

**8 GREAT GIFTS** for newbie turners

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*Projects, Techniques, and Products* *magazine*

## Make this textured **DIMPLED BOX**

### Projects:

- Clever Kissmas tree for tasty treats
- Two perplexing puzzle projects
- Retro Shoot the Moon game
- White oak wall shelf with resin inlay

**12**TIPS  
and **JIGS**



VOL. 17/NO. 98 DEC/JAN 21

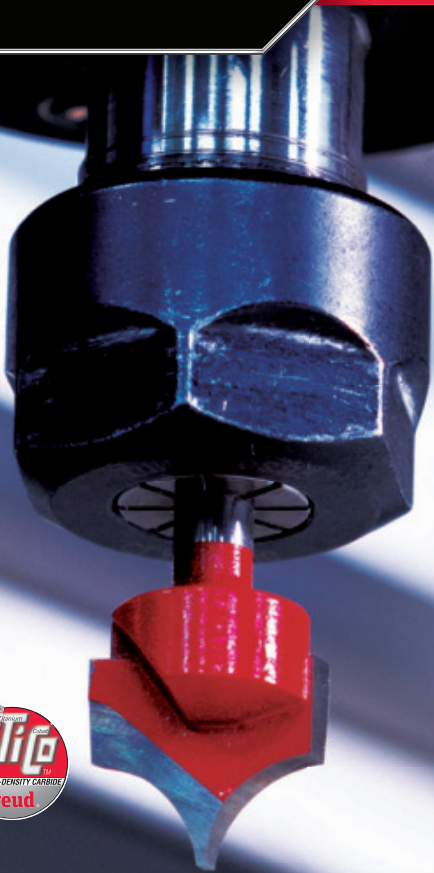
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## Projects

### 24 Shoot the Moon

This vintage tabletop game has been around for more than 70 years, and it might take you that long to perfect your play. But building it is much easier than getting to the moon, and lets you try your hand at cold forging.

### 28 Kissmas Tree

Everyone will want to be at your home for the holidays with this festive tabletop tree adorned with chocolates. It's easy to build, easy to enjoy, and even easier to store until next season.

### 32 Walnut Dimpled Box

Power-carved dimples, string inlay, uninterrupted grain, and a frame-and-panel, lift-off lid are just a few of the eye-catching elements adorning this unique box. The inside is just as striking, featuring suede lining and a sliding tray.

### 44 Two for Tee

Build two brain-"T"easing puzzles while brushing up on your hand tool techniques.

### 48 Display Shelf

High-tech woodworking meets antique design in this colonial-style display shelf cut with a CNC router and inlaid with epoxy.

## Tools & Techniques

### 41 Turning Tool Combos

Tired of turning just pens? Check out this group of select tools and the types of projects they make possible.

24



28



32





## Departments

### 04 Contributors

### 06 Getting Sharp

- 2020 Hindsight

### 10 News & Views

- Gain new SKILs
- WoodRiver makes the cut
- Side table slip-up
- Easy access
- A little something extra

### 14 Readers Showcase

### 16 Hot New Tools

- RIKON 8" benchtop jointer
- Next Wave SHARK SD100 CNC Machine

### 20 Tips & Tricks

- Walker workstation
- Banjo-based chuck holder
- Tape rule shims
- Keyhole slot routing jig
- Drawer planing platform

### 52 WoodSense

- Black Walnut

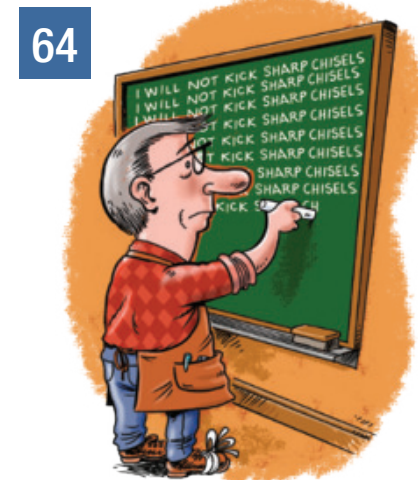
### 56 Great Gear

- Yeti 30 oz Rambler Tumbler

### 62 Buyer's Guide/Ad Index

### 64 Outfeed

- The School of Woodworking



## Contributors



**Rob Spiece** has become quite a regular on our pages. In recent years, he has shared his expertise on making small boxes, flattening slabs, recovering from woodworking mistakes, and more. In this issue's contribution (The Dimpled Box, p. 32), he shares his technique for adding delightful texture to a handsome box. In addition to teaching classes at the Lohr School of Woodworking, he and fellow instructor Larissa Huff stay busy designing and building custom furniture commissions.



Photographer **John Hamel** gets around. In addition to snapping stellar photos in numerous woodshops (see page 32), he has traveled to 46 states and 6 countries to photograph icons such as Paul Newman, Dave Barry, and Arlo Guthrie, as well as Olympic medalists

Dan O'Brien, Eric Heiden, and Bonnie Blair. His award-winning work has appeared in over 300 books and 700 magazines and is included in the permanent collection of The International Center of Photography in New York.



Being one of those kids who took things apart to see how they worked, and then reassembled them, **Dan Thornton** drove his parents crazy. However, he learned a great deal about how to show others how things are made. Dan's illustrations, of everything from simple jigs and

grandfather clocks, to the white oak display shelf on page 46 reflect his lifelong love of woodworking. Dan and his wife Laurie make their home in western Connecticut. ■

## On the Web



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Our new digital subscription gives you access to the same excellent issues in an easy-to-access PDF format, delivered directly to your e-mail inbox. Along with that, you get unlimited web access to our entire back catalog, plus exciting extras like templates, patterns, and videos. And you'll have access to the issue before it even hits the newsstand. Best of all, print subscribers are automatically subscribed to the digital version. Visit our website for more information on how to get your digital issue.

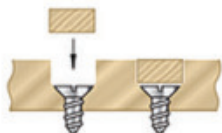
**A flock of freebies.** When you're finished flipping through this issue, check out our website for premium content such as a plan for a handy box to hold the Kissmas Tree (p. 28) during the offseason and a video showing the tree in use. But that's not all. In our onlineEXTRAS section of the website, you'll find free downloadable CNC patterns for the Display Shelf (p. 46) and an accompanying article on Bevel-edge Inlay. The "T" puzzles on page 44 come with patterns and printable solutions. There's even a complimentary article on making table-sawn splines, as demonstrated in the Dimpled Box (p. 32). Enjoy the bonus content on us, and Happy Holidays. ■



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## 2020 Hindsight

I don't think I'm creeping to the end of a limb to suggest that this was a particularly rough year. Natural disasters, some man-made ones, a bitterly divisive election, and a worldwide pandemic have marred 2020 with hardship and tragedy not seen for generations. And that's just scratching the surface. If you're anything like me, you can't wait to see this year in your rear-view mirror. But I don't want to just wave goodbye as the year crashes into history. I want to observe 2020 with the benefit of hindsight, while cruising into the New Year a little wiser.

Webster's defines hindsight as "Perceiving the nature of an event after it has happened." But this clear-eyed rearward view is only helpful when we apply what we've learned. Fortunately for woodworkers, thoughtful retrospection is innate to our craft, as every project we engage in informs the next. Surprises will always arise during a build, but the bumpy roads we've already traveled make our hands steadier on the wheel going forward.

In this holiday issue, our team of talented woodworkers have employed their hard-won wisdom to deliver a load of fun, thoughtfully designed projects. For starters, we have a fes-

tive table topper (p.28) that displays tasty treats during the season, and cleverly stows away the rest of the year. Then there's a battery-free game that provides hours of holiday entertainment (p.24), and a pair of puzzles (p.44) that are as fun to build as they are to solve. Neat gifts, all. And if you know a newbie turner, they may love something from the carefully curated list of tools on page 41. If you're into CNC woodworking, check out the display shelf on page 48. Anyone would like it. Finally, that very special someone would be awed to receive the spectacular dimpled box on the cover of this issue. Giving birth to any of these projects is a great way to wave goodbye to a stinker of a year.

As its replacement climbs the horizon, it's bound to hold some promise. How will you use your hindsight? As for me, this New Year's Eve, my oversized party glasses will be fitted with 20/20 lenses. Happy 2021, my friends! ■



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magazine

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## Share your ideas.

We love hearing from readers! And there are all kinds of reasons to get in touch with the crew at *Woodcraft Magazine*. Check out the details below.

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Important: Please include your phone number, as an editor may need to call you if your trick is considered for publication.

### Have a tough woodworking question?

We'll do our best to find the expert and provide the answer. Email us at [editor@woodcraftmagazine.com](mailto:editor@woodcraftmagazine.com) and put "Expert Answers" in the subject line.

### News & Views:

This catch-all column is where we do our best to correct mistakes, publish feedback from readers, and share other noteworthy news items. It's easy to participate in this discussion. Just email us at [editor@woodcraftmagazine.com](mailto:editor@woodcraftmagazine.com) and put "N&V" in the subject line.

### Submit an article idea:

Do you have a story idea? We'd love to hear about it. To find out how to submit an article, email us at [editor@woodcraftmagazine.com](mailto:editor@woodcraftmagazine.com) and put "Submission" in the subject line.

### Share photos of your projects:

We'd like to see what you're building. To show off your work send your photos to [editor@woodcraftmagazine.com](mailto:editor@woodcraftmagazine.com), or find us on social media.



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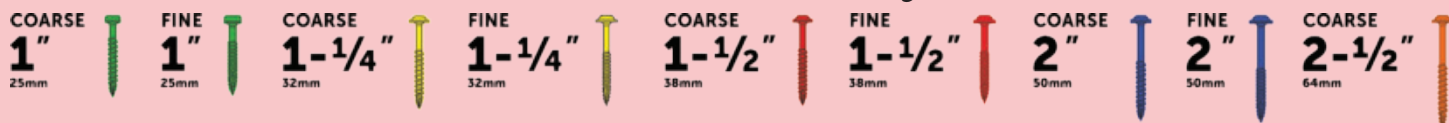


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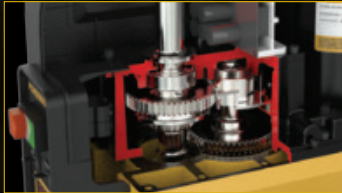
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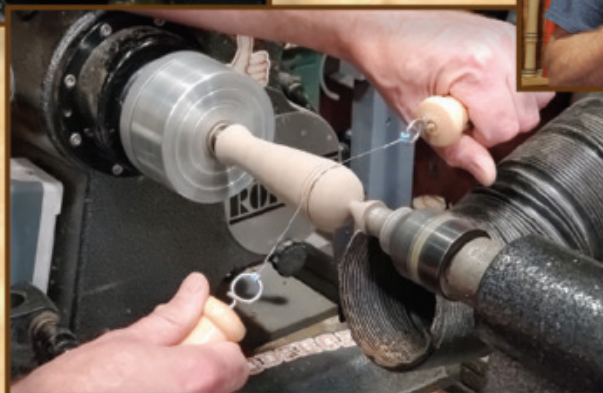
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## Gain new SKILs

Woodcraft now carries two SKIL routers, a 10-amp fixed base, and a 14-amp two-based kit. The 10-amp model (#174808, \$79.99) features a 2 HP motor, while the 14-amp model (#174809, \$139.99) shown here, boasts 2.5 HP and includes both a fixed and a plunge base. An LCD display in the 14-amp router allows you to input the bit type and material to let it suggest an appropriate speed. You can also set the speed manually. Both units include  $\frac{1}{4}$ " and  $\frac{1}{2}$ " collets, and micro-depth adjustment. The SKIL routers are available now online through [woodcraft.com](http://woodcraft.com) and at participating stores.

## WoodRiver makes the cut

Very few dado sets stack up to SawStop's rigorous standards, but the company recently announced that Woodcraft's WoodRiver 8" dado set has been approved for use with all styles and configurations of SawStop table saws. The announcement means the WoodRiver dado set passed SawStop's thorough evaluation, making it only the sixth dado set to do so. It's also one of the most affordable SawStop-compatible dado sets available. WoodRiver's set is made in Israel from German steel and features carbide tips manufactured by Luxembourg-based Ceratizit Group.

## Side table slip-up

In the Single-drawer side table drawing on page 33 of Issue #96 (Aug/Sept 2020), the side apron width should be 5" instead of the 4" dimension shown.

### How to reach us

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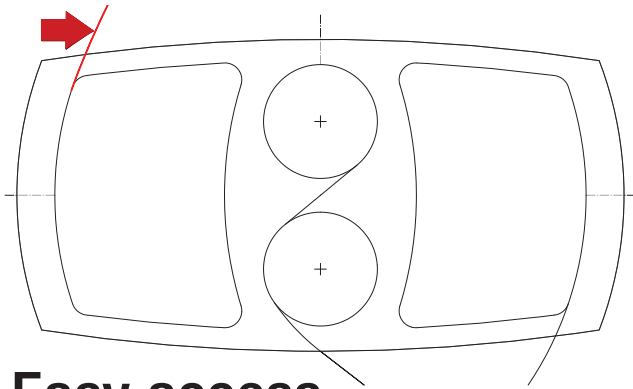
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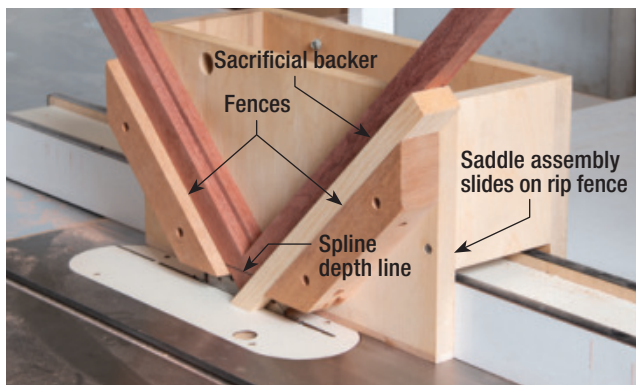






## Easy access

The leftmost access line on the double tray template layout (Issue 97, Oct/Nov 2020, page 24) should have come from the top of that layout as shown here. The original line from the bottom of the template would be impossible to cut on most bandsaws, as the workpiece would run into the machine's column. The corrected template is available online at [woodcraftmagazine.com](http://woodcraftmagazine.com).



## A little something extra?

Page 35 of the Aug/Sept 20 issue mentions that plans for "A lifetime tenon jig" can be found in onlineEXTRAS. The one pictured on page 35 appears to have a 45-degree feature that isn't included in the online plans. That's piqued my interest.

—Bill Schneider, via email

### Senior editor Paul Anthony replies:

Good eye, Bill! One of the beauties of this symmetrical fence-straddling carriage jig is that each face can be outfitted for its own purpose. In this case, one face is outfitted for tenoning, and the other for sawing spline slots to reinforce frame miters. The online article focuses on the former, while the photo here shows the latter. Without a doubt, this dual-purpose jig is one of my most used table saw accessories. Plans for the spline miter jig are available in onlineEXTRAS. ■

# Robert Sorby

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## Reader Showcase



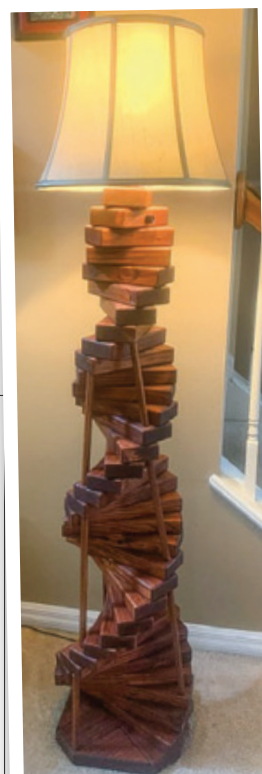
**JIM TOWNSEND,**  
ROCK HILL, SC

**Stately study.** Townsend took the Famous Furniture article on the Senate Desk in Issue 95 as a challenge. Pulling his measurements off the photos with an engineer's scale, he created this impeccable version without any other plans, dimensions, or drawings. The desk includes detailed spindles supporting the shelf, and mortise-and-tenon joinery for the trestle legs. Changes from the original include making the desk square instead of trapezoidal, and using walnut rather than mahogany and rosewood. It's a project both parties can agree on!



**JAMES RAINES,**  
BRENTWOOD, TN

**Duck that call.** Raines turns these made-to-order duck calls from figured walnut and hard maple, and uses his own proprietary blend of finishes to achieve a hard, water-resistant layer. Neoprene o-rings ensure a tight fit between barrel and insert, and lessen the risk of cracking due to swelling.



**DENNIS THOMSEN,**  
CUMMING, GA

**Lighting with a twist.** This Georgia builder lit up his son's bedroom with a unique floor lamp. Cherry-stained pine 2x4s get a quarter inch shorter as they twist upward from a solid base. A hole through the center hides the cord, and dowels maintain stability. ■



**JIM SMOLLER,** PITTSBURGH, PA

**Driven a Ford lately?** Smoller crafted this woody wagon for his leadfoot grandchildren. The built-tough oak chassis sits on lawnmower wheels, ensuring a smooth ride. A hand-rubbed paste wax finish brings showroom sheen to this 2020 model.

### Show off your work!



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### Overview

- Full table size extends from 30½" to 51½"
- 2"-dia. helical-style cutter head with 16 two-sided carbide inserts
- 4" dust port
- Motor: 10A, 120V, 60HZ
- Speed: 20,000RPM



The benchtop jointer market is chock-full of 6" machines, but not many 8" models. RIKON Power Tools has addressed this lack with their new 20-800H 8" jointer. They essentially installed 8" tables on a base similar to that of their popular 6" jointer (20-600H). But being able to dress 8" stock for about 600 bucks is newsworthy indeed.

While its machined aluminum tables are the same length as on the 6" model, the 20-800H supports longer boards via extendable metal arms that increase the combined infeed and outfeed length from 30½" to 51½". The fence can be adjusted to any angle between 90° to

135°. Lever handles securely lock it into place anywhere across the length of the knives. Unfortunately, it's a challenge to keep the fence square to the tables. The depth-of-cut adjusts by rotating a knob under the infeed table, which locks in place by tightening a knob located on the machine's front just to the right of an easy-to-read depth scale. Below that lies an on/off switch featuring a removable plastic safety key. The cutter head is what RIKON calls helical-style. This is to say that it doesn't have full-length knives, but rather 16 indexable carbide inserts that are offset in six in-line rows. (Four rows

have three cutters, two rows have two cutters.) When one of these double-edged cutters gets dull or nicked, simply rotate it 180° to bring the fresh edge into play. (For additional specs, see Overview above.)

RIKON touts this 50-pound machine as portable. Sure, you can move it around, but hoisting the jointer by its tables or extension bars may well knock them out of coplanar. My advice: unbox the machine, and immediately bolt it to a stand outfitted with lockable casters. You do not want to throw the tables out of alignment, as readjusting them is a truly vexing proposition.

The 20-800H performed well at general edge-jointing, and when face-jointing lumber from ½" to 1" thick at lengths from 12" to about 30". It produced square stock with smooth surfaces in a myriad of domestic and exotic woods. To prevent the modest motor from bogging down when making wide cuts in thicker, heavier boards, a very shallow cut and steady feed rate will usually do the job. All in all, the machine's 8" capacity and its extension arms absolutely expand the variety of projects a beginner can take on. And, at the entry level, that's a big deal.

—Tester, Chad McClung



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# Pint-sized CNC packs a well-conceived punch

## Next Wave SHARK SD100

Cue the music: *Baby shark, doooo, doooo, doooo...* My experience with large industrial CNC (computer numeric control) machines left me a little skeptical when the Next Wave SHARK SD100 swam into my shop. But I was pleasantly surprised by this minnow-sized machine's ease of use and what it has to offer the small-shop woodworker interested in dipping their toe into CNC waters.

Next Wave has thought out everything well. The machine came out of the box fully assembled and included everything I needed except for a computer and a trim router. All I had to do was attach a router, install the included software onto my computer,

and connect the SHARK SD100 to my computer via the included USB cable. (The router holders accommodate any trim router on the market.)

The machine comes with two pieces of software to install. VCarve Desktop allows you to create your designs and generate toolpath files. Ready2Control aligns the bit with your workpiece, and runs those toolpath files to make your cuts. Both interfaces are straightforward, but as with any software, there is a learning curve involved. Fortunately, the SHARK SD100's owner's manual is well-written and comprehensive, and the Next Wave website ([www.nextwaveautomation.com](http://www.nextwaveautomation.com)) is also quite helpful when it comes to operating

the machine. VCarve Desktop is from a second company: Vectric ([www.vectric.com](http://www.vectric.com)). It is one of the most popular toolpath programs and there is plenty of help available online to take you to the next level after you exhaust the information provided.

Once configured, the machine ran well and did everything I asked of it. The one problem I encountered occurred when I went to move the router out of the way so I could clamp down a second workpiece. I inadvertently drove the gantry up against its stop blocks using the keyboard arrows. This didn't harm anything, but the machine did lose its zero point. This meant that instead of being able to



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## Overview

- XYZ travel 12 × 13 × 3"
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- Rugged composite/metal construction
- Made in the USA
- Can trade in when you're ready to upgrade

make a second part immediately, I had to go back and reset the bit to zero. A minor but important point to keep in mind.

The only other potential problem I see involves its size. The SHARK SD100 is a great, relatively low-cost way to get into CNC, but if you see yourself eventually cutting out furniture parts and templates, you'll outgrow it. But Next Wave has considered this and allows you to trade in for a larger model. Next Wave then refurbishes your old machine and donates it to a worthy school program. Now to get back to my next computer-enhanced project. If only I could get that song out of my head... ■

—Tester, Ken Burton



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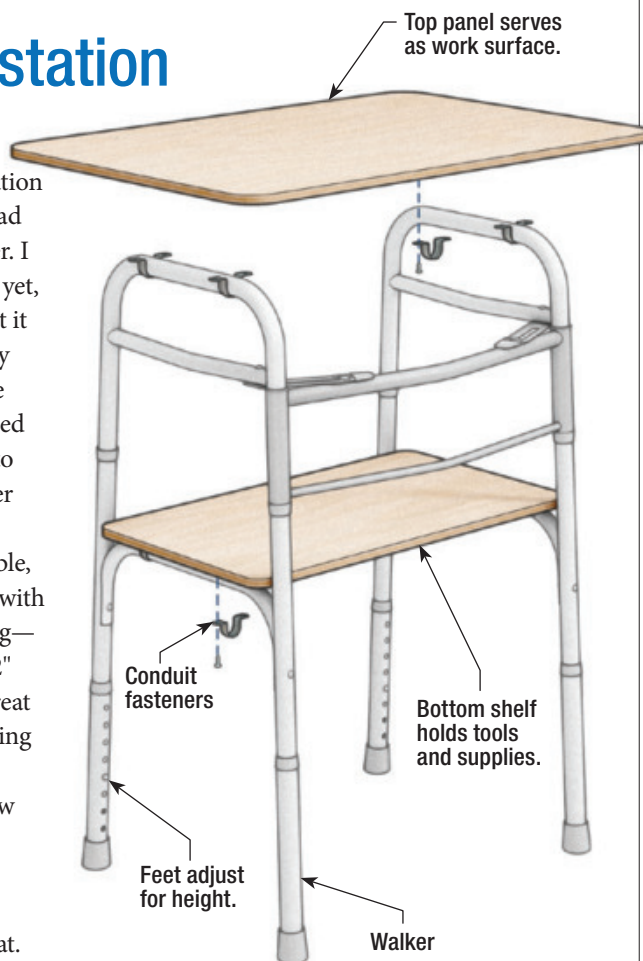


## TOP TIP

## Walker workstation

I had been pondering making a portable, lightweight workstation when my neighbor asked if I had any use for an unneeded walker. I laughed and told him no—not yet, anyway. But then I realized that it would make a great base for my purposes. I easily knifed off the molded plastic handles, and used inexpensive conduit fasteners to attach wood panels to the upper and lower bars. In less than an hour, I had created a small, stable, lightweight workstation that—with the push of a button on each leg—easily adjusts in height from 32" to 40" in 1" increments. It's a great help in the shop or when working on home projects, providing a work surface with staging below for tools and supplies. A new walker can cost as little as \$25, and they are often available at thrift stores for a fraction of that.

—Jim Kelly, Trappe, Pennsylvania



## Tape rule shims

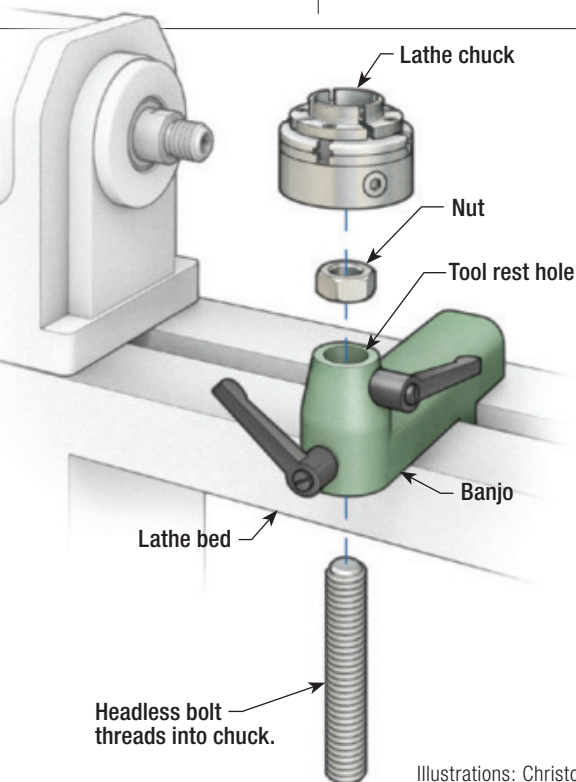
Like any dusty packrat, I hang on to all manner of scraps, including sections of self-adhesive measuring tape left over from jig-building. I find that this stuff makes great shim material because it's thin, durable, and self-sticking. It's easily cut into appropriately-sized lengths for shimming fences and jig parts. It can also be cut into very small pieces if necessary. For example, I have affixed tiny pieces of it along the underside edges of recessed machine table inserts to bring them flush to the table top. Whenever I need to shim something just a bit, it's one of the first things that comes to mind.

—Barton Grimsley, Houston, Texas

## Banjo holder for a chuck

Sometimes when I'm adding carved or burned details to my turned bowls, I find it easier to hold the work upright. To facilitate this, I've found that I can use my lathe's banjo as a sort of bracket to hold work that's still secured to a chuck or faceplate. To create the set-up, first cut the head off a large bolt whose threads match those on your lathe spindle, and install a nut to serve as a shoulder. Now, when you want to hold work-in-process horizontally, just unscrew the chuck or faceplate from your headstock spindle, thread it onto the headless bolt, adjust the nut against the chuck, and slip the assembly into the banjo hole. (If your spindle diameter doesn't match your banjo hole, buy an adaptor that will connect two appropriately sized bolts.) As an added benefit, I find that switching out different-sized chuck jaws is much more easily done when the chuck is held horizontally.

—Jeff Peters, Redgranite, Wisconsin



Illustrations: Christopher Mills



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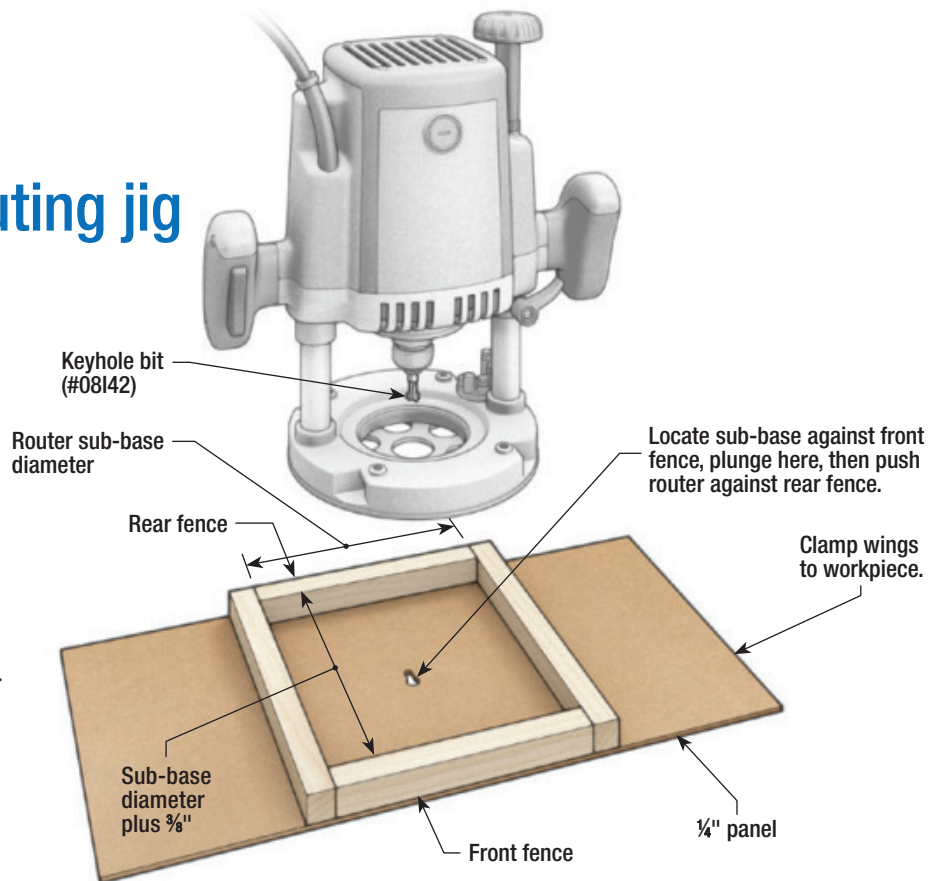


## CLASSIC TIP

## Keyhole slot routing jig

Routed keyhole slots provide a great way to hang everything from picture frames and plaques to small cabinets. Plunging the keyhole bit into the work, and then moving it forward about  $\frac{3}{8}$ " creates a keyhole-shaped slot that accepts the head of a screw. Here's a simple jig to help with the job. It's nothing more than a small panel of  $\frac{1}{4}$ "-thick plywood or hardboard with a frame of fences attached to guide the router. The panel "wings" allow clamping the jig to a cabinet. For smaller workpieces, attach the panel with double-faced tape or hot-melt glue.

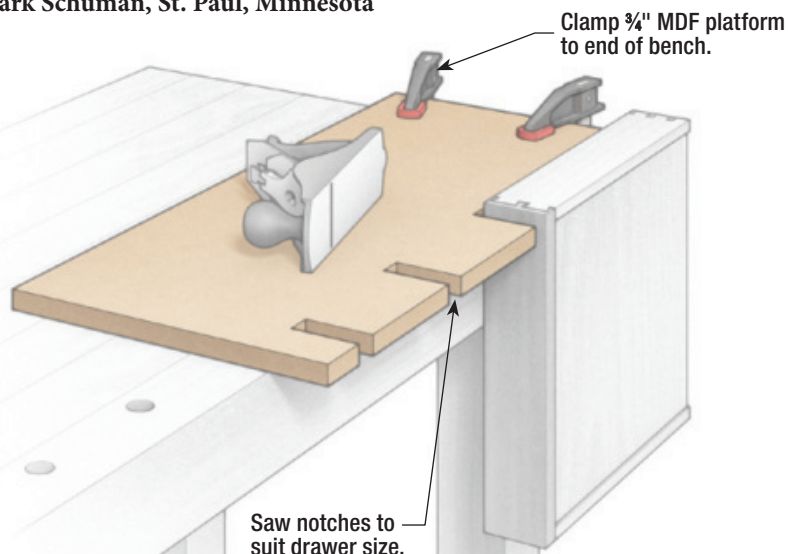
—Paul Anthony, senior editor



## Drawer planing platform

When planing drawers to fit their openings, it's important that the surface being planed remains flat during the process. If a drawer side flexes under the pressure of the tool, you won't be able to plane it evenly. My solution is to use a  $\frac{3}{4}$ "-thick MDF planing platform that I slot to accommodate drawers of different sizes. I cantilever the slotted section off the edge of the bench as shown, and clamp the platform in place. Fine sandpaper adhered to the section under the clamps helps keep the panel from shifting in use. ■

—Mark Schuman, St. Paul, Minnesota



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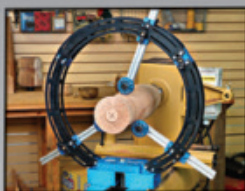
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# SHOOT THE MOON

*A nostalgic game of gravity-defying skill*

By Ken Burton



This simple game is as much fun today as it was when it first appeared over seventy years ago. It offers hours of entertainment without batteries or screen time. The object is to roll the steel ball-bearing up the steel rods and then drop it in the highest-scoring hole. Building the game is straightforward: drill some holes, rout a groove and

a slot, and screw together some boards. You can even get in touch with your inner blacksmith as you cold forge the ends of the metal rods.

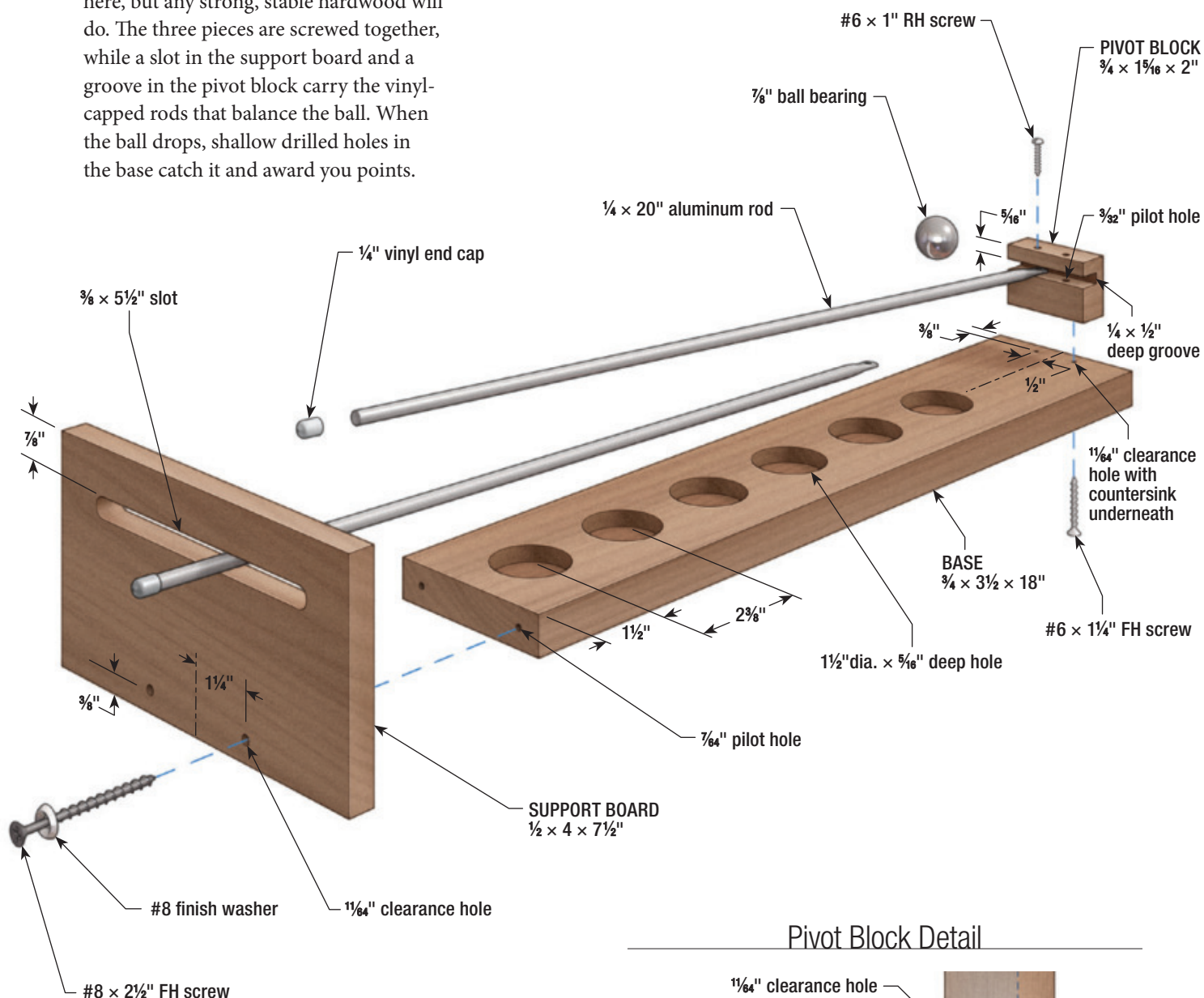
To play, start with the bearing at the bottom of the hill and spread the rods to get the bearing moving. Then, ease the rods together to keep the bearing from dropping as it rolls upward. Finally,

open the rods wide to drop the bearing in one of the scoring holes. Easier said than done. I numbered the holes in my game starting with 5 at the bottom then 10, 20, 30, 40, and 50. But feel free to use any scoring system you like. To make the game more challenging, assign the lowest hole a negative point value.

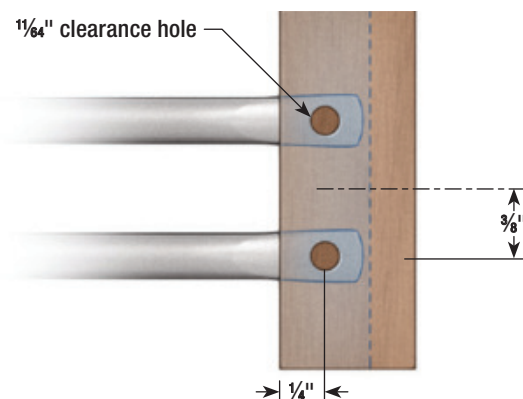


# Three boards + two rods = twice the fun

I used black walnut for the game shown here, but any strong, stable hardwood will do. The three pieces are screwed together, while a slot in the support board and a groove in the pivot block carry the vinyl-capped rods that balance the ball. When the ball drops, shallow drilled holes in the base catch it and award you points.



## Pivot Block Detail



## Order of Work

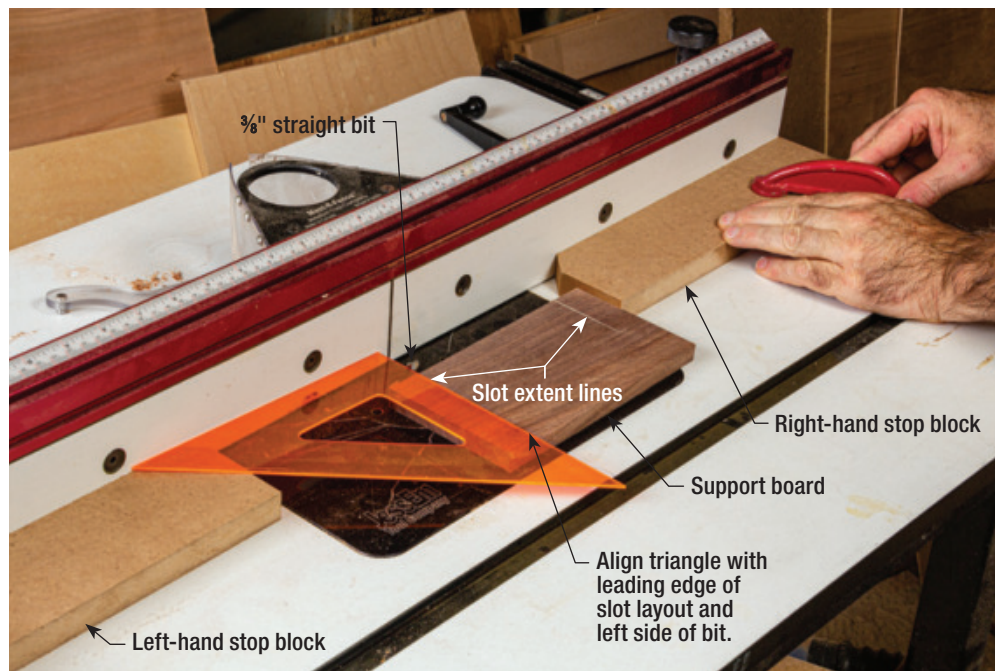
- Rout the groove & slot
- Drill the holes
- Assemble and finish
- Shape and attach the rods
- Practice & play



# Get in the groove

Mill the three workpieces to the sizes specified in the drawing on page 25, but leave the pivot block at least 6" long for safe handling while routing its through groove. Chuck a  $\frac{1}{4}$ " straight bit in your router table, and position the fence to locate the groove  $\frac{5}{16}$ " in from one edge. Rout the groove to full depth in several shallow passes,

running the piece from right to left. Lay out the slot in the support board. Install a  $\frac{3}{8}$ " straight bit and adjust its height to slightly more than half the stock thickness. Set the fence  $\frac{7}{8}$ " away from the bit and set up stop blocks as shown. Rout the slot in two passes, one from each side.



## Support board slotting setup.

To position the right-hand stop block, hold a drafting triangle against the fence and align its other 90° edge with the left side of the bit and leading slot extent line on the support board. Place one end of the stop block against the trailing end of the support board, and clamp the block in place. To set the left-hand stop block, align the triangle with the trailing slot extent line and the right side of the bit. Clamp the block in place against the leading end of the support board.



**Pivot to get started.** Hold the trailing end of the support board against the right-hand block and the fence, and pivot the leading end onto the spinning bit. Rout the slot from right to left until the leading end hits the stop block. Turn the piece over while keeping the same edge against the fence. Repeat the process to finish the cut.





# Drill, assemble, and apply a finish

Lay out the scoring holes where shown in the drawing on page 25, and drill them as shown below. If you plan to build more than one or two games, set up a stop block and spacers for positioning the holes. Locate the first hole under the bit, and clamp the stop block at the base's far end. Then insert 2 $\frac{3}{8}$ "-wide spacers in between the block and the base to locate the subsequent holes.

Clamp the support board to the base, and drill pilot holes for the assembly screws as shown. Cut the pivot block to length. Drill the necessary holes and screw together the pieces. Finish as desired, I used boiled linseed oil. Add felt (available at most craft stores) discs to the holes with your desired scoring written in the center of each.



**Right down the center.** Align a fence to center the workpiece under the bit. Drill the six  $\frac{5}{16}$ "-deep scoring holes along the length of the base with a  $1\frac{1}{2}$ " diameter Forstner bit.



**Clamp and screw.** Position the support board on the upper end of the base, flush with the bottom and centered from side to side. Clamp it in place. Drill  $\frac{7}{64}$ " pilot holes into the end of the base, followed by  $1\frac{1}{64}$ " clearance holes through the support board. Fasten with screws and finish washers.

## A little metalwork

Acquire enough  $\frac{1}{4}$ " aluminum (or steel) rod from the hardware store to make two 20"-long pieces. Cut the pieces to length with a hack saw. Flatten one end of each and drill pivot holes as shown. File to remove any burrs. Drill clearance holes through the top "tongue" of the pivot block where shown in the drawing on page 25. Drill pilot holes into the lower part. Slide the rods into the groove and drive in the screws to hold them in place. Note that the center-to-center spacing of the rods is critical to how well the game functions. You can bend the rods slightly so they are closer together to make the game easier to play, but don't go overboard. If they are too close, you won't be able to open them far enough for the ball to roll. To finish up, add  $\frac{1}{4}$ " vinyl caps to the ends of the rods.



**Beat 'em.** Flatten one end of each rod with a ball-peen hammer on the anvil end of a machinist's vise to create a flat approximately  $\frac{3}{16}$ " wide and  $\frac{3}{4}$ " long. Strike a dimple centered  $\frac{3}{16}$ " in from the ends with a center punch.



**Drill 'em.** Hold the rod securely in a vise or with a clamp to prevent the rod from leaping up when the bit breaks through the underside. Drill through the flattened end of each rod with an  $1\frac{1}{64}$ " regular twist drill bit. Be careful of the metal chips—they will be hot and sharp. ■



# KISSMAS TREE

*A table ornament twinkling with tasty tinsel*

By Derek Richmond

**B**ing Crosby plays an outsized role in setting the holiday mood in my house, from our annual screening of *White Christmas* to his albums revolving on the turntable as the fire crackles. But I never quite understood why Bing, crooning “I’ll Be Home for Christmas,” asks that his presents be *on* the tree until I designed and constructed this festive little holiday piece. With presents of foil-wrapped chocolates trimming each bough, this decoration will make everybody want to be at your home for Christmas. And when it isn’t the season any longer, the tree folds flat for convenient storage until next December.

Construction is straightforward, as the piece is basically just hardwood sticks stacked on a central rod and cut to shape. The bottom two sticks act as a base when the branches are fanned out, keeping the tree straight and stable. Shallow counterbores cut with a Forstner bit keep the chocolates in place. The top of the tree is adorned with a decorative finial available online for a few dollars, although a carved angel or turned wooden ornament would make a suitable crown. This tree was made of guanacaste, but any hardwood will do—or try mixing various exotics for a multi-colored tree.

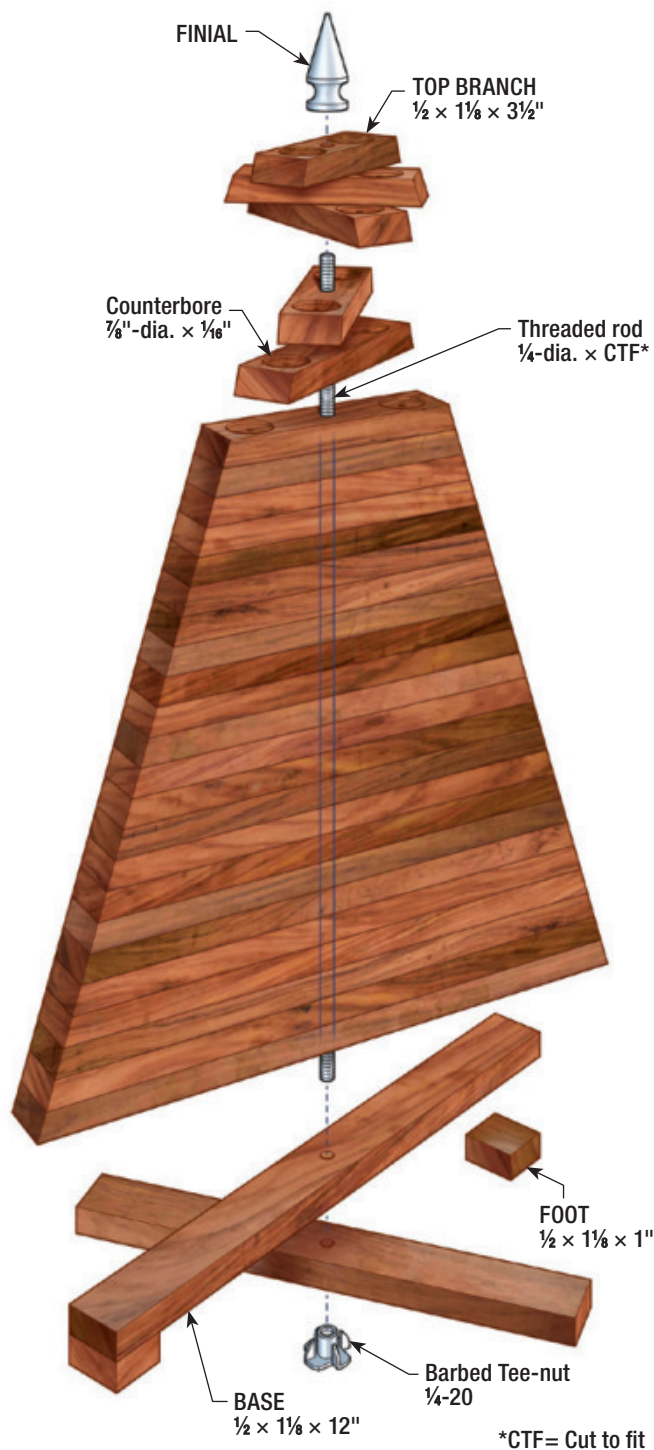


## Order of Work

- Drill for threaded rod
- Cut tree to shape
- Make base
- Counterbore for chocolates
- Apply finish and assemble

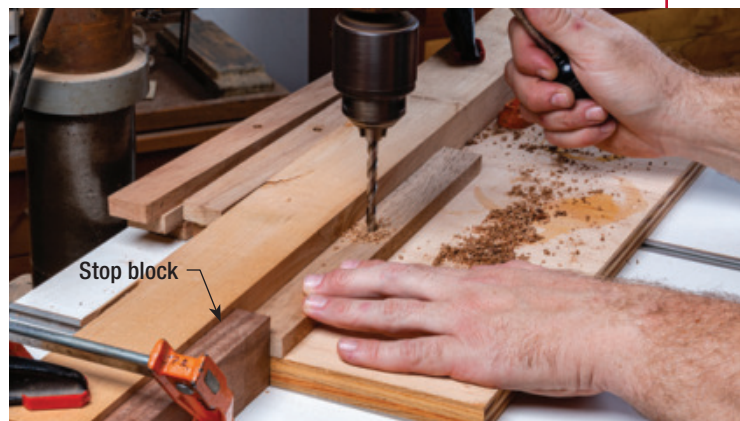
# A flat-pack tree comes 'round at Christmas

The tree is built from a stack of 30 sticks of wood run through with a threaded rod that's captured at the bottom in a tee-nut and at the top with a threaded finial. Each of the strips is counterbored to corral Hershey's Kisses. The two bottom-most sticks serve as a base when oriented perpendicularly. Splaying the branches at 45° to each other creates the conical tree shape.



## Start with a stack of sticks

Mill thirty  $\frac{1}{2} \times 1\frac{1}{8} \times 12$ " sticks for the tree, plus some extras for tool set-ups. Chuck a  $\frac{1}{4}$ " bit in your drill press and set up to bore the threaded rod holes, centering them as precisely as possible. Drill the  $\frac{1}{4}$ " holes in all but the bottom-most stick. Next, switch out your bit for a  $\frac{5}{16}$ "-diameter bit, and drill the through-hole in the bottom-most stick. Then drill a counterbore in the bottom-most stick to accept the flange on a  $\frac{1}{4}$ " tee-nut. Tap the tee-nut into its hole and screw one end of a length of threaded rod into it. Sand the top and bottom faces of all the sticks, and slip them onto the rod. Snug them down with a nut and washer and cut off the rod about 1" from the nut.



**Center hole first.** A fence and stop block setup allows accurate, efficient boring of the  $\frac{1}{4}$ " diameter through-hole for the threaded rod in each of the branches. For clean drilling, use a brad point bit, and place the stock on a backer board to minimize exit tearout.



**Countersink the tee-nut.** Without changing your drill press setup, bore a  $\frac{5}{16}$ " through-hole in the bottom-most stick, and then follow up by drilling a  $\frac{1}{8}$ "-deep counterbore using a  $\frac{7}{8}$ " Forstner bit as shown to accept the flange of a tee-nut.

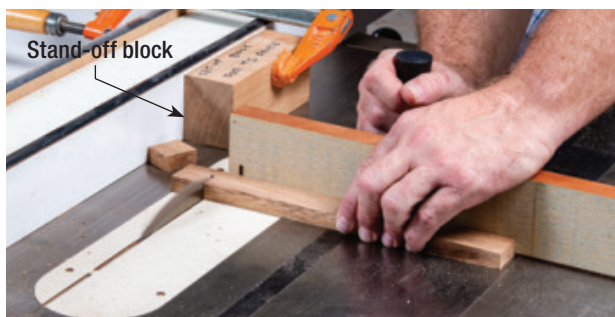


# Taper the top and fashion the feet

With the tree parts still all pinched together on the threaded rod, mark the triangular profile, tapering the sides from 3½" wide at the top to 12" at the third piece up from the bottom. Then trim to your cutlines as shown. Sand the edges and faces of the tree, and then remove the sticks from the rod, keeping them in order. Create the "feet" by crosscutting the outermost 1" from each end of the bottom-most stick, and gluing the pieces to the ends of the stick above it. The space lost to the saw kerf creates clearance for the two base pieces to rotate independently.



**Trim the tree.** After marking out the taper on the stacked sticks, saw to your cutline. Guide the work using a miter gauge faced with fine sandpaper to prevent slippage.



Stand-off block

**No kicking.** When sawing the feet free of the bottom-most stick, don't use the rip fence itself as a stop, which can create kickback. Instead, use a stand-off block against the fence in front of the blade.

# Counterbores for Kisses

Using a 7/8" Forstner bit in a drill press, cut 1/16"-deep counterbores to keep the chocolate candies in place. Again, a fence and stop-block setup simplifies the process for quick, accurate drilling, but this time adding a 1¼ × 2½" spacer. Drill all of the outermost counterbores first, then move inward to the others as shown. Keep all the sticks in order as you work.



Stop block

**Outermost counterbores first.** Drill the outermost counterbore ¾" on center from the end of each stick. Set up the cut with the 1¼ × 2½" spacer placed lengthwise between the stick and stop block.



**Second set next.** Rotate the spacer 90° to drill the second set of holes moving inward. Do not drill any counterbore closer than ¾" from the stick's center hole.



**Innermost last.** For a third counterbore on the longest branches, remove the spacer. Again, drill no closer than ¾" from the center hole to allow kissing room.



## Finial and finish

Sand all the sticks and apply finish to them, still keeping them in order for organized reassembly afterward. Let the finish dry well, then remount the sticks on the rod and mark it for cutting to final length, based on the thread depth of your chosen finial. Hacksaw the rod to length, clean up the cut at the grinder, and reassemble the tree one last time. To put it on display, rotate the “branches” into position and load them with Kisses. I’ve learned to leave a few spots empty to invite plucking, as everyone seems reluctant to be the first.



**Finishing up.** I finished the sticks with three coats of Tried & True Original Wood Finish—a combination of polymerized linseed oil and beeswax. I applied it with a lint-free rag, let it sit about an hour, then wiped away the excess with a clean rag. After letting each coat cure for 24 hours, I burnished with a clean cloth before applying the next.



**It's beginning to look a lot like Christmas.** Make sure the redundant two base sticks are perpendicular to each other for stability, then fan out the branches, securing everything by tightening the finial.



**'Til next year.** Rotating all the branches parallel allows the tree to fold flat for easy storage. Tighten the finial to keep them that way. ■



### onlineEXTRAS

For a video of the tree setup and a detailed drawing of the storage box shown here, visit [www.woodcraftmagazine.com](http://www.woodcraftmagazine.com)



# Walnut DIMPLED BOX

*Texture and techniques wrapped up in a fun build*

By Rob Spiece



This box started out as an experiment in playing with texture. I wasn't sure where I was going to go with it, but I had in mind power-carving a surface of random dimples using a ball grinder in a rotary tool. After playing some with the design, I decided to wrap a band of texturing around the box walls, bordering it with string inlay. Miter joints create clean corners that allow the grain to wrap around uninterrupted. Because miters themselves are not particularly strong, I reinforced them with splines, which are set into grooves in the miter faces.

I found that the inlay lifted the box into a classy realm that seemed to demand an equally classy frame-and-panel lid. After dimpling the lid panel and framing the textured section in string inlay to complement the sides, I added a wooden handle that attaches with two dowel posts. The lid simply lifts off, as I didn't want to incorporate hinges or other hardware. Removing it reveals a soft surprise inside: more texture in the form of a suede-covered bottom. A sliding tray sitting atop mitered ledger strips gives the box even more utility.

Obviously, you can use any materials you like, but this piece sure does love to be built from walnut with maple stringing that really makes the textured surfaces pop!



## Order of Work

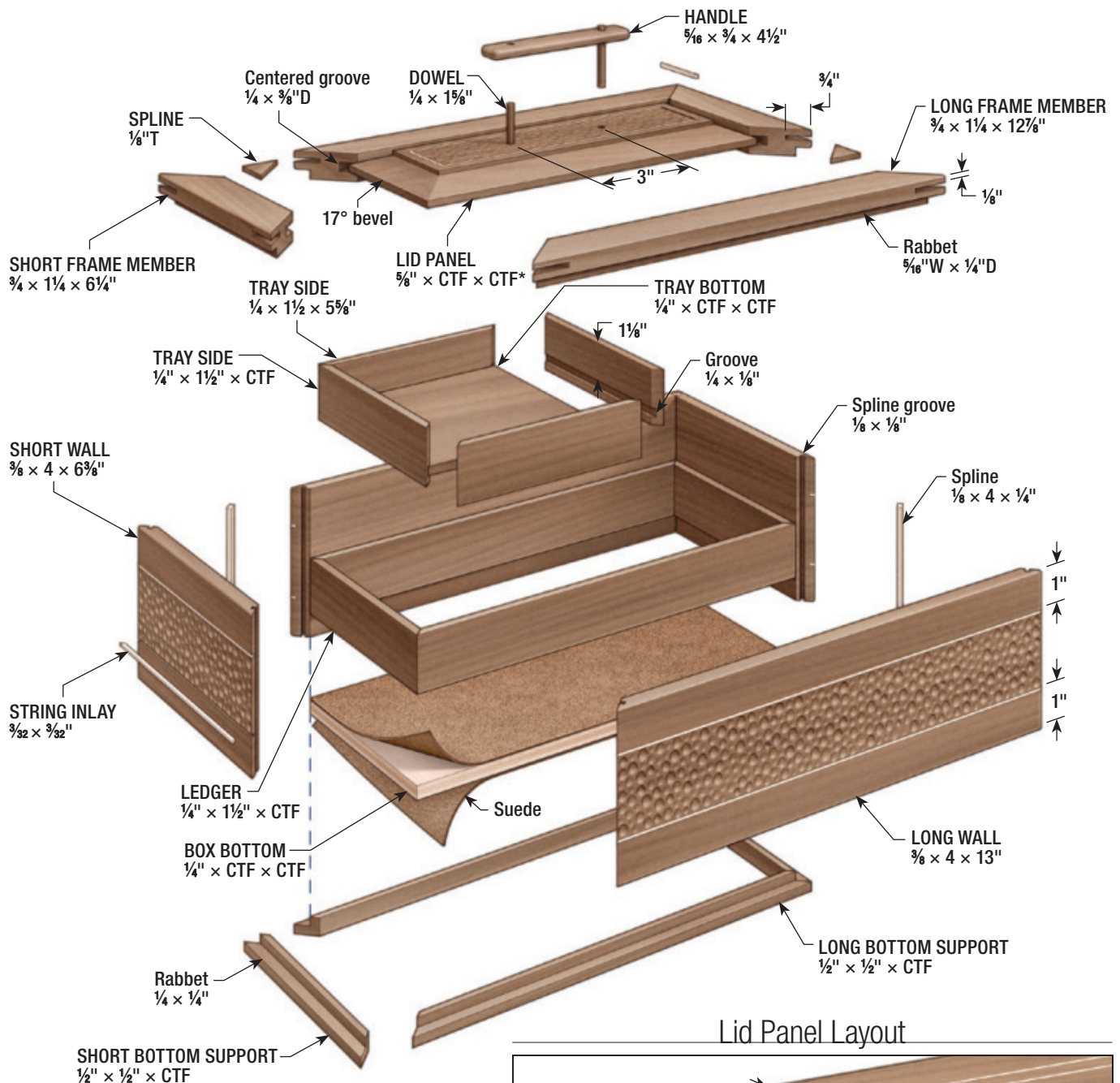
- Make and inlay box walls
- Carve dimples
- Miter and assemble walls
- Make lid parts
- Detail and assemble lid
- Outfit interior
- Handle and finish



Splines reinforce the box wall and lid frame miters, while dimpled texturing bordered by string inlay provides visual character. Rabbeted bottom support strips create an inset “footing,” and allow inserting the

leather-covered bottom after finishing.

A sliding tray sits atop ledger strips, and the frame-and-panel lid sports a shop-made handle.

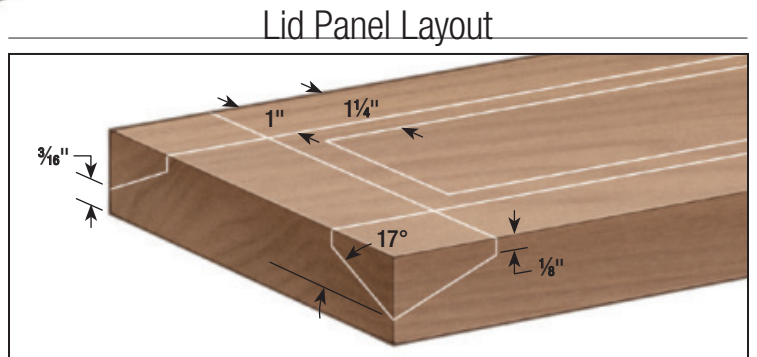


\* CTF = Cut to Fit



**onlineEXTRA**

- Table-sawn Splines (Feb/Mar 2009)





# Make and inlay the walls

Mill the stock for the walls. For the most attractive box, I resaw the wall material to allow wrapping the grain around the corners, as shown on the facing page. Begin with 5/4 stock about 24" long. This creates two workpieces—each of which include one long wall and

one short wall. Before crosscutting the four individual walls to length, saw the  $\frac{3}{32}$ "-deep inlay grooves using a thin-kerf ( $\frac{3}{32}$ ") blade. Next, make the inlay strips, including what you'll need later for the lid. Glue them in their grooves as shown, and then plane them flush.

## Making inlay strips



**Table saw rip first.** Having sawn the  $\frac{3}{32}$ "-wide inlay grooves in the box walls, rip  $\frac{3}{32}$ "-wide strips to fit in them. It may take a few tries to get a perfect fit. Using a caliper can help. You'll also need a sacrificial push stick and a zero-clearance throat plate to do the job.



**Bandsaw rip next.** Saw the individual inlay strips to a little more than  $\frac{1}{8}$ " wide. This is best done on the bandsaw, feeding the work atop a wide zero-clearance board that prevents the thin pieces from falling into the saw's throat plate opening or sliding under the fence.

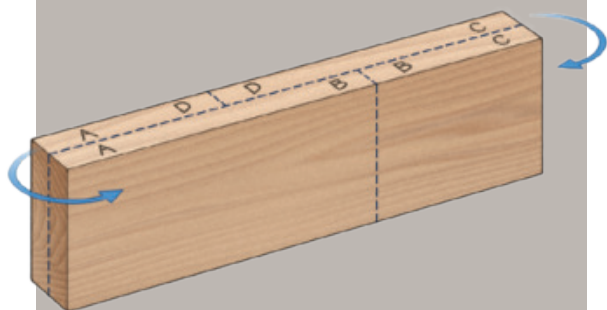


**Install the inlay.** Apply glue to the grooves and tap the inlay strips into place. Snug-fit pieces shouldn't need clamping, but use painter's tape to hold down any loose ones. Afterward, plane the strips flush, as shown in the piece as right

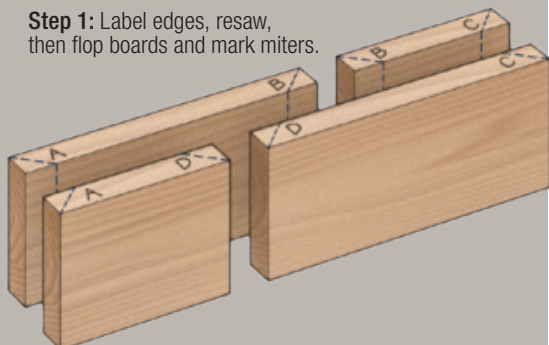


## How to grain-wrap a box

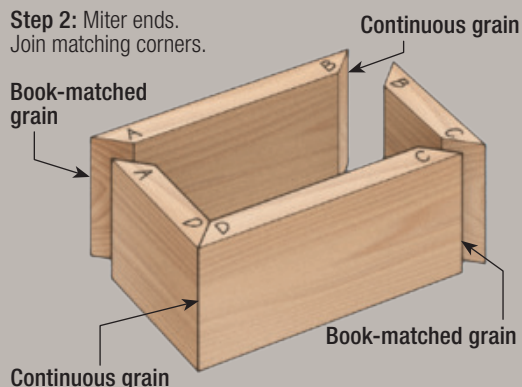
A mitered box looks best when the grain runs uninterrupted around the corners. To perform this trick, begin with stock that's twice the desired thickness of your finished wall, plus 1/4" or so for milling. Rip it to finished width, and about 1/4" longer than the combined length of two contiguous walls. Lay the walls out to length in the order shown in the top drawing, lettering the individual parts for reorientation later. After resawing the stock, plane it to final thickness, and then cut the pieces to length. To lay out the miters, first swap the pieces as shown in the top two drawings, which effectively turns the blank inside-out. After cutting the miters and joining the letter-matched ends, one pair of diagonally opposed box corners will exhibit continuous grain, and the opposite corners will be book-matched. Nice!



**Step 1:** Label edges, resaw, then flop boards and mark miters.



**Step 2:** Miter ends. Join matching corners.



## Carve the dimples

Before crosscutting the four individual walls to length, do the dimpling. Outfit a rotary tool with a round ball cutter, and practice making random dimples on scrap. After getting a feel for the process, dimple the box walls, staying between the stringing. Afterward, smooth the surface through 220 grit using a random orbit sander.



**Tool for the job.** This round ball cutter mounted in a high-speed rotary tool such as a Dremel creates the dimpling that gives this box its distinctive texture.



**The dimple dip.** Steadying the rotary tool with both hands, dip the cutter quickly into the wood surface, lifting it straight up afterward. Have fun practicing on scrap, creating a random pattern with dimples of slightly different depths. Stay close to your inlay lines without straying into them. Maintain the same angle of attack throughout so light reflects evenly on the surface.



## Miter and assemble the walls

The next step is to saw the miters while cutting the walls to their final length. I use a simple sled for the job, as shown. For enduring strength, miter joints need reinforcement, which I incorporated by installing full-length splines. Saw the spline slots first, then mill the splines to fit them. I made my splines from maple to provide a nice visual accent at the top ends of the joints.

Fit the splines carefully. They should slip easily in their slots, but without slop, and should bottom out without preventing full joint closure. I tend to cut my splines a bit oversized in width, and then trim them to fit with a finely-set block plane. Dry-fitting before glue-up is crucial. After gluing and clamping the box, make sure to check it for square while sitting on a dead-flat surface.

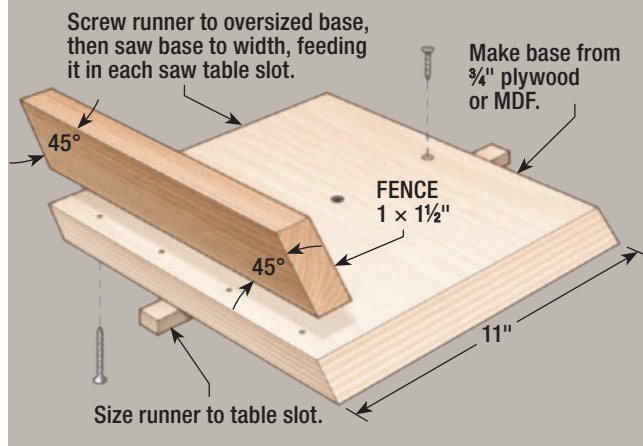


### Saw the wall miters.

When mitering the box walls, first saw the outermost ends of each strip of wall material. Then use a stand-off block registered against the rip fence to cut each long wall to its final length, as shown. Clamp a stop block to the miter sled fence for the short walls. This helps ensure that your box will be truly square.

### Miter sled

This sled can be used in either saw table slot. It allows a miter offcut to fall safely away from the blade, while the zero-clearance fence minimizes exit tearout. Initially make the base oversized in width so that each side of the jig is trimmed when making your first miter cut with the jig in each table slot. Make sure that the fence is dead-square to the runner.



**Cutting spline slots.** To saw flat-bottom spline slots, use a  $\frac{1}{8}$ "-kerf ATBR combination blade tilted to  $45^\circ$ . Clamp a stop block to your miter gauge to register the  $\frac{1}{8}$ "-deep slots, locating them about  $\frac{1}{4}$ " in from the tip of the miter.



## Making short-grain splines



**Stand-up job.** For strength, the spline grain must run perpendicular to the joint line. The first step to making the splines is to saw them to a thickness that's an easy friction-fit in the slots.



**Lying down on the job.** Use a miter gauge to feed the spline-stock block on the flat to cut the individual splines free. A stand-off block placed against the rip fence registers the cut length while preventing kick-back from a freed piece pinching between the fence and blade.

### Glue-up performance.

After dry-fitting to rehearse your clamping dance and to ensure the joints draw up tight, glue up the box walls. Triangular clamping cauls previously glued to 1/4" scrap plywood strips allows applying very firm, controlled pressure directly perpendicular to the joints. Use a slow-set glue such as Titebond III to give yourself extra time to pull everything together.





## Make the lid panel

Mill two lengths of stock to  $\frac{3}{4} \times 1\frac{1}{4} \times 24$ " to make the frame members. Saw a centered  $\frac{1}{4}$ "-wide  $\times \frac{3}{8}$ "-deep groove into what will be the inner edge of each piece. Lay out one short and one long mitered frame member on each of the two lengths, and saw the four frame members to final length as shown. Measure the groove-to-groove distances in your dry-assembled frame, and saw the lid panel for a snug fit. Lay out the 1"-wide bevels and inlay grooves where shown in the drawing on page 33. To cut the inlay grooves, outfit your router with a  $\frac{3}{32}$ "-diameter straight bit and an edge guide, and then rout the  $\frac{3}{32}$ "-deep grooves. Afterward, square the corners with a chisel. Next, saw the bevels. It would be dangerous to feed a panel on end by hand, so I use a sliding tall fence, which I also employ for sawing tenons and other operations. (See sidebar on facing page.) After sawing the bevel shoulders as shown, fit the string inlay, glue it in place, and trim it flush to the surface. Instead of a plane, I use a chisel, as it's a little easier to negotiate mitered intersections.



**Miter the frame pieces.** A stop block clamped to an auxiliary miter gauge fence ensures that the lengths of opposing frame pieces match exactly to create a square assembly. Extending the fence past the blade backs up the cut to minimize exit tearout.



**Saw the bevels.** This sliding tall fence, which straddles the table saw rip fence, holds the box lid panel securely when sawing the bevels on the edges. After tilting the blade, set the rip fence so the blade is cutting to the layout lines. To minimize exit tearout, cut both ends first, then the edges, all at the same blade and fence setting.



**Saw the shoulders.** With your blade at 90°, set its height to intersect the thick end of the bevels. First saw the end shoulders, registering the cuts against a stand-off block as shown. Then reset the fence to saw the long-grain shoulders, keeping the waste piece on the "away" side of the blade to prevent the offcut from kicking back.



**Fit the inlay.** Miter the ends of the stringing to meet in the corners. Use a frame offcut as a chisel guide. Start with the long pieces, cutting one end then tucking the piece into its groove to gauge its length. Cut it slightly oversize initially, then pare to an exact fit. Glue the long piece in then repeat the process for the short pieces.



## Detail and assemble the lid

You're almost ready to assemble the lid. But first drill the  $\frac{1}{4}$ "-diameter dowel through-holes 3" apart in the panel using a brad point bit at the drill press. Then dimple the area within the string inlay border. Afterward, sand the panel and the inner edges of the frame. Do a test fit, and then glue up the frame as shown. Do not glue the panel in its grooves. Lay out a corner spline slot, offsetting it  $\frac{1}{8}$ " down from the top face of the frame. Saw the spline slots in the corners using the sliding tall fence. Mill the splines, install them, and trim the excess. Finally, set up a dado head and sacrificial fence on the table saw, and rabbet the underside of the frame for a snug, but not too tight fit in the box opening.



**Glue up the lid.** Apply painter's tape near the dry-fit frame corners, then attach the triangular miter offcuts to the tape with CA glue. Glue up the frame, clamping across the offcuts. After the wood glue sets, they will pop right off.



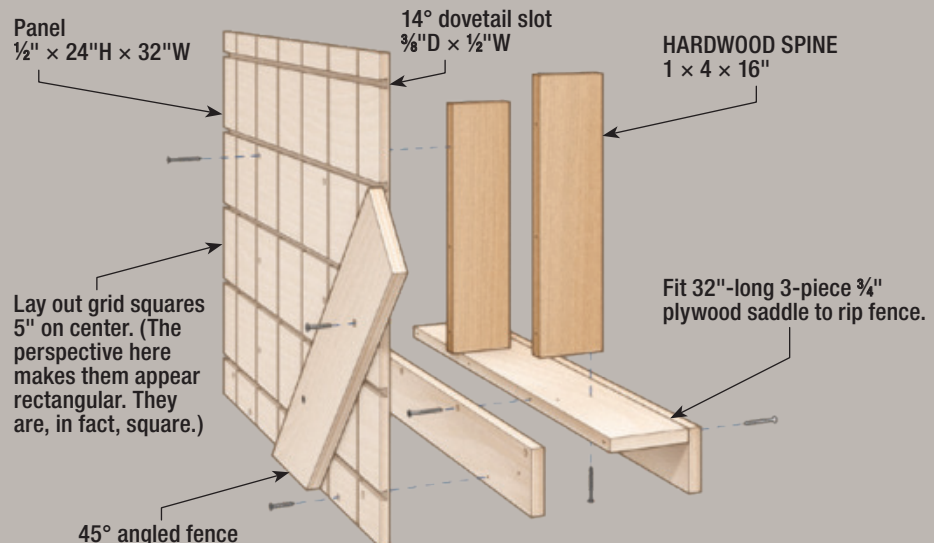
**Slot for the splines.** Screw a 45° fence to the sliding tall fence to support the lid. Position the lid on the angled fence, securing it with the dovetail clamps. Adjust the blade height and rip fence, then saw a  $\frac{3}{4}$ "-deep slot in each corner.



**Install splines.** Having cut your splines for an easy friction fit, glue them into their slots, making sure they seat fully. After the glue sets, saw and plane them flush.

### Sliding tall-fence

This table saw jig provides a great way to hold work on edge for feeding it across the blade. The dovetail slots in the panel accept Micro-jig dovetail clamps to secure the work, and custom fences can be attached to help support the work in any position. The panel is attached to a saddle that fits snugly over the rip fence, with spines to stiffen it and keep it vertical.





## Outfit the interior

To safely make the bottom support strips, cut a  $\frac{1}{4} \times \frac{1}{4}$ " rabbet into the edge of a  $\frac{1}{2}$ "-thick board, and then rip that edge to  $\frac{1}{2}$ " wide. Miter and fit the strips into the underside of the box, glue them in place, and secure them with tape. The strips create an inset base that lifts the box up while creating a nice shadow line underneath. Mill the ledger strips and tray sides to thickness and width, but leave them oversized in length for now. Groove the tray side material before mitering the tray ends and ledger pieces for a snug fit within the box walls. Then assemble the two components as shown. Lastly, glue leather to both sides of a slightly oversized bottom panel, then trim the bottom at the table saw to tightly fit the box interior, but don't install it yet.



**Assemble the internals.** After cutting the parts for the ledger frame and sliding tray to size, glue them up, stretching painter's tape around the corners to close the joints. Partially tuck the glued ledger frame into its opening to keep it square. Remember to include the tray bottom as you assemble the tray sides.

## Handle and finish

Make the handle, drill it to match the lid holes, and sand it for comfort. Cut the dowels, install them in the panel, and then attach the handle as shown. Afterward, saw the dowels at  $\frac{3}{16}$ " above the handle, then dimple the top of each. Apply the finish of your choice. I begin by applying boiled linseed oil, which I let dry for five days. Next, I rub paste wax into all the surfaces using 0000 steel wool, after which I buff off any excess with a rag. I let it dry a few minutes, then chuck a stiff-bristled burnisher brush into a hand drill and buff out the wax for a beautiful look and silky feel. When you're done with the finish work, assemble the box by pressing in the bottom and ledger frame. No need to glue them.



**Handling the lid.** With the lid panel resting on a back-up block, and a  $\frac{5}{16}$ "-thick spacer placed between the dowels, glue the handle to the dowels, tapping it down against the spacer.



**Dowel Dimple.** Using the same round ball cutter and rotary tool that you used for dimpling the box, carve a shallow concavity in the top of each dowel.



**Buff-out.** A burnisher brush buffing the surface at high speed converts the tacky wax into a hard, smooth surface, and brings out a lovely sheen, reaching even into the textured areas. ■





# TURNING TOOL COMBOS

*Product pairs to expand your arsenal*

By Derek Richmond

**S**o you bought a lathe and have discovered the joy of making pens. That's great, but what more is there to do with your new machine? The world of turning awaits: Peppermills, vases, lidded boxes, bowls, and more are just a few revolutions away. But how to get there? With the vast array of

chucks, measuring tools, and kits available, it's hard to know which are necessities and which are merely nice to have. To help with those decisions, we've paired up some tools here along with the projects they make possible. With a few key purchases, you'll soon be getting a lot more out of your lathe.





**Drilling on the lathe.** For a safe and secure fit, make sure the tapered shank on your drill chuck matches the tapered holes in your lathe's spindles. Most lathes use a #2 Morse taper. Run the lathe on low speed when drilling, retracting the bit often to clear chips and prevent overheating the bit.

**Nothing to sneeze at.** With a drill chuck and the appropriate bits and extensions, you'll be set up to make pepper mills, salt shakers, tall vases, and other bored-out items.



## Jacobs chuck and Forstner bits with extension

A drill chuck—also known as a Jacobs chuck—mounts in the lathe's tailstock and holds drill bits. This allows you to bore perfectly centered holes in the ends of workpieces without removing them from the lathe. You can also mount a drill chuck in the headstock to hold small turnings such as drawer pulls and finials. In addition, it will hold a threaded mandrel for turning pens and bottle stoppers. With a capacity up to ½", this WoodRiver drill chuck will easily hold standard twist bits as well as Forstner bits for boring large flat-bottomed holes.

For deeper holes in turnings such as pepper mills and vases, adding a Forstner bit extension does the trick. Make sure the hole in the extension is sized to fit the shank of your Forstner bits. The 4" extension shown works well on smaller lathes; longer versions are available for use on larger lathes and deeper turnings.



**Smooth sweep.** With a longer tool rest, long flowing cuts such as the one that forms the neck of this vase become much easier to control.



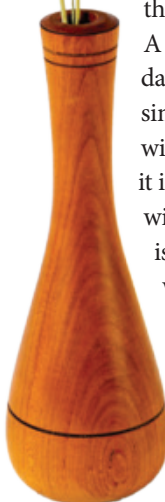
**Hotwiring.** To make a dark accent line, first use the tip of a parting tool or skew chisel to make a small groove. Pull the taut wire against the groove with the lathe running. Friction will produce a scorch mark. For safety, remove the tool rest before burning, and never wrap the wire around the workpiece.

## Long tool rest and wire burning kit

The tool rest that comes with most mini lathes is only about 4" long. Swapping that for a longer version makes work on longer projects much easier. Not only will you spend less time repositioning the tool rest, you'll be able to make uninterrupted cuts on long curves, as shown. Check the post size of your current tool rest to be sure your new one fits your lathe's banjo (most mini lathes use a ⅝" post). The 12" Teknatool rest I'm using here is part of the

Nova Modular System, which lets you mix and match the tool rest with the appropriate diameter of post.

A wire burning kit provides a quick, easy way to add dark accent lines to enhance plain-figured wood and/or simple shapes. While you can make your own burning wire, this kit from Easy Wood Tools is versatile because it includes three lengths each of three wire gauges along with two, easy-to-attach maple handles. Having handles is safer than holding a wire by hand, meaning the workpiece is the only thing getting a friction burn.



**This bud's for you.** This cherry bud vase benefits from the eye-catching details created by wire burning, while using a longer tool rest made its smooth lines easier to turn.



# Screw chuck and calipers

When it comes to holding work on your lathe, a screw chuck is ideal when the blank isn't big enough to fit the screw holes on a faceplate, or when those screw holes would penetrate an important feature of the finished piece. The screw chuck from Precision Machine shown here requires a  $\frac{5}{16}$ "-diameter hole drilled into the workpiece for a secure hold. Screw chucks thread onto the lathe's spindle, so be sure to purchase one whose internal threads match those on your lathe's spindle. Most mini lathes are threaded 1"-8tpi.

Adding a set or two of calipers to your collection makes measuring diameters easier. This 8" set from Groz expands wide enough to measure most turnings, and their slim profile means they can measure even a shallow rabbet like the one cut on the box top shown here. Or use them to measure diameters when making a duplicate of a finished piece such as a chair spindle.



**The perfect fit.** I drilled a  $\frac{1}{4}$ " hole in this laminated maple box blank before bandsawing the box to shape. I plugged the  $\frac{5}{16}$ " screw-mounting hole on the underside of the lid after I finished turning.



**A different way to mount.** Using a screw chuck is as simple as drilling a hole in the back of your workpiece. Be sure not to drill deeper than the screw length. Then just remember to keep the shape high in the middle to avoid cutting into the hole.

## A little off the top.

For a perfectly fitted box lid, set the calipers to the diameter of the drilled opening, then use a parting tool to cut a shallow rabbet on the underside of the lid, checking the diameter often. Stop when the calipers just barely slip over the rabbet.



# Turn the page

For inspiration, new ideas, and techniques, look online or turn to one of the many books available on the subject. What's nice about books is that you can take them into the shop with you and have them open beside the lathe. Technique books, such as the one here by Richard Raffan will help you expand your skills. Project books such as Ellis Hein's may help push you out of your comfort zone into more challenging endeavors. ■

**Read all about it.** The great thing about turning is that "round" is just the beginning. Peruse turning books for projects, techniques, or designs that move you, then incorporate your own style based on what you have read.





# TWO FOR TEE

## *A pair of perplexing puzzles*

By Ken Burton

I've always enjoyed wooden puzzles, both making and solving them. The two puzzles shown here are easy to make, but challenging to solve. The "Broken Tee" consists of four pieces to arrange into their namesake "T" shape. The "Framed Tee" is a double-sided puzzle: Its four Tees perfectly fit the frame on one side in a particular pattern, and the frame on the other side in a different pattern.

The "Broken Tee" is the easier of the two to make. A few saw cuts, a little sanding, and you're done. The "Framed Tee" puzzle requires a bit more care. For the puzzle to work, the Tees must all be identical and precisely sized. The frames—one of which is just slightly smaller than the other—must also be perfectly sized. While there are many ways to cut the lap joints that connect the Tees for the frame puzzle, I chose to use my dovetail saw and chisels. The pieces are small enough that cutting them with power tools would be dicey without using suitable hold-downs. If you prefer the production speed of a table saw or router, consider scaling all the dimensions up for safer part-handling.

I suggest digging into your box of exotic offcuts and making a batch of these puzzles for the inquisitive folks on your gift list. In case you want the fun of solving these yourself, we're not showing you the solutions right here, they're on page 60.

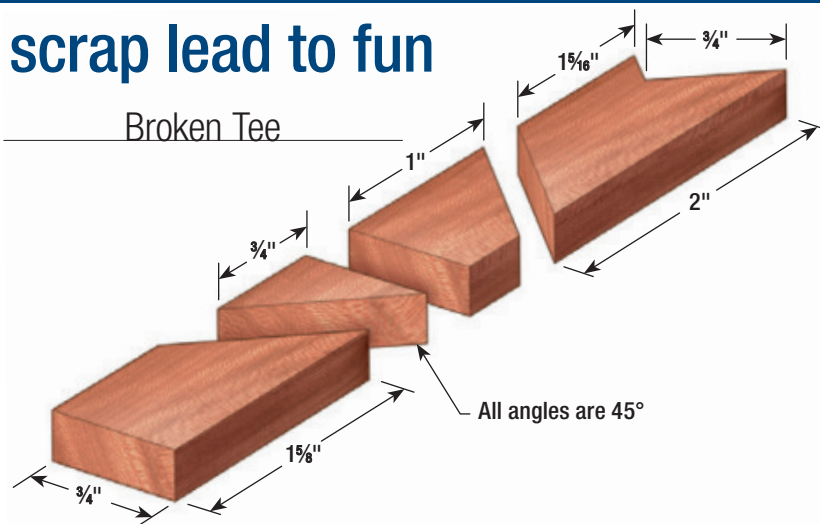


## A few cuts in a piece of scrap lead to fun

Bandsaw the pieces for the Broken Tee puzzle from a single length of  $\frac{1}{4} \times \frac{3}{4} \times 5"$  stock. Sand the edges to clean up the saw marks and break the edges before applying a finish. I used Danish oil. There is a full-size pattern available online should you need it.

### ⚠ CHOKING HAZARD ⚠

Both of these puzzles are unsafe for children under the age of three as they contain small pieces that could present a choking hazard.





# Four lap-jointed Tees fit a two-sided frame

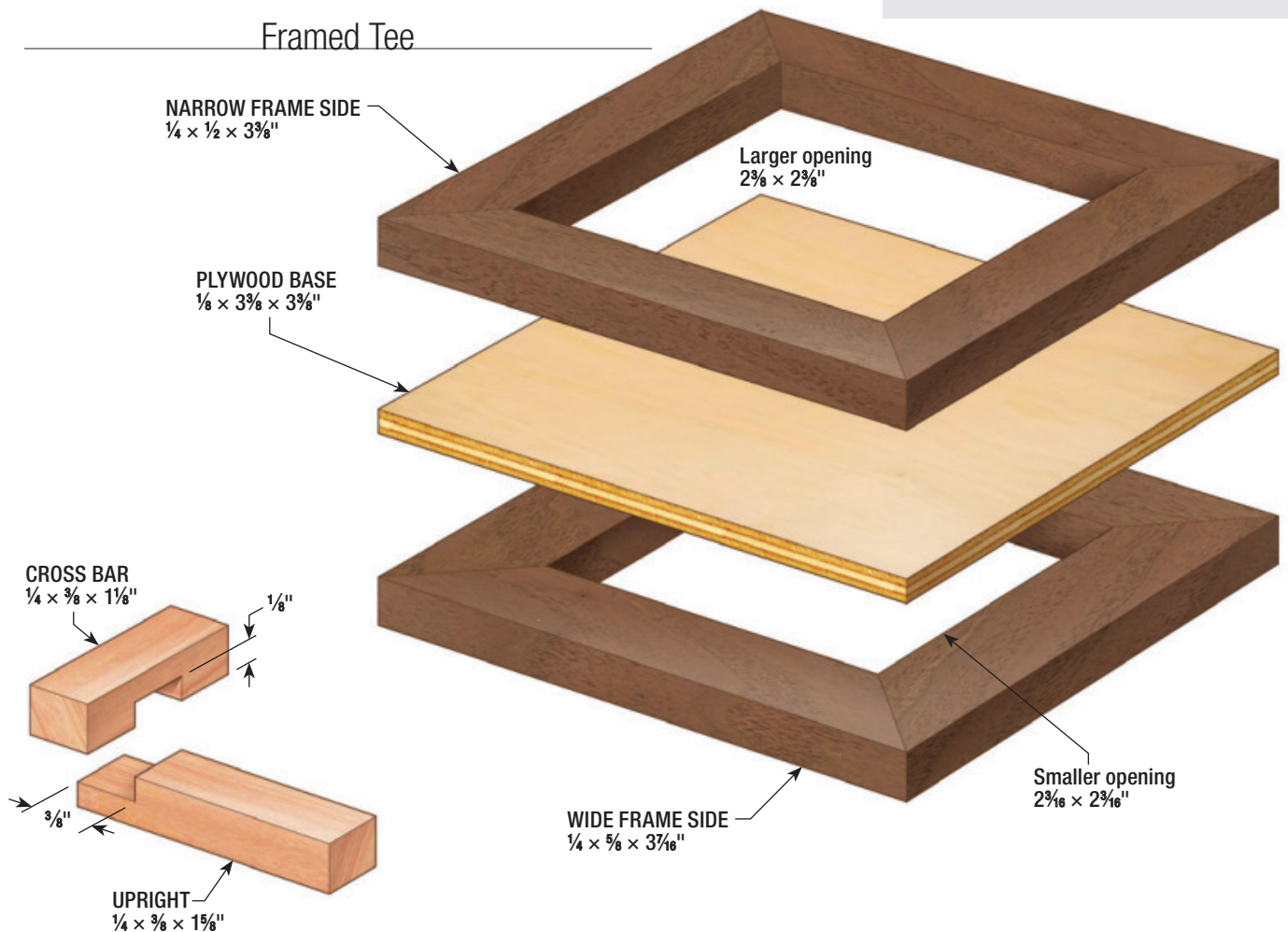
The “Framed Tee” puzzle consists of four Tees and a double-sided frame. Make the four Tees from a single length of stock. Pay close attention to all part sizes and frame dimensions, as they are critical to the success of the puzzle. Follow the construction notes below.



## onlineEXTRAS

- Full-size Broken Tee pattern
- Printable solutions

### Framed Tee



## Construction Notes

- **Cut the Tee parts.** Mill a piece to  $\frac{1}{4} \times \frac{3}{8} \times 15"$ . Crosscut the pieces on the tablesaw to the required lengths using a miter gauge. For uniformity, place a stand-off block against the rip fence forward of the blade.
- **Cut the lap joints.** Hold the pieces against a bench stop as you make the crosscuts for the lap joints with a dovetail saw. Hold the uprights in a vise as you make the rip cuts to complete the rabbets. Chisel away the waste from between the crosscuts on the cross bars.
- **Glue the Tees.** Sand the pieces before gluing up the joints. Clamp with binder clips or spring clamps.
- **Cut the frame stock.** Cut a piece of  $\frac{1}{8}"$  plywood to size to serve as the frame base. Cut two 16" lengths of hardwood for the frames: one  $\frac{1}{4}"$  thick  $\times \frac{1}{2}"$  wide and the other  $\frac{1}{4}"$  thick  $\times \frac{5}{8}"$  wide.
- **Miter the frames.** Saw each length into four equal pieces with 45° miters at both ends to form the frames. Cut the  $\frac{1}{2}"$ -wide frame pieces to form a square with an interior opening of  $2\frac{3}{8}"$  and the  $\frac{5}{8}"$ -wide pieces to form a square with an interior opening of  $2\frac{3}{16}"$ . Sand all the parts. Glue one frame at a time to the base. The frame made from the wider pieces will probably overhang the plywood slightly. After both sides of the frame are glued in place, sand the outside edges of the completed frame flush. Apply your favorite finish. I used Danish oil.
- **Let the fun begin.** Try your new puzzles on yourself and/or on an unsuspecting victim. If necessary, refer to the solutions on page 60. ■



# WOODCRAFT<sup>®</sup> magazine

## SCAVENGER HUNT

### GIVEAWAY

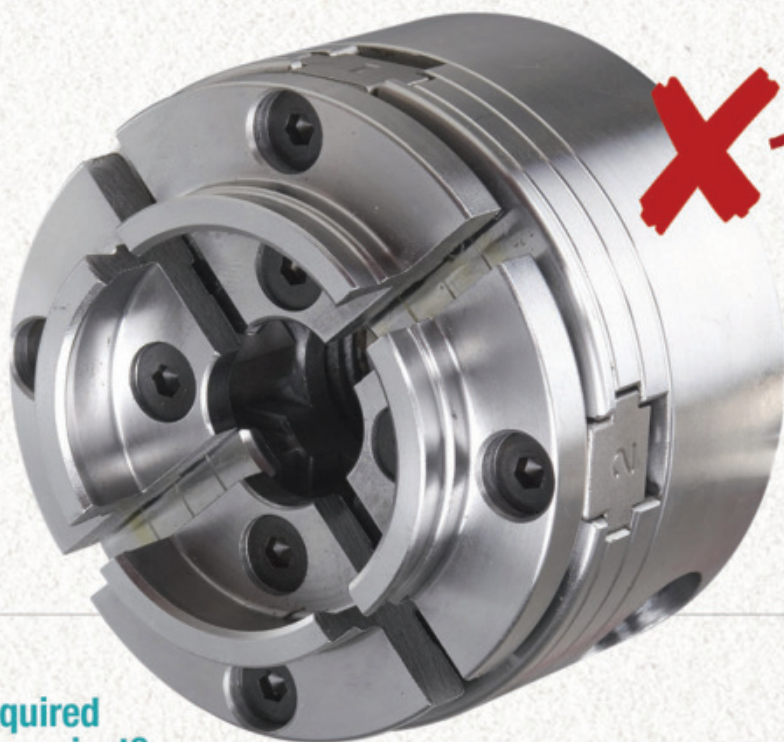
Join the Hunt for a chance to win the prize below!

## NOVA 48232 G3 REVERSIBLE WOOD TURNING CHUCK

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Read this issue closely to  
answer the following questions.



1. What kind of metal forging is required to complete the Shoot The Moon project?
2. What happened to Paul's first side table?
3. Did you peek at the Two for Tee puzzle solutions before starting the project? (No wrong answers)

Go to our Facebook page for instructions on how to win.

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# WOODCRAFT®

## RETAIL FRANCHISE OPPORTUNITIES

*After 30 years in the travel industry, it was time to move on.  
So, I turned my passion for woodworking into a second career.*

**Mike Sauder**

Multiple Woodcraft Store Owner  
Texas

In Texas, you either go big or you go home. And Mike is living proof. After 30 years in the travel industry, he took a swing at improving his golf game. But when that didn't go as planned, he turned all his attention to his other love – woodworking. An energetic entrepreneur, Mike quickly realized he could turn his hobby into a second career. So when he saw franchise opportunities with Woodcraft, one of the most trusted names in woodworking, he knew he was about to carve out a whole new future for himself.

No wonder. From demographic research for a store location to a detailed operations manual coupled with ongoing technical and marketing support, Woodcraft provides a complete franchise system backed by the most recognized brand in the industry. If you talked to him, Mike would tell you that thanks to Woodcraft and a lot of seven-day weeks owning and operating six Woodcraft stores, he is truly living his dream. Which makes you stop and think, when are you going to start living yours?

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# DISPLAY SHELF

with Epoxy Inlay

*A high-tech version  
of an antique design*

By Ken Burton

This small wall shelf is a bit of an anachronism. The original design comes from colonial times when small shelves like this were used to hold candles. Today, it functions as a display for turnings or other three-dimensional keepsakes. While I built this one with parts cut on my CNC router, you can easily follow the dimensions given to cut things on the band saw. The epoxy inlay on the back piece is a bit trickier. Without access to a CNC machine, your best bet might be to create an inlay based on the methods presented in Michael Kehs's inlay story from our April/May 2020 issue.



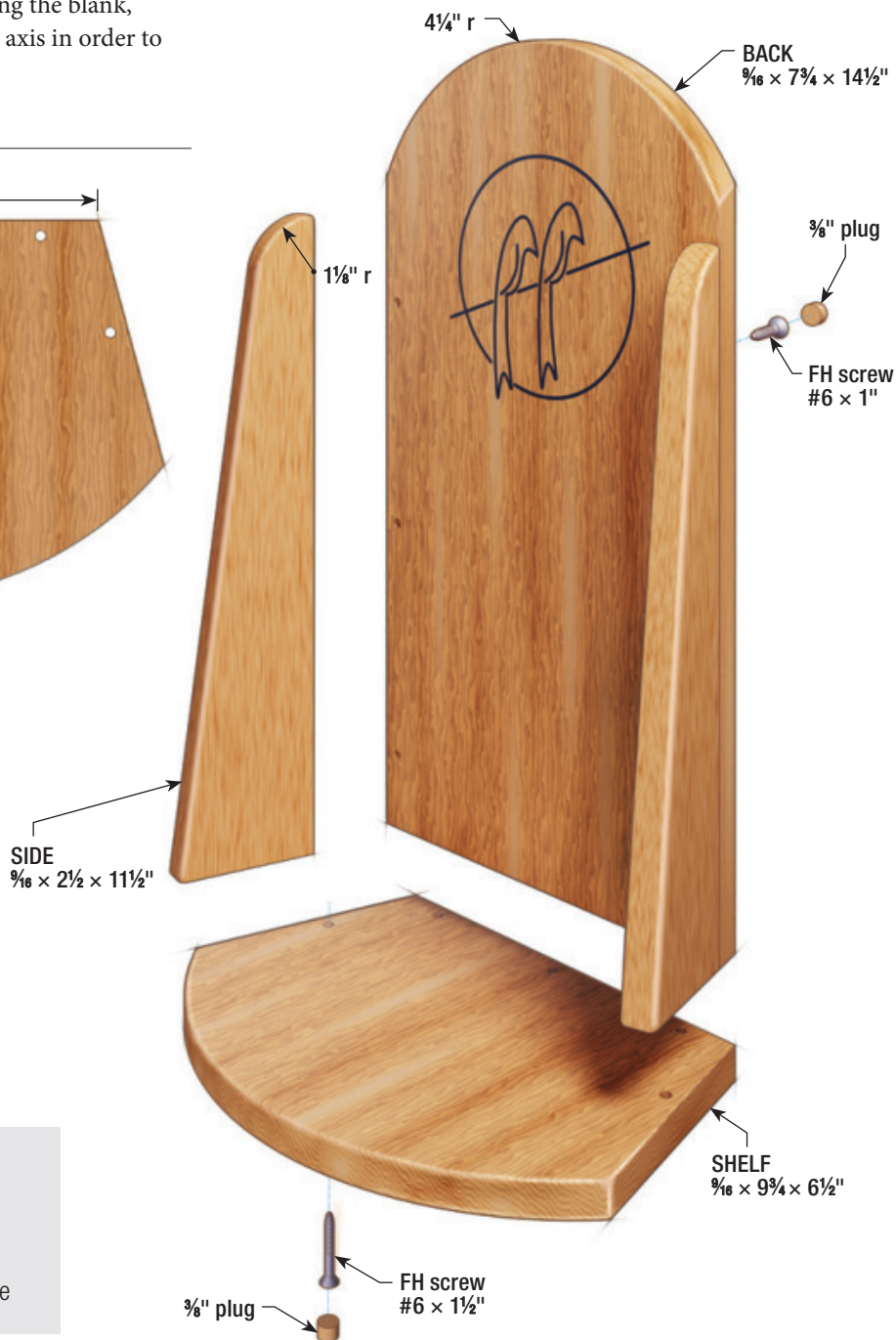
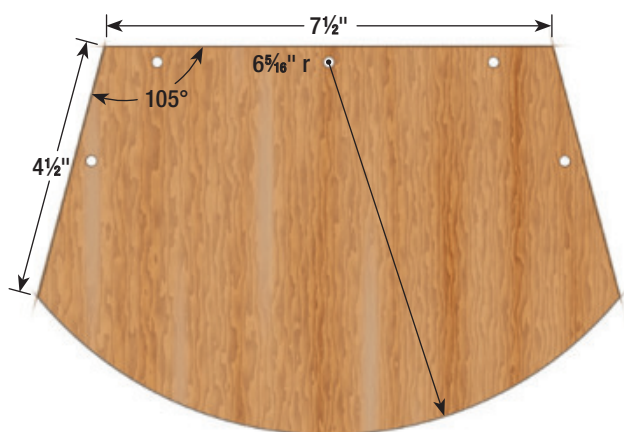


# Prep the parts and run the files

For my display shelf, I used quartersawn white oak with Alumilite epoxy resin for the inlay. The cutting files (see onlineEXTRAS below) are set up to cut the shelf and the back from the same  $10 \times 25$ " blank and the two sides from a second  $6 \times 15$ " piece. These sizes allow a safe,  $1 \times 1$ " area at each corner for hold-downs. Mill the stock to  $\frac{1}{16}$ " thick. Mount the larger piece on your router bed and zero a  $\frac{3}{8}$ " straight (or spiral upcut) bit in the center. Run the *Outsides Cutouts* tool path. Without moving the blank, switch to a  $\frac{1}{16}$ " straight bit and reset the Z axis in order to

zero the bit on the surface of the blank. Run the *Bird Inlay* toolpath. Switch to a  $\frac{3}{32}$ " straight bit, re-zero the Z axis and run the *Outside Circle Inlay* toolpath. I find running each of the inlay toolpaths twice makes for a cleaner cut. The second passes help clean out any residual fuzzies. Mount the smaller blank to your router bed, switch back to the  $\frac{3}{8}$ " bit, rezero in the center, and run the *Side Cutout* toolpath. Then bandsaw the parts free from the waste.

Shelf Detail



## Order of Work

- Download CNC files
- Cut out parts
- Cut inlay recesses
- Shape edges
- Pour and scrape epoxy
- Sand, assemble, and finish



## onlineEXTRAS

- CNC cutting files with optional inlay tool paths
- Bevel-edge Inlay technique article



## Pour and scrape the epoxy



**Squeeze and pour.** For my birds, I wanted to approximate the iridescent greenish-blue of tree swallow feathers. So I added both blue and green metallic powder to the mix along with a drop of black. I scooped the powders with the end of a dry stir stick, adding a pinch of each color about half the size of my little finger nail. Stir the colors in before squeezing the cup to form a pouring spout.



### Scrape away the excess.

No matter how carefully I pour, the epoxy always seems to puddle. Fortunately, the excess is readily removed with a card scraper after allowing the epoxy to harden overnight. Once it is level with the wood, sand through 400 grit.

Sand the front surface of the back through 120 grit and apply two coats of spray shellac to seal it. The shellac helps keep excess epoxy from soaking into the surrounding pores and is scraped away later. The epoxy for the inlay comes as a two-part liquid (resin and hardener) into which you can add colorants. First, measure out the two parts according to the directions on the packaging. The bird inlay won't require a lot. I use Dixie cups for mixing. Pour enough of each liquid into its own cup to reach the top of the bottom seam—about  $\frac{1}{8}$ " deep. Then pour the hardener (it flows better) into the resin and mix thoroughly before adding in the color. A little bit of the color goes a long way, so add it a little at a time. Once the epoxy is ready, pour it into the grooves as shown. After the epoxy cures, scrape and sand it flush.

## Assemble and finish



**Drill straight counterbores.** While the screws will go in at an angle, the counterbores for the plugs are drilled perpendicular to the surface. Position a fence to help keep the holes in line.



**Drill slanted holes.** With the sides clamped in place, drill three pilot holes through the back into each. Rest the assembly on a spacer block to keep the back level. Adjust a tee-bevel to help with drilling at the appropriate angle.

Bevel both edges of the back and the rear edge of each side to 105° at the jointer. Be sure to make a left and a right side. Shape the top edges of the back and the front edges of the sides and shelf with a  $\frac{3}{16}$ " roundover bit in your router table. Also rout two keyhole slots in the back for hanging. (See page 22 for one approach.) Counterbore the underside of the shelf and the rear surface of the back (as shown) for  $\frac{3}{8}$ " plugs. Clamp the shelf to the back and drill  $\frac{3}{32}$ " pilot holes in the three rearmost counterbores. Enlarge those holes in the shelf with an  $\frac{11}{64}$ " bit to make them clearance holes. Screw the shelf in place. Clamp the sides, then drill and screw them to the shelf. With the clamps still in place, drill angled pilot holes into the sides as shown. Again, enlarge the holes in the back before screwing the back to the sides. Glue plugs in the holes and sand all the outside surfaces flush. Finish as desired. I used wiping varnish. ■







# BLACK WALNUT

*One of North America's finest offerings*

By Ken Burton

**B**lack walnut (*Juglans nigra*) is one of North America's most popular and sought after hardwoods. It is prized for not only its rich, dark brown color, but also its strength, stability, durability, and ease of use. Today it can be readily found not only in the form of rough-sawn and surfaced boards, but also as live edge slabs. Perhaps its only drawback at this point is its cost—about twice that of other premiere domestic species such as cherry, oak, and maple.

## Where the wood comes from

Black walnut trees grow throughout the eastern half of the U.S., although much of the wood commercially harvested comes from the Midwest states of Indiana, Illinois, and Missouri. It is a fast-growing, pioneer species quick to sprout along roadsides and hedgerows. Despite the popularity of the lumber, the trees are not particularly desirable for landscaping. They tend to be late to leaf out in the spring, and one of the first species to drop their leaves in autumn. Additionally, their roots and the decaying nut husks produce toxins that can stunt the growth of surrounding plant life.

Left alone, a black walnut tree can live for 100-125 years and reach a diameter of 2 to 3 feet. While not cited on either the CITES list or the IUCN Red List as being endangered, the wood's popularity and value have contributed to a decline in the number of trees yielding wide boards.

**Figure abounds.** Black walnut often displays fabulous figure, as in this platter by master turner Palmer Sharpless. The feathery grain grows near a crotch in the tree.

## History in woodworking

Nearly as soon as the first colonists started clearing the eastern forests, black walnut was recognized as a valuable commodity. Ships' manifests dating from the early 1600's list black walnut lumber being exported to England for use in the furniture industry. Another noted use was (and continues to be) for gun stocks. Black walnut's shock resistance, combined with its stability and relatively light weight make it an ideal material for the wooden parts of a rifle.

More recently, the late woodworking icon George Nakashima is known for his use of live-edge black walnut in many of his signature pieces. Of particular note are the "peace altars" he made from a certain spectacular walnut log. To date, three of these magnificent tables have been placed around the world with a fourth planned for installation in South Africa.

## Selecting the best stock

Black walnut is available as lumber, veneer, and plywood. As solid stock, it comes in thicknesses from 4/4 to 16/4. While boards as wide as 20" and lengths up to 16' are available, stock 6-8" wide and 8-12' long is far more common. Black walnut prices vary widely, but don't be surprised to find premium stock going for in excess of \$10 per board foot. When



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**Lightness into dark.** In its natural state, black walnut has creamy white sapwood with rich, reddish-to chocolate-brown heartwood. The middle board here was steamed, which takes some of the color from the heartwood and infuses it into the sapwood.

selecting stock for a specific project, try to find boards cut from the same tree. Black walnut's color can vary a lot from a reddish brown to a rich chocolate brown, so grain matching is easier if you have kindred boards. When shopping for walnut, ask if the wood was steamed as it was dried. Steaming is a commercial process that darkens the creamy white sapwood a bit by transferring some of the pigment from the heartwood. Unfortunately, the process tends to mute the color of the heartwood somewhat. Also, in my experience, steamed walnut is brittle in comparison to its non-steamed counterpart.

## Working and finishing

Walnut is a joy to work with. If you're new to hand-planing, find a nice, clear piece of walnut and use it to build your skills. It is hard enough to cut cleanly,

but soft enough to make the job seem easy. Likewise, when machining, it behaves admirably. It also bends and glues well. About its only drawback is that walnut dust is somewhat acrid, and a potential sensitizer. So wearing a tight-fitting mask or respirator is a good precaution. As for finishing, the wood readily accepts both water- and oil-based finishes. In my opinion, the latter look better. See, for example, the dimpled box featured on page 32. If you must use a water-based finish, try to find one with an amber tint added. Also worth noting is that although black walnut flooring is available, it isn't really hard enough to stand up to heavy use. If you decide you must have a black walnut floor, save it for areas that don't see a lot of foot traffic.

## My perennial favorite

Years ago, when I was first learning the craft, I made nearly everything out of black walnut. I've since branched out, but it is still among my favorite woods to work. It is fun to turn, it carves well, and finishes easily. What more can you ask for? It is even my go-to wood for simple picture frames. As I was gathering the pieces to photograph for this column, it was enlightening to see how they had aged over the years. The platter shown on the opposite page was a gift from Palmer Sharpless, one of my mentors. It is finished with Waterlox, an oil-based wiping varnish. While it has lightened a little in 34 years, it still highlights the beauty of the grain. I finished the hollow vessel below with shellac. As I recall, it was on the light side to begin with, and has lightened even more over time. I made the trivet just recently and finished it with Danish oil, giving it that rich, dark color I've come to love. For another look at oiled walnut, check out the Shoot-the-Moon game on page 24. I finished it with boiled linseed oil. ■



### A difference of age and finish.

The two pieces here clearly show the difference age and finish can make with black walnut. I made the lighter turned vessel over three decades ago, and finished it with shellac. The darker trivet is a more recent piece finished with Danish oil.



## Black Walnut Uses

- Furniture
- Cabinetry
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- Musical instruments
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## Climate control for the shop

Not all of my assets for successful woodworking live in my tool cabinet. I hold this insulated tumbler on par with both my block plane and pocket square when it comes to shop efficiency. During the frigid winter months, it keeps my tea piping hot all morning. This is especially important on the days I choose not to run the heat. I can also fill it with ice cubes and water to help keep hydrated throughout those hazy, hot summer afternoons. The tight-fitting plastic lid keeps spills to a minimum, and the magnetic slide seals out dust, limiting my fiber intake to what I actually decide to ingest. You can get this shop essential at Yeti's website for about 35 bucks. ■

—Ken Burton

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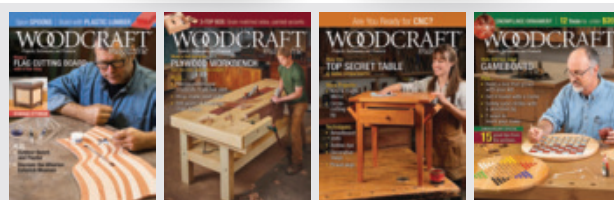
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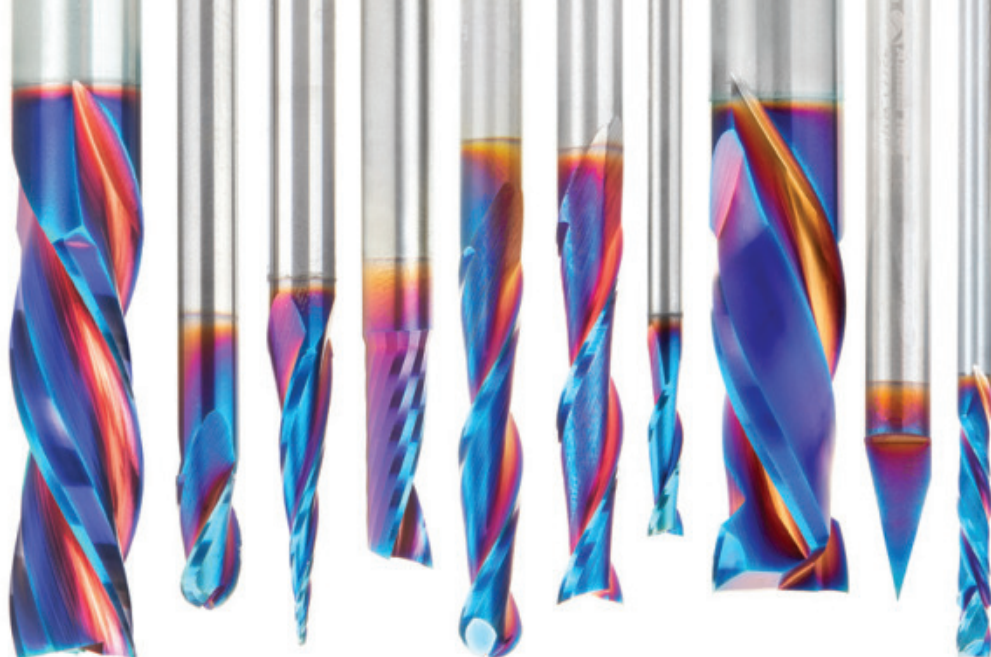


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### Paul Anthony

Author of *Taunton's Complete Illustrated Guide to Tablesaws*



## When to sharpen table saw blades

**Q:** *I enjoyed the article in issue #95 on choosing table saw blades. What advice might the author have regarding when to sharpen a blade?*

**Quinn Robertson**  
Albany, New York

**A:** *A number of symptoms can indicate when a blade is starting to dull, including burning, excessive tearout, and increased feed resistance. If you suspect that a blade is dulling, try cleaning it first, as gummed up teeth can cause poor cutting. Spritz the teeth with concentrated citrus cleaner or undiluted Simple Green cleaner, let it sit five minutes, and then scrub the teeth with a brass-bristle brush. Rinse the blade, dry it, and spray it with metal protectant.*

*Next, inspect the teeth under strong light using magnification, which should reveal any significant rounding of the tips. Just as with a chisel edge, sharp teeth will not reflect light at the tips and edges. After cleaning, you may find that a blade cuts noticeably better and with less burning, in which case, you can probably*

*hold off on sharpening for a while. Unless you're doing production work with it, a blade may only need sharpening once every few years.*

*I've found that the best way to gauge saw blade wear is to compare a current saw cut against a cut made when the blade was new or freshly sharpened. I keep a stash of these annotated sample rips and crosscuts, along with a length of the source board for making comparison cuts.*

*Finally, remember to preserve your blades' sharp edges. Protect the brittle teeth from hard knocks. Don't lay blades on your metal saw table, and never stack them directly on top of each other; at least sandwich cardboard between them. I keep my blades in a dedicated cabinet with individual shelves to keep them safe and organized.*

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**Cut quality.** When comparing the quality of a current cut to a cut made when a blade was new or resharpened, inspect the surfaces under a strong, glancing light. Here, the solid wood pieces underneath display the end grain cut, while the plywood strips on top show the amount of exit tearout. ■

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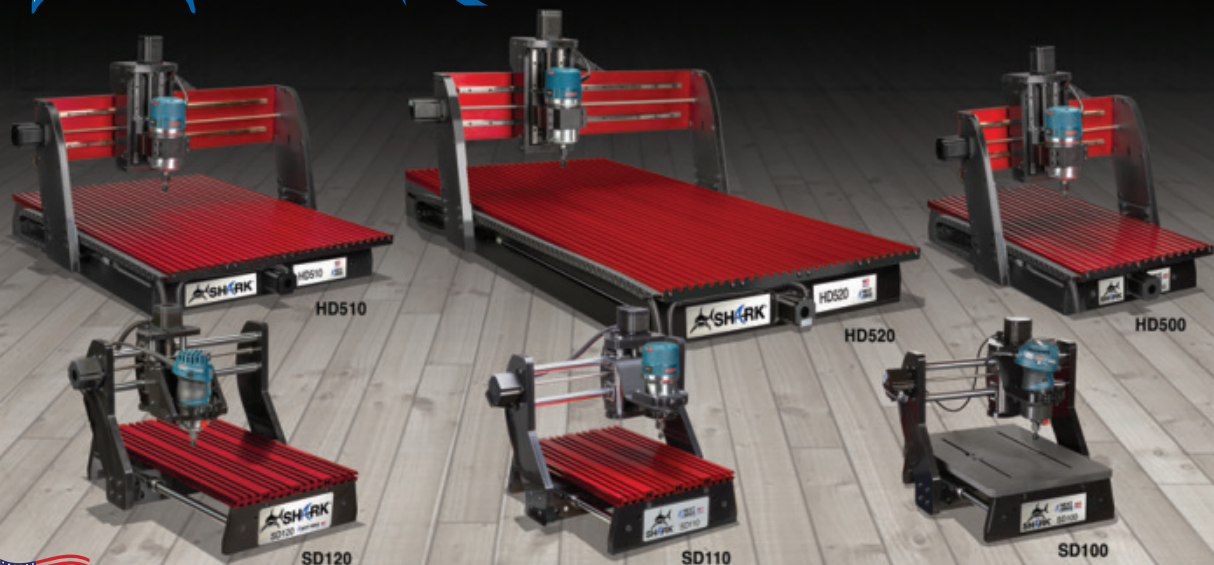
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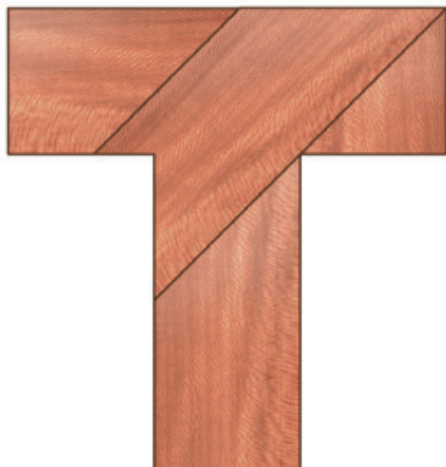




# TWO FOR TEE puzzle solutions

See the project on page 44

## Broken Tee Solution



## Framed Tee Large Frame Opening Solution



## Framed Tee Small Frame Opening Solution



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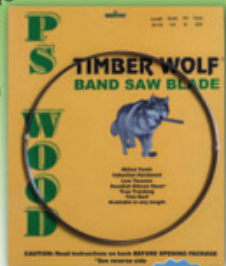
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## Kissmas Tree (p. 28)

1. Tried & True Wood Finish, Polymerized Linseed Oil & Beeswax ..... #126854, **\$21.99**
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## Walnut Dimpled Box (p. 32)

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## Display Shelf (p. 48)

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# Ad Index

| ADVERTISER                      | WEB ADDRESS                      | PAGE  |
|---------------------------------|----------------------------------|-------|
| Amana                           | <i>amanatool.com</i>             | 5, 57 |
| The American Woodshop           | <i>wbgu.org/americanwoodshop</i> | 21    |
| Armor Tool                      | <i>armor-tool.com</i>            | 7     |
| Berea                           | <i>woodcraft.com</i>             | 58    |
| Bosch                           | <i>boschtools.com</i>            | 15    |
| Bow Products                    | <i>bow-products.com</i>          | 11    |
| Carter                          | <i>carterproducts.com</i>        | 23    |
| Connecticut Valley School of WW | <i>schoolofwoodworking.com</i>   | 61    |
| Easy Wood Tools                 | <i>easywoodtools.com</i>         | 9     |
| Forrest Mfg                     | <i>forrestblades.com</i>         | 56    |
| Freud                           | <i>woodcraft.com/Freud</i>       | IFC   |
| Harbor Freight                  | <i>harborfreight.com</i>         | 51    |
| Howard                          | <i>howardproducts.com</i>        | 19    |
| JessEm                          | <i>jessem.com</i>                | 13    |
| JPW                             | <i>jpwindustries.com</i>         | 8     |
| King Arthur's Tools             | <i>katools.com</i>               | 21    |

| ADVERTISER          | WEB ADDRESS                     | PAGE           |
|---------------------|---------------------------------|----------------|
| Kutzall             | <i>kutzall.com</i>              | 17             |
| Laguna              | <i>lagunalathe.com</i>          | 1              |
| Lignomat            | <i>lignomat.com</i>             | 54             |
| Next Wave           | <i>nextwaveautomation.com</i>   | 59             |
| Oneida              | <i>oneida-air.com</i>           | 10, 21, 54     |
| PS Wood             | <i>pswood.com</i>               | 61             |
| Rikon               | <i>rikontools.com</i>           | 0BC            |
| Robert Sorby        | <i>robert-sorby.co.uk</i>       | 12             |
| Rogue               | <i>rogue-industries.com</i>     | 61             |
| Rustoleum           | <i>rustoleum.com</i>            | 18             |
| Satellite City      | <i>caglu.com</i>                | 61             |
| Thomas Flinn & Co.  | <i>flinn-garlick-saws.co.uk</i> | 54             |
| Whiteside Machine   | <i>whitesiderouterbits.com</i>  | IBC            |
| Woodcraft Franchise | <i>woodcraftfranchise.com</i>   | 47             |
| Woodcraft Magazine  | <i>woodcraftmagazine.com</i>    | 19, 46, 56, 61 |
| Woodcraft Supply    | <i>woodcraft.com</i>            | 55, 63         |





## THE AMERICAN WOODSHOP

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## www.thewoodshop.tv

Woodcraft is pleased to partner with woodturner Carl Jacobson of TheWoodshop.TV. Carl started woodworking as a young boy with his grandfather and then developed a love for turning as an adult after seeing a turned project in a friend's shop.

When he couldn't find a how-to video for duck calls in the early days of YouTube, he decided to use his passion to share and instruct the craft in his own video, which led him eventually to start his own YouTube channel and instructional website.

His mobile shop allows him to travel around the country to teach, demonstrate and promote woodturning, while inspiring others to give it a try.





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*Today's Homeowner* has been delivering fresh, original and practical home improvement advice to television viewers for over 20 years now. Woodcraft is pleased to partner with co-hosts Danny Lipford and Chelsea Lipford Wolf to guide do-it-yourselfers on everything from simple repairs to complete remodels, to helping viewers prepare their homes for extreme weather and seasons.

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# The School of WOODWORKING

*The lessons don't stop at layout, joinery, and finishing*

By Paul Anthony

Having worked wood for some 45-odd years, my fat head is stuffed with knowledge about wood structure, joinery, geometry, fractions, tools, finishing, and thousands of other woodworking-related things. Much of it is even correct. But what amazes me is how many life lessons the craft has also taught me along the way. They include patience, resourcefulness, perseverance, self-confidence, and a lot of other things that no school teacher or textbook could have instilled in my rebellious young mind.

Problem-solving skills rank high on the list, gained from things like having to design a multi-functional kitchen workstation that suits two cooks, that can be built in a crowded workshop with available tools, and on a specific budget. Oh, and it has to be done by Thanksgiving, in three weeks. Now *there's* an equation for you.

Of course woodworking is also fat with physics lessons, as anyone knows who has toppled over while testing the balance of a new chair mock-up. And working in the shop can certainly demand mental

alacrity. For example, when something falls off the bench, you have a split-second to decide whether or not to break its fall with your foot. Quick! Was that your expensive try-square or a freshly sharpened chisel? The wrong answer could be a lot more painful than a rap on the knuckles with a ruler.

I don't consider patience one of my defining personal characteristics, but I do know how to bring it into play when necessary, having practiced it during interminable sanding sessions. (The trick involves disciplined daydreaming.) And the perseverance developed while working my way through complicated projects has served well when faced with other daunting life challenges. And every victory—every early project that looked pretty good and didn't fall apart—contributed to my budding self-confidence.

I find that I have even developed language translation skills from interpreting various tool manuals. I'm not proficient at it yet, but I can almost make out the meaning of "*In time of dismantling frequently, operate this procedure*

*according to the opposite order of proper misadjustment.*"

This craft can teach moral lessons too. One of the first pieces I ever built was a small side table for my parents. It was a humble piece, but that didn't stop me from bragging about it. My mom loaded it with heavy potted plants before we sat down to dinner in the kitchen. In the middle of dessert, a

loud crash came from the living room. Talk about "Pride goeth before a fall."

Anyway, I'm glad I enrolled in the School of Woodworking, and that I managed to pass most of the courses. Wouldn't my 6th-grade teacher, Mrs. Schulte, be proud? I can almost hear her muttering, "Well I knew he had *potential* anyway..." ■

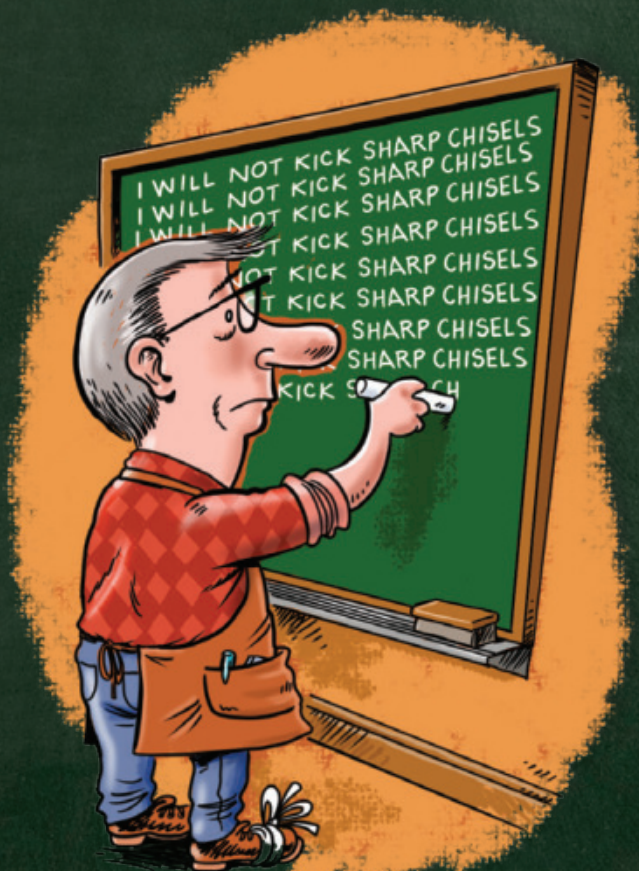


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