Easy Weekend Project!

Planter with Trellis

More Great Projects
- Treat-tossin’ Trebuchet p.70
- Dining Room Chair p.56
- Classic Wall Mirror p.16
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Sharpen Forstner Bits and Save $$ p.36

Turn Your Jigsaw into a Clean-Cutting Machine! p.54

SHOP TEST: 14” Bandsaws p.64
12" JOINTER/PLANER COMBINATION MACHINE

- Motor: 5 HP, 220V, single-phase
- Jointer table size: 14" x 59/16"
- Cutterhead dia.: 3/4"
- Cutterhead speed: 5034 RPM
- Max. jointer depth of cut: 1/4"
- Max. width of cut: 12"
- Planer feed rate: 22 FPM
- Max. planer depth of cut: 1/4"
- Max. planer cutting height: 8"
- Planer table size: 12-1/4" x 23/4"
- Approx. shipping weight: 734 lbs.

New!
Carbide insert spiral cutterhead!

NEW END-MOUNTED FENCE

BEAUTIFUL WHITE COLOR!

12" x 60" SHORT BED JOINTER with Spiral Cutterhead

- Motor: 3 HP, 220V, single-phase, TEFC
- Precision ground cast iron table size: 13" x 60"
- Fence: 51/4" x 31/4"
- Cutterhead dia.: 3/4"
- Cutterhead speed: 4950 RPM
- Bevel jointing: 45°, 90°, 135°
- Max. depth of cut: 3/8"
- Approx. shipping weight: 832 lbs.

New!
Choose either 4 HSS knives or spiral cutterhead model

FREE SAFETY PUSH BLOCKS

15" PLANERS

- Motor: 3 HP, 220V, single-phase
- Precision ground cast iron table size: 15" x 20"
- Min. stock thickness: 3/8"
- Min. stock length: 8"
- Max. cutting depth: 1/4"
- Feed rate: 16 FPM & 30 FPM
- Cutterhead speed: 5000 RPM
- Approx. shipping weight: 660 lbs.

New!
Choose either 3 knife or spiral cutterhead model

FREE SAFETY PUSH BLOCKS

CYCLONE DUST COLLECTOR

- Motor: 1/2 HP, 110/220V, 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: 13/16"
- Height: 68 5/8"
- Built-in remote control switch
- Approx. shipping weight: 210 lbs.

New!

FULLY MOBILE WITH BUILT-IN CASTERS

BEAUTIFUL WHITE COLOR!

1 HP WALL MOUNT DUST COLLECTOR

- Motor: 1 HP, 110V/220V, single-phase
- Airflow: 14/7
- Intake size: 4"
- Bag size (dia. x depth): 13 3/8" x 24"
- Balanced steel, radial fin impeller
- Air suction capacity: 450 CFM
- Max. static pressure: 7.2"
- Approx. shipping weight: 51 lbs.

New!

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

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Break out of the oak-and-pine rut and choose something different—even exotic—wood for your next project. At woodmagazine.com/woodprofiles, learn about more than 100 wood species from alantus to zebrawood and everything in between.
To see Lucas’ blog about making these blocks, and download a PDF of the patterns, go to woodmagazine.com/blocks.
Readers dig Construction-Grade toys

Custom tracks add detail
I built the bulldozer in issue 199 (September 2010), as well as the excavator in issue 194 (November 2009). After finishing the dozer, I thought it would look better with typical web tracks. So I made my own. Here’s how.

For less than $2 at a fabric store, I bought a length of 1 1/4-inch wide black elastic band. After measuring the circumference (the path around the wheels), I cut the band 2” shorter and sewed it together in a loop. Next, with the band in place on the dozer, I glued the cleats in place 1/4" apart using cyanoacrylate glue. Although it might not hold up to the rugged play of a child, it sure looks nice.

—Glenn Main, Louisville, Tenn.

Eager builder adds three models to fleet
After making the excavator and bulldozer from your series of construction toys, they looked lonely. So I designed and built a tandem-axle dump truck, pivoting pan scraper, and a skid loader, as shown below. I maintained the scale as well as a few other themes from the series: the use of walnut and maple; machine bolts with acorn nuts; and store-bought wooden wheels. (I broke from the mold on the scraper by making my own wheels.) Thanks for the plans and the inspiration!

—Lauren Bowler, Bloomfield Hills, Mich.

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In order to show you precise details in photos, we frequently remove safety guards. In your work, be sure to use all safety devices, as well as wearing vision, breathing, and hearing protection.

—WOOD magazine editors

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**Top Shop Tip**

**Miter gauge stops keep sliding fences accurate**

I like to keep the fence of my aftermarket miter gauge close to the blade to support the cut. But when I rotate the gauge for angled cuts, I must slide the fence out along the gauge head to prevent cutting into it. Unfortunately, after doing so, I have to recalibrate the tape on the fence.

To make this easier, I made a pair of small hardboard stops that attach to the fence’s T-track and register the miter gauge head with the fence positioned for 90° cuts. Simply loosen one stop, and slide it aside to move the fence for angled cuts. Once you’re finished, slide the fence until it butts against the other stop, and your tape again measures accurately.

—Cliff Furman, Englewood, Fla.

For sending in this issue’s Top Shop Tip, Cliff Furman gets the MRC23EV5K two-base router kit from Bosch. Way to go, Cliff!

continued on page 10

---

**Your tips earn cash, tools!**

Tell us how you’ve solved a workshop stumper. If we print it, you’ll get $100 and a DVD copy of Woodworking Secrets: Tips & Techniques (woodmagazine.com/tipsdvd). And, if your idea garners Top Shop Tip honors, we’ll also reward you with a tool prize worth at least $300.

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Introducing the Premier Fusion saw blade in both Thin and Full Kerf design. Now woodworkers have a superior general purpose blade for both the table and chop miter saw in the shop and for the lower horsepowered saw on the job site. The New Thin Kerf combines the advanced Premier Fusion features with a thinner kerf design to provide a flawless finish while reducing material waste, which makes it the ideal choice for lower powered saws.

Freud’s patent-pending Premier Fusion Saw Blade is the most technologically advanced blade on the market with a radical new “Fusion” tooth design that combines a double side grind with a 30 degree Hi-ATB to produce a glass-smooth, chip-free top and bottom surface while ripping and crosscutting.

The unique Fusion tooth design, combined with Freud-made TiCo™ Hi-Density Carbide, superior anti-vibration design and patented Perma-SHIELD® non-stick coating create the ultimate general purpose saw blade with flawless cutting performance.

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Self Cleaning 1 Micron Filter
Quick Connect Drum Lever
55 Gallon Drum Portable!
$1949.00

The JDS 1.5 HP Dust-Force is perfect for small shops. The unit can be used with short duct runs or dedicated to a single machine. It is also portable and can be rolled around the shop with ease. The powerful 1.5 HP motor produces 1250 CFM maximum airflow. The TEFC motor has an aluminum housing that keeps the motor cool and quiet. The plastic collection bag provides 42 gallons of capacity. The 1 micron bag filters down to 1 micron dust particles preventing fine dust from escaping into your shop. The 1 micron canister has 5 times the surface area of the bag and provides better airflow as well as high filtration.

**Two-Stage Cyclone Dust Collectors**

**JDS Company SINCE 1987**

With high performance and more features, the JDS 3HP Cyclone is raising the bar for 2-stage dust collectors. The TEFC motor has an aluminum housing that keeps it cooler and helps it run more efficiently. The “Turbo-Fan” impeller produces high amounts of CFM when placed under high amounts of resistance. Removing the steel drum is quick and easy, just lift up the drum lid lever and roll out the drum. The self-cleaning 1 micron canister filter has a motor that automatically rotates flappers inside the filter knocking dust down into a collection bag.

**2HP Cyclone**
1700 Max CFM!
68 inches tall
Quick Drum Lever
35 Gallon Drum Portable!
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The JDS 2HP Cyclone is the most powerful and compact 2HP Cyclone in the industry. This unit is 68” tall and has a footprint of 40” x 28”. The perfect size for basement shops and shops with limited space. The TEFC motor and “Turbo-Fan” impeller produces high amounts of CFM when placed under high amounts of resistance. Removing the steel drum is quick and easy, just lift up the drum lid lever and roll out the drum. The self-cleaning 1 micron canister filter has a motor that automatically rotates flappers inside the filter knocking dust down into a collection bag.

**Fold-away lumber trikes**
These lumber trikes work perfectly for moving sheet goods or stacks of lumber around your shop. When not in use, the trikes fold away, taking up little space.
—Dick Ayers, Barron, Wis.

**Shop Tips**

**Non-slip rubber pad**

**3" swivel casters**

**3/4" carriage bolt 2" long in counterbored hole**

**WOOD magazine May 2011**
Keep it clean with glue edge guards and clamp-caul cappers
I made bench risers similar to those in WOOD® magazine issue 193 (October 2009), but I added one improvement: plastic, U-channel shelf caps from the hardware store. Because they’re made to conceal particleboard shelving edges, they fit \( \frac{3}{4} \)" stock perfectly. They protect the risers from messy glue-ups so well, I went ahead and added them to my collection of clamping cauls.
—Serge Duclos, Delson, Que.

Turn a machinist’s vise into a tail vise
Here’s a trick I came up with when I wanted to do some hand-jointing on a long workpiece: Secure one end of a long pipe clamp in your machinist’s vise, prop up the screw end of the clamp with support blocks, and clamp your workpiece. This arrangement provides rigid support in only a few seconds, and gives you all-around access to the workpiece.
—Bill Wells, Olympia, Wash.

continued on page 12

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Turncrafter Commander Midi Lathes
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Shop Tips

Proud dovetails get cut down to size
When cutting through dovetails, I leave the pins and tails a hair proud. But sanding them down afterward can prove to be tedious. To quickly and cleanly trim dovetail joints, use a handheld router with a 1”-long flush-trim bit.

To trim the pins, rabble the end of a scrap board to accommodate the proud tails; then clamp the board over the tail side, as shown below, to give the router a smooth surface on which to ride. With the pin side flat, trim the tails by clamping two pieces of sacrificial scrap to the edges of the sides to prevent tear-out from the cross-grain routing. Finally, a few minutes with a palm sander or sanding block will yield a perfect dovetail joint.

—Steven Goddis, Winston, Ore.
A stick-to-your ribs clamping solution
Here's a quick way to clamp jigs or fences to the undersides of ribbed cast-iron tables, such as those often found on drill presses. In a scrap of wood the same thickness as the recess in the bottom of your table, drill a counterbore and epoxy in a rare-earth magnet to create a filler block that stays put.
—Charles Mak, Calgary, Alta.

continued on page 14

Nanofiber eats the competition’s dust!
(FREE with any Tempest Cyclone!)
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Shop Tips

At-a-glance grinder gauge
Here’s a simple way to reset your grinder’s tool rest to the correct angle. After adjusting the angle just where you want it, lay a scrapwood block on the table alongside the grinder wheel and trace the curve of the wheel onto the block. Saw just on the waste side of the curved line, and then “grind” the shape of the wheel into the curve for a perfect fit. Next time you need to sharpen that tool, use the block as a gauge to position the tool rest.

—Carl Johnson, Elmhurst, Ill.

A gallon of dust collection for an inch of sander
The 1” belt sander was the final frontier of dust collection in my shop. I conquered it using a rinsed-out 1-gallon plastic bleach jug. After some careful tracing and cutting, the jug enclosed the belt and pulleys, and I strapped it to the sander, as shown. When I hooked up my shop-vacuum hose to the jug mouth, it proved a surprisingly effective dust trap.

—Erv Roberts, Windsor Heights, Iowa
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  & Much More!
Construct this mirror in a weekend, then enjoy it for a lifetime thanks to its ultra-sturdy mitered half-lap joinery and timeless styling.

1. From ¼" stock, cut the stiles (A) and rails (B) to size. Follow the directions on page 20 to create the mitered half-laps. Rout the ¼" rabbets ¼" deep on the back of the frame parts and the ¼" coves on the inside front edges, as shown [Drawing 1]. Then glue and clamp the frame (A, B) and set it aside to dry.

2. From ¼" stock, cut the stile trim (C), rail trim (D), and pediment trim (E) to size plus 1" in length. Rout ¼" round-overs on the front edges of each trim piece. Miter-cut the stile trim (C) and rail trim (D) to final length, test-fitting them around the assembled frame (A/B) to fine-tune their lengths. Then glue them to the frame, positioning them to overlap the back of the frame by ¼". The overlap of the trim will hide the edges of the back (G).

3. To create the pediment (F), cut a piece of walnut to ¾ x 3½ x 22¼". Lay out the pediment [Drawing 2] on the blank. Drill the ¼" holes in both ends where dimensioned on the drawing. Use a Forstner bit or holesaw to drill the 2¼" hole on the top. Then cut the blank to its final length and width before making the angled cuts along the top edge using a bandsaw or a tapering jig on the tablesaw. Use a bandsaw to open up the top circle. Cut the pediment trim (E) to final length and round over the ends. Glue
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the trim to the top of the pediment. Glue the pediment, centered, to the top of the mirror frame.

4 Sand all surfaces to 220 grit, vacuum, and apply three coats of clear satin finish.

Cut the back (G) to size. Fit the frame with a ¼"x18x30" mirror secured in place by the back, screwed to the frame with #8 x ¾" wood screws. Then step back and take a look at the proud builder of a new mirror.

### Materials List

<table>
<thead>
<tr>
<th>Part</th>
<th>Finished Size</th>
<th>Matl.</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3/4&quot; x 2&quot; x 21 1/4&quot;</td>
<td>W</td>
<td>2</td>
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<td>B</td>
<td>3/4&quot; x 2&quot; x 21 1/4&quot;</td>
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<td>W</td>
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<td>W</td>
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<tr>
<td>G</td>
<td>3/4&quot; x 21 1/4&quot; x 33 3/4&quot;</td>
<td>H</td>
<td>1</td>
</tr>
</tbody>
</table>

*Parts initially cut oversize. See the instructions.

**Materials key:** W-walnut, H-tempered hardboard.

**Supplies:** #8 x ¾" flathead wood screws (14), ¼"x18x30" mirror.

**Bits:** Rabbeting, straight, ¼" round-over, and ¾" cove bit router bits; 3/16" Forstner bit, 2 1/4" Forstner bit or holesaw.
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Loads of glue surface area make a half-lap one of the most durable miter joints you can make.

With seven years of bad luck on the line, you'll want more than an end-grain to end-grain miter joint cradling the hefty mirror glass on page 16. Fortunately, thanks to a couple of easy router-table jigs, you'll be cranking out mitered half-laps quickly and accurately.

Start by machining your frame stock to thickness and width. Assemble the rail routing jig [Drawing 1] and the stile routing jig [Drawing 2], designed to work with 2"-wide frame stock. For a different width, customize the rail routing jig by making the fence overlap and the...
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Just-Right Joinery

slot between fences the same width as your frame stock [Photo A]. Then adjust the stile routing jig by making the fence overlap exactly half the width of your frame stock.

Cut the frame stiles and rails to the final height and width of your frame, mitering the ends of the rails only.

Chack a ¼" straight bit into your table-mounted router and set the bit’s height to remove half the thickness of the rail and stile stock. Then follow these four simple steps to set up and cut the mitered half-laps.

4 Easy Steps to Tight Miters

STEP 1: SET UP FOR THE CUT

With the base of the rail routing jig against the bit’s cutting edge, lock the fence against the jig. Clamp scrap stock in the jig and make a test cut by running the jig against the fence. Advance the stock for subsequent cuts.

STEP 2: STACK THE STOCK UP

Rout test half-laps on two pieces of scrap frame stock and check the height by stacking the half-lapped stock on a flat surface, as shown. Dial the bit height until the tops of both scraps are perfectly flush.

STEP 3: USE THE RAIL JIG FOR MITERED ENDS

With the bit height set, clamp the mitered rail stock face up in the rail routing jig for the first cut, as shown. Advance the rail and repeat until the mitered tip of the rail touches the router fence for the final cut.

STEP 4: USE THE STILE JIG FOR STRAIGHT ENDS

Reset the router fence for the stile jig as you did in Step 1. Clamp the stile against one of the fences, face down, and rout the half-lap with multiple cuts. Use the opposite fence to rout the other end of the stile.
MAKES
RIGHT ANGLES
CORRECT ANGLES.
AND
ODD ANGLES
ROUTINE.

INTRODUCING THE CRAFTSMAN MITERMATE™ SAW.
Get the exact angle the first time on inside or outside corners with the angle finder. Then transfer the captured angle directly to the pivoting fences for precise cuts. With more innovation and superior value, trust that Craftsman has the tool to get the job done right. Find it at craftsman.com.

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Materials code: 291
Wise Buys

Our Experts Test

Variable-and Slow-Speed Bench Grinders

Why buy?
Woodworkers use this tool mainly for sharpening, but also for grinding down hardware, and, with wire wheels or cloth buffing wheels, cleaning and polishing. A variable-speed machine better suits this wide range of jobs than a single-speed, 3,450-rpm model. Slow the tool for sharpening; use higher speeds for cleaning, buffing, and polishing.

We prefer an 8" grinder because the 1"-wide wheels provide a broad sharpening surface, and the fast rim speed grinds and polishes quickly. 6" models cost less, but cut slower (better for sharpening), and provide only ¾"-wide wheels.

We tested 11 slow- and variable-speed models and found these three offer good value for the daily grind.

CRAFTSMAN 21162 (8") $160; 21154 (6") $100

PORTER-CABLE PCB575BG (8") $119; PCB5258G (6") $79

WOODCRAFT 150780 (8") $110

21162 (8") shown

PCB575BG (8") shown

Wheels: 60-grit silicon carbide, wire brush RPM: 1,800–3,315 (8"); 1,870–3,180 (6"

Test-drive:
If you change wheels frequently, you’ll appreciate this grinder. Removing just one threaded knob frees the wheel cover. An included wrench holds the motor shaft while you loosen the arbor nut. The same wrench helps you loosen the tool rests for sliding them forward and back.

The grinding wheel works for touching up tool edges, and I used the wire wheel to clean rust from an old hand plane.

The included accessories offer a mixed bag of performance: The star-wheel dressing tool works fine for truing 60-grit and coarser wheels; a drill-bit sharpening plate mounts on either tool rest (but I had little luck reving bits with it); a handy quench cup clips to the base and holds water for cooling tools while sharpening.

The 6" and 8" versions of this grinder have near-identical features, so let your needs and wallet dictate your choice.

Get it if: You need rough grinding as well as wire-wheel cleaning.

Forget it if: You expect razor-sharp tools from the 60-grit wheel.

—Tested by Craig Ruepegger, Projects Editor

To learn more:
800-549-4505; craftsman.com

———

PORTER-CABLE PCB575BG (8") $119; PCB5258G (6") $79

Test-drive:
The wheels of these similarly featured grinders cover a wide range of tasks, from rough grinding to touching up woodworking tools. Both grinders run nearly vibration-free, with smooth rpm changes across the variable-speed range.

Threaded knobs make positioning the tool rests and safety shields easy. The poker-chip-like interlocking ridges in the tool rest and mount provide solid, repeatable positioning, but prevent fine-tuning between those graduations.

A T-shaped, diamond-embedded dressing tool stores on the back of the base and a quench cup sits up front.

Two grips: I didn’t care for the drill-bit-sharpening groove cast into the left tool rest, as narrow chisels tended to dip into it. And the task light only comes on when the motor is running, so it can’t be used when setting up the grinder.

Get it if: Sharpening chores range from lawnmower blades to chisels.

Forget it if: You want a grinder mostly to touch up woodworking tools.

—Tested by Lucas Peters, How-to Editor

To learn more:
888-848-5175; deltaportercable.com

———

WOODCRAFT 150780 (8") $110

Wheels: 60- and 120-grit aluminum oxide RPM: 1,790

Test-drive:
This affordable, single-speed grinder doesn’t offer a task light or a dressing tool, but in exchange you get high-quality, aluminum-oxide wheels meant for sharpening tools. And for what those wheels would cost as an upgrade, you could easily add a light and dressing tool, and still be money ahead.

The grinder’s slow speed means minimal vibration: It stayed put on my bench, even without clamping it in place.

However, I had to double-faced-tape wedges to the fixed-angle tool rests to hold my plane irons at the proper angle. Adjusting the tool rests forward and back requires a wrench that you provide.

Although you could mount a wire wheel or buffing pad, doing so requires removing five screws from the wheel cover. And the slow speed means jobs with these accessories will take longer.

Get it if: You touch up woodworking tool edges frequently.

Forget it if: You’re not willing to work a bit to set it up.

—Tested by Karl Ehlers, Art Director

To learn more:
800-225-1153; woodcraft.com

———
Rip-Fence Tenoning Jig

Rather than paying $50 to $100 for a factory-made tenoning jig, make this one from scrap stock and get equally great results. We used it to cut perfect tenons when building the side chair on page 56. Before using the jig, align your tablesaw’s rip fence parallel to the blade to prevent pinched cuts and inaccurate tenons.

Start by cutting the three jig-body parts to size from ¼”-thick plywood. Glue and screw the jig together as shown below right.

**Note:** To ensure the jig slides easily on the fence, slip a sheet of 220-grit sandpaper between one of the vertical parts and the fence face for spacing during assembly.

Next, cut the support block as shown from any scrap stock you have on hand, even a piece of 2x6 pine. With the jig body resting on the locked-in-place rip fence, screw—don’t glue—the support block to the tall jig face. (This allows you to replace the support block after repeated cuts have chewed it up.) Finally, ease the sharp edges and ends on all parts with a sanding block.

Find more Quick & Easy Jig plans at: woodmagazine.com/freeplans
This face launched 1,000 projects.

JEFF BAENEN is a mechanical designer and the grand prize-winner of The Woodworking Shows’ First Annual ShowOFF Showcase with his project “My Nightmares and Dreams,” an amazing box - see it at TheWoodworkingShows.com. Jeff makes intricate boxes that are both useful and incredible works of art.

Favorite Tool: Toss-up between the table saw and the router table and - it may sound corny - but the other favorite tool that I use more than everything, is the pencil. I love sketching out new ideas...and who doesn’t always need a pencil, within arm’s reach, while in the shop.

Best Project: That is a tough one. I fall in love all over again every time I start a new box. My favorite one, on the engineering side of my brain, would be “Box of Chocolates.” It has three wooden lifting mechanisms within it. Artistic side would be “My Nightmares and Dreams” or my newest box “Ripple.” In the end my favorite project will always be a new box.

Working On: I recently got back from a business trip to Japan and while I was there I hunted down a woodworking store. I bought a Japanese Bamboo Froe and a block of wood to build a display box for it. Other than that I promised a pencil box to my budding artist niece...and I just happen to be in need of one also.

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www.thewoodworkingshows.com  P: 800.826.8257
The planter box by itself makes a handsome addition to your landscaping.

Overall dimensions: 42 1/4" wide x 24 1/4" deep x 76 3/4" high (23 1/4" high without trellis)
Plant this box wherever you'd like a splash of greenery, and perhaps some added privacy. An open grid inside the box supports plant containers while allowing water, leaves, and dirt to fall through. Build just the box (inset), or add the wood-and-copper-water-pipe trellis to support vines. We built ours from cypress [Source, page 34], but cedar or redwood, or fir with a coat of paint will also stand up to the elements.

**Stack slats to build a box**

Machine the box front, back (A), and side (B) slats to size [Materials List, page 34]. Rout a 3/8" chamfer on the top outside edge of six front and back slats and six side slats [Drawing 1]. Use a squaring brace [More Resources, page 34] to help assemble four slat frames [Photo A]: three with chamfered edges and one unchamfered.

[Diagram of box assembly]

**Foot Detail** (Right front and left rear shown)

Planer Box & Trellis
CUT WIDE DADOES WITH A REGULAR BLADE

Set the blade 3/4" above the table and the rip fence 3/4" from the blade. Make a pass across one end of each front and back foot (l).

RESET THE FENCE 1 1/2" FROM THE OUTSIDE OF THE BLADE AND MAKE A SECOND KERF IN EACH FRONT AND BACK FOOT.

SLIDE THE WORKPIECE AWAY FROM THE FENCE ONE BLADE WIDTH AT A TIME AND Nibble AWAY THE WASTE BETWEEN THE KERFS.

RABBET THE SIDE FEET

Cut a rabbet in each side foot (J), leaving a tongue that fits the dado in the front and back feet (l).

BORE HOLES FOR THE PIPE

To mark the hole depth, wrap tape around a 1/8" spade bit 3/8" above the cutters. Drill the holes on the marks.

LAY OUT HOLES FOR THE TRELLEIS

Draw lines across all five trellis dividers (O), then lay out the intersecting centerline along each piece to find the hole centerpoints.

2. Cut the front/back corner trim (C) and side corner trim (D) to size.

3. **Quick Tip!** Stack the four slat frames (A/B) with 1/8" spacers between them to determine the exact length of the trim pieces. Glue and screw a front/back corner trim and a side corner trim together to make four corner assemblies [Drawing 1]. Finish-sand the slat frames and corner assemblies to 150 grit.

4. Starting with a chamfered slat frame (A/B), screw the slat frames to the corner assemblies (C/D). Use the 1/8" spacers again to space the frames [Photo B].

5. Cut the top- and bottom-frame rails (E, F, G, H) to size [Drawing 1]. Assemble the top and bottom frames with pocket screws, then rout a 1/8" chamfer along the bottom outside edge of the top frame (E/F) and the top outside edge of the bottom frame (G/H). Finish-sand the frames to 150 grit.

6. With the chamfered face of the bottom frame (G/H) facing up, use a water-resistant wood glue (Type II or III PVA or polyurethane) to glue the box (A-D) to the bottom frame, centered. Then center and glue the top frame (E/F) to the top of this assembly with the chamfers facing down [Drawing 1].

7. From 1 1/2"-thick stock (we laminated 3/4" boards), cut the front and back feet (l) and side feet (J) to size [Drawing 1a]. Cut 3/4" dadoes in the front and back feet as shown in Photos C, D, and E. Reset the rip fence 3/4" from the outside of the blade and cut a rabbet in each side foot [Photo F].

8. Lay out the arch on each front, back (l), and side (J) foot [Drawing 1a]; then jigsaw just outside the line, and sand up to the line. **Note:** Make two rights and two lefts of each part. Glue and clamp a front or back foot to each side foot. After the glue dries, sand the feet to 150 grit, then glue the feet to the bottom frame, centered on the width of the frame rails (G, H).

Try the trellis

1. From laminated 3/4" stock cut the trellis uprights (M) and rails (N) to size [Drawing 2]. Lay out the dadoes on the uprights and the rabbets on the rails. Using the same method used on the feet (l, J), cut the joints.

2. On the uprights (M), lay out locations for the holes that hold the pipe [Drawing 2], then drill them [Photo G].

3. Cut the trellis dividers (O) to size. Set them side by side on your bench...
with their ends flush and lay out the hole locations [Photo H, Drawing 2a]. To prevent chip-out when the bit exits the hole, set the divider on top of a piece of scrap, then drill the holes.

4 Tilt your tablesaw blade to 45° and install a zero-clearance insert. Clamp a stopblock to the rip fence in front of the blade and, making test cuts on scrap the same thickness as the trellis dividers (O), adjust the rip-fence position to cut ⅜" bevels [Photo I]. Bevel the ends of the dividers.

5 With a hacksaw or pipe cutter, cut eight 31¼"-long pieces of ⅜" copper pipe. Remove lettering and stickers from the pipe using a cloth dampened with lacquer thinner.
Glue and clamp one end of each trellis rail (N) to a trellis upright (M). Dry-fit the pipes and trellis dividers (O) [Photo J] and clamp this assembly between the trellis uprights to check the fit. Remove the dividers and pipes and once again dry-fit the loose upright to the rails. Center the uprights/rails assembly on the back of the box (A–L) and mark locations for notches to accept the uprights. Cut the notches with a handsaw or coping saw.

Cut the trellis top (P) to size and rout a ¼" chamfer around one face [Drawing 2]. Disassemble the trellis and set the pipes aside. Sand the trellis parts to 150 grit. Tape off the unglued half-lap joints on the trellis upright (M) and rails (N) and apply a finish to the uprights, rails, dividers (O), and trellis top.

After the finish dries, remove the tape, reassemble the trellis, and glue the final upright (M) in place. Screw the top (P) in place, centered on the depth and width of the trellis. Fit the trellis in the notches in the top-frame rail (E) and screw the trellis to the rear of the box [Drawing 2]. Place containers on the drip frame (K/L) and fill them with plants.

Produced by Craig Ruesegger with Kevin Boyle
Project design: Kevin Boyle
Illustrations: Roxanne LeMolne; Lorna Johnson

**Cutting Diagram**

<table>
<thead>
<tr>
<th>Part</th>
<th>FINISHED SIZE</th>
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<tbody>
<tr>
<td>Plnter box</td>
<td>T</td>
<td>W</td>
</tr>
<tr>
<td>A</td>
<td>front/back slats</td>
<td>3/4&quot;</td>
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<tr>
<td>B</td>
<td>side slats</td>
<td>3/4&quot;</td>
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<tr>
<td>C</td>
<td>corner trim</td>
<td>3/4&quot;</td>
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<tr>
<td>D</td>
<td>side corner trim</td>
<td>3/4&quot;</td>
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<tr>
<td>E</td>
<td>top-frame front/back rails</td>
<td>3/4&quot;</td>
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<tr>
<td>F</td>
<td>top-frame side rails</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>G</td>
<td>bottom-frame front/back rails</td>
<td>3/4&quot;</td>
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<tr>
<td>H</td>
<td>bottom-frame side rails</td>
<td>3/4&quot;</td>
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<tr>
<td>I</td>
<td>front/back feet</td>
<td>1 1/4&quot;</td>
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<tr>
<td>J</td>
<td>side feet</td>
<td>1 1/4&quot;</td>
</tr>
<tr>
<td>K</td>
<td>drip-frame ends</td>
<td>3/4&quot;</td>
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<tr>
<td>L</td>
<td>drip-frame slats</td>
<td>3/4&quot;</td>
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**Trellis**

- M: trellis uprights | 1 1/2" | 2 1/4" | 71 1/4" | C | 2 |
- N: trellis rails | 1 1/2" | 2 1/4" | 35" | C | 2 |
- O: trellis dividers | 3/4" | 1 1/2" | 42" | C | 5 |
- P: trellis top | 3/4" | 3" | 42 1/4" | C | 1 |

*Parts laminated from ¾"-thick stock.

**Material key:** C-cypress.
**Supplies:** 4×8-1/4"; 8×2-1/2" stainless steel F.H. wood screws (or 1 1/4" and 2" deck screws); 1" coarse-thread pocket screws; 3/8" copper pipe (3 10’ lengths).
**Bits:** 45° chamfer router bit; 3/8" space bit.

**Source**

*Cypress lumber:* Wilson Lumber Co., 1279 N. McLean Blvd., P.O. Box 820526, Memphis, TN 38182-0526, 901-274-6887, cypressusa.com. For a list of other cypress suppliers, go to the Southern Cypress Manufacturers Assn., cypressinfo.org.

**Planting possibilities**
The planters shown here were filled by the manager of the Better Homes and Gardens Test Garden® using plants readily available at most independent garden centers or big-box stores.

1. Clematis “Sweet Autumn”
2. Duranta “Gold Edge”
3. Coleus “Kingswood Torch”
4. Thyme “Lemon”
5. Calibrachoa “Trailing Plum”
6. Canna “Burning Ember”
7. Coleus “Dark Star”
8. Pennisetum “Princess Molly”
9. Sweet potato vine “Black Heart”

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(S=Download these plans for a small fee.)
How to Sharpen Forstner Bits

Are your bits losing their edge? Rather than giving them the heave-ho, try the ol’ re-hone.

To see a free video of this technique in action, visit woodmagazine.com/forstner.

If those formerly cut-smooth-as-butter Forstner bits now take excessive force to push through wood, and produce more curls of smoke than wood, don’t toss them. For about the price of a single premium replacement bit, you can assemble a kit of files and slipstones that will help you get Forstners back in ship-shape boring form in a matter of minutes. The kit consists of a \( \frac{1}{4} \)” round fine-grit abrasive file, a \( \frac{1}{4} \)” triangular fine-grit abrasive file, and a 3-piece flat mini-hone set. (See Sources.)

Start by cleaning off any pitch or resin buildup on the bits using blade and bit cleaner (such as Boeshield, item no. 128479, woodcraft.com). Then follow the steps, on the next page to restore cutting edges. Remember: Never file the outside of the cutting rim because doing that will change the bit’s diameter.

You’d never bore through sandpaper as we did to quickly dull the bits for this article, but some woods, such as cedar, contain silicates that have a similar, albeit slower, dulling effect.
3 Steps to Sharp Forstner Bits

**STEP 1: CHOOSE YOUR FILE: ROUND FOR RIMS, TRIANGLE FOR TEETH**

For bits with a cutting rim, chuck a round file in your drill press. At the drill’s lowest speed, lightly hone the interior of the rim taking care to match the angle of the interior of the rim to the file as you turn the bit through a few quick strokes.

*TIP:* Bolster confidence by practicing the motion with the drill press turned off first.

If your Forstner bits have serrated teeth on the cutting rim, skip the round file and instead clamp the bit in a vise and hone the back of each tooth with a triangular file. Don’t overdo it; a few strokes per tooth will suffice.

**STEP 2: FILE THE FLATS**

Next, with the bit clamped in a vise, hone the leading edge of the chippers with a fine mini-hone, ensuring a flat plane and sharp cutting edge. Pay close attention to the intersection where the chipper meets the cutting rim. A crisp corner makes clean cuts.

**STEP 3: KEEP THE CENTER SPUR CENTERED**

Finally, use the triangular file to hone the center spur. Use your thumb as a guide to protect the chippers and rim. Don’t overdo it here: Use the same number of light strokes on each face to keep the point of the spur centered.

Sources:
- ¼” round file: McMaster-Carr item no. 4499A11, $10; mcmaster.com, 330-995-5500; ¼” triangular file: McMaster-Carr item no. 4498A11, $8;
- 3 piece mini-hone kit: Woodcraft item no. 147298, $22; woodcraft.com, 800-225-1153.
To some woodworkers, cedar ranks high as the wood of choice for building decks. Others rely on it for lining closets or cigar humidors. How can one wood be so versatile? It’s because multiple varieties exist with different properties and uses. We’ll slice through the five most common species so you can choose the cedar that best suits your project.

**Western Red Cedar**

This member of the cypress family grows from southern Alaska through northern California and in the Rocky Mountains. The trees may grow 200’ tall with trunk diameters of 10’.

Western red cedar (*Thujopsis dolabrata*) reigns supreme for the production of decking, siding, shingles, and outdoor structures because of its natural decay resistance, ability to repel water, and abundance. Low density and light weight make it easy to cut and shape using hand or power tools. But contact with the sawdust can cause rashes and respiratory problems.

The heartwood of this species bears a consistent reddish-brown tone, sometimes tinged with pink. Knots prove prevalent in lower grades, though “clear” grades are available. Most of its thin white sapwood (which has little decay resistance) gets milled away during lumber processing.

**Sources:** Find knotty grades in dimensional sizes at home centers and lumber yards; clear grades at hardwood dealers.

**Price:** $1 to $3 per linear foot in dimensional sizes, $4 to $6 per board foot (clear 4/4 $25 stock).

**Northern White Cedar**

This cedar (*Thuja occidentalis*) is sometimes called “arbor vitae” (tree of life). It grows in southeastern Canada and the northeastern quarter of the U.S., south to Tennessee and west to Iowa. Trees grow 50’ tall with 2’-diameter trunks.

Northern white cedar resists decay and insect infestation like its western red cousin, making it similarly suitable for outdoor projects, such as shingles, posts, and decking. Canoe builders use the wood to fashion their boats.

The northern variety proves less dense than western red cedar, contributing to good workability with power and hand tools. The wood tends to be brittle, tearing out without sharp cutters and backer boards. And some woodworkers report rash and respiratory problems.

A thin band of creamy white sapwood surrounds the wood’s light brown heartwood, with knots often present.

**Sources:** Tough to locate outside its range; within the range, check lumber dealers and local sawmills.

**Price:** $1.75 per board foot (4/4 $25 stock).
Eastern Red (Aromatic) Cedar
This tree (Juniperus virginiana) also belongs to the cypress family. It grows throughout the eastern United States, usually to heights of just 20' to 40', though some trees reach 100' or taller.

Most people refer to this wood as “aromatic cedar” because of its pungent natural oils, and use it to line closets and hope chests to ward off insects. Little scientific data exists, however, to show the wood repels bugs effectively.

It works easily with hand and power tools, but use a respirator and gloves if you experience rash and respiratory problems. Nonetheless, pencil makers prefer the wood, as do producers of souvenir wooden novelties.

Eastern red cedar heartwood bears pinkish-red tones with an occasional purplish tinge and deep reddish-brown streaks. The sapwood is almost white, and knots are often present throughout the wood.

Choose polyurethane or lacquer for the best finishing results. In confined spaces, the resins in eastern red cedar can cause finishing problems, as they inhibit proper hardening of oil finishes.

Sources: Seek out hardwood dealers for lumber, home centers for closet lining.
Price: $3.50 per board foot (4/4, 2x2 stock).

Yellow Cedar
Also known as Alaska cedar, this tree (Chamaecyparis nootkatensis) grows in the Pacific Northwest, from Alaska through British Columbia and into Oregon. The wood ranks as hard and dense, with tight rings indicative of its slow growth. Even so the wood remains lightweight, giving it an impressive strength-to-weight ratio.

Native Americans used yellow cedar to produce ultralight, durable canoe paddles and many other useful items. Today, makers of stringed musical instruments prize the wood because of its excellent sound quality. Boatbuilders use it for decks, railings, and interior paneling.

Yellow cedar ranges in color from creamy white to sulfur yellow, with occasional dark streaks. The wood machines beautifully, glues and stains well, and develops a satiny sheen.

Sources: Luthier’s supply companies, specialty hardwood dealers.
Price: $6.50 to $7 per board foot (4/4, 2x2 stock). Prices for instrument-grade wood run much higher.

Spanish Cedar
The sole hardwood and only import of this group, Spanish cedar (Cedrela odorata) grows natively in Central and South America, and has been planted in Florida. This relative of mahoganies can grow to 100' tall.

Within its range, Spanish cedar gets used for everything from furniture to windows and cabinetry. Builders of lightweight racing boats fashion the wood into sleekly curved hulls. Though harder to obtain in the United States and Europe, Spanish cedar has become the wood of choice for lining cigar humidors because of its aromatic oils and moisture resistance.

The lightweight wood bears straight grain and proves easy to machine and finish. Spanish cedar heartwood has a pinkish to reddish-brown tone that darkens over time.

Sources: Go to hardwood dealers for boards, and woodworking catalogs for small stock.
Price: $7 per board foot (4/4, 2x2 stock).

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- Aromatic Cedar: Myth or Mothbuster? woodmagazine.com/aromatic
- Cedrus libani, the cedar of the Bible: woodmagazine.com/biblicalcedar
- Build a mahogany and aromatic cedar blanket chest. woodmagazine.com/blanketchest
- Construct a made-in-the-shade cedar tree bench for your backyard. woodmagazine.com/treebenchplan

$=Download this article for a small fee.
Amp Up Your Bandsaw

Elevate your bandsaw from good to great with these performance-enhancing accessories.

- Crank and quick release ease tension adjustments.
- Balanced wheel smooths operation.
- Beefy blade rips into resawing.
- Full-featured fence improves accuracy.
- Upgraded guide bearings reduce friction.
The bandsaw may be one of the easiest stationary tools to “amp up” with numerous accessories that improve performance or convenience. Some do both. Not every saw needs all these improvements, but yours will probably benefit from at least a few of these upgrades.

**Boost power and performance**

All the accessories in the world won’t help much if your bandsaw stalls during demanding cuts or shakes like an over-cafeinated chihuahua. Smooth out the tremors and get as much cutting power as possible with these upgrades.

**Cinch up your belt ▲**

When the V-belt that connects the motor pulley and drive pulley sits in one position too long, it can take on a permanent curve, or “set,” where it wraps around the pulleys, causing a nasty vibration. Replace it with a link belt that stays flexible and absorbs vibration better than one-piece V-belts. Buy it by the foot, then adjust its length to fit your saw by adding or removing links. (99/ft., item 52133, Rockler, 800-279-4441, rockler.com.)

**Put some teeth into it ▲**

Resawing wide stock requires all the power a bandsaw has to give, so make the most of your saw’s efforts by stepping up to the widest 3-tooth-per-inch (tpi) blade your saw accepts. A wider blade flexes less for truer rip cuts and its larger surface area dissipates heat better so the blade stays sharp longer. The aggressive hook angle of the teeth on a resaw blade cuts quickly, generating a lot of sawdust. The large gullets clear that waste faster.

A blade with variable pitch, right, alternates sections of 2-tpi and 3-tpi. The 2-tpi sections cut quickly, even through the widest stock your saw handles. The 3 tpi sections reduce vibration, giving a relatively smooth finish. (Timber Wolf ¾x2-3/PC blade or ½x3PC blade, $23.74, Suffolk Machinery, 800-234-7297, suffolkmachinery.com.)

**Checks and balances ▲**

If replacing the belt doesn’t calm the jitters, check for out-of-balance wheels. To do this, remove the blade and drive belt so the wheels spin freely. Working on one wheel at a time, make a mark on the inside edge of the rim at its lowest point. Give the wheel a gentle spin, wait for it to stop, and make another mark at the bottom. Do this five times. Randomly-spaced marks mean the wheel is balanced. But a cluster of marks in one area points out a heavy spot and indicates the wheel needs to be balanced.

To do this, clean the wheel rim directly opposite the marks with rubbing alcohol and allow it to dry; then apply self-adhesive wheel weights to the cleaned area, starting with ¼ ounce. Repeat the “spin test,” this time making marks with a different-colored marker. Grouped marks again tell you to apply more weight, or change the amount or position of weights already in place. For small adjustments, divide the soft metal weights with an old chisel or knife. (Strip of twelve ¾ oz. weights, $4, Competition Accessories, 800-543-6208, compacc.com.)
Guidance counseling: Keeping the blade and workpiece on track

Without guide blocks or bearings above and below the table, a bandsaw blade would wander like a four-year-old on her first ride without training wheels. Like that child, bandsaw blades, and sometimes the workpiece, need guidance. Keep them on track with these enhancements.

Get your bearings

Guide blocks, with their large surface area, work especially well guiding wide blades, while roller bearings create less friction and heat buildup. Stacked roller-bearing guides from Carter Products, above, combine the best of blocks and bearings. They also have toolless adjustment: Twist a thumbscrew to loosen a bearing; then fine-tune its position with the microadjuster. Cinch up the thumbscrew to lock the bearing in position.

A specialized guide bearing, above, helps narrow blades (1/16" and 1/8") track true during curved cuts. The rear of the blade rides in a groove in the bearing’s edge. The groove provides side-to-side support and the bearing reduces friction.

Block party

If you don’t have the budget for bearing guides, ceramic guide blocks provide an inexpensive upgrade from the factory-supplied metal blocks. The large, flat faces provide the same solid blade support, but the ceramic material generates less friction, so they run cooler. That translates into longer blade life. Installation is as simple as loosening a bolt or thumbscrew to remove the steel blocks, then putting the ceramic blocks in place. They wear so well that the manufacturer guarantees them forever. (Ceramic guide blocks and thrust bearings, $18, item 40213, Hartville Tool, 800-345-2396, hartvilletool.com.)

Fence me in

For resawing and straight-line rips, a good fence is essential, yet many saws come with no fence or a poor-performing one. The Kreg fence packs a lot of features in an affordable package. It pivots to account for blade drift (the tendency of a blade to pull to one side). For sawing thin, narrow stock, mount the fence with the wide face down on the table. It can then extend under the guide assembly, even with the assembly close to the tabletop. The fence easily lifts off the rail for quick switching from straight cuts to freehand work. An optional micro-adjuster makes precise fence movements easy. (Rip fence, No. KMS7200, $120; Micro-adjuster, No. KMS7215, $15; Kreg Tool, 800-447-8638, kregtool.com.)
Tension is a good thing
Like any of us, a bandsaw occasionally needs relief from tension—the tension needed to keep its blade cutting true, that is. Relieving that tension extends the life of the wheel bearings and tires, and makes blade changes possible. These accessories simplify taking your saw from tightly wound to relaxed and back again.

Put the squeeze on ▲
Bandsaw springs, like all of us, lose their ability to bounce back as they get older. If yours no longer has enough “oomph” to tension wide blades, replace it with a heavy-duty aftermarket spring. On most saws, installation goes quickly and doesn’t require any special tools.

We found that after installing a stronger spring, it took fewer turns of the tensioning knob to properly tension a blade. With springs to fit most sizes of bandsaws, this inexpensive upgrade offers a lot of bang for your buck. (912-518, Ituna Design, 904-642-2802.)

Take ‘er for a spin ▲
Small tensioning knobs prove difficult to grip, don’t provide much leverage, and only allow half of a rotation before you need to change your grip. Turning them can literally be a pain. Mount a 6”-diameter cast wheel with a spinning handle, and adjusting blade tension becomes easy. The chrome finish prevents rust and looks nice, too. (item 10888 $47, Ituna Design, 904-642-2802.)

Instant tension relief ▲
A quick-release lever applies or removes blade tension in a snap. In the up position, the mechanism keeps the blade under tension, ready for use. Pivot the lever down toward the table to release all tension for blade changes and between work sessions. The middle position relieves stress on the wheels and saw frame, but provides enough tension to hold the blade in place while mounting a blade and checking tracking. This upgrade took about 15 minutes to install, a small investment quickly regained with faster blade changes. (Carter Products, item QR, $199, 888-622-7837, carterproducts.com.)

Time to lighten up
No bandsaw add-on will help much if you can’t see your work. So defeat the forces of darkness with a task light. The magnetic base on this one sticks to any steel or iron surface, and the gooseneck puts the light exactly where you need it. Eleven LEDs shine a bright spotlight without the heat of incandescent bulbs. Juice comes from four AA batteries in the base, or use the optional AC power cord. (555, item 26429, Rockler, 800-279-4441, rockler.com.)

Written by Craig Ruegsegger with Bob Hunter
Turn defects into details

To err is human. To hide your mistakes using a flush-trim V-groove bit is divine.

Not every face frame and cabinet case go together like a match made in heaven. The frame may slightly overlap the case sides, or hairline gaps may emerge after the glue-up. That's when you need the perfect solution for an imperfect world: a flush-trim V-groove router bit.

These bits look and work much like straight flush-trim bits with one exception: A V-shape groove-cutter extends about ¼" past the bottom-mounted pilot bearing and cutters, as shown below. This V forms a groove on the joint line between the face frame and the case; the rest of the bit trims the frame edge flush, as shown above.

On cabinets with a clear finish, the groove helps mask hairline gaps. On painted cabinets, it works like an expansion joint in concrete, concealing cracks that inevitably form between the face frame and the case, as shown below. Such a shallow groove won't interfere with pocket-hole screws or other fasteners.

Bits from most manufacturers use cutters running straight up and down. If you're working with figured wood or species prone to tear-out with straight cutters, choose a bit with an angled (down-shear) edge, below left, that slices as it cuts for smoother results.

Find your groove

Size the face frame or rough-cut it so you trim off less than ¼" of waste to avoid tear-out. Place the router base on the face frame, as shown above, and adjust the bit depth until you center the groove over the joint. Check that the bearing rides against the case.

Then start the router and move it counterclockwise, trimming first along the end grain on the frame stiles. Routing the sides last removes tear-out. To smooth any rough spots, use 220-grit sandpaper wrapped around a hardwood scrap block.

Sources

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

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Desktop Trebuchet
Page 70
Back bevel cut at 27°

For a Mission chair plan visit:
woodmagazine.com/missionchair

Each square = 1"

shoe mortise

$\frac{3}{8} \times 2\frac{7}{8}$" deep

$\frac{9}{16}$" × $\frac{15}{16}$" × $\frac{9}{16}$"
Dining Room Chair
Page 56

To download a FREE full-size back leg pattern, go to woodmagazine.com/chairleg.
Right-angle Router-table Push Block

Please work safely
In your work, be sure to use all safety devices, as well as wearing vision, breathing, and hearing protection.
—WOOD magazine editors
Table Lamp

Here's a bright idea: a light fixture you can build in a weekend. Watts not to like?

A good place to start on this project may be in your collection of too-good-to-throw-away cutoffs. It takes less than two board feet of lumber for the column (we used ash), and some scraps of a contrasting species for everything else (cherry on ours).

The column consists of four tapered corner pieces joined with splines that create the recesses accenting each face. This assembly also includes a hollow center for the power cord. Let's start off by constructing the column.

Overall dimensions:
6¼" wide × 6¼" deep × 18½" high without lamp hardware and harp.
AT A GLANCE

- Find complete lamp hardware kits at home centers and lighting stores.
- Customize the look with a lamp shade suitable for your decor.

CUT IT CLOSE

Taper one face of each column corner (A). After cutting and smoothing this taper, lay out the second taper on the newly cut face.

Corner-cutting encouraged

1 Quick Tip! No lines, no waiting.
Cut the column corners (A) from 6/4 or 8/4 stock if you can, and eliminate glue-up time and joint lines. If you don’t have thick stock, laminate two layers of ¾”-thick stock for the four column corners, then cut them to size (Materials List, page 53).

Note: When planing glued-up column corners to thickness, remove equal amounts from each face so the joint line remains centered.

2 Position the four column corners (A) with the grain oriented as shown in Drawing 1b; then mark each of the faces that will receive a groove. Set up a ¼” dado blade in your tablesaw and cut the ¼”-deep grooves.

3 Lay out a taper on one ungrooved face of each column corner (A) (Drawing 1). Cut just outside the line on the bandsaw (Photo A; More Resources, page 53); then smooth the face with a jointer, hand plane, or belt sander. Mark the second taper on the adjacent ungrooved face of each column corner and repeat the process.
YOU'VE GOT SOME SPLINING TO DO

Glue a spline (B) between two column corners (A), keeping the ends flush, to make two half-column assemblies [Photo B]. Then glue and clamp the two half-column assemblies together to make the column [Photo C].

CAP IT OFF

Center each cap (C, D) on the column (A/B), drill pilot holes centered through the shank holes and screw the caps in place.

SLIDE THE PIPE IN

With the hardware installed on the top of the lamp pipe, push the pipe through the lamp pieces until the neck rests on the top (E).

MAKE YOUR MARK

Using a fine-point permanent marker, mark the pipe's final length flush to the bottom of the lamp bottom (F).

WIRE YOU GOING?

Push the bare end of the cord through the pipe. When the lamp stands up, the cord runs through a channel between two feet (G).

4 Plane a spline blank from contrasting stock to fit the grooves in the column corners (A). Rip four \( \frac{3}{8} \)-wide splines (B) from this blank. Finish-sand the column corners and splines up to 220 grit, then glue up these pieces to create the column [Photos B, C].

5 Cut the top and bottom column caps (C, D) to size. In each piece, drill a centered \( \frac{3}{16} \)" hole and countersunk \( \frac{1}{4} \)" shank holes near opposite corners [Drawing 1a]. Then, screw the caps in place [Photo D].

6 From \( \frac{1}{2} \)"-thick material, cut the top (E) and bottom (F) to size. Rout a \( \frac{1}{4} \)" chamfer around each piece [Drawing 1].

7 Using a \( \frac{3}{8} \) Forstner bit, drill a \( \frac{1}{4} \)"-deep counterbore centered on the bottom face of the bottom (F) [Drawing 2]. Next, drill \( \frac{3}{8} \)" holes centered on the bottom (F) and top (E).

8 Cut four feet (G) to size. Place the feet on your bench, arranged in a square with the grain of all pieces running in the same direction. Mark the inside corner of each foot, then cut it away [Drawing 1]. Finish-sand the top (E), bottom (F), and feet up to 220 grit. Glue each foot to the bottom (F) with the grain running in the same direction as that of the bottom, and revealing \( \frac{1}{4} \)" of the foot’s outside edges on each side.

9 Apply finish to all pieces. (We sprayed on three coats of polyurethane, sanding between coats with a 400-grit sponge.)

Now, the hard(ware) part

1 Thread the neck, washer, harp, and the socket bottom cap onto one end of the lamp pipe [Drawing 2]. Slide the other end of the pipe through the top (E), column (A-D), and bottom assembly (F/G) [Photo E]. Press the column, top, and bottom assembly together, and with the neck tight to the top (E), mark the length of the lamp pipe [Photo F]. Using a hacksaw, cut the pipe to length, and file away any sharp burrs on the inside and outside of the end, taking care not to damage the threads.

Quick Tip! Use your nut. Before cutting the lamp pipe, thread a nut on the pipe above the cutline. After cutting the pipe, removing the nut cleans up the threads.

2 To prevent the top (E) and bottom assembly (F/G) from spinning out of alignment, put a small amount of epoxy on the column caps (C, D), then reassemble the pipe assembly, top, column (A-D), and bottom assembly. Slide a brass washer onto the bottom of the
pipe, and thread on the brass nut. Align the wood pieces of the lamp; then tighten down the nut on the pipe to pull everything together.

Thread the lamp cord through the bottom of the pipe [Photo G]. Push the cord through the socket bottom cap and tie an Underwriter’s knot [Drawing 2a]. Strip away insulation from the cord to expose 1/4" of each wire. Secure the neutral wire (ribbed) under the silver screw on the socket, and the hot wire (smooth) under the gold screw.

Slide the insulated cover over the socket and press this assembly into the socket bottom cap until it seats firmly. Screw in a bulb, secure a lamp shade on the finial, and your lamp is ready to brighten any room, even when turned off.

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

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**Materials List**

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<th>Part</th>
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<td>1/4&quot; x 1/4&quot; x 16&quot;</td>
<td>A</td>
<td>4</td>
</tr>
<tr>
<td>B splines</td>
<td>1/4&quot; x 1/2&quot; x 16&quot;</td>
<td>C</td>
<td>4</td>
</tr>
<tr>
<td>C top column cap</td>
<td>1/4&quot; x 1/4&quot; x 1/4&quot;</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>D bottom column cap</td>
<td>1/4&quot; x 1/2&quot; x 1/2&quot;</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>E top</td>
<td>1/2&quot; x 4&quot; x 4&quot;</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>F bottom</td>
<td>1/2&quot; x 6&quot; x 6&quot;</td>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>G feet</td>
<td>1/4&quot; x 3&quot; x 3&quot;</td>
<td>C</td>
<td>4</td>
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Materials key: A-ash; C-cherry.
Supplies: #6 x 1" flathead wood screws (4), make-a-lamp kit.
Blade and bits: Dado set, 45° chamfer bit, 1/8° Forstner bit.
For cutting curved parts, a jigsaw makes a safe, portable, and affordable choice, compared to a bandsaw or scrollsaw. But a jigsaw's reciprocating blade can leave a cutline littered with splintered shards of wood and torn-out gaps that need mending. It doesn't have to be that way. Read on.

The road from Splinterville starts at the blade
Choose the right tooth count for the cuts you make. Blades with aggressive 6-tooth-per-inch (tpi) designs work great for sawing construction lumber, but cut too coarsely for woodworking project parts. Instead, select a 10- to 12-tpi blade for larger, gradual curves, or a 20-tpi blade for tight curves (1” radius or less) in solid wood and all cuts in plywood or melamine-coated particleboard.

Beyond tooth count, also consider the blade design. For decades, jigsaw-blade teeth were “set,” alternately leaning left and right, as shown above left. This makes them cut coolly and quickly, but at the expense of cut quality.

To remedy this, several manufacturers now make blades with ground, inline teeth, as shown above right, that slice the wood like a surgical scalpel rather than bluntly tear at it. This produces much cleaner cuts. For this reason, in the WOOD® magazine shop we use Bosch Clean-For-Wood and Xtra-Clean-For-Wood blades. Just be aware that these blades can burn your wood if you set the jigsaw's speed too fast or feed the saw through the wood too slowly. Our best
**CHOOSE YOUR BLADE WISELY**

1. U-shank blades tend to wobble, flex more, and produce more tear-out than T-shank blades. If you own a jigsaw that uses these blades, unfortunately, you have fewer options in blade choices. Opt for higher tooth counts as much as possible to reduce tear-out.

2. Progressive-tooth blades have a greater hook angle near the tip, putting those aggressive teeth where they’re needed for fast cutting in materials thicker than 1". Less-aggressive teeth close to the shank end help the blade cleanly exit the top surface of the workpiece.

3. Standard 6-tpi blades use steep hook angles on the teeth and large gullets between them for quick waste removal. These blades work best when speed is more important than cut quality, such as working with construction lumber.

4. Reverse-tooth blades cut on the downstroke, minimizing chip-out on the face side of a workpiece when you must put the best face up during cuts. Making a sink cutout in a countertop calls for one of these blades.

---

**Now set up the jigsaw for continued success**

For softwoods, softer hardwoods (popular, mahogany, alder, etc.), and sheet goods, run your jigsaw at its highest speed for most cuts. If you encounter resistance, back off the speed slightly. Dense hardwoods, such as cherry, maple, oak, and walnut, call for a slower blade speed to avoid burning. Use the slowest speed setting for cutting plastics and metals.

If your jigsaw has an orbital setting—an internal action that rocks the blade in a pendulum-like motion while simultaneously stroking up and down—set it to the greatest orbit for fast, but rough, cutting. Turn off the orbital action for cutting curves with less than a 3" radius. But if you’re cutting large, sweeping curves, a little orbital action helps.

You also can reduce top-face workpiece tear-out by adding a zero-clearance shoe, such as the one shown at right, to your jigsaw. Make it from 1/4" hardboard and secure it to the saw’s foot with machine screws or double-faced tape. Ease the corners and edges with sandpaper to prevent making any scratches on your workpieces.

---

**TIGHTER SHOE = CLEANER CUTS**

Cut a V-notch in the shoe to just in front of the blade. This opens your sight lines while maintaining anti-chip-out protection.
Step-by-Step
Elegant Chair

PROJECT HIGHLIGHTS
- Overall dimensions: 20”W x 20”D x 40”H
- Built from solid cherry with a clear oil finish.
- Cost of materials (per chair): $125 for wood, $40 for seat materials.
Combining elements from Federal, Chippendale, Arts & Crafts, and Early American styles, furniture-maker Tom McLaughlin designed this chair for WOOD magazine readers to be elegant without sacrificing comfort. Templates help you easily make the curved parts, and Tom does all the joinery on three machines: tablesaw, bandsaw, and mortiser (or drill press). When it’s all done, fashion a comfy seat using our proven, easy-to-do technique.

Think before you cut
Because of a chair’s complexity, it pays to be organized when machining and fitting parts. Tom suggests these tips:
- Machine setup proves critical in creating precise-fitting mortise-and-tenon joints—particularly the angled ones—so make 2 or 3 test pieces of each chair part. This helps you fine-tune setups before machining your final parts.
- If you make more than one chair, mill each part for all chairs at the same time to avoid repeating machine setups.

About the chair’s builder
Tom McLaughlin started his professional woodworking career in eastern North Carolina, learning to make furniture from P.A. "Pug" Moore, a renowned craftsman of 18th-century reproductions. By his mid-30s, Tom had settled in the rolling hills north of Concord, N.H. These days, he teaches about 12 woodworking classes a year at McLaughlin Woods, his 3,600-square-foot, three-level shop built into a hillside, shaded by maples, birches, and oaks. (For information about the school, go to mclaughlinwoods.com or call 603-783-9700. To view a slideshow of Tom’s other furniture projects, go to woodmagazine.com/mclaughlin.)

Tom loves to design and build chairs more than anything else. “The challenge of trying to make them comfortable and appealing from all vantage points is what really drives me,” he explains. Tom has designed more than 20 chairs, earning numerous design awards.

Cut the legs to shape
Using the pattern in the WOOD Patterns insert, draw the back leg (A) [Drawing 1] pattern at full size. Make a template of that pattern from ¼" hardboard and lay out the mortise locations on it. Trace the template on a 1½"-thick leg blank and bandsaw to within ⅛" of the lines. Repeat for the other back leg.

To download a FREE full-size back-leg pattern, go to woodmagazine.com/chairleg
**Tom’s Tip!** For the best appearance, you want the grain direction on the front face of each back leg to be mirror images. To ensure that, when you lay out the legs, flip your pattern end for end [Photo A]. Then nest multiple legs like spoons. This will ensure you have mirror-image right- and left-leaning-grain legs [Photo B].

2 Mount the template to a bandsawn leg with double-faced tape. Install a 2" flush-trim bit in your table-mounted router, set the height so the bearing runs against the template, and trim the back legs’ edges to shape. Mark the top and bottom of each leg with a pencil, remove the template, and sand the legs to the marked lines.

3 Cut the front legs (B) to size [Materials List, Drawing 2], and mark the front faces. Till your tablesaw blade to 7° and bevel-rip the outer face of each leg—making the front face wider than the rear face. From scrap stock, rip two wedges, each about 10–12" long, with the same bevel; you’ll need these when making the mortises in the legs.

**Size up the seat back**

1 Cut the shoe (C) to size [Drawing 4], but do not cut the top-side bevels yet. Lay out the four mortises as shown.

2 Cut the crest rail (D) to size [Drawing 5] but ¾" longer than its final length. Make two copies of the Crest Rail Pattern, located in the WOOD Patternise insert. Adhere one pattern to the bottom edge, but don’t cut the curves yet.

3 For the splat (E) and spokes (F), machine a single ½"x7½x21" blank [Drawing 6]. You’ll rip the spokes away later after cutting the tenons.

**Make all the mortises**

1 Lay out mortise locations on the legs (A,B) where shown in Drawings 1 and 2, remembering to make mirrored left and right versions.

2 Cut the ¾" mortise to accept the front seat rail (G) [Photo C, Drawing 2] in the front legs (B). Rotate the front leg (B) so the beveled edge rests against the mortiser or drill press fence [Photo D], and then cut the angled ¾" mortise for the side seat rail (H). Repeat for the other front leg.

3 If you did not have a large enough scrap cutoff from your back-leg blank, make a curved support block [Photo E] from scrap as thick as or a little thinner than the leg and measuring about 3½x20". This will hold the leg at the correct angle for cutting the side seat-rail mortise.

4 With the curved block supporting the back leg (A) [Photo F], cut the ¾" mortise for the side seat rail (H). Repeat for the other back leg.

**Wedges give you a needed lift**

To ensure the mortise walls run parallel to the leg’s front face, support the leg, beveled edge down, with a 7° wedge, cut from scrap. Rest the front face on a wedge and use another to clamp the leg securely. (Skip the second wedge if your mortiser lacks this clamp.)
MAKE A QUICK ARCH SUPPORT

Transfer the end marks for the side seat-rail mortise onto a scrap blank, trace the curve, and then bandsaw it to shape.

Line up the support-block mortise marks with those on the leg. If the leg touches the mortiser table it will alter the mortise angle.

To make the ⅜" mortises in the back legs (A) to fit the shoe (C), hold the leg's flat face—where you just cut the previous mortise—against the fence and make the cut on the inside faces.

Cut the ⅞" crest-rail (D) mortise on the inside top of each back leg (A), holding the front face against the fence.

Make the ¼" mortises in the shoe (C) [Drawing 4] for the splat (E) and spokes (F).

Cut the ¼" splat (E) mortises on the bottom of the crest rail (D) [Drawing 5]. For the spoke (F) mortises, insert a 4° wedge between the crest rail (D) and fence, as you did in Step 2.

Now for the tenons

1. Make the tenoning jig shown in the Quick & Easy Jig on page 28.
2. Make three spacers from scrap stock in ¼", ⅜", and ⅝" thicknesses—plus the thickness of your blade—about 3" to 4" wide to cut the three tenon sizes.
3. Cut the front (G) and side (H) seat rails to size [Drawing 7]. Holding or clamping the corresponding spacers between the jig and your project parts [Photo G], cut the 90° tenon cheeks on the front seat rail (G), side seat rails (H, front tenons only), shoe (C), crest rail (D), and splat/spoke (E/F) blank [Drawings 4, 5, 6, 7]. (Although the crest-rail tenons ultimately will be cut down to ⅛" long, make them ⅝" for now to avoid making a separate setup at the tablesaw.)

Tom’s Tip! After making the tenon cheek cuts on scrap stock, remove most of the waste material at the bandsaw—but stay back ¼" from the shoulders. Removing this waste prevents the cutoff from being trapped between the tablesaw blade and rip fence. Check the test tenon’s fit in its mortise. If the tenon fits too loosely, add a strip or two of masking tape to the spacer and cut another test tenon.
SPACERS NET DEAD-ON TENONS

For the \( \frac{1}{4} \)" tenons on the seat rails (G,H), insert that size spacer to make the first cut. Remove the spacer for the second cut.

CUT THE SAME, BUT NOW ANGLED

Using the same setup as before—but with the blade tilted 7°—hold the rail's outer face against the jig and cut the tenon cheeks.

8. Cut the top shoulders into the front and side seat-rail tenons (G, H) [Drawing 7]. Crosscut \( \frac{3}{8} \)" off the end of each crest-rail (D) tenon.

9. Dry-fit the chair, lightly trimming any tight-fitting tenons with a shoulder plane or file. Fit the splat and spokeshave into the shoe and crest-rail mortises first, and then fit the shoe and crest rail into the back legs. Next, fit the seat rails into the legs. Disassemble when all parts fit.

Shape all curves and tapers

1. Cut the crest rail (D) front and rear curved faces on the bandsaw, and then sand or scrape them smooth.

2. Use the remaining Crest-Rail Pattern to make a \( \frac{1}{4} \)" hardboard template of the front curve. Use this template to draw the beveled curve on the top and back of the crest rail (D). Mark a curve on the top edge that parallels the front curve [Photo L]. Tilt your bandsaw table to 27° and cut along both lines. Sand or scrape the curves smooth.

3. Lay out and bandsaw the 16° end bevels on the shoe (C) [Drawing 4]. Now tilt your tablesaw blade to 22° and rip the side bevels. Smooth all four bevels with a block plane. Using the crest rail front-curve template, mark the arc on the bottom edge of the shoe. Use your bandsaw to cut the arc, and then sand or scrape it smooth.

SHOP TIP

Hone your hand-tool skills for a flush splat fit

Cutting out the notch in the middle of the splat tenons can be a challenge to do with only power tools. Your best bet: Make the dividing cuts up to the shoulder at your bandsaw or with a sharp backsaw. Then use a coping saw, which pivots sharply in this tight area, to cut out the waste within \( \frac{3}{8} \)" of the shoulder. Finally, with a chisel, pare the rest away flush with the shoulders.

Make the first coping-saw cut angling from one kerf to the back corner of the other. Then saw out the remaining waste.

Angle the chisel slightly inward so you’re back-cutting. This will ensure a tight fit at the joint line.
Make the first shoulder cut so the blade just kisses the tenon cheek. Use a sliding bevel gauge and marking knife to transfer the 7° angle of the shoulder to the spot where the second shoulder will be. Finally, switch to the other side of the blade and cut the second shoulder to that line.

4 At the bandsaw, cut the tapers on the back (A) and front (B) legs [Drawings 1 and 2]. Sand or plane the tapers smooth.

5 Make marks on the back face of the rear legs (A) at 7°, 18 1/2°, and 21° from the top. With a 45° chamfering bit in your router, rout progressively deeper.

Full-size in WOOD Patterns® Insert on Page 46
chamfers (for both edges of each leg): \( \frac{1}{4}'' \) deep from the top to the 21" stop mark; \( \frac{3}{8}'' \) deep from the 7" mark to the 21" stop; and \( \frac{3}{8}'' \) deep from the 18\( \frac{1}{2}'' \) mark to the last stop [Photo M].

At the 21" mark, use a rounded rasp to shape and extend (by about 1") a scooped curve from the chamfer stopping point. **Note:** At the top of the leg, the chamfers and center flat should be of equal width. Be sure to avoid cutting the chamfer deeper than the shoulder line of the crest rail.

6 Use a block plane to make slight chamfers around the bottoms of all legs (A, B). At the top of the back legs (A), plane \( \frac{1}{6}'' \) chamfers around the front and sides [Drawing 1]. Plane a \( \frac{1}{2}'' \) chamfer on the rear from the top.

7 Scrape or sand all parts smooth, including a final sanding to 220 grit. **Tom’s Tip!** Wet all parts to raise the grain prior to your 220 sanding. This eliminates grain-raising when you wipe away glue squeeze-out with a damp rag. That helps you avoid the difficult sanding afterward between and around joined parts.

8 **SEAT FRAME ASSEMBLY**

4 Build and upholster the seat (K) [Drawings 3 and 9]. For a free downloadable technique on easy upholstery, go to woodmagazine.com/upholster. When finished, attach this seat to the chair brace (L) with \#8\times2" screws.

Finally, assemble and finish

1 Glue the splat (E) and spokes (F) into the crest rail (D) and shoe (C). Then glue and clamp that assembly between the back legs (A). Glue the front seat rail (G) into the front legs (B). When these assemblies have dried, glue the side seat rails (H) into the front (B) and rear (A) legs and clamp securely.

2 Cut the front and rear braces (I, J) [Drawing 8] and install them with glue and screws to strengthen the chair’s frame and provide a mounting surface for the seat.

3 Apply your finish of choice. (Tom recommends three coats of Watco Danish Oil or any wiping varnish.)

**Materials List**

**Part** | **FINISHED SIZE** | **T** | **W** | **L** | **Matl.** | Qty.
---|---|---|---|---|---|---
A | back legs | \( \frac{1}{4}'' \times \frac{3}{4}'' \times 96'' \) | C | 2
B | front legs | \( \frac{1}{4}'' \times \frac{1}{2}'' \times 17'' \) | C | 2
C | shoe | \( \frac{1}{4}'' \times \frac{3}{8}'' \times 14'' \) | C | 1
D | crest rail | \( \frac{1}{4}'' \times \frac{1}{4}'' \times 2'' \) | C | 1
E | splat | \( \frac{1}{4}'' \times 2'' \times 20'' \) | C | 1
F | spokes | \( \frac{1}{4}'' \times \frac{3}{4}'' \times 20'' \) | C | 2
G | front seat rail | \( \frac{1}{4}'' \times 2'' \times 16'' \) | C | 2
H | side seat rails | \( \frac{1}{4}'' \times 2'' \times 16'' \) | C | 2
I | rear braces | \( \frac{1}{4}'' \times \frac{3}{4}'' \times 6'' \) | C | 2
J | front braces | \( \frac{1}{4}'' \times \frac{3}{4}'' \times 6'' \) | C | 2
K | seat | \( \frac{1}{4}'' \times 19'' \times 15'' \) | BP | 1

**Materials key:** C—cherry; BP—birch plywood.

**Supplies:** Double-faced tape, spray adhesive, \#8\times1\frac{1}{4}'' flathead wood screws (B), \#8\times2'' flathead wood screws (4), medium-density upholstery foam, high-loft polyester quilt batting, fabric for seat, \( \frac{3}{8}'' \) upholstery staples.

**Router bits:** \( \frac{1}{8}'' \) round-over, 45° chamfer, 2' flush-trim.
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• Heater runs less frequently by redistributing rising heat back down to floor level

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Tool tester Bob Saunders feeds an ash board through this bandsaw to test its resawing power and accuracy.
Choosing to purchase a 14" deluxe bandsaw says a lot about where you are in your woodworking journey. You're ready to move to a machine capable of tackling all curve-cutting, ripping, crosscutting, and resawing tasks in even the thickest and hardest wood species. Thankfully, you don't have to jump to a pricey 18" or larger bandsaw to get these attributes. This class of 14" bandsaws—measured by wheel diameter—does it all.

What to look for in a 14" bandsaw

**Ample resawing capacity.** Start your search by focusing on the widest board the saw can rip standing on edge. Get as much capacity as possible, because you’ll never wish you had less. Having the ability to rip a wide board into thinner pieces opens up greater project options, such as bookmatched door panels or thin slabs laminated around a curved form. Resawing allows you to maximize the face (showing surface) of a prized piece of wood, such as spalted maple or quilted mahogany.

A one-piece steel frame—found on three of the bandsaws in this test—provides 10–14" of resaw capacity. On the other hand, three of the C-frame saws (Delta 28-206, Grizzly G0555X, and Powermatic PWBS-14CS)—which look like big cast-iron C-clamps on bases—resaw only 6" out of the crate.

But if you install an optional riser block ($70–$120), shown below left, you’ll double that capacity. Though a C-frame saw, the Jet JWBS-14DXPRO comes standard with 12" resaw capacity built into its column; no need for a riser block. The C-frame Powermatic includes the riser-block kit as standard equipment. (Watch a free video on installing a riser block at woodmagazine.com/riserblockvid.)

**Plenty of power.** Cutting curves or ripping stock up to 2" thick won't challenge the power of any 14" bandsaw. But when you resaw—especially hardwoods 10" or wider—you need power in spades. For this, look at two factors. First, the motor should be rated at least 1 hp, but go bigger if your budget and shop's electrical capacity can handle it. (Bandsaws powered by 110-volt motors top out at 1½ hp; anything greater requires a 220-volt circuit.) In our testing, the 3-hp Laguna 145UV dominated the power showdown. (See the chart below.)

The second power factor: the wheels that drive the blade. Cast-iron wheels outperform aluminum ones because their greater weight generates more momentum to power the blade through a cut. This weight also dampens vibration, resulting in greater accuracy and cut quality. Of the tested saws, all but the Delta have cast-iron wheels.

---

**THE LAGUNA CUTS TWICE AS FAST**

Inches cut per minute

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<th>Blade</th>
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</table>

We resawed 10"-wide ash boards using new 3-tpi, ½"-wide Carter AccuRight blades, feeding them as fast as the saws could cut. We averaged the results of three cuts.

woodmagazine.com
Quality blade guides. A bandsaw with great power and cut capacities but lackluster blade guides is like a Mercedes without power steering. Adjustable blade guides mounted above and below the table prevent the blade from twisting or wandering side-to-side during cuts, greatly enhancing accuracy. The best guides prove easy to set and adjust, because you'll do this every time you change from one blade width to another.

The tested saws feature three types of guides, shown above: steel blocks, ball bearings, and ceramic contacts. All held blades true enough in our curve-cutting and resawing tests, but we like the ceramic guides best because they completely eliminated blade twisting.

Now look at these user-friendly features

Comfortable table height. Table height on five of the seven tested saws ranges from 42” to 44”. Find a working height that's comfortable for you without hunching over, then look for a match. Our 6’-tall tester found himself bending down to use Laguna's 35½”-high table; he liked the Rikon 10-325's table height—just under 40”—best. If you plan to add a mobile base to your saw, remember it will add an inch or two to the table height.

Accurate, adjustable rip fence. For straight-line cutting, a rip fence proves a vital accessory, and all but the Delta and Jet include one. All the fences include adjustments to compensate for blade drift (when the blade fails to cut parallel to the fence). Four of the saws' rip fences can be used in two dimensions: upright for resawing tall stock, and low and flat, shown at right, for reaching underneath the blade guides on thin, narrow rips.

This double-duty fence is a dandy

Dual-position fences, such as this one (on both Grizzly's), mount by T-slot onto a rigid fence arm that locks onto the guide rail. They give you tall and short surfaces for guiding boards.
■ Reliable tension scale. On these deluxe saws, we hoped for more-reliable blade-tension gauges, but found we could rely on the scales of just two saws (Grizzly G0555X and Rikon). So it’s a good idea to know how to set the tension without the scale. Our tester used the flutter method, where, with the blade guides pulled back and the saw running, he loosened the blade tension until the blade fluttered side-to-side. Then he tightened it gradually until the flutter disappeared. (Watch Bob demonstrate this technique in a free video at woodmagazine.com/flutter.) All of the saws have quick-release tension levers that relieve enough tension to change blades, and then return to your previous setting without tedious cranking and checking the blade tension as you go.

■ Effective dust collection. Dust buildup on the rubber tires of these saws reduces blade grip, so it’s important to hook up the saw to a dust collector. Each of the models in this test has a 4” port next to the lower wheel; these proved most effective on the steel-frame models. Doors on the C-frame saws did not seal as tightly, reducing dust-collection effectiveness.

A Closer Look at the Tested Saws

**Delta 28-206, $825**
800-223-7278; deltamachinery.com

+Pluses: The steel-block blade guides performed well in our curve-cutting tests, even with the riser block installed. Two speed settings provide you the option of slowing the blade speed for cutting nonferrous metal, such as brass or aluminum.

-Minuses: The 28-206 lacks the oomph of the other test saws, especially when resawing wide stock with the riser block installed. Setting the proper blade tension proved difficult because the saw’s scale was so far off we could not use it. The saw vibrated more than any other we tested, its blade deflected the most (slightly more than \(\frac{1}{32}^{\prime\prime}\)), and its dust collection proved inadequate. It does not come with a rip fence, and Delta does not offer one as an option. The motor eats up potential storage space in the lower cabinet.

**Grizzly G0457, $895**
800-523-4777; grizzly.com

+Pluses: We really like the rip fence on this saw. Although the G0457 has only 10” of resaw capacity, it was one of three models to cut with less than \(\frac{1}{8}^{\prime\prime}\) of blade deflection. That’s important so you don’t waste wood later at the planer flattening a resawn face. And we found it easy to square the table to the back of the blade by adjusting setscrews on the trunnion bracket.

-Minuses: You can’t install or remove \(\frac{3}{4}^{\prime}\)-wide blades without removing the table first, because the blade teeth hit the rabbeted edge of the 2”-diameter table hole. (Grizzly’s Bill Crofutt said his company will investigate this and might make changes on future models.) Because the aluminum rip fence mounts onto the right side of a cast-iron arm, you can’t rip stock with the fence on the right side of the blade.

**Grizzly G0555X, $770**
800-523-4777; grizzly.com

+Pluses: This saw has the same rip fence as the G0457, but it has a different table, minus the blade-changing problems. And with a 110-volt motor, it cuts slightly faster than the 2-hp, 220-volt G0457. You can install a blade and rely on the tension scale to be accurate. We like its wide-rimmed task light because it mounts on the blade side of the upper cabinet, letting you better direct light onto the outline. The price above includes an optional riser-block kit that gives you the ability to resaw 12”-wide boards. If you don’t need this resaw capacity, save the $70 and assemble the saw as equipped from the factory.

-Minuses: The quick-release blade tension lever is stiffer to engage than on the other saws, although it held with no problems. Like the G0457, the rip fence will not work to the right of the blade.
Jet JWBS-14DXPRO, $1,000
800-274-6848; jettools.com

**Plus**: We could change blades quickest on this saw with its easy-to-set ball-bearing blade guides, and yellow tires on the wheels that make it easier to see the blade through the plastic window when adjusting tracking. The rack-and-pinion guide post makes it easy to adjust the top guides up and down without it crashing to the table. A second set of fence-scale markings helps you position the fence accurately for resawing with the attached pivot. If you cut brass or aluminum, you’ll like the two speed settings.

**Minus**: You have to buy the $100 fence kit separately, and we’d love that 2½”-tall fence to be a few inches taller for better support during resawing. The quick-release blade-tension lever is stiffer than most.

Price includes optional rip fence and resaw pivot.

Laguna 14SUV, $1,495
800-332-4094; lagunatools.com

**Plus**: For this price you expect a saw to deliver above and beyond competitors costing much less—and that’s what you get. The 14SUV has the most power by far, the greatest resaw capacity (14”), the best blade guides, an L-shaped fence you can use in up or down positions, and a magnetic power switch that prevents accidental start-ups. It also features a table with a rack-and-pinion gear and gas strut for smooth, easy tilting; two 4” dust ports for the best dust collection; a foot brake with power disconnect to quickly stop the blade; and a built-in mobile base. Plus, it comes with a 3/8” carbide-tipped resawing blade—a $160 value.

**Minus**: The table measures 35½” from the floor, about 5” too low for our 6’-tall tester. It’s the noisiest of the lot—10 decibels more than the quietest. There’s no lower cabinet for storage of accessories.

### 14” Bandsaws $700 and Up: What to Buy When You Deserve a Top Machine

<table>
<thead>
<tr>
<th>BRAND</th>
<th>MODEL</th>
<th>POWER</th>
<th>CURVE-CUTTING ABILITY</th>
<th>BLADE-GUIDE ABILITY</th>
<th>EASE OF CHANGING BLADE</th>
<th>ABSENCE OF BLADE DEFLECTION</th>
<th>EASE OF TENSIONING BLADE</th>
<th>ABSENCE OF VIBRATION</th>
<th>DUST-COLLECTOR EFFECTIVENESS</th>
<th>RIP-GUARD EFFECTIVENESS</th>
<th>DUST-CAVITY EFFECTIVENESS</th>
<th>CABINET/DOOR QUALITY</th>
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<td>15½”×21½&quot;</td>
<td>39½</td>
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</table>

**Notes**
1. **A** Excellent
2. **B** Good
3. **C** Fair
4. **(*)** $93½” without riser block
5. **(*)** Ball bearing (B) Ball bearings (F) Blade (C) Ceramic inserts (G) Rip fence (S) Steel blocks (M) Miter gauge (P) Resaw pivot (N) Mobile base (T) Riser block kit (R) Riser block kit (U) Tools for adjustment

**14” Bandsaws $700 and Up: What to Buy When You Deserve a Top Machine**

**Performance Ratings (1)**

**Motor**

**Blade**

**Table**

**Width × Depth, Inches**

**Height from Floor, Inches**

**Tilt Range (Right/Left), Degrees**

**Summary**

- Delta 28-206: Good performance, but without the riser block.
- Grizzly G0457: Excellent, but without the riser block.
- Grizzly G0555X: Excellent, but without the riser block.
- Jet JWBS-14DXPRO: Excellent, but without the riser block.
- Laguna 14SUV: Excellent, with the riser block.
- Powermatic PWBS-14CS: Excellent, with the riser block.
- Rikon 10-325: Excellent, with the riser block.

**Conclusion**

When choosing a 14” bandsaw, consider the following:

- **Power**: Delta 28-206 and Grizzly G0555X offer the most power.
- **Blade Guides**: Laguna 14SUV and Powermatic PWBS-14CS offer the best blade guides.
- **Ease of Changing Blades**: Jet JWBS-14DXPRO and Powermatic PWBS-14CS offer the easiest blade changing.
- **Clarity of Manual**: All models have clear manuals, but Powermatic PWBS-14CS has the best.

Make sure to consider your budget and the features that are most important to you.
Powermatic PWBS-14CS, $1,000
800-274-6848; powermatic.com

+Pluses: Although all the tested saws come with blade-tension quick-release handles, only this saw's orange handle could be seen from the operator position when untensioned. That helps prevent accidental start-ups with an untensioned blade. This saw comes with a 6" riser-block kit as standard equipment, as well as 1/8" and 5/8" blades. The task light mounts and works like that on the Grizzly G0555X. It's nice to have cabinet-mounted hooks for storing the rip fence and miter gauge.

-Minuses: Despite a 1½-hp rated motor, this saw bogged down frequently in our resaw testing, necessitating a slower feed rate. The ¼" plastic tubing intended to blow dust off the cutline does little good. And the motor sits inside the lower cabinet, negating potential storage space.

Rikon 10-325, $900
877-884-5167; rikontools.com

+Pluses: The 10-325 has 13" of resaw capacity and a powerful 110-volt motor. The near-absence of blade deflection makes it a great resaw machine. We like its L-shaped aluminum rip fence that locks solidly on a steel rod, yet slides off quickly. And there's more to like: a rack-and-pinion gear makes for easy table tilting; setscrews on the table trunnion bracket help it easily square the table to the blade; yellow tires enhance blade visibility; and two wheel speeds ease the cutting of non-ferrous metals.

-Minuses: You'd expect blade changes to be easiest on this saw because the blade slides forward through the table rather than to the side. But the guide bearings move as you tighten their setscrews, making it more difficult to set up accurately, resulting in the test-longest setup times.

---

<table>
<thead>
<tr>
<th>BLADE-GUIDE STYLE (4)</th>
<th>RESAW (5)</th>
<th>THROAT (BLADE TO COLUMN) (D)</th>
<th>OVERALL DIMENSIONS (WxHxD), INCHES</th>
<th>TASK LIGHT (YES, NO)</th>
<th>STANDARD</th>
<th>OPTIONAL</th>
<th>NOISE LEVEL, NO-LOAD, DECIBELS</th>
<th>WEIGHT, POUNDS</th>
<th>POWER-CORD LENGTH</th>
<th>WARRANTY, YEARS</th>
<th>COUNTRY OF ASSEMBLY (7)</th>
<th>SELLING PRICE (8)</th>
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<td>17½x23x74</td>
<td>N</td>
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<td>5</td>
<td>C</td>
<td>$825*</td>
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<td>M, R</td>
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<td>C</td>
<td>$900</td>
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<td></td>
</tr>
</tbody>
</table>

7. (C) China
   (T) Taiwan

8. Prices current at time of article production and do not include shipping, where applicable.
(*) Includes riser-block kit.
(?) Includes rip-fence kit.

---

Commit your tool $$$ to these resaw kings

Not surprisingly, the $1,495 Laguna 14SUV proved itself superior in this seven-saw field, earning it our Top Tool award for 220-volt models. Try as we might, we could not bog down this 3-hp workhorse, even when resawing 14"-wide oak and ash.

If your shop’s not wired for 220 volts, or if you can’t afford the Laguna’s price tag, go for the Rikon 10-325 for $900. It’s our Top Tool among 110-volt saws.

If both of these fall out of your price range, then look to the Top Value Grizzly G0555X. Add the optional riser block and you’ll have a saw worthy of any shop for less than $800.

Produced by Bob Hunter with Bob Saunders
Illustration by Tim Cahill

MORE RESOURCES

- Watch a free video for an alternative technique on setting blade tension at woodmagazine.com/bladetension.
- Find helpful tips and techniques as well as reviews of other bandsaws at woodmagazine.com/bandsaw.
"Loads" of fun
Trebuchet
Catapult fun into high gear with this easy-to-build, thing-slingin' toy.

Trebuchet Trivia
A trebuchet (pronounced treb-yoo-SHET) was a medieval device used to hurl large stones and other heavy projectiles at enemy fortifications. Using the mechanical advantage of a counterweight to rotate an arm, the device could heave objects up to 350 pounds hundreds of feet at high speed. The projectile was placed in a sling that was pulled along the platform. When released, the sling and arm rapidly rotated to the vertical position, where one end of the sling came free, releasing the projectile.

Overall dimensions:
5'W x 12'L x approximately 17 1/2'H
(with arm at top position)
Launch into the platform

1 From \(\frac{1}{4}\)" maple (or \(\frac{3}{8}\)" stock resawn or planed to \(\frac{1}{4}\)"), cut the platform sides (A) and platform (B) to the sizes listed [Materials List, page 74]. Place a couple of \(\frac{1}{8}\" spacers under the platform. Glue and clamp the sides to the edges of the platform, flush with the ends [Drawings 1 and 1a], checking the sides and platform for square.

2 From \(\frac{1}{2}\" stock, cut the feet (C) to size. Fit your tablesaw with a \(\frac{1}{2}\" dado blade. Then, using a miter gauge with an extension, and your rip fence as a stop, cut a \(\frac{3}{8}\"-deep dado 1" from each end of the feet and spaced \(2\frac{1}{2}\" apart, where dimensioned [Drawing 1], flipping the feet end for end between cuts.

Quick Tip! Cut dadoes in a test piece first for an exact setup. When using a cut-flip-cut method to form dadoes in parts, such as the feet, any offset doubles the spacing error between the dadoes. Make test cuts in scrap the same size as the part to verify correct spacing of the dadoes before you cut the parts. Apply glue in the dadoes. Now mount the feet to the platform sides (A) where dimensioned and as shown [Photo A].

Raise your arm supports

1 From \(\frac{1}{2}\" stock, cut the arm supports (D) to size. Using your table-mounted router and a 45° chamfer bit, rout \(\frac{1}{8}\" chamfers along the outside edges and on the top and bottom of each support, where shown [Drawing 1]. Then drill a centered \(\frac{3}{8}\" hole through each support where dimensioned to receive a \(\frac{3}{8}\"-diameter brass rod.

2 Make four photocopies of the full-size Brace Pattern found in the WOOD Pattern insert. From \(\frac{1}{4}\" stock, cut the braces (E) to the size listed and spray-adhere a pattern to each brace. Then bandsaw (or scrollsaw) the parts and sand to the pattern line. Remove the patterns, rubbing them with a cloth moistened with lacquer thinner to loosen the adhesive.

3 Apply glue along the long edge of two braces (E). Clamp the braces to an arm support (D), flush with the support's bottom and inside (nonchamfered) face. Repeat for the remaining braces and support.

4 To mount the arm-support assemblies (D/E) to the platform assembly (A/B/C), hacksaw a 4\(\frac{1}{4}\"-long piece of \(\frac{3}{8}\"-diameter brass rod for aligning the supports. Apply glue to the bottom \(\frac{3}{8}\" along the inside face of each arm-support assembly, and insert the brass rod through the \(\frac{3}{8}\" holes in the supports, as shown [Photo B]. Now mount the assemblies, centered on the platform assembly inner feet (C). After the glue dries, remove the brass rod.
Next up: The arm and brackets

1. From ¼" stock, cut the arm (F) blank to size. Photocopy the Arm Pattern; then spray-adhere it to the arm blank. Bandsaw and sand the arm to the pattern lines. Remove the pattern.

   **Note**: You'll drill the ⅜" hole, shown on the pattern, through the arm after gluing an arm bracket (G) in place.

2. To form the arm brackets (G), cut a 1⅞" x 12" blank from ¾" stock. Make two copies of the full-size Arm Bracket Pattern. Spray-adhere the patterns to the blank. Then bandsaw and sand the brackets to shape.

   Using your drill press, drill the ¼" and ⅝" holes through the edges of the arm brackets (G) where shown on the patterns.

Quick Tip! Drilling pointers. Drill the ⅜" holes accurately to ensure proper parts alignment later with the brass rod. To prevent bit wandering on the hard maple, use Brad-point bits instead of twist bits. Also, for perfectly aligned holes, verify that your drill-press table is exactly 90° to the drill bit. Now rout ⅛" chamfers along the indicated edges and ends on both faces of...
the brackets [Photo C]. Remove the patterns. For safety when routing these small parts, hold them with a handscrew and reduce the opening around the bit to a minimum. You can close up the opening using snap-in inserts, as shown, if you have this type of router plate. If not, refer to the Shop Tip, top right, for an easy-to-make alternative.

4 Refer to the Arm Pattern for the location of the arm brackets (G). Glue and clamp a bracket to the arm (F). After the glue dries, drill the ¾" hole through the arm to receive the brass rod later as shown [Photo D]. Then glue the remaining bracket to the arm with the ¾" holes aligned [Photo E].

**Now build the counterweight bucket**

1 From ¼" stock, cut the counterweight bucket sides (H), front and back (I), and bottom (J) to the sizes listed. Make an extra bottom for use as a spacer. Lay out, bandsaw, and sand ½×⅔" angled corners on the top of each side (H) [Table 2]. Now assemble the bucket as shown [Photos F and G].

2 Rout ⅛" chamfers on the outside face of the bucket sides (H) where shown [Table 3].

3 From ⅛" stock, cut the bucket brackets (K) to size. Using a brad-point bit, drill a centered ¼" hole through the brackets where shown. Then form ¼" chamfers at the ends. Because of the small size of these parts, safely hand-sand the chamfers using a sanding block with 100-grit sandpaper.

4 Glue and clamp the brackets (K) to the sides (H), ¼" from the top ends and centered side-to-side.

**Finish up**

1 Drill a ⅛" hole ¼" deep for a no. 216 screw eye into the arm (F) where dimensioned [Table 3]. Then drill a ⅛" hole ⅜" deep into the narrow end of the arm for a ⅛" escutcheon pin ¾" long where dimensioned. Thread in the screw eye, and drive the pin, leaving a projection of ½".
To make the arm-pull sling, cut two pieces of string 8-1/2" long and a 1-3/4" piece of canvas or suede. Using an awl, punch a centered hole through the material near each end where shown. Tie one piece of string to a hole in the sling and the other end to the screw eye. Tie the other string to a 1/4" flat washer and the remaining hole in the sling.

Before mounting the arm/bracket assembly (F/G) between the arm supports (D), drive a #12 x 3/4" flathead wood screw approximately 1/4" into the 1/4" hole in each arm bracket (G) [Drawing 1]. Then pivot-mount assembly F/G between the arm supports, using the 3/4"-diameter brass rod and 1/4" flat washers inserted between the assembly and supports where shown. Center the rod end to end.

To suspend the counterweight bucket (H/I/J/K) from the arm assembly, attach a 1/4" eyebolt 2" long to each bucket bracket (K) with two 1/4" nuts where shown [Drawing 1], leaving the nuts loose. Then hang the bucket and tighten the hardware as shown [Photos H and I].

Finally, sand the trebuchet to 220 grit, remove the dust, and apply a finish, if you wish. We sprayed ours with three coats of satin aerosol lacquer. Ready for some treat-tossin’ fun! Refer to the sidebar “How to use the launcher,” right, for safety and operating tips. Now start hurling! 🎯

Produced by Owen Duvall with Kevin Boyle Project design: Jeff Mertz Illustrations: Roxanne LeMoine; Lorna Johnson

**Materials List**

<table>
<thead>
<tr>
<th>Part</th>
<th>FINISHED SIZE</th>
<th>Matl. Qty.</th>
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<td>M 2</td>
</tr>
<tr>
<td>B</td>
<td>1/4&quot; 2 1/4&quot; 12&quot;</td>
<td>M 1</td>
</tr>
<tr>
<td>C</td>
<td>1/4&quot; 5&quot; 4&quot;</td>
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<tr>
<td>D</td>
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</tr>
<tr>
<td>F</td>
<td>1/4&quot; 1&quot; 12&quot;</td>
<td>M 1</td>
</tr>
<tr>
<td>G</td>
<td>1/4&quot; 1 1/4&quot; 3 1/4&quot;</td>
<td>M 2</td>
</tr>
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</table>

**Counterweight Bucket**

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<th>M 2</th>
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<td>K</td>
<td>1/2&quot; 1/2&quot; 1 1/4&quot;</td>
<td>M 2</td>
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</tbody>
</table>

*Parts initially cut oversize. See the instructions.

Materials key: M=maple

Supplies: 34"-diameter brass rod 1/4" long; no. 216 screw eye; 3/4" escutcheon pin 1/4" long; 3/8"-long string (2); 1 x 3/4" piece of canvas or suede; 1/4" flat washers (3); #12 x 3/4" flathead wood screws (2); 1/4" eyebolt 2" long (2); 1/4" nuts (4).

Blade and bits: Dado blade set; 45° chamfer router bit; 1/4", 3/8", and 1/2" brad-point bits.

**How to use the launcher**

Though similar in concept to the giant war machines of old, this project is designed and scaled to sling small, lightweight snack items, such as peanuts (in the shell) and candy, toward a bucket or target for entertainment purposes only. To safely operate the trebuchet and ensure it’s the “lift” of the party, follow these tips.

**For safety’s sake:**
- Wear eye protection.
- Never aim the trebuchet at a person or animal.
- Do not launch metallic or sharp objects.

To operate the launcher:
- Place small weights, such as 1/4"-1" fender washers or coins, in the counterweight bucket. The number of weights needed depends on the object type and the desired launch trajectory and distance to the target. You’ll find the optimum weight by experimentation. We found that 14 fender washers were ideal to sail a peanut about 15 feet.
- Place your “ammo” in the sling, and slip the 1/4" flat washer attached to the end of the sling’s free string over the escutcheon pin at the end of the arm (F). NOTE: Bending the escutcheon pin slightly up or down also alters the release timing and projectile path.
- Pull the sling along the platform (B), raising the counterweight bucket, until the tip of the arm contacts the platform. Align the arm with your target, and let go of the sling to fire away!

Watch a FREE video of the trebuchet in action at: woodmagazine.com/trebuchet
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-Jon, Restaurant Lighting & Fixtures

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Make Your Grinder Greater

Improve the performance of your bench grinder with these simple tips and accessories.

Most bench grinders, whether outfitted with 6" or 8" wheels, come ill-equipped from the factory for use in a woodworking shop, thanks to stone wheels that prove too coarse for sharpening fine-cutting tools, clumsy tool rests, and accessories that are inadequate or just not helpful. Follow these simple steps to turn a ho-hum grinder into a smooth operator in no time.

Top performance always comes down to the wheels
Most grinders come with 36- and 60-grit silicon carbide wheels, identifiable by the gray, coarse texture. Those work great for lawn mower blades, but not for woodworking tools. So replace the 36-grit wheel with a 100- or 120-grit aluminum oxide wheel (usually sold in white or blue colors). Although the softer aluminum oxide wears more quickly than the silicon carbide, it also grinds cooler, saving the temper of your tools' steel. (See Sources on page 78 to buy these wheels.) Keep the aggressive 60-grit wheel for quickly reshaping chipped or damaged tool edges. Then go to the finer wheel for final sharpening.

Most grinders come with 3/4"-wide wheels, but 1"- or 1 1/4"-wide wheels sharpen wider tools without sliding the tool side-to-side. To install wide wheels on many grinders you'll have to replace the bell-shaped flanges—which eat up 1/2" or more of the arbor shaft on each side of the wheel—with thinner supports. We recommend tablesaw blade stiffeners [Sources], typically about 3/8" thick, that measure at least 3" in diameter. [Photo A].

If you notice vibration, install balancers [Sources] on your grinder wheels, as shown in Photo B on page 78. Start by mounting your wheel on the balancing flange—which requires a 1" arbor bore in the wheel—and securing continued on page 78.
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the three balance bolts in the “4-8-12” clock positions. Next, mount the flange and wheel on the included stand. Starting with the same bolt at the top each time, rotate the wheel gently and let it coast to a stop. If the top bolt consistently returns to the 12 position, adjust the other two bolts toward it slightly to compensate for the out-of-balance weight. Repeat until the wheel stops in random positions.

Next, use a dressing tool, such as the diamond-tipped one [Sources] shown in Photo C, to flatten the wheel edge. The dressing tool also removes metal filings that embed in the wheel’s pores as you sharpen. Left embedded, these filings increase heat buildup and reduce sharpening effectiveness.

Give your tools a good rest
The key to creating crisp, sharp cutting edges: Hold tools at a consistent angle, matching the tool edge’s bevel angle. If your grinder lacks an adjustable tool rest, make angled wood blocks to replicate the angle, build a tool-holding jig from our plans [see More Resources, right], or replace the factory-supplied tool rest with an aftermarket model.

Veritas’ tool rest [Photo D] mounts on your grinder support in front of the wheel. Use it alone or with an optional grinding jig that rides in the shelf slot.

A handy angle gauge comes with the tool rest. Oneway’s Wolverine grinding jig [Photos E & F, Sources] accepts a variety of rests to easily sharpen chisels, plane irons, or woodturning tools.

Get on solid ground
To keep your bench grinder from scooting away while sharpening, anchor it down. Build a dedicated stand, such as the one on page 24, if you have floor space for it. Bolt the grinder to the stand, and if possible, bolt the stand to the floor. If you’re squeezed for space, then bolt your grinder to a piece of ¾”-thick plywood, and clamp it to your workbench, as shown above.

More Resources
- To buy project plans for a shop-made grinding jig, go to woodmagazine.com/grindjig.
- To buy project plans for a shop-made grinder stand, go to woodmagazine.com/grindstand.
- Watch a FREE video on sharpening wood chisels on a grinder at woodmagazine.com/sharpenvid.
- Watch FREE videos on sharpening woodturning tools at woodmagazine.com/woodvision. Click on the woodturning link.
**Which hand planes should a power-tool woodworker buy first?**

**Q:** I'm strictly a power-tool woodworker, but I've noticed a resurgence in the popularity of hand planes. I don't want to miss out, but where do I start? If you had to recommend three, which hand planes should I start with?

—Robert Risher, Abilene, Texas

**A:** An informal poll of the (admittedly power-tool-centric) guys on the WOOD staff showed much agreement on the top two contenders, Robert. Your first purchases should be a low-angle block plane and a shoulder plane, below. Both help you put a refining touch on the less-than-perfect cuts produced by your power tools.

For example, with a few strokes, a finely tuned low-angle block plane shaves burn marks or fuzz off end grain that saw blades leave behind. The plane quickly everts out joiner scallops on edge grain and even makes short work of shallow chamfers.

With its open sides and body-width blade, a shoulder plane assists you in cleaning up tenons and rabbets and pares corners perfectly square.

In choosing a third must-have hand plane, we agreed to disagree. We can make a good case for the No. 5 jack plane—a good all-around plane. Shorter than a jointer plane and longer than a smoother, the jack plane tackles edge and face flattening well, making it a good introduction to the world of hand-powered stock prep. On the other hand, you may find the shorter-bodied No. 4 smoothing plane especially useful if you work with figured wood and don’t want to risk the tear-out commonly caused by powered jointers and planers.

The low-angle block (left) and shoulder (right) planes make great first planes for the power-tool woodworker, cleaning up marks that motorized tools leave behind.

If you want to replace some powered machining operations with hand-plane work, test the waters with a No. 5 jack plane (left) or a No. 4 smoother (right).

---

**Stain removal for nooks and crannies**

**Q:** I'm a beginning woodworker using oil stain on a cabinet for the first time. When I wipe off the excess, I'm having a hard time getting it out of interior corners. Any advice?

—Gabriel Garcia, Booneville, Miss.

**A:** For those pesky corners, Gabriel, a wiping rag might not conform.

First, remove as much excess as you can with the rag. Then, use a dry bristle brush on the rest, pulling outward from the corners. Dry the brush as you go by daubing the excess stain on a paper towel. Continue brushing until the stain blends to match the color of the rest of the project.

continued on page 82
Who said kangaroos aren’t found in America.

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Ask WOOD

Spiral cutterheads make their mark

Q. I recently bought an aftermarket spiral cutterhead for my jointer. Now when I use it, the face of each board shows slight grooves running along its length. Am I doing something wrong?

—Travis Adair, Cincinnati, Ohio

A. Probably not, Travis. We’ve found similar results in our tests of spiral cutterheads. The small individual blades that corkscrew around the cutterhead have slightly convex cutting edges that fight tear-out, but also leave the linear striations you’re noticing. So if you’re used to a nearly finished face out of your straight-knife cutterhead, you might be disappointed by the additional sanding burden added by the spiral cutterhead.

Still, a spiral cutterhead brings several advantages: Where tear-out-prone straight knives can wreak havoc on highly figured woods, spiral heads shear the wood without damage. Also, straight knives can be a hassle to replace and adjust. Not so with spiral cutters. When one edge of the small four-sided, self-indexing cutters becomes dull or nicked, simply rotate them 90° to bring a fresh edge to bear. That adds up to four times the cutting life. And that’s not counting the fact that many of the replacement spiral cutterheads use long-lasting carbide rather than high-speed steel. At pennies per replacement cutter, you won’t break the bank when you need to replace one, either.

The many square cutters on a spiral cutterhead make adjustments easy but typically leave a slightly less-finished board.

Blue chalk reveals the slight linear peaks—separated by shallow valleys—caused by the convex blades of a spiral cutterhead.
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To ensure best results, we ship you living sheets of genuine Amazox Zoysia Grass, harvested directly from our farms. Plugs are not cut all the way through. Before planting, simply finish the separation by cutting 1/8” into the plugs with shears or knife. Then follow the included easy instructions to plant plugs into small plug holes about a foot apart. Our guarantee and planting method are your assurance of lawn success backed by more than 5 decades of specialized lawn experience.

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No more pulling out weeds by hand or weeds sprouting up all over your lawn. Zoysia plugs spread into a dense, lush, deep-rooted, established lawn that stays out unwanted growth and stops crabgrass and summer weeds from germinating.

Environmentally Friendly, No Chemicals Needed!
No weed control means no chemicals. You’ll never have to spray poisonous pesticides and weed killers again! Zoysia lawns are safer for the environment, as well as for family and pets!

Cuts Watering & Mowing By As Much As 2/3!
Many established Zoysia lawns only need to be mowed once or twice a season. Watering is rarely, if ever, needed – even in summer!

Stays Green In Summer Through Heat & Drought!
When ordinary lawns brown up in summer heat and drought, your Zoysia lawn stays green and beautiful. The hotter it gets, the better it grows. Zoysia thrives in blistering heat (120°), yet it won’t winter-kill to 30° below zero. It only goes off its green color after killing frosts, but color returns with consistent spring warmth. Zoysia is the perfect choice for water restrictions and drought areas!

Our Customers Love Their Zoysia Lawns!
One of our typical customers, Mrs. H. R. Mitter of PA, wrote how “I’ve never watered it. It’s greener and watered it. It’s greener and watered it … Last summer we had it mowed 2 times…” When everybody’s lawns here are brown from drought, ours just stays as green as ever!”

Order Now And Save!
The more Amazox Zoysia Plugs you order, the more you SAVE! And remember, once your Zoysia lawn is established, you’ll have an endless supply of new plugs for planting wherever you need them. Order now!

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Extra Step-on Plugger $8.95 + $3 Shipping
Extra Amazox Power Auger™ for 3/8” Dril $24.95 + $5 Shipping

Order Now! www.ZoysiaFarms.com/mag
SawStop “hybrid” saw proves worthy for home shops

SawStop’s 1 1/4-hp Professional Cabinet Saw brings all the features I like in its heavier-duty tablesaws into a more affordable price range for the home woodworker. This machine, though still a sizable investment at $2,300, features the same cabinet, top, and trunnion-and-arbor assembly as the company’s 3-hp Professional Saw, but with a lighter-duty motor and rip fence. And, as with all SawStop tablesaws, this model has flesh-detecting technology that stops the blade before it can cut deeply into your fingers.

The motor runs on 110-volt electrical circuits, a nice option for home shops where 220-volt service might not be available. I ripped 2”-thick red oak to test this saw’s mettle, and although it bogged down slightly, it slowed no more than other 110-volt tablesaws. Decreasing the feed rate solved this issue.

I tested the base model for the PCS175 series, which comes with an aluminum T-square-style rip fence and 30” rip capacity. This fence barely moved in my deflection test, and its smooth sidewalls proved straight and square to the tabletop. You can upgrade to a Biesemeyer-like fence in 36” (add $175) or 52” (add $275) rip capacities. I really like the ease of swapping between the one-piece splitter/blade guard and the shark-fin riving knife: It takes just a quick turn of a lever. And the throat insert features a handle that locks it in place when pushed down.

SuperCharger saves space, energy, and battery life

It’s an age-old woodworker’s dilemma: Should you store cordless-tool battery packs off the charger, where they’ll gradually lose their charge; or store them on the charger, where “trickle” charging gradually cooks the battery chemistry away and shortens the pack’s life? Ryobi solves that problem with the SuperCharger. This portable, multipack station charges any 18-volt Ryobi cordless-tool batteries in an hour or less, and then checks each pack periodically and tops it off when needed.

The SuperCharger proved so efficient that it cost me only a penny a day to keep four packs (a mix of nickel-cadmium and lithium-ion units) charged—the same cost as charging and storing a single pack on the charger that came with my tools. Separate LED indicators for each of the six ports display the current charge condition of each pack.

I mounted the SuperCharger on the wall of my shop using the included mounting bracket, freeing up counter space from a clutter of individual chargers. The device dismounts quickly from the bracket, and has a handle for hauling the whole thing to a worksite.

—Tested by Dave Campbell, Deputy Editor

6-Port battery charger, #P125

Performance ★★★★★
Price $79
Ryobi 800-525-2579; ryobitools.com

continued on page 86
Shop-Proven Products

This driver works it “right” when space is tight

Right-angle drills work great in close quarters, but that cramped space sometimes makes it difficult to apply the needed force to drill a hole or drive a screw. Craftsman’s right-angle impact driver doesn’t need much operator assistance. Delivering 700 inch-pounds of torque in both forward and reverse, this tool muscled 3/8” lag bolts into deck posts while I held it with only one hand. What a time-saver!

This impact driver runs on 12-volt lithium-ion batteries, part of Craftsman’s Nextec cordless-tool line. I also like its LED light—especially in tight, dark spaces—because it shines directly where needed. Like all impact drivers, it holds bits with a 1/4” quick-connect chuck. And Craftsman also throws in four common driver bits.

—Tested by Bob Hunter, Tools Editor

Right-angle impact driver, #5702

Performance ★★★★★

Price $100

Craftsman 800-383-4814; craftsman.com
Time travel at the speed of a 1935 Speedster?

The 1930s brought unprecedented innovation in machine-age technology and materials. Industrial designers from the auto industry translated the principles of aerodynamics and streamlining into everyday objects like radios and toasters. It was also a decade when an unequaled variety of watch cases and movements came into being. In lieu of hands to tell time, one such complication, called a jumping mechanism, utilized numerals on a disc viewed through a window. With its striking resemblance to the dashboard gauges and radio dials of the decade, the jump hour watch was indeed “in tune” with the times!

The Stauer 1930s Dashtronic deftly blends the modern functionality of a 21-jewel automatic movement and 3-ATM water resistance with the distinctive, retro look of a jumping display (not an actual jumping complication). The stainless steel 1 1/2” case is complemented with a black alligator-embossed leather band. The band is 9 1/2” long and will fit a 7–8 1/2” wrist.

Try the Stauer 1930s Dashtronic Watch for 30 days and if you are not receiving compliments, please return the watch for a full refund of the purchase price. If you have an appreciation for classic design with precision accuracy, the 1930s Dashtronic Watch is built for you. This watch is a limited edition, so please act quickly. Our last two limited edition watches are totally sold out!

True to Machine Art esthetics, the sleek brushed stainless steel case is clear on the back, allowing a peek at the inner workings.
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Bench with a bonus
The lid on this Shaker-inspired bench reveals handy hidden storage. Finish it clear or with milk paint.

Biscuit joiners
We test six popular models in search of the best among these quick-and-easy joinery tools.

Learn picture-framing fundamentals
A framing pro shows how to showcase artwork with the right combination of mats, molding, and glass.

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