

THE NEW CORDLESS CHAINSAWS ... WITH POWER TO BURN! (page 52)

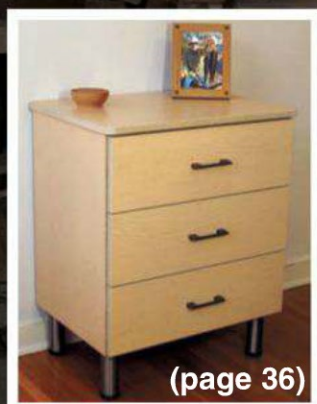
WOODWORKER'S JOURNAL

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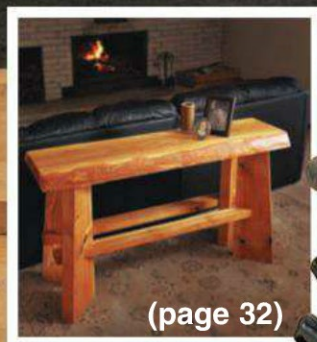
UPDATE: HOT NEW CORDLESS CIRC SAWS

We pick the best!
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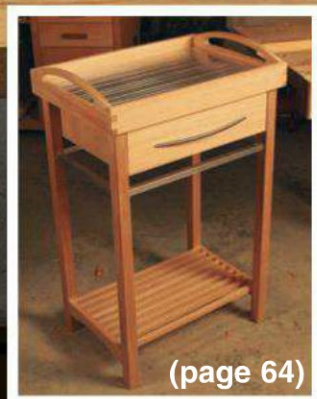
Simple dresser
for under \$100!



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- Sawmill Savings
- Brad Pitt's Furniture
- Donating Power Tools
- How To Finish a Deck

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15" PLANERS

- Motor: 3 HP, 220V, single-phase
- Precision-ground cast iron table size: 15" x 20"
- Min. stock thickness: 3/16"
- Min. stock length: 8"
- Max. cutting depth: 1/8"
- Feed rate: 16 FPM & 30 FPM
- Cutterhead speed: 5000 RPM
- Approx. shipping weight: 662 lbs. (G0453P) 666 lbs. (G0453PX)



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- Max. cutting width: 20"
- Max. cutting height: 8"
- Min. stock thickness: 3/16"
- Min. stock length: 8"
- Max. cutting depth: 1/8"
- Feed rate: 16 FPM & 20 FPM
- Cutterhead diameter: 3 3/8"
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- Amps: 11 at 110V, 5.5 at 220V
- Blade size: 93 1/2" long (1/8" - 3/4" wide)
- Cutting cap/throat: 13 1/2"
- Max. cutting height: 6"
- Overall size: 67 1/2" H x 27" W x 30" D
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- Table tilt: 45° right, 10° left
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14" BANDSAW

- Motor: 1 HP, TEFC, 110V / 220V single-phase, 1725 RPM
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- Max. cutting height: 6"
- Overall size: 66 1/2" H x 26 3/4" W x 30 1/4" D
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- Tilt: 45° R, 10° L
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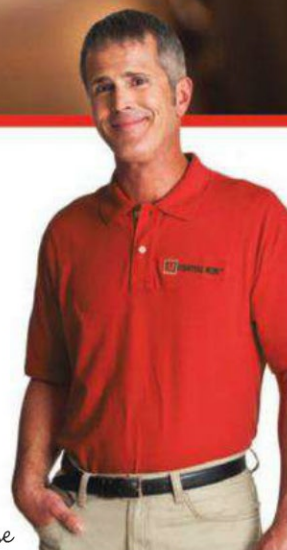
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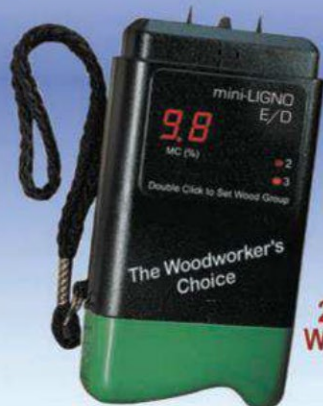
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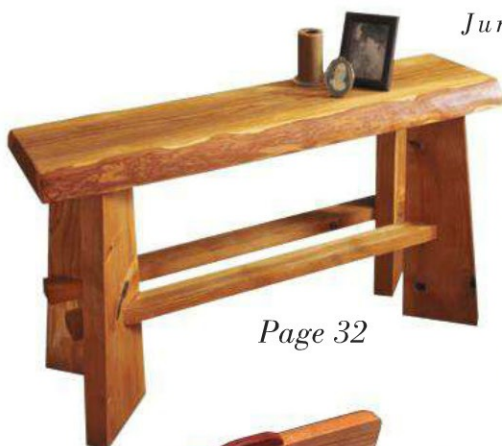
Woodworker's Journal

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By Journal Staff

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By Rob Johnstone

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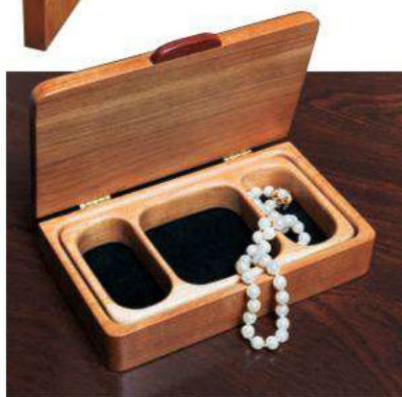
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\$100 and half a day gets you a quick, easy-to-build dresser.

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A tiny box with a removable insert highlights the scroll saw's ease with internal cuts.



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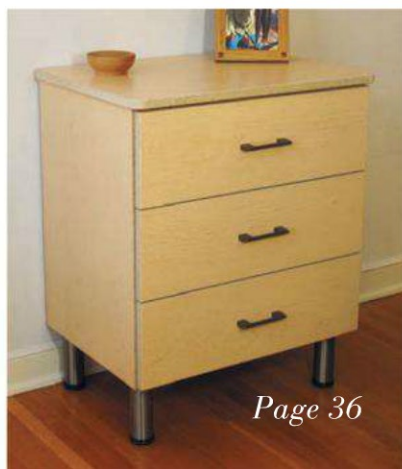
A new power tool tune-up app — plus more new tools.

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Beyond the basic barbecue cart: metal components add the perfect complement.

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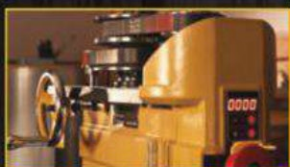
Easy-to-apply deck finishes — do they do the job?



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PRECISION MEETS INTUITIVE DESIGN

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Letters

Thick or Thin, Big or Small ... Readers Respond

ADVENTURES IN WOOD BUYING ...

I've had great success buying lumber from established retailers on the Internet, woodworking specialty stores and, of course, lumberyards. But the places where I've had the most fun buying wood were small, local sawmills. Often one-man shops, the lumber is locally sourced and often found in thicknesses and groupings hard to get elsewhere. You want four slabs of 3"-thick oak in a sequential flitch? (Got it right here!) Chunks of 4"-thick black walnut with plenty of sapwood included? (How many you want?) While you'll find no exotics, local sawmills are often a source of lumber that you'll have a hard time finding anywhere else. And, I'm guessing a lot of you appreciate the joy of traveling off the beaten path to find great prices on high quality, locally harvested stock. If so, tell me about it and I'll share your stories here!

—Rob Johnstone



For more about local sawmills, check out the story on page 30 and the *Slab Top Sofa Table* project on page 32.

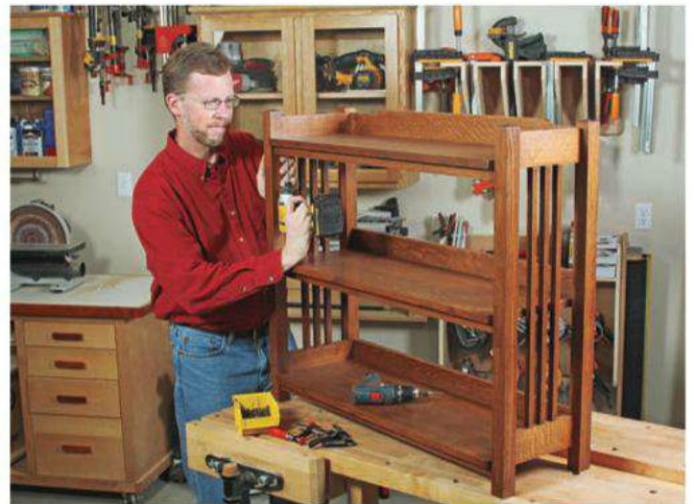
Saw Blades Questions

I am just getting back into woodworking after a 10-year break, and your "Saw Blade Questions Answered" article in the February 2013 issue provided me a wealth of information on starting my blade collection. However, I was surprised to see my Bosch table saw pictured with the caption that it would benefit from thinner blades. The instruction manual clearly states to not use "extra" thin-kerf saw blades. Is there a difference between thin and extra thin blades?

Alan Roland
Aberdeen, Maryland

WJ Responds: There are in fact some "extra" thin-kerf blades on the market, but in order for the riving knife to work properly, Bosch suggests using a standard .128"-kerf thin-kerf blade on its benchtop table saws.

—Chris Marshall



Senior editor Chris Marshall puts the final touches on our first *Small Shop Journal* project. The department has been a big hit with subscribers.

Oldies But Goodies

A friend of our daughter just gave us some old *Woodworker's Journal* magazines that she thought we would be interested in. After going through the magazines, I was really thrilled. There were several projects I really liked. The thing that amazed me the most was that some of the *Woodworker's Journal* issues weren't in magazine form. They were in newspaper form from 1979 to 1980. I think *Woodworker's Journal* was just as great back then as it is now.

Beth Walter
Scales Mound, Illinois

WJ Responds: They are great, aren't they? We're working on putting all of these old issues on a CD, which will be available soon.

Small Shops, Big Ideas

First, as a regular subscriber, I want to thank you for the fine work and useful material. I appreciate the new feature (*Small Shop Journal*). My basement workspace is pretty small, and I share it with the washer/dryer/water softener —

though that has not stopped me from doing large projects (like an 8' x 14' bookcase from reclaimed barn boards)! I am looking forward to see what you come up with next.

Cindy Zembryki
Shinglehouse, Pennsylvania

Your last issue of *Woodworker's Journal* is great reading. Back in 1948, I worked in a machine shop that was starting to make the Shopsmith. After hours, I machined the parts and put together my own unit. It's used regularly as a saw and a lathe. Perfect for my small shop. Just finished two desktops and now I'm making knife holders that fit against walls. I learn a lot from the *Woodworker's Journal*.

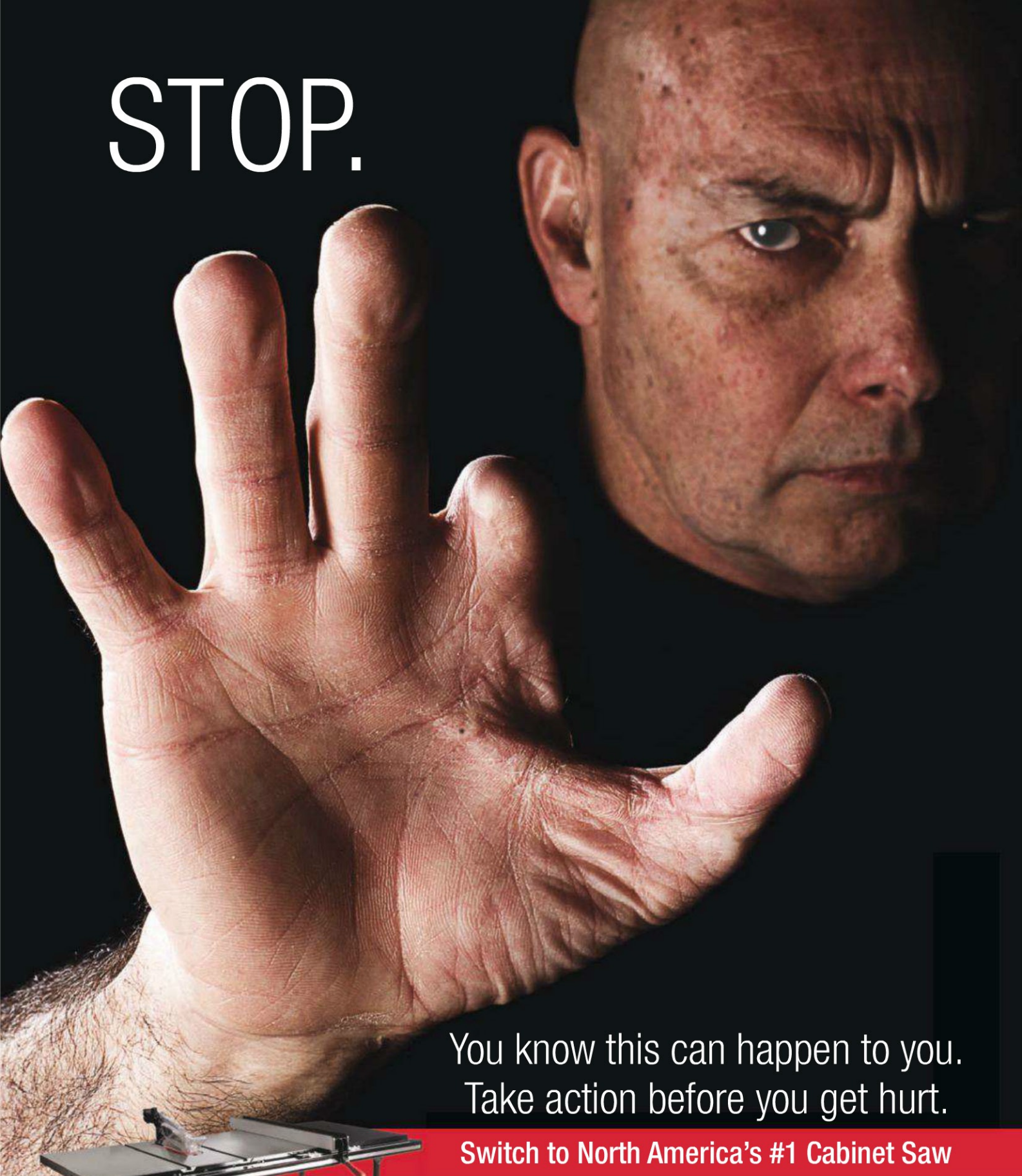
Bob Covey
Hotchkiss, Colorado

I started woodworking at the age of 10, sitting on the floor of the boiler room shaping small pieces of wood with a cinder block as my bench. When I was 15, we moved to a house with a basement and I set up a

Letters continues on page 8 ...



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shop in a 10x10 corner. I did a little whittling in that shop and made some furniture, too. Then, at the age of 18, my father told me I could use the two-car garage (filled with junk) as a shop. I went nuts setting that place up.

I went to the tool store one New Year's Eve day with a loan from my father and had a ball. I bought a 10" contractor's saw, 14" band saw, tabletop drill press, 10" miter saw, and a scroll saw (all Delta, and all of which I still have, except the miter saw).

I reconfigured that shop many times over the next 16 years — added a used radial arm saw and a small compressor and bent and attached pipes to the wall for a vertical sheet goods storage rack. It was woodworking bliss.

Then my father passed away. I couldn't afford to buy the house right then, so it was sold. I bought an 18' enclosed trailer and packed my shop into it. I also bought a 12' box truck with cabinets on the sides for work. The trailer got moved from place to place (since I rented an apartment with no shop space at all). I would just set up shop in the yard from the truck when I needed to build something.

Now, I am about to embark on the adventure of trying to set up shop in the one-car garage of a house I've rented. I have seen tiny, I have seen portable, and I have seen fully equipped. Now it's time to take bits of all of those shops and make a new one. I can't wait to get started, and your *Small Shop Journal* will be a great help.

Pete Stolz
Smithtown, New York

I think that yours is by far the most helpful woodworkers' periodical. I devour every new edition and want to register my delight that you have instigated the *Small Shop Journal* for people like me. I live with severely limited space and money to



Power tool manufacturers: anyone want to start taking trade-ins? Car makers do ...

invest in new equipment. When I read your own personal review of the Powermatic PM2800B Drill Press, I immediately wanted to own it — even though my old drill press still functions adequately. So I started wondering if any power tool manufacturers or outlets have considered the standard automobile industry's incentive of "trade-in" arrangements. I would readily consider such an offer to justify to myself (and my wife) an updated model purchase.

Keith J. Reeve
Raleigh, North Carolina



A Quick Trick Upgrade

A February 2013 *Trick of the Trade* was to use twist ties to hold band saw blades in place

while installing them. Spring clamps with plastic or plastic-coated jaws also work fine for holding the blade in place, and they're a lot quicker to install and remove than twist ties.

Brent Clayton
Northport, Alabama

Letters continues on page 10 ...

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THE VOICE OF THE WOODWORKING COMMUNITY

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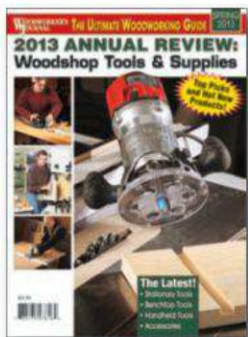
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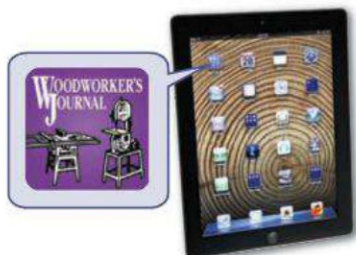
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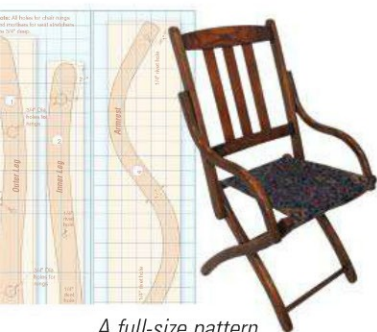
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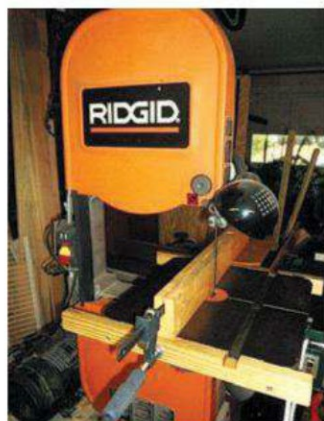


A full-size pattern for the Civil War Officer's Chair (August 2012) is available at woodworkersjournal.com. See that issue's More on the Web section.

Inspirations!

Your article on the "Shop-Made Band Saw Fence" by Tom Flader [October 2012] caught my interest since I was unable to find a commercial version for my seven-year-old RIDGID band saw. Based on Tom's basic design, I used a cut-down 2 x 4, some scrap wood material and a \$5 bar clamp (my only out-of-pocket expense). It might not be as attractive as Tom's, but it is just as functional with fewer parts. Thanks for the inspiration!

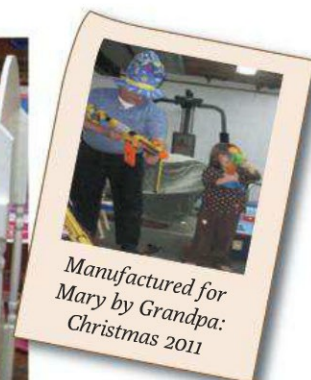
Jim Cutler
Wilmington, North Carolina



Jim Cutler's band saw fence is unique, but was inspired by one in our magazine back in October.

Thanks for the plans and the inspiration on your Kitchen Island ["Rolling Kitchen Island," *October 2012*]. This is my first attempt at a project from your magazine. I have limited woodworking skills and was able to build this from raw lumber with minimal difficulties. I don't know what types of wood I used, but the base is a beetle-damaged wood and I added two strips of purpleheart and dovetail keys to my light-colored top slabs. My main woodworking tool is a Shopsmith.

David Carnes
Seattle, Washington



Shhhhh ... If you know Ray Drago, don't you dare tell his grandkids that he's making their cool gifts (under contract to Santa).

Secret Labels

First, I must say that I thoroughly enjoy reading every issue of *Woodworker's Journal*. Second, while I also thoroughly enjoy woodworking, I do not consider myself a "woodworker" — at least not in a class with most of the woodworkers featured in the magazine! I am not a fine furniture builder. Mostly, I make sawdust as a form of recreation and to make my grandkids smile! Over the years I have built a number of projects for my grandkids (six, ranging in age from 1.5 to 16 years, at this writing) such as the baby doll bunk bed shown in the attached image. These projects are generally Christmas gifts and, as such, they come from Santa Claus, not from grandpa.

On the bottom of every project that Santa brings at

Christmas I affix a label such as the one shown above (right).

Since the kids never see the bottom of the projects (which are generally very large), they have not seen the labels yet. My hope is that they will see the labels many years from now when they pass these sturdy projects on to their own children. I am almost 70 myself so I may or may not be here to see that day, but every time I see one of the kids playing with one of Santa's woodworking projects, I can't help but smile and imagine the day that they each see one of the special labels.

Just thought that I'd pass on the idea to my fellow woodworkers. I'll bet lots of them are also grandpas or grandmas!

Ray Drago
Glen Mills, Pennsylvania





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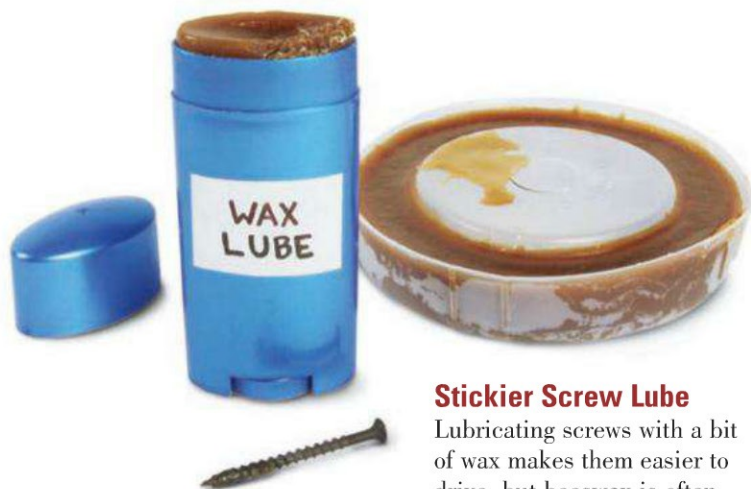
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MADEINUSA



Tricks of the Trade

Problem Solvers from Simple Supplies



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.

Stickier Screw Lube

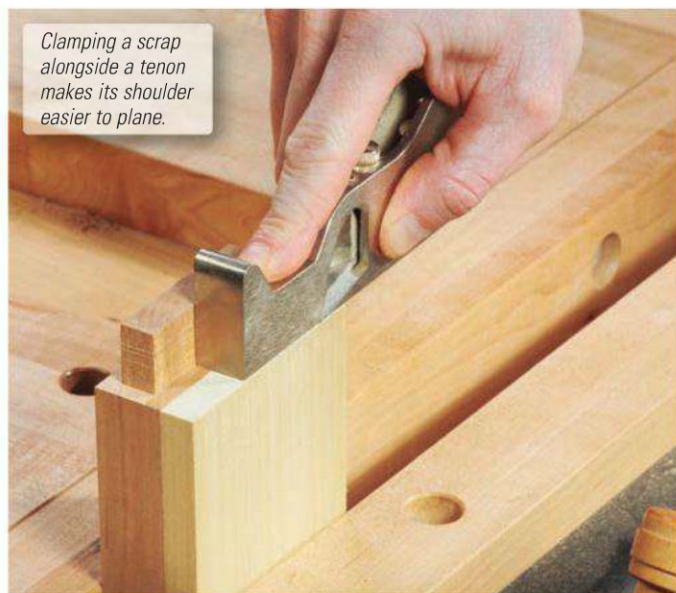
Lubricating screws with a bit of wax makes them easier to drive, but beeswax is often too hard and flakes off the threads. While helping a friend replace a toilet recently, I noticed that the wax ring was a soft, sticky consistency, perfect for screw lube! But the shape would be messy to store. So, I melted the wax down in a double boiler and poured it into an empty deodorant container. It winds up easily when you need more, and you can just cap it when you're done, for no-mess toolbox storage.

John Cusimano
Lansdale, Pennsylvania

Broader Shoulders Make Better Planing

When I need to adjust an uneven tenon shoulder, I use a shoulder plane set for a thin cut. The trouble is, there isn't much bearing surface for the plane's sole to prevent me from accidentally rounding the shoulder's edge. So here's an easy fix I came up with: I clamp a thin board beside the shoulder and align it to the amount of material I want to trim off. It provides more contact surface for the plane and keeps the shoulder's edge crisp.

Alejandro Balbis
Longueuil, Quebec



Clamping a scrap alongside a tenon makes its shoulder easier to plane.

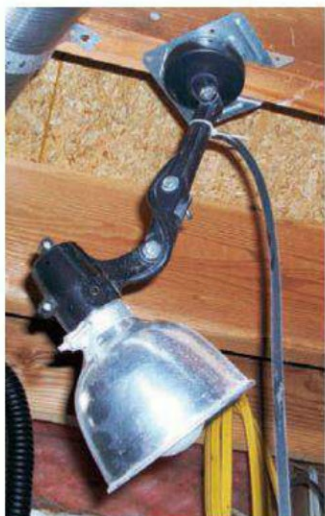
PICK OF THE TRICKS



Adjustable Router Trammel

In your December 2012 issue, page 28, the author made a router trammel from MDF, but it isn't easily adjustable. Here's my version that you can make from a couple lengths of steel rod, a piece of scrap and a nail. It uses the edge guide mounting holes of your router base so you can adjust it to rout any size circle you need, provided the rods are long enough. I cut steel rod from a home center into two matching lengths. With the rods inserted in my router base and tightened down with screws, I located their positions on the trammel's wooden rail — a 3/4"-thick scrap, 1 1/4" wide and about 5" long. The rail should sit flush with the work surface once the rods are installed. I drilled a pair of slightly undersized holes through the rail for the rods and pounded them into place. A third hole run down through the rail holds a nail that serves as a pivot point. This \$5 jig took me less than an hour to make and sure makes circle cutting easy.

Allan Hawley
Wappapello, Missouri



Floor Joist Light Bracket

A trip to the deck hardware section of my local home center provided the base I was looking for to hang a magnetic task light.

I found that a galvanized hurricane tie plate, nailed to the exposed floor joists in my workshop, allows me to mount

the light just about anywhere I need it. It's very handy and ended up costing me only a few dollars.

Thomas Marinelli
Washington, Michigan

Old-school Dowel Chamfers

Chamfering the ends of dowel pegs makes them easier to tap into holes. I used to ease their edges on my disk sander, but I'd often end up sanding my fingertips in the process. Ouch! Then I discovered a painless option: Just stick the dowel into an ordinary pencil sharpener and give it two cranks. Presto — you get a nice, clean chamfer. After all,



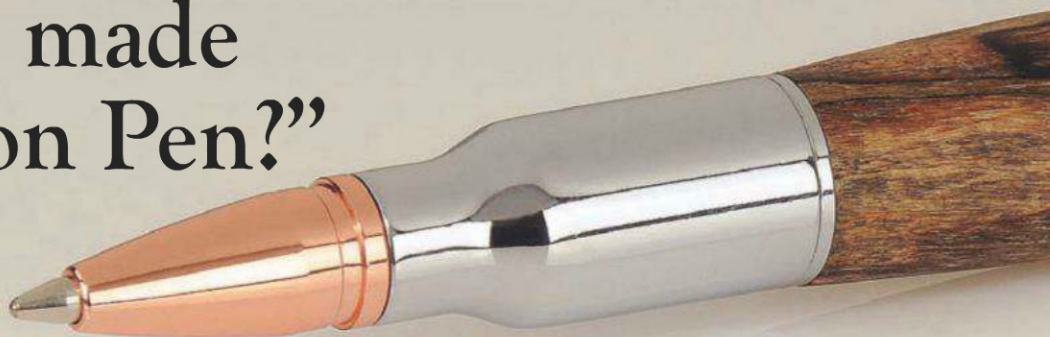
a dowel is really just a pencil without a lead. A typical sharpener will accept any standard-size dowel diameter up to 1/2" by turning the dial.

Jake Wilhelm
Plymouth, Minnesota



In addition to our standard payment (below), Allen Hawley of Wappapello, Missouri, will also 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. To join in the fun, send us your original, unpublished trick. Please include a photo or drawing if necessary. Submit your Tricks to Woodworker's Journal, Dept. T/T, P.O. Box 261, Medina, MN 55340. Or send us an email: tricks@woodworkersjournal.com

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Questions & Answers

Readers Dig Deeper

THIS ISSUE'S EXPERTS

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

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

Joanna Werch Takes is a senior editor at *Woodworker's Journal*.

James Vintzel is global product manager, compressors, for Stanley Black & Decker.

Contact us

by writing to "Q&A,"

Woodworker's Journal,

4365 Willow Drive,

Medina, MN 55340,

by faxing us at (763) 478-8396

or by emailing us at:

QandA@woodworkersjournal.com

Please include your home

address, phone number and

email address (if you have one)

with your question.

Q After reading the very thorough *Tool Review* in the December 2012 issue ["Eight Benchtop Band Saws"], I started shopping for a Skil 3386 in local stores and online. Reading the posted reviews, I found a wide variety of opinions expressed. In fact, some were commenting on model 3385. I turned my attention to other makes/models named in the article and found similar ranges of comments posted.

My questions are:

1. Is there any difference between Skil models 3385 and 3386 or is this just that one retailer gets one and the others get the other model?

2. Does the setup and adjustment required to make the saw work well require the talents and experience of a career woodworker with skills enough to write for a magazine like yours?

3. Are there that many "lemons" out there due to manufacturing and handling issues that only the luck of the draw determines if you get a piece of junk or a tool that does everything you ask of it?

Ralph Watson
Seneca, South Carolina

A I'll answer your three questions in turn:

1. Skil models 3385 and 3386 are completely different saws! They've definitely



The Skil 3386 won our Best Bet award in the December 2012 issue.

Do tool makers make more than one "version" of the same tool? This reader wants to know.

improved this saw (the 3386) with better features and (I think) better construction on some parts of the unit as well.

2. When I did my review, I basically did nothing special to the saws, other than assemble the parts that needed assembly and adjust the parts that require adjustment before use (mostly, setting up the blade guides following the procedures described in the manual). There was just one exception: I ran a small coarse whetstone briefly against the back corners of each of the blades. This is a good thing to do on ANY band saw blade,

as it removes any burr that are present, which helps the blade glide more smoothly through the stock when cutting curves. I learned that trick from band

saw expert Mark Duginske, who wrote a book on tweaks and tune-up tricks to get a saw running its best; I highly recommend Mark's *Band Saw Handbook* to anyone who wants to get top performance. However, for my article, I wanted to see how well the saws did without tweaks to the wheels, table, guides, etc.

3. I believe that in order to get their small band saws to be competitive with other models, manufacturers definitely cut corners and "go cheap" on some parts of these small machines. None of the saws I tested (save the tiny Proxxon saw) was what I would call "high quality." I like the Skil's feature set, its compact size and light weight, and price. If you just want to cut some curved parts or occasionally need to resaw small stock, I think you could be happy with the Skil. If you're looking for a serious piece of machinery, I suggest you up the ante and get a good 14" saw.

— Sandor Nagyszalanczy

Continues on page 16 ...



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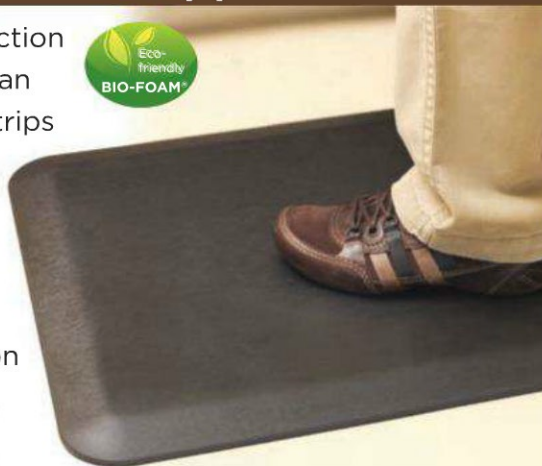
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Questions & Answers continued



If you properly clean and care for your paintbrushes, they will last a long, long time.

Q I have several good Purdy brushes, but now that I need to use them, I find that they are all stiff. I clean all my brushes after each use, but it has been about three years since I used them. I would like to know if there is a way to bring the brushes back to new or near new. I do not want to have to get new brushes, as they are not cheap.

Brian M. Finnegan
Granada Hills, California

A A stiff brush is one that was not cleaned adequately, but it can almost always be saved.

Since many finishes will not re-dissolve with their original thinner, use liquid paint remover, which will soften any finish but won't harm the bristles. Suspend the brush so the bristles are soaking all the way up to the ferrule, but don't rest the brush on its bristle tips or they will deform.

When the finish is liquefied and the bristles are again flexible, immediately scrub the bristles with lacquer thinner. Wear gloves and make sure you remove all of the residue, right up to the ferrule.

Squeeze or shake out the excess solvent and immediately scrub the damp bristles aggressively in lots of warm water and liquid dish soap. Rinse and repeat until the soap foams readily, which means the solvent has been removed and the bristles are clean.

Rinse out all the soap, shake out the excess water, and roll the ferrule and wet bristles in brown bag paper. Feel for the ends of the bristles and fold the rolled paper over about an inch past the ends. Let the brush dry and by morning it should be soft, supple, and reshaped.

— Michael Dresdner

Q Just received my very first *Woodworker's Journal*. Even as a young 69-year-old, I may have made a mistake by taking a subscription at this time. Reading your articles, I find I need to take a Woodworker Language Course 101. Terms such as jigs, mortises (both blank and loose tenon) or Dominos stumped me. Any advice on basic reference on the language I will need to navigate your magazine would be appreciated.

Mike Johnson
Las Vegas, Nevada



Brown bag paper makes a perfect brush storing medium.



Fold the paper tightly around the bristles and then crease the paper above the bristles as shown here.



Finish up by using a rubber band to hold the paper in place.

A As with any specialty (cooking, auto mechanics, surfboarding), woodworking has its own lingo. For a crash course and handy reference on those words and phrases you find difficult to figure out through the context they appear in, you'll find a handy glossary online at woodworking.com. You can find the definitions you're searching for at the URL woodworking.com/ww/Glossary.aspx.

— Joanna Werch Takes

Continues on page 18 ...



Winner!

For simply sending in his question on shopping for tools, Ralph Watson of Seneca, South Carolina, wins an *Osborne Miter Gage* by Excalibur (from General International). Each issue we toss new questions into a hat and draw a winner.

The facts are hard to ignore.

Titebond® III outperforms polyurethane glues.

Glue comparison

What woodworkers need to know!

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Easy Water Cleanup	✓	
Much Safer To Use	✓	
Shorter Clamp Time	✓	
No Foam - Less Mess	✓	
Shorter Open Time	✓	✓
Doesn't Stain Skin	✓	✓
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Bonds Oily / Exotic Woods	✓	
Lower Cost - Better Value	✓	
Longer Usable Shelf Life	✓	

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Stumpers

Unlocking a Mystery

Participants in our game unlock the door to identifying a mystery tool.



Terry Elfers of Cincinnati, Ohio, sent the photo below — his key to the mystery tool.



After **Len Urban** of Rancho Mirage, California, sent in his mystery tool featured in the February *Stumpers*, **Dean Miller** of Kilgore, Texas, knew "it's a specialized portable router with a special bit."

Darrell Slimick

of Hayward, California, recognized it, too, but admitted:

"I must say that I have inside information; I am a locksmith by trade."

What does a locksmith know about a specialized portable router?

Randy Beauchene of Valley Springs, South Dakota, explains: "The Stumper is a lock mortiser. Clamp it to the edge of a door, turn the handle clockwise, and the router will travel back and forth, routing out the edge of a solid core door so a mortise lock can be installed."

"Not clearly visible in the picture you provided, there is an adjustment on the side of the machine opposite the crank where the stroke size can be adjusted for changing the vertical size of the mortise that was cut into the door edge. The number of times you turned the crank controlled the depth of the mortise," said **Steven Miller**

Winner! Jeff Long of Rock Hill, South Carolina, wins a DeWALT DW618PK 2 1/4 HP Router Combo Kit. We toss all the Stumpers letters into a hat to select a winner.



of Coral Gables, Florida. **Mike Sinnott** of Wauconda, Illinois, added, "There are other attachments that set the height from the top of the door and additional templates for trim plates for the door."

"This saved tremendous time over a brace and bit and a chisel," said **Bill Wetherill** of Neptune City, New Jersey. "Once set up, a carpenter could set locks all day without worry."

Fred R. Pace of Tucson, Arizona, said, "before the current types for door knobs were made popular, all of the doors had mortise type locks or 'box locks,' as they were called." Fred also noted that "these tools were made by PORTER-CABLE and Stanley"; others also cited Rockwell as a manufacturer.

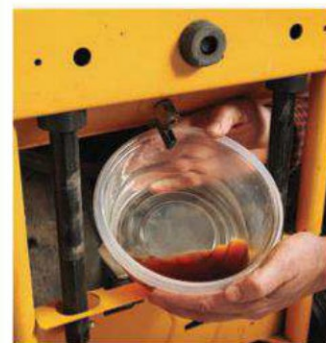
In fact, **Dennis Gallagher** of Towson, Maryland, noted that there is still "a 513 Heavy-Duty Lock Mortiser in the PORTER-CABLE lineup." He ought to know: Dennis's job title is "product manager, wood-working" at parent company Stanley Black & Decker.

—Joanna Werch Takes

Questions & Answers continued

Q As a woodworker who is new to having an air compressor in my shop, I was surprised that in short order, there was a bunch of water in the air tank. So I drained the tanks, and a couple of days later, bango ... the same thing happened. My buddy said, "get used to it — there's nothing to be done." Is he right? Blowing water through my pneumatic tools can't be good for them, right?

Bobby D. Johnson
Beaumont, Texas



Drain the water from your compressor every day that you use it. Don't let it get rusty like this.

A During the operation of the compressor pump, atmospheric air is compressed and condenses moisture into the tank. In general, the higher the temperature and the higher the max psi, the more that condensation will take place. This is a normal part of the compressor operation, which is why the tank has been outfitted with a drain valve (to drain this water from the tank). Compressor manuals and tank warning labels call for tanks to be drained daily. This is for two reasons:

1) To reduce the chance of water passing through the lines into air tools and onto work, as stated in the example. This is not good for either.

2) To reduce the chance of corrosion inside the tank. Regular tank draining can increase the life of the tank.

— James Vintzel



What's This?



Brian Hummel of Frederick, Maryland,

found this in a box with other old tools. The wooden wheel is about 1/8" thin at the edges and 7/16" thick in the middle. Brian has "no idea what this is." Do you?

Send your answer to

stumpers@woodworkersjournal.com

or write to "Stumpers,"

Woodworker's Journal, 4365 Willow

Drive, Medina, MN 55340 for a

chance to win a prize!

Chicago Doctor Invents Affordable Hearing Aid

Outperforms Many Higher Priced Hearing Aids

Reported by J. Page

CHICAGO: A local board-certified Ear, Nose, Throat (ENT) physician, Dr. S. Cherukuri, has just shaken up the hearing aid industry with the invention of a medical-grade, affordable hearing aid. **This revolutionary hearing aid is designed to help millions of people with hearing loss who cannot afford—or do not wish to pay—the much higher cost of traditional hearing aids.**

"Perhaps the best quality-to-price ratio in the hearing aid industry" – Dr. Babu, M.D. Board Certified ENT Physician

Dr. Cherukuri knew that untreated hearing loss could lead to depression, social isolation, anxiety, and symptoms consistent with Alzheimer's dementia. **He could not understand why the cost for hearing aids was so high when the prices on so many consumer electronics like TVs, DVD players, cell phones and digital cameras had fallen.**

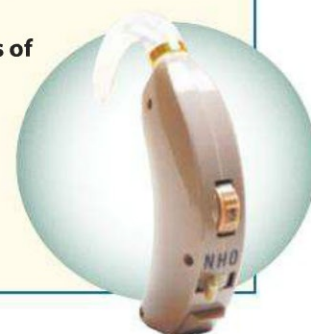
Since Medicare and most private insurance do not cover the costs of hearing aids, which traditionally run between \$2000-\$6000 for a pair, many of the doctor's patients could not afford the expense. Dr. Cherukuri's goal was to find a reasonable solution that would help with the most common types of hearing loss at an affordable price, not unlike the **"one-size-fits-most" reading glasses** available at drug stores.

He evaluated numerous hearing devices and sound amplifiers, including those seen on television. Without fail, almost all of these were found to amplify bass/low frequencies (below 1000 Hz) and not useful in amplifying the frequencies related to the human voice.

Inspiration from a surprising source

The doctor's inspiration to defeat the powers-that-be that kept inexpensive hearing aids out of the hands of the public actually came from a new cell

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phone he had just purchased. "I felt that if someone could devise an affordable device like an iPhone® for about \$200 that could do all sorts of things, I could create a hearing aid at a similar price."

Affordable Hearing Aid With Superb Performance

The high cost of hearing aids is a result of layers of middlemen and expensive unnecessary features. Dr. Cherukuri concluded that it would be possible to develop a medical grade hearing aid without sacrificing the quality of components. The result is the MDHearingAid PRO®, starting well under \$200. **It has been declared to be the best low-cost hearing aid that amplifies the range of sounds associated with the human voice without overly amplifying background noise.**

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The MDHearingAid PRO® has been rigorously tested by leading ENT physicians and audiologists who have unanimously agreed that the **sound quality and output in many cases exceeds more expensive hearing aids.**

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*"I have been wearing hearing aids for over 25 years and these are the best behind-the-ear aids I have tried. **Their sound quality rivals that of my \$3,000 custom pair of Phonak Xtra digital ITE**" —Gerald Levy*

*"I have a \$2,000 Resound Live hearing aid in my left ear and the MDHearingAid PRO® in the right ear. **I am not able to notice a significant difference in sound quality between the two hearing aids.**" — Dr. May, ENT Physician*

*"We ordered two hearing aids for my mother on Sunday, and the following Wednesday they were in our mailbox! Unbelievable! Now for the best part—they work so great, my mother says she hasn't heard so good for many years, even with her \$2,000 digital! **It was so great to see the joy on her face.**" —Al Peterson*

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Shop Talk

What to Do with the Tools? One Solution...



Jim Neuman and friend Tom Hurst made lemonade out of lemons when they needed to downsize their shops: they created a shop at the Sarett Nature Center (www.sarret.com) in Benton Harbor, Michigan.



Downsizing Woodworker *Creates a Lasting Legacy*

Over the past few months, readers have had a discussion going in our *Letters* department about what to do with a shop full of tools when a woodworker's time of using them is past. Jim Neuman of St. Joseph, Michigan, donated his in a way that's truly nurturing a new generation of woodworkers.

"About a year ago, at age 65, I decided not to build a new shop on the property where we were building our new house," Jim said. "I felt that at that age I would not likely get the value from such an expensive undertaking."

That disappointed the Sarett Nature Center in Benton Harbor: over the years, Jim had built cabinets, displays and even animal cages for them.

So, the nature center found an available 24'x36' building with a stud wall interior. Jim and some helpers wired, insulated and paneled it — and then Jim and his friend Tom Hurst, who was also in the process of downsizing, donated their tools.

The nature center's new shop ended up with a Powermatic 66 table saw, 18" band saw,



Small puzzles, pens and games are among the projects kids have made in the nature center's shop.



16" lathe, jointer, drill press, spindle sander, 6" belt/disc sander and router table. Plus, there were numerous smaller power tools like a cordless drill/driver, three routers, two handheld drills, a circular saw, biscuit joiner, belt sander, random orbit sander and a Kreg® pocket-hole joinery system, as well as setup and hand tools "too numerous to list."

"Mine was a pretty well-equipped, fully working woodshop, and it now is so as



Brad Pitt Designs Furniture?

Yes, and Frank Pollaro Builds It

You'd expect a Hollywood big shot to commission some fancy furniture, and in 2008, that's just what Brad Pitt did. When the builder, Frank Pollaro, was installing the custom desk — at Brad's chateau in France — in 2008, he happened to notice a design sketchbook on a nearby table filled with 10 years' worth of furniture sketches.

Frank encouraged Brad to enter a partnership with him to make those sketches into

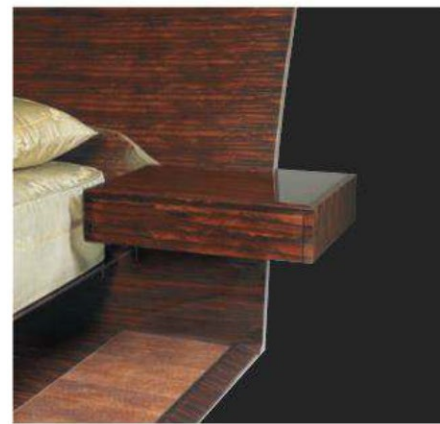


Double Helix Side Table

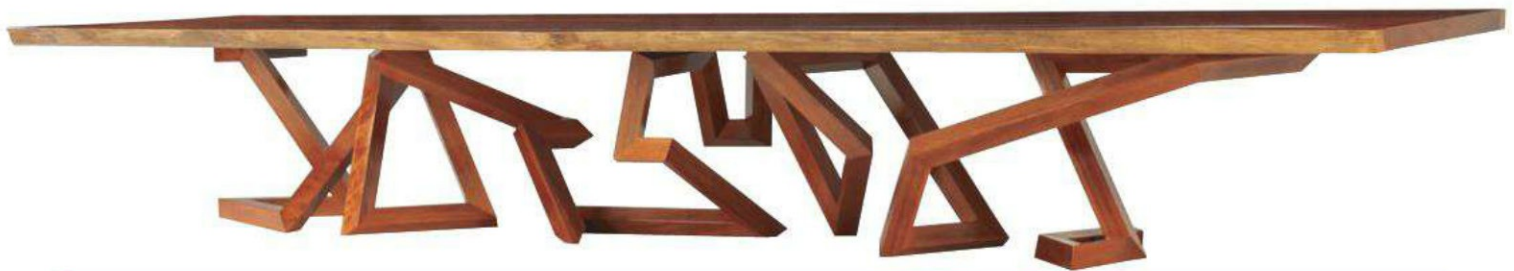
real furniture pieces. Brad made wire or clay models for the pieces, the design department at Pollaro Custom

Furniture, Inc. in New Jersey turned them into design drawings, and Brad and Frank reviewed and revised those to turn them into shop drawings. Brad visited Frank's shop frequently, both to participate in the design process and to select materials — like the farm-raised stingray skins used in the mattress coverings on a bed, or the Bastogne walnut used in a wall slab.

After several years of collaboration, they launched the Pitt-Pollaro collection,



This version of the PP-2 Bed is made from ziricote, with details like bedside tables in nickel. The "Long Run Table," below, has a single-piece slab top.



Sarett's woodshop," Jim said. In addition, he and Tom both donated a significant amount of lumber of various species. "My guess is that there is at least 500 board feet and the equivalent of 20 sheets of various plywoods," Jim said.

And then, the best part of this story? "While this idea started as just a woodshop from which to build necessary items for the nature center, it has evolved into a teaching facility," Jim said. He and Tom have taught classes both for homeschooling groups and

for nature center members, on topics such as birdhouses and feeders, a table, a toolbox, and lots of pen turnings.

"The tables are probably the closest thing to real full woodworking," Jim said. "Tom and I cut all of the major parts for the projects, but we have a pretty safe table saw sled that we let the kids use with our supervision to make simple crosscuts. Kids crosscut the aprons on the table saw, cut the corners off the tabletops on the sled, round over the edges of the four legs and the



aprons and the tops at the router table, drill the aprons for Kreg screw attachment to the legs and top, and sand all of the parts."

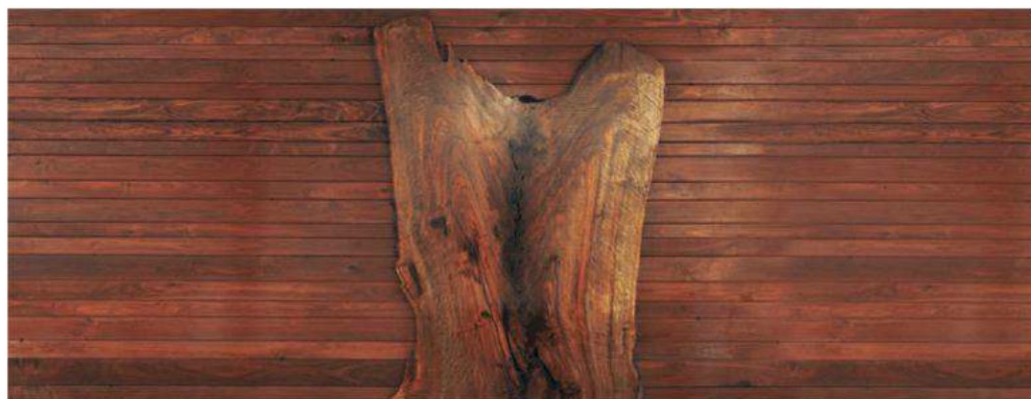
This arrangement, Jim said, allows him to continue

woodworking, and "I know that after I am done, my equipment will continue to provide a benefit to the community. Everybody wins."

— Joanna Werch Takes

Brad Pitt and Frank Pollaro

have pieces in their furniture line using materials like Macassar ebony, Ceylon satinwood, olive ash burl, stainless steel, glass — and marble, in the “Toi et Moi Bath Tub,” below.



The Bastogne Walnut Wall Slab, above, is 96" high, 252" wide and 5" deep — but it's customizable.



currently consisting of a bed, two dining tables, three cocktail tables, two club chairs, an integrated shelf unit, a stone bathtub and a decorative wall installation. The bed alone took more than 2,600 hours to design and build, according to Frank Pollaro, who said, “The design development process for the Pitt-Pollaro collection was exhaustive, and Brad insisted on being intimately involved in every step in the

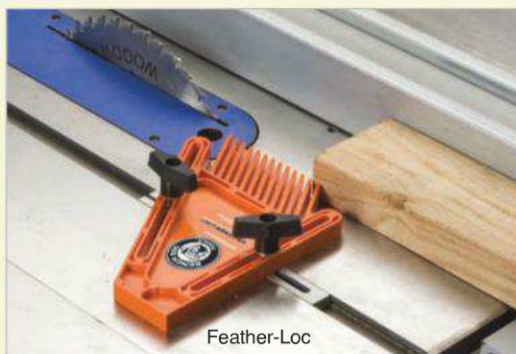
process. Each piece took at least six months to create.” Each limited edition piece is signed by Brad and Frank. They are planning to add new pieces to the collection in the future, and will customize them in terms of materials, finish and accessory details in accordance with a client's taste.

For further information, visit www.pitt-pollaro.com or call 908-206-1888.

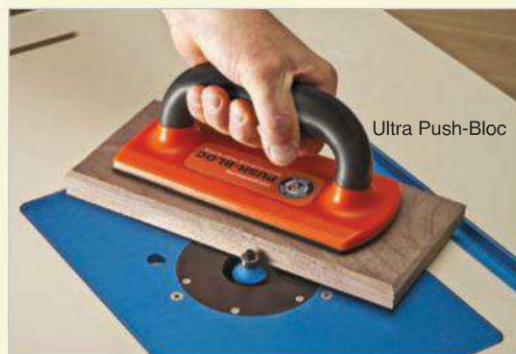


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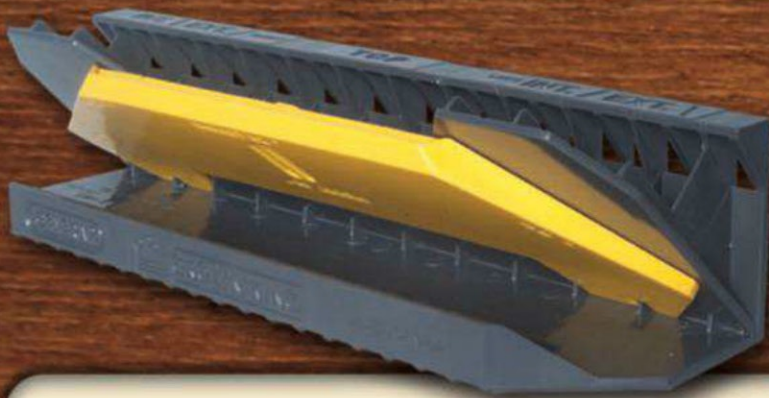
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General Tools & Instruments

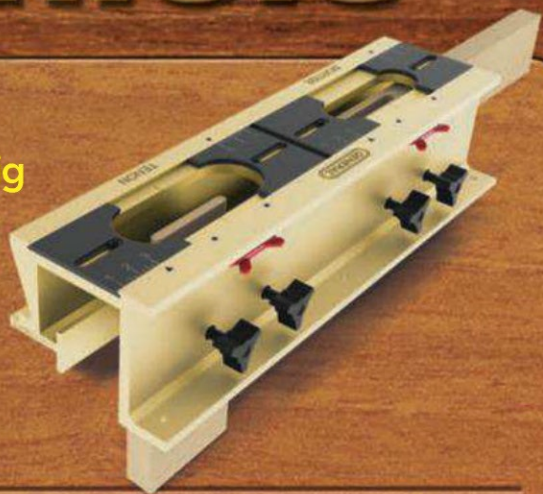
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Woodturning

Bench Grinders: Covering the Basics

By Ernie Conover

Sharpening your cutting tools is critically important for woodturners. Jigs and accessories for your grinder can help with that task, but the objective of this article is not to focus on sharpening per se, but on getting your grinder ready for sharpening — quickly, and above all, safely.



MORE ON THE WEB

For a video of the author making properly sized bushing for his grinding wheels, visit woodworkersjournal.com and click on the "More on the Web" tab shown above.

A bench grinder is, in essence, a double-ended motor with a grinding wheel mounted on each of the protruding shafts. As well, the motor has a base and guards surrounding the grinding wheels and eye shields to protect you from sparks and debris. Top-end grinders even have a variety of upgrades to this basic package. You can pay anywhere from well south of a hundred bucks to several thousand dollars for a bench grinder. Obviously, you get something for your money, so let's take a look at features.

Wheel Size

Size: Grinders are sold in 6", 7", 8" and 10" sizing, which refers to the diameter of the grinding wheels the machine accepts. Unless you're on a limited budget, avoid the 6" and 7" machines. They generally lack enough power to grind tools quickly. My preference is for 10" grinders, but they tend to be industrial machines costing between \$450 and several thousand dollars.

The 8" size offers the best balance of value and utility for the home shop enthusiast. Before we get into the 8" size,

we need to talk a little about motor speed. Induction motors run at two basic speeds: 1,725 rpm for low-speed motors and 3,450 rpm for the high-speed variety. Traditionally, 6", 7" and 8" grinders have been built on 3,450 rpm motor frames and 10" on 1,725 rpm frames. The chart at right shows the surface speeds for the size wheels and the motor rpm. Recently, 8" grinders have been showing up with 1,725 rpm motors. They're slower than the 10" grinders and actually below the optimum speed for dry grinding of tool steels. Don't let this bother

you for even a moment, for the low speed allows much more control of the sharpening process. For the home shop guy, getting the job done safely and correctly far outweighs time constraints.

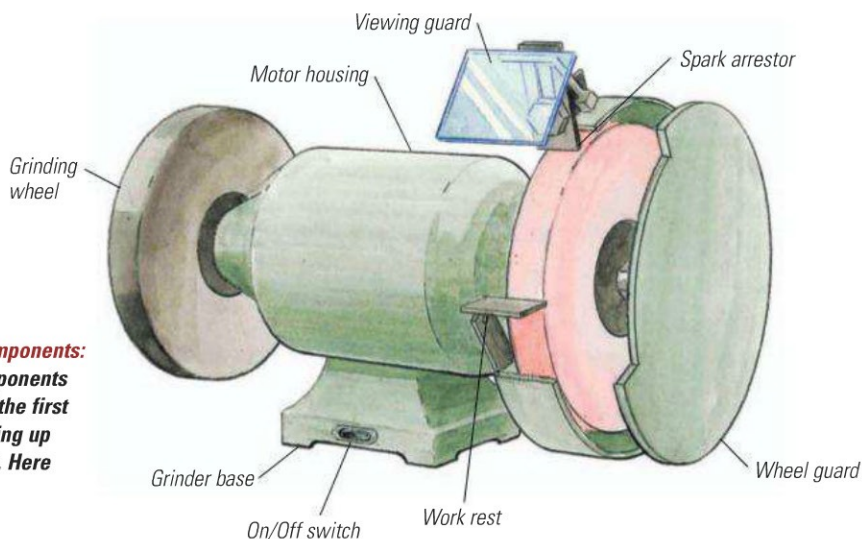
Grinding Rests: All grinders come with adjustable tool-rests, but most are not much good for woodturners as they are designed for machinists to sharpen machine tool cutters. Fortunately, there are good aftermarket rests designed for woodturners. Therefore, the stock rests are of no concern in your buying decision because you should replace them. Any rest should be adjusted to within 1/8" of the wheel before you grind.

Safety Shields: All grinders come with safety shields, but the protection they afford varies greatly with price. In my opinion, the plastic shields on economy grinders offer very little eye protection. My 10" Baldor is an industrial machine with heavy shields that consist of a sheet of polycarbonate between two sheets of safety glass, all held in a sturdy metal frame.

Even with all of this protection, I would not dream of not wearing safety glasses when grinding. While standard eyeglasses afford some degree of protection, they are not safety glasses. Wearing a face shield over your prescription glasses is a necessity.

If you think the dust coming off your lathe is bad for your lungs, the particles coming off

Basic Grinder Components:
Knowing the components of your grinder is the first step towards setting up your tool properly. Here are the basics.



your grinder are far worse. You should wear a respirator or have a vacuum system that completely sucks up the particles any time you grind. The best of all worlds is both.

Setting Up Your Grinder

The first matter of business in setting up a grinder is location. As the name implies, a bench is a good place. It is best practice to secure your grinder to the bench with a clamp or other means. This is a necessity if you are going to use sharpening jigs. A pedestal base for your grinder can be a good investment as it frees up bench space and allows you to position the grinder in the most convenient location for the work at hand. You may have to interpose a piece of wood under the base of the grinder to elevate it above the bench (or plywood on a pedestal) to allow jigs to mount under the guards. I have done this with my Rockwell Delta grinder shown on the following page.

Grinder Height: I have visited a number of private and club shops lately where the grinding machine is mounted at chest height, which puts the wheels at face level. The theory is that one has better visual acuity at this altitude. I think the practice is unwise. I have witnessed a couple of exploding grinding

wheels in my days. Leave your grinder at bench height.

Wheel Inspection: Once you have your new or used grinder located and affixed to the bench or pedestal, you should remove the guards and dismount the wheels to visually inspect and ring test them. Visual inspection is straightforward: examine for cracks and defects. Also check that the maximum speed rating of the wheel exceeds that of the grinder. Ring testing entails balancing the wheel on one finger inserted into the center hole and tapping it lightly with a metallic object. I use a big scraper. A serviceable wheel will yield a clarion ring while those with a defect have a dead tone reminiscent of a cracked baseball bat or a cracked wine goblet. You will recognize a bad wheel when you hear one. Once they are tested, remount them on the grinder, making sure to snug



Your grinding wheel needs both sight and sound inspection: a solid wheel should ring if you tap it with a gouge.



Rests should be no more than 1/8" from the grinding wheel. Rest adjustment is made with the grinder stopped.

Grinder Wheel Speed Chart

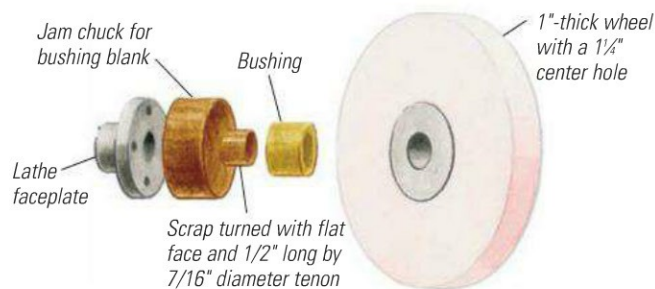
Wheel Diameter	Motor Speed	Surface Feet/Minute
6"	3,450 rpm	5,420
7"	3,450 rpm	6,320
8"	3,450 rpm	7,225
8"	1,725 rpm	3,615
10"	1,725 rpm	4,520



The author's grinder (above) has a shop-made base that lifts the grinder off of the table. He clamps the base to the bench when grinding. The additional handles are used when moving the hefty tool to where it is needed around the shop.

the arbor nuts, but not tighten them so much the wheel could be damaged. As a final precaution, I step to one side of the grinder and power it up. I then go have a cup of coffee while the wheel spins for five or 10 minutes. Defective wheel explosions usually happen at, or shortly after, startup.

Arbor Bushings: Which brings me to the next bit of troubled water, arbor bushings. Grinding wheels are cast around a central hub. To match the opening in a grinding wheel to the arbor shaft, manufacturers provide



Shop-made Wheel Bushing: Many plastic bushings provided with grinder wheels are poorly sized. Woodturners can make their own bushings from hardwood on a lathe.

plastic bushings. Bushings vary greatly from maker to maker, but suffice it to say many are poorly made. I overcome this problem by turning my own from wood as per the illustration above.

Spark Arrestor and Work Rests: The spark arrestor is at the top opening of the guards just under the viewing shields. It should be adjusted to about 1/8" from the wheel and readjusted anytime the gap reaches 1/4". Any work rest should be adjusted to within 1/8" of the wheel.

Grinding Wheels: The final weak link in grinders is the wheels themselves. Many grinders come with questionable grinding wheels. If you are buying a grinder in the \$100 range do not expect quality wheels. A good upgrade is a new set of premium quality wheels, but a shocker will be that they can cost 60% of the price of the grinder, about \$32 per wheel in 8" sizing. Always make sure you buy a wheel exceeding the speed rating of your grinder.

Grit and Structure: Do not make the mistake of thinking fine-grit wheels will give you sharper tools; they are more likely to burn your tools. I use a 46-grit wheel on the left side of my grinder and an 80 on the right. They grind fast, efficiently and, above all, coolly. A wheel structure of 5 gives enough open space between particles to grind

cool. For the abrasive, you want an aluminum oxide or an aluminum zirconium wheel.

Friability: Another grinding wheel purchasing decision is friability, which is related to the amount and type of bonding agent used in the wheel. Friable means "to crumble." Abrasive particles dull and, as they do, they dislodge from the grinding wheel. I prefer an "I" wheel for grinding carbon steel and a "K" wheel for high-speed steel (HSS). Since all my turning tools are HSS, I use the latter wheels for them.

Dressing: Because wheels are cast, they are never perfectly round when first mounted. Not only will this cause the grinder to jump around, it will prevent good grinding because it is eccentrically shaped. The first order of business is to adjust the grinding table to within 1/8" of the wheel, and employ a dresser to bring the wheel perfectly round. Simply set the dresser on the rest and run it across the wheel. This task should be repeated as the wheel wears or dulls.

I know this has been a lot of information, but I think it's very important for woodturners to know. Next time out: sharpening jigs and buffers.

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

What are you buying?

Grinders that cost \$100 to \$150

Basic grinder with minimal shielding and great variation between individual machines. Horsepower anemic. Base will provide little elevation above table. Vibration prone. Wheels will work but will have to be replaced (about \$65) to grind well.

Grinders that cost \$151 to \$300

Heavier castings. Base elevates grinder sufficiently to mount most jigs under wheels. Better shielding, less vibration prone. Quality of wheels must be determined.

Grinders that cost \$301 to \$500

Vibration-free commercial machine. Heavy construction, excellent guarding. Decent shields. Lighting likely. Wheels sufficient.

Grinders that cost \$501 to \$2,000

True heavy cast-iron industrial machine with stout arbors, lights, glass/plastic sandwich viewing shields. Good stock rests, heavy guarding. May have facility to attach specialized spark arresting vacuum systems. May have cast-iron quench bowl.



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FEATURES:

- Deluxe extruded aluminum fence
- 4" dust port
- Deluxe heavy-duty stand
- Includes one 3/8" blade, fence, and miter gauge
- Rack-and-pinion guide post adjustment for upper blade guides
- Cast iron wheels

SPECIFICATIONS:

- Motor: 1 HP, TEFC, 110V/220V, single-phase (prewired 110V)
- Amps: 11 at 110V, 5.5 at 220V
- Cutting capacity/throat: 13 1/2"
- Max. cutting height: 6"
- Footprint: 23 1/2" x 16 1/2"
- Table height above floor: 43"
- Table tilt: 45° right, 10° left
- Frame construction: cast iron
- 2 blade speeds: 1800 & 3100 FPM
- Blade size: 93 1/2" long
- Precision-ground cast iron table
- Blade width range: 1/8" - 3/4" wide
- Table size: 14" x 14"
- Sturdy T-shape fence design
- Overall size: 67 1/2" H x 27" W x 30" D
- Approx. shipping weight: 247 lbs.



FEATURES:

- Deluxe extruded aluminum fence
- Includes miter gauge
- Two 4" dust ports
- Quick-change blade release/tensioner
- Blade tension indicator
- Micro-adjusting geared table
- Blade height scale measurement
- Blade tracking window
- Includes 1/2" blade

SPECIFICATIONS:

- Motor: 2 HP, 110V/220V, single-phase, TEFC capacitor start induction, 1725 RPM, 60 Hz, prewired 220V
- Amps: 20A at 110V, 10A at 220V
- Power transfer: Belt drive
- Precision-ground cast iron table
- Table size: 17" x 17" x 1 1/2" thick
- Table tilt: 10° left, 45° right
- Floor to table height: 37 1/2"
- Max. cutting height: 12 1/8"
- Blade size: 131 1/2" long
- Blade width range: 1/8" - 1" wide
- 2 blade speeds: 1700 and 3500 FPM
- Wheels: computer-balanced cast aluminum with polyurethane tires
- Wheel covers: pre-formed steel
- Blade guides: Euro-style roller disc with full enclosure protection
- Bearings: sealed and permanently lubricated
- Overall size: 73" H x 32" W x 32" D
- Approx. shipping weight: 342 lbs.



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LUMBER

from Your Local Sawmill

Woodworker's Journal Staff



One of the great things about our craft is that, unlike money, lumber really does grow on trees. Or more precisely, lumber is made from trees. And as trees grow all across the United States (OK, not everywhere — sorry, Texas Panhandle), there are also people turning those trees into lumber from Alaska to Florida and most places in between.

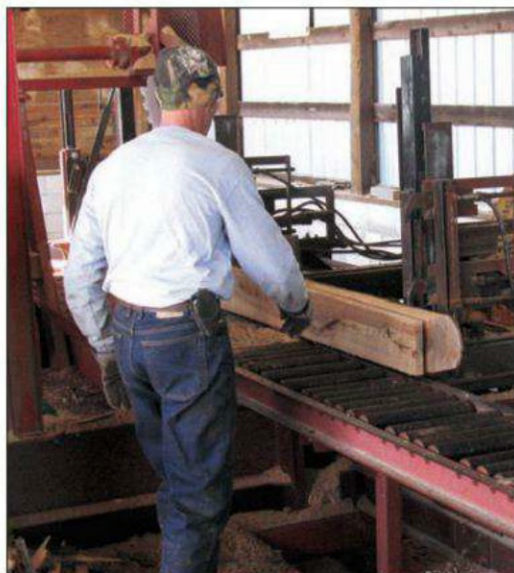
Some of those lumber operations are huge Weyerhaeuser type companies — but many are small mom-and-pop mills slicing up local lumber and selling it to all comers. Last March, the *Journal* visited a couple of one-man operations near our Minnesota headquarters and got some insight into their world.

Ted Solberg and Steve Timm have sawmills about 30 miles apart, both in the shadow of Minneapolis, Minnesota. Both are family businesses — Ted, now in his mid 70s, started sawing wood back in 1974. Steve Timm's dad, Russ, began reclaiming lumber in the 1970s and started up his own mill in 1981. Steve took over in the 1990s. Curiously, both of them made their own mill from scratch, although the novice would never know that by looking at them. And the product they produce is top-notch.

The direction of their businesses is slightly different. Steve Timm has a focus on post and beam construction in addition to the regular task of making boards from logs. He also does custom sawing of brackets and corbels, mostly sold to home construction contractors. Post and beam construction requires mortise-and-tenon joinery, so Russ Timm built his own mortising machine (photo, opposite page) and cleverly used corded electric drills as his stepper motors.

In an industry that includes giant multinationals, there are still hundreds of small sawmill operators around the country. Find one close to you, and you'll discover a great source of unique lumber and a place that's a joy to visit!

Ted Solberg (above, at far left) starts a cut on a red oak log on his sawmill. The \$5,000 saw blade makes short work of the cut. At right, his son is ready to grab the board and stack it on a cart. His grandson (next photo to right) runs the cutoff saw and sends the leftovers to the scrap pile. On the next page is the solar kiln Ted built to dry his lumber.



Ted Solberg checks out a pile of hardwood lumber.

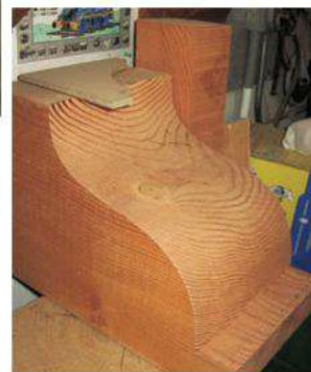


Ted, on the other hand, decided to add lumber drying to his process and built a large solar kiln. It dries wood efficiently by heating the air between an envelope of plastic sheets. When the air gets hotter, it also loses moisture, helping to dry the wood even faster. Both Ted and Steve will do custom sawing if a person has some logs that they want cut into lumber. The price is so-much a board foot, plus a fee for any saw teeth that may be broken in the process. And they have found some weird things in the saw logs over the years — anything from bullets to nails, glass insulators to horseshoes. Once Ted sliced a 6-foot-long piece of pipe in half the long way ... because it had been enveloped into a tree somehow.

Like almost all small lumbermill owners, they are happy to sell their stock to individual woodworkers. The only challenge they run into when selling to John Q. Public is that sometimes we don't understand that these folks are making a living from their efforts. Bargain hunters that are looking to see if there is any "scrap wood" lying around will be disappointed. Both of these operations sell every piece of wood they mill ... right down to the sawdust, which is used as horse bedding. Another challenge that comes up from time to time is the guy who wants one piece of wood — but it's the chunk that is sitting at the bottom of a stack of a few hundred pieces of lumber.

With that said, neither mill is locked into selling wood as a commodity, so they sell thicknesses and cuts of wood that commercial mills would not find profitable — which makes their product especially interesting to the woodworking community.

So look around for a local sawmill in your neck of the woods. They will likely have stock that will strike your fancy, and the field trip to the mill is worth the effort. And on top of that, you will likely find their prices to be more than competitive.



Steve Timm stands at an Italian band saw (above), useful for cutting architectural components like the large corbel at left. The saw moves on an articulated arm as the wood remains stationary. Timm's shop-made mortising machine (below) is used to assist in post and beam construction.

www.woodworkersjournal.com
MORE ON THE WEB

For a video that shows one of these sawmills in action, click on the "More on the Web" tab shown above.



A rustic wooden slab top sofa table is the central focus, positioned in front of a black leather sofa. The table is made of thick, light-colored wood with a natural, wavy edge on the top. It has a simple, sturdy design with thick legs and a lower shelf. On top of the table, there is a small framed portrait, a candle, and a small round object. The background shows a fireplace with a fire burning, and a patterned rug is on the floor.

Slab Top Sofa Table

By Rob Johnstone

This rustic sofa table uses wood sourced from a local sawmill. At just over 3" thick, this lumber provided our editor with a workout and a hefty piece of furniture at the end of the process.

Working with thick waney stock was a treat that I had never done before. So, when the opportunity came to build this table, I jumped at it. At first I thought that the toughest task would be finding the 3"-plus thick wood to work with — but it turned out to be surprisingly easy. I simply called a local sawmill, a farmer in my area who also saws and dries wood, and asked what he had on hand. He told me

that he had some really great ash lumber in the stack ... and he was right. After a quick trip to his place I was ready to kick this project into gear.

Preparing the Stock

I selected the best looking section of the lumber to be the tabletop, and cut it roughly to length. Because this table has waney edges and is designed to be built with extra-thick stock, the width and

thickness of your top may vary a bit from the dimensions found in the *Material List* on page 34. I decided that if I left the bark on the edges of the tabletop, my dusting time would increase significantly, so instead, I chose to remove most of the bark, leaving behind the underbark. That remnant provided a color change on the edges that helped to define the top. Using a drawknife, I was able to slice the bark away in very short order. When that was

done, I moved on to flattening and smoothing the top and bottom faces of the tabletop. As you might expect, the ash lumber was sold to me in a rough state, right off the saw. At 17" wide, the width of the piece exceeded the capabilities of my planer and jointer. This left me in a bit of a pickle, but after a moment's thought, I picked up my 07 hand plane and got busy flattening the tabletop. I planed at a diagonal to the grain, and found this method to be quite effective at getting a flat smooth surface, and it did not take an exceptionally long time. The surfaces were not mirror smooth (hey, I'm not Ian Kirby), but they were ready for sanding when I got done planing.

With the tabletop set off to the side, I moved on to the legs. These pieces were narrow enough that I could rip them roughly to width and put them across my jointer, then through the planer, to get them ready to be cut to exact size. I used a template to mark out the legs. They have a taper in them which gives the table a sense of style. I thought of the look as "Eastern" as in Japan or China; my staff identified it as "Western" as in Montana or Wyoming ... such it is with beauty and the beholder.

Despite the fact that the legs are less massive than the top, they are indeed some big chunks of wood, so I joined them to the table using loose tenons. And because I own a Domino XL, that is the system that I used for this project. With that said, you could use any loose tenon method to attach the legs to the top — or you could use a more traditional mortise-and-tenon technique. Chop mortises into the underside of the tabletop, and raise tenons on the tops of the legs. You'd just need to add the length of the tenons to the overall length of the legs in that case.

One challenge came to the fore as I was making the legs. There were several large knots that I could not avoid and they had material in them that I needed to remove. (The knot fibers were loose and the void looked bad.) To address the knotholes, I decided to fill them with Bondo®, colored to match other solid knots in the wood. I used universal colorant to mix the exact shade that I



The first step in making this table was to take the bark off the waney edges with a drawknife, as shown above.



Then, the author chose to flatten and smooth the top and bottom faces with an 07 hand plane, as shown at left. The wood was rough-cut lumber right off the saw.



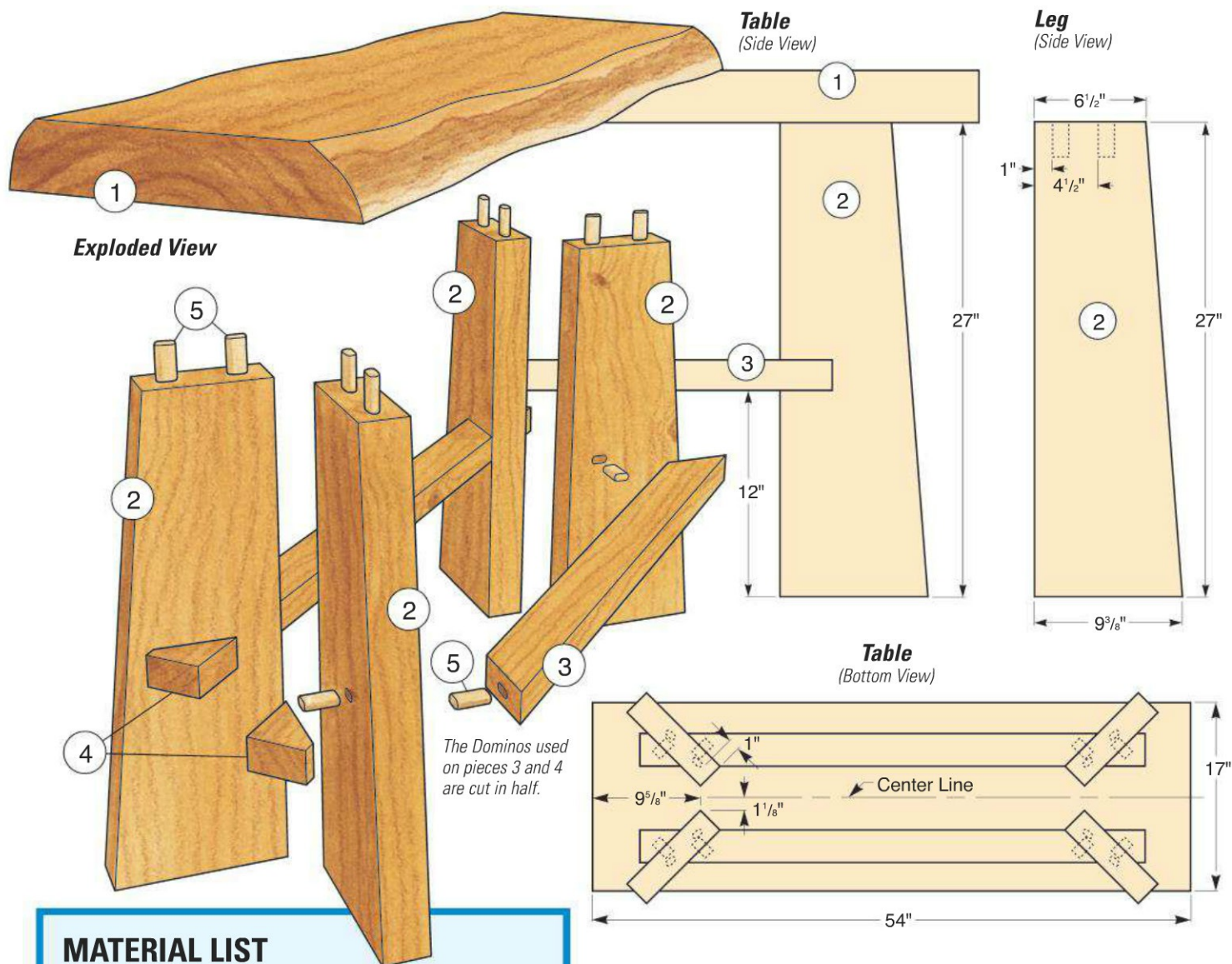
To get identical leg sizes and shapes (above, left), the author used a template to mark them out.



Some knotholes were unavoidable, so Bondo dyed with universal colorant (above, right) was used to fill the voids.

The author chose Festool's new Domino XL loose tenon system (right) to create his mortises.





MATERIAL LIST

	T x W x L
1 Top (1)*	3" x 17" x 54"
2 Legs (4)	2 1/2" x 9 3/8" x 27"
3 Stretchers (2)	1 3/4" x 3" x 37 1/2"
4 Faux Stretcher Ends (4)	1 3/4" x 3" x 3 3/4"
5 Dominoes (12)	14 x 100mm

*The width and thickness of the top may vary a bit due to the material that you will find available to you.

needed. One important point — if you look at the photo on the previous page, you can clearly see that I applied some shellac around the holes that were to be filled. That shellac sealed the grain so that I did not get an unwanted halo of black Bondo squeezed into the open-grained ash. After I applied the Bondo, it cured quickly and I sanded it smooth in just a short while. Sanding also removed the shellac. With that done, I was able to lay out the mortise locations on the ends of the legs and then cut them as shown in the lower photo, previous page. Then I moved on to doing layout on the bottom face of the tabletop.

top's edges were not straight and I couldn't accurately measure from them. I used a simple shop-made layout tool for the next steps. It is just a rectangular piece of 1/2" MDF that has an accurately formed 45-degree cut on it. As shown in the photo sequence on the top of the following page, align the mitered edge of the jig to the center line and strike lines for the outside edge of the legs. (See the *Drawings* above for details.) Then measure the offset from the center line and use the jig to mark parallel lines to the centerline. The intersection of those lines locates the exact corner of the leg. Trace around the leg, take off the mortise locations, and you

Locating the Legs

To accurately locate the legs on the underside of the tabletop, I first struck a line down the center of the table. I worked from a center line because the table-

can chop the mortises into the bottom of the table.

At this point, you may have noticed an intentional quirk to the design of this table — that, while the table legs are connected to each other on each side of the table, they are not joined one side to the other, except by the tabletop itself. This is because the tabletop is so thick, it is more than strong enough to resist the forces that may have cupped a top of less hefty dimensions. (And seasonal expansion and contraction will not be hindered.)

With the legs and tabletop prepared, put the tabletop upside down on a work surface and test-fit the legs to the top. If you are satisfied with the leg joints, it's time to move on to making the stretchers.

The stretchers fit between the legs and are joined to them with loose tenons to the inner faces of the legs. (See the *Drawings* for details.) Located on the outer face of the legs are faux tenon ends. They are attached so that it looks as if



After striking a center line down the length of the tabletop, the author made a layout jig with a 45° angle formed on one end. Using the center line, he located the positions for the table legs as shown in the photo sequence above. After tracing around the legs and taking off the mortise locations, our editor cut the mortises for the Domino loose tenons. Any loose tenon system (or even a traditional mortise-and-tenon) would work for these legs.

the stretchers pierce the legs. (Again, see the *Drawings*.) As a way to further this illusion, cut the material for the stretchers long enough so that you can cut the faux tenon ends off of either end of the prepared stock. That way the grain pattern and colors will look as if they flow right through the legs.

Once again, joining the stretchers to the legs was a task that I used the Domino to do — but if you are not using that system, a pair of dowels on the joining faces of the pieces would work just fine. After you have machined the joinery on the stretchers, dry-fit and clamp everything together. I used a band clamp around the stretchers and faux tenon ends, but I did not clamp the legs down to the tabletop. Their weight and gravity were sufficient to form a solid glue joint.

When everything fits just right, take the pieces apart and get ready for your favorite woodworking task — sanding. But before you sand, you may need to pull one more trick out of your sleeve.

If you, like me, used wood that is a bit thicker than 3" for your tabletop, chances are that you did not have a circular saw blade that was thick enough to cut through the top in one pass. So you cut off the ends in two passes, and likely the cuts were not perfectly aligned. If that is the case, grab a router and chuck a flush-trimming bit into the machine. Then use the bit to trim a flush end to your tabletop. With that done, there is no putting off the sanding any longer. When you have worked up through the grits (I stopped at 180-grit), it's time for assembly.

The sheer weight of the legs was a sufficient "clamping force" to form a solid glue joint between the legs and the tabletop. Here, the author tightens a band clamp, pulling the faux stretcher ends, stretchers and legs together firmly. A shop helper sure would have been useful during the glue-up process.

Assembly and Finishing

Because I had taken the time to dry-fit the pieces earlier, there were no surprises during the glue-up. I will say this, however: if I was going to make another of these tables, I would have a friend with me in the shop for the glue-up process. (Did I mention, this table is heavy? Really heavy!) An extra set of hands would have made this task much smoother and easier. The ends of the legs and the stretcher are end grain that is being glued to face grain. Be sure to apply enough glue to those end-grain areas to achieve good results. (A little glue squeeze-out here is not a bad thing — it will not easily be seen and you'll know that you have enough glue coverage.)

After the glue had cured, I used a chisel to remove the glue squeeze-out. A bit more hand sanding preceded a shellac finish. I mixed amber shellac and clear shellac mixed half and half right out of the cans. I applied it with a soft brush, denibbing between coats.

And that's it. All you need to do when you're done is find a couple of really strong teenagers to help you put the table exactly where you want it!

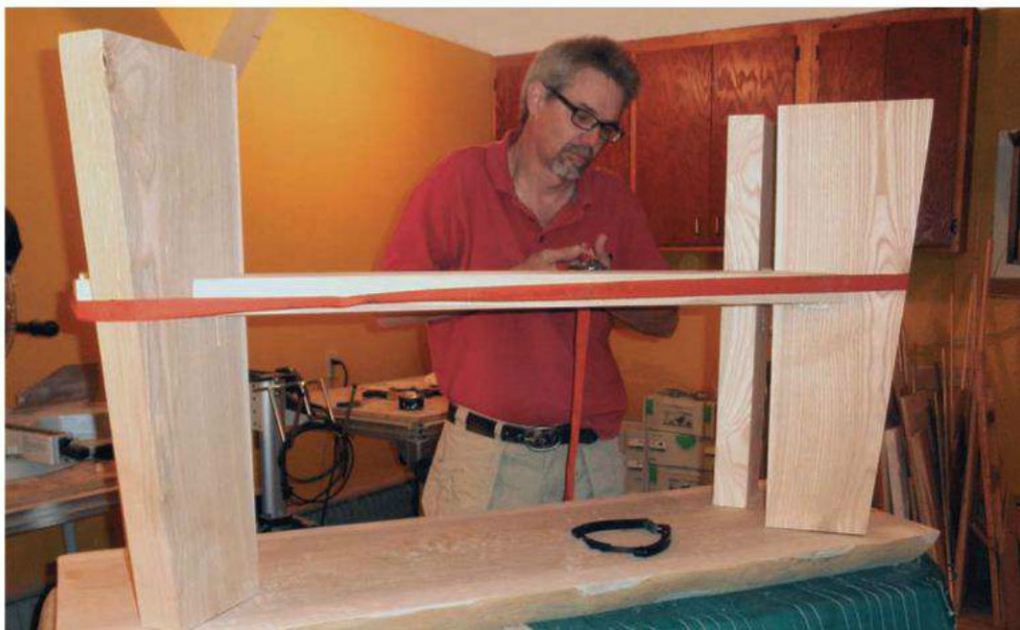
Rob Johnstone is the editor in chief of the Woodworker's Journal.



The faux stretcher ends are cut off the stretchers as they are fitted between the legs of the table. Keep the ends with their stretchers.



Before the final glue-up, it is always a prudent step to dry-fit and clamp the project together. Glue-up is hard to reverse!



A Super Fast, Ridiculously Inexpensive

Simple Dresser

By Bruce Kieffer

All you need is about a hundred dollars and a bit of time. A half day later, you're done!



Sometimes building furniture is not about making a museum quality piece, but rather it's about pure function and saving time and money. My wife and I needed a dresser to tide us over until I could build our "real" dresser, so off to the furniture store we went, only to find very expensive junk — basically made of cardboard — and nothing for less than \$200.

I'm thinking, no way am I putting money into anything like that when I can build one for half the price that will function 100 times better. Hence the piece you see here. It really fits the bill ... and when I complete our official dresser, it will find a new life somewhere else in our home!

The construction is simple: just cut, rout, biscuit, drill, and assemble. I used 3/4" melamine with a maple coating for the carcass, 1/2" fiberboard for the drawers and 1/4" melamine for the back and drawer bottoms — a half sheet of each. The panel

stock I used was CARB 2 compliant (very low formaldehyde), so I didn't need to apply any finish, and that's a huge time saver.

Now, even though it costs just \$100 for materials, in no way does that imply it's an ugly beast. Sure, it's not a Victorian bow-front dresser crafted from Honduras mahogany, but it does look pretty darn good considering what it's made from, and I'm confident it will serve me well for many years. I was so happy with the results that I even made another one to be used as a sewing supplies cabinet, and I have future plans for shop cabinets based on the same design.

Construction Notes

You'll need the following tools to make this little dresser: a table saw, a router with an edge guide, a 1/8"-radius roundover bit and 1/2"-diameter straight bit, a pattern flush-trim bit, a router table,



a biscuit joiner, drill press, brad nailer, staple gun, a jigsaw, and some bar clamps. Having a palm router to shape the 1/8"-radiused rounded over edges is also nice, but not absolutely necessary, and you could manage without using a router table if you chose instead to machine the drawer side end rabbets on your table saw, using a dado blade and a zero-clearance throat plate.

Although most of the pieces of this project are some form of rectangle cut on the table saw, it is always a good idea to take a moment to look at the *Drawings* and the *Material Lists* before

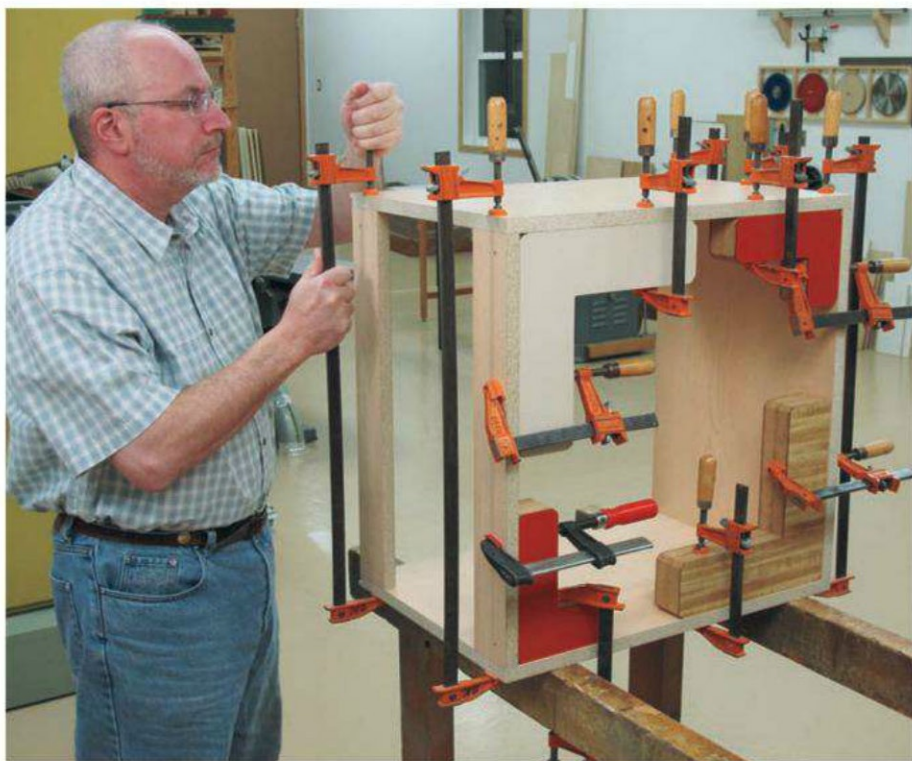


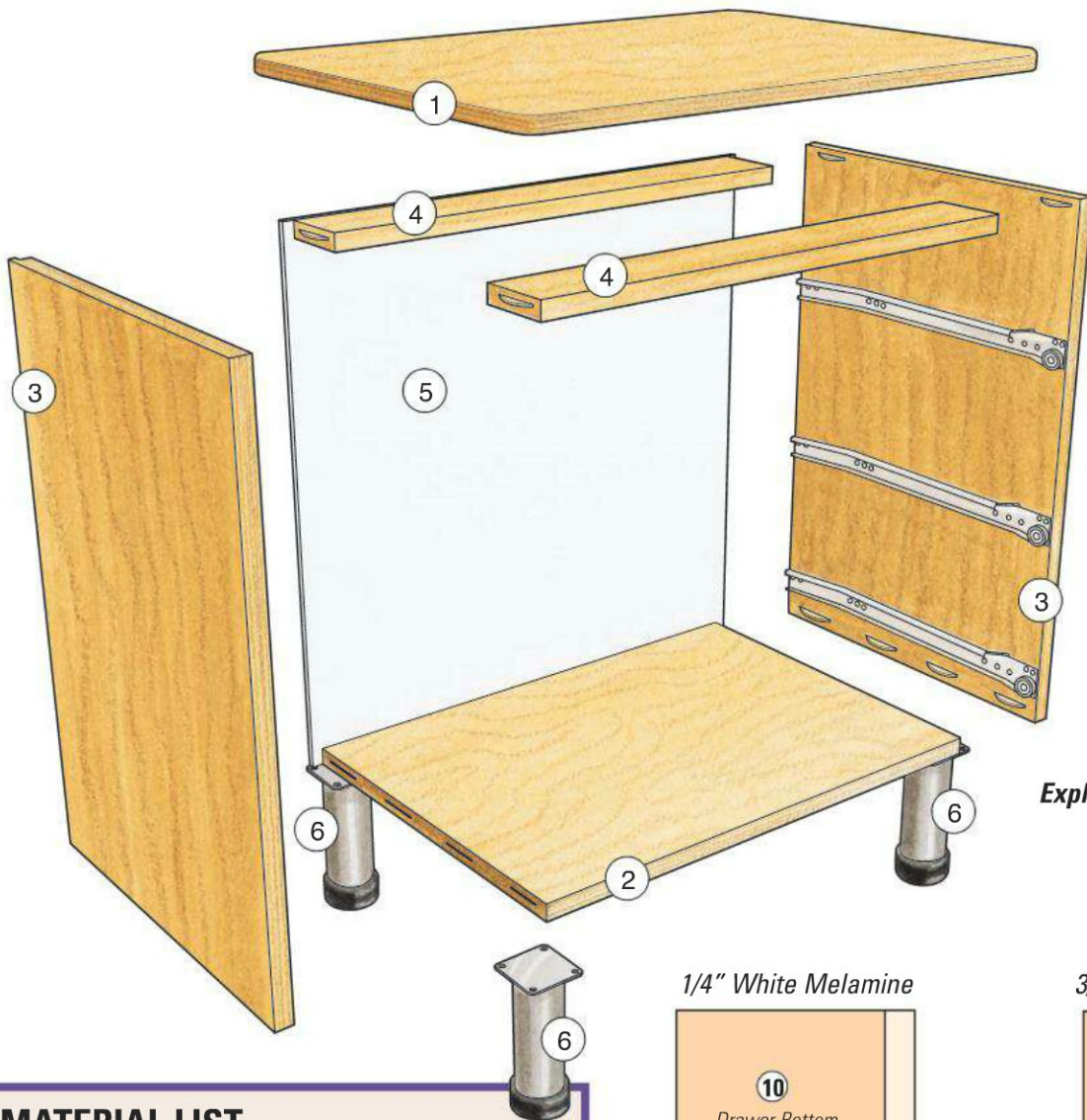
Photo 1: Get started by routing the 1/4" x 1/2"-deep rabbets in the sides (pieces 3) to accept the back (piece 5). Use a 1/2"-diameter straight bit and edge guide.



Photo 2: Assemble the carcass in two stages. First glue, biscuit, and clamp the bottom (piece 2) and stretchers (pieces 4) to one of the sides (piece 3).

Photo 3: Complete the carcass assembly by adding the remaining side. I use cabinet squares to ensure the carcass parts are 90° to each other.



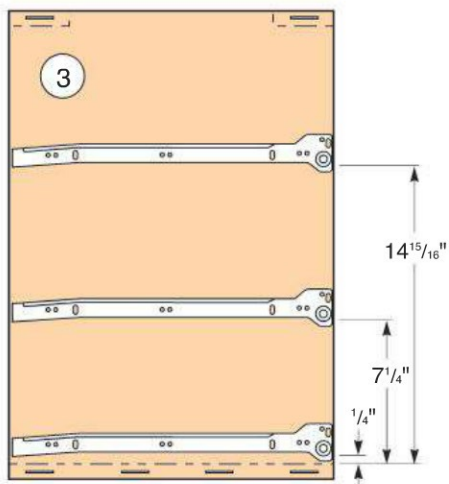


Exploded View

MATERIAL LIST

	T x W x L
1 Top (1)	3/4" x 17 3/4" x 24 1/2"
2 Bottom (1)	3/4" x 15 7/8" x 22"
3 Sides (2)	3/4" x 16 5/8" x 23 1/4"
4 Stretchers (2)	3/4" x 3" x 22"
5 Back (1)	1/4" x 23" x 23 1/4"
6 Adjustable Cabinet Legs (4)	2" dia. x 6"

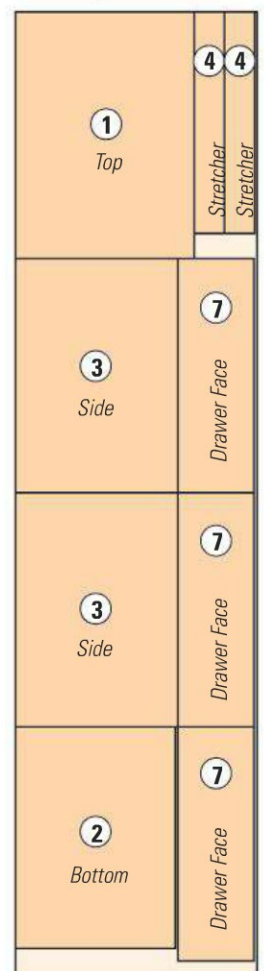
Side
(Inside View)



1/4" White Melamine



3/4" Maple Melamine



**Cutting
Diagrams**

“I’m thinking — no way am I putting money into anything like that when I can build one for half the price that will function 100 times better.”

you start cutting up material. Cutting the 1/2" fiberboard and 1/4" white melamine pieces from half sheets is easy since there's room for waste with them, but getting all the 3/4" maple melamine pieces from a half sheet is a bit tight. Use the three cutting diagrams provided here so you can minimize your waste. The secret, I found, was to start by putting the stretchers (pieces 4) next to the top (piece 1). Once I'd figured that out, the rest of the pieces fell into place.

The dresser design is based around the use of 3/4" extension white, epoxy-coated, side-mounted drawer slides. They're inexpensive, very easy to mount, and they operate really well.

The drawer components of the slides wrap around the bottom edges of the drawer sides. This allows the drawer bottom to be overlaid and nailed or stapled on, eliminating the need for cutting drawer bottom rabbets. If you use other slides, then note that the dimensions in the *Drawings* for the cabinet components of the drawer slides' mounting heights are the same as the distances the drawer bottoms are relative to the carcass bottom (piece 2). Knowing that should help you figure out any alterations you may need to make if you use different drawer slides.

You'll notice that the design is so simple that there is only one size drawer, and one size drawer face. This makes the work very easy. The only difference in the drawer construction is the alignment of the drawer faces to the drawers. The top two drawers are the same, with a drawer face bottom edge overhang of 1/4", but the bottom drawer face overhang is 15/16". Carefully follow the specified dimensions in the *Drawings*, and you should have no problem getting everything to align correctly when you assemble your dresser.

Assemble the Carcass and Drawers

Now that you have the overall picture of the project, it's time to start making sawdust! Go ahead and cut all the pieces to size using the *Material List* on the previous and next page (pieces 1 through 5, and 7 through 10), and get started by routing the back rabbets (see photo 1). Machine the biscuit slots in the bottom (piece 2), sides (pieces 3) and stretchers (pieces 4). With that done, drill the screw holes in the stretchers. Glue, biscuit and clamp the carcass together as shown in photos 2 and 3, back on page 37.

Drill the screw holes in the drawer fronts (pieces 8) (photo 4). The 5/16"-dia holes allow you to make minor drawer face alignment adjustments later. Rout the rabbets on the ends of the drawer sides (pieces 9) (photo 5). Now, assemble the drawers (photo 6), using 1" brads to “pin” the drawer joints. Attach the drawer bottoms (pieces 10) to the drawers using 3/4" staples. Rout 1/8"-radius edges around the top edges of the drawers (photo 7), but don't rout the front edge of the drawer fronts. Then drill the pull bolt holes in the drawer faces (pieces 7) and



Photo 4: Drill the 5/16"-dia. holes in the drawer fronts (pieces 8) for the screws used to attach the drawer faces (pieces 7).



Photo 5: Rout the 1/4" x 1/2"-wide rabbets on the ends of the drawer sides (pieces 9). The total finished width of the drawers needs to be 21".



Photo 6: Glue and nail the drawers together. I made a 14 1/16"-long L-shaped support from white melamine to hold the drawer front and back (pieces 8) upright and square as I attached the first drawer side (piece 9).

Drawer Side (Top View)



MATERIAL LIST

	T x W x L
7 Drawer Faces (3)	3/4" x 7 ⁹ / ₁₆ " x 23 ¹ / ₄ "
8 Drawer Fronts and Backs (6)	1/2" x 6" x 20 ¹ / ₂ "
9 Drawer Sides (6)	1/2" x 6" x 15 ¹³ / ₁₆ "
10 Drawer Bottoms (3)	1/4" x 15 ¹³ / ₁₆ " x 21"
11 Pulls (3)	96mm Amerock®
12 Drawer Slides (3)	16" Blum

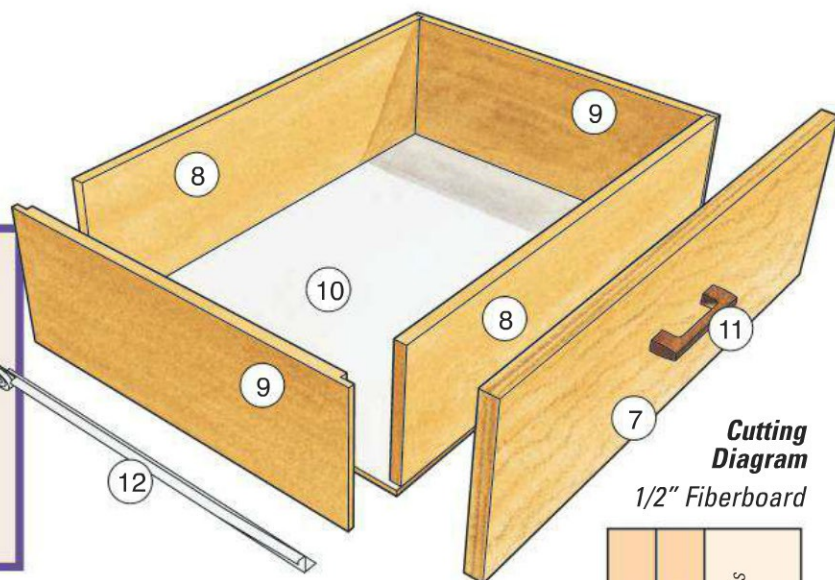


Photo 7: Rout the 1/8"-radius roundover top edges on the assembled drawers. Don't rout the front edges. I screwed a long auxiliary base to the palm router for added support and control.

follow up by routing the drawer face 1/8" roundover on the corners and edges (photo 8).

To mount the drawer faces, align and clamp them to the drawers and mark the pilot hole locations for the drawer-face mounting screws as shown in photo 9, below. Note that on the two upper drawers the faces overhang the drawers by 1/4" at the bottom, and the lower drawer's face overhangs its drawer by 15/16". Unclamp the drawer faces and use your drill press to drill the pilot holes, then attach the drawer faces.

Mount the drawer slide cabinet components (pieces 12) to the carcass sides using spacers to locate them (photo 10). Only the long flat bottom edge of the slide should rest on the spacer when you mount the slides. Align the slide front ends

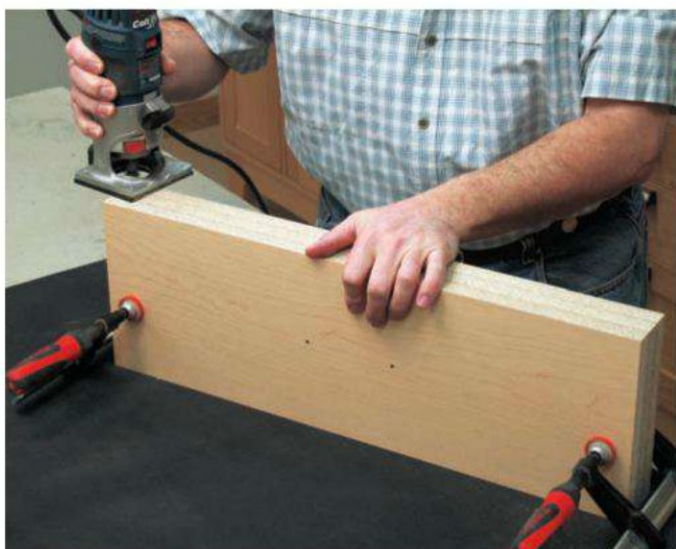
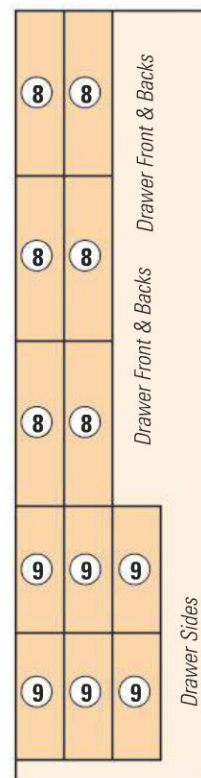


Photo 8: Rout a 1/8" radius on the corners of the drawer faces (pieces 7). Clamping the drawer faces together and gang routing them like this makes supporting the router much easier.



Photo 9: Mark the pilot hole locations for attaching the drawer faces to the drawer boxes. Use 1/8"-wide spacers to center the drawer face side to side, and 1/4" "lifts" to align the height.



Photo 10: I used spacers to position and mount the drawer slides. Work from the top down, starting at $14\frac{15}{16}$ " up from the carcass bottom, then $7\frac{1}{4}$ ", and finally $1\frac{1}{4}$ ".

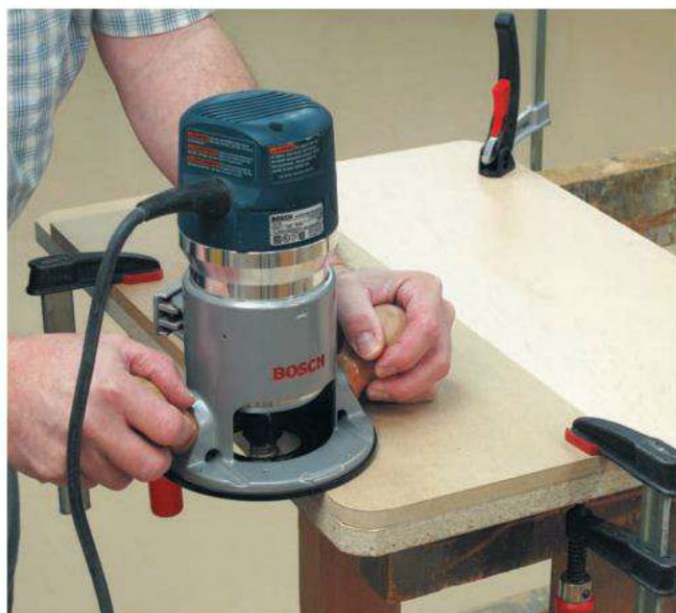


Photo 11: Rout the 1"-radius corners of the top panel (piece 1) to shape. Rough-cut the corners first, and then finish the shaping with a shop-made template and router with a pattern flush-trim bit.

flush with the carcass front edge. Now attach the drawer slide components to the drawer boxes. Align their front edges $1/16$ " back from the drawer faces — it stops the drawers from banging against the face of the carcass. I used a $1/16$ "-thick spacer.

Final Assembly

Staple the back (piece 5) to the carcass. Shape the top's (piece 1) 1"-radius corners as demonstrated in photo 11 and then cut the $1/8$ " roundovers on the top's edges. Then, screw the top to the stretchers. Note that the overhang is $3/8$ " at the back.

Drill the pulls' bolt counterbore holes in the drawer fronts (photos 12 and 13). If you're wondering why I drill the pull bolt counterbore holes this way, it's because inevitably the pull mounting bolts loosen over time, and I want to be able to tighten them without having to remove the drawer face, and then having to realign the drawer face. When that is done, secure the pulls (pieces 11) to the drawer faces.

Mount the legs (pieces 6), being careful not to split the carcass sides when you're driving the screws into the panel edges. This is an inherent problem with composite panels. Drill pilot holes for all the leg mounting screws, and make the pilot holes for the screws that go into the side panel edges $1/16$ " less than the screw's diameter. Apply wax, and drive the screws slowly. Insert the drawers and make any necessary alignment adjustments to the drawer faces. And ... you're done! (I told you this was going to be fast!)



Photo 12: Drill $3/32$ "-diameter holes through the pull holes in the drawer faces and through the drawer fronts to locate the pull bolt holes on the insides of the drawer fronts.



Photo 13: Drill $1/2$ "-diameter pull bolt counterbore holes through the drawer fronts. Use a Forstner bit centered in the locator holes you just drilled. Don't drill into the drawer face.

Bruce Kieffer has been a professional woodworker since 1978. He is the proprietor of Kieffer Custom Furniture and a frequent contributor to the pages of Woodworker's Journal.

Dresser Hard-to-Find Hardware

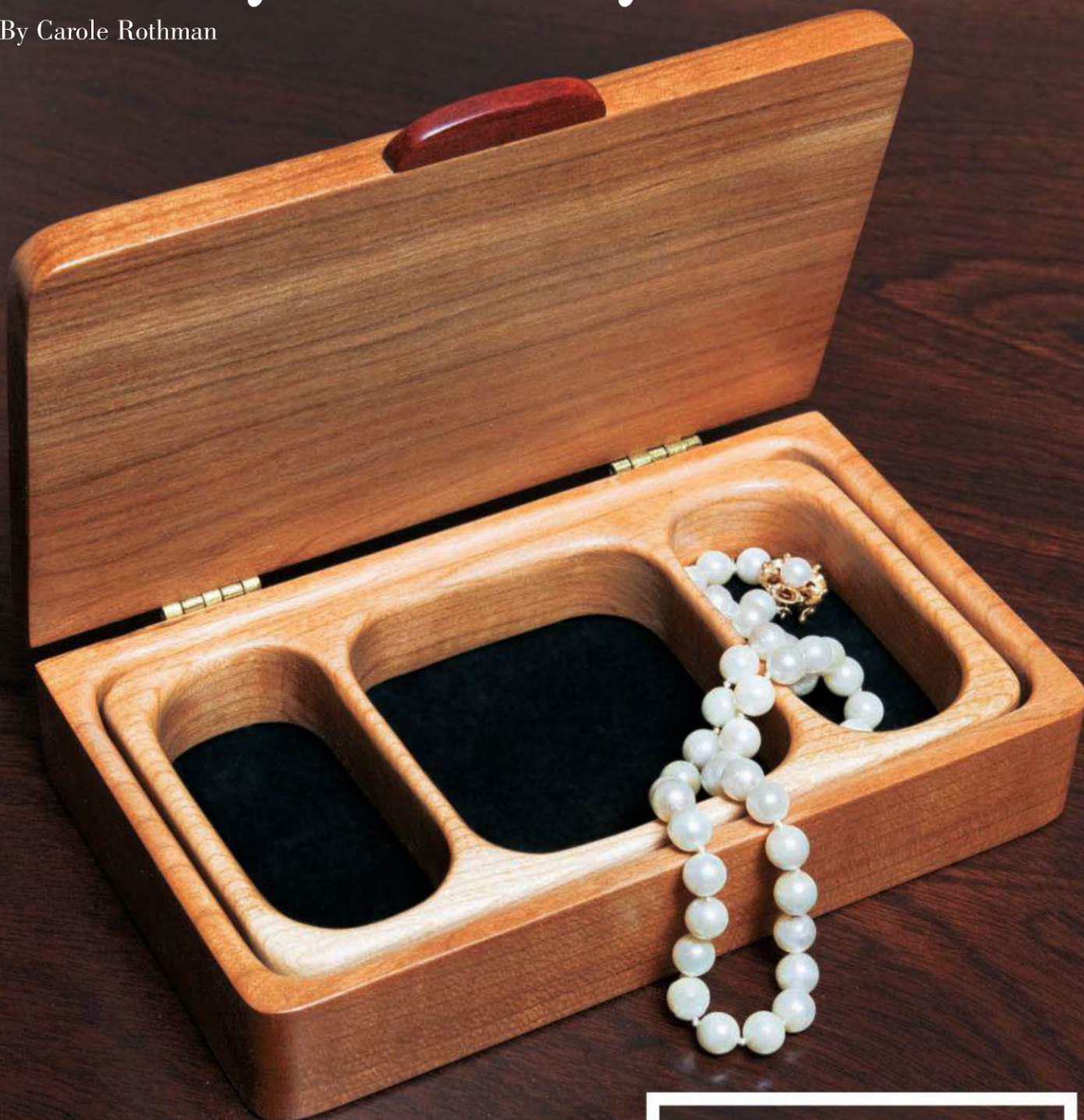
The following supplies are available from Woodworker's Journal.

Drawer Pulls (3) #1006631 \$5.79 each
16" White Drawer Slides (3) #34843 \$6.99 pair

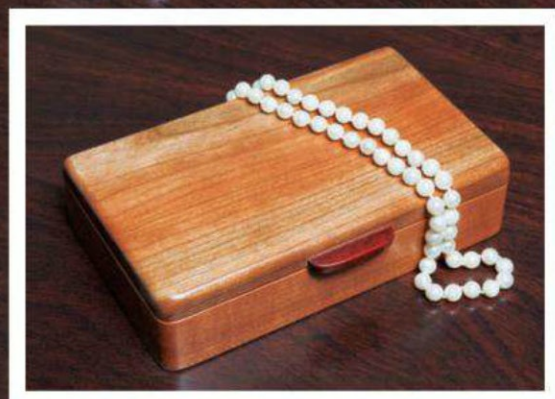
To purchase products online, visit www.woodworkersjournal.com and click on the "Store" tab. Or, call 800-610-0883 (code WJ1331).

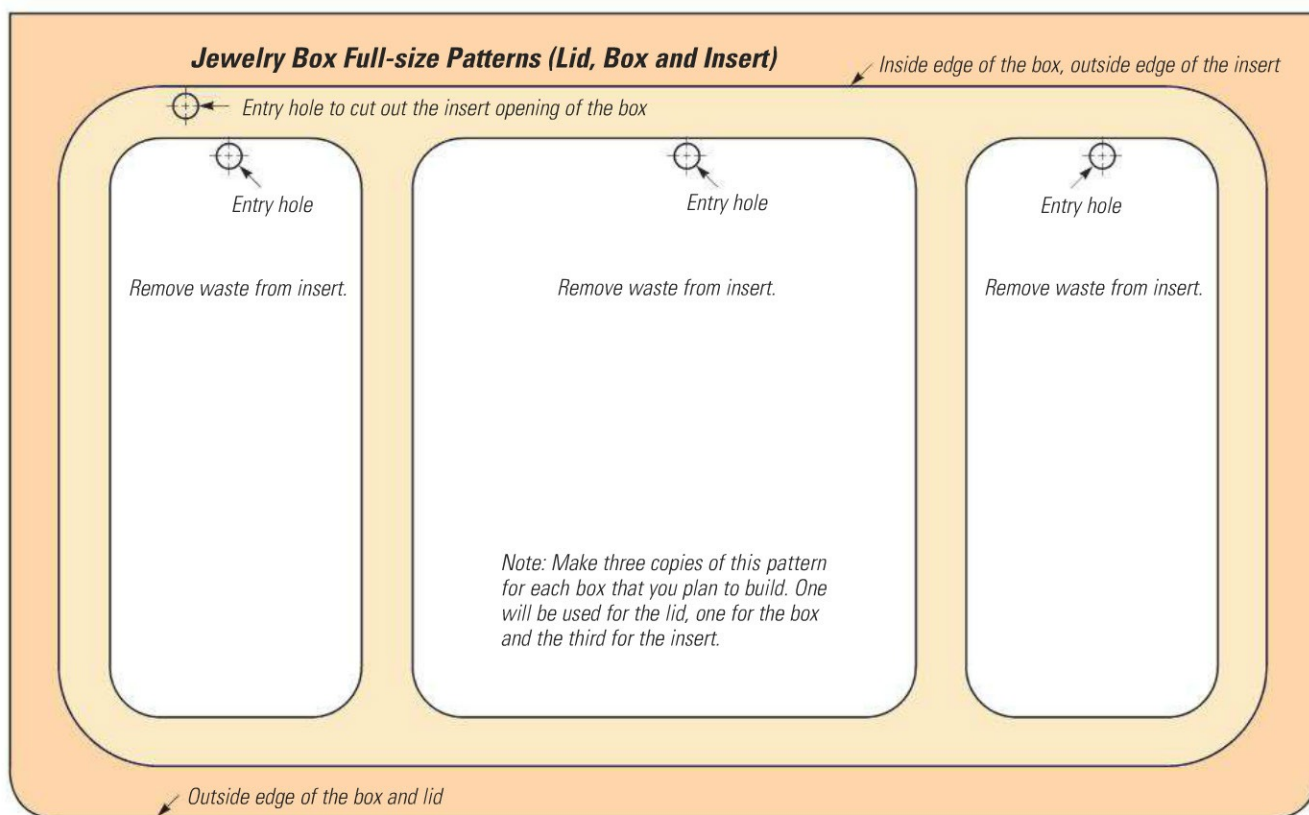
Cherry Jewelry Box

By Carole Rothman



If you're looking for an easy-to-make jewelry box, this little project is perfect. It features a removable insert and capitalizes on the scroll saw's ability to make internal cuts with ease.





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Jewelry boxes are often made with complex joinery to give them an air of sophistication and high style. But you can make a wonderful little heirloom without all the extra work, using just a scroll saw. Scroll saws often sit idle in many shops because we don't stretch their potential. Here's a fun way to put yours back into service and prove that it's more versatile than you might think.

Forming the Box and Insert

In selecting your wood for the box and the lid, look for a good color match between the two and an attractive grain pattern for the lid. I rough-cut both pieces to size and jointed the long edges that would become the back of the box, using a portable drum sander with a fence. Then make three copies of the pattern shown above. Starting with the box body, I applied clear packing tape to the 1½"-thick piece of cherry to help prevent burning when cutting it, then attached a copy of the pattern with temporary-bond adhesive, matching the jointed edge with the back of the pattern. Check your saw table to be sure it's level before cutting the remaining three sides of the box's perimeter using a #9 blade.

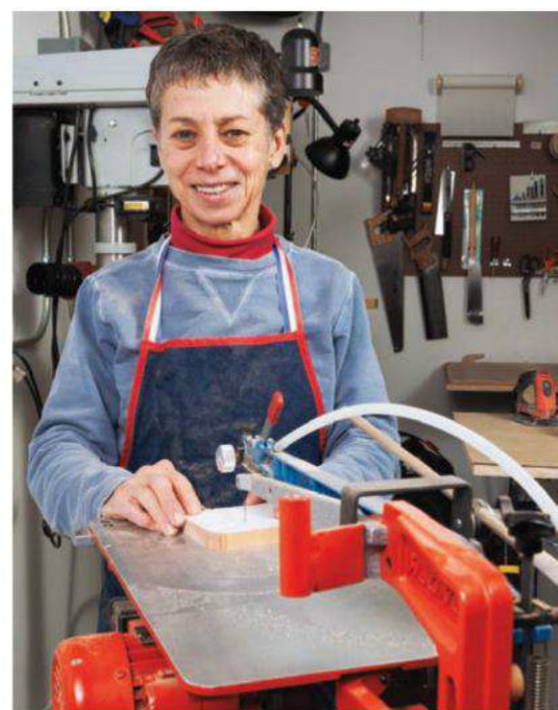
To complete the box body, drill an entry hole just inside the inner cutting

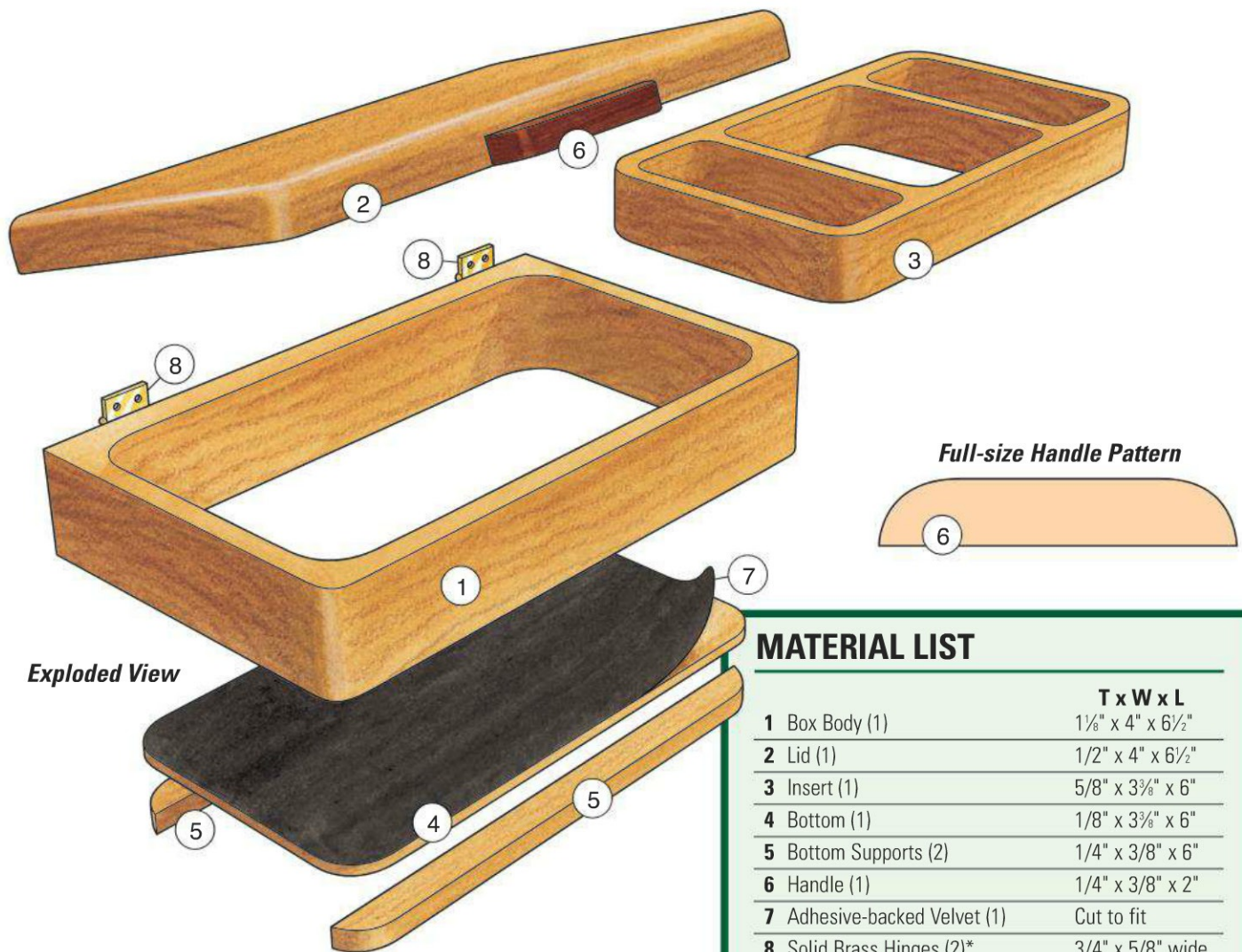
line, insert the blade and follow the cut line to remove the center piece. Given the generous size of this waste piece, I set it aside to use for another project. I then sanded the inner and outer faces, using a spindle sander, detail sander and belt sander to remove any burn and blade marks that might be present.



After cutting the box's outer profile to shape, drill a starter hole in the insert area of the pattern to thread your blade through. Then cut out the large inside waste piece with a #9 blade. Consider saving the waste piece for a future project.

Your next step is to make the insert and compartments, using the 5/8"-thick piece of cherry. I covered the wood with tape and attached a second copy of the pattern. Cut along the outer layout line for the insert first, then drill an entry hole in each compartment, and cut out the center compartments. After you sand





the outer and inner faces completely smooth, place the insert into the box body to check the fit. Mark any edge areas that rub the box sides, and sand them down until the insert slides into the box easily.

I rounded the top inside edge of the box and all the upper edges of the insert with a piloted roundover bit in my router table. The box interior and insert were given a final sanding, working progressively to 320-grit. But don't sand the outside of the box at this time; it will receive further sanding after you attach the lid.

Creating the Bottom and Supports

Next comes the plywood bottom. I traced the inner edge of the box body directly onto the piece of 1/8" plywood to get a cutting line that reflected the sanded dimensions of the box interior. To make it easy to position this piece again after cutting it out, make a few reference marks on the side and the bottom. I cut along the line with a #3 blade and sanded the piece lightly to smooth the edges



Smooth the inside edges of the box and remove all evidence of sawing with a small-diameter sanding drum.

and adjust the fit. Now use the bottom panel as a pattern for the velvet liner by placing the plywood facedown on the paper side of the velvet and tracing its outline. Trim the velvet to size, and set it and the bottom aside for now.

Making the box body from a single piece of wood is faster and easier than using conventional joinery, but it doesn't allow for cutting the groove that typically holds the bottom in place. I compensated for this by providing support under the bottom, using 3/8"-wide strips of cherry, curved at the ends to conform to the rounded inside corners of the box. To cut these supports to shape, place the strips lengthwise under the box body, lining up their outer edges with the inner edges of the box. This will make it easier to trace the curve of the corners directly onto the strips. I marked the location of the strips, cut along the marked lines, and glued the strips into position so their bottom faces are flush to the box bottom. Small clamps hold them in place as the glue cures.

Once the glue dries on the supports, glue the bottom panel in place.



A second copy of the same template serves as a guide for cutting out the insert and its three compartments (left). Cut to the waste side of the layout lines, depending on which portion of the insert you are creating — its outer or the inner edges. Use your box's inside edge to trace the shape of the bottom panel before cutting it out of 1/8"-thick plywood (right). That way, it will match your box's interior shape as closely as possible.

Adding the Lid

To make the lid, attach the third copy of the pattern to a 1/2"-thick piece of cherry, matching the cutting line for the back of the lid with the jointed rear edge. Cut the top out and sand it lightly to remove burn or blade marks. At this point, I compared the profiles of the lid and box, marked any lid overhang, and corrected significant discrepancies by sanding. Final matching will be done once the lid is installed.

Before attaching the lid, take two precautionary steps. First, since the final thickness of the rear wall will depend on the amount of sanding you've done, and since the hinges mount from the back, check to be sure that your hinge screws will not protrude into the box body. If it looks too close for comfort, snip off their

tips. Second, I cut two 3/4"-wide strips from a playing card, cutting crossways, and set them aside. These strips, and the remainder of the card, will be inserted between the box and lid on both sides of the hinges, to ensure that the lid will close properly. Once these preliminaries are completed, set the lid in place on the box and so their edges line up. Clamp them together. Draw a line 7/8" from each side of the box, on both the box and lid, to mark the outward position of each hinge. Then insert the three pieces of playing card between the box and lid, position the hinges, and mark the screw holes with an awl. I put each piece to be drilled into a vise to hold it firmly and wrapped masking tape around the bit to serve as a depth stop. Now stabilize the hinges with a dot of epoxy, and screw them into place to mount the lid.

Sand flush any places on your jewelry box where the lid and box don't line up. I then set my sander table to 45°, sanded a bevel around the front and side edges of the lid top, and rounded the bevel to form a gentle curve. (The bevel serves as a

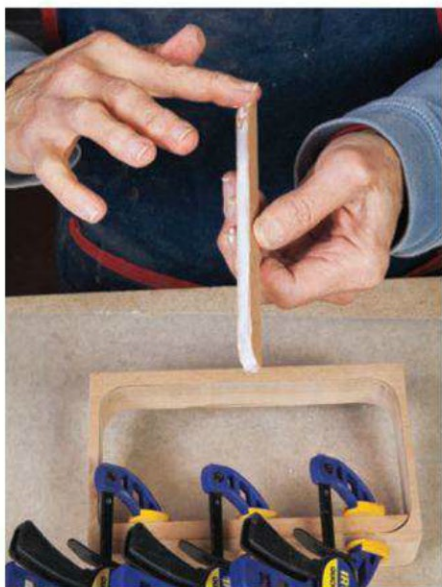
guide for sanding.) Once shaping is complete, give the exterior a final sanding, ending with 320-grit. Cut and sand your lid handle to shape — I used a scrap of bloodwood for mine. Mark the center of the lid, and glue the handle along the lower edge. When the glue dries, unscrew the hinges to prepare for final finishing.

Finishing Up

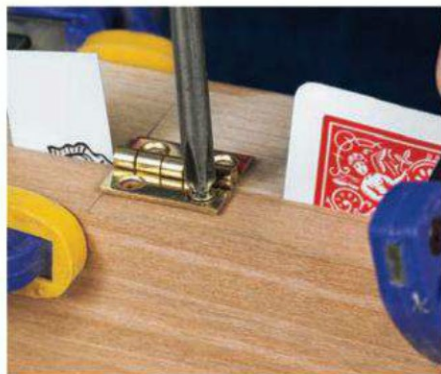
For my finishing process, I started with a light coat of shellac to seal the surfaces, then rubbed the wood down with 0000 steel wool and tacked it off to remove the dust. Several light coats of clear gloss spray lacquer followed. A final rubout with 0000 steel wool removed any irregularities and left an attractive matte finish.

Now place the velvet, backing still attached, into the box to see if it needs trimming. When you are satisfied with the fit, remove the backing and stick it to the bottom. Place the insert inside, and your project is ready for jewelry.

*Carole Rothman is the author of **Wooden Bowls from the Scroll Saw** (Fox Chapel).*



The bottom rests on two supports glued to the inside edges of the box. Trace and cut these to shape using the box interior as a guide.



Strips of a playing card act as spacers between the box and lid when installing the hinges, to ensure correct hinge operation.



The author cut the lid's bloodwood handle to shape, then smoothed the profiles further and eased the edges with her spindle sander.

Shop Test

18-volt Circular Saws Cut the Cord

By Chris Marshall

Whether you're building a fence or a fleet of cabinets this summer, one of these 6½"-diameter lithium-ion circular saws will help make the job easier and more enjoyable. I tested each of them and have our "Best Bet" selected.



It's summertime again, and if you're like me, that means it's time to mend those cracked fence pickets, replace some deck boards or build the dock you've had on your "honey-do" list for way too long. I can't think of a single woodworker who doesn't also do home repair. And, when my "shop" shifts to some far corner of the yard, cordless tools are essential.

In recent years, lithium-ion batteries have taken the cordless industry by storm. Truth be told, this leapfrog in battery technology wasn't really intended for us hobbyists: lighter, longer running power packs matter most to the folks who make their livings building houses, running conduit and smashing concrete — it's for the trades. But we all benefit ... who wouldn't rather take fewer trips back to the charger?

That's why I expected top performance from these five 18-volt, pro-quality 6½" circular saws. These tools are built with punch lists and bottom lines in mind. And they delivered the goods in some tough cutting trials. I cut sheets of plywood to strips and made repetitive crosscuts on resiny, hard 2x12 Southern yellow pine. But, which "jobsite" saw edged out the rest for "Best Bet"? Read on!

DEWALT DCS390L

There are plenty of loyalists out there to DeWALT's bright yellow color, and I'm sure this compact circular saw is toted

DeWALT DCS390L

Street Price: \$269

Volts: 18

Cutting Capacity: 2¼" @ 90°; 1½" @ 45°

Batteries Included: 1 XRP™ Li-ion

Charging Time: 1 hour

Net Weight (w/ power pack): 7.8 lbs

Web/Phone: www.dewalt.com / 800-433-9258



in quite a few truck boxes. Its magnesium base and upper guard keep the tool light but tough, when those accidental drops occur, and a soft overmolded grip makes it comfortable in hand. I like the oversized flip lever and T-nut for changing cutting depth or setting up bevel cuts. They're easy to grab with gloves on.

The tool's single included battery also pulls free easily without taking your gloves off, by depressing two tabs. It charges in an hour, which is good, but other saws in this test with two power packs or faster chargers are more helpful for those really big

cutting jobs.

DeWALT provides a universal charger that will replenish either Li-ion or NiCad DeWALT batteries ranging from 7.2 up to 18 volts. This charger could cover all your DeWALT tools. Very practical.

A wide, marked slot on the saw base's front edge makes it easy to determine where the blade kerf will hit your workpiece, whether making straight cuts or tipped to 45°.



The bevel scale is stamped with demarcations for each degree up to 50; a swipe of black paint would make them even easier to read.

With its battery topped up to full charge, I was able to make 24 cuts across a quarter sheet of ¾" plywood, using



DeWALT's oversized controls (left) work well with gloved hands, and a 2¼" cutting depth (right) will tackle 8/4 or 2x lumber with ease.



A helpful depth-setting scale in back (left) and upright handle position (right) when compared with other test saws are two of the CCS180K's stronger features.

Bosch CCS180K

Street Price: \$299

Volts: 18

Cutting Capacity: 2" @ 90°; 1½" @ 45°

Batteries Included: 1 (2.6Ah) Li-ion

Recharging Time: 30 minutes

Net Weight (w/ power pack): 7.6 lbs

Web/Phone: www.boschtools.com / 877-267-2499



a fresh Freud Diablo 40-tooth blade, before the battery was spent. Then, once it cooled and fully recharged, I swapped in a new 24-tooth Diablo framing blade and went to work on a 2x12. DeWALT made 36 crosscuts this go-round. A respectable showing but not the leader here by quite a stretch.

For \$269, here is a no-frills, get-it-done saw.

BOSCH CCS180K

When UPS delivered this sample from Bosch, I was surprised at the small carton size. Turns out, that's because Bosch doesn't provide a hard carry case or a duffel bag for stowing this tool, unlike the other four test saws. Odd.

The saw's standard features were a mixed

Hitachi C18DL

Street Price: \$309
 Volts: 18
 Cutting Capacity: 2¼" @ 90°; 1⅞" @ 45°
 Batteries Included: 2 (3.0Ah) HXP Li-ion
 Charging Time: 45 minutes
 Net Weight (w/ power pack): 7.1 lbs
 Web/Phone: hitachipowertools.com / 800-448-2244



Hitachi provides a hex T-wrench for blade changes (left), but it doesn't stow on the saw as do the Allen wrenches of other saws. Ample overmolds and grips (right) make gripping the C18DL more comfortable.



blessing for me. It has comfortable overmolds on the top and front handles, and the primary grip is tilted back farther vertically than other saws to suit a more natural wrist position. I found the machine to be well-balanced, and it has a large safety lock button alongside the trigger for easier startups with gloves. There's also a helpful depth-of-cut indicator in back so you won't need a tape measure to set cutting depth. All good.

The bevel tilt scale, though, isn't as detailed as DeWALT's — demarcations at 5° increments only — and the two blade index slits in front should be marked in some fashion. They aren't, so you'll need to double-check by referencing the blade and slits instead of just looking down and lining up the correct notch with a layout line. It's

less helpful but something you'll probably adapt to in a few cuts.

A single battery comes with this tool, and it charges up in just 30 minutes, which you'll appreciate if there's lots of cutting to do. I'd still rather have two batteries *and* a quick charger. Removing the power pack involves pushing a rear button while sliding the pack

backward. It wasn't as easy for me as packs with two side tabs and a pull-down release.

Depth of cut, tilt and arbor lock controls are amply sized, and the magnesium base is ribbed on the bottom for lower resistance when pushing the saw over rough surfaces.

Once charged up and outfitted with appropriate Freud blades, the CCS180K made short work of 30 passes across 24 inches of plywood.

It bested DeWALT by six more crosscuts on a 2x12, before the battery dropped off to sleep. And, the saw had plenty of power throughout.

All in all, \$299 seems steep for a tool with one battery and no carry case, but you can buy this saw as a "bare" tool option if you already have other Bosch 18-volt Li-ion tools (see sidebar, page 50).

HITACHI C18DL

For ten bucks more than Bosch, Hitachi packs in added features for the money. You get two 3.0 Amp/hour (Ah) batteries, a hard case and an edge guide for making accurate rip cuts. When you hit the trigger safety, the C18DL also sports a light to illuminate the blade area. Call it a sign of aging, but I really appreciate well-placed task lights on tools. And, even though it isn't a long-lasting LED, the bulb is replaceable.

Hitachi never skimps on overmolds. This saw is fully

With Li-ion, who needs NiCad?



Ten years ago, I laid hands on a then-cutting-edge 24-volt, 6½" circular saw that felt like a lead anchor. While it cut well, it was so darn heavy, and NiCad batteries were partly to blame. What a change a decade makes! These new circ

Makita BSS610

Street Price: \$349

Volts: 18

Cutting Capacity: 2¼" @ 90°; 1½" @ 45°

Batteries Included: 2 (3.0Ah) Li-ion

Charging Time: 30 minutes

Net Weight (w/ power pack): 7.6 lbs

Web/Phone: www.makitausa.com / 800-462-5482



wrapped on both front and primary grips with elastomer for sure handling and comfort. These grips are also amply sized for large hands, and I found the main grip's pistol styling to be my favorite of all.

Hitachi's fan-cooled charger will rejuvenate either Li-ion or NiCad batteries ranging from 7.2 to 18 volts. The charger's illuminated display is a bit counterintuitive: a constant green light means the battery is actually overheated, while blinking red tells you it's fully charged. Still, the process takes just 45 minutes while you're busy sawing with the other pack.

Hitachi outfits the C18DL with a black, stamped-steel base, which is fine, but don't drop the tool. Steel bases are more likely to bend out of shape. Two front cutouts set the index markers for lining up the blade, but my test saw cut 1/16" to the "keep" side of the layout line, thus leaving

workpieces a kerf width short. It can't be adjusted.

In the cutting test, Hitachi was mid-pack all the way, producing 27 plywood cuts and 42 crosscuts in 2x with each charge. Sawdust ejection was messier here than some other saws, with more debris left on the workpiece. But, overall, this green machine performed pretty well. I think \$309 seems a decent deal, and there's a "bare" option for about a third of that price.

MAKITA BSS610

With more than 60 different cordless tools in its inventory, Makita is heavily invested in pro-user options these days. And for those who want good performance without the bulk, this BSS610 is lightweight and is smaller in overall stature than these other saws.

A bright, white LED lights up the blade when you lightly depress the trigger, and the base's blade indexes are clear and accurate. Depth of cut is also easy to dial in, thanks to a series of common blade depths molded into the lower guard. Flip-lever controls for tilting the base or changing blade depth are smaller here but still easy to manipulate.

Makita's NiCad/Li-ion universal charger, which powers batteries back up in 30 minutes, has an elaborate diagnostic display and a fan that draws air through the



Makita's bright LED light (above) makes cut lines easier to see in dim conditions, and they're simple to line up using the saw's front-mounted index notches (right).



packs during charging to minimize heat buildup. Heat is the bane of tool batteries.

In testing, Makita came up a tad short on plywood cuts at 23, but that's still the equivalent of ripping almost six sheets lengthwise on one charge. It delivered 40 crosscuts on a 2x12 before the motor finally stopped.

Two batteries, an edge guide and carry case all are provided for the same price as Milwaukee's contender, next.

MILWAUKEE M18

Milwaukee boldly describes itself to be "Nothing but HEAVY DUTY," and after

Shop Test continues on page 50 ...

saws are both light and gutsy. Their lithium-ion cells offer much longer run times than NiCad, in compact packages that shed tool weight while delivering top performance.

Shop Test continued

Milwaukee M18

Street Price: \$349

Volts: 18

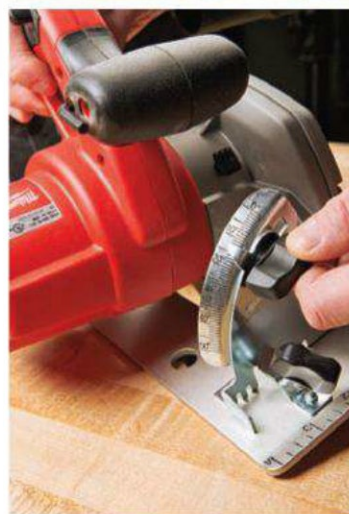
Cutting Capacity: 2 1/8" @ 90°; 1 1/16" @ 45°

Batteries Included: 2 RedLithium XC Li-ion

Charging Time: 1 hour

Net Weight (w/ power pack): 8.5 lbs

Web/Phone: www.milwaukeetool.com / 800-729-3878



An illuminated fuel gauge (above) makes it easy to monitor remaining run time on Milwaukee's RedLithium batteries. A black-on-silver tilt scale (bottom) sets to single-degree increments.



Quik-Link takes you directly to the web page on which these products appear! No navigation necessary ... just go to www.woodworkersjournal.com and click on the Quik-Link icon shown above.

testing the M18 (Model 2630-22), I can see why the pros might agree. While it's a tad heavier than others, this saw features a thick, aircraft-grade aluminum base with oversized scales and a clear, easy-to-read tilt scale. Control levers are generous, and overmolded handles provide good control. Two proprietary RedLithium batteries come with it, and they have helpful illuminated readouts to show you their charge levels at any time. A universal charger with two battery mounts refreshes 12- or 18-volt Milwaukee batteries in an hour. A duffel bag stows the works, plus a steel edge guide.

Aside from this saw's rugged features, it simply left the competition in the dust during

cutting trials. The 2630-22 sliced 38 cuts in plywood before I switched batteries, then it chomped an impressive 53 crosscuts on 2x before the battery could go no further. With the exception of less-than-tidy sawdust ejection, which could be improved, the saw was a robust and pleasant tool to use. There's something special about RedLithium technology, and it provided long-running endurance here. Given its performance and good features, while priced competitively with Makita, it deserves our "Best Bet" award ... and your consideration at buying time. It's a great saw.

Chris Marshall is a senior editor of Woodworker's Journal.

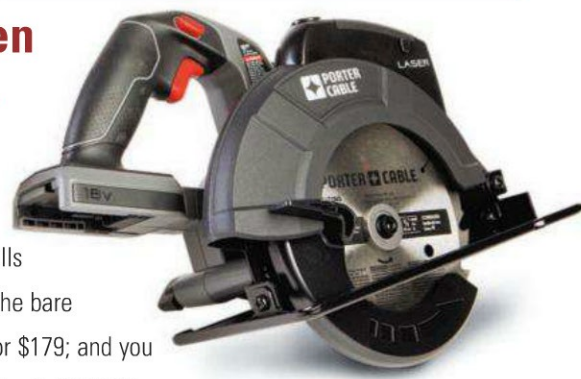


An increasing number of cordless tools, like the RIDGID and PORTER-CABLE 6 1/2" circular saws shown here, are only available within a larger combo kit of tools powered by a single charger and battery set, or as "bare" options for use with the batteries you already own.

Have the batteries? Then consider a "bare" saw.

Once you buy into a tool company's battery platform, you don't really need a charger and batteries for every new tool purchase. Use the packs you own, buy just the new tools, and save money. The trend is called "bare" tools, and many cordless manufacturers are pursuing it. In this test, for instance, Bosch's CCS180K can be had as the CCS180B for \$119;

Hitachi offers a C18DLP4 for \$109; Makita sells the BSS610 as the bare BSS610Z saw for \$179; and you can nab Milwaukee's 2630-20 for \$119. Same tools ... no batteries or charger. Depending on the saw, you could save more than 60% by going "bare." Other 18-volt, 6 1/2" saws, like the RIDGID R865N X3 and PORTER-CABLE's



PC18CSL, currently are available only in larger kits or "bare," which is why they were not tested here. Our aim was to present all-in-one saw/charger combinations for this roundup.



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Today's Shop

Cordless Chainsaws: Powerful, Portable and *Quiet!*

By Sandor Nagyszalanczy

Many woodworkers use chainsaws — both in their shop and around the house. Here is the latest on a new crop of battery-powered chainsaws. Their power and versatility just may surprise you!



MORE ON THE WEB

Chainsaws can be dangerous. For a primer on chainsaw safety from our author, visit woodworkersjournal.com and click on the "More on the Web" tab shown above.

Just about everyone I know who has moved from a bustling city to a rural setting has had this experience: After working tirelessly all week, you're sleeping in on a Saturday morning, looking forward to reading the paper and sipping hot coffee in tranquility. But suddenly, your Norman Rockwell moment is shattered by the nerve-grating sound of a screaming chainsaw (likely

wielded by your otherwise considerate neighbor cutting firewood or clearing downfall on their property).

Despite their portability and effectiveness in all types of woodcutting chores, gas chainsaws are some of the noisiest, smelliest, most annoying power tools on the planet. But fortunately, the latest electric cordless chainsaws now have the potential to restore the peace

on those pastoral weekend mornings. Fueled by high performance batteries, cordless chainsaws are surprisingly powerful and just as portable as gas saws, yet run very quietly and expel zero noxious emissions.

Cordless chainsaws have been around for a while. But the early models were small and not very powerful. In contrast, the cordless models of today are equipped with

The three types of chainsaws: a gas-powered saw (the STIHL), a corded electric saw (the Makita) and a cordless saw (the OREGON).



longer bars and run on voltages ranging from 18-volt to a whopping 40 volts. These tools are capable of doing serious work and are worth consideration by woodworkers and DIYers, as well as rural residents who need a portable saw to help maintain wooded properties.

3 Types of Chainsaws

There are three kinds of chainsaws: gas, corded electric and cordless. Depending on your needs and situation, each has its own pluses and minuses. First developed back in the 1920s, gas-engine-driven chainsaws are powerful and flexible, but terrifically loud. Since they're powered by 2-stroke engines, they require a mixture of gasoline and special 2-stroke motor oil, which must be mixed in the correct proportion before being added to the saw. Because of this fuel mixture, gas saws belch out clouds of bluish, odorous smoke.

Corded electric chainsaws are somewhat less powerful than gas chainsaws, but they're clean running and they are a lot easier to use: Just plug in the saw and pull the trigger to switch on the saw's electric motor and the tool

delivers immediate and impressive torque to the chain. There's no fuel to mix and pour, and no deafening noise to assail your neighbors. Of course, a corded electric saw requires a heavy-duty extension cord, which limits the range that the tool can be used away from a 120-volt power outlet.

Although it's the least powerful of all chainsaw types, cordless saws offer all the convenience of corded electric saws, but they can be used virtually anywhere you can carry them. This is a tremendous convenience if you have a large property to roam, or you simply don't want the hassle of dealing with an extension cord.

All but a few cordless chainsaws currently on the market are run by lithium-ion battery packs, which offer impressive power for their size, plus they're much lighter than older nickel-cadmium and nickel-metal hydride packs and more environmentally friendly as well. As with all cordless power tools, having a pair of battery packs — one in the tool while the other is charging — can keep you cutting all day long, with little interruption.

Chainsaw Anatomy

All types of chainsaws share the same basic design: A motor powers a flexible chain that's interspersed with sharp teeth around a lozenge-shaped bar. Tabs in the underside of the chain ride in a narrow slot around the edge of the bar. A cog on the end of the motor shaft spins just behind the rear end of the bar, driving the chain around the bar. A tension mechanism lets you adjust the tightness of the chain on the bar: too loose and the chain may jump out of its slot; too tight, and the chain puts strain on the motor and bearings. Some saws feature tool-less tension adjustment. This can be a real



NOTE: See Quick-Link at woodworkersjournal.com for web links to these products.

Ryobi (ONE+ P543)
800-525-2579

Craftsman (#315.34130)
800-469-4663

Black & Decker (LCS120)
800-544-6986

GreenWorks (20092B)
888-909-6757

STIHL (MSA 160 C-BQ)
800-467-8445

GreenWorks (20082A)
888-909-6757

Ryobi (RY40510)
800-525-2579

OREGON (CS250-E6)
800-223-5168



As with other cordless power tools, having a second battery to use with your cordless chainsaw while the spent one is charging allows you to continue cutting all day long.



Tool-less chain tension adjustment provides a quick, convenient way to tighten a loose chain on a cordless saw any time it's needed.



On cordless chainsaws lacking an automatic oiler, the bar must be regularly lubricated by pressing a button that forces oil onto the chain.



As a rule, the lower a saw's battery voltage, the shorter its bar. The 18-volt Ryobi in front has a 10" bar; the 40-volt model, a 12" bar.



A cordless chainsaw is extremely handy for yard work such as pruning trees, clearing downfall and cutting up small branches.

convenience, especially if you're working away from your shop and don't have the right adjustment tools at hand.

Every chainsaw has a pair of handles: A pistol-grip-style rear handle houses the trigger that controls the saw's motor. A transverse-mounted front handle provides control as well as an easy way to carry the saw. A guard just ahead of the front handle protects your hand and, on some electric saws, also is used as a chain brake, to stop and lock up the chain in case of a sudden kickback. A plastic scabbard slides over the bar, to prevent accidental cuts, as well as protect the chain teeth from getting nicked when the saw isn't in use.

All chainsaws have a built-in system for lubricating the chain, to keep it traveling around the bar smoothly, with little friction. Premium models feature automatic lubricating systems. Cheaper model saws have manual oilers that require you to regularly press a button, usually atop the saw just ahead of the handle, to dispense the oil.

Cordless Saw Sizes

As with all cordless power tools, cordless chainsaws come in different sizes, as determined by both bar length and battery voltage. The smallest, most affordable saws, including the Ryobi ONE+ P543, Craftsman #315.34130, Black & Decker LCS120 and GreenWorks 20092B, have 8" to 10" long bars and use 18- to 24-volt battery packs. Bigger, more expensive saws feature more powerful batteries and longer bars. Models include the STIHL MSA 160 C-BQ, GreenWorks 20082A, Ryobi RY40510, and OREGON CS250-E6. The 36-volt STIHL and 40-volt GreenWorks and Ryobi saws sport 12" bars, while the 40-volt OREGON has a 14" bar.

Generally speaking, the higher the battery voltage, the more power a cordless saw has on tap, and the longer the bar it is fitted with and the thicker the stock the saw is capable of cutting. Smaller saws with 18- to 20-volt batteries and 7" or 8" bars are fine for light tasks, such as slicing up thin lumber, carving details on a log or ice sculpture or cutting up kindling and pruning small tree branches. Bigger saws naturally handle bigger jobs: Models with 36- to 40-volt batteries and 12" or 14" bars can tackle just about any job you'd do with a gas or corded electric saw. (**Editor's Note:** See the author's chainsaw safety article on our homepage in the "More on the Web" section.)

In addition to its voltage, battery packs are also rated by amp hours. The higher a pack's amp hour rating, the more capacity it has and the longer it will power the tool before running out of juice. GreenWorks, STIHL and OREGON offer both standard and optional higher-amp-hour batteries for use with their cordless saws. Although higher-capacity batteries are expensive (OREGON's 2.4-amp-hour Endurance pack costs over \$200), they're a good choice if you work away from power plugs for extended periods of time.

As with other power tools, the more you pay for a cordless chainsaw, the more useful features it's likely to have. All 36- and 40-volt saws sport automatic oilers and many also feature tool-less chain tension adjustment. Pricier saws also include more sophisticated battery chargers that not only recharge packs more quickly, but have electronics that monitor charging in order to prolong the life of the lithium-ion batteries. A unique feature found on OREGON's premium-priced CS250-E6 saw is a chain

Parts of a Cordless Chainsaw



sharpener. This reduces the need for regular hand sharpening, which is both painstaking and time-consuming.

Something to consider when buying a cordless saw is, does its battery pack fit the manufacturer's other cordless tools? For example, the 18-volt packs that power Ryobi ONE+ chainsaws also work with an extensive line of workshop tools. If gardening is your passion, battery packs from GreenWorks, OREGON and STIHL chainsaws also work with weed trimmers, blowers and other landscaping power tools.

Do You Need One In the Workshop?

Some would say that there's no major advantage to having a cordless electric chainsaw in a workshop. However, with a battery-powered saw, you'll never accidentally cut through or get tangled up in a power cord. You also won't worry about getting electrocuted when working in wet conditions.

If you're a woodturner, the larger 36- and 40-volt models are great for roughing out turning blanks, either from green logs or heavy timbers. They're great for quickly cutting big planks to size, if you build heavy furniture pieces, as well as for carpentry jobs such as trimming and shaping the ends of large beams and rafters. A big cordless model is also ideal for sawing smaller logs for building an outbuilding or small cabin and, of course, bucking logs for firewood (without waking the neighbors!).

Yes, big cordless saws are cool, but even smaller 18- to 24-volt cordless chainsaws are a nice addition to your tool arsenal. There are lots of small tasks for which these saws have adequate power and capacity: for example, trimming long boards or cutting panels down to a manageable size before taking them to the table saw, jointer or planer. The agility of smaller cordless chainsaws is also a definite advantage when taking on more delicate tasks, such as carving sculptures or shaping tenons and other joinery members.

Like all battery-powered tools, cordless chainsaws have their limitations. Even the priciest 40-volt model simply doesn't have the torque of a corded electric saw, or the speed and horsepower of a gas saw. But unless you're in a big hurry, I don't think this limitation outweighs the convenience that modern cordless models offer.



A unique feature found on OREGON's 40-volt cordless chainsaw allows you to lightly restore sharpness to dull teeth in a few seconds with the simple pull of a lever.



Even a small, 18- to 24-volt, cordless chainsaw can be extremely useful around the workshop for carving tasks, trimming large planks or roughing out large joinery.



Larger cordless chainsaws with 36- to 40-volt batteries and 12"- or 14"-long bars are great for cutting logs and burls into turning blanks.

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

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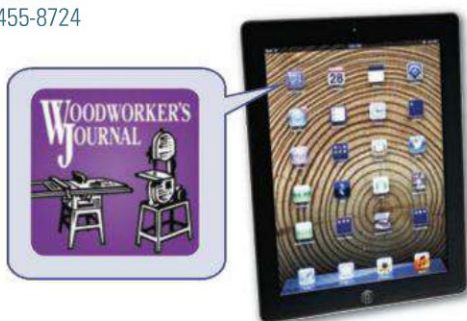
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Paint Lid*



Flexy Cord

The **Flexy Cord™** line of *extension cords* are designed to be tangle-proof and kink-proof, using material with “memory” that retracts the cord back to its original length. The reduced cord diameter and increased coil diameter was inspired by the design of Slinky toys. Flexy Cords are made in the U.S. and come in a variety of lengths, ranging from 4 inches (extending to 8 feet) to 20 inches (extending to 45 feet). Prices vary according to length, starting at \$10.99 for the small cord, while a multi-pack containing five different cord lengths is priced at \$79.99.

Rockler has introduced a larger, gallon-sized version of its original (quart-sized) *Mixing Mate™ Paint Lid*. The new size (item number 44170) functions in the same manner as the smaller version: four cam locks create a tight seal to the can; after it's locked, the user cranks the handle clockwise for approximately 30 seconds to completely mix the paint or finish. The pouring handle has a spring-loaded thumb trigger that allows one-handed operation, similar to a maple syrup dis-

penser. The spring-loaded spout seals itself for storage after you've finished pouring. Mixing Mate can be reused and transferred to other cans. The gallon-sized Mixing Mate is priced at \$19.99.

OttLite® task lighting has options to light up your work — and, to store small things where you're working, the *Craft Caddy Lamp* offers removable trays that fit into a 10"-diameter base. The shade and the arm, meanwhile, collapse for portability. If you're moving things around, there's a storage reel for the lamp cord; there's also an extra outlet on the base for your tools. Regular price for the *Craft Caddy Lamp* is \$79.99.



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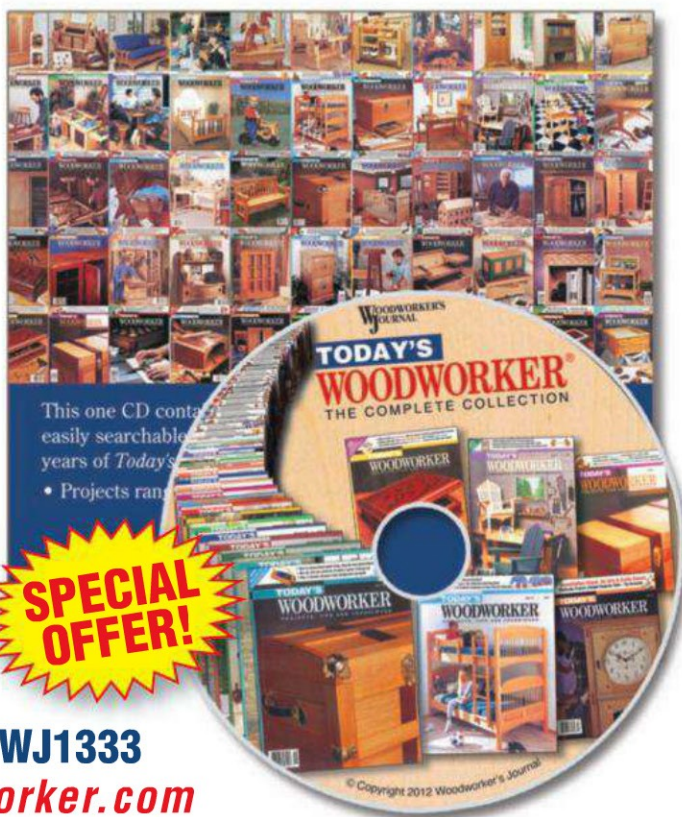
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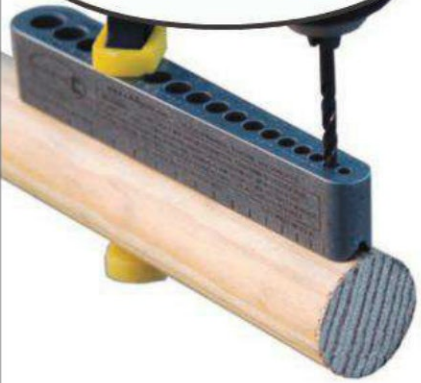
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WORKSHOP Detachable Blower Vac

The **WORKSHOP®** Detachable Blower Vac is a wet/dry vac with a 12-gallon drum and a vacuum power head that doubles as a detachable handheld leaf blower. The Detachable Blower Vac has a peak horsepower of 5 and a 2½" Dual-Flex™ Locking Hose that offers 180-degree flexibility at both hose ends: a locking tab keeps the hose connected to the vacuum during use, but detaches easily. Accessory storage is available on the caster feet and a Roll Tight™ Locking Sleeve keeps them securely connected. The WORKSHOP Detachable Blower Vac is priced at \$115.99.

Elmer's® new *ProBond Advanced™* adhesive is their strongest multi-surface glue. Designed for use on surfaces like wood, ceramics, stone, metal, glass, and more, ProBond Advanced dries translucent and is weather-proof for both interior and

exterior use. The nontoxic adhesive cleans easily with water and won't stain hands. It has a longer shelf life than standard polyurethane adhesive. ProBond Advanced comes in two-, four- and eight-ounce bottles priced at \$4.99, \$6.50 and \$10.99, respectively.



Elmer's ProBond Advanced adhesive

The new **Lamello Classic X Biscuit Joiner** has the first-ever flush base plate in a Classic machine, allowing for easy and fast alignment to the side of a workpiece in all positions, including tight corners. Angle and height adjustment scales have been moved so that both are in clear view of the operator, and there's a new multi-functional stop square that slides onto the base plate to make the application surface larger for more vertical use. The base plate retains Lamello's slide system for rendering precise parallel grooves for alignment of the workpiece.

The motor in the Lamello Classic X has been updated to 780-watts. Simply pulling off the motor cap allows tool-less changes of spare parts like

carbon brushes, switches or electronic parts. Made in Switzerland, the Classic X can install 15 different Lamello joining elements and offers applications like biscuit cutting, connector joining, cutting grooves for tongue and groove connections, cutting expansion gaps for wood ceilings and floors, repair of resin pockets and small defects and trimming of solid wood or plastic edges. The new Lamello Classic X comes in a carrying case and is priced at \$599, the same as its predecessor tool.

The new **Shop Fox W1833 Pocket Hole Machine** offers a stationary approach for making pocket holes. Powered by a 1/2hp universal motor under the front table, the machine bores a single pocket hole with each pull of a lever, into workpieces ranging from 1/2"- to 1½" thick. Cutting action happens by means of a standard 3/8"-dia., 6"-long stepped drill bit, which is replaceable. The machine features an extruded aluminum fence plus two "swing" stops and a hold-down made of high-density polyethylene. Shop Fox reports that the hold-down clamp is a "no adjust" patented design that accepts any workpiece within the thickness range without needing further adjustment. The machine measures 18" wide, 27" tall and 29" front to back, with a 14" x 25¾" footprint. It weighs 56 lbs. The W1833 Pocket Hole Machine has a suggested list price of \$810.



Shop Fox W1833 Pocket Hole Machine



NOTE: See Quik-Link at woodworkersjournal.com for web links to all of these products.

Lamello Classic X Biscuit Joiner



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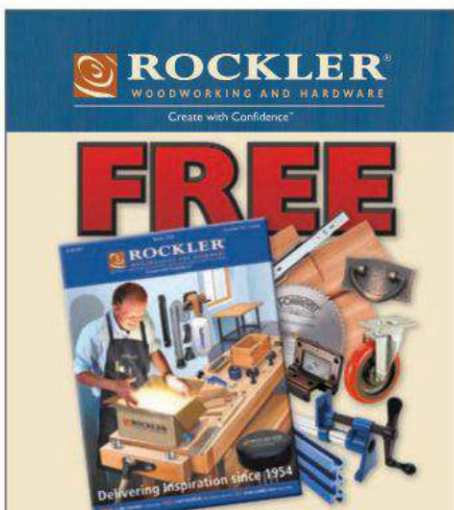
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What's In Store continued



Powermatic PM1500 Bandsaw

"The **Powermatic PM1500 Bandsaw** has a full 14" of resaw height and 14½" of blade-to-frame width, creating a class of its own," says Joan Duvall, director of product management for wood. The 21½" x 16" cast-iron table, situated 40" from the floor, tilts 45 degrees to the right and 10 degrees to the left. The miter gauge features a pivoting head with stops at 45° and 90° left and right. The exclusive, extruded aluminum Accu-Fence is a T-style that's fully adjustable.

Upper and lower blade wheels on the PM1500 are made from iron castings and accept blades up to 153"

long, from 1/8" to 1" wide. Both wheels run on dual ball bearings. Safety features include a foot-operated braking system, a power shut-off switch and a blade tension release with an electrical interlock to prevent the saw from starting when the blade is de-tensioned or released. The thrust bearing accommodates different sizes of blades with no need for aftermarket stabilizers. A magnetic switch protects against power variations. The PM1500 has a 3hp motor, a blade speed of 3,000 sfpm and a 4"-diameter dust port on the back. It is priced at \$2,800.

Universal Internet Thermostat from Hunter Fan



The *Universal Internet Thermostat* from **Hunter Fan** is a programmable thermostat that works with a broad range of heating and cooling systems and can be controlled from anywhere, any time, with an app that works on iOS devices. You can use it to control multiple locations. The Universal Internet Thermostat has a 5 Minute Installation System, works with either a C-wire or 4 AA batteries, and is priced at \$99.99.

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12" RATCHET BAR CLAMP/SPREADER
PITTSBURGH
LOT NO. 46807/
68975/69221/69222

Item 46807 shown

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drillmaster
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SUPER COUPON!

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Small Shop Journal

Indoor/Outdoor Serving Tray Cart

This unique project with removable tray will make outdoor dining easier, while spiffing up your deck or patio. The combination of mahogany, metal and box joint construction makes it an equally attractive furniture piece indoors.



Our Small Shop Journal offering this time includes elementary metalworking. In this case, aluminum tubing makes for a nice first attempt and an attractive accent.

Weather-resistant mahogany elegantly crafted allows this table to be equally comfortable on the deck or in the kitchen.



Grilling and dining out on the deck or patio is one of those great American pastimes. But then there's the matter of getting all your supplies from the kitchen to the Great Outdoors ... and that takes some of the festivity out of it. Several months ago, our art director Jeff Jacobson was contemplating a way to make the whole process easier — wishful thinking after a *very* long Minnesota winter! — and that started a lively design conversation between Jeff, editor in chief Rob Johnstone and our publisher, Larry Stoiaken. The result of their noodling and repeated sketching is the eye-catching Serving Tray Cart you see here. Yep, you read the name right — the top tray lifts off to tote sundries from fridge and cupboard to grill and picnic table.

While you can always take a utilitarian approach to outdoor projects (translate: boring), we wanted this piece to be as stylish and fun to build as it is practical. So, the slats in the serving tray, and the slats they mesh with on top of the cart, are square aluminum tubing. They won't rust if you store this cart next to the grill year-round. They also form a nice visual contrast to the exterior-tough mahogany we used for all the wood parts of the project. The drawer slides are sealed with epoxy coating for durability. Even the drawer pull is brushed stainless steel ... this cart is made for life in the elements. But, box joints and gentle arches here and there offer subtle hints of fine furniture, so this piece will look equally good inside the house.

This Small Shop...

SHOP SIZE:
10' X 14'

PRIMARY TOOLS:
Miter Saw
Benchtop Planer
Portable Table Saw
Disk Sander
Jigsaw, Drill/Driver
Mortising Machine

ACCESSORIES USED:
Tenoning Jig
Box Joint Jig
Various Clamps



If you're ready to ply your skills at some simple metalworking and box joints, then let's get started. To help you out, we sourced the 1/16"-thick-walled, 3/4" x 3/4" aluminum tubing from *onlinemetals.com*. Eight 6-ft. pieces were sufficient, but one extra piece is a good idea, if you happen to make a miscut.

Building the Tray: Measure at Least Twice!

Before we dove into construction, Jeff offered cautionary advice well worth taking to heart. "You're gonna want to build the tray first; it's all about how the tubing fits together ... everything follows from that." He was right. The tray tubing captures the cart tubing when you set the tray down into place. If that interface isn't just so and the tray gets stuck, it's game over. So, we'll start with the tray which, as Jeff points out, begins with the tubing.

Head to your miter saw, and attach a long fence to it so you can size the tray tubing (pieces 1) and the cart's top tubing (pieces 7) accurately with a stop block clamped to the fence. If you've never cut aluminum with a carbide-tooth saw blade, don't sweat it. The process is totally safe, and it won't damage your blade from the abrasion or friction of sawing. Just be absolutely sure to wear your safety glasses, and treat the tubing as you do when cutting wood. Slice the 21 slats to the required lengths (see the Material Lists on pages 66 and 68).

Now crank up your disk sander to knock off all of the sharp edges and corners of the tubing. We set a miter gauge to 60° and clamped it to the sander's table. It kept the bevels consistent and really sped up the process of making those edges "skin friendly." Round the bevels with a file until they're smooth.

Here's the step where Jeff's edict comes through loud and clear again. After you've surfaced and cut the tray's two sides (pieces 3) to length, apply two wraps of painter's tape around both ends of each piece of tubing. This introduces the slip-



A miter saw with a fine-tooth, carbide-tipped woodworking blade makes easy work of cutting the aluminum tubing to size. Use a stop block (see inset) clamped to a long fence to ensure consistent lengths for the tray and cart top tubing.



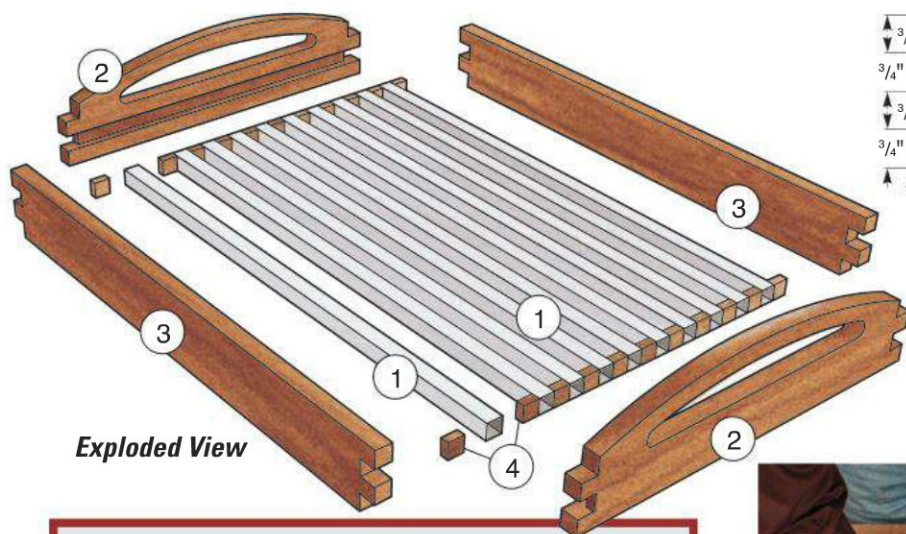
A benchtop disk sander and clamped miter gauge are a good combination for easing the sharp edges and corners of the tubing pieces. Once they're beveled, round over and smooth the ends further with a file.

Serving Tray Cart Hard-to-Find Hardware

The following supplies are available from Woodworker's Journal.

Drawer Pull (1) #1013926 \$19.19 each
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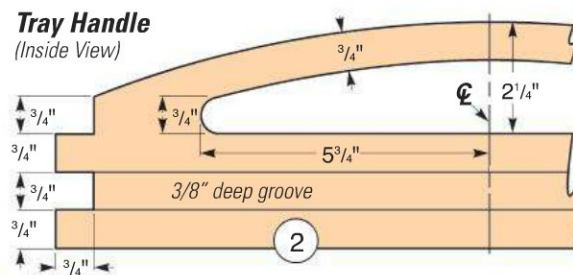
Exploded View

MATERIAL LIST (TRAY)

	T x W x L
1 Tray Aluminum Tubing (10)	3/4" x 3/4" x 24"
2 Tray Handles (2)*	3/4" x 4 1/2" x 17 1/16"
3 Tray Sides (2)	3/4" x 3" x 24 3/4"
4 Spacers (22)*	3/8" x 3/4" x 3/4"

* These measurements are based on the overall width of the tubing when laid out with two wraps of spacing tape.

Tray Handle
(Inside View)



Once the tray's box joints are cut, make a half template of the handle shape from hardboard or other scrap to lay out these details. Cut the handles out with a jigsaw, and round them over with a router.



In order for the top tubing to engage properly, apply two wraps of painter's tape near the ends of each piece. Set them together and take a width measurement with the tray sides to find the tray handle lengths.

space tolerance you'll need to engage the tray on the cart. Lay all 21 tubes together with the tray sides (see photo, above), and carefully take an overall measurement to determine the exact length of the tray handles (pieces 2). Our *Material List* gets you very close, but tape thickness might vary. Honor your measurement, whatever it turns out to be, not ours.

We cut blanks for the tray handles and commandeered a new INCRA IBox Jig to cut 3/4" box joints on their ends. But, a shop-made box joint jig will work too, provided you set it up accurately. When the joinery is done, follow the *Tray Handle* drawing, above, to create a half template for laying out the tray



A series of wooden spacers separate the tray tubing and hold it in place. The length of these spacers must exactly match the width of the cart top tubing plus the tape wraps. Slip-space tolerance is what's at stake here.

handles. Cut them with a jigsaw, sand the curves smooth and ease the inside and outside edges with a roundover bit in a router. Now mill a 3/8"-deep, 3/4"-wide dado for the tubing along the inside faces of the handles. Align these dados with the first slot up from the bottom of the tray so they'll be hidden when the joints are assembled. Slip the 10 tubes into their dados before you glue up the tray frame (use waterproof glue).

Small Shop Projects continues on page 68 ...



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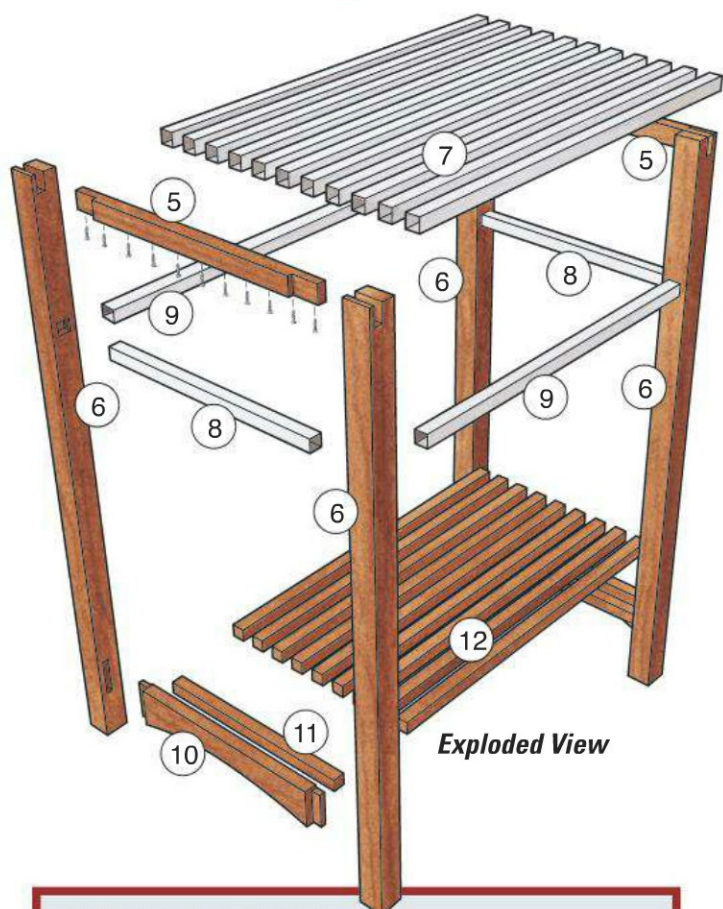


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Materials code: 489



Exploded View

MATERIAL LIST (BASE)

	T x W x L
5 Top Stretchers (2)	3/4" x 1" x 16"
6 Legs (4)	1 1/2" x 1 1/2" x 35 3/4"
7 Top Aluminum Tubing (11)	3/4" x 3/4" x 23 3/16"
8 Side Aluminum Tubing (2)	3/4" x 3/4" x 13 3/4"
9 Front/Back Aluminum Tubing (2)	3/4" x 3/4" x 21 1/4"
10 Bottom Stretchers (2)*	3/4" x 2 1/2" x 14 7/16"
11 Shelf Slat Supports (2)*	3/4" x 3/4" x 12 15/16"
12 Shelf Slats (9)	3/4" x 3/4" x 21 5/8"

* These measurements are based on the overall width of the tubing when laid out with two wraps of spacing tape.

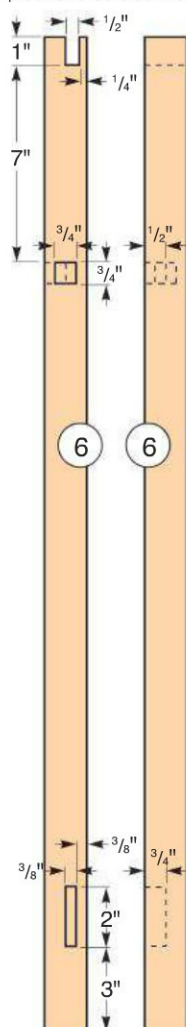
The tray tubes are separated by wooden spacers (pieces 4). Cut these exactly to the width of the cart top tubes plus their tape wraps — use a calipers for precise measurement. Insert the spacers between the tubes with dabs of glue.

Making the Cart Frame

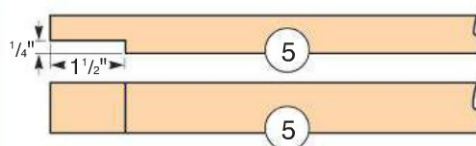
Notice in the exploded view drawing above that the cart's top

The tops of the legs have open mortises that receive the top stretcher tenons. You can mill them vertically with a sturdy and accurate tenoning jig.

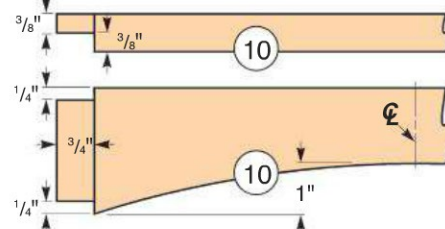
Front Legs (Back and Outside Views)



Top Stretcher (Top and Inside Views)



Bottom Stretcher (Top and Inside Views)



Invert the tray over wide spacers (we used 2x4s), and fit the cart top tubing in place. Remove tape where the stretchers will attach.



Attach the stretchers to the cart tubing with 3/4"-long screws driven into deep counterbores. Arrange the tenon shoulders so they face out.

stretchers (pieces 5) join to the legs (pieces 6) with off-set through tenons. Make your leg blanks at this point, in order to cut the open mortises first; then saw the tenons to fit them. Strip the tape from the cart top tubing on *just* the faces that will be secured to the stretchers with screws, and slip these tubes into place on your tray, with the tray inverted and supported by blocking. Fit the stretchers against the tray handles (see bottom photo, above) so the notched shoulders of the tenons face outward. Bore 1/2"-deep countersunk holes into the stretchers and pilot holes into the cart top tubes so you can attach them with #8 x 3/4" oval head sheet metal screws. Drive the screws into place, then pull the cart top up and off. With that, you can now remove all the tape from the project. Check the fit: the tubing should slip past one another with ease.

Dust off your mortising machine to create 1/2"-deep, 3/4" square mortises for the side, front and back accent tubes (pieces

Small Shop Projects continues on page 70 ...



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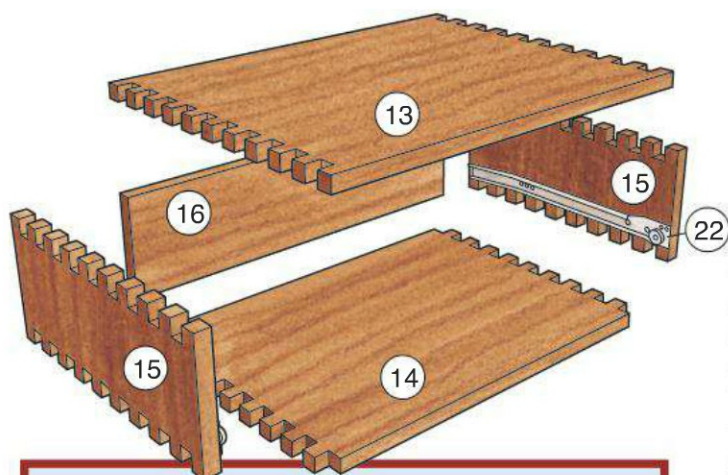
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MATERIAL LIST (DRAWER BOX)

	T x W x L
13 Drawer Box Top (1)	3/4" x 15 3/4" x 20 5/8"
14 Drawer Box Bottom (1)	3/4" x 14 1/4" x 20 5/8"
15 Drawer Box Sides (2)	3/4" x 6" x 14 1/4"
16 Drawer Box Back (1)	3/4" x 5 1/4" x 20 5/8"

(pieces 12) to length. Attach the supports to the inside faces of the stretchers, 3/4" down from their top flat edges, with countersunk screws. Once the clamps come off the subassemblies, fit the front and back tubing into their mortises and bring the framework together by fastening the shelf slats to the supports with 1/4" countersunk screws driven up from below. Start with the outermost slats and space the rest 3/4" apart. Complete the cart's skeleton by spreading glue into the open mortises at the top and dropping the cart tubing assembly down into place.



With the drawer box assembled, the slide hardware installed and screw mounting holes in place, a pair of spacers clamped to the legs makes the box easy to slide in for fastening. Locate it 1/4" below the top tubing.

Adding the Drawer Box

To keep the contents of the drawer dry, and to conceal the slide hardware, the drawer fits inside of a box that hangs between the legs. More 3/4" box joints are a fitting way to put this box together. But, be careful when you glue up the solid-wood panels that make the top, bottom and side components (pieces 13 through 15). Wood movement, especially on an outdoor project, is a real concern. A cross-grain connection here could tear this box apart when the barometer changes. So, here's the fix: glue up a long panel and crosscut the four box parts from it. This way, you'll form a "folded" style box with the long grain running all the way around in the same orientation. The box will expand and contract across its front-to-back width and not cause problems later. Mill the box joints, but as you plan your cuts, notice that both the top and side panel edges start with a pin. The bottom panel has a slot first. Refer to the *Drawing* above.

Once these joints are machined, fasten the "cabinet" side drawer slide hardware (pieces 22) to the inside faces of the drawer box sides. Now is also the right time to drill a pair of countersunk holes in the box sides that will attach it to the front legs. Make slotted screw holes or even short saw kerfs (they'll be hidden), oriented horizontally when the box is assembled, to

Small Shop Projects continues on page 72 ...

We tried out INCRA's new IBox Jig for cutting all of the box joints on this project — including the drawer box joinery shown here. A More on the Web video will show you how it worked — joinery made much easier.

8 and 9). A 3/8" hollow chisel works well. You'll discover that these mortises will partially open up where they intersect inside the legs when you cut them. Don't worry about it ... you've located them fine. Then slide the legs down to the other ends to mill the 2"-long bottom stretcher tenons. Make these 1/2" deep.

You're nearly ready to do some assembly, but there are still a few more parts to make. First cut blanks for the bottom stretchers, and raise their offset tenons on the ends (see *Bottom Stretcher Drawings*, page 68) before you lay out and cut arches along the bottom edges — it's always easier to make tenons on flat-edged parts. With the stretchers shaped, cut the side and front/back tubing to length. There's a bit of grinding to do here: these four tubes need to have about 1/4" of their inside corners mitered at 45° in order to fit together where mortises meet.

Slather some waterproof glue on the stretcher tenons before inserting and clamping them between pairs of legs (with the side tubing installed) to create two leg subassemblies. As the glue cures, cut the two slat supports (pieces 11) and the nine shelf slats

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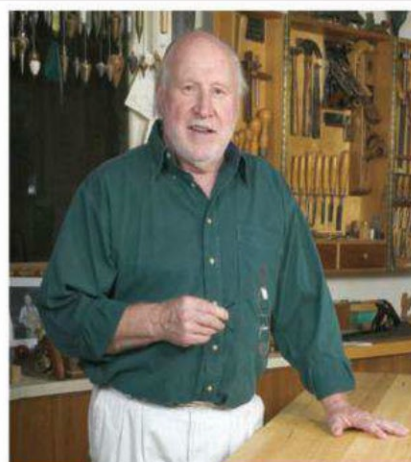
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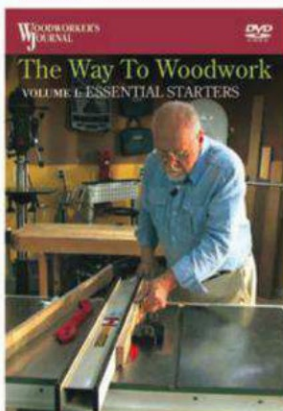
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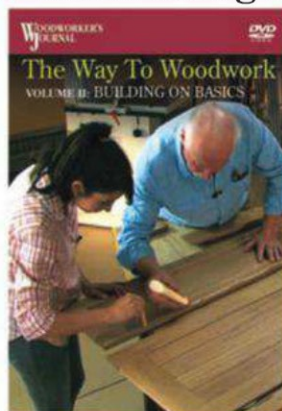


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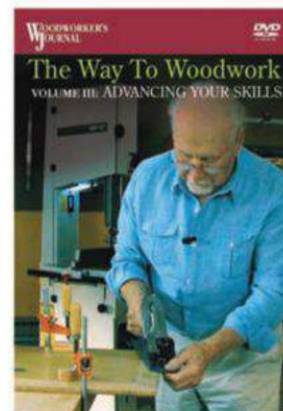
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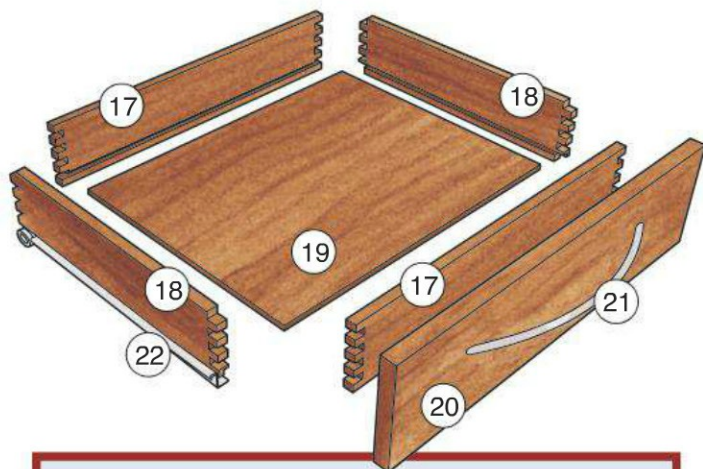
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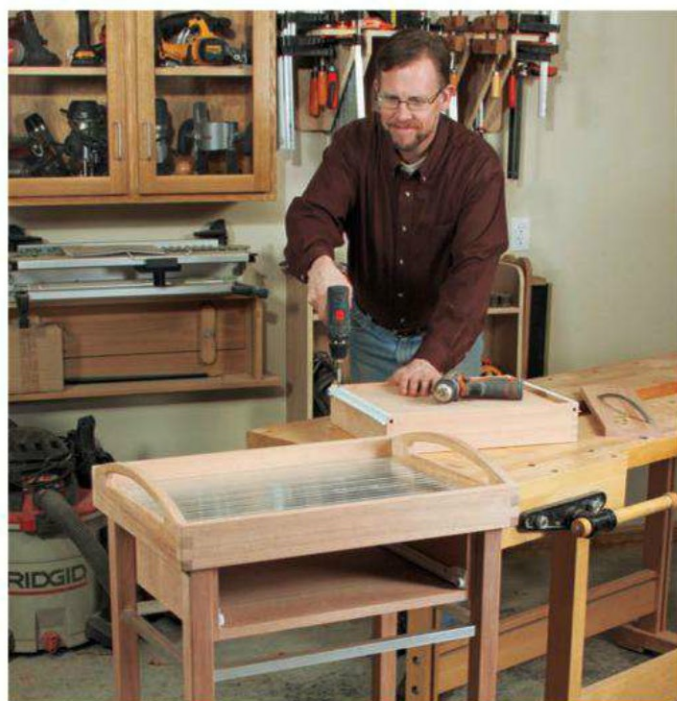


MATERIAL LIST (DRAWER)

	T x W x L
17 Drawer Front and Back (2)	1/2" x 3 3/8" x 17 5/8"
18 Drawer Sides (2)	1/2" x 3 3/8" x 14"
19 Drawer Bottom (2)	1/4" x 13 3/8" x 17 1/4"
20 Drawer Face (1)	3/4" x 5 1/4" x 20 1/8"
21 Drawer Pull (1)	Stainless Steel
22 Drawer Slides (1)	Blum 14"

serve as attachment points for the back leg screws: this way, the box can move front to back but the drawer opening will remain stationary on the front legs from season to season.

Go ahead and glue up the box — notice that the top protrudes past the sides by one pin to serve as a “roof” over the drawer face and box back. We recommend applying strips of tape where the box’s inside corners come together to make glue cleanup easier — just peel off the tape once the glue congeals. When the rest of the glue thoroughly dries, plane or sand the corner joints flat and smooth, and you’re ready to hang the box between the legs. Locate it 1/4" down from the cart top tubing. Extend pilot holes for the screws into the legs. Attach the box to the front legs with flathead wood screws, and use washer-head screws for



Inexpensive but durable epoxy-coated drawer slide hardware should provide many years of reliable use for this drawer, even if left out on the deck or patio year-round. The slides are also virtually foolproof to install.

the back slotted holes. If you build this project during low humidity, position the back screws toward the back of the screw slots so the box can expand when the humidity rises. If it’s already a muggy summer, shift the screws to the front of the slots so the box can shrink. Then cut the back (piece 16) to size and install it with counterbored and plugged screws.

Wrapping Up with the Drawer

With so many box joints influencing this cart, we continued the theme for the drawer carcass. After you’ve cut the front, back and sides to size (pieces 17 and 18), switch your box joint jig and dado blade or router bit setup for cutting a 3/8" pin-and-slot pattern. Make the joints 1/2" deep to accommodate the drawer side thicknesses. Plow drawer bottom grooves on the inside faces of the carcass parts, aligned with the first slots up from the bottoms of the drawer sides. For weather-resistance, go with a mahogany bottom panel (piece 19) and glue it into the front groove when joining the carcass together, but leave the side and back grooves “dry” so it can expand front to back. Screw the slide hardware to the drawer, and hang it in the box. Then install the drawer face (piece 20); center it between the legs and secure it with short screws driven from inside the drawer. Overly long screws, which come with the pull (piece 21), will secure it to the drawer face. Protect your cart with a good exterior finish and move it outside. It’s ready for your next cookout!



The interlocking aluminum tubing of the tray and top inspired us to use large box joints as the joinery choice throughout the project.

MORE ON THE WEB

For a video that shows how the INCRA IBox Jig works to form box joints, visit woodworkersjournal.com and click on the “More on the Web” tab shown above.



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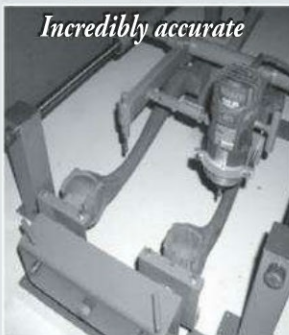
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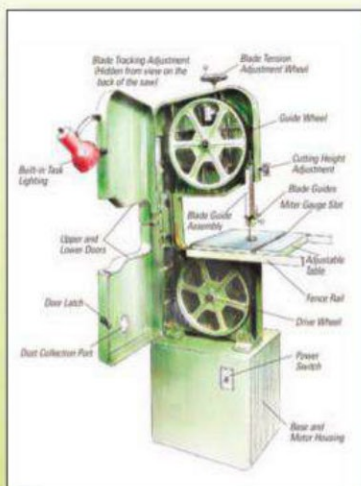
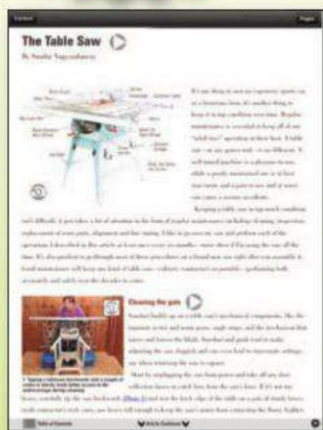


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Finishing Thoughts

Deck Maintenance the Easy Way

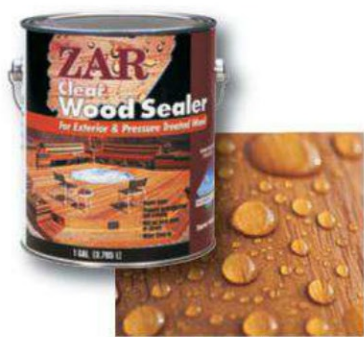
By Michael Dresdner

If you are finishing wood that needs to spend its life outside, consider this attractive and easy-to-apply option.



Surface Prep is Important

When using a penetrating oil or water-based sealer, a really good cleaning is the first order of business. Following that, application is straightforward and exceptionally easy. When done, water will bead up and your wood will be protected.



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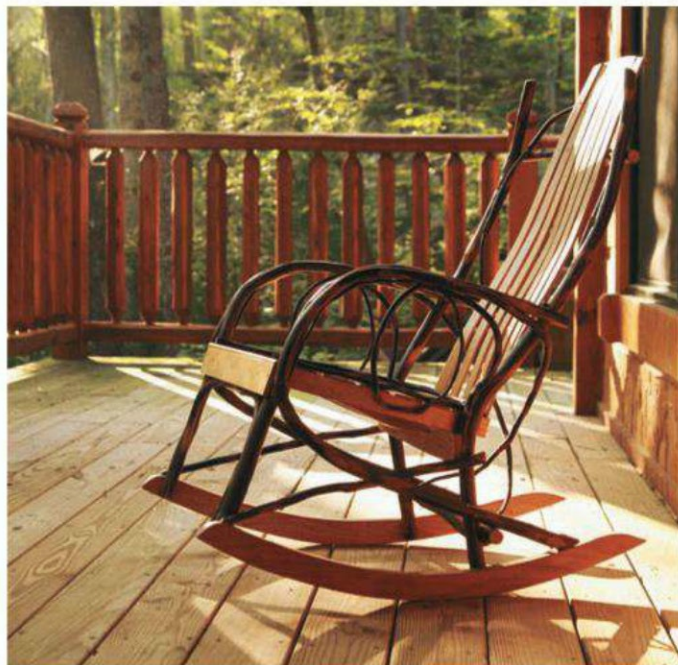
There are plenty of \$30 and \$40 per gallon deck coatings on the store shelves boasting up to four years of UV and mildew protection. They range from clear through lightly tinted toner, to more pigmented semitransparent stain, and on up to opaque deck paint. For a more varnished or painted look, they're a fine option.

But down at the south end of the aisle are the much cheaper deck waterproofers, ranging between \$10 and \$20 per gallon. For many of us, these are a genuine bargain and an ideal choice.

These waterproofing sealers are usually clear or very slightly tinted and may cover more square feet per gallon than more expensive coatings. Besides being inexpensive, they go on uniformly and are quite easy to apply with a large 18" deck roller, an oversize paint pad or, if you own one, a spray gun.

There's another advantage. Unlike deck stains with high resin and pigment contents, these waterproof sealers are designed to impregnate the wood rather than sit atop it. Coatings that sit atop the wood can wear off with foot traffic, while impregnating ones don't.

Typically, these thin, penetrating oil- or water-based mixtures contain a relatively small amount of protective resin. They may also contain wax, to help shed



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The balance: while they beautify and protect your wood well, penetrating oil sealers will need to be reapplied regularly.

water, fungicide and mildewcide, to prevent mold and mildew growth, and UV blockers or absorbers to offer a bit of sun protection. How much of each ingredient the mix contains, especially the rather expensive UV blockers and mildewcides, will affect the price.

On the down side, the low resin and pigment content mean you shouldn't expect them to last too long. Assume you'll have to recoat every year, and if you are in a place with extreme sun and weather exposure, possibly even more often. Fortunately, that is offset by the fact that re-application is fast and easy, and even surface preparation, a must-do activity, is quick and fairly simple.

Surface preparation means cleaning the deck each year before you coat or recoat it. You can buy one of the many deck cleaners on the market,

usually about \$10 per gallon, or save a bit by making your own. Here's a simple recipe.

Dissolve a cup of TSP (trisodium phosphate) in a gallon of hot or warm water, then add a gallon of chlorine laundry bleach. Soak the surface of the deck and keep it wet for a full minute or two to help soften any dirt or mold. Dislodge it by scrubbing with a stiff bristle brush, then hose off the residue. For wood that has gone gray, restore the color by applying a 10% solution of oxalic acid in water to the cleaned, hosed surface. Wet the deck evenly with the acid solution, let it dry, then hose off the white residue before resealing.

Of course, if you own a pressure washer, you can remove dirt, mildew and graying without any chemicals, and it is way more fun to use than a scrub brush.





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