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FREE TOOLS!
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POISONS IN YOUR FINISH: WHAT'S IN THAT CAN? (page 70)

WOODWORKER'S JOURNAL

"America's leading woodworking authority"™

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2012



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- Max. cutting height: 6"
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- Precision ground cast iron table size: 14" x 20 1/2"
- Table tilt: 15° L, 45° R
- Cutting capacity/throat: 13 1/2"
- Max. cutting height: 6"
- Blade size: 92 1/2" - 93 1/2" L (1/8" - 3/4" W)
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- Max. stock thickness: 3 1/2"
- Min. stock length: 8"
- Sanding drum size: 4"
- Sanding belt: 3" x 70" hook & loop
- Dust collection port: 2 1/2"
- Approx. shipping weight: 160 lbs.

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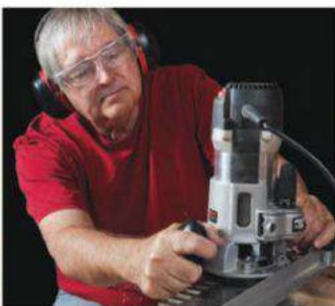
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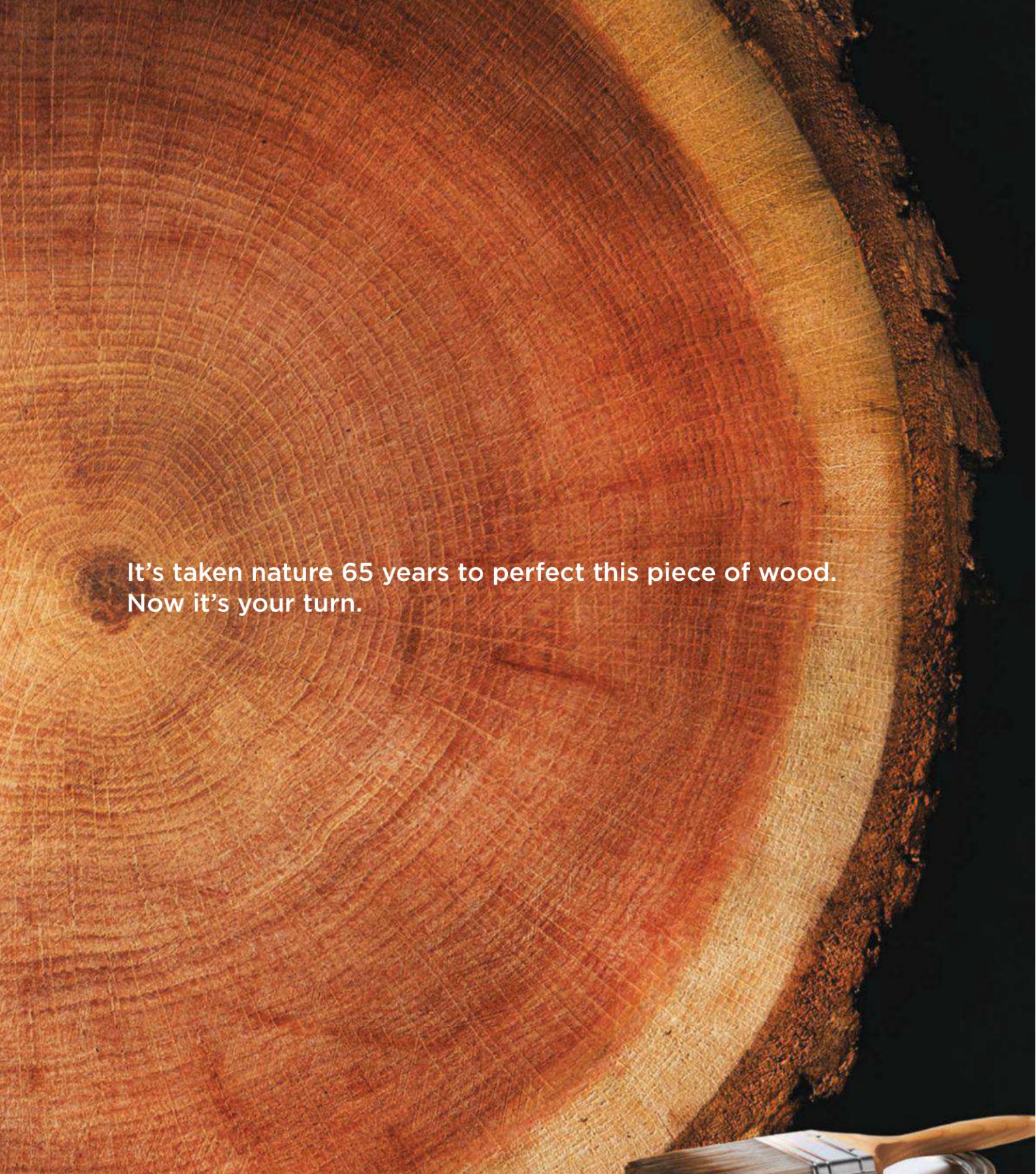
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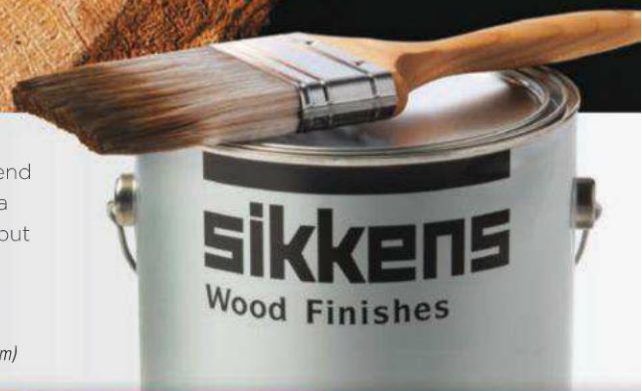


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Tale of Three Bookcases

WOODWORKER'S PROGENY

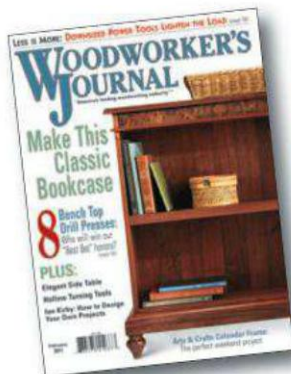
Last February, I posted a short blog entry about a youth-sized dresser



that I'd just completed for my first grandchild. I asked readers if they'd like an article showing how to build it and, to my surprise, I got a ton of emails in the affirmative (several entreating me for the plan ASAP as they had grandkids "in the hopper!"). So,

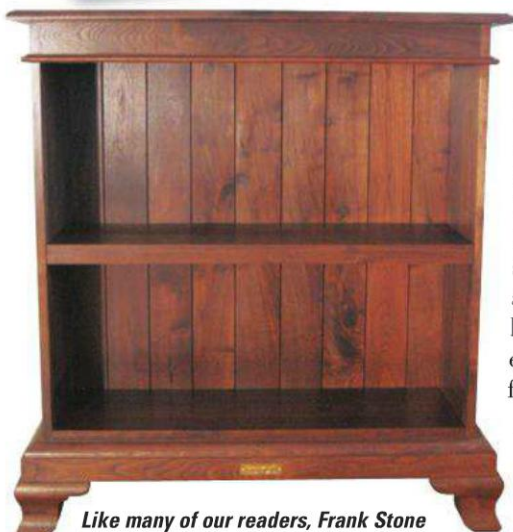
on page 34, you'll find *Maggie Lu's Little Dresser*. I hope that you'll enjoy reading about it as much as I enjoyed making it — but you'll have to excuse me if I think that is unlikely. Because, for me, this effort had a different focus, not of the moment, or for a customer, but for the future. Who knows how many little Johnstones may eventually use that little dresser? Your guess is as good as mine, but I must admit, I find it a truly satisfying subject to think about!

—Rob Johnstone



Bookcase No. 1

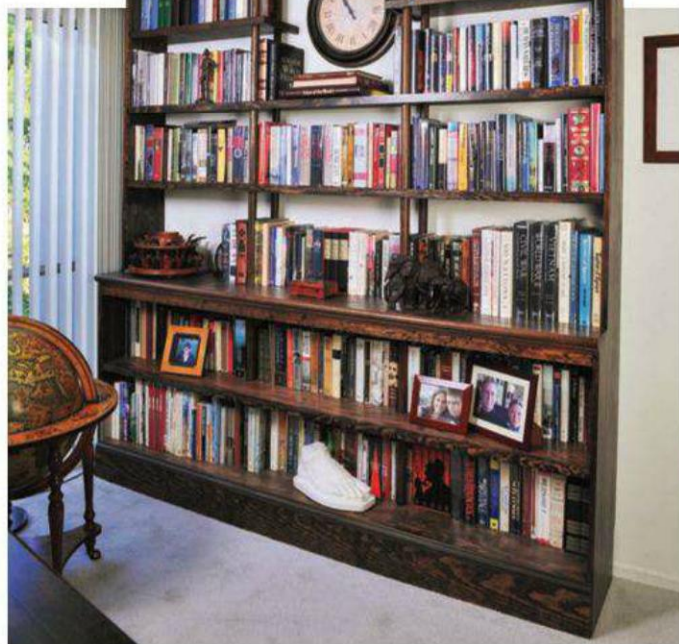
I have completed the construction of the "Classic Walnut Bookcase" found in the February 2011 issue of WJ. I used walnut in the construction, but I did not apply the veneered accent strip. I used a piece of walnut that had the "character" that I wanted. I also made Queen Anne legs as a substitute for the



Like many of our readers, Frank Stone used our bookcase plan as a starting point and let his skills and wood supply play their roles in his final piece.

bun feet. I have received many compliments on this change. The last change was on the top. The dimensions are the same, but I used a 1½" band strip on the sides and front. This band eliminates the end grain when finishing as well as giving it a classy look. Thanks for the excellent projects and keep them coming.

Frank Stone
Richmond, Indiana



Bernard Botes Krüger knockdown bookcase

Bookcase No. 2

I found the short article "Easy Knockdown Bookcase for Small Spaces" [*Shop Talk*, April 2012] quite interesting — and very timely, since my retired friend wants to build a removable bookcase in his bedroom. I would hope more specific details and drawings could be obtained for this bookcase. I may be able to construct a unit from the article, but there would be more trial and error than I care to tackle.

Russ Dieckman
Kingsford, Michigan

We, at the Fitchburg, Wisconsin, Senior Center are planning to build a semi-open built-in bookcase for our center lounge. The unit by Bernard Botes Krüger in the April 2012 issue may be just what we are looking to build. My calculations show I need three 4' x 8' sheets of plywood. Mr. Krüger, however, used five sheets of plywood, so I am interested in the dimensions of various parts.

Bob Hillner
Fitchburg, Wisconsin

Mr. Krüger responds: I'm pleased that you liked my bookcase design! Yes, you are correct that THREE sheets of plywood are needed for each unit. (I said "five" because I made two bookcases and the shelves of the second unit were somewhat smaller.)

Good luck to both of you with your projects. To help you out in that regard, *Woodworker's Journal* has agreed to post my seven-page PDF document, including drawings and dimensions, on their website! Just click on their "More on the Web" icon.

— Bernard Botes Krüger

Bookcase No. 3

We set aside the bookcase project you built for your daughter ["Modular Bookcases," *December 2009*] and finally found time to complete our rendition of it (*see photo on next page*).

We needed to be able to have the floor vent open in the middle and wanted a design that fit with our decor. The TV is mounted on the wall, so the bookcase was adapted to fit

Letters continues on page 8 ...

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Ken and Courtney Sinibaldi loved our bookcase design (December, 2009), but didn't let that stop them from making a few necessary adjustments for their own piece.

under it by using 1/2" ply in the glue-up, faced with 1/2" strips. Because of the facings, the units would not have abutted well without some creative adaptations.

Love the design. Thanks for the article and the plan. Enjoy the magazine every time and use the ideas a lot.

Ken and Courtney Sinibaldi
Lopez Island, Washington

Extra-large Pizza Peel

I am sending you a photo of the third pizza peel I made after seeing the plan in *Woodworker's Journal* ["Pizza Peel," February 2012]. I altered the design to account for the large, heavier pizza that my four always-hungry grandchildren require. Thanks for the plan!

Max Lee
Cameron Park, California

Your Wife is Right

I am 73 years of age, handicapped, and mostly wheelchair-bound. I received much inspiration from your article several months ago [*Shop Talk*, "Finding Refuge in the Workshop," February 2011] about the handicapped physician who keeps on keeping on with his woodworking shop. My wife wants me to do the same. She believes that it will keep me younger and healthier than I would be otherwise.

Paul L. Fletcher
Indianapolis, Indiana

Letters continues on page 10 ...



AUGUST 2012

Volume 36, Number 4

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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, \$5.99. Reproduction without permission prohibited. Publications Mail Agreement Number 0861065. Canadian Publication Agreement #40009401.

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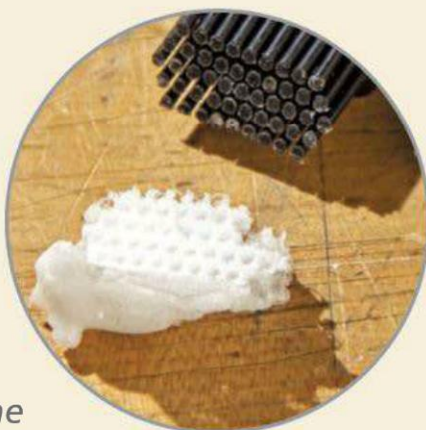
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WOODWORKER'S JOURNAL

You'll find more info online: check out our online "More on the Web" section for this issue for additional info on how to build Bernard Botes Krüger's easy knockdown bookcases, as discussed on the first page of Letters.



woodworking.com



Miter Saw Two-fer

Your recent miter saw table plan ["Ultimate Miter Saw Stand," June 2010] inspired me to do what I've wanted to do for eight years. My adaptation of using stock cabinets and my existing miter saw table resulted in the above photo. The cabinets saved time and provided me with what I really needed: dust-free storage to put stuff in my cutting room.

Steve Messick
Hastings, Minnesota

It's been a while since you featured the miter saw stand in the June 2010 issue ["Ultimate Miter Saw Stand"]. I've attached a few pictures to show a morphed 3' x 8' version with removable and/or replaceable support tables, asymmetric bays, a drop-leaf extension, cobbled dust collection system, etc. It's a workhorse, not a show horse, to be sure. And it dutifully houses the DeWALT sliding miter saw my son and daughter gave me at retirement. Thanks for the great inspiration.

Ed Weyer
Fayetteville, Georgia



Stumper Stumble

Thank you for printing my thoughts about the Androck mixer [Stumpers, April 2012]. It's fun to see my 70+-year-old story; however, I now wonder what David M. Moore of Lawrenceville, Georgia, wanted us to know.

Glenn Gehring
Menomonie, Wisconsin

WJ Responds: Oops! We apologize for the error which had us misattributing Glenn's story of whipping cream so enthusiastically he turned it into butter. (David Moore's mind was on mixing other things: he thought the basket went into a paint can.)

Saw or Subscriptions?

I am a novice woodworker. Thanks to the bust in the economy, I now have time to do a little woodworking. You and other magazines keep writing about jigs for table saws, but 90 percent of them are of no use to me. I have a 10" Ryobi table saw that has a built-in sliding miter table

Two of our readers liked field editor Chris Marshall's miter saw table plan so much that they allowed it to serve as the inspiration for their own versions, shown here. At left is Steve Messick's adaptation and down below is Ed Weyer's 3' x 8' workhorse version.

with no miter slots. Being on a fixed income, I can't afford to go and buy a new table saw. I guess I could if I dropped all my subscriptions, but that seems counterproductive. Please remember us little guys out here that can't afford all the newest equipment!

Ray Nielson
Atlantic Beach, Florida

Who Gets the Tools?

I thoroughly enjoy your publication and look forward to every issue. Not to be morbid, but what are your readers going to do with their workshops and tools after they "graduate"? I have spent 30-plus years purchasing high quality tools and teaching myself and my three children how to use them.

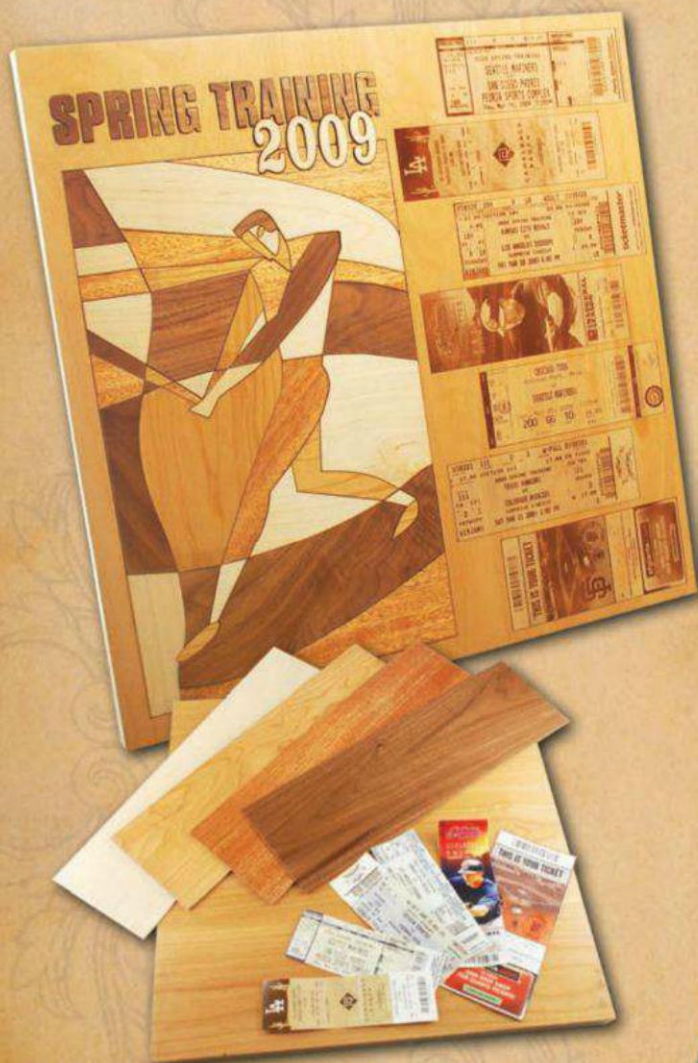
Fortunately, I am blessed with two choices: let my children divide up the equipment or build a shop at our summer house in Maine. I wonder, what will other readers do? It might be an interesting question to pose.

Ned Thompson
via Internet



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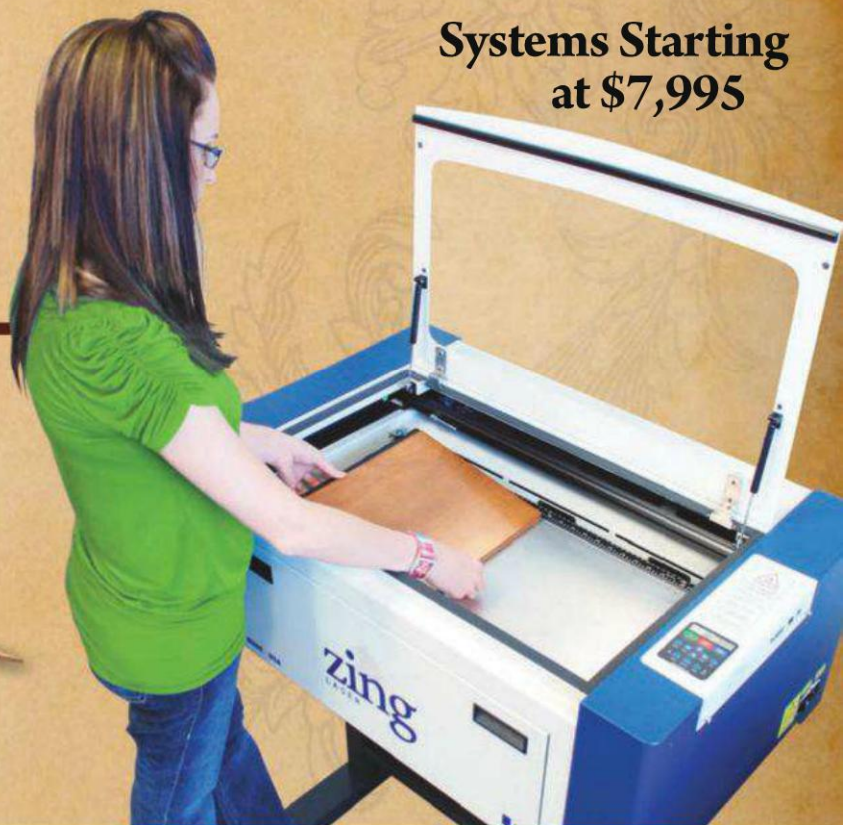
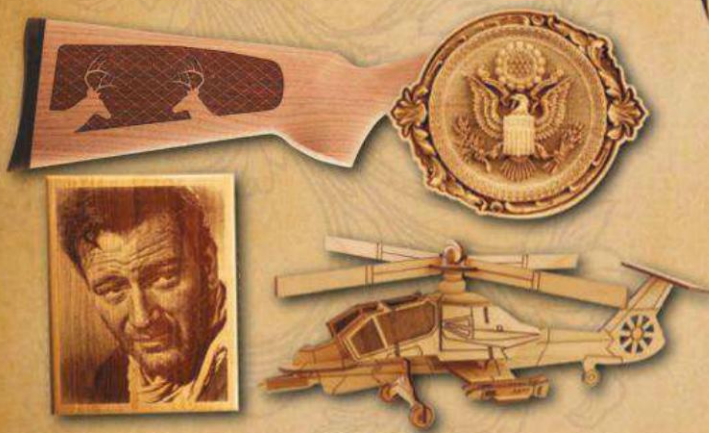
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Tricks of the Trade

Scraps, Caps and Hooks in the Shop



A condiment bottle dispenses powdered wood putty accurately.



Cup hooks with spring flaps help to manage power cords.

Mustard Bottle Wood Powder Dispenser

Mixing powdered wood putty with water and attempting to get the correct ratios was always hit or miss ... mostly miss. Generally the powder went to waste. So, I took a mustard dispenser, cut the tip off and loaded it with powder. Now it's much easier to dispense in the correct volume.

Mark Thiel
Coral Springs, Florida

Safety Cup Hooks Make Handy Cord Holders

Frequently, the power cords for machines and extension cords need to be run under workbenches and tables. To keep them off the floor, I use

"Safety Cup Hooks" available from most home centers and hardware stores. They have a spring flap over the opening of the hook, and the large size hook easily holds a power cord. The "Safety Hook" feature captures it securely and still allows for easy removal when needed.

Rich Flynn
Huntington Beach, California

PICK OF THE TRICKS

Low-tech Laser Accuracy

If you don't have a miter saw with a laser beam, fear not, you can still cut unknown angles just as accurately if you use this low-cost and simple trick.



Lay out your workpiece with the angle you need to cut and set it on the miter saw bed. Unplug the saw and hold the guard up to expose the blade. Using a spring clamp, secure a blade guide made out of a piece of thin plywood or scrap of hardboard to the saw blade. Now lower the blade until the scrap rests on the workpiece, and swivel the saw left or right as needed until the scrap lines up with your layout line. Lock the angle. Remember to position the blade on the waste side of the line. Here's laser accuracy with just a little left- and right-hand coordination.

Serge Duclos
Delson, Quebec

Better Bench Saw Vise

I sharpen my own hand saws, and I have designed a wooden saw vise from scrap that presents some improvements over other alternatives. My vise has two sets of independent vertical arms that transfer the clamping pressure of a bench vise to the wooden jaws that hold the saw blade. The vertical arms are connected to one another by crosspieces at the bottom. The advantage of this design is that the bench vise screw and rods do not

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.



interfere with the clamping of the wooden arms. You can also clamp the saw blade as low to the bench vise as you want to apply more pressure and transfer less vibration while filing the teeth. I can clamp everything from small dovetail saws up to a 28" rip saw by using narrow strips of wood for the contact surfaces of the jaws.

The vise measures 14½" long by 12" tall, and the arms are

spread far enough apart to fit around my vise hardware.

Alejandro Balbis
Longueuil, Quebec

Save Those Chisel Caps!

Installing or removing mortiser chisels is a clumsy job, and it can lead to poked fingers or damaged points if the bit slips. There's a cheap solution: protect the sharp points (and your fingers!) with the plastic cap that comes

with most new mortiser bits. Install the cap to help push the auger and chisel into place. Put it back on when you're through mortising to prevent the bit and chisel from falling as you're removing it from the machine.

Charles Mak
Calgary, Alberta



Winner!

In addition to our standard payment (below), Serge Duclos of Delson, Quebec, will receive a Lamello Vario Box 440 Piece Set of Biscuits and Joining Elements from Colonial Saw

(www.csaw.com) for being selected as the "Pick of the Tricks" winner. We pay from \$100 to \$200 for all tricks used. Send your original, unpublished tricks with a photo or drawing to Woodworker's Journal, Dept. T/T, P.O. Box 261, Medina, MN 55340.

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Questions & Answers

Spin Control

THIS ISSUE'S EXPERTS

Bill Hylton is a woodworker and author of *Woodworking with the Router*.

Bob Behnke is a senior technical specialist with Franklin International, makers of Titebond® wood glues.

Michael Dresdner is a nationally known finishing expert and the author of *The New Wood Finishing Book*.

Ernie Conover is the woodturning columnist for *Woodworker's Journal* and author of *The Lathe Book*.

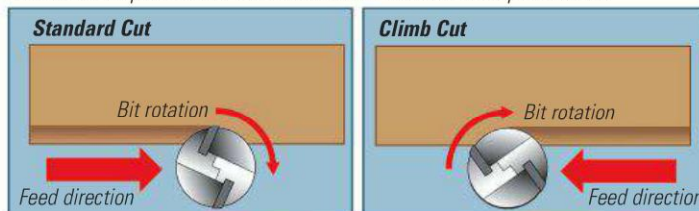
Q As a newbie woodworker, I get confused by wood-working terms. Often, the meaning becomes clear from the context it is used in. But other times, I am left in the dark. When reading a recent article, the author talked about using a “climb cut” with his router to avoid tearing out highly figured grain. What is a climb cut, and if it works better than a non-climb cut, why wouldn’t you use it all the time?

Jack Danielson
Blaine, Minnesota

A If you allow your router, spinning a piloted, edge-cutting router bit, to go the direction it wants to go, it’ll be making a climb cut. Hold a rabbeting bit at the edge of a board (shank up), and rotate it clockwise. Like a paddle-wheel, the cutting edges will dig into the wood and pull the bit to your left. But at the same time, they’ll be pushing the bit away from the wood’s edge. The natural tendency of a bit is to “climb out” of the cut, hence the name.

Chuck that bit in your router and let it guide you through a cut. You’ll find the router takes off to the left, surging unpredictably along the edge. It can be unnerving. The cut will be clean, but its width will waver. Try again, but this time push the router to the right. You’ll feel some resistance, but

Illustrations depict a router and router bits oriented as in the photo below.



the router will hug the wood’s edge. You’ll feel in control. To be safely in control is why you should avoid climb cuts.

— Bill Hylton

Q How long can you keep woodworking glue (the white and yellow varieties) around your shop before they go bad? I have not found any “best if used by” dates as I would if the glue was a food product. Are there any tests or guidelines I can follow?

Liam Moriarty
Harrisburg, Pennsylvania

A Most companies put an “official” shelf life on their products to limit liability in case poor storage conditions cause product failure. The official shelf life of wood glue typically is between one and two years. However, if kept in good storage condi-

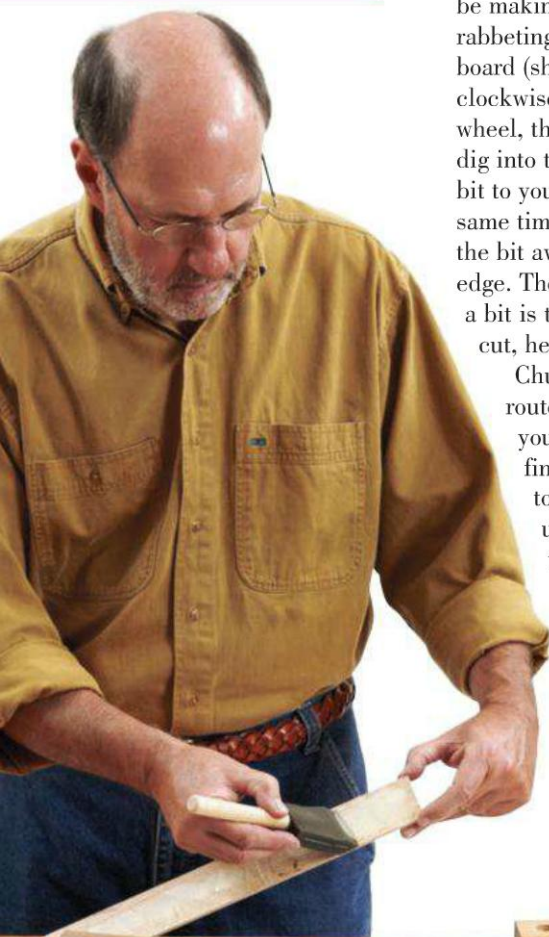
tions, such as a basement offers, white and yellow glues can last up to 10 or more years. Increased chemical reactions between glue particles can decrease the expected shelf life of water-resistant or fast-grab adhesives.

The worst storage conditions allow freezing, then thawing and heat. Most wood glues are designed to withstand a minimum of five freeze/thaw cycles. With each cycle, the glue forms gels. Mixing easily breaks up these gels, but each subsequent freeze/thaw incident will make the gels more difficult to disperse. Eventually, the gels won’t break up, and the glue will remain solid. Heat also can cause the polymer to clump and gel.

Here is a rule of thumb for testing wood glue to see if it is still good. It’s a good sign when the glue comes out of the bottle. Then, the glue must wet out the joint smoothly. It shouldn’t look pasty, stringy or want to stick to

Continues on page 16 ...

Our reader wants to know how long glue stays good and usable. And what happens if it freezes?



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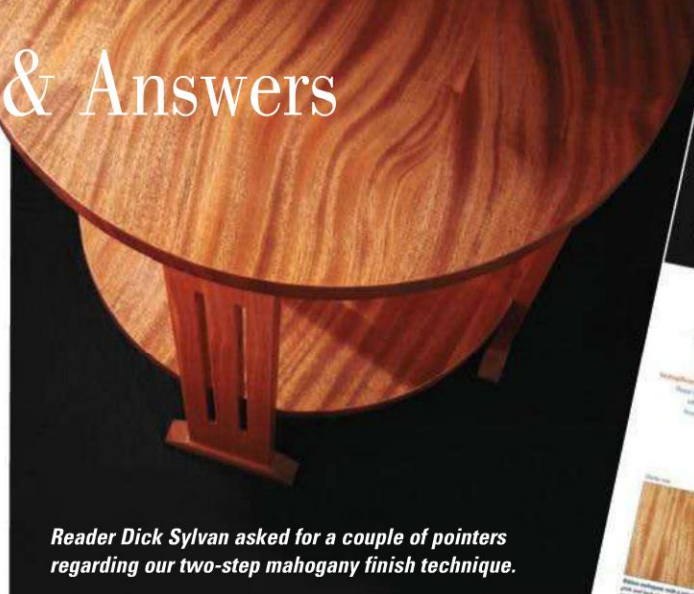
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Questions & Answers



Reader Dick Sylvan asked for a couple of pointers regarding our two-step mahogany finish technique.



itself better than to the wood substrate. If it does, it is time for a new bottle of glue. Otherwise, the glue should bond as well as the day it was produced.

If the adhesive passes the test but is a bit thick, add about five percent water.

In short, there isn't a "best if used by" date; it's just best to store the glue correctly.

— Bob Behnke

Q Just read "Mahogany Two-Step" [*Finishing Thoughts*, April, 2012], and I have one big question. As I am now working on a Thomas Elfe reproduction mahogany chest on chest, I tried the Honey Amber TransTint dye in water approach on a test piece, but when I sprayed over the dye with the Zinsser shellac, I found that the dye ran as if it had been applied with alcohol rather than water. To solve the problem, I "sealed" the dye with BLO and then sprayed with shellac. But I am not sure that was really the best approach. Is there a better way? My chest will be very large and cumbersome with so many steps. Help, please!

Dick Sylvan
Houston, Texas

A TransTint will mix with water, alcohol and lacquer thinner. You can lock it in with boiled linseed oil (BLO), which contains none of those solvents. However, you can also seal with alcohol-based shellac, but for that, two conditions must be met. Let's return to the article, emphasizing a few key words.

"A small amount of Homestead Finishing Company's Honey Amber TransTint in water provides just the right color. Wipe it off completely and let it dry overnight...Seal the dyed wood by spraying one thin coat of dewaxed shellac."

In other words, use very little dye and a very thin sealer coat. Avoid putting an excess of dye on the wood, and be sure to wipe it all off completely while it is still wet. You'll then have very little dye to bleed or run, no matter what you put over it. Follow with a very thin coat of sealer, especially when sealing with a finish that has the same solvent as your dye. In this case, apply the shellac sparingly, avoiding runs, puddles and drips. If there are no runs, there will be no running of color.

— Michael Dresdner

Q Good article! One specific question you didn't quite get to in the "A Slippery Slope" article [*Finishing Thoughts*, February 2012]: are drying oils all food-safe, and are resin-laden oils food-safe?

I'm also a bowl turner. I can't seem to identify the variables that leave me with a reasonably smooth vessel after use and one that is very fuzzy. For example, hard maple plates that looked and felt like glass when they were made and 2-3 coats of oil applied were very fuzzy after one meal off of them, but a black willow salad bowl, after several usings for food, is about as smooth as it started — which, since it's not a very hard wood, is soft feeling but not fuzzy. I'd appreciate any help you can give!

Ann Dinsmoor
Newton, Massachusetts

A Let's start with the fuzzy grain. As you surmise, wood species can affect grain behavior, but maple or cherry are both excellent for treenware. Dry or green wood should make little difference. I suspect the problem is not starting with coarse 60- or 80-grit sandpaper and not sanding long enough to get through end-grain tear. Going to very

Continues on page 18 ...



Winner! For simply sending in his question on proper dye application, Dick Sylvan of Houston, Texas, wins an Osborne Miter Gage by Excalibur (from General International). Each issue we toss the new questions into a hat and draw a winner.

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What's This?



Larry Hartford of Bonner Springs, Kansas, found this 4½"-long thingamabob at an estate sale. Do

you have a better name for it — or, better yet, know what it's for? Send your answer to "Stumpers," Woodworker's Journal, 4365 Willow Drive, Medina, MN 55340 or email it to us at stumpers@woodworkersjournal.com for a chance to win a prize!

In our April issue, **David Gwinner** of Dallas, Oregon, presented a mystery tool he originally thought was a tenon cutter for a brace (above).

Alfred Kraemer of Menomonee Falls, Wisconsin, said, "Tenon cutter" would be close, but this is a hollow auger." **John S. Rauth** of Ridgely, Maryland, further elaborated: "It is made by the A.A. Woods & Sons Co. #B31 Hollow Auger. His has a wrong driving tang. The correct tang is the type on a regular auger bit."

Use? "This is for putting a tenon on the end of a spoke for a horse-drawn wagon wheel," said **Harold McGee** of Tustin, California. **Larry Van Havermaet** of Rochester, Minnesota, said, "The lower knob is for setting the size tenon and the center guide sets the length of the tenon."

"You put the tool, held in a brace, over the end grain of a piece of wood that is cut closely to the desired size of the dowel. The tool is rotated with the brace, and the dowel is very neatly cut," explained **Carl Winkler** of Crownsville, Maryland.

Back in the day — of the



Tom Rowan of Danville, Iowa, cuts tenons with his answer to April's mystery tool.

19th century wheelwrights, that is — **Lorin Blakeslee** of Erie, Pennsylvania, said, "The auger was also used by ladder and chair makers to make tight joints for ladder rung ends, chair legs and backs."

The grandfather of **Donald Steinke** of St. Marys, Ohio, "was born in 1874 and followed his father in the wagon and buggy business. The tool is like one I have from him. [It] has an adjustable depth stop, adjustable blade/cutter and, on the opposite side, is a knurled adjuster for a variable diameter tenon up to 1½", whereby one can cut two different diameter tenons on the same wood blank so as to have a step effect for a shoulder and socket pocket hole, either clear through and wedged or bottom-stopped and glued."

—Joanna Werch Takes

Winner! Donald Steinke of St. Marys, Ohio, wins a PORTER-CABLE 18V Close Quarters Drill (PCC520B).

We toss all the Stumpers letters into a hat to select a winner.



Questions & Answers

continued



fine paper will not affect the issue you describe if the initial sanding is not aggressive. If initial sanding is adequate, wet sanding with water, mineral spirits or oil will improve things greatly.

Oil is a great bowl finish. It is easy to apply, easy to repair, and it enhances the beauty of the wood.

Commercial oil finishes include Minwax® Antique Oil, Watco®, Waterlox and a host



Getting a food-safe finish on a turned bowl is an important consideration. Our expert has the answer.

of others. These are really catalyzed tung and/or linseed oil mixed with oil-based (alkyd) varnish. They build to a very durable finish, which will withstand sustained use and hand washing, but these finishes are toxic if ingested.

However, the feeling in the woodturning community is that, once polymerized, the heavy metals are locked inside the coating so will not get into food because they are encased in finish. Since I only give my bowls to relatives and friends, I have a certain amount of diplomatic immunity, so I use a drying oil on most of my bowls.

—Ernie Conover

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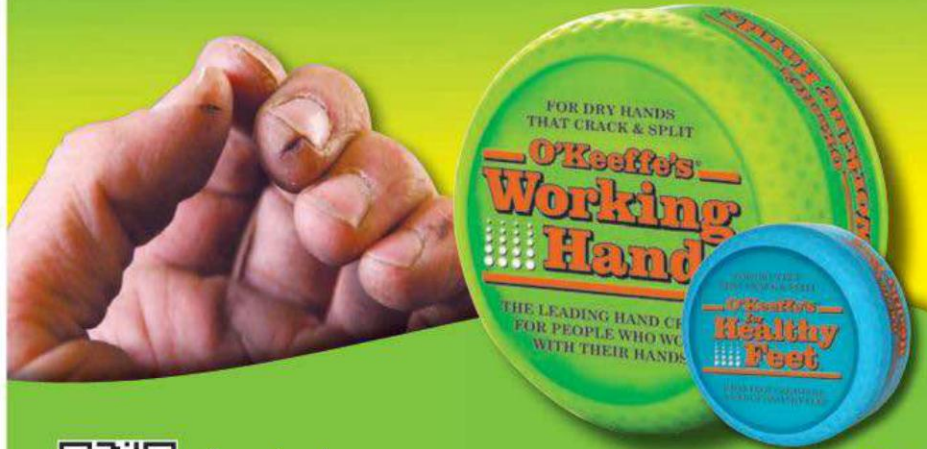
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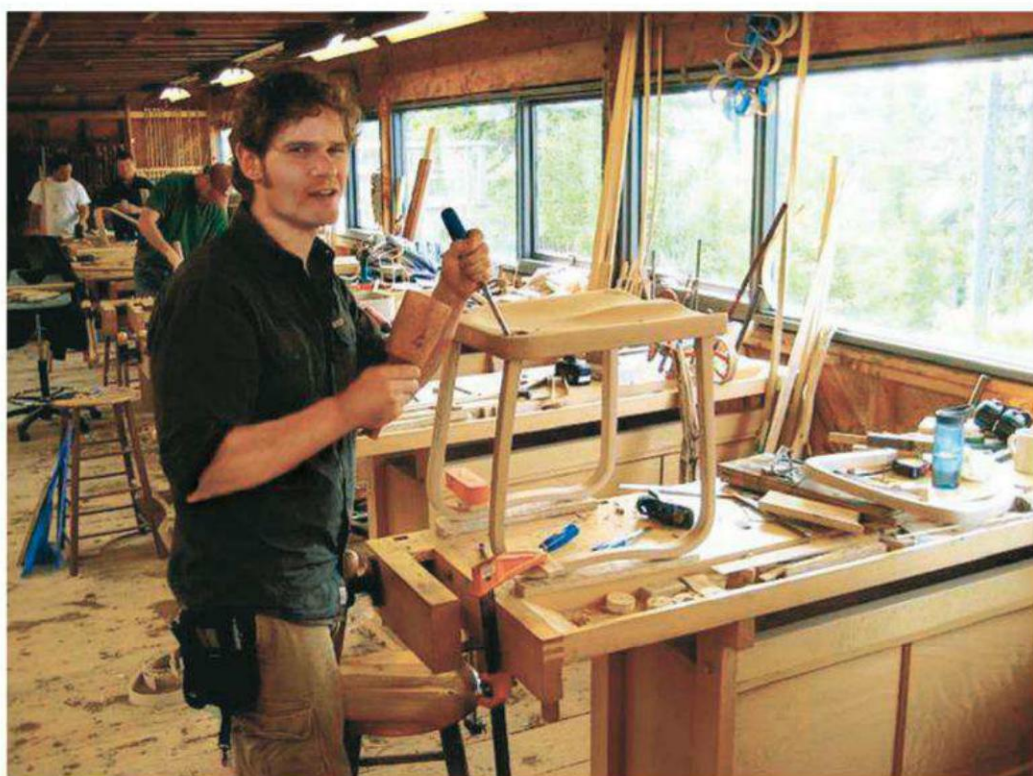
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Shop Talk

The Next Generation of Woodworkers

Schools participate in the Furniture Society scholarship program at their request; students on these pages attended Anderson Ranch Arts Center, Haystack Mountain School of Crafts, Penland School of Crafts and the Center for Furniture Craftsmanship.



Furniture Society-Powermatic scholarships increase young woodworkers' skills in areas ranging from steam bending (Gill Benzion, above), to intermediate furniture making (Joanna Ginsberg, left).



Student Scholarships

Lending support to woodworkers at the beginning of their careers, the Furniture Society this spring announced the latest crop of winners in the Furniture Society-Powermatic® Student Workshop Scholarships. Powermatic has been the partner sponsor since the beginning for the scholarship program, which fully funds

winners' participation in specific workshops offered by participating schools.

Among the classes chosen by the five 2012 winners are "Finishing A-Z" at the Center for Furniture Craftsmanship, "Advanced Woodworking: Tables and Benches" at Anderson Ranch Arts Center and "Fundamentals of Boat Building" at Penland School of Crafts.

The students (scholarship applicants must be students, and must be Furniture Society members) identify their desired workshop during the application process, which requires them to submit photos of their work and a short essay explaining, in the words of 2011 winner Teresa Audet, "why you wanted to do this, why it would help your career, and how it helps

give back to the Furniture Society."

Barry Schwaiger, Powermatic's director of product development and the Furniture Society representative on the three-person scholarship jury, said, "The scholarship program encourages innovation and assists promising students of furniture making to hone their knowledge and skills. Some of these students will go on to head their own independent workshops, while others will become designers and executives in the furniture industry."

In addition to Schwaiger, the other jurors are past Furniture Society president Miguel Gomez-Ibanez and past Furniture Society Conference chair John Dennison.



2012 Furniture Society-Powermatic Student Scholarship winners are: Brendan Taylor of Oakville, Ontario, a student at Sheridan College who will attend a workshop on metal furniture at Anderson Ranch Arts Center in Snowmass, Colorado; Bradley Wolcott of Brookline, Massachusetts, a student at North Bennet Street School who will participate in a workshop on finishing A-Z at the Center for Furniture Craftsmanship in Rockport, Maine; Vincent Edwards of Bloomington, Indiana, a student at Herron School of Art & Design who will participate in a workshop on advanced woodworking: tables

and benches at Anderson Ranch Arts Center; Sophie Glenn of New York, New York, a student at Purchase College who will attend a workshop on fundamentals of boat building at Penland School of Crafts in Penland, North Carolina; and Nathaniel Chambers of Clyde, North Carolina, a student at Haywood Community College who will participate in a workshop on making connections/basketry at Haystack Mountain School of Crafts in Deer Isle, Maine.

Further information on the scholarships and applications are available online at www.furniture society.org or by phone at 828-255-1949.



Last year's recipients chose workshops in topics like chair design (Juan Pablo Blanco, top) and relics, cabinets and boxes (Teresa Audet, above and facing page).

George Nakashima's Work on Display

Commissioned in Early 1970s, Pieces are in Daily Use

It's a safe bet that anyone who knows the work of George Nakashima would appreciate any opportunity to see one of his pieces, but what about over six dozen? If you think that such a collection would only be located at the legendary woodworker's former home or his foundation's workshop and gallery, you'd be wrong. It's actually over a thousand miles away from both, and completely open to the public.

Visitors to the Anderson Horticultural Library in Chaska, Minnesota (about 25 miles west of Minneapolis), are treated to an extensive collection of Nakashima's work, ranging from tables and chairs to desks, display cases and library shelf endcaps.

Shop Talk continues on page 22 ...



Stylistic details typical of Nakashima's work include butterfly wedges and natural edges, often on walnut.

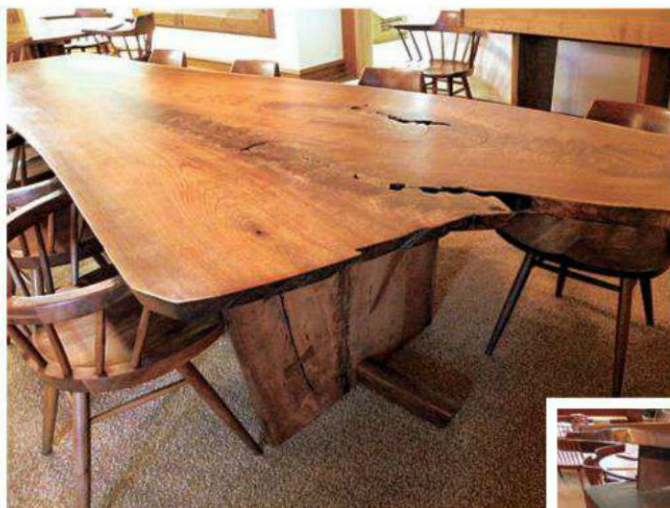


some photos courtesy of University of Minnesota Libraries

MORE ON THE WEB

Visit the “More on the Web” section of woodworkersjournal.com for a video tour of more pieces from this collection.

More information about the history of the Anderson Horticultural Library can be found at the following website:
www.arboretum.umn.edu/library.aspx



The library is part of the Minnesota Landscape Arboretum, which is part of the Department of Horticultural Science within the College of Food, Agricultural and Natural Resource Sciences at the University of Minnesota.

The majority of the pieces were commissioned during the library’s construction in the early 1970s by its namesake benefactors, former Minnesota Governor Elmer L. Anderson and his wife Eleanor. The pair viewed some of Nakashima’s work during a visit to the Renwick Gallery of the Smithsonian Institution in Washington, D.C., and thought his

Daughter Mira’s pieces supplement famed woodworker George Nakashima’s work for the library.

furniture would be a perfect match for their new library.

Since then, there have been some recent additions from Mira Nakashima (George’s daughter), such as a book cradle, a computer desk and “The Mitten” (photo previous page), which is used to add some privacy to the library’s computer.

While many would argue that these pieces belong in a museum, they’re actually

being treated the way Nakashima intended: they’re put to use every day. Readers sit in chairs, librarians fill display cases, and weekly storytime participants make use of the tables. It’s in keeping with Nakashima’s philosophy that the pieces are “lived with and not considered overly precious.”

Of course, there’s plenty of care put into making sure pieces are available for future generations. Every January, library staff members and local volunteers come together for what’s referred to as “Miserable Day.” All the pieces are cleaned with a mild detergent and oiled, a cleaning regimen encouraged by Mira Nakashima. The name comes from the soreness that the cleaners feel at the end of the day — Katherine Allen, the librarian for the Anderson Library, said it’s astonishing how many chairs there are in the collection, and it takes a while for every slat and leg to be cleaned and polished.

— Matthew Becker



Fred Winkel of Sheboygan, Wisconsin, found a way to repurpose wooden blinds.

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About 25 years ago, I considered it a waste to throw away samples of wood blinds — so I put them away, along with old blinds that I took apart. Then my idea of attaching them to the walls of my garage workshop came into being. I had to wait until I semi-retired, in 2009, to devote my summers to woodworking.

I will say the entire project was a lot of fun.

I will say the entire project was a lot of fun.

— Frederick W. Winkel

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Woodturning

System Three Clear Coat Finish

By Ernie Conover



Sometimes one of our authors "discovers" a product that answers a woodworking problem so well, that he just can't keep quiet about it. This is one example of just such a case.

The finishing of turned work, be it bowls or treenware, presents special problems in terms of how the finish performs. The perfect finish for such items would have these following qualities:

1. Easy to apply, can be wiped or brushed on.
2. Protects the object during use and subsequent washing.
3. Nontoxic during application and once dry.
4. Brings out color, grain and figure of the wood.
5. Yields either a matte low luster finish or a mirror-like "piano" finish.

6. Tack dries quickly so dust in the air does not get trapped in the wet finish.
7. Easy to repair.
8. Sands easily between coats and does not clog sandpaper.
9. Odorless during application and drying.
10. Clear once applied and non-yellowing with age.
11. Unused portion stores without degradation.

Traditionally, oil finish is the finish of choice for bowls and treen. Non-polymerizing or slowly setting oils are the choice when the finish must be assured food-safe. Choices are mineral oil or vegetable

oils, such as olive or walnut oil. These are easy to apply, give some protection, are food-safe and bring out the color in the wood — but are only low luster. They are easy to repair (just wipe more on), but they attract dirt with use so they don't stay clear. They store indefinitely.

The quality that gives such oils both their good and bad properties is that they have no ability to polymerize. The best choice is walnut oil, which has some ability to polymerize but not to a very hard coating. It also hardens slowly ... on the order of three weeks.

For a video of the author demonstrating the techniques for applying this special finish, visit woodworkersjournal.com and click on the "More on the Web" tab shown above.

Raw linseed oil does form a hard film but also takes a long time. Traditionally, it was thermally treated by boiling, which increases its ability to polymerize, albeit to a yellow coating. Today, a better "boiled" linseed oil is made by adding a catalyst to cause polymerization — usually a heavy metal, which is toxic if ingested. Tung oil, which is extracted from the nut of an Asian tree, is also an oil that can be catalyzed and gives a much clearer finish than linseed oil does but takes many coats to build.

A harder finish can be obtained from so-called oil finishes sold commercially. They are either linseed and/or tung oil mixed with a varnish that wipes on easily. These varnishes are usually alkyd resins, which are polyester resins polymerized with natural oil, usually soybean. The resins are very thick by themselves, so they must be thinned with solvent to make them easier to apply. They dry really hard in about 24 hours, but they give off a lot of VOC (Volatile Organic Compound) vapors during application and drying. Application is a smelly process that can get you thrown out of the house. You can make your own by mixing equal amounts of linseed and/or tung oil, varnish and mineral spirits. Since all of these products have a propensity for spontaneous combustion, it's bad shop practice to leave oil on rags



A graduated dose cup is available from System Three or at good drugstores. I have found that, if I ask the pharmacists politely, they will generally have a bucket of small plastic dose measuring cups like the one shown above — which they intend to throw away at the end of the day.

for too long, as they can actually catch on fire from the heat oxidation reaction.

One huge disadvantage of all boiled linseed and tung oils, as well as any varnish, is that once the can is opened the finish will cure quite rapidly. The more air space and the warmer the storage area, the faster it will polymerize in the can. Since small amounts of finish are used in a turner's average finishing session, this is a thorny problem. I have disposed of as much, maybe more, finish as the amount that I have used over the years.

A Problem Solved

It was therefore with some excitement that I learned of a clear epoxy finish from System Three that was easy to apply like oil, had no VOCs and no heavy metal catalysts. Called Clear Coat, it is a two-part epoxy that has a long pot life but dries tough and hard. Although it tack dries in a couple of hours, full curing takes 72 hours. The long drying time is about the only drawback over oil finish. Second coats seem to dry faster than the first coat and



Always wear disposable nitrile rubber gloves when mixing or applying Clear Coat, as contact of the uncured finish with skin can cause an allergic reaction for some people.



The easiest way to apply Clear Coat is to wipe it on with a 2" square of towel (inset above). Sanding between coats is a must, but easy to do.



temperature plays a big role. You need to keep the work at 70° for timely curing; however, higher temperatures speed things considerably. There is a halving of curing time for each 18°F, so 80° makes quick work of the process. If you must finish in a cold shop in the 40° to 60° range, System Three offers Turbo Cure, which reduces curing time to normal.

Exposure to bare skin of mixed or unmixed material should be avoided, for some

Could a two-part epoxy-based finish be the answer to the finishing challenges posed by treenware? Treenware is a term for wooden bowls, spoons and forks — basically kitchenware that comes in contact with food.

people have an allergic reaction to epoxies. Also, it is very difficult to get off your hands, so I wear disposable nitrile gloves during all mixing and application. Unlike oil finishes and varnishes, which have a strong smell, Clear Coat has almost no odor at all. This is because it has no organic compounds vapors. I have applied it at my kitchen island on winter nights when the shop was oh-so-cold.

A huge advantage of Clear Coat is that very small amounts can be mixed as needed, and the unmixed product has an indefinite shelf life. I do take care to carefully wipe the threads of the bottles off with a paper towel before resealing or the lids become

reluctant to unscrew. I have successfully mixed as little as 1.5 teaspoons but normally mix 3/4, 1½ or 3 ounces. You must mix accurate proportions of one part hardener to two parts resin, and the easiest way to do this is with a dose cup. This is a transparent paper drinking cup with graduations in both metric and avoirdupois. Dose cups can be purchased from System Three, at woodworking stores or at good drugstores.

You can also purchase wood tongue depressors for mixing but, being the frugal woodworker, I fish sticks out of the scrap bin.

The street price for twelve ounces of Clear Coat is just

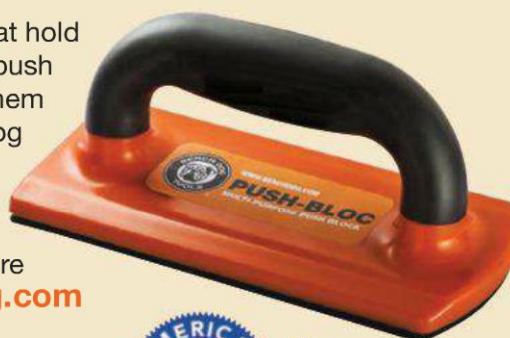
Continues on page 28 ...

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Woodturning continued



Although Clear Coat is a great clear finish, you can also add colorants to it if you wish.



under \$35 but, because I can mix small amounts without the rest going bad, it is far cheaper than oil finish/wiping varnish in the long run.

Application can be by brush, but I prefer to wipe Clear Coat on with a 2" square of cloth towel. The environment should be as dust-free as possible. I soak the square with finish

and wipe liberal amounts onto the work. I wipe on more finish as it soaks in, which also takes care of any holidays (bare spots). After about 10 minutes, I wipe off the excess with clean paper towel, using new pieces as they become soaked with finish.

I have found sanding beyond 180-grit for the first coat is counterproductive. Prior to subsequent coats, I sand with 220-, 320- and 400-grit respectively. I have never had to put on more than four coats, and generally two or three do nicely. One of the best qualities of Clear Coat is its sandability. It sands easily, leaving a white powder that does not clog sandpaper at all.

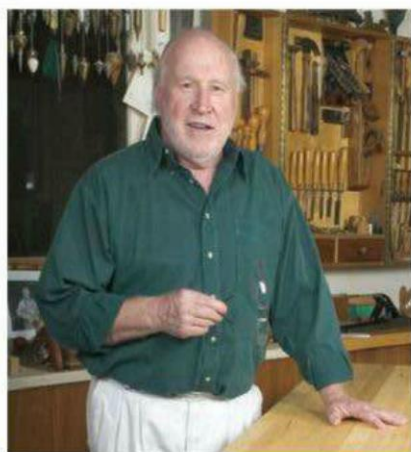
Conclusion

Of the list of eleven characteristics of a perfect treenware finish I provided at the beginning of this article, Clear Coat only comes up short on being nontoxic during application (possible allergen only) and drying quickly.

On the other side of the ledger, Clear Coat is the most durable finish I have found to date by any measure available. As an endurance test, I've actually run two test bowls through the automatic dishwasher on the pots and pans cycle five times with no discernable impact.

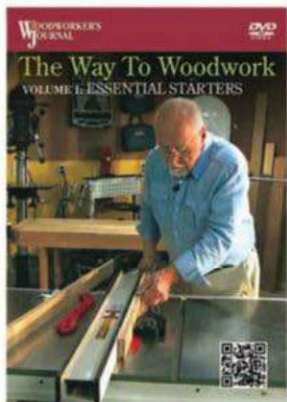
Ernie Conover is the author of The Lathe Book, Turn a Bowl with Ernie Conover and The Frugal Woodturner.

The Way To Woodwork

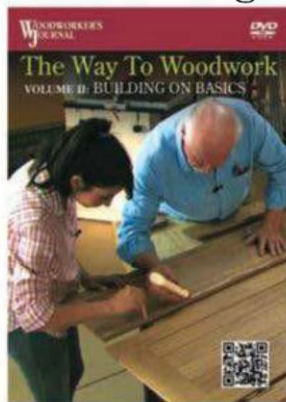


The keys to woodworking, with master woodworker Ian Kirby.

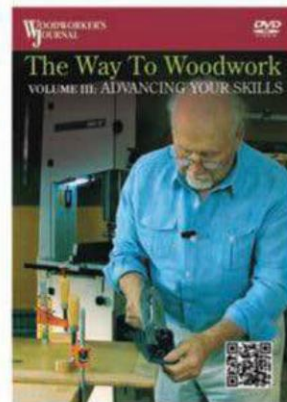
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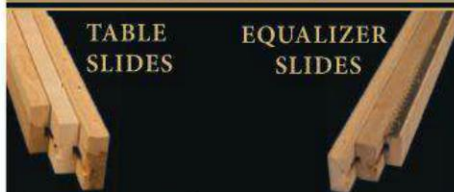


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Reader's Survey

Stationary Power Tools on Runway Again

Stationary power tools are the heavyweight champs of many woodworking shops. Table saws, band saws, shapers, jointers and, for some lucky woodworkers, the list goes on.

They improve our productivity and spark our imaginations. Elsewhere in this issue, field editor Chris Marshall asks some of the biggest tool makers in the industry about new products and how the market is holding up. But when it comes to purchasing a big chunk of cast iron, our readers have some pretty hard-core opinions ... and here they are, for all to see.



ARE YOUR TOOLS STARTING TO SHOW THEIR AGE?

58% of woodworkers are in the market for a new or upgraded stationary power tool. We are not exactly sure why ... but it's clear that their tools are starting to get just a bit gray and long of tooth. We asked our survey takers about the age of their tools and were especially intrigued by the percentage whose tools are **ten years old or older**, as shown in the chart at right:

Table Saw: 54.0%

Drill Press: 77.5%

Band Saw: 53.6%

Jointer: 63.5%

Planer: 61.7%

THE BIG THREE STATIONARY TOOLS

Which three tools are dominating the landscape of home woodworking? It's the table saw, drill press and band saw. **82%** of woodworkers report owning these stationary tools.



#3: Band Saw

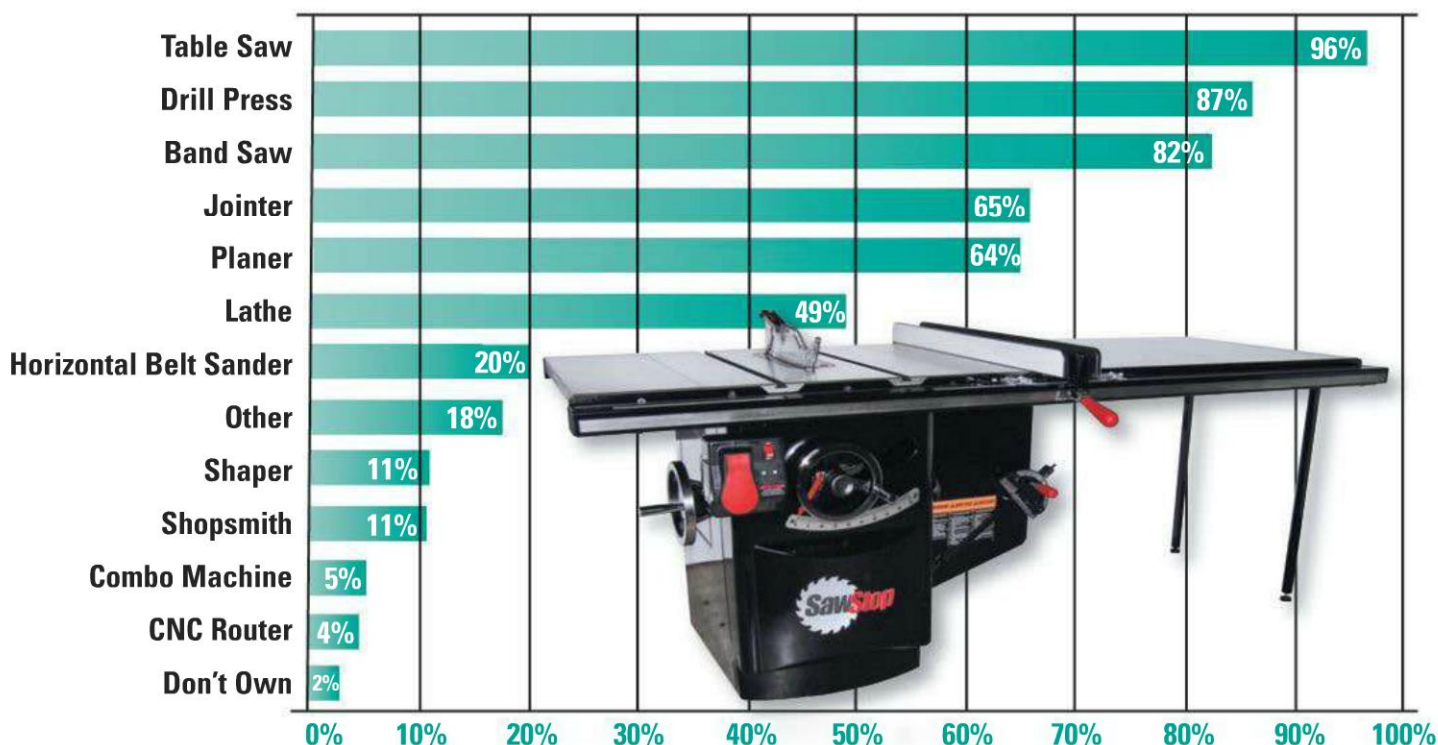


#1: Table Saw



#2: Drill Press

STATIONARY TOOL OWNERSHIP

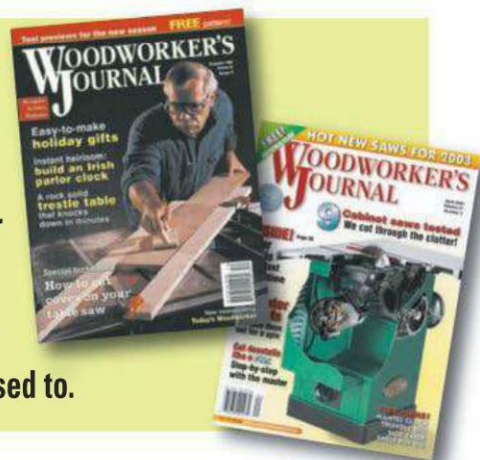


THE SHAPE OF THINGS

Only **11.5%** of woodworkers own a shaper as one of their stationary power tools.



Woodworking magazines are more than twice as useful as any other media when woodworkers are researching a stationary power tool purchase — and **49%** of woodworkers are now doing more pre-purchase research than they used to.



SO ... WHY DO YOU BUY? WHY DO YOU UPGRADE?

40% of woodworkers have changed their approach to buying stationary power tools over the last few years ... the top reasons they changed their approaches are:

- They have all the stationary power tools they need (**27.0%**)
- The economy has made them more cautious about big tool purchases (**19.5%**)
- They recently retired and are living on a fixed or reduced income (**17.7%**)
- Other (**35.8%**)



Stepping up to the next level: When asked why they would consider upgrading a type of stationary tool they currently own, the top three reasons given were ...

- Desire better quality (**17.5%**)
- They are just ready to step up (**10.6%**)
- Desire for a new feature (**10.0%**)
- However, **41.5%** of woodworkers say they are not planning to upgrade their tools.





THE LAST BIG THING

We've reported for a while that the lathe is finding its way into more and more readers' shops. Our survey revealed that, after table saws (#1) and band saws (#2), the stationary power tool most woodworkers plan to buy next is a lathe. And they're off to a good start: **49.3%** of responders already do woodturning as part of their woodworking hobby and **74%** said they are "interested."



THE NEXT BIG THING?

For better or worse (and we get letters leaning both ways on this), it may be that a new host of more affordable CNC routers will be the next big thing in small shop woodworking. The numbers don't lie: Almost **40%** of our survey takers either own a CNC router or indicate that it's a tool they would consider buying in the future.

THE BIGGEST LOSERS

You might see these tools in pro shops, but hobbyists are holding back from buying them. Percentages of readers who still "do not own" these tools:

Combo Machine	94.3%
CNC Router	92.9%
Shaper	76.6%
Horiz. Belt Sander	66.2%



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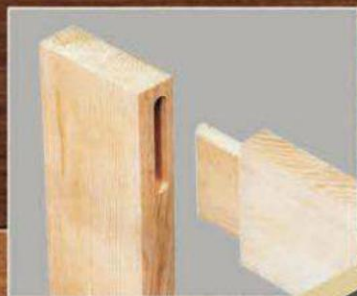


PATRIOTISM — FOR A PRICE

There's no doubting the loyalty of our survey takers — over **90%** say they would prefer to purchase a stationary power tool "Made in the USA." However, of those woodworkers, **25%** would not be willing to pay more to make that purchase and **41%** would only be willing to pay a "patriotic premium" of **10%** more. European manufactured products are preferred over Asian-made tools for **76%** of our group, but again, not for a higher price.



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(Circle No. 19 on PRODUCT INFORMATION form)

Maggie Lu's Little Dresser

By Rob Johnstone



Little things can be extremely important. For example, last January I became a grandfather for the first time, and in the wink of an eye, that little person completely stole my heart. Even before she made her grand entrance, I built a little dresser (youth-sized) to help control the mountains of clothing that a baby generates. (My sister used to tell me that with each new baby, the amount of laundry triples.) As I was designing this dresser, I focused on small details that, when incorporated into the whole, added up to make an eminently practical piece of furniture — with attractive proportions and a touch of style. So, while I used birch veneer-core plywood panels, because

they are dimensionally stable and accept paint well, I also added hardwood trim to all the forward exposed edges — because hardwood will stand up to the beating a child dishes out. The drawer faces are held back from the front edges of the sides to protect them from that same abuse. Narrow but wide drawer pulls are easy for small hands to grab, and their curved contours reflect the Art Deco style of the shaped corners and the sunrise detail on the back rail. (The rounded corners and edges are shaped that way to be more forgiving if a kid caroms off a corner at high speeds.) The drawer slides are under-mounted (so they are hidden from view) and self-closing. They slowly



Sometimes in life it's the little things that make a difference!

pull the drawers closed for the last few inches of their travel, to keep tiny fingers from getting pinched in the process.

The drawers themselves start out shallow with the top one, then gain depth with each successive drawer. The open web frames allow you to anchor the dresser to a wall if the child in question turns out to be a “drawer climber.” And finally, the finish I chose for the dresser is white lacquer applied over several coats of white primer (see the sidebar on page 39). Lacquer is an extremely durable finish that is easy to clean — not quite bombproof, but pretty close. Any one of these details alone may be a minor consideration, but together they comprise a sweet little project for a grandpa to build for his grandchild.

Little things, indeed.

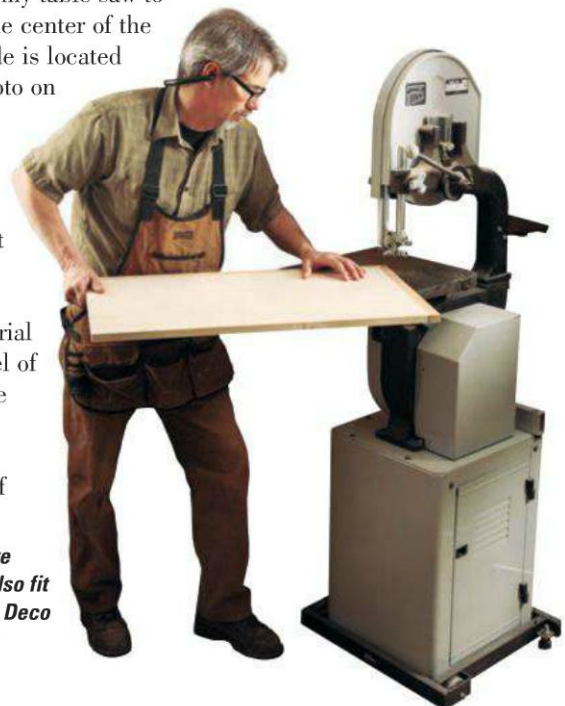
Starting Off

Get started by gathering your stock and hardware in your shop. I used birch plywood and birch hardwood — but any paint-grade plywood and lumber will work well. I would avoid veneer covered MDF, as I think the dresser would get too heavy, but you are the builder and it's your choice. Because the dresser was going to be painted, I opted for very basic joinery. It harkened back to my younger days as a cabinetmaker — rock-solid joinery that goes together fast: butt joints, rabbets, nails, screws and glue. The *Material List* on page 37 gives you the information that you will need to get started building your dresser. Cut the sides from plywood and the trim from hardwood (pieces 1 through 3) as you begin. I mitered the over-large trim pieces where they meet at the upper front corner (see the *Drawings* for detail) for a couple of reasons. When you cut the front corner round and then groove it for a decorative look, the miter eliminates exposed end grain. The end grain would break easily after being grooved, and it would accept paint differently. The mitered corner avoids both of these problems. Fit the trim (it should be a bit thicker than the plywood), and then glue it in place and allow the glue to cure. When it's cured, scrape off the glue squeeze-out and then sand or plane that excess thickness of the hardwood flat to the plywood. Next, mark the radius on the mitered corner and step over to your band saw to cut the curves. I used a stationary disc sander to remove the saw marks from the cuts and then moved to my table saw to cut the shallow decorative grooves into the edges of the sides.

Now, about the technique I used to groove the sides (see the photo on page 36). You may not have seen someone do something like this before. If not, you can evaluate it and think: “that's a silly way to do that,” or “I would never do it that way,” or “I'd figure out a way to do that on the router table,” — all of which are legitimate opinions. But if your evaluation is centered on its relative safety, if you are concerned that I'm setting woodworkers up for injury, well, that's just not the case. With this setup, even if you accidentally got your finger stuck between the featherboard and fence and somehow managed to cut yourself, the resulting injury would be easily treated with a Band-Aid® ... a small one. But with that said, I'm not looking for anyone to prove me right! I used this technique (and share it here with you) because it is safe, fast and easy and always delivers good results for shallow grooves like the ones on this dresser.

Set up for the cut by putting a zero-clearance insert into the table saw. Raise the full-kerf blade to a strong 1/16" above the insert and set the fence to locate the groove. Put a featherboard in place to help guide the stock as you cut. I also mark an arrow to indicate where the center of the exposed saw blade is located (see the inset photo on page 36). If you have not done something like this before, I recommend a test run on a scrap piece of MDF or other sort of material so you get the feel of cutting the groove and rotating the panel around the rounded corner of

Rounded corners are safer for kids and also fit in well with the Art Deco style of the dresser.





The hardwood trim that is glued onto the top and front edge of the sides is planed flush to the surface of the plywood. The author finds hand planing faster than sanding.



In a "not at all dangerous" technique, the author used a saw blade raised just above a zero clearance insert to groove around the forward edges of the sides. An arrow is drawn on the tabletop (inset photo) to indicate the saw blade's center.



"If you have trouble keeping the panel from wobbling during the cut, add a tall fence to your setup and everything should be jake."

the panel. If you have trouble keeping the panel from wobbling during the cut, add a tall fence to your setup and everything should be jake.

One fence setting will cut both grooves on each panel. After that, on the bottom of the sides there is a cut-out section that produces two feet on each side panel. I cut them out using a handheld jigsaw. I marked the line with a pencil, then scribed the line with a shop knife to help reduce tearout. The last machining step on the sides stop is rabbets formed to accept the back. I used a rabbeting bit in a handheld router to cut them; it was quick and easy.

With the grooves and the rabbets cut, put the sides away for now, and cut the material to make the top, bottom and web frames (pieces 4 through 8). These parts will be joined to the sides to form the case. Take a few moments to glue and clamp the top front trim to the top, and set it aside until the glue cures. Now grab the pieces that make up the web frames and get ready to assemble them.

Web frames are rectangular constructions that horizontally divide case-work projects. Often, drawers would attach to the frames, but in this case, the frames are there to join the sides and make the case rigid. I counter-bored holes in the web frame fronts and backs to allow screws to be driven into the web frame sides. (See the *Drawings* at right for details.) I used glue and screws to form the frames, testing them for square and winding (flatness) as I assembled them. When that is done, grab the top and plane the hardwood trim flush to the plywood. Now you're almost ready to do some assembly.

Start the Subassembly

Before you put together the case subassembly, make the bottom cleats (pieces 9) and take a look at the *Elevation Drawings* on the opposite page. The bottom cleats are glued and nailed to the inside face of each side. Attach the bottom to the cleats and then use spacers to properly place the web frames and the top in succession. I glued and screwed the web frames in place (see photo below left), and I nailed the top in place through the sides. With that done, check the subassembly for square by measuring on the diagonal and make any adjustments required. Then rip and cut the rub blocks to size, and secure them in place with glue (where the top and side meet), rubbing them back and forth until the glue tacks. Allow the glue to cure before moving the subassembly.

Move ahead by making the back panel from 1/4" plywood (piece 11), but set it aside for now. The rear glue blocks and the toe kick are next (pieces 12 and 13). Make the glue blocks from 3/4" hardwood and glue them in place for added strength and lateral support. The toe kick is also made of hardwood, fitted between the sides and with a rabbet cut as shown in the *Drawings*. As you did on the sides, create two feet on the toe kick by cutting a section out; the curves add a nice detail to the dresser. Secure it with glue and drive nails in through the sides. Things are coming along nicely now.

The final carcass parts to make are the base and sunrise backslash (pieces 14 and 15). This simple decorative treatment added a bit of Art Deco to the look of the piece, which I find appealing. Start by laying out the sunrise backslash. Mark out the shape and then make all the straight

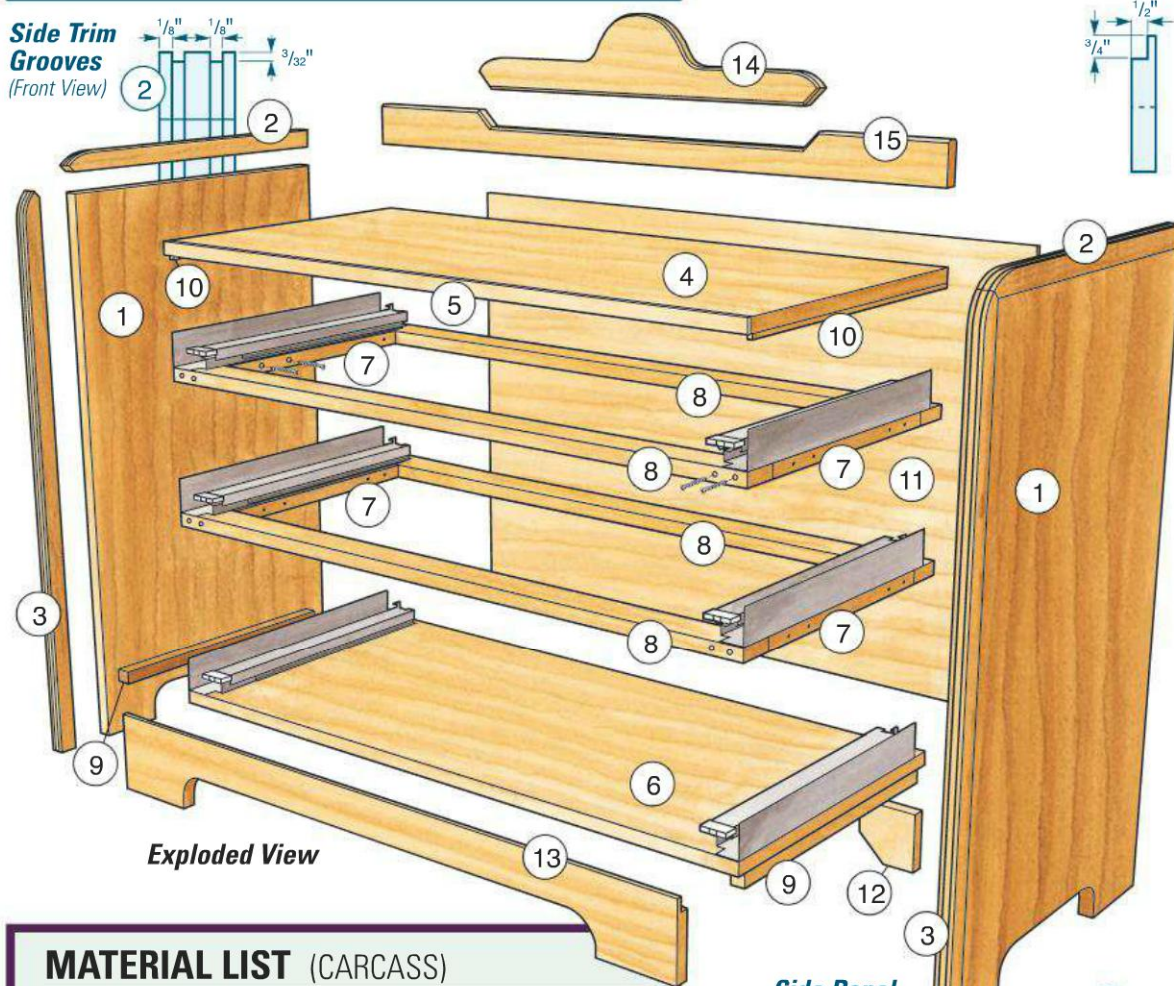
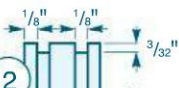
After mounting the bottom on its cleats, the author relies on well-marked spacers to accurately locate the web frames and the top. Once they're clamped in place, he glues and screws the web frames to the sides.

Dresser Hard-to-Find Hardware

The following supplies are available from Woodworker's Journal.
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Side Trim Grooves
(Front View)



Exploded View

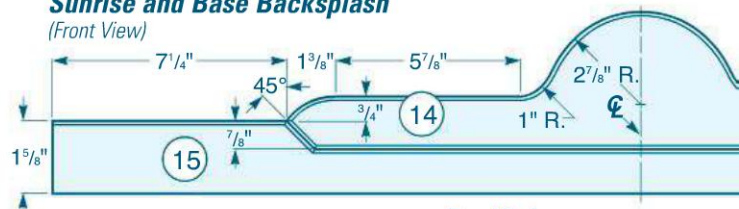
MATERIAL LIST (CARCASS)

	T x W x L
1 Sides (2)	3/4" x 17 ⁵ / ₈ " x 31 ¹ / ₄ "
2 Side Top Trim (2)*	3/4" x 1" x 18 ⁵ / ₈ "
3 Side Front Trim (2)*	3/4" x 1" x 32 ¹ / ₄ "
4 Top (1)	3/4" x 17 ¹ / ₄ " x 36 ¹ / ₂ "
5 Top Front Trim (1)	1/8" x 3/4" x 36 ¹ / ₂ "
6 Bottom (1)	3/4" x 17 ⁵ / ₈ " x 36 ¹ / ₂ "
7 Web Frame Sides (4)	3/4" x 2" x 13 ³ / ₈ "
8 Web Frame Fronts and Backs (4)	3/4" x 2" x 36 ¹ / ₂ "
9 Bottom Cleats (2)	3/4" x 3/4" x 15 ⁵ / ₈ "
10 Rub Blocks (2)	1/4" x 1/4" x 17"
11 Back Panel (1)	1/4" x 25 ³ / ₄ " x 37"
12 Rear Glue Blocks (2)	3/4" x 3 ¹ / ₂ " x 3 ¹ / ₂ "
13 Toe Kick (1)	3/4" x 4 ¹ / ₄ " x 36 ¹ / ₂ "
14 Sunrise Backsplash (1)	3/4" x 4 ¹ / ₄ " x 22"
15 Base Backsplash (1)	3/4" x 2 ¹ / ₄ " x 36 ¹ / ₂ "

* Parts 2 and 3 need to be slightly thicker than 3/4" before they are glued onto pieces 1.

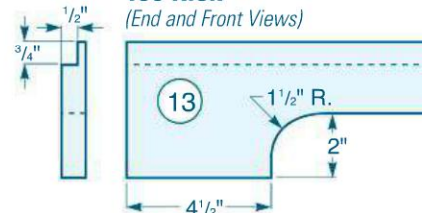
Sunrise and Base Backsplash

(Front View)



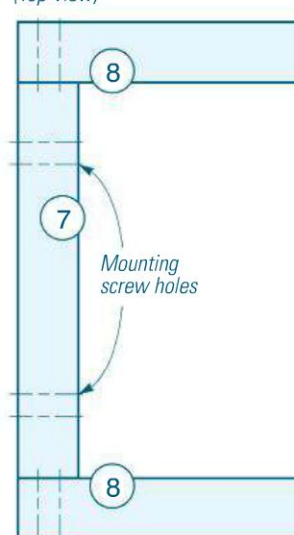
Toe Kick

(End and Front Views)



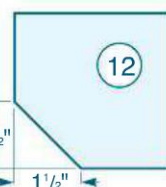
Web Frame

(Top View)



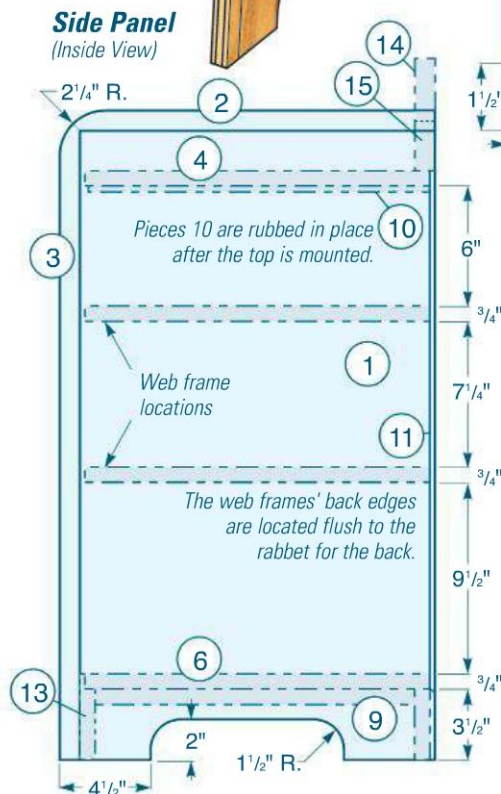
Rear Glue Blocks

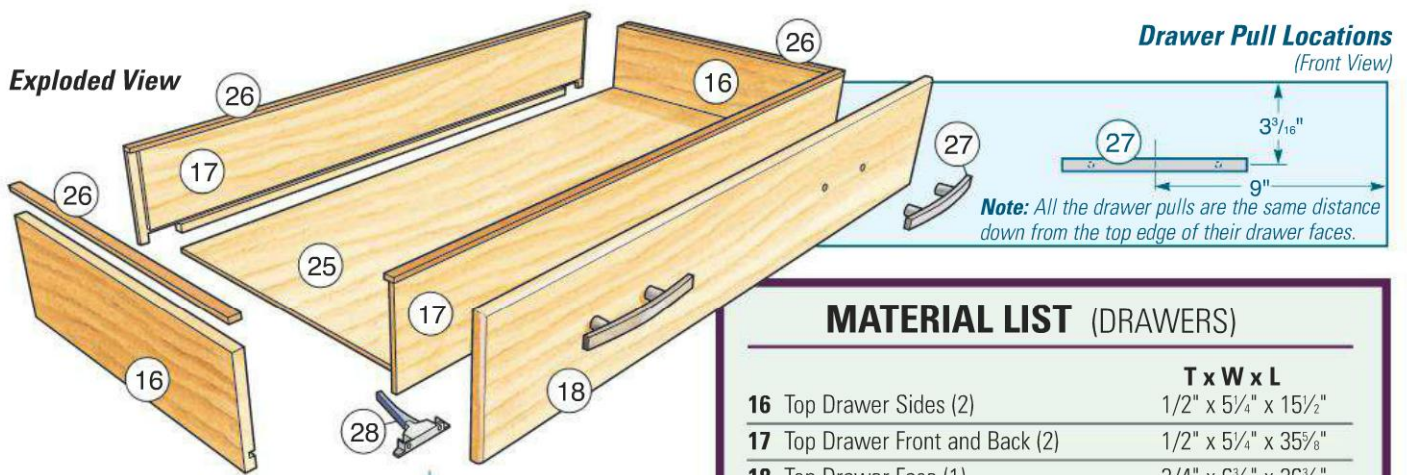
(Front View)



Side Panel

(Inside View)





Drawer Pull Locations
(Front View)



Note: All the drawer pulls are the same distance down from the top edge of their drawer faces.

MATERIAL LIST (DRAWERS)

	T x W x L
16 Top Drawer Sides (2)	1/2" x 5 1/4" x 15 1/2"
17 Top Drawer Front and Back (2)	1/2" x 5 1/4" x 35 5/8"
18 Top Drawer Face (1)	3/4" x 6 7/8" x 36 3/8"
19 Middle Drawer Sides (2)	1/2" x 6 1/2" x 15 1/2"
20 Middle Drawer Front and Back (2)	1/2" x 6 1/2" x 35 5/8"
21 Middle Drawer Face (1)	3/4" x 7 7/8" x 36 3/8"
22 Bottom Drawer Sides (2)	1/2" x 8 3/4" x 15 1/2"
23 Bottom Drawer Front and Back (2)	1/2" x 8 3/4" x 35 5/8"
24 Bottom Drawer Face (1)	3/4" x 9 3/4" x 36 3/8"
25 Drawer Bottoms (3)	1/4" x 15 1/2" x 34 7/8"
26 Mahogany Lipping (1)	1/4" x 1/2" x 315"
27 Drawer Pulls (6)	7 1/16" Satin Nickel
28 Drawer Slides (3 pr.)	16" Undermount

cuts you can on the table saw (see photo sequence below) and then step to the band saw and cut the radiused sections of the detail. Sanding it smooth comes next. Next, rip the base back-splash and mark out the section of stock to be removed to accept the sunrise detail. I used the sunrise detail to help mark the section. Again, use the table saw to make the straight cuts that you can, cutting the miters and raising the saw up through the piece (photos 4 and 5 below). You'll need to clean up the corners with a handsaw and chisel. After taking a look at the pieces together, I decided that the "bump" on the sunrise detail was too big, and I cut it down (as shown in the *Drawings* and lead photo). Then I chamfered the edges of the backsplash and detail and set them aside, in order to begin making the drawers.

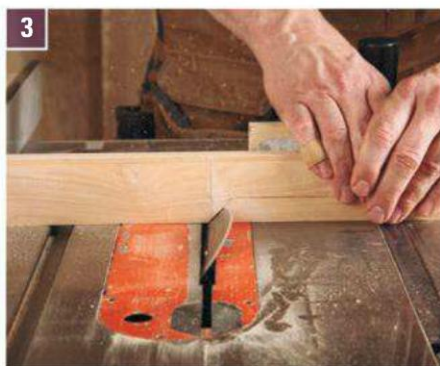
Drawers and Hardware

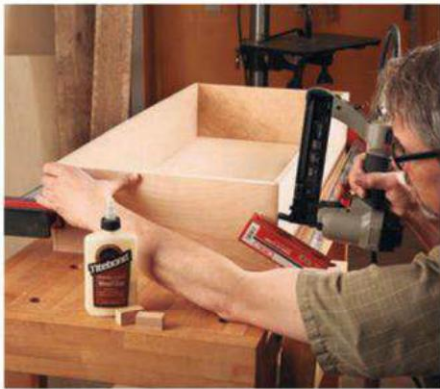
The drawers in this dresser are not at all complicated. The sides and ends are made from 1/2"-thick plywood, rabbeted at the corners and joined with glue and brads. The bottom is held exactly 1/2" up to accommodate the undermount drawer slides. I secured mahogany lipping to the top edges of the drawers after the drawer boxes were assembled (photos above right). In a bit of a twist, I borrowed a boat-making technique on the drawer faces. Using 1/2" Baltic birch for the drawer faces, I rounded

Two-Part Backsplash

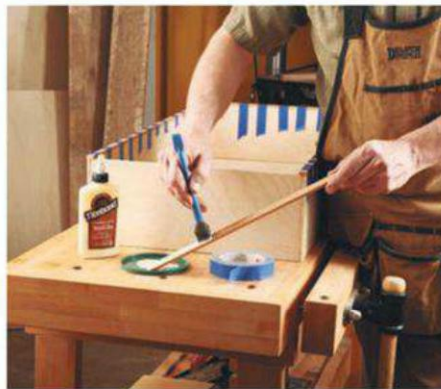
The author used a table saw to cut all the straight lines that he could on the sunrise backsplash (photo, right). To cut the curved aspects of the piece, he used a band saw (photo far right). Sanding the profile was next.

Below, the angles are cut into the base backsplash. Then the table saw blade was raised up through the piece to make the long straight cut (below, center). Complete the cutout with a handsaw and chisel (photo below, far right).

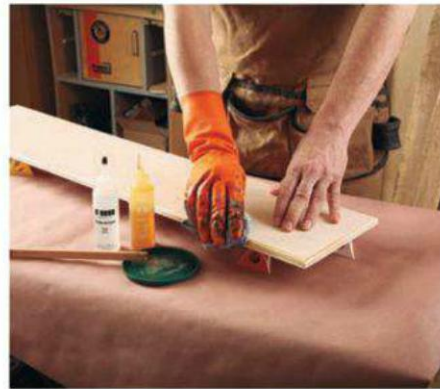




The drawer boxes are rabbeted at the corners and brad-nailed. The drawer bottoms are held up exactly 1/2" for the undermount slides.



Mahogany lipping is glued to the top edge of the drawer. The shallowest drawer is on the top and the next two get successively deeper.



The drawer faces are made from Baltic birch plywood. The author sealed the shaped edges of the drawer faces with a coat of epoxy.



The undermount drawer slides are easy to install but the system works far differently than side-mounted slides. A notch and hole on the rear of the drawer are required. Catches connect the slides to the drawer box; they're mounted in the front corners with screws.



over their edges with a 3/8" roundover bit. Then I sealed the edges using epoxy, brushed and then wiped on. Once it hardened, I sanded it smooth — leaving a hard durable edge on the plywood without resorting to trimming it with hardwood.

The self-closing Accuride® slides I used were really great, but they had a couple of quirks as to how they are mounted. First, the drawer had to be exactly 16" deep, because the drawer slides hook into a drilled hole at the back of the box. (See photo above.) They also required a notch to be cut out at the back of the drawer box ... something I had not done before. I located the hole at the back of the drawer boxes by first mounting the slides to the sides of the carcass (with just a couple of screws for now), and then pushing the drawer box back into the opening. The little hooks at the back of the drawer slides left dimpled marks where the hole should be. Simple and easy.

The catches for the drawer slides mount at the front of the drawer with screws driven in at a 10° angle. There is a good bit of adjustment that can be made after the slides are installed. When everything fits well, add the rest of the screws inside the

case. With the drawers done, fit and secure the backsplash and sunrise detail — simply glue and clamp them in place. Take a moment or two to mount the back and then, it's unavoidable: give the piece a good sanding to about 150-grit.

Now it's time to apply the finish to the dresser. I used Watco® oil for the drawer boxes, but a more complicated process for the rest of the dresser. See the sidebar below for more details.

The drawer faces are the last thing to be mounted (screws driven from the inside of the drawer boxes) after the finishing is complete. You will need to attach the pulls before you do that, countersinking the machine bolt heads below the surface of the back of the drawer faces. Take care to align the faces with even reveals all around the opening.

With that done, this little dresser is ready to serve for years and years ... perhaps my great-grandchild will use it some day. That is another "little thing" that I am looking forward to!

Rob Johnstone is an exceptionally proud new grandpa and editor in chief of the Woodworker's Journal magazine.

A Kid-proof Finish?

The finishing process for this dresser built up a tough and easy-to-clean surface. First, I filled all the nail holes and gaps with wallboard compound. Spackle will work, but I find the compound to be tougher. Then I applied a good coat of primer. Gaps at the intersection of the top and the backsplash were then caulked. Following

that, I sprayed another two coats of primer, addressing any gaps, cracks or holes that still showed with caulk. Then two coats of white lacquer sealed the deal. After the finish cured for about 7 days, paste wax added a thin protective (and silky-smooth to the touch) layer.

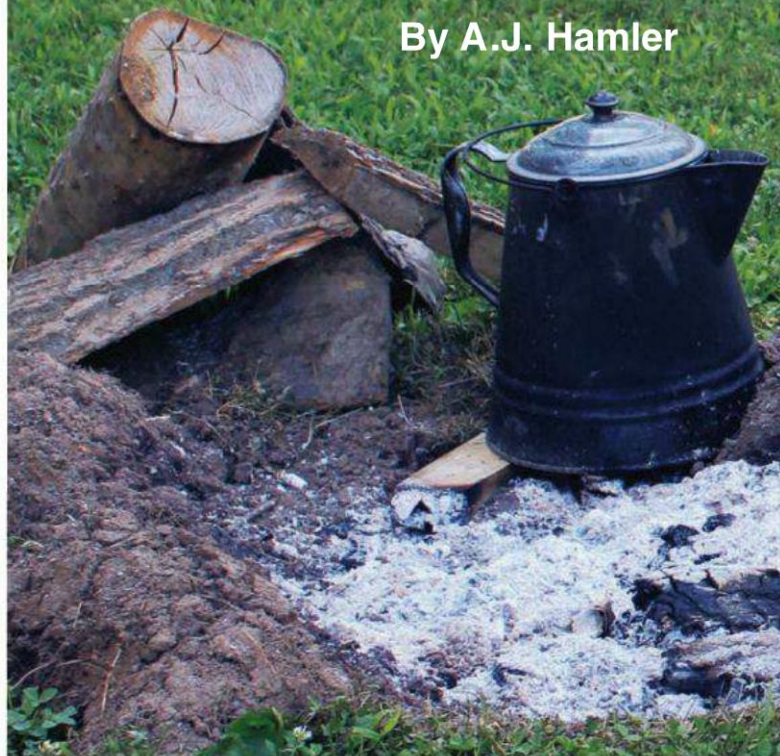


Finish sprayed from a can is perfect for a small project like this. It does lay down thin coats, so multiple applications are required.



Civil War Officer's Chair

By A.J. Hamler



Images at left from Library of Congress

One item of furniture that seemed to be everywhere during the Civil War was a particular style of folding chair that was very popular with officers. These chairs were common before the war — they were the mid-19th century equivalent of the folding chairs nearly everyone today has stashed in a closet — but once the army started moving, officers both North and South took these chairs with them. By war's end, thousands more were manufactured to meet the demand. It's no wonder we see them so frequently in the photographic record.

Usually made of oak, these chairs featured a carpet or tapestry seat and, while it might not be apparent, it was that fabric seat that held the chair in its upright position — remove the

fabric and the chair collapses. The chairs folded flat for storage or transport; pivoting joints were anchored with mild-steel rivets, the most common method of the day.

As a Civil War reenactor, I enjoy making authentic reproductions of the period and got lucky a few years ago when I found a rather battered mid-19th century chair on eBay. It was more than a little wobbly after 150 years, and a layer of red tapestry fabric had been added over the original carpet seat; both layers of fabric were quite weak. But everything else about it was intact, and it would act as the perfect guide to making an accurate reproduction.

Changing History ... Just a Little

These chairs look identical in wartime photos, but there were some subtle differences — number and location of rungs, whether the legs curved out or curved in, back slats that ran either vertically or horizontally, etc. — but the most obvious dif-



ference is the shape of the armrests. Some were nearly straight with only a suggestion of curves, while others took on a very distinct S-shape possible only with steam-bending. The curves on the armrests of my original chair are about halfway between the two extremes, but still a bit on the sharp side. But, with a bit of tinkering, I eased the sharpness of those curves a bit, so no steam-bending is needed to create armrests with a graceful curve that you can cut from solid stock.

I also opted to make the stock just a hair thicker. The main components of my original chair are all 7/8". However, people were generally a bit smaller and lighter 150 years ago, so I increased the stock thickness for the project chair to a full 1" (which also makes those armrests just a bit stronger).

Finally, I refined the backrest. My original chair has only two very widely separated vertical slats in the back with nothing in

the center, and whoever reupholstered the chair with red tapestry also covered that open space on the backrest with poor results: still not much support and not very comfortable. I decided to eliminate the tapestry on the backrest, which wasn't original anyway, then move those two slats a bit closer together and add a center slat. The result is far more comfortable.

For everything else, however, I stayed with the original historical model: The chair features hand-peened rivets at all pivot points for the folding action, 100% cotton tapestry for the seat, and a shellac finish matching the original.



The original chair on which the project chair is based had a layer of tapestry applied over the original carpet seat.



Lay out the component patterns to best match grain direction. The author used an awl punched directly through this pattern to accurately mark the locations for rivet holes. Time taken to make patterns is time well-spent.



The best way to get identical parts for the pieces that come in pairs is to cut them simultaneously. Holes for the screws that hold the pieces together during machining are located where rivet holes will go later.

Lay Out and Prepare the Components

This project begins with a lot of preparatory work to get the components ready; in fact, nearly every part has to be cut and/or shaped before any assembly can begin.

Start by milling your stock for the legs, backrest and armrests. I found a nice piece of red oak perfect for this chair that I first cut into manageable lengths, followed by planing to a uniform 1" thickness. From that, I cut smaller pieces, selecting for the best grain orientation, and I traced the pattern pieces onto them. The pivot locations are somewhat critical for the chair to fold properly, so you might find it easier to use an awl to mark their locations right through the patterns.

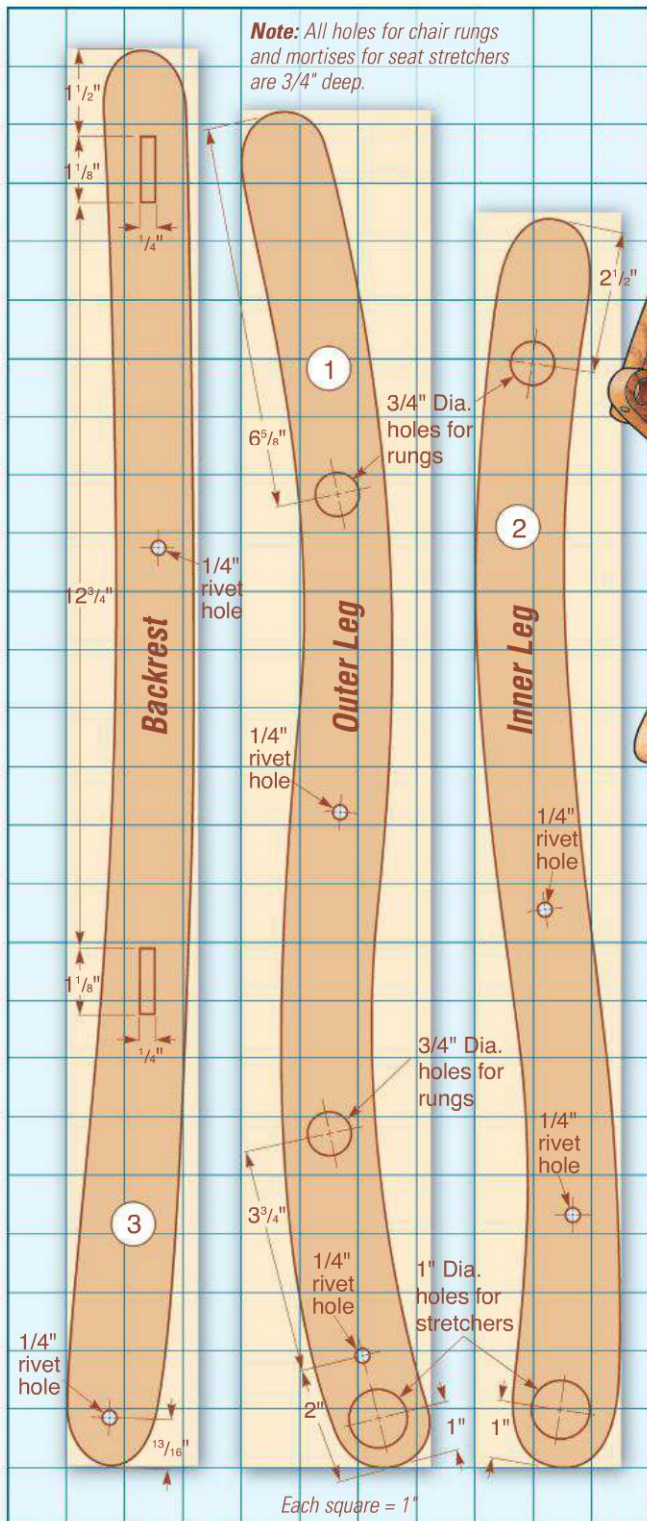
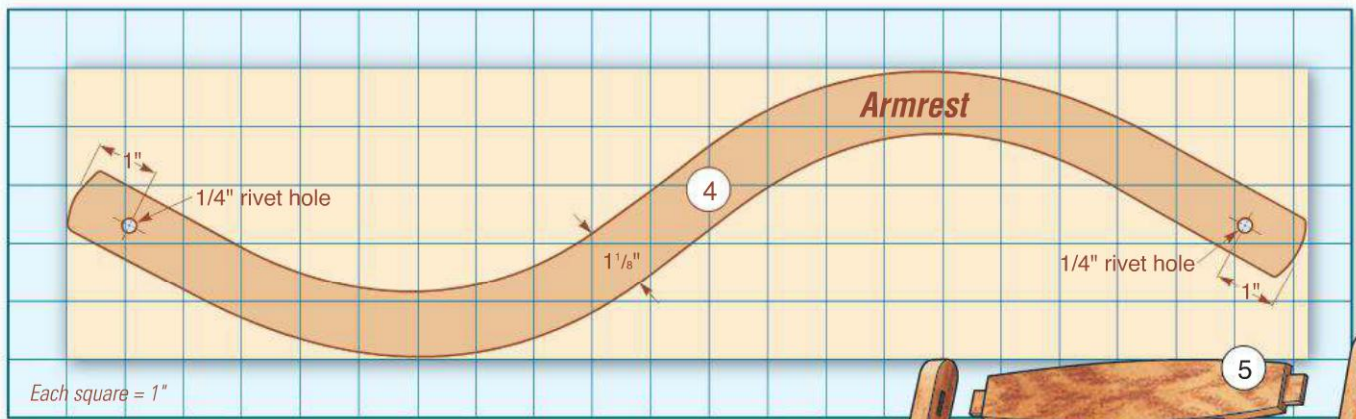
All of these components are in identical mirror-imaged pairs. You can create these most effectively — and easily — by doubling up the workpieces and cutting them simultaneously, using the pivot locations as anchor points. You'll drill those out later to accommodate 1/4" rivets, but for now drill smaller pilot holes at those locations and attach the workpieces together in pairs with screws. In this manner, create four sets of components: a pair each of outer legs, inner legs, backrest sides and armrests.

Cut each set out on the band saw, cutting just shy of the line. Follow this up with a good sanding, smoothing all curves right up to the cut line. A disc sander handles all the convex curves, while a spindle sander takes care of the concave curves. Finish-sand everything to remove any machine sanding marks; a combination of a random orbit sander and a sanding block make short work of this task.

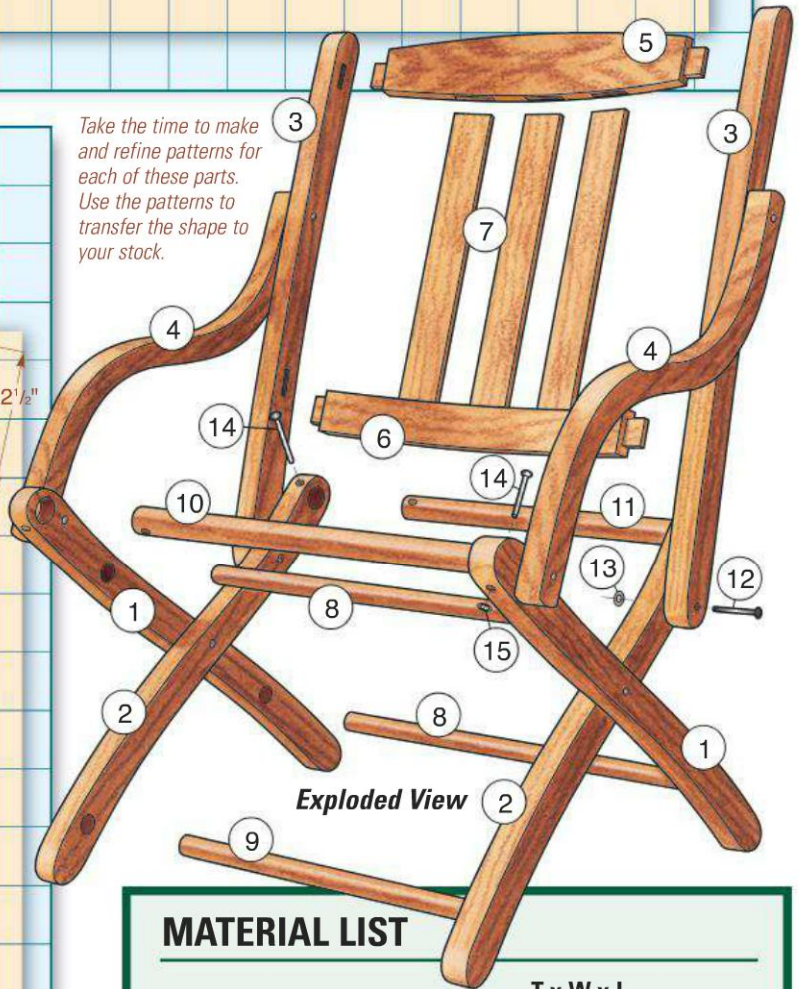
The last thing to do before separating your paired workpieces is to drill the 1/4" rivet holes. As with cutting, it's best to drill both workpieces in each set simultaneously, which guarantees that each component matches exactly. Apply some clamps to



With all components cut out, refine the curves smoothly by sanding down to the marked line. A benchtop disc sander easily handles outside curves, while an oscillating spindle sander takes care of inside curves. Following that, do the finish sanding by hand in combination with a random orbit sander.



Take the time to make and refine patterns for each of these parts. Use the patterns to transfer the shape to your stock.



MATERIAL LIST

	T x W x L
1 Outer Legs (2)	1" x 3 1/4" x 23 1/4"
2 Inner Legs (2)	1" x 2 1/2" x 21 3/8"
3 Backrest Sides (2)	1" x 2 1/4" x 24 1/4"
4 Armrests (2)	1" x 5" x 21 3/8"
5 Upper Backrest Stretcher (1)	1 3/4" x 2 3/4" x 16 1/4"
6 Lower Backrest Stretcher (1)	1 3/4" x 1 3/4" x 16 1/4"
7 Back Slats (3)	1/4" x 1 3/4" x 13 1/2"
8 Outer Leg Rungs (2)	3/4" x 16 1/4"
9 Inner Leg Rung (1)	3/4" x 14"
10 Outer Seat Stretcher (1)	1" x 16 1/4"
11 Inner Seat Stretcher (1)	1" x 14"
12 Steel Round-head Rivets (8)	1/4" x 2 3/8"
13 Steel Rivet Washers (24)	1/4" (hole) x 1/16" (thick)
14 Steel Flat-head Rivets (4)	3/16" x 1 3/4"
15 Steel Rivet Washers (4)	3/16" (hole) x 1/16" (thick)
16 Cotton Duck (1)	16" x 19" trim to fit
17 Tapestry Cloth (1)	16" x 19" trim to fit
18 Steel Tacks (20 approximately)	1/2"



To make the task easier, clamp the component pairs together before removing the screws. To improve accuracy, use the screw holes as guides when you drill the rivet holes into the complex shaped pieces.



A benchtop mortiser makes short work of cutting mortises into the backrest components. It's easy to cut on the wrong side of mirror-imaged components like these, so it's important to mark everything clearly.



Temporarily insert rivets (photo above) to check the folding action to be sure nothing binds. The author cut the end of one leg just a hair too wide (photo right), causing the lower tip of the backrest to rub at the penciled-in arrows. A little more time on the spindle sander refined the leg to allow for clearance. (Note: rivets were purchased at www.rjleahy.com)

each of your sets, then remove the screws. Rest the clamped-up workpiece sets on some scrap (which both raises the workpieces off your worktable to make room for the clamps, and prevents tearout on the back side), and use the screw holes as guides to drill your rivet holes.

Separate the workpieces and, using the patterns, pencil in the mortise locations on the inside face of each backrest piece. You can cut these 3/4"-deep mortises by hand, drilling out the waste first and then finishing up with a sharp chisel, but it's hard to beat the accuracy and efficiency of a benchtop mortiser for this task. With the mortises complete, drill the rung and seat stretcher holes 3/4" deep into the legs, per the patterns.

The components you've made so far play a direct role in the chair's folding action, so it's a good idea to check that action before going any further. Slip rivets into the holes and assemble the four pieces making up each side of the chair. Now verify that the folding action is smooth and that no parts rub against each other. The tolerances on this chair — as on the original — are pretty close, so cutting just slightly off-pattern can create a bind in the action at one key point. In the photo below, you can see how the bottom of the backrest side piece comes very close to one of the legs about midway through the folding action. If you've cut either component slightly too large at this key point, you won't be able to fold the chair. If that's the case, remove the rivets and sand these spots out a bit until they clear each other smoothly without rubbing. Remember that you made the components in pairs. If it rubs on one side it's likely to rub on the other, too, so check both sides.

When you're satisfied that the folding action works perfectly, give the leg, backrest and armrest components a soft roundover on each angled edge.

Now, let's move on to the backrest by tracing the curve patterns onto the upper and lower stretchers. The first thing you'll want to do is create the tenons; it's essential that you do this while the stock is still square. Make your measurements carefully, and cut the tenons by your preferred method.

Mill the 3/4"-deep mortises for the back slats on the



inside edges of the stretchers (top edge of the bottom stretcher; bottom edge of the top stretcher).

Moving back to your band saw, cut out the curves on the two stretchers. For the lower stretcher, simply cut the two face curves, and that workpiece is done. The upper stretcher will have a curve on top, but cut just the two face curves for now.

Finally, cut out the three back slats from 1/4" stock to the dimensions in the *Material List* on page 43.

Begin Assembly — The Backrest is Key

Back when we checked the working action of the components, you saw how the two leg sets and the backrest worked together to perform the folding action (the armrests pretty much just go along for the ride). To do this, the inner leg set must fit perfectly inside the other, while at the same time fit inside the completed backrest. The two leg sets are easily adjustable — the length of the dowel rungs and seat stretchers determines the width — but the mortise-and-tenon construction of the backrest isn't quite so forgiving. For that reason, we'll begin assembly with the backrest, and fit everything else to that.

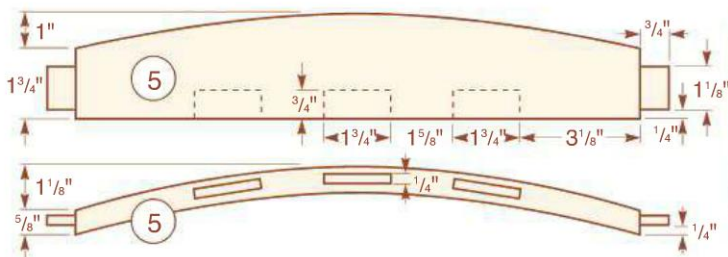
Slip the three back slats into their respective mortises in the lower stretcher. Don't use glue in the mortises; when the chair is complete, leaning against the backrest will cause those slats to flex slightly, so they need to be free to move a bit. Slip the top stretcher into place over the three slats. If you've cut everything correctly, the fit will be snug enough to hold everything together. Apply glue into the backrest side mortises and slip the stretcher/slat assembly in place. Put glue into the other backrest component and slide it into place. Clamp up the completed backrest assembly.

While the glue is drying, cut the rungs to length for the inner leg set per the dimensions on the *Material List*. It's best to err slightly long on the rungs; it's easy to shorten them to the exact length in the next step, but you can't make too-short rungs longer.

Remove the clamps from the backrest. Dry-assemble the inner leg set, and place it inside the attachment points in the bottom of the backrest. You need to allow for 1/8" on each side of the leg set for washers, so if you've cut your rung and seat

Upper Backrest Stretcher

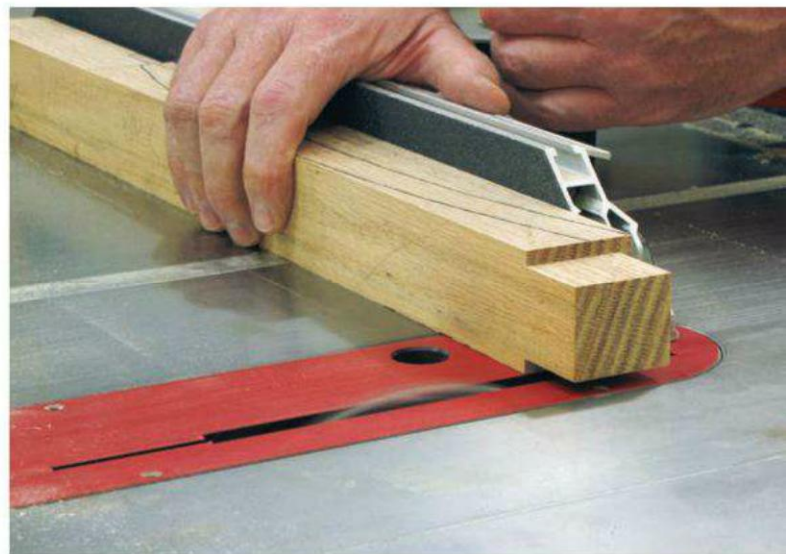
(Front and Top Views)



Note: the Lower Backrest Stretcher (piece 6) is the same as the Upper Backrest Stretcher (piece 5) except for the shaped top edge.



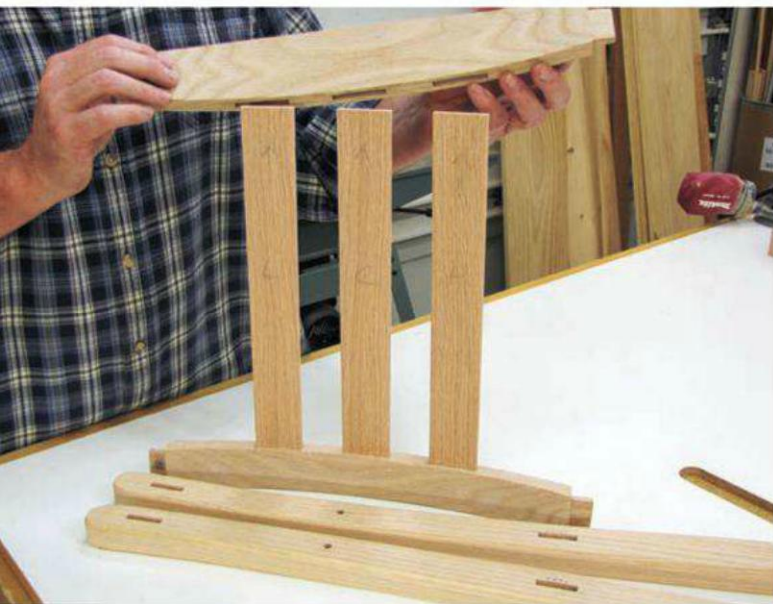
A roundover bit mounted in a router table is used to ease the edges of all the chair's components. All four edges of each leg and arm piece receive the roundover; it helps the chair look, feel (when you sit) and work better.



To give you more control and to allow the workpiece to run squarely over your table saw's dado cutter, mill the tenons on the ends of the backrest stretchers before cutting them to the curved shape.



Cut the curves into the stretchers on the band saw. With all the curved parts on this chair, your band saw will get a workout. During the Civil War era, these curves would have been cut with a bow saw by hand.



Don't use glue when installing the slats between the backrest stretchers. These parts must remain "floating" so they'll provide some flex (and comfort) when an occupant begins leaning back into the chair.



After a proper test fitting for the entire subassembly, the author glues the stretchers into the backrest side pieces, taking care to orient the pieces correctly. Care is needed; glue-up is nearly impossible to reverse.



With glue applied to all joints, clamp up the backrest subassembly. When the glue has cured, you'll use the chair's completed backrest as a guide when you begin assembling the rest of the project.

stretcher correctly, you should have exactly 1/4" of play here. I like to use a piece of 1/4" scrap as a feeler gauge to determine the fit — a cutoff from one of the back slats works well. If it slips perfectly into the gap you're done. If it's too tight, remove the rungs, shorten them slightly and try again; if it's too loose, cut new rungs a bit longer. When the inner leg set fits perfectly, glue the rung and seat stretcher in place.

Now, the outer leg set is the exact same width as the backrest assembly, so we'll use the inner leg set to size the outer one in a reverse of the procedure we just did. Dry-assemble the outer leg set and place the inner set inside it. As before, the clearance should be 1/4" to allow 1/8" for washers on each side. When you're satisfied with the fit, glue and clamp the outer leg set till dry.

Final Assembly

Let's see how everything works by slipping rivets into all the holes and assembling the chair. My original chair had a 1/8" washer at each pivot point, but I doubt you'll have any better luck than I did finding washers of that thickness. Instead, just double up a pair of washers — they're usually 1/16" thick — to achieve the right gap.

You'll remember that I noted earlier that it's the seat fabric that holds the chair in its upright position. Since we haven't made the seat yet, you'll need to brace the chair at the feet to keep it upright while you measure for the seat fabric. The fabric on my original chair was so rotten and stretched that it didn't hold the seat very high — the longer the seat fabric, the lower the chair will sit. You can alter this a bit to suit your own preference, but I found that with the two seat stretchers at 15", measured from outside edge to outside edge, it makes the chair seat about 16½" high at the front and 15½" at the back, which suits me perfectly. If you want your chair higher, make this distance a bit shorter. Make your measurement and add 2" at the front and back to allow for wrapping the fabric around the stretcher. (The fabric for my chair came to 19" long.)

Because the fabric seat supports the chair, you can imagine the stresses on those seat stretcher dowels. Disassemble the chair and reinforce those stress points exactly as they did back then, by drilling through the leg tips and through the dowels and installing a 3/16" rivet on each of the four seat corners.

Reassemble the chair, beginning with the two leg sets. Slip a rivet through each side of the outer leg set, add a pair of washers, then continue the rivet through the inner leg set. Top this with a single washer and peen over the tip of the rivet till solid. Attach the backrest in the same manner — rivet slips through from the outside, a pair of washers between, slip the rivet the rest of the way, top with a single washer and peen over the tip. Finally, attach the two armrests, again with a pair of washers between moving parts.

Finish your chair any way you like. Originals were either stained or not depending on the whims of the maker — I opted for a dark walnut oil stain. For the highest protection, you can then top with a few coats of polyurethane, but for an authentic



Sizing the leg set to exactly fit between the backrest members is critical. To allow for 1/8" on each side for washers, use a piece of 1/4" scrap as a feeler gauge. Adjust the length of rungs to give the leg set a perfect fit.



Use braces clamped to your work surface to keep the chair upright when taking seat measurements. Note the string tied around the stretchers — it'll keep the chair from collapsing should it slip out of the braces.



Drill a 3/16" hole through the ends of each seat stretcher, then install a rivet to create a rock-solid joint that simply won't come loose. This is the exact same joinery system that was used in the Civil War-era chairs.



A row of steel tacks secures the seat fabric in place. Note that the author used a piece of scrap to solidly support the seat stretcher while tacking. There are two layers of fabric on this chair to improve its strength.

appearance, use amber shellac instead. The combination of amber shellac and walnut stain makes for a nice golden brown that's very striking.

Best Seat in the House

To keep the chair authentic, I used 100% cotton tapestry fabric for the seat. Tapestry fabric isn't strong enough by itself, plus it's really stretchy, so I backed up the tapestry with a layer of cotton duck.

For a chair with a 15" spread across the stretchers, cut a piece of tapestry and a piece of heavy cotton duck to 19" long. The fabric width should match the width of the exposed portion of the stretchers (14¾" at the front, 12½" at the back) plus 1/2" on each side. This results in two 19" pieces of fabric that are 15¾" wide at one end and 13½" at the other. Pin the two pieces together with the "good" side of the tapestry facing inward, and put a row of stitching 1/2" from the edges down both sides. Now, turn the seat right side out so the good side of the tapestry is showing, and run a double row of stitching across each end.

Attach the seat with 1/2" to 5/8" steel, brass or copper tacks. Keep in mind that the seat will begin to stretch a bit immediate-

ly upon use, so attach it a little "tight." That is, fasten it in place so the stretcher distance is a bit less than you measured. For the 15" stretcher distance I wanted here, I actually made it more like 14½" — the seat quickly stretched with applied weight to the desired size.

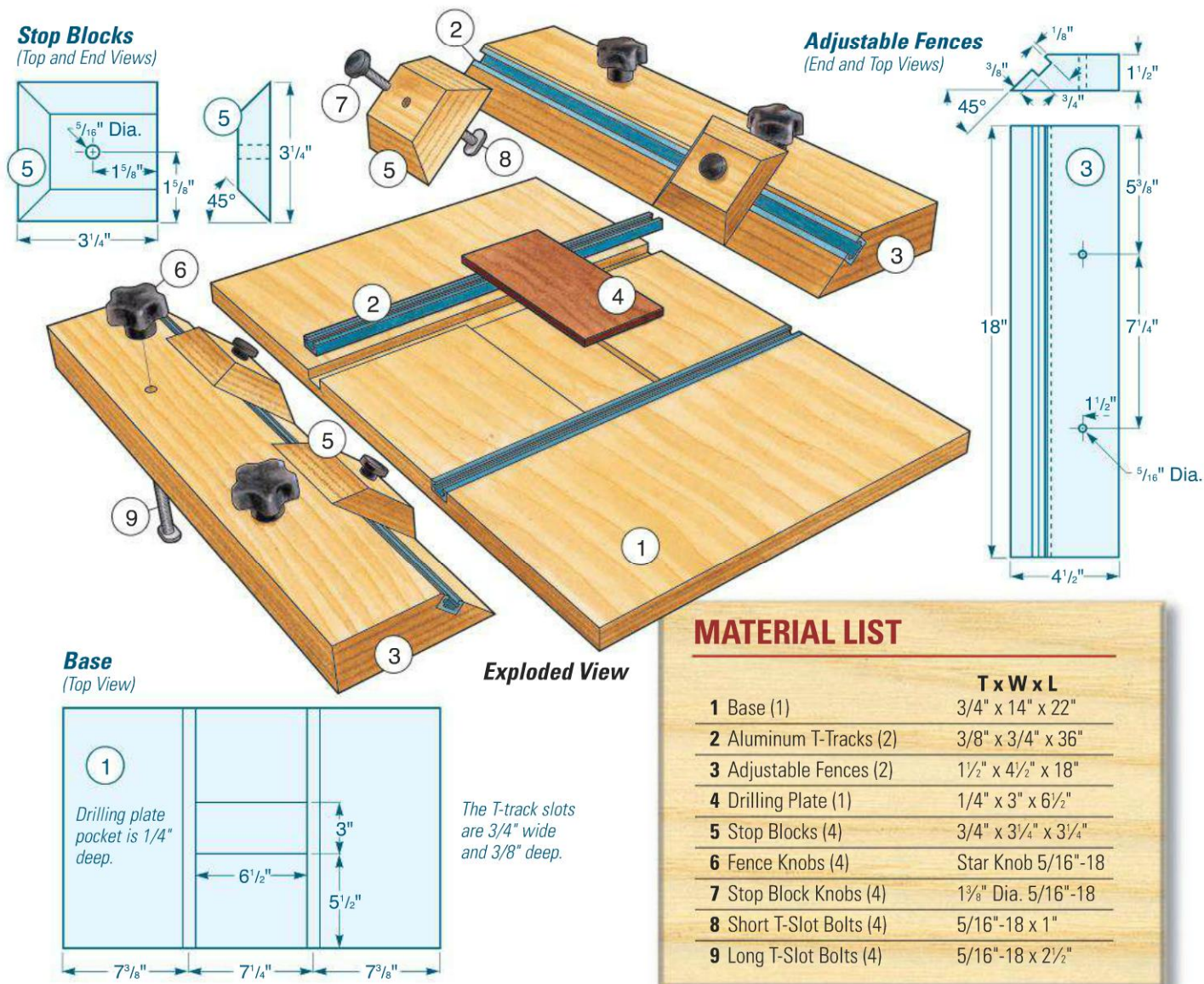
Speaking of size, keep one last thing in mind. This project reflects the exact size of an original 150-year-old chair, which offered about 17" seating room between armrests (a hair less than the typical airline seat). If you'd like a bit more room, you'll need to extend the length of pieces 5, 6, 8, 9, 10 and 11 by an equal amount. All of the other parts remain the same.

A.J. Hamler is a woodworking author, former editor of Woodshop News, and the author of Civil War Woodworking.



Jigs & Fixtures

Cylindrical and Round Object Drilling Jig



Bringing an accurately placed hole into a round piece of wood, either a cylinder or a sphere, can be a tricky feat to accomplish. Round things roll (of course) and adding to that challenge is the complication that cylinders and spheres are hard to clamp securely because, by definition, they don't have many (or any) flat surfaces. Thankfully, there's a solution to the round object drilling problem: it's called a V-block.

A V-block is just a thick chunk of wood with a deep V-groove cut into it. The V in the block cradles the cylinder, allowing it to be clamped securely in place, and then the whole thing can be accurately located on a drill press for drilling. Most woodturners have made hundreds of them ... and then, after they have misplaced or thrown away the latest V-block, they end up making another one. Another reason for making multiple V-blocks is that, once made, the block only properly fits cylinders of a set size range. If what you need to drill is too big or too small, it's time to make another block. Not a big deal, but we are talking time and material to make each successive V-block.

And what about if you want to drill a round object? The answer is pretty simple: you just cut two V-grooves at 90 degrees to one another, and the place where they intersect will keep a ball-shaped object from moving. But once again, the block, once made, is not really adjustable.

The jig shown here addresses all of these needs and even adds a useful feature or two, like drilling rectangular legs. It's adjustable, multifunctional and, on top of that, it's fun to make.

Making the Jig

This jig is made almost entirely from 3/4" plywood. Any scrap lying around the shop will do, but we made this one from birch plywood. (Scrap plywood or even MDF would do just fine.)

Make the base (piece 1) and test its size out on your drill press table. You may have to adjust the size or decide to secure it to your drill press by means of screws driven up through the table. Before you cut the grooves for the T-track (pieces 2), cut up a

Drilling Jig Hard-to-Find Hardware

The following supplies are available from Woodworker's Journal.

Universal T-Track (2) #26420 \$18.99 each
5-Star Knobs 5/16"-18 (4) #23812 \$1.99 each
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To purchase products online, visit www.woodworkersjournal.com and click on the "Store" tab. Or, call 800-610-0883 (code WJ1242).



You can easily do most of the machining for this project on the table saw. To ensure accuracy, make test cuts to set the blade to exactly 45° (as above). It's time well-spent.



Using a dado head in a table saw to make the slots for the aluminum T-track is a fast and accurate technique. The section for the drilling insert was removed using a handheld router chucked with a straight bit.

couple of pieces of plywood about 5 1/2" wide and 37" long. Face-glue these pieces together with glue and clamps ... this will form the blank from which to make the adjustable fences (pieces 3). While the glue cures, mount a 3/4" dado head in your saw and plow the grooves for the T-track in the base. See the *Drawings* for locations. (When completed, take the dado set out of the saw, but don't put it away yet.) Next, form the 1/4"-deep recess for the drilling plate using a router with a straight bit chucked into the collet. When that's done, fit the drilling plate (piece 4) to the opening, then set the plate aside for now.

Take the glued-up blank out of its clamps and clean up one edge on the table saw. Then set the saw blade to 45 degrees and cut the blank to width by shaping the other edge of the piece to the 45° angle. Return the blade to 90 degrees and cut two 18" fences from the blank. Grab your dado head and set it up to cut the grooves for the T-track in the fences.

The stop blocks (pieces 5) are next. Again, make them on the table saw to the dimensions shown in the *Material List* and the *Drawings*. Take a few moments to attach the T-track to the fences and base with small screws. Then get ready for the rest of the hardware (pieces 6 through 9). Step to the drill press (or you could bore the holes with a handheld drill if you choose) to make the holes for the T-bolts. Test-fit the pieces together to be sure it all works properly. If it does, we recommend putting a coat or two of Watco® Danish Oil Natural oil finish on the jig. After it has dried, you are ready to start drilling round, cylindrical and rectangular pieces with ease.



In addition to securing cylindrical objects during drilling, this jig will also locate and secure spherical objects. Another function it will facilitate is drilling into the corner of rectangular pieces like table legs. Its stop blocks have a 90-degree face as well as 45-degree edges.

Today's Shop

The State of Stationary Power Tools

By Chris Marshall



Seven "heavy metal" manufacturers share their thoughts on the recent recession, what woodworkers want these days and the future of their industry.



While most woodworkers will only own one or two table saws or band saws in a lifetime, stationary machinery is a volume-based commodity like any other heavy industry. Machines are being developed, manufactured and shipped, day in and day out.

What do users think?

After reading what these industry insiders have to say about stationary power tools, check out what the tool users have to say in our survey on page 30.

It wouldn't have taken an economist to predict that the economic downturn that began here in the States around 2008 would have a ripple effect in woodworking's stationary power tool industry. It has. The past few years have been quite challenging

for some tool companies and clearly felt by all. But, the industry has shown resilience: no brands have been forced to close their doors as a result.

We at *Woodworker's Journal* have been wondering for some time how the "heavy machinery" side of our

industry has weathered the storm of a struggling global economy. Maybe you've wondered, too. That's why I recently interviewed seven leading tool companies to gather their thoughts about manufacturing through lean times and how woodworkers

have influenced their businesses in a changing marketplace.

Before I share their thoughts, the *Journal* graciously thanks our survey group for their candid and thought-provoking commentary: Zoltan Barkoczy, vice president of marketing and development at Colovos Company (designer and importer of woodworking machinery); Mark Strahler, director of product development for Delta Power Equipment; Norman Frampton, sales and marketing for General/General International; Shiraz Balolia, president of Grizzly Industrial; Torben Helshoj, president of Laguna Tools; Barry Schwaiger, director of product development for Walter Meier (JET and Powermatic brands); and Rod Burrow, vice president of technical support for RIKON Power Tools.

What Happens to R&D During a Recession?

While it might seem like there have been fewer new machines being introduced these past four years, five of the seven companies assured me that new product research and development has continued on at a pre-recessionary pace. General and Laguna actually increased R&D during this time, with Frampton admitting that



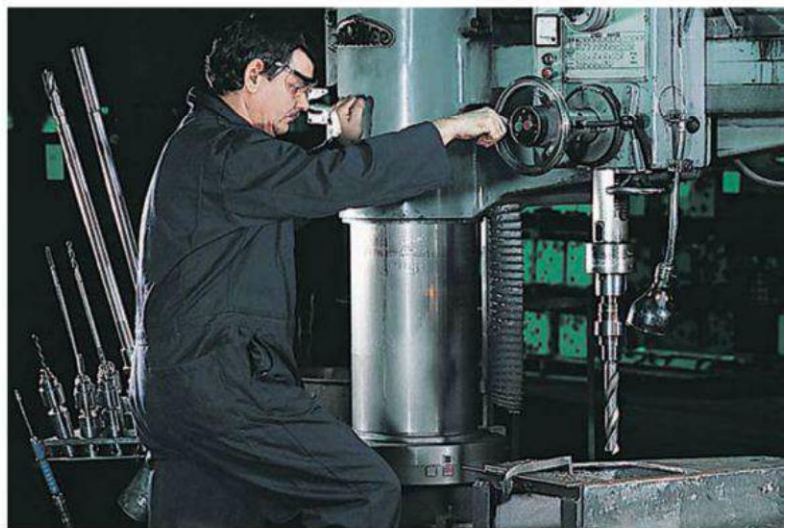
“R&D is the best investment to ensure future success.” Laguna’s Helshoj added, “If you stop R&D, you basically strangle your company’s future” and risk forfeiting a leader position.

Grizzly and General each have added more than 30 new machines to their lines during the past three years; RIKON launched 15 new models. The “new” Delta, which became a wholly independent company just two years ago, is heavily invested in rebuilding a number of tool lines that were previously discontinued by the former Delta Machinery. This includes both stationary and benchtop machines. Laguna has launched new CNC and 3000-series band saw lines, plus seven new jointers and planers since ’08.

Schwaiger says JET and Powermatic put product development “on hold” in 2009 to weather the worst of the downturn but then resumed R&D in 2010; new models will begin to appear this year and next.

Have Our Buying Patterns Changed?

When jobs are being eliminated, homes aren’t



selling and the stock market languishes, discretionary income dries up, too. It’s simple economics. Still, the manufacturers agree that we woodworkers have always been discriminating customers who research our purchases carefully and will invest in quality but with an eye to value. We buy when we need to, even in a “down” market.

While there has certainly been some degree of a “wait and see” mentality that has curtailed spending on new tools, the experts shared that the buying patterns of hobbyists really haven’t changed much during the



Twenty-first century tool manufacturing is a blend of state-of-the-art automation and machine operator precision.



Steel frame band saws, such as those by Grizzly shown here, have continued to gain momentum in the hobbyist marketplace during the recent recession.

“If you stop R&D, you basically strangle your company's future.”

— **Torben Helshoj**
(Laguna Tools)

recession. Sales slowed in varying degrees, but woodworkers have continued to invest in big tools. “If woodworking is your passion, says Barkoczy, “it has remained so.” But Balolia and Frampton also report that some “underbuying” has been evident — you may have settled for a 15" planer instead of a 20" model, or bought a more value-priced tool or a benchtop version instead of a stationary model to make do. RIKON identified one change in the hobbyist segment: some older woodworkers are now selling projects to supplement family income — and they're trading up to better machines to help improve their workflow. Some benchtop tool owners are also growing into stationary tools, in order to realize costs that can be saved by processing their lumber from rough stock.

Colovos has also noticed that machinery buyers are

shifting back to mainstay brands and away from the offerings of big box merchandisers like Lowe's® and Home Depot®, who have reduced their showroom floor space for stationary tools.

Sales in machinery repair parts have also remained fairly steady over the past four years or have grown modestly. There aren't clear indications that, because of the recession, we have been repairing or retrofitting our machines instead of buying new models.

Reasons to Buy Again?

The manufacturers agree that sales and attractive pricing continue to draw customers in off the sidelines when purchases have been delayed. But undergirding what woodworkers consider to be a “good deal” is, as Strahler puts it, “the right products with the right values for the target customer.” Finding that sweet spot in the machinery

business involves, for General International, evolving, developing and innovating constantly. Says Frampton, “if we want our customers to upgrade to new equipment, we need to give them a reason to justify the expense — be it more power, better productivity, ease of use, safety features, accuracy — and more overall value for their hard-earned dollar.”

The JET and Powermatic brands, Schwaiger adds, have broken from the approach of chasing price points and doing “reactive product development” to attract sales. Instead, Walter Meier is embracing Apple Inc.'s business model of “setting new standards” with its products, regardless of price. Schwaiger says the goal for Powermatic is to be the “undisputed category leader,” and the company is moving JET's “center of gravity” of quality “from good to great.”

“ ... if we want our customers to upgrade to new equipment, we need to give them a reason to justify the expense ... ”

— **Norman Frampton**
(General International)



Delta Power Equipment manufactures certain machine models, including the Unisaw, from its Anderson, South Carolina, facility.

how to get the next generation interested in woodworking?” Frampton says General International is heavily invested in small, affordable CNC systems now, and they are “scrambling to keep up with the demand.” Rod Burrow sees the benefit of small-shop CNC primarily for automated carving.

Is CNC simply the latest fad? Schwaiger wonders about it. “CNC is nothing new and NOT the next big thing, says Grizzly’s Balolia, adding that current small CNC systems are for the most part “toys” that lead to service issues. Laguna, which offers a number of CNC systems, has learned that “it requires a whole other level of customer support” to be effective, says Helshoj. But the small machines, in his opinion, should continue to be popular.



Recent tool developments include JET’s Vortex single-stage dust collectors (above) and the Click N Carve CNC machine by Colovos (below).



What’s Hot (and What’s Not) These Days?

One tool category that’s received strong interest from hobbyists during the recession has been smaller lathes, and Rod Burrow sums up the growth of the pen- and bowl-turning markets as “explosive.” Frampton concurs and added that General has also seen growth in mid-priced table saws, scroll saws and the company’s new Excalibur router tables. Schwaiger attributes some of the surge in lathe interest to Baby Boomers who are getting started in woodworking and choosing a lathe as their singular tool, because “not everyone who buys a lathe wants a full woodworking shop.”

Steel-framed band saws are also selling well these days. RIKON has introduced several new models, Delta is developing some, and most of the surveyed companies have introduced band saws in recent years. Grizzly reports that its band saw sales have always been strong, given the company’s huge selection. Frampton says better quality on the whole — higher blade tension capacities, better fences and guide bearings, increased resaw capacity and more power — is the reason.

For other tools, Burrow says RIKON’s recent combination jointer/planer machines have been doing well with small-shop hobbyists.

It was interesting to learn what hasn’t been selling well: according to Colovos, at least, it’s drill presses and jointers. There isn’t clear indication as to why drill presses are less popular now, but Barkoczy attributes limp jointer sales to better saw blades that may be taking the place of a jointer’s edge smoothing purpose.

Mark Strahler suggests that some of these tool trends may not actually be recession-related. Sometimes innovation or modifications “draw a lot of interest in how a particular operation has been done, and it takes off with a lot of new ideas feeding the initial step.” In other words, woodworkers get excited about new ways of doing things. He cites scroll saws, benchtop mortisers and tenoning jigs as past examples of these sorts of trendsetters.

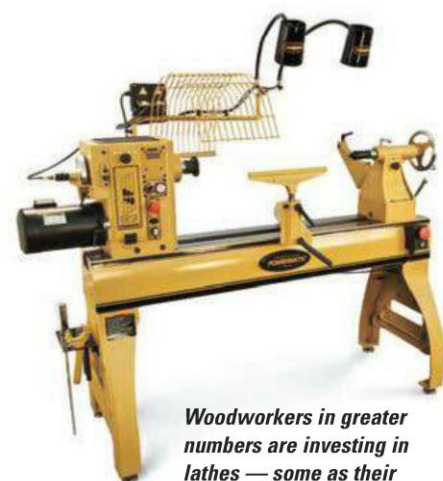
Is CNC the Future?

Speaking of new trends, I asked our experts to share their perceptions of the recent increase in small CNC routing systems. Is “computer monitor” woodworking the next “big thing?”

Opinions were divided. Both Barkoczy and Strahler speculate that CNC could be an opportunity to attract “non-traditional” hobbyists as well as the technologically savvy and younger people into woodworking. Strahler adds, “it could answer the question that we (in the industry) have been asking for 20 years —



Looking ahead, the experts predict that woodworking machinery will, by and large, continue to be manufactured outside North America.



Woodworkers in greater numbers are investing in lathes — some as their primary shop machine.

Will There Be More American-made Tools?

A segment of the woodworking market continues to request American-made tools. Will machinery manufacturing ever return to a significant degree from the Pacific Rim? The experts say it's an unlikely reality, and here's why: until we are willing to pay the higher prices required to manufacture tools in North America, it's not cost-effective for most manufacturers to build stationary machines on this continent. "Machinery manufacturing in the USA is history with all the regulatory, labor and liability issues," says Balolia, and "we

do not see it coming back."

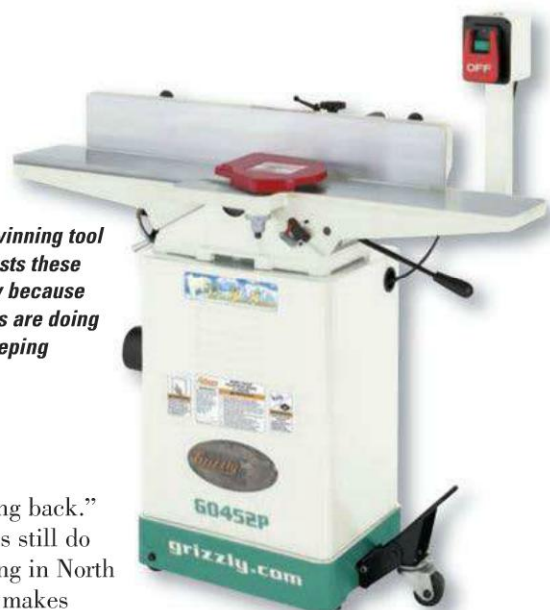
A few companies still do some manufacturing in North America. General makes several dozen machines in its Canadian plant, but while the company appreciates customers willing to pay the higher price tags, Frampton admits "the numbers don't lie ... the bulk of our sales come from products made to our specifications in Asia."

But, woodworkers who are skeptical of the quality of Pacific Rim tools should keep an open mind, Strahler suggests. Delta makes machinery both stateside and abroad, depending on where the company can bring the right products to end users. "It's a matter of what you want to offer to the marketplace. There's a difference between a less expensive product and a cheaply made product. We manufacturers can go to Asia to do either — solely to bring costs down or to add value to a product." He says Delta can turn lower manufacturing costs overseas into value-added tools that, when supported by a strong service network, leave customers completely satisfied with their machine purchases.

Are Better Days Ahead?

While the stationary tool industry is no canary in the mineshaft to forecast our national or global economic situations, the manufacturers unanimously agree that sales are up over this time last year. Woodworkers in greater

Jointers aren't winning tool popularity contests these days — possibly because table saw blades are doing a good job at keeping edges smooth.



numbers are opening their wallets again. Moreover, the manufacturers are confident there will always be a market for stationary power tools. Strahler believes that the manufacturers who will succeed will be those that are committed to bringing the best value and innovative features to their customers. General/General International, for one, is poised for the challenge: it has recently invested in new technology, expanded warehousing and distribution channels and broadened its visibility at trade shows "while many others in our business have been cutting back" on product offerings, staff and capital expenditures, Frampton says.

But, aside from smart business strategies or a healthier economic scene, this writer believes stationary tool manufacturing will continue because of the enduring passion we have for our craft and the satisfaction it brings us. Helshoj puts it best: "Woodworking is an amazing hobby. Just look at the explosive growth of fine hand tools in recent years. Put a nice hand plane in your hands and clamp a piece of wood in your vise and make a shaving. That's pure therapy."

Chris Marshall is Woodworker's Journal's Field Editor.



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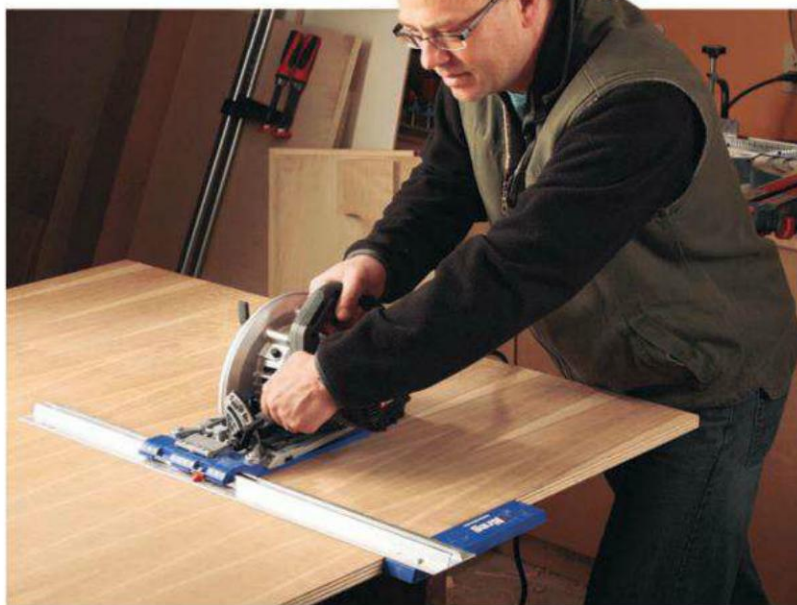
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Bench Dog Tools, Inc. has introduced the *Strap-Loc™* strap holding device. The butterfly-shaped body has slots for a strap up to 1" wide and wings to help keep the strap on center while wound around the body. When it's completely wound, an adjustable rubber cord with three tension stops snaps into a built-in hook to secure varying lengths of strap. The Strap-Loc can be used to secure extra lengths of strap during use, or as a handy storage solution. Suggested pricing is \$5.99 for a pair.

DELTA®'s new *Heavy-Duty Oscillating Bench Spindle Sander, Model 31-483*, has a

15/16" oscillating action that uses more of the sleeve, to prolong its life, and achieves 20 oscillations per minute.



DELTA Heavy-Duty Oscillating Bench Spindle Sander, Model 31-483

For bevel sanding, the 14 3/4" x 14 3/4" cast-iron table tilts from 0° to 45°, with a positive stop at 90° and a large bevel scale for accuracy and convenience. Twin locking handles provide stability in any bevel position. On the Model 31-483, a heavy-duty worm and gear mechanism drives the oscillations, with the spindle speed reaching 1,725 rpm. The motor is 1/2hp, 115-volt. The Model 31-483 has a suggested price of \$449.99.



Bench Dog Tools
Strap-Loc





Grizzly G0725
Benchtop Jointer

Grizzly Industrial®, Inc. has put built-in dust collection into a benchtop jointer with its *Model G0725 6" x 28" Benchtop Jointer*. The dust collection system has a 2½" dust port, dust collection fan and bag. The jointer itself runs on a 1½hp, 20,000 rpm universal motor with a two-knife cutterhead that can make 20,000 cuts per minute for smooth finishes. The fence and tables are both cast-iron,

with the fence measuring 4⅝" tall and tilting 45° left and right for bevel jointing.

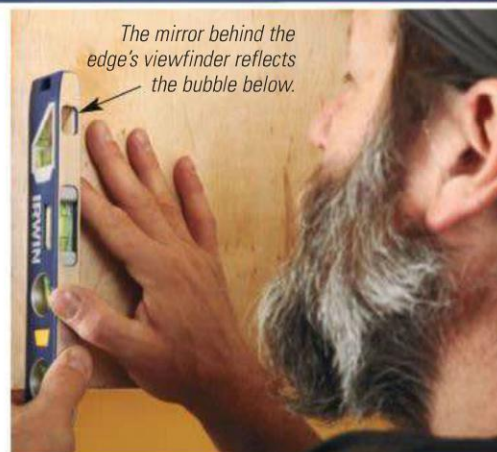
The *Model G0725 6" x 28" Benchtop Jointer* is priced at \$235.

IRWIN® Tools' new *250 Series Magnetic Heavy-Duty Torpedo Level* is one of several new levels from the company. The *Plumb-Site®* feature is an integrated mirror that allows you to get an accurate reading in a tight spot by providing dual-sided, undistorted viewing — you can see the plumb

vial from the front, as well as the traditional side view. The nine inch die-cast aluminum level is equipped with rare-earth magnets for hands-free work around metal and has an integrated 1.5° button for setting up 1/4" per foot drainage. The list price for the 9" 250 Series Magnetic Heavy-Duty Torpedo Level (item number 1794153) is currently set at \$30.66.



IRWIN 250 Series
Magnetic Heavy-Duty
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The mirror behind the
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Shop Test

Innovative Measuring and Layout Tools

By Sandor Nagyszalanczy

While big power tools have the cachet, you can't do woodworking without a good set of marking tools. Fortunately, you have plenty to choose from!

Tape measure, rule, square, bevel gauge, compass. How far could you get on any project without these basic layout and measuring devices? The most rudimentary forms of these tools have remained nearly unchanged in decades, if not centuries. But time stands still for no man — or tool: A number of tool manufacturers have taken up the task of reimagining and reinventing measuring and layout tools. Dozens of these innovative tools employ clever designs (many patented) and unique features intended to make the layout process quicker and easier for woodworkers and DIYers alike. In this article, I'll show you more than 50 such tools, including: tape measures and rules, squares, miters and bevels, marking and measuring gauges, compasses and dividers and multipurpose tools. All of the tools described in the following

pages are both affordable and available, either at home and hardware stores or through mail order catalogs or via the Internet. Depending on the kind of work you do, I'm sure you'll find at least a tool or two that would make your project-building life a little easier. One caveat: I've shied away from including "electronic" tools in this article. My reasoning is that there are plenty of simple mechanical tools that get the job done and won't quit on you because of a rundown battery.

Measuring Tapes

Hardly a day goes by when a craftsman doesn't use a tape measure. One pet peeve of mine is that practically all standard tape measures have the numbers printed so that they read from





M-Power's R1 Tape



Lee Valley Blindman's Tape



FastCap FlatBack Tape



U.S. Tape CenterPoint Tape



Veritas Story Tape



Rockler
Square Check



Tape Tip



Utilitas Tool
Works Miter Hook

Square N
Tape

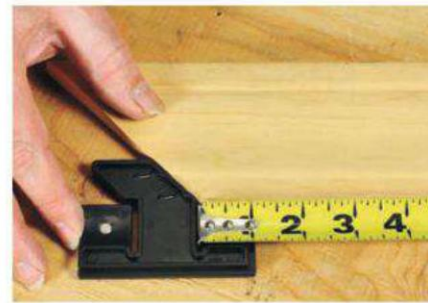


left to right. That means you have to hold the tape body with your right hand and make pencil marks with your left — not exactly ideal if you're right-handed. But the numbers on M-Power's R1 Tape read from right to left, allowing you to handle the pencil comfortably with your right hand. If you'd swear that the numbers on your rules and tape measure are getting smaller every year, then it might be time to switch to Lee Valley's Blindman's Tape. The numbers and increment markings on this tape are supersized, so they're much easier to read, even in low light. Another common irritation is that the cupped profile of a standard tape measure — added to allow the tape to be extended without buckling — makes it harder to read and mark measurements on flat surfaces. A FastCap® FlatBack Tape solves this

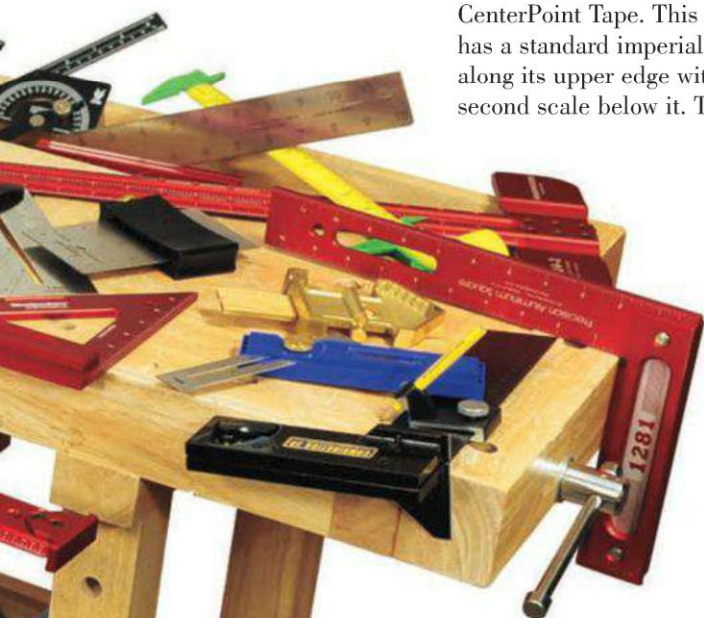
problem by making the tape itself flat. Not only does it lie flush on a board or panel, but it wraps around curved parts easily. Another innovative feature of this tape is an unmarked strip at the edge, which allows you to mark one or a series of part dimensions with a pencil directly on the tape, as shown at right. This way, you can keep track of measurements without having to write them down, and transfer them to a cut list or use the tape to set up machines.

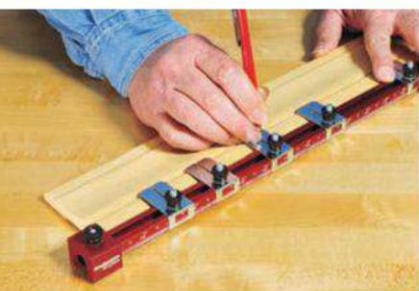
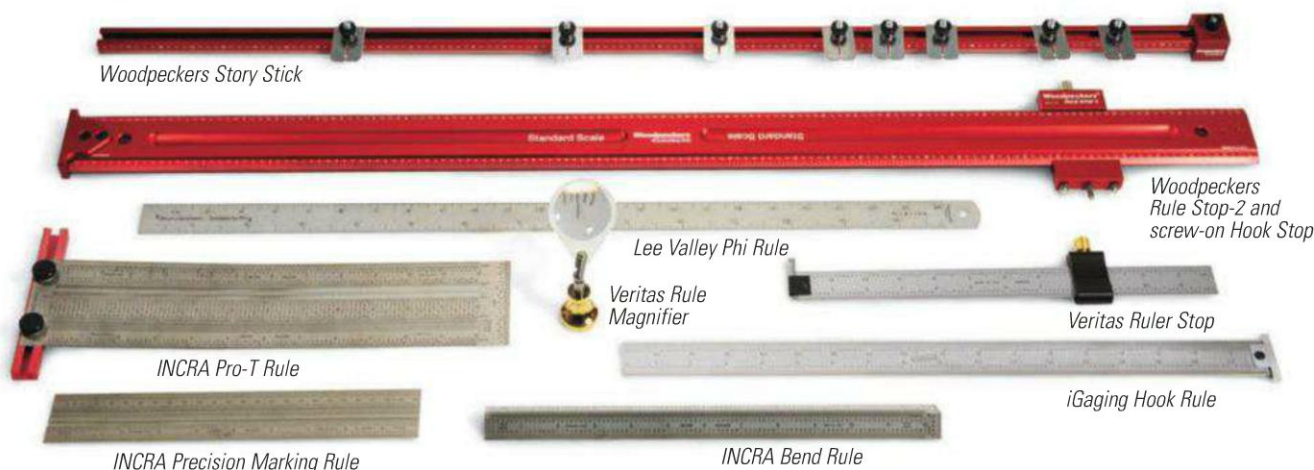
There are a number of other specialized tape measures available that are designed to perform specific tasks, including the U.S. Tape CenterPoint Tape. This model has a standard imperial scale along its upper edge with a second scale below it. To

mark the center point of any length, you find that number on the lower scale, and then use the corresponding increment on the scale directly above it. Another cool specialized tape is the Veritas® Story Tape. It's basically a tape with a completely blank surface that lets you mark out a series of dimensions to use as a story stick. There are also a couple of handy accessories that work with most standard tape measures. The Rockler Square Check secures to the end of your tape with a magnet, and it hooks over the outside corner of any box or chest, allowing you to accurately check the diagonals during assembly to see if they're the same (which means the box is square). The orange plastic Tape Tip also uses magnets, but attaches to your tape's end in different positions, allowing you to take both inside and outside measurements. It also has a V-notch for a pencil and a center hole that allows the tip to be used as a marking gauge or a compass. The Utilitas Tool Works Miter Hook magnetically attaches to a tape measure and allows quick, accurate measurements of mitered parts, tip-to-tip or the more difficult to measure



Innovations to the ubiquitous measuring tape, such as a markable edge or an add-on for measuring heel-to-heel miter distances, are a boon to woodworkers.





Accurately marking the edge of a square-edged board, laying out a rectangle to the golden ratio or marking multiple dimensions at one time ... there are specialty rules to help do all these tasks.

heel-to-heel, as shown on page 61. The Square N Tape™ is a neat accessory that mounts directly to your standard tape, to provide a 3½" square and marking gauge that's at hand.

Rules

Think that there isn't much to improve on a standard rule or yardstick? Consider these innovative measuring tools: If you like to use a fine pencil rather than a striking knife for laying out dimensions, INCRA® Precision Tools makes a line of innovative rules with slots and holes precisely placed at 1/64 in. increments. The slots/holes fit a .5mm mechanical pencil lead, for very precise marking. In addition to the standard flat Precision Marking Rule, there's a Pro-T model that features an end stop that squares the rule to the work, and also a Bend Rule, for layout on the edge of a board. Need to precisely measure or mark from the end or edge of a part? An iGaging Hook Rule makes the process easier: An adjustable hook zeroes the rule on the end/edge of the part. With Woodpeckers® Rules, you can add a screw-on Hook Stop. A really handy way to use a standard ruler for laying out joinery, pocket cuts or pilot holes for hardware is to add a rule stop, like the Veritas Ruler Stop or Woodpeckers Rule Stop. Either of these slide onto a rule and lock at any measurement, so you can use the end of the rule to mark lines at that distance from the edge of the work.

One of the most unusual

measuring devices is Lee Valley's Phi Rule, which uses a pair of scales to help you quickly calculate aesthetically pleasing "golden ratio" proportions for furniture and cabinet parts. To use the rule, you simply measure the known side of the drawer, box, panel, etc., with the upper scale, then use the same numerical increment on the lower scale to mark out the part's other dimension (one scale is 1.618 times longer than the other). One side of the Phi Rule is used to measure the known short dimension, the other the known long dimension of a workpiece. And if your aging eyes are having trouble reading the fine increments on this or any rule, consider using a Veritas Rule Magnifier. The tool has a weighted base that also has magnets to hold it to a steel rule. A magnetic friction hinge lets you adjust the 3-power magnifier's lens to any angle, so you can see the finest graduations with less eyestrain.

Normally, a story stick is a plain piece of wood onto which you mark all the dimensions of a particular project. But the Woodpeckers Story Stick puts a different twist on this concept. This piece of anodized aluminum track is etched with imperial scales on both sides and comes with adjustable tabs

and an end stop. By aligning the cursor on each tab with the track's scale and locking it in place, you can save a whole series of layout dimensions, then use the narrow pencil slot on each tab to transfer that dimension to multiple workpieces.

Squares, Miters, Bevels

A tool that's become standard equipment in carpenter's tool bags, a speed square is basically a 45°-45°-90° triangle with a lip on one of the short edges. Made of anodized aluminum, the Woodpeckers 6" Carpenter's Square quickly aligns to an edge so you can mark lines at 90 or 45 degrees. Unlike a standard try square, Woodpeckers 12" Precision Aluminum Square also features a lip on the inner edge of its stock, so that it stays put on the edge of the stock while you mark lines or measure dimensions. For bigger jobs that require a larger tool, you can add a lip to a standard carpenter's framing square by attaching a Veritas Square Fence to one of the square's legs. For marking square lines across the face of a panel, a draftsman's T-square is a great choice. Woodpeckers Precision T-Squares take this traditional tool one step further by adding a lip to the square's head (to keep it flat and level



on the edge of the work) and scales on both edges for accurate measurements from the panel's edge. There are also holes at 1/16" increments, for marking a line parallel to an edge: Insert a .7mm mechanical pencil lead in a hole and slide the whole tool along the edge.

For smaller-scale tasks you often encounter in cabinet and furniture making, like checking stock and part edges for square, a Veritas 6" Precision Square is very handy. Built like a pint-sized carpenter's square, it's easy to carry around in an apron pocket so it's at hand when you need it. Veritas also makes a unique tool they call a Sliding Square, designed to lay out or transfer measurements as well as mark short 90 degree lines, or to mark parallel to an edge. The tool's 3"-wide blade has scales marked on three sides, allowing you to measure or mark dimensions in two axes at once, thus saving time and trouble. Another way to save time during layout is to mark two surfaces of a part at once, say when marking both the depth and width of a hinge mortise on the face and edge of the work. Veritas wide and narrow Saddle Squares are compact tools made to suit the layout task at hand.

When it's time to mark miter cuts for a picture frame

or molding, a Japanese-made 45°-90°-45° Saddle Square and Miter or a Veritas Miter Saddle speeds up the process, as they're preset to a precise 45° angle. There are even specialized saddle tools made just for marking dovetail joints. Veritas offers 1:6°, 1:8° and 14° Dovetail Saddle Markers, which let you mark both the angled and square edges of a pin or tail with the same tool. For other standard miter angles, the BORA Multi-Angle™ Adjustable Square is like a try square with a pivoting blade that folds open and locks to any one of seven angles — 22.5°, 45°, 67.5°, 90°, 112.5°, 135°, and 157.5° degrees — with great accuracy (BORA claims it's repeatably accurate to +/- .05°!). When a project involves laying out other angles, say to build a multi-sided planter box, the Blue Right™ Woodworker's Protractor has a nice, big transparent protractor with a bottom-mounted fence that lets you read and mark angles with great accuracy. The CCKL Creator Angle Finder II has an adjustable protractor attached to a 20" long arm, allowing you to set and mark an angled line anywhere from 15° to 180° with the same tool. If you prefer to use a conventional sliding bevel for angled layouts, a Veritas Bevel Setter

makes setting the tool to a precise known angle a breeze. The plate is marked with lines from 0° to 90° at half-degree increments, plus common dovetail angles and polygon miter angles. A lockable fence lets you use the tool by itself for marking angles. The BORA Angle Master™ is an innovative tool useful for duplicating existing frame angles. After setting the tool against an angled joint, the tool divides in half. You then use this half tool to set your crosscut saw to cut the necessary angle.

Measuring and Marking Gauges

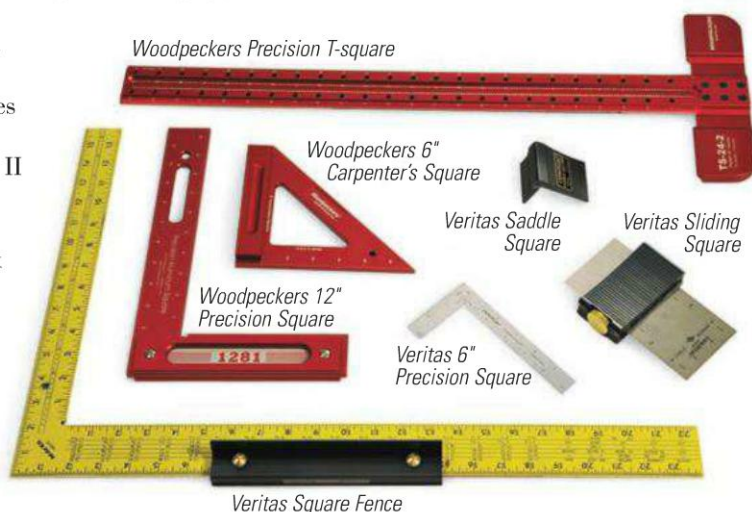
Any time you need to measure the thickness or diameter of a part, width of a slot or rabbet, depth of a hole or mortise, or the length of a dowel or tenon, there's a measuring gauge that's right for the task (see photo, next page). One of the

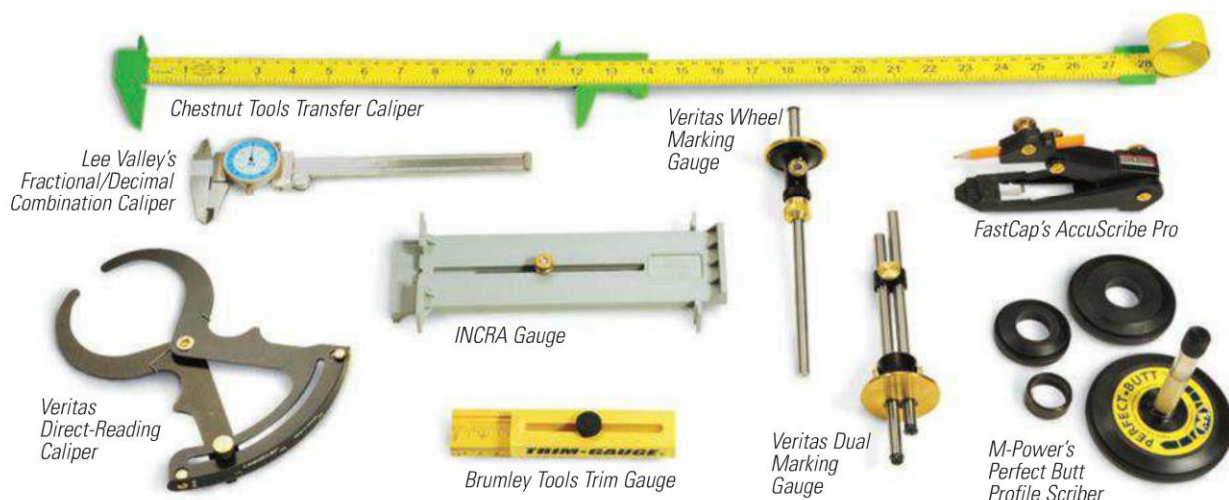


Put the BORA Angle Master against an angled joint and then take the tool apart. You then use this half tool to set your crosscut saw to cut the necessary angle — matching it perfectly.



The Veritas Sliding Square is great for marking joints like mortises.





Scribing irregular shapes is made easier with M-Power's Perfect Butt stylus and wheel system (top). Measuring joint heights and offsets is the bailiwick of Brumley's Trim Gauge (bottom).

most useful such tools is a basic machinist's caliper. While a standard dial caliper lets you read inside and outside dimensions, as well as depths on a scale that shows thousands of an inch, a caliper with a fractional scale is much more useful to woodworkers. Lee Valley's Fractional/Decimal Inch Combination Caliper has markings as fine as 1/64th of an inch — no more converting from thousandths to fractions!

When you want to use a caliper for measuring much longer parts, check out the Chestnut Tools Transfer Caliper. This clever device has a pair of plastic caliper heads on an inch-wide tape that rolls up into a compact package. You unroll as much of the tape as you need to accommodate the length of the work (up to 48 inches), then slide the moving head to take either an inside or outside measurement. Another kind of caliper that's often used by woodturners and luthiers (but is useful for many woodworking tasks) is the legged caliper. The Veritas Direct-Reading Caliper is very handy for reading outside dimensions with good accuracy, with a scale that's oriented so it's easy to read by a woodturner when measuring the diameter of a spindle. As their name suggests, depth/height gauges are useful when checking the length of short parts and joinery, say the length of a tenon, or to see how deep a hole or mortise is. The INCRA Gauge can be used to mark out joinery or hardware mounting positions at a chosen distance from an edge, thanks to INCRA's unique interlocking rack system that sets precisely at 1/32" intervals. The Brumley Tools Trim Gauge™ is a small but very handy gauge for measuring heights or lengths of

short parts, joineries and reveals (there's even a pair of built-in levels, for carpentry tasks like setting doorjamb).

Traditional woodworking marking gauges have points that scratch lines into the work's surface. In contrast, gauges with hardened steel cutting wheels cut wood fibers cleanly, rather than tearing them, for more accurate joinery layouts. The Veritas Wheel Marking Gauge comes in a model that features a shaft with imperial scale graduations and a micro-adjust feature (the scale allows the tool to also serve as a depth gauge). The Veritas Dual Marking Gauge has a pair of independently adjustable marking rods. By locking each to a different setting, you can quickly mark out both sides/edges of mortises, tenons, slots, etc.

Scribing is a special kind of marking that's needed when fitting cabinets to an irregular wall, or wherever parts intersect or need trimming. FastCap's AccuScribe Pro has an adjustable arm that adapts the tool to make a wide variety of scribing tasks easy and accurate (it can also be used as a pencil compass). M-Power's Perfect Butt Profile Scriber provides another approach to scribing: Its pencil stylus fits into one of four different diameter wheels that ride along the surface that's being

transferred. The amount of offset between the surface and marked line is determined by the wheel's radius.

Compasses and Dividers

Marking circles and arcs on tabletops or radiuses, for rounded edges on panels or frames, is a job made a lot easier by a good compass. (See photo on next page.) At the small end of the scale, the Veritas Carpenter's Gauge handles circles up to a 12½" diameter, yet stores conveniently in a pocket or pouch. Separate radius and diameter scales make it very easy to set; it also works as a pencil marking gauge. At the other end of the scale (pun intended) is the Brat Manufacturing Rotape, a specialized tape measure with a removable center point. You simply extend the locking tape to the desired radius — up to a whopping 72 inches! — press the point into the work, and swing the tool's pencil stylus around to mark the arc or circle. Another tack is to transform a standard rule or yardstick into a compass. M-Power's Flat Lying Trammel Set includes a pair of fittings that do just that. One has a carbide steel pivot point, while the other holds either a pencil or a razor knife,

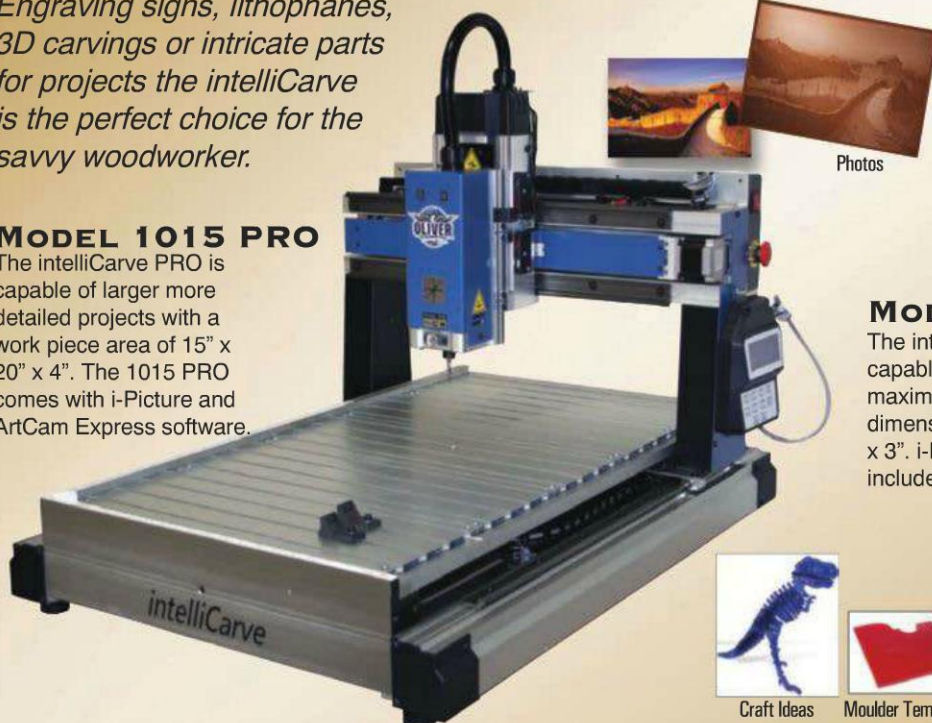
Shop Test continues on page 66 ...

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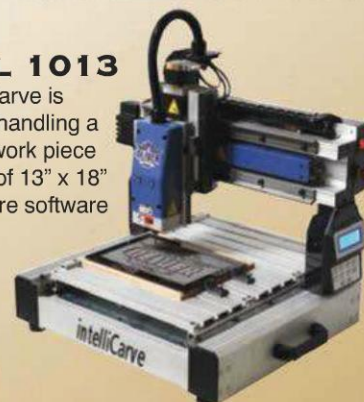
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Shop Test continued



From striking extremely large curves to scribing accurate divided lines, there is a marking tool for the task. The dividing rule by Veritas (at right) is a shop favorite. Brat Manufacturing's Rotape is above left.

workpiece (up to 8" wide), simply use a pencil with the series of holes that suits your desired divisions, anywhere from two to 10 even segments. The rule has stops that engage the edges of the work as you slide it along the length of the rectangular board or part while the pencil marks the segment lines.

Layout Multi-tools

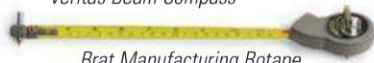
Looking for the Swiss Army knife of measuring and layout tools to have on hand for your desert island wood project? There are several multipurpose tools out there that could fit the bill. First off, there's the M-Power Combination-3D, a tool that features a large try square made of heavy cast aluminum with a resettable Sheffield steel 9 in. blade laser-etched with imperial and metric scales. There's also a 2"-wide saddle square, a bevel gauge etched with standard miter angles and a removable marking gauge. The latter features an adjustable pencil holder that can be set to any position along the square's blade, allowing you to mark accurate lines parallel to an edge. A much more compact tool, the Kreg Multi-Mark™ has a 6" rule (imperial scales on one side, metric on the

other) that mounts in any one of three positions, for use either as a try square, a 45° miter square, or a depth gauge. The steel rule can also be used separately. The tool's plastic body has a ledge for setting a 3/16" reveal when mounting moldings and trim, and a built-in level vial makes the Multi-Mark a useful torpedo level. Last, but not least, is a re-creation of the famous Stanley #1 Odd Jobs tool that was originally manufactured from 1888 to the 1930s. The Rockler Odd Job features a solid brass body and 6" brass-edged maple rule (a 12" rule is optionally available), and Garrett Wade's larger Jumbo Odd Job comes with a 12" rule, with an 18" rule as an available option. Both Odd Jobs pack a lot of function into an attractive tool that looks like a tiny Victorian house: A try square/T-square, an inside square, a miter square, a depth gauge, a marking gauge, a compass and a plumb level (the Jumbo Odd Job has separate plumb and level vials). Plus, the rules can be used separately. Small removable steel styluses serve as scratch awls, scratch points for the marking gauge, and a screwdriver, for extending/retracting the steel compass center point at the peak of each tool's "roof." When used as a compass, a notch in the end of the rule guides the stylus or a pencil when marking a circle or arc.

Sandor Nagyszalanczy is a contributing editor to Woodworker's Journal. His books are available at Amazon.com.



Veritas Beam Compass



Brat Manufacturing Rotape



Veritas Carpenter's Gauge



Veritas Dividing Rule

M-Power's Point-2-Point



M-Power's Flat Lying Trammel Set

allowing you to either mark circles or cut them out of veneers, cardboard and other thin materials. But if you want a compass designed for extremely precise layouts, the Veritas Beam Compass is the

ultimate kit for marking or scribing circles and arcs up to 80 inches in diameter. The set consists of three rods that screw together to suit the desired length, a pencil holder and a pair of brass trammels with steel points. One of the trammels connects to a micro adjuster that allows you to tweak the compass's radius to perfection. The set even includes a brass pivot disc, so the pivot point won't put a hole in your workpiece.

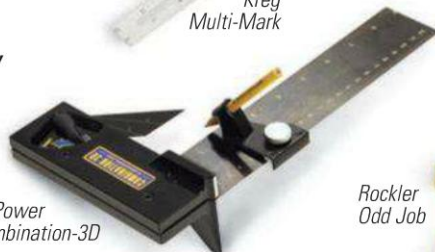
When it's time to divide a length into even segments, the M-Power Point-2-Point™ can divide parts up to 23½" long into up to seven even segments. While this tool is lightning-quick to set and use, it's not meant for high precision layouts, but rather for tasks such as spacing dowels or plate biscuits evenly along an edge. For more precise jobs, like laying out dovetails or finger joints, check out the innovative Veritas Dividing Rule. After slipping the tool over the



Marking tools that do several tasks have a long history in the woodshop. While the Kreg Multi-Mark (upper photo) is new to the scene, the Odd Job tool is a modern-day revival of the Stanley version from the 1880s.



Kreg Multi-Mark



M-Power Combination-3D

Garrett Wade Jumbo Odd Job



Rockler Odd Job



Vectric

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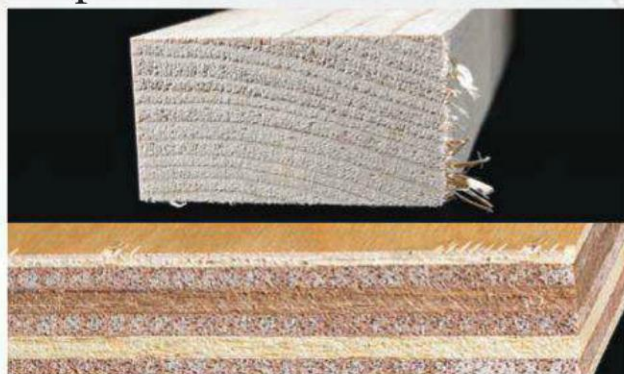


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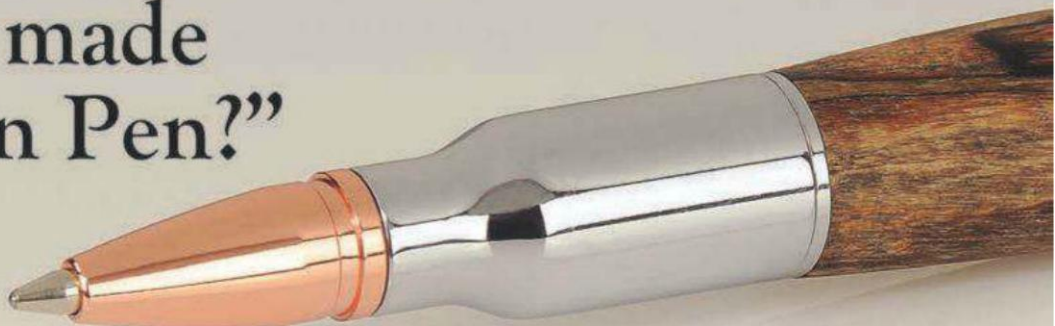
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Router Joinery Basics: Half-Blind Dovetails

By Bill Hylton

With their attractive appearance and strong holding characteristics, dovetails are a joint that woodworkers love.

MORE ON THE WEB

For an extended article on cutting half-blind dovetails with a handheld router and router jig, go to woodworkersjournal.com and click on the "More on the Web" tab shown above.

Or send a large SASE to Woodworker's Journal, Skill Builder 28, 4365 Willow Drive, Medina, MN 55340.



Two examples of half-blind dovetails from a router jig.

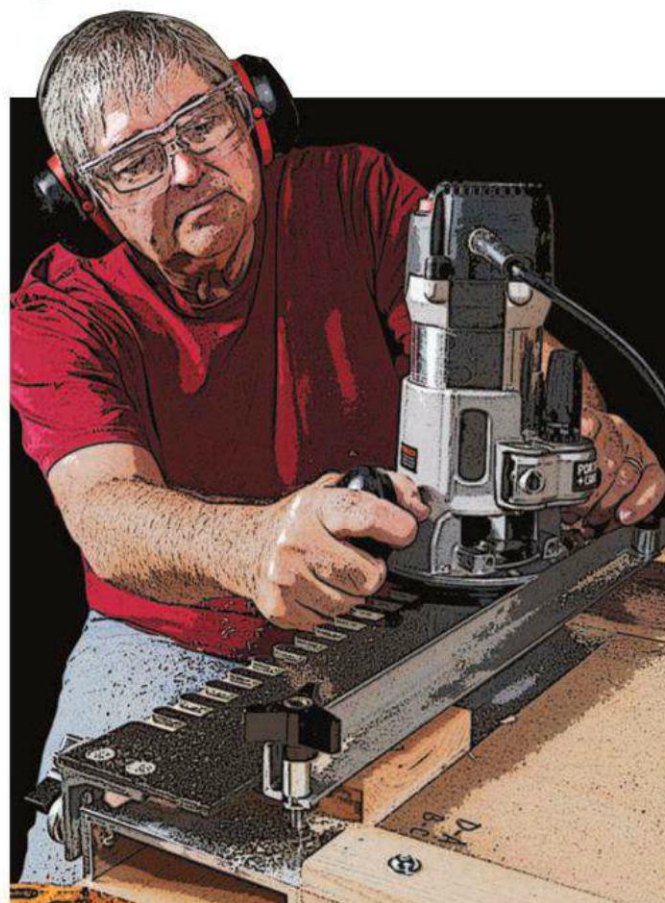
Dovetails are prime joints. They're strong, have great appearance, are strong, and have cachet. Dovetails are used in boxes, drawers and carcasses. Oh, and did I mention that dovetails are really strong?

Nonetheless, for many woodworkers, cutting dovetails with saw and chisels presents an insurmountable challenge.

If you are in that group, there are plenty of router accessories on the market to help you. There are so many, in fact, and they have so many variations in setup and operation, that I'm going to narrow my focus to the most common: the half-blind dovetail jig.

The typical half-blind dovetail jig consists of a metal base with two clamping bars to hold the workpieces. A comb-like template rests on the top to guide the router in cutting both pieces at once.

Besides the jig, you need a router, a 1/2", 14° dovetail bit and a guide bushing. Usually a 7/16" O.D. bushing is required, though occasionally a larger bushing is called for. The appropriate bit and guide are typically packaged with the jig, and in most instances, you'll find they are generic. Because the working end of the bit is larger than the opening in the template guide, you have to install it after the guide. That means there's benefit in using a long-shanked bit. Any router can be used. I've routed



As with nearly any jig and tool operation, careful setup is the key to success when it comes to routing half-blind dovetails. Our author has a series of seven steps that will lead you through that setup.

dovetails with a laminate trimmer, but typically I use a 1½- to 2hp fixed-base model. The ability to plunge is irrelevant in this operation, and plunge routers generally are awkward for work on the edge (which this work is), owing to their high centers of gravity. Brute power doesn't contribute much, if anything. But don't go buy a new router just for dovetailing.

7 Steps to Perfect Half-Blind Dovetails

There is an in-depth treatment of each of these following points in the online

version of the article. But the following seven steps will assure accurate, repeatable router-cut half-blind dovetails.

1. Set Up Your Jig

Every half-blind dovetail jig I've ever seen needed to be attached to a base (something like a piece of 3/4" plywood), which could then be clamped to a workbench. In my online content, I'll teach you how to make a dedicated jig base.

2. Set Up the Router

Get out your router and make sure it has the correct collet installed. Mount your guide bushing and then the dovetail bit in the router.



3. Clamp Work in the Jig

The workpieces have to be clamped in the jig in a particular way. The tail piece is on the top, and the socket (or pin) piece is in the front.

4. Position the Template

The template rests on top of the work. It must sit flat on the work. The fore-and-aft alignment is critical.

5. Cut a Test Joint

A test cut using properly prepared material sets the pattern for the production cuts that are to follow.

6. Fine-Tune the Setup

Chances are, your setup will need a little fine-tuning. You

slip the two test pieces together, and something's off. A bit too loose — or too tight. Or the sockets aren't deep enough. Or the parts are a little offset. All of these ills are cured by fine-tuning.

7. Mark the Parts

Before starting to make your cuts on the actual project parts, make sure you're

organized and know what to cut where. The parts are worked "inside out." Some are cut on the right side of the jig, others on the left. It's easy to get mixed up, whether you're dovetailing one drawer or 50. So proper marking of all the pieces must be done before you start.

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Finishing Thoughts

Understanding the Label

By Michael Dresdner

Ever wondered about those abbreviations, numbers and nomenclature on finishing products? Well, you're not alone ...

The Fair Packaging and Labeling Act

is a U.S. law that applies to labels on many consumer products, requiring the label to state the identity of the product; the name and place of business of the manufacturer, packer, or distributor; and the net quantity of contents.

A reader making children's toys asked for some translation help with the confusing safety warnings he discovered on the labels of the stains and finishes he wanted to use. Of course, we rode to the rescue.

1. What does "conforms to ASTM D4236" mean?

ASTM (American Society for Testing and Materials) D4236 is the protocol used for labeling art materials. They ensure that safety warnings on labels are consistent, from one brand to the next, on any given type of product. Similarly, grocery food labels use the same format on foods for calorie, fat and salt listings — issues helpful with foods but pointless with paints.

2. If the can is silent on being toxic-free, is it?

Not necessarily, but somewhere, the label will warn you of any dangers that are present. But, don't confuse toxic (poisonous) with hazardous (dangerous): a coating can be one, both, or neither.

3. What does "HMIS ratings health 2" mean?

It means "Temporary or minor injury may occur." The Hazardous Materials Identification System (HMIS) has four categories. A letter code suggests safety equipment, while health, flammability and physical hazard warnings use a numbering system from 0 to 4, with 0 being the most benign. Use it to stay safe by using products as directed.

4. What does "VOC content of 86 percent" mean?

VOC is shorthand for "volatile organic compound," a descriptor that covers most of the solvents used in finishes. The solvent evaporates after application, leaving only solids and binder remaining on the wood. Thus, only 14% of that product will be left on the wood once it dries. If the coating also contains non-VOC thinners, like water, there will be even less remaining on the wood.

5. What does the state of California know about products that cause birth defects? Is this a concern to the rest of us?

States are permitted to exceed national standards

with their own label warnings. California labels go further than most states, begging the question "Is California wiser, or fanatical?" That's a great topic for another article.

6. Some products say nontoxic and lead-free. What about the others?

Lead pigment was removed from indoor paint in the 1970s, so that's not an issue. Nontoxic usually describes the wet material, since most coatings sold to homeowners are nontoxic once they are dry.

7. If vapors are stated as harmful, can the dried product be safe?

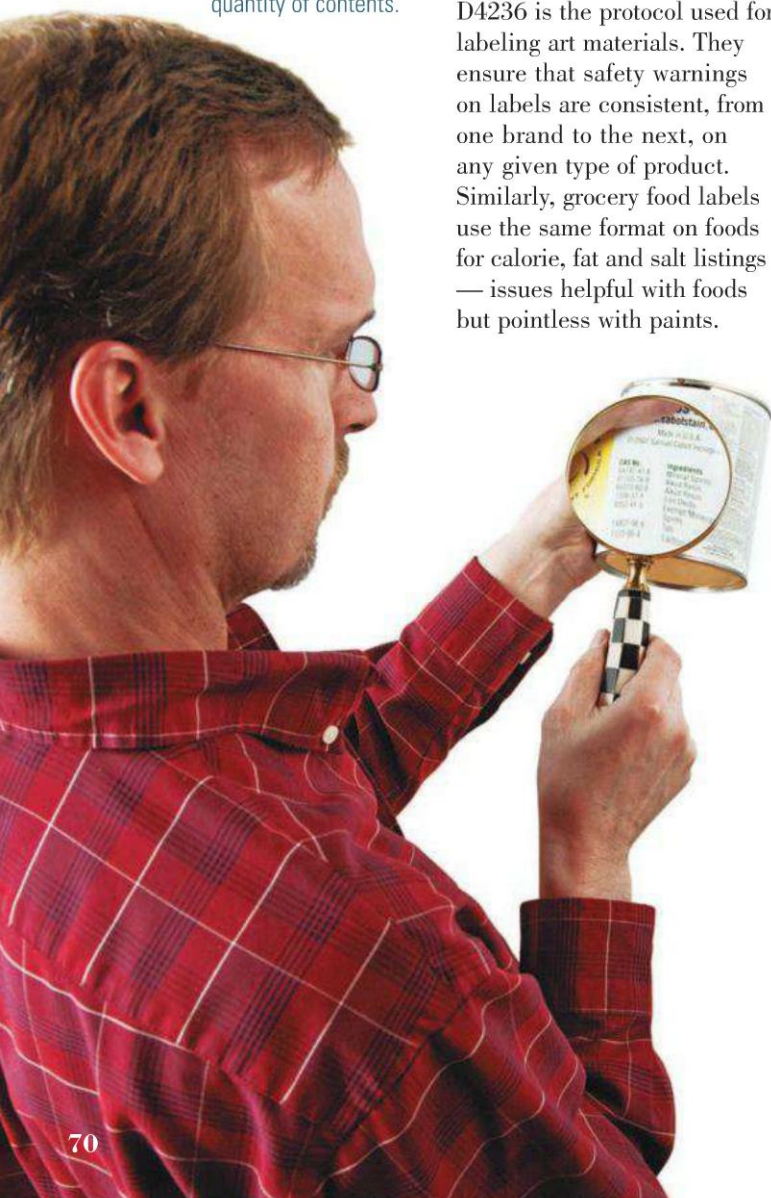
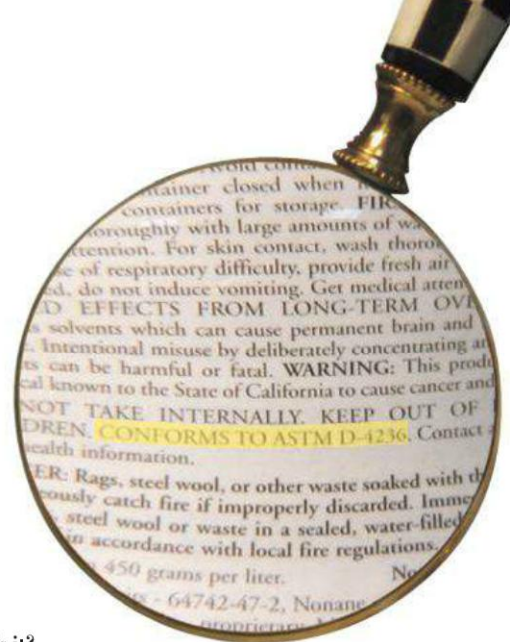
Of course. Once the vapors are gone, the harm is gone. It's like a night on the town: when alcohol leaves your system, you aren't drunk. (Paint doesn't get hangovers.)

8. Can I spray over an unknown paint with a toxic-free product to make a toy safe?

Not necessarily. If there's poison below the finish and a child can chew through the finish, then it's accessible. However, as I said in question 6, most "unknown" coatings are safe when dry.

9. How about food coloring on the toys, which turned raw pine a very nice green?

Food coloring is edible dye, and it works just fine on wood. Unfortunately, food dyes are not necessarily lightfast and may soon fade, but many wood dyes are made to be much more resistant to fading.





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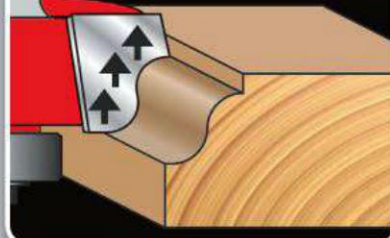


**Other
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2 Cutter
Design**

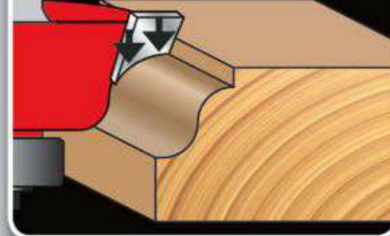


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