

AIR TOOLS IN THE SHOP: SO EASY ... AND THEY'RE CHEAP! (page 56)

WOODWORKER'S JOURNAL

"America's leading woodworking authority"™



7 BEST-IN-CLASS
JIGSAWS
WE PICK THE
WINNER! (page 44)

A Stunning Shaker Dresser

This American furniture
standard is elevated by
quilted and flame maple.
(page 32)

INSIDE!

Modern Coffee Table
Weekend Turning Project
Designing Basics

June
2011



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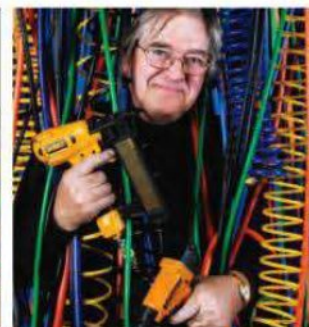


Woodworker's Journal

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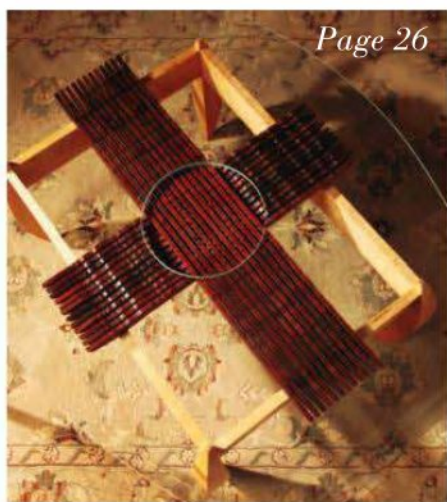
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Letters

We're Having a Contest:

AND YOU'RE ALL INVITED!

We have a select group of woodworkers — thousands of them — who have signed on to answer questions about woodworking and related topics. Recently we asked them about "Designing." Do they design their own projects, do they use plans, do they modify those plans, and do they use CAD software, like Google SketchUp, to express their ideas? We were pretty wowed by the responses and came away confident that the series of design articles that we're presenting right now is being well received.

That brought to mind a pretty cool contest idea, the details of which you'll find at woodworkersjournal.com/design. In a nutshell, we want readers to use Google SketchUp (sketchup.google.com; it's a free download) to design a small project. We'll build our favorite in the December issue of the magazine, and the winner will receive the completed project (after we're done with the photo shoot).

—Rob Johnstone



Reader Scotty Gann, at right, followed the encouragement of his long-time girlfriend and decided that he would jump into woodworking with both feet — even if one of his arms is not at 100 percent. As you can see, his grandson thinks he did great.



not often that a woodworking magazine brings tears to my eyes. Although my wife hasn't been diagnosed yet, I've witnessed firsthand what Dr. Gross is dealing with. I commend him for following his passion and realize the difficulties he has overcome. Thank you for sharing.

Marc Doucette
Toronto, Ontario

My name is Scotty Gann from California. I spent three months building my desk/command center. It is all maple construction. My first time with raised panels, love it! Here is the kicker: I am disabled with limited use of my left arm. I am in a power wheelchair, but not confined. I have wanted to have a shop like Norm [Abram]'s since the first episode of *New Yankee Workshop*. Well, I did just that. I am now 45, but I became disabled when I was 27. I was a licensed contractor doing tile

and marble. I loved it but was unable to continue. I sold all of my tools, thinking that I would never do anything in my shop again. Five years ago for Christmas, my girlfriend Julie gave me a router, a biscuit joiner, a jigsaw and some other items. That lit a fire under me that started my desire to go for it. I have since built a great shop, accessible for me. I encourage all of you that have a desire to create or build something, just do it! The only thing that stops you is you!

If I can do it, anyone can!

Scotty Gann
Hesperia, California

Letters continues on page 8 ...



Inspiring Reading

I just bought my first copy of *Woodworker's Journal*. I picked up the February 2011 issue to help pass the time at the hospital waiting for my wife to do tests at an MS [multiple sclerosis] clinic, only to find Dr. H. Phil Gross's article on living with MS. It's

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Finger, Feather Fixes

I just received my copy of the *Journal* and saw the letter from Grant Thorsett having trouble with a fingerboard ["Letters," February 2011]. The attached drawing provides my answer to that.

Billy McClane
Bentonville, Arkansas

Understated Elegance

The last paragraph, second sentence of "New Look for a Country Table," February 2011, refers to a "master of understatement." One heck of a good master craftsman, too! That table looks great!

Rich Flynn
Huntington Beach, California

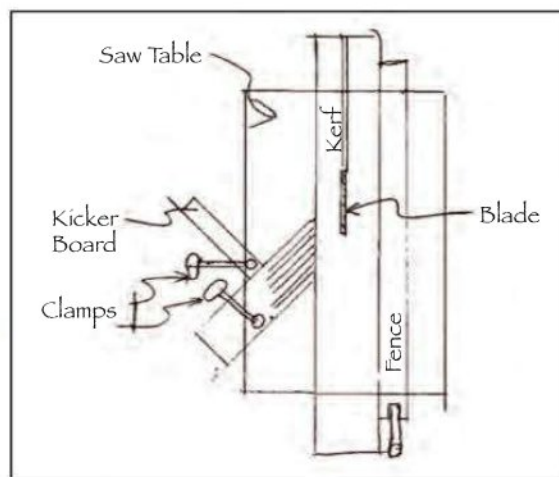
First of all, thank you for many ideas for hours of joy.

Next: the table, and its feet. The feet are made up of two pieces of wood, glued together heel-to-heel, which give no strength. The tenon fibers add

almost no strength, as they run in the wrong direction to do that. By adding some weight on top of the table, I'm afraid the leg will split where the feet parts meet, and the feet spread. My guess is that the original model was constructed with each foot made from one piece of wood, making the fibers run horizontally and uncut through the center section, where the leg mortise is cut, with no support beneath.

Ian Kirby Responds:

Eivind, You say "my guess is that the original model was constructed with each foot made of one piece of wood." While I agree that there are "many ways to skin a cat,"



Reader Billy McClane sketches his featherboard solution.

I truly doubt this idea because cutting the semicircle out of one piece of wood requires a very wide board. A flatsawn board would be prone to distortion and a quartersawn board, which would stay flat, would be weak across the short grain in the lower part of the quadrant. The grain direction, as shown in the article, will give better results.

As to the joint, every mortise and tenon suffers from the fact that the fibers of the two components are at right angles one to the other. The glue line becomes stressed only if there is extraordinary shrinkage. In this case, the glue area is about 2½" by 1⅜", which is not really large enough for shrinkage to make a difference.

If you are still not convinced of the efficacy of the joint, then peg it with a ¼" dowel, as shown in the diagram at left.

Missed it on Morse Taper

With regard to your February 2011 Q&A, it might be more enlightening to have someone quickly determine which taper is used on a modern lathe that uses either a Morse #1 or Morse #2 taper: to distinguish them, get a half-inch dowel or drill shank and attempt to put it into the socket. If it doesn't go in, it's Morse #1; if it drops all the way in, it's Morse #2. With older lathes (antique), there are other tapers that

Letters continues on page 10 ...



Leg Strength?

Master woodworker Ian Kirby notes that you could add pegs to the bottom joint for additional strength.



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Woodworker Dewey Lackey built our Arts & Crafts blanket chest to give to his wife. Dewey modified the design slightly because he had trouble finding 6/4 and 8/4 lumber thicknesses in his neck of the woods.

might show up: Jarno, Brown and Sharpe, American Standard and various bastard ones. With those, you have to machine your own plugs. Technically speaking, the tapers are not the same for the Morse #1 and #2, differing by about 0.1%. Measuring the length of the taper presupposes that one has an existing attachment for your lathe, and that it is a modern version. I have seen some attachments that carry the taper beyond the $2\frac{1}{8}$ ", $2\frac{9}{16}$ " dimensions, so it isn't a foolproof distinguishing factor. For those, measure the small end of the taper: it'll be about $3/8$ inch for the Morse #1 and about $9/16$ for the Morse #2.

Dave Gennert,
Dover, Ohio

Project from the Past

I finally got around to building the Arts & Crafts Blanket Chest featured in the April 2010 issue of *Woodworker's Journal*. Due to the cost of quartersawn white oak here

(only one source available) at almost six dollars a board foot, I chose to use regular sawn white oak at three dollars a board foot. I must say that, for a woodworker who does not come close to being considered a top-class woodworker, the project turned out nicely.

Overall, I am pleased with the project, as is my wife, for whom I made the chest. I did use the dissolved asphalt roofing cement to highlight the veins in the wood, wiping it off immediately. I then finished it out with two coats of teak colored Briwax. I improvised on the thickness of the lid's appearance by planing down 5"-wide boards to 1/2"-thick and gluing them around the edges. This was done because 6/4 or 8/4 thickness was not available locally.

My total costs for lumber, hardware and finishes were about \$300.

Dewey Lackey
Brentwood, Tennessee

JUNE 2011

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Founder and CEO

ANN ROCKLER JACKSON

Editorial Advisors

NORTON ROCKLER JOHN KELLIHER

Advertising Sales

DANA SEVERSON *Advertising Director*
dseverson@woodworkersjournal.com
(763) 478-8306 Fax (763) 478-8396

ALYSSA TAUER *Advertising Operations*
atauer@woodworkersjournal.com
(763) 478-8366 Fax (763) 478-8396

Member



Audit Bureau of Circulations

Editorial Inquiries

ROB JOHNSTONE
rjohnstone@woodworkersjournal.com
JOANNA WERCH TAKES
jtakes@woodworkersjournal.com
CHRIS MARSHALL
cmarshall@woodworkersjournal.com

Subscription Inquiries

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Tricks of the Trade

Better Ways to Make Rules Measure Up



Spread lip balm on screw threads before driving them.

Lip Balm Substitute for Beeswax

It's always a good idea to lubricate screw threads before driving them into pilot holes, but you may not have a block of wax handy when you need it. No worries. Just drag the tips of the screws across a stick of lip balm. The waxy substance works as well as other screw lubes, and I've never had a problem with it interfering with glue or other finishes.

Don Jones
Converse, Texas

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.

Baby Oil Removes Poly

Not long ago, I was in a hurry to get finish applied to my newly constructed workbench. I decided to use oil-based poly and didn't put on a pair of gloves before I commenced with the finish. When I was through, my hands were sticky and uncomfortable. I tried washing and using thinner to clean them, but nothing was working. My wife handed me a bottle of baby oil and suggested I try that. I thought, yeah right, but wouldn't you know it — it worked! The poly came right off my skin. Give it a try some time.

Kyle Phillipson
Trussville, Alabama



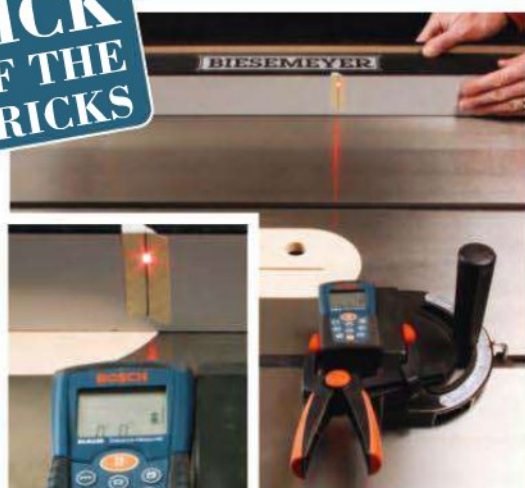
Add a few dabs of hot-melt glue to the seam to stop the door from rattling.

A Hot Fix for Rattling Cabinet Door Panels

Here's my approach to silencing a rattling cabinet door panel. I pull out my hot-melt glue gun and apply a few small beads of transparent glue into the seam where the panel meets the door frame on the back side. On solid wood panels, center the glue so the panel can expand and contract across the grain. Trim off the excess for an inconspicuous fix.

Bob Hicks
Chittenango, New York

PICK OF THE TRICKS



Square Your Miter Gauge, Buck Rogers Style

I square up my table saw's miter gauge with laser precision. First, I clamp a laser level or pointer to the miter gauge fence and set the gauge to 0°. Then I draw a fine vertical line on my rip fence. I slide the fence over close to the miter gauge and move the gauge until the line "splits" the beam (see inset photo). Now move and lock the fence as far as it will go away from the miter gauge. If

the laser beam is still split by the line, you know the gauge is square. If the beam drifts off the line, the gauge isn't square. Adjust the miter gauge fence, and repeat the close/far inspections until the beam remains centered on the line. Assuming you are within 1/32" of centering the beam, your gauge will be accurate to a tenth of a degree.

Bill Wells
Olympia, Washington

New Grip on Metal Rules

When drawing or knifing mark-up lines, a slippery metal rule can shift off of its mark. Instead of pressing down on it with the whole pads of your fingers, use just half the pad of your thumb and middle finger. Press the other half against the workpiece. It pins the rule down more securely.

Serge Duclos
Delson, Quebec



A strong magnet holds both the plane blade and rule together when honing a microbevel.

Even Greater Attraction to Microbevels

David Charlesworth developed a technique for forming a microbevel on the back of a plane iron when sharpening it on a stone. He uses a thin metal rule as a spacer under the blade. Trouble is, the rule tends to slide off the stone as you move the blade over it. To

remedy the problem, I attach a strong magnet to the plane blade, which also holds my rule in place. Now I can take full advantage of this clever sharpening technique.

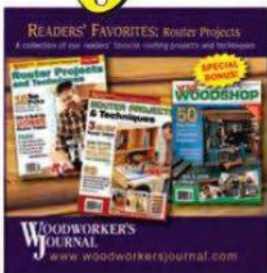
Charles Mak
Calgary, Alberta



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works with all the products in Craftsman's 12-volt lithium-ion NEXTEC line and can be programmed for either the three-minute charge to 25 percent of a battery's capacity, or for a 30-minute full charge. Onboard diagnostics monitor charging progress using red, yellow and green LED lights. The QuickBoost Charger is included in new NEXTEC kits; sold separately, it's priced at \$39.99.

composites and woods as hard as ipe. According to the manufacturer the screws back out easily if a board needs to be replaced and they offer limited lifetime warranty against rust and corrosion on the screws, available in ProTech coated or stainless steel finishes and in 1½" or 2½" lengths. Built-in shoulders on 3" driver bits for both grooved and ungrooved boards set automatic depth



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of drive. The Marksman installation tools are available in either a do-it-yourself (\$19.95) or Pro (\$49.95) version, with the driver bits priced at \$3.95 for a two-pack for ungrooved boards and \$5.25 for a two-pack for grooved boards. Screws pricing ranges from \$11.95 for a 100-count pack of 1½" Protech coated, to \$128.95 for a 700-count pack of 2½" of stainless steel.

Craftsman NEXTEC
QuickBoost Charger





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Questions & Answers

The Cautious Woodworker

THIS ISSUE'S EXPERTS

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

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

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

Contact us

by writing to "Q&A,"
Woodworker's Journal,
4365 Willow Drive,
Medina, MN 55340,

by faxing us at (763) 478-8396
or by emailing us at:

QandA@woodworkersjournal.com

Please include your home
address, phone number and
email address (if you have one)
with your question.

Q I consider myself a careful woodworker, paying attention to detail. Yet, many of my flat glue-ups for which I use biscuits don't line up on the "top," or finished side — the side the public sees. I've taken into consideration the following factors already: I know it is imperative that I place the biscuit jointer on the same side of each board. I do that, and I index the boards with witness marks.

I know that the tool must be held flat and square, and I know that the tool must not move around, lest the biscuit sit in a wallowed-out hole.

I thought one of the biggest selling points of the plate jointer was to keep the tops of the boards aligned to minimize sanding after glue-up, but I'm not having those results.

Jim Randolph, D.V.M.
Long Beach, Mississippi

A Without knowing the misalignment you are talking about, I have to make an assumption or two. I'm guessing that

you are talking about that exceptionally annoying slight misalignment that takes a frustratingly significant amount of sanding to "erase." (Trust me, I've been there many times.)

Perhaps if I owned a Lamello, which is in the stratosphere of biscuit joiner quality, I might sing a sweeter song — but it's been my experience that biscuit joiners are just not precise enough to provide perfect edge alignment.

Biscuits do help align long butt joint glue-ups. It is much easier to align and edge glue two 60" pieces together with biscuits than without them, but there will still likely be

places where the edges will not meet perfectly. And I have to say that, on shorter butt joint glue-ups, say 30" or shorter, I don't find biscuits to be of any help or benefit whatsoever. They are great for face frames, installing shelves, end grain to end grain glue-ups, solid wood to plywood glue joints — but butt joints in solid wood are not in any practical sense stronger for the use of biscuits, so why use them?

To treat your original problem, my friend Ian Kirby would tell you to get a good #07 bench plane along with a few extra irons for it — and just plane the surface flat. It will take only a few moments, and you won't even need to sand it when you are done.

— Rob Johnstone

Q I was using my sliding miter saw the other day, rocking the saw down close to the fence and then sliding the saw away from the fence. My friend told me I should pull the saw away from the fence and then rock it down and cut towards the fence. I have always started cutting with my

Are biscuits beneficial for butt joints? Will they perfectly align your joint?





Push or pull? Should a woodworker employ the same cutting direction with miter saws and radial arm saws?

radial arm saw behind the fence and pulled it away from the fence. It seems to me that the force of the blade tends to pull the wood down and towards the fence that way. Which way is correct with the sliding miter saw and the radial arm saw?

Dan Withrow
Plainfield, Illinois

A Dan, according to the safety instructions that come with a radial arm saw, your cutting methodology is right for that machine: start with the motor head closest to the column and protected by the fence, and pull it through the wood to make the cut. But your friend is right about how to operate a sliding miter saw.



With the saw turned off, pull the motor all the way toward you, squeeze the trigger, lower the blade down into the table slot and push the blade through the cut. It's the opposite approach from a radial arm saw. I prefer the "feel" of operating a sliding miter saw, because you are pushing the blade against its rotation and pressing the wood into the fence at the same time. Still, the correct technique for a radial arm is a "pull" cut.

— Chris Marshall

Continues on page 18 ...



Winner!

For simply sending in his question on determining square, Jim Randolph, D.V.M. of Long Beach, Mississippi wins a Osborne Miter Gage by Excalibur (from General International). Each issue we toss new questions into a hat and draw a winner.

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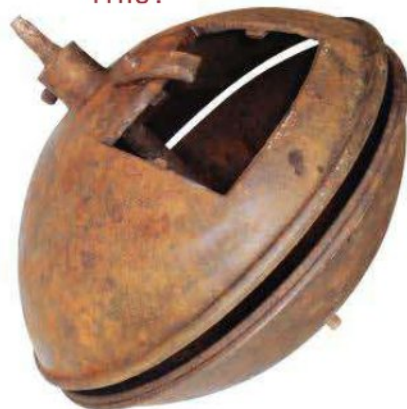
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Stumpers

Strong Supporter

Readers let the cat out of the bag when they identified this sack holder.

What's This?



What might you call this whatchamacallit that Terry Luther of Marietta, South Carolina, found "near an old homeplace"? Or what might it be used for? Send your answer to stumpers@woodworkersjournal.com for a chance to win a prize!

You could stuff a sack full of the guesses we received for our February 2011 mystery tool — and, luckily, the sack holder would be there to support it.

James Mullins of Cape Girardeau, Missouri, commented that "the 'C' shapes" on the tool belonging to **Ron Sollinger** of Wenatchee, Washington, "would loop over a rail" — but it took **Dave McKean** of Bountiful, Utah, to provide the full explanation:

"The item you are showing is used to hold open sacks. The end with the curled 'C' hooks can be hung on a pipe. That end has two sharp

points, where the open end of the sack is stretched tight and pulled onto the pins holding it in place. The opposite side of the sack is hooked onto the pins and is lifted up by the thin blade with the chain on it, to where the round pipe is located. The pipe can slide back far enough to allow the flat blade to be lifted flush with the handle shaft. The handle slides forward, locking the blade and sack in place.

"The framework provides for a square opening to place, or dump — whatever — into the sack. We used our frames to place large onions."

Winner! Dave McKean of Bountiful, Utah, wins a PORTER-CABLE 23GA, 1½" Pin Nailer Kit (Model PIN138).

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



Don Pontler of Puyallup, Washington, had a bit more to add: "[I was] raised on a wheat ranch, and this is similar to an attachment on a large wood panel used in the 1920s, '30s, even maybe the '40s, when harvesting wheat. The panel had two holes with sliding gates. Mounted on the other side of the panel were two sack holders to hold burlap sacks, similar to the Stumper. Once a sack was filled, a large handle would be moved so that the slide gate was closed and the

other slide gate opened. The handle on the sack holder was pulled back, releasing the U-shaped

piece with the chain and tang, allowing the grain sack to be removed as it folded up. A new sack was fitted to the four prongs, and the U-shaped piece moved up into place by the chain so the handle could be moved forward to lock it into place."

And there you have it — with no one left holding the bag.

— Joanna Werch Takes



Questions & Answers continued



Q I am building a set of bookcases from birch plywood with pine facing, trying to match those installed about 25 years ago. I chose to shellac the cases first to avoid blotching and perhaps get a more even finish. I've shellacked the new cases but now decided this was not a good idea. I know alcohol will soften the shellac, but how can I tell if the shellac has indeed been removed, and is this the best method to remove it? Should I decide it isn't worth the trouble to remove the shellac, what will be necessary to paint over the shellac as well as over the older polyurethane?

R. Williams
Newnan, Georgia

A Scrub the wood with denatured alcohol on nylon abrasive pads and wipe up the resulting slurry with paper shop towels. When the towels start to wipe clean rather than being discolored by the slurry, you have as much of the shellac removed as will be coming off. Sand the wood again with the final grit you used before and proceed with your finish. If you want to paint over any existing finish, the process is as follows. Clean the surface by scrubbing with mineral spirits or TSP on fine nylon abrasive pads. If you're unsure of the compatibility of the existing finish with what you plan to apply, add one coat of Zinsser SealCoat™, a clear primer, before adding the topcoat.

— Michael Dresdner

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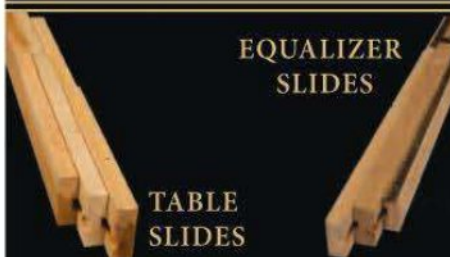
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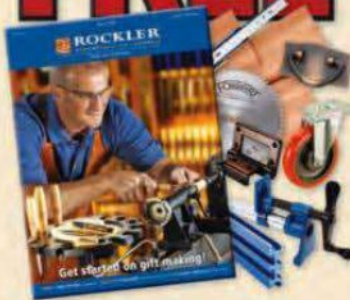
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Shop Talk

Trees and Teapots



"The first thing
you have to do when
preparing to make one-of-
a-kind wooden items is to
find one-of-a-kind chunks
of wood to work with!"

— Chris Lubkemann in

Tree Craft:

*35 Rustic Wood Projects
That Bring the Outdoors In.*

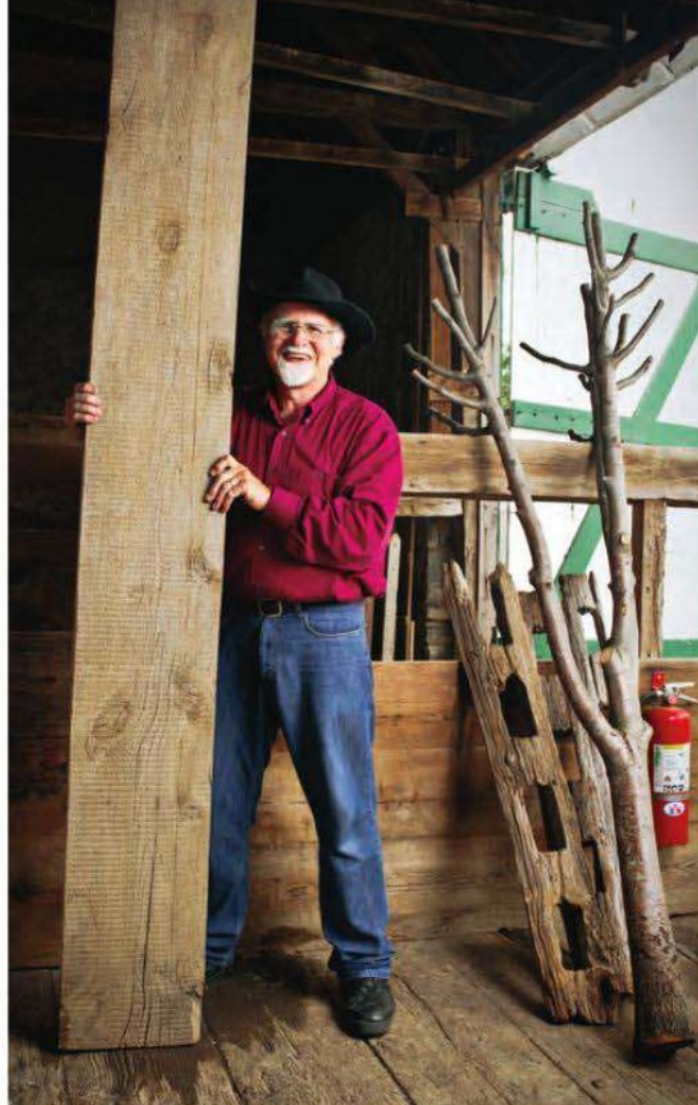
Tree Craft

Working with Found Wood

From a childhood in the South American jungle to an Amish farm in Pennsylvania Dutch country, Chris Lubkemann has been playing with wood — reflected in his book of playful creations, *Tree Craft* (published by Fox Chapel), with a focus on projects made from found wood.

Chris himself first discovered his passion for working with wood as a young boy in Brazil and Peru, where his parents were missionaries. As his dad made furniture, Chris saved small pieces of wood that fell to the ground to build "fun little things" like boats. He found inspiration from all the boat building going on at the town on Peru's alligator-filled Ucayali River.

In his adult life, Chris's woodcarvings — some of them sold door-to-door — have helped to fund his



Chris Lubkemann's projects come largely from "found" wood — he thinks this piece, from a secondhand shop, may have been an old floor joist.

college education and the overseas travel of Chris and his wife, who themselves served as missionaries for many years.

In his travels, Chris says he's used about 80 species of wood. Generally, he prefers

harder woods: birches, maple, oaks, citrus woods, holly, beech, guava in the Philippines. The tighter grain and smaller pith in the harder woods works better for his type of projects: when carving in spongy pith, he said, "It's like carving



One of Chris's specialties is carving roosters from Y-shaped branches. His smallest (so far) is 1/8" tall, including comb and tail.

Styrofoam®. It doesn't hold up."

His own career has held up well and, in 1972, he began teaching carving to others, including via television in England and Portugal. Despite his self-identification as "low man on the totem pole" among carvers, it was Fox Chapel that asked Chris to write an "eco-chic" book.

Tree Craft's focus is not particularly on carving, but on creating its 35 projects for home or personal use from found wood. A checker set was created from a stump in Chris's front yard; a coat rack from a neighbor's Bradford



Chris Lubkemann has picked up wood in Portugal, the Philippines, Canada, Mexico and more. These branch carving knives reside on his homepage at whittlingwithchris.com.

pear tree that had to come down — Chris told him, "Don't throw it out. I'll make something out of it" — and some lamps from old Christmas trees, old oak firewood and hardware Chris took out of lamps purchased from Goodwill.

Knothole picture frames are a project from the book Chris cites as particularly practical, and wooden knives, spreaders and letter openers as among the most popular. "I can't

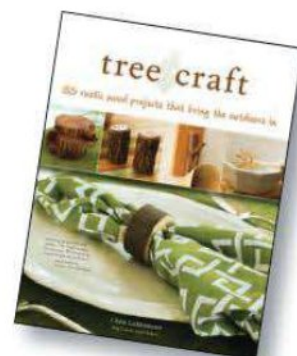
believe how much people like these little wooden knives."

Chris makes his projects using a drill, a makeshift table saw and a small belt sander. "I don't have a fully equipped shop; most everything I do is with hand tools," he said. That 12' x 20' shop is located in part of an old barn, where Chris is a resident artisan at the Lancaster County, Pennsylvania Amish Farm and House living history museum.

"I have a ton of fun in what I do," he said.

— Joanna Werch Takes

Shop Talk continues on page 22 ...



Tree Craft:
35 Rustic Wood Projects
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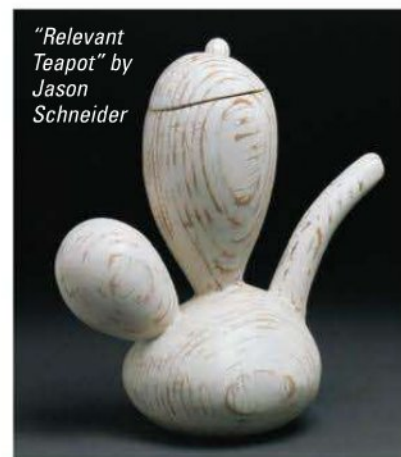
"Tea" is for Turning

Gallery of Wood Art Hosts Past, Future Exhibits

The American Association of Woodturners' [AAW] Gallery of Wood Art recently hosted a feast for woodworkers' senses with exhibits of "The Teapot" and "A Gathering of Spoons." The teapots numbered over 40, each of them created, at least partially, on a wood lathe, and the spoon exhibit displayed more than 50 hand-carved wooden spoons. You can see the entire exhibit catalog at the galleryofwoodart.org website.

The AAW will serve up an even more sizable sampling of exhibits, demonstrations, discussions and more this June 24-26

at its 25th anniversary symposium in St. Paul, Minnesota. For more information you're invited to visit their home page at (woodturner.org) or call 877-595-9094.



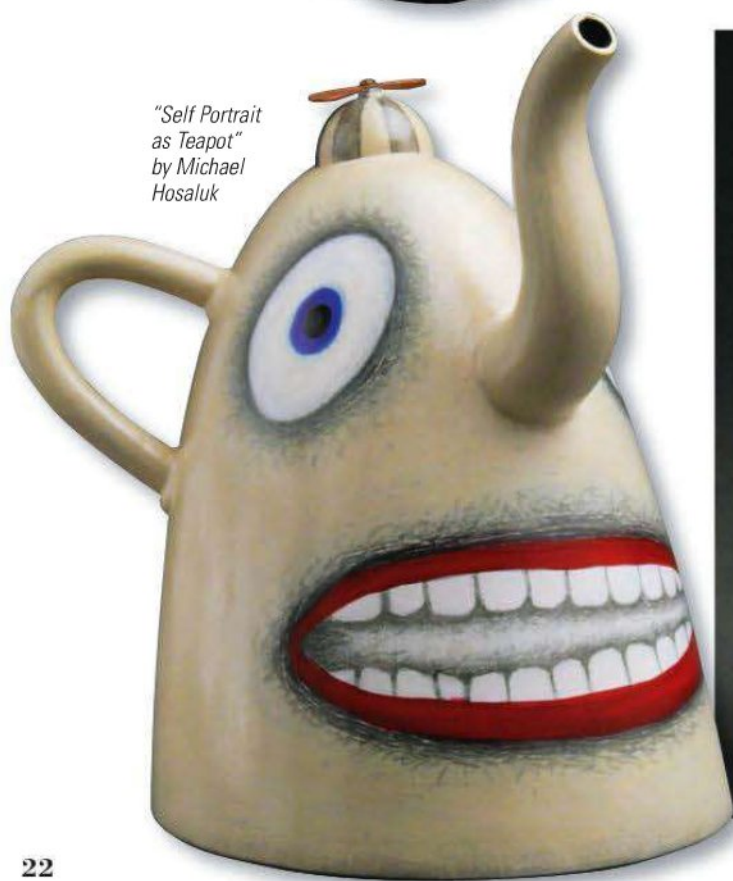
"Relevant Teapot" by Jason Schneider



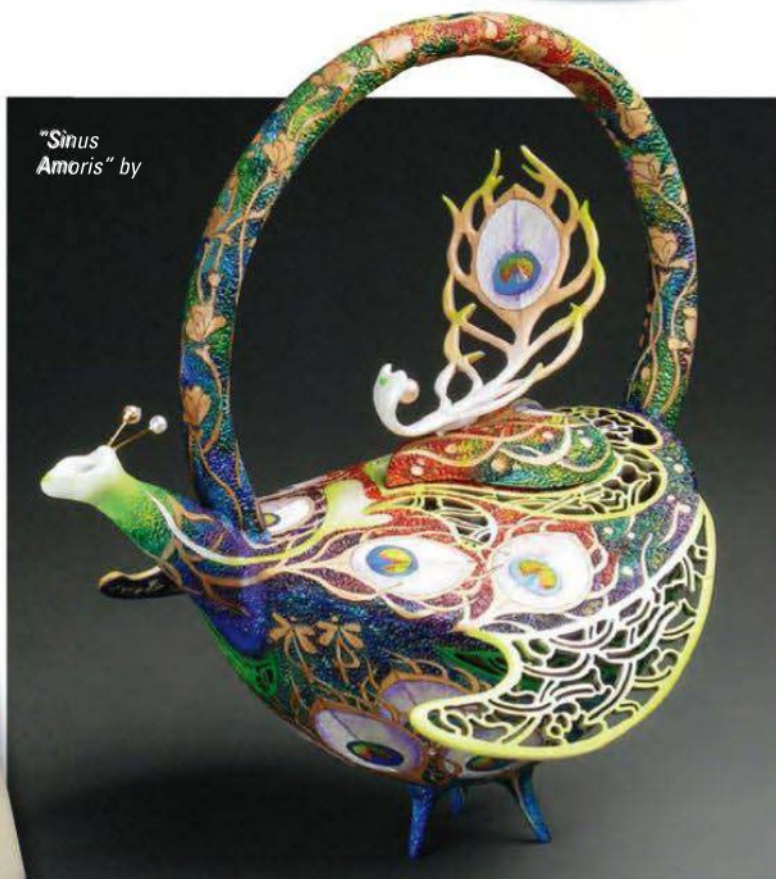
"Lip Service" by Dixie Biggs



"Late Harvest Blend" by John Goodyear



"Self Portrait as Teapot" by Michael Hosaluk



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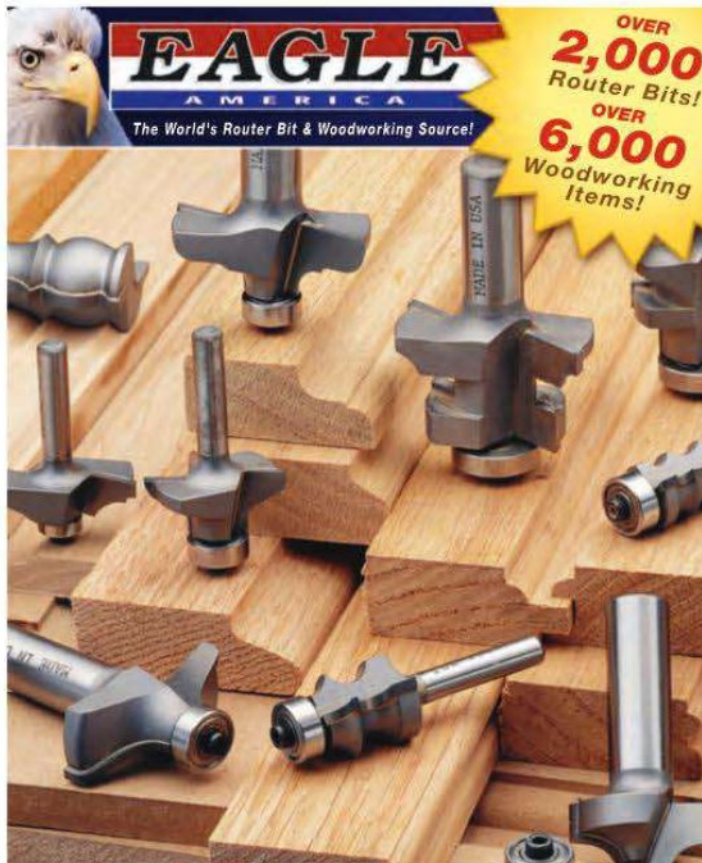
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An Exercise in Form and Space

By Ian Kirby

Design is a different exercise than woodworking — with its own vocabulary and methods of expression. Proportion, form and space, for example, are terms that our author has been discussing in this series of articles. Gaining an understanding of these terms and concepts will equip a person with tools to help him or her make informed decisions when designing woodworking projects.



The space above and below the rails on this table gives it a balanced look. How would the more dramatic relationships shown in the adjacent drawings sit with you?

“**V**isually, the space is more interesting than the form,” was a proposal I offered in the previous article in this series. It was made to get you to pay as much attention to the space as possible — the assumption being that most woodworkers tend to look at the wood, and only the wood. Of course, the form and the space are inextricably linked. If you change the form, you change the space.

Regardless of whether you are fully conscious of space or not, it's very likely that at some time you've taken it into account. For instance, if you have ever made a table or a chair with lower rails, then just where to place them is very much a matter of the space. In deciding their position we would generally ask the questions: are the rails too high, too low or just right? If you think about that, what we are really asking is, “are the spaces right?” Once you have determined the dimensions of the rails, the positioning may be partly structural, but it's mostly spatial. We earlier asked the question “are the rails just right?” Rail and right are not at all the best words to use here. Try “are the proportions of the spaces in accord here?” Are they in proportion to one another in the same way that the legs, rails and overall dimensions are in proportion?

Of course, you may have never built a piece of furniture with this sort of rail, but you have looked at tables and chairs with lower rails and, even if you didn't consciously think “those rails are too high or too low,” your subconscious was disturbed enough to think there was something unbalanced about the piece. Look at the series of drawings below. Using sketches of the same table we used as our example from the last article, I placed the lower rail in a variety of positions. It is the same single rail in the first five drawings — but as it is relocated, the space, or you might say the overall “look,” changes dramatically. In the last drawing, another rail is added and you can see immediately that the space becomes even more complicated. In the same way, you would evaluate the legs of a table or a chair and they could be square or cylindrical.



Concentrate on the Negative



Understanding space is an important step in learning about design. But how, you might ask, can we see space? Think about film photography. A negative image is created from which a positive image is printed. Interestingly, those negative images, as shown in the chair image above, do a great job of emphasizing space over form.

We could determine that they are too heavy or too thin for their situation and, in doing so, we would agree that the proportions are “wrong.” But what are the proportions “wrong” against? Is it the space that’s too great or too small or is it the form? Whatever it is, in this case, it’s the wood that you’re going to adjust and that will affect the space.

Our table’s top rail (also called an apron) is different in that it’s not in space like a leg or a lower rail. Its relationship is much more bound up with the proportion of the top. In our example, the top is flush with the base, but it could have had an overhang, and that would have changed the balance of the form and space significantly.

Full-size Mock-ups

When you are designing a piece, after getting your ideas and thoughts together, you should make a working drawing. This would best be a full-size drawing that will include the sizes and proportions of both the forms and the spaces. You may be well satisfied with the looks of the piece as shown on the orthogonal drawing. But curiously, it’s not a safe bet that you will like it when it is built. In the translation from the two-dimensional drawing to the three-dimensional reality, spaces become volumes. That is why I always build a full size mock-up — it is well worth the effort. With that said, a recent *Journal* survey showed that less than 2% of woodworkers make a full-size mock-up as part of their

design process. My question is why not build a full-size mock-up? Is it a lack of materials, lack of understanding of the “how-to,” believing you don’t have time or that the return on the effort is too small — what exactly?

As a furniture designer, I think it’s a vital part of the design process and worth every minute spent on it. Furthermore, if you have neither the tools nor the skill to make a drawing, you can begin with a mock-up and it will help you express your design decisions very well.

As you become more attuned to and conscious of spatial relationships, the mock-up becomes more than a tool to determine joints and methods of making. It allows you to evaluate proportion, form and space. Make it accurate in every detail and, when it’s painted white, it will show off its design features to the fullest. Your actual project will be vastly improved as a result of your efforts. Try it, and I am confident that you will agree.

Third in a Series: Our survey results showing over 90% of woodworkers want to learn more about “how to design their own projects” spurred the *Journal* to call on Ian Kirby to write on the topic. With a degree in furniture design from Leeds College of Art in England, Ian is the perfect woodworker to cover this often confusing topic.

— Rob Johnstone



Form and space are inextricably linked — if you change one, you change the other. Moving the location of the rail (part of the form) strongly affects the spaces of the piece. Combining drawings such as these with building full-sized mock-ups will help you to determine the dimensions of parts and position them so that spaces are in balance.

Glass Top Coffee Table

By Frank Grant

The author makes use of a bevel-edged glass top to put the intricate shapes of this table's woodworking on display.

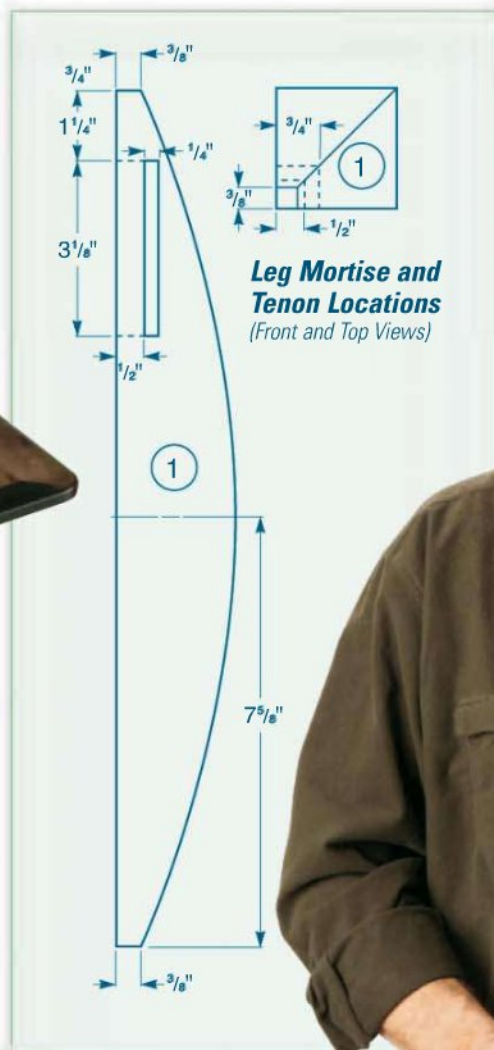


Ten years ago, I had an idea involving four 2½" x 17¼" scrap blocks of maple that were left over from a previous project. That project, a dining room table entitled "Dinner Music," incorporated many of the details that inspired this coffee table. I call it "Dinner Music II: the Aftermath," because it represents the natural progression from an evening meal to the couch.

The coffee table has one thing its predecessor didn't: a glass top, something I couldn't afford at the time. A custom-shaped piece of ½" glass with a 15" hole cut in the middle just wasn't in the budget.



For accuracy, the author used his mortising machine to chop the mortises for the aprons. As shown in the Drawing at left, the mortises are positioned so that the top of the legs and lattice are on the same plane.



These legs are formed on the band saw using the same two-cut technique that is used to make cabriole legs. This shape is much less complicated, but still needs to be precisely made.





Using carpet (double-faced) tape to secure the leg blanks to the template, the author carefully shapes and smooths the curved faces of the legs with a pattern-routing bit.



Bare-faced tenons join the aprons to the legs. With the tenons cut, the author bored a series of holes in the edges of the aprons for securing the lattice (inset).

“A bit of cabriole inspiration led me to these curvaceous legs.”

— Frank Grant

But back to the legs. I was sitting there at my bench looking at these nice sticks of maple, and I began to wonder what it would look like to form adjoining radii, constructing them in a manner not unlike cabriole legs. It's a technique where you trace your pattern onto adjoining leg faces, starting by making a cut through one face to form the profile, then reattaching the waste wood with double-sided tape, rotating the leg 90°, retracing the shape and cutting the adjoining profile. In this case, the technique revealed an interesting and cool compound shape. It's fun to do, but, as with traditional cabriole legs, be sure to complete your joinery first — it's easier and far more precise that way.

I quickly settled on the shape of the legs and found a nicely figured maple board sized perfectly to make the ends and sides (which form the apron) of the table. I also had a nice stash of purpleheart lying around, and this helped hatch the idea of constructing a decorative cruciform shape that would present a “woven” appearance, but without actually weaving it. I just love making more work for myself, especially when it comes to joinery.

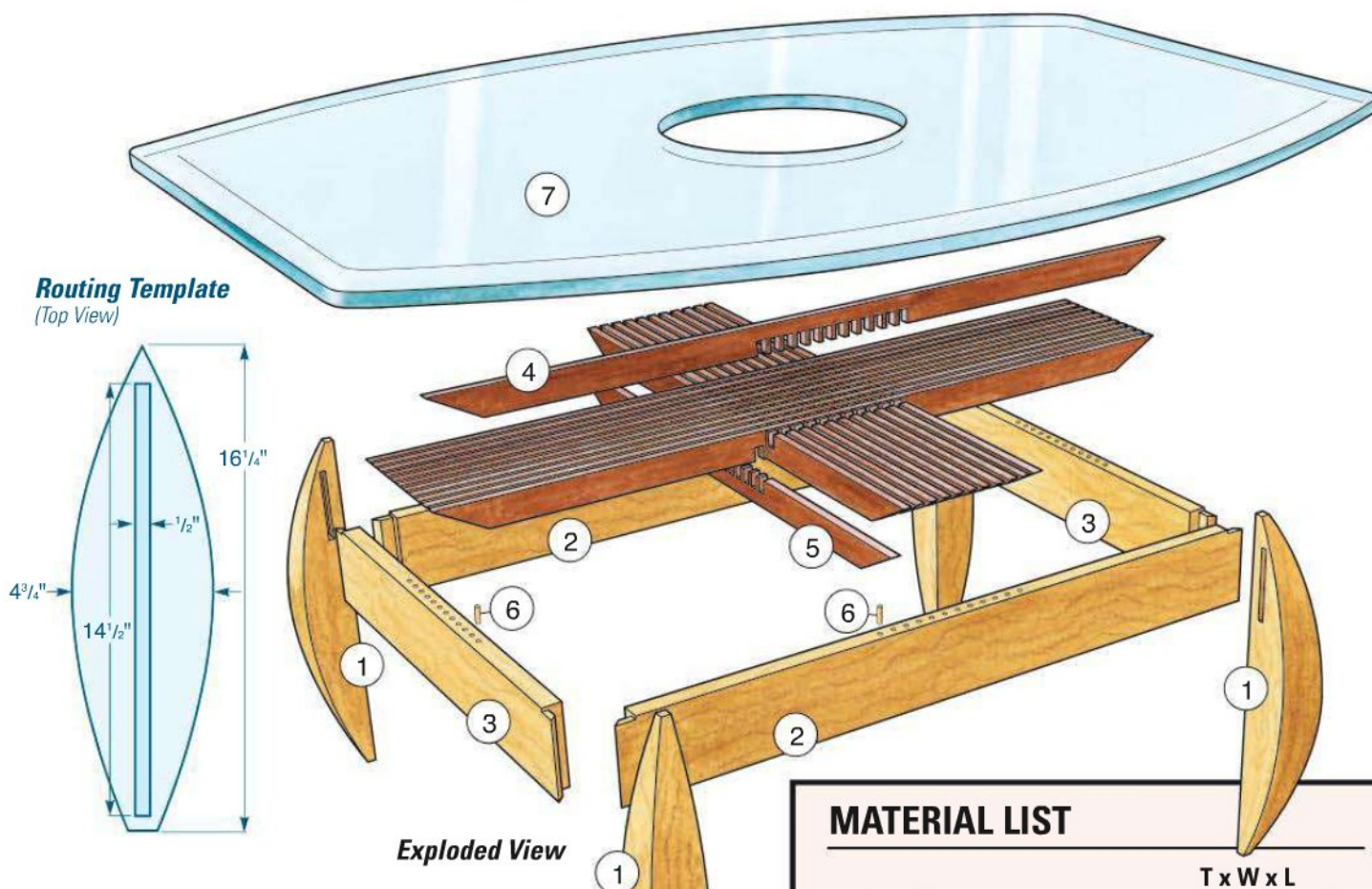
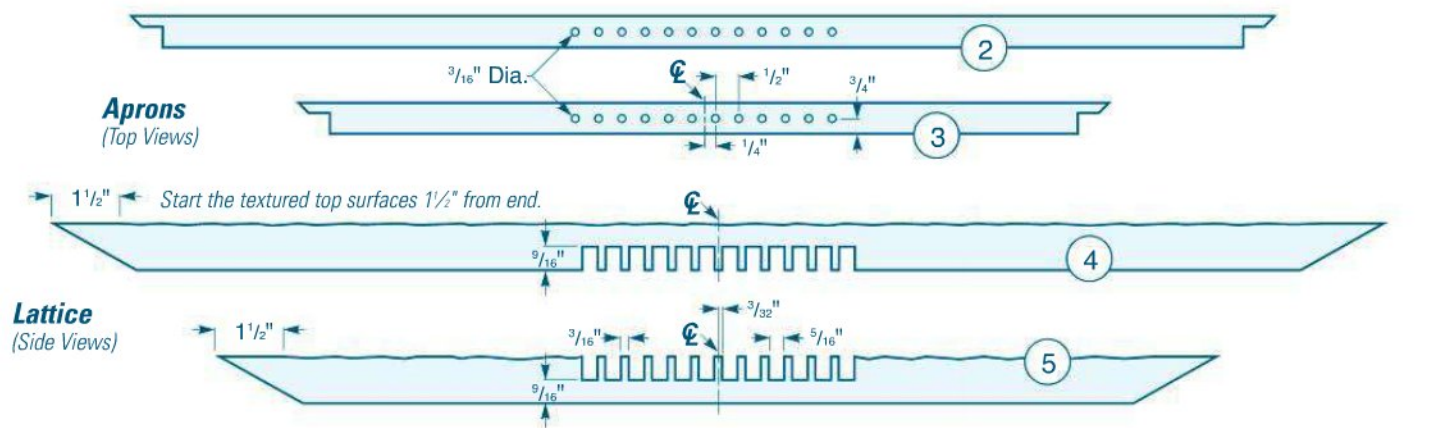
While the shape of each leg was very simple, it also needed to be precise, so I included making a leg template in the design process. I used a stick compass to make the curves for the legs, and in doing so I was quickly able to see that normally shouldered tenons (with the tenon in the center of the 3/4" apron boards) would project beyond the leg curve. So I decided I would offset the apron tenons flush with their outside faces (called a bare-faced tenon), locating their inside faces flush with the inside corners of the legs. This construction would form a clean, simple detail when seen through the glass top. I then shifted the mortises on the legs down about 1 1/8", the thickness of the purpleheart leftovers that would become the cruciform centerpiece. With the construction details determined, I moved on to the machining steps.

Making the Parts

Shellac or poly, glossy or flat — which looks better? Tails or pins, mortises or tenons ... which should you make first? Without taking time to solve all of woodworking's raging controversies, I can tell you that I make my mortises first, and then fit the tenons to them. In this case, I used a benchtop mortiser to chop the apron mortises. I had to be careful not to cut too deep and chop through what would become the finished curved faces of the legs. You can find the details for the mortise and tenon dimensions in the *Drawings* on the previous page. For overall joint integrity, I cleaned up the bottom of the mortise with a 1/4" chisel to take out the roughness the mortiser tends to leave behind.

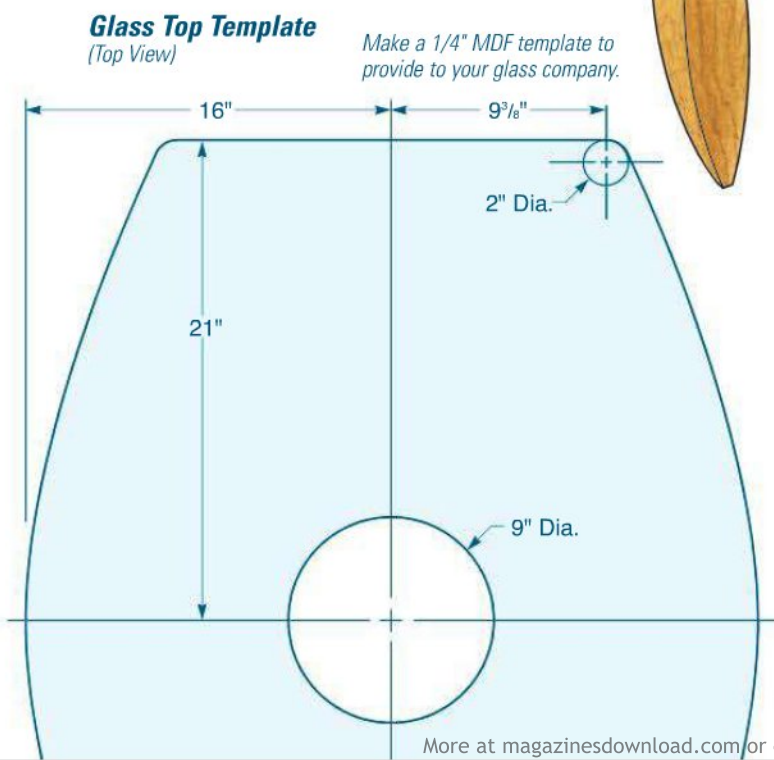
To minimize the amount of sanding required on the legs and at the same time ensure uniformity, I template-routed them using a two-sided jig (see the *Drawings*). I fastened the legs to the jig, using double-faced tape, and finished their shape on the router table using a pattern-cutting bit. The trick here is to rough-cut the legs to within 1/16" of their finished dimension. This will give you less resistance, especially on the uphill climbs through the grain where the danger of kickback and chip-out are greatest. Use a 3hp router for best results. After shaping one curved side (raising the bit step-by-step to smooth the entire surface), flip the leg over and re-tape it to the other side of the jig to shape the other face of the leg. Another option would be to use a stationary bench sander to smooth them, but be careful not to change their shape in the process.



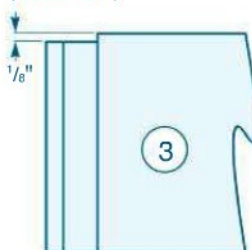


MATERIAL LIST

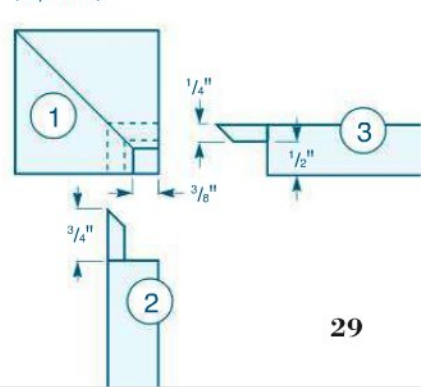
	T x W x L
1 Legs (4)	2 1/8" x 2 1/8" x 15 1/4"
2 Side Aprons (2)	3/4" x 3 3/4" x 27 1/2"
3 End Aprons (2)	3/4" x 3 3/4" x 19 1/2"
4 Long Lattice (12)	5/16" x 1 1/8" x 32"
5 Short Lattice (12)	5/16" x 1 1/8" x 24"
6 Dowels (48)	3/16" x 1 1/4"
7 Glass Top (1)	1/2" x 32" x 42"

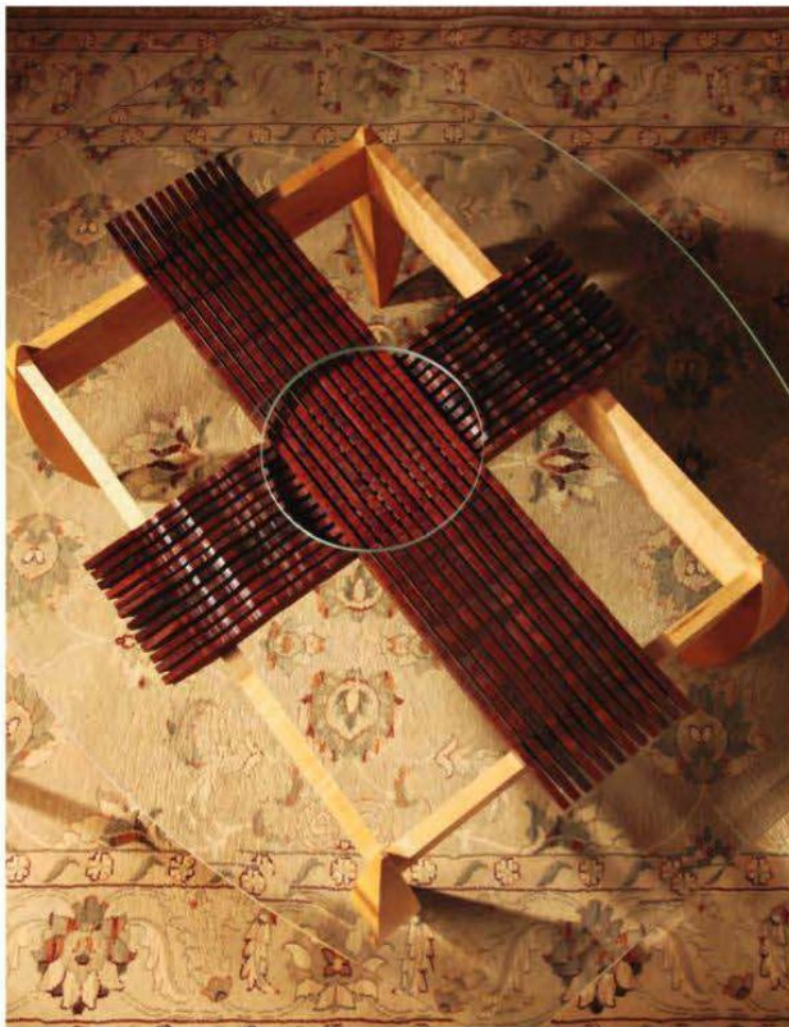


Apron
(Inside View)



Leg and Aprons
(Top View)





With 288 notched cuts needed to “weave” the cruciform shape together, and 48, 3/16” dowels needed to attach it to the table aprons, this simple-looking table has a huge amount of joinery that essentially disappears from view.

“What happened next could be described as multiple, maniacal bridle joint-mode.”
— Frank Grant

Next, I cut the side and end aprons to length and width, and set up a shop-made tenoning jig on the table saw. I finished the tenons with a crosscut controlled by my miter gauge and stand-off blocks on the fence. It is a simple, two-step process, but I always check my setup on scrap lumber first. One little trick on the tenons was that I cut a tiny micro-shoulder on the top of the tenon (see the *Drawing* details). Before I completed the final fitting for the mortises, I took a detour to the drill press and bored 3/16"-diameter dowel holes into the top edge. These will help secure the woven lattice.

Note the mitered ends on the tenons: they just miss each other within the mortise. You can cut those with a backsaw. Another trick I used when fitting the tenons was to remove just a smidge of material from the face of the aprons using my jointer. It worked well (but don't take off too much!).

Test clamp the end and side subassemblies together without glue, using scrap that was cut away from the legs as clamping cauls (perfectly shaped!) and, when they fit, go ahead and glue the base section together.

Weaving the Lattice

What happened next could be described as multiple, maniacal bridle joint-mode. I set up an indexing system using the miter gauge on my table saw to precisely locate each small notch on the long and short lattice (again, look to the *Drawings* for details). I made an indexing key and mounted it on my miter gauge. I cut these one at a time.

The important thing is to make sure the cuts are all very accurate — if the cuts vary 1/64" over a few of them, it'll be a mess. If you cut these individually on the table saw as I did, you must consider everything you're doing, even how you place your hands and push the stock through the saw. Use some sideways force to keep the miter gauge riding on the left or right side of the slot in the saw table for every single cut, 288 in all. Challenging but fun! My advice: practice with scrap, lots of it. And don't sweat the breakage — those

little pieces glue right back in and no one will know the difference except you, me and thousands of readers like you!

Earlier, I bored holes in the apron for the 3/16" dowels that secure the lattice to the aprons. Now it was time to drill the

Saving the curved sections of the legs that were cut away on the band saw allowed them to be reused as clamping cauls: a simple and effective solution.



reciprocal holes in the purpleheart. I set up stop blocks on the drill press, spending the necessary time (and supply of scrap) on setup to make everything go together right. After drilling, I then went back to the patterns to trace the irregular shapes onto the lattice strips.

When making these shapes, I incorporated high spots to bear the weight of the glass in the appropriate areas. I figured that a 9" hole in the middle of a sheet of glass could be a major stress-riser (meaning, a weak place in the sheet that becomes the breaking point when subjected to load; ask the solid-surface countertop folks). After assembly, I would turn it upside down on my bench, locate the high spots and level them with a hand plane, belt sander or some other tool.

Now, for the most dreaded assembly of all — the cruciform lattice work. I'm not sure what kind of advice I would give regarding this arrangement, but I can tell you I did pull it off, and I only broke off three of the little short grain pieces while doing so. If you dry-fit the purpleheart together and it works, I say leave it without glue: it has little structural importance and the weight of the glass (50 lbs. or so) will keep everything in place.

How to smooth or treat band-sawn edges of the purpleheart was a dilemma. In the end, I simply scraped these edges using a steel card scraper, working downhill with the grain from all the high points. It was easier than I suspected it would be. The result is a rather burnished effect that works well on the edges of this freakishly hard, stringy wood.

Important note: use a straightedge to check that there are no high spots in the lattice assembly (they'd add stress to a glass table) — plane or sand them down to exactly the level of the ends of the legs.

The finish is shellac, sprayed on from an aerosol can. Very simple and easy to fix. It's also easy to repair and, of course, with a piece of furniture like this you don't really need bar-top durability.

Finally, I worked out the final shape of the top by looking at several MDF mock-ups. When I was happy with the shape, I debated whether to put the bevel on the edge — but in the end, I was happy I had. It adds an important shadow line that defines the edge of the glass very well. I ordered the glass 1/2" thick, with the edges polished, except in the center hole, which was just sanded.

Well, there's the short story, and it all started with a few pieces of scrap lumber sitting on my workbench!

Frank Grant is a professional woodworker and furniture maker from Minneapolis, Minnesota and is a regular contributor to Woodworker's Journal.



The purpleheart lattice is attached to the aprons with small dowels. Drill the holes, using a drill press for best results, while the stock is stuck-up rather than after it has been shaped on the band saw.



The exacting task of forming the interlocking notches in the long and short lattice requires significant attention to detail ... even to the point of holding your hands in the same position for each cut.



While it's not exactly a textbook use of the band saw, the author uses a 3/16" blade — cutting, scraping and carving the shape into the top edge of the lattice. Later, he smooths it some more with a cabinet card scraper.

Shaker Dresser

By Chris Marshall

Our author takes a classic American furniture standard and elevates its curb appeal with stunning quilted and flame maple.

Ever since Rob Johnstone's Shaker End Tables graced the cover of our August 2010 issue, I've had figured maple "on the brain." If you've worked with it before, you know what a treat it is when the finish goes on and the wood's shimmery chatoyance lights up before your eyes. Who wouldn't be hooked? So, after almost a year's wait, Rob agreed to let me give figured maple another "go" on this Shaker-inspired dresser: quilted maple on top and flame maple for carcass, drawers and base. But this practical design could also be made from any other wood species you prefer.

Big dresser drawers like these can get heavy when loaded with clothes, so I employed a couple of strategies to fortify them for long life and easy daily use. First, they ride on undermount ball bearing slides instead of wooden runners. And second, I beefed up their bottoms to 1/2" plywood — they'll never sag under load.

Making the Side Panels

Flip to the *Drawings* on page 34, and you'll see that the dresser's skeleton consists of a pair of dadoed side panels that support five web frames. Start the construction process by gluing up two blanks for these two big panels (pieces 1), making sure they're flat and square. In order to produce even 1/16" reveals around the drawer faces of your dresser, this project needs to be accurate right from the start.

I used a slotted, shop-made router jig to guide a plunge router and a 1" O.D. rub collar for milling the five dadoes in each of the side panels. A 3/4" straight bit cut them to a final depth of 3/8" and my jig kept it all straight and true. Notice that the dadoes stop 3/4" from the front edges of the side panels; a stop block on my jig made these termination points easy to hit. Chisel them square. When the dadoes were tidied up, I cut 1/2"-wide, 3/8"-deep back panel rabbets at the table saw.

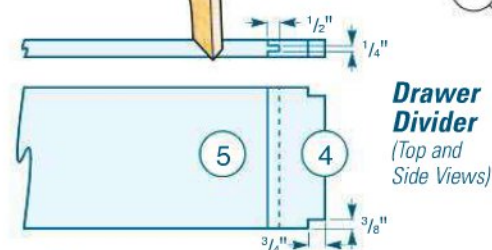
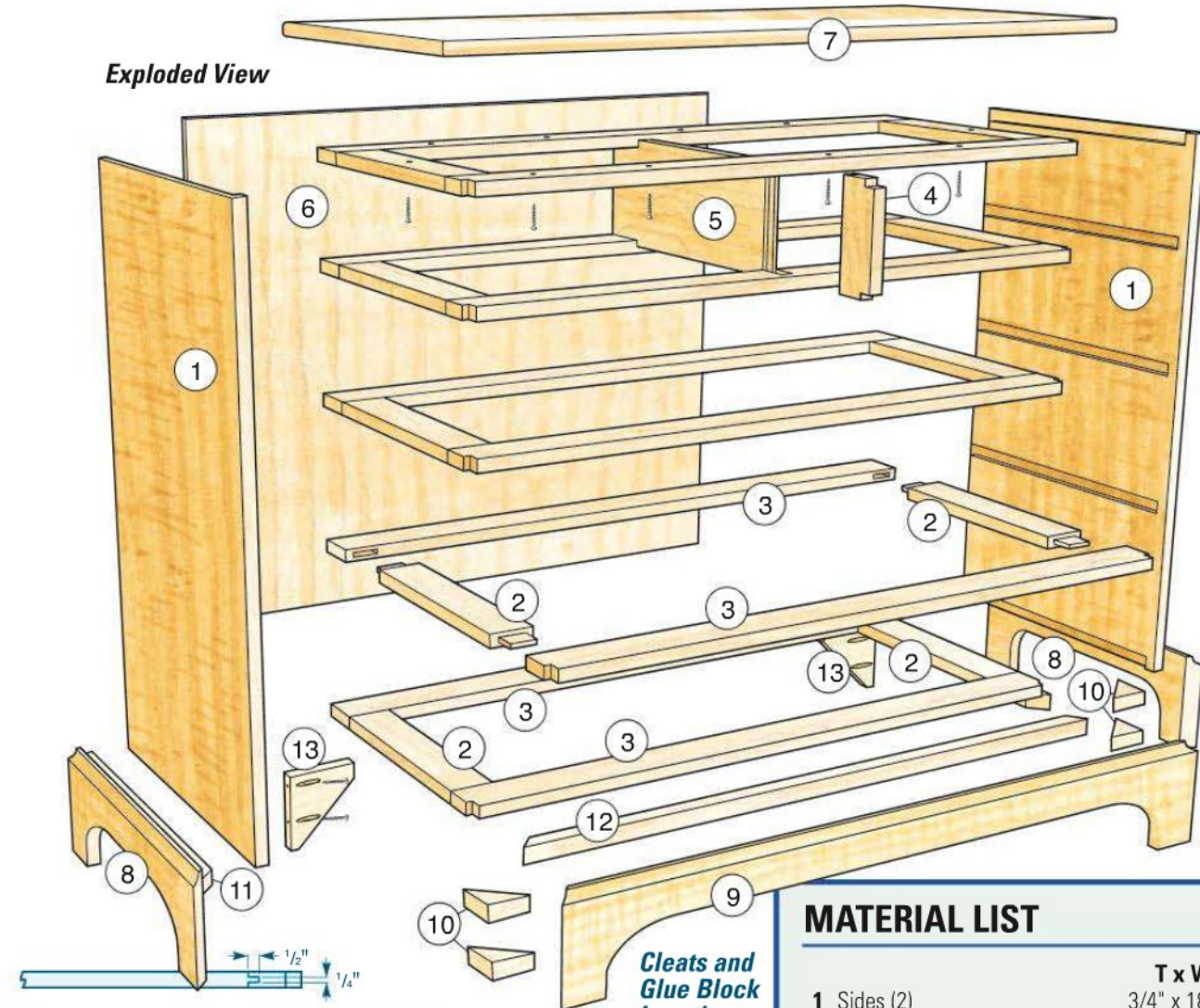


Matching side panel dadoes were easy to mill accurately with a slotted routing jig, rub collar and straight bit.

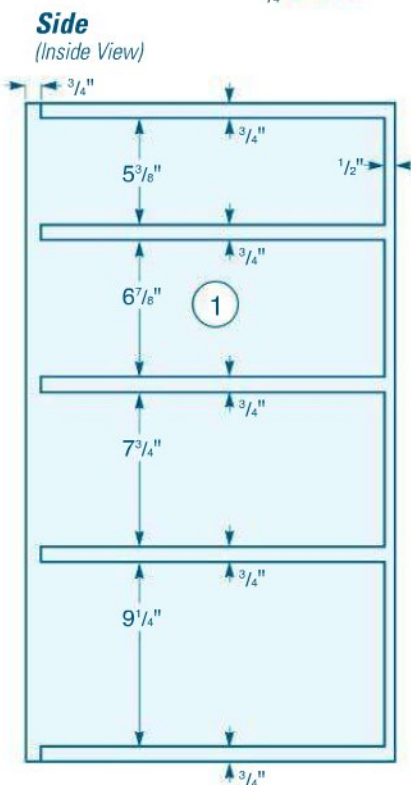




Exploded View

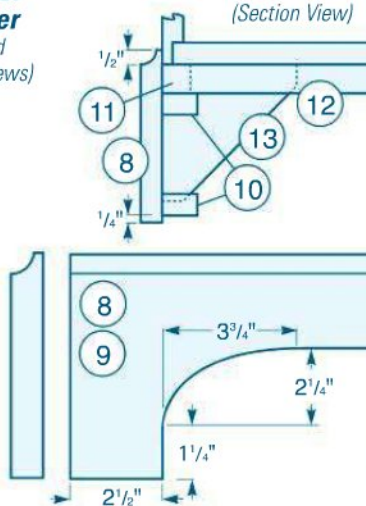


Drawer Divider
(Top and Side Views)



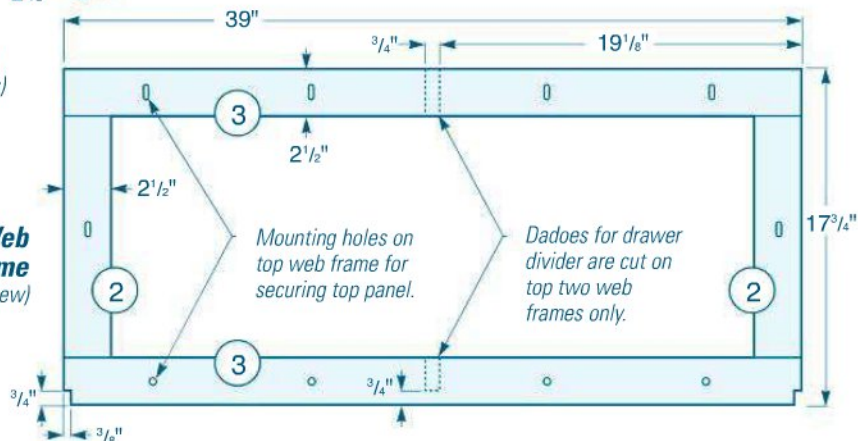
Side
(Inside View)

Cleats and Glue Block Locations
(Section View)



Base
(Front and End Views)

Top Web Frame
(Top View)



MATERIAL LIST

	T x W x L
1 Sides (2)	3/4" x 18 1/2" x 33"
2 Web Frame Rails (10)	3/4" x 2 1/2" x 15 1/4"
3 Web Frame Stretchers (10)	3/4" x 2 1/2" x 39"
4 Drawer Divider, Front (1)	3/4" x 2 1/2" x 6 7/8"
5 Drawer Divider, Back (1)	3/4" x 6 7/8" x 15 3/4"
6 Back Panel (1)	1/2" x 33" x 39"
7 Top (1)	3/4" x 19" x 42"
8 Base Sides (2)	3/4" x 6" x 19 1/4"
9 Base Front (1)	3/4" x 6" x 41 1/4"
10 Glue Blocks (4)	3/4" x 1 1/4" x 1 1/4"
11 Side Cleats (2)	1" x 1" x 17 1/4"
12 Front Cleat (1)	1" x 1" x 39 1/4"
13 Rear Support Blocks (2)	3/4" x 4 3/4" x 4 3/4"



Mortise and tenon joints strengthen the connections between web frame stretchers and rails. A hollow-chisel mortiser made quick work of hogging out the 20 deep mortises.

Building the Web Frames

The five web frames won't benefit from a face frame to help true up their front stretchers, so be sure to surface your rails and stretchers (pieces 2 and 3) dead flat. It's also important to match the web frame stock thickness carefully to the dado width on the side panels; you want a good friction fit of the frames in their dados to help strengthen the carcass.

Since I planned to use flame maple for the drawer faces, I made my five front web frame stretchers from flame maple as well, instead of the plain maple I used for the rear stretchers and rails. It's a small detail, but one that helps to harmonize the overall face of the project.

I settled on mortise and tenon joinery to attach the frame parts — these stout connections will prevent the frames from racking and ensure nice, square carcass corners. I stepped to my mortising machine to cut 1/4"-wide, 1 1/2"-long mortises on the inside edges of the stretchers, 1 1/4" deep. The rail tenons were easy to whip into shape at the table saw.

You could assemble the five web frames and then nibble their front corners to fit around the stopped side panel dados, but I notched the stretchers first at the table saw. I didn't want to wrestle those big frames vertically against my miter gauge. Now glue up the web frames. To speed the clamping process, I pinned the joints with a few 5/8" brads.

Next, I reached for my slotted routing jig again to plow dados across the inside faces of the four top stretchers; they hold the vertical drawer divider square and lock it in place. The front two stretchers on this pair of frames have stopped

Short brads eliminated the need for extended clamping time when gluing up the web frame joinery.



dados, just like the side panels. The drawer divider fits into and around them. Chisel these two dados square.

Wrap up the web frames with one final step: select one as the topmost frame, and outfit it with pilot holes for screwing the dresser's top panel in place later. I drilled four evenly spaced holes along the front. Then I routed a series of 1/2"-long slotted screw holes in the rails and rear stretcher, all oriented parallel with the rails. This way, the top panel can move

seasonally toward the rear but still show a consistent overhang in front year-round.

Assembling the Carcass

You're nearly ready to turn some loose parts into a carcass, but not before making the drawer divider. It's a two-piece assembly of a vertically oriented front edge (piece 4) joined by a tongue and groove to a longer horizontal rear member (piece 5). Again, my front edge was flame maple to match the web frame stretchers.



The top two web frames receive centered dados to house a drawer divider. Again, the author put his slotted router jig to good use to cut them. Square up the stopped ends with a chisel and mallet.



The two-piece drawer divider features a tongue and groove joint. After assembling it, you need to nibble away the front corners to fit this piece into and around the web frame dados.



Assembling the carcass involved fixing the web frames into their side-panel dados with a short bead of glue and several brads driven diagonally across the joints. Scrap MDF braces outfitted with dados held the frames square to the side panel and parallel to one another during this process.

MDF braces helped tame a potentially unwieldy carcass assembly.

But even if you build your dresser from plain-figured stock, make your divider's "show edge" from edge-grain stock and not end grain. That would soak up more finish and stick out like a sore thumb between the upper drawers. Notch the top and bottom front corners of the divider to fit into the stretchers' stopped dados.

Start assembling the carcass by gluing and screwing the drawer divider between the two top web frames to form a sub-assembly. While that glue dried, I made several long braces from MDF and outfitted them with dados that matched the dado placement on the side panels. Clamped in place, these would hold my web frames vertically as well as square and parallel to one another as I assembled the big case. They really helped, since this is a rather unwieldy assembly. You can see how I employed the braces in the bottom left photo on this page.

To carry out the glue-up, I laid one side panel on the bench, set the drawer divider assembly in place in its dry dados and stacked the web frames on-edge so I could install them one by one. Starting with the bottom web frame, I spread glue along only the first six inches of the dado (this allows the side panels to expand to the rear without cracking the panel or breaking a longer glue joint). I clamped the frame to two braces and pinned it to the side panel with several 1½" brads. These were driven through the frame and into the end of the side panel.

Continuing to work up from the bottom, the third and second web frames came next. Each was fitted into its dados in the MDF braces and rested in a 6" bead of glue in the side-panel dados. The difference here, was that I drove shorter 1" brads at a steep angle through the bottom edges of the web frames to pin them to the side panel. Three evenly spaced brads were sufficient. Last to glue and pin in place was the drawer divider sub-assembly. As you install each frame, make sure the front edge lines up flush with the front of the side panel. (Note: The web frames are actually 1/4" narrower than the lengths of the side panel dados; this is by design to facilitate

side-panel wood movement.) Glue and pin the other side panel into place.

Measure against your glued-up carcass to size and cut your dresser's back panel to shape. I installed mine at this point when I unclamped the braces to help square things while the glue joints set. However, don't install it permanently. I used six screws for temporary attachment. You'll appreciate the ability to pull this panel off when mounting the slides.

Prepare your dresser's top panel (piece 7) and set it aside for now. I routed the edges with a gentle bullnose profile.

Adding the Base

The dresser's base consists of a front and two sides (pieces 8 and 9) joined at the corners by miters. Cut overly long stock for these three parts, and miter the corners to refine the fit of these joints. Once they're airtight, cut the extra length off of the sides and follow the *Drawings* to create a template for marking the curved cutouts that form the foot shapes. I cut these out on my band saw and smoothed the edges on a spindle sander. Glue and clamp the three base pieces together; a miter clamping jig, square backup block and a few long pin nails will ensure tight-fitting connections.

The dresser carcass rests on three long cleats (pieces 11 and 12) glued and screwed inside the base. Make and install those next. Now, reinforce the miter joints from behind with four small triangular glue blocks (pieces 10) — one pair butted under the cleats and the other two located 1/4" up from the bottom.

Mill a 1/2"-radius cove around the top outer edges of the base to add an attractive shadow detail here. Give the carcass and base a good sanding up through the grits to 180, and fasten the two components together with 1 1/2" screws driven into countersunk holes in the cleats.

A last reinforcing step is to add triangular support blocks (pieces 13) behind the rear feet. I installed these flush with the back edges of the web frame stretcher, using a combination of pocket and countersunk screws driven into the feet and down through the stretcher.



The author recommends miter-cutting the base sides and front piece first to perfect these joints, then marking and cutting the curved feet to shape (above left).



A fabricated miter-clamping jig (above right) pulled the base joints together, in tandem with a square back-up block, some additional C-clamps and a few pin nails.

Once the cleats and glue blocks are in place, you can rout the cove profiles around the upper edges of the base at the router table (right). The assembly is tall, but it's still lightweight and easy to control. Fasten the base to the carcass by driving screws up through the base cleats (below), then add blocking to reinforce the back feet.

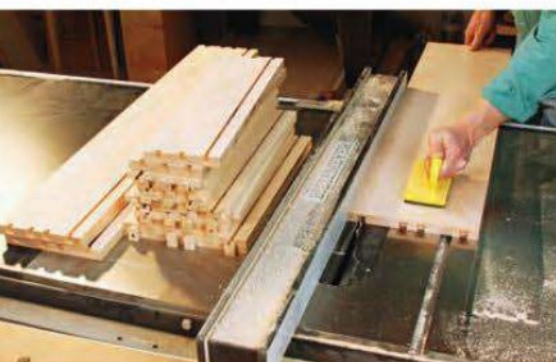




Leigh's D4R Pro Jig tackled this dresser's variable-spaced, half-blind dovetail layout on the drawers. The tail machining happens first.



Flipping the finger template over on the jig resets it for cutting sockets and pins in the drawer faces with the same bit and setting.



Tail sockets hide the drawer bottom grooves, so they can be cut completely across these parts.



Thick drawer bottoms prepare these drawers for heavy use, but they must be rabbeted on three sides to fit the drawer bottom grooves. Magnetic featherboards ensured consistently thick tongues.



While the design of these drawers was straightforward and conventional, their accuracy and squareness was crucial in order to fit properly inside the dresser's tight tolerances.

Building the Drawers

The five drawers have straightforward designs. Half-blind dovetail joints bring the front corners together, and a 1/2"-wide dado allows the backs to slip into place in the sides. Cut your drawer faces (pieces 14, 18, 22 and 26) to carefully fit their openings. Mill 1/2" stock to make up workpieces for the side panels and backs (see *Material List*, facing page, for part numbers). I used Leigh's new D4R Pro Jig to cut variable-spaced dovetail patterns to connect the faces to the sides.

When you study the *Drawings* for the dovetail layout, you'll see that I set the drawer bottom grooves unusually far up in the drawer boxes — 7/8". This extra

clearance allows room for the 1/2" drawer bottom panels, the slide hardware and shims that helped me adjust the vertical position of the drawers in their openings. Use a 1/4"-wide dado blade, raised 1/4", to cut the bottom panel grooves across the insides of the drawer faces and sides.

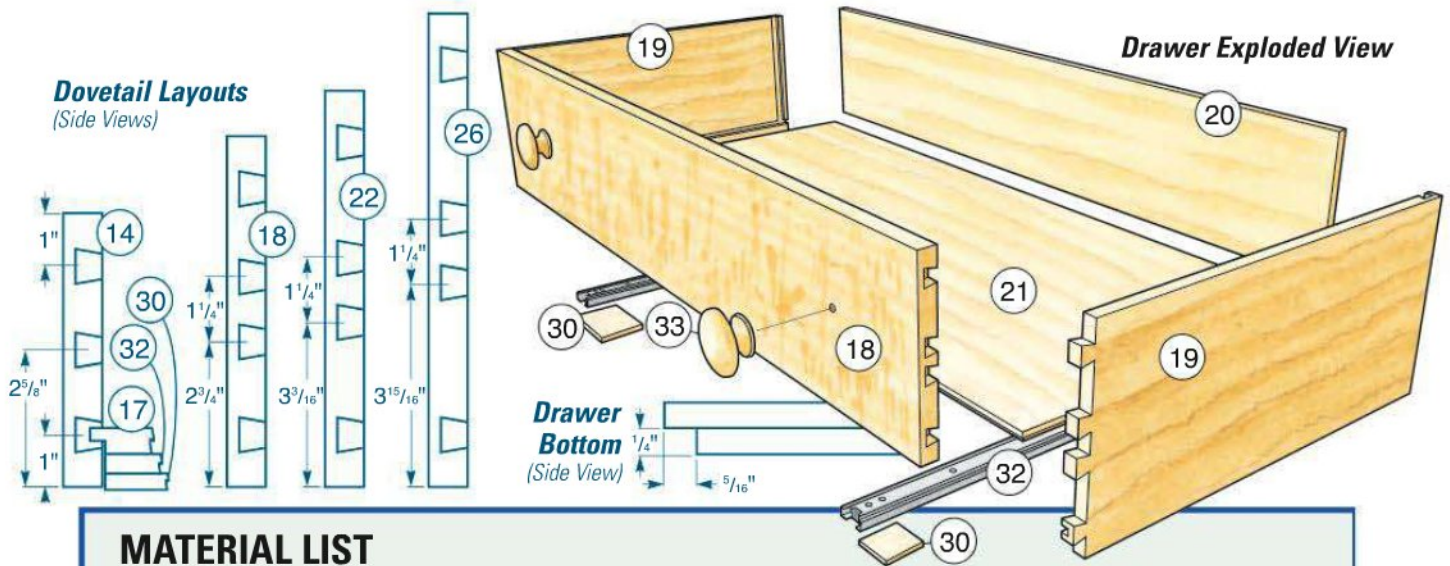
You'll need to mill rabbets around the front and side edges of your 1/2"-thick drawer bottom panels to fit them into their grooves. I adjusted my dado blade for 1/4"-thick rabbet tongues but made them 5/16" long to give me a bit of slip-space when fitting the drawers together.

Assemble the drawers in the usual way, but check your drawers very carefully for square during the clamping process —

there is so little clear space inside this dresser, given the nature of these inset drawers, that square boxes are absolutely critical. Be fussy and take your time!

Installing Slide Hardware

As I mentioned, shims (pieces 30 and 31) were my solution to "floating" the drawers evenly in their openings. I started the shims all at 5/16" thick and stock long enough to span the web frames front to back. After attaching the hardware to the drawers, I removed the dresser's back panel and laid pairs of long shims across each opening. Then I slid the drawers and slides inside to evaluate the top and bottom clearance. Some drawers had even



MATERIAL LIST

	T x W x L		T x W x L
14 Top Drawer Faces (2)	3/4" x 5 1/4" x 18 5/8"	24 Third Drawer Back (1)	1/2" x 6 1/2" x 37 5/8"
15 Top Drawer Sides (4)	1/2" x 5 1/4" x 17"	25 Third Drawer Bottom (1)	1/2" x 16 3/4" x 37 5/8"
16 Top Drawer Backs (2)	1/2" x 4 1/8" x 18 5/8"	26 Bottom Drawer Face (1)	3/4" x 9 5/8" x 38 5/8"
17 Top Drawer Bottoms (2)	1/2" x 16 3/4" x 18 5/8"	27 Bottom Drawer Sides (2)	1/2" x 9 5/8" x 17"
18 Second Drawer Face (1)	3/4" x 6 3/4" x 38 5/8"	28 Bottom Drawer Back (1)	1/2" x 8" x 37 5/8"
19 Second Drawer Sides (2)	1/2" x 6 3/4" x 17"	29 Bottom Drawer Bottom (1)	1/2" x 16 3/4" x 37 5/8"
20 Second Drawer Back (1)	1/2" x 5 5/8" x 37 5/8"	30 Front Shims (10)	5/16" x 2" x 1 5/8"
21 Second Drawer Bottom (1)	1/2" x 16 3/4" x 37 5/8"	31 Rear Shims (10)	5/16" x 2" x 2 1/2"
22 Third Drawer Face (1)	3/4" x 7 5/8" x 38 5/8"	32 Drawer Slides* (10)	17" Accuride 1029
23 Third Drawer Sides (2)	1/2" x 7 5/8" x 17"	33 Drawer Knobs (8)	2" Dia.

*Purchase the drawer slides at woodworkersjournal.com or by calling 800-610-0883. Accuride Slides # 32557 (10 req.); \$8.99 each; code #WF061

reveals, but a few required me to shave the shims a whisper thinner. When each drawer fit nicely, I sliced the shim strips into shorter segments to tuck behind the drawer faces and longer ones for the rear stretchers. I tacked them into place with CA glue. With the shims fixed, the slide hardware could be pulled apart and the carcass portion screwed down to the shims. Accuride outfits the slides with elongated holes that made it easy to tweak them left or right to give the drawers even side-to-side reveals in their openings. With the drawers hung, I could finally install the back and top for good.

Finishing Up

As Michael Dresdner points out in this issue's *Finishing Thoughts* article (see page 66), my challenge was to match the darker reddish quilted-maple top with the rest of the blonde flame maple. The finishing solution came in three parts: I polished the raw wood with 320-grit sandpaper to clarify the figure, then I applied Zinsser's amber shellac thinned 25%

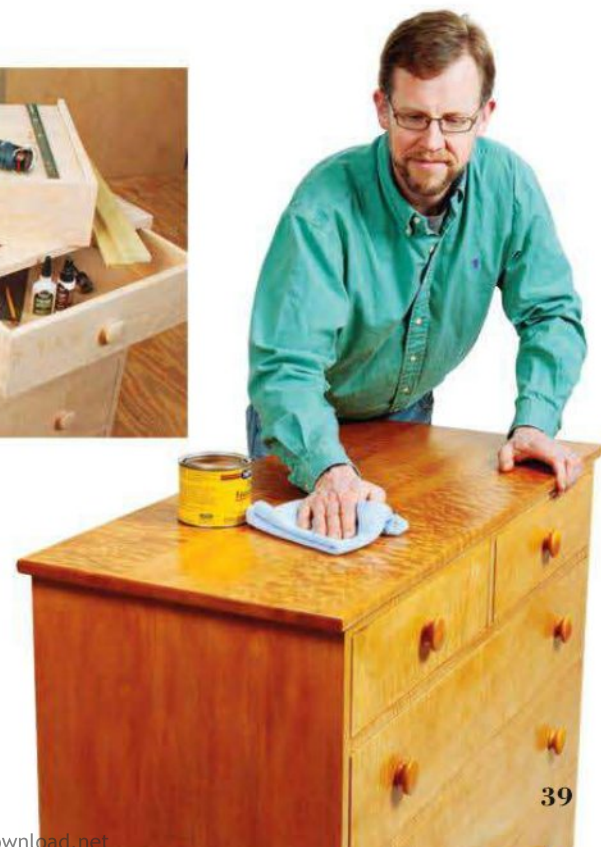
Fitting the drawers and slide hardware with shims (top right), followed by some refinements to the top panel (immediate right) ushered in the final three-step finishing process (far right).

with alcohol to help tone the two color variations. Six light coats of aerosol lacquer later and then wax made the figure dazzle. All that was left was to thread on the drawer knobs and fasten the top panel. This showy dresser was ready to begin a lifetime of practical purpose.

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

MORE ON THE WEB

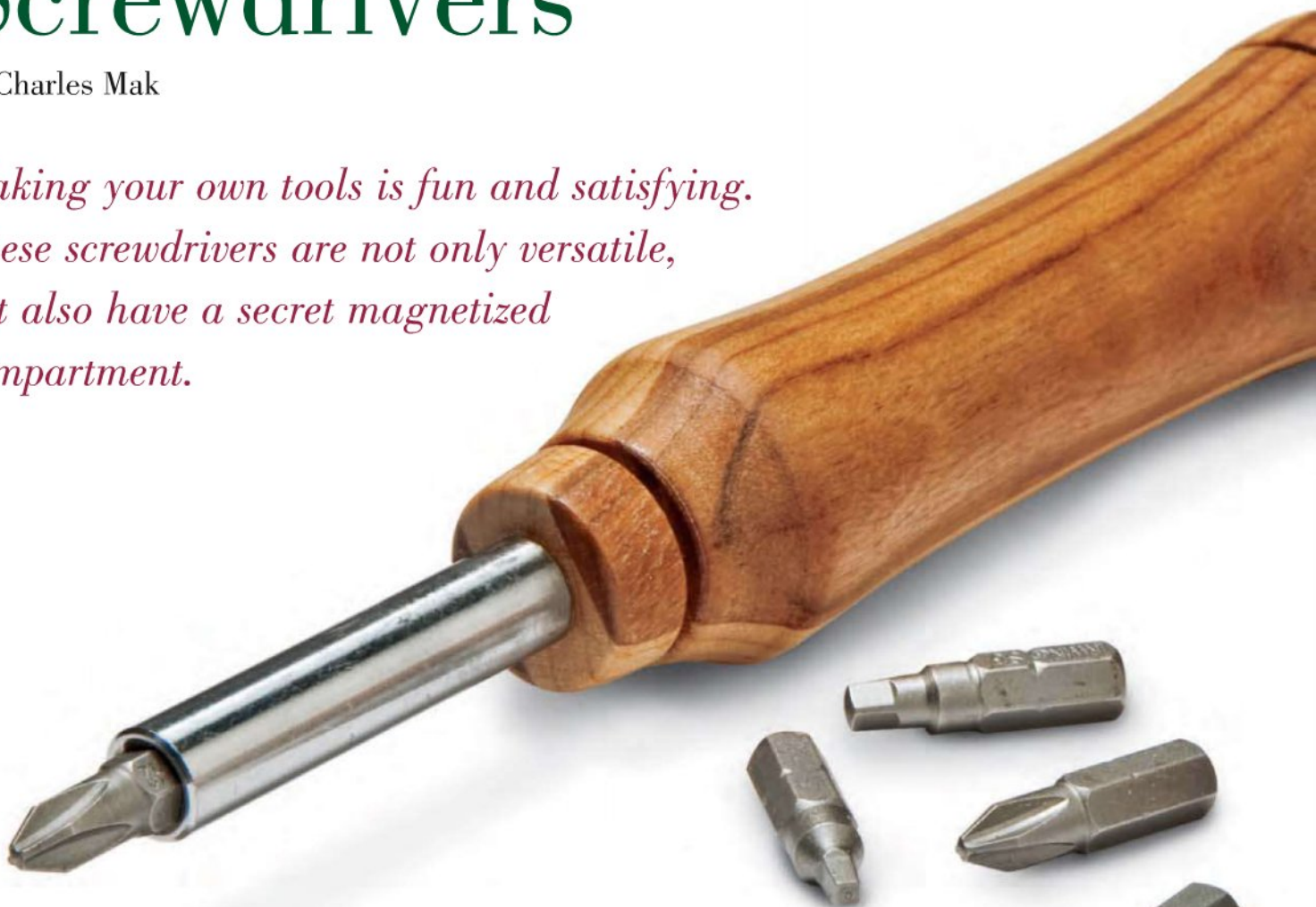
To learn more about how Chris fit the drawers in this dresser, go to woodworkersjournal.com and click on the "More on the Web" tab shown above to watch his video overview.



Turned Multi-bit Screwdrivers

by Charles Mak

Making your own tools is fun and satisfying. These screwdrivers are not only versatile, but also have a secret magnetized compartment.



Until now, woodworkers who have wanted to use a multiple-bit screwdriver had to settle for a store-bought version. That's not such a cool option for people who take pride in working with wood! So, I came up with a hollow-body design (with a press-fit cap) using a bit holder. My screwdriver consists of four parts: the cap, the handle, the bit holder and a locking mechanism for the cap. Its compartment can hold up to eight 1"-screw bits or four 2"-screw bits.

Getting Started

You'll need a hardwood blank of your choice, a screwdriver bit holder, a rare-earth magnet, a screw and a photocopy of the full-size template found on the last page of this article.

First off, use a drill press to bore a hole for the bit holder on one end of your blank (in my case, the hole was $1\frac{1}{8}$ " deep and $17/64$ " in diameter), as seen in Figure 1. Alternatively, you could mount the blank on the lathe in a scroll chuck and bore the hole using a drill chuck; it's your choice. You're now ready to begin turning — first the handle and then the cap.

Turning the Handle

To make the handle, I mounted the blank between centers with the live cup center (tailstock) secured in the starter hole and the other end driven by a spur drive center on the headstock (Figure 2). Again, you may choose a scroll chuck instead of a spur drive center to hold your stock if that's your normal or preferred setup.

With the lathe set at about 1,600 rpm, I used a roughing gouge to true the blank to a $1\frac{1}{2}$ "-diameter cylinder. Then I slowed down the lathe, laid the template on the tool-rest against the cylinder and scribed a circle around the blank at the three contour points for the handle: $7/8$ ", $1\frac{1}{4}$ " and $1\frac{1}{8}$ " (Figure 3). To help locate the handle's transitions, I made gauging cuts at the contour points with a parting tool.

At the tailstock end, I used a parting tool to form a $3/8$ " by $7/8$ " diameter tenon (Figure 4). Next, I used a spindle detail gouge to shape the body of the handle, checking the contour dimensions with a pair of outside calipers. I blended the contours into each other for a smooth transition along the handle (Figure 5). Stopping the lathe, I ran my hand over the length of the handle to detect any high or low spots which I then smoothed out. Just for decoration, I cut shallow grooves with a parting tool on the handle, one near the top and one near the bottom.



A 3" bit holder is the key to this project.



Figure 1: Drill a center hole to fit the bit holder shank.



Figure 2: Mount the blank between centers.



Figure 3: Scribe a circle at each contour point.



Figure 4: Cut the tenon to size.

Turning the Cap

The cap has both a dome-shaped top and a 3/4"-diameter tenon. I laid the template on the tool-rest to guide me and, on the headstock end, scribed a circle around the blank for the 3/4" and 1" dimensions. With the lathe reset at about 1,600 rpm, I used a parting tool to cut a 3/4"-diameter tenon into the cap (Figure 6). After the tenon was formed, I switched to a spindle gouge and shaped the cap's top to a dome profile (Figure 7).

Now it was time to finish-sand the handle and the cap (avoid sanding the cap's tenon). I set the speed to below 1,000 rpm and worked from 150- to 180- to 220-grit papers. After the sanding was done, I made a deep groove on the top of the cap with a thin parting tool, leaving about 1/4" diameter of material there (Figure 8). I then parted off the whole cap from the handle.



Figure 5: Shape the handle.



Figure 7: Shape the cap top into a dome.

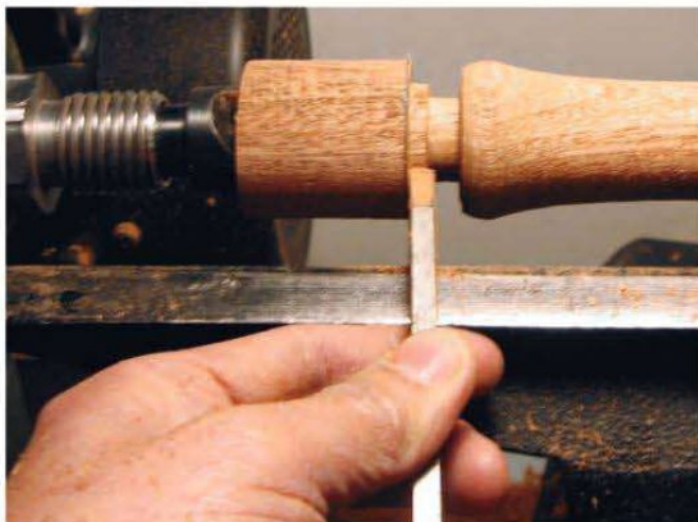


Figure 6: Cut a tenon on the cap.

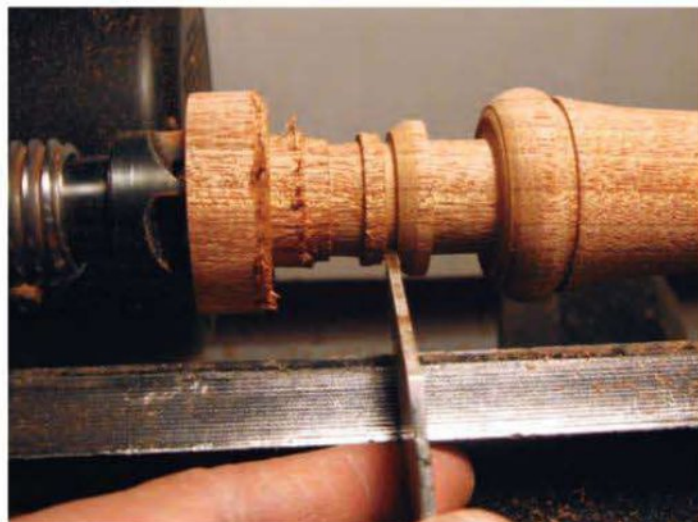


Figure 8: Make a deep cut between the cap and the waste.

Hollowing the Handle

After marking a center point on the top of the handle, I chucked a 3/4" diameter Forstner bit into the drill press and bored a 2 1/2"-deep, 3/4"-diameter hole, forming the compartment in the handle (Figure 9). (Again, you can do this with a drill chuck and scroll chuck on the lathe.) I checked for a good fit of the cap in the hole, light-sanding to resize the inside edge of the hole if necessary. After I was happy with the fit, I used a fine-tooth handsaw to saw the cap free of the waste stock (Figure 10). I lightly sanded the freshly cut area to remove all the saw marks. I take pride in the work I do and like to sign it in some way, so I hammered my initial "M" on the cap top with a punch stamp.

Making and Installing the Cap Lock

The press-fit cap alone might fail due to repeated use or changes in temperature and humidity. I addressed that concern with a slick magnetic "lock" that consists of a 1/10" x 3/8"-diameter rare-earth magnet and a 2 1/2" #6 wood screw.

First, on the drill press, I bored a 3/32"-deep x 3/8"-diameter hole, centered on the underside of the cap (Figure 11) and epoxy glued the magnet in the hole. Next, I drilled a 1/2"-deep x 1/8"-diameter pilot hole at the bottom of the compartment. As a last step, using a bench grinder, I ground the screw head down to about 3/16" in diameter to provide passage for the screw bits to go into and out of the compartment (Figure 12).

To complete the locking mechanism, I drove the screw into the pilot hole until the screw was about 3/8" (the height of



Figure 9: Hollow the handle to create the screwdriver bit compartment.

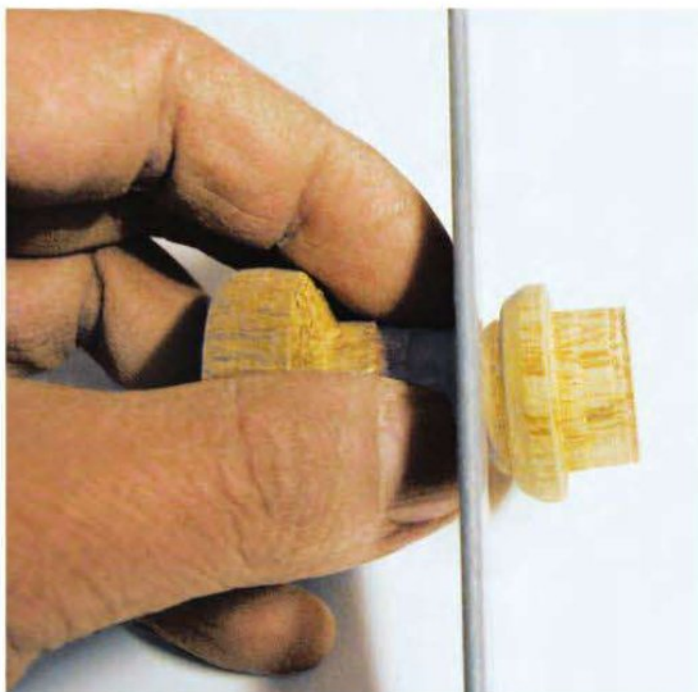


Figure 10: Saw off the cap from the waste.



Figure 11: Drill a shallow hole on the underside of the cap for a magnet.

the cap's tenon) below the top of the compartment opening. I adjusted the screw up or down so the magnet was in contact with the screw when the cap was replaced. Finally, I test-fitted the bit holder shank into the hole and, after making sure there was no wood dust in the hole, I epoxy glued the bit holder shank into the handle.

Finishing

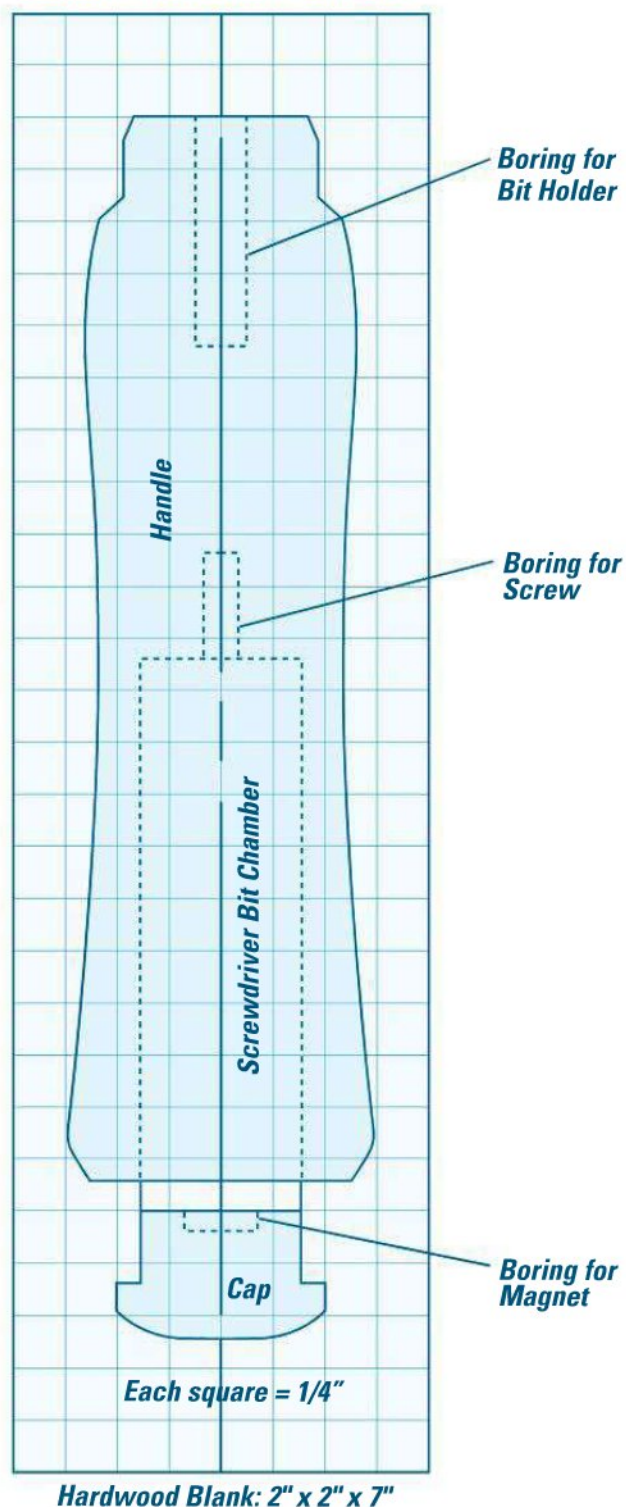
I rubbed a few coats of low-luster oil finish (for example, mineral oil or boiled linseed oil) on the handle and cap top, leaving both the cap's tenon and the compartment unfinished. To make it a multi-bit tool, I simply put several 1" screw bits into the compartment. The cool thing is, the steel bits usually come out attached to the cap's magnet, making it easy to select the proper bit for the task at hand.

This is a fun and easy evening shop project, and now you won't have to settle for one of those store-bought screwdrivers!



Figure 12: Grind the head of the #6 x 2 1/2" screw down to about 3/16" diameter.

Handle Pattern: Full-size



Woodworker's Journal grants permission for readers to photocopy this Full-size Pattern, or the PDF format available at woodworkersjournal.com via the More on the Web button, for personal use.

Charles Mak, a businessperson by day in Alberta, Canada, was first bitten by the woodworking bug about a decade ago and has since become a hobbyist woodworker, tipster, teacher and writer.

Testing Seven Top-Shelf Jigsaws

By Sandor Nagyszalanczy



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I've always thought of a jigsaw as a sort of "poor man's band saw." During my early woodworking days when I lacked both the funds and space for a band saw, I used the best jigsaw I could find (I borrowed money from a friend to buy it). I used that jigsaw for all my curve cutting tasks, as well as the jobs a band saw couldn't do: pocket cuts, inside circular cutouts, and all manner of trimming inside built-in cabinets and furniture.

Nearly 35 years later, when it came time to pick a batch of jigsaws to review for the *Journal*, I was anxious to try out the "top-shelf"

models offered by the best-known power tool manufacturers. These include the best offerings from Bosch, DeWALT, Festool, Hitachi, Makita, Metabo and Milwaukee. The Porter-Cable 9543 was slated to be part of this group, but was, unfortunately, recently discontinued. I also tried to include a jigsaw made by the Swiss power tool company Hilti, but they chose not to participate in the article.

Instead of discussing each saw individually, I will compare all of their attributes and cutting abilities in two sections: The first contrasts the features and accessories of the seven models. The second section describes the

performance tests I put each jigsaw through and reports on how well each model fared.

Features & Accessories

Handle & trigger: A good handle is important on a jigsaw for user comfort and also because a solid grip is essential to controlling the movement of the tool during cutting. All of the saws in this group, save the Festool, have a rubber-like overmold covering their handles. Overmolds are softer to the touch than hard plastic, provide a more secure grip and even dampen tool vibration slightly. Of the seven saws, the handles on the Makita and Hitachi fit my medium-sized hands the best. I also liked the longer handles found on these saws (as well as several others) because their length allows for a varied grip to suit different working





Bosch 1590 EVSL: This tool from the company that essentially invented the jigsaw displays an impressive combination of innovative features and quality.



DeWALT DW331K: Built for comfort and durability, the DeWALT is a heavyweight contender with stout construction and no-nonsense features.



Festool Trion PSB-300-EQ: This is a well-featured saw built by a company with a reputation for power tools that stand up to rigorous professional use.



Hitachi CJ110MV: The economically priced Hitachi may lack some of the features and accessories of the top models, but it offers performance that belies its low price tag.

positions (photo below). Theommel at the front of the DeWALT's handle allows a two-handed grip — helpful when cutting in awkward positions.

A jigsaw's most important operational feature is its trigger that switches the tool on and off. I generally prefer a wider tool trigger that allows two-finger operation, to help reduce hand fatigue. Wide triggers also let users place their hands in a variety of positions along the tool's handle. The Festool was the only saw in the group with a narrow trigger, and I didn't like its stiff, clunky on/off action. I preferred the comfortable, smooth-operating, wide triggers on the DeWALT and Makita (below). All the saws have trigger locks, so you don't have to hold the trigger on during long cuts. The Bosch's trigger lock is the only one designed for use by left- or right-hand users.

The Bosch, DeWALT and Milwaukee saws feature variable triggers that let you ramp up the speed of the blade gradually, up to the

maximum set on its variable-speed dial. This is useful when starting cuts in very hard and/or splintery woods as well as materials prone to chipping, like tile and plastics. The Bosch's unique trigger works with a two-step action: Pull the trigger lightly, and the saw immediately switches on to a slow speed. Press the trigger a little farther and it fully varies the speed up to the set maximum. Although the Bosch's trigger works well enough, I prefer the triggers on the DeWALT and Milwaukee, which let you ramp the speed up from zero to the maximum set speed with one continuous pull.

Variable-speed & soft start:

All seven saws are variable-speed models with dials that allow you to set the motor speed and, hence, the number of blade strokes per minute (see below). This makes a jigsaw a more versatile cutting machine: Choose slower speeds for fine cuts and when cutting dense materials and plastics and faster speeds for quicker,

rougher cuts in lighter woods and porous materials. (Interestingly, the saws with the highest maximum speeds didn't necessarily cut faster than those with slower speeds; see the "Testing" section of this article.) I like the position of the speed dials on the Hitachi and Festool saws. These are easier to see and set than the rear-mounted dials on the Bosch, Metabo and Makita. The DeWALT and Milwaukee have trigger-mounted speed dials that I find hard to see and set without tipping or inverting the saw.

The Metabo and Makita both feature "soft-start" motor electronics that ramp up motor speed gradually when the tool's trigger is pulled. Soft start can prevent the saw from suddenly jerking if you start cutting with the blade in contact with the material. But, overall, I found soft start more of an irritation than an aid; I didn't like having to wait for the saw to come up to speed each time I started a cut.



Makita 4350 FCT: With clean industrial design and well conceived ergonomics, the Makita is an efficient cutting machine that's very comfortable to use.



Metabo STEB135 Plus: The German-made Metabo jigsaw features a large cast metal body with nice fit and finish and a very solid feel.



Milwaukee 6268-21: The largest saw in the group, the Milwaukee has good ergonomics and performance, and a fine blend of features.



A longer handle allows for different grips suitable for a variety of cutting situations.



Our author prefers wider triggers for comfort and for shifting hand positions.



Variable-speed control is a feature common to all of the featured saws. Location of the speed dials varies.

Tool Review continued

Orbital blade selection is one of the most important features that a jigsaw can have. The orbit adjusts cutting aggressiveness.

Selectable blade orbit:

Probably the single most important feature on a top-notch jigsaw is its orbital blade action. This mechanism moves the blade forward slightly during the upstroke cut, resulting in a more aggressive cutting action than if the blade simply reciprocated up and down. The mechanism also moves the saw blade back slightly, so it clears the kerf during the return down stroke and saves wear on the teeth. Adjusting



the amount of blade orbit makes the saw cut more or less aggressively. Most saws have four orbit settings: 0 (no orbit) or 1 for cutting metals and plastics; 1 or 2 for fine and curved cuts; and 3 (maximum orbit) for faster, rougher cuts. The Metabo features five orbit selections instead of four, but I didn't find the greater range of select ability to be particularly necessary or useful. The Milwaukee has a small, somewhat handy blade orbit and speed selection chart mounted on the side of the tool (see photo above).

Blade guide systems:

A unique feature found on the Festool and Bosch saws is a special saw blade guide positioned below the orbit mechanism's guide wheel (see photo at left). These small metal guides work like the guide blocks on a band saw, to help stabilize the blade and keep it from deflecting during cutting. The Festool's guide has two small prongs that contact the blade more closely at the back than at the front. They're user-adjustable via an included Allen wrench. The Bosch's "Precision Guide Control" has two small parallel blocks that are user-engaged via a small pushbutton. The blocks apply light spring-loaded pressure against the sides of the blade. The guide's jaws open automatically when the blade release lever is pulled. Both of these innovative systems are very easy to use and significantly improve performance.

Tool-less blade clamps: All seven jigsaws allow tool-less blade changes, employing a lever that opens the blade clamp on the end of the saw's plunger — the part that moves the blade up and down. Tool-less blade clamps make changing the tang-style saw blades each model uses quick and easy. But each clamp is different, and some are easier to work with than on others.

The Festool, Makita and Bosch blade clamps are among my favorites. The Festool's "Fast Fix" blade change mechanism has a relatively stiff lever, but its clamp accepts blades without fuss and holds them rock-solid. The Makita also has a terrific mechanism with a spring-loaded lever that's easy to pull open and a clamp that accepts blades easily and positively. As good as these clamps are, the Bosch's "One Touch" blade change system (photo, below left) is my favorite. There's no clunky mechanism or oversized blade clamp on the end of the plunger, just a simple slot. After pulling back the small, easy-to-use release lever, a spring gently ejects the blade. This can save you from burning your fingers trying to pull a hot blade out of the clamp after a prolonged cutting session. The new blade inserts easily into the Bosch's plunger slot and latches with a positive feel.

Tilting footplate: Adjusting the angle of a jigsaw's footplate (a.k.a. "shoe") allows the saw to make bevel cuts, say for the edge of a picture



The Festool and Bosch saws (above) are the only models to feature blade guide systems, similar in concept to those on band saws. Below, tool-less blade change mechanisms are standard on all seven jigsaws.

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Some of the saws in this test allow tool-less footplate angle adjustments, while others require an Allen wrench (top photo). Chip extractor fittings (bottom photo) are provided as a standard feature only on the Metabo, Bosch and Festool — the most expensive tools in this review.

frame or decorative plaque. While all these jigsaws have tilting footplates, only the Bosch, Milwaukee and DeWALT allow tool-less angle changes. Each of these saws has a lever that releases and locks the footplate easily and quickly. The Bosch's even includes a separate dial for adjusting locking tightness. I like the Milwaukee's wide lever the best because it operates smoothly and positively. The other four saws employ an Allen wrench, which conveniently stores on board the tool, for angle changes. Yes, using a wrench does take more time, but then again, how often does the average woodworker take bevel cuts with a jigsaw? Angle detents are very useful

"During my early woodworking days ... I used the best jigsaw I could find (I borrowed money from a friend to buy it)."

for locking in commonly used tilt settings. All the saws have a 0-degree detent for square cuts, and most have detents at 45 degrees and other angles as well (see the chart on page 50). After checking the accuracy of the all-important 90-degree detents, I found that only the Festool and Bosch consistently kept their blades at near perfect square to the footplate. The other saws required a bit of fussing with a try square to get their blades dead on 90 degrees.

Dust collection and sawdust blower: Having written many articles and several books on woodshop dust control, I'm a huge advocate of built-in dust collection on portable power tools. The three most expensive jigsaws in this group — the Festool, Bosch and Metabo — come with a chip extractor fitting for dust collection; it's an optional accessory for the other four saws. This plastic fitting clips into the back of the saw's footplate and connects to a small diameter vacuum hose (the Bosch comes with a hose adapter). A clear plastic chip guard snaps in place over the front of the saw to enclose the blade area and enhance chip collection. The guard must be removed for blade changes.

I only tested dust collection with the three saws that came standard with the extractor fitting. Both the Bosch and Festool collected chips effectively, but there was a problem: Their chip guards limited the visibility of the line of cut, and as fine dust built up

on the inside of the guard, it became nearly impossible to see. Visibility was considerably better with the Metabo when using dust collection, as its chip guard is much taller and larger and didn't seem to attract as much fine dust.

An alternative means of clearing sawdust from the line of cut is to simply blow it away. All the saws feature a dust blower that uses air channeled from the motor fan to blow dust away from just in front of the blade. The blowers on all the saws do a pretty good job, save the Makita, whose airflow is rather sluggish. The Bosch has a blower On/Off lever (see the top photo on page 50), and the DeWALT and Milwaukee have controls for reducing the amount of blown air. Shutting off or turning down the airflow is desirable when you're working inside your home and don't want to launch sawdust everywhere, or when blown dust might end up in your eyes, say when jigsawing plumbing and electrical cutouts inside a kitchen cabinet.

Built-in light: The Hitachi, Makita and Milwaukee all include one of my favorite portable power tool features: a built-in LED light. Interestingly, these are the three lowest-priced saws in the group (I guess toolmakers figure that the folks that buy more expensive saws also have better eyesight!). A built-in light is particularly welcome on a jigsaw, since the overhanging body tends to cast a shadow in the area of

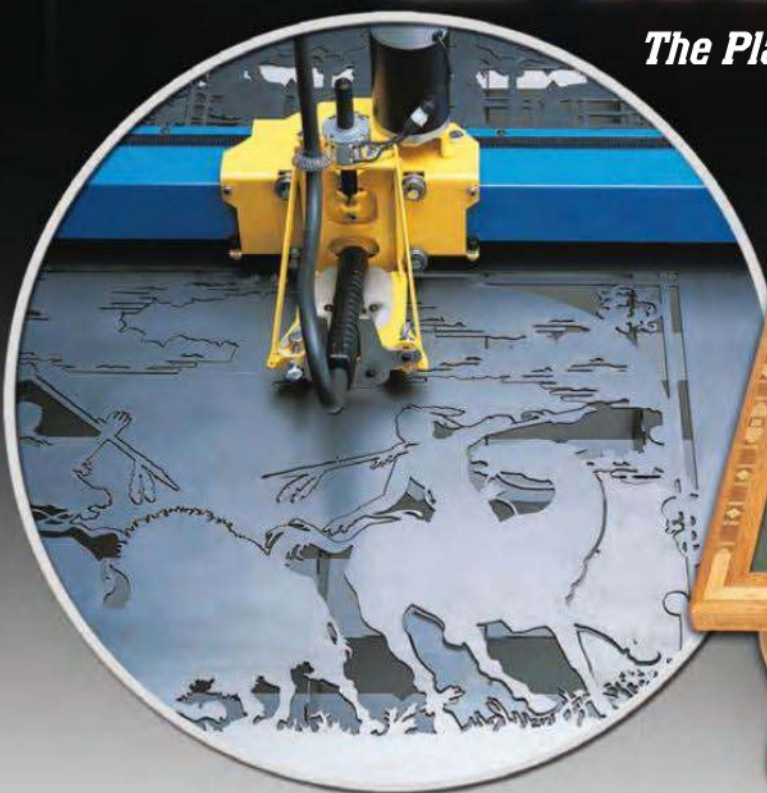
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To see our author's chart that notes and records all of the performance data and criteria used in this review, as well as a video featuring each saw, go to woodworkersjournal.com and click on the "More on the Web" tab shown above.



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Tool Review continued



The Bosch saw has an On/Off switch for its dust blower — unique among the tools reviewed here. Only the three least expensive saws have an LED light to help illuminate the line of cut.



the blade. The Hitachi's light (photo, below left) has a small plastic pointer that conducts some of the LED's light and sticks down in front of the blade. Although its goal is to better visually define the line of cut, I found it actually obscured the work area.

Other features: An accessory plastic shoe cover comes with the Bosch, Makita, Milwaukee and DeWALT jigsaws (photo at far right). This thin, slick plastic cover snaps in place over the tool's footplate, allowing you to saw delicate materials — decorative veneers, plastics, Corian® countertops — without fear of causing scratches. The Festool doesn't include a shoe cover, but it doesn't really need one. Its cast alloy footplate already has a slick plastic covering.

All the jigsaws in the group, except the Hitachi, come with a plastic anti-splinter insert (see top photo, page 52). This small accessory snaps into its footplate to surround the area directly around the blade, like

a zero-clearance throat plate in a table saw. These inserts really do help reduce splintering, and I recommend using them when taking fine cuts on splinter-prone woods and plywoods, as well as materials with delicate surfaces, such as melamine.

Except for the economy-priced Hitachi, all the jigsaws in the group come with a plastic tool case. The Bosch and Festool saws have special stackable cases, each part of a system that allows multiple cases to be latched together for storage or transport.

Like all other current Festool portable power tools, the Trion jigsaw features a detachable "Plug It" power cord. This makes it easier to stow, as you don't have to wrap the cord around the tool. Plus, you can easily replace a damaged cord by simply plugging in a new one.

The back of the Hitachi's body has a loop molded in, making it easy to connect the tool to a lanyard or other hook — a nice feature if you work on a roof or ladder.

Jigsaw Specifications

Make Model	Festool Trion PSB-300-EQ	Bosch 1590 EVSL	Metabo STEB135 Plus	DeWALT DW331K	Makita 4350 FCT	Milwaukee 6268-21	Hitachi CJ110MV
Street Price	\$310	\$201	\$179	\$156	\$153	\$151	\$95
Motor Amperage (input power)	6 amps	6.4 amps	6 amps	6.5 amps	6.3 amps	6.5 amps	5.8 amps
Variable Speed Trigger/Soft Start	No/Yes	Yes*/No	No/Yes	Yes/No	No/Yes	Yes/No	No/No
Blade Strokes Per Minute	1,000 – 2,900	500 – 2,800	1,000 – 3,000	500 – 3,100	800 – 2,800	0 – 3,000	850 – 3,000
Blade Stroke Length	1 inch	1 inch	1 inch	1 inch	1 inch	1 inch	1 inch
Number of Blade Orbit Settings	4	4	5	4	4	4	4
Dust Collection Standard	Yes	Yes	Yes	No	No	No	No
Dust Blower	Yes	Yes ^{^^}	Yes	Yes [^]	Yes	Yes [^]	Yes
Built-in LED Light	No	No	No	No	Yes	Yes	Yes
Bevel Capacity/ Detents/ Tool-less Adjust	45 – 0 – 45/ 0/ No	45 – 0 – 45/ 45 – 0 – 45/ Yes ^{**}	45 – 0 – 45/ 0, 15, 30, 45/ No	45 – 0 – 45/ 0, 15, 30, 45/ Yes	45 – 0 – 45/ 0/ No	45 – 0 – 45/ 45 – 0 – 45/ Yes	45 – 0 – 45/ 0/ No
Weight	5.29 lbs.	6 lbs.	5.7 lbs.	6.4 lbs.	5.7 lbs.	6.4 lbs.	4.9 lbs.
Included Accessories	Stackable plastic case, chip extractor, chip guard, anti-splinter insert, 2 blades	Stackable plastic case, chip extractor, hose adaptor, chip guard, anti-splinter insert, shoe cover, 3 blades	Plastic case, chip extractor, chip guard, anti-splinter insert, 1 blade	Plastic case, anti-splinter insert, shoe cover, 2 blades	Plastic case, shoe cover, anti-splinter insert, 6 blades	Plastic case, chip guard, anti-splinter insert, shoe cover, 2 blades	1 blade

*Two-step trigger; first position low-speed on, then fully variable

[^] Adjustable blower output

^{^^} Dust blower On/Off switch

^{**} Features adjustable locking tightness

Part 2: Testing

Note: For a chart that shows all the jigsaw performance data and ratings, go to woodworkersjournal.com and click on "More on the Web."

Cutting Fast: An obvious question when comparing the performance of different jigsaws is "which saw cuts the fastest?" I created a speed cutting test to determine the answer. First, I fitted each saw with a new Bosch Progressor blade, designed specifically for fast, rough cutting. With the help of my wife, Ann, I timed how long it took each saw to crosscut a 2x6, as shown in the lead photo on page 44. I took several passes, then averaged the times for each saw. I tried to push each saw as hard as I could without bogging its motor down.

In the final tally, the premium-priced Festool turned in the fastest average time: 2.74 seconds, notable because this saw doesn't have the highest-ampere motor or fastest blade stroke speed in this group of jigsaws. The next

fastest cutting time was clocked by the Makita — less than a tenth of a second slower than the Festool. Posting a slightly slower time than that was the Bosch, followed (in timed order) by the Metabo, Milwaukee and Hitachi. The DeWALT held up the rear of the pack with a rather slow 4.27-second average time.

The second-and-a-half difference between the fastest and slowest saws might not seem like much. But this time can really add up if you have dozens of rafter ends to decoratively jigsaw, or a pile of curved parts to cut out.

Vibration: Regardless of how fast a jigsaw cuts, the less vibration it produces, the better. All jigsaws employ some sort of counterbalance system to reduce the up-and-down shaking created by the reciprocating plunger and blade, and some work better than others.

In truth, I found it quite difficult to accurately compare the vibration of the various



A useful accessory that comes with some jigsaws is a slick plastic cover that prevents its metal footplate from scratching the work.

saws in the group, as it varied under different circumstances. For example, the DeWALT felt very smooth-running when idling at full speed. However, when I put the saw to wood, it produced noticeably more vibration.

After careful consideration, I found the Bosch and Festool, closely followed by the Milwaukee and Makita, consistently produced the least vibration when cutting a variety of wood types and thicknesses with a variety of blades. That's not to say that the DeWALT and Hitachi produce unacceptable amounts of vibration, but they just didn't feel as smooth-running as the top saws. At the bottom of the pack, the

Metabo jigsaw consistently produced more vibration than any of the other saws.

Cutting cleanly: Getting clean jigsaw cuts with only light splintering, tearout and surface chipping is chiefly a matter of selecting a blade that's designed for the job (see sidebar below). But I still wanted to see just how smooth a cut each saw was capable of producing with a general-purpose blade. I fit each saw with a fine-toothed blade and set it to a medium speed with a slight orbit (#1). I then took several cuts with each on a piece of 3/4" melamine — a material notorious for

Continues on page 52 ...

Use the Right Saw Blade



Any power tool that cuts is pretty much only as good as the blade it's fitted with. Even a great jigsaw will only do so-so work if it's cutting with a dollar-store-quality bargain blade. There's no excuse anymore for not buying and using good jigsaw blades — all seven saw manufacturers represented in this article offer very high quality blades that work with any saw that accepts a tang-style blade. Bosch has the most

extensive array of jigsaw blades, with many designed for very specific tasks: Need clean cuts in plywoods, hardwood or laminate materials? There are blades made for each particular job. Want to cut through lumber quickly and not ruin teeth on embedded nails and fasteners? Bi-Metal blades with hard, yet incredibly durable, teeth will serve you well. Choose narrow blades for tight-radius cuts and wider, longer blades for straighter cuts in thick lumber. And don't forget the specialty blades made for cutting dozens of different non-wood materials, from plastic and fiberglass to aluminum and steel to rubber and leather. Given all the choices, you'll be awfully glad you bought a jigsaw with a quick-change blade clamp!



Each of these three long saw blades, made by Starrett, Festool and Bosch, is specifically designed for quick cuts in thicker woods.

Tool Review continued



Bosch 1590 EVSL

Most jigsaws come with anti-splinter inserts that snap into the footplate. They're very useful in reducing splintering and chipping.



Good visibility is an important attribute of a jigsaw when cutting intricate scroll patterns.



The author tested how well the saws cut melamine, a material that tends to chip easily.



The blade guide systems on the Festool and Bosch helped keep their blades square and true when cutting thick wood.

chipping easily (see photo at left, second from the bottom).

After experimenting with different rates of feed, I selected the cutoffs that displayed the cleanest edge produced by each saw. The Bosch, aided, I suspect, by its precision control guide, left the cleanest cut edges. With cuts only slightly more ragged than the Bosch were the Makita, Festool and DeWALT, followed by the other saws. It's worth noting that I was able to get a much cleaner cut with all of these saws by fitting them with a special saw blade designed for laminates, as well as an anti-splinter insert.

Cutting accurately: The major factors that affect the accuracy of jigsaw cuts are: How well you can see the line of cut and how well the saw's blade stays square to the workpiece (or at a fixed angle during bevel cuts). Generally, a saw with less of its body overhanging the blade is easier to use, especially when you're working in cramped quarters or trying to follow a

curvaceous line, say when cutting out a scrollwork pattern, as shown in the photo at left. The open front end configuration of the Bosch and Metabo make it much easier for me to see the blade without having to crane my neck. The Milwaukee and Hitachi have the most blade-obscuring body overhangs, but the former's built-in LED light helps to improve its line-of-cut visibility.

It's usually true that the thicker, denser (or more variable in density) a workpiece is, the more likely that a jigsaw's blade will deflect when cutting it. This is especially true when cutting tight curves. To judge this aspect of cutting accuracy, I crosscut 4x4 lumber with each jigsaw. Most models left edges that wavered in squareness and up-and-down straightness over the length of the cut. The exceptions were the Bosch and Festool models, which left nearly dead square and straight cut edges (bottom left photo). It's safe to assume that such superior performance was likely due to the special blade guide systems on these saws, which helped prevent their long saw blades from deflecting.

Picking a Winner

I've conducted dozens and dozens of tool reviews in my career, but few were as close as this one: After a couple of weeks of testing and hundreds of cuts, I found a small range of differences between my most and least favorite saws.

All seven are truly top quality tools capable of putting in a serious day's work. Even the relatively bargain-priced Hitachi is a well-built machine that deserves a place in this lineup.

But as capable as these machines are, some models proved to be better performers and more "user-friendly" than others. The three factors that were the most important to me when choosing the best jigsaws included: 1. Solid performance — a blend of aggressive cutting and smooth operation; 2. Superior user comfort — a comfy grip and easy to use controls; 3. Good value for the money — the balance of features and price. When I considered the saws independent of price, there was a fairly small point spread between the top models, with the Bosch, Makita and Festool leading the pack. It was a bit easier to choose an alpha saw when price entered the picture. As good as the top-priced Festool Trion proved to be, I don't think it's twice as good as the Makita that's half the price. The Makita 4350 FCT is a very good jigsaw for the price, but the Bosch had a better feature set and overall performance for just under \$50 more. Therefore, the Bosch 1590 EVSL earns my choice as the "Best Bet" in this group of impressive top-shelf jigsaws.

Sandor Nagyszalanczy is a furniture designer/craftsman, writer/photographer and regular contributor to the Journal.

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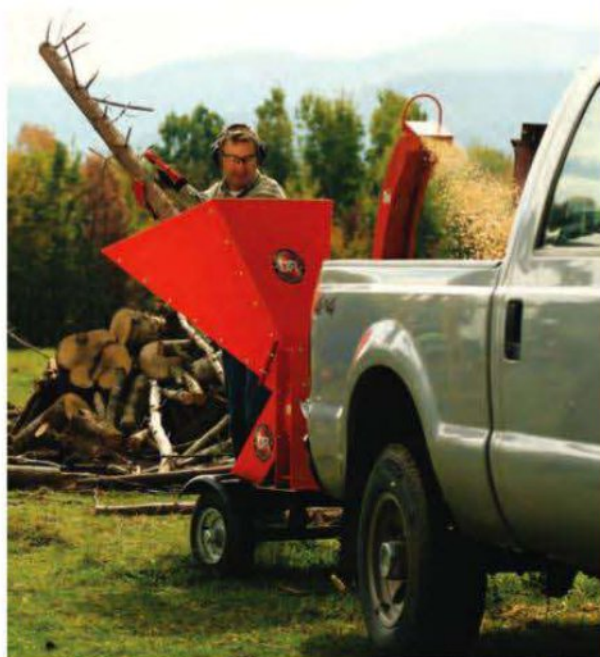
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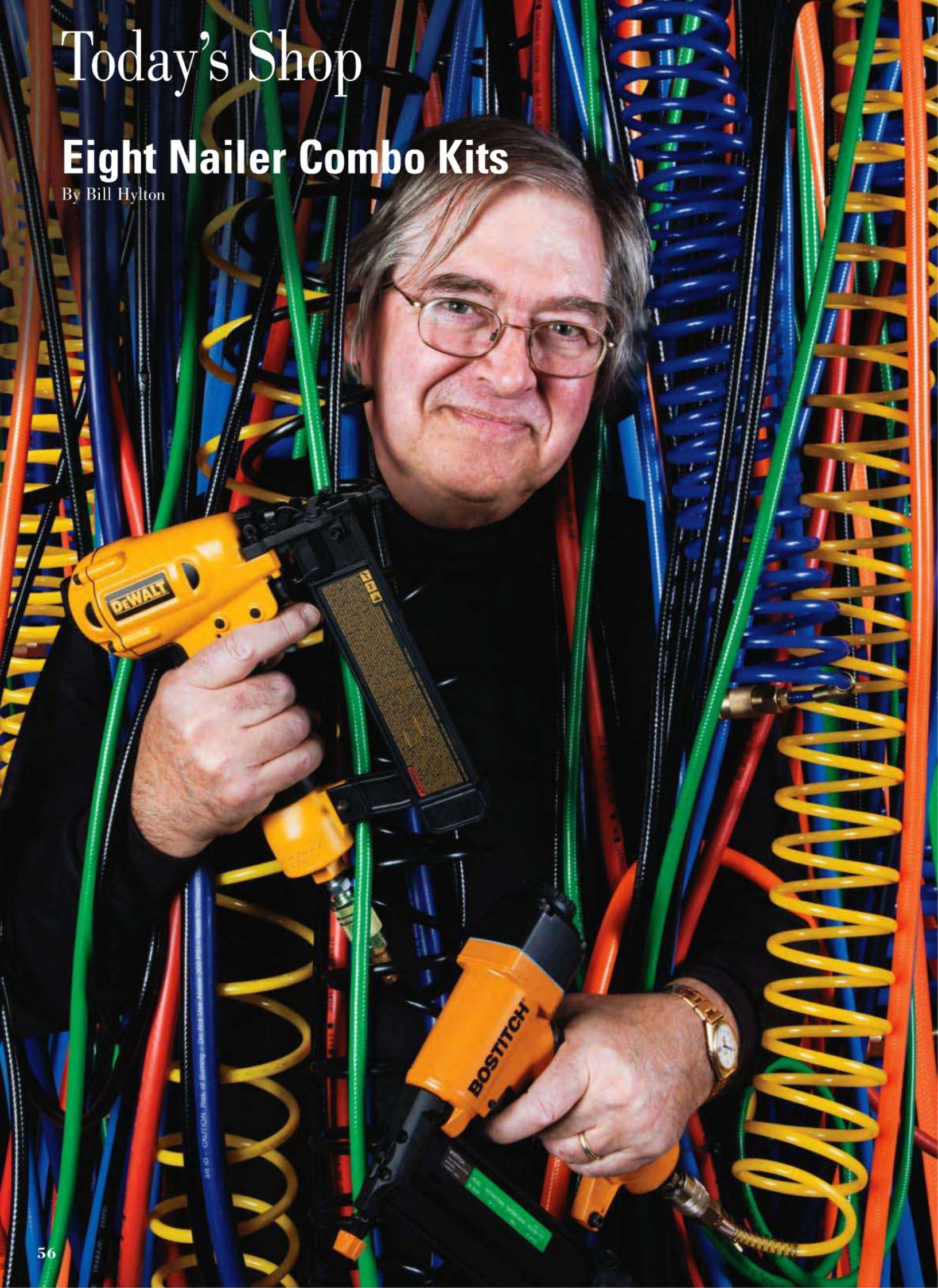
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Today's Shop

Eight Nailer Combo Kits

By Bill Hylton



Whether you're a woodworker only or dabble in DIY, too, sooner or later you'll want a pneumatic nailer. These combo kits offer one-stop shopping convenience.

Everyone who has watched a certain bespectacled and bearded woodworker on television use a pneumatic powered nailer and stapler to tack a piece of wood securely in place knows that these tools can be really handy. But there are so many different kinds of compressors and nailers ... how can you choose which is right for you?

Obviously, if you get a combo kit of a compressor, gun and hose, you leap ahead in the game, which is why I was asked to round up eight compressor/nailer/stapler combo kits for your review.

Craftsman Evolv

This is a consumer-grade package, and I don't know how long and hard you can use it. I wouldn't expect to use the compressor with any construction nailers. But it's the lowest priced unit by far — just \$80. Though Sears markets a full range of air compressors and pneumatic nailers and other tools, this is the company's only compressor-nailer package.

Overall, the 3-gallon compressor's design is tidy. All the controls, including the power switch, are visible at a glance. Even the icons labeling the two pressure gauges are instantly understandable. The noise of charging is bearable. There's a cord wrap and even a little widgets bin with a lid atop the unit. At 100 PSI (pounds per

square inch) max, the power is wanting, though it is rated at 0.6 CFM (cubic feet per minute) at 90 PSI.

The brad nailer is adequate. With a sleek design, it takes the full range of brad lengths. I'd like it better if the safety didn't block your view of exact brad placement, and if its tip were cushioned. I'd also prefer tool-free jam clearance, but you have to keep in mind that you aren't spending much for this unit.

The product box also contained a blow gun and inflation needle, a tire chuck, a male coupler, and a roll of Teflon® tape. The blow gun is especially useful in the shop.

Campbell-Hausfeld

Campbell-Hausfeld's entry features a lightweight (18 lbs.) two-gallon compressor, a combination brad nailer-stapler, a recoil hose, and a pack with three male couplings, a tire chuck, and a pair of inscrutable (to me) plastic nozzles. It's clearly a consumer-grade package, available for about \$139. Curiously, the horsepower rating of the motor is not listed anywhere, and its CFM rating (0.39 at 90 PSI) is the lowest of this group.

The nailer is likewise of limited capacity. Yes, it can shoot both brads and staples, but only short ones. The range is 1/2" to 1" for staples, 5/8" to 1 1/4" for brads. Moreover, the tool lacks a depth-of-drive adjuster, fires only in the

sequential mode, and requires you to use tools to clear jams.

Senco

Lightweight, QUIET, yet tough, the Senco package I worked with has been around for quite a few years. I acquired the unit shown about seven years ago, and I've been using it in the shop and around my house pretty regularly since. I won't give it up, though the larger units I've now been exposed to are mightily seductive.

The package consists of the company's PC1010 compressor, a 1/4" x 25' recoil hose, and a FinishPro18 brad nailer. The nailer handles the full range of 18-gauge brads, from 5/8" up to 2". I've seen a similar package with a pinner instead of a brad



Campbell-Hausfeld
FP209599AV 2-Gallon
Twinstack Air Compressor
and 2-in-1 Brad
Nailer/Stapler Kit (\$139)



Craftsman Evolv 3-Gallon
Pancake Air Compressor
with 2" Brad Nailer and
Accessory Kit (\$79.99)



*Senco PC0947/FP18KIT
18-Gauge Nailer Compressor
Combo Kit (\$200)*

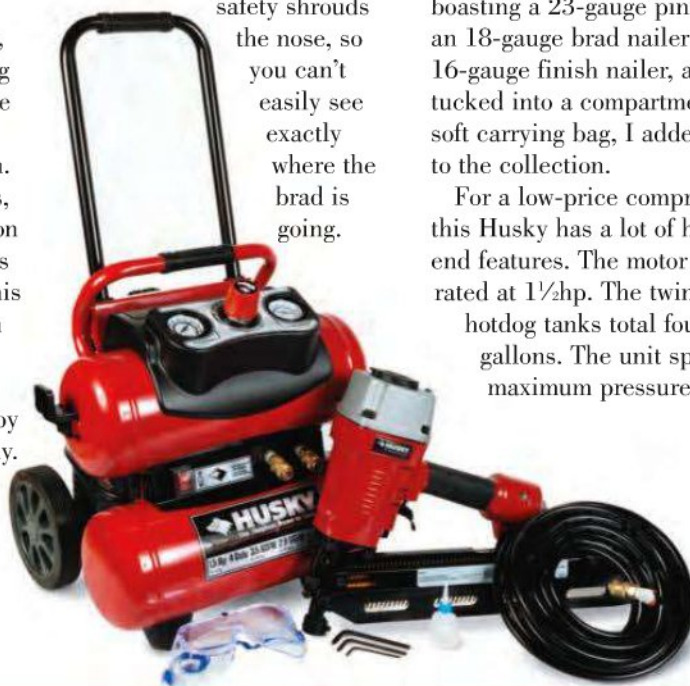
nailer, but couldn't get my hands on one for this survey.

The compressor has a one-gallon hotdog tank with a maximum pressure of 125 PSI, providing 0.6 CFM at 90 PSI. This is sufficient for a pinner, brad or finish nailer, but insufficient for a framing nailer. I could fire only three 3" framing nails before the compressor motor kicked on.

Among these compressors, only Senco's has an induction motor, which accounts for its quiet operation. I suspect this unit will outlive its brethren with universal motors. Weighing barely 20 pounds and measuring 14" by 13" by 10", it totes and stores easily.

The FinishPro 18 brad nailer is altogether satisfactory, though Senco does market newer, more feature-rich units. The gun has on-tool depth-of-drive adjustment but not tool-free jam clearance. To change firing mode from the standard sequential trip, you have to change the trigger. No trigger lock. There's a belt hook, but it's fixed, not adjustable. The only thing I'll grouse about is the way the plastic pad on the

safety shrouds the nose, so you can't easily see exactly where the brad is going.



*Husky H1504FK Frame
Nailer and Stack-Tank
Compressor Kit (\$199)*

Husky

Husky is the "house brand" of Home Depot. The package I tried — the only compressor-nailer combo Husky offers — mates a framing nailer with an altogether nifty compressor, at a competitive price (\$199). The framing nailer doesn't exactly match up against the other packages, but it does reflect the variety of the marketplace. When I spied a three-tool nailer package being sold by Husky (for \$99), boasting a 23-gauge pinner, an 18-gauge brad nailer and a 16-gauge finish nailer, all tucked into a compartmented soft carrying bag, I added that to the collection.

For a low-price compressor, this Husky has a lot of high-end features. The motor is rated at 1½hp. The twin hotdog tanks total four gallons. The unit sports a maximum pressure rating

A Nailer (and Nail) for Every Task

Part of the challenge of selecting a combo kit is figuring out which nail guns you need. Two issues to consider here are nail length and gauge. Surely, you'll want to drive a range of nail lengths, just as you would with ordinary hand-nailing, to create solid connections. A 15- or 16-gauge brad nailer will provide you the sturdiest nails in lengths up to 2½", but they leave the biggest hole behind. Eighteen-gauge brad nailers also accept a wide range of nail sizes up to 2". The thinner nails are ideal for general woodworking and trim jobs, and their signature is more discreet. For ultra-fine work, where appearance matters more than brute strength, a 23-gauge pin nailer is ideal. Pin-hole sized dots are their only trace.



“Of the eight compressors I used, only one has an induction motor, which accounts for its quiet operation.”

of 155 PSI — topping all the compressors — and delivers 2.8 CFM at 90 PSI. It isn't quiet or lightweight at 43 lbs. But it does have a pair of 7" rubber-tired wheels along with a collapsible pull handle, so



Husky three-tool nailer package

you can roll it around the shop or wherever it's needed.

All of the controls — pressure gauges, regulator, two couplings, even the power switch — are up front. To round out the features, the compressor has hangers for stowing the hose and nailer (although it seems wimpy for a big framing nailer).

I won't say much about the nailer; I have no others for comparison. Suffice it to say that, like all framing nailers, it is heavy — twice as heavy as any of the 16 other nailers here. Its kickback is significant compared to the smaller guns, too.

For specs, the carriage is angled at 21 degrees to the nailer's head, and it is swung several degrees out of alignment with the handle. It shoots full round-head nails, 2" to 3½" long. The firing mode is switched by changing triggers, and the trigger for bump firing comes standard.

Porter-Cable

Porter-Cable markets several compressor-nailer packages, and the PC3PAK that I tried

is the top of their line.

The package provides three nailers with P-C's six-gallon pancake compressor, and it's the lowest priced of the multi-nailer packages I tried here.

The “pancake” tank looks more like an aggressively inflated Mylar® balloon, and the motor and compressor that are perched on it are housed in a plastic shroud incorporating a cord wrap and handle for lifting and carrying the unit. All of the controls are grouped in the top front. As do all the compressors in the collection, the P-C unit runs on a standard 120-volt circuit, and it draws 10 amps.

The compressor produces 0.8 horsepower, 150 PSI maximum pressure, and 2.6 CFM at 90 PSI — sufficient moxie to power a framing nailer and even intermittent use of a small spray gun.

It's worth pointing out that this compressor is in each of P-C's combo kits. If you don't want all three guns, P-C offers it with either of two brad nailers, with just a finish nailer, and with both a brad nailer and a finish nailer. Curiously, the other packages can cost as much as or more than the PC3PAK. Go figure.

The nailers provided are first-rate, with great fit and finish, and a full array of features: padded tip on the safety rod, on-tool depth-of-drive adjuster, tool-free jam clearance, trigger lock and adjustable belt hook. All are equipped with sequential firing. You can buy a black trigger — it is not provided in the box — and replace the

red one to get bump firing.

My only gripe is that the kit doesn't give you a 2" brad nailer or a 1½" stapler. The BN138 supplied tops out at 1⅜" brads. The NS100B shoots 1" staples.

Hitachi

I like this package for the nailers. The 15-gauge brad nailer handles a full-range of brad lengths, from 5/8" to 2". It is light in weight and comfortable in my hand. It offers on-tool depth-of-drive adjustment and tool-free jam clearance. The plastic-tipped safety is located behind the nose, so you have unobstructed views of the brad placement from either side or the front. It is the only brad nailer with a switch for changing from sequential firing to bump firing. Missing are a trigger lock and a belt hook (but I've never used either of those in my work).

The obvious feature of the finish nailer is the angled carriage. A nailer's nose can be maneuvered into inside corners to, for example, facilitate baseboard and crown molding installation — if its nail carriage isn't at right angles to the nailer head. Maybe it's just the novelty of it, but I want it. I should point out that the angled carriage means you have to buy nails in clips of a matching angle.



Porter-Cable PC3PAK Finish Nailer/Brad Nailer/Stapler Compressor Combo Kit (\$295)

The Nail Gun Idea

was invented one evening in the 1950s at the Winstead, Minnesota, American Legion. This is according to an interview of Marvin Hirsch by Ryan Gueningsman, which appeared in the August 1, 2005 *Winstead Herald Journal*.



Hitachi 6-Gallon 145 PSI
Electric Air Compressor
Kit (\$265)

The nailer's other features match those of the included 18-gauge brad nailer — no depth-of-drive adjustment, but switch-controlled firing mode change and tool-free jam clearance. The safety is heavier, but this gun is almost twice the size and weight of the brad nailer. Its tip loops from side-to-side around the front of the nose.

The compressor is not the best of the lot, but it's a good one nonetheless. A 1+ hp motor drives the compressor, feeding a six-gallon pancake tank. (This one looks more like a buttermilk biscuit to me.) It delivers 2 CFM at 90 PSI. The rated maximum pressure is 145 PSI.

All the mechanicals sit atop the tank, fully enclosed in a black plastic housing that's

topped by a lift handle. A bit of a groove formed where the housing meets the tank serves as a cord wrap, and the plug is molded to squeeze onto the cord, securing the wrap. The controls are grouped on the front of the housing, with a red pull-push power switch on the right side, the two couplers, regulator and the safety relief valve in a line across the front, and the two pressure gauges just above the regulator knob.

Rounding out the package are a green 1/4" x 25' PVC hose and a soft bag for stowing the two nailers.

This Hitachi kit is sold only by Lowe's. Though Hitachi USA supplied me with the package, it isn't listed on the manufacturer's U.S. website.

DeWALT

DeWALT has a solid tradesman reputation, and this package lived up to that rep. The one I tried includes a two-gallon compressor, 25' PVC hose, a brad nailer and a finish nailer. DeWALT markets a second package, which I haven't even seen, that mates a one-gallon compressor with a brad nailer.

Its price puts this package in the middle of three others with six-gallon compressors. Despite having the lowest

horsepower rating and the smallest tank of the four "high-end" packages I tried, the DeWALT's pressure maximum of 150 PSI and airflow rating of 2 CFM at 90 PSI make it fully competitive.

Design-wise, the DeWALT compressor looks no-nonsense, with its sturdy chassis, stout tank and up-front controls, and its embossed step-plate-looking top. The immediate disconnect between image and reality is the "No Step" label on that step-plate-looking top. Why not beef it up and have it be a step? A second disconnect is the hidden power switch. It's black, mounted in the back, beneath that black no-step top, on the black motor shroud.

The pair of nailers in the package — you will certainly stash them in the soft carrying bag that's included — are quite fine. Both tools feature soft-tipped safeties, tool-free jam-clearing, and on-board depth-of-drive adjustment. The triggers have a "lock-off," which you twist to the right to lock the trigger, thus preventing the tool from firing. The tool weights — just under 2½ lbs. for the brad nailer and under 4 lbs. for the finish nailer — are comfortable. Because the compressor has two couplers, you can (provided you have or buy a second hose) connect both nailers for a trim-out job,



DeWALT D55141FNBN
Combo Finish Nailer/Brad
Nailer Combo Kit (\$280)



Bostitch CPAC300 3-Tool and Compressor Combo Kit (\$292)

using the brad nailer to fasten casing to jamb edges, the finish nailer to secure it to the wall studs.

The one reservation I have is that the brad nailer is limited to fasteners 1 1/4" or less. The presumption, I suppose, is that once you use fasteners longer than 1", you'll want to switch to the heavier gauge. That's a choice I'd want to make for myself.

Bostitch

I'm not known for making a quick shopping decision, so I'm still waffling as I write this about which of these kits I'd buy if I were in the market. But I'm pretty sure that this Bostitch combo is the package I'd pick if I had to choose. It isn't my ideal, mind you, but its components all rank close to the top in their categories. Plus, Bostitch provides three nailers rather than two or only one.

Consider first the compressor. It looks like a fraternal twin of the Hitachi, thanks to the biscuit-shaped six-gallon tank with the works on top. The upper housing is slightly different, and the handle is positioned at right angles to the Hitachi's. The grouping of controls generally matches that of the Hitachi. The pressure gauges are up top, and the coupler, regulator, safety relief valve, and On/Off switch are in the same plane across the front of

the compressor's display.

But the Bostitch has more moxie overall. It has a slightly higher horsepower motor (1.5hp vs. 1.1hp), a slightly higher maximum pressure rating (150 PSI vs. 145 PSI), and delivers almost 30 percent more air (2.8 CFI at 90 PSI vs. 2 CFM at the same pressure). I didn't measure any of these machines with a decibel-o-mometer, but my ear tells me the Bostitch makes pretty much the same noise as the Hitachi, or for that matter, as the Porter-Cable, Husky, or DeWALT. And by my scale, the Bostitch weighs one pound less than its "twin" and six pounds less than the Husky.

My quibbles are these: Why only one coupler? I've seen compressors with two, so that's what I want! And why no plug you can press onto the cord to secure it in the cord wrap?

I have more reservations about the nailers. I applaud Bostitch for bundling full-range nailers in the package, providing a 2" brad nailer and a 1 1/2" stapler to go with a 2 1/2" finish nailer. (DeWALT shorts you on the brad nailer in its package, and Porter-Cable does the same with its stapler as well as its brad nailer.) All three nailers have padded-tip safeties (good) that obscure your view of exact fastener placement (bad). Two of the three have on-tool depth-of-drive adjusters; the

stapler lacks it. The finish nailer offers tool-free jam clearance, but neither the stapler nor the brad nailer do. All three require a different trigger — not supplied — to switch from sequential to bump firing mode. None have a trigger lock or a belt hook.

One last note on Bostitch. Like Porter-Cable and DeWALT, Bostitch markets more than a single package. In the lineup are a compressor-brad nailer set and a compressor with brad and finish nailers package. All include the same compressor as the three-gun package.

Nailing the Right Kit

Clearly, if you're planning to add pneumatic fastening to your arsenal of power tool woodworking, there are lots of decisions to make in this "combo" category. Generally I think they present good value, and their all-in-one convenience will get you popping those fasteners in no time. While I wasn't charged with the task of picking a "Best Bet" here, I would suggest you look beyond a lowball price when making your choice. As that old cabinetmaker's adage goes, buy the best quality tool you can afford, and you'll only cry about it once.

Bill Hylton is a regular contributor to Woodworker's Journal.

Air Options



From fine work with tiny pins to shop-based stapling jobs to trimming out your home, air-powered nailers are available in an array of combo kit options to suit most any need and budget.

Woodturning

Chatter That You'll Learn to Love

By George Vondriska

With a chatter tool and just a little practice, you can add a unique pattern to the end grain of your turnings.



Long Edge, Left to Right

Position the Tool-rest

Typical lathe turning has you keeping the tool-rest as close as possible to the work. When using a chatter tool, you'll need to have the tool-rest backed away from the turning. Cantilevering the tool past the rest so it can vibrate is the very thing you're trying to avoid with a conventional chisel, but it's what allows a chatter tool to work. (See photo below.)

Start with the tool-rest above the center line of your material so the chisel is angled downward when it cuts. Changing the elevation of the tool-rest is one of the variables that changes the resulting chatter: it's something with which you'll want to experiment.

Make the tool-rest parallel to the end grain you're working on so you can do a chatter start to finish in one fluid motion.

What Chatters, What Doesn't

Chattering works on the end grain of hardwoods. Period. Believe me, I've tried face grain, and I've tried softwoods. It just ain't gonna happen. The material simply isn't rigid enough to withstand the force of the chatter tool. Instead of chattering, it ends up tearing. Your best bets are close-grained woods like maple, cherry, walnut and rosewood.

Before chattering, you should face the end grain off so it's smooth. My preferred method for this is a shearing cut with a 3/8" bowl gouge.

Typically, when you get chatter on a lathe project, it's a bad thing, leaving unsightly marks you have to cut or sand away. With a chatter tool, you can control the chatter pattern and make it decorative, instead of a mistake. The tool comes with interchangeable cutters that will produce a variety of patterns.

This article will give you an overview of how the chatter tool works and how you should use it. In order to avoid throwing too much chatter, and too many variables, at you at once, I'm going to concentrate on just one of the four cutting profiles the tool comes with, giving you recipes for setup to make it easier for you to chatter forth on your own.

Sharpen First

The chatter tool works a lot like a scraper, and it is sharpened similarly. Sharpening can be done on a fine grinding wheel or by hand. The burr produced by sharpening helps the chisel cut, and it should be left on the tool.



The tool-rest has to be set farther from the work than usual, giving the cutter a chance to flex and "chatter."

MORE ON THE WEB

For a video that further demonstrates how a chatter tool works, visit woodworkersjournal.com and click on the "More on the Web" icon shown above.



Probe With the Point



Long Edge, Right to Left



Tip Only, Light Touch



Four Chatter Setups

Here are four setups, all using the same cutting tip, that create four different patterns. All were cut in hard maple at 1,000 rpm. This will provide you with a recipe for doing your own chattering, but remember that this is more of an art than a science, and it's nearly impossible to perfectly duplicate a pattern.

Probe With The Point:

Push the V-shaped point into the material in evenly spaced intervals, leaving about 1/8" between each cut. Then go back and probe again, hitting the uncut spots.

The result is a herringbone pattern. The chatter looks best if you leave uncut areas next to it for contrast.

Long Edge, Right To Left:

Engage the straight edge of the cutter against the material and pull the tool from the center toward the outside. This pattern is of fine lines.

Long Edge, Left To Right:

Use the long edge again, but move the tool from the outside toward the center. The result is a slightly counterclockwise spiral. (See photos, opposite page.)

Tip Only, Light Touch:

Make contact with the V-shaped point, hold the tool rolled slightly toward the right, and move from the outside to the inside.

The result is a pattern that resembles a weave. Increase the rpm to get a deeper, more widely spread pattern.

Seven Chatter Techniques

Again, this is more art than science, so don't try to make it too formulaic. Here are a few

guidelines to get you started:

- 1) Low rpm results in finer patterns, high rpm results in bigger patterns.
- 2) A high-pitched squeal means you're making a good chatter (be sure to wear your hearing protection).
- 3) Allowing the cutter to project farther from the tool creates a heavier, more widely spaced pattern. Start with the cutter extended about 1".
- 4) The tool should angle down slightly toward the work.
- 5) Cutting on center makes a pattern with lines that radiate straight out from center.
- 6) Cutting below center makes lines that spiral clockwise,

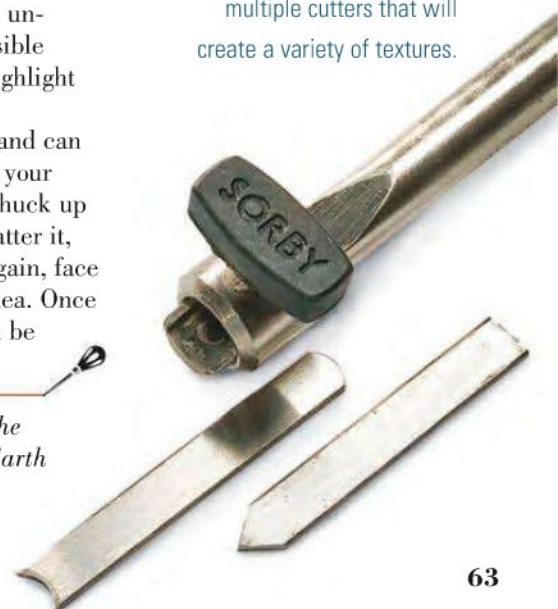
while cutting above center makes lines that spiral counterclockwise.

- 7) Leaving some spots unchattered creates a visible contrast, which will highlight the textured work.

This is a lot of fun, and can add a unique touch to your turning projects. So, chuck up a hardwood blank, chatter it, face it off, chatter it again, face it off ... you get the idea. Once you give it a try, you'll be chattering up a storm.

George Vondriska is the director of the Wild Earth Woodworking School.

This Sorby
RS215K tool comes with multiple cutters that will create a variety of textures.



Skill Builder

The Jointer

By Sandor Nagyszalanczy

Power Tool Tune-ups: 2011 Schedule

Table Saw
February

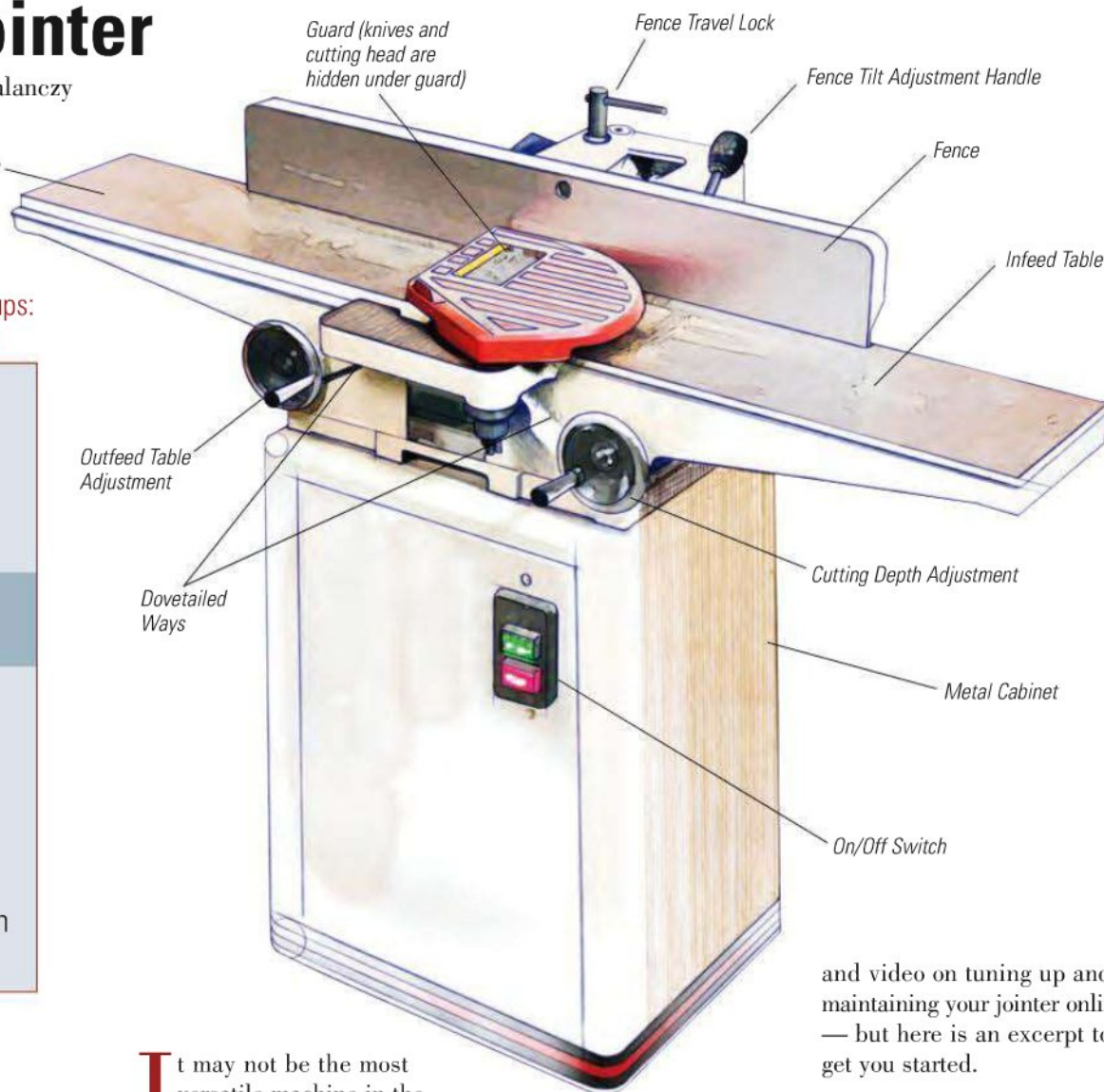
Band Saw
April

Jointer
June

Drill Press
August

Planer
October

Dust Collection
December



and video on tuning up and maintaining your jointer online — but here is an excerpt to get you started.

It may not be the most versatile machine in the shop, but without a jointer to put flat faces and straight edges on the lumber we build with, most of our other machines wouldn't be worth their weight in sawdust. We need true edges and faces on our stock that will ride solidly, smoothly and safely on our machine's tables and against their fences. You'll find my complete text

Parallelism of Tables

For the jointer to do its job correctly, the infeed and outfeed tables **MUST** be parallel to one another. If your jointed boards are coming out with either a convex (humped) or concave (hollowed) edge instead of straight, it's possible that your tables aren't truly parallel. To check this, use a straightedge with a dependably straight, preferably ground, edge that will make firm contact with the table's machined surfaces. Better still, I recommend using a long, high quality carpenter's level, four or five feet long. Unlike a straightedge, the

MORE ON THE WEB

For a more extensive article and video on using and maintaining your jointer, visit woodworkersjournal.com and click on the "More on the Web" tab shown above. Or send a large SASE to Woodworker's Journal, Skill Builder 21, 4365 Willow Drive, Medina, MN 55340.



To work properly, the infeed and outfeed tables in a jointer must be parallel to one another — if they are not, the tool is virtually worthless.



If there is a gap under a straightedge, (far left) you should adjust the gib screws (immediate left). The gibs are metal bars fitted between the dovetailed ways to lock these joints and hold the tables in place on the central metal component of the jointer.

edge of a level will sit flat and not fall over.

After repositioning the fence so it's clear of the tables, set your straightedge or level across both jointer tables. Raise the height of the infeed table up to the level of the outfeed table. Now tap on the ends of the level to see if it rocks back and forth, an indication that the tables have drooped, and they are lower at the ends than in the middle. If the level doesn't rock, check to

see if there's a gap under the level near the cutterhead ends of both tables. Check the gap using the thinnest leaf in a feeler gauge set (typically .0015 in. thick). If you don't have feeler gauges, a piece of regular paper will work. If the feeler gauge reveals a gap, it's an indication that the tables are lower in the middle than the ends.

In either case, you can usually return the tables to parallel by adjusting the screws that press on the

gibs in the jointer's dovetailed ways. The ways are the joints that connect each table to the base and allow it to slide up and down. If one or both tables have drooped, tighten the gib screws nearest to the outer ends of the table. If the tables sag in the middle, concentrate on the screws near the cutterhead end of each table (for more information on gib adjustments, consult your machine's manual).



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



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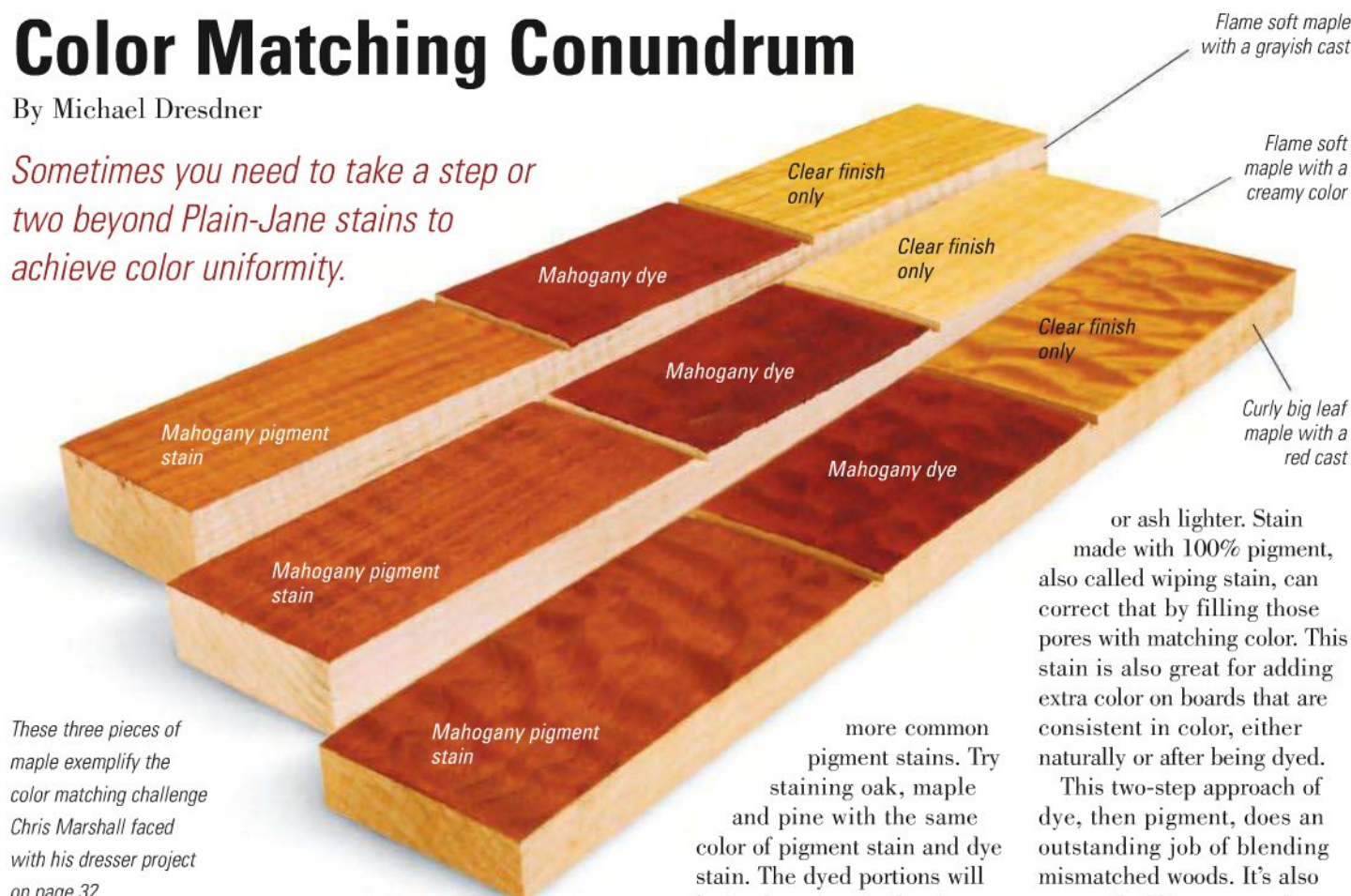
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Finishing Thoughts

Color Matching Conundrum

By Michael Dresdner

Sometimes you need to take a step or two beyond Plain-Jane stains to achieve color uniformity.



These three pieces of maple exemplify the color matching challenge Chris Marshall faced with his dresser project on page 32.

Build a project from a single board and the finished piece will be visually consistent. Use several different boards, even of the same species, or mix solid wood and plywood, and you may end up with an array of glaring color surprises once the finish goes on.

Stain can mitigate color differences, but it may not erase them completely. In fact, the stain may accentuate the differences, creating a more obvious mismatch from board to board. Fortunately, using the right stains in the right order can help blend errant color challenges.

First Step: Dye

Of the two major types of stain, dye, which goes directly onto sanded, raw wood, usually does a better job of blending color and grain differences than do the

more common pigment stains. Try staining oak, maple and pine with the same color of pigment stain and dye stain. The dyed portions will look a lot more similar than the pigment stained ones. That's because the color particles are vastly smaller: small enough so they don't just lodge in the large pores, but color universally.

While any stain makes wood darker, dye's semi-transparent nature also lets you make wood lighter, or at least brighter, without becoming muddy. This is handy for blending woods like steamed walnut. A weak dye stain of water-soluble amber or reddish-orange dye will add highlights that reduce a wan, gray look to give walnut a brighter, richer base tone.

In many cases, dye alone will yield the uniformity and color you want. If not, you can move on to the next step.

Second Step: Pigment

While dyes color background wood evenly, they may leave deep pores of woods like oak

or ash lighter. Stain made with 100% pigment, also called wiping stain, can correct that by filling those pores with matching color. This stain is also great for adding extra color on boards that are consistent in color, either naturally or after being dyed.

This two-step approach of dye, then pigment, does an outstanding job of blending mismatched woods. It's also a way of adding extra color to dense woods, like maple, that are sometimes a bear to get dark enough.

Third Step: Toner

If the color is still not dark enough, or if you have sections that are too light, toner is the perfect next step. Toner is clear finish tinted with color. It's sold as one-step stain and polyurethane in either cans or aerosols, and as shading lacquer in rattle cans. You can also mix your own by adding small amounts of compatible dyes or pigments to your topcoat.

Apply toner selectively on lighter colored areas, or uniformly to add color overall, but apply it sparingly. Build up too much toner and you can obliterate the wood beneath, turning beautiful wood into what looks like a solid painted surface.

Aniline

was first isolated from the destructive distillation of indigo in 1826 by Otto Unverdorben, who named it crystalline. In 1834, Friedrich Runge isolated from coal tar a substance that produced a beautiful blue color on treatment with chloride of lime, which he named kyanol or cyanol.

— Wikipedia

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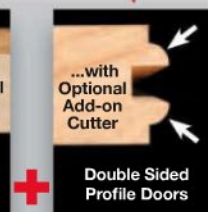
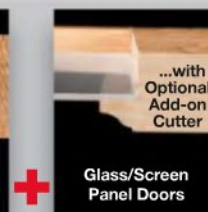
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