exclusive safety blade-brake—a huge advantage over the field—a rip fence that did not deflect at all, an easy-to-use-and-change blade guard and riving knife, a built-in mobile base, and the best dust collection.

On the other hand, Delta's made-in-the-U.S. Unisaw has our favorite blade guard and riving-knife system, a stellar miter gauge, and the largest crosscut capacity in front of the blade. The big top combines

with a massive trunnion to make it the heaviest saw in the test. The Unisaw also has the best standard-issue blade, a storage drawer below the extension table, and the most routinely used controls—blade height and bevel, riving-knife release, and a large dial bevel gauge—all on the front of the cabinet for easy access.

If these saws prove out of your price range, then consider the Grizzly G0691, our Top Value at \$1,350. With plenty of power and an easy-to-use riving knife, this Grizz gives you a lot for the money. With changes coming to correct the rip-fence scale's inaccuracy, this saw will serve you well. 🌲

Written by **Bob Hunter** with **Bob Baker**

3-HP CABINET TABLESAWS WITH RIVING KNIVES

	PERFORMANCE RATINGS (4)										ACCESSORIES (6)		NOISE LEVEL, DECIBELS (7)	WEIGHT, LBS	CORD LENGTH, FEET (8)	WARRANTY, YEARS	MOTOR MAKE, COUNTRY OF MANUFACTURE (9)	COUNTRY OF ASSEMBLY (9)	SELLING PRICE (10)			
	PRIMARY					SECONDARY					STANDARD	OPTIONAL										
	OBSERVED POWER	ABSENCE OF RIP-FENCE DEFLECTION	ACCURACY OF RIP-FENCE SCALE	QUALITY OF MITER GAUGE	EASE OF USING BLADE GUARD/RIVING KNIFE	EASE OF CHANGING BLADES	EASE OF USING ON/OFF SWITCH	EASE OF ADJUSTING TABLETOP TO BLADE	EASE OF ADJUSTING RIP FENCE	EASE OF ADJUSTING BEVEL STOPS										ACCURACY OF BEVEL SCALE	DUST COLLECTION (5)	EASE OF USING HANDWHEELS
	A	A	A	A	A	a	a	a-	b+	a	a	b-	a	B,P,R	D,O,T,Z	82	660	8	5	MARATHON/U	U	\$3,300
	A	A	A	B	B-	c-	a-	b	b	b	b	b+	b+	R	D,T,Z	79	495	N/A	2	BALDOR/U	CA	2,900
	A	A	A	B	B+	b-	a-	b	b	b	b-	a-	b	R	D,Z	80	396	N/A	2	GEN. INT./T	T	2,400
	A	A	A	B	C+	b-	a-	a	a-	b	a	b+	a	B,O,R	D,Z	87	430	10	1	YOUBA/CH	CH	1,995
	A	B+	C-	B-	A	b	b	b	a	b	b	c	b	B,D,R	Z	80	590	6	1	LEESON/CH	CH	1,350
	A	A	A	C+	B	b-	c	b	a-	b	b+	b+	a		D,R,T,Z	83	330	N/A	5	JET/T	T	1,700
	B+	B+	C-	A-	C	b	b	b	a	c	b	c	a	D,R	Z	87	386	6	1	LEESON/CH	CH	1,995
	A	A	A	A	B	b-	a	b	a-	c	a	b+	a		D,R,T,Z	85	540	6	5	POWERMATIC/T	T	2,600
	A	A	A	B	A	a-	a	a-	a-	a-	a	a	a	B,C,R	D,E,O,Z	78	520	6	2	SAWSTOP/T	T	3,000

6. (B) 10" blade
(C) 10" blade-brake cartridge
(D) Dado throat insert
(E) 8" dado blade-brake cartridge
(O) Outfeed table
(P) 4"-to-5" dust-port adapter
(R) Riving knife
(T) Thin-kerf riving knife
(Z) Zero-clearance throat insert

7. Measured running under no load.
8. (N/A) Cord not included with this saw.
9. (CA) Canada
(CH) China
(T) Taiwan
(U) United States
10. Prices current at time of article production and do not include shipping, where applicable.

Tablesaw Tune-up Tips

Go beyond what's covered in your owner's manual for easy assembly and spot-on accuracy.



Whether you're preparing to buy a new tablesaw or putting off some much-needed maintenance on your existing saw, it's critical to get your machine dialed-in so your cuts will be flawless. *WOOD*® magazine tool-testing expert Bob Baker put together and fine-tuned the nine 3-hp cabinet tablesaws reviewed on page 49. In doing so, he mastered

the process and developed a shop full of shortcuts and tips to help you assemble a new saw or simply give your old one some overdue TLC. Although many of the photos in this article show Bob setting up a 220-volt cabinet saw, nearly all the steps apply to lesser-powered 110-volt contractor-style and hybrid saws as well, with some tips specific for each of those types.

Install the wings flush to the tabletop in 6 simple steps



1. Clamp two straight boards about 3' long to one of the cast-iron extension wings. Extend the boards over the main tabletop.



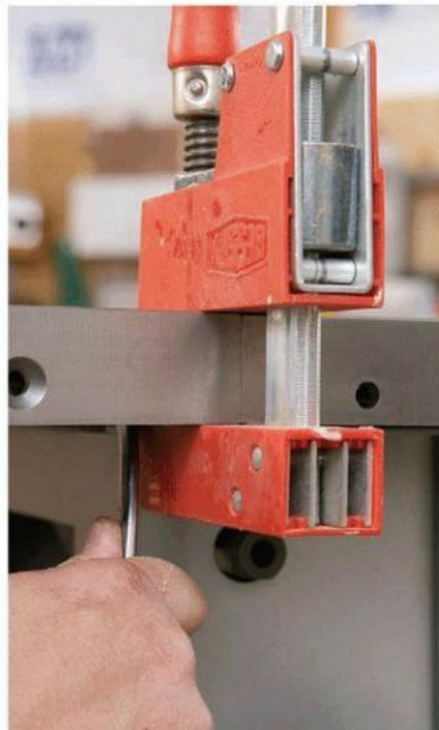
2. Holding the wing loosely aligned front to back with the table edges, clamp the boards tightly to the main tabletop.



3. Now perfect the edge alignment by tapping the wing laterally with a rubber mallet until the mounting holes align.



4. Insert the mounting bolts and hand-tighten them. If you need to raise the wing slightly, use a scrap board on your leg for leverage.



5. Clamping securely across the seam holds the tops flush. Tighten the bolts when the wing aligns perfectly flush with the main table.



6. To remove sagging, changing a clamp to spreader mode lets you microadjust the wing height. Parallel-jaw clamps work great for this.

If your saw has one, add the extension table and level it with the top



LEFT: To save bending down, assemble the extension table, support legs, and frame on your saw's tabletop.

CENTER: Align the mating table surfaces by clamping directly on the seam or using a board with a straightedge and clamps. Bolt them together. Some extension tables bolt only to the fence rails, not the extension wing. For those, install the fence rails first, and then mount the extension table.

RIGHT: Finally, using a long straightedge that reaches from the extension table corners to the cast-iron top, raise or lower the adjustable feet to level the table surface. Tighten the table-mounting nuts when the two surfaces are level.

Align long, beefy rip-fence rails easily with a couple of tricks



OPTION 1: Use two adjustable-height work supports to hold a rail in position while you insert bolts and set the correct height using the template that came with the saw.



OPTION 2: If you don't have adjustable work supports, simply let one rail end rest on the floor while you loosely secure the other with a bolt; then do the other end.

8 setup steps to ensure absolute accuracy and clean cuts



1. Using a dial indicator, align your saw's miter slots parallel to the blade, checking the same tooth at the front and back of the blade. Strive to get any discrepancy within .002".



2. If you don't have a dial indicator, you can also do this step with a combination square. Set the blade to touch a tooth in front, lock it, and then check the same tooth at the rear.



3. Once you've aligned the top to the blade, tighten the mounting bolts securely. On cabinet saws the top mounts to the cabinet, providing easy access for adjustments.



4. On contractor-style and most hybrid saws, the top attaches directly to the trunnions that hold the blade assembly. To align the blade, loosen the trunnion-mounting bolts and tap the trunnions side-to-side, then retighten.



5. Now align the rip fence so it's parallel to the miter slots, again within .002". If it's not exactly parallel, any slight discrepancy should toe away from the blade at the outfeed end to avoid pinching boards during rip cuts.



6. Adjust the fence by tightening or loosening the setscrews in the fence's T-square bracket. This also affects how tightly the fence locks and slides on the rail, so plan on trial-and-error fitting to find the sweet spot.



7. Align the riving knife or splitter with the blade. Hold the rule against the plate of the blade so it doesn't touch any teeth. Do this for both sides of the blade.



8. If the riving knife isn't aligned with the blade, adjust its fit by placing thin shims in front of or behind the knife as needed. If you ever remove the riving knife, make note of the shims so you can replace them later.

Dial-in the bevel stops and miter gauge for repeatable, reliable settings



1. Use a drafting square to check the blade bevel-angle settings for the 0° and 45° stops. Adjust the bevel stops as needed.



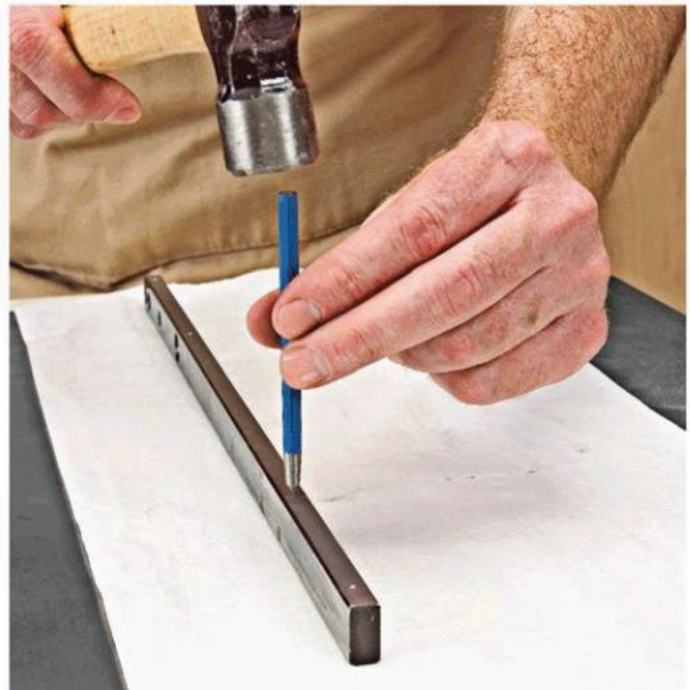
2. Verify the angle settings on your miter gauge, particularly those with stops, against the sawblade plate.



3. Adjust any inaccurate miter-gauge angle stops using a screwdriver, and verify the settings to the blade again.



4. If your miter gauge bar fits too tightly in the slot, rub one edge along 150-grit, self-adhesive sandpaper, applied to your saw's tabletop, until it glides smoothly.



5. If your miter gauge bar fits too loosely in the slot and doesn't have adjustment screws, add dimples every 4–6" by peening it with a hammer and punch.

MORE RESOURCES

RELATED ARTICLES

- "How to Buy a Tablesaw" issue 184 (May 2008). \$
- "Amp up Your Tablesaw" issue 176 (May 2007). \$
- Hybrid Tablesaw review, issue 187 (Nov. 2008). \$
- Miter Gauges & Sleds review, issue 179 (Oct. 2007). \$
- Tenoning Jigs review, issue 193 (Oct. 2009). \$
- 6" Dado Blade review, issue 188 (Dec./Jan. 2008/2009). \$

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✓Yes



✓Yes



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Three-point Lidded bowl

Created with ordinary turning techniques, a trip to the bandsaw makes it extraordinary.



1 Prepare your templates and turning stock

Make three copies of the **Bowl Profile Pattern** and one copy of each of the six remaining bowl, lid, and finial patterns in the *WOOD Patterns*® insert in the center of this issue. Spray-adhere all the patterns to lightweight card stock, aligning the **Bowl Profile Patterns** as indicated. Cut out each pattern along the solid

lines, and cut out the center of the **Bowl Profile Pattern**.

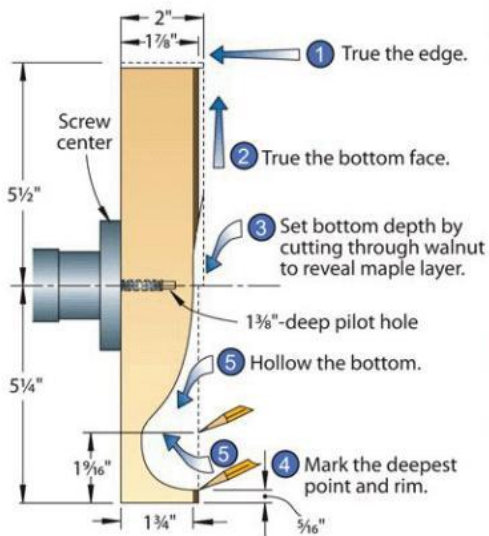
Glue up a $1\frac{3}{4} \times 11\frac{1}{4} \times 11\frac{1}{4}$ " maple blank for the bowl. Laminate $\frac{1}{4}$ "-thick walnut to the bottom of the blank. Also glue up a $\frac{3}{4} \times 6\frac{3}{4} \times 6\frac{3}{4}$ " walnut blank for the lid. Trim the bowl blank to 11" square and the lid blank to $6\frac{1}{2}$ " square. Find the

center of each blank by drawing diagonals from corner to corner, and set the lid blank aside. Using a compass, mark an 11"-diameter circle on the bowl blank. Bandsaw the blank to rough shape. In the center of the maple face, drill a $1\frac{3}{8}$ "-deep pilot hole sized to fit your lathe's screw center, and mount the blank.

2 True the blank and shape the bottom

Tool: $\frac{3}{8}$ " bowl gouge
Speed: 400–800 rpm

True the edge of the bowl and turn the blank to $10\frac{1}{2}$ " in diameter. Move the tool rest parallel to the face of the blank

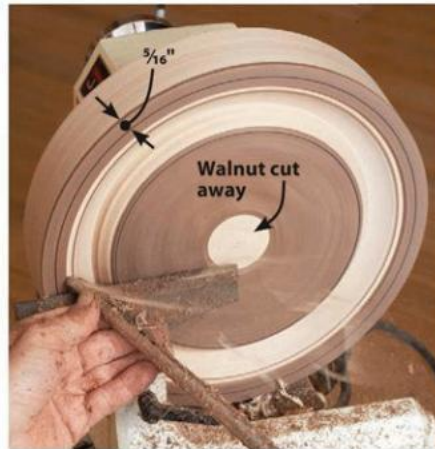


and true the face until the walnut is $\frac{1}{8}$ " thick. To establish the bottom of the bowl, cut away the walnut in the center to just reveal the maple.

Stop the lathe and use the **Bowl Bottom Pattern** to lay out the $\frac{5}{16}$ " width of the foot and the deepest portion of the bowl. Begin forming the outside curve of the bowl bottom with push and pull

cuts from the outside to the center, as shown *below left*, and pull cuts from the center outward. Stop and use the pattern to check your progress, marking high spots as shown *below*.

After reaching final shape, sand the bottom of the bowl from 80 grit through 320 grit. Remove the bowl from the screw center.



3 Shape the outside of the bowl and begin hollowing

Tools: Parting tool, $\frac{3}{8}$ " bowl gouge
Speed: 600–1,000 rpm

Make a jam chuck by cutting an $11\frac{3}{4}$ " circle from $\frac{3}{4}$ " plywood and mounting it to the faceplate. True the outside edge, leaving an $11\frac{1}{2}$ "-diameter blank. With the lathe running at slow speed, place a pencil against the chuck to lay out a circle matching the outside diameter of the bowl. Increase the lathe speed to 1,000 rpm and, using a parting tool, cut a $\frac{1}{8}$ "-

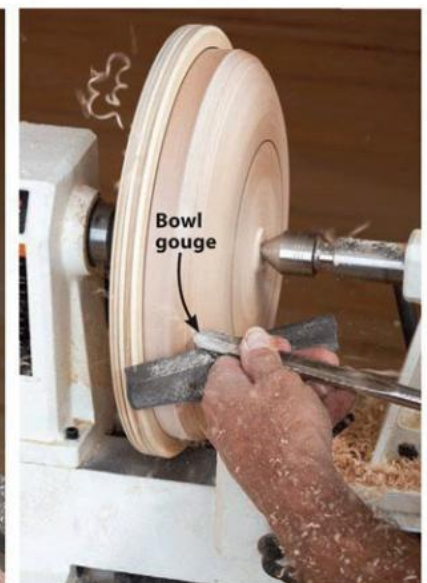
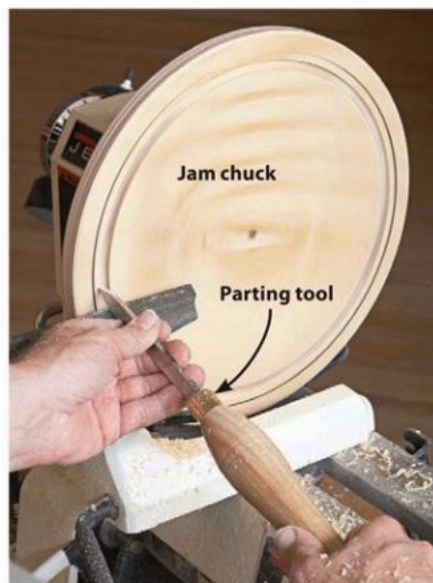
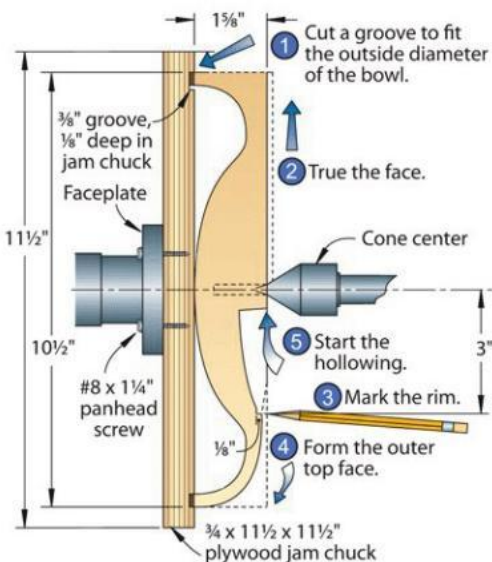
deep groove about $\frac{3}{8}$ " wide, inside the layout line, *below*. Gradually widen this groove until the bowl rim fits snugly in it. Mount a cone center in the tailstock and use it to apply pressure to the bowl, keeping it firmly against the jam chuck.

Switch to a bowl gouge and true the face of the blank, reducing it to a thickness of $1\frac{5}{8}$ " measured from the face of the jam chuck.

Mark out a 6" diameter for the lid rim. Starting at this line, shape the outside

edge of the bowl to match the **Bowl Outside Pattern**, *below*. Align the "6" diam." mark on the pattern with the layout line for the lid rim.

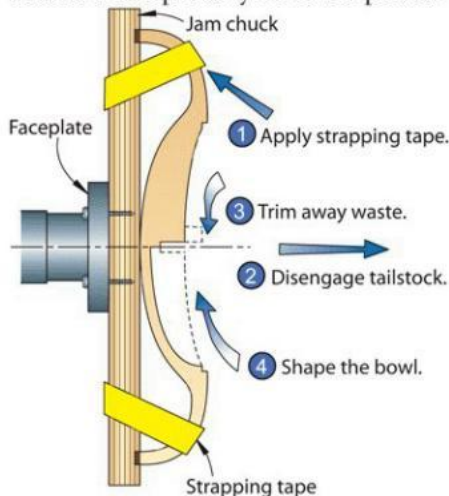
With your parting tool, form a $\frac{1}{8}$ "-deep groove inside the layout line. Using a bowl gouge, begin removing waste from the inside edge of the groove toward the middle, bringing the inside of the bowl to rough shape. (The bottom will be shaped in the next step.) Sand the outside of the bowl to 320 grit.



4 Hollow out the bowl

Tool: $\frac{3}{8}$ " bowl gouge
Speed: 800–1,000 rpm

Secure the bowl to the jam chuck by wrapping it with lengths of strapping tape as shown at *right*, keeping the tape outside of the partially hollowed portion



of the bowl. **Quick Tip! Tape the tape.** If the tape peels away from the plywood, wrap a strip around the circumference of the jam chuck to hold the other lengths of tape in place. Slide the tailstock away, reposition the tool rest, and remove the nub at the center of the



bowl. Working from the outside to the middle, begin hollowing out the bowl as shown *below* until it matches the profile of the **Bowl Inside Pattern**. Sand the inside of the bowl to 320 grit, being careful to leave a sharp corner on the recess where the lid will sit.

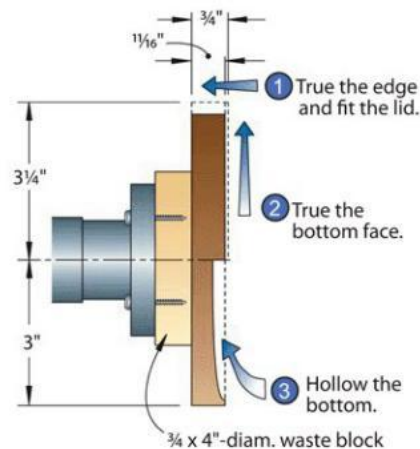


5 Put a lid on it

Tool: $\frac{3}{8}$ " bowl gouge
Speed: 800–1,000 rpm

On a 4"-square scrap, mark diagonal lines from corner to corner. Using the intersection as the centerpoint, use a compass to mark a 4"-diameter circle, then bandsaw it to shape. Retrieve the lid blank, use the same procedure to lay out a 6½"-diameter circle, and bandsaw it to shape. Glue the 4" scrap to the outside face of the lid blank, aligning the marks. After the glue dries, screw the faceplate to the scrap and true the lid to fit the opening in the bowl as shown at *right*. You want a snug fit now, as sanding will reduce the diameter slightly.

Hollow the inside of the lid using the **Lid Bottom Pattern** to gauge your progress.



SHOP TIP

A toolbox full of gauges

With open-end wrenches, there's no need for setting and resetting calipers. The wrenches make perfect gauges for checking small diameters. Have $\frac{5}{8}$ ", $\frac{3}{8}$ ", and $\frac{1}{4}$ " wrenches ready for gauging the diameters of the finial. Lightly touch the wrench to the finial. When the wrench slides easily over the workpiece, you've reached the desired diameter.



MORE RESOURCES

FREE VIDEOS

■ Learn how to sharpen and use a bowl gouge and get turning tips at: woodmagazine.com/turning-vids

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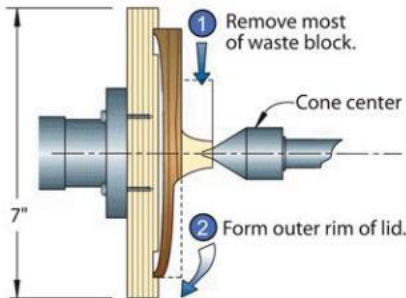
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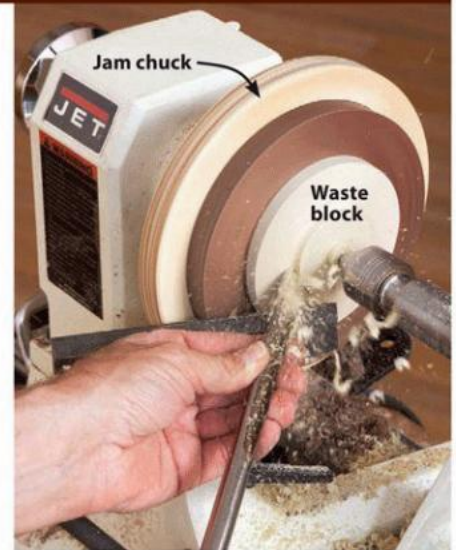
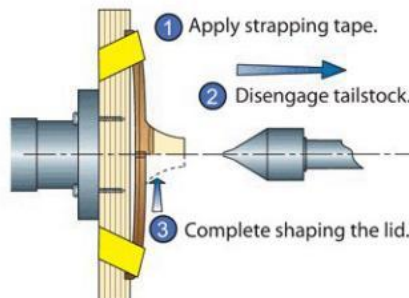
6 Shape the top of the lid

Tool: $\frac{3}{8}$ " bowl gouge
Speed: 1,000 rpm

Remove the lid from the faceplate and create a 7"-diameter jam chuck as you did for the bowl. Use the cone center and tailstock to hold the lid to the jam chuck as shown at *right*.



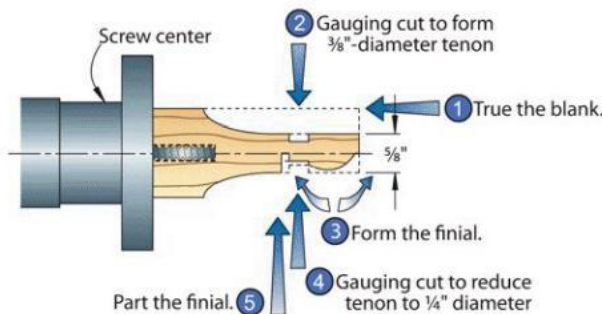
Turn away as much of the waste block as possible, then begin shaping the outside of the lid. Use the **Lid Top Pattern** to gauge your progress. Secure the lid with strapping tape, pull the tailstock back, and finish forming the lid. Then sand it to 320 grit. Mark the center of the lid with a pencil to mark the finial location.



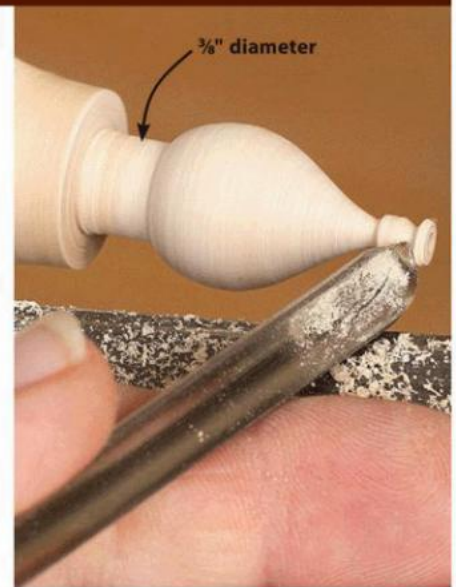
7 Create the finial

Tools: $\frac{1}{4}$ " bowl gouge, $\frac{1}{8}$ " parting tool
Speed: 1,000–1,200 rpm

Drill a pilot hole centered in one end of a 1×1×3" maple blank and mount it to the screw center. True the outer 2" of the blank to $\frac{5}{8}$ " in diameter. Place the **Finial Pattern** next to the spinning blank and mark the locations of the $\frac{1}{4}$ " and $\frac{3}{8}$ " diameters. Turn the tenon to $\frac{3}{8}$ " diameter, then shape the finial as shown at *right*. Once the finial reaches final shape, sand it to 320 grit. Then reduce the tenon to $\frac{1}{4}$ " in diameter and part it from the blank, leaving a $\frac{1}{4}$ "-long tenon.



Drill a hole in scrap to test the fit of the tenon. When you're satisfied with the fit, drill a hole in the lid and glue the finial in place.

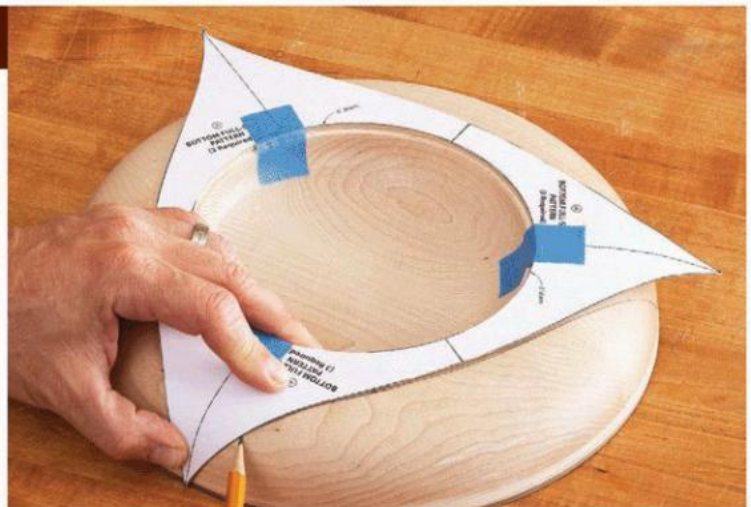


8 Saw the bowl to shape

Retrieve the **Bowl Profile Pattern**, align the center cutout with the interior of the bowl, and tape it in place, *right*.

Quick Tip! Rotate the pattern to find the placement that keeps the most attractive grain and cuts away flaws. Fold the pattern over the bowl and trace the edges. Remove the pattern, bandsaw close to the lines, then sand the edges smooth to 320 grit.

Apply a finish to all pieces. We sprayed on three coats of aerosol semigloss lacquer, sanding lightly between coats with a 320-grit sanding sponge.



Written by **Craig Ruegsegger** with **Jeff Mertz**
 Project design: **Jeff Mertz**
 Illustrations: **Roxanne LeMoine; Lorna Johnson**

VISIT WITH A MASTER



Fred Heim does not stand 12' tall. He just builds woodworking projects that are half as large as life.

Fred Heim: Big Toys For Big Boys

How do you follow up a successful career constructing housing developments, shopping centers, and retirement communities? Rather than simply reminiscing, Fred Heim of Marlborough, Massachusetts, recreated the good old days...in half scale. His wooden models of heavy construction equipment are so detailed that, without a nearby size reference, they're indistinguishable from the real thing.

Models: A growing concern

As he prepared to hand over the construction business to his sons, Fred Heim decided to revisit a childhood hobby: model-making. The first models he tackled in "retirement," $\frac{1}{16}$ -scale wooden trucks, were incredibly detailed, made completely out of wood, and apparently unsatisfactorily diminutive. Looking at those models one idle day in his shop

office, he decided it was time to scale things up a bit.

Fred built his first half-scale model, the Peterbilt truck, *above*, out of fiberglass, mahogany, and plywood on an aluminum chassis. And—get this—it *runs*. Powered by a 26-hp diesel tractor engine, the cab just fits Fred's six-foot frame thanks to a removable

PETERBILT 379 WITH HILL DUMP TRAILER



An aluminum frame lends Fred's 26' dump trailer strength while a professionally powder-coated body gives its mahogany-plywood sides the convincing look of metal.

CATERPILLAR D8R BULLDOZER



No half-scale construction business can get by without earth-moving equipment, so Fred made this half-size replica Caterpillar D8R dozer. Overlooking no detail, he had decals scaled from the original.

Where's the wood?

Even up close, it's hard to be sure that you're not looking at metal. Fortunately, photographic evidence proves the existence of wood underneath the powder-coatings and Caterpillar-yellow paint jobs of Fred's models.

NOW YOU SEE IT, NOW YOU DON'T



Blocks of dimensional lumber, aluminum plates, and layer upon layer of laminated, sculpted plywood hide under a powder-coating that makes the Caterpillar 980H's axle housing nearly indistinguishable from its full-sized cast counterpart.



A SMOOTH CHANGE TO METAL



Fred smooths auto-body filler over marine-grade mahogany plywood, disguising seams and nail holes.

steering wheel. The truck features working lights, 12" trailer wheels riding on golf-cart axles, an air-bag suspension system, hydraulic brakes, and a high-gloss automotive paint job. The fittings, mechanisms, latches, and trim had to be hand-made to fit or repurposed from smaller cousins of the real thing.

The natural first question everyone asks Fred is: Why? "I just have to keep going or I'd die. And I want to do something that no one else has done, something that makes people excited."

Even at half scale, the truck weighs more than a ton and measures 22' in length. Fortunately, Fred's three-story shop is spacious, because Fred's next project was a 26' dump trailer. Its sides look so much like metal that you can't resist knocking on the side just to be sure Fred's not pulling off some huge prank. Sure enough. Sounds like wood. Fred just smiles. "That's the first thing

everyone does," he says in a thick New England accent.

Fred took his massive models on the road to truck shows (both for real trucks and models), drawing amazed—and often confused—stares from drivers as he pulled the rig down the highway, and huge, curious crowds at the shows. "I couldn't stop at any gas station or rest stop for less than an hour. Every time I stopped, I'd have every trucker there asking me questions about it."

His construction connections gained him access to a nearby heavy-equipment dealer, so next up was a half-scale Caterpillar D8R bulldozer, along with a drop-bed trailer for it to ride on. He followed that up with a Caterpillar 345C L excavator, *below left*.

Although they are static (unpowered) models, both the bulldozer and the excavator feature rotating aluminum axles along with buckets, booms, and

pistons constructed so realistically that the models can move just like the real things. Fred handmade each link in the fully articulated tracks (88 for the dozer and 104 for the excavator) out of mahogany, solid-surface material, and PVC.

Fred's *pièce de résistance*, however, is his latest half-scale model, a powered Caterpillar 980H wheel loader, *below*. Large remote-controller box strapped around his neck, Fred steers the dirt mover around the basement-turned-parking-lot of his shop. He raises, lowers, and rotates the bucket, demonstrating that his "toy" can do anything the big boys can. See Fred's models in motion at woodmagazine.com/fredheim.

Fred claims that the 980H completes the set. "I keep saying this one's my last half-scale, and I keep doing something. It's a sickness." Never one to sit still, Fred began work on a vehicle of a different kind. And it's definitely not a model.

CATERPILLAR 345C L EXCAVATOR ON DROP TRAILER



Each link in the 345C L excavator's tread contains nine pieces of mahogany or PVC. Both of the fully-articulated, working treads have 52 links. That adds up to 936 pieces of half-scale detail.

CATERPILLAR 980H WHEEL LOADER



Fred drives his half-scale Caterpillar 980H wheel loader by remote control around the basement level of his shop. The hydraulics give the arms and bucket the full range of motion of the real thing.

Scaling Projects from Photos and Illustrations

Fred took hundreds of reference photos and measurements for each model. Diagrams from manufacturers' brochures provided precise dimensions. Toy replicas served as both inspiration and confirmation as the projects progressed. Like Fred, you can reproduce or scale projects from photos by following these tips:

- Take photos from all sides as straight-on as possible.

- If you're unable to take measurements directly, include a tape measure in the photos for scale.

- Lacking that, find a benchmark object in the photo, estimate its size, and use this measurement to produce a ratio for scaling the remaining dimensions.

- Take close-up detail shots of joinery, moldings, carvings and trim pieces.

A SURPLUS OF SNAPSHOTS



SALES BROCHURES SUPPLY SIZES



A READY POCKET REFERENCE



Fred goes full-scale with his latest project

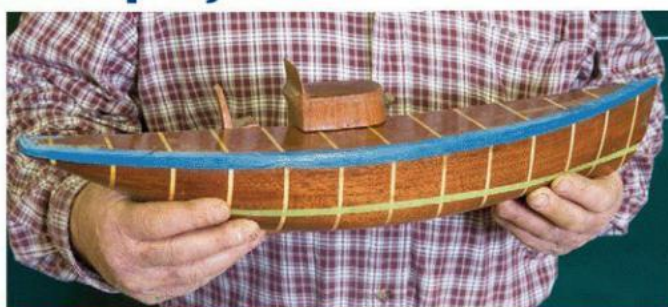
Between building malls and models, Fred continued building full-scale boats, a hobby he started fresh out of school.

During the build, the Rachel H.—a mahogany craft with gleaming stainless steel trim—dominated the ground-level, second floor of Fred's 3-story shop. It's one of dozens that he's built over the past few decades. But this one holds special significance: It's a 50th-anniversary gift to the boat's namesake, Fred's wife. He chose the design, a 31' wooden fantail launch based on early 1900s runabouts, specifically for slowly cruising the Charles River, one of Rachel's favorite getaways. "Obviously, I have a very understanding wife of 50 years." Fred says. "After the half-scale models, I

thought that she deserved this."

The boat features all the amenities to pamper up to 13 passengers: a fully equipped head (bathroom), ample refrigerator space for beverages, plush upholstery, and a sun canopy with all-weather curtains to protect passengers from bad weather.

After a round of boat shows in early 2009, the Rachel H. settled into her berth at the Watertown Yacht Club for a life of



FROM HERE, HE SCALES UP!

The Rachel H. started as—what else?—a model. Points were pulled from the stripes and scaled up to make full-sized rib patterns

leisurely river cruising. Of course for Fred, leisure is all business. His next project—what else?—building model boats, this time in 1/12-scale.

THE CAPTAIN BUILDS HIS SHIP



The Rachel H.'s hull consists of two layers of overlapping mahogany planks attached with stainless steel staples. A coating of epoxy inside, in-between, and outside the planks ensures a watertight hull.

PREPARING FOR HER MAIDEN VOYAGE



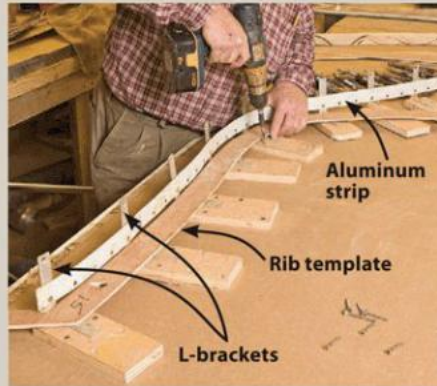
Nearly completed, the Rachel H. awaits a few final details. The flat-bottomed-hull design limits the boat's speed to about seven knots, perfect for leisurely river cruises.

3 Techniques for Crafting Colossal Curves

The complex curved hull of a boat requires precisely mating joinery—and lots of it—to keep her from visiting Davy Jones’ locker. Here are three ways that Fred uses small jigs to break down the large task:

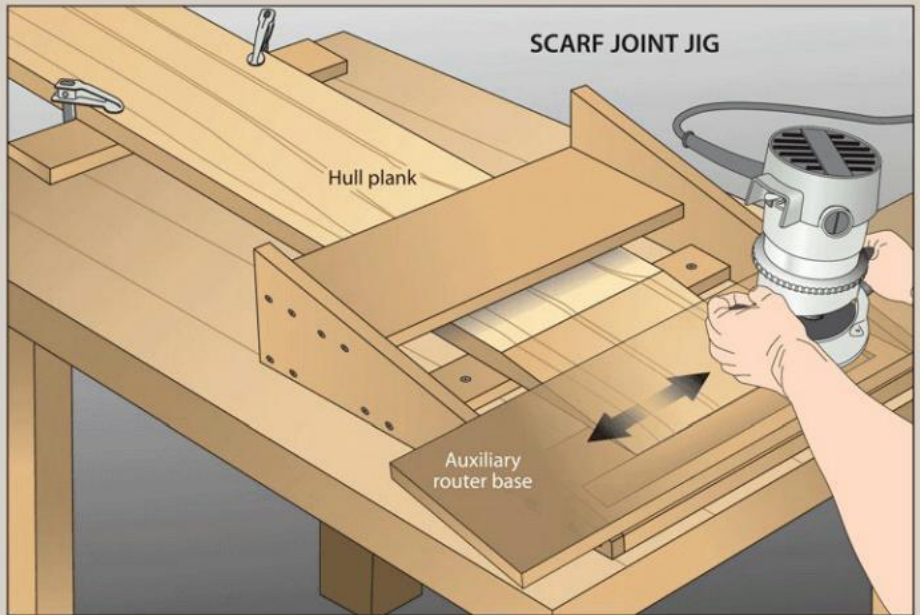
1. Laminating strips into curved parts

Home-center, steel L-brackets screwed to plywood scraps form a base to hold a flexible aluminum strip. Fred forms the reusable, shop-made “spline-and-duck” mold around a full-sized, plywood template of one of the boat’s ribs and secures the bases to a work surface (near photo). Epoxy-coated strips of oak are pressed into the curve and clamped to the spline with C-clamps (far right). To watch a free video on using a spline and ducks to lay out irregular curves go to woodmagazine.com/duckvid.



2. End-to-end joints

With the boat’s frame complete, it’s time to add the planks. The length of the boat necessitates multiple lengths of mahogany. Joining wood end-to-end under tension requires a long, tapered joint, called a scarf joint, overlapping between the ribs to maintain the continuous curve. Fred crafts a scarf joint using this simple router jig. The slanted base defines the 10° angle of the joint, while the extra-long auxiliary router subbase slides back-and-forth to nibble away the waste with a straight bit in successively deeper passes.



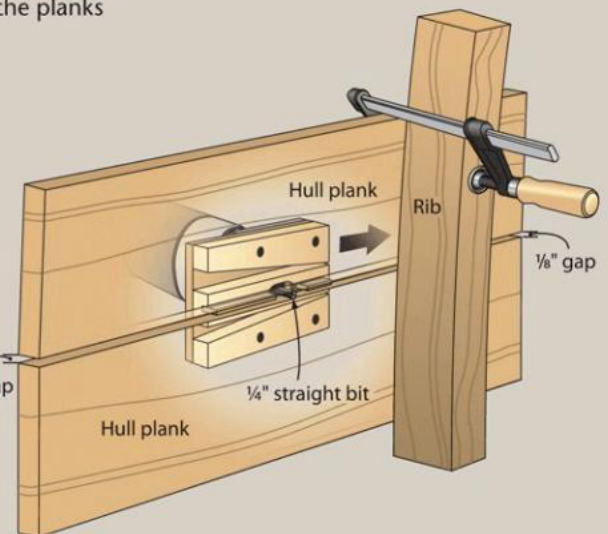
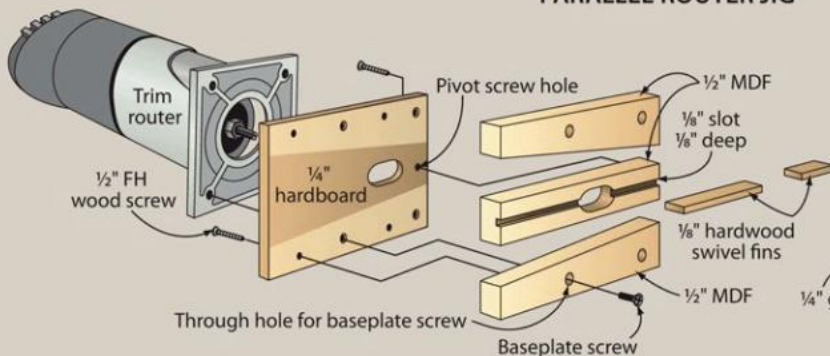
3. Jointing curves for a seamless fit

After one plank is attached to the ribs, the next plank is clamped above the previous leaving a 1/8–3/16" gap. The two planks must fit together seamlessly in a sweeping curve around the ribs. To

accomplish this, Fred uses a trim router equipped with a 1/4" straight bit and this shop-made auxiliary subbase. The swivel fins on the subbase slide in the gap between the planks while the 1/4" straight bit cuts the mating edges of the planks

parallel to each other. The process can be repeated to fine-tune the fit by sliding the upper plank down slightly and making a second pass. 🌲

PARALLEL ROUTER JIG



Written by **Lucas Peters**
 Photographs: **Brian McCay; Fred Heim**
 Illustrations: **Tim Cahill**

Media Cabinet

Gracious and spacious, this case holds your entire music and video library.



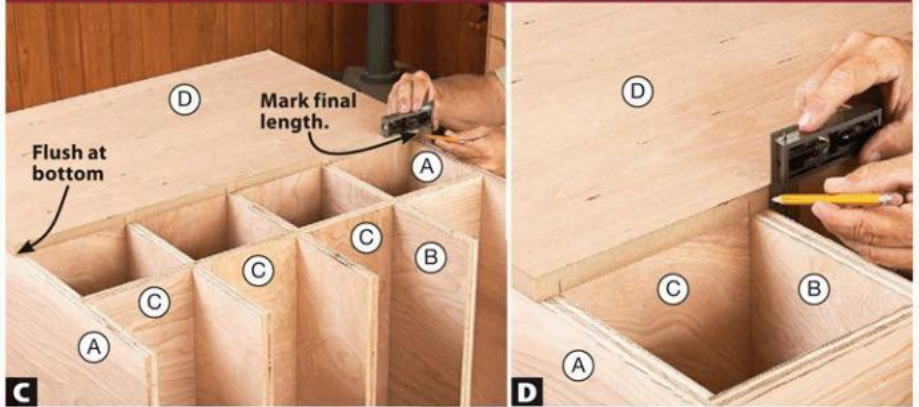
Dimensions: 29 $\frac{1}{2}$ " wide x 19 $\frac{1}{2}$ " deep x 34 $\frac{3}{4}$ " high

ALIGNING THE SHELVES



B Temporarily clamp a piece of plywood to the cabinet to align the shelves (B) and top and bottom (A) and to keep the assembly square.

MARK THE SIDES' LENGTH AND LAY OUT THE DADOES



C Set a side (D) on the cabinet (A-C) with its end flush with the outside face of the bottom (A), above. Mark the side's final length. Then, using a square and a pencil, mark on the side the locations of the dadoes for the shelves (B), above right.

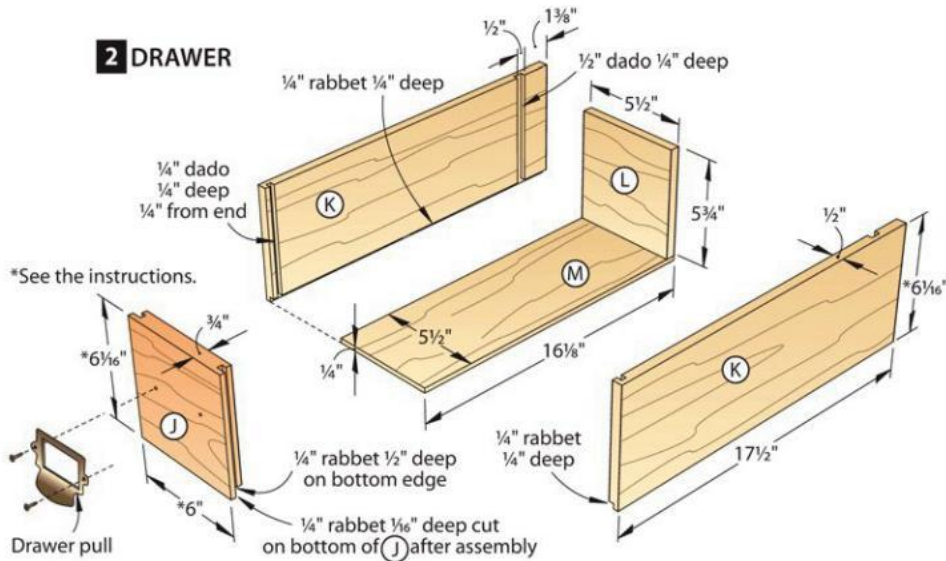
4 Cut the dividers (C) to size. Sand the top and bottom (A), shelves (B), and dividers to 150 grit. Glue three dividers into the dadoes in the bottom and clamp a shelf to this assembly. **Note:** Make sure the marked end of each panel is on the same side. Repeat this procedure, working your way up one level at a time. **Quick Tip!** Short clamps work big. Make use of shorter clamps by running them from a shelf to the top or bottom [Photo B].

5 Cut the sides (D) to width and rough length. Lay the cabinet (A-C) on your bench and rest a side on it [Photo C]. Mark the sides' final length and the locations of the dadoes [Photo D]. Using these marks, trim the sides to length, then cut the dadoes. Rabbet each end and the back edges of the sides [Drawing 1], sand them to 220 grit, and glue the sides to the cabinet. Check the assembly for square.

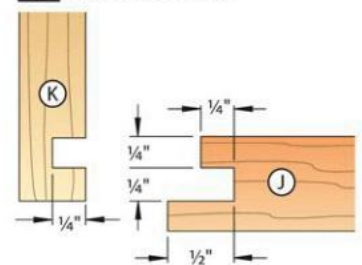
6 Rip the side, shelf, and divider trim (E, F, G) to width and crosscut the side and shelf trim slightly overlength. Cut 26"-long blanks for the divider trim (G). Plane the side trim (E) to match the thickness of the sides (D). Cut it to match the height of the sides, and glue and clamp it in place [Photo E]. Plane the remaining trim to match the shelf (B) and divider (C) thickness. Crosscut the shelf trim (F) to fit between the side trim and glue and clamp one piece to the bottom (A). Cut a length of divider trim from each blank to fit between the shelf trim and the lower shelf, and glue them in place. Repeat this process, working your way up the cabinet, applying trim to the remaining shelves and dividers [Photo F].

7 Cut the back (H) to size and set it aside for now. Glue up boards for the

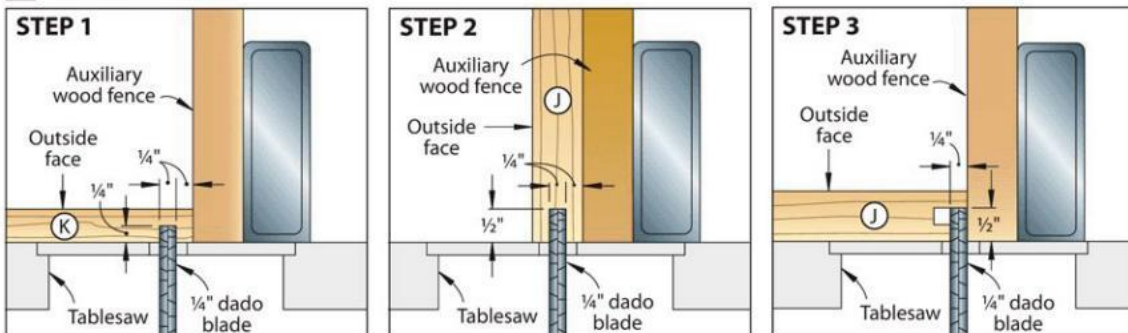
2 DRAWER



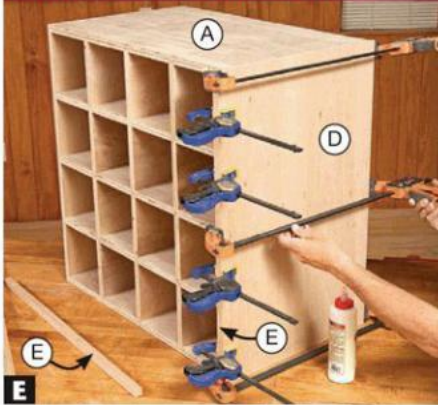
2a DRAWER JOINT



3 DRAWER JOINERY

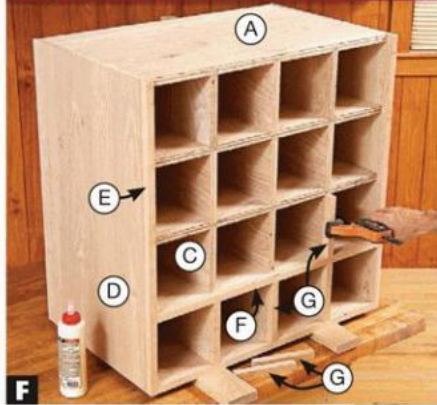


TRIM THE SIDE PANELS FIRST



E Clamp the side trim (E) to the side (D). Clamps across the joint line keep the trim and side flush on both faces.

NOW THE SHELVES AND DIVIDERS



F For a seamless fit, glue the trim (F, G) in place working from the bottom up, cutting the trim to length as you go.

SHOP TIP

Clearly better labels

When exposed to light for even a short time, cherry begins to darken. Using opaque tape for labels could leave a telltale light spot. Instead, label the drawer fronts (J) on clear packing tape. It allows light through so the entire piece ages evenly. Line up the drawer fronts, stretch a piece of tape across them, then cut them apart after labeling. But even clear tape and ink block some light. So don't leave the tape on longer than necessary.



top panel (I), cut it to size, and rout a $\frac{1}{4}$ " round-over around the lower edge. (Save the router-table setup for later use.) Sand the top to 220 grit and set it aside.

You make 16 drawers, what do you get?

Note: To cut the drawer joinery as shown [Drawing 2a], the drawer fronts (J) must be exactly $\frac{3}{4}$ " thick, and the sides (K) must be exactly $\frac{1}{2}$ " thick. Cut some extra pieces for testing setups as you cut the joinery.

1 For a continuous grain pattern across the drawer fronts (J) in each row, choose boards with enough clear grain to yield four drawer fronts next to each other. The length of each drawer front is $\frac{1}{8}$ " less than the width of a drawer opening. The width of the drawer fronts is $\frac{1}{16}$ " less than the opening's height. Cut them to size, then label each set of four so you can re-create the grain flow [Shop Tip, above right]. From $\frac{1}{2}$ " stock, cut the drawer sides (K) to size [Drawing 2].

2 Attach an auxiliary fence to your tablesaw's rip fence and set up a $\frac{1}{4}$ " dado blade [Drawing 3]. Cut a dado across the front end of each drawer side (K) [Step 1]. Raise the blade to $\frac{1}{2}$ " and cut a groove in each end of the fronts (J) [Step 2]. Reposition the rip fence [Step 3] and make a pass along the ends of each front

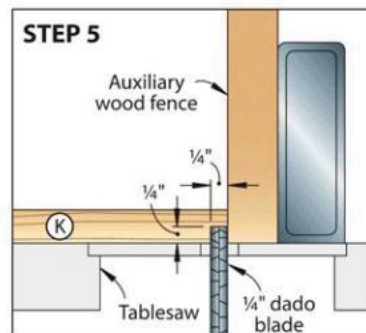
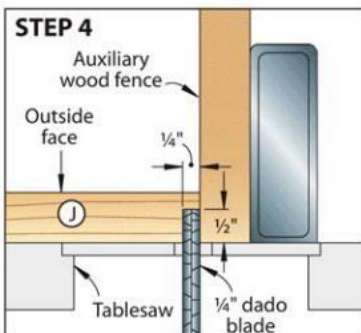
with the outside face up. With the same setup, cut a rabbet along the bottom edge of the fronts [Step 4]. Lower the blade to $\frac{1}{4}$ " and rabbet the bottom inside edge of the sides [Step 5]. Add chippers and shims so the dado-blade width matches the thickness of the backs (L). Cut the $\frac{1}{4}$ "-deep dados toward the rear of the sides [Drawing 2].

3 Measure the length of the inside face of a drawer front (J). Rip the drawer backs (L) to width and crosscut them to this length [Drawing 2]. Cut the drawer bottoms (M) to size. Sand the inside faces of the drawer pieces to 220 grit; then glue up the drawers, checking each of them for square and twist.

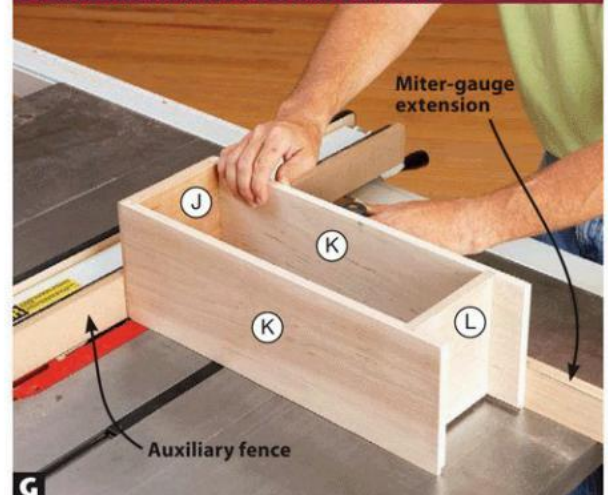
4 After the glue dries, create a shadow line below each drawer [Photo G]. Write the drawer number on the back face of the back (L) and remove the tape from the drawer front (J). Sand the out-sides of the drawers to 220 grit.

Build a base

1 From $\frac{3}{4}$ " stock (or laminated $\frac{3}{4}$ " stock), cut two $1\frac{1}{2} \times 1\frac{1}{2} \times 11$ " blanks for the legs (N). Lay out the mortises at each end on two adjacent faces [Drawing 4].



A RABBET MAKES A SHADOW LINE



G With an extension on the miter gauge to steady the drawer, cut a $\frac{1}{4}$ " rabbet $\frac{1}{16}$ " deep on the bottom edge of each drawer front (J) to create a shadow line.

scrap [Drawing 5a, Photo J], then test the fit in a mortise [Photo K]. If needed, cut off the test tenon, adjust the blade height, and cut another tenon to get a snug fit. When the tenon fits, repeat this process on both ends of the rails.

3 Raise the blade to $\frac{1}{4}$ " above the table, stand each rail (O, P) on edge, and cut the short shoulders to complete the tenons [Drawing 5a].

4 Use a fairing stick to lay out the curve on each rail (O, P) [Drawing 5]. Bandsaw close to the line, then sand up to it. **Quick Tip! Shape two pieces at once.** Use double-faced tape to fasten the front rail to the back rail and the side rails to each other before cutting and sanding the curves. Sand them to 220 grit, then glue and clamp the rails and legs (N) together [Photo L].

5 Cut the base trim (Q, R) to size and 1" longer than listed. Rout $\frac{1}{4}$ " round-overs on the outside edges [Drawing 5]. Then miter-cut each end. **Quick Tip! Perfectly matched mates.** Double-faced-tape two matching trim pieces together face-to-face before you miter-cut them to length. Glue up the base trim [Photo M]. After the glue dries, sand the trim (Q/R) to 220 grit. Then glue and clamp it to the base (N-P) centered side-to-side and front-to-back.

Bring it all together

1 Apply a finish to all pieces. (We used three coats of boiled linseed oil.) Install the back (H), and screw a drawer pull to each drawer front (J). (See the Quick and Easy Jig on page 18.)

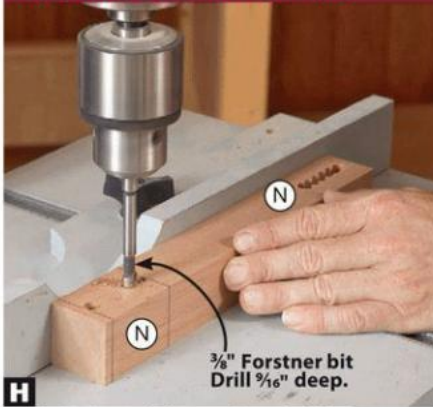
2 Turn the case (A-H) upside down and center the trim (Q/R) on it. Drill $\frac{3}{4}$ " pilot holes through the trim and into the case bottom (A). Screw the trim to the bottom [Drawing 1]. Flip the case over on its legs (N). Reaching into the

Bring it all together

1 Apply a finish to all pieces. (We used three coats of boiled linseed oil.) Install the back (H), and screw a drawer pull to each drawer front (J). (See the Quick and Easy Jig on page 18.)

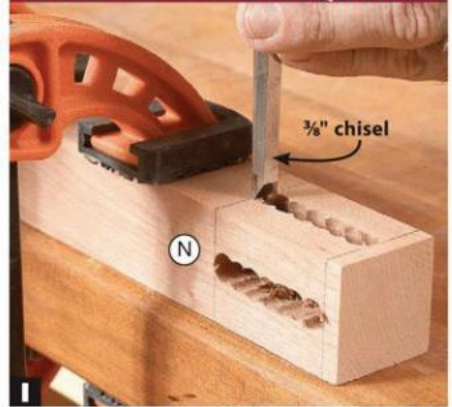
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ROUGH OUT THE MORTISES



H Drill a hole to define each end of the mortise, then bore overlapping holes to remove most of the waste between them.

CHISEL THE MORTISES SQUARE

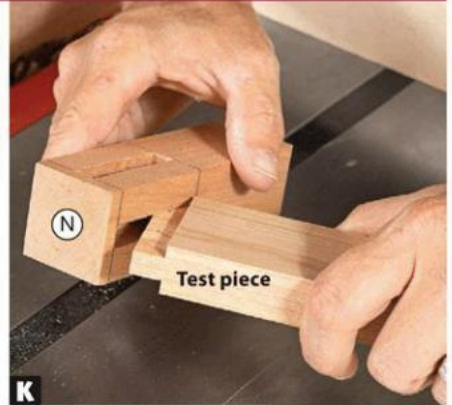


I Square up the ends of the mortise first, then switch to your widest chisel to remove the ridges from the sides.

TEST SETUPS ON SCRAP FIRST



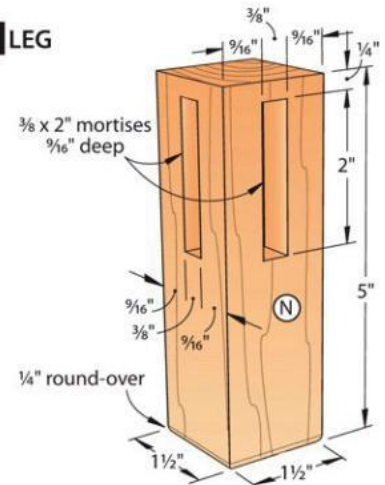
J House a $\frac{1}{16}$ "-wide dado blade in an auxiliary fence and raise the blade $\frac{3}{16}$ " above the table. Cut rabbets on each face of a test piece.



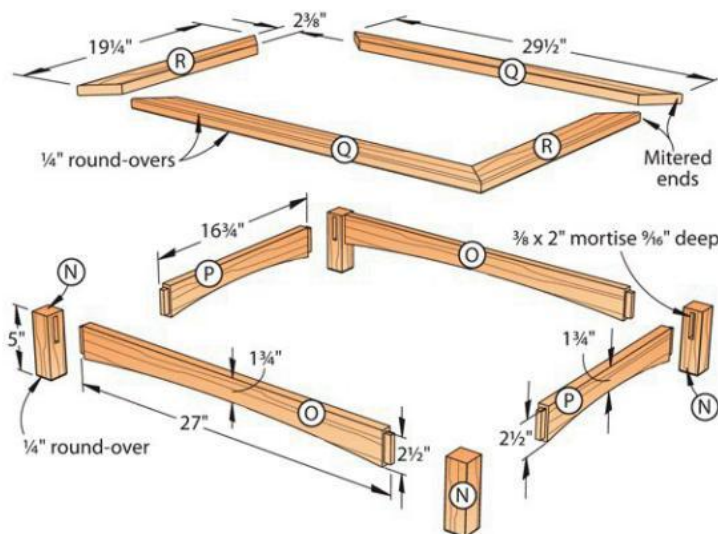
K When the corner of the test tenon slides snugly into a mortise, cut rabbets on each end of the rails (O, P).

end drawer openings, drill and countersink $\frac{3}{16}$ " holes at the rear of the top (A). Drill $\frac{3}{16} \times \frac{1}{2}$ " slots toward the front [Drawing 1]. Retrieve the top panel (I) and screw it to the top (A) centered side-to-side and flush at the back. After printing cards for the drawer pulls, pop some popcorn, and cue up your favorite movie. It will be easy to find. 🌿

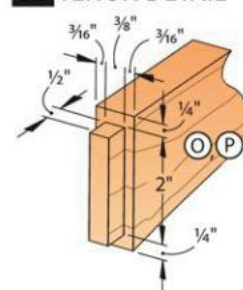
4 LEG



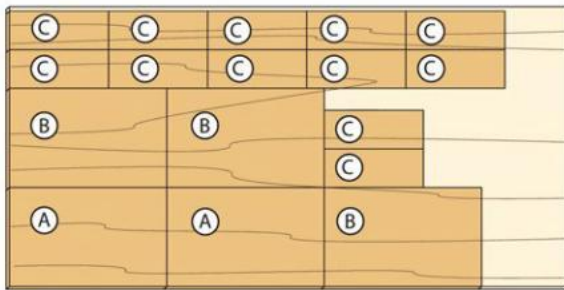
5 BASE



5a TENON DETAIL



Cutting Diagram



3/4 x 48 x 96" Birch plywood



3/4 x 5 1/2 x 96" Cherry (4 bd. ft.)



3/4 x 7 1/4 x 96" Cherry (5.3 bd. ft.)



3/4 x 7 1/4 x 96" Cherry (5.3 bd. ft.)



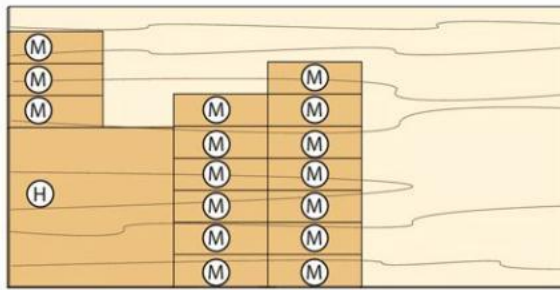
3/4 x 7 1/4 x 96" Cherry (5.3 bd. ft.)



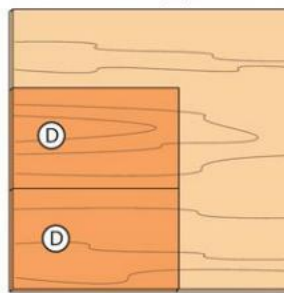
3/4 x 7 1/4 x 96" Maple (5.3 bd. ft.) (6 needed)



3/4 x 7 1/4 x 96" Maple (5.3 bd. ft.) *Plane or resaw to the thickness listed in the Materials List.



3/4 x 48 x 96" Birch plywood



3/4 x 48 x 48" Cherry plywood

Materials List

Part	FINISHED SIZE			Matl.	Qty.	
	T	W	L			
Cabinet						
A	top/bottom	3/4"	17"	27 1/4"†	BP	2
B	shelves	3/4"	17"	27 1/4"†	BP	3
C	dividers	3/4"	6 5/8"	17"	BP	12
D*	sides	3/4"	17 1/4"	28 1/4"	CP	2
E*	side trim	3/4"	3/4"	28 1/4"	C	2
F*	shelf trim	3/4"	3/4"	26 3/4"	C	5
G*	divider trim	3/4"	3/4"	6 1/8"	C	12
H	back	1/4"	27 1/4"	28 1/4"	BP	1
I	top panel	3/4"	18 3/4"	29 3/4"	EC	1
Drawers						
J	fronts	3/4"	6 1/8"†	6"†	C	16
K	sides	1/2"	6 1/8"†	17 1/2"	SM	32
L	backs	1/2"	5 3/4"	5 1/2"	SM	16
M	bottoms	1/4"	5 1/2"	16 1/8"	BP	16
Base						
N*	legs	1 1/2"	1 1/2"	5"	C	4
O	front/back rails	3/4"	2 1/2"	27"	C	2
P	side rails	3/4"	2 1/2"	16 3/4"	C	2
Q*	front/back base trim	3/4"	2 3/8"	29 1/2"	C	2
R*	side base trim	3/4"	2 3/8"	19 1/4"	C	2

*Parts initially cut oversize. See the instructions.
† See instructions to determine exact dimensions.

Materials key: BP—birch plywood; CP—cherry plywood; C—cherry; EC—edge-glued cherry; SM—soft maple.
Supplies: Double-faced tape, #8 x 3/4" flathead wood screws (15), #8 x 1 1/4" flathead wood screws (14).
Blade and bits: Stacked dado set; 1/4" round-over router bit; 3/8" Forstner bit.

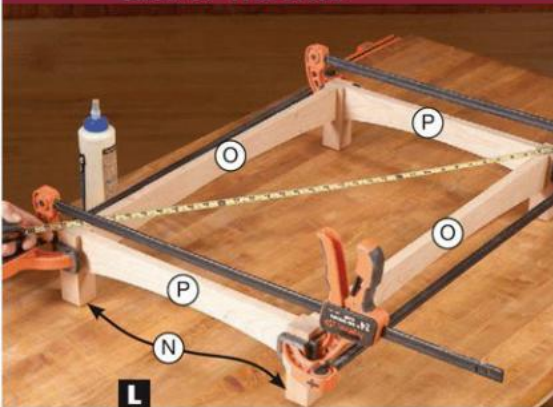
Source

Drawer pulls: Bronze label holders with pull (16) item no. 02004947, \$3.99, VanDyke's Restorers, 800-558-1234, vandykes.com.

In the opening photo: Better Homes and Gardens® Antique Bronze Table Lamp Base sold at Wal-mart®. Shade sold separately.

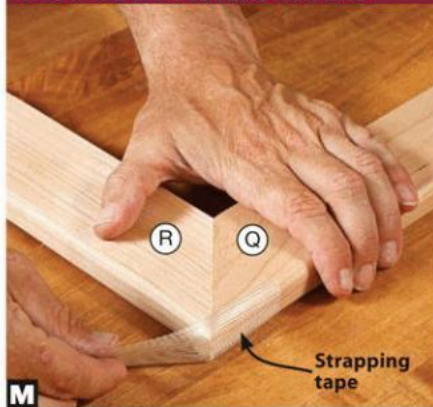
Written by **Craig Rueggegger** with **Jeff Mertz**
Project design: **Kevin Boyle**
Illustrations: **Roxanne LeMoine; Lorna Johnson**

GLUE UP THE BASE



Clamp across the width and length of the base. Adjust the assembly as needed to get identical diagonal measurements.

TAUT TAPE MASTERS MITERS



Wrap strapping tape around the miter joints to pull the joints tight during glue-up and to prevent the pieces from slipping.

MORE RESOURCES

FREE PLANS

- Make a fairing stick for laying out curves: woodmagazine.com/fairing
- Turn your corded drill into a drum sander for smoothing curves: woodmagazine.com/drillsand

FREE VIDEOS

- Learn how to use a fairing stick: woodmagazine.com/fairingvideo
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About our product tests

We test hundreds of tools and accessories, but only those that earn at least three stars for performance make the final cut and appear in this section. Prices are current at the time of article production and do not include shipping, where applicable.

Delta delivers a new spin on mini-lathes: reverse

Until recently, only full-sized wood lathes could reverse direction. But Delta has changed that by incorporating a reverse function into its variable-speed benchtop lathe. I really like this feature for sanding because I can better smooth all the wood fibers that tend to lean the direction of my cuts. And I know some left-handed woodturners who like to stand on the back side of the lathe to hollow out vessels in reverse.

I tested both the 5-speed 46-455—which does not have the reverse capability—and the variable-speed 46-460. Although the 5-speed model demonstrated more torque than its sibling, its slowest speed, 500 rpm, proved too fast for roughing out a 10"-or-larger bowl blank (something both machines have capacity for, thanks to 12½" of swing). And I would have liked another speed between that and its 900-rpm second speed, especially for bowl and vessel turning.

I'll gladly sacrifice the torque for finer speed control, however, and the 46-460 runs from 250 to 4,000 rpm in three speed ranges. Both lathes have a large access panel to move the drive belt for easy speed changes. Each also exhibited a vibration sufficient to loosen the banjo and tailstock locks at times.

—Tested by Brian Simmons,
a professional woodturner and teacher



12½" mini-lathes

Performance	★★★★☆
Price	5-speed, #46-455 \$500
	variable speed, #46-460 \$600
Delta Machinery 800-223-7278; deltaportercable.com	



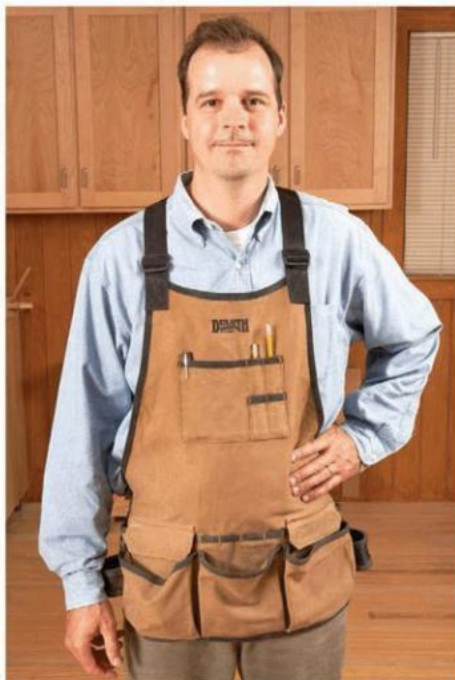
These pocket holes let dust filter through

Shop aprons protect your clothes and keep tools close at hand, but they also collect dust and chips in the pockets. So when the folks at Duluth Trading Company asked me what I wanted in a woodworking apron, I said "clean pockets." They responded by making this apron with mesh bottoms in the three largest pockets. After using this apron for several months, I love how most of the debris slips right through. Hook-and-loop flaps on some pockets secure items you don't want to get loose, such as a small square or block plane. And the apron is made of a durable, lightweight material, so it stands up against sharp-edged tools as well as stains, finishes, and glues. 🌱

—Tested by Kevin Boyle, Senior Design Editor

Shop apron, #85021

Performance	★★★★★
Price	\$26.50
Duluth Trading Company 800-505-8888; duluthtrading.com	



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A plane repair for a wobbly chair

Q: As the woodworker in my family, I've apparently also been designated the furniture repairman. The latest thing on my bench is a chair with a few loose legs and stretchers. One stretcher even pulls right out of its socket. How do I tighten the joints?

—Timothy Conner, Charlotte, N.C.

A: The first step, Timothy, is to carefully disassemble any loose joints. Use a spreader between the legs and slowly apply pressure to separate the tenons from the sockets, as shown at *right*. Heat stubborn joints for a couple minutes with a heat gun or a hair-dryer set on high before trying the spreader again. Don't skip any suspect joints because they might be hard to access after you re-glue the others.

With the joints separated, clean any old glue from the tenon and the socket with sandpaper and files. Next, enlarge the tenons so they are once again snug in their sockets. To do this, glue and wrap them with hand-plane shavings, as shown at *right*. After the glue dries, trim away any protruding shavings with a hobby knife and test fit the joint. If it's still too loose, apply another layer of hand-plane shavings. Too tight? Use sandpaper or a file to size it back down to a snug fit. Then reglue the joint.



Is a thin-kerf blade all I need?

Q: As a newbie woodworker, I'm trying to stock my shop inexpensively. I've read that thin-kerf, carbide-tipped tablesaw blades waste less wood and put less strain on the saw's motor. If they work so much better, is there any reason to even buy a full-kerf blade?

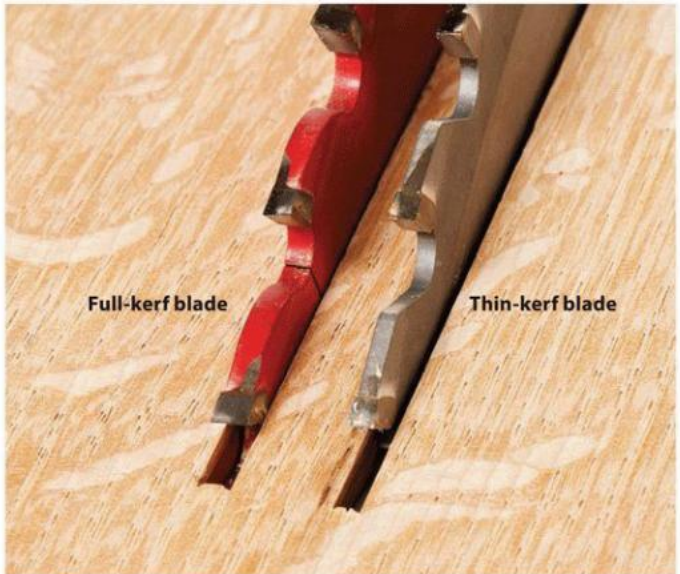
—Tom Messerly, Huntington, W.Va.

A: Tom, you are correct about the advantages of thin-kerf blades. On average about $\frac{1}{32}$ " thinner than its full-kerf counterpart, the thin-kerf blade marginally reduces wasted wood, but this advantage only really becomes noticeable if you are doing a lot of thin-strip ripping. However, the reduction in sawdust generated is a more noticeable boon, especially if you're ripping a lot of air-fouling MDF.

As for motor strain, if your well-aligned saw is bogging down with a full-kerf blade, a switch to thin-kerf will likely eliminate the problem. (The general rule of thumb: thin-kerf blades for saws under 3-hp and thin- or full-kerf for saws 3-hp and over.)

While conventional wisdom has long held that thin-kerf blades provide certain performance trade-offs, such as more flex or chatter due to the thinner plate, these trade-offs have largely faded in the face of new materials and manufacturing technologies.

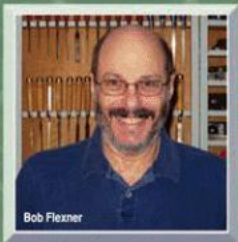
Cliff Paddock, cutting tools product manager for Freud America, Inc., says, "The stability of blades derives from a number of factors, including the quality of the steel plate, precise tensioning and flattening of the blade body, and



precision balancing. I would not agree that a full kerf automatically produces a smoother cut."

According to Cliff, the choice to use a full-kerf blade on a modern, 3-hp table saw largely comes down to personal preference. "In our shop here at Freud we use thin-kerf blades in most applications, even though all of our table saws have 3-hp or larger motors."

continued on page 82



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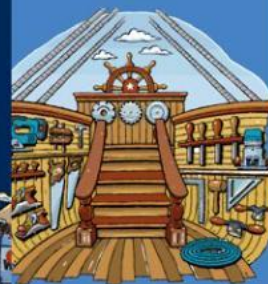
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Bearing bit bites the dust after cleaning

Q: After gumming up a bearing-guided bit while routing pine, I soaked it in some blade and bit cleaner before scrubbing it clean. The bit seems to cut better, but now the bearing doesn't spin smoothly. What happened?

—John McCurdy, Boca Raton, Fla.

A: John, it's likely that the solvent you used to soften and remove the pitch buildup on the bit also leached the lubrication out of the bearing. Discard the bearing and get a replacement from the bit manufacturer.

Next time you need to clean a bearing-guided bit, first remove the bearing and inspect it. If it needs cleaning, don't soak it along with the rest of the bit. Simply wet a shop cloth with your blade and bit cleaner, scrub the bearing's surface clean, and wipe it dry. Apply high-speed, router-bearing lubricant, such as Empire's Router Bit Lube (Woodcraft item no. 829400, \$10, 800-225-1153, woodcraft.com), before reinstalling the bearing.

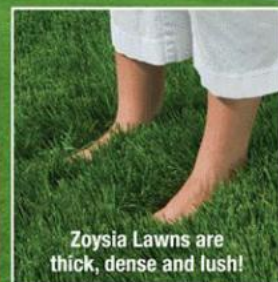
If you notice pitch buildup on your router bit or blades, don't wait to clean it off. Not only does it affect performance, mimicking the effects of a dulling, but the resins could also corrode the body and carbide cutters, hastening actual dulling. 🌲

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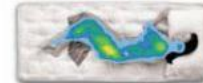
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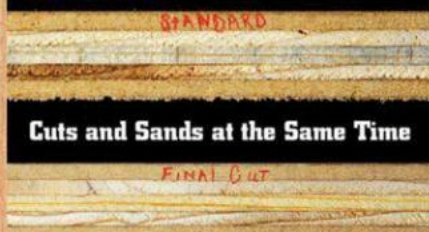
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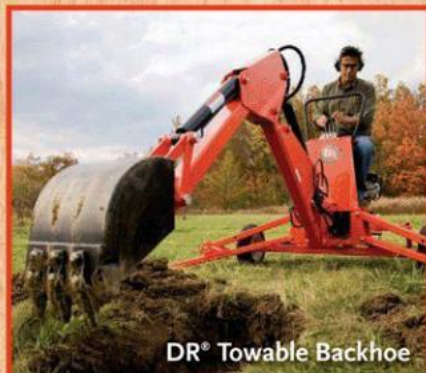
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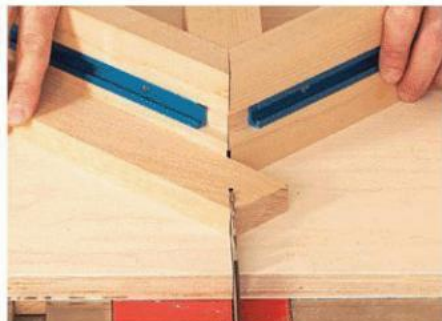
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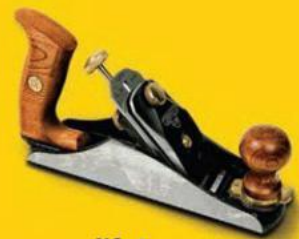


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