

OUR TOP TOOL SELECTIONS FROM 2017'S BIGGEST TRADE SHOW

WOODWORKER'S JOURNAL

"America's leading woodworking authority"™

Gift Projects Galore!

Bookcase
Folding Table
CNC Projects
Cutting Boards
Turned Canisters
INSIDE!

December 2017

\$7.99



7 33175 59242 0

Display until January 1, 2018

Music
Stand

Page 50

SUPERIOR FINISH FROM BEGINNING TO END



JET DRUM
SANDERS PICK UP
97% OF
ALL DUST
CREATED

25% MORE THAN
THE COMPETITION

THE JET 1632 AND 1836 DRUM SANDERS ARE THE MOST EFFICIENT DRUM SANDERS ON THE MARKET

Utilizing their exclusive patent pending molded dust hood baffle, the JET 1632 and 1836 Drum Sanders extract 97% of all dust for a superior finish and cleaner shop environment. When paired with the JET Cyclone Dust Collector, the JET Drum Sanders extract 25% more dust than the competition.

LEARN MORE AT [JETTOOLS.COM/DRUMSANDERS](https://jettools.com/drumsanders)

STAND BEHIND YOUR WORK™



550+ SERVICE CENTERS NATIONWIDE

INDUSTRY-LEADING WARRANTIES

EXPERT TECHNICAL SERVICE

GREAT PRICING ON CUSTOM-WELDED SAW BLADES

Q201® Premium Band Saw Blades – 72"x1½" (6'0"x1½")

72" length for Shopsmith or
similar models, hard edge,
Hard Back Carbon
only \$12.57ea

Q201® Band Saw Blades – 93½"x1½" (7'9½"x1½")

Hard Back Carbon, fits most
14" Delta Jet, etc.
only \$15.11ea

Q201® Band Saw Blades – 105"x1½" (8'9"x1½")

Hard Back Carbon, fits most
14" band saws with risers
only \$16.38ea

Q201® Band Saw Blades – 80"x1½" (6'8"x1½")

Hard edge, flex back, Hard Back
Carbon, for Sears Craftsman
12-inch models
only \$13.84ea

Q201® Custom Band Saw Blades

Manufactured with
precision ground tooth
Computer controlled hardening
Custom welded to any length
Shipped in 24 hours

Ideal for the woodworking
industry, our custom-welded
blades feature spring-tempered
backs and precisely hardened
teeth allowing for very
accurate cuts.



GO DIRECT

CUT OUT THE MIDDLEMAN

Fantastic everyday deals on our complete
line of saws and blades like these:



Evolution 380 Carbide Saw (includes blade)
\$389.00
(Free shipping)



Trajan 125 Band Saw
450.00
(Free shipping)



Q-Saw Wood Blade 7-1/4" x 5/8" x 24T
\$9.30 ea.



Q-Saw Wood Blade 10" x 5/8" x 40T
\$20.35 ea.

SAWBLADE•COM®
RUN LEAN

800.754.6920

Woodworker's Journal

Contents

December 2017

Volume 41, Number 6

Projects



Page 46

GIFT! Red Oak Bookcase

By Chris Marshall

Built in the Arts & Crafts style, this is a "quick build" project that will provide generations of useful service.



Page 70

GIFT! Circular Jewelry Frame

By Chris Marshall

Unique, beautiful and practical, this jewelry frame makes a great gift. It also makes a big use of a small amount of wood.



Page 50

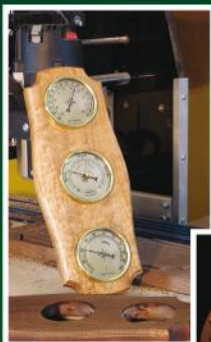
GIFT! Wooden Music Stand

By Sandor Nagyszalanczy

Graceful curves create an elegant music stand. In addition, it safely holds a guitar ready for use.

Hi-Tech Gifts

If your program includes using a CNC router to make some gifts this fall, we've got some free programming for you. (There are analog versions available, too!)



Page 44



GIFTS!



Page 38

GIFT! "Retro" Folding Table

By Kimberly McNeelan

With a nod to card tables of the 1940s and 50s, this folding table is ready to party! It's made of cherry lumber and cherry veneer plywood.



NEW



versatility. unmatched.™

DTSC, ETSC, RTSC - Consistent sanding performance either cordless or corded.



Battery pack



AC Adapter

NEW Cordless Sanders



DTSC 400

ETSC 125

RTSC 400

festoolusa.com

FESTOOL®
Tools for the toughest demands

Departments



8 Letters

Readers remember this past summer's outdoor projects, from the porch swing to birdhouse to picnic basket.

14 Cyber Makers Spotlight

Check out what makes our "On-line Woodworking Cousins" tick and what they are working on.

16 Tricks of the Trade

Reuse common supplies to create rotary tool polishing wheels and drawer face spacers.

18 Questions & Answers/Stumpers

Is a dado blade the best choice for cutting half laps? Plus slimy waterstones and dust collection ductwork.



22 Shop Talk

Pre-teen "boatbuilders" and some inspiring work from the San Diego Woodworking Show.

28 Woodturning GIFT!

Spindle-turned canisters: a great gift idea and fun to make, just in time for the holidays.

32 Techniques GIFT!

Are they cutting boards or are they art? Maybe they are a little bit of both.

60 Tool Preview

The staff at *Woodworker's Journal* selects the best tools from the AWFS trade show. Our choices just might surprise you.



76 What's In Store

New tools to keep you active in your shop.

82 Finishing Thoughts

Spraying a finish without a spray gun has never been easier or more versatile, thanks to the latest "rattle can" products.

86 Hey ... Did You Know?

Fire-resistant redwoods and broadleaf Christmas trees ...



woodworkersjournal.com



If you're not a subscriber to our weekly newsletter, then you've already missed out on thousands of free tips, plans, tool updates and more. On top of that, you missed out on the 500th (500th!) issue. We commemorated this milestone by giving the newsletter a makeover. It's now called *Woodworker's Journal Weekly* and it features a fresh new design and the same great content that over 260,000 current subscribers know and trust.

My point is, if you're not already receiving *Woodworker's Journal Weekly*, then you're missing out. Don't miss another issue. Head over to our website and click on the *Woodworker's Journal Weekly* signup boxes. It's free!

P.S. It's not too late to make a few holiday gifts. If you're still looking for project ideas, we put together a bunch of project plans that make great gifts. You'll find a link to this collection featured on the homepage of *woodworkersjournal.com*. Or you can go directly to the page at www.woodworkersjournal.com/2017GiftPlans.

— Dan Cary



RIKON

4-Piece Woodturning Tool System with Carbide Insert Cutters

Enjoy the superior cutting action of carbide!

Designed for spindle and faceplate work where scraping and shear cutting action needs the precision that these new tools deliver.

- ✓ Tungsten Carbide Insert Cutters keep sharp longer than carbon or HSS tools.
- ✓ Simply rotate a dull cutter for new edge! Takes just seconds.
- ✓ Circle, Square and Diamond Cutters provide variety of shapes for turning needs.
- ✓ Tool-less Chuck in the handle makes changing between shafts/cutters fast and easy.
- ✓ Machined Shafts with cutters include flat bottom with 2 side flats for consistent tool positioning in scraping or shear cutting mode.
- ✓ 16" Metal Handle with soft grip for best anti-vibration and user control. Hollow interior for adding counterweights, threaded end for adding extensions.



Includes: Handle and 3 shafts with carbide cutters in sturdy storage/presentation case.



CIRCLE CUTTER

Bowl interiors, coves, & contours



SQUARE CUTTER

Straights & convex shapes



DIAMOND CUTTER

Detail lines, V's, & undercuts



70-800 MSRP \$199.99

Additional Accessories for the Woodturning System Available



Call today for more information **877-884-5167**
or visit **www.rikontools.com** for a dealer near you!



Letters

Building Gifts and More



MAKING MEMORIES IN YOUR SHOP ...

One thing that gives me a sense of well-being is when I visit one of my adult children's houses, and I see a piece of furniture that I made years ago being used in their home. Not only does it feel good that these items are still providing service, but I know that my family likes them a little more because I was the one who built them. And it also gives me a peaceful feeling to know that they will still be around when I

am gone. While some may find that a bit of a dark thought, it is not that way to me at all. I have no false impression of my importance in the world; my life is indeed just a vapor. But within my family, the fact that they can have a lasting part of their parent or grandparent remain with them, that is important and something that not everyone can have. So, if you are in the process of using your craft to provide joy to a loved one this holiday season, think also of the legacy that you are building. You are working in more than simply wood: you are working with comforting memories.

— Rob Johnstone

Swing Time

I saw your porch swing in the June 2017 edition ["Carefree Summer Porch Swing"]. Here is my final result. It goes great with our home. I used roughsawn white oak to make the boards I needed. Thanks for a great project.

Mark Pendleton
Flagstaff, Arizona

Great Videos!

"Making a Coopered Birdhouse" [www.woodworkersjournal.com] is an excellent video. It was exceptionally clear and easy to follow.

I wished the demonstrator, Ernie Conover, would have mentioned the angle he cut the stays at on his table saw! Is there anyway to get that dimension?

I have been a fan of your videos for many years and have successfully produced a number of the projects, all enhancing my woodturning experiences!

Paul J. Brown
Murphy, North Carolina



WJ Responds: As covered in the June 2017 article "Barrel-Shaped Birdhouse," which this video was made to accompany,

Continues on page 10 ...

ROCKLER PRESS

THE VOICE OF THE WOODWORKING COMMUNITY

DECEMBER 2017

Volume 41, Number 6

ROB JOHNSTONE *Publisher*
ALYSSA TAUER *Associate Publisher*
JOANNA WERCH TAKES *Editor*
CHRIS MARSHALL *Senior Editor*
JEFF JACOBSON *Senior Art Director*
CASSIDY SMITH *Associate Art Director*
DAN CARY *Senior Web Producer*
MATTHEW HOCKING *Internet Production Coordinator*
MARY TZIMOKAS *Circulation Director*
LAURA WHITE *Fulfillment Manager*

Founder and Chairman
ANN ROCKLER JACKSON

Contributing Editors
NORTON ROCKLER
SANDOR NAGYSZALANCZY
ERNIE CONOVER

Advertising Sales
ROB JOHNSTONE *National Sales Contact*
rjohnstone@woodworkersjournal.com
(763) 478-8255 Fax (763) 478-8396
ALYSSA TAUER *National Sales Support*
ataur@woodworkersjournal.com

Editorial Inquiries
JOANNA WERCH TAKES
jtakes@woodworkersjournal.com

Subscription Problems/Inquiries

(800) 765-4119 or
www.woodworkersjournal.com
Write Woodworker's Journal, P.O. Box 6211,
Harlan, IA 51593-1711
email: WWJcustserv@cdsfulfillment.com. Include
mailing label for renewals and address changes. For gift
subscriptions, include your name and address and
your gift recipient's.

Book Sales and Back Issues

Call: (800) 610-0883
www.woodworkersjournal.com

Other Questions or Problems

Call: (763) 478-8255
rjohnstone@woodworkersjournal.com

Woodworker's Journal (ISSN: 0199-1892), is published in February, April, June, August, October and December by Rockler Press Inc., 4365 Willow Dr., Medina, MN 55340. Periodical postage paid at Medina, Minnesota and additional mailing offices. Postmaster: Send all address changes to Woodworker's Journal, P.O. Box 6211, Harlan, IA 51593-1711. Subscription Rates: One-year, \$19.95 (U.S.); \$28.95 U.S. funds (Canada and other countries). Single copy price, \$7.99. Reproduction without permission prohibited. Publications Mail Agreement Number 0861065. Canadian Publication Agreement #40009401.

©2017 Rockler Press Inc. Printed in USA.

December 2017 Woodworker's Journal

MAXIMUM PERFORMANCE

NO CORDS NEEDED

BRUSHLESS
X2
18V 18V 36V

TWO BATTERIES DELIVER
MAX POWER, SPEED & RUN-TIME



DUAL DUST
COLLECTION PORTS



UNIQUE 2-STEEL RAIL
SLIDING SYSTEM ALLOWS
OPERATION FLUSH
AGAINST A WALL

IN-FRONT BEVEL LOCK

SOLID ALUMINUM BASE

UP
TO
334 CUTS
IN 2x4 LUMBER PER CHARGE**

NEW
XSLO6PT
18V X2 (36V) LXT® BRUSHLESS 10"
DUAL-BEVEL SLIDING COMPOUND MITER SAW KIT*

CUTTING CAPACITY

6-5/8"
CROWN MOLDING
(NESTED)

5-1/4"
BASE MOLDING
(VERTICAL)

4 x 12
NOMINAL LUMBER
(AT 90°)

BRUSHLESS
X2
18V 18V 36V

UP
TO
125 CUTS IN 4X8
SHEETS
OF 1/2" PLYWOOD PER CHARGE**

NEW
XPS01PTJ
18V X2 LXT® LITHIUM-ION (36V)
BRUSHLESS 6-1/2" PLUNGE CIRCULAR SAW KIT

- Smooth, splinter-free cuts in plywood and large wood panels
- Two batteries deliver max power, speed & run time
- Optional guide rail system available for accurate cuts with minimal tear-out (Sold Separately)

LXT® BRUSHLESS

CUTS UP TO
380 FEET
OF RED OAK PER CHARGE***

NEW
XTR01T3
18V LXT® BRUSHLESS
COMPACT ROUTER KIT

- Corded power meets cordless convenience
- Compatible with bases and accessories used with Makita corded compact routers (RT0700C, RT0701C)



The MAKITA TEAL COLOR is the trade dress of Makita® Corporation and is protected under common law and registered with the U.S. Patent and Trademark Office. 0917 MA-3250-17

*Stopper and stand not included **Using (2) BL1850B 5.0Ah Batteries ***Using a 6mm Straight Bit with a cutting depth: 4mm

f i y t
makitatools.com

Makita

"Each piece of wood has its own personality, it's my job to bring it out. That's why I trust Varathane."



When Nathan Wiens, artist and proprietor of Chapel Arts, takes on multiple projects, he needs to work

fast and efficiently. Which is why he turns to Varathane. He says it not only saves him time, but it also leaves a truly rich, deeper color in under an hour, with just one coat. Don't just finish it, Varathane it.



- Covers 75% more (275 sq. ft. per quart)
- No wood conditioner required



- Achieve true color in just one coat
- Dries in 1 hour



- Offered in a wide array of beautiful colors from traditional to contemporary

© 2017 Rust-Oleum

Letters continued

Ernie cut the staves with his table saw blade tilted to 10°, giving each stave an included angle of 20°. Don't forget to visit www.woodworkersjournal.com for video content related to many of our articles!

Teardrop Trailer Thoughts

Just read the letter from Jim Sholtis about rebuilding his teardrop trailer [Questions & Answers, August 2017].

While I thought your plywood suggestion was very good, I think you and he have missed an overriding concern that should be considered. Adding length and height to his 10-year-old

trailer that is showing signs of decay in the wood might well take it beyond the design standards. I am not an engineer, nor do I have any structural training, so I confess that I may not know what I'm talking about. However, I would suggest the trailer needs to be checked for aging issues as well as its ability to carry the additional weight. In addition, I wonder about the effect the extra height, length, weight and aerodynamic changes that occur pulling the trailer will have on the tongue's ability to handle the additional torque.

Jonathan Whitney
Thomson, Illinois

Last summer I did a similar project, where I glued up sheets of 1/4" plywood to make a right angle desk. In my case, I glued up four sheets. The fourth sheet definitely made it more robust. I thought two key processes were critical: 1. Have a very flat surface to lay the plywood on for gluing. 2. Have plenty of weights to hold the newly glued sheet down. I suspect I had close to 1,000 pounds of miscellaneous weights placed all over

the top of the plywood. I ended up using one and a half gallons of Titebond II glue. I trimmed off the edges when complete and saw I had good bonding. Well satisfied.

Roger Mickelson
West Burlington, Iowa

Waxed Wood = Wet Wood

In response to the question on waxed wood [Questions & Answers, August 2017]: I asked that question myself about 50 years ago but found no answer until I bought a large turning blank completely heavily waxed. The writer in question was in the same situation but did not understand why the piece he had was heavily waxed. Ernie did not explain that heavily waxed turning blanks are that way so they will NOT dry out, making the wood much easier to turn because it is still wet. After turning the bowl or whatever, the wax flies off in chips and the unfinished bowl goes on a shelf for drying and then, much later, turning to the final shape.

But the questioner was thinking of making a box or a small piece of fur-



While perfectly fine for use in projects, typically this lumber is labeled as turning blanks.

niture by slicing the blank into panels. That is what I did and made a beautiful tabletop with the panels. I did not own a moisture meter at the time and did not know what dealing with wet wood meant. It would dry and split and crack, which mine did, leaving large openings in the tabletop. The questioner should have been warned that waxed wood is wet wood and needs careful drying techniques to use it.

Howard van Valzah
Roscoe, Illinois

Continues on page 12 ...

ENHANCES WOOD
GRAIN AS EASILY AS
IT ENHANCES THAT
SENSE OF PRIDE.



**Introducing Varathane®
Wood Grain Enhancer.**

You'll be amazed at what you can
do with your next wood project.

Its revolutionary formula is
designed to highlight the grain
of any wood you choose, while
the original stain and bare wood
tones remain. This simple process
not only brings out those one-of-
a-kind accents, it has a way of
bringing out that personal sense of
accomplishment as well.

**Don't just finish it,
Varathane it.**



*Demonstration on Red Oak with
Varathane Kona Stain*

NATURAL

STAINED

+ GRAIN ENHANCER

Varathane
SINCE 1958

VARATHANE.COM

There's more online at
woodworkersjournal.com

MORE ON THE WEB

Check online for more content covering the articles below:

Woodturning (page 28):

Hollow form canister (video)

CNC Gifts (page 44):

Drawings, .tap, .crv and videos

Bookcase (page 46): Project build; routing jig (videos)

Music Stand (page 50): Steam bending the legs (video)

Tool Preview (page 60): Tool debuts at trade show (videos)

Weekend Projects (page 70): Circle cutting methods (videos)

What's in Store (page 76): Featured tools in action

"Must Build" Picnic Basket

I subscribe to several wood-working magazines and review each one every month, looking for the project that I "just have to build." The "Picnic Basket" in the August issue was one of those projects. I opted to make it from maple (rather than ash), and it turned out great! I did find that I had to wet the weaving strips to make them more pliable to prevent breakage.

Rather than band sawing the weaving strips, then finish planing them to final thickness, I ripped them to the final 3/32" on the table saw. I used a Wixey digital gauge against the fence. I cut the first strip from a full



Reader Jim Hanna made our Picnic Basket, then auctioned it off for charity.

width board, then for each successive cut, simply moved the fence .218" (.093" for the thickness of the slat, and .125" for the thickness of the blade) closer to the blade. The finish on the slats was perfectly smooth right off the saw, and for that reason required no further sanding. Perhaps this may have wasted slightly more wood than the method suggested in the

article, however (for me) it seemed quicker, easier, and omitted another step, in addition to constructing the carrier board.

As a slight variation to the plans, I put two conventional handles on my picnic basket, which was auctioned off for charity at a nice price!

Jim Hanna

Franklin, Pennsylvania





SuperMax Tools



Superior Quality. Affordable Efficiency.

Introducing the
16-32
DRUM SANDER

- 1-1/2 HP TEFC 110V/15A Drive Motor.
- Patented Quick Adjust Lever for fast adjustments.
- Turbo Vented Dust Port for increased air flow.
- Built-in DRO for consistent thicknesses.
- INTELLISAND Technology.

The newest member of our family

Please visit SuperMaxTools.com for full specifications and distributor locations.

P. 888.454.3401
F. 651.454.3465

SuperMaxTools.com
sales@SuperMaxTools.com



Newly designed Turbo Vented Dust Port increasing CFM air-flow to dust collectors by 15%



Built-in Digital Read Out helps maintain consistent thicknesses to increase accuracy and quality



Patented "Quick Adjust Lever" allows instant height adjustments from 0" to 3" to reduce set-up time and increase productivity



Optional folding infeed/outfeed tables also available

SANDING SIMPLIFIED.

Goes
Farther

Dries
Faster

Looks
Fabulous

ZAR® Oil-Based Wood Stain wipes on like furniture polish to stain and seal in one quick, easy application. It gives wood a natural range of color and enhances the wood grain. Our full bodied formula covers more square feet and dries faster than other wood stain products.



To download a ZAR Interior Wood Finishing Project Guide or to find a dealer near you visit www.ugl.com or call 1-800-272-3235.

The facts are hard to ignore.

Titebond® III outperforms polyurethane glues.

Reference Guide

Glue comparison

What woodworkers need to know!

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

Woodworking Handbook

As the leader in wood glues, we want you to know the truth about polyurethane glue and woodworking. A straightforward comparison between Titebond® III Ultimate Wood Glue and polyurethane glue tells the story.

Titebond® III is THE ultimate choice for bonding wood to wood. Period.

www.titebond.com/TBIIIvsPolyurethane



Cyber Makers Spotlight

Katie Cleveland, David Picciuto and Brad Rodriguez

Our first shout-out to the new wave of online makers and woodworkers ...

Once upon a time, books, magazines and TV were the only sources for how-to-do-it information. They were effective, but had some limitations — they are expensive and complicated mediums to communicate through. But because of the expense, both to publish content and to buy it, high quality of the information was paramount.

In recent years, the Internet has removed much of the expense and heavy lifting. Online publishing has become easy: lots of folks are telling you how to build things and showing off their work. But as the costs were removed, in some cases, so were the quality filters. As one of the well-established outlets of quality content, we want to shine a light on Internet woodworkers and makers we see doing interesting work of high quality. Here are our first three.

Addicted2diy.com

Katie Cleveland has successfully taken over her husband's workshop. Now, before you get too worried about that, you should know that he is more than OK with it. Katie's entry into the blogging world came after she started building furniture for their new home. Saving money and getting just what you are after are the core of her blog. If you subscribe to our eZine, Katie will be familiar to you from our March 2017 Today's Woodworker profile.



[Make Something \(YouTube\)](http://MakeSomething.com)



David Picciuto offers solid woodworking projects and how-to information via seriously entertaining YouTube videos. David's sense of humor is well-known across the how-to blogging community and has made him a leader in the field.

You may recognize the bandsawn box above, as he shared it with *Woodworker's Journal* readers last December.

Fixthisbuildthat.com

Brad Rodriguez took a path to woodworking familiar to many of us: an interest in building things and the purchase of a house needing some serious attention. Brad's projects are practical and really well-received.





- Patented, innovative design
- Military-grade aluminum frame
- Heavy-duty bearings for super smooth cutting operation and long life
- Dual-bevel
- Up-front miter/bevel controls

**Available in
10" and 12" blade size.**
www.deltamachinery.com

AccuMASTER™

Precision Woodworking Tools

Save Time & Money!



Moisture Meter Model 7440

- Measure moisture in any wood for any project
- Large, easy-to-read, backlit display is always on
- Versatile – use for wood and building materials



2-in-1 Digital Angle Gauge Model 7434

- Perfect angles for perfect cuts
- Magnetically attaches to blades, tables and more
- "Always on" backlight
- MEMS sensor = long battery life



For a dealer near you call 1-800-854-8075 or go to www.calculated.com

From Kitchens to Heirlooms

Perfect Dovetails
are Easy with
Leigh Dovetail Jigs.



SEE VIDEO
leighjigs.com
800-663-8932

LEIGH
Celebrating 35 years

New Uses for Common Supplies



Inexpensive Polishing Wheels for Rotary Tools

Ordinary felt furniture pads with plastic backs can be made into polishing wheels for high-speed rotary tools, like Dremel. I use a center finder to mark where to drill a small hole into the pad's back surface. Then, I simply screw the pad onto a felt bob shaft — it's the accessory shaft that appears to have a pointed sheet metal screw on the end (see photo, above). Alternately, you could use the cutoff wheel shaft if you trim away enough of the felt so that the shaft's center screw can thread down and tighten against the pad's plastic back.

Don Baker
Tulsa, Oklahoma



Veneer Tape Drawer Spacers

Recently I needed some really thin spacers to position the inset drawer faces on the bathroom vanity I was building. I didn't have any handy, but I did have a roll of iron-on veneer edge tape. So, I ironed a few layers of veneer together to achieve the spacer thickness I needed — in this case, 1/16". They were just the ticket for this task.

William Petersen
New Harmony, Utah



"Simple" Blade Cleaner

I use Simple Green® biodegradable concentrate for general household cleaning. When it came time to clean my table saw blade a while back, I gave Simple Green a try on that, too. I mixed a 1:3 solution of cleaner and water and soaked the blade in it for about an hour. This pleasant-smelling and nontoxic solution effectively softened the resin deposits so they were easy to scrub off.

Charles Mak
Calgary, Alberta



Sander Pad Sanding Block

Eventually the hook-and-loop pad on a random-orbit sander will wear out. Instead of throwing the old pad away, I used its mounting holes to screw it to a palm-sized block of wood. Even with some of the hook-and-loop surface worn away, I've found there's still enough grip left on the pad to hold sanding discs for a convenient hand-sanding block.

Paul Guncheon
Wahiawa, Hawaii

PICK OF THE TRICKS



Flush-trimming Router Jig

I use a plastic offset base to give my palm router a larger footprint. Here's how I modify my base to trim overhanging banding, dowels or even dovetails and box joints flush. I affix a "house"-shaped trapezoidal spacer to the bottom of my offset base with carpet tape. It's made of plastic, and the tapered end is fashioned to an angle less than 90° so this spacer will fit even better into corners. To use it, I set a short straight bit or dish-carving bit (shown here) just shy of the work surface. Then, sweeping the jig over the protruding edge banding, dowel, etc., trims it neatly flush.

Barry Chattell
Salt Spring Island, British Columbia



Safety First

Learning how to operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary guards have been removed from equipment shown in our magazine. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturers' instructions and safety precautions.

TRICKS OF THE TRADE SPONSORED BY TITEBOND



NEW! QUICK&THICK Multi-Surface Glue



No Runs • No Drips

Ordinary Wood Glues

Don't be fooled by the name. Of course it's specifically designed for wood... it's from Titebond, after all. However, this formula is also very effective on ceramic, stone, glass, fabrics and more!

Plus, it offers strong tack, a permanent bond and excellent sandability.

For where to buy, call 1-800-347-GLUE (4583) or visit titebond.com/QuickandThick.



In addition to our standard payment (below), Barry Chattell of Salt Spring Island, British Columbia, will also receive 12 bottles of Titebond Quick & Thick Glue and a Titebond pullover jacket for being selected as the "Pick of the Tricks" winner. We pay from \$100 to \$200 for all tricks used. To join in the fun, send us your original, unpublished trick. Please include a photo or drawing if necessary. For your chance to win, submit your Tricks to Woodworker's Journal, Dept. T/T, P.O. Box 261, Medina, MN 55340.

Or send us an email:
tricks@woodworkersjournal.com



Questions & Answers

Avoiding Ragged Cuts for Half-Laps

THIS ISSUE'S EXPERTS

Chris Marshall is senior editor of *Woodworker's Journal* and the author of several woodworking books.

Brian Leonard is marketing and communications manager at Norton/Saint-Gobain.

Sandor Nagyszalanczy is a writer/photographer of several woodworking books and a frequent contributor to *Woodworker's Journal*.

Contact us

by writing to "Q&A,"

Woodworker's Journal,

4365 Willow Drive,

Medina, MN 55340,

by faxing us at (763) 478-8396

or by emailing us at:

QandA@woodworkersjournal.com

Please include your home

address, phone number and

email address (if you have one)

with your question.

Q I am making a door with half-lap joints. We have all seen this done using a dado blade. A dado blade is a ripping blade, meant to go with the grain of the wood. When you use it to cut a half-lap or a stub tenon, it leaves a very ragged surface, which would seem unsuitable for a glue joint. I used my shoulder plane to clean up the rough cut, so my question for you is: Should you use a dado blade to cut tenons or half-lap joints, or is there a better way? Is a band saw accurate enough for this type of joint, or is the only option a tenoning jig, which limits the length of the wood that you can use?

Jon Rouleau
Geneseo, New York

A The outer blades of most quality dado blades are actually combination blades, not ripping blades (ripping blades have a much more aggressive hook angle to the teeth). They're intended to offer a reasonably clean cutting solution for both long-grain and cross-grain cuts. They have to be, because so many joinery cuts run across the grain.

My favorite way to cut half-laps and tenons is with a dado blade, laying the workpiece down flat on the saw table to serve as a reliable reference surface. I typically cut my tenons slightly too tight, then plane them down as you do, Jon, for a slip fit.



A quality dado can be a good solution for cutting half-lap joints, but there are plenty of other milling options too.

So, I don't think a dado blade is a bad choice to use for all-around joinery cuts. But, if the blades and chippers on your dado really make a mess of the cuts, the other options you suggest could certainly work, too. Most tenoning jigs — especially the cast-iron prefabricated versions — can take a pretty large and long workpiece, and using a standard blade to make the cuts will yield cleaner surfaces than a dado set. A band saw could also work. The issue there is to make sure the band saw's table is square to the blade — both alongside the blade as well as along the spine.

Of course, option three could be the router table. A straight, mortising or spiral bit in the router table can produce very accurate and clean cuts. And, for really short stub tenons, there's always a rabbeting bit that can cut both cheeks and shoulders at the same time. So, keep the router table in mind as well.

— Chris Marshall

Q Before I put my woodshop together in 2002, I bought and read all kinds of woodworking magazines and reference materials — including information on how to sharpen your chisels and plane irons ["Put the Shine in Sharpening," April 2001, in which author Ian Kirby referenced his book *Sharpening with Waterstones*].

One of the first things I bought was the Norton Waterstone set of 220, 1000, 4,000 and 8,000 grits. One of the first things I built in my new woodshop is what I call a Wet Bench. I installed low slope (flat) roofing for a living at the time. So my bench included a tank lined with thermoplastic roofing with a small drain in the bottom.

In the information I read, it said you should keep your waterstones submerged continuously when not in use to keep them from disintegrating. That's why

Should waterstones be constantly submerged, and if so, how do you keep the water from getting slimy?

I put a tank in the bench. I used waterbed additive to keep the mold and algae at bay and to keep the water from getting slimy. I ran out of this stuff, and I can't find it locally any more. I was wondering if you had any suggestions on a product to use to keep the slimies at bay that doesn't hurt the Norton Waterstones?

John E. Adams
Reed City, Michigan

A Different waterstones will have slightly different compositions, which might react differently to additives. Try adding



a little bleach to the water and keep the tank covered. This should keep the mold or "slimies" at bay. Check waterstones periodically.

A quick Google search found waterbed additives on Amazon as well as other sources.

— Brian Leonard

Q I have a Harbor Freight 2hp dust collector in my shop. My Powermatic table saw is about 25 feet away. I have a 4" flex hose with blast

gates to separate each tool like my band saw, 8" jointer, 12" planer and a lathe. There is very little suction on the table saw. Should I buy a bigger, more powerful dust collector, or would putting in a more rigid piping such as galvanized help?

Jim Raines
Birmingham, Alabama

A Although flexible hose is very handy to use

Continues on page 20 ...



Winner!

For simply sending in his question about dust collection, Jim Raines of Birmingham, Alabama, wins a Bora MiterX Angle Duplicator.

Each issue we toss new questions into a hat and draw a winner.

THE ALL NEW CNC PIRANHA XL®



MADE IN THE USA

www.NextWaveAutomation.com



**UNLIMITED PERFORMANCE –
IN A SMALL FORMAT CNC**

Full-Size CNC Functionality at a Fraction of the Cost!

- Commercial grade construction
- User-friendly, color touch screen pendant controller system
- Large 12" X 24" cutting area
- Exclusive Auto Edge and Center Detection System
- Virtual Zero Technology
- 3D carving capability includes sixty 3D model library
- VCarve Desktop V8 Design Software included
- Perfect for projects like carvings, plaques, ornamental boxes and precision parts machined from wood, soft metals, or plastics
- Router sold separately



Stumpers

Wrenching it Out

Firefighters put out the answer



What's This?



Paul Fell of Mount Pleasant, Iowa, got this thing from his father-in-law, who had received it from his dad. Do

you know what it is?

Send your answer to

stumpers@woodworkersjournal.com

or write to "Stumpers,"

Woodworker's Journal, 4365

Willow Drive, Medina, MN 55340

for a chance to win a prize!



Woodworker's Journal editor
Joanna Werch Takes compiles
each issue's Stumpers responses
— and reads every one.

"The thingamajig in August 2017 is a folding spanner wrench used in the fire service to tighten fire hose." That's **Tommy Pearson** of Inman, South Carolina's answer to the mystery tool sent in by **Andy Omdal** of Mount Vernon, Washington.

As fire captain **Tom McLean** of Ketchum, Idaho, noted, the spanner wrench "is typically folded and kept in the pocket of a firefighter." That way, said **Jerry Anderson** of LaConner, Washington, the wrench was handy to "easily connect and disconnect hoses from hydrants or fire engines."

"Older fire hose featured round lugs on the couplings, which the head of this wrench would slip over," explained **Dave Kinman** of Deming, New Mexico.

"Pin lugs are cylindrical nubs that protrude from the swivel fitting on fire hoses or caps to hook a spanner (wrench) to while the curve or offset of the spanner hugs the rim of the fitting," said **Keith Walton** of Salem, Oregon. **Ron Smith** of Elk Creek, California, further explained it: "When the handle was opened up, it increased the leverage of the tool for better tightening."

Winner! Keith Walton of Salem, Oregon, wins a **RIDGID Oscillating Edge/Belt Spindle Sander (EB4424)**. We toss all the Stumpers letters into a hat to select a winner.

Greg Stewart of Westminster, Maryland, shows where August's mystery tool was used on his fire department's 1939 pumper.

"Although most fire hoses no longer have the double pins on the coupling, this tool is used to tighten (or loosen) the connections when multiple sections of hose are pieced together — for those hose couplings having the pins," said **Phillip Gilbert** of Decatur, Alabama.

As a college-age volunteer firefighter in the 1950s, **Jim Schreiber** of Beavercreek, Oregon, said, "I hated dragging that old style canvas hose up stairwells with those pin couplings catching on every step."

Today's hose fittings, notes **Dale Hupp** of Riverdale, Iowa, "have an elongated flat lug to prevent snagging." Dale says he has carried one of these wrenches around for 43 years.

Fire Captain **Richard Booth** of Peoria, Illinois, notes that, "We still carry these in our toolboxes in Peoria. You just don't throw away neat stuff like that."



Questions & Answers continued

when setting up a small dust collection system such as yours, it's not the best choice when used for longer runs between machines and collector. The ribbed inner surface of flex hose creates a lot more air resistance than the smooth surface inside a rigid duct. More air resistance means that the dust collector's motor has to work a lot harder to pull the air, dust and chips through the flexible hose. In your setup, a 25-foot long 4" flex hose creates more than three times as much air resistance as the same span of rigid duct would. Given the difference, I'm not surprised that your 2hp collector doesn't have the air-moving capacity to get the job done.

The good news is that simply replacing your main duct with 4" or 5" rigid ductwork — either metal or plastic —



Smooth-walled, rigid ductwork improves the airflow to machines by reducing air resistance inside.

should improve collection from each of your machines, especially the ones that are farthest from the collector itself. Just make sure the sections of flex hose that connect the blast gates to the machines are kept short — no more than 3 or 4 feet, if possible. If chip collection from the table saw is still a little weak, try opening one of the other gates a little bit, as this helps create more airflow through the main duct.

— Sandor Nagyszalanczy

THE FUSION M2 40

ENGRAVE IT. CUT IT. MARK IT.



- Large 40" x 28" engraving area
- Flame-polished edge cuts
- Laser tube wattages up to 120 watts
- Large viewing door with LED lighting
- Our CO₂ highest engraving and cutting speeds
- Engrave items up to 13.25" in height
- Dual source option (fiber and CO₂)
- eView™ camera options
- Maximum substrate compatibility



Get **MORE INFO** or
SCHEDULE A DEMO!

888.437.4564 | sales@epiloglaser.com
www.epiloglaser.com/wwj



MADE IN USA

SATAjet 1000 B

The Versatile One!

- Simply perfect finishes, applies the perfect application of modern finishes such as stains, glazes, primers, latex finishes, and pre & post cat lacquers (clear & pigmented)
- Easily handles stains without blotching
- Low pressures help to get even coverage in profiles on raised panel doors with minimal bounce back



Watch our YouTube video on spraying stain with the SATAjet 1000 B
more wood videos at [YouTube/SATAbbyDanAmCo](https://www.youtube.com/user/SATAbbyDanAmCo)

*Our sincere thanks
for your business this
past year*

DanAm®

The exclusive independent
distributor of SATA products
in the US and Puerto Rico

Phone: 800-533-8016
E-mail: satajet@satausa.com
www.satausa.com



German Engineering



SATA, SATAjet and/or other SATA products referenced herein are either registered trademarks or trademarks of SATA GmbH & Co. KG in the U.S. and/or other countries.

Shop Talk

Maritime Museum Trains Future Boatbuilders



Chesapeake Bay Maritime Museum Hosts Girls' Woodshop

The Chesapeake Bay Maritime Museum in St. Michaels, Maryland, hosted a three-evening Girls' Woodshop program

this past August. Girls in grades six through nine were invited to learn the basics of hand tools and wood construction while creating their own planter box from scratch.

The workshop was designed

to provide girls with basic woodworking knowledge while helping them feel confident and at home in a workshop. Workshop leaders were Lauren Gaunt and CBMM staff member Chloe Tong. Gaunt is a shipwright apprentice for the Rising Tide program, a position funded by the Seip Family Foundation. Rising Tide teaches students basic boatbuilding skills, ranging from wood-

working to engine repair and maintenance.

In the Girls' Woodshop class, Gaunt and Tong taught a total of eight participants how to use woodshop items like an electric drill, power



The girls' completed project was a planter box, suitable for seedlings (lumber and seedlings provided as part of the workshop).



The girls learned the basics of wood construction and using hand tools, such as the hand plane used here.



CBMM Rising Tide Apprentice Lauren Gaunt (not pictured) supervised the girls as they learned to use the drill press.



After cutting plugs on the drill press, the girls chiseled them out of the board and glued them into their planter boxes.



A sanding block was a necessary tool for the girls in the woodshop program. The class was popular and full to its capacity.

sander and hand plane, tape measure, hand saw, pull saw and drill press, with an emphasis on keeping themselves and others safe in a working environment.

“Our goal is to give these girls an opportunity they may not have elsewhere,” Gaunt said. “We really want them to feel comfortable in both our boat shop and other woodworking environments. CBMM is dedicated to teaching students about the history and culture of the Chesapeake Bay’s commu-

nities and environment, and opening up our working shop is just another part of that.”

More workshops like this were planned for fall 2017, along with weekly sessions of CBMM’s Rising Tide After-School Boatbuilding Program, designed for all students in grades six to nine, with additional workshops to come. CBMM also offers a number of hands-on programs in the Boatyard for adults, such as woodworking, carving classes, metal casting and tool sharpening.

The Chesapeake Bay Maritime Museum is a world-class maritime museum dedicated to preserving and exploring the history, environment and people of the entire Chesapeake Bay. To learn more about the educational programs, visit cbmm.org/RisingTide, email risingtide@cbmm.org or call the museum at 410-745-2916.



Chesapeake Bay Maritime Museum staff member Chloe Tong, left, showed a participant how to use a drill driver to attach two sides of her planter.



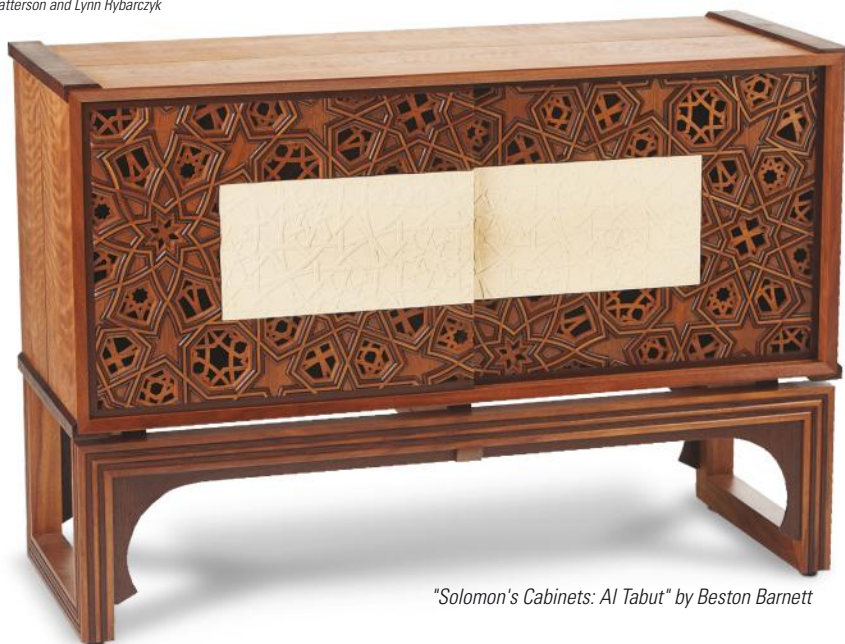
Girls in the workshop chose their own finishing details — paint, wood-burning or other decor — for their planter boxes.

"Wedding Staff" by Rodney Layden

Winning Woodworking

Stunners from San Diego Show

Photos by Andrew Patterson and Lynn Rybarczyk



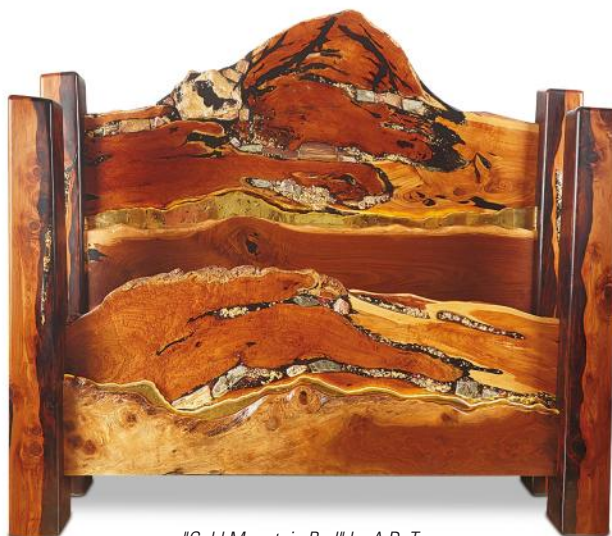
"Solomon's Cabinets: Al Tabut" by Beston Barnett



"Tripod Chair" by Todd Bradlee

This past summer marked the 36th anniversary of the Design in Wood show hosted by the San Diego Fine Woodworkers Association at the San Diego County Fair. *Woodworker's Journal* was once again a sponsor of one of the awards, with Todd Bradlee of Bishop, California, receiving the Excellence in Design recognition for his maple and walnut "Tripod Chair," pictured at left below.

Participants entered in classes including Contemporary Woodworking, Traditional Woodworking, Art Furniture, Furniture Designed and Executed by Computer *Continues on page 26 ...*



"Gold Mountain Bed" by A.D. Tonnesen



Dovetails & Box Joints

Easy with Leigh Super Jigs



SEE VIDEO

leighjigs.com

800-663-8932

LEIGH
Celebrating 35 years

TOUGH Dries Natural Color, No Foam GLUE



Gorilla Wood Glue's premium formula creates a cross-linking bond to provide superior strength with a Type II water resistance, indoors and out.



**For the Toughest Jobs
on Planet Earth®**

www.gorillatough.com

©2017 The Gorilla Glue Company

World's Most Powerful Leaf Vacuum...at a New LOW PRICE!

Now Starting
at Just
\$999⁹⁹

with
**FREE
SHIPPING**



DR® LEAF VACUUMS have proven in laboratory testing to achieve the most vacuum power versus competitors. And now, our All-New PILOT™ Model combines this same amazing yard clean-up power with an equally amazing new price!

- ✓ **Rated #1 in Vacuum Power**
- ✓ **Now at the Lowest Price Ever**
- ✓ **Converts to an All-Purpose Trailer**
- ✓ **Stores Flat in Minutes**



Unload with just one hand!



Doubles as a utility trailer!

98293X © 2017

FREE SHIPPING
1 YEAR TRIAL

SOME LIMITATIONS APPLY
Call or go online for details.

Call for FREE DVD and Catalog!

TOLL
FREE

877-201-7888

DRleafvac.com



Shop Talk continued

"Dutch Galliot, 17th Century" by Robert Hewitt



"18th Century Laptop" by Robert Stevenson



"Cubes Galore" by Douglas Buddenhagen

(Laser and/or CNC), Made for Children, Model Building, Musical Instruments, Clocks, Veneering/Marquetry, Wood Turning, Wood Carving and Scroll Saw.

Information on entry requirements for the 2018 show will be available soon at www.sdfwa.org/design-in-wood-exhibition, or you can call coordinator Ed Gladney at 619-251-4410.



"Floating Jelly" by Steve Sisson



"Rose Table" by Ken Cowell



"Train to Sleepy Town" by Ralph Crowther



MEASURE MOISTURE IN THE WOOD NOT ON THE WOOD



MOISTURE METERS
DESIGNED FOR WOODWORKING PROFESSIONALS

www.wagnermeters.com 800-505-1281

UNIVERSAL DUST FREE ROUTER HOOD™

Your life just got easier.

"I can't believe
there's no dust!"



Routers,
hoses and
vacuums
not
included.

**Fits almost any
portable router!**



U.S. Patent
Pending

- Easy to install and built to last.
- No more dusty mess!

*2015
Visionary
Award
Winner*



Dust Collection Since 1993

For a complete list of compatible routers and to see the unit in action, visit: routerhood.com

1.800.732.4065

www.oneida-air.com

Made in
the USA

— BE YOUR OWN BOSS — TURN YOUR GARAGE OR SHOP INTO A FURNITURE FACTORY

- Turn key business solution
- Proven business model
- Work from your garage or shop
- Achieve financial independence
- A Business Program that includes know-how, jigs, templates & materials for your first production run (enough to recoup 70% of your investment).



EUREKA
WOODWORKS

« BUSINESS PROGRAM »

Call us today to start
your dream of owning
your own business!

P: 214-221-1147

www.EurekaBusiness.com

"Serving entrepreneurs since 2002"

nova CHUCKS

The first with a 4-jaw design for woodturning in 1987
Still at the forefront of industry innovation
Still the market leader 30 years later

NEW nova™ TITAN III CHUCK

SKU 13060



**LATEST
RELEASE**

- NOVA's biggest capacity chuck yet
- Delivers superior holding capacity for really BIG work
- 3 hole positions for extra strength
- Fully compatible with standard
- NOVA chuck accessories with the largest range of accessories on the market
- PLUS 2 unique accessories suitable only for the Titan III (SKUs 13040 & 13041)



IMPORTANT NOTICE: Safety Advisory! Only use authentic NOVA accessories on your NOVA chuck. Using non genuine NOVA and copies of accessories could lead to operation and safety issues and will void our market leading warranty. NOVA accessories are designed for use only on NOVA Chucks. Do not use on any other chuck.

For more, see www.teknatool.com

Woodturning

Hollow Form Turning Storage Canister

By Ernie Conover

Spindle turn a vessel — without needing to buy specialty tools.



A useful storage canister for the kitchen can make a great woodturner's gift for the holiday season. The one I'm making here is a pure hollow form that will introduce hollow turning skills.

"Hollow forms" is a fairly recent term that has appeared in the past 20 years for tall, slender, spindle turned vessels. Many turners think of making a vessel strictly in terms of faceplate turning; however, as a vessel is made taller and more slender, there is a point where it is better to spindle turn the form because it will be stron-

ger and more visually pleasing. (Where the crossing point between appropriate techniques occurs is always open for debate.)

Unlike the pricey special equipment used for turning amphora-shaped hollow forms with their narrow necks, this canister has a mouth opening not much smaller than the base, making its turning within everyone's grasp with the tools you probably already have. At the worst, you might need a larger spindle gouge and some heavy scrapers — both good additions to your general turning tool collection.

Choosing Your Wood

You do need a good size chunk of wood to make the canister. If it is your first go at hollow form turning, a piece of straight-grained wood is best. (After you gain a bit of experience, choosing curly figure or burl can add greatly to the beauty of the piece.) You could also turn the canister itself out of straight-grained wood and the lid out of burl.

Whatever you choose, you need a billet that is 5" x 5" by 9" to 10". Finding dry wood this size may be difficult, but green wood works fine and is actually better if this is

www.woodworkersjournal.com
MORE ON THE WEB



For a video on turning a hollow form canister, please visit our website at woodworkersjournal.com and click on "More on the Web" under the Magazine tab.

your first go at hollow forms. Since this is spindle turning, the warpage will be minimal compared to faceplate work. The lid will warp the same amount as the canister but still fit: I have seen many antique canisters that were turned this way, with a lid that secures fine because you can match the ovals then turn the lid a bit to lock it.

If this is your first canister, I also recommend turning a smaller one. Mine is larger because the size makes photography and video better for you to see what is happening.

Turn Your Canister

To start your canister, turn the 5" x 5" x 9" blank round and make a stub tenon on each end. The diameter of the tenon will be determined by the optimal opening of your chuck. Use a parting tool to cut through about one-third of the diameter of the billet at a distance of 5 1/8" from the end. The larger portion created by this cut will be your canister; the rest will be the lid.

Turn the canister body to a slight taper. It should be 4 7/8" at the base and 4 3/8" at the top. Then complete the parting cut to separate the lid from the canister. Use a parting tool to separate the lid of the canister from the vessel itself.



The author's stub tenons are 3/8"-long by 2 1/2" diameter: the optimal outside holding diameter of his Oneway Stronghold chuck. Adjust your tenon dimensions according to your chuck. Here, he is parting the lid away, leaving the canister height 5 1/8" above the tenon.

Hollow out the canister. The lion's share of the hollowing out work is done with a spindle gouge, but big square-end and medium roundnose scrapers are necessary to finalize the wall and bottom.

Leave the bottom of the canister about 1/2" thick. For strength, this end grain area needs to be thicker than it would have to be in a faceplate turned bowl.

Sand the outside and inside, apply finish, and unchuck.

Chuck the lid part of your turning blank and turn a tenon that is a snug fit with the canister. Setting out the rough diameter with dividers is very helpful. Remove small amounts and check the fit constantly. Turning a very slight chamfer on the end of the tenon with each check will help you to judge how much to remove after each trial fit.



The lion's share of the hollowing can be done with the spindle gouge, but you'll need large square-end scrapers to finalize the side wall and bottom.



Chuck the lid and turn a tenon that is a press fit with the canister opening.

Woodturning continued



The bottom of the canister is turned by pinning it against the lid. The bottom should be slightly undercut to a small chucking nubbin which can be chiseled and sanded away later.



The lid is a lopsided bead, steep toward the tenon and lazy to the top. The near side in the photo should only go to where the outside of the canister meets the tenon's shoulder.



Hollow out the center of the tenon to reduce weight and give a refined look. After parting off, the top of the lid can be turned to shape in a jam chuck or simply sanded to a gentle domed shape.

Place the canister body over the tenon you just turned on the lid portion, and use the tailstock live center to catch the original tenon you turned on what is now the bottom of the canister when you first started turning your blank.

Turn away that chucking tenon and apply finish to the canister body and lid.

The canister bottom needs to be undercut very slightly, so that only the outer diameter touches the kitchen counter it will reside on. You will need to leave a very small area under the live center. This can be chiseled and sanded away later.

Remove the canister body from the lathe and turn most of the lid as a big lopsided bead: steep on the side toward the tenon but gentle and lazy on the side that will be the top. The side toward the tenon should only curve in to the point where the shoulder meets the canister. Setting a pair of dividers to the wall

thickness of the canister and incising a line around the tenon for this distance greatly helps to get this perfect.

Hollow out the center of the cap to lighten and refine it, then cut the cap off from the chuck. The very top can be sanded to shape with intelligent orbital sanding or it can be jam chucked (as seen in my video) and turned to shape.

Pro Tips and Options

This useful project is a great introduction to hollow form turning. It could also be embellished with chip carving or other techniques to add your own personalized touch.

A couple more pro tips: First, if you are going to be making a large number of the canisters, you might want to invest in a large Forstner bit to remove the center portion, as it can make this task easier to accomplish.

Second, if you're using green wood as your turning blank, you could rough turn the canister to a heavier wall, in the neighborhood of about 3/4", and let it sit for a few weeks. Then, re-turn the vessel to its final thickness of about 3/8". (The outside should be trued at this time as well.)

Of course, waiting a few weeks for wood to dry presupposes that you have planned your gift-giving with plenty of lead time ... Wishing you joy in giving canisters to friends and loved ones!

Ernie Conover is the author of The Lathe Book, Turn a Bowl with Ernie Conover and The Frugal Woodturner.

MIRKA

Introducing Mirka® DEOS



Mirka® DEOS features and benefits:



- Orbital electric sander using brushless DC motor technology (3mm orbit)
- 3.2" x 5.2" Grip faced pad
- Low profile of 4" allows for easy maneuverability
- Ideal for tight and low profile woodworking spaces
- Optimized ergonomics for a comfortable grip
- Speeds can be adjusted from 5,000-10,000 opm
- Fast, efficient and dust-free sanding performance
- Bluetooth connectivity pairs with MyMirka App

Dust- Free Perfection starts with the Mirka® DEOS

Start your project out right with the Mirka® DEOS, the first orbital electric sander using advanced brushless DC motor technology, without the need for an external power transformer. Combine high performance and a longer product life by using Mirka's Abranet® abrasive. The patented NET construction means that no dust particle is more than 0.5mm from a dust extraction hole, eliminating dust clogging the abrasive. Paired with Mirka's Dust Extractor and hose, this system provides an excellent dust-free sanding solution.

The Complete Mirka® Dust-Free System



Mirka® DEOS Sander



Abranet® Mesh
Abrasives



Vacuum Hose



Dust Extractor

mirkawoodworking.us • mirka.com

Mirka USA • 2375 Edison Blvd., Twinsburg, Ohio 44087 • tel 800-843-3904 • fax 800-626-6970

Techniques

Well-Crafted Cutting Boards

By Marlen Kemmet

Our author's technique for creating stunning designs turns a basic kitchen item into a work of art.



Originally created these glued-up laminations as cutting boards, but as the designs have become more intricate, most people use them for wall hangings and kitchen accent pieces. Since most of the pieces glued to the plywood base are quite small, my scrap box serves



The position of the center panel determines the location (and squareness) of all the surrounding pieces. Measure carefully to precisely center it.

as the main source for many of these projects. After making several hundred of these over the years, I have fine-tuned the process for expediency. Follow along and learn the secrets to my proven success.

Base and Center Panel

Cut a piece of 1/2" or 3/4" plywood to size for the base of the project. Since I make small-production runs, I cut a sheet of 4x8' plywood into 24 bases measuring 12" x 16" each. Using a carpenter's square, measure and mark crosshairs on the top (poor side) of each base to find its center. Start with a figured piece of wood 3/8"-thick for the center panel. Center it on the base using the marked crosshairs and a combination square to ensure the piece is perfectly centered. Mark its outline on the top of the base.

Apply a thin, even coat of woodworkers glue to the bottom side of the center panel. Glue the center panel to the base. To keep my process moving quickly, I use a few drops of hot-melt adhesive in addition to woodworkers glue to secure the center piece in place. The woodworkers glue provides the strength between the two pieces, while the hot-melt holds the piece in place. This combination of hot-melt adhesive and woodworkers glue allows me



Once you've trimmed the surrounding strips to the exact length so there are no protrusions, glue the thin strips around the center panel. A glue syringe allows a more exacting method of glue application.

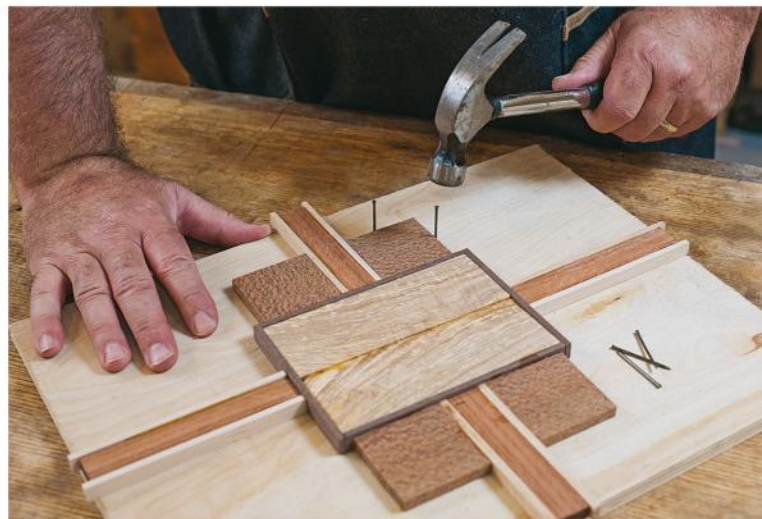
to forgo the use of clamps, which greatly increases the speed in which I can create the multi-pieced top.

Linear Strip "Frames"

To "frame" larger pieces, I cut long linear strips measuring 1/8"-wide by 3/8"-thick. Hold a thin strip against the center panel, mark the cutline, and crosscut it to length. The more flush you can keep the top surfaces of all the pieces of wood, the less sanding you'll have to do later. Hold the thin strip in place and make sure it is the same exact length as the center panel. Trim if necessary, then glue it in place. By holding it in place about 10 seconds, it sets and bonds without the use of clamps. Wrap the center panel with a row or two of thin strips.

For stubborn pieces that just won't stay in place, a few finish nails tacked to the base make excellent "clamps."

Using other pieces of interesting and contrasting pieces of wood, continue working out from the center panel, keeping the design symmetrical. When you get to the outer perimeter of the base,



Most of the time, you can simply hold a piece for a few seconds and it will stay in place. For positioning pieces where finger pressure simply won't do, use finish nails along the outside edges as makeshift clamps.



Working from the center of the project to the outside edges, glue pieces of wood to the plywood base, keeping the design symmetrical.

Techniques continued



Use a spacer strip between the fence and plywood base to ensure a parallel cut along the opposite edge of the project. The spacer strip must be equal to or slightly thinner than the plywood base.



Keeping the belt sander flat and starting with a 60-grit belt, slowly work the sander around the entire lamination to flatten and smooth the top surface of the lamination.



Crosscuts from laminated "logs" make for a more intricate design in the boards.

Intricate "Logs" Option

To make more intricate surface designs, I laminate stock into 10"- to 12"-long "logs." Starting from the center, I glue and clamp pieces around the center piece. I'll rip along the length of the lamination at the table saw and glue thin strips into the kerfs, always keeping the lamination symmetrical. I joint the rough edges for a flat surface before adding the next layer. When finished with the laminations, I crosscut 3/8" slabs from the ends and glue them to my board tops.

use wider pieces of wood as you'll be trimming these flush with the plywood base later. When adhering the outermost pieces, I overlap the plywood by about 1/8".

To trim the overhanging edges flush with the plywood

base, first use a 1/2"-wide spacer strip between the base and the rip fence. The strip ensures the cut at the opposite edge of the board will be parallel with the plywood base. Now, run the trimmed edge directly against the



Band opposite edges of the trimmed project with solid stock, keeping the top edges of the banding flush with what will be the top surface of the completed project. Wipe off any glue squeeze-out with a damp cloth.

Continues on page 36 ...

POCKETHOLE

HARDER BETTER FASTER STRONGER

Say goodbye to splintering with Quickscrews Pocket Hole screws for soft woods. Made with hardened steel and an extra sharp point, the sharper coarse threads allow you to drive into pocket holes smooth as butter.



WWW.QUICKSCREWS.COM

800.743.6916

Techniques continued



With your miter gauge fence positioned precisely 90° from the blade, crosscut the ends of the board flush.



Inject glue into small cracks, wipe off the excess glue, and lightly sand over the glue-filled crack to hide the gap with fine sawdust.



Finish the top and bottom of the board with several coats of finish. Brush along the bottom edges to eliminate drips.

fence to rip the opposite edge parallel to the first, flattened edge. Repeat this process for the remaining two edges.

Banding the Boards

To band the laminated boards, cut 1¼"-wide strips from 3/4"-thick maple stock. Resaw the stock to create the banding. Glue and clamp banding along the trimmed edges of the board, keeping the top edges flush.

Later, remove the clamps, and use a miter gauge with a fence attached or a table saw sled to trim the remaining two ends of the board and banding flush.

Glue and clamp banding to the two trimmed ends. Belt- and orbital-sand the board top. A horizontal drum sander saves me hours of tedious sanding when making these cutting boards en masse.

Sand the board through

180-grit, sanding a slight roundover along all edges of the banding. No matter how careful you are when creating the project, you'll end up with a few small gaps between pieces. To hide the gaps, inject glue into the cracks. I use a curved-tip glue syringe. Wipe off the excess glue with a damp cloth so only glue in the crack remains. Now, sand over the glue-filled crack to fill it with sawdust. You may have to do this a few times to completely hide a crack.

Sign the bottom of the board and apply several coats of finish. I use Behlen Salad Bowl Finish. To apply the finish, do the bottoms first, position the board on Painter's Pyramids, and then apply finish to the top and sides. Finally, run the brush along the bottom edge of the banding to eliminate any drips.

After each coat of finish, I lightly sand the project with 320-grit paper, wiping off any sanding residue with a clean cloth dampened with mineral spirits. For boards that do get used as cutting boards and get lots of use, I will resand and refinish the top surface every few years, as knife cuts can eventually allow moisture to reach the bare wood.

Marlen Kemmet is a woodworking editor who resides in central Iowa and has a fondness for Greene and Greene style furniture. His website is www.marlenkemmet.com.



**FOR MESSSES
BIG OR SMALL,
WORKSHOP
HAS YOUR VAC.**

FEATURING THE WS1600SS STAINLESS STEEL WET/DRY VAC

16 GALLON DRUM

Reduce how often you have to empty with ample space.

6.5 PEAK HP

The 266 Max Air Watts make short work of collecting the debris.

740 AVERAGE MOTOR HOURS

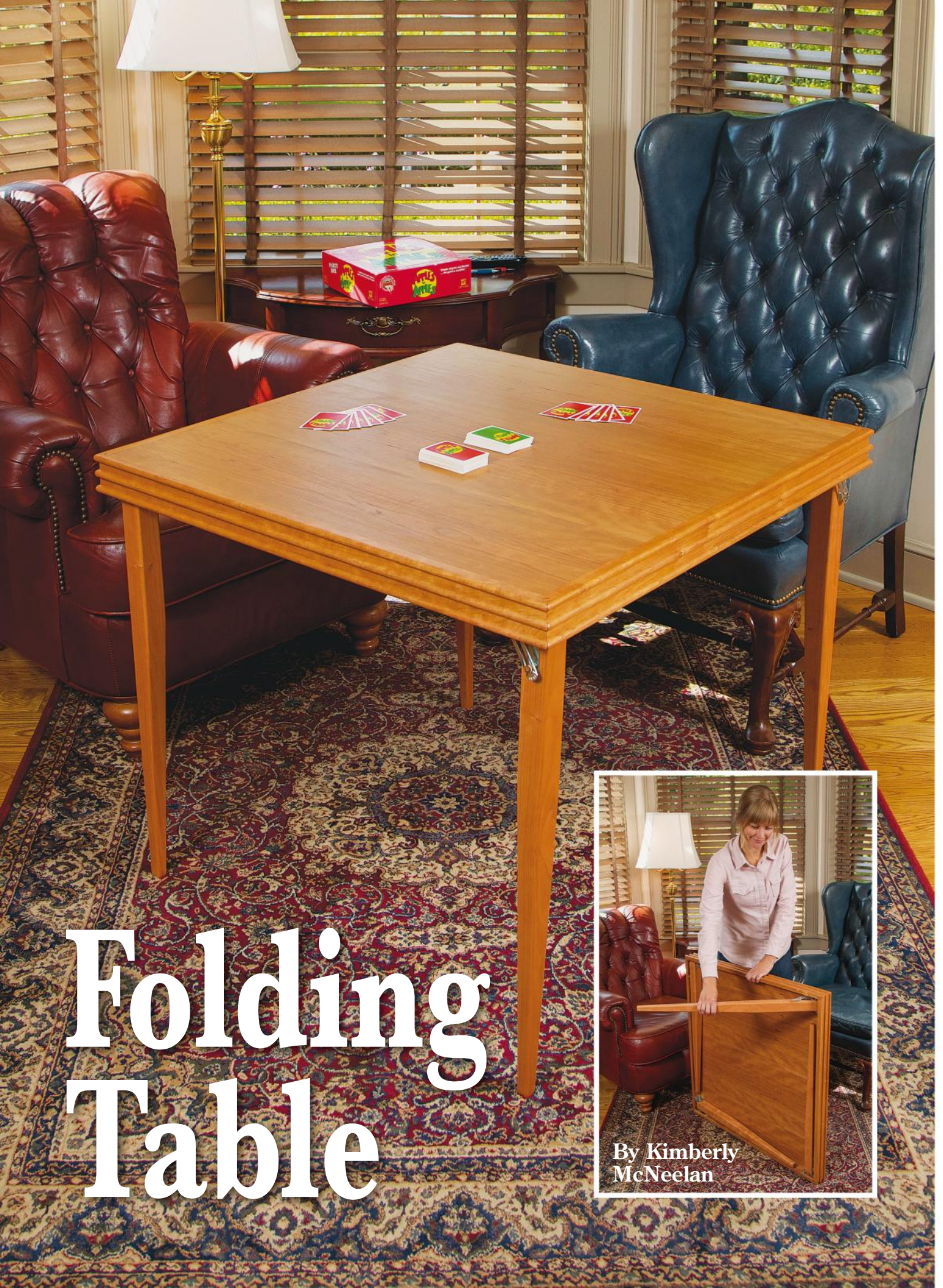
Tested to ASTM standards, this vac is durable.



WORKSHOP
WET/DRY VACS

See The full line of power vacuums at:
workshopvacs.com

With over 45 years of Wet/Dry Vac engineering and manufacturing excellence under our belts, we produce high-quality vacs, accessories and filters. We especially like to keep our woodworker's needs in mind with a full line of durable vacs equipped with large drums, incredible power, and large diameter hoses.



Folding Table



By Kimberly
McNeelan

Our easy-to-make folding table with its vintage styling is a great addition for the holidays!

Folding tables make me think of parties, games, puzzles and hobbies. Activities like these that are full of merriment and maybe some rest and relaxation usually involve card or board games on a “card table.” Not owning one, let alone a nice retro-styled folding table, I decided to design and build one!

Cherry’s warm tones conjure up cozy thoughts of entertainment shared around the table for me. So, cherry was my first choice here. To get started, I picked up some 8/4 and 5/4 solid stock and cherry veneered plywood from the local hardwood store. Then I jumped straight into milling up the stock.

Prepping Stock, Tapering the Legs

My cherry lumber was kiln dried, so I wasn’t too worried about giving it time to acclimate to my shop. Even so, since this wasn’t a rushed project, I milled the

apron and the leg stock about 1/8" over-size, then let them sit for about a week. To my surprise, a couple pieces cupped and twisted just a bit; leaving them slightly oversized once again proved to be good practice! I re-milled everything to be flat, square, and to proper thickness. I left the apron pieces overly long so that I could use them as test pieces for the mitering setup, and I kept back a 12"-long extra piece of apron sized scrap for testing my routing setups, too.

I decided to taper the legs for a couple of reasons: first, I love the look of tapered legs. Second, the taper added to the vintage card table look that I was going for. Rockler’s taper/straight-line jig makes ripping long angles like these safe and easy (see photos, above). Mark the dimensions and the taper angle on one of the legs. Check that the table saw blade is set square to the saw table. Set the leg in the jig on the table saw and make adjustments so that you will be cutting on the waste side of the marks. Once the jig is set and the leg is locked in place, rip tapers on two adjacent faces of all four legs.

Shaping the apron profiles requires precise setup. Flip the aprons to rout the top and bottom beads. Typically you insert the shank of the bit deeply in the collet. But here, the shank is only inserted 3/4" of an inch to provide clearance to create the center bead.



Crosscut the legs to length on the miter saw, but make sure you use a stop for precision. The legs need to be accurately cut for the table to sit level.



The author adjusted the tapering jig with a leg in place, according to her pencilled layout. Have the blade cut to the waste side of the layout line. After fine-tuning the setup, slide the jig forward to create the tapered rip cut, then flip and re-clamp the leg in the jig to taper an adjacent leg face.

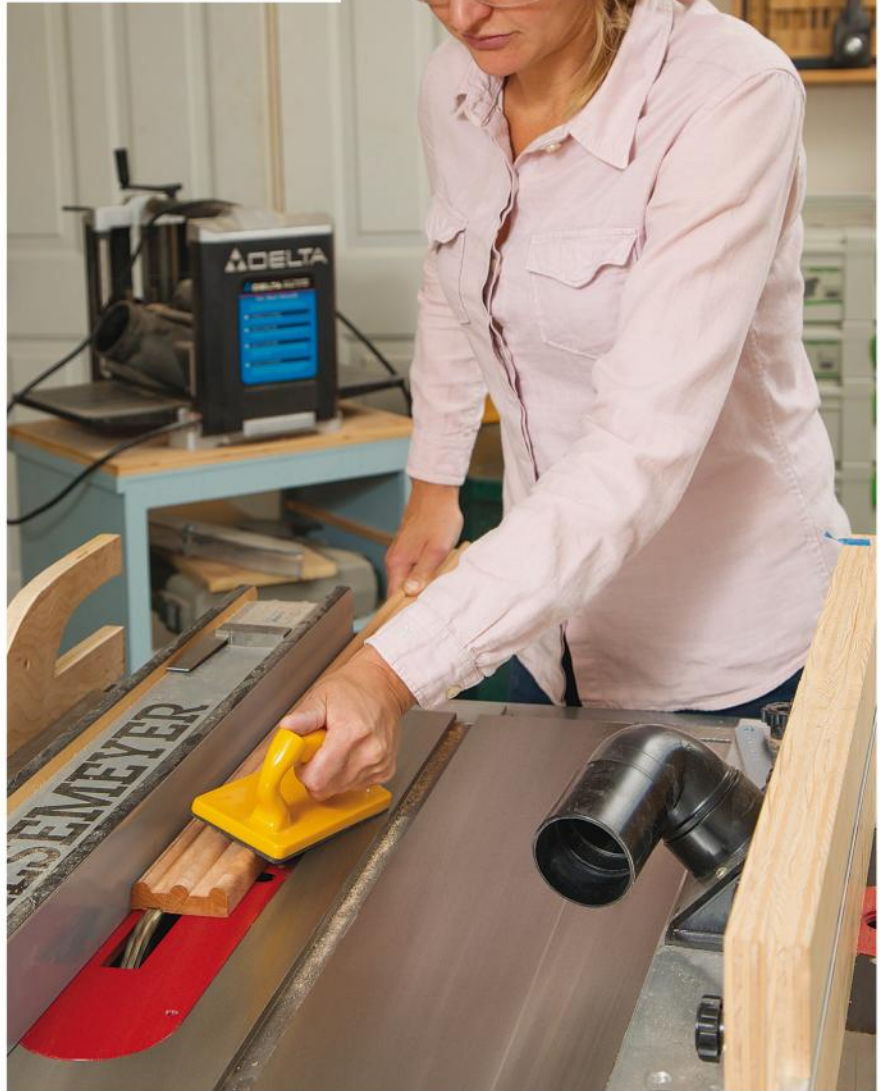




Scribe a deep line into the face veneer on the plywood before creating the rabbets, to help eliminate possible tearout — particularly on the edges where you will cut across the grain.

Profiling the Aprons

I played around with a few different styles of aprons for the table. The aprons will be glued to the plywood tabletop and the legs will be attached to them, so the aprons need to be both sturdy and attractive. Simple round-ed-over edges would look nice, but I settled on a three-beaded pattern that adds even more interest. A bullnose radius router bit and a 1/2" straight bit can create this retro looking molding. The exact bits I used are listed in the *Hard-to-Find Hardware* box on the opposite page. This is where you can put that 12" test piece to work as you check all the setups carefully before you shape the actual apron stock.



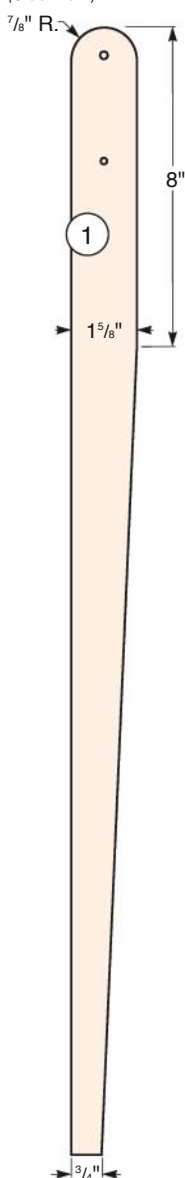
Use your test apron piece to check the fit of the groove for the plywood top before milling the actual aprons. You will want to err on the side of the solid molding sticking up a hair higher than the plywood. That way there is less chance you'll sand through the veneer on the plywood later on.

Before I got to the router table, I used a 1/2"-wide dado blade stack in the table saw to plow out most of the waste for the two grooves in the aprons. Then I set up the bullnose bit in my router. The bit height should be set so that the bit rounds over the raised section of the molding (see the *Drawings*, next page, and the photos on the previous page). Once the bit height is set, adjust

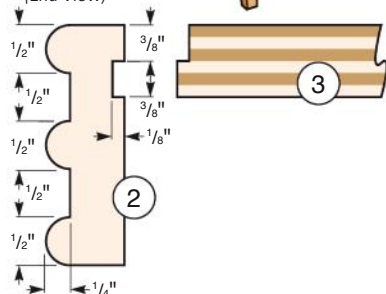
the router fence so that you are only removing about 1/16" of material at a time, creeping up to create the perfect rounded beads.

Now adjust the bullnose bit in the collet as needed so the cutters will be able to reach and shape the middle bead when the router collet is fully raised. Reset the fence so that, once again, you are only removing about 1/16" of mate-

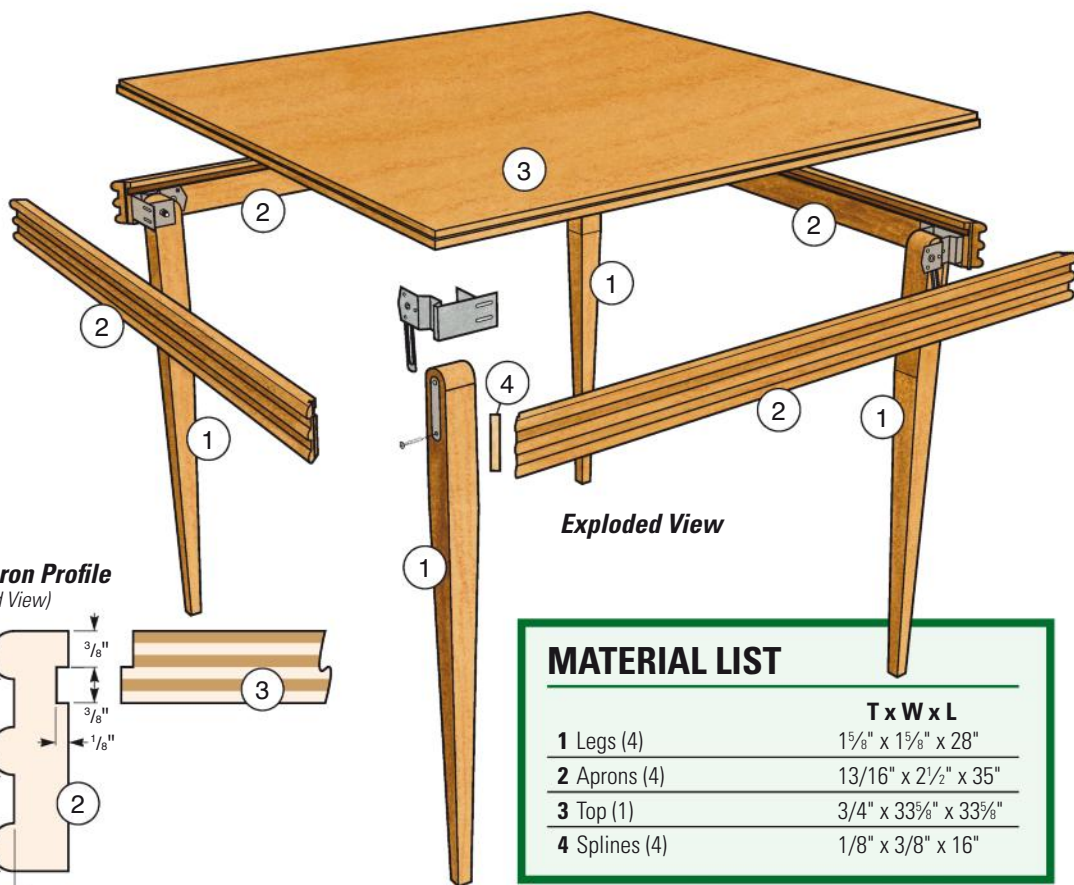
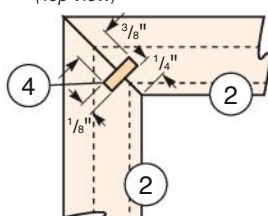
Leg (Side View)



Apron Profile (End View)



Spline Location (Top View)



MATERIAL LIST

	T x W x L
1 Legs (4)	1 5/8" x 1 5/8" x 28"
2 Aprons (4)	13/16" x 2 1/2" x 35"
3 Top (1)	3/4" x 33 5/8" x 33 5/8"
4 Splines (4)	1/8" x 3/8" x 16"

Folding Table Hard-to-Find Hardware

Card Table Leg Brackets (4) #63198 \$22.99 pr.
Taper / Straight Line Jig (1) #21597 \$89.99 ea.
Bullnose Radius Router Bit, 1/2" Shank (1) #32545 \$34.99 ea.
Straight, 2-Flute Router Bit, 1/2" Shank (1) #90550 \$16.49 ea.

To purchase these and other products online,
visit www.woodworkersjournal.com/hardware
Or, call 800-610-0883 (code WJ1577).

material at a time. Once the beads are milled, switch to a 1/2"-dia. straight bit to clean up the grooves between the beads.

The next step in making the tabletop is cutting the plywood to size. Evaluate which of its faces looks best, and mark it as the top face.

Notice in the *Drawings* above that you'll need to form a tongue on all four edges of the tabletop, and you'll do that by machining a rabbet. Use a marking gauge to score the plywood 1/8" in from its top edges. I decided to also tape a piece of paper to the top face to protect it from getting scratched while working with it. Mill the four rabbets with either a dado blade or using a handheld router and rabbeting bit.

The 1/8"-long tongues you've just formed are captured in a groove in the aprons to form sturdy, interlocking joints. So go ahead and put a 3/8"-wide dado stack in the table saw. Adjust the rip fence 3/8" away from it, and raise

the blade just slightly higher than 1/8". Test your setup on the 12" molding scrap before milling a long groove into the back face of all four aprons. (Milling these grooves slightly deeper than 1/8" allows a bit of extra depth at the bottom of the joints for excess glue to migrate when the tongues are inserted.)



If the mitered corners are not made well, gaps will be quite visible. Use a square to check that the miters meet at 90-degrees.

Mitering the Aprons

Miter joints need to be spot-on accurate to fit together well. Prepare for cutting them by first squaring your table saw miter gauge's fence to the blade and adding a long sacrificial fence. Now tilt the blade to exactly 45 degrees. Cut miters on the ends of the test piece and one apron, and fit



Cut a sample spline joint using one of the aprons and your test piece to verify the spline groove location and depth (top). Rip spline strips from solid stock; they should fit easily and fully into the grooves (left).

Apply a liberal bead of glue along the top grooves of the aprons and into the spline slots. Prop the tabletop up on spacers of some sort so that you aren't fighting to get the aprons onto the plywood as you assemble the tabletop components with a long band clamp.

them together. Check for accuracy with a square (see photo, previous page). If the joint is square, mark the length of one of the aprons and miter it to length. Test it against the plywood tabletop. If it fits properly, cut the other three aprons to length, too, checking for accuracy by fitting them into place on the tabletop. Cut and fit them one at a time.

Assembling the Top with Splines

The apron miter joints are held together with splines that fit into grooves, so we'll cut those next. Use the *Drawings* to mark a spline cut on your test molding. Tip your table saw blade to 45 degrees and adjust the blade so it will cut 3/16" into the mitered face (half the groove width). Now clamp a block to the rip fence, ahead of the blade, to serve as a "step off" for the far ends of the aprons and to help position the groove cuts.

Rip 1/8"-thick splines from a piece of 3/8" solid stock, and cut them 2 5/8" long so that you'll have a little extra length to grab onto when gluing up the aprons.

A band clamp is a great choice for gluing up the tabletop. Dry-fit the tabletop pieces first. Make sure you apply plenty of glue in the spline cuts and the apron grooves. Clamp the aprons, splines and top piece together, then carefully scrape the glue squeeze-out from the top after about 20 minutes, once the glue becomes rubbery.

Adding Leg Hardware

The metal leg brackets that allow these table legs to fold can be finicky to install



Here's the layout for the folding table leg brackets, measured from the non-tapered face.



Bore through holes for the leg bracket bolts at the drill press rather than with a handheld drill. This way, they will pass straight through and remain perpendicular so the brackets will work properly.



Chamfering the feet helps prevent scratching and snags. For even more protection, cover the feet with adhesive-backed felt pads.



The author used a 1/2"-thick piece of wood to sand effectively between the apron beads. Sand all the way up to 220-grit.



After the finish cures, apply a coat of paste wax for a bit of extra protection as well as to make the table's surfaces silky to the touch.

properly. Since the legs are tapered, be sure to orient them correctly inside the brackets so the tapers face inward. The dimensions spacing the holes from the top of the leg are correct, but these holes are drilled 13/16" from the outside, non-tapered face of the leg. It is imperative to drill the 5/32"-dia. through-bolt holes on the drill press — they must remain perpendicular as they pass through the legs or the locking mechanism may not work correctly. Go ahead and drill the 3/16"-dia. holes for the machine bolts on the drill press, too (see bottom photos, previous page).

Round the tops of the legs with a 7/8" radius on the band saw, and then sand them smooth. When that's done, soften the sharp edges of the legs using a 3/16" roundover bit chucked in a router table. Take a couple of passes so that you don't overtax the router or risk chipout. I chamfered the feet of these legs with a sanding block and added adhesive-backed felt pads so they won't snag carpeting or scratch a floor.

Well, you knew it was coming ... now it's time for sanding. I used a palm sander on the top of the table and on the faces of the legs. A little 1/2"-wide stick wrapped with sandpaper will make sanding the surfaces between the apron beads much easier. I cupped the sandpaper in my hand to sand the rounded edges of the legs and the apron beads.

Finishing with Varnish and Wax

General Finishes Arm-R-Seal in a satin sheen is a great choice for this project. I just love applying the first coat of finish and really bringing the wood's color and figure to life! I wiped on three coats of finish, allowing at least 8 hours of drying time between each coat. A little scuff-sanding with 400-grit between coats of finish kept the surfaces smooth.

After you give the finish at least 24 hours to cure, I recommend applying paste wax next. First, mush the wax into 0000 steel wool, and then wipe it on in the direction of the grain. Work in small areas so the wax won't dry before you

can buff it smooth with a clean cotton cloth. It's a simple way to make the surfaces feel velvety smooth.

Assemble and attach the leg hardware, following the instructions that come with it. Hold the legs and hardware in place on the aprons to mark where to drill pilot holes to attach the four leg assemblies to the aprons.

Now try out your new table! The chilly weather has me thinking it's time for a puzzle and some tea. Enjoy!

Kimberly McNeelan is a woodworker, artist and woodworking teacher. Follow her on Instagram at ksm_woodworker.



Use a wrench and screwdriver to attach the bracket's top bolt with the locking nut. After marking the screw hole locations on the aprons, drill their pilot holes. Be careful not to drill through the aprons — wrapping the drill bit with masking tape can serve as a simple and prudent depth stop.

High-Tech Holiday

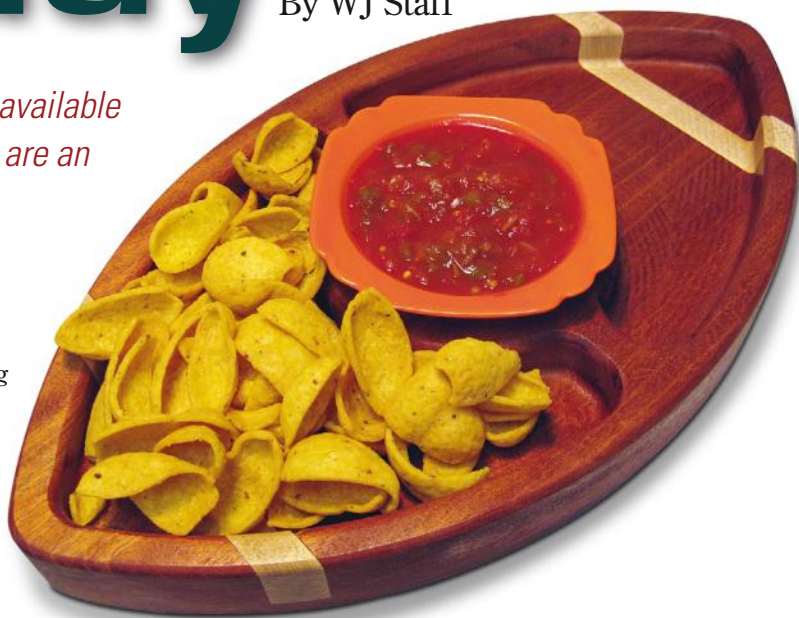
By WJ Staff

Free downloadable CNC programming is available for all of these projects online. But if you are an analog woodworker, all is not lost.

Back in the day, a woodworker would need to start building projects for the holidays in about March, cutting down the trees, slicing planks with a hand saw, curing the lumber and planing it by hand. Most of us are glad that technology has moved us forward from there. These days, thanks

Weather Station

How do you plan for the weather when your cell phone runs out of juice? This old-school weather station is just the ticket. No electricity required.



Football Snack Tray

Football is a near-religion for many Americans, and part of that tradition often involves eating tasty snacks while they watch. This snack tray will serve gridiron fans in style — whether it's regular season or playoffs!



Desk Caddy

Is it hard to find your "cheaters" when they aren't on your face? Does a favorite pen go missing when you need it most? Get organized with this desk caddy that also holds a cell phone charger.



Downloadable files and videos of these projects are available online. Please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab for a link to the special page.



Cribbage Board

You can make cribbage boards by the dozens and drill the pattern into wood pieces that are of any shape you'd like. It is a fun gift and a great game.

to CNC routing, projects that might have taken our great-grandparents months to plan and build can be tackled in a weekend or even a day with prepared lumber and digital efficiency.

If you are a fan of this sort of high-tech woodworking, here are six fun gift projects with free CNC programming you can access online. Most of the projects shown here have both .tap and .crv files available. Find them on our website at www.woodworkersjournal.com/CNCgifts.

As you well know, one of the really great aspects of CNC routing is that you can make the same project over and over again, so if you have folks on your list that you'd like to offer a "personally made gift," but the size and scope of your gift list makes that difficult, one (or all) of these projects might come to the rescue.

We also have downloadable drawings available, so if you don't have access to CNC you can make these gift projects with conventional woodworking tools instead. To top things off, we're even offering free videos covering their construction to help you decide if the projects are right for you — another good use of technology!

Epoxy "Inlaid" Coffee Table

Making excellent use of CNC capabilities, the inlay look of the top is achieved using colored epoxy flowed into grooves cut by the CNC router. The multiple legs are a snap to make with our available programming.



Modern End Table

With a nod to Mid-Century style, this project combines graceful curves with thick lumber to create a beautiful and useful end table. Made here from cherry lumber, it will fit into many different decors.



Simple Red Oak Bookcase

By Chris Marshall

Build this Arts & Crafts-inspired oak bookcase with a few power tools and standard-sized home center lumber.



Building this four-shelf bookcase doesn't require high-level skills or fancy lumber to add practical, sturdy storage to any room. In fact, if you have a circular saw, router, doweling jig and a sander, you have all the power tools you'll need. Gather three 8-ft. 1x2s and four 8-ft. 1x4s of red oak from a home center or lumberyard. Make sure the stock is as straight and flat as possible. And while you are at the store, buy a 2 x 4-ft. piece of 3/4" red oak plywood for the shelves.

Making Side Assemblies

Start by crosscutting four legs to length from 1x4s, according to the *Material List* on page 49. Be sure to make clean, square cuts with your circular saw. Then crosscut four side rails to length from another 1x4.

Measure 3" up from the bottoms of the legs to mark for the bottom edge of the bottom rails. Mark 1" in from this edge along the bottom end of the legs, and connect the marks to draw layout lines for the angled "feet" on the bottoms of the legs. Cut the feet to shape. Then miter-cut the top front corners of the front legs at a 45° angle, sizing this cut at 1 3/4" from both the leg's top end and front edge.

Next, set and clamp pairs of legs and rails together, with the rails positioned between the legs so the top rail is flush with the tops of the legs and the bot-

www.woodworkersjournal.com
MORE ON THE WEB



To follow the building process for this bookcase step-by-step, and watch a video about making a slotted routing jig, visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.

tom rail's bottom edge aligns with the angled intersection of the feet. Carefully measure between the inside edges of the rails to determine the final length of the side stiles. Crosscut four side stiles to final length from 1x2s.

You're ready to mark the ends of the rails and the inside edges of the legs for dowel joints. Plan for two 5/16"-dia. dowels per joint. Position them 1 1/4" apart, 1/2" down from the top edge of the top rail and 3/8" down from the top edge of the bottom rail. This way, the dowels will stay clear of the dados you will mill later for the shelves.

With that done, mark the inside facing edges of the rails for the side stile dowel joints. Here, the stiles will attach to the rails with a single 5/16"-dia. dowel at each end. Locate these dowels 1 3/4" in from the ends of the rails, and center each of them on the stiles.

It's always a good idea to mark the parts of an assembly to keep the orientation clear, so do that for your bookcase sides. Now bore 5/16" dowel holes in the legs, rails and stiles at your marked locations. Drill each of the dowel holes slightly deeper than half the length of your dowel pins so they will fit in the joints without bottoming out in the holes, which could prevent the joints from closing properly.



Mark the side assemblies for single dowels that connect the stiles and rails. Center the dowel joints on the stiles. Scrap blocks inserted between the stiles can help hold their spacing for marking.

Take a few minutes to sand the inside edges of the legs, rails and stiles up to 180-grit, while the part surfaces are still easy to access. Then dry-fit the two side assemblies together, with the dowels in place, to be sure the parts go together well. If they do, spread glue into the dowel holes and onto the mating surfaces of the joints for one side assembly. Insert the dowels, fit the parts together and clamp the side assembly so the joints close. Be sure to glue the stiles between the rails first, and then add the legs. Clean away any glue squeeze-out.

Repeat the process to glue up the second side assembly. When the glue dries, sand or scrape any misalignments between the joints flat. Then sand these assemblies up to 180 grit.

Adding the Shelves

Next, cut four shelves to size from 3/4" plywood. If you use a 2 x 4-ft. sheet, you'll be able to get all four shelves from one piece of plywood.



Bore dowel holes at your layout lines in the legs, rails and stiles. When drilling holes in the ends of the narrow stiles, it's helpful to clamp all four together (see inset). One of two bits must be removed from the Triton Duo Dowel Jointer, shown here, to drill single holes in the stiles and rails.



Cut the four shelves to size from a 2 x 4-ft. oak plywood "handy panel." Guide your circular saw with a clamped straightedge, or use a track if your saw has one, to ensure that these cuts are straight.

Bookcase Hard-to-Find Hardware

Rockler Undersized Plywood Router Bit Set (1) #60788 \$44.99 ea.
Red Oak Hot Melt Edge Banding, 13/16" x 25' (1) #44805 \$7.99 ea.
FastCap Quad Edge Banding Trimmer (1) 45318..... \$19.99 ea.

To purchase these and other products online,
 visit www.woodworkersjournal.com/hardware
 Or, call 800-610-0883 (code WJ1577).



One way to produce straight dados that are exactly 23/32" wide is to use a shop-made slotted jig to guide a handheld router. Here, a 1" outside-diameter guide collar (see inset) fits in the jig's 1"-wide slot to keep the machine tracking properly. An "undersized plywood" bit measuring 23/32" in diameter will match the actual thickness of today's 3/4" sheet stock.



Lay both side assemblies flat with their back edges together, and mark the back legs for the four shelf dado locations. Marking them simultaneously guarantees that the shelves will line up. Make two layout marks for each shelf, 3/4" apart, so you'll be sure to cut the dados between these lines.

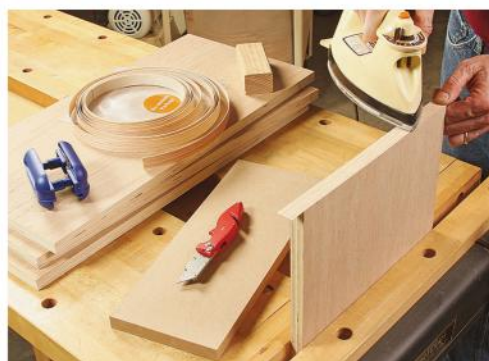
The shelf dados must stop 1" from the front edges of the front legs. So, mark a termination line at the end of each dado location to be sure you'll stop these dado cuts correctly.

Three-quarter-inch plywood is almost always 23/32" thick instead of a full 3/4", but you can buy an "underthickness" 23/32"-diameter straight bit for a router that will cut perfectly fitting dados for 3/4" plywood. It's a helpful bit to own here. I'll recommend that you make a simple slotted jig from scrap, to guide the router during dadoing. (I show how to make one in a "More on the Web" video on woodworkersjournal.com.) It has a 1"-wide slot to accommodate a 1" outside diameter guide collar, fixed to the router's base. The jig's base squares it against the bookcase side assemblies. Align and clamp the jig carefully to cut each dado. Rout the dados in three successive passes each, deepening the cut by 1/8" with each pass. Their overall

depth should be 3/8". TIP: Slip scraps between the side stiles to fill the slots between them during dadoing. This will prevent the router bit from splintering the back edges of the stiles as it passes through them.

When the dust clears, carefully chisel the stopped ends of the dados square. Make sure the plywood shelves fit fully against these squared ends and, when installed, are still flush with the back edges of the bookcase sides.

The ends of the two middle shelves will show their plywood cores in the gaps between the side stiles unless you cover them. The easy fix is to



Red oak veneer edge tape with a pre-applied adhesive will cover the plys on the ends of the two middle shelves and the backs of all four shelves. Heat the tape with a household iron to adhere it to the wood, then trim off the excess carefully.

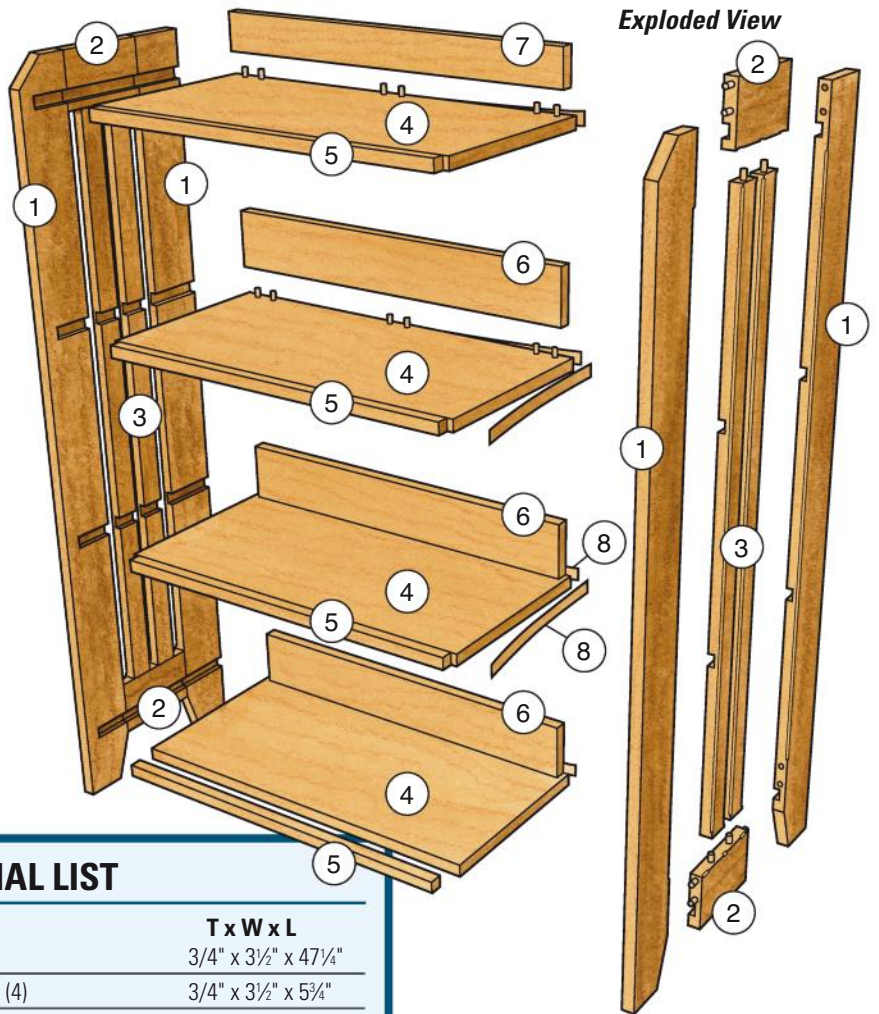
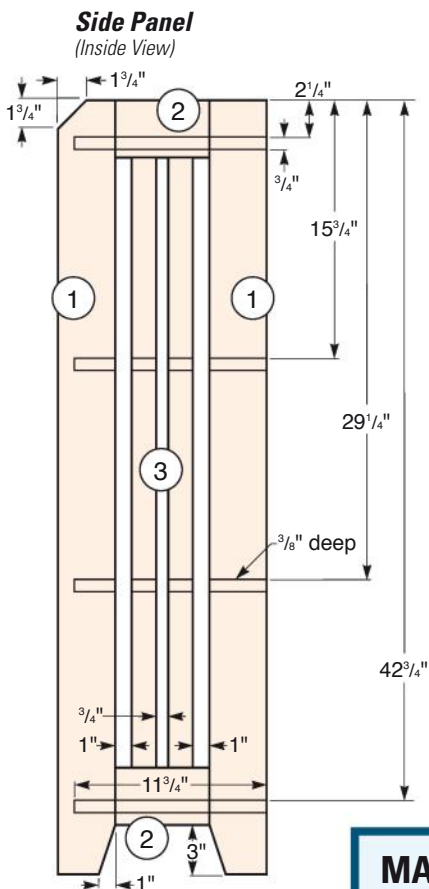
apply adhesive-backed iron-on red oak veneer edge tape to the edges of these shelves. While you're at it, apply a strip of edge tape to the back edges of all four shelves, so the edge plys won't show up on the back of the bookcase, either. Carefully trim the edges and ends of the veneer tape flush with the shelves.

Now, go ahead and dry-assemble and clamp the bookcase with the four shelves in their dados. This way, you can measure for and crosscut three lengths of 1x4 to serve as vertical backs for the bottom three shelves. Rip a fourth strip of 1x4 to 2 1/4" wide, which serves as a narrower back for the top shelf. Crosscut it to length and test-fit it, too. Dismantle the bookcase.

Sand the faces of the shelf backs and shelves up to 180 grit. Then lay out three pairs of dowel joints between the bottom edges of the shelf backs and the top faces of the shelves along their back edges. Drill these dowel holes. Be careful to adjust your dowel hole depths to avoid drilling through the shelves.

Reassemble the bookcase to make sure the shelves and shelf backs fit properly together with the dowels in place. If they do, glue and clamp the backs to the shelves — but don't glue the shelves in their dados just yet.

The front edges of the shelves are covered by strips of solid oak trim, to add durability here. Cut strips of 1x2 to fit the shelves and, if possible, rip-cut them to 3/4" x 3/4". (Alternatively, if you don't have a table saw to make these narrow rip cuts, you can glue 1x2s to the shelves first, then rip the front trim to 3/4" with your circular saw after the glue dries.) Spread glue along the front edge of each shelf, and install its trim strip with the bookcase still dry-assembled. Hold the trim strips in position with clamps or strips of wide packing or painter's tape while the glue dries.



MATERIAL LIST

	T x W x L
1 Legs (4)	3/4" x 3 1/2" x 47 1/4"
2 Side Rails (4)	3/4" x 3 1/2" x 5 3/4"
3 Side Stiles (4)	3/4" x 1 1/2" x 37 1/4"
4 Shelves (4)	3/4" x 11 3/4" x 23 3/4"
5 Front Trim (4)	3/4" x 3/4" x 23"
6 Lower Shelf Backs (3)	3/4" x 3 1/2" x 23"
7 Top Shelf Back (1)	3/4" x 2 1/4" x 23"
8 Veneer Edge Tape (1)	25' roll

Finishing Up

Take the bookcase apart and carefully plane or sand the front trim on the shelves flush with the shelf faces as needed, as well as to clean off any residual glue. Then ease

stiles where they attach to the middle two shelves; narrower, long bar clamps will fit between the stiles and pull these joints tight.

Arts & Crafts-inspired bookcases of this sort will typically be stained a dark "Mission" brown or antique walnut color. Once you've colored the wood with the stain of your choice, apply three coats of your favorite clear finish to complete this project.



With the bookcase dry-assembled, install the shelf backs on the shelves with the dowels in place to test the fit of these joints before gluing the parts together.

the sharp edges around the side assemblies with a chamfering bit in a router. Keep these chamfers small, at just 1/16" or so, to add a subtle detail. Then cut a 1/8"-wide chamfer around the inside edges of the stiles and rails — it adds a nice shadow line here and makes the sides of the bookcase look less "cookie cutter." The router bit will leave the corners of these inner chamfers rounded. So, carefully chisel the corners square. Use the same larger chamfer along the front edges of the shelves.

With that done, you can finally glue and clamp the bookcase together! Make sure the shelves seat fully in their dadoes. You may also want to clamp the



Glue strips of solid oak to the front edges of the shelves. These hide the plywood's inner plys, but they also stiffen the shelves and make their front edges more durable.

Wooden Music Stand

By Sandor Nagyszalanczy

The sleek curvy legs that support an adjustable music holder of ample size also sport a hanger that keeps a guitar, ukulele or other instrument close at hand.

I've been playing guitar since I was 12 years old, but I've never had a music stand that I really liked. The fold-up ones were too flimsy, and the big metal ones were heavy and kind of ugly. So I decided to build my own sleek music stand from wood. I wanted it to be stable and functional, yet appear more modern and curvy than traditional music stands. Hence, my design here features compound-curved legs that are both sawn and steam bent. I made the stand's music holder strong enough to support a large music book and wide enough to hold two pages of sheet music side by side. Thanks to quick-action cam clamp hardware, the holder also tilts and adjusts up and down over a small range, which should suit the majority of musicians who play while standing or sitting on a stool.

As an added bonus, I incorporated a guitar hanger — a feature I've never seen on any other music stand. The hanger accommodates all but the largest guitars as well as ukuleles and banjos. It can also be altered to hold violins, violas, mandolins and other instruments (it may also be omitted). I built my stand from ash, which makes it very light in weight: less than 7 lbs.! However, you can use any wood that steam bends well: white or red oak, cherry, walnut, beech, etc.



Cutting Out the Parts

Once you've selected the wood for your music stand, the first step before cutting begins is to use the parts diagrams shown on page 53 to make full-sized paper patterns. You can do this by either scanning and printing them using a computer, or drawing them full-size by hand using the grid of squares shown on each diagram as a guide (you only need one paper pattern for each part). The patterns for the smaller parts — the stretcher, guitar hanger, bracket arm and top spacer — can be applied directly to the stock; just be sure to plane the stock to final thickness first, following the parts list on page 53. Apply a light coat of spray adhesive, such as 3M Super 77, to the back of each pattern, then press it onto the wood. As the stand's pairs of legs and feet will be pattern routed, glue their paper patterns onto 1/4" hardboard or MDF template stock instead.

Saw out all the smaller parts as well as the leg and foot templates using a band saw or jigsaw, cutting just outside the marked lines (glue the pattern to the stretcher, but don't cut it out just yet). Carefully trim the excess back to the pattern lines using a stationary disc or belt sander for the convex edges, and a drum or oscillating spindle sander for the concave edges. When cutting out the parts for the guitar hanger, it's best to cut out and sand the upright first, glue on the two hanger prongs as rectangular blanks, then saw them to shape.

To finish the leg and foot templates, sight down each long curved edge to make sure that it's smooth and flowing, and sand out any irregularities as necessary (it's not important for the curves to perfectly match the pattern lines; close is close enough).

When choosing stock for the legs, the boards with the straightest grain will give the best results when steam bending. Use the templates to mark out the legs and feet on the stock with a soft pencil; make two pairs of parts that are mirror symmetrical. Saw the legs out, cutting just shy of your pencil lines as before. Attach the templates atop the rough cut blanks using either double-stick tape or adhesive transfer tape.

In preparation for pattern routing, chuck a flush-trim bit into your router table. You'll get the cleanest cut with a 1/2" shank piloted bit that's at least 3/4" in diameter with shear angle cutters (rather than straight ones) such as the Rockler Double Bearing Shear Flush Trim Router Bit. Set the height of the bit so that the top bearing firmly contacts the template.



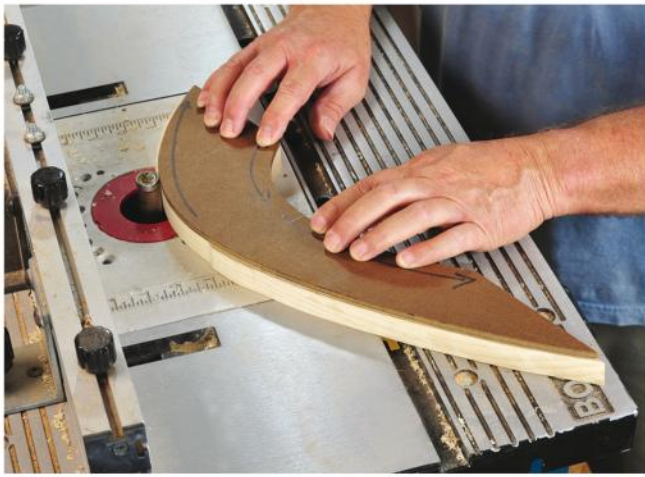
Use spray adhesive to glue the paper pattern atop a piece of 1/4" hardboard, then saw the template to rough shape, trimming it to final shape using disc and drum sanders.



Two rectangular blanks for the guitar hanger's prongs are first glued to the sides of the upright piece, then cut to shape on the band saw. Their edges are rounded and shaped with rasps and rifflers, then sanded smooth.

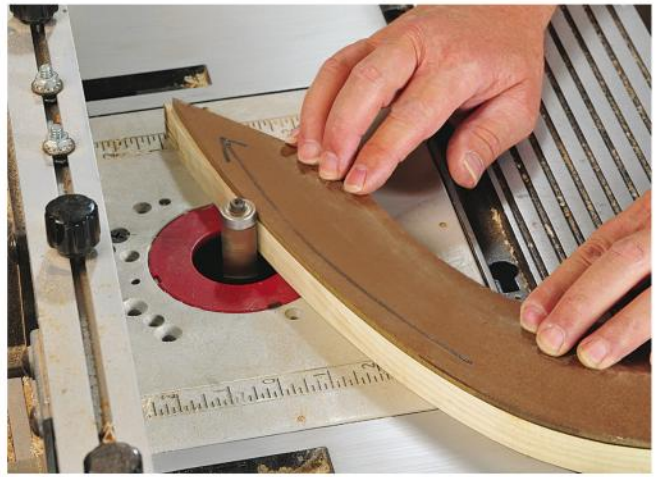


In preparation for pattern routing, the leg template shown here is temporarily attached to the rough-cut stock using adhesive transfer tape. Pounding with a mallet increases the strength of the tape's bond.



Chuck a piloted flush trim bit in a router table to trim one of the music stand's feet. This first pass routs only the parts of the foot where the wood's grain runs with or parallel to the direction of the bit's cut.

Before switching on the router, it's important to check to see how the grain of the wood runs relative to the template. For best results, *only rout the sections of leg or foot where the bit is cutting with the grain*. Cutting against it is likely to result in severe grain tearout. After those sections have been routed, the way you trim the unrouted sections depends on the type of bit you're using: For a double-bearing bit (with bearings both above and below the cutter), simply flip the part over, reset the bit's height so the bearing rides against the template and finish trimming. If your bit has a single top-mounted bearing, pry the template off and attach it to the opposite side of the part, carefully aligning the sections which have already



Before trimming the un-routed sections of the foot, remove the template and then re-affix it to the part's opposite surface. To assure correct alignment, carefully align the already-routed edges of the part to the template.

been trimmed with the template. Leave the bit at the same height and finish trimming the unrouted sections. Repeat this process for both legs and both feet.

Machining the Legs

Before the stand's legs are ready for steam bending, you need to rout the lap joint that attaches the legs to the feet as well as the slot that the music holder mounts to. Start by temporarily clamping one of the legs to the inside surface of its corresponding foot, positioning it as shown in the *Drawing*. Prop this assembly atop a flat workbench and position a long rule (or a straight stick) square to the benchtop with one edge



With a leg and foot clamped together and set on a flat table (left), position a sheet rock square against the back edge of the foot and use a rule to confirm the alignment of the leg. The distance to the top of the leg should be 6 1/4"; if it's not, the angle of the leg can be tweaked slightly. Scribe the edge of the leg's lap joint with a sharp knife (top), before routing the joint to a depth of 1/4" using a straight bit in a router (above), then trimming it with a chisel.

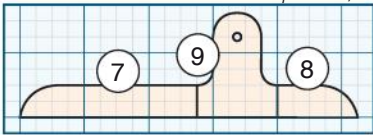
flush with the rear end of the foot. The distance between the rule/stick and the top of the leg should be 6 1/4". If it's not, shift the end of the leg back or forth as necessary. Using first a pencil, then a sharp knife, scribe a line onto the leg where it overlaps the foot. Use a router fitted with a straight bit to rout away the lapping section of the leg to a depth of 1/4", working from the bottom end towards the scribed line. Rout as close to the line as you dare, then finish trimming with a sharp chisel or a gouge with a low sweep number (#2 or #3). The trimmed edge should be nice and square relative to the face of the leg.

To assure that the music holder mounting slots are properly aligned on both legs, you'll first rout a slot into the leg template that will be used to guide a router fitted with a guide bushing

Music Holder Bracket

(Gridded Drawing)

Each square = 1/2"

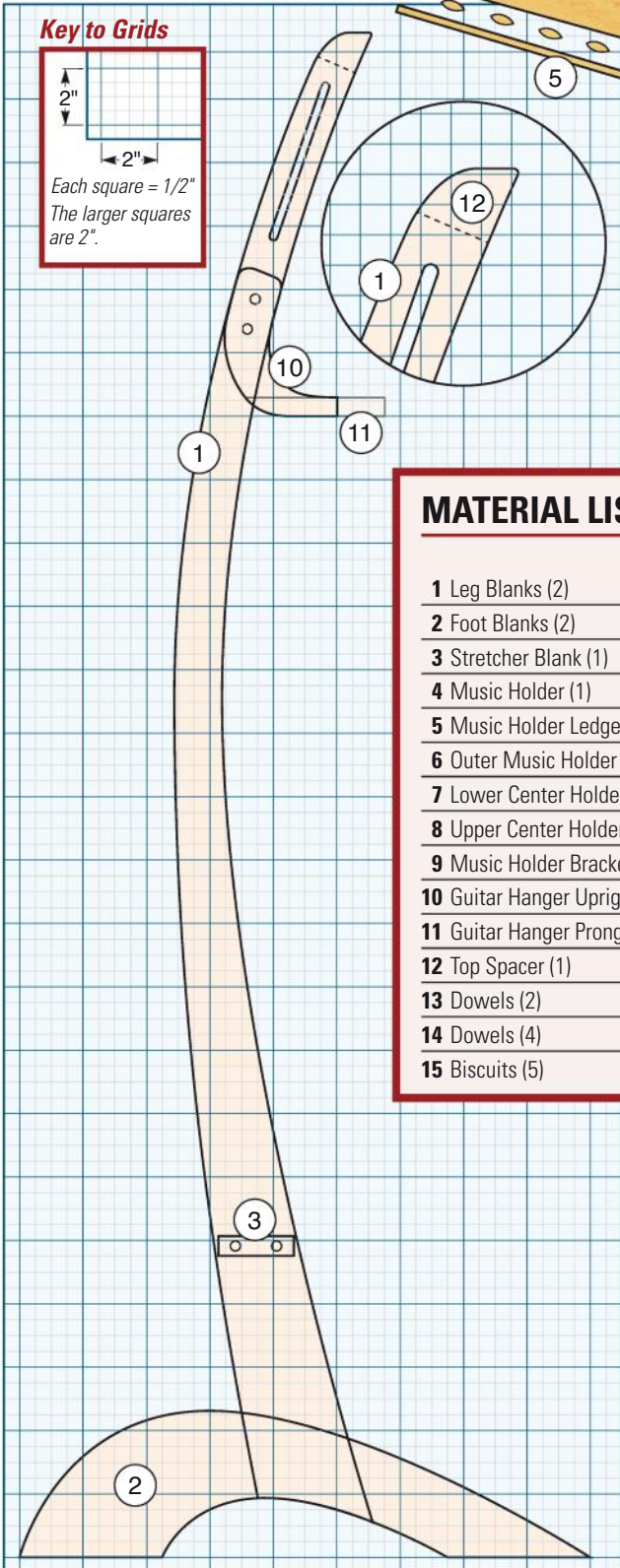
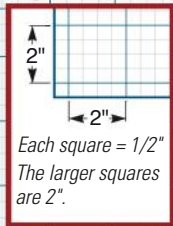


Music Stand

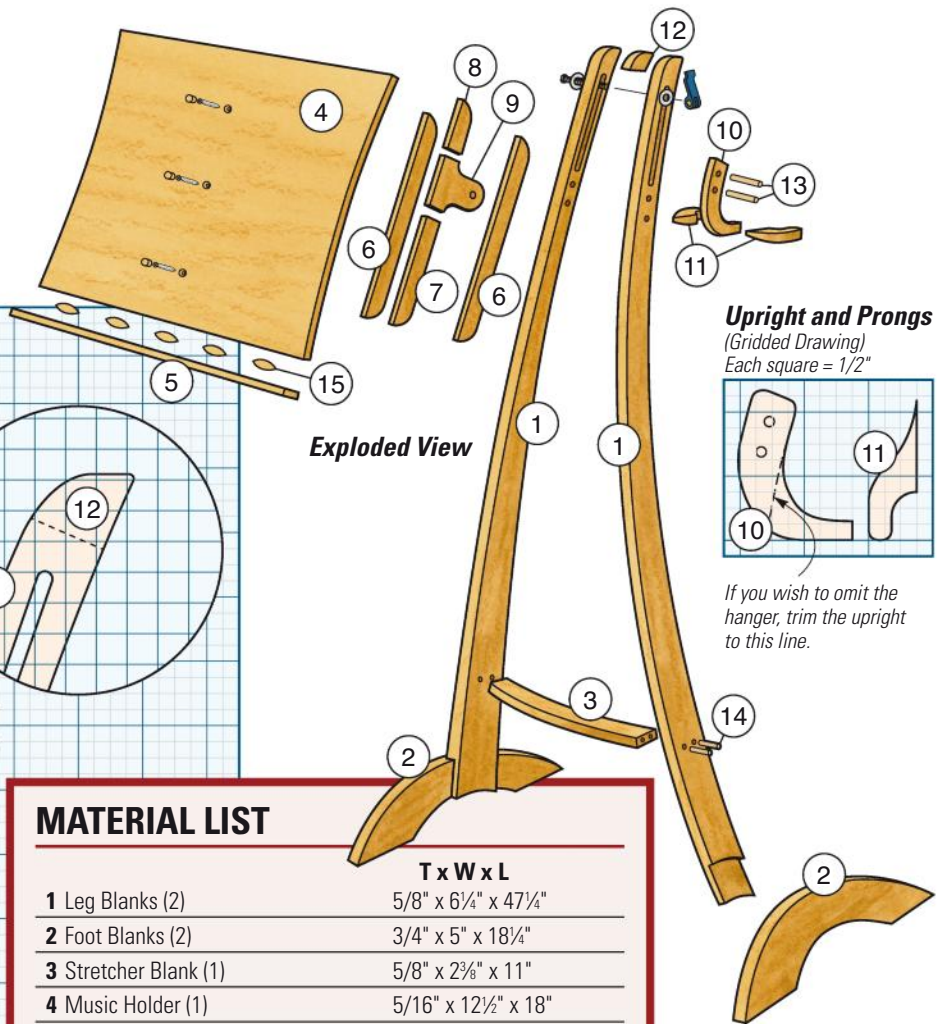
(Gridded Drawing)

Each square = 1/2"

Key to Grids



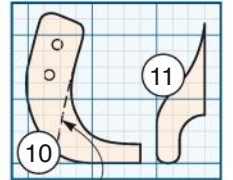
Exploded View



Upright and Prongs

(Gridded Drawing)

Each square = 1/2"



If you wish to omit the hanger, trim the upright to this line.

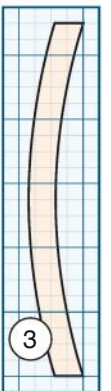
MATERIAL LIST

	T x W x L
1 Leg Blanks (2)	5/8" x 6 1/4" x 47 1/4"
2 Foot Blanks (2)	3/4" x 5" x 18 1/4"
3 Stretcher Blank (1)	5/8" x 2 3/8" x 11"
4 Music Holder (1)	5/16" x 12 1/2" x 18"
5 Music Holder Ledge (1)	5/16" x 2" x 18"
6 Outer Music Holder Brackets (2)	5/16" x 1" x 10 1/2"
7 Lower Center Holder Bracket (1)	3/8" x 1" x 5 1/2"
8 Upper Center Holder Bracket (1)	3/8" x 1" x 2 1/2"
9 Music Holder Bracket Arm (1)	3/8" x 2 1/2" x 3 1/4"
10 Guitar Hanger Upright (1)	25/64" x 3 1/2" x 4 5/8"
11 Guitar Hanger Prongs (2)	9/16" x 1 1/2" x 4 3/8"
12 Top Spacer (1)	25/64" x 1 5/16" x 1 5/16"
13 Dowels (2)	5/16" x 2 1/4"
14 Dowels (4)	5/16" x 1 1/2"
15 Biscuits (5)	#0

Stretcher

(Gridded Drawing)

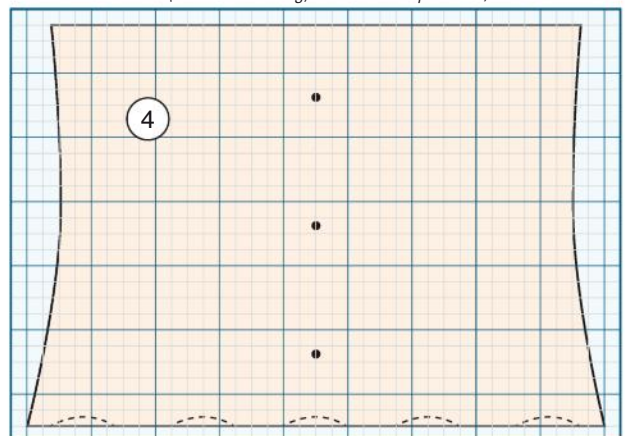
Each square = 1/2"



Music Holder

(Gridded Drawing)

Each square = 1/2"





Use two scraps of 1/2" ply to guide a bushing-fitted router to create a 3/8"-wide guide slot at the top of the leg template. The scraps are positioned parallel to one another and 1/2" apart — the O.D. of the guide bushing.



A 3/8" O.D. guide bushing guides the router in the template guide slot as a 1/4" slot is routed. This slot accommodates the bolt and cam lock that support and allow adjustment of the stand's music holder.

and straight bit to rout the actual leg slots. To rout the template slot, clamp two straight-edged pieces of 1/2" plywood atop the leg template, setting them exactly 1/2" apart and parallel to each other. Then use a plunge router fitted with a 1/2" O.D. guide bushing and a 3/8" straight bit to rout a slot that's centered, widthwise: it's 5 3/8" long and begins 1 1/16" from the top end of the template. Then, attach the template to the leg (using double-stick or adhesive transfer tape) and rout a through slot with a 1/4" straight bit (preferably with fluted cutters) and a 3/8" O.D. guide bushing mounted to the router's subbase. It's best to rout the slot in several passes, increasing the bit's cutting depth each time. Scrap boards clamped on either side of the template/leg assembly will help to keep the router steady as you work.

The final machining step is to round just the front-facing edges of both legs using a 1/4" radius piloted roundover bit. When routing the inner-facing edge of each leg, stop the cut about 9 3/4" short of the top. Now is also a good time to round the upper, outer-facing edge of both feet, using a 1/2" radius roundover bit.

Steam Bending the Legs

Bending the stand's legs in their flat dimension gives them their sinuous shape, which curves in two dimensions. In preparation for bending, build the form onto which the heated legs are clamped after steaming, so that they'll retain their shape as they cool. You can make this form out of just about any 1/2" or 3/4" scrap plywood or MDF you have lying around. You'll need at least six form segments, cut to the shape shown in the *Drawing* on page 55 (if you run low on stock, the outer two can be shorter on the skinny end). Nail or screw the segments together with a couple of 3/4"-thick spacer strips between until the form is at least 6 1/2" wide. (A form this wide is needed since the legs are wide in their non-bent direction, and one leg must be clamped in one direction on the form, the other in the opposite direction.) Nail/screw the assembled form to a 1/2" ply baseplate, with a piece of 1/2" ply screwed on top, flush to the skinny end of the form segments.

To perform the actual steam bending, you'll need a source of steam, a sealable steam box big enough to accommodate

Steam Bending the Legs



Before steaming begins, build a bending form from scraps of 1/2"- or 3/4"-thick plywood. Nail 3/4"-thick spacers between the sawn segments to make the form 6 1/2" wide, then nail the assembly to a plywood baseplate.



A steam generator supplies steam to a 4-ft.-long plywood steam box. Steam each of the stand's ash legs for 45 minutes before quickly removing them and clamping to the form. Wear oven mitts to protect from burns.

the legs and a hose to connect them together. Rockler sells a kit that includes all the essential equipment, save the steam box, which you build yourself. A thermometer, like the kind used for checking meat while cooking, is also needed (you can watch my entire steam bending process in my More on the Web video for this article).

If the wood used for the legs has been kiln dried, it's best to soak them in water for about 24 hours before steaming. Once the steam is flowing, wait until the temperature inside the steam box is around 212° Fahrenheit before you put the leg into the box and seal it. Leave it in for about 45 minutes, then be sure to wear oven mitts or heat-protective gloves when you open the box to remove the leg. Quickly place it on the bending form and use a large quick-action clamp to bow it down in the center. Apply as many clamps as necessary until the leg is in firm contact with the entire form. Let the leg cool at least for a few hours before removing it. Repeat this process on the other leg; just make sure to bend it in the opposite direction on the form, so you end up with a mirrored pair.

Joining the Stretcher

The next step is to trim and shape the music stand's curved stretcher, then join it to the legs. First, clamp the legs to their respective feet, then clamp the top of the legs together with the guitar hanger and top spacer set in place, but not glued. Set the assembly atop a flat, level workbench, spread the feet so that they're 18" apart (outside measurement) and parallel, then clamp them down onto the benchtop. Using a sliding bevel set on a spacer block, check the angle of the inside of one of the legs at 9½" above the benchtop (the bottom surface of the stretcher). Use the bevel to set the tilt of the blade on your table saw (or miter saw) and trim one end of the stretcher. Measure the angle of the other leg and reset the saw blade tilt, then measure the distance between the two legs



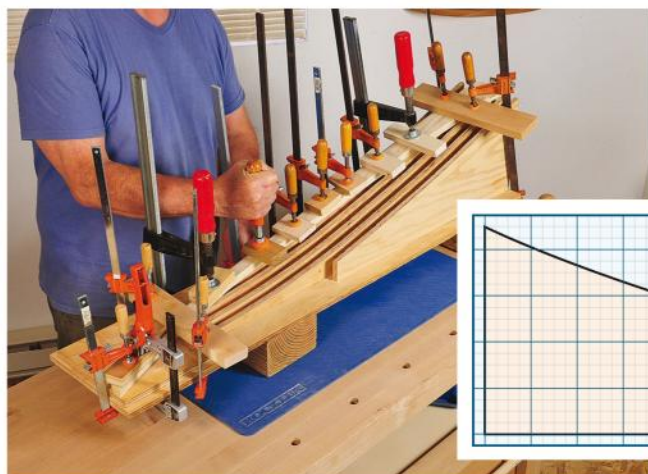
A sliding bevel measures the angle of the bent legs (above) which is used to trim the ends of the stretcher. A cordless drill, leveled and taped on spacer blocks (right) drills two 5/16" holes for dowels that join the curved stretcher to the legs.



at the stretcher height. Trim the other end of the stretcher, cutting it to its final length.

Now you can saw out the stretcher's curved shape, following the pattern you glued on earlier. Round all long edges with a 1/4"-radius roundover bit, and sand the stretcher smooth.

Use a cordless drill to bore holes for the four 5/16"-dia. dowels that join the stretcher to the legs. To prepare for this operation, chuck up a 5/16" brad point bit, set the drill on the bench and use a small level to see if the bit is parallel to the benchtop. If it's not, tape a wedge to the underside of the drill's battery. Now use as many spacers (scraps of plywood, Masonite, cardboard, etc.) as it takes to elevate the drill until



Clamp the steamed legs atop the bending form while still hot, thus conforming them to the curved shape. Flip the second leg over before clamping to the form so that it will curve in the opposite direction.

MORE ON THE WEB



For a detailed look at the process used to steam bend the music stand's legs, see the video. Please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.

Bending Form (Gridded Drawing)

Each square = 1/2"



The drawing above shows the shape of one of the 36¼"-long, 9"-high segments that make up the bending form. You'll need to cut out seven of these to properly build the form.



A guide block, made on the drill press by drilling two 5/16" holes 1" apart into scrap block, guides a cordless drill's bit as it bores holes for dowels through both legs and the guitar hanger upright.

the center of the bit is $9\frac{13}{16}$ " high. Clamp the stretcher in position between the legs atop a sturdy box or blocks and clamp it to the benchtop. Working slowly and carefully, drill two $1\frac{1}{2}$ "-deep holes through the legs, into each end of the stretcher. Drive a couple of dowels (sanded to be slightly undersized) into these holes to keep the stretcher in place, but don't glue them in just yet.

Next, you'll drill a pair of holes for the 5/16" dowel holes that join the guitar hanger to the legs. Unclamp only the stretcher and feet from the benchtop then set the stand on the floor. At the drill press, make a drilling guide out of a $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x 3" scrap wood block by boring a pair of 5/16" holes spaced 1" apart. After confirming that the guitar hanger is in exactly the right position, clamp the drill guide to the leg with the holes positioned as shown on the drawing page 53. Clamp a scrap block to the leg opposite the holes (to prevent tearout from the emerging bit), then bore through both legs and the hanger (see photo, above).



Use a section of the concave side of the leg template to shape both curved side edges of the music holder. The pattern routing process is the same process used earlier to trim the legs and feet to shape.

Making the Music Holder

The music holder, ledge and bracket sides are all made from stock that's been resawn and/or planed down to 5/16" thickness. Unless you have some really wide stock, glue up enough stock to make the $12\frac{1}{2}$ "-wide music holder. Rough cut the ends of the holder to shape, then use a section of the leg template (adhered as before) to pattern-route the curves. Next, cut the ledge to size, then saw a $1\frac{1}{4}$ "-radius curve into both outer-facing ends. Sand the holder and ledge smooth. To form a strong joint between these parts, plunge-cut five evenly spaced slots for #0 biscuits into both parts, and glue them together. Drill three countersunk holes for #6 screws through the face of the music holder, positioned as shown in the *Drawing*, for the screws that attach the music holder to the bracket.



Use a biscuit joiner to plunge cut slots for the five #0 biscuits that reinforce the joint between the music stand's music holder and ledge. Three countersunk holes in the holder will be used to join the holder to its bracket.

To make the music holder bracket, first put a 1"-radius roundover on the outer ends of the bracket sides and spacers. Glue them together with the bracket arm, as shown in the top photo, next page, then rout the outer edges with a $1\frac{1}{4}$ "-radius roundover bit (don't rout the bracket arm).

Final Assembly

Before gluing the stand together, make sure that all parts are sanded smooth. Bevel the bottom edges of both feet by running them over a jointer with its fence set at a 105° angle — just make sure to keep the non-rounded-edge side of each foot against the fence. Now glue the legs to the feet at the lap joints, making sure to keep the legs properly positioned during clamping. Once these joints are dry, scrape off the excess glue. Glue the top spacer in place on only one of the legs and let it dry. Working atop your bench again, dry clamp the legs together as before, with the guitar hanger in place, but not glued. Position the stretcher and glue in $1\frac{1}{2}$ "-long, 5/16"-dia. dowels into all four holes. Apply a clamp, if necessary, to make sure the joint is snug. Once dry, trim the protruding ends of the dowels and sand these areas smooth.

With the music stand on the floor, remove all clamps from the top of the legs and apply glue to the top spacer and guitar hanger upright. Clamp the legs together again, making sure that everything is properly aligned. Glue in the two $2\frac{1}{4}$ "-long 5/16" dowels that secure the guitar hanger, and clamp

everything tight. Do one final check by setting a try square horizontally against the back edges of the legs, to make sure they're square to one another, before leaving the assembly to dry. Trim and sand both ends of the hanger dowels, then sand the tops of the legs and spacer so that they're all flush and smooth. Using a rasp or rifflers and sandpaper, round the top of the inner curve on the guitar holder's prongs so that they cradle the headstock of your instrument and prevent it from accidentally sliding off.

Press the music holder bracket into its slot and check the fit; if it's too tight, plane or sand it until it slides smoothly. If it's too loose (or the holder won't stay locked), stick a disc cut from 180 PSA sandpaper to the bracket arm centered on the bolt hole. Fit the $2\frac{1}{2}$ " x $1/4$ "-20 bolt and cam clamp that lock the bracket into position (see the photo inset, right), then center the music holder on the bracket and clamp them together. Check to make sure the holder's ledge is level and tweak its



After cutting the bracket arm to shape, glue and clamp the five bracket pieces together (above). A $1/4$ " bolt set through the leg slots and bracket hole secures the music holder via a cam clamp (right).



angle slightly, if necessary. Then, drill pilot holes through the countersunk holes you drilled earlier and drive three #6 x 1" screws to secure the holder to its bracket.

You can finish the music stand with whatever finish you prefer; I applied a Danish oil to mine, which made the ash I built it from look darker and richer. Best of all, my finished music stand harmonizes beautifully with the décor of my music room; now that's something to sing about.



Sandor Nagyszalanczy is a professional furniture designer/craftsman with more than 35 years of experience. He is the author and photographer of more than a dozen books on woodworking, tools and design.

Music Stand Hard-to-Find Hardware

Double Bearing Shear Flush Trim Router Bit (1) #27867 \$42.99 ea.
Steam Bending Kit (1) #42826 \$79.99 ea.
 $1/4$ "-20 Cam Clamp (1) #58244 \$9.99 pr.

To purchase these and other products online,
 visit www.woodworkersjournal.com/hardware
 Or, call 800-610-0883 (code WJ1577).

INTRODUCING



Mk IV

Our newest woodworker's saws are the strongest ever made. Designed to provide up to six times the tension of a traditional saw in order to give you the ultimate control.

WWW.KNEWCONCEPTS.COM

HOWARD



Finish Fixer

Semi-Hard Putty Sticks

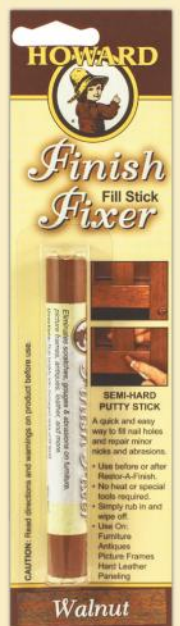
A quick and easy way to fill nail holes and repair minor nicks and abrasions.

- May be used before or after Restor-A-Finish when used on a wood finish
- Great for fixing Furniture, Antiques, Paneling, Veneer, Vinyl, Hard Leather, etc.
- Simply rub in, scrape excess and buff smooth, no heat or special tools required
- Available in 7 fade-resistant, non-bleeding, permanent colors that can be mixed

Before



After



Visit Our Website www.HowardProducts.com
 Or Call 800-266-9545
 To Find A Dealer In Your Area



QUALITY TOOLS AT RIDICULOUSLY LOW PRICES

800+ Stores Nationwide • HarborFreight.com

CENTRAL MACHINERY ✂️ **SUPER COUPON**

16" VARIABLE SPEED SCROLL SAW
Customer Rating: ★★★★★

SAVE \$79

\$699.99

ITEM 62519/63283
93012 shown ~~\$999~~ Compare \$149



CENTRAL PNEUMATIC  **SUPER COUPON**

18 GAUGE, 2-IN-1 NAILER/STAPLER

WE CARRY A FULL LINE OF NAILS

SAVE 77%

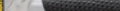
Customer Rating
★★★★★



\$15.99
~~\$22.99~~

Compare **\$69.98**

ITEM 63156/68019 shown


85235316



SUPER COUPON

FREE

WITH ANY PURCHASE

3-1/2" SUPER BRIGHT NINE LED ALUMINUM FLASHLIGHT



\$4.97

VALUE

ITEM 69111
63599/62522/62573
63875/63884/63886
63888/69052 shown



70468215

LIMIT 1 - Cannot be used with other discount, coupon or prior purchase. Coupon good at our stores, HomeDepot.com or by calling 800-423-2587. Offer good while supplies last. Shipping & Handling charges may apply if not picked up in-store. Non-transferable. Original coupon must be presented. Valid through 3/2/18. Limit one FREE GIFT coupon per customer per day.

SCISSORS

SUPER COUPON

20%

OFF

ANY
SINGLE
ITEM

70467225

LIMIT 1 coupon per customer per day. Save 20% on any 1 item purchased. *Cannot be used with other discounts, coupons or any of the following items or brands: Inside Track Club membership, Extended Service Plus, gift card, open box items, 5-day Parking Lot Sale items, computer sale, new jobs, new auto, storage solutions, shorts or socks, Volvo, Versace, western apparel, flower, cobra, cowboy, daphne, larkspoke, hercules, jasper, jeans, jacket, jordan, kimberly, kipling, ylang, white, zorch. Not valid on prior purchases. Non-transferable. Original coupon must be presented. Valid through 3/31/98.

U.S. GENERAL SAVING SINCE 1938 **SCISSOR** SUPER COUPON

56" x 11 DRAWER INDUSTRIAL QUALITY ROLLER CABINET

SAVE \$2845

Customer Rating
★★★★★

\$649.99

\$749.99

\$3495

Compare **\$3495**

- 25,363 cu. in. of storage
- 3458 lb. capacity
- Weighs 400 lbs.

ITEM 69395/67681 down

856509770

CHICAGO an **ELECTRIC**
POWER TOOLS

CUSTOMER RATING
★★★★★

SAVE \$94

10" SLIDING COMPOUND MITER SAW

- Powerful 15 amp motor

Blade sold separately

\$84.99

~~\$114.99~~

ITEM 61971/61972/98199 shown

Compare **\$179**




**CENTRAL
MACHINERY**


SUPER COUPON

**10", 12 SPEED
BENCHTOP
DRILL PRESS**

Customer Rating

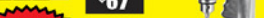

**SAVE
\$67**



\$10999

Compare
\$177.59 ~~\$12999~~

ITEM 63471/60237 shown



86663596

PREDATOR.

NEW

2000 WATT SUPER QUIET INVERTER GENERATOR

SAVE \$569

Customer Rating

\$429.99

~~**\$499.99**~~

ITEM 62523 Compare **\$999**

86814391

CENTRAL PNEUMATIC  **SUPER COUPON**

3/8" x 25 FT. RETRACTABLE AIR HOSE REEL

Customer Rating


SAVE \$100

\$39⁹⁹

ITEM 69266
 69234 down **~~\$49⁹⁹~~** Compare **\$139.99**



PITTSBURGH  **SUPER COUPON**

12" RATCHET BAR CLAMP/SPREADER



SAVE 80%

\$2.99

~~**\$3.99**~~ Compare **\$14.97**

ITEM 46807/68975/62123/63017/69222 *shown*



87108955

HERCULES BEATS DEWALT  **SUPER COUPON**
 Customer Rating:  **5.0/5.0**

20 VOLT LITHIUM CORDLESS
1/2" COMPACT DRILL/DRIVER

- 576 in. lbs. of torque
- 2.5 amp hour battery
- Weighs 3.6 lbs.



\$99.99 **NEW**

\$109.99 **SAVE \$79**

Compare **\$179** ITEM 63381


 87272397



SUPER COUPON

DUST AND PARTICLE MASK

5 PACK

SAVE
60%

99¢

Compare
\$2.48 ~~\$4.95~~



ITEM 62606/63723/50027 shows



87273820

✂ SUPER COUPON

SAVE 50%

**TWO TIER
COLLAPSIBLE
EASY-STORE
STEP LADDER**

Customer Rating
★★★★★

\$19.99

ITEM 67514

• 225 lb.
capacity

~~\$29.99~~ Compare at \$39.99

87279166


**CENTRAL
MACHINERY**


SUPER COUPON

**2 HP, 5 MICRON
INDUSTRIAL
DUST COLLECTOR**

Customer Rating

★★★★★

- 70 gallon capacity

\$169.99

Compare

\$384.99

**SAVE
\$215**

\$109.99

ITEM 61790, 97869 down





87281267

WINDSOR DESIGN  **✂ SUPER COUPON**

**60" HARDWOOD WORKBENCH
WITH 4 DRAWER**

Customer Rating
    

**SAVE
\$265**

Tools sold separately.

Compare
\$395 **\$159.99**

ITEM 93454/69054/63395/62603 shown


872833397

drillmaster  SUPER COUPON

80 PIECE ROTARY TOOL KIT

SAVE 61%



~~\$999~~ Compare **\$17.99**

ITEM 63292/63235/68986/69451/97826 shown


87460046

PITTSBURGH  **SUPER COUPON**

SAVE 57%

50" CLAMP AND CUT EDGE GUIDE

Customer Rating 



~~\$149.99~~

~~\$229.99~~

Tools sold separately: ITEM 66581 Compare **\$34.99**



Lifetime
CARBIDE

✂️ SUPER COUPON

Customer Rating
★★★★★

**ALUMINUM OXIDE
SANDING SPONGES
PACK OF 10**

COARSE
ITEM #46751
63918

MEDIUM
ITEM #46752
63915

FINE
ITEM #46753
63912

YOUR CHOICE
~~\$4.99~~ **\$3.99**

HARDY  SUPER COUPON

MECHANIC'S GLOVES

SIZE	ITEM
MED	62434/62426
LG	62433/62428
X-LG	62432/62429

SAVE 75%

YOUR CHOICE
\$3.99
~~\$5.98~~

Customer Rating


Compare **\$16.12**



Item # 62425 shown


 89315928

Lynxx ✂️ SUPER COUPON

40 VOLT LITHIUM CORDLESS

BRUSHLESS BLOWER

Customer Rating
★★★★★

NEW



Compare \$149 **ITEM 63284**

\$119.99

89487675

CENTRAL MACHINERY **SCISSOR SUPER COUPON**

4" x 36" BELT/6" DISC SANDER
Customer Rating ★★★★★
• Powerful 3/4 HP motor

SAVE 35%

\$599
Compare \$799 \$92.59
ITEM 62502/97181 shown

80487765

LIMIT 4 - Coupon valid through 3/2/18*

SAVE 65%

7 FT. 4" x 9 FT. 6" ALL PURPOSE WEATHER RESISTANT TARP
Customer Rating ★★★★★

\$299
Compare \$8.58 \$499
ITEM 69249/69115/69137/69129/69121/877 shown

90806464

LIMIT 8 - Coupon valid through 3/2/18*

Bauer **SCISSOR SUPER COUPON**

NEW 15 AMP, 12-1/2" PORTABLE THICKNESS PLANNER
Customer Rating ★★★★★

\$2499
Compare \$2899
ITEM 63445

90874070

LIMIT 3 - Coupon valid through 3/2/18*

CENTRAL PNEUMATIC **SCISSOR SUPER COUPON**

3 GALLON, 100 PSI OIL-FREE AIR COMPRESSORS
A. HOT DOG
ITEM 69269/97080 shown
B. PANCAKE
ITEM 60637/61615
95275 shown

YOUR CHOICE \$399
Compare \$98.62

90937022

LIMIT 5 - Coupon valid through 3/2/18*

CENTRAL MACHINERY **SCISSOR SUPER COUPON**

350 LB. CAPACITY FOLDABLE SAW HORSE
Customer Rating ★★★★★

SAVE 49%

\$899
Compare \$1329 \$17.97
ITEM 60710/61979/69446 shown

90993480

LIMIT 8 - Coupon valid through 3/2/18*

PREDATOR **SCISSOR SUPER COUPON**

6.5 HP (212 CC) OHV HORIZONTAL SHAFT GAS ENGINE
Customer Rating ★★★★★

SAVE \$230

\$999
Compare \$1199 \$329.99
ITEM 60363/69730
ITEM 69727 shown
CALIFORNIA ONLY
ITEM 62915/60600 shown

91047363

LIMIT 3 - Coupon valid through 3/2/18*

SCISSOR SUPER COUPON

FOLDABLE EAR MUFFS
Customer Rating ★★★★★

SAVE 50%

\$499
Compare \$600 \$9.99
ITEM 94334

91357639

LIMIT 3 - Coupon valid through 3/2/18*

KRAUSE & BECKER **SCISSOR SUPER COUPON**

AIRLESS PAINT SPRAYER KIT
Customer Rating ★★★★★

SAVE \$124

\$7499
Compare \$2199 \$299
ITEM 62915/60600 shown

91358704

LIMIT 4 - Coupon valid through 3/2/18*

PITTSBURGH **SCISSOR SUPER COUPON**

***1 SELLING JACKS IN AMERICA**
Customer Rating ★★★★★

RAPID PUMP® 1.5 TON ALUMINUM RACING JACK
• 3-1/2 Pumps Lifts Most Vehicles
• Lifts from 3-1/2" to 14-1/8"
• Lightweight 34 lbs.

SAVE \$50

\$599
Compare \$109.99 \$799
ITEM 68053/62160/62496/62516/60569 shown

91358932

LIMIT 3 - Coupon valid through 3/2/18*

HaulMaster **SCISSOR SUPER COUPON**

1000 lb. capacity MOVER'S DOLLY
Customer Rating ★★★★★

SAVE 59%

\$799
Compare \$1099 \$19.97
ITEM 61899/62399/63095/63096
63098/63097/93888 shown

91359220

LIMIT 6 - Coupon valid through 3/2/18*

U.S. GENERAL **SCISSOR SUPER COUPON**

30", 5 DRAWER TOOL CART
• 8100 cu. in. of storage
• 704 lb. capacity
• Weighs 120 lbs.

SAVE \$980

\$1599
Compare \$1150 \$1799
ITEM 61427/63308/69397/95272 shown

91436597

LIMIT 3 - Coupon valid through 3/2/18*

luminar OUTDOOR **SCISSOR SUPER COUPON**

NEW 24 FT., 18 BULB, 12 SOCKET OUTDOOR STRING LIGHTS
Customer Rating ★★★★★

SAVE 63%

\$1999
Compare \$2499 \$54.98
ITEM 63483 shown

91439105

LIMIT 4 - Coupon valid through 3/2/18*

drill master **SCISSOR SUPER COUPON**

1/4" TRIM ROUTER
Customer Rating ★★★★★

SAVE \$79

\$199
Compare \$99 \$299
ITEM 61626/62659
44914 shown

91441863

LIMIT 7 - Coupon valid through 3/2/18*

CHICAGO ELECTRIC POWER TOOLS **SCISSOR SUPER COUPON**

2.5 HP, 10" TILE/BRICK SAW
Customer Rating ★★★★★

SAVE \$279

\$2199
Compare \$499 \$2799
ITEM 62391/69275 shown

91511050

LIMIT 3 - Coupon valid through 3/2/18*

VOYAGER **SCISSOR SUPER COUPON**

15" TOOL BAG
Customer Rating ★★★★★

SAVE 58%

\$699
Compare \$1099 \$16.97
ITEM 62348/62341
61469 shown

91631150

LIMIT 3 - Coupon valid through 3/2/18*

WINDSOR DESIGN **SCISSOR SUPER COUPON**

DOVETAIL JIG
Customer Rating ★★★★★

SAVE 45%

\$2799
Compare \$51.72 \$2499
ITEM 34102 shown

91680348

LIMIT 5 - Coupon valid through 3/2/18*

PITTSBURGH **SCISSOR SUPER COUPON**

32 PIECE SCREWDRIVER SET
Customer Rating ★★★★★

SAVE 56%

\$599
Compare \$799 \$13.67
ITEM 61259/90764 shown

91682402

LIMIT 8 - Coupon valid through 3/2/18*

EARTHQUAKE **SCISSOR SUPER COUPON**

1/2" INDUSTRIAL QUALITY SUPER HIGH TORQUE AIR IMPACT WRENCH
• Weighs 6 lbs.

SAVE \$190

\$1999
Compare \$899 \$269.99
ITEM 62627/68424 shown

91746026

LIMIT 5 - Coupon valid through 3/2/18*

CHICAGO ELECTRIC POWER TOOLS **SCISSOR SUPER COUPON**

10", 15 AMP BENCHTOP TABLE SAW
Customer Rating ★★★★★

SAVE \$59

\$1199
Compare \$179 \$1299
ITEM 68827/63117
63118 shown

91746068

LIMIT 3 - Coupon valid through 3/2/18*

CENTRAL PNEUMATIC **SCISSOR SUPER COUPON**

3" HIGH SPEED AIR CUT-OFF TOOL
Customer Rating ★★★★★

SAVE 50%

\$599
Compare \$799 \$12
ITEM 60243/47077
69473/60374 shown

91795739

LIMIT 8 - Coupon valid through 3/2/18*

Tool Preview

Top Tools of the 2017 AWFS Trade Show

by WJ Staff

Want to know what catches our eye at the big trade shows? Innovation, of course, but also tools that solve common woodworking problems.



Every year it is a bit different — but in a curious way it remains the same. The creativity and innovative nature of our woodworking community continues to come up with interesting and helpful tools and accessories. While we woodworking editors may get a bit jaded from time to time, just watch us at a tool trade show ... any veneer of indifference slides away and we become kids in a candy store! Last August, several *Woodworker's Journal* staffers were at the AWFS trade show in Las Vegas, Nevada. Each of us discovered some personal favorites among the aisles, and here are the highlights.

www.woodworkersjournal.com MORE ON THE WEB



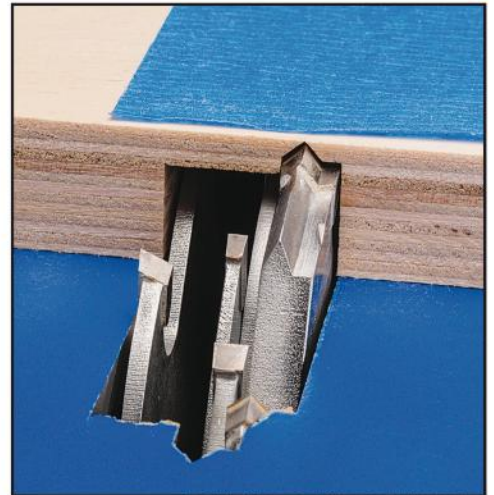
For videos covering these new products and others, please visit www.woodworkersjournal.com/awfs

If you have not yet checked out our video blog from this year's AWFS, it's not too late. We shot videos of the tools and accessories you see here, plus more. You can learn right from the manufacturers as they demonstrate and describe the benefits of their new products.

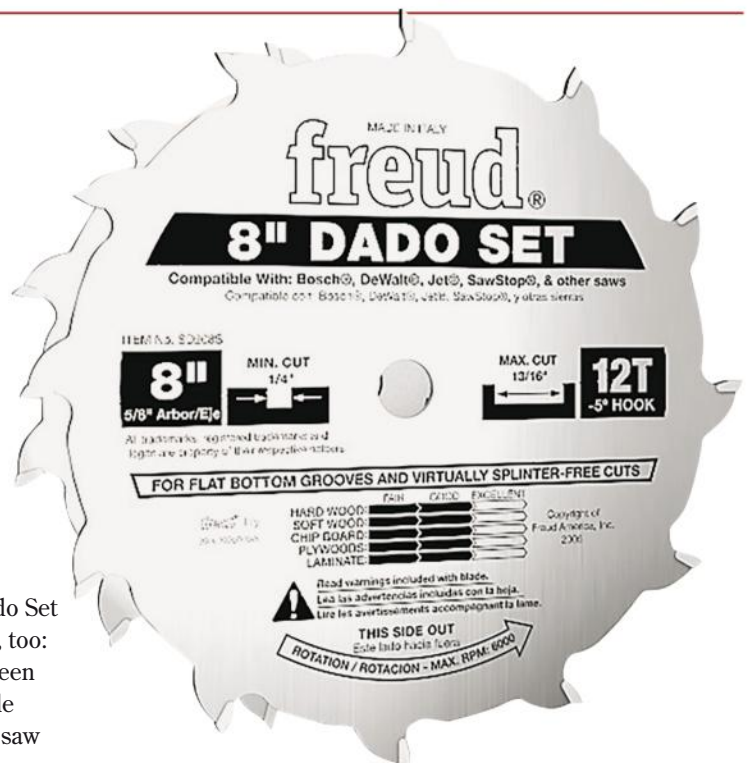




Rob Johnstone



Rockler's Miter Fold Dado Set (item 54799, \$349.99, www.rockler.com) has become quite a sensation over the past months, and it was a big hit at the AWFS! In a nutshell, it's a stacked dado blade with a thick specialty blade that cuts an interlocking miter joint in veneered plywood. With just four cuts on your table saw, you'll have a five-piece box that simply folds up along its outer veneer layer for a neat, wrap-around grain pattern and no-slip glue-ups. Very cool!



Freud's (www.freudtools.com) updated SD208S 8" Dado Set (Rocker item 58894, \$99.97) is worth your attention, too: its overall diameter and anti-kickback provisions have been redesigned, enabling it to work on injury-mitigating table saws from SawStop or Bosch, as well as any other table saw that can take an 8" dado blade — including jobsite table saws.

Tool Preview continued



Chris Marshall

Up till now, the CNC routers we've come to know are tabletop or larger machines that pretty much run themselves. But Shaper Tools is carving out a fresh niche in the CNC world with this radical new Shaper Origin machine. It's a self-contained, 15-lb. portable CNC system with a touch screen interface on top. Load it with a CAD file, using its on-board USB port — or use Origin's built-in drawing tools. Then lay down a grid of special adhesive tape on your workpiece (not shown) to help Origin define where it can rout and where it can't. Once you start the program, Origin's screen shows you where to steer the tool, while its gantry moves the spindle in X-Y-Z axes to rout the object, inlay recess, joinery, lettering or template you need to make — with robotic precision! Think of it as a hybrid handheld router with a state-of-the-art autopilot feature. Origin sells for around \$2,100. Learn more about it at www.shapertools.com.



Back to “analog” woodworking, SawStop (www.sawstop.com) showed us some new accessories at the AWFS to trick out any of the company's cast-iron table saw models. There's a tubular steel outfeed table with rollers that folds down flat (item TSA-FOT, \$299). Or consider the company's cast-iron router table — SawStop offers it in packages with a power switch, extruded aluminum fence with dust collection and support legs for about \$499 (model RT-TGP, for professional and contractor saws) or \$649 (model RT-TGI) for its industrial cabinet saws. A four-post router lift with lock (item RT-LFT, \$399) and a downdraft dust collection box (item RT-DCB, \$115) are available separately.

Continues on page 64 ...

Veritas® Combination Plane

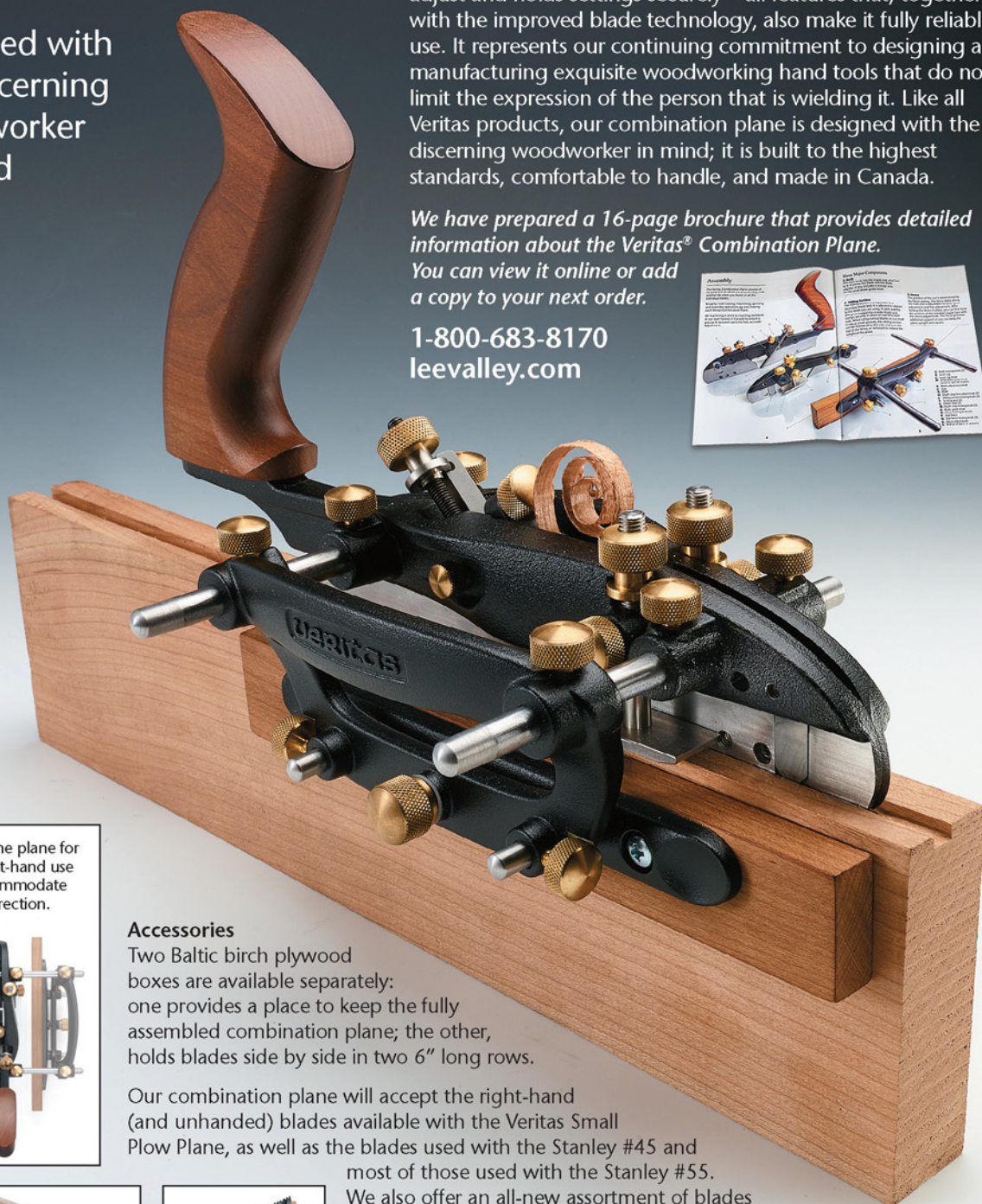
Designed with
the discerning
woodworker
in mind

Originally created to replace stacks of wooden-bodied molding and joinery planes, combination planes are defined by their flexibility. Invaluable for restoration work, a combination plane remains an ideal choice for times when you need to make a short run of custom molding.

The Veritas Combination Plane is the result of four years of research and development. It is precisely machined, easy to adjust and holds settings securely – all features that, together with the improved blade technology, also make it fully reliable in use. It represents our continuing commitment to designing and manufacturing exquisite woodworking hand tools that do not limit the expression of the person that is wielding it. Like all Veritas products, our combination plane is designed with the discerning woodworker in mind; it is built to the highest standards, comfortable to handle, and made in Canada.

We have prepared a 16-page brochure that provides detailed information about the Veritas® Combination Plane. You can view it online or add a copy to your next order.

1-800-683-8170
leevalley.com



Configure the plane for left- or right-hand use or to accommodate grain direction.



Accessories

Two Baltic birch plywood boxes are available separately: one provides a place to keep the fully assembled combination plane; the other, holds blades side by side in two 6" long rows.

Our combination plane will accept the right-hand (and unhand) blades available with the Veritas Small Plow Plane, as well as the blades used with the Stanley #45 and most of those used with the Stanley #55. We also offer an all-new assortment of blades to create a variety of decorative profiles.



Box for
combination plane



Blade box

Combination plane blades



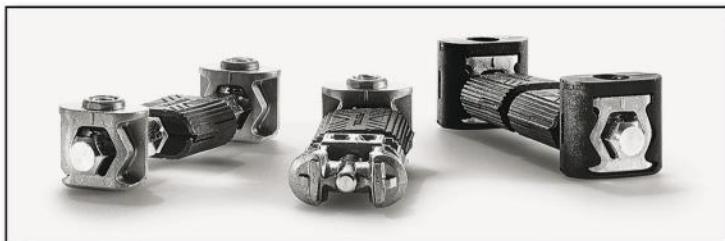
Tool Preview continued



If you're on the fence about whether to buy an 18-gauge brad nailer or a 23-gauge pinner, GREX's H850LX (around \$300) may offer the best of both worlds. This 3.6-lb. pneumatic gun shoots 3/8" to 2" slight-head 21-gauge brads instead — they have holding power closer to 18-gauge brads but leave a hole size closer to pin nails, so the evidence is easier to putty. The new H850LX is also optimized to work better with smaller compressors. It has a one-touch override to drive the last brads in a stick, a belt hook and an edge guide to drive brads faster and more accurately. Visit www.grextools.com to find a dealer near you.



Festool (www.festoolusa.com) has rolled out a new line of XL knockdown connectors that could be extremely handy if you need to build big projects in the shop but then disassemble, transport and reassemble them on-site. These XL connectors (about \$4 to \$5 each) will create either flat or corner joints, and the Domino XL (DF 700 EQ) cuts their mortises quickly and simply. Note: the connectors are not compatible with the smaller Domino DF 500 machine.



Continues on page 66 ...



FURNITURE MEDIC®

Start a business with your own two hands.

Turning your passion for woodworking into a full-time business is easier than you think. When you franchise with Furniture Medic® you become part of a multi-billion dollar industry*, maintaining, restoring and repairing commercial and residential wood of all kinds.



As a Furniture Medic® franchisee, you'll benefit from:

- National accounts with potential for recurring revenue**
- Scalability across multiple revenue streams
- Expert business, marketing, and technical support
- Extensive education and training programs
- Franchisee intranet and technical hotline

Top franchisee earnings of more than \$1.9 million in average annual gross sales***

**Join our winning team of
more than 300 franchisees.**

 **Call 888-841-0634**
or visit furnituremedicfranchise.com
to take the first step in transforming
your business.

*IBISWORLD Industry Report, August 2015

**Not available in all areas. Referrals not guaranteed.

***Based on average annual gross sales for franchise Ownership Groups with average of over \$125,000 during the three-year period 2014-2016 as stated in Furniture Medic 2017 Franchise Disclosure Document.

The franchise sales information in this communication does not constitute an offer to sell a franchise. The offer of a franchise can only be made through the delivery of a Franchise Disclosure Document. Certain states require that we register the franchise disclosure document in those states before offering and selling a franchise in that jurisdiction. NY NOTE: This Advertisement is not an offering. An offering can only be made by a prospectus filed first with the Department of Law of the State of New York. Such filing does not constitute approval by the Department of Law. Moreover, we will not offer or sell franchises in those states until we have registered the franchise (or obtained an applicable exemption from registration) and delivered the franchise disclosure document to the prospective franchisee in compliance with law. Furniture Medic L.P. Minnesota File No. F7440. Furniture Medic L.P., 860 Ridge Lake Blvd., C2-7400, Memphis, TN 38120.

Financing is available through The ServiceMaster Acceptance Company L.P. ("SMAC"), a ServiceMaster company, to credit qualified individuals.

© 2017 Furniture Medic Limited Partnership. All rights reserved.

17-xFM-1452

Tool Preview continued

Dan Cary



Nail guns are great, but steel brads, finish nails and staples aren't always ideal — they can corrode, you can't paint or stain them well and, if you've ever damaged a blade, cutter or sanding belt when you hit one, you know my pain. But SENCO's new plastic composite fasteners solve these problems: they don't rust, won't harm tooling or belts and will take finishes. SENCO offers several 15- or 18-gauge brad sizes and 20-gauge staples. They also sell specialized brad nailers and staplers to drive them. Visit www.senco.com to see the full lineup of plastic composite fasteners and tools.



Fisch prides itself on producing premium quality, forged drill bits, including the new Black Shark Forstner Bit line. Made in Europe, these bits feature the company's unique Wave Cutter technology with cylindrical grinding around the rim. Fisch reports that Black Shark provides cleaner cutting on hardwoods, significantly reduced dynamic friction and a 25 percent increase in cutting speed. Their shanks have three flats to help avoid chuck slippage. All of this adds up to the longest possible service life. Available in both imperial and metric sizes, see the Black Shark Forstner Bit line at www.fisch-tools.com.



Continues on page 68 ...

More News From Forrest

5 Newest Blades For Discerning Woodworkers

Forrest sets the standard for excellence with these latest top-quality blades:

• **Ply Veneer Worker.** Best for rip and cross cutting two-sided plywood (finished or unfinished) and cross cutting solid woods. Has 70 teeth, 10° hook, high alternate top bevel grind.

• **Woodworker II 48-Tooth** general-purpose blade. Has a 20° face hook, 25° bevel, and sharp points for clean, quiet cross-grain slicing.

• **"Signature Line" Chop Master** for quiet, precise cutting and less splintering. Has 90 teeth, a -5° hook for feed rate control, and re-designed angles.

• **2- & 4-Piece Finger Joint Sets.** Each reversible, interlocking 8" blade has 24 teeth. Ideal for rabbets and grooves. Sets make 3/16" and 5/16" cuts or 1/4" and 3/8" cuts.

• **Thin Kerf Dados** for clean cutting 3/16" to 1/4" grooves in thin plywood and man-made materials. Available in two-piece and three-piece sets.

**NEW Website!
More Blades!**



Our blades are American-made and have a 30-day, money-back guarantee. Custom sizes available. Order from Forrest dealers or retailers, by going online, or by calling us directly.

FORREST

The First Choice of Serious Woodworkers Since 1946

www.ForrestBlades.com 1-800-733-7111 (In NJ, call 973-473-5236)

© 2017 Forrest Manufacturing Code WWJ

GO VERTICAL

Panel Cutting Made Easy

Horizontal Cuts



Limited Time
Offer Only
\$989



Vertical Cuts



- One Person Sawing
- Requires Little Floor Space
- Very Safe To Use
- Portable To The Job Site
- Quick and Easy Set Up

www.panelpro.com • 800-599-1655

Moisture Meters

pin and pinless from Lignomat

- ✓ better quality
- ✓ better accuracy
- ✓ better warranty
- ✓ better customer service

Don't waste time and money on wet wood, use a moisture meter



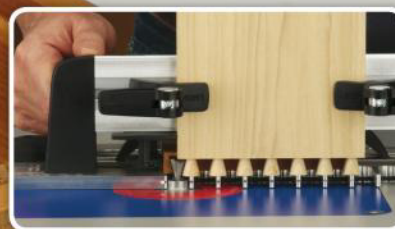
**AUTHOR'S
BEST OVERALL
CHOICE**

Fine
Woodworking
Magazine

800-227-2105
www.Lignomat.com
www.wood-moisture.com

Router Table Joinery Jig

RTJ400 by Leigh



- Box Joints
- Half-Blind Dovetails
- Through Dovetails

RTJ400

SEE VIDEO

leighjigs.com 800-663-8932

LEIGH

Tool Preview continued



Sporting a 24" swing and 36" between centers, Laguna's new REVO 24/36 Lathe (www.lagunatools.com; \$3,799) should easily satisfy the demands of serious woodturners. From its 3hp, 220-volt variable frequency drive motor (135 to 3,500 rpm or 50 to 1,300 rpm speed ranges), to its twin control panels, redesigned banjo and precision-ground steel bed, this lathe has user-friendly features in spades. Laguna has also beefed up the leg castings by 80 percent over its 18/36 REVO lathe, for improved vibration dampening.



Hulking 4x8 sheet goods from a truck bed into the shop and then up onto a table saw for processing is backbreaking work — just ask anyone who lifts 3/4" MDF sheets regularly! But Rockler's new Material Mate Panel Cart/Shop Stand (item 56889; \$249.99) can help. You can set its tubular steel top frame to several heights to match your truck bed or machine tables, then use it as infeed support. Or tip it upright to fit a load through 30" service doors. Rolling on 4" casters, of which two are lockable, this heavy-duty shop helper can double as a work table when needed.





SNAP-CHECK PRO

Decimal/Fractional Dial Indicator

Makes Machine Setups A SNAP!

FEATURES:

- Dual Hands
- Fine-Adjust Knob
- Height Range 0-2"
- Magnetic Base
- 3 Scales: .001", 1/64", .010"



AVAILABLE EXCLUSIVELY FROM

chipsfly.com

513.233.9019

Watch
our online
VIDEO



THE WORLDS FINEST SELECTION

SLABS • TURNING WOOD • LUMBER



ORDER DIRECT
AND SAVE!

1.877.672.5275
www.cookwoods.com

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION
(Required by 39 USC 3685) 1. Publication Title: Woodworker's Journal.
2. Publication No. 0199-1892. 3. Filing Date: October 1, 2017. 4. Issue
Frequency: bimonthly. 5. No. of issues published annually: six. 6.
Annual Subscription Price: \$19.95. 7. Complete mailing address of the
publication office: 4365 Willow Dr., Medina, MN 55340. 8. Complete
mailing address of the headquarters: 4365 Willow Dr., Medina, MN
55340. 9. Full names and mailing address of publisher and editor in chief:
Rob Johnstone, Publisher; Joanna Takes, Editor. Rockler Press, Inc.,
4365 Willow Dr., Medina, MN 55340. 10. Owner, names and addresses
of stockholders: Rockler Press, Inc.; Ann Rockler Jackson, 4365 Willow
Dr., Medina, MN 55340. 11. Not applicable. 12. Not applicable. 13.
Publication Title: Woodworker's Journal. 14. Issue date for circulation
data below: September/October 2017.
15. Extent and nature of circulation

	Average no. copies each issue during preceding 12 months	Actual no. of single issue pub. nearest to filing date
A. Total number of copies (net press run)	128,046	119,793
B. Legitimate paid and/or requested distribution		
1. Mail subscription	119,721	112,252
3. Sales: dealers, carriers, counter and vendors	2,691	2,553
C. Total paid and/or requested circulation	122,412	114,805
D. Non-requested distribution		
1. By mail samples, complimentary and other free	749	743
4. Outside the mail	505	515
E. Total nonrequested distribution	1,254	1,258
F. Total distribution	123,666	116,063
G. Copies not distributed	4,380	3,730
H. Total	128,046	119,793
I. Percent paid and/or requested circulation	99.0%	98.9%
16. Electronic copy circulation		
a. Requested and paid electronic copies	1,806	1,771
b. Total requested and paid print copies and requested/paid electronic copies	124,218	116,576
c. Total requested copy distribution and requested/paid electronic copies	125,472	117,834
d. Percent paid and/or requested circulation (both print and electronic copies)	99.0%	98.9%

I certify that 50% of all my distributed copies (electronic and print) are
legitimate requests or paid copies.

17. Publication of Statement of Ownership for a Requestor
Publication is required and will be printed in the November/December
2017 issue of this publication. 18. Signature and Title of Editor, Publisher,
Business Manager or Owner: Rob Johnstone, Publisher. Date: 09/11/17.
I certify that all information furnished on this form is true and
complete. I understand that anyone who furnishes false or misleading
information on this form or who omits material or information requested
on the form may be subject to criminal sanctions (including fines and
imprisonment) and/or civil sanctions (including civil penalties).



Bainbridge Manufacturing, Inc.
Your Plastic Hardware Specialists
Product Design, Rapid Prototyping
Injection Molding Hardware in USA
1-800-255-4702
www.bainbridgemfg.com

ROCKLER®
WOODWORKING AND HARDWARE

Create with Confidence™



The most complete catalog for woodworkers

- Featuring over 10,000 items
- Innovative jigs and tools
- Router accessories
- Rare hardwood
- Turning supplies

Get your **FREE** catalog today
at www.rcklr.co/247 or
call **1-800-279-4441** (Code 247).

Weekend Projects

Circular Jewelry Frame

By Chris Marshall



My wife's earrings and necklaces tended to get jumbled up and twisted in her jewelry box, so her frustration inspired me to create this easy-to-make circular jewelry frame. It's designed mostly like a picture frame, except that a sheet of copper screen with 1/8"-square openings (dickblick.com, "Decorative" Mesh, item 33408-7060) provides an easy means of displaying earrings neatly — those with hooked-wire backs slip right into the mesh. A few brass hangers from Rockler keep necklaces organized and accessible, too. This could be an ideal project for using a piece of figured or special lumber you've had squirreled away (I used curly maple here). A 5-ft. length of 3½"-wide stock is all you need.

Quick Jig for Accurate Angles

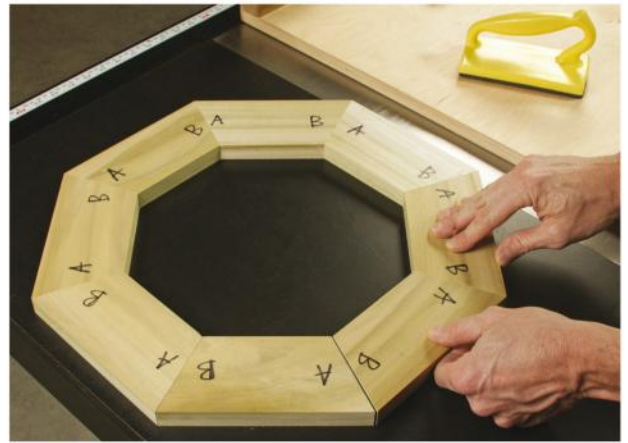
The strongest way to build a circular frame from wood, and avoid showing end grain, is to make this jewelry frame from miter-cut segments that form an octagon. Then, cut the circle out of the octagon shape. To make this project's 16½"-diameter frame, with the frame having 2¼"-wide members (final width), you'll need eight workpieces that each begin at 3¼" wide and 7⅞" long — they're overly wide because some stock width will be lost during the circle-cutting process. Rip and crosscut these



Used in a crosscut sled, this triangular jig and two stop blocks (marked A and B) enable pairs of the frame's segments to be cut against the long legs of the triangle to form the octagon's 135° angles. Position and nail the stop blocks to maintain the part lengths.



Cut eight test pieces to width and length first, and mark them with A and B ends. Hold each segment against the A stop and miter-cut one end to 67.5°, then set the mitered end against the B stop to angle-cut the opposite end.



Fit the test segments together, with A and B ends forming each joint. If the last joint remains open (as shown here), or overlaps, change your cutting angle just slightly and recut the part ends to improve their fit.

eight blanks to size. While you're at it, cut eight test workpieces to the same size from some spare scrap.

The eight outer angles of an octagon each measure 135°. Bisecting those obtuse angles determines the two acute angles that must be cut to bring the eight segments of the octagonal frame together. So, both ends of each segment need to be miter-cut to 67.5° — or half the obtuse angles.

You could cut these angles with your miter saw or table saw's miter gauge swiveled to 22.5° — it's the complementary angle to 67.5°. But, I went a different route: I created a quick cutting jig to use on the crosscut sled of my table saw: it's simply an isosceles triangle, made of 3/4" scrap plywood, with its top (obtuse) angle measuring 135°. The advantage to using it is that each pair of octagonal segments can be miter-cut while resting against the legs of the triangle and a stop block — one half of the joint against one leg of the triangle and the other half of the joint against the triangle's other leg. This way, pairs of adjacent part ends will match the triangle's obtuse angle and fit together as closely as possible.

Whether you try my crosscut sled jig or use another option, miter-cut the ends of your "test" segments and see how a sample octagon fits together. Use a stop block when cutting the parts to make sure they don't get shorter in the process. If your shape won't close up completely, the joint angles are slightly more than 67.5°. Conversely, if the last joint of the octagon overlaps, the miter angles are slightly less than 67.5°. Ad-

just your cutting angle ever so slightly and re-cut the test pieces to improve their fit. It only takes the slightest change of angle to make a big difference in how the shape fits together, so be very conservative here.

Gluing Up the Frame

Once your cutting method is dialed in, go ahead and miter-cut the ends of the actual project segments to shape. Since these segments will form weak end-grain joints, a pair of 1/4" dowels at each joint will strengthen the frame. Lay out their locations. I positioned the center of one dowel 1/16" in from the inside corner of the mitered ends, and I located the center of the second dowel 7/8" away from the first dowel. Drill pairs of dowel holes at each joint.

You're ready to glue and clamp the octagon together. Spread glue on the contact surfaces and into the dowel holes,



Reinforce the miter joints with a pair of 1/4" dowel pins. Position them 1/16" from the inside corner of the frame segments and 7/8" apart.



The initial cost of a band clamp will be forgotten the first time you need to clamp an irregular frame like this together. It's the perfect solution. Spread glue onto the joint surfaces, insert the dowels, and tighten the clamp to close the joints. The band applies even pressure to every joint simultaneously.

Routing the Circle



A pivot pin on the circle-cutting jig's base fits into an adjustable stop on the jig's arm to set the router and bit to various cutting diameters.



With the octagon taped securely, rout through the wood in a series of deepening passes, pivoting the arm to form a perfect circle.

An ellipse and circle-cutting jig provides one way to mill your octagonal frame round. Mount the jig's base to the center of a piece of sheet stock that's quartered off with layout lines. Its center pin will enable the jig arm and your router to pivot around, compass-style, to rout the inner and outer rims of the frame. Then, secure the octagon to the sheet stock with strips of double-sided tape, making sure to center it carefully on the layout lines. Install a 1/4"-dia. straight or upcut spiral bit in your router, adjust the jig arm to either the inside or outside diameter, and rout all the way down through the wood in several deepening passes. Repeat to mill the frame's other rim.

then fit the segments together. (Note: If you're planning to cut your frame round with a band saw, see the *sidebar*, page 74, before gluing all the joints together.) A band clamp is the easiest way to provide even clamping pressure all around the shape at the same time. When you tighten the clamp, be sure it doesn't distort the frame's ability to lie flat.

Cutting, Detailing the Circle

When the glue dries, remove the frame from the clamp and flatten the joints with a hand plane, card scraper or sander. Next up, it's time to cut the frame round, and here again, you have options. You could use a compass to draw the frame's circular shape, then cut it out with a jigsaw, scroll saw or band

saw. But a quick, accurate and really fun way to do the job is with a circle-cutting jig and a router (see *sidebar*, above).

Besides the convenience and accuracy a circle-cutting jig offers you for routing this frame to shape, a second benefit is that you can also use it to form decorative details on your frame's face. I used a V-groove router bit to cut a pair of



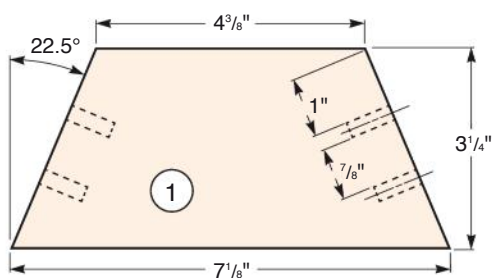
Detailing your frame with concentric rings is easy with a circle-cutting jig and a V-groove bit or any other end-cutting router bit you prefer. Small-diameter core box, ovolo or straight bits are other options to consider.



Form a recess around the back inside edge of the frame with a piloted rabbeting bit to house the wire screen and a retaining ring. Make this rabbet 1/2" wide and 3/8" deep. Take several shallow passes.

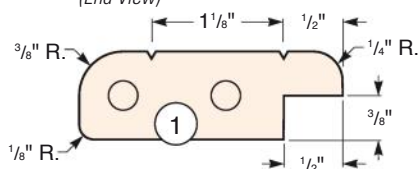
Octagon Segment

(Top View)



Frame Segment Shaped

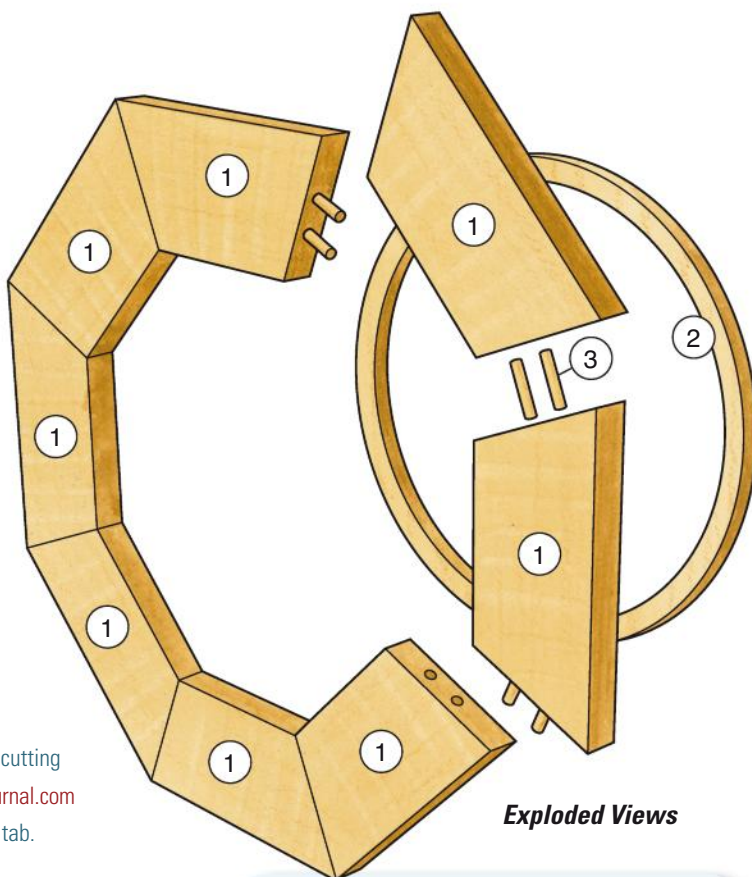
(End View)



www.woodworkersjournal.com
MORE ON THE WEB



For videos showing two different methods of cutting this frame round, please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.



Exploded Views

Circular Jewelry Frame Hard-to-Find Hardware

Compact Router Ellipse and Circle Jig (1) #55819 \$69.99 ea.

Freud® Solid Carbide Upcut Spiral Bit (1) #55748 \$36.97 ea.

V-groove Router Bit, 1/4" Shank (1) #90869 \$19.99 ea.

Self-centering Doweling Jig (1) #49221 \$62.99 ea.

Spiral Dowel Pins, 1/4" Dia. (1) #21113 \$2.99 pk.

Solid Brass Necklace Hangers (3) #93633 \$5.99 ea.

To purchase these and other products online,
visit www.woodworkersjournal.com/hardware
Or, call 800-610-0883 (code WJ1577).

MATERIAL LIST

	T x W x L
1 Frame Segments (8)	3/4" x 3/4" x 7 1/8"
2 Backer Ring Blank (1)	5/16" x 14" x 14"
3 Dowel Pins (4)	1/4" Dia x 1 1/2"



Embed the copper screen into a bead of clear silicone caulk in the frame's rabbet to secure it around the entire perimeter. Press the wooden ring down into place to cover the screen, and pin-nail it in place.



Add three necklace hangers around the bottom half of the frame to enhance this project's usefulness. A dab of 5-minute epoxy provides a sturdy way to bond these brass posts into shallow mounting holes.

Weekend Projects continued

shallow, concentric rings, spaced 1/2" in from the inner rim and 5/8" in from the outer rim. Cutting them was as easy as setting the bit depth to 1/16" and taking the router for a spin around the frame at each ring location. Experiment with this detailing on scrap, first, to arrive at the look you prefer best. If you don't have a V-groove bit, a little core box, ovolo or even a straight bit can provide other design options.

Next, shape the inner and outer edges of your frame. I routed the frame's outer diameter with a 3/8"-radius roundover bit and eased the inner rim with a 1/4" roundover bit. A 1/8" roundover took care of the back's outer edge.

Give your frame a thorough sanding up through the grits to 180 or even 220 if you're using some attractive figured wood. Then, apply your favorite topcoat.

I wiped this curly maple down with an oil finish first to enhance the figure, let that dry, then sprayed on four coats of satin lacquer for a low-luster sheen.

Adding Screen and Hardware

We'll fit the center screen into the frame just like a piece of glass in a photo frame. For that job, I routed a 1/2"-wide, 3/8"-deep rabbet around the inside back edge with a rabbeting bit in the router table. Then cut a 13"-diameter circle of screen with a scissors to fit inside the rabbeted recess — the copper wire is pretty soft and easy to cut by hand.

I milled a circular backer ring from a panel of 1/4" maple to cover the back rabbet and screen. Make it 1/2" wide and 5/16" thick. I made mine using my compact router and circle-cutting jig again. To bond the wooden ring and

copper screen to the frame, I used a thin bead of silicone caulk dispensed around the rabbet. Embed the screen in the wet caulk, and press the wooden ring down into the rabbet. I secured the ring with 5/8"-long, 23-gauge pin nails to hold everything securely while the caulk set.

All that's left to do is to install some necklace hangers to the front lower half of the frame. Those I'm suggesting from Rockler in our "Hardware" box (see page 73) are solid cast brass and will give your project a quality finishing touch. A shallow hole and a bit of epoxy will mount these hangers permanently.

Now, attach a couple of picture hanging brackets to the back of the frame and tuck this project away until it's time to wrap up for the holidays — you're one handmade gift closer to done!



Bandsawing the Circle



ONLINE
VIDEO!

If you don't have a circle-routing jig, no sweat! Another option for turning an octagon into a circle is to glue up two subassemblies of four segments, draw the circular rim layout lines with a compass and bandsaw the half frames to shape. Cut just outside your layout lines by about 1/16" or so. Then glue the half frames together to form a rough circle. Now, you can refine the rims easily by sanding — a disc sander will clean up the outer rim in no time flat, and a drum sander can do the same job to the inside rim.



A band saw will make quick work of cutting two subassemblies of four segments into semicircles. Gang them up with double-sided tape.



After gluing the half circles together, refine the outer rim on a disc sander and smooth the inner rim on a drum sander.

BUILD BETTER STUFF



Better engineering.
Better components.
Better technical support.
The best CNC value available.

AXIOM
PRECISION
Learn more at axiomprecision.com

NEW GREX® H850LX THE MOST ADVANCED 21 GAUGE NAILER ON THE PLANET

H850LX

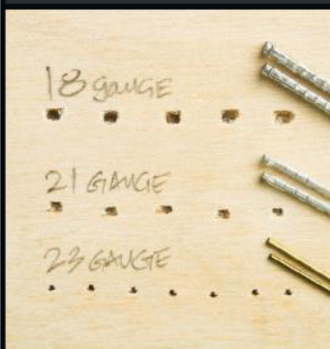
2" 21 Gauge Brad Nailer

Built on 16+ years of Grex
23 gauge pinner expertise
that pros have relied on



See the Edge Guide in action

The holding power closer to
that of an 18 gauge brad,
but with a hole size closer to
a 23 gauge pin.



On-Board
Adjustable
Edge Guide



FIND YOUR DEALER
www.grextools.com

888-447-3926 866-633-7788

What's In Store

New Tools for Your Wish List

Contact Information

Festool
888-337-8600

Makita
800-462-5482

Milwaukee Tool
800-729-3878

Preval
877-753-0021

Rockler
800-279-4441

SKILSAW
877-754-5999

SuperMax Tools
888-454-3401

MORE ON THE WEB

For videos demonstrating featured tools, please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.

Makita 18V LXT Brushless Cordless Compact Router XTR01



The Rockler Dust Right® Magnetic Floor Sweep Attachment attaches to your Dust Right floor sweep. Its powerful ceramic magnets attract ferrous metal parts, like dropped screws and fasteners, before they get into your dust collection system. The Magnetic Floor Sweep Attachment includes a shroud and adhesive that can be used to permanently attach the shroud to your floor sweep if desired; otherwise, it is easily removable. The Dust Right Magnetic Floor Sweep Attachment (item 50870) is priced at \$14.99.

Makita's new 18V LXT® Brushless Cordless Compact Router (model XTR01) has a variable speed dial with five settings from 10,000 to 30,000 rpm. The brushless motor has electronic speed control and soft start. The router features a rack-and-pinion fine depth adjustment system, dual LED lights and a quick-release cam lock system. It can make plunge cuts up to 1 3/8" deep with a plunge base attached or cut up

Rockler Dust Right Magnetic Floor Sweep Attachment



to 1 9/16" deep when installed in the fixed base. The 5 1/4"-long motor weighs 4.6 pounds with battery installed and mounted in the trimmer base. Model XTR01Z is the bare tool, which comes with a trimmer base, 1/4" collet, wrench and edge guide for about \$129.99. Model XTR01T7, a kit, is priced at about \$389.99 and includes two batteries and charger, both bases and a tool case.

The Preval Sprayer from Preval is an aerosol-based spray system that attaches to a removable, refillable container and uses a patented Venturi Vacuum Process to pull the paint, chemical or solution from the container and convert it into sprayable material. It works with paint, coatings or lacquer and sprays an unadulterated finish with no color change. You can add the exact amount of paint you need to the contain-

er, minimizing waste, and can add in hardeners, accelerators or catalysts to inexpensively create two-component spray paints. Between uses, clean the Preval Sprayer by spraying a paint thinner appropriate to the material you are using through the Sprayer for 10 seconds. Both the glass jar container and the aluminum aerosol power unit are recyclable. The Preval Sprayer provides an output pressure of 70 psi and is made in the U.S. It is priced at \$9.99.

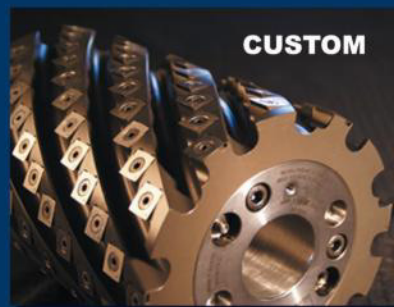
Preval Sprayer



Continues on page 78 ...



BRAZED



CUSTOM

Freeborn Tool Company

QUALITY WITH A SOLID REPUTATION



INSERT



CNC

www.freeborntool.com 1.800.523.8988

Full Size Plans
Detailed with full size drawings & text

Plan #82 \$18.50
Cycle Rocker For advanced woodcrafters. Size 44"L x 27"H.

Plan #62 Cradle \$18.95
Swinging Baby Cradle 21"x31"x39"H

16 Pg catalog of plans/parts \$2 or free with order

More plans @ armorplans.com

Plan #24 \$15.95
Pony Rocker is 36" L x 24" H

Visa/MC call 800 292 8296

Armor Box 576 Monterey TN 38574

UNIQUE SOLUTIONS

Our Dust Bags Feature

- Optimum Performance
- 1-Micron Filtration
- Custom Designs
- Cleaner Air
- Longer Life
- Proudly Made In USA

Other Products We Offer

- 6-mil Poly Bags
- Quick Release Hose Clamps
- Self Adhesive Foam Gasket
- Custom Transfer Sleeves
- Cartridge Filters

We Fix Dust Collection Problems!

Free Design Assistance for All Custom Made Dust Bags

AMERICAN FABRIC FILTER CO.
www.americanfabricfilter.com 800-367-3591

Easy-On, Easy-Off Snow Plow

Perfect for Homeowners!

Plow your own driveway and save!
Pays for itself quickly if you currently hire a plow. Don't struggle snow-blowing your entire driveway... give yourself a break with the DR® Redi-Plow™!

For trucks, and SUVs.
Attaches to a front receiver hitch (included). Automatically engages when you drive forward and releases when you reverse. Works on gravel or pavement. Can be locked in travel position.

One pass and you're free to go! Never be trapped waiting for a snow plow again. The DR® Redi-Plow™ is light enough for one person to handle. Clear your parking area, and a path to the barn with ease!

Tough Enough For Any Snowstorm!

- No Hydraulics or Electric Components
- Heavy-Duty Rubber Blade Edge
- Receiver Hitch Included

FREE SHIPPING
1 YEAR TRIAL
SOME LIMITATIONS APPLY
Call or go online for details.

Call today for FREE Buyers Guide!
TOLL FREE **877-201-7888**
DRrediplow.com

PROFESSIONAL POWER
DR
DONE RIGHT

98294X © 2017

What's In Store continued



*SuperMax 16-32
Drum Sander*

The new 16-32 *Drum Sander* (model 71632) from **SuperMax Tools** has a newly patented Quick Adjustment Lever that changes the drum height faster, moving it from 0" to 3" with one pull of

a lever instead of multiple revolutions of a hand wheel. The gear motor has also been moved to the rear of the machine to allow for stock to be pulled through, rather than pushed. A built-in digital readout monitors material thicknesses to increase accuracy and quality. A Turbo Vented Dust Port has an impeller-like design that improves dust collection by 15%. The new 16-32 Drum Sander has a maximum sanding thickness of 3" and maximum sanding width of 32". Retail price is \$1,199.

SKILSAW, the company that invented the portable circular saw, has now added a 13-amp *Reciprocating Saw*, the



*SKILSAW 13-amp SPT44A-00 Reciprocating
Saw with Buzzkill*



*Milwaukee M12 cordless 3/8"
Crown Stapler*

SPT44A-00, which includes patented "Buzzkill™" technology to suppress vibration by up to 35%. Linear, rather than rotational vibration, simplifies the counterbalance to maintain vibration control with fewer wear points. A patented single-wobble drive train reduces friction to slow down heat buildup, while a clock spring brush system has a constant spring designed for durability as the saw pushes through a cut, regardless of heat or dust flow. Later this year, SKILSAW plans to release a 15-amp SPT44-10 reciprocating saw in this line, which will be priced at \$179. The 13-amp SPT44A-00 is priced at \$99.

Milwaukee Tool has introduced the *M12™ 3/8" Crown Stapler*, designed to be compact at 3.5 pounds with battery, 7¼" long and just over 1½" wide at the nose. The M12 3/8" Crown Stapler operates in either bump or sequential fire mode and is capable of firing up to 1,500 3/8" crown (T50® style) staples on a single 1.5 amp-hour battery pack. It features staple leg locating arrows that allow the user to see exactly where the staple legs are leaving the tool and includes dry-fire lockout. According to Milwaukee Tool, the



crown stapler requires 80% less muscle effort than hand tools and is up to 35% lighter than competitors' cordless staplers. Suggested price is \$99 for the bare tool and \$149 for a kit with battery, charger and bag.



Festool "hybrid" sanders

Festool has introduced three new "hybrid" sanders, which can be used as either corded or cordless power tools. The delta-shaped DTSC 400, 5" ETSC 125 random orbit sander and rectangular RTSC 400 orbital sander have the same functionality as their corded counterparts. The 18-volt battery power provides up to 30 minutes of runtime when at full power. The battery's low placement optimizes both the tool's center of gravity and its ergonomics. Or, when you want to convert the sanders to corded use, Plug-It AC adapters offer that option. Each of the sanders operates with a brushless motor for additional efficiency and comes with a dust bag. Prices are \$535 for the ETSC 125 and \$600 for both the RTSC 400 and DTSC 400.

A QUANTUM LEAP FOR CYCLONES

ADVANCED **CLEAN AIR** SHOP SOLUTIONS

- **HEPA**
- **EZ LIFT DRUM**
- **SMART SENSORS**
- **NOISE REDUCING FOAM**

PRODUCT SHOWN:

P|FLUX:E

G2C

GENERATION TWO CYCLONE



LAGUNA **AIR**

THE DUST HAS SETTLED



B|FLUX:1
\$499

C|FLUX:1
\$1099

C|FLUX:2
\$1499

C|FLUX:3
\$1799

P|FLUX:1
\$1499

1-HEPA

P|FLUX:2
\$1999

1-HEPA

P|FLUX:3
\$2299

1-HEPA

T|FLUX:5
\$3499

T|FLUX:10
\$4999

X|FLUX:10
\$9999

LAGUNA **CLEAN AIR**.COM

DEALER INQUIRIES CONTACT BENNYH@LAGUNATOOLS.COM | © 2017, LAGUNA TOOLS, INC.

Woodworking Tools & Supplies Index



December 2017

For product information in the blink of an eye, visit www.woodworkersjournal.com and click on "Woodworker's Marketplace" under the Tools & Supplies tab.

ADVERTISER	Page No.	Web Address	ADVERTISER	Page No.	Web Address
American Fabric Filter Co.	77	www.americanfabricfilter.com	Knew Concepts	57	www.knewconcepts.com
Armor Crafts	77	www.armorplans.com	Laguna Tools	79, 81	www.lagunacleanair.com
Axiom Tool Group, LLC	75	www.axiompprecision.com	Lee Valley Tools	63	www.leevalley.com
Badger Hardwoods of WI, Ltd.	81	www.badgerwood.com	Leigh Industries, Ltd.	15, 25, 67, 81, 83	www.leighjigs.com
Bainbridge Manufacturing, Inc.	69	www.bainbridgemfg.com	Lignomat	67	www.lignomatusa.com
Beall Tool Company	81	www.bealltool.com	Makita USA, Inc.	9	www.makitatools.com
The Burgess Edge	81	www.burgessedge.com	McFeely's	83	www.mcfeelys.com
Calculated Industries	15	www.calculated.com	Mirka Abrasives, Inc.	31	www.mirkawoodworking.us
Cook Woods	69	www.cookwoods.com	Next Wave Automation	19	www.nextwaveautomation.com
DR Professional Power	25, 77	www.drpower.com	Oneida Air Systems	27	www.oneida-air.com
The Craftsman Gallery	69	www.chipsfly.com	PanelPro	67	www.panelpro.com
Delta Power Equipment Corporation	15	www.deltamachinery.com	Quickscrews International Corp.	35	www.quickscrews.com
Earlex	87	www.earlex.com	Rikon Power Tools	7, 81	www.rikontools.com
Epilog Laser	21, 81	www.epiloglaser.com/wwj	Rockler Woodworking and Hardware	69, 85	www.rockler.com
Eureka Woodworks	27	www.eurekabusiness.com	SATA Spray Equipment	21	www.satausa.com
Festool	5	www.festoolusa.com	Sawblade.com	3	www.sawblade.com
Forrest Manufacturing Company	67	www.forrestblades.com	Steve Wall Lumber Co.	81	www.walllumber.com
Freeborn Tool Company, Inc.	77	www.freeborntool.com	SuperMax Tools	12	www.supermaxtools.com
Freud	88	www.freudcnc.com	Teknatool (NOVA)	27, 81	www.teknatool.com
Furniture Medic	65	furnituremedicfranchise.com	Titebond	13, 17	www.titebond.com
Gorilla Glue	25	www.gorillatough.com	Varathane	10, 11	www.varathane.com
Grex Power Tools	75	www.grextools.com	Wagner Meters	27	www.wagnermeters.com
Harbor Freight Tools	58, 59	www.harborfreight.com	Woodworkers Source	81	www.101woods.com
Howard Products, Inc.	57	www.howardproducts.com	WORKSHOP	37	www.workshopvac.com
JET	2	www.jettools.com/drumsanders	ZAR	13	www.ugl.com

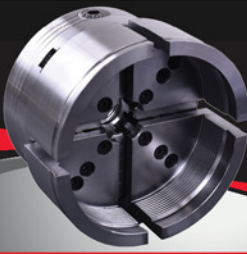
Marketplace

INTRODUCING THE LAGUNA PL12|20



The brand new Laguna portable laser with a removable plate which allows users to raster or cut directly onto items such as tables, chairs, counters & more.

NEW nova TITAN III CHUCK



30 NOVA YEARS

www.teknaatool.com

LEIGH Router Table Dovetail Jig
by Leigh



RTJ400
Rout both boards at the same time

SEE VIDEO
leighjigs.com

For all the latest information and releases from

RIKON

Please visit Our Website Today!

www.rikontools.com

THE BEST HARDWOOD LUMBER
Delivered to You

100% Satisfaction Guarantee EVERY ORDER

FRIENDLY Service

EASY Ordering

Walnut • Cherry • Exotics & More

www.101Woods.com

VISA MasterCard PayPal 800-423-2450

The Burgess Edge



The Burgess Edge is a patented matched pair of router bits for edgbanding plywood. The unique bearings make processing large and or curved pieces easy.

Save money-order the 1/2" & 3/4" combination set

www.burgessedge.com

802 233-1489 bmichael@sover.net

BADGER HARDWOODS of Wisconsin, Ltd.

Great selection of premium hardwoods and plywoods, custom mouldings, bulk packs, and more!

Call Badger Bob Today!
(800)252-2373

WWW.BADGERWOOD.COM
badgerwood@badgerwood.com

Est. 1986
Walworth, WI

STEVE WALL LUMBER CO.
Quality Hardwoods and Plywood For The Craftsmen and Educational Institutions

WE SELL IN LARGER QUANTITIES!

Ash.....4/4.....1C.....1.85.....Select.....2.60	8/4.....Select.....2.95	4/4.....\$103.00	8/4.....\$109.00
Basswood.....4/4.....Select.....1.95	8/4.....2.60	4/4.....\$ 89.00	8/4.....\$ 93.00
Birch.....4/4.....Select.....3.50		4/4.....\$117.00	8/4.....NA
Butternut.....4/4.....2C.....2.50.....1C.....3.25	8/4.....1C.....3.75	4/4.....\$100.00	8/4.....\$129.00
Cedar.....4/4.....1C+Btr.....2.00		4/4.....\$ 87.00	8/4.....NA
Cherry.....4/4.....1C.....2.75.....Select.....4.90	8/4.....5.75	4/4.....\$126.00	8/4.....\$139.00
Cypress.....4/4.....Select.....3.00	8/4.....4.00	4/4.....\$ 99.00	8/4.....\$109.00
Hickory-Pecan.....4/4.....1C.....2.00.....Select.....3.00	8/4.....Select.....3.50	4/4.....\$110.00	8/4.....\$137.00
Mahogany (African).....4/4.....Select.....5.25	8/4.....Select.....5.55	4/4.....\$124.00	8/4.....\$127.00
Maple (Hard).....4/4.....Select (N).....3.00.....Select (W).....3.65	8/4.....Select.....4.50	4/4.....\$118.00	8/4.....\$126.00
Maple (Soft).....4/4.....Select.....2.60	8/4.....Select.....3.00	4/4.....\$ 97.00	8/4.....\$107.00
Oak (Red).....4/4.....1C.....2.10.....Select.....2.80	8/4.....Select.....3.95	4/4.....\$107.00	8/4.....\$129.00
Oak (White).....4/4.....1C.....2.20.....Select.....2.80	8/4.....Select.....4.95	4/4.....\$107.00	8/4.....\$135.00
Poplar.....4/4.....1C.....1.30.....Select.....1.80	8/4.....Select.....2.00	4/4.....\$ 87.00	8/4.....\$ 91.00
Walnut.....4/4.....1C.....3.25.....Select.....6.25	8/4.....Select.....7.00	4/4.....\$129.00	8/4.....\$149.00
White Pine (Soft).....4/4.....F.G.....1.40	8/4.....F.G.....1.80	4/4.....\$ 80.00	8/4.....\$ 86.00
Yellow Pine (Soft).....4/4.....Clear.....2.20	8/4.....Clear.....2.60	4/4.....\$ 92.00	8/4.....\$ 99.00
Western Red Cedar.....4/4.....2C+Btr.....2.50	8/4.....2C+Btr.....2.50	4/4.....\$101.00	8/4.....\$107.00

20 BDF BUNDLES

Above prices are for approximately 20 bd. ft. bundle of clear 1" Face (except for cedar and white pine or lumber listed as 1C+Btr. which have tight knots) 4" x 10" wide x 3'-5' long. Lengths and widths are random. Add 15% to price of bundle if you specify particular lengths and widths. Lumber is surfaced two sides (1316" on 1" stock x 134" on 2" stock) or rough. Some of the heavy woods are skinned to meet the 70 lb limit even though rough lumber is specified. Prices include delivery prepaid in the Continental U.S. Sapwood in walnut and cherry is no defect. Please Specify Rough or Surfaced Stock. *Add \$5 if Rough. (Shipped in 2 bundles) Add \$5 if over 5' Long.

OLIVER MACHINERY DEALER

HARDWOOD PLYWOOD

CUSTOM RAISED PANEL DOORS

CUSTOM PLANK HRDWD FLOORING

THIN CRAFTWOOD

EXOTIC LUMBER

STEVE H. WALL LUMBER CO.

BOX 287
MAYODAN, N.C. 27027
336-427-0637
1-800-633-4062
FAX 336-427-7588
Email: woodslee@walllumber.com
Website: www.walllumber.com

Send \$1.00 For Lumber Catalog
Prices Subject to Change Without Notice

WOODWORKER'S JOURNAL

TOYS AND GAMES

A collection of our readers' favorite toys and games projects



WOODWORKER'S JOURNAL www.woodworkersjournal.com

TOYS AND GAMES CD

Whether you're building a Tugboat for the tub or challenging your friends with your handmade Chess Set, you'll find step-by-step instructions, technical drawings and how-to photography that walk you through each project as if it were child's play. These 25 fun-filled projects are guaranteed to up your shop's fun factor!

Item #53974\$14.99

ORDER NOW!

Phone: 800-610-0883 (mention code WJ1761)

Web: woodworkersjournal.com/wj1761

ENGRAVE IT. CUT IT. MARK IT.



Get MORE INFO or SCHEDULE A DEMO!
www.epiloglaser.com/wvj

Seriously Big Collet Chucks



Sized to fit the most popular lathes, with collets that hold 7/8", 1", 1-1/8" & 1-1/4" stock diameters. Equipped with thrust bearings that make them practically effortless to tighten & release...

THE BEALL TOOL CO.
541 Swans Road N.E. Newark Ohio 43055
1-800-331-4718 www.bealltool.com Dpt. WJ

Finishing Thoughts

Rattle Can Roundup

By Michael Dresdner

Today's spray can finishing offers a wealth of aerosol options.



pattern. Make the surface wet but not dripping. To clear the tip, turn the can upside down and spray until only air comes out.

Fly in the Ointment

There are two drawbacks to aerosols that you do not encounter with spray guns, but there's help for both. The first is that, until recently, aerosols did not offer the range of spray fan options common to guns. With a spray gun, you can change the cap, tip, air feed and fluid feed to create round, fan-shaped, full or sparse spray patterns. In the past, aerosols did not offer such options, but all that has changed.

Mohawk now offers 16 different replaceable spray tips to give you a range of fan widths, sizes, shapes and spray volumes. At around 25 cents each, you can have a set of tips that makes your rattle cans rival your spray



Michael Dresdner

is a nationally known finishing expert. He shares his expertise on the DVD *The Way to Woodwork: Step-by-Step to a Perfect Finish*, available through the store at woodworkersjournal.com.

Woodworkers who don't have spray equipment but still want to spray finishes have long relied on aerosol cans. Even those who do own spray guns may find some of the newer aerosol options rather alluring.

Aerosols can be a lifesaver when you want to avoid having to clean the gun, for hard-to-find materials, or tough to match colors or when you only need a small amount of a particular finish. Shading toner, specialty colors, touch-up lacquer, blush chaser and cross-linked coatings are just a few of the options making "rattle cans" a boon for woodworkers of every stripe.

First, let's do a quick recap of spray can tips and tricks.

Rattle On

Any can that requires mixing will have a small ball inside that rattles around during agitation. Even though it feels agonizingly long, keep shaking the can for a full 60 seconds AFTER you hear the ball start moving.

As with guns, spray evenly about 6" to 8" from the surface, keeping the tip parallel to the wood. Move the can at a consistent speed for even coverage, and overlap each pass about half the width of the spray



Tips



Mohawk offers 16 different aerosol spray tips for a range of fan shapes and sizes, and to replace clogged tips.

Comfort



New ergonomic "trigger" cans are much more comfortable than spraying with a button tip.

gun, and have replacements should the tip clog.

The second problem is that finishes in aerosol cans are usually low in solids, often around 6%, which means you'll need to apply more coats than with a spray gun. In particular, you'll notice that the first coat or two will be almost totally absorbed by end grain or softer wood.

You can even the playing field by priming or sealing the wood first by hand. Flood the raw wood surface

with dewaxed shellac, then quickly wipe off whatever is not absorbed. That will seal the wood and create a base to help the spray finish build more quickly.

Improved Comfort

Admittedly, spending an hour with your finger pushing a spray gun tip is tiring, but even that is changing. More and more, aerosols like Rust-Oleum's Universal line, designed to spray over multiple substrates, now come

Clear Finishes



Keep brass hardware and cane heads bright with special brass lacquer.

in comfortable, ergonomic trigger cans. They're easier to handle and less tiring when spraying a lot.

Clear Finishes

Spraying is ideal for fast-drying finishes, like shellac or lacquer, and for an "off the gun" sprayed satin or matte finish, which has a different look than rubbed satin. Luckily, aerosols are available in all sheens.

Continues on page 84 ...

Custom Finishes



Make your own finish into an aerosol spray with Mohawk's spray power pack and jar.

Contact us

with your finishing questions by writing to Woodworker's Journal, 4365 Willow Drive, Medina, MN 55340, or by emailing us at: finishing@woodworkersjournal.com.

Please include your address, phone number and email address (if you have one) with your thoughts or questions.



DO NOT GET LEFT IN THE DARK



Saw Blades



Router Bits



Drill Bits



Multi-Tool Blades & Implements



SCAN THE QR CODE TO LEARN MORE
mcfeelys.com/bits-blades-abrasives.html

McFeely's.com

Professional Grade. Professional Results.

 1-800-443-7937

 McFeelys.com



Mortise & Tenon Joints?

No problem.

Leigh Mortise & Tenon Jigs make challenging joinery projects like chairs incredibly easy.



Leigh FMT Pro

SEE VIDEO

leighjigs.com

800-663-8932



Celebrating 35 years

Finishing Thoughts continued

Glaze



Aerosols make glazing easy. Spray it on, wipe it off, let it dry, then seal with clear.

Tint



Quickly create a border or tint a panel with strong, translucent dye in lacquer.

Toner



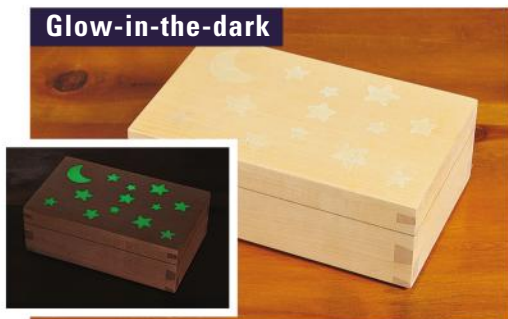
Mohawk Shadow Toner is a weakly pigmented aerosol that lets you gradually creep up on just the right color for overall shading or sunbursts.

Repair



Got blush? A quick spray with Mohawk Super Blush Retarder removes it instantly.

Glow-in-the-dark



Spruce up a keepsake box, or highlight a light switch plate, with clear, glow-in-the-dark paint.

Chalkboard



Create a convenient chalkboard on any wood surface with clear chalkboard paint.

For those who prefer oil-based polyurethane, that, too, is in rattle cans, and unlike cans of liquid finish, the remaining polyurethane in aerosols won't skin over or harden. Even pre-cat lacquer is now offered in aerosol cans, as well as specialty coatings, like brass lacquer and plastic primer, for non-wood substrates.

If you can't find the right color or finish in a can, make your own with the aerosol power pack sprayer. Fill the jar, screw it onto the aerosol power pack, and spray away.

Glazes, Tints and Toners

Want to do a wet glaze finish? Normally you'd mix a glaze of pigmented color in a fairly slow-drying medium that you brush on and wipe off, leaving color in pores, inside edges and recesses. There's now a faster, easier way. Mohawk sells pre-mixed colored glazes in aerosol cans, ready to spray on, wipe off and blend for the look you want.

You'll also find tinted clear finish in both translucent dye and more opaque micronized pigment versions. Use them to subtly change the color of the

wood, touch up light or sanded-through areas to match, make faux inlays or add uniformity to uneven wood.

Stretch your finishing skills by using Shadow Toner to create a gradual sunburst or corona. Simply spray your chosen color of Shadow Toner around the edges of a panel, door, box or instrument.

Finish Repairs

Got blush? That's the annoying, cloudy, white haze caused by spraying lacquer when the humidity is too high. Eradicate it

without even emptying your spray gun by spraying with Mohawk's Super Blush™ Retarder Aerosol.

Need to do a spot repair? Mohawk's Perfect Blend® lacquer is just the ticket, with low bounce-back and a gentle spray for smooth blending of the finish even in just a small area. Working on-site where odor is a problem? There's now water-based, low odor touchup lacquer in spray cans as well.

More Options, Versatility

No discussion of spray cans would be complete without mentioning the staggering array of solid colors, metallic hues and even pearlescent paints, but that's just the beginning. There are other materials bound to tickle your creativity.

For instance, use a stencil with glow-in-the-dark paint to add a stars-and-moon motif to your work.

Chalkboard paint, available in traditional black, several colors, and even clear can turn any surface, even a kitchen cabinet door, into a handy notepad.

There's also aerosol white-board paint, if you prefer that. Textured paint offers a sandblasted or dry spray appearance, while hammered finish gives the look of industrial metal, perhaps just the thing for a man cave bar top.

Whatever your spraying needs, chances are there's an aerosol with your name on it.

Rockler and Earlex team up to design an HVLP Spray System for a professional quality finish at an affordable price!



Spray anything from lacquer to unthinned latex with minimal over-spray. Designed with simplicity and versatility in mind, the Rockler finishing sprayer is the ideal solution for anyone wanting a smooth, professional-quality finish in very little time. It's easier than ever to *create with confidence*.

Rockler Finishing Sprayer
(56405) \$149.99



EMAIL SUBSCRIBERS

FREE
SHIPPING
EVERY DAY
ON \$35+ ORDERS

Sign up for our emails and get everyday FREE SHIPPING!
For details go to rcklr.co/246 or call **1-800-279-4441**
and mention code 246 at checkout.

 **ROCKLER**
WOODWORKING AND HARDWARE

Create with Confidence™

To shop, find a store or free catalog:
Rockler.com | **1-877-ROCKLER**

HEY Did You Know?

Woodworking trivia: holiday cheer with cherry

What Does It All Mean?

A quick guide to terms from the world of woodworking.

Caul: A piece of material, often scrap wood, placed between clamp and workpiece to provide even clamping pressure and prevent marring of the surface

Open time: The amount of time that glue can be exposed to the air and still be workable; also called working life or pot life

Pigment: The component in paint, stain or other finish that provides the color

Raker: The flat-topped tooth in an alternate top bevel (ATB) circular saw blade that cleans out the material at the bottom of the cut to flatten it

Although we traditionally think of **Christmas trees** as **evergreens**, other types of trees, such as cherry and hawthorn, have been used as Christmas trees in the past.

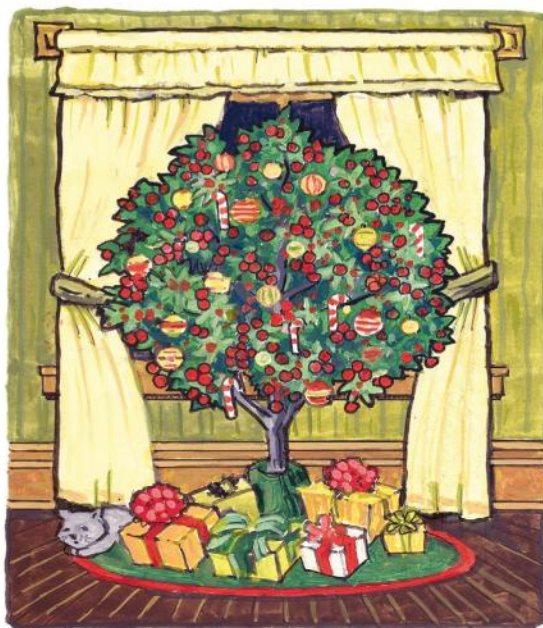


Photo courtesy of the Forest History Society, Durham, N.C.

The **redwood tree** is **fire-resistant**. The bark that covers the tree as a firewall can be up to 12" thick. In San Francisco after the Great Fire that started after the earthquake in April 1906, the flames were often stopped at the streets where the houses and shops had redwood siding.

The Stephens No. 36 combination rule, patented in 1858, is **not just a 12" folding rule**. It's also a two-fold ruler, a try square and an inclinometer.



Submit your own trivia ...

Send in a curious fact about your favorite topic and ours: **woodworking**. If it is selected for use, you will win an awesome prize!

Submit your Trivia to Woodworker's Journal, Dept. Trivia, 4365 Willow Drive, Medina, MN 55340. Or send us an email: trivia@woodworkersjournal.com

Your Trivia Test:

Q Even if a fire has burned part of a redwood, it can still survive. What do you call a cave-like fire scar at the base of a redwood?

According to the Save the Redwoods League, it's a "goose pen."
Answer



Anthony Farmwald of Grayson, Kentucky, will receive a BESSEY K Body REVO Parallel Clamp Kit for having a contribution selected for the Trivia page.

PROFESSIONAL HVLP

Earlex[®] SPRAYPORT

The professional spraying series

Introducing the SprayPort[®] 6000 Series for a Flawless Finish

- Compact and robust 2 or 3-stage base turbine
- Pro-8™ non-bleed gun in gravity or pressure-fed options for superior atomization
- 25' Lightweight and flexible HyperFlex™ hose



6000
series

www.earlex.com



freud[®]

8 Pc General
Purpose Set
Item # 87-208

How Can You Get the Most Out of Your CNC Router?

Use Freud's New CNC Router Bit Series

Freud's new CNC router bits are specially formulated with our exclusive TiCo™ carbide, unique cutting geometries and Perma-SHIELD® non-stick coating for unmatched cutting performance and durability on workshop and small CNC machines.

With over 25 years experience in developing premium CNC bits combined with being the only manufacturer that produces its own carbide, Freud is able to create these new finite, yet durable CNC bits that the woodworker needs to create premium quality projects.

Whether you are creating detailed inlays, decorative projects or sign making, Freud's unique, initial offering of seven new CNC bits and two new sets will deliver superior cutting performance and quality finish. Ideal for hardwoods, softwoods, aluminum and plastics.



8 Piece Sign Making
CNC Bit Set
Item # 87-108

LEARN MORE AT WWW.FREUDCNC.COM