ISSUE 213 SEPTEMBER 2012

Better Homes and Gardens®

WOOD®

The World's Leading Woodworking Resource

24 TRICKS TO DEAD-ON MEASURING AND MARKING p.45

Easy-to-Build Compact Combo Tablesaw/Router Table p.28

And our shop tests reveal *exactly* which saw to put in it! p.34

114 Shop Tips Inside!

Plus More Great Projects

- Wall-hung Quilt Rack p.61
- Family Game Table p.48
- Travel Tic-Tac-Toe p.58

Stretch Your Dollars with Secondary Woods p.22

No Jointer? No Problem! Get Straight, Square Stock Without One p.64

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- Cutting capacity/throat: 16 1/4"
- Max. cutting height: 12 1/8"
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- Approx. shipping weight: 342 lbs.

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G0513 HEAVY-DUTY 17" BANDSAW SALE $895.00

10" LEFT-TILTING CONTRACTOR -STYLE TABLE SAW with Riving Knife

- Motor: 1 1/2 HP, 110V/220V, single-phase
- Precision-ground cast iron table with wings
- Table size: 25 1/2" x 40" • Arbor: 5/8"
- Arbor speed: 4000 RPM
- Capacity: 3 1/8" @ 90°, 2 1/4" @ 45°
- Rip capacity: 30" R, 12" L
- Approx. shipping weight: 221 lbs.

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- Motor: 3 HP or 5 HP, 220V, single-phase
- Precision-ground cast iron table size with wings: 27" x 48"
- Arbor: 5/8"
- Cutting capacity: 25 5/8" R, 8" L
- Max. depth of cut: 3" @ 90°, 2 1/8" @ 45°
- Approx. shipping weight: 546 lbs.

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G1023RLWX 5 HP ~~$1350.00~~ SALE $1295.00

10" CABINET TABLE SAW with Riving Knife

- Motor: 3 HP, 220V, single-phase
- Precision-ground cast iron table
- Table size with extension: 27" x 40"
- Arbor: 5/8" • Arbor speed: 4300 RPM
- Max. depth of cut: 3 1/8" @ 90°, 2 3/16" @ 45°
- Max. rip capacity: 29 1/2"
- Max. dado width: 13/16"
- Approx. shipping weight: 542 lbs.

3 HP LEESON® MOTOR!

G0690

~~$1325.00~~

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10" CABINET TABLE SAW with Riving Knife & Extension Rails

- Motor: 3 HP, 220V, single-phase
- Precision-ground cast iron table
- Table size with extension: 27" x 74 3/4"
- Arbor: 5/8" • Arbor speed: 4300 RPM
- Max. depth of cut: 3 1/8" @ 90°, 2 3/16" @ 45°
- Max. rip capacity: 50"
- Max. dado width: 13/16"
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- Motor: 1 HP, 110V/220V, single-phase, TEFC
- Precision-ground cast iron table size: 14" sq.
- Table tilt: 15° L, 45° R
- Cutting capacity/throat: 13 1/2"
- Max. cutting height: 6"
- Blade size: 92 1/2"–93 1/2" L (1/8"–3/4" W)
- Blade speeds: 1500 & 3200 FPM
- Approx. shipping weight: 196 lbs.

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19" HEAVY-DUTY BANDSAW

MADE IN TAIWAN

- Motor: 3 HP, 220V, single-phase, TEFC, 60 Hz
- Precision-ground cast iron table size: 26 3/4" x 19"
- Table tilt: 5° L, 45° R
- Cutting capacity/throat: 18 1/4"
- Max. cutting height: 12"
- Blade size: 143" L (1/8"–1 1/4" W)
- Blade speeds: 1700 & 3500 FPM
- Approx. shipping weight: 480 lbs.

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12" JOINTER/PLANER COMBINATION MACHINES

BEAUTIFUL WHITE COLOR!

- Motor: 5 HP, 220V, single-phase
- Jointer table size: 14" x 59½"
- Cutterhead dia.: 3⅛"
- Cutterhead speed: 5034 RPM
- Max. jointer depth of cut: ⅛"
- Max. width of cut: 12"
- Planer feed rate: 22 FPM
- Max. planer depth of cut: ⅛"
- Max. planer cutting height: 8"
- Planer table size: 12¼" x 23⅛"
- Approx. shipping weight: 734 lbs.

NEW END-MOUNTED FENCE

CARBIDE INSERT SPIRAL CUTTERHEAD!

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G0634XP ~~$2195.00~~ SALE **$2150.00**

ALSO AVAILABLE

G0633 3 KNIFE JOINTER/PLANER ~~$1995.00~~ SALE **$1950.00**

G0634Z SPIRAL CUTTERHEAD MODEL ~~$2450.00~~ SALE **$2395.00**

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CYCLONE DUST COLLECTOR

BEAUTIFUL WHITE COLOR!

- Motor: 1½ HP, 110V/220V, single-phase, TEFC, 3450 RPM
- Air suction capacity: 775 CFM
- Static pressure at rated CFM: 1.08"
- Intake port: 6" with included 5" optional port
- Impeller: 13½"
- Height: 65½"
- Built-in remote control switch
- Approx. shipping weight: 210 lbs.

PLEATED FILTER IS PROTECTED BY A STEEL CAGE

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FULLY MOBILE WITH BUILT-IN CASTERS

G0703P ONLY **$725.00**

8" JOINTERS

- Motor: 3 HP, 220V, single-phase, TEFC
- Precision-ground cast iron table size: 9" x 72½"
- Max. depth of cut: ⅛"
- Max. rabbeting depth: ½"
- Cutterhead dia.: 3"
- Cutterhead speed: 5000 RPM
- Cuts per minute: 20,000
- Approx. shipping weight: 500 lbs.

FREE SAFETY PUSH BLOCKS

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CHOOSE EITHER 4 HSS KNIVES OR SPIRAL CUTTERHEAD MODEL

4 KNIFE CUTTERHEAD
G0656P ~~$795.00~~ SALE **$750.00**

SPIRAL CUTTERHEAD
G0656PX ~~$1195.00~~ SALE **$1150.00**

$150 shipping

8" X 76" JOINTERS

- Motor: 3 HP, 220V, single-phase, TEFC, 3450 RPM
- Precision-ground cast iron table size: 8" x 76⅜"
- Infeed table size: 8" x 43⅜"
- Cutterhead knives (G0490): 4 HSS, 8" x ¾" x ⅛"
- Cutterhead speed: 5350 RPM
- Cutterhead dia.: 3⅛"
- Max. depth of cut: ⅛"
- Max. rabbeting depth: ½"
- Deluxe cast iron fence size: 36" L x 1¼" W x 5" H
- Approx. shipping weight: 597 lbs.

FREE SAFETY PUSH BLOCKS

CSA C US 208624

BUILT-IN MOBILE BASE

$150 shipping

4 KNIFE CUTTERHEAD
G0490 ~~$945.00~~ SALE **$895.00**

SPIRAL CUTTERHEAD
G0490X ~~$1250.00~~ SALE **$1195.00**

15" PLANERS

- Motor: 3 HP, 220V, single-phase
- Precision-ground cast iron table size: 15" x 20"
- Min. stock thickness: 3/16"
- Min. stock length: 8"
- Max. cutting depth: ⅛"
- Feed rate: 16 FPM & 30 FPM
- Cutterhead speed: 5000 RPM
- Approx. shipping weight: 660 lbs.

CHOOSE EITHER 3 KNIFE OR SPIRAL CUTTERHEAD MODEL

$150 shipping

BUILT-IN MOBILE BASE

3 KNIFE CUTTERHEAD
G0453P ~~$1050.00~~ SALE **$1025.00**

SPIRAL CUTTERHEAD
G0453PX ONLY **$1650.00**

Z SERIES 20" PLANERS

- Motor: 5 HP, 220V, single-phase
- Precision-ground cast iron table size: 20" x 25¾" (20" x 55½" w/ extension)
- Max. cutting height: 8"
- Max. cutting depth: ⅛"
- Feed rate: 16 & 20 FPM
- Cutterhead dia.: 3⅛"
- Cutterhead knives: 4 HSS (G0454)
- Cutterhead speed: 5000 RPM
- Approx. shipping weight: 920 lbs.

CSA C US 208624

2 SPEEDS!

BUILT-IN MOBILE BASE

$179 shipping

4 KNIFE CUTTERHEAD
G0454 ~~$1575.00~~ SALE **$1550.00**

SPIRAL CUTTERHEAD
G0454Z ~~$2495.00~~ SALE **$2450.00**

10" DRUM SANDER

- Motor: 1½ HP, 110V, single-phase
- Conveyor motor: 1/10 HP
- Drum speed: 2300 FPM
- Drum size: 5⅛" x 10"
- Max. sanding width: 10"
- Max. workpiece height: 3"
- Min. workpiece height: ¼"
- Variable feed speeds: 1–10 FPM
- 4" dust port
- Approx. shipping weight: 220 lbs.

WHEELS & STOWABLE TRANSPORT HANDLES FOR MOBILITY

$79 shipping

G0716 ~~$415.00~~ SALE **$395.00**

1 HP WALL MOUNT DUST COLLECTOR

- Motor: 1 HP, 110V/220V, single-phase
- Amps: 14/7 • Intake size: 4"
- Bag size (dia. x depth): 13½" x 24"
- Balanced steel, radial fin impeller
- Air suction capacity: 450 CFM
- Max. static pressure: 7.2"
- Approx. shipping weight: 51 lbs.

MADE IN TAIWAN

SPECIAL WALL MOUNT DESIGN!

EASY MOUNTING WALL BRACKET & LOCKING THUMB SCREW SECURES DUST COLLECTOR IN PLACE!

G0710
~~$174.95~~
SALE
$165.00

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Swappable game boards and ample game-piece storage help you build a monopoly of fun times!

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No Xs, but you'll hear an appreciative "Oh!" whenever you break out this timeless game.

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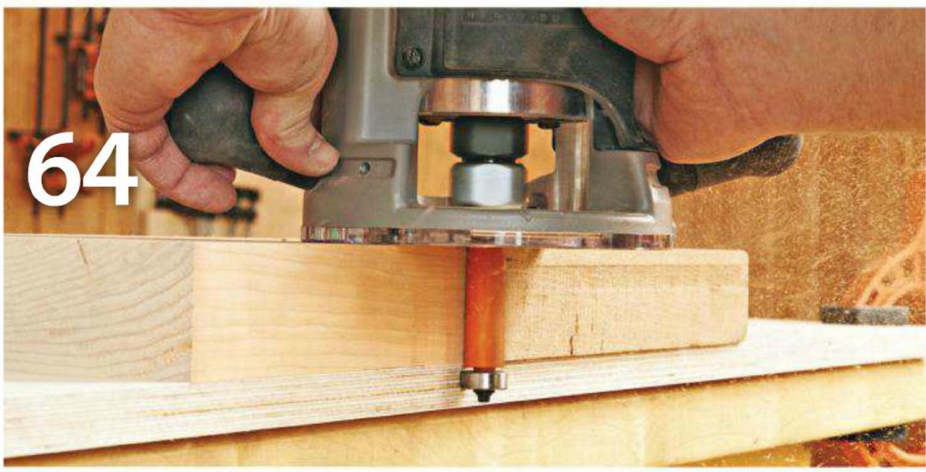

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Dual-drilling jig for shelves, easy-to-add tail vise, and more.

BASIC-BUILT™
GREAT PROJECTS MADE SIMPLE.

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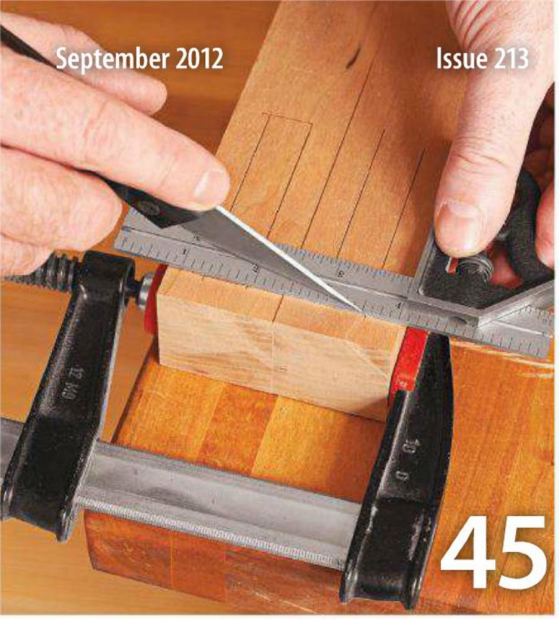

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This seal is your assurance that we build every project, verify every fact, and test every reviewed tool in our workshop to guarantee your success and complete satisfaction.

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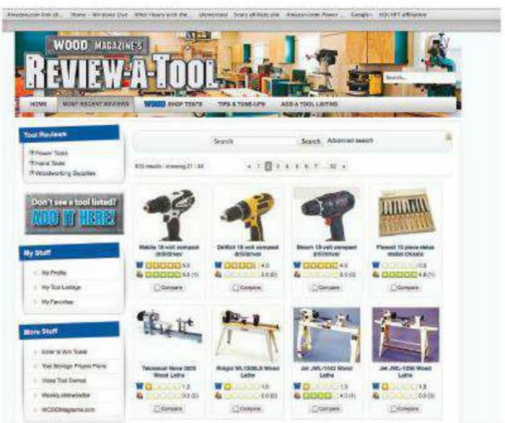
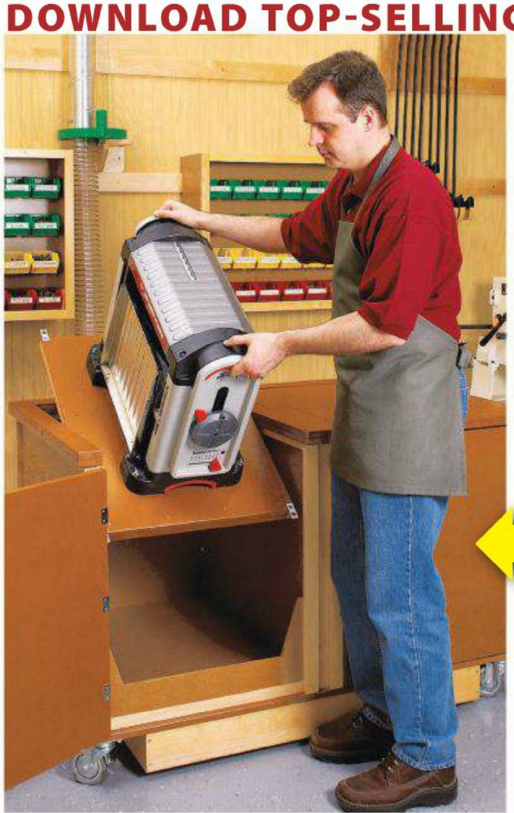
BUYING A TOOL? CHECK THESE REVIEWS FIRST

Before you plunk down your money on a new tool or machine, read other woodworkers' opinions of it at **woodmagazine.com/toolreviews**. Once you decide which to buy, compare prices at several retailers with a click!



DOWNLOAD TOP-SELLING SHOP PLANS



If you like the Tablesaw/Router Table on *page 28*, you'll love these shop project plans:

Combo Tablesaw/Routing Center
woodmagazine.com/workcenter
Bench-tool Storage and Workstation
woodmagazine.com/benchtoolsystem
Tall Rollaround Tool Cabinet
woodmagazine.com/mobiletoolcab
Old-school Traditional Workbench
woodmagazine.com/tradbench
Build-It-Yourself Cyclone Dust Collector
woodmagazine.com/cyclone
Shop-in-a-box Wall-hung Tool Cabinet
woodmagazine.com/shopinbox
Air-compressor Catchall/Caddy
woodmagazine.com/compairstat
Reliably Rugged Assembly Table
woodmagazine.com/assemblytable
Flip-top Work Center
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Tumble the planer forward on this Flip-top Work Center to hide the tool and regain precious counter space in your shop.

Downloading plans requires a small fee.

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SHOP FOX® machines are backed by a 2 Year Warranty!

10" TABLE SAWS with Riving Knife

- 3 HP, 220V, single-phase motor
- Cast iron table size: 27" x 40¼"
- Max. rip capacity: (W1819) 29½", (W1820) 50"

Free 10" Carbide-Tipped Blade

W1819 10" Table Saw
W1820 10" Table Saw w/ Long Ext. Table

SLIDING TABLE and ROUTER TABLE ATTACHMENTS for W1819 & W1820

SAW NOT INCLUDED

W1821
SLIDING TABLE ATTACHMENT
- Industrial grade anodized aluminum table size: 47" x 9"
- Max. cross cut: 48"

W1822
ROUTER TABLE ATTACHMENT
- Precision-ground cast iron table size: 27" x 20"
- Universal router mount

3 HP LOW PROFILE CYCLONE DUST COLLECTOR

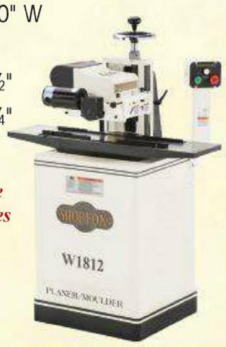
- Motor: 3 HP, 220V, single-phase, TEFC class "F", 3450 RPM
- Air suction capacity: 1489 CFM
- Filter: 0.2–2 microns
- 55 gal. steel collection drum with casters

Only 80" Tall!

W1816
Cyclone Dust Collector

VARIABLE SPEED PLANER/MOULDER with Stand

- Motor: 2 HP, 220V, single-phase
- Precision ground cast iron table with wings: 36¼" L x 10" W
- Max. cutting width: 7"
- Max. planing height: 7½"
- Max. moulding depth: ¾"



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

W1812
Planer/Moulder

10" HYBRID TABLE SAW with Extension Table

New

Free 10" Carbide-Tipped Blade

- 2 HP, 110V/220V, single-phase motor
- Precision ground cast iron table measures 27" x 55" with phenolic extension
- Rip capacity 30" right, 12" left

W1824 10" Table Saw w/Extension Table

8" JOINTER with Parallelogram Adjustable Beds

- 3 HP, 220V, single-phase, TEFC motor
- Precision ground cast iron parallelogram design table measures 8" x 76⅝"
- Cutterheads: (W1741) 4 HSS knives (W1741S) spiral

Built-in Mobile Base

W1741 8" Jointer
W1741S with Spiral Cutterhead

OUTSTANDING SHOP FOX® ACCESSORIES

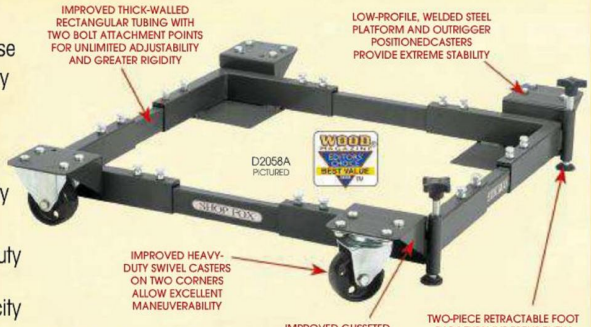
ADJUSTABLE MOBILE BASES

STRONGER FRAME WITH IMPROVED WHEELS AND GUSSETED SUPPORTS!

D2260A
Mini Mobile Base
600 lb. capacity

D2057A
Heavy-Duty Mobile Base
700 lb. capacity

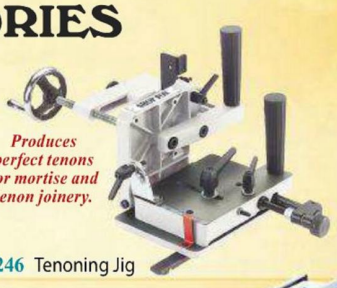
D2058A
Super Heavy-Duty Mobile Base
1300 lb. capacity



D2259A Extension Kit (fits all models)
D2246A 36" Extension Bars (fits all models)

TENONING JIG

- Heavy cast iron construction
- Precision adjustment points
- Adjusts for angled tenon cutting set-ups
- Standard ⅜" x ¾" miter bar fits all miter gauge slots including T-slots



Produces perfect tenons for mortise and tenon joinery.

D3246 Tenoning Jig

Aluma-Classic® FENCE

Extruded Aluminum & Steel Contruction
Precision Right Angle Design

W1716 Aluma-Classic® Fence w/ standard 57" rails
W1720 Aluma-Classic® Fence w/ long 79" rails & legs (50" cutting capacity)
W1721 79" rails & legs (fence not included)
W1722 Set of 3 powder coated sheet metal wings

Self-adhesive measuring tape & adjustable magnified cursor for quick positioning.

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WOOD®

September 2012 | Vol. 29, No. 4 | Issue No. 213

What is a woodworking skill you'd like to learn?

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Sounding Board

Our bulletin board for letters, comments, and timely updates

Little nib stirs big response

The Ask *WOOD*® question from issue 209 (Dec/Jan 2011/2012) about the mysterious "nib" found on antique handsaws, like the one shown *below*, sparked a wave of responses from readers who insist they know what it was *really* designed for. Here are few:

The nib allowed the saw blade blank to be rigidly held in a special jig at the factory during the cutting of the teeth.

—Thomas Wood, Stillwater, Minn.

My dad was a homebuilder and cabinetmaker. As a young boy, I watched him sharpen the nib, and then use it to cut through a 16d nail.

—Marshall Hill, Danbury, Wis.

If the saw failed any quality control tests, the nib could be broken off at the factory and sold as a "second" for a discount.

—Joseph Roth Jr., Holmes, Pa.

A blade sheath hooks over the nib with a leather thong and around the back of the handle.

—Ted Perotka, Alton, Ill.

My 1902 Sears and Roebuck catalogue shows the nib being used for installing a saw gauge on the blade.

—George Wells, Dove Creek, Colo.

This Disston and Sons handsaw was one of the last to be manufactured with the mysterious nib in question—more than 90 years ago. Why exactly it was included in the saw's design, we may never know.

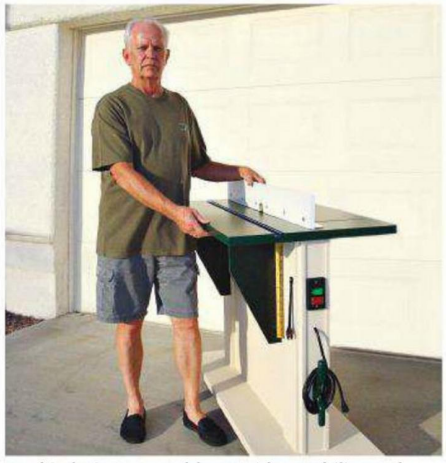
We flat-out love this adaptation

Every fold-flat project *WOOD* comes up with saves me crucial shop space, so I incorporated a few fold-flat design features when I built this router table (*right*). Constructed from phenolic-faced plywood (which has a low-friction finish great for use on tabletops), the top hinges a full 90° and allows my router table to squeeze neatly in between other stationary tools in the shop. Thanks for the inspiration!

—Fred Bohn, Scottsdale, Ariz.

To see all the projects in the Fold-Flat series, visit woodmagazine.com/foldflat.

—WOOD *Editors*



Fred Bohn's router table provides mobility and space efficiency: With a set of four locking casters, he can move it out of the way when not in use.

Article Updates

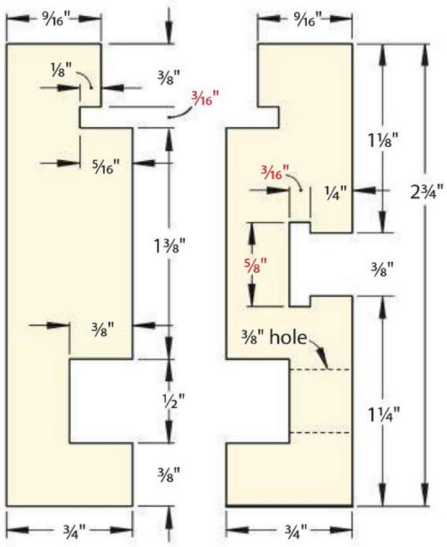
▶ Issue 208 (November 2011)

In the Media Center project on page 30, the door rails (Z) should measure 15⅞"-long.

▶ Issue 209 (Dec/Jan 2011/2012)

In the Miter-gauge Extension project, the drawing "Body/Extendable Stop" on page 30 should have its dimensions changed to those in red, *below*.

BODY/EXTENDABLE STOP



▶ Issue 212 (July 2012)

When installing the Easy Swingin' Arbor project on page 28, be sure the point where the two chains come together is as high as those shown in the photo. Connecting them at a lower point can cause dangerous instability. To further reduce tipping hazards (especially if young children may stand on the swing), move the rear chain connection point to the back upright (I), just above the arm (M).

In the table of contents, the correct price for a subscription to *WOOD* on Nook Color is $2.99.

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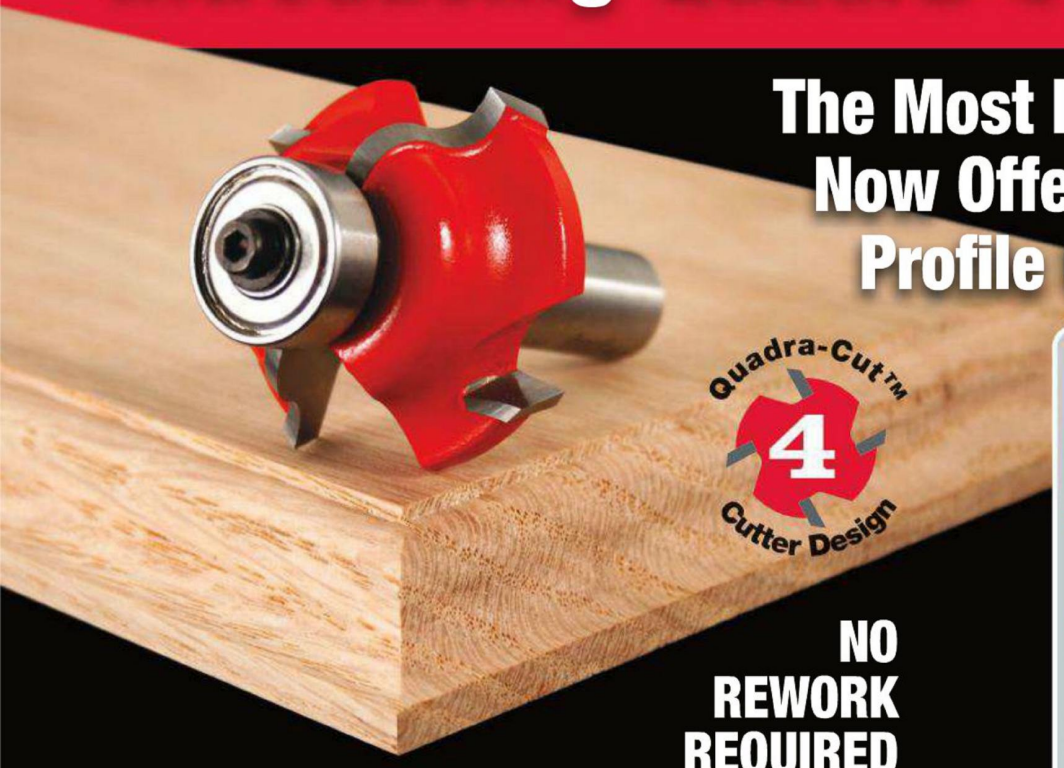
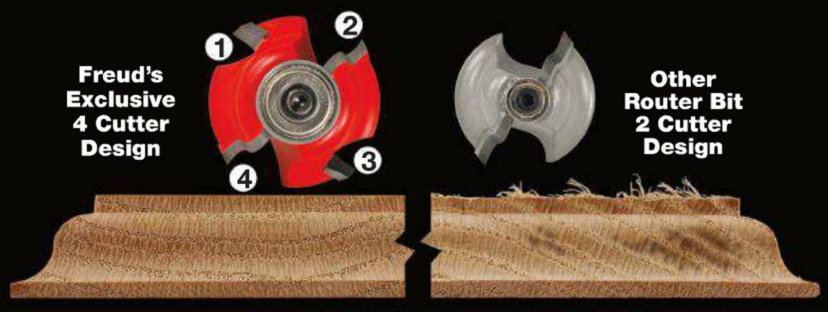
Introducing Quadra-Cut™ Sets



The Most Innovative Bits Now Offered In Popular Profile Combinations!

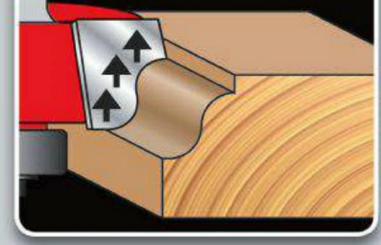
Quadra-Cut™ 4 Cutter Design

NO REWORK REQUIRED

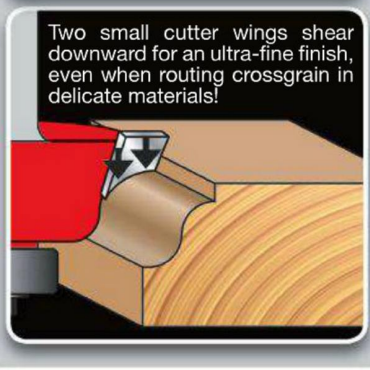


How It Works!

Two large cutter wings shear upward to remove most of the stock for fast, extremely smooth cuts.



Two small cutter wings shear downward for an ultra-fine finish, even when routing crossgrain in delicate materials!



U.S. Patent No. 8,899,252

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4 Piece Set

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- 3/8" Rounding Over Bit, *#34-124*
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- 5/32" Roman Ogee Bit, *#38-104*
- Classical Cove & Bead Bit, *#38-362*

3 Piece Set

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- 5/32" Roman Ogee Bit, *#38-104*
- Classical Cove & Bead Bit, *#38-362*
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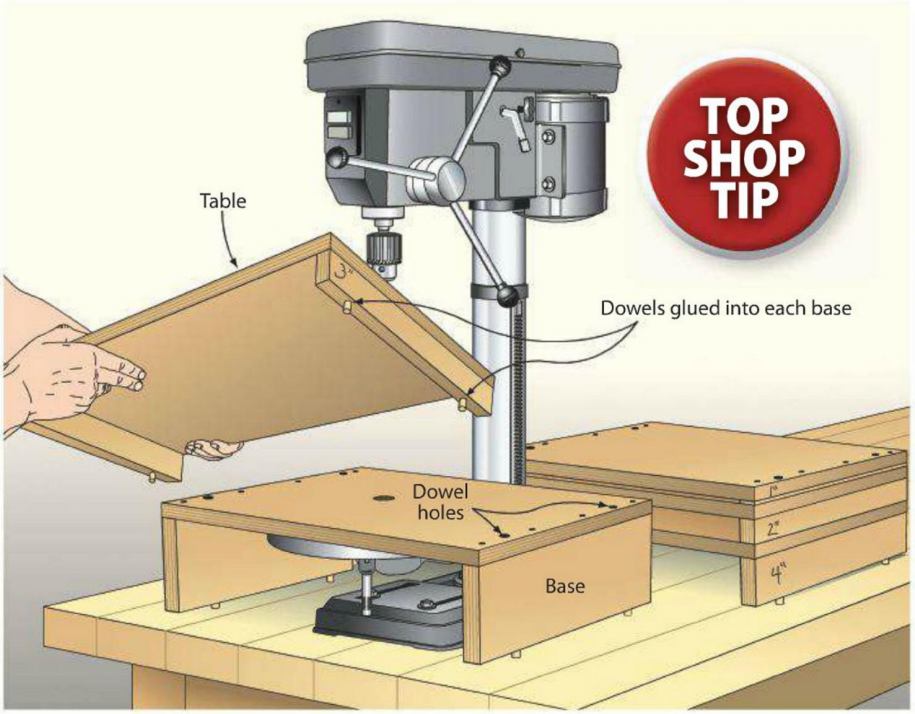
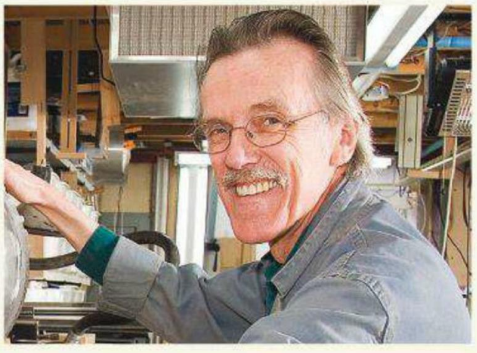
Stackable tables step up for simpler drilling

Few jobs in the shop result in tired arms and banged knuckles like making large changes to the height of a drill-press table. Rather than wasting time with the table lock and crank, I built these stacking tables to lift the workpiece closer to the bit.

Build each table to a different height—1, 2, 3, and 4"—to get a broad range of adjustment when combining them. To hold the stack together, drill mating dowel holes in each table; then insert and glue dowels.

—Serge Duclos, Delson, Que.





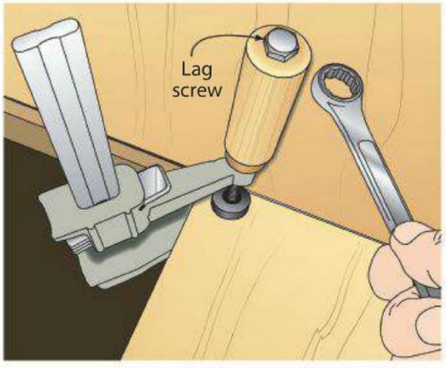
Ximena Griscti Photography

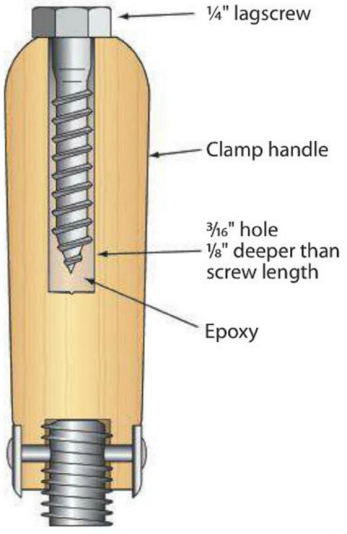
For sending this issue's Top Shop Tip, Serge receives a DeWalt 20V Max Premium Brushless Impact Driver with two Lithium ion 3.0Ah batteries and fast charger worth about $350.

Get a grip on clamp handles in tight quarters

Sometimes, you need to put a clamp where it gets a good grip on the workpiece, but where you can't get a good grip on the clamp handle. Try this simple solution: Drill the clamp handle, pour in a dab of epoxy, and install a ¼" hex head lag screw. After the epoxy cures, tighten the clamp using a wrench. This modification works great for anyone who struggles with limited hand strength, too.

—John Cusimano, Lansdale, Pa.





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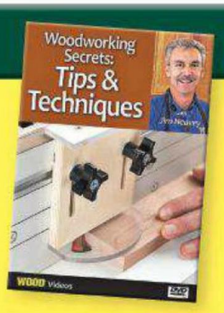
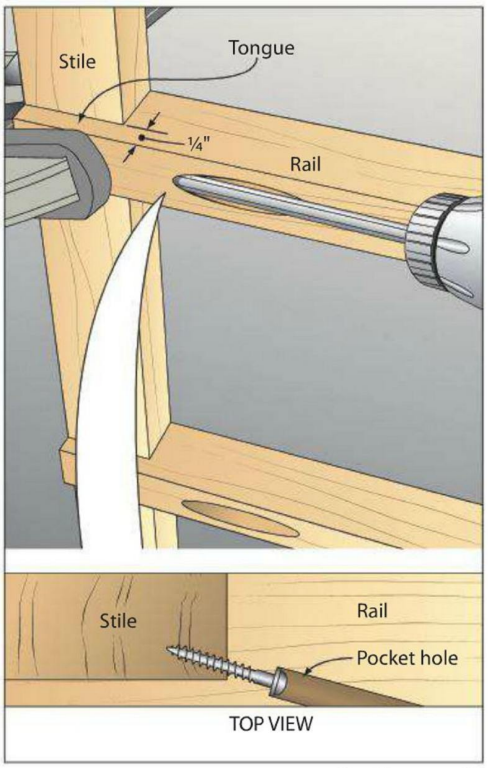


Tongue and screw for no-roll rails

Some of the cabinets I build use narrow rails between drawers. I used to reinforce the joints with dowels, but found over the years that they sometimes worked loose and even rotated slightly. So I developed a hybrid joint to fix the problem. First, I make the rails ¼" deeper than the stiles, with a tongue to overlap the back of the stile. Then, a dab of glue and a pocket screw hold the rail and stile together for a twist-free fit.

—Doug Spencer, West Jordan, Utah



continued on page 10

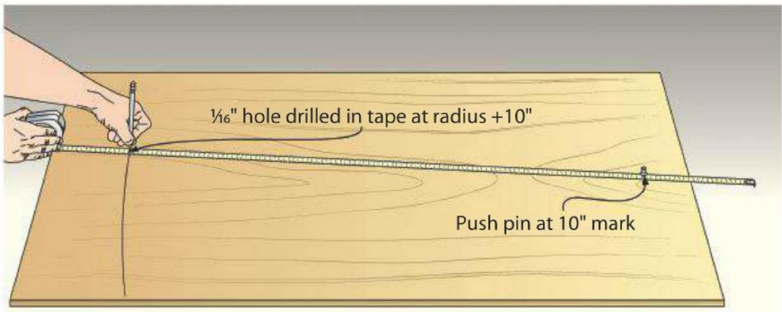
Shop Tips

Tape measure trammel helps you mark big arcs

When you need to scribe a large, precise arc or circle on a workpiece, just reach for a tape measure. First, drill a 1/16" hole centered on the tape's 10" mark: This keeps the tape's metal hook out of the way, and 10 is an easy number to work with. (Don't worry about damaging the tape measure—a few tiny holes won't break it.)

Then, determine the radius of your circle. Remember to add 10" to it to account for the position of the first hole; then drill another centered 1/16" hole in the tape measure at that location. Use a push pin to anchor the 10" point at the center of the circle, place a pencil in the other hole, and scribe the arc.

—Bill Wells, Olympia, Wash.

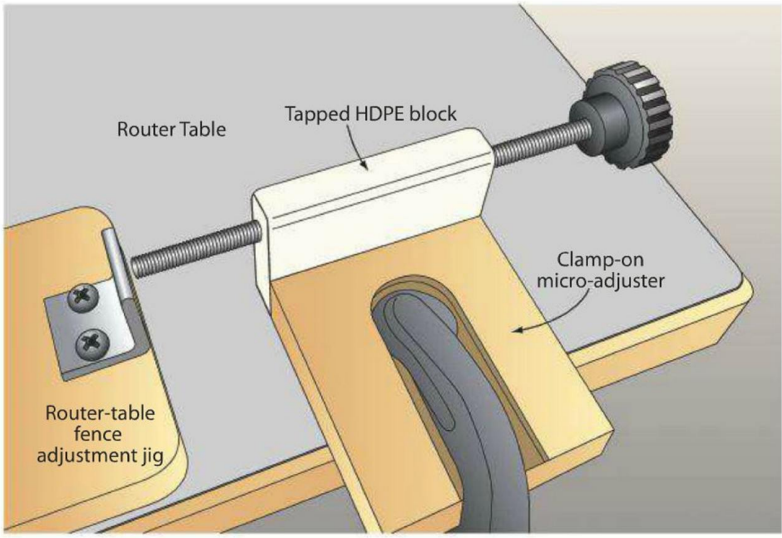


Bad vibes can't shake this adjuster loose

Machine vibrations sometimes cause threaded adjusters to wiggle out of alignment. For jigs that require threaded adjusters (like the router-table fence adjustment jig shown *below*), try high-density polyethylene (HDPE) instead—available in sheets and blocks from plastics manufacturers.

The trick to getting an HDPE block to hold tight against movement caused by machine vibration: When tapping the threads for the adjuster, stop just short of completing the threads through the block; instead, let the screw itself cut the last few threads.

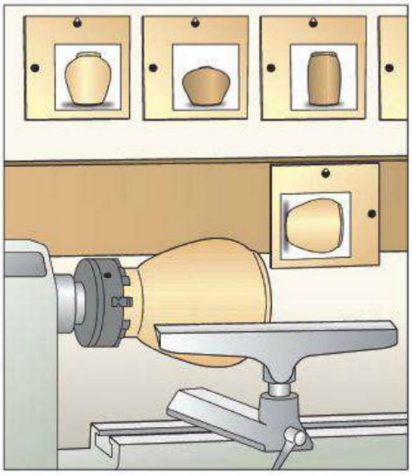
—Doug Spencer, West Jordan, Utah



Scaled-down photos make handy turning reference

When turning, I typically only use a single photo or drawing as a guide. But dragging a book into a dusty shop and trying to keep it open and supported near the lathe just doesn't work. Instead, try this trick: Use a photocopier to shrink or enlarge images of your favorite vessel shapes to roughly 5×6". Then, cut 5×7" pieces of ⅛" plywood, drill holes on adjacent edges (where shown), and use spray adhesive to adhere the images to the plywood. Hang the images vertically. After selecting a shape, hang the image horizontally behind the lathe to view it in the on-lathe orientation.

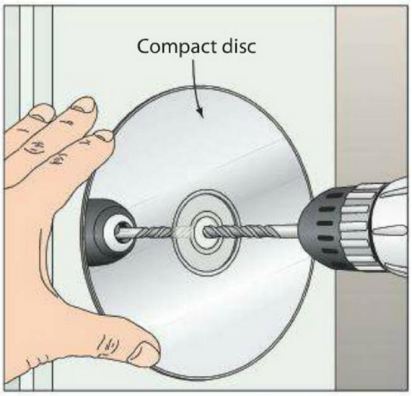
—Marlen Kemmet, WOOD® Managing Editor



Fine 'tune' drill bit angle using a CD

To drill perpendicular holes with a handheld drill, here's an inexpensive solution. Grab a compact disc (scratched ones that won't play work just fine for this) and center it on the hole mark. As you drill the hole, watch the reflection in the CD—keep the bit in a straight line with its reflection for a perpendicular hole every time.

—Robert Heil, Wheeling, W.Va.



continued on page 12

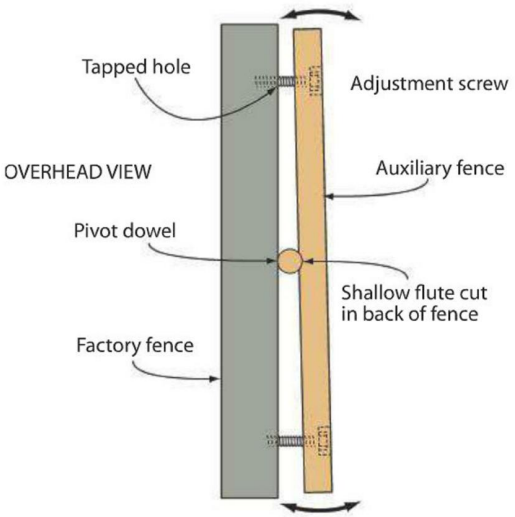
Shop Tips

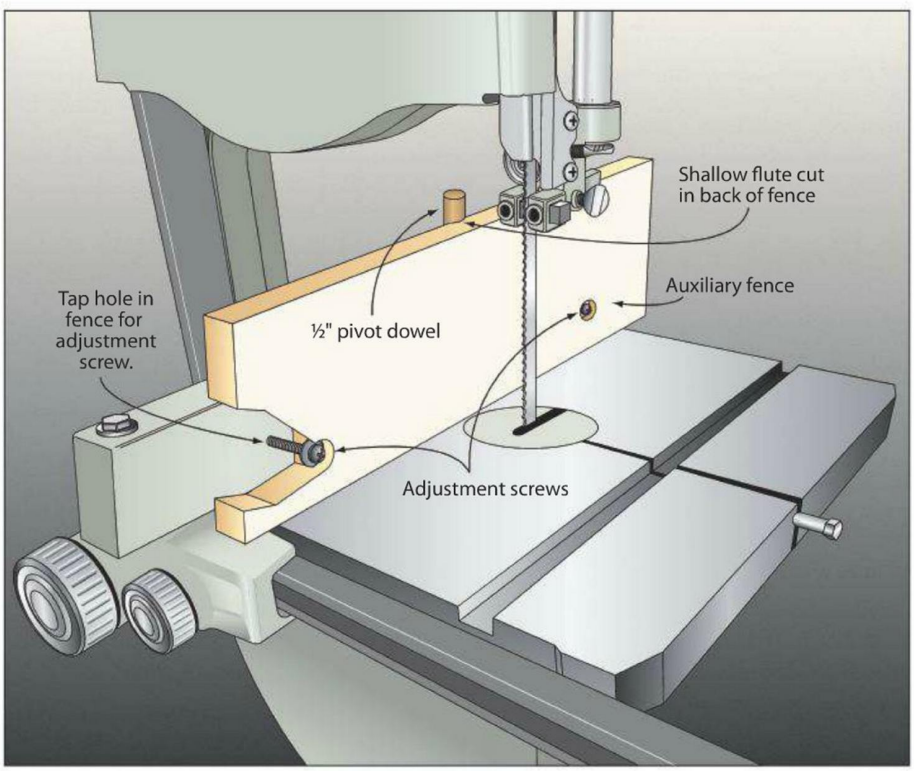
Adjustable fence corrects for blade drift

After buying a new bandsaw, my old one got relegated to resaw duty. With its new designation in mind, I set about making a permanent, adjustable auxiliary fence to account for blade drift—a problem that can occur even with a sharp, wide blade installed.

To make such a fence, cut it to size from a piece of ¾" melamine (a workpiece slides easily along its slick surface) and rout a shallow flute to fit a ½" dowel with a round nose bit (½" round nose bit, #39264, $19.99, 800-279-4441, rockler.com), where shown. With the fluted side against the factory fence, drill and tap two holes in the factory fence for machine screws, and then drill two corresponding holes in the auxiliary fence—countersinking the heads of the screws in those holes. Place a ½" dowel between the auxiliary fence and factory fence to serve as a pivot point. To adjust the fence, loosen one screw and tighten the other.

—Joseph Tripodi, Glendale, Ariz.



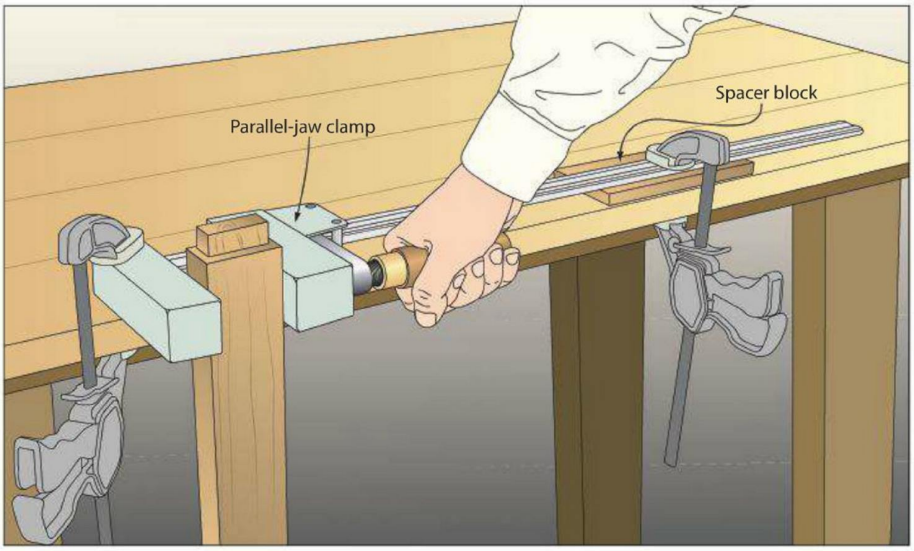


Turn a clamp into a temporary, large-capacity vise

Sometimes, it would be handy to have a second vise, especially one that can hold a wide workpiece steady. The solution is as close as your clamp rack.

Clamp a parallel-jaw clamp to your bench, as shown, using a spacer block beneath the clamp bar to hold it level on the workbench. Then, clamp the workpiece between the jaws. With this setup, you can hold in place a workpiece as wide as the clamp's capacity.

—Joe Tripodi, Glendale, Ariz.

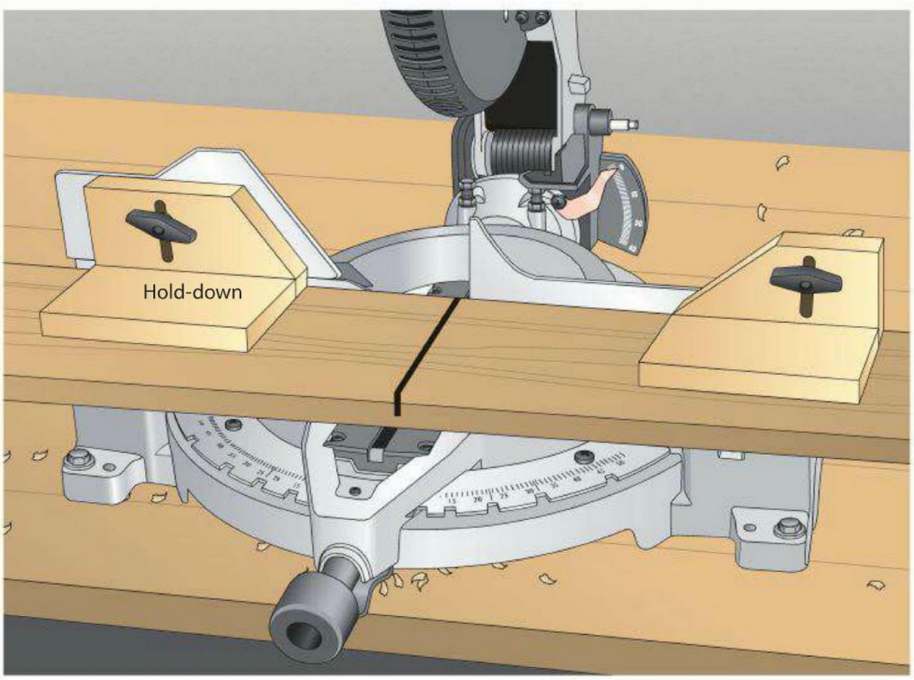


Onboard outfeed support for the mitersaw

My mitersaw doesn't have much outfeed support which makes cutting long boards difficult. So, I made these L-shaped hold-downs from scraps of ¾"-thick hardwood and bolted them to the fence using T-knobs and ¼" × 20 bolts. (My fence had mounting holes, but you may have to drill your own.)

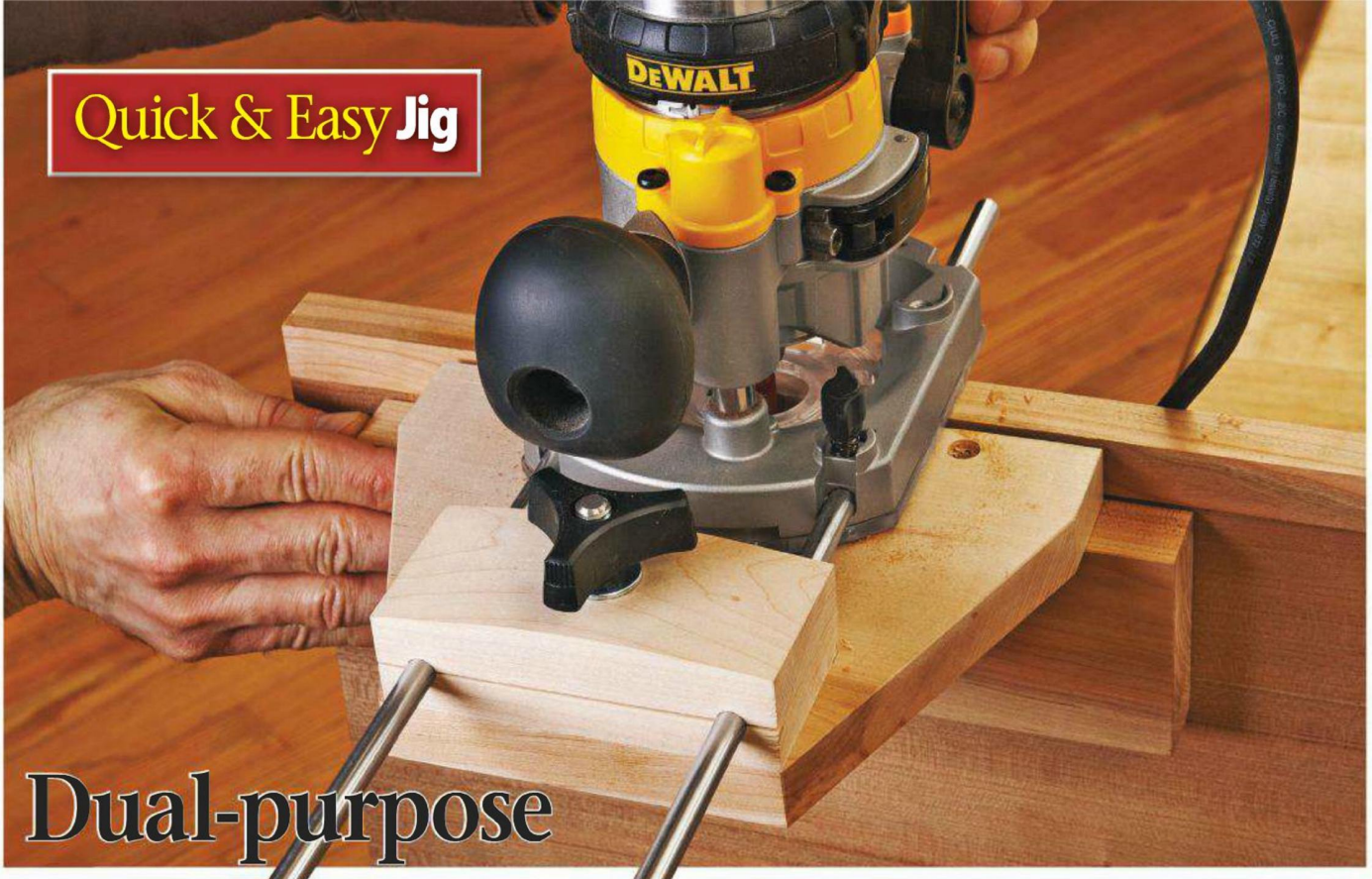
The slots let the hold-downs raise and lower to accomodate different thicknesses of stock, and I miter cut the ends to allow clearance for the motor and for bevel cuts. Finally, I bolted the mitersaw to the workbench so it won't tip over when a long board is clamped to it.

—Raymond Whitridge, Pierceton, Ind.

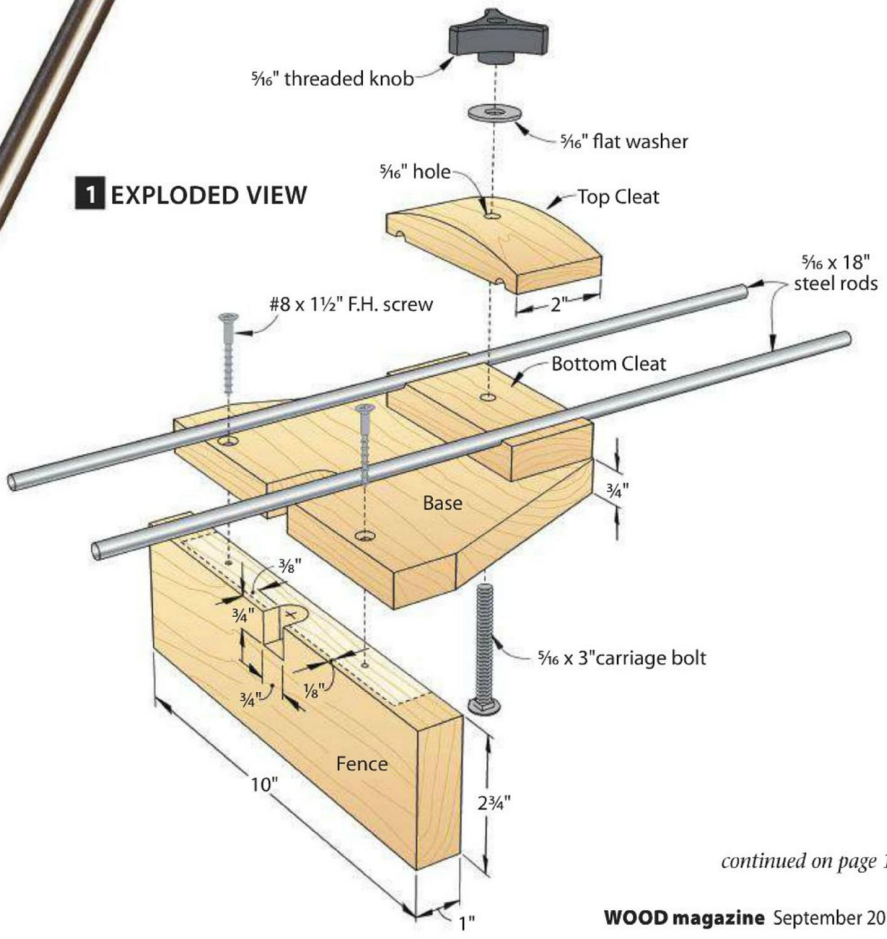


Quick & Easy Jig

Dual-purpose Router Edge Guide



1 EXPLODED VIEW



An edge guide helps you accurately rout dadoes, grooves, and rabbets. With the addition of a fence, this versatile jig also assists you in cleanly trimming edging flush to the face of a panel, *above*.

Start by measuring the distance between the edge-guide mounting holes in your router base. Cut a 1½×2" blank 1½" longer than that dimension for the top and bottom cleats [**Drawings 1, 2**]. Drill two 5/16" holes centered on the edge of the blank to match the hole spacing [**Drawing 2**]. Also drill the 5/16" hole centered on the top face. Resaw the blank in half to make the top and bottom cleats. Sand an arc on the top cleat to provide some knuckle room when tightening the knob.

continued on page 16

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Quick & Easy Jig

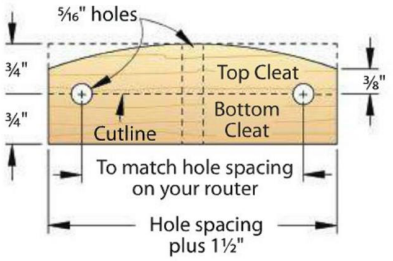
Next, bandsaw the base to shape [**Drawing 3**] and glue the bottom cleat to it [**Drawing 1**]. Drill a 5/16" hole through the base, using the hole in the bottom cleat as a guide.

Cut the fence to size [**Drawing 1**], then create the recess using a 3/4" Forstner bit in your drill press and a chisel. To allow room for edging that overhangs the face of a panel, position the fence 1/8" proud of the edge of the base, then screw the fence in place. Slide a 5/16 × 3" carriage bolt through the base and top cleat and use a threaded knob to secure the steel rods between the cleats.

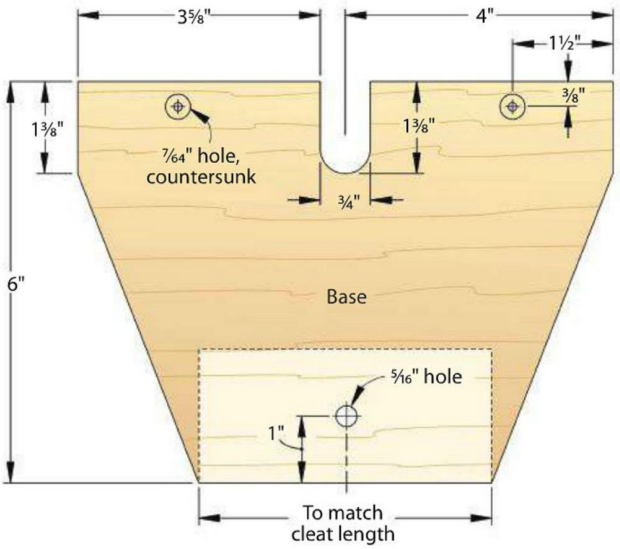
To cut dadoes, grooves, or rabbets with the guide, install a straight bit in your router and attach the jig without the fence to your router's base. Slide the router along the steel rods to position the bit the desired distance from the edge of the panel.

To trim edging flush, attach the fence and chuck a bearing-piloted flush-trim bit in the router. Position the router to place the outer edge of the bit's bearing flush with the face of the fence.

2 CLEATS (Side view)



3 BASE



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Finishing School

Give Dye a Try

Do you ever find yourself standing in the stain aisle of the home center wishing for options beyond the one or two brands available? Then it's time to give dye a try. Adding dyes to your finishing tool kit—either on their own, or in tandem with pigments—multiplies your grain-popping options. This "other" stain applies just like those brush-on-wipe-off pigment-based stains, but affects wood grain in a fundamentally different way.

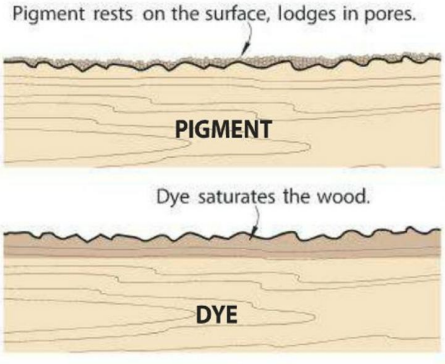
Dyes and pigments: What's the difference?

The premixed stains you find on the home center shelf are typically pigment-based stains (or pigment/dye mixtures). Pigments—essentially ground chunks of solid color—are mixed with a binder that bonds the colorant to the wood. They lodge in surface irregularities, such as sanding scratch marks and wood pores, as shown *bottom left*. Open-grain woods like red oak collect these pigments in their large pores, where it darkens the grain. And coarsely sanded wood accepts more pigment than finely sanded surfaces.

Dyes, on the other hand, dissolve completely in their solvents. Wherever the solvent soaks into the wood fibers, it takes the dye with it, changing the color of the wood cells themselves. This produces a noticeably different look than pigments, especially on dense, tight-grained woods, such as maple, that offer few places for pigment to settle. Figured grain, which can be obscured by pigments, also benefits from dye's grain-popping penetration.

For a rich, layered look, choose the best of both worlds. First, apply a dye that soaks deep into the wood fiber, emphasizing figure. Then top it with a pigment stain that settles into the surface pores emphasizing the grain. See the recipes on *page 20* for examples.

COLORING WOOD: PIGMENT VS. DYE



Choose dye stains for:

- Emphasizing highly figured wood grains, such as bird's-eye maple and walnut burl.
- Dense woods, such as hard maple, where pigments can't find purchase.
- Evening out contrasting colors in wood, such as walnut sapwood or streaks in poplar.
- Nonwood tones for vibrantly colored project accents.
- Blotch-prone woods, such as pine. Mix alcohol-soluble dye with shellac and spray.

Choose pigment stains for:

- Emphasizing contrasts in coarsely textured grains.
- Pieces that will sit in direct sunlight. (Pigment adds protection against ultraviolet rays that dye doesn't.)

TWO TREATMENTS FOR OAK

Dye lessens the color variation by soaking into both types of grain equally, blending the cathedral grain for a warmer, more subdued look.

Pigment settles into red oak's large pores, starkly emphasizing the characteristic contrast between its early and late wood.

continued on page 20

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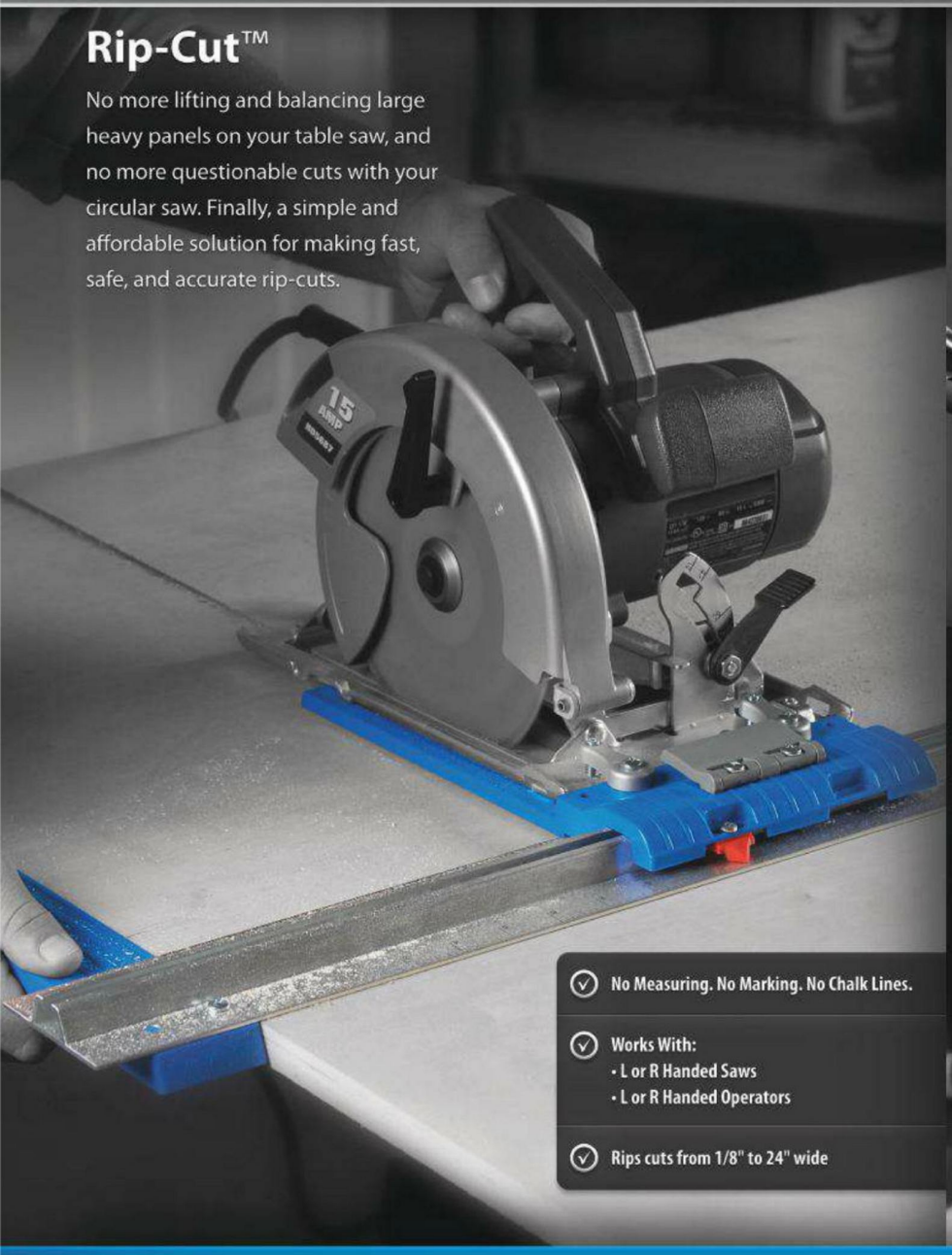

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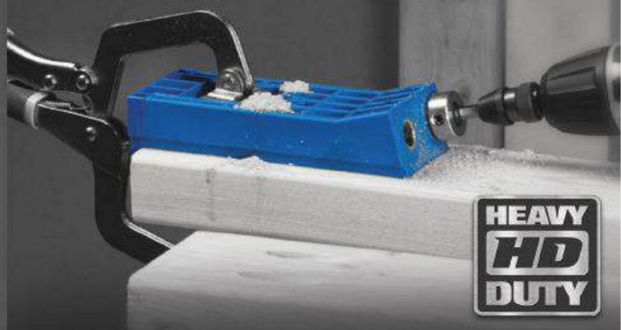

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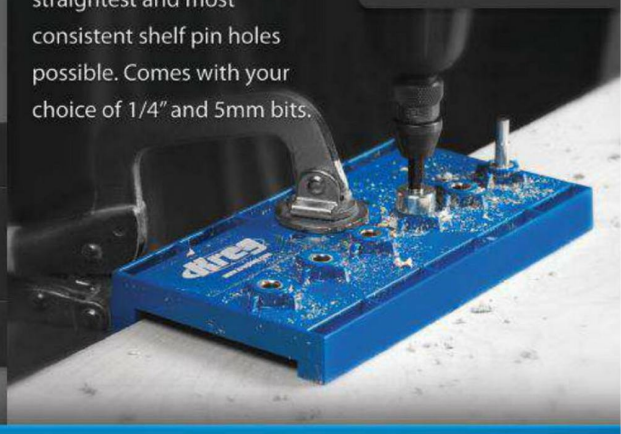

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continued from page 18

Mixing and applying dyes

Unlike pigmented stains, dyes come as concentrates (powders or liquids) that must be mixed with a solvent (usually water or alcohol) before application. Fortunately, mixing them is surprisingly easy.

If you're new to dyes, start with a water-soluble concentrate, such as Lockwood (866-293-8913, wdlockwood.com) or Transtint (216-631-5309, homesteadfinishingproducts.com). With a longer open time, water-soluble dyes offer a more forgiving application than alcohol-soluble dyes. Because they penetrate the farthest into grain, they are the most color-fast dye options. And they come in premeasured amounts to get the ratio perfect. Wear a dust mask to avoid breathing in any powder, and follow the directions, at *right*, to mix.

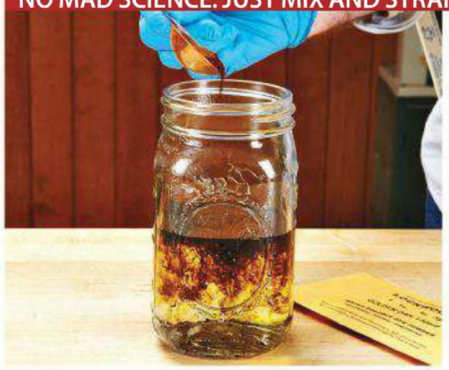
As with any finish, test the dye first on a scrap of wood from your project before applying, following these steps: First, sand to 220 grit. Next, to avoid raising the grain during dyeing with a water-soluble dye, pre-raise the grain by wiping it with a water-moistened sponge or cloth. Allow the wood to dry completely before sanding one last time with 320-grit paper.

Brush or wipe on dye with a foam brush or rag, using enough of the solution to keep a wet edge between your brush strokes. Then wipe away the excess with a cloth. If you prefer a darker look, simply allow the first coat to dry before adding another coat. Too dark? Lighten the coloring by wiping the dye with a rag dampened in the appropriate solvent. This works best while the dye is still wet, but because dye stains contain no binder, you can lighten the color slightly even after the dye has dried.

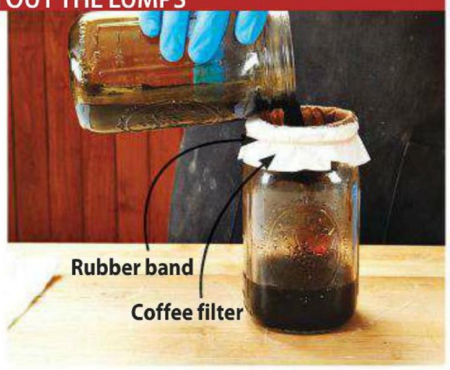
Dyeing tips from the *WOOD*® magazine shop:

- Liquid concentrates, like those from Transtint, eliminate straining, making them easier to mix. But they cost more. So start with a base of less-expensive powder dye and reserve the liquid concentrates for fine-tuning the color using easy and precise drops.
- A quart of dye (the amount commonly mixed from a packet of powder) goes a long way and keeps indefinitely when sealed in a canning jar. Simply shake the jar before use.
- Label the jar with the dye's brand, color, number, and ratio of dye to solvent used so you can re-create it precisely should you need to.
- If you're nervous about over-darkening your wood, simply dilute a small amount of your dye mixture with its solvent, writing down the ratios. It's always easier to add more dye to the wood than it is to evenly remove it.
- Many dyes tend to fade when exposed to ultraviolet light. If you plan to display your piece where it will encounter direct sunlight, choose a pigment or a combination pigment/dye stain instead.

NO MAD SCIENCE: JUST MIX AND STRAIN OUT THE LUMPS



Measure and heat distilled water according to the dye's directions before adding the dye and stirring thoroughly.

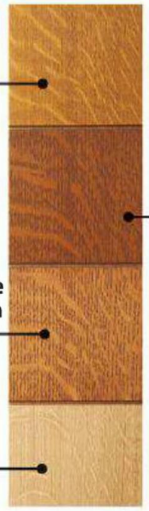


Strain the dye through a rubber-band-secured coffee filter into a container to remove any undiluted lumps of dye.

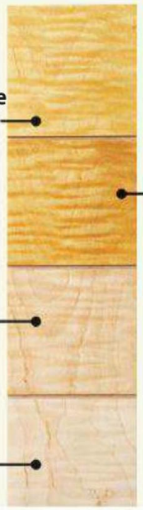
Three recipes to dye for

Greene & Greene look on new mahogany

Mission finish that pops on white oak



Figured maple that shows depth



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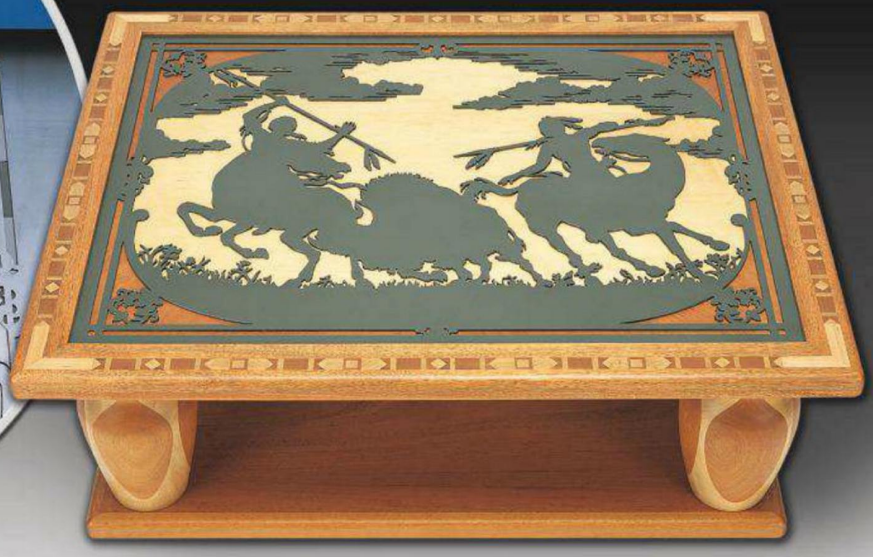

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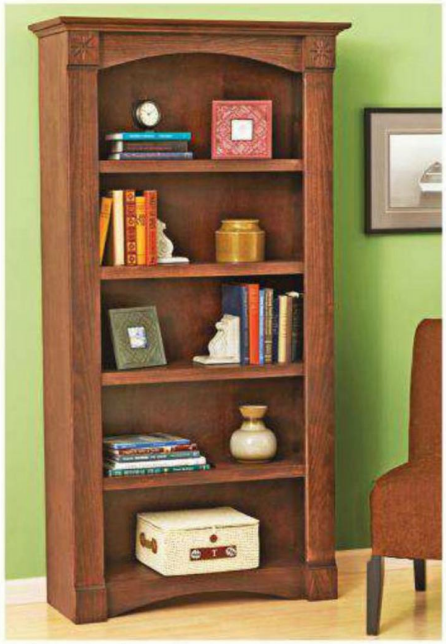
Save some $cratch using Secondary Woods

Poplar, soft maple, pine, and plywood: These oft-maligned also-rans of commercially available wood products bring stability, strength, and—most importantly—savings to your furniture projects. Use these tips to squeeze even more out of secondary woods.

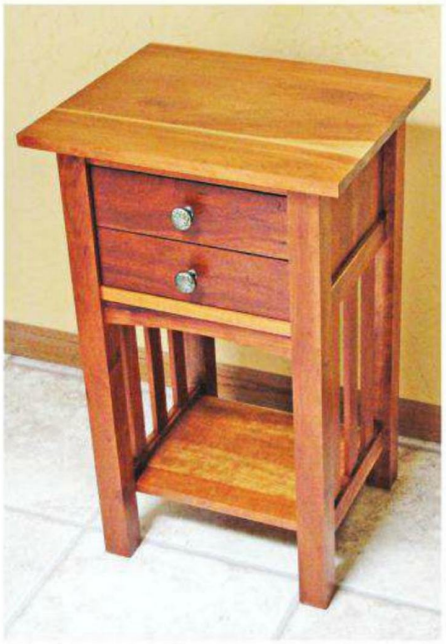
Hide it

Master furnituremakers of centuries-past hid common, unremarkable woods behind a showy and expensive primary wood. You can, too, by keeping a supply of poplar or soft maple on hand to cut by half the cost of hidden project parts—dust dividers, bracing, nailing cleats, and drawer sides and backs, *top*.

Save even more by shopping in your scrap bin first. Those early furnituremakers notoriously mixed and matched whatever was nearest at hand for their secondary woods. You might be surprised by the amount of secondary wood you can cull from your scrap—or even the sawn-off sapwood from your primary wood.



A dark gel stain combats poplar's tendency toward blotchiness and lends this inexpensive bookcase a classic walnut look.



By judiciously including cherry sapwood, craftsman Jim Heavey transformed the plain lines of a mission end table into a work of art.

Color it

Do you really want to hide high-dollar hard maple under a dark stain when inexpensive poplar will do (*near right photo*)? Other inexpensive woods mimic pricier species, as well. For example, alder makes a low-dough cherry substitute with only minor color tweaks. And well-chosen soft maple is a dead-ringer for hard maple, especially for bookcase backs, shelves, or case dividers that will be partially covered or obscured. Even that infamously contrasting walnut and cherry sapwood can be tamed with dyes. (See *page 18* to learn more about dyes.)

Celebrate it

Finally, many species considered "secondary woods" due to their low price have their own unique beauty. Soft maple more commonly displays eye-popping figure, such as curl and birdseye, than hard, but isn't always sorted for figure. So, you can find some steals with careful rummaging. Sapwood streaks that might otherwise be sent to the scrap pile can be used to deliberately display striking patterns, *above*, separating your project from a world of factory-made furniture.

More Resources

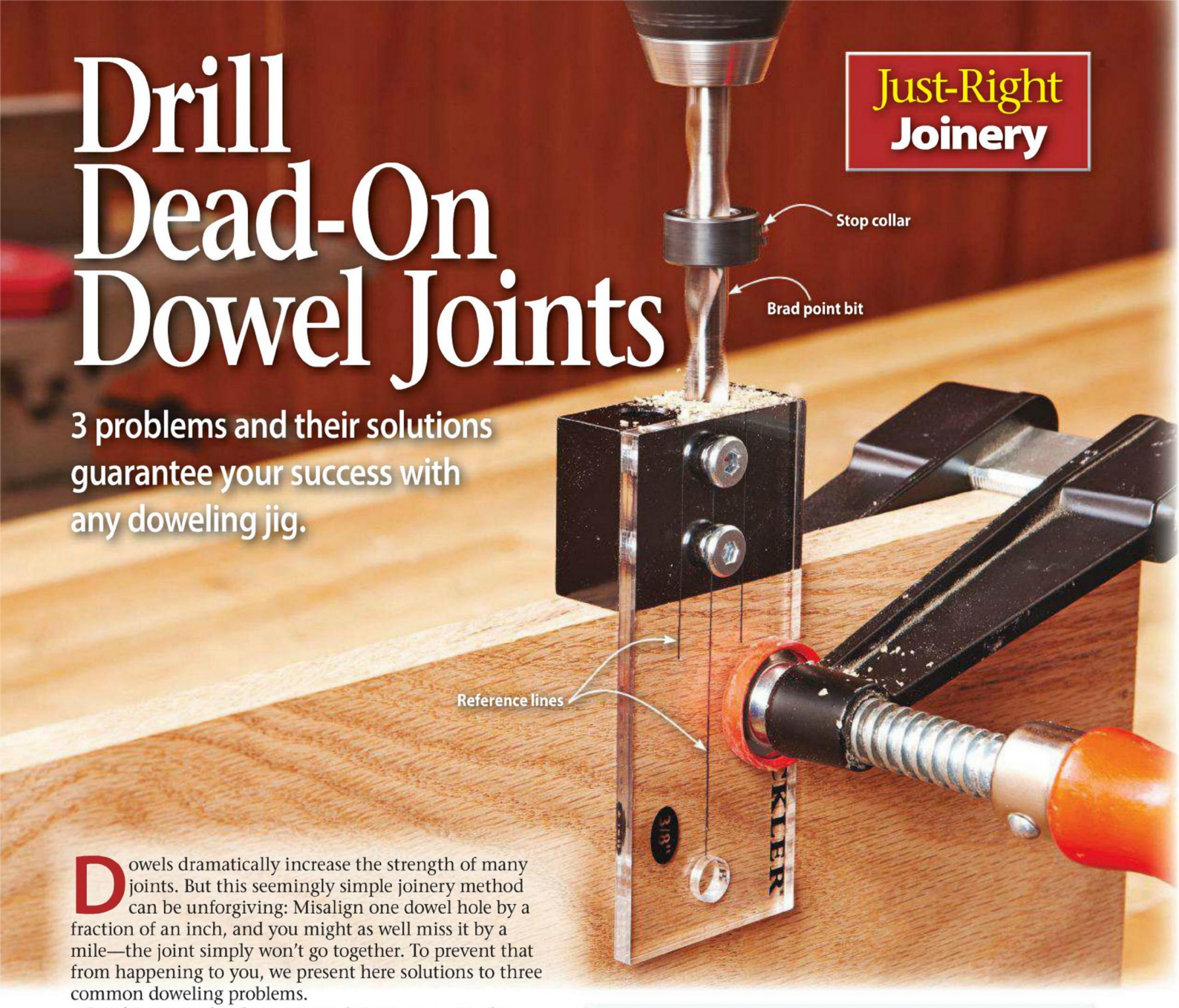
- Find the classic bookcase plan, *above left*, at woodmagazine.com/classicbookcase. $
- Find the Shaker dresser plan, *top*, at woodmagazine.com/shakerdresser. $

$ Requires a small fee.

Drill Dead-On Dowel Joints

Just-Right Joinery

3 problems and their solutions guarantee your success with any doweling jig.



Dowels dramatically increase the strength of many joints. But this seemingly simple joinery method can be unforgiving: Misalign one dowel hole by a fraction of an inch, and you might as well miss it by a mile—the joint simply won't go together. To prevent that from happening to you, we present here solutions to three common doweling problems.

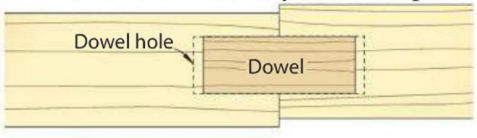
But first, consider these essential tips to improve the accuracy of your dowel joints.

- Mark locations with a marking knife or sharp pencil. A fat pencil tip robs you of precision.
- Use sharp brad point bits instead of twist bits (because you typically drill dowel holes on end or edge grain, which encourages twist bits to wander).
- Mount a stop collar to your bit to get consistent hole depths. (Drill ⅛" deeper than one-half the dowel length.)

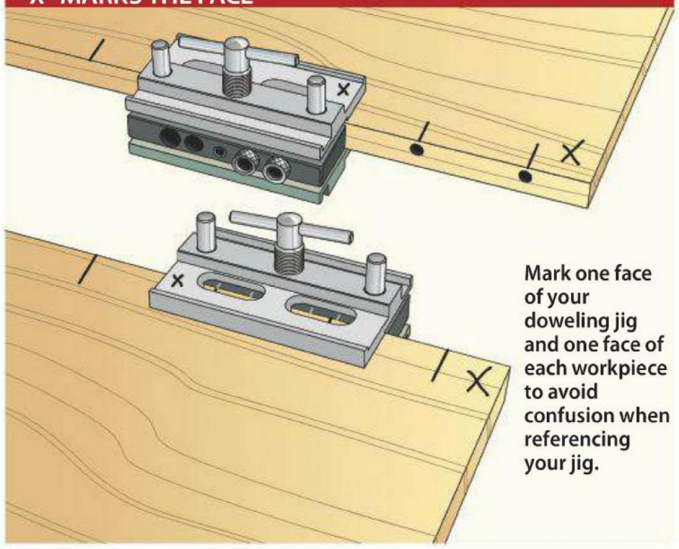
1 Problem: My edge-to-edge joint fits together, but the faces are not flush.

Solution: The jig's guide holes may not be centered between its faces. Always reference the jig against common faces of each mating piece (shown *right*). Do so, and though the holes may not center in the boards' thickness, they will line up.

VERTICAL MISALIGNMENT



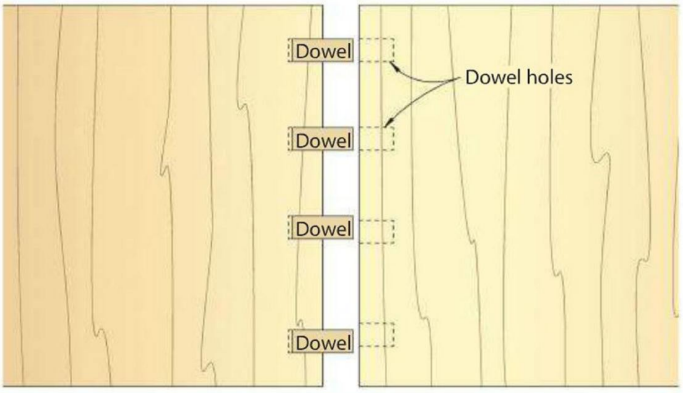
"X" MARKS THE FACE



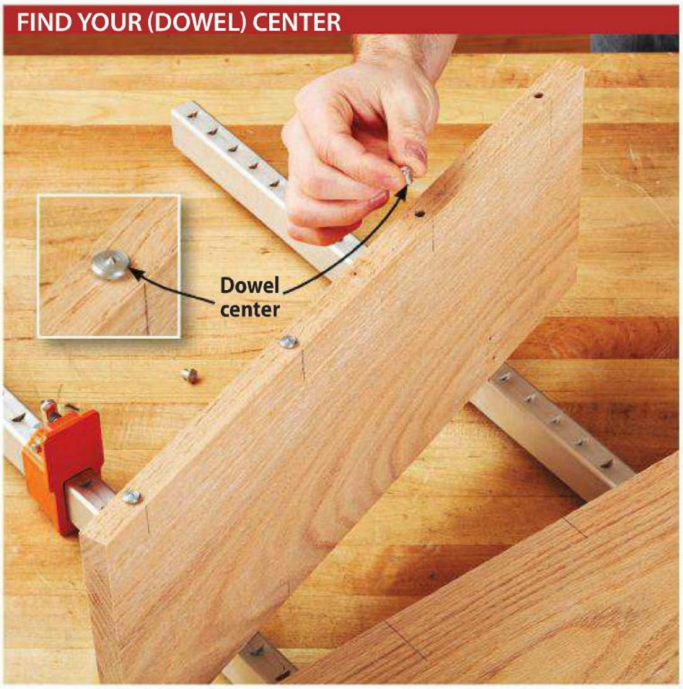
Mark one face of your doweling jig and one face of each workpiece to avoid confusion when referencing your jig.

2 Problem: After drilling the edge of one board, I'm having trouble duplicating the hole spacing on the mating piece.
Solution: To ensure mating dowel holes, skip measuring altogether and use dowel centers (⅜" dowel centers, #42366, $6.29 pkg., 800-279-4441, rockler.com). First, use your jig to drill all the dowel holes in one of the two mating pieces; then slip a dowel center in each hole (as shown *below*) and clamp the joint together. A dimple left by the dowel center shows you where to drill the mating dowel hole. Locate the doweling jig over the dimple and drill the hole (*below right*).

HORIZONTAL MISALIGNMENT

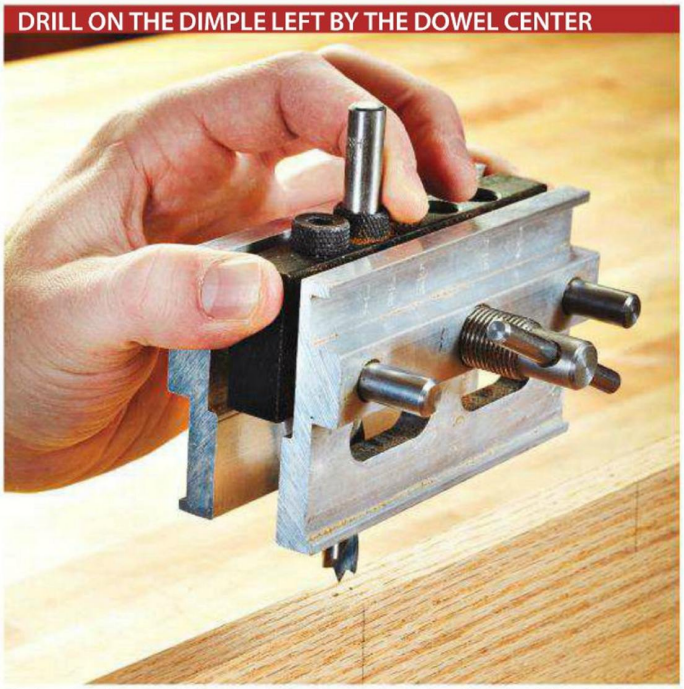


FIND YOUR (DOWEL) CENTER



For dead-on dimples, tighten the clamps only enough to pull the mating pieces together loosely, fine tune the alignment, and tighten.

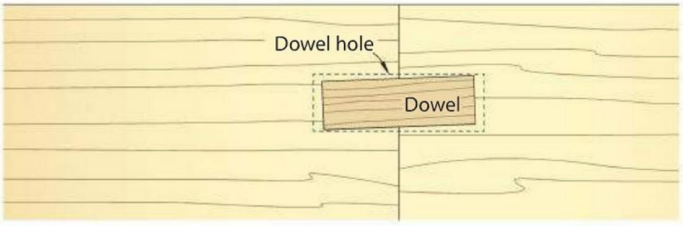
DRILL ON THE DIMPLE LEFT BY THE DOWEL CENTER



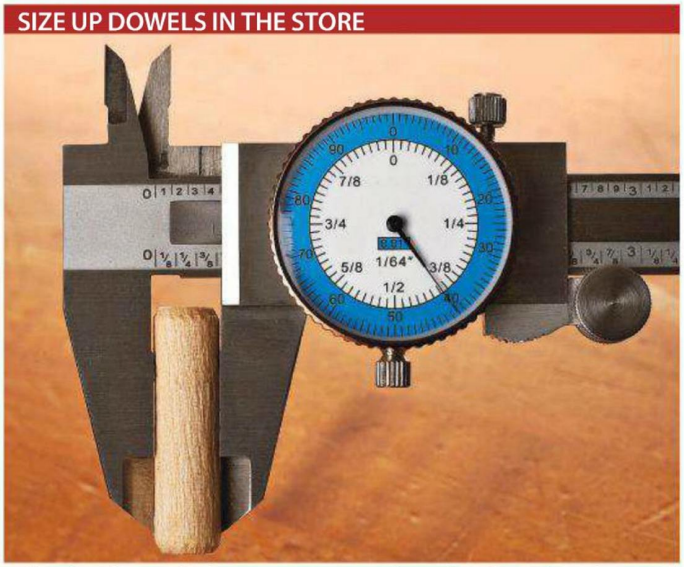
Slide a brad point bit through the jig and into the dimple. While holding the bit in place, tighten the jig to the workpiece; then drill.

3 Problem: I set the jig up correctly, but the dowels still fit sloppily in the drilled holes.
Solution: Check that the dowels have been made to precisely the right diameter (*right*). Mass-produced, commercially available dowels may be manufactured slightly over or undersized, and, like most wood, swell or shrink with humidity change. If the dowel size matches, it may be that your jig's guide holes have become worn and imprecise—leading to sloppy dowel holes. Replace any guide hole inserts, or, if the jig doesn't have them, discard the jig.

UNDERSIZED DOWEL MAKES FOR A SLOPPY FIT



SIZE UP DOWELS IN THE STORE



Before heading to the home center to purchase dowels, tuck a caliper in your pocket. Measure before you purchase to ensure they'll fit.

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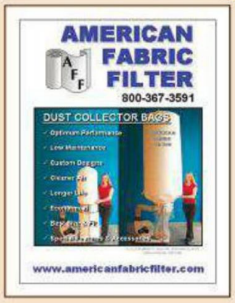

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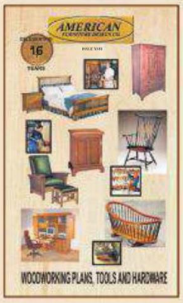

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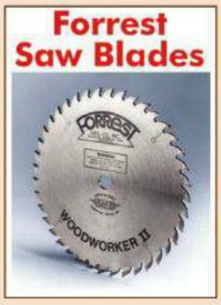

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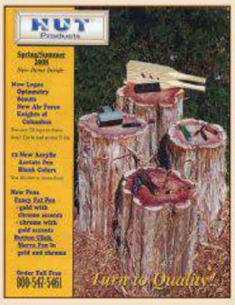

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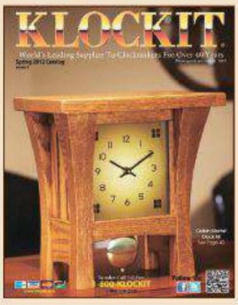

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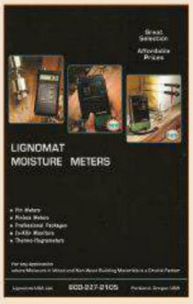

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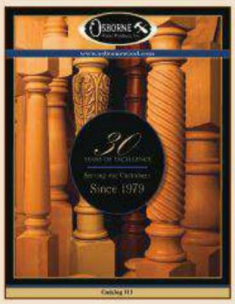

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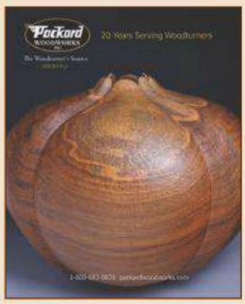

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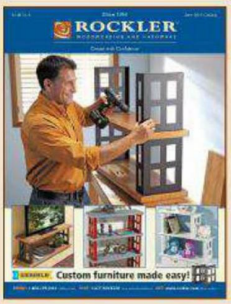

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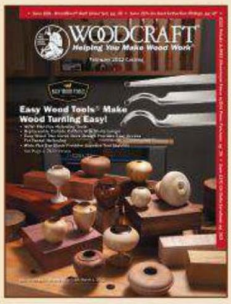

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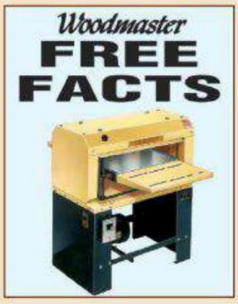

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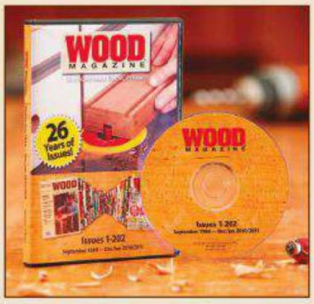

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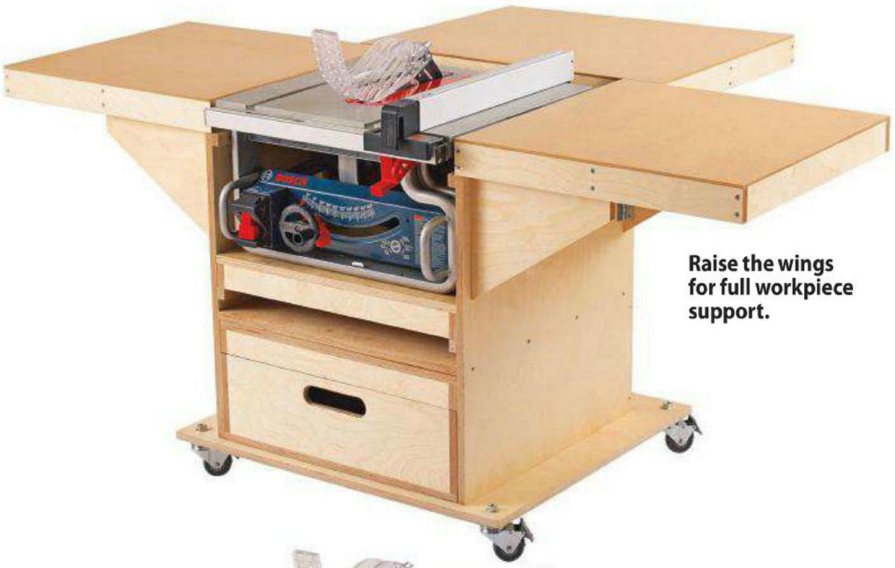
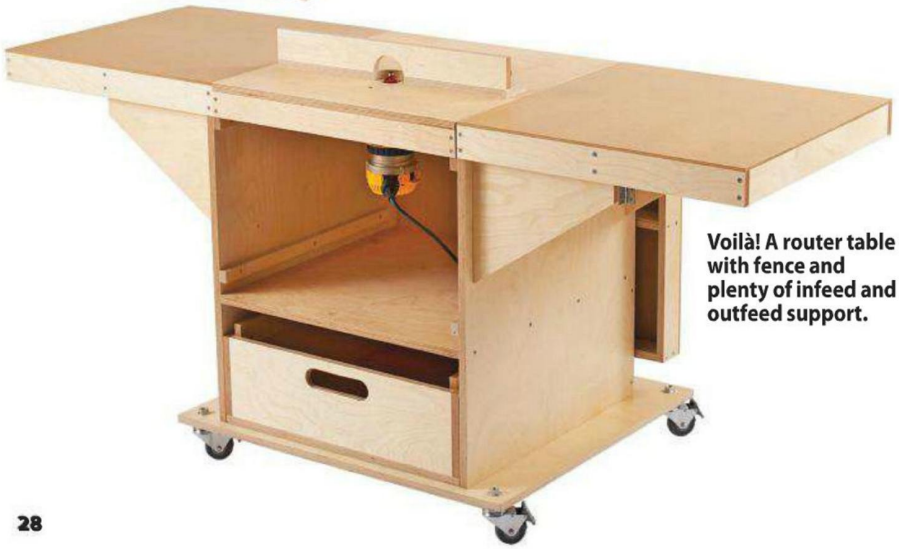
Quick-convert Tablesaw/Router Station

This easy-to-build mobile tool stand packs a shop full of convenience in a small package.



Raise the wings for full workpiece support.

A router table and accessories stow away in the drawer.



Voilà! A router table with fence and plenty of infeed and outfeed support.

With a footprint of less than 7 square feet when folded, this mobile tool stand expands into a massive 17-square-foot tablesaw worksurface. And it's multitalented—to switch to a router table, simply slide out the on-board router drawer. See **More Resources**, *page 32*, for an idea about compatible storage for the tablesaw.

Note: *The dimensions in this project assume a material thickness of ¾". Most sheet goods will be slightly undersize. In order to ensure that dimensions of subassemblies are correct, measure the thickness of your materials and adjust the length of adjoining project parts to compensate.*

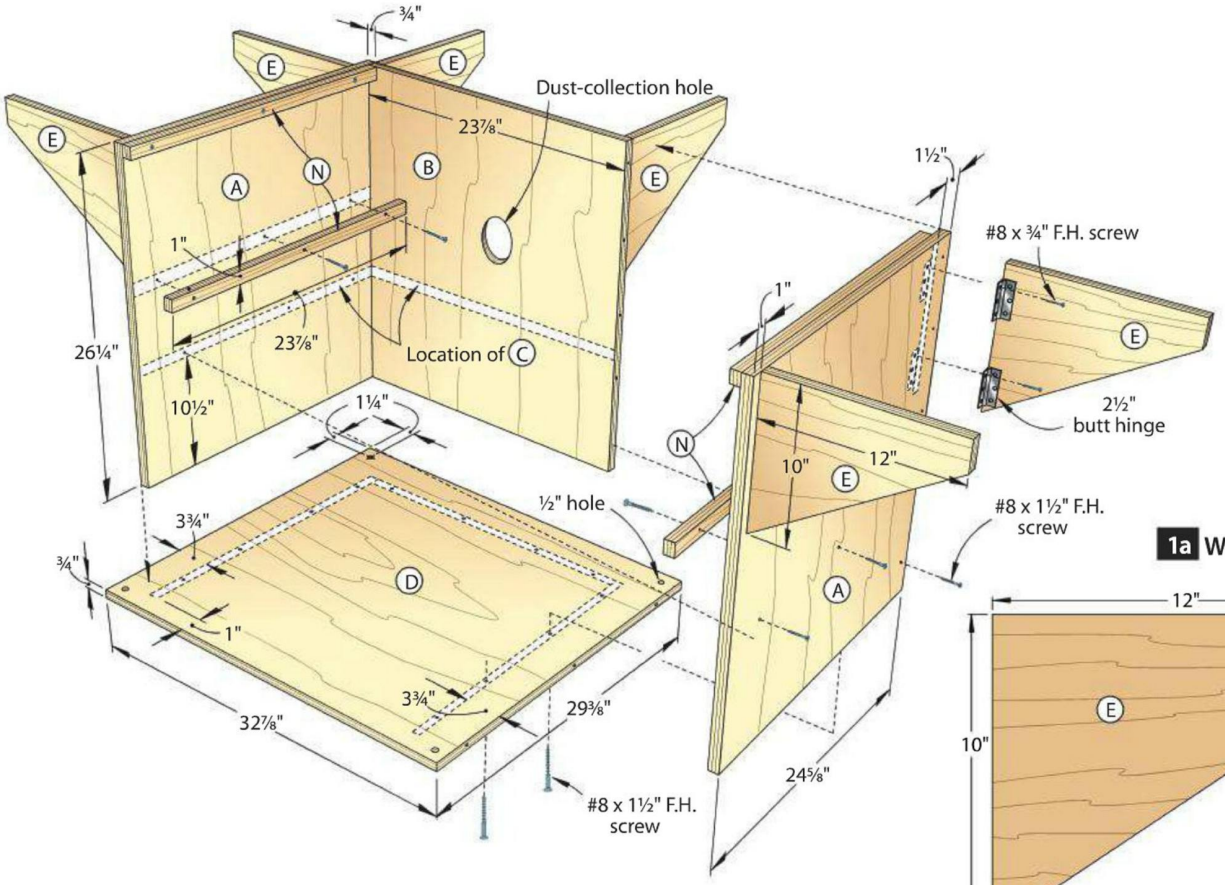
While we show this mobile base with the Bosch GTS1031 benchtop tablesaw (find a review of this saw at woodmagazine.com/benchtopbosch), the base was designed to fit many similar-size tablesaws. Before building, measure your chosen tablesaw's dimensions carefully and adjust the base to match your saw if necessary. Likewise, measure your router's height to ensure it fits in the bin.

- Overall dimensions when folded are 32⅞" wide × 29⅜" deep × 31¼" high. Unfolded: 72×48×31¼".
- Materials needed: Birch plywood and medium-density fiberboard (MDF).

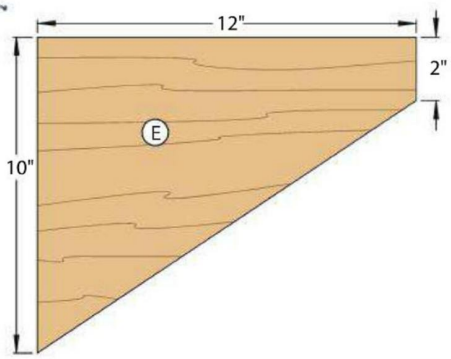
Skill Builders

- Discover an easy way to table-mount a router.
- Use guides to accurately position and install hinges.

1 CARCASE



1a WING SUPPORT



Construct the carcase

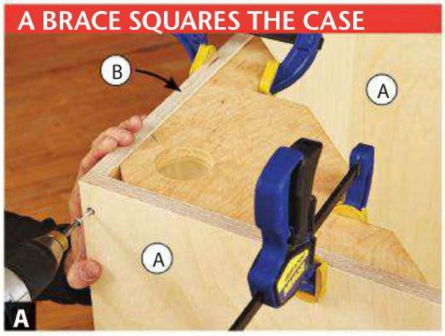
1 From ¾" plywood, cut the sides (A), back (B), shelf (C), and base (D) to size. (See **Materials List**, *page 32*.) Predrill and screw the sides to the back as shown [**Drawing 1, Photo A**].

2 With the case on its back, slide the shelf (C) into place [**Drawing 1**] and secure with screws. Now, flip the case onto its top. Center the base (D) side-to-side, positioning it 1" from the front of the case, and screw it into place. Drill holes to fit the caster stems and, before righting the case, install the casters to ease mobility during assembly.

3 From ¾" plywood cut three 12×12" blanks, and lay out the wing support (E) dimensions [**Drawing 1a**]. Use a jigsaw to cut the blank into two supports along the diagonal [**Photo B**]. Then, smooth the cuts with a sanding block.

4 Use a scrapwood guide as a straight-edge to locate and secure the 2½" butt hinges to the wing supports (E) [**Photo C**]. Be sure to attach the hinges on the inside faces of the wings, creating three mirrored pairs of wing supports. Use scraps to position and secure the wing supports to the case sides (A) and back (B) [**Photo D**].

A BRACE SQUARES THE CASE

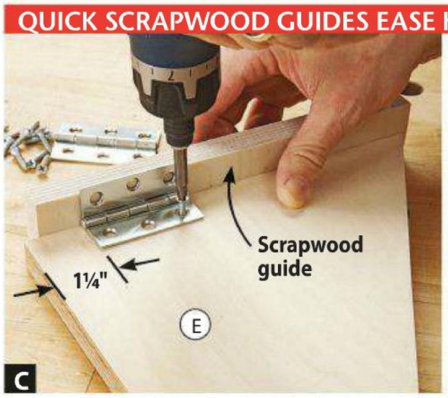


A squaring brace (see More Resources, *page 32*) aligns and steadies the sides (A) and back (B) for drilling and screwing.

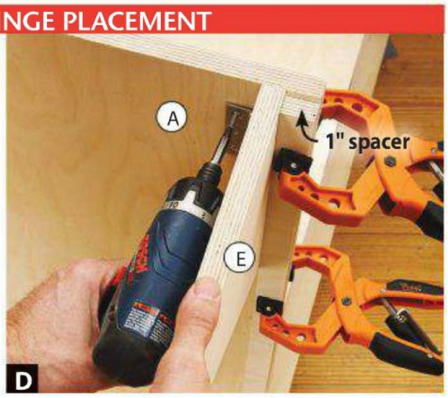
CUT TWO SUPPORTS FROM ONE

Firm support, a 10-tpi or higher blade, a slow-but-steady cut rate, and zero orbital action ensure a smooth, straight jigsaw cut.

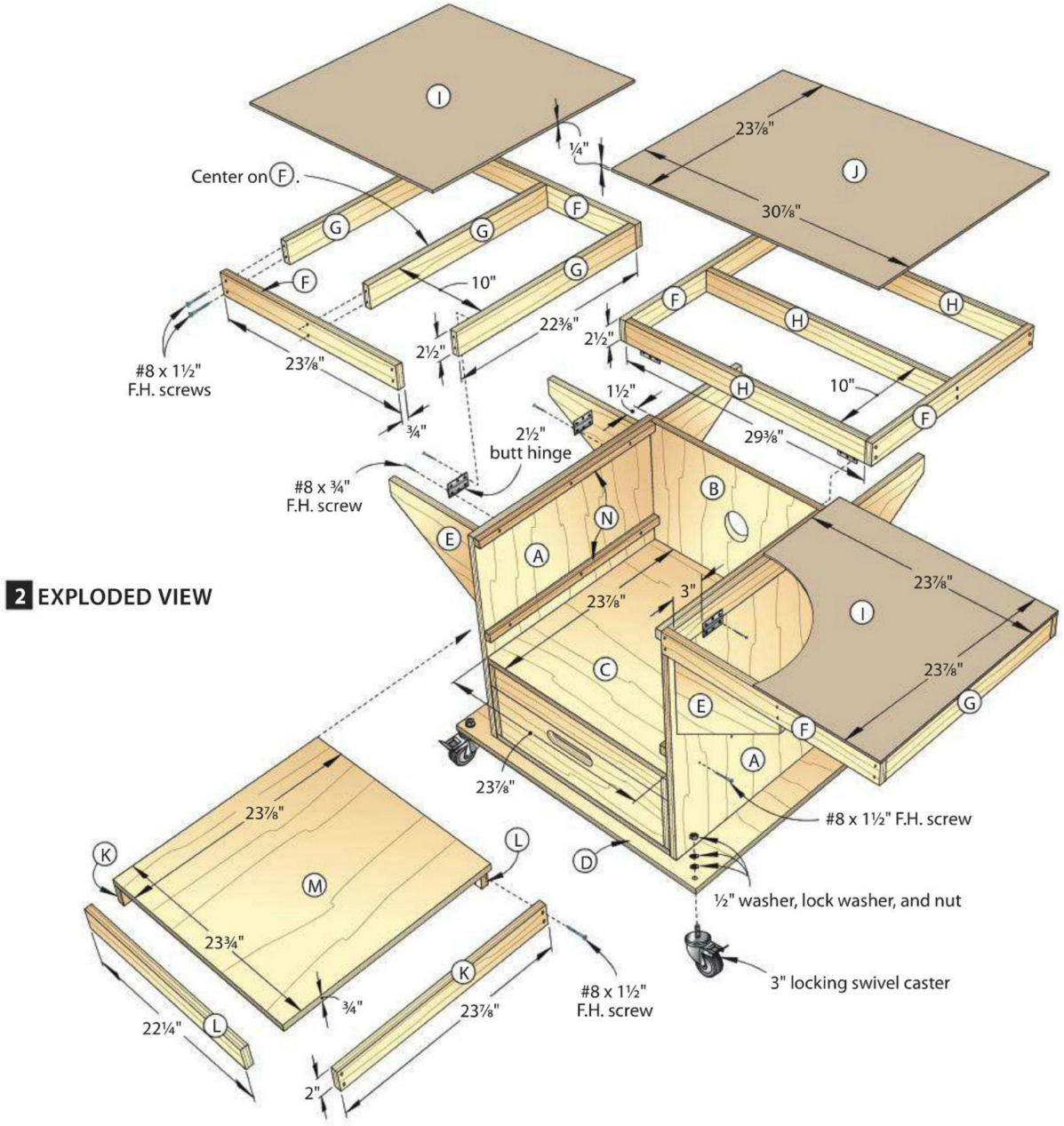
QUICK SCRAPWOOD GUIDES EASE HINGE PLACEMENT



A scrapwood guide held against the back edge of the wing support correctly positions the hinge at 90° while you secure it.



Clamp a spacer to the case (1" for the front; 1½" for the back). Position the wing support (E) flush with the case top, and secure the hinge.



2 EXPLODED VIEW

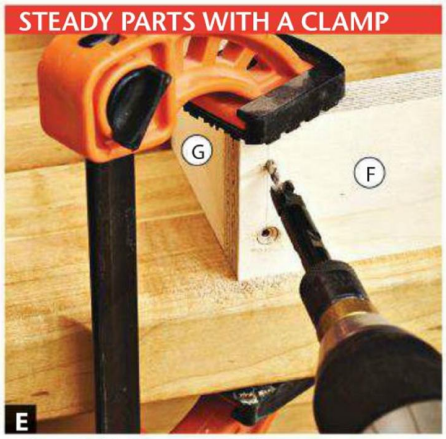
Now give it wings

1 From ¾" plywood, cut the wing outer bracing (F), wing bracing (G), and outfeed bracing (H) to size. Then, assemble the bracing with screws **[Drawing 2, Photo E]**.

2 From ¼" medium-density fiberboard (MDF), cut the side wing tops (I) and outfeed top (J) ⅛" larger than the width and length listed in the **Materials List**. Apply a bead of glue to the top edge of each wing bracing assembly (F/G and F/H) and clamp the tops in place **[Drawing 2]** with 1/16" overhang on all sides. After the glue has dried, trim the edges flush **[Photo F]**.

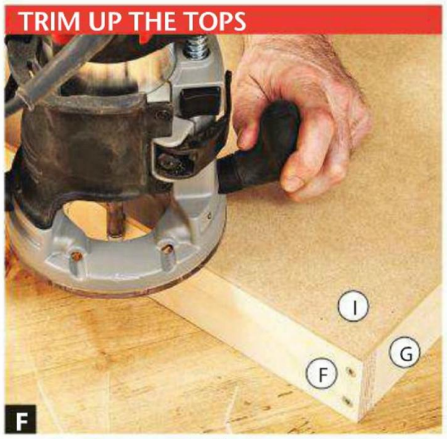
3 Attach 2½" butt hinges to the inside of each wing (F/G/I and F/H/J) **[Drawing 2]**, centering the hinge barrel on the bottom edge. Rest one side wing (F/G/I) on the wing supports (E), positioning its front flush with the front of the case. Then secure the hinges to the case. Repeat with the opposite side wing. Then, center the outfeed wing (F/H/J) on the rear wing supports and secure the hinges.

STEADY PARTS WITH A CLAMP



A clamp holds the corners of the wing bracing assembly (F/G) flush and steady while you predrill, then secure it with screws.

TRIM UP THE TOPS



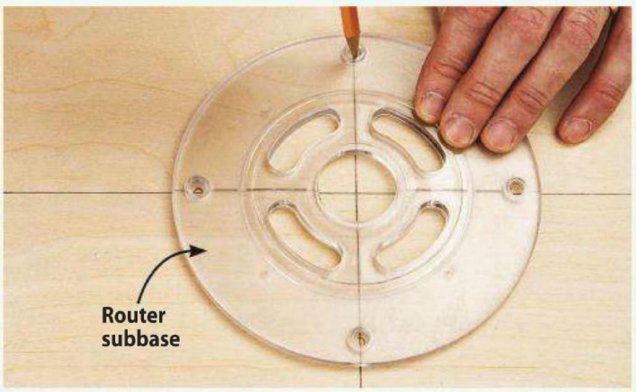
Trim the wing top with a flush-trim bit. Set the bit depth so the bearing doesn't dip into screwhead depressions, which could gouge the edge.

Baseplate helps you target mounting holes with template precision

The fine-threaded screws used to table-mount your router require a certain degree of precision when locating mounting holes. Fortunately, your router has a built-in template: its baseplate.

Retrieve one of the tray assemblies (K/L/M) for use as the router-table top. Mark a centerpoint for the bit access hole, centered 8¾" from one end [**Drawing 3**]. Remove and position your router's baseplate, centered on the marks. Be sure to orient it so that the router, when mounted in the same position, will have its controls easily accessible. Mark the locations of the mounting screws (and lift screw, if your router has one); then, drill and counterbore holes to fit the mounting screws. Next, drill a 1½" bit access hole on the center mark.

Now, test-fit the router. You may have to purchase longer screws of the same diameter and thread pitch in order to reach the router base. Remove the router to continue the construction.



You only need to center the bit access hole to "eyeball" precision. Once located, however, hold the subbase firmly to mark the mounting holes accurately.

Add two trays, fence, and bin

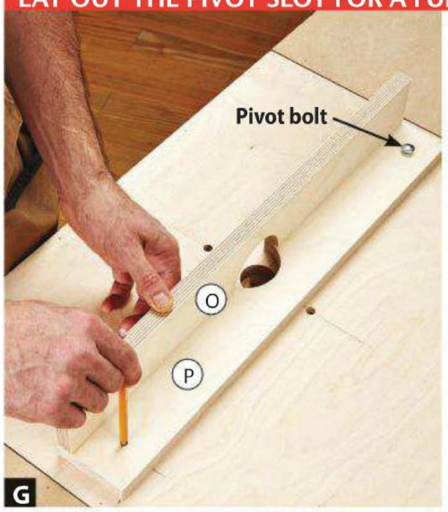
1 From ¾" plywood, cut the long edging (K), the short edging (L), and the tray panels (M) to size. Next, assemble the edging with screws before gluing and clamping the panels in place [**Drawing 2**]. After the glue dries, see the **Shop Tip**, *above*, to locate the mounting holes for your router in one of the tray assemblies (K/L/M).

2 Cut the tray supports (N) to size. To position the lower supports, measure and add the height of your tablesaw table to the height of the tablesaw tray assembly (K/L/M). Measure and mark this distance down from the top edge of the case. Now, use screws to fasten the supports to the case with the top flush with these marks [**Drawing 2**]. Next, secure the upper tray supports flush with the top of the case. Then, rest the tablesaw tray assembly on the lower tray support, and the router tray assembly on the top tray support.

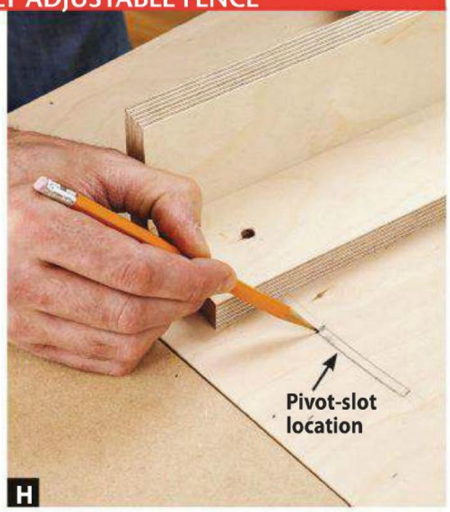
3 Cut the fence face (O) and fence base (P) to size. Lay out and jigsaw the 3"-diameter semicircles, centered, where shown [**Drawing 3**]. Sand the cuts smooth; then glue and clamp the face to the base.

4 After the glue dries, drill the ¼" pivot holes in the fence (O/P). Position the fence where shown [**Drawing 3**], and clamp it in place. Using one fence pivot hole as a guide, drill through the tray assembly (K/L/M). Remove the clamps and temporarily pin that end of the fence to the table using a ¼" carriage bolt. Now, rotate the fence to mark the location of the pivot slot [**Photos G** and **H**], drill ¼" holes at either end of the arc, and cut away the remainder of the slot with a jigsaw.

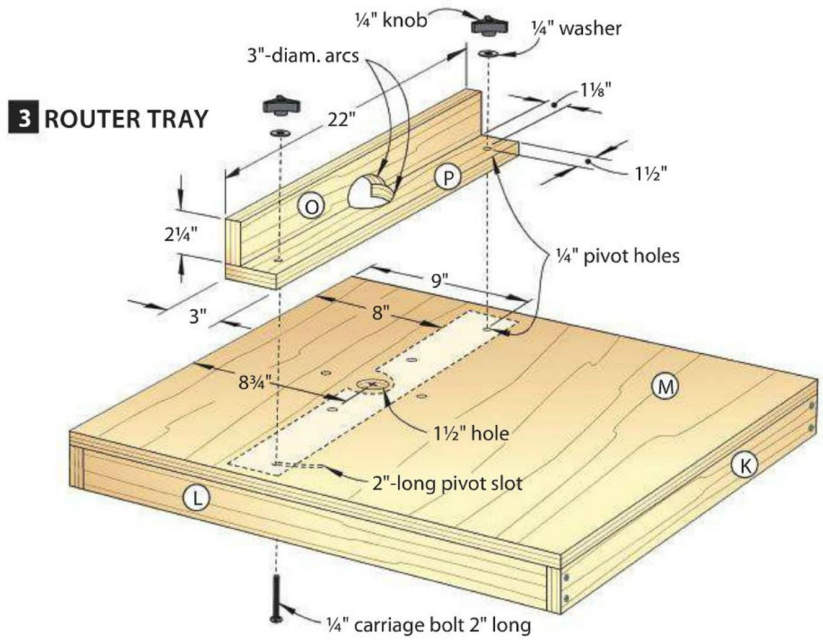
LAY OUT THE PIVOT SLOT FOR A FULLY ADJUSTABLE FENCE



Pivot the fence about 2" away from the bit access hole while drawing a pencil line first on one side of the hole, then the other.



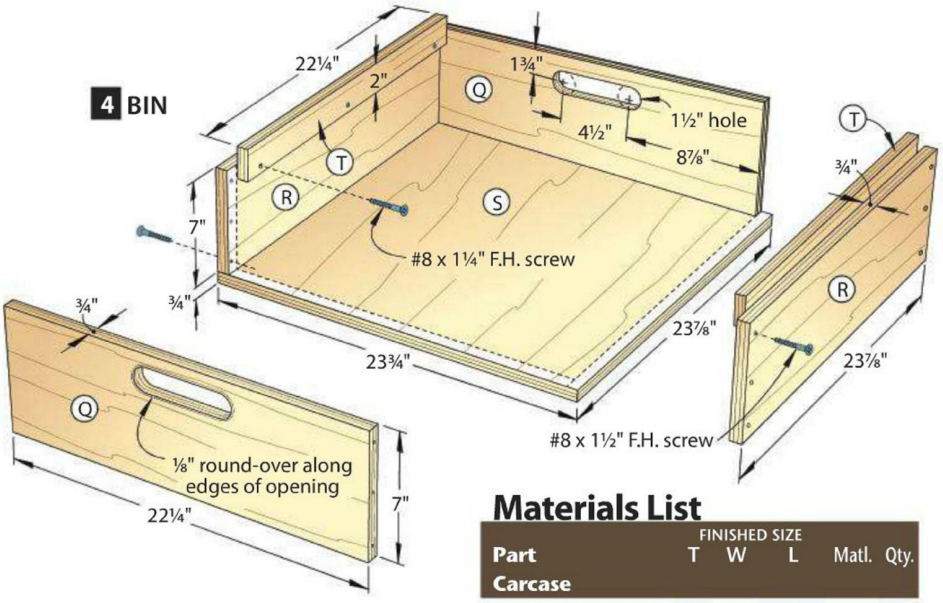
Connect the two arcs to complete the pivot-slot layout before drilling the ends and cutting away the waste with a jigsaw.



5 Cut the bin front and back (Q), bin sides (R), bin bottom (S), and bin cleats (T) to size. Lay out, drill, then jigsaw the handle cutouts in the front and back [**Drawing 4**]. Then, sand the cuts smooth and round over the edges with a ⅛" round-over bit. Assemble the sides, front, and back with screws before gluing and clamping the bottom in place. After the glue is dry, screw the bin cleats to the bin side half in, half out of the bin.

6 Bolt or screw the tablesaw to the tablesaw tray and slide the tray into place. If your tablesaw has a dust-collection port, mark the location and lay out a hole slightly larger than your dust hose [**Drawing 1**]. Drill a blade start hole and cut out the dust-collection hole with a jigsaw.

Mount the router in the router-tray assembly (K/L/M). Store the fence and router accessories in the bin, cap it with the router-table tray, and get to work!



Produced by **Lucas Peters** with **Kevin Boyle**
Project design: **John Olson**
Illustrations: **Lorna Johnson**

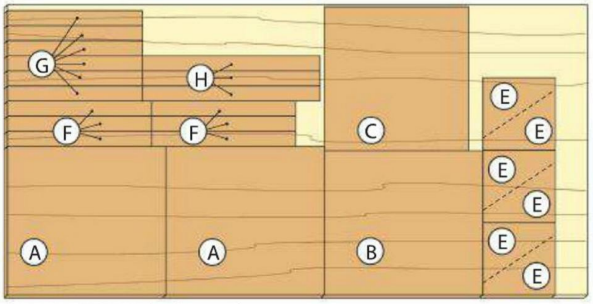
Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
Carcase						
A	sides	¾"	24⅝"	26¼"	BP	2
B	back	¾"	23⅞"	26¼"	BP	1
C	shelf	¾"	23⅞"	23⅞"	BP	1
D	base	¾"	29⅜"	32⅞"	BP	1
E	wing supports	¾"	10"	12"	BP	6
Wings						
F	wing outer bracing	¾"	2½"	23⅞"	BP	6
G	wing bracing	¾"	2½"	22⅜"	BP	6
H	outfeed bracing	¾"	2½"	29⅜"	BP	3
I*	side wing tops	¼"	23⅞"	23⅞"	MDF	2
J*	outfeed top	¼"	23⅞"	30⅞"	MDF	1
Trays						
K	long edging	¾"	2"	23⅞"	BP	4
L	short edging	¾"	2"	22¼"	BP	4
M	tray panels	¾"	23¾"	23⅞"	BP	2
N	tray supports	¾"	1"	23⅞"	BP	4
Router fence						
O	face	¾"	2¼"	22"	BP	1
P	base	¾"	3"	22"	BP	1
Router bin						
Q	front and back	¾"	7"	22¼"	BP	2
R	sides	¾"	7"	23⅞"	BP	2
S	bottom	¾"	23¾"	23⅞"	BP	1
T	cleats	¾"	2"	22¼"	BP	2

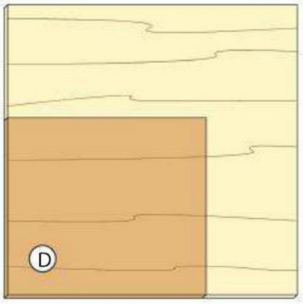
*Parts initially cut oversize. See the instructions.

Materials key: BP–birch plywood, MDF–medium-density fiberboard.
Supplies: 3" locking swivel casters (4), ½" washers, lock washers, and nuts (4 each), 2½" butt hinges (9 pairs needed), #8×¾" F.H. screws (for hinges), #8×1½" F.H. screws, #8×1¼" F.H. screws; ¼" knobs, ¼×2" carriage bolts, and washers (2 each).
Bits: Flush-trim and ⅛" round-over router bits; 1½" Forstner bit.

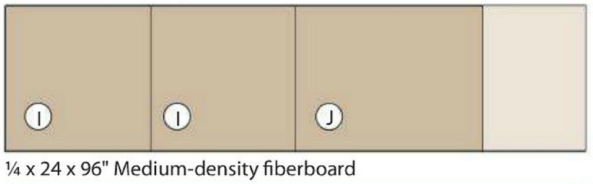
Cutting Diagram



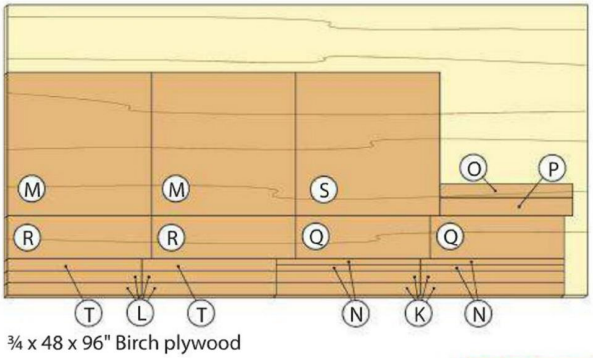
¾ x 48 x 96" Birch plywood



¾ x 48 x 48" Birch plywood



¼ x 24 x 96" Medium-density fiberboard



¾ x 48 x 96" Birch plywood

More Resources

- The tool trays in this mobile base were made to be compatible with the Bench-tool System from the October 2007 issue of *WOOD*® magazine. You can find the plan here for a small fee: **woodstore.net/besy.html**
- For a free right-angle clamping brace plan, see **woodmagazine.com/clampingbrace**

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Mid-Priced Tablesaws

SHOP TESTED

In the market for a tablesaw capable of delivering the power and precision required to churn out quality woodworking cuts without breaking your wallet? We tested 7 models priced from $500 to $675 that'll do just that.

If you want a quality tablesaw for your shop but can't afford to shell out $1,000 or more for a 3-hp cabinet saw, this price range includes top-of-the-line benchtop/job-site saws as well as entry-level stationary contractor-style saws. Deciding between the high-end portable saws and the contractor saws proves a tough choice because both have advantages and disadvantages. Read on to learn more.

4 types of tablesaws: Let's cut the confusion

When is a contractor saw not a saw used by contractors? Pretty much all the time these days. Twenty or so years ago, the tablesaw of choice for contractors was the iconic floor-standing saw with a cast-iron top, an open-leg stand, a three-sided cabinet with an open back and bottom, and an easily detached motor hanging out the back. You swept up dust only after it settled on the floor. Back in the day, it was the most-portable, least-expensive tablesaw on the market, and the favored saw of home shops.

Today, it's still called a contractor saw, though it has been supplanted on construction sites by the lightweight benchtop/job-site saw, either mounted on a collapsible stand or used on sawhorses or pickup tailgates. Nevertheless, the contractor saw lives on. Blurring the line ever further is the hybrid saw, another entry in the tablesaw market in the last decade. To clear up the confusion, here's how tablesaw manufacturers define the four types of tablesaws sold today:

▶ **Benchtop/job-site saws** have small aluminum or plastic tops and 110-volt universal motors, and can be carried by hand or attached to work stands.
Weight: 40–80 lbs without stand
Price: $100–$700

▶ **Contractor saws** have 110-volt induction motors, cast-iron tops, and open-leg stands (although the saw bases are now typically enclosed).
Weight: 200–400 lbs
Price: $500–$1,200

▶ **Hybrid saws** also have 110-volt motors and cast-iron tops, but with enclosed steel cabinets, similar to cabinet saws.

Weight: 350–500 lbs
Price: $800–$1,500

▶ **Cabinet saws** feature 3-hp (or larger), 220-volt motors and heavy-duty trunnions and arbor assemblies inside closed steel cabinets.
Weight: 450–700 lbs
Price: $1,200 and up

Traits both saw types share

▶ **Power.** All seven tested saws have enough power to saw through tough 2"-thick oak and maple. Each contractor saw uses a long-lasting induction motor connected to the arbor pulley with a short belt to spin the blade. The job-site saws have noisy universal motors that turn the blade either directly on the motor shaft or on an offset, gear-driven arbor shaft.

Like routers, these saw motors have electronic circuitry that monitors the cutting load and delivers more power when needed to maintain blade speed. Those speed controls helped all four job-site saws handle every cut we threw at them. Although we were able to bog down the contractor saws with aggressive feed rates, backing off that rate eliminated any problems.

▶ **Quality cuts.** You can make clean, accurate rips and crosscuts with any of the tested saws if you do two things: Tune it up and use a quality blade. We'll discuss the ease of making adjustments later in the article. As for blades, the Bosch 4100-09 and Ridgid R4512 came with 40-tooth blades that outperformed the others. Still, we improved the cut quality of every saw when we installed new Freud blades. (We tested with both thin- and full-kerf blades and found no difference in cut quality attributable to blade thickness, but all the saws ran better with thin-kerf blades.)

▶ **Protected cuts.** In sports, good officiating means you don't notice the officials; likewise, we hardly noticed these saws' blade guards once we started making cuts with them in place. All the saws come with a removable split blade guard (the left and right sides operate independently) and antikickback pawls mounted on a multiposition riving knife, shown *above*. A great improvement over old-style splitters and guards, they raise and lower with the blade. And we got equally good results when we removed the guards and pawls and used the riving knives alone.

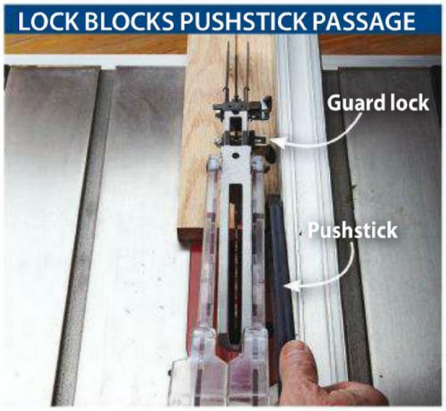
Still, the blade guards make narrow rip cuts (less than 1½" wide) difficult because there's no room for a pushstick between the guard and fence. And two saws have protruding features, shown *above, lower left*, that add to this.

EASY-TO-USE BLADE-GUARD SYSTEMS MAKE YOU WANT TO USE THEM

The split blade guard and antikickback pawls mount directly onto the riving knife, shielding all but the back third of the blade.

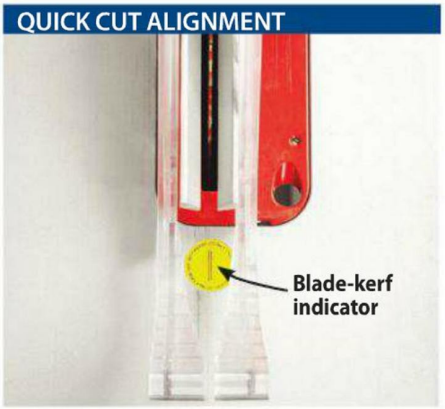
Remove the guard and pawls for partial-depth cuts and narrow rip cuts. The riving knife holds the kerf open to prevent kickback.

LOCK BLOCKS PUSHSTICK PASSAGE



Guard locks on the Craftsman 21833 (shown) and Makita 2705X1 stick out an extra ¾", impeding a pushstick on narrow rips.

QUICK CUT ALIGNMENT

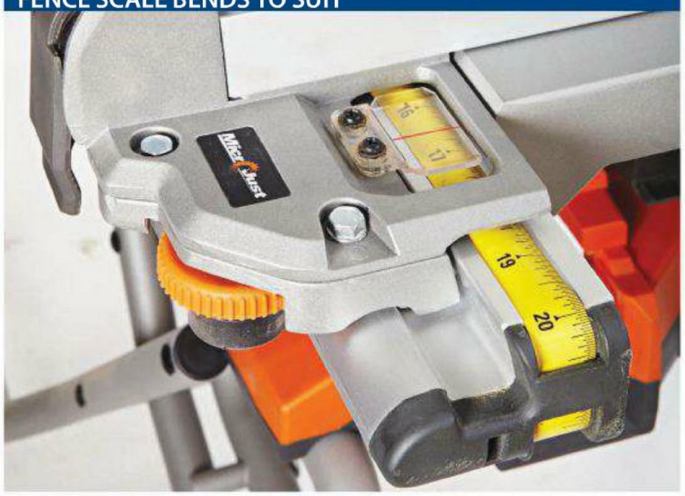


Because guards conceal the blades so well, the Bosch (shown) and Ridgid R4510 saws have kerf indicators to assist with lining up cuts.

RIP FENCE HAS DIAL-IN PRECISION

You lock the DeWalt rip fence in place on the rails, and then fine-tune its location using the rack-and-pinion adjuster.

FENCE SCALE BENDS TO SUIT



The Ridgid R4510's rip-fence scale is a flexible measuring tape that wraps around the end. We wonder about its longevity.

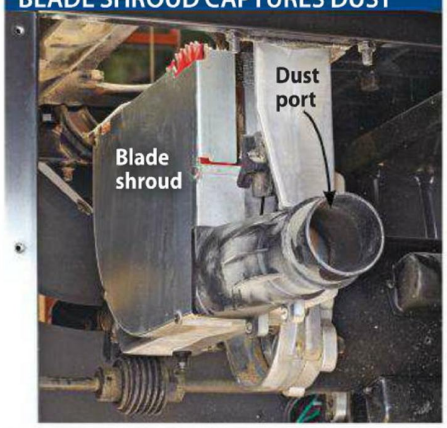
▶Deflection-free fences. Although we found some differences in rip-fence functionality on the job-site saws (see photos *above*), none of the fences, when locked in place, deflected more than a few thousandths of an inch (an amount we can live with) during our testing. And we were able to get pinpoint accuracy with all fences.

▶Good dust collection. Five saws use a blade shroud, like the one shown at *right*, to help a shop vacuum or dust collector better suck up dust at the source of the cut. With the shroudless Craftsman and Ridgid R4512, dust gets pulled through a centered 4" port in the bottom panel. Both types performed well at evacuating dust.

▶A place for everything. With only a couple of minor exceptions, all the included accessories (rip fence, miter gauge, blade wrenches, blade guard, antikickback pawls, and pushstick), as well as any extra blades, store onboard. This proves especially helpful with a job-site saw because it contains and protects everything should you need to transport it.

The exceptions: The Porter-Cable PCB270TS lacks a storage spot for an extra blade; the DeWalt DW744XRS lacks a power-cord wrap; and Makita's rip fence sticks out beyond the protective "zone" of the saw-and-stand perimeter, where it can bang into door casings and such as you wheel it around.

BLADE SHROUD CAPTURES DUST



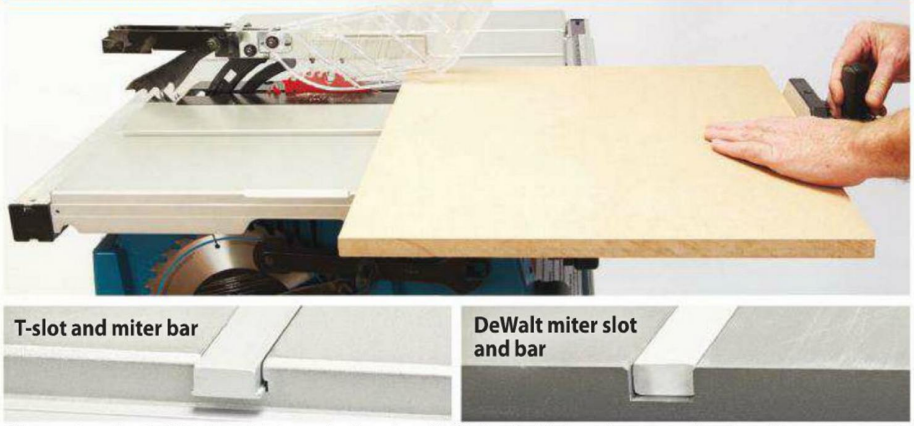
The metal covering surrounding the bottom half of the blade (shown on the Porter-Cable) funnels sawdust directly into a 2½" dust port.

Features that separate the two saw types

▶Capacities. The cast-iron tops with stamped-steel wings on the contractor saws nearly double the size of the tops on the job-site saws. This adds about 5" of rip capacity and 3–7" in crosscut capacity for the contractor saws. But the design of the miter slots also affects crosscut capacity. (See photos *below*.)

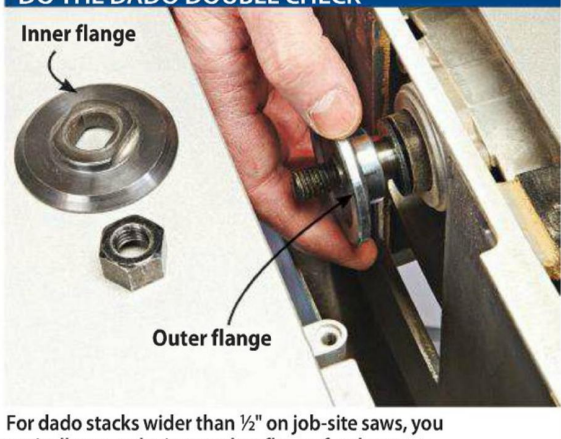
Although we were able to install at least a ¾" dado stack on each saw's arbor shaft, it's a little more hassle on the job-site saws, as shown *below*. **Advantage: Contractor.**

T-SLOTS HELP YOU CROSSCUT WIDER BOARDS



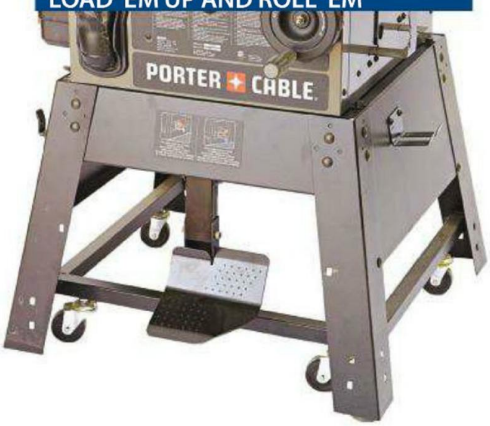
All saws but the DeWalt have T-shaped miter slots (left) that hold the miter gauge level and let you extend the miter gauge and board off the table without it sagging, preventing a catch on the table edge.

DO THE DADO DOUBLE CHECK



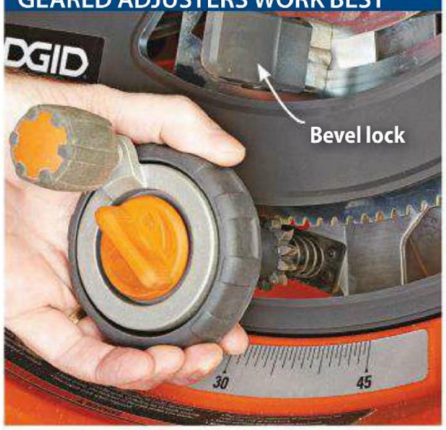
For dado stacks wider than ½" on job-site saws, you typically swap the inner arbor flange for the outer one. Be sure to check your saw's owner's manual.

LOAD 'EM UP AND ROLL 'EM



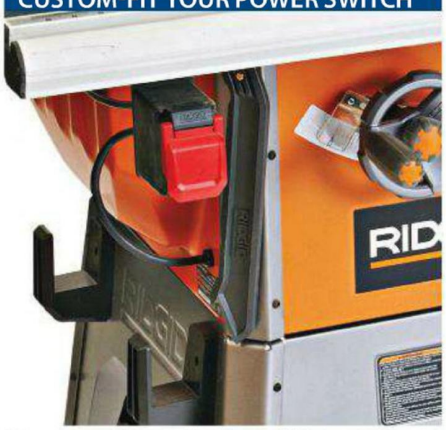
All three contractor saws we tested, including the Porter-Cable shown here, have built-in mobile bases that engage with a foot pedal.

GEARED ADJUSTERS WORK BEST



To adjust the bevel angle on the Ridgid R4510, you unlock the trunnion and turn the rack-and-pinion outer ring. (The crank adjusts blade height.)

CUSTOM-FIT YOUR POWER SWITCH



The power switch on the Ridgid R4512 not only can be bumped off easily with a leg, but can be positioned anywhere along the fence rail.

▶**Portability/storage.** Contractor saws weigh about twice that of job-site saws, and that adds stability. But don't even think about lifting a contractor saw into a pickup without three friends handy! Built-in mobile bases on the contractor saws, *above*, make them easy to roll around a shop or garage, but the overall footprint never changes.

On the other hand, job-site saws (on stands as tested) collapse into a tidy size for storage. You can save about $100–125 by buying the Bosch, DeWalt, and Makita saws without stands. We removed each saw from its stand and used it on a bench-top with good results. (Ridgid does not sell the R4510 without one.) And job-site saws lift easily into a pickup or van. DeWalt's splayed-leg stand proved the most stable when unfolded, but because the wheels mount to the saw base, they're off the floor (see photo on *page 34*)—you need to lift or scoot the whole setup to move it. For maximum mobility, we like the strut-assisted Bosch stand because of its ease of setup and smooth-rolling pneumatic tires. Makita's stand has two height settings, the lower one more convenient for ripping large, heavy workpieces. **Advantage: Job-site.**

▶**Blade tilting.** Traditionally, job-site saws had free-sliding blade-tilt controls: Loosen the lock, swing it to the desired angle, and lock. The DeWalt and Bosch saws still use this method, which proves difficult for setting precise angles—other than the 90° and 45° presets—without using a bevel gauge or precut reference block placed next to the blade. The Makita and Ridgid R4510, shown *above center*, use rack-and-pinion bevel controls that provide greater precision, though are stiff to turn. Contractor saws, on the other hand, have smooth-turning, geared bevel handwheels with larger, easier-to-read scales. **Advantage: Contractor.**

▶**Blade adjustments.** Out of the box, all of the saws came with the blade aligned parallel to the miter slots. However, should you need to correct this alignment, the job-site saws make this process easier because you access the trunnion-mounting bolts from outside the saw. With the contractor saws you have to remove the back panel and reach into the cabinet to loosen the bolts.

Likewise, the blade-tilt stops for 90° and 45° will need to be recalibrated periodically. All but the DeWalt and Porter-Cable saws provide access to these adjustment screws or bolts from outside the saw base or on the top. **Advantage: Job-site.**

▶**Power switches.** We liked being able to kill the power to the Craftsman and Ridgid (*above*) contractor saws by bumping the fence-rail-mounted switch with a leg, freeing both hands for workpiece control. Switches on the job-site saws and Porter-Cable contractor saw sit sheltered on the base and prove more difficult to shut off without looking. **Advantage: Contractor.**

▶**Throat inserts.** To get tear-out-free cuts, you need to use a sharp, quality blade in addition to a zero-clearance insert that supports wood fibers on both sides of the cut. Only Bosch and Craftsman sell these as accessories, and the thin rabbeted edges (see photo *below*) on every saw but the Bosch make us uneasy about making our own inserts. **Advantage: None.**

▶**Assembly.** Ridgid's R4510 needed no assembly, and the other job-site saws required only minor assembly of the stands. On the other hand, it took 2–4 hours to assemble each contractor saw. **Advantage: Job-site.**

WOOD MAGAZINE'S
REVIEW-A-TOOL

Add your own review of these tablesaws and read more reviews from your fellow woodworkers at **toolreviews.woodmagazine.com.**

THIN INSERTS LIMIT YOUR OPTIONS

We would not trust a shop-made insert with a rabbeted edge this thin because the insert could easily break along the kerf opening and fall into the saw cavity—a dangerous consequence.

Two types, two Top Tools

If you prefer portability and ease of storage, go for the Bosch 4100-09. It has plenty of power, our favorite blade-guard system, an easy-to-use rip fence, and a stand that's a snap to set up and roll around. With a ⅜"-thick throat insert, it's the only saw among the seven for which we'd feel comfortable making and using shop-made zero-clearance throat inserts. If you need to save money, get the saw without the stand (model 4100) for $500.

GOOD CHOICES FOR VALUE-PRICED WORKSHOP TABLESAWS

BRAND	MODEL	PERFORMANCE RATINGS (1)														MOTOR		CAPACITIES, INCHES						
		PRIMARY						SECONDARY																
		POWER	QUALITY/ACCURACY OF RIP FENCE	QUALITY/ACCURACY OF MITER GAUGE	EASE OF USING BLADE GUARD/RIVING KNIFE	CUT QUALITY WITH FACTORY BLADE	CUT QUALITY WITH PREMIUM BLADE	EASE OF ADJUSTING BLADE TO TABLETOP	EASE OF USING ON/OFF SWITCH	EASE OF CHANGING BLADES	EASE OF CHANGING BLADE-BEVEL ANGLE	EASE OF ADJUSTING BLADE-BEVEL STOPS	DUST-COLLECTION EFFECTIVENESS	EASE OF LOADING SAW/STAND INTO PICKUP (2)	CLARITY/HELPFULNESS OF OWNER'S MANUAL	TYPE (3)	SPEED, RPM	MAX. CROSSUT (BLADE SET 1" HIGH)	MAX. RIP RIGHT OF BLADE	MAX. RIP LEFT OF BLADE	MAX. BLADE HEIGHT AT 90° BEVEL	MAX. BLADE HEIGHT AT 45° BEVEL	MAX. DADO WIDTH
BENCHTOP/JOB-SITE SAWS																								
BOSCH	4100-09	A	A	B	A	B+	A-	A	B	A	B	A-	B	A	A	U	3,650	8¼	25	7⅜	3⅛	2¼	13⁄16
DEWALT	DW744XRS	A-	B	C	A	C-	B	A-	B	A	B	B-	B	B	A	U	3,650	6¾	24½	15⅞	3⅛	2¼	13⁄16
MAKITA	2705X1	A-	B+	B	B-	C-	B	B+	B	A	A-	A-	B	B	B	U	4,800	10	25	8⅛	3 9⁄16	2½	13⁄16
RIDGID	R4510	A	B	B	A	B-	B+	A	B	A	A-	A-	B	A	A	U	4,400	8¾	25	12	3½	2½	¾
CONTRACTOR-STYLE SAWS																								
CRAFTSMAN	21833	A-	A	B	B-	B-	A	B	A	A	A	A	A	NR	A	I	3,550	13	30	14⅝	3⅛	2 13⁄16	13⁄16
PORTER-CABLE	PCB270TS	A-	B	B	C	C+	A-	B	B	A	C+	B	A	NR	B	I	3,450	12½	30	18¼	3½	2¼	13⁄16
RIDGID	R4512	B+	A	B	A	B+	A	B	A	A-	A	A-	A	NR	A	I	3,450	13¼	30	15	3¼	2¼	13⁄16

1. A EXCELLENT
   B GOOD
   C FAIR
2. (NR) Not recommended due to size and weight
3. (I) Induction
   (U) Universal
4. (B) Blade
   (D) Dado throat insert
   (F) Digital rip-fence indicator
   (G) Miter gauge
   (M) Mobile base
   (O) Outfeed support
   (P) Pushstick
   (S) Collapsible stand
   (Z) Zero-clearance insert

But should you prefer the capacity and stability of a contractor saw, then buy the Ridgid R4512. With it you can rip workpieces up to 30" wide. Nice touches include a rip fence with T-slots for mounting auxiliary fences and hold-downs, a built-in mobile base, the easiest-to-read rip-fence and blade-tilt scales, and beveled edges on the cast-iron top. Its 13-amp motor trailed slightly behind the other contractor saws, but not enough to worry us.

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

	DIMENSIONS, INCHES			BLADE CHANGES: 1 OR 2 WRENCHES?	NUMBER OF MITER-GAUGE ANGLE STOPS	DUST-PORT DIAMETER, INCHES	ACCESSORIES (4)		CORD LENGTH	WEIGHT, LBS	NOISE LEVEL (NO LOAD), DECIBELS	NOISE LEVEL (CUTTING), DECIBELS	WARRANTY, YEARS (5)	COUNTRY OF ASSEMBLY (6)	SELLING PRICE (7)
	OVERALL (H×W×D)	TABLETOP (W×D)	DEPTH WHEN STAND IS COLLAPSED				STANDARD	OPTIONAL							
	38×46×29	29¼×21½	22	1	3	2½	B, G, P, S	D, F, O, Z	9'	115	89	99	1	T	$600
	35×39½×36	26½×19¼	23	2	3	2½	B, G, P, S	D, O	7'	95	94	96	3	M	630
	38×42×26	30½×22½	23	2	3	2½	B, G, P, S	D, O	8'	130	90	93	1	U	675
	35×48×29	30¼×21	29	2	3	2½	B, G, P, S	D, O	6'	100	95	107	3*	C	500
	37½×57×32	40×27	N/A	1	3	4	B, D, G, M, P	Z	6'8"	295	80	97	1	C	650
	37½×60×31	40½×27¼	N/A	1	9	2½	B, G, M, P	D	6'4"	225	83	97	3	T	600
	37×57×32	40¼×27	N/A	2	3	4	B, G, M, P	D	6'	240	82	95	3*	C	530

5. * Eligible for Lifetime Service Agreement upon registration

6. (C) China
(M) Mexico
(T) Taiwan
(U) United States

7. Prices current at time of article production and do not include shipping, where applicable.

Contact information
Bosch: 877-267-2499, boschtools.com
DeWalt: 800-433-9258, dewalt.com
Makita: 800-462-5482, makitatools.com
Ridgid: 866-539-1710, ridgid.com
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Porter-Cable: 888-848-5175, portercable.com

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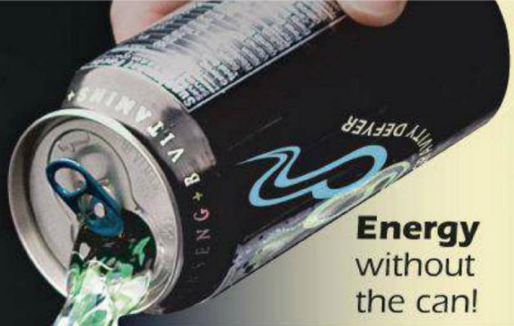

Feel Like You're Defying Gravity

This is my story

I used to be more active. I used to run, play basketball, tennis; football… I was more than a weekend warrior. I woke up every day filled with life! But now, in my late 30's, I spend most of my day in the office or sacked out in front of the TV. My energy has fizzled and I'm embarrassed to admit that I've grown a spare tire (I'm sure it's hurting my love life). Nowadays I rarely walk. For some reason it's just harder now. Gravity has done a job on me.

Wear them and you'll know

But that's when a friend told me about a new kind of shoe. A shoe biomechanically engineered to make standing and walking on hard surfaces like concrete, tile and linoleum easy. They defy the force of gravity by absorbing harmful impact and propel you forward maximizing energy return. The longer he talked, the more sense it made. He was even wearing a pair himself!

Excitement swept through my body

I received my package from GravityDefyer.com and rushed to tear it open like a kid at Christmas. Inside I found the most amazing shoes I had ever seen – different than most athletic shoes. Sturdy construction. Cool colors. Nice lines… I was holding a miracle of technology. This was the real thing.

GDefy Benefits

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- **Have Instant Comfort**
- **Improve Energy Return**
- **Appear Taller**
- **Cools Feet**
- **Reduces Foot Odor**
- **Customize Your Fit**
  Accommodate most orthotics

I put them on and all I could say was, "WOW!" In minutes I was out the door. I was invincible; tireless in my new Gravity Defyer shoes. Years of feeling exhaustion seemed to slip away. It was as if my legs had been replaced with super-powered bionics. At last, I was back in the game. Gravity has no power over me!

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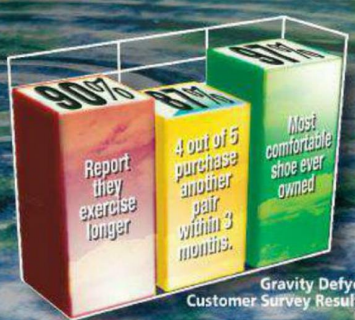
So, my friend, get back on your feet like I did. Try Gravity Defyer for yourself and live better, one step at a time.

ABSORB SHOCK
For ultimate comfort.

REBOUND PROPELS YOU FORWARD
Maximize energy return.



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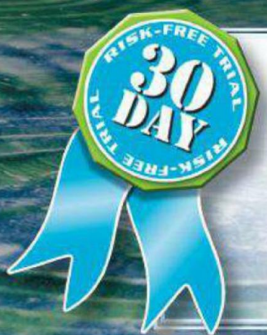

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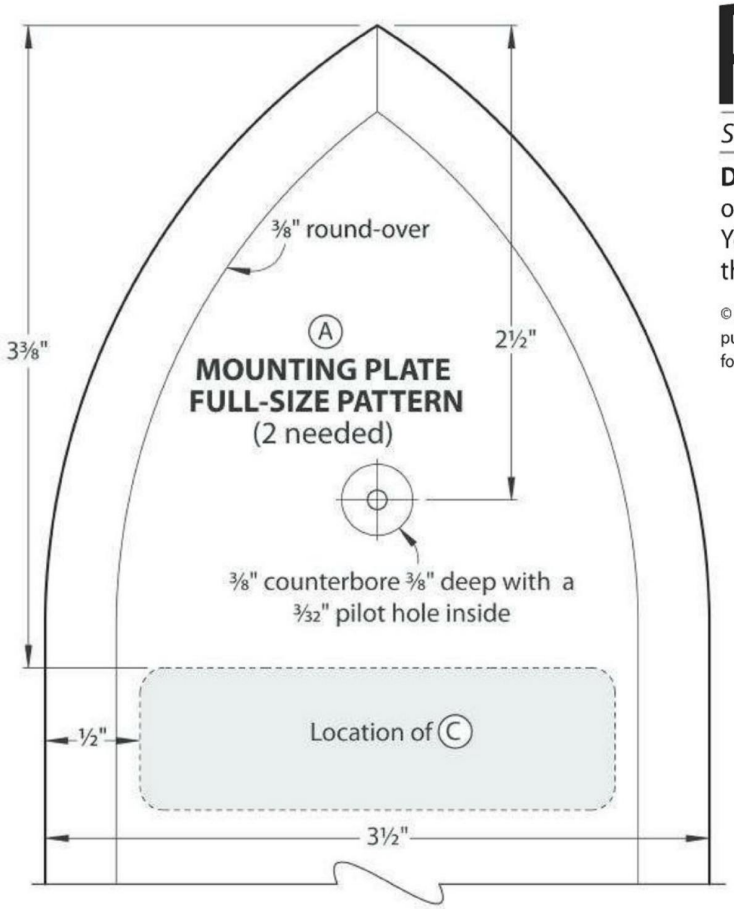
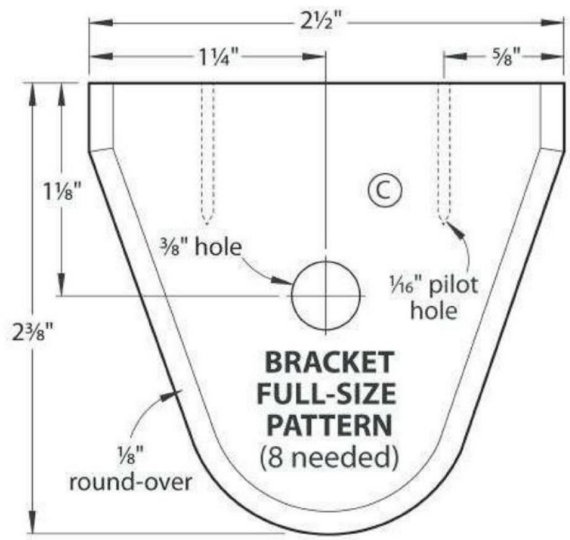
Download these full-size printable patterns at **woodmagazine.com/zinio213**

Better Homes and Gardens®
WOOD®
PATTERNS®
September 2012 *Issue 213*

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.



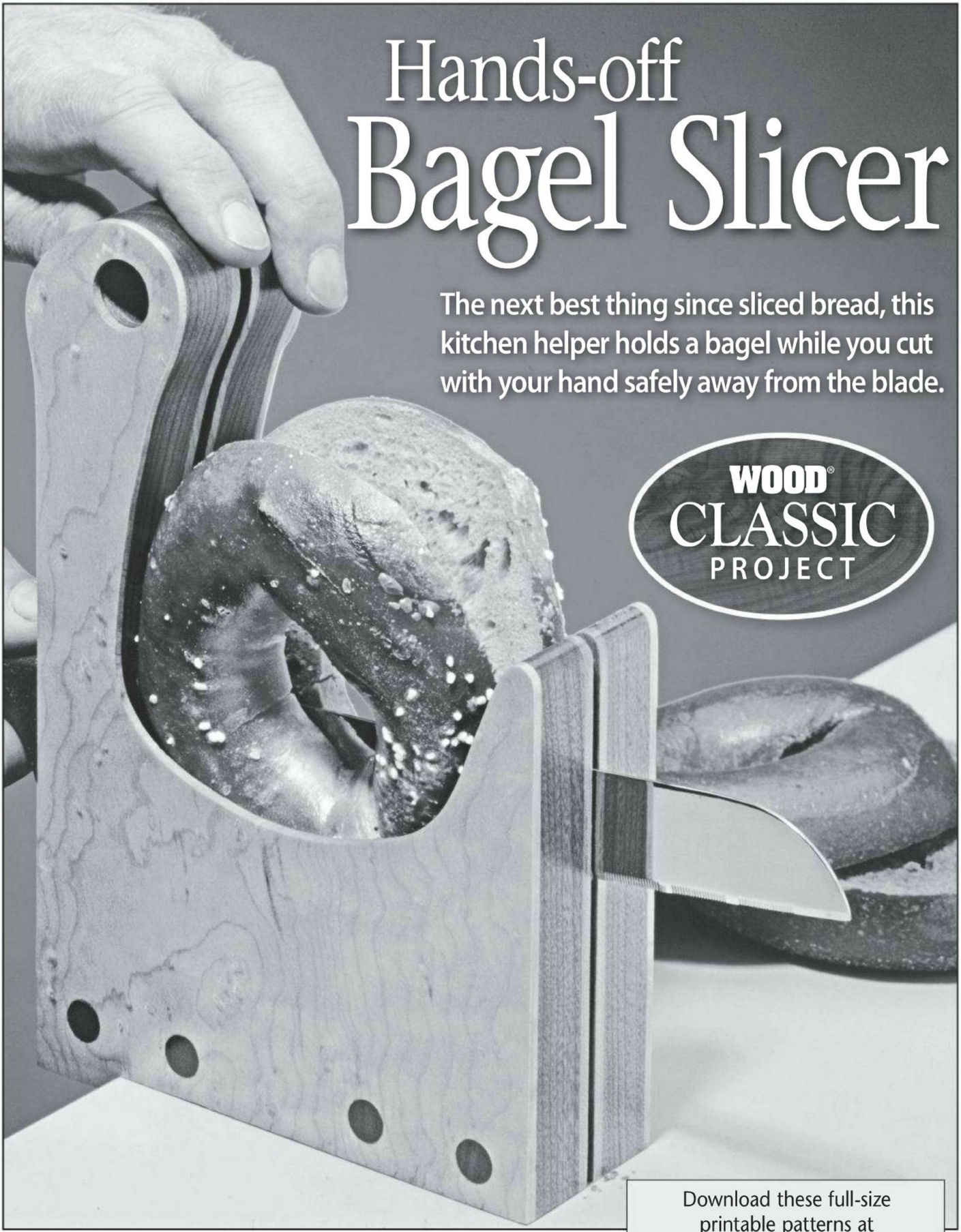


Quilt Rack
Page 61

Hands-off Bagel Slicer

The next best thing since sliced bread, this kitchen helper holds a bagel while you cut with your hand safely away from the blade.

WOOD® CLASSIC PROJECT



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Note: *We sized our holder for the 4"-or-so bagels commonly available in our area. If you usually buy fatter, larger bagels, enlarge the pattern to fit them.*

Build the two body halves first

1 For each bagel slicer, cut four 1/8×5¾×8½" blanks for parts A and C, the inner and outer faces (we used maple), and two 5/8×5¾×8½" blanks for parts B, the body cores (we used cherry). Cut two pieces of ¾"-thick scrapwood the same size for clamping pads. You'll also need four 1 15/16" lengths of ⅜" cherry dowel rod.

2 Make two photocopies of the **full-size pattern**, which you'll find on *page 44*.

3 Glue up two laminations, each consisting of one thin blank (A) and one thick blank (B). Square the edges, and clamp the laminations between the scrapwood pads until the glue dries.

4 Unclamp the laminations, and fasten them together with double-faced tape, placing the 1/8"-thick faces together. Adhere a copy of the pattern to the stack, using rubber cement or spray adhesive.

5 Bandsaw slightly outside the pattern line. Follow the dotted line inside the throat. Using a drum sander, sand the throat area to the dotted line. You can sand slightly beyond the ends of the dotted line, but don't sand the rest of the edge yet. Remove the pattern, but do not separate the parts.

6 Tape the remaining 1/8"-thick blanks together, and adhere the remaining pattern to the stack. Bandsaw or scrollsaw around the solid pattern line, leaving the line.

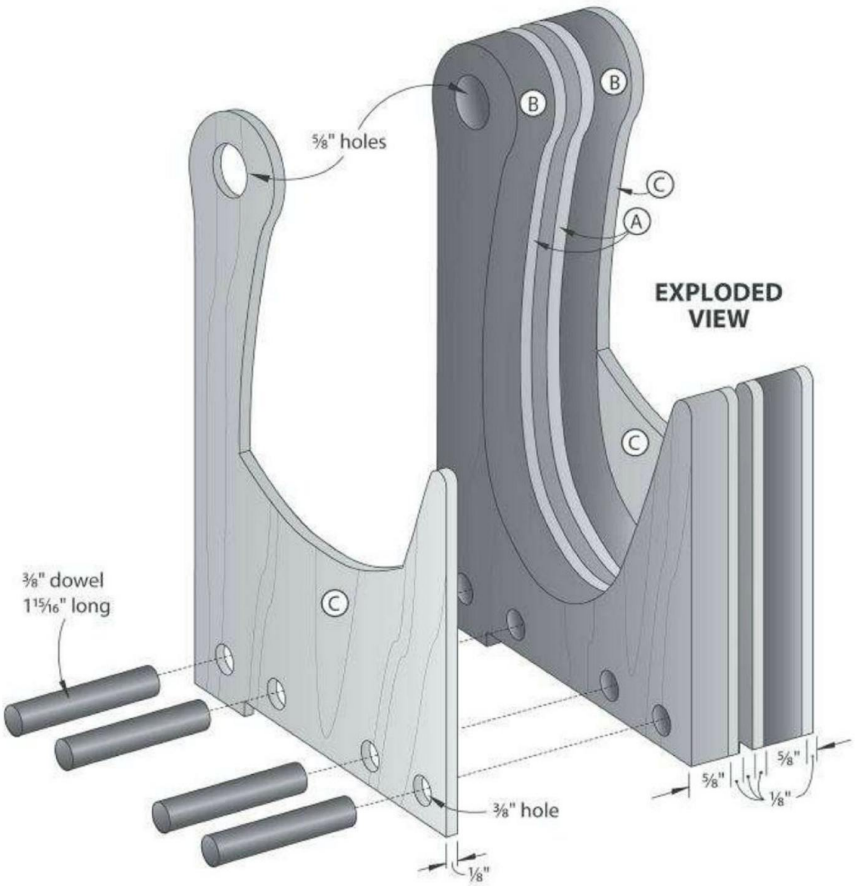
7 Separate the pieces, and glue them to the outside faces of the taped-together parts. Clamp them between scrapwood pads until the glue dries, then sand to the line.

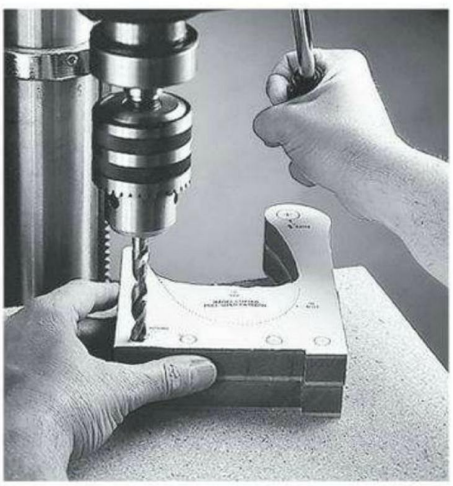
Now, put the halves together

1 Chuck a ⅜" bit (or the size that best matches your ⅜" cherry dowels) in your drill press, and drill the four holes along the bottom, shown *above left*. Change to a 5/8" Forstner bit, and bore the hole at the top of the handle.

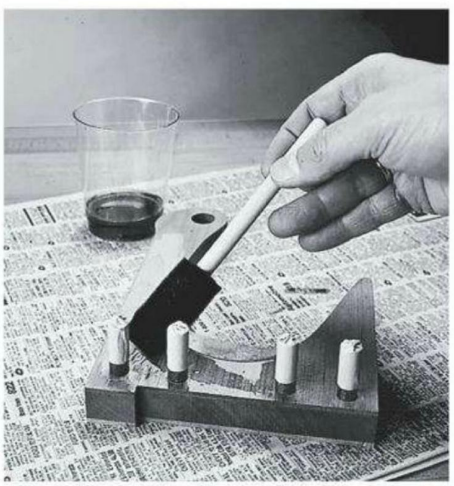
2 Remove the pattern. Separate the parts, and sand the inside face of each one smooth.

3 Glue the four dowels into the ⅜" holes in one laminated body half. Bring the ends flush with the body's outer face.





Drill through both body halves at once. This way, the sides will mate accurately.



Finish the inside faces before assembly. Mask the dowels for good glue joints.

4 It's easier to apply the finish to the inside faces and edges before final assembly. Mask about ¾" at the end of each dowel, then apply a clear oil finish as shown *above right*. On the other half, be careful not to get finish in the dowel holes. (You could stick wads of paper or cotton balls in the holes to protect them.) After the oil cures, spray on clear polyurethane for durability.

5 Allow the finish to dry, then remove the masking. Apply glue to the dowel ends, and slide the other body half onto them. Slip scraps of 1/8"-thick material between the halves to space them evenly.

6 Sand the dowel ends flush on both sides. Finish-sand the outside faces, and apply the oil and polyurethane as before.

Full-size pattern on page 44

Project Design: **Larry Johnston**
Illustrations: **Roxanne LeMoine; Lorna Johnson**

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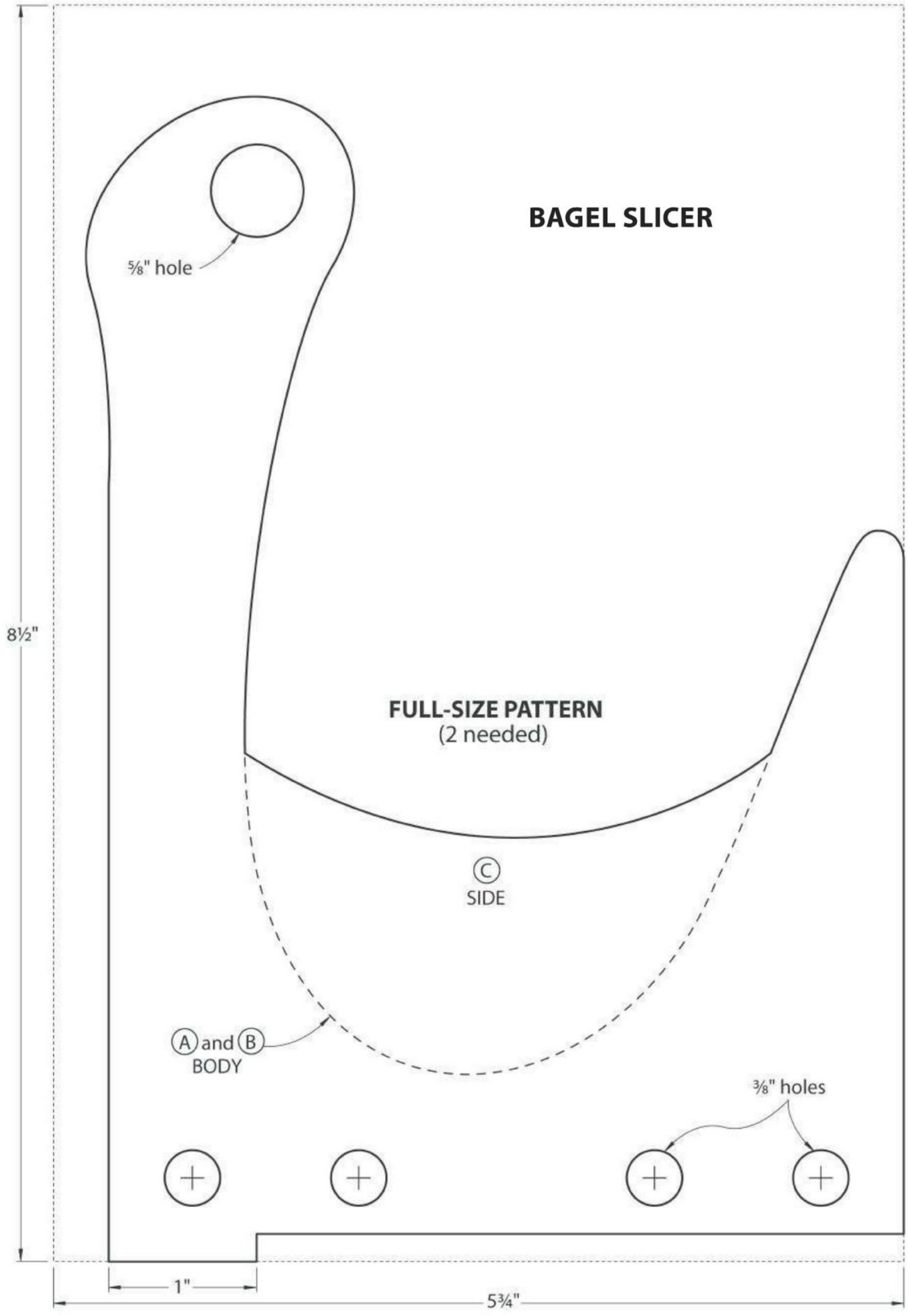


Measure and Mark for Better Accuracy

There's more to measuring and marking than stretching a tape across a board and drawing a pencil line. By using the right tools and accessories, you'll greatly improve your precision and even speed up your work. Fortunately, these improved results don't require fancy gizmos or staring through a jeweler's loupe.

Be sharp to make your mark

Let's focus first on the most basic item—what you mark with—and how it affects accuracy. The thick lead of a carpenter's pencil draws a line 1/16" wide, *below*. Cutting to one side of the line yields a far different result than cutting to the other side. Accurate layout of parts and joinery requires the fine line drawn by a pencil with a 5H lead, available at office-supply stores. The harder lead sharpens to a finer point and holds that point longer.

Save your carpenter's and no. 2 pencils for writing notes and marking machined surfaces, *below right,* where bolder marks are easier to spot at a glance, letting you know what operations are completed and which need to be done on a board.

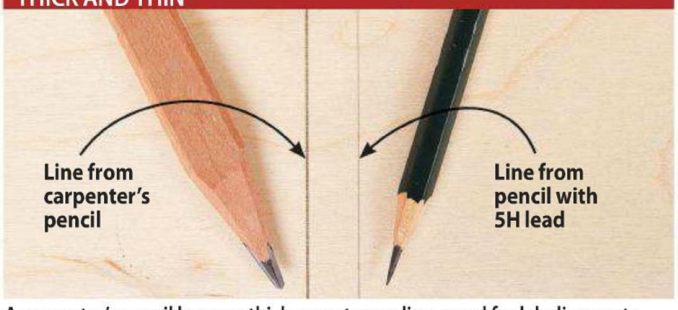
A pencil won't leave permanent marks on a workpiece; the marks erase or sand away easily. To avoid leaving a mark in the first place (such as when marking a finish-sanded part), apply a piece of masking tape and write on the tape.

When marking a line that will be cut away or hidden by other parts, switch to a marking knife, *above*. The beveled face and flat back of the knife put the cutting edge right next to a straightedge for a surgically precise mark. And a sharp marking knife severs the wood fibers, creating a shallow kerf—the ideal starting point to register the blade of a chisel or the teeth of a handsaw. The kerf creates a shadow, which is easier to see on the workpiece than a pencil line.

To use a marking knife, place a steel rule on the "keeper" piece and, with the flat face of the knife against the rule, draw the knife along. If the knife should stray off course, the mark ends up on the waste piece.

continued on page 46

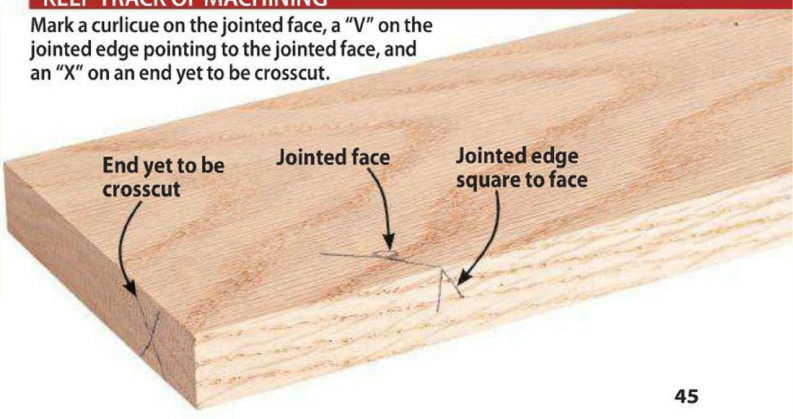
THICK AND THIN

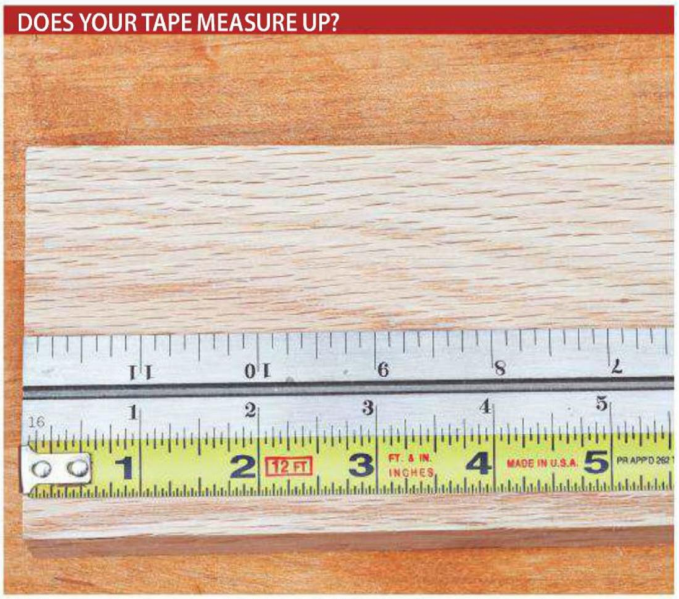


A carpenter's pencil leaves a thick, easy-to-see line, good for labeling parts. A 5H lead makes a much finer line for precise layouts.

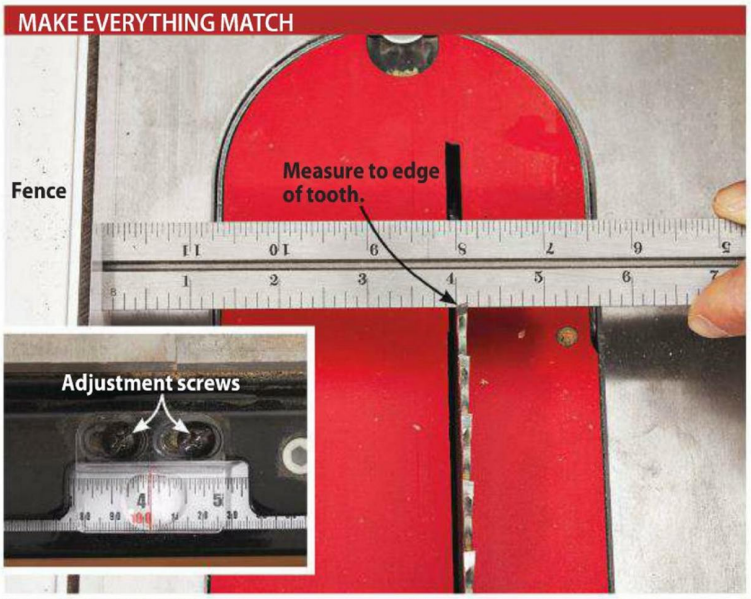
KEEP TRACK OF MACHINING

Mark a curlicue on the jointed face, a "V" on the jointed edge pointing to the jointed face, and an "X" on an end yet to be crosscut.





Markings on this tape perfectly match those on the steel rule, eliminating any error caused by switching between them. Check your tape occasionally to make sure a bent hook hasn't thrown off its accuracy.



Using your reference ruler, check the accuracy of the tablesaw rip-fence scale. Loosen the adjustment screws, adjust the indicator as needed, and then tighten the screws, making sure the indicator doesn't shift.

Establish a definitive rule

Every country has a bureau of standards, which maintains a set of incredibly precise measuring instruments against which other measuring devices are calibrated. Carry this concept into your workshop. Choose a precise, finely etched 12" steel rule for the bulk of your measuring tasks. A quality combination square provides not only a rule; the head, with 90° and 45° angles built in, increases the tool's versatility [see **Proving a square has the right angle**, *below*]. For measurements longer than 12", use only one 12' tape measure. Anything longer is just extra bulk to carry. And check the tape against the rule to make sure they agree, *above left*.

Now that you've established which rule rules the roost, make sure everything else in your shop agrees with it; for example, the rip-fence indicators on your bandsaw and tablesaw, *above*, and any other rulers. If other rulers don't measure up, relegate them to the house.

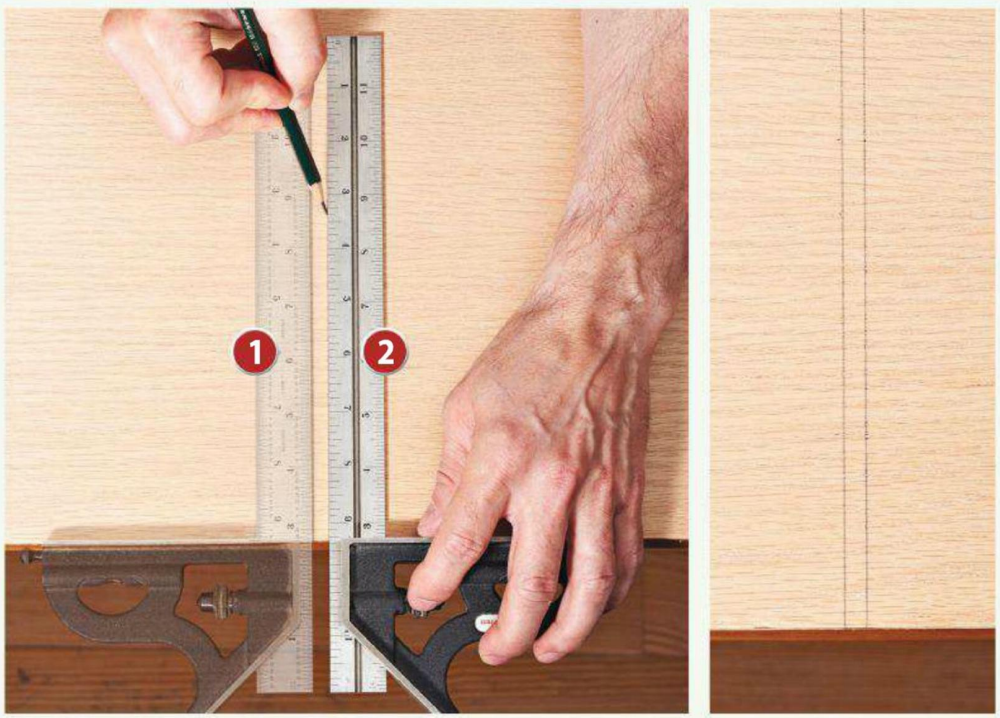
A metric rule can come in handy, too, especially if calculations with imperial dimensions give you a headache. For example, determining one-half, one-fourth, one-fifth, or three times 7⅞" brings out the pencil and paper compared with working with its metric equivalent, 20cm.

Proving a square has the right angle

Calling a tool a square doesn't *make* it square. To ensure that yours lives up to its billing, do this simple test with a piece of straight-edged scrap.

With the head of the tool to one side, draw a line the length of the blade. Flip the square and draw a second line next to the first. If the second line parallels the first, *far right*, the square is true. If the lines slant away from each other, the square needs adjustment or replacement.

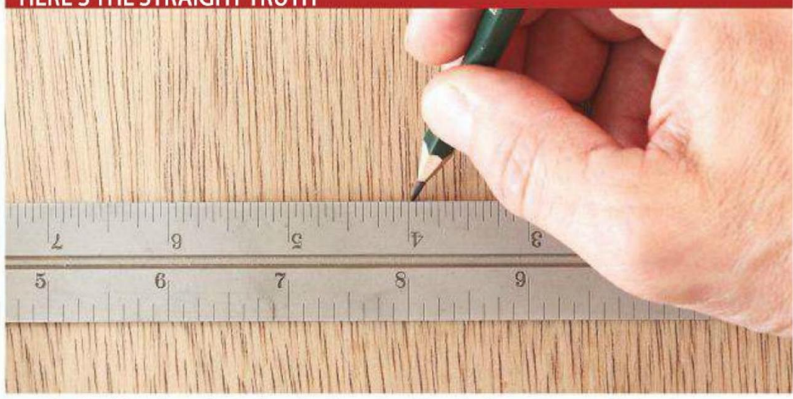
After determining that your square is square, protect it from drops and bumps that could compromise its accuracy.



LOOKS GOOD FROM HERE

From this angle directly above the head of the square, the pencil point appears to be exactly on the 4" mark…

HERE'S THE STRAIGHT TRUTH



…but looking down from directly above the 4" mark shows the pencil about 1/16" from the intended spot.

Put accurate tools to use

After choosing quality measuring and marking tools, use these simple techniques to get the most accurate results.

First, select reference edges and faces and measure from them as often as possible. For example, when laying out a series of drawer openings along a cabinet's stiles, always measure from the same end of each stile. After marking the locations, measure between the marks to double-check your accuracy.

When marking, make sure you sight straight down on the ruler. Working to one side throws off what appears to be an accurate mark, *above*.

To mark a dimension, draw a "V" extending from the ruler instead of a single tick mark. A single line can end up angled, causing confusion over which end is the real dimension. To extend a line or transfer it around an edge, place your knife or pencil on the tip of the "V" and gently slide your square or ruler up to it. Then use moderate pressure and draw the pencil or knife across the workpiece *once*. Repeated passes only widen the mark, reducing accuracy.

Maintain the proper orientation of nearly identical parts as you mark them by indicating which surfaces are the top, bottom, left, right, front, back, inside, and outside as needed. For several pieces needing identical layout marks, such as matching mortises in opposing table legs, save time and improve accuracy by clamping the pieces together and marking across all of them at once, *below left*.

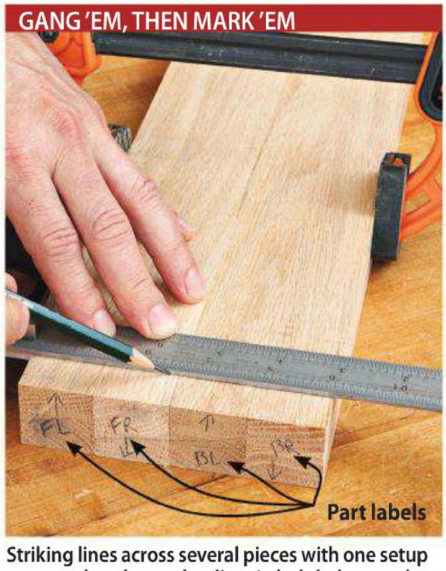
Finding the center of a workpiece is simple: Measure the width, then divide that number in half. To confirm your math, measure in that distance from each edge and make a mark, *below*. If the marks fall on top of each other, you've found dead center. If not, adjust the measurement by half of the amount between them and try again.

In some instances, the most accurate measurement comes from *avoiding* a ruler or tape. For example, when fitting a divider between two rails in a face frame, *bottom left*, measuring and then transferring that dimension to the workpiece invites at least two chances for error to creep in. Instead, place the workpiece against the opening and mark the dimension directly onto the workpiece.

Apply these methods to your work and watch the improvement.

Produced by **Craig Ruegsegger**

GANG 'EM, THEN MARK 'EM

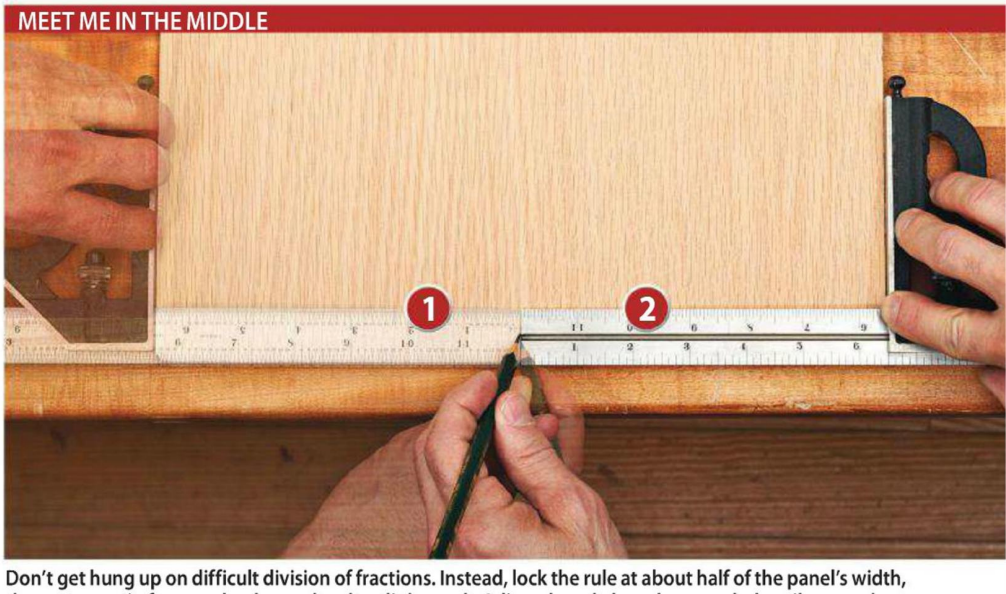


Striking lines across several pieces with one setup ensures that the marks align. Labels help you place the marks on the correct faces.

GET IT DIRECT

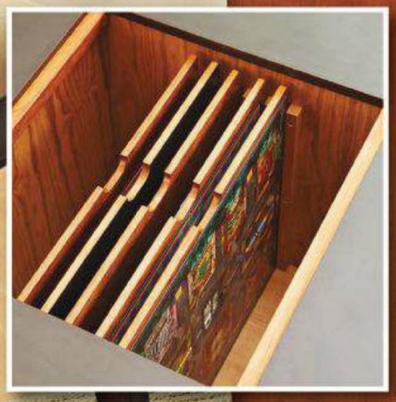
Rest a knife flat against the rail, then press the cutting edge against the workpiece. Use a square to help transfer the mark to the face.

MEET ME IN THE MIDDLE



Don't get hung up on difficult division of fractions. Instead, lock the rule at about half of the panel's width, then measure in from each edge and make a light mark. Adjust the rule length as needed until you end up with overlapping marks that confirm the center of the workpiece.

Store-it-all GAME TABLE



Let the games begin! And when the fun is done, organize the boards and playing pieces neatly inside.

Dimensions: 36"W × 36"D × 30 3/16"H
Approximate materials cost: $315

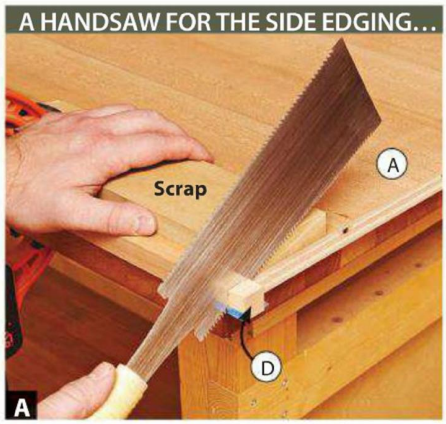
Hidden inside this table are five tabletop inserts with different game boards mounted to each of their faces, as shown in the inset *above*. A sixth insert, covered in matching laminate, provides a smooth surface for playing dominoes or cards, or using the table in typical fashion. Below, a drawer that pulls out either side of the table has compartments for storing playing pieces and accessories. If you've never applied laminate before, see **Add Some Glam with Plastic Laminate** on *page 54*.

Make the carcase first

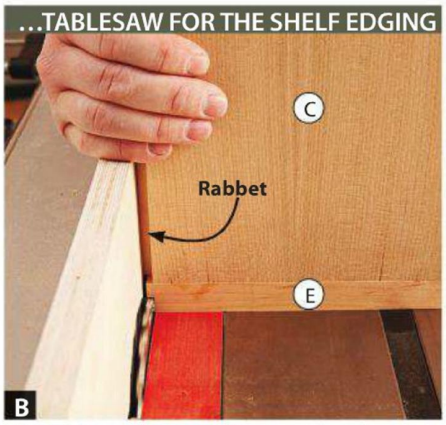
1 From ¾" cherry plywood, cut the sides (A), front and back (B), and shelves (C) to size [**Drawing 1**]. Mount a ¼" spiral downcut bit in your router and attach an edge guide. (See **Quick and Easy Jig** on *page 14*.) Rout the ¼"-deep dadoes across the sides.

2 Mill the side edging (D) and shelf edging (E) to thickness and width, and crosscut each piece ½" longer than the panel it bands. Set the edging aside for the moment.

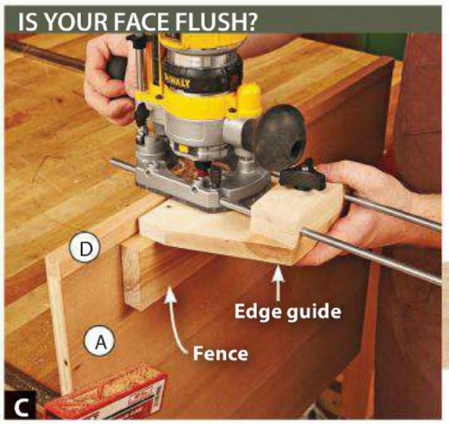
3 Set up a ⅜" dado blade in your tablesaw and attach an auxiliary face to the rip fence. Position the fence and raise the blade ½" into the auxiliary face to expose ¼" of the blade. With this setup, cut a ½"-deep rabbet on a ¾" plywood scrap and test the fit of the remaining tongue in a dado in a side (A). Adjust the blade height and fence position as needed, then cut rabbets along the edges and the bottom end of the front and back (B), and the edges of the shelves (C) [**Drawing 1**]. Save the tablesaw setup.



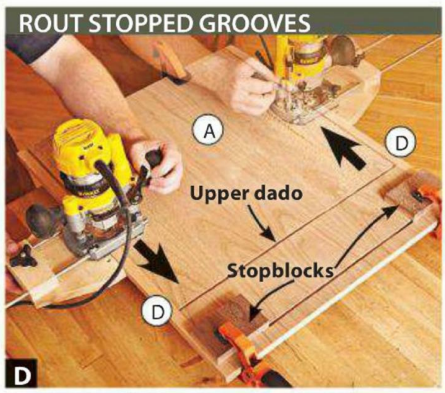
A scrap with a square end helps guide the saw, and painter's tape around the bottom face of the side edging (D) prevents chip-out.



The tablesaw fence setting saved earlier trims the shelf edging (E) perfectly flush with the rabbet in the shelf (C).



The fence on the edge guide steadies the router while trimming the side edging (D) flush with the face of the side (A).



Position stopblocks to prevent routing the grooves past the upper dado in the sides (A). Rout in the directions shown.

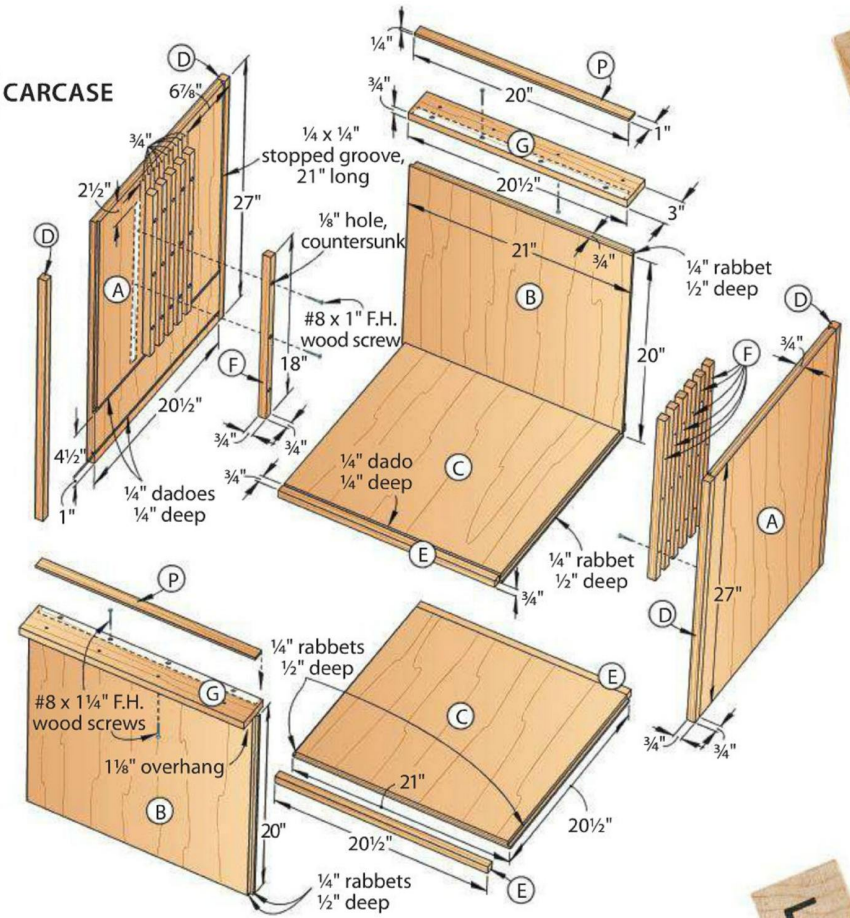
4 Glue the side edging (D) and shelf edging (E) to the sides (A) and shelves (C), flush to the inside face of each panel [**Shop Tip,** *below*]. After the glue dries, trim the side edging (D) flush with the ends of the sides using a handsaw [**Photo A**]. Raise the dado blade in your tablesaw to match the thickness of the shelf edging (E) and trim the edging flush with the rabbets [**Photo B**].

5 Mount a flush-trim bit in your hand-held router and install the fence on the router edge guide. Set the bit's bearing flush with the face of the fence, then trim the side edging (D) and shelf edging (E) flush with the outside faces of the sides (A) and shelves (C) [**Photo C**].

6 Remove the fence from the edge guide and install a ¼" spiral downcut bit. Set the edge guide to rout a groove in the sides (A) along the joint with the edging (D) [**Drawing 1**]. Clamp two stopblocks to the sides to stop the groove at the upper dado, then rout along each edging [**Photo D**]. With this same setup, rout the grooves on the upper shelf (C/E) [**Drawing 1**]. Finish-sand the inside faces of the sides to 220 grit.

7 Cut twelve cleats (F) to size [**Drawing 1**], then set them aside. Dry-fit a

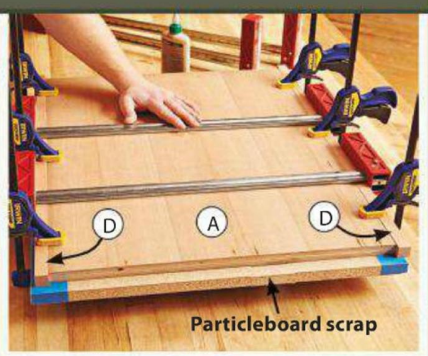
1 CARCASE

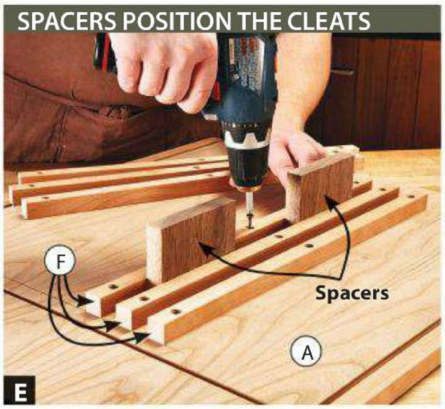


SHOP TIP

Start with one face flush

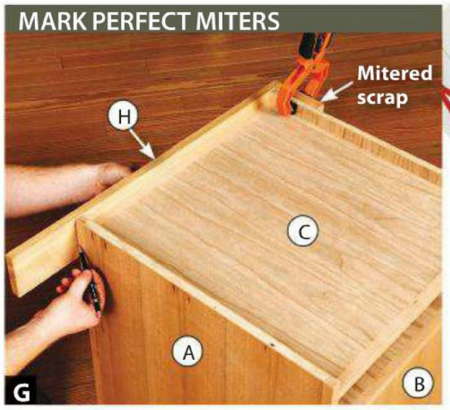
When gluing edging (D, E) to a panel, such as the sides (A) or shelves (C), here's how to ensure that one face of the edging starts out flush with the panel, so you only need to flush-trim the opposite face. First, apply strips of painter's tape along the edges of a flat scrap of sheet goods as wide as the edged panel. (This prevents the workpieces from being glued to the scrap.) After gluing and loosely clamping the edging to a panel, clamp the assembly to the scrap, *right,* then tighten the clamps across the edging.





After screwing the first cleat (F) in place, fit each successive cleat against two ¾"-thick scraps to space them equally.

A dry fit reveals any joints that need fine-tuning before glue-up. Risers create room for clamp heads below the carcase.



Clamp a mitered scrap to the carcase to register the mitered corner of the base trim (H). Mark the heel of the opposite miter.

shelf (C/E) in the upper dado in each side (A/D) and mark the location of the shelf's top face on each side. Set the shelf aside and install the cleats with one end flush with this line [**Drawing 1, Photo E**]. Finish-sand the sides (A/D/F), front and back (B), and shelves.

8 Before assembling the carcase, dry-fit its pieces [**Photo F**]. If all pieces fit well, glue the front and back (B) in the grooves in the upper shelf (C/E). Glue this U-shaped assembly (B/C/E) to one side (A/D/F). Then glue the lower shelf to the side, and the remaining side to this assembly.

9 Cut the top stretchers (G) to size [**Drawing 1**]. Glue and screw them to the top of the front and back (B), overhanging the outside faces by 1⅛".

Add a base

1 Cut the base trim (H) at least 1" longer than listed [**Drawing 2**]. Miter one end of a piece of base trim and of a ¾"-thick scrap. Flip the carcase (A–G) upside down and, using the scrap to help position a piece of base trim, mark the opposite end of the trim [**Photo G**]. Miter the trim, clamp it to the carcase and work your way around, mitering the remaining base trim. Mark each piece's location, then remove the trim.

2 Lay out the cutout on one piece of base trim (H) [**Drawing 2**], and bandsaw and sand it to shape. Trace the profile from this piece onto the three remaining pieces of base trim. Bandsaw them within 1/16" of the line, then flush-trim them to shape [**Photo H**]. Rout a ⅜" chamfer along the top edge of each trim piece, then finish-sand the base trim.

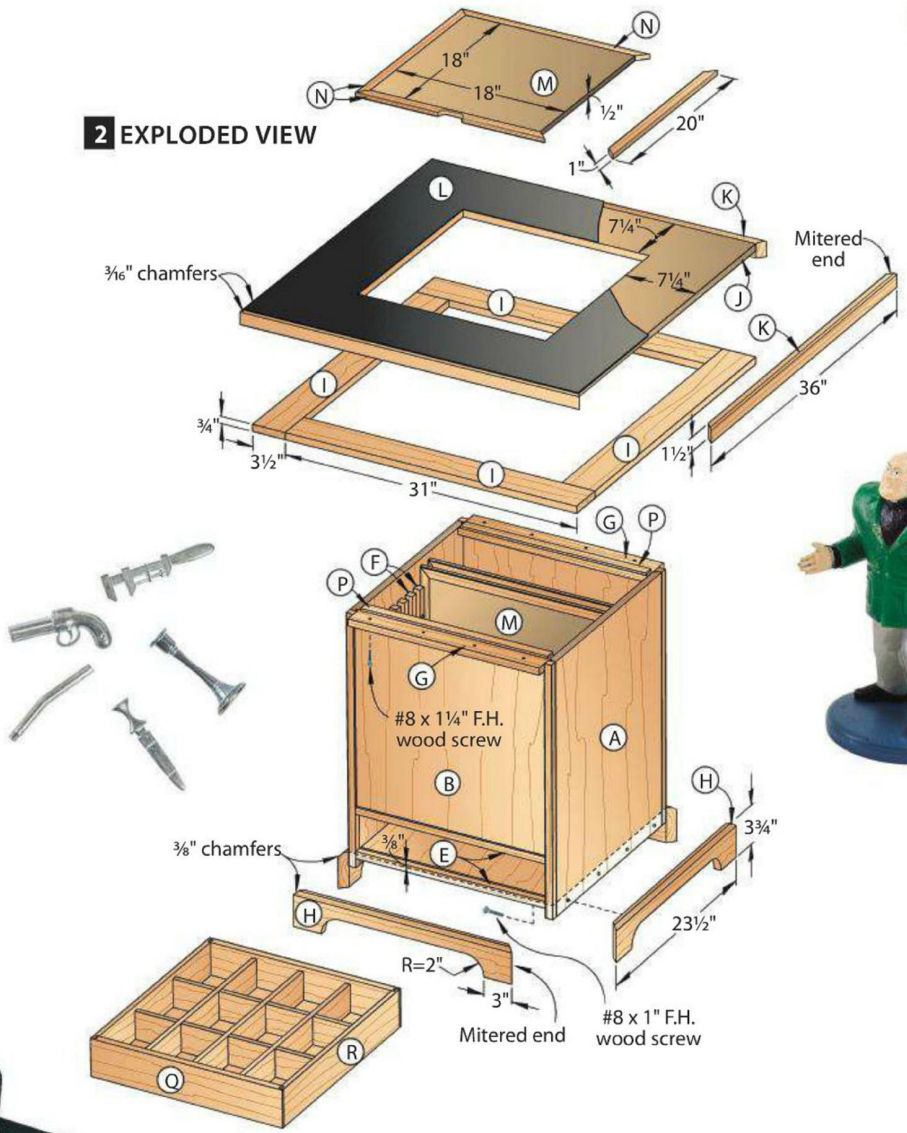
3 Glue the base trim together. After the glue dries, glue and screw this assembly to the sides (A/D) and shelf edging (E) [**Photo I**].

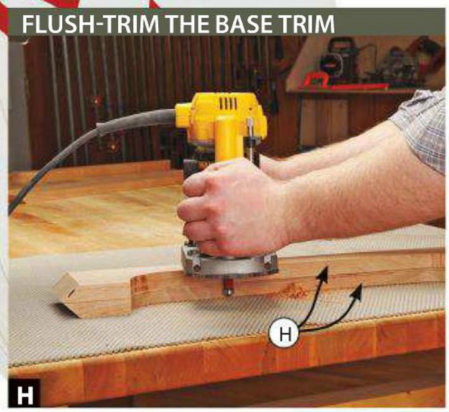
Build a slick tabletop

1 From ¾"-thick cherry, cut the supports (I) to size [**Drawing 2**]. Glue them together in the configuration shown. Sand the edges and faces, checking for smooth joint lines.

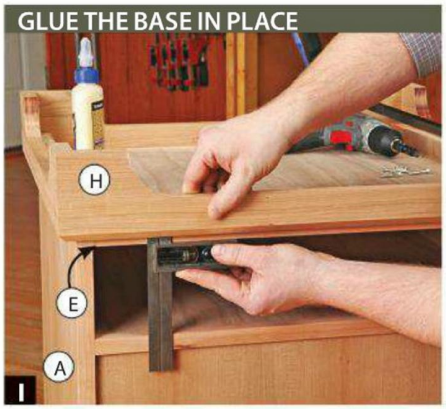
2 Cut the substrate (J) to 35×35" and glue and clamp it to the supports (I) overhanging all four sides. After the glue dries, flush-trim the substrate to the supports [**Photo J**].

3 Lay out the opening for the game-board insert by drawing lines on the substrate (J) 7¼" from each edge [**Drawing 2**]. Jigsaw inside this area within 1/16" of the line. Mount a ⅜" bushing in your



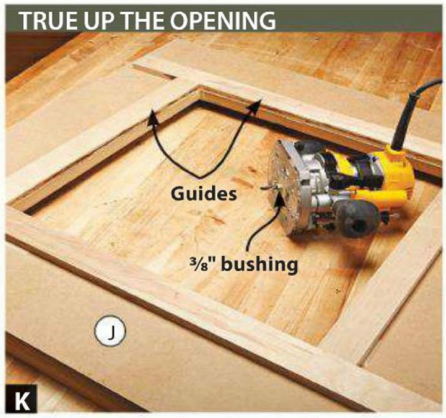


After shaping the profile on one piece of base trim (H), use it as a guide to flush-trim the profile on the remaining pieces.

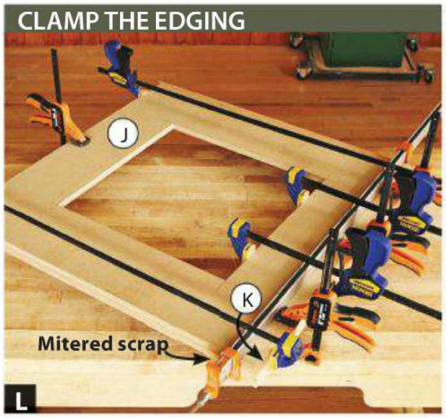


Apply glue to the base trim (H), then position the assembly ⅜" below the top of the shelf edging (E). Clamp it in place and drive screws from the inside.

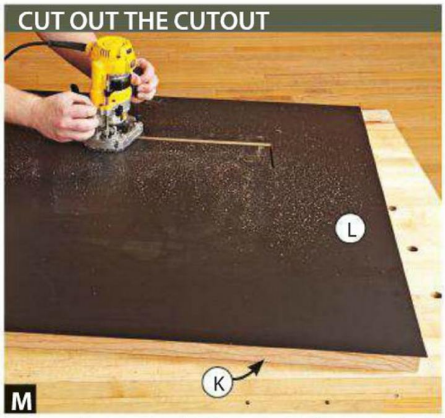
With a flush-trim bit in your router, trim the substrate (J) even with the edges of the supports (I). Sand the routed edges smooth, if needed.



Double-faced-tape 3"-wide guides 1/16" outside the layout lines, check that the guides are square, and trim the opening.



Glue and clamp one piece of tabletop edging (K) at a time, using a mitered scrap to help position it. Keep the tops of the edging and substrate (J) flush.



Plunge the rotating bit through the laminate above the opening. Move the bit to contact the substrate (J), then rout around the opening.

router's subbase and chuck in the ¼" spiral downcut bit. Rest the tabletop (I/J) on spacers to provide clearance for the router bit [**Photo K**], position guides to guide the bushing, and rout the opening.

4 Cut the tabletop edging (K) 37" long; then, using the same procedure as used on the base trim (H), miter it to fit around the tabletop (I/J). Finish-sand the edging, then glue and clamp it in place [**Photo L**].

5 Cut a piece of plastic laminate (L) to 37×37". (We chose a matte-finish, standard-grade laminate in black. See *page 54* for more on working with laminate.) Apply contact cement to the top face of the substrate (J) and tabletop edging (K), and the underside of the laminate. Allow the adhesive to dry per the instructions on the container. Space dowels 6–8" apart on the substrate and rest the laminate on them. Then, one by one, pull the dowels out, pressing the laminate to the substrate. For a secure bond, apply firm pressure to the laminate with a roller.

6 Use a panel-pilot bit (see *page 54*) to trim away the laminate (L) in the center opening of the tabletop [**Photo M**]. To prevent burning the edging (K), switch to a bearing-guided flush-trim bit and trim the laminate around the perimeter. Next, chuck a chamfer bit in your router and rout a 3/16" chamfer around the top outside edges of the tabletop [**Drawing 2**].

Make and fit the inserts

1 Cut six inserts (M) to size [**Drawing 2**]. As you did on the base trim (H) and tabletop edging (K), miter-cut insert edging (N) to fit around each insert, and glue it in place. Test the fit of each insert in the cutout; trim all four edges at the tablesaw as needed until the insert drops in easily but doesn't move around.

2 Lay out the fingerhold in the insert edging (N) of one insert [**Drawing 3**], bandsaw and sand it to shape, then use it as a pattern to lay out and flush-trim the remaining fingerholds. Rout 1/16" round-overs around both faces of the insert edging (N) on five inserts and around only one face on the sixth. Finish-sand both faces of each insert.

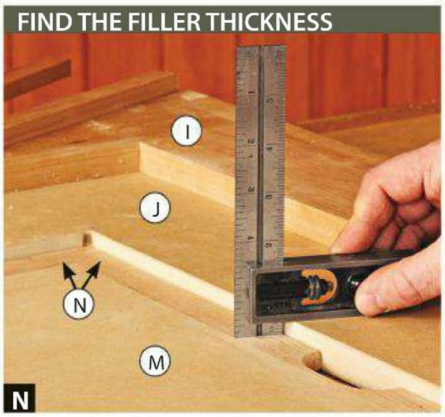
3 Cut the insert laminate (O) to 21×21", adhere it to the insert face without round-overs, and trim it flush.

4 Place the tabletop (I–L) upside down on your bench and place an insert (M/N) in the cutout. Measure the distance between their faces [**Photo N**]. Plane two fillers (P) to this thickness and set them aside.

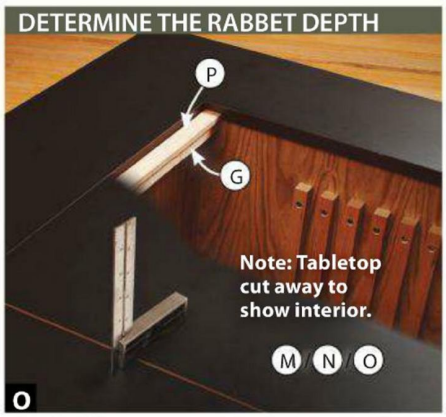
5 Place the tabletop (I–L) on the carcase (A–H), place the fillers (P) in the cutout, and place the laminated insert (M–O) in the cutout [**Photo O**]. Measure how far the insert sits above the surrounding tabletop. Cut rabbets to this depth on the opposite side of the insert where it rests on the fillers. If needed, trim the fillers to width so they sit flush with the edges of the top stretchers (G).

6 Place the tabletop (I–L) upside down on your bench and center the carcase (A–H) on it. Drill pilot holes through the top stretchers (G) into the bottom face of the supports (I) and screw the tabletop in place [**Drawing 2**]. Stand the assembly upright and glue the fillers (P) to the top stretchers and snug to the substrate (J). Remove the tabletop.

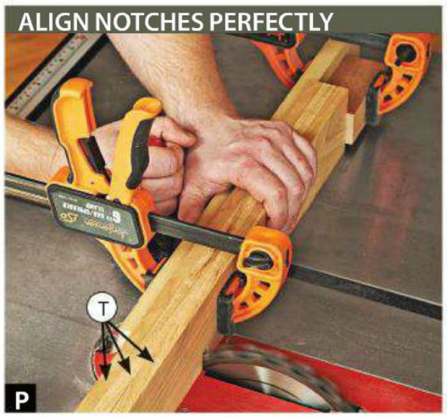
7 Mask off the laminate, the top ends of the sides (A), and the top faces of the top stretchers (G) with painter's



Use a combination square to measure the difference in thicknesses between the insert (M/N) and the tabletop (I–L).



With the filler strips (P) under the laminated insert (M–O), measure to determine how deep to rabbet the opposite face so it sits flush.



To cut evenly spaced notches, clamp a stopblock to a miter-gauge fence and flip the dividers end for end after cutting the first notch.

tape. Apply a stain and finish to the carcase, tabletop (including the edges of the cutout in the substrate), and inserts. (We stained with General Finishes' Antique Cherry, then applied two coats of General Finishes' satin-finish water-based polyurethane.)

8 After the finish dries, remove the tape, and glue and screw the tabletop (I–L) to the carcase (A–H). Use double-faced tape to attach the game boards to the inserts, one on each face, if desired.

A drawer for game pieces

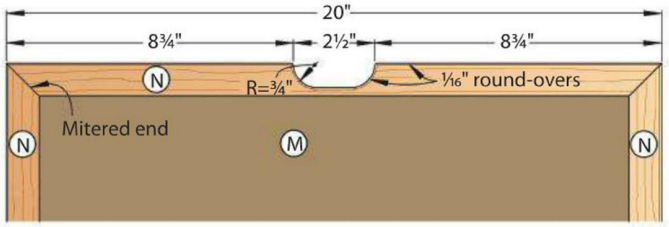
1 Cut the drawer front and back (Q) ⅛" shorter than the width of the opening in the carcase (A–L/P) **[Drawing 4]**. ***Note:*** *The drawer front and back are both visible, so choose attractive grain for these pieces.* Cut the drawer sides (R) ½" shorter than the depth of the drawer opening. Following the steps in **Drawing 5**, cut the lock-rabbet joints and the grooves for the drawer bottom (S).

2 Dry-fit the drawer parts (Q, R) and cut the drawer bottom (S) 7/16" longer and wider than the drawer's interior dimensions. Glue up the drawer with the bottom.

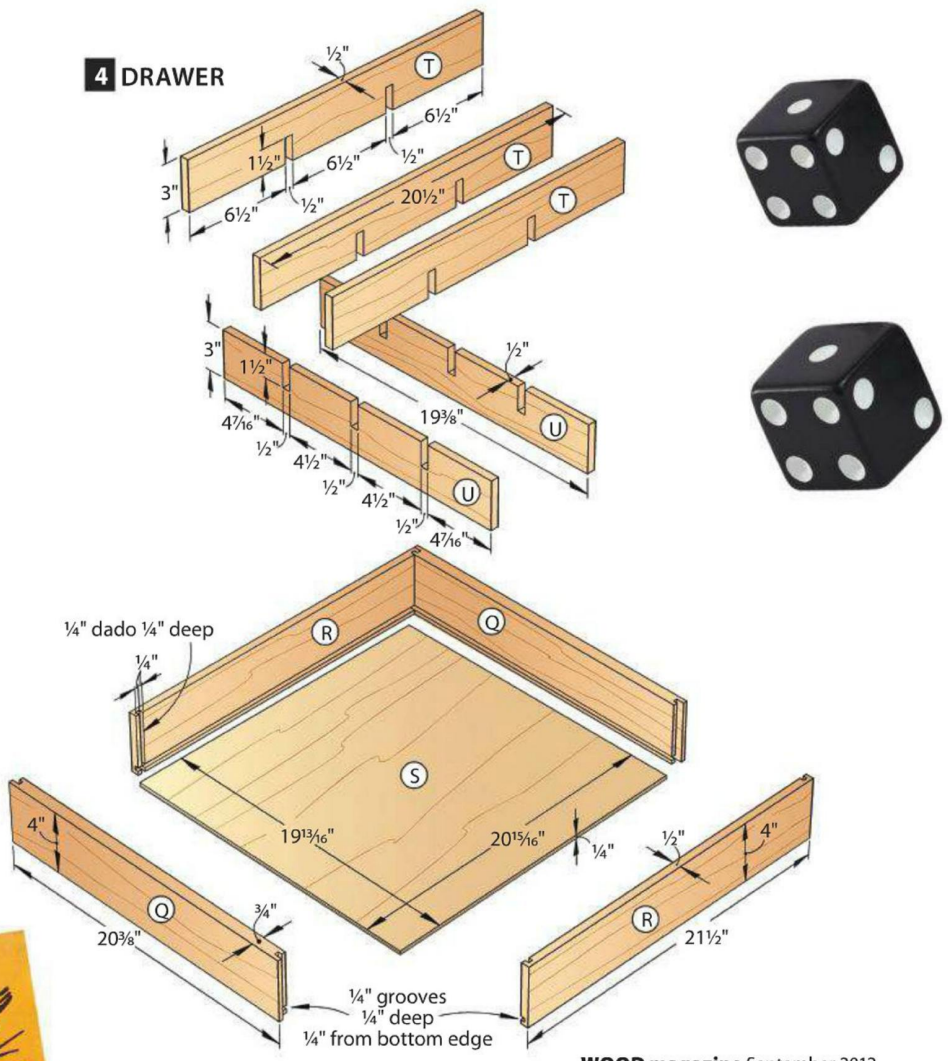
3 Cut three long dividers (T) to fit between the drawer front and back (Q), and two short dividers (U) to fit between the drawer sides (R) **[Drawing 4]**. Set up a ½" dado blade in your tablesaw, clamp a stopblock to an auxiliary miter-gauge fence, and cut the slots in each set of dividers **[Photo P]**.

4 Apply a stain and finish to the dividers (T, U) and drawer (Q–S). After the finish dries, dry-fit the dividers together, then place this assembly in the drawer. Slide the drawer into the carcase and get ready for a great time on your next game night.

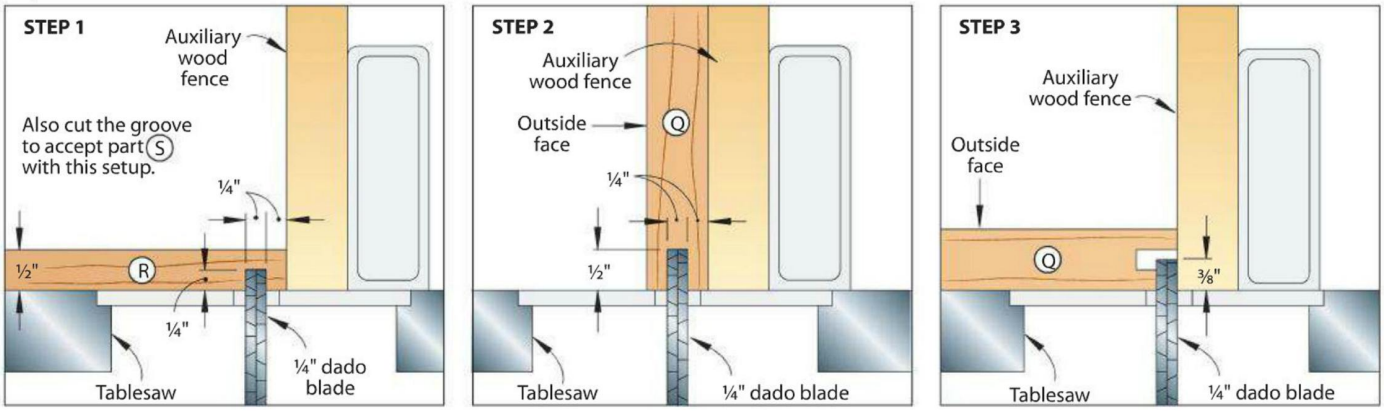
3 INSERT DETAIL



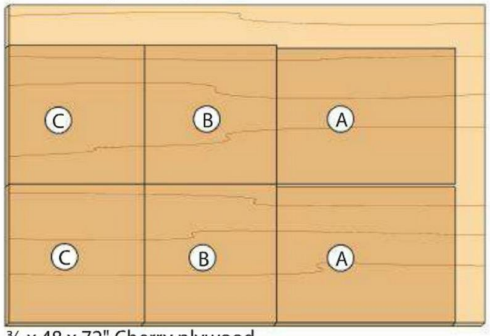
4 DRAWER



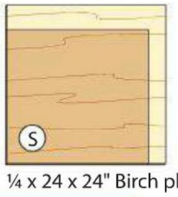
5 HOW TO CUT A DRAWER LOCK-RABBET JOINT IN 3 QUICK STEPS



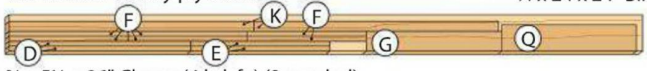
Cutting Diagram



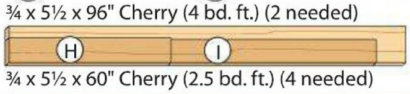
¾ x 48 x 72" Cherry plywood



¼ x 24 x 24" Birch plywood

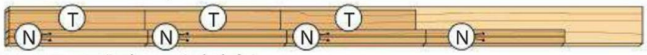


¾ x 5½ x 96" Cherry (4 bd. ft.) (2 needed)

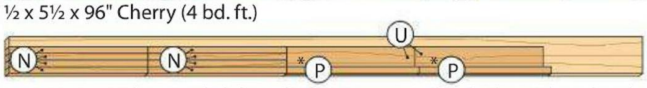


¾ x 5½ x 60" Cherry (2.5 bd. ft.) (4 needed)

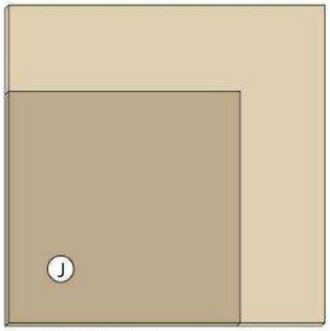
½ x 5½ x 96" Cherry (4 bd. ft.)



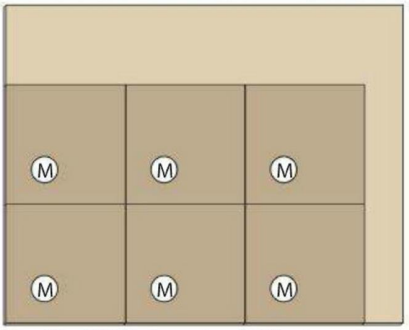
½ x 5½ x 96" Cherry (4 bd. ft.)



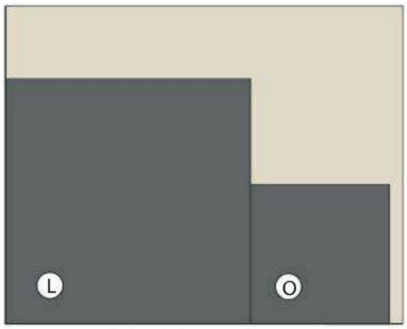
½ x 5½ x 96" Cherry (4 bd. ft.) *Plane or resaw to the thickness listed in the Materials List.



¾ x 48 x 48" Medium-density fiberboard



½ x 48 x 60" Medium-density fiberboard



1/16 x 48 x 60" Plastic laminate

You can quickly and easily order the following router bits needed for this project at woodmagazine.com/213gamebits. Before checkout, simply delete from the order any of the bits you already have on hand:

- **¼" spiral downcut (¼" shank)**
- **½" flush-trim (½" shank)**
- **Panel-pilot (¼" shank)**
- **1/16" round-over (¼" shank)**

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
Carcase						
A	sides	¾"	20½"	27"	CP	2
B	front/back	¾"	21"	20"	CP	2
C	shelves	¾"	21"	20½"	CP	2
D*	side edging	¾"	¾"	27"	C	4
E*	shelf edging	¾"	¾"	20½"	C	4
F	cleats	¾"	¾"	18"	C	12
G	top stretchers	¾"	3"	20½"	C	2
H*	base trim	¾"	3¾"	23½"	C	4
Tabletop						
I	supports	¾"	3½"	31"	C	4
J*	substrate	¾"	34½"	34½"	MDF	1
K*	tabletop edging	¾"	1½"	36"	C	4
L*	tabletop laminate	1/16"	35⅝"	35⅝"	L	1
M	inserts	½"	18"	18"	MDF	6
N*	insert edging	½"	1"	20"	C	24
O*	insert laminate	1/16"	20"	20"	L	1
P	fillers	5/16"	1"	20"	C	2
Drawer						
Q	front/back	¾"	4"	20⅜"	C	2
R	sides	½"	4"	21½"	C	2
S	bottom	¼"	19 13/16"	20 15/16"	BP	1
T	long dividers	½"	3"	20½"	C	3
U	short dividers	½"	3"	19⅜"	C	2

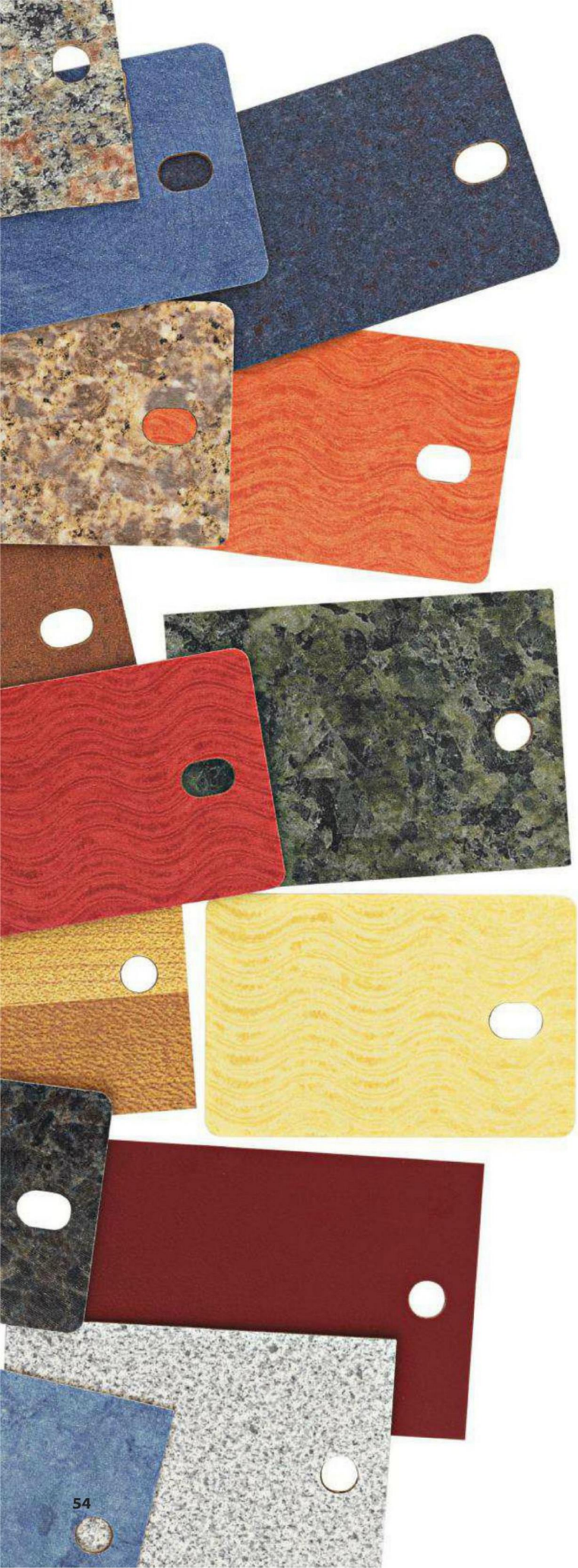
*Parts initially cut oversize. See the instructions.

Materials key: CP–cherry plywood, C–cherry, MDF–medium-density fiberboard, L–plastic laminate, BP–birch plywood.
Supplies: Double-faced tape, #8x1" flathead wood screws (44), #8x1¼" flathead wood screws (16).
Blade and bits: Dado blade; ¼" spiral downcut, flush-trim, panel-pilot, 1/16" round-over, 45° chamfer router bits; ⅛" drill bit.

Produced by **Craig Ruegsegger** with **John Olson**
Project design: **Kevin Boyle**
Illustrations: **Lorna Johnson**

More Resources

▶ Free for a limited time: To watch a video on handling sheet goods easily go to **woodmagazine.com/sheetgood**.



Add Some "Glam" with Plastic Laminate

Give any surface a blast of personality using the skills you have now.

Colorful, durable, and easy to apply, plastic laminate transforms any project's appearance. Make a medium-density fiberboard (MDF) tabletop look like granite or quartz. Use light-colored laminate to brighten the interior of a cabinet, or add eye-catching color to children's furniture. Here's what you need to know to apply this versatile covering.

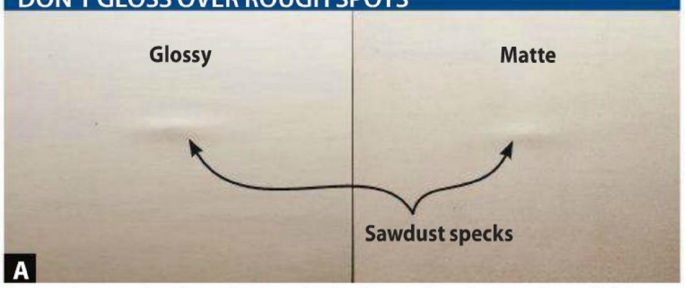
Laminate 101

Buy plastic laminate from a home center, countertop fabricator, or cabinet shop. The two most common grades, standard (.050" thick) and post-forming (.042" thick), work well for countertops, tabletops, and shelving. (When heated, post-forming grade can be flexed around curved edges.) Vertical grade is thinner (.030") and more likely to chip, dent, or crack, so avoid it.

As you choose from almost limitless colors and patterns, keep in mind that solids and dark shades show scratches more readily than patterns and light colors. A glossy finish also emphasizes blemishes [**Photo A**].

Laminate comes in 3'-, 4'-, and 5'-wide sheets up to 12' long and ships rolled up in a coil about 2' across. You may want a helper to assist you as you unroll it the first time to keep it from springing open uncontrolled.

DON'T GLOSS OVER ROUGH SPOTS



Same-size specks of sawdust under laminate show how a glossy finish reveals a tiny bump that a matte finish downplays.

What lies beneath

Plastic laminate requires a smooth substrate, such as MDF or high-density particleboard, because any texture or irregularities in the substrate surface telegraph through [**Photo B**]. Find either material at home centers.

After cutting the substrate to size, give the faces and edges a quick once-over with 150-grit sandpaper on a sanding block to remove any nubs; then vacuum the surface. Also, clean your worksurface to remove debris that could stick to the adhesive and end up under the laminate.

Cutting laminate

Because it's made of paper pressed together with resins, plastic laminate cuts easily using one of several methods. Precision isn't required because you cut the laminate oversize, and then trim it flush after adhering it to the substrate. Just work carefully to avoid unintended cracks or chipping.

For small pieces, curved cuts, or interior cuts, use tin snips [**Photo C**]. Make straight cuts by scoring the laminate with a utility knife guided along a straightedge [**Photo D**]. Use this method when the cutline doesn't run parallel to an edge or to cut a large sheet down to a size manageable on the tablesaw.

To cut laminate on your tablesaw, use a sharp 60-tooth alternate-top bevel (ATB) blade and install a zero-clearance insert in your saw [**Photo E**]. Place the good face of the laminate up to reduce chip-out, and press the laminate firmly to the table to prevent it from chattering during the cut.

ROUGH PLYWOOD MAKES WAVES

B

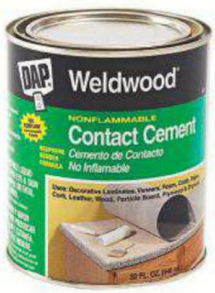
Laminate won't smooth out a less-than-perfect substrate. The ripples in this plywood transferred through to the surface.

Using contact cement

To join plastic laminate to a substrate, choose a water-based contact cement, *below*. You'll find it at home centers and hardware stores. Solvent-based adhesive poses a greater fire risk than water-based, but it dries in less than half the time, so professional shops choose it to speed assembly. We prefer water-based cement because of the reduced fire hazard, lower odor, and easy cleanup.

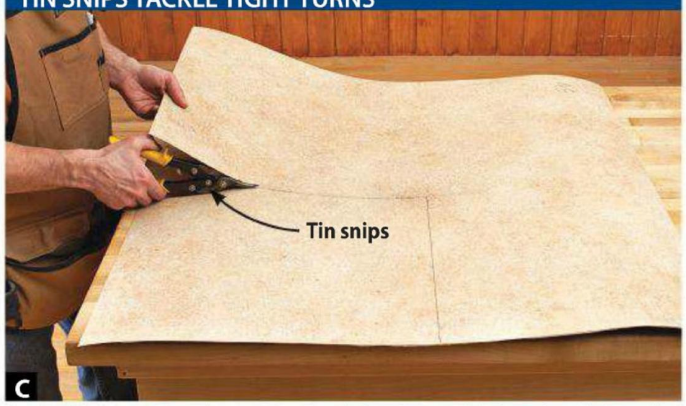
Contact cement works differently than wood glue. Instead of coating one or both pieces, then joining them *before* the glue dries, with contact cement you coat both pieces, then wait until the adhesive dries to the touch (about 30–60 minutes for water-based cement).

As the name says, it bonds on contact—you get one chance to position the pieces correctly. For that reason, cut the plastic laminate about 1" longer and wider than the substrate it will cover (½" for edging) to provide some "fudge factor." After pressing the laminate to the substrate, assure a good bond by applying pressure with a hand roller. Then trim the excess laminate with a flush-trim bit in your router. Keep the bit moving to avoid marring the laminate.



Identify water-based contact cement by the words "nonflammable," "waterborne," or "water-based" on the label.

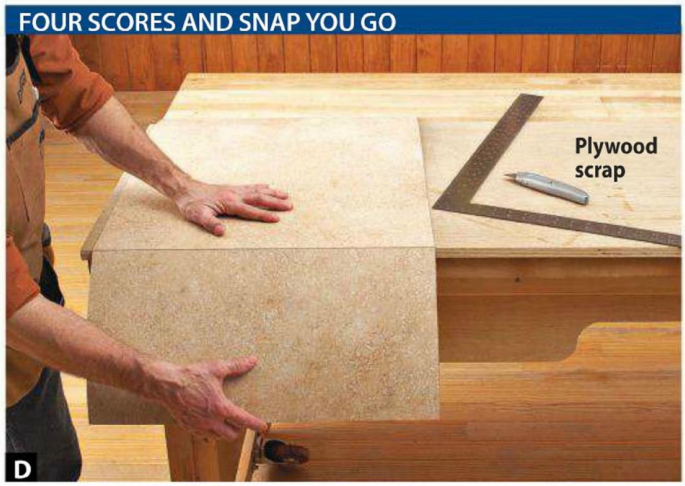
TIN SNIPS TACKLE TIGHT TURNS



C

Cut inside corners and curves in plastic laminate with tin snips. Lift gently on one side to create room to use the snips.

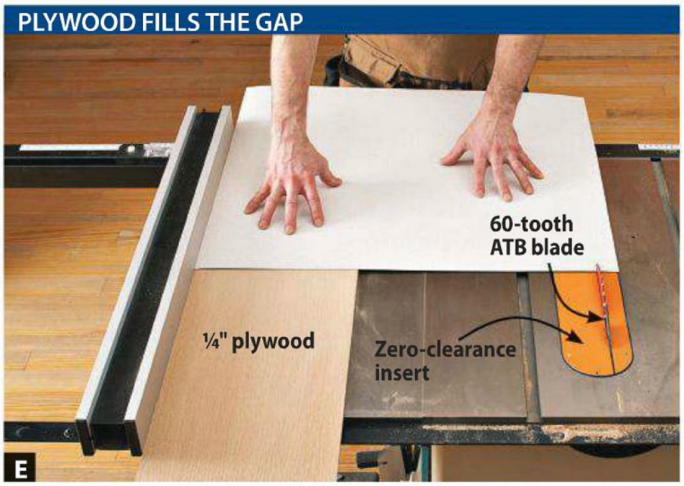
FOUR SCORES AND SNAP YOU GO



D

Draw a sharp utility-knife blade along a straightedge several times, then flex the scored line over the sharp edge of a piece of plywood.

PLYWOOD FILLS THE GAP



E

To prevent the laminate from sliding under your saw's rip fence, adhere a strip of ¼"-thick plywood to the table next to the fence.

Give yourself an edge

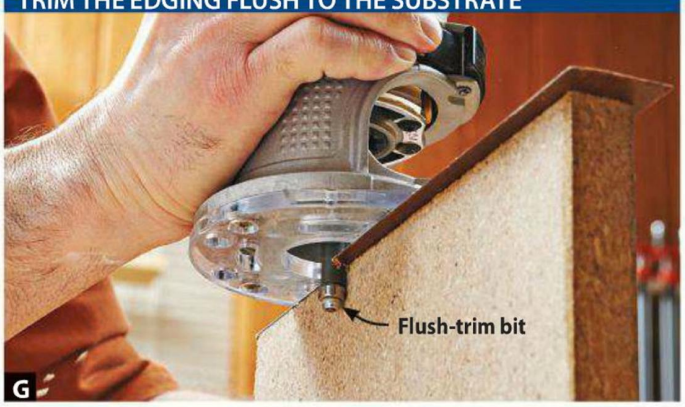
The edges of the substrate need covering first (with one exception as noted under **Step up your edging**, *below*), typically with plastic laminate or wood. The top laminate overlaps the edging, preventing dirt or liquids from getting behind it.

When applying laminate to the edges, the first pair of opposite edges covered will show dark, narrow lines on each end when you finish; the other two will not. So on a shelf, for example, apply and flush-trim the end edging first [**Photos F, G**]. The dark ends of the two remaining pieces of laminate [**Photo H**] face the ends of the shelf, hidden from view. After flush-trimming the edging, sand the top surface [**Photo I**] before applying laminate to the top.

COVER THE SHORT EDGES FIRST

A spacer below the substrate allows room for the over-width edging to extend past the bottom face. Roll the edging firmly after application.

TRIM THE EDGING FLUSH TO THE SUBSTRATE



Use a flush-trim bit in your router to remove the excess laminate. A trim router is perfectly sized for this job.

LAMINATE THE LONG EDGES LAST

Position the two remaining pieces so they extend past the end edging. Roll the edging firmly; then trim it flush.

SAND LIGHTLY IN ONE DIRECTION

Using 180-grit sandpaper on a block, sand from the laminate toward the substrate, removing excess adhesive and smoothing any uneven edges.

Step up your edging

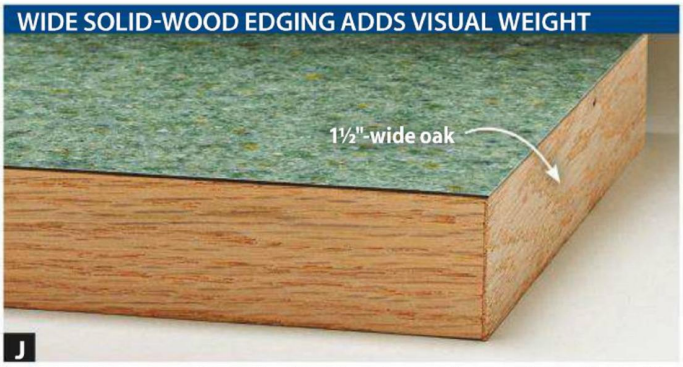
Adding wood edging instead of, or in addition to, laminate creates numerous options for dressing up a panel.

Wood-only edges: Add the edging before the laminate to leave only the front and bottom faces of the wood visible [**Photo J**]. Sand the top of the edging flush with the substrate before applying the top laminate.

Add wood edging *after* the top laminate to create a fully exposed profile [**Photo K**]. Finish-sand this edging before applying it to avoid scarring the laminate.

Wood-and-laminate edges: For a routed profile that reveals a decorative strip of wood along the top edge [**Photo L**], glue the wood edging to the substrate, apply laminate over the edging,

WIDE SOLID-WOOD EDGING ADDS VISUAL WEIGHT

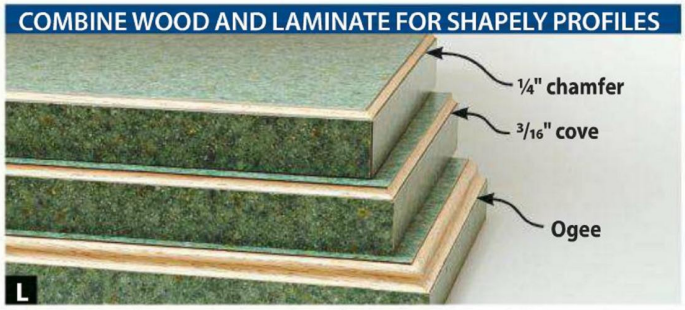


Wood edging looks nice and resists dings better than laminate. Mask off the laminate with painter's tape before applying finish to the wood.

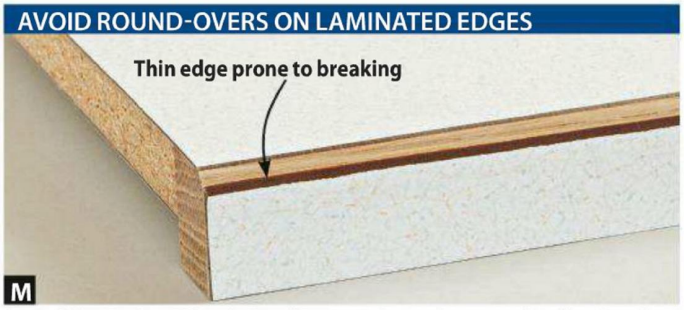
CREATE THE APPEARANCE OF AN INSET PANEL

Use biscuits (or rout grooves in the substrate and edging, and then use splines) to help align the edging and laminate flush.

adhere the top laminate, and then rout the edge. Keep in mind that the profile of a routed edge should intersect the laminate and wood on both faces at a 45° angle or greater. For example, a round-over [**Photo M**], as it transitions between the colored laminate and the wood, reveals a wide, unattractive strip—the dark, lower layers of the laminate.



Adhering laminate to the front face of wood edging and then routing a profile reveals an accent strip of wood.



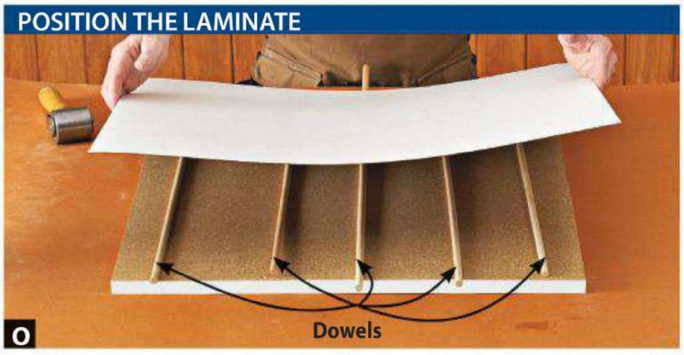
In addition to the wide, dark strip, a round-over leaves a thin, fragile edge where the laminate and wood meet.

Tips for laminating large surfaces

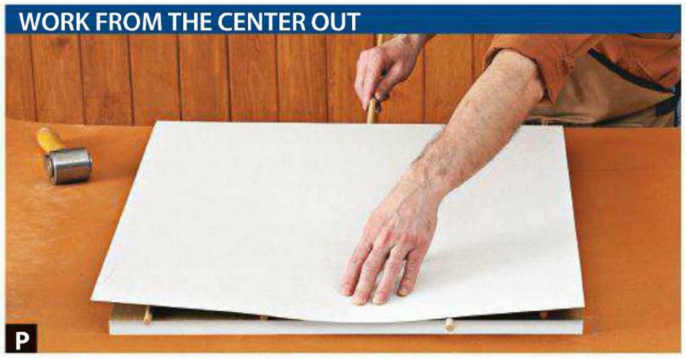
After choosing an edge treatment and preparing your laminate and substrate, apply the laminate to the top surface following the steps shown in **Photos N** through **Q**.

After flush-trimming the laminate, sand the edges gently to ease the sharp edges, being careful not to mar any laminate on the edges of the panel.

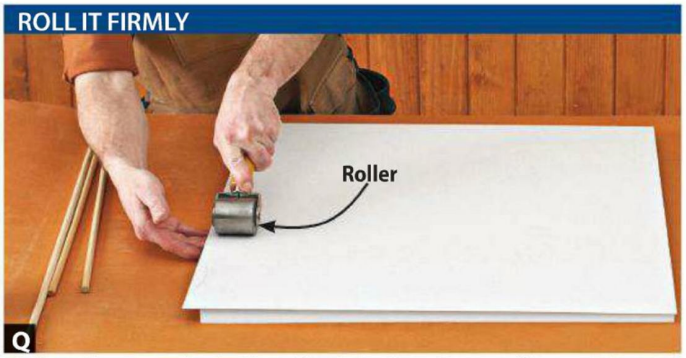
When spreading cement on a wide area, work quickly and make sure to cover the entire surface. A roller speeds work on large surfaces.



Dowels spaced 4–6" apart keep the adhesive-coated surfaces separated. Rest the laminate on the dowels, overhanging all edges of the substrate.



Beginning in the middle, pull out a dowel while pressing the laminate to the substrate. Remove the dowels to one side, then to the remaining side.



With a roller, press the laminate firmly in place. Use your fingers to locate the substrate edges so you don't roll past them and crack the laminate.

Caring for plastic laminate

Though durable and resistant to spills, laminate is not indestructible. Follow these simple care instructions:

- Don't set hot dishes on it; that can scar the laminate or dissolve the contact cement.
- Wipe up spills quickly; grape juice, coffee, and tea can stain.
- Clean with mild, bleach-free, nonabrasive cleaners, using damp paper towels, a sponge, or a soft cloth. Powdered cleaners, stiff brushes, and scouring pads will scratch the surface.

Produced by **Craig Ruegsegger**

Inside jobs call for a panel-pilot bit

The pointed end of a panel pilot bit pierces laminate to begin an interior cut, such as when cutting out the center of the game-table tabletop on *page 48*. Without a bearing, the smooth guide surface between the point and the cutters tends to heat up, so move the bit quickly to avoid burning or marring the substrate or edging.

Countertop pros use only a panel pilot bit because the bearing on a flush-trim bit clogs with adhesive after extended use. If you go with a panel-pilot bit, lubricate the edge laminate with a light coat of petroleum jelly to prevent scarring.

Tic-Tac-Toe Game Set

As simple and quick to build as it is to play

The two-sided lid doubles the box's appeal. When you're ready to get your game on, simply slide the lid out to retrieve the tiles, then flip the lid over to reveal the game board.

This portable game console needs no batteries or wires, so pull it out almost anywhere for some quick entertainment with the kids (or grown-ups). And there's no arguing over who gets X and who gets O; instead choose maple or cherry playing tiles.

Before you start

Although you can cut the top and bottom (D) from ¼" maple plywood, it's easy to create panels covered with a figured veneer to give the box some extra "pop." **Veneering 1-2-3,** *below,* shows you how. If you choose to do this, make the veneered panels first so you can properly size the grooves in the box to accept them.

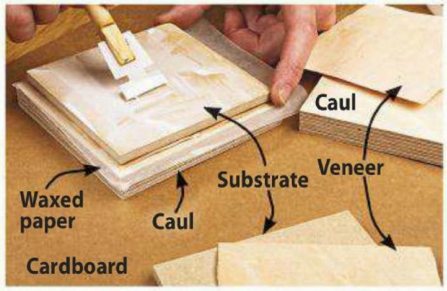
Also, don't cut the top and bottom panels to finished size until you dry-fit the box in **Step 4** to determine the final dimensions.

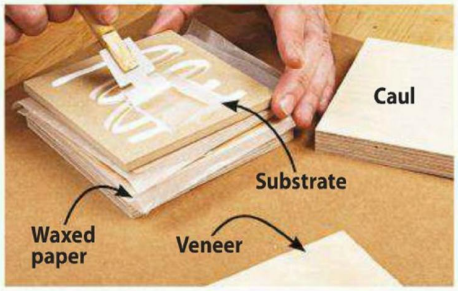
Veneering 1-2-3

Panels the size of the top and bottom (D) of the tic-tac-toe box are perfect for trying your hand at veneering.

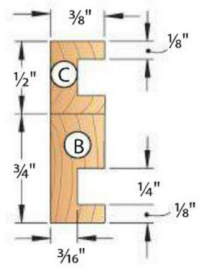
Start by cutting two 5×5" blanks from ¼" hardboard for the top and bottom. Cut two 5×5" cauls from ¾" plywood. Use a razor knife and straightedge to cut four pieces of veneer ¼" wider and longer than the blanks. Finally, cut four pieces of waxed paper just larger than the veneer.

Stack a caul, one sheet of waxed paper, and a piece of veneer. Apply glue to one face of a blank. (We used white glue because it has a 10-minute open time, and dries clear.) Place the blank on the stack, spread glue on the other side [***left* photo**], and top it with a second piece of veneer and waxed paper. Then repeat the process [***middle* photo**]. Double-check that the veneer fully covers the blanks, and clamp the entire stack [***right* photo**].

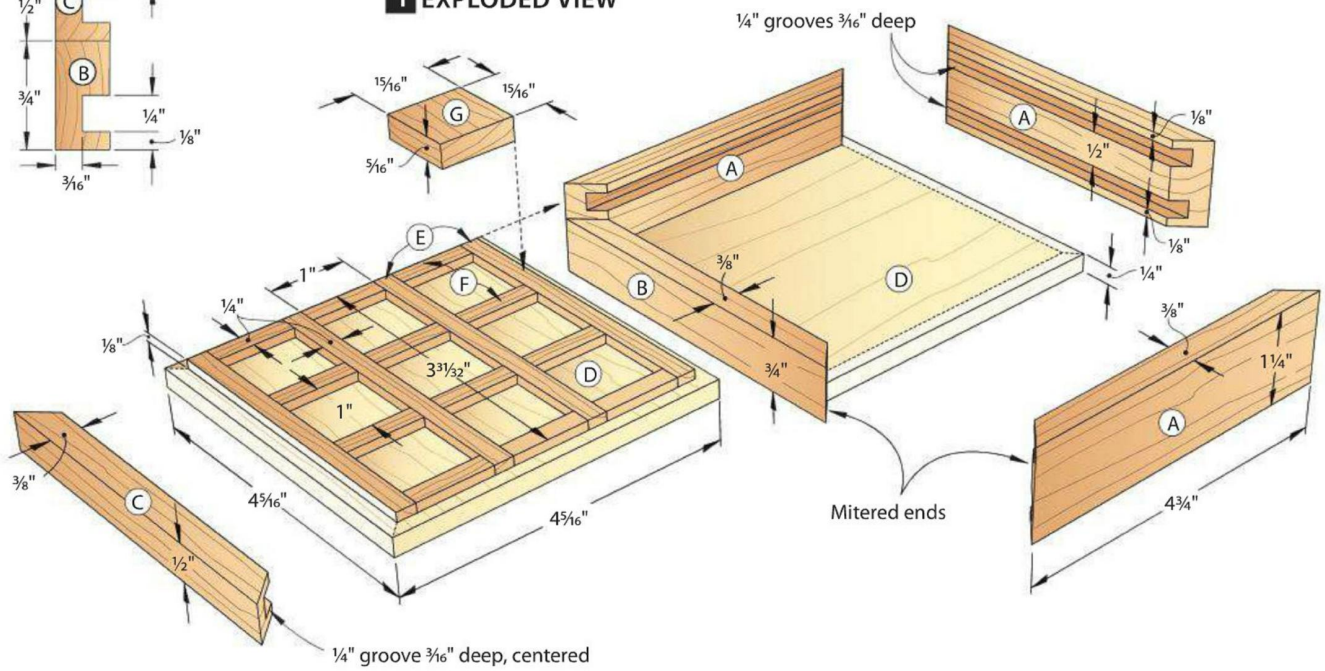




1a DETAIL



1 EXPLODED VIEW



On with the game

1 From straight-grained stock, prepare a 3/8×1¼×29" blank for the sides (A), lower front (B), and upper front (C). Rip a groove 1/8" from each edge to match the thickness of the top and bottom panels (D) **[Drawing 1a]**.

2 To help cut the sides (A), lower front (B), and upper front (C) to length, make a 24"-long miter-gauge sled like the one shown in **Photo A** by gluing a strip of hardboard to a scrap of ¾" plywood. Pivot your miter gauge to 45° and screw the sled to the miter gauge so it extends past the blade 10", measuring from the front edge of the hardboard. Cut a kerf through the sled, and double-faced-tape a stopblock 4¾" from the kerf.

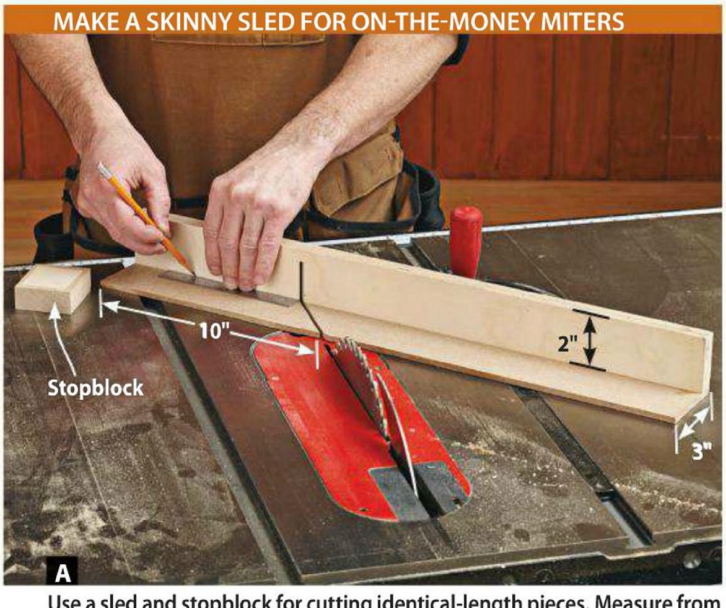
3 With the blank to the left of the blade, miter-cut one end, trimming away as little as possible. Flip the blank face for face, butt the mitered end against the stopblock, and cut away a piece **[Photo B]**. Flip the blank face for face again, trim away the remaining miter, and repeat the process to cut four more pieces from the blank.

Quick tip! *Number each piece as you work so you can reassemble them in the order in which they were cut to create a grain wrap around the box.*

Set aside three pieces for the sides (A). Rip the lower front (B) from the fourth, and the upper front (C) from the fifth.

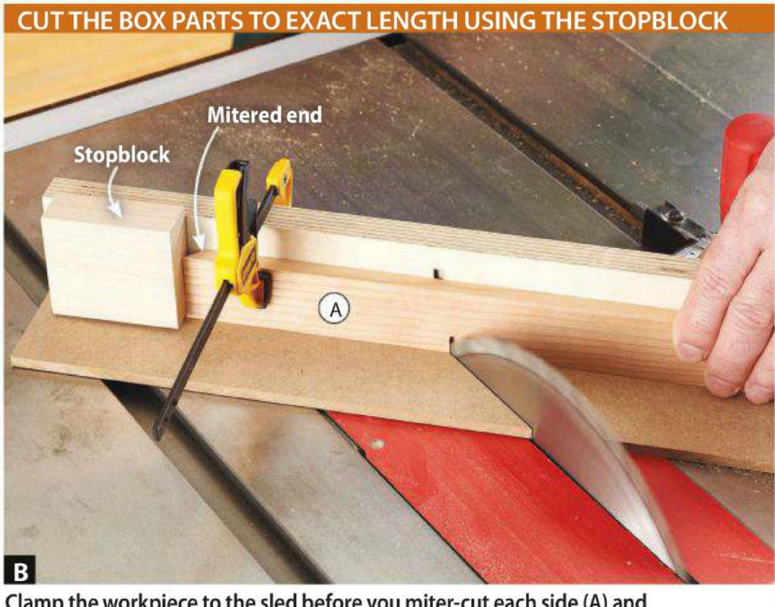
4 Finish-sand the inside faces of the sides (A), lower front (B), and upper

MAKE A SKINNY SLED FOR ON-THE-MONEY MITERS

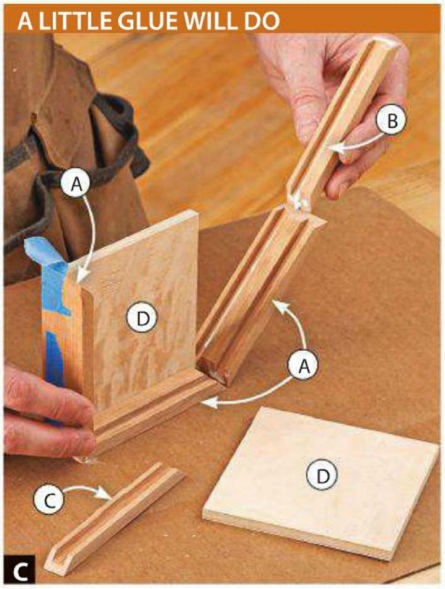


Use a sled and stopblock for cutting identical-length pieces. Measure from the kerf to position the stopblock.

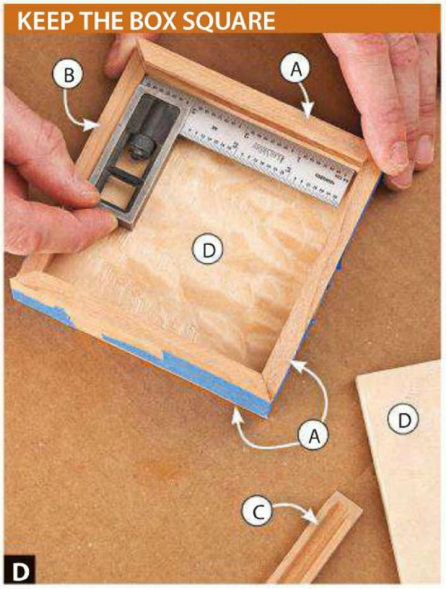
CUT THE BOX PARTS TO EXACT LENGTH USING THE STOPBLOCK



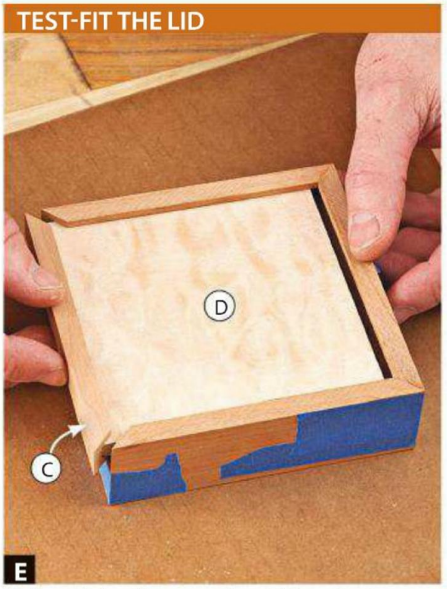
Clamp the workpiece to the sled before you miter-cut each side (A) and the blanks for the lower front (B) and upper front (C) to length.



Apply a bead of glue to the bottom of the groove in the sides (A) and lower front (B), then wrap the assembled box with tape.



After gluing up the box, check for square. If you don't have a small square, check for identical diagonal measurements.



Before gluing the upper front (C) to the top panel (D), slide the top panel in place and check for a tight fit at the front miter joints.

front (C). Arrange the sides and fronts on your bench, outside faces up, with the miters touching and their edges aligned. Apply a strip of painter's tape across the pieces, then roll up the pieces to create a frame. Add 5/16" to the interior dimensions of the frame and cut the top and bottom panels (D) to this size **[Drawing 1]**. Test the fit of the panels in the frame pieces, then glue up the box **[Photo C]** and check the assembly for square **[Photo D]**. Allow the box to dry.

5 Dry-fit the upper front (C) with the top panel (D) and check the fit into the upper groove **[Photo E]**. If needed, sand an edge of the top panel for a smooth-sliding fit. Apply glue to the groove in the upper front, keeping it ½" from the ends to avoid squeeze-out, and glue the upper front to the top panel. Slide the assembly back into the sides (A) to make sure it is properly positioned.

6 Cut four 1/8×¼×12" blanks for the dividers (E, F). With the top (C/D) in place in the box (A/B/D), crosscut four long dividers (E) to fit between the sides (A) with 1/32" clearance. Crosscut the short dividers (F) to length **[Drawing 1]**. With the top still in place, dry-fit the dividers on the top to check the fit. Remove the dividers, apply a light coat of glue to the bottom faces of two long dividers, and glue them to the top panel (D), centered between the sides, and pressed against the rear side (A) and the upper front (C). Butt two short dividers against each of these long dividers and glue the last two long dividers in place. Give the glue a few minutes to grab, then glue the short dividers in place.

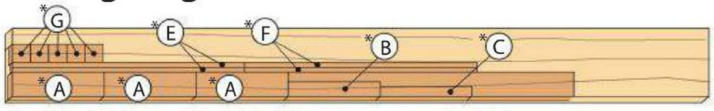
7 After the glue dries, sand the top assembly (C–F) smooth with a sanding block. Check the fit of the top into the sides (A) with the grid inverted.

8 Cut five square tiles (G, H) each from contrasting wood species **[Drawing 1]** to fit in the grid on the top (C–F). (We used cherry and maple.) Finish-sand the tiles and box (A/B/D) to 220 grit, easing the edges slightly. Apply a finish. (We wiped on three coats of General Finishes' Arm-R-Seal oil/urethane satin finish.)

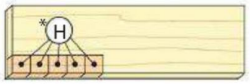
9 Allow the finish to dry thoroughly, then place the tiles in the box and slide the top in place.

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

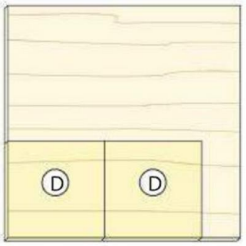
Cutting Diagram



½ x 3½ x 36" Cherry (1 bd. ft.) *Plane or resaw to the thicknesses listed in the Materials List.



½ x 3½ x 12" Maple (.3 bd. ft.)



¼ x 12 x 12" Veneered hardboard

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
A*	sides	3/8"	1¼"	4¾"	C	3
B*	lower front	3/8"	¾"	4¾"	C	1
C*	upper front	3/8"	½"	4¾"	C	1
D	top/bottom panels	¼"	4 5/16"	4 5/16"	VH	2
E*	long dividers	1/8"	¼"	3 31/32"	C	4
F*	short dividers	1/8"	¼"	1"	C	12
G	cherry tiles	5/16"	1 5/16"	1 5/16"	C	5
H	maple tiles	5/16"	1 5/16"	1 5/16"	M	5

*Parts initially cut oversize. See the instructions.

Materials key: C–cherry; VH–veneered hardboard; M–maple.

More Resources

▶ For more toy, game, and kid's furniture plans, go to: **woodmagazine.com/kidsfurn**. $

$=Download these plans for a small fee.

Swinging-arm Quilt Rack

This weekend project saves floor space and puts prized quilts where they're readily seen and easily retrieved.

Project Highlights

- Overall dimensions: 52" high × 3⅛" deep × 28" wide (arms extended to same side); 52" wide when arms extended both directions.
- Materials needed: ¾" and 1" red oak.

Skill Builder

- Cut threaded rod into smaller lengths.

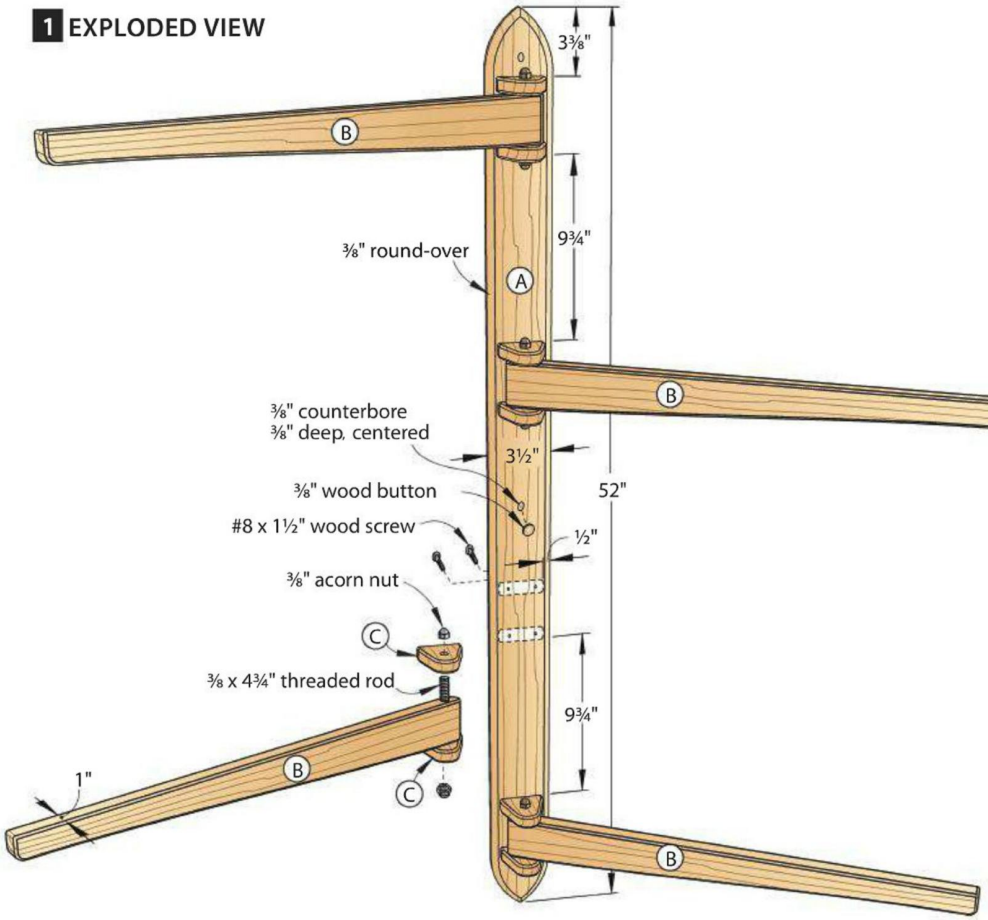
Start by cutting the parts

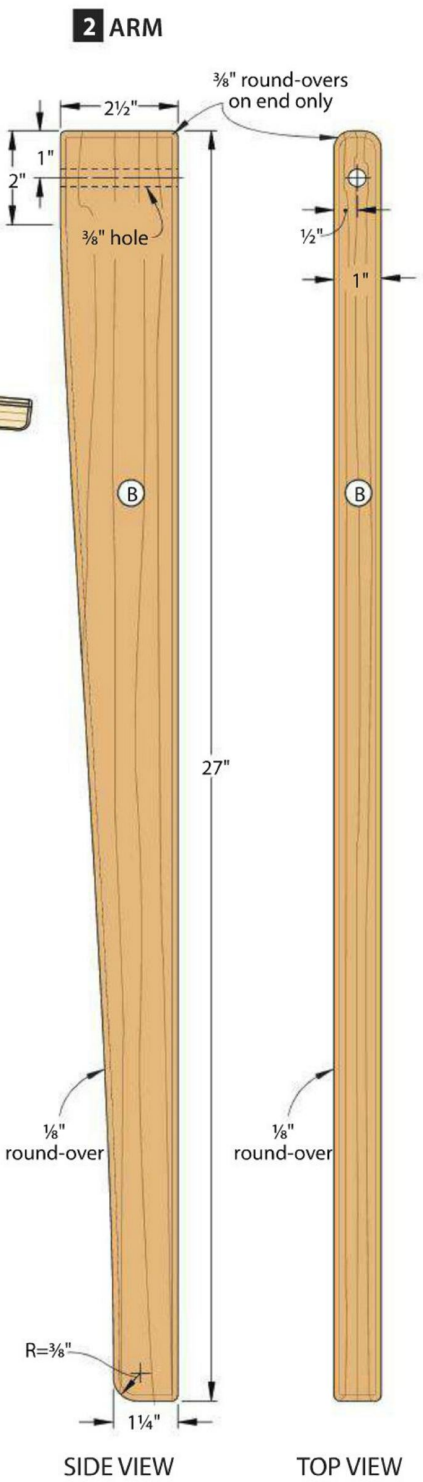
1 From ¾"-thick stock, cut the 3½×52" plate (A) [**Drawing 1**]. Make two copies of the full-size **Mounting Plate Pattern** from the *WOOD Patterns*® insert on *page 41*. Adhere a pattern at each end.

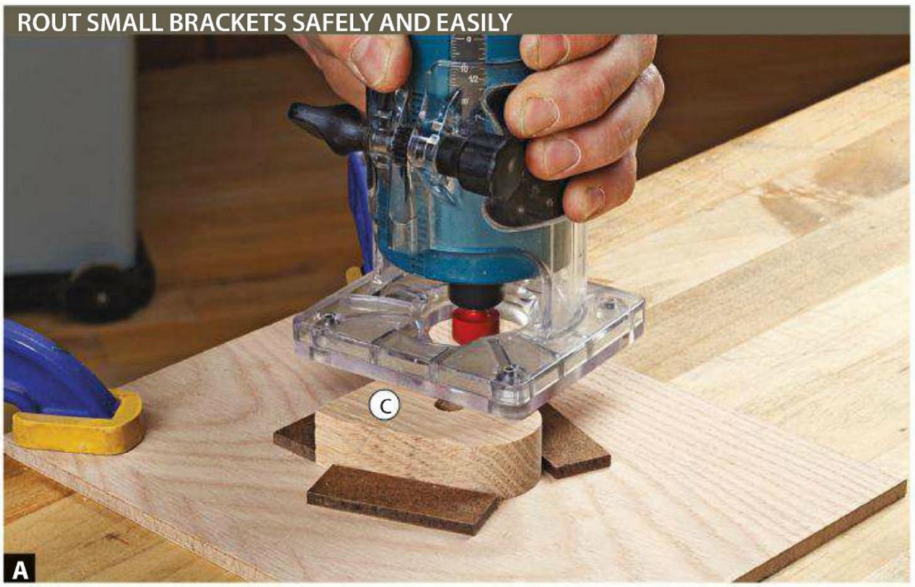
2 Bandsaw the plate (A) ends to shape and sand the edges smooth. Drill the mounting-screw holes and counterbores where marked on the pattern and in the center of the plate [**Drawing 1**]. Remove both patterns, and rout a ⅜" round-over along the front edges.

3 Cut four arms (B) from 1"-thick stock as shown in **Drawing 2**. Drill the ⅜" mounting hole where marked on each arm. Lay out and cut the taper on each arm using a bandsaw or a tapering jig on your tablesaw. (For plans to build a tapering jig, see **More Resources**, *page 63*.) Sand or plane the tapered edges smooth.

4 Rout ⅜" round-overs on the mounting end of each arm (B) [**Drawing 2**]. Sand a ⅜" radius across the taper side (bottom) on







Double-faced-tape three ⅛"-thick scraps to a larger scrap blank, trapping the bracket (C) so you can safely rout the ⅛" round-overs.

each arm's narrow end. Finally, rout a ⅛" round-over along each remaining edge and end.

5 Cut a ¾"-thick bracket blank (C) 2½" wide and 24" long. Make eight copies of the full-size **Bracket Pattern** and apply them to the blank with the grain running front to back. Drill a ⅜" hole through each marked bracket. Separate the brackets by crosscutting at the mounting end of each. Next, bandsaw the curves on the pattern and sand the edges smooth. Remove the patterns, then rout ⅛" round-overs on the top and bottom edges [**Photo A**], but not the mounting end.

6 Sand all parts smooth with a progression of grits, stopping at 220 grit.

To ensure working threads on the cut ends, first thread a nut onto the rod. After cutting to length, spin off the nut to restore the threads.

Using a countersinking pilot bit, drill holes for the screws. The bit bores the pilot hole as well as the countersink for the head.

Now put 'em together

1 From a length of ⅜" threaded rod, use a hacksaw to cut four pieces 4¾" long [**Photo B**].

2 Join together one arm (B), two brackets (C), one rod, and two ⅜" acorn nuts—finger-tight only. Repeat for the remaining parts.

3 Lay out the bracket-mounting locations on the front of the plate (A) [**Drawing 1**], and the screw locations on its back. Clamp one arm-and-bracket assembly (B/C) in place, drill the 5/32" screw pilot holes [**Photo C**], and then secure with screws. Repeat for the remaining assemblies. Remove the nuts, rods, and arms.

4 Apply stain and clear finish (we used Zar Salem Maple stain with General Finishes Enduro Water-Based Urethane, satin finish) to the plate/bracket assembly (A/C) and arms (B), as well as wood buttons to conceal the wall-mounting screws. Let it dry before final assembly.

5 Reinstall the arms (B) to the plate/bracket assembly (A/C), making sure each nut is tight on its rod yet allows the arm to rotate smoothly. Because multiple quilts can be surprisingly heavy, mount the rack directly to a wall stud with 3"-long screws.

Produced by **Bob Hunter** with **Kevin Boyle**
Project design: **Kevin Boyle**
Illustrations: **Lorna Johnson**

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
A	plate	¾"	3½"	52"	O	1
B	arms	1"	2½"	27"	O	4
C*	brackets	¾"	2½"	2⅜"	O	8

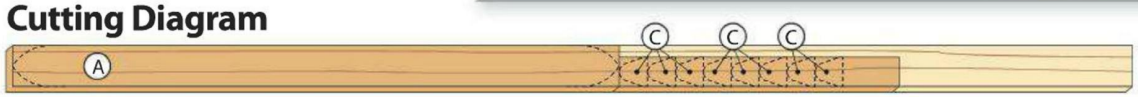
*Parts initially cut oversize. See the instructions.

Materials key: O–Oak.
Bits: ⅛" and ⅜" round-over router bits.
Supplies: ⅜×20" threaded rod (1); ⅜" acorn nuts (8); #8×1½" wood screws (16); #8×3" wood screws (3); ⅜" wood buttons (3).
Supplies on Demand: You can quickly and easily order supplies needed for this project at woodmagazine.com/213quiltrack. Simply delete any supplies you already have on hand before checkout.

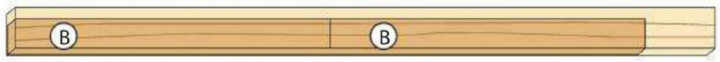
More Resources

- Get a free tapering-jig plan at woodmagazine.com/taperjig1, or on page 12 of issue 188 (Dec./Jan. 2008/09).
- Purchase a downloadable video of using a tablesaw tapering jig at woodmagazine.com/taperjig2.

Cutting Diagram



¾ x 3½ x 96" Oak (2.7 bd. ft.)



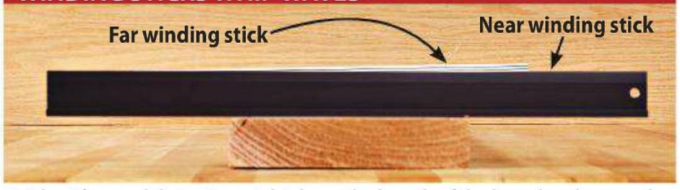
1 x 3½ x 60" Oak (1.7 bd. ft.) (2 needed)

5 Tricks for Truing Lumber Without a Jointer

No jointer? No problem! You can still mill flat boards with square edges. Your grandad may have reached for a hand plane (see **More Resources** for a video on flattening boards by hand), but today there's an easier way. With a few common power tools, you can use any of these five easy methods for flat boards in no time.

Quick Tip! *Before starting, identify any wood distortion with winding sticks: a pair of short, straight lengths of wood or metal, as shown* below.

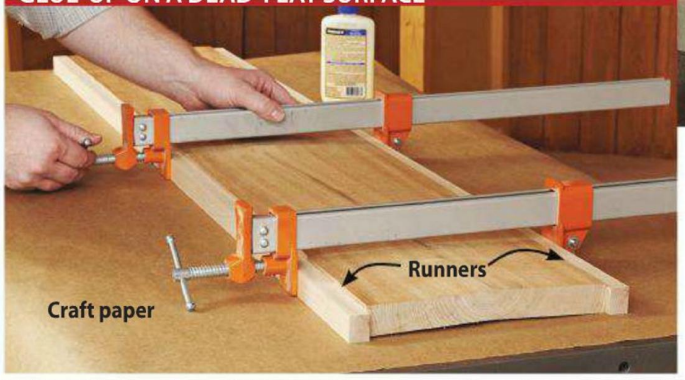
WINDING STICKS WHIP WAVES



To identify wood distortion, sight down the length of the board and across the top edges of winding sticks in contrasting colors.

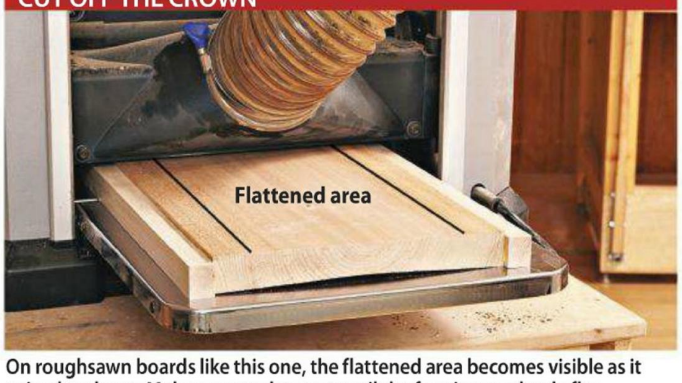
1 For a cupped board, cut a pair of straight runners the length of the workpiece and glue them to both edges, as shown at *right*. After the glue dries, remove the clamps and run the assembly through the planer—crowned face up. Continue planing until the planer flattens the entire top face of the board. Then, flip the workpiece over and run it through the planer again to flatten that face. Use your tablesaw to rip away the runners and square the edges.

GLUE-UP ON A DEAD-FLAT SURFACE



To flatten the board accurately, cover your tablesaw with craft paper and use it as a flat reference surface when attaching the runners.

CUT OFF THE CROWN



On roughsawn boards like this one, the flattened area becomes visible as it exits the planer. Make repeated passes until the face is completely flat.

2 To flatten a twisted board, make a sled from a scrap of flat plywood or MDF slightly longer and wider than your workpiece. Glue a cleat on the trailing end of the sled to capture the workpiece as it goes through the planer. Using scrapwood wedges held in place with double-faced tape, shim the gaps between the sled and the twisted board to keep it from rocking. Now, run the sled and board through the planer to flatten the top. Remove the workpiece from the sled, place the flattened face down and plane the opposite face.

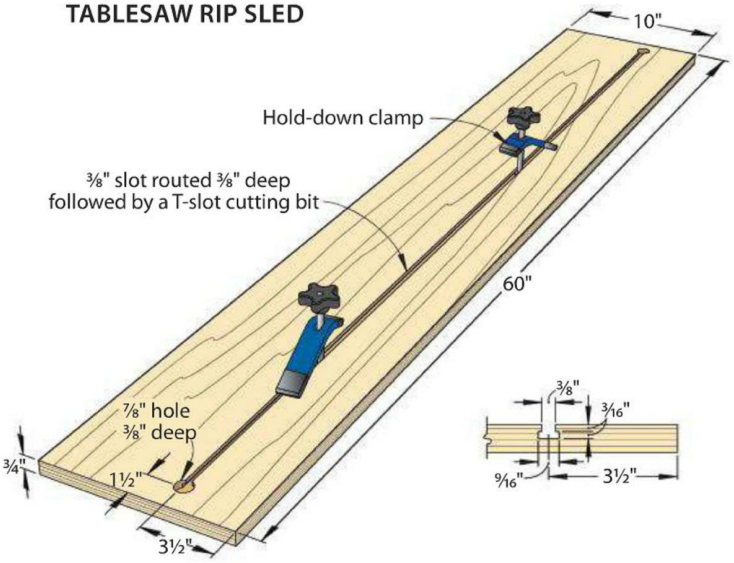
FIND THE RIGHT SPOT FOR SHIMS

Insert shims without tape first. Once you've stabilized the board, remove one shim at a time, apply tape, and return it to its location.

3 To rip a straight edge on boards, build this sled and use it as a secure platform. To make a T-slot, use a Forstner bit to drill ⅜"-deep starting holes where shown; then run your router against a straightedge clamped to the sled base and plow the channel between the two holes with a ⅜" straight router bit. Without moving the straightedge, install a T-slot cutter bit and rout the channel.

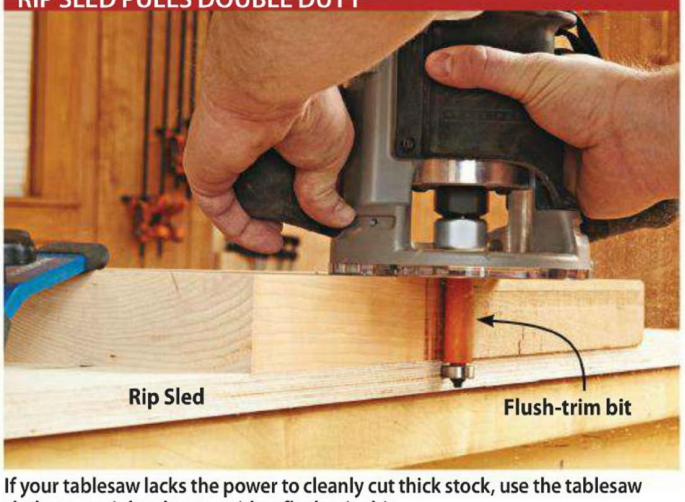
To use the sled, let the rough edge of the workpiece overhang the sled and secure the workpiece with hold-down clamps (#35283, $10.29, 800-279-4441, rockler.com). Butt the opposite edge of the sled against your fence and rip the crooked edge away, as shown *previous page, top.*

TABLESAW RIP SLED



4 For pieces too cumbersome or thick for the tablesaw, use a router, bearing-guided flush-trim bit, and a plywood straightedge instead. As with jointing on the tablesaw, one edge of the workpiece must overhang the straightedge. A 1⁄16" overhang should be adequate for most boards. Set the cutting depth so that the bearing runs against the straightedge, as shown, then trim the rough edge.

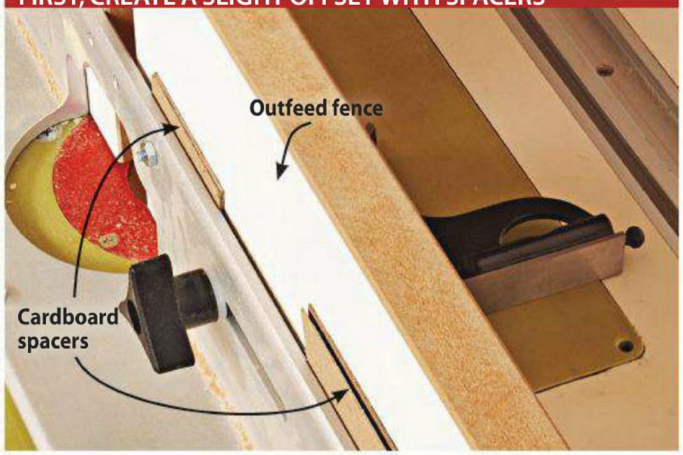
RIP SLED PULLS DOUBLE DUTY



If your tablesaw lacks the power to cleanly cut thick stock, use the tablesaw sled as a straightedge to guide a flush-trim bit.

5 For small, short, or highly figured boards prone to tear-out, set up your router table as an edge jointer. This technique also saves time when edge-jointing several pieces because you won't have to clamp a straightedge to each workpiece. To start, install a straight bit in your router table, and then use thin spacers to offset the outfeed side of the table 1⁄16", as shown below.

FIRST, CREATE A SLIGHT OFFSET WITH SPACERS

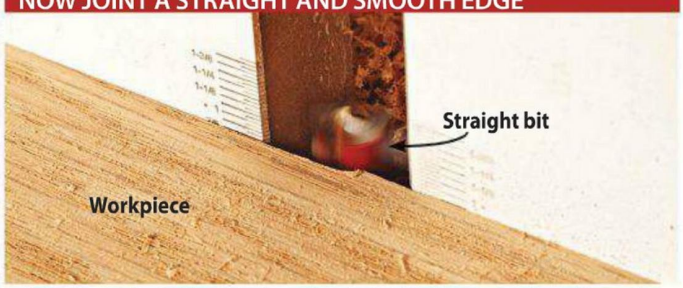


Place thin cardboard spacers behind your router table's outfeed fence to offset it like a jointer's outfeed table. Space them evenly so the fences remain parallel.

CHECK THE FENCES FOR PARALLEL

Using a measuring square, check to see that the outfeed fence sits no more than 1⁄16" proud of the infeed fence and that the two fences are parallel.

NOW JOINT A STRAIGHT AND SMOOTH EDGE



Adjust the outfeed side of the fence flush with the bit. Remember, this isn't a jointer—feed stock slowly to minimize tear-out and give the smoothest edge.

Produced by **Nate Granzow** with **John Olson**
Illustrations: **Lorna Johnson**

More Resources

- FREE for a limited time: view a video on truing up a board with a hand plane at **woodmagazine.com/handplaneflat**.
- For help seeing your winding sticks, go to **woodmagazine.com/windingsticktip**.

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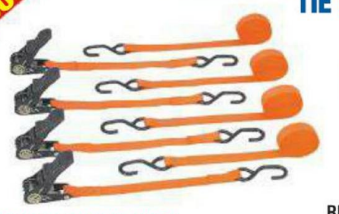

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42201014

SUPER COUPON!

CENTRAL MACHINERY

OSCILLATING SPINDLE SANDER

SAVE $60

LOT NO. 95088

$89.99

REG. PRICE $149.99

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46811848

SUPER COUPON!

CENTRAL MACHINERY

4" x 36" BELT/ 6" DISC SANDER

LOT NO. 93981/97181

$54.99

REG. PRICE $99.99

SAVE $45

Item 93981 shown

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SAVE $70

LOT NO. 68048/69227

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Item 68048 shown

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45168924

SUPER COUPON!

EIGHT DRAWER WOOD TOOL CHEST

WINDSOR DESIGN

SAVE $40

LOT NO. 94538

Tools sold separately.

$59.99

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50099073

SUPER COUPON!

29 PIECE TITANIUM NITRIDE COATED DRILL BIT SET

LOT NO. 5889

drill master

SAVE 60% $9.99 REG. PRICE $24.99

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40414875

SUPER COUPON!

4 PIECE WOOD CHISEL SET

Item 42429 shown

LOT NO. 42429/69471

SAVE 43% $4.49 REG. PRICE $7.99

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41111588

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PITTSBURGH

24" CLAMP AND CUT EDGE GUIDE

LOT NO. 66126

SAVE 46% $6.99 REG. PRICE $12.99

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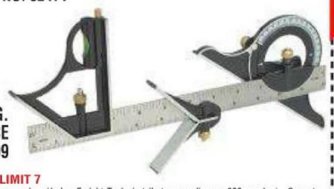
89422229

SUPER COUPON!

PITTSBURGH

12" COMBINATION SQUARE SET

LOT NO. 92471



SAVE 55% $4.49 REG. PRICE $9.99

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84876581

SUPER COUPON!

6" DIGITAL CALIPER

PITTSBURGH

LOT NO. 47257

$9.99 REG. PRICE $29.99

Includes two 1.5V button cell batteries.

SAVE 66%

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34873155

SUPER COUPON!

drill master

ORBITAL PALM SANDER

LOT NO. 40070

SAVE 55% $8.99 REG. PRICE $19.99

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22402383

SUPER COUPON!

18 VOLT CORDLESS 3/8" DRILL/DRIVER AND FLASHLIGHT KIT

drill master

LOT NO. 68287

Includes one 18V NiCd battery and charger.

SAVE 50% $19.99 REG. PRICE $39.99

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73756687

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18 GAUGE 2-IN-1 NAILER/STAPLER

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66914986

SUPER COUPON!

LEATHER INDUSTRIAL WORK GLOVES - 5 PAIRS

Western Safety

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SAVE 40% $5.99 REG. PRICE $9.99

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90347265

SUPER COUPON!

CENTRAL MACHINERY

8" x 12" BENCH TOP WOOD LATHE

LOT NO. 95607

SAVE $60 $89.99 REG. PRICE $149.99

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79069240

SUPER COUPON!

Bunker Hill Security

36 LED SOLAR SECURITY LIGHT

LOT NO. 98085/69644

Item 98085 shown

Includes 1.2 volt, 600mAh/6 volt NiCd rechargeable battery pack.

SAVE 28% $17.99 REG. PRICE $24.99

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94427290

SUPER COUPON!

CENTRALPNEUMATIC 3 GALLON, 100 PSI OILLESS PANCAKE AIR COMPRESSOR

LOT NO. 95275

SAVE 50% $39.99 REG. PRICE $79.99

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35555661

SUPER COUPON!

CENTRAL MACHINERY

2 HP INDUSTRIAL 5 MICRON DUST COLLECTOR

LOT NO. 97869

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SAVE $100

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18499198

SUPER COUPON!

12" SLIDING COMPOUND MITER SAW WITH LASER GUIDE

CHICAGO ELECTRIC POWER TOOLS

LOT NO. 98194

SAW BLADE INCLUDED

SAVE $80 $119.99 REG. PRICE $199.99

Laser guide requires two AAA batteries (included).

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93550958

SUPER COUPON!

60" HARDWOOD WORKBENCH

WINDSOR DESIGN

LOT NO. 93454/69054

Item 93454 shown

SAVE $85 $144.99 REG. PRICE $229.99

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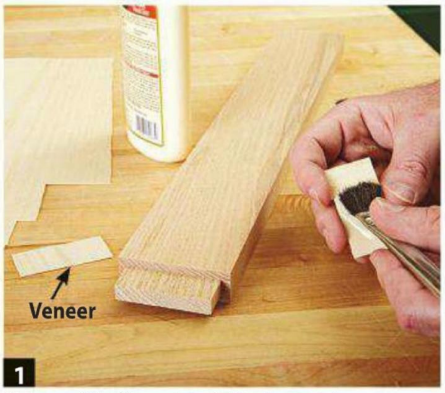
Lose the too-thin-tenon blues

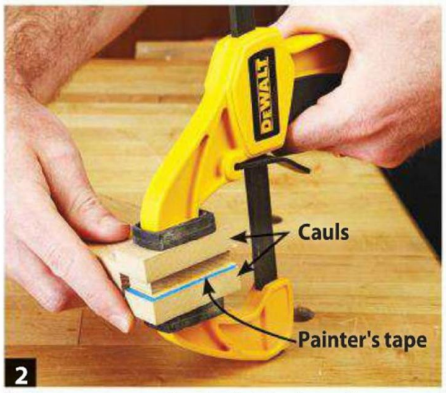
Q **I learned my lesson the hard way: Mortises first, tenons second. But now that the mistake has been made, how can I salvage tenons that fit too loosely in a mortise?**

—Wyatt Miller, Nashville

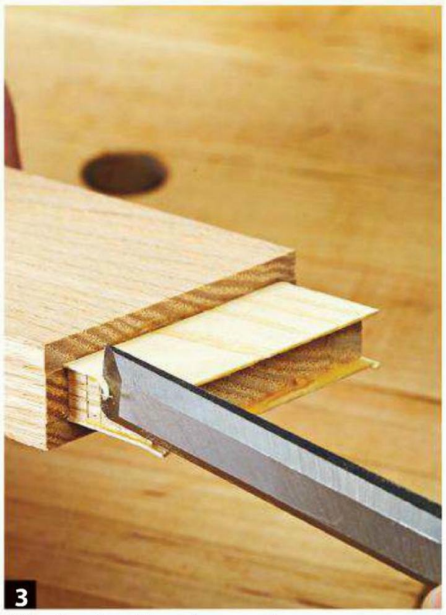
A To add wood back to the cheeks, Wyatt, simply follow the steps, *below*, and check the fit again. If the tenon needs more bulk, repeat the process. Cheeks now too chubby? Thin them equally with a sanding block or shoulder plane until the tenon fits snugly.



Use a craft knife and straightedge to trim veneer pieces slightly larger than the tenon cheeks, and glue them in place.



Using tape-covered cauls, lightly clamp the veneer pieces in place on the cheeks of the tenon and wait for the glue to dry.



After the glue dries, trim away the excess veneer and any glue squeeze-out with a sharp chisel or craft knife.

To lock or not to lock?

Q **Engaging the cutterhead lock on my planer after every pass gets tedious during large milling operations. Do I have to use it every time or is it safe to leave it disengaged?**

—Brandon O'Brien, Concord, Calif.

A It's perfectly safe to operate the planer without the cutterhead lock engaged, Brandon; after all, planers had gone without them for years. But, you'll likely see better results with the lock engaged. Here's why:

As a board passes through a planer—especially one with short infeed and outfeed tables—the weight of the board and pressure of the cutterhead tends to torque the cutterhead a bit, causing a full-width gouge, called "snipe," at the beginning and end of the pass. The cutterhead lock resists this torque, thereby reducing snipe.

If your planer doesn't snipe much with the lock disengaged, go without. Or compromise: Use it only on the last pass or two when it matters.

The cutterhead lock found on many benchtop planers helps to alleviate snipe on the ends of boards.

continued on page 70

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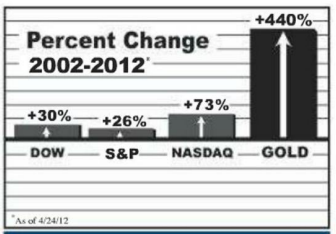

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Ask WOOD

An easy fix for drawers that bind

When I built the curvy-front jewelry box from issue 195 (Dec./Jan. 2009/10) as a Christmas gift for my daughter, I used box joints for the drawers rather than rabbets. But six months later the drawers bind and don't slide as easily. The binding seems to be more side-to-side than up-and-down. Is this a result of using box joints?

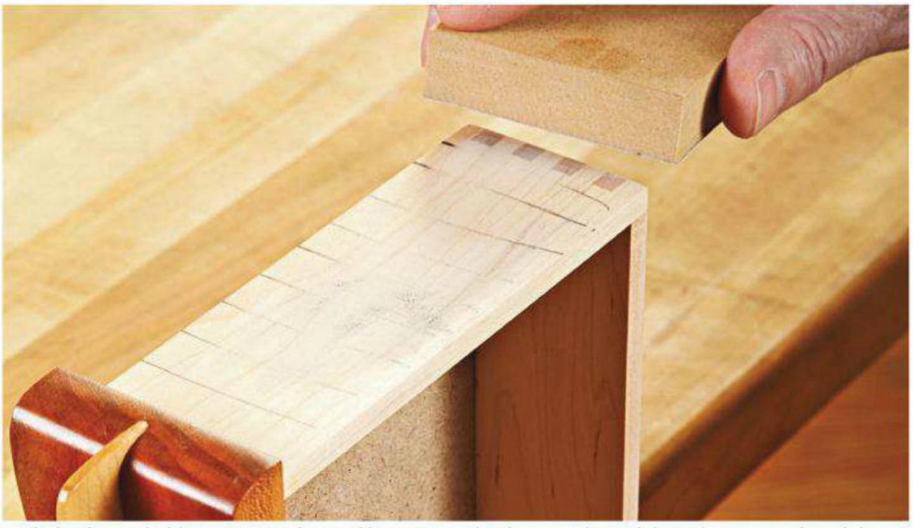
—D'Andre Thomas, Harrisonburg, Va.

A You've run into a classic case of wood swelling due to seasonal humidity changes, D'Andre—not a problem with your choice of joinery. When you built the project in a cold-weather, low-humidity time of year, everything fit together nicely. As humidity increased in summer, that wood expanded and tightened up those drawers in their openings.

To correct this, simply remove some of the material from each drawer side, as shown *below*, then check the fit. If it still binds a little, repeat the process until you get an easy-gliding drawer.

Source

Briwax Spray: product #151316, $13.69 for 13.5 oz aerosol can, Woodcraft, 800-225-1153 or woodcraft.com.



With the drawer held in a vise, mark pencil lines across the drawer side, and then plane or sand until those marks disappear.

Once the drawer slides easily, apply wax to the drawer sides and the inside of the jewelry box, then buff for a slippery finish.

continued on page 72

Amazing New Hybrid Runs Without Gas

The new face of time? Stauer's Compendium Hybrid fuses form and functionality for UNDER $30! Read on...

Innovation is the path to the future. Stauer takes that seriously. That's why we developed the ***Compendium Hybrid***, a stunningly-designed hybrid chronograph with over one dozen analog and digital functions that is more versatile than any watch that we have ever engineered.

New technology usually starts out at astronomical prices and then comes down years later. We skipped that step to allow everyone the chance to experience this watch's brilliant fusion of technology and style. We originally priced the Stauer ***Compendium Hybrid*** at $395 based on the market for advanced sports watches... but then stopped ourselves. Since this is no ordinary economy, we decided to offer the ***Compendium Hybrid*** at 92% off. That means this new technological marvel can be yours for only $29.95!

Welcome a new Digital Revolution. With the release of the dynamic new ***Compendium***, those boxy, plastic wrist calculators of the past have been replaced by this luxurious LCD chronograph that is sophisticated enough for a formal evening out, but rugged and tough enough to feel at home in a cockpit, camping expedition or covert mission.

The watch's extraordinary dial seamlessly blends an analog watch face with a stylish digital display. Three super-bright luminous hands keep time along the inner dial, while a trio of circular LCD windows track the hour, minutes and seconds. An eye-catching digital semi-circle animates in time with the second hand and shows the day of the week. The watch also features a rotating bezel, stop-watch and alarm functions and green electro-luminescence backlight. The ***Compendium Hybrid*** secures with a rugged stainless steel band and is water-resistant to 3 ATMs.

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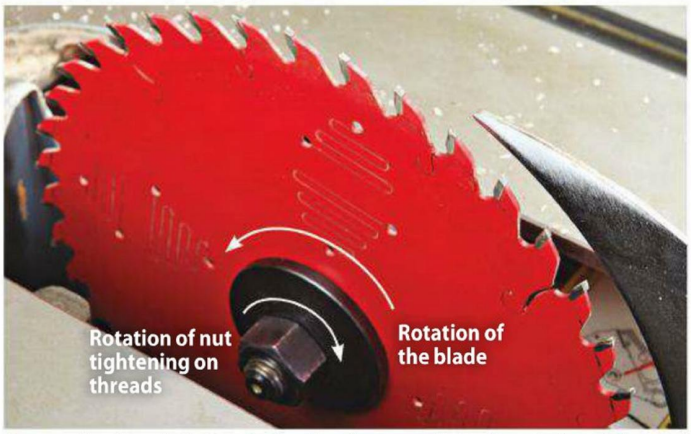
Ask WOOD

Is "snug" good enough for arbor nuts?

After my neighbor used my tablesaw, I could barely remove the arbor nut, he had installed it so tightly. I learned to just snug it. A "neighborly" exchange of ideas ensued. Who's correct?

—James Watkins, West Valley City, Utah

Stick with snug, James. To keep from loosening during use, arbor nuts thread in the opposite direction of the blade rotation, making the nut, in effect, self-tightening. So, secure the arbor nut firmly without straining your muscles. Let your neighbor know that if he works too hard tightening the nut, he risks fusing the threads or bending the arbor shaft.



Because the threads tighten in the direction opposite to the rotation of the blade, the arbor nut tends to tighten, rather than loosen, as the blade spins.

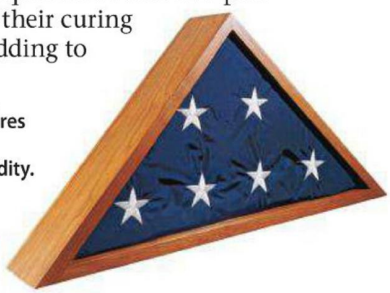
Avoid acidic woods to protect a precious flag

I'm building a flag case for a recently deceased family member who was in the military. I read somewhere that you should avoid acidic woods to protect the flag. Would red alder or madrone be suitable?

—Bill Collins, Gold Hill, Ore.

The acidity of a species of wood depends primarily on its tannin content, Bill. As a rule of thumb, the lighter-colored the wood, the lower the tannin content. Oak, walnut, cherry, and mahogany, have higher tannin levels, while maple, birch, and aspen rank low in tannin content and acidity. Unfortunately, both madrone and red alder fall into the high-tannin category. In fact, madrone bark has been used to tan leather. (Tan, tannin. See the connection?)

The good news: Most film-forming finishes provide a barrier against acidity. Polyurethane adds the maximum protection against the moisture that dissolves tannins into tannic acid. Avoid catalyzed lacquer and other two-part finishes that use acid as one of their curing agents, because you could be adding to the problem.



Cherry's moderate tannin content requires a moisture-resistant finish, such as polyurethane, to protect a flag from acidity.

Find this flag-case plan at:
woodmagazine.com/flagcase

A Brief history of Arts & Crafts

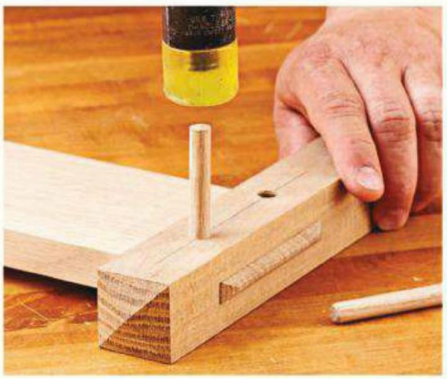
I see a lot of projects in *WOOD*® magazine and other publications labeled as "Arts & Crafts." What makes a piece "Arts & Crafts?"

—Peter Ensley, Pineville, Ky.

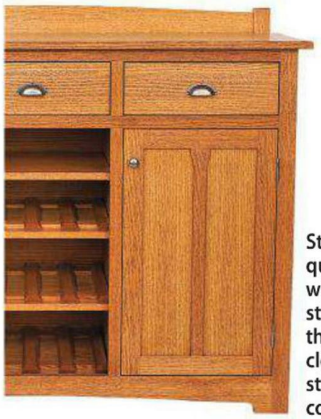
Good question, Peter. The Arts & Crafts movement was a mid-19th-century reaction in England against what was seen as superfluously decorated furniture, art, and architecture. The movement sought instead to emphasize simple, solid, artisan-crafted pieces rather than factory-spewed ornamentation.

The movement's principal proponent in England, textile-maker William Morris, derived his designs from medieval or gothic patterns, creating solidly built furniture and simple repeating-design fabrics, wallpaper, and stained glass.

Gustav Stickley, an American designer, became a proponent of the style after a visit to England. His architecture and furniture designs simplified the forms even further, emphasizing simple lines; celebrating humble, straight-grained white oak; favoring handcrafted hardware; and exposing joinery to plain view. Stickley dubbed his interpretation of the movement "Craftsman." Later, the misnomer "Mission" was also applied to his furniture and stuck. So you'll often see these labels used interchangeably in our magazine and elsewhere.



Because they expose, rather than hide, the joinery, through tenons are often used in Arts & Crafts furniture to celebrate the craftsman's work.



Stickley prized quartersawn white oak for its straight grain that accentuated clean lines and straightforward construction.

Charles and Henry Greene's take on American Arts & Crafts—known as "Greene and Greene"—features "cloud lift" details and exposed ebony plugs.

Shop-Proven Products

These woodworking wares passed our shop trials

About our product tests

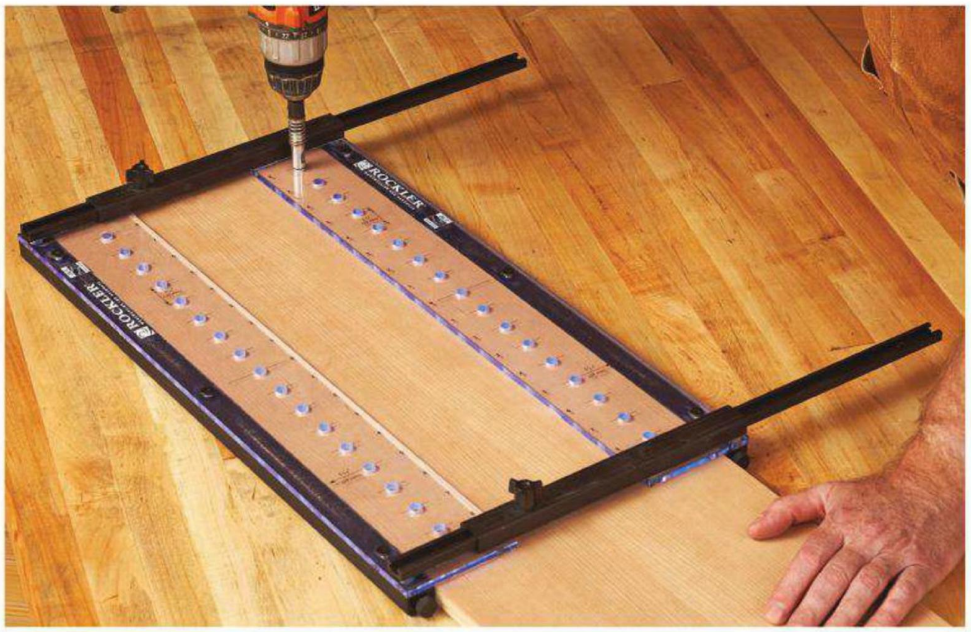
We test hundreds of tools and accessories, but only those that earn at least three stars for performance make the final cut and appear in this section. Prices are current at the time of article production and do not include shipping, where applicable.

Dual-edge jig makes quick work of shelf-pin holes

Rockler's Pro Shelf Drilling Jig eliminates half of the setup work required with typical shelf-pin boring jigs. Use the two parallel fences and plastic drilling guides to "trap" the workpiece, such as a bookcase side, and drill both rows of holes without moving the jig. And with 17 holes on each guide, you can drill up to 34 holes without moving it.

If you need more pin holes, simply slide the jig down the workpiece and index it in the just-drilled holes with two of the ¼" or 5mm guide pins (a pair of each come with it). Locking knobs on the aluminum arms and rubber grips on the guide fences hold the jig securely in place.

I was disappointed that this jig didn't come with a self-centering spring-loaded drill bit. Rockler sells those in four sizes for $22 each.



—Tested by Steve Feeney, a woodworker with 26 years experience and a 6-year WOOD® magazine tool tester

Pro Shelf Drilling Jig, #31571

Performance	★★★★★
Price	$80

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

Adding a tail vise is no longer a tall order

A tail vise typically runs along the edge of a workbench and helps you secure long stock for cutting mortises or shaping a profile or taper and for clamping pieces vertically. But with most tail-vise hardware you have to build it into the bench design, cutting away a section of the top and building jaws for the vise. Veritas' quick-release sliding tail vise mounts onto any existing workbench top with sufficient clearance underneath.

After bolting this 6½×17" vise to the bottom of my bench, I simply attached a shopmade jaw (2"-thick maple) to the sliding headstock. Then I installed a piece of equal thickness to the workbench edge to clamp against. I used this vise while building several projects, and its holding power proves equal to all the built-in tail vises I've used.

—Tested by Bill Damman, a hand-tool aficionado and historical reenactor in an 1870s-era woodworking shop

Quick-release tail vise, #05G30.01

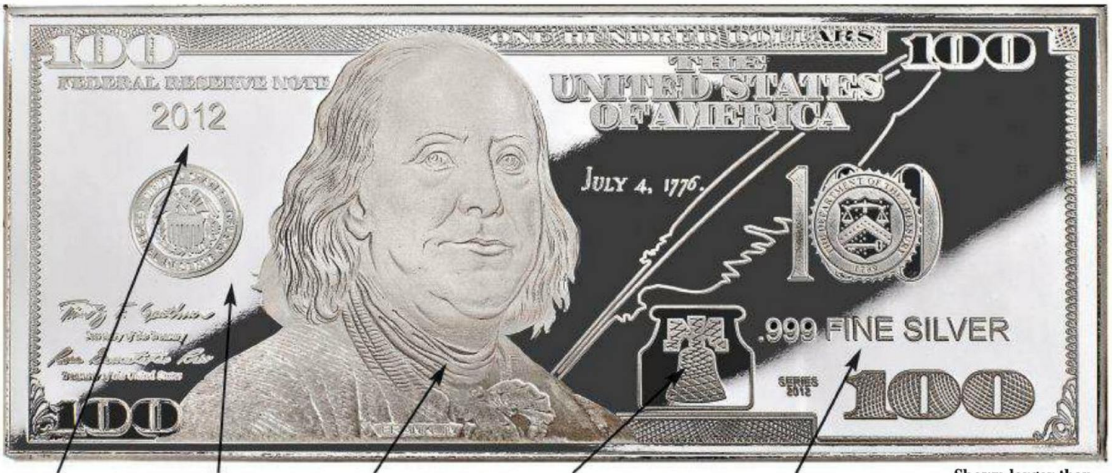
Performance	★★★★★
Price	$269

Lee Valley/Veritas
800-871-8158; leevalley.com

continued on page 77

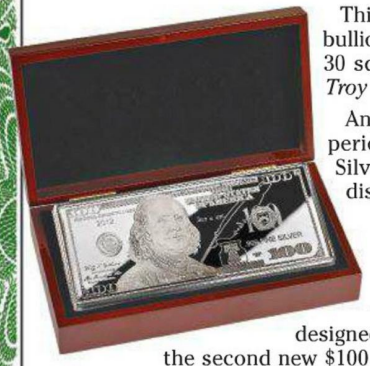
Limited Mintage Striking...

WORLD'S FIRST $100 SILVER PROOF



Collectible 2012 date | Mirrored proof background | Larger Franklin portrait | Liberty Bell, quill pen & July 4th date | Minted in one Troy ounce of pure silver bullion | Shown larger than actual size of 6" x 2½"

New York Mint Announces the Limited Mintage Striking of an Extraordinary Silver Proof —the New United States $100 Bill Struck in Pure Silver Bullion. Discount Price $99



This extraordinary piece of pure silver bullion has a surface area that exceeds 30 square inches...and it contains *one Troy ounce of pure silver bullion*!

And now, during a limited strike period, the *very first* Year 2012 $100 Silver Proof is available at a special discount price—only $99!

EXQUISITE DETAIL

The historic 2012 $100 Silver Proof is an exquisite adaptation of the United States Treasury's newly-designed $100 Federal Reserve Note—only the second new $100 bill design in 70 years. It is a true artistic masterpiece that will always be treasured.

.999 SILVER

Best of all, this stunning Silver Proof is even more beautiful than the original, because it's struck in precious silver bullion!

It is a landmark in proof minting, combining unprecedented weight with extraordinary dimension. The specifications for this colossal medallic proof are unparalleled.

Each one:

- Is Individually Struck from Pure .999 Silver Bullion.
- Weighs one Troy ounce.
- Has a Surface Area That Exceeds 30 Square Inches.
- Contains 31.10 Grams (480 Grains) of Pure Silver.
- Is Individually Registered and Comes With a Numbered Certificate of Authenticity.
- Is Fully Encapsulated to Protect Its Mirror-Finish.
- Includes a Deluxe Presentation Case.

ADVANCE STRIKE DISCOUNT

The price for the 2012 One-Ounce Silver Proof will be set at $129 per proof.

However, if you place your order now, you can acquire this giant silver proof at the special advance strike discount price—only $99.

NOTE TO COLLECTORS: *If you place your order for the $100 silver proof within the next 10 days, it will be processed immediately, and the earliest orders will receive the lowest registration numbers.*

ADDITIONAL DISCOUNTS

Substantial additional discounts are available for serious collectors who wish to acquire more than one of these exquisite silver proofs.

You can order:

ONE Year 2012 $100 Silver Proofs for just $99 each + *s/h*
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There is a limit of twenty $100 Silver Proofs per order, and all orders are subject to acceptance by New York Mint.

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Shop-Proven Products

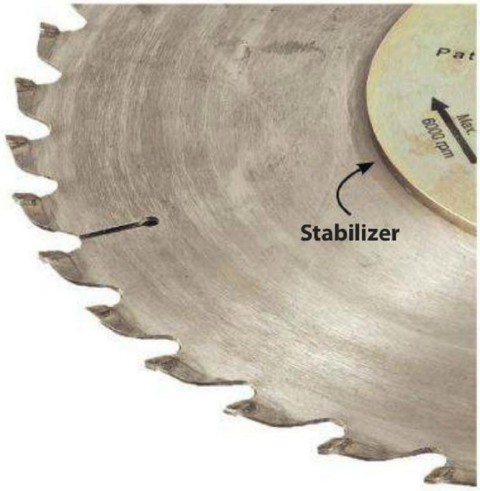
Super-thin blade saves waste and gives more cutting power

The Micro-Kerf 40 tablesaw blade cuts a kerf less than half that of a full-kerf ⅛" saw blade, and noticeably thinner than most thin-kerf blades. To prevent blade deflection, the makers sandwich it between two heavy brass stabilizers, limiting cutting depth to 2". It's a great way to minimize waste when ripping wood, especially pricey exotics.

In my tests, the only detected deflection was when shaving a whisker off the edge of a board and when ripping a full sheet of MDF. (The Micro-Kerf 40 blade left a slightly wavy cut, due, I suspect, to subtle shifting as I fed the large sheet.)

But the Micro-Kerf 40's $185 price can be a tough sell just to save on sawdust. That's why I compared my 110-volt tablesaw's amp draw using this blade, a regular thin-kerf blade, and a full-kerf blade. The Micro-Kerf 40 required three fewer amps to make the same cuts as the full-kerf blade; a thin-kerf blade fell about in the middle. That gives your saw more cutting power in thick hardwoods, and, over time, can help extend the life of a tablesaw motor.

Because this blade is thinner than any saw's riving knife, I suggest you buy the matching splitter for $18 and mount it on your saw's throat insert. It's just a good safety measure.



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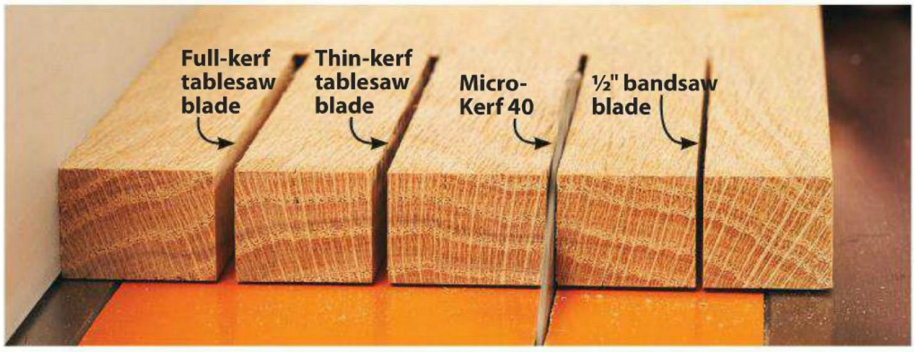

Micro-Kerf 40 tablesaw blade

Performance	★★★★☆
Price	$185

Total Saw Solutions
800-773-3133;
totalsawsolutions.com

—Tested by Jan Svec, a former WOOD® magazine project designer, builder, and editor

Shop Proven Products

Dual-base router delivers bang for your bucks

Although I normally use a couple of professional-quality routers in my shop, Skil's 1830 two-base combo kit won me over with steady, accurate, vibration-free performance in every task I threw at it. That's surprising for a router kit that costs about 60 percent less than pro units.

I routed deep mortises and could not bog it down at reasonable feed rates. While hogging away substantial profiles in both handheld and table-mounted modes, it kept up just fine without affecting cut quality.

A reliable depth stop on the plunge base and microadjusters on both bases made depth adjustments easy and accurate. I also appreciate the soft-start motor, dual-position slide power switch, and LED lights around the collet that not only illuminate the cut area, but also remind you to unplug the cord before changing bits.

—Tested by Tom Brumback, a woodworker with 30 years of experience building furniture

2¼-hp router combo kit, #1830

Performance	★★★★☆
Price	$110

Skil Tools
877-754-5999; skiltools.com

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It wasn't more than ten years ago that we met with former U.S. Mint Director Donna Pope. She spoke with pride about what she considered to be her greatest achievement as Director under President Reagan: Creation of the American Eagle silver and gold bullion coin programs, the first of their kind in our nation's history.

The purpose of these coins was to give people the opportunity to own physical silver and gold in a form certified for weight and purity by the U.S. Mint. While the bullion coin program was a signal success, nobody took into account the profound effect it would have on the collector market.

Silver Eagles = Today's Morgan Dollars

In the 1800s and early 1900s, the U.S. Morgan Silver Dollar was struck year upon year at various mints and circulated at face value. Their core value was in their precious metal content. However, in top grades, Morgan Silver Dollars can sell today for tens and even hundreds of thousands of dollars each!

For the same reason, many collectors today see the Silver Eagle series as a literal "ground floor" opportunity to acquire the top-grade coins as they are released. They started submitting Silver Eagles to the leading independent coin grading services, such as Numismatic Guaranty Corporation (NGC), praying that the coins would come back with the highest possible grade: MS70 (all Uncirculated coins are graded on a point system from a low of 60 to a high of 70, with 70 representing flawless perfection). Of all the Silver Eagles produced by the U.S. Mint in 2011, less than one out of every 788 earned the NGC MS70 grade!

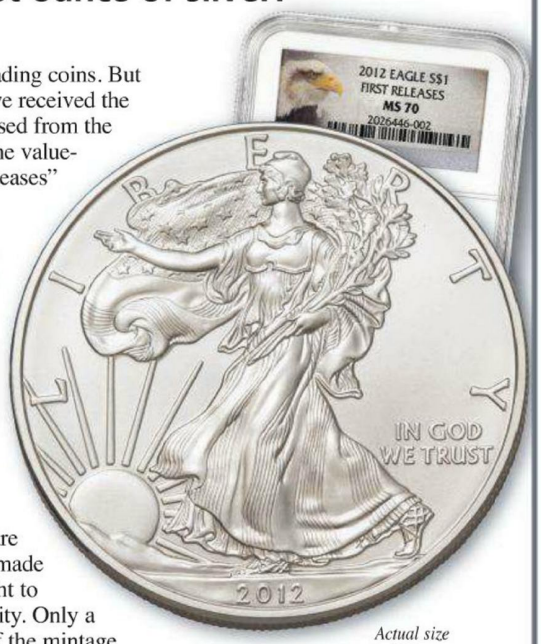
MS70 = $$$$$!

In the rarified atmosphere of MS70, Silver Eagles have soared to market prices that I can only characterize as surreal. Consider this: MS70 Silver Eagles have been selling for truly stratospheric prices. Here are just a few eye-popping examples:

1996 MS70 Silver Eagle	$5,340
1988 MS70 Silver Eagle	$2,660
1991 MS70 Silver Eagle	$3,910
1994 MS70 Silver Eagle	$1,660

It Just Keeps Getting Better

I was thrilled to lock up a guaranteed supply of Perfect Gem MS70 2012 Silver Eagles from a primary distributor who gets them directly from the U.S. Mint. (This is a coin you cannot buy directly from the U.S. Mint). Moreover, every coin is certified and encapsulated by NGC, one of the top two firms for grading coins. But better yet, because we received the very first coins released from the mint, they all have the value-enhancing "First Releases" designation.



Actual size is 40.6 mm

What Does "First Releases" Mean?

NGC designates only those coins it certifies as having been released during the first 30 days of issue as First Releases. Collectors place a premium on these coins because they are struck from freshly made dies, which is thought to impart superior quality. Only a miniscule number of the mintage gets the First Releases pedigree - so it can turbo charge the value of an already valuable MS70 coin.

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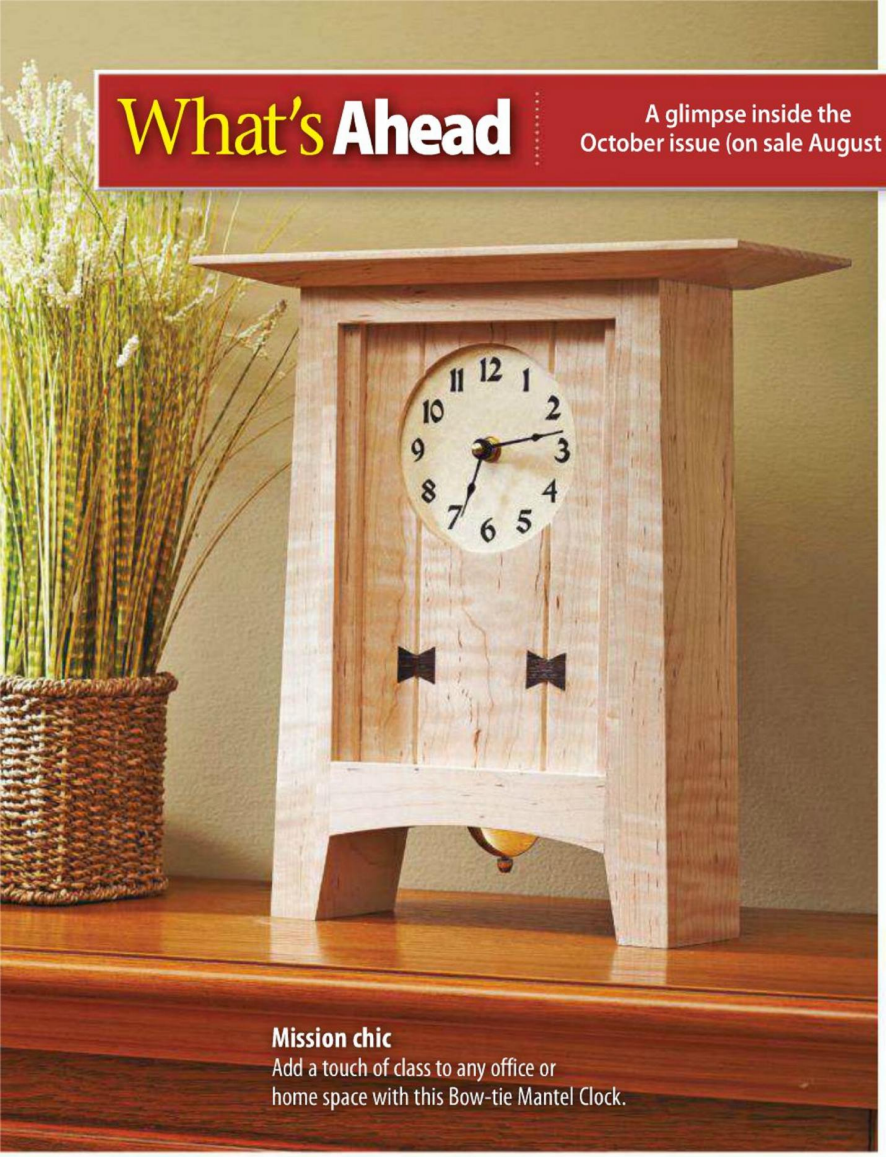
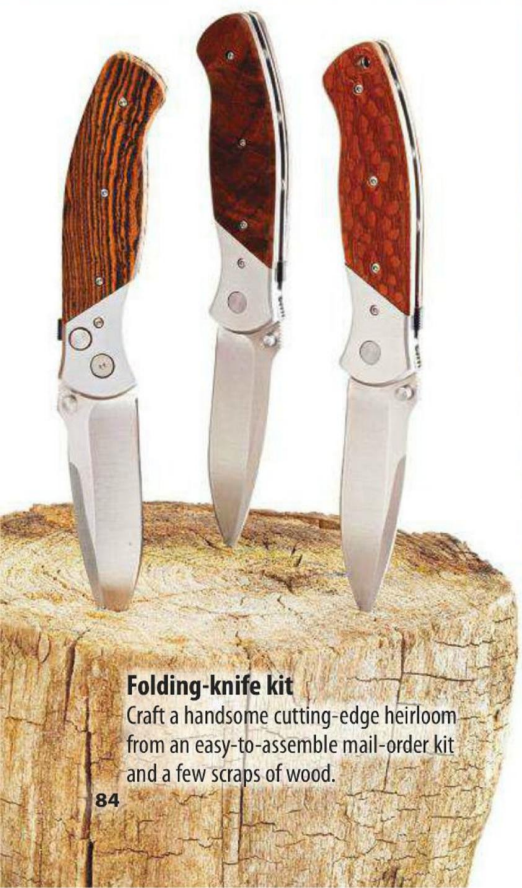
What's Ahead

A glimpse inside the October issue (on sale August 21)

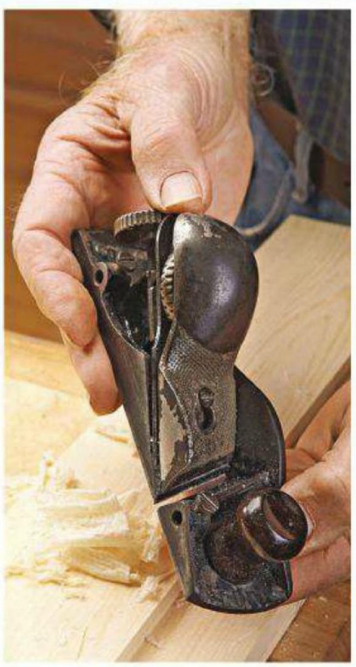


Mission chic
Add a touch of class to any office or home space with this Bow-tie Mantel Clock.

Tower bookcase
Make use of corner space with this eye-grabbing design. Its open shelves create a display area visible from anywhere in the room.

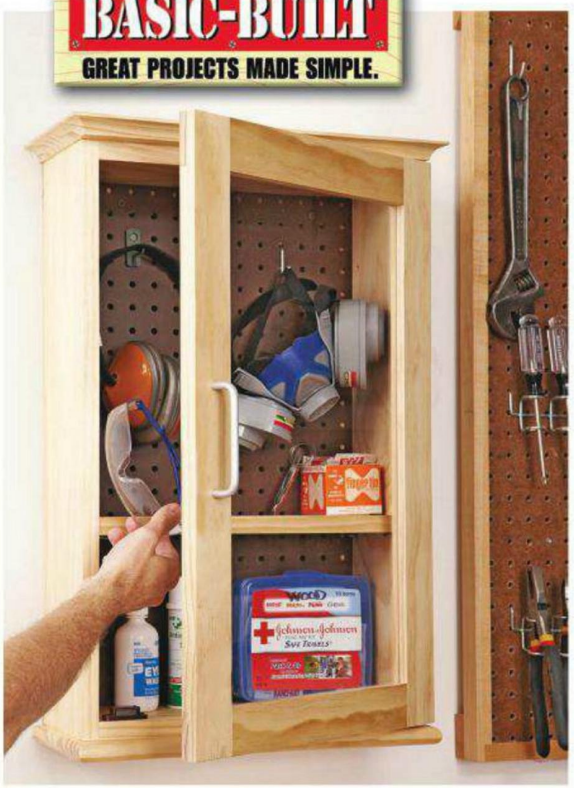


Folding-knife kit
Craft a handsome cutting-edge heirloom from an easy-to-assemble mail-order kit and a few scraps of wood.



Our favorite hand tools
The *WOOD*® magazine staff shares why we like them and where you can get them.

BASIC-BUILT
GREAT PROJECTS MADE SIMPLE.



Safety-gear cabinet
Keep shop necessities dust-free and readily accessible in a cabinet that adapts to other duties throughout your home.

Better Homes and Gardens® WOOD® magazine (ISSN-0743-894X) is published seven times a year in March, May, July, September, October, November, and December/January by Meredith Corporation, 1716 Locust St., Des Moines, IA 50309-3023. Periodicals postage paid at Des Moines, Iowa, and additional mailing offices. Better Homes and Gardens trademark registered in Canada and Australia. Marca Registrada en México. One-year subscription prices: U.S. and its possessions, $28; Canada, $41; other countries, $49. Canada Post Publications Mail Sales Product Agreement No. 40069223. Canadian BN 12348 2887 RT. Return undeliverable Canadian addresses to Better Homes and Gardens WOOD magazine, PO Box 882 STN Main, Markham, ON L3P 929. POSTMASTER: Send address changes to Better Homes and Gardens WOOD magazine, PO Box 37439, Boone, IA 50037-0439.

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WOOD MAGAZINE TOP GLUE APPROVED

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