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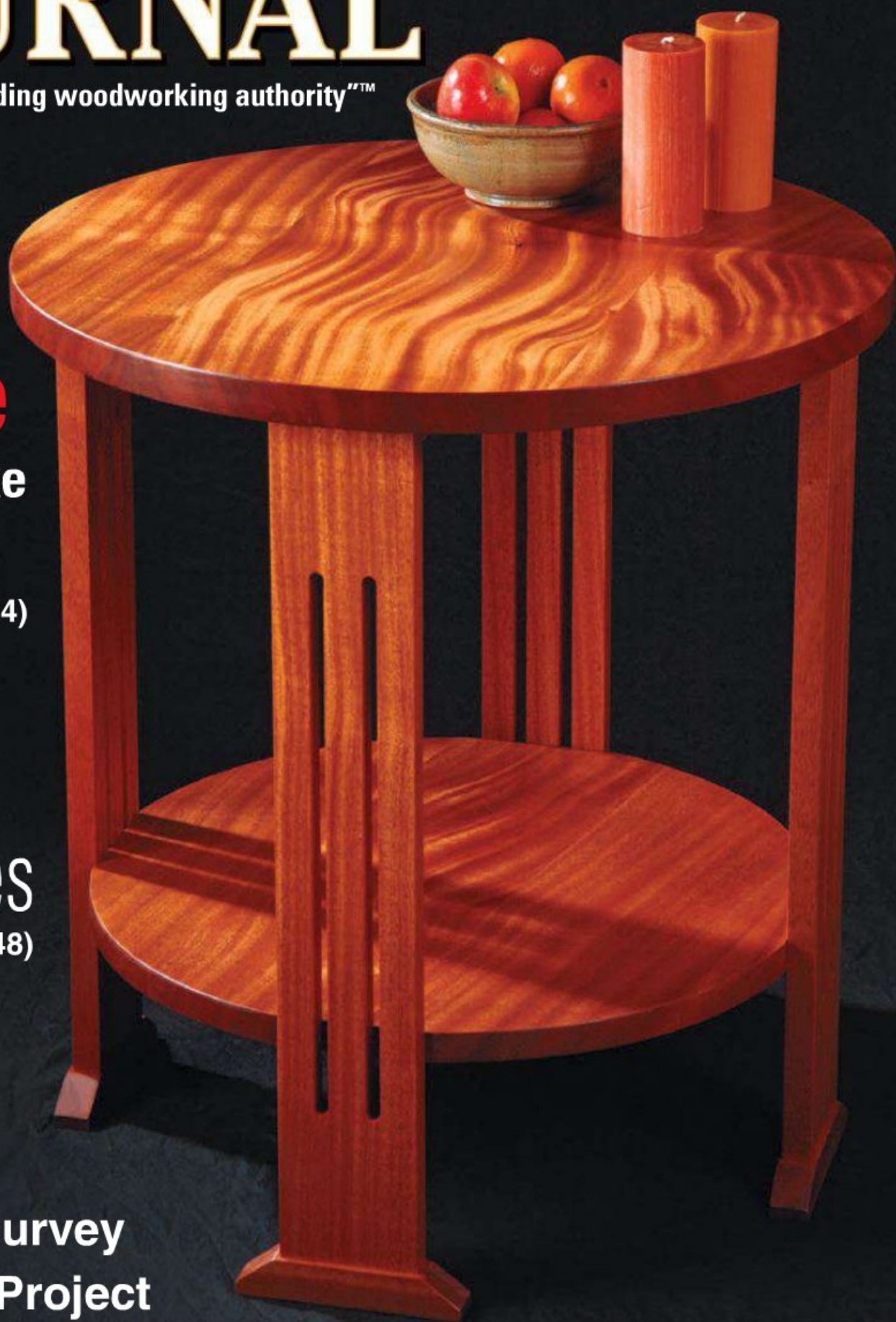
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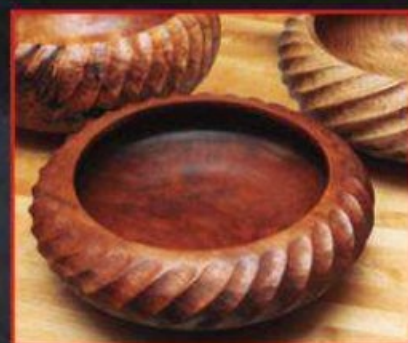
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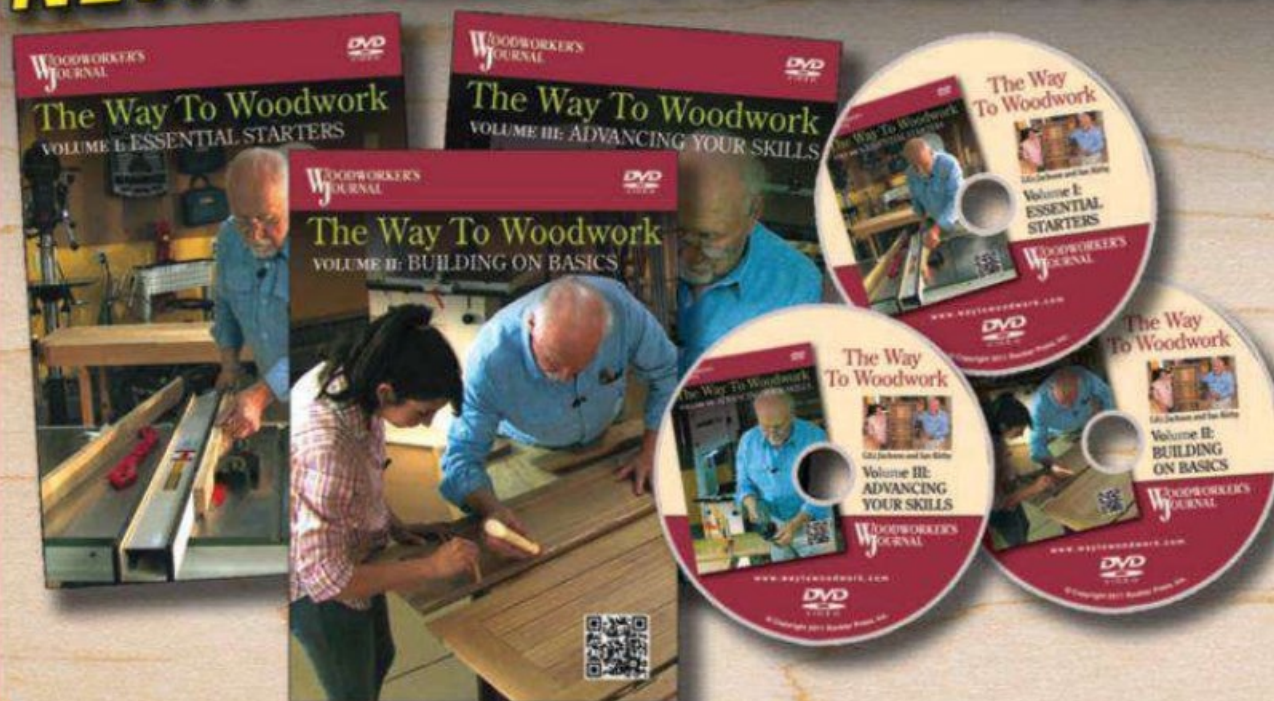
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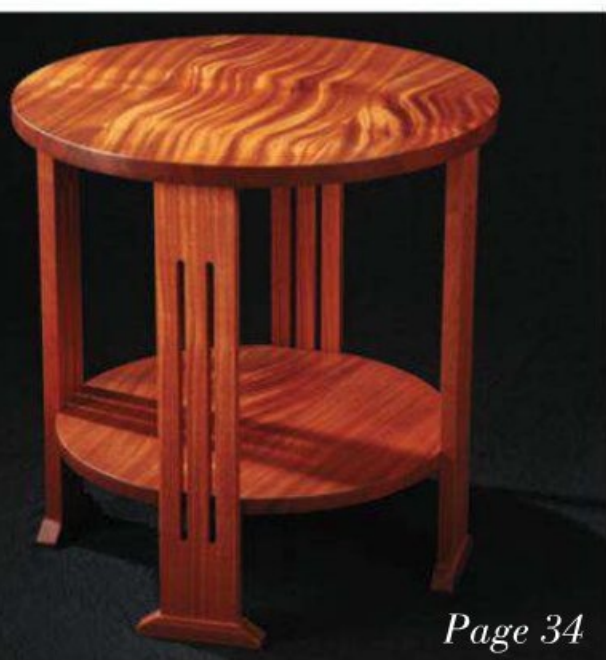
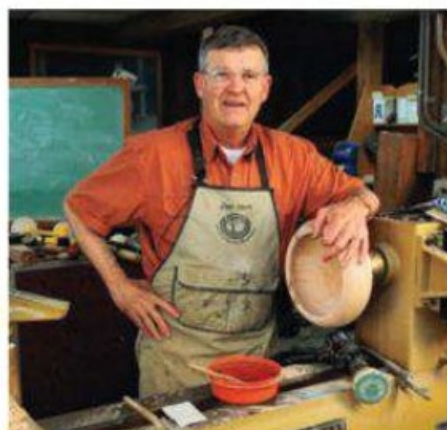
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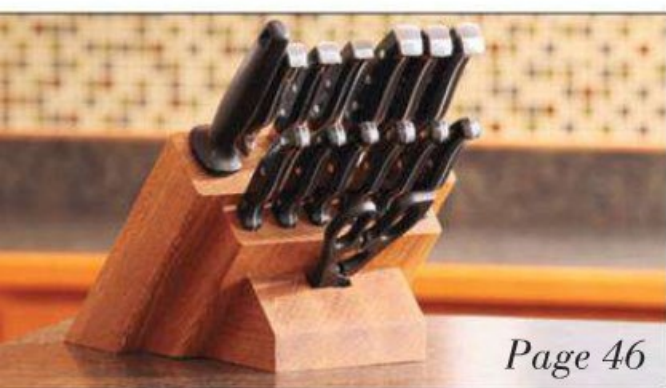
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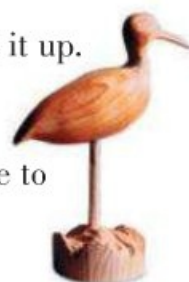
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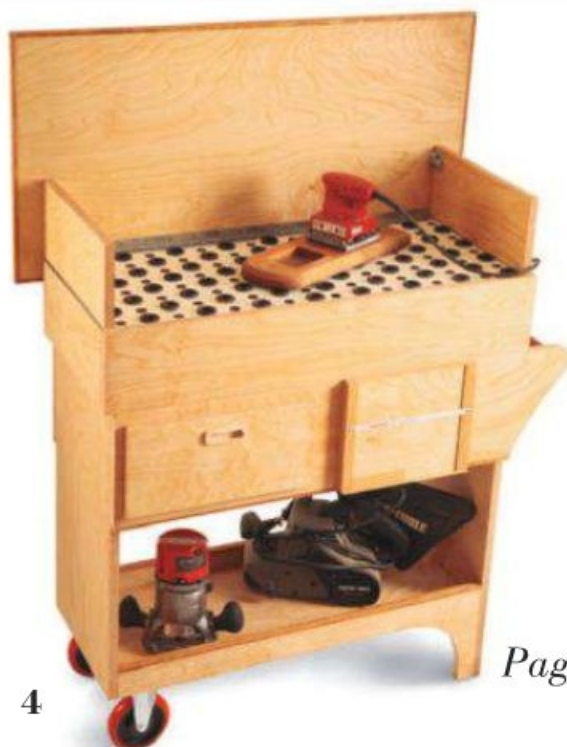
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Project Designs: What Goes Around ...

Well, even if I have to say it myself, 35 years is a pretty significant accomplishment. No, I'm not 35 years old. Heck, I can't even remember back when I was 35. It is *Woodworker's Journal* that is celebrating that anniversary. Much like dog years, magazine years seem to be an arcane multiple of calendar time. If you look around, the number of magazines lasting as long as us is pretty slim. The very first *Woodworker's Journal*, published by Jim McQuillan as a black and white tabloid, is a far cry from the *Journal* as it exists today — with our award-winning online and DVD efforts added to our state-of-the-art magazine. But in the most important ways, we are exactly the same: high quality woodworking information, delivered in an enjoyable manner that respects our readers and the craft. It's how we started, and it's how we are moving into the future.

Reader Adron Joyner designed and built his planer cart before our version was even published

Rob, I want to assure you I did not “mess with your children,” since I built my planer table long before your October issue [2011, “Planer Cart”] hit the streets, but I think mine is better. No rollers to adjust nor slides to pull out — just a quick “snap-up” supporting hinge at each end, and I have an eight-foot, smooth, straight through planing surface. Plus six drawers and a shelf for tool storage. A bag of concrete for stability?



Trivets and Tugboats

First off, I greatly enjoy the magazine. I was reading the article on the “Trammel-Jig Trivets” [December 2011] and thought this would be a good excuse to finally break down and buy a plunge-type router. Soon I was coming up with reasons how one would have turned up in the shopping cart. My wife, who was last year’s host of the family

Thanksgiving, was preparing the menu and out of the blue told me we needed some trivets. The last time we had the family over, someone put a hot dish on the counter and scorched the countertop.

Now that we had a need, I put together the trammel jig. I used scraps of different kinds of plywood, so my jig doesn't look near as nice as the one in the article. I glued up some more scraps for the trivets and was able to make two of them that day. I showed them to my wife, and she really liked them. She crossed off trivets and potholders on her list of things to buy and asked if I could make a few more. I made a few more to

6



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An oil finish is a great option when sealing a project with lots of grooves and slots — like our trivets.

would have taken them instead.) I did copy the plans, but at 90 percent so I could use a 2x4 as the boat hull. It was a fun weekend project, and my nephew and the other kids sure enjoy them.

Thanks for the great projects.

Ron Wold
Lakeside, California

In the December “Trammel-Jig Trivets” article, no mention was made about finishing. I would like to put a clear finish of some sort on it, but being a trivet, I would expect it to be used to set hot (or at least warm) dishes on it. What finish would you suggest that would be heat-resistant?

Thank you. Love your mag.

Donald Haff
Bothell, Washington

WJ Responds: Put a simple oil finish on them — mineral oil, walnut oil or even a Watco type oil. They are good with heat, and if there is discoloring, you can sand a bit and then re-oil. Film finishes like poly or shellac are not a good bet here.

SketchUp Runner-Up

I want to thank *Woodworker's Journal* for the kind mention provided in the December [2011] issue [“Letters”] regarding the SketchUp contest category winners and for selecting me as one of them. Although I didn't reach the top modeler plateau, I am

Letters continues on page 10 ...

give as Christmas presents to my mom, sisters-in-law and nieces.

This was a great weekend project (two weekends for me; I had to wait for the glue to dry on the trivets). Please put more “easy” weekend projects in future issues. Next, I made some of the tugboats [“Rootin’ Tootin’ Tugboat,” *December 2011*]. Three of them were Christmas presents, and the rest I gave to the Toys for Tots. (At the time I wasn't sure if they took handmade toys; a friend who volunteers at a hospital

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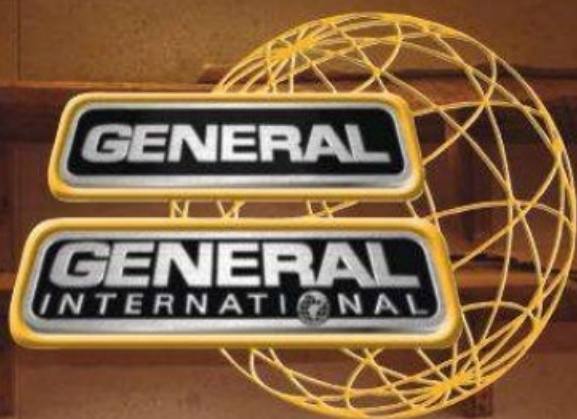
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quite all right with being a runner-upper. The thing is ... well, the whole thing is sorta weird. See, I don't subscribe to WJ because I'm magazine poor, so I get your issues from the newsstand whenever I see something that piques my interest. When your contest was announced back in ... whenever ... a member of our woodworking email list posted a note saying, "Hey, Joe! *Woodworker's Journal* is holding a SketchUp contest! You should enter!"

Before I continue, a little background is in order. I've been a proponent of SketchUp ever since version 4, which was when I first heard about it, and since then I have stood on many soapboxes trying to get woodworkers to walk into the light and accept it as their savior. I post notes whenever I find a new way to do something, whenever I find a site with additional information, and I verbally beat up people who don't come into the light. Some would be in league with you if you were to accuse me of being a SketchUp tyrant.

I responded saying, "Oh, OK, just so you know, I fully intend on winning. No, I'm not going to show anyone my design until after the decision



Google SketchUp is making a significant entry into woodworkers' computers (it was used to design our cribbage board, above). Some folks, like our letter writer, are passionate about it.

date and no, I'm not going to tell you what category I shall enter." Fast forward several months; imagine my surprise when a totally different list member, a subscriber of WJ, announced to the same list that I was one of the category winners.

I somehow had this thought where we, as entrants, would be notified of such goings-on and be given a heads-up. But, it was fun finding out through the woodwork ... ya know, where all things seem to clamber out of these days.

Joe Johns, category winner of the SketchUp Kitchen Organization Design Model Contest of the World and Beyond. Or whatever it was called. **[Editor's Note:** It was called the Google SketchUp Design Contest. Joe won in the Kitchen Storage category.]

Seriously, I'm thrilled. Thanks.

Joe Johns
Ronan, Montana

Reader is a Bosch Fan

I must admit that I own more than five routers: eight ["What Do You Think?" *December 2011*]. I have chosen Bosch as my mainstay router, owning



three of their 2.25hp, variable, soft start units. I also own one Colt. I chose them all the same, because I wanted to interchange bases. I have made add-on features for various bases. I wish the switch was in the handle, but that's not a priority. Two of them are mounted in vertical and horizontal router tables. The horizontal table I crafted myself and love it for special applications. I keep bits in the other routers so they are handy when needed. My two other routers are made by Trend. Routers are the most versatile tools with many applications and the safest tool made. I have attached an LED light to one of the bases for added visibility.

I am gradually switching over other power tools to Bosch, which I think is making an effort to improve its product line.

Dennis L. Weaver
Goshen, Indiana



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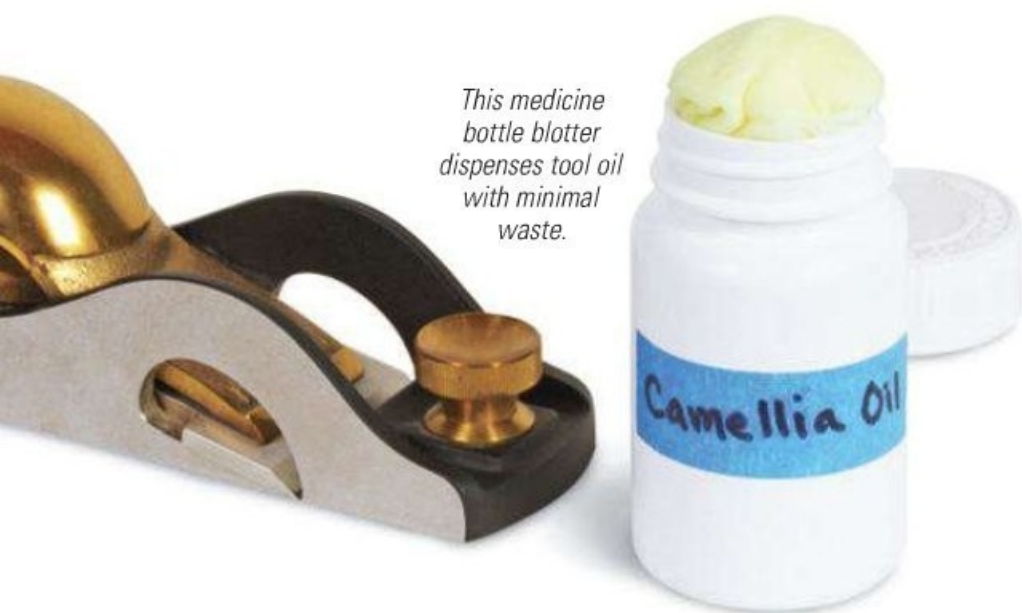
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Tricks of the Trade

Workarounds for Workshop Conundrums



This medicine bottle blotter dispenses tool oil with minimal waste.

Safety First

To demonstrate techniques and show details, Woodworker's Journal sometimes removes necessary guards from power tools. We do not advocate this practice and urge readers to strictly follow tool manufacturers' instructions and safety precautions.

Easy Tool Oil Applicator

I like to put a coat of camellia oil or jojoba oil on all of my hand tools, such as planes, saws and chisels, to protect them from rust. Typically these oils come in spray bottles, but the spray pattern doesn't ensure that all of the tool surface gets oiled, and the overspray inevitably leads to waste. I've seen other oil dispensers, but they cost more than I care to spend. So, I invented my own from an empty medicine bottle with a deep cap. I saturated a piece of old cotton T-shirt in the oil, stuffed it into the bottle and kept a portion of the material protruding out to act like a blotter. The cotton is

absorbent enough to keep the oil from dripping, and rubbing the blotter over the tool dispenses the oil without all of the waste. It's a good solution that costs next to nothing to make.

Charles Mak
Calgary, Alberta

New Use for Auto Mats

Carpeted car or truck floor mats with dimpled bottoms make great anti-fatigue mats for a concrete shop floor. They lie flat and don't move around when you're standing on them. They're not only comfortable underfoot but also help clean the sawdust off your shoes.

Lawrence Nielsen
The Colony, Texas

Arbor Nuts At-the-ready

My table saw comes with two arbor nuts — one with a flange washer attached for use with a standard blade and the other without a flange washer for dado blade setups. I switch from one blade style to the other pretty often in my projects, and those arbor nuts are easy to knock off the saw. So, I attach the nut I'm not using to the side of my table with a 3/4" rare-earth magnet. It holds the nut securely and I always know where the spare nut is attached. This would work equally as well for stowing the flange washer of a standard arbor nut.

Liam Moriarty
Harrisburg, Pennsylvania



A strong rare-earth magnet on the edge of the tabletop holds a spare arbor nut or flange washer securely when it's not needed.

PICK OF THE TRICKS



Shop-made wedges apply proper glue-up pressure.

Thrifty Three-way Edge Clamps

Three-way clamps used for gluing shelf lipping or face frames to carcasses are handy, but you tend to need a lot of them, and most of us don't use them often enough to justify their expense. Here's a simple alternative that uses the C-clamps or F-style clamps you already own. All you need to do is locate and secure the clamps far enough above the

lipping or face frame to slide a shim underneath the clamp body or bar. I create my shims with a gentle taper down to about 3/16" or 1/4" thick. Once you've got the glue spread between the parts, tap the shim into place under each clamp to apply the necessary lateral pressure.

John Cusimano
Lansdale, Pennsylvania

Adjustable Wrench Takes Quick Measurements

Have you ever had trouble identifying the correct drill bit size for boring holes for dowels, bolts or pipe? If you don't own a caliper, all you really need is an adjustable wrench. Close the jaws of

the wrench around a dowel or bolt, then match the bit to the jaw opening. While it's no vernier caliper, the wrench still works quite well.

Bob Crabb
Chester, New Hampshire



An adjustable wrench makes a serviceable caliper for matching drill bits to the job.



Rightsizing a Dowel Hole

When a dowel is slightly undersized for the hole you've drilled for it, a scrap piece of fabric is a great way to shore up the fit. Spread glue on a small piece of fabric and the dowel. Place the fabric over the dowel hole, and tap the dowel down into place. Trim off the excess fabric before the glue dries.

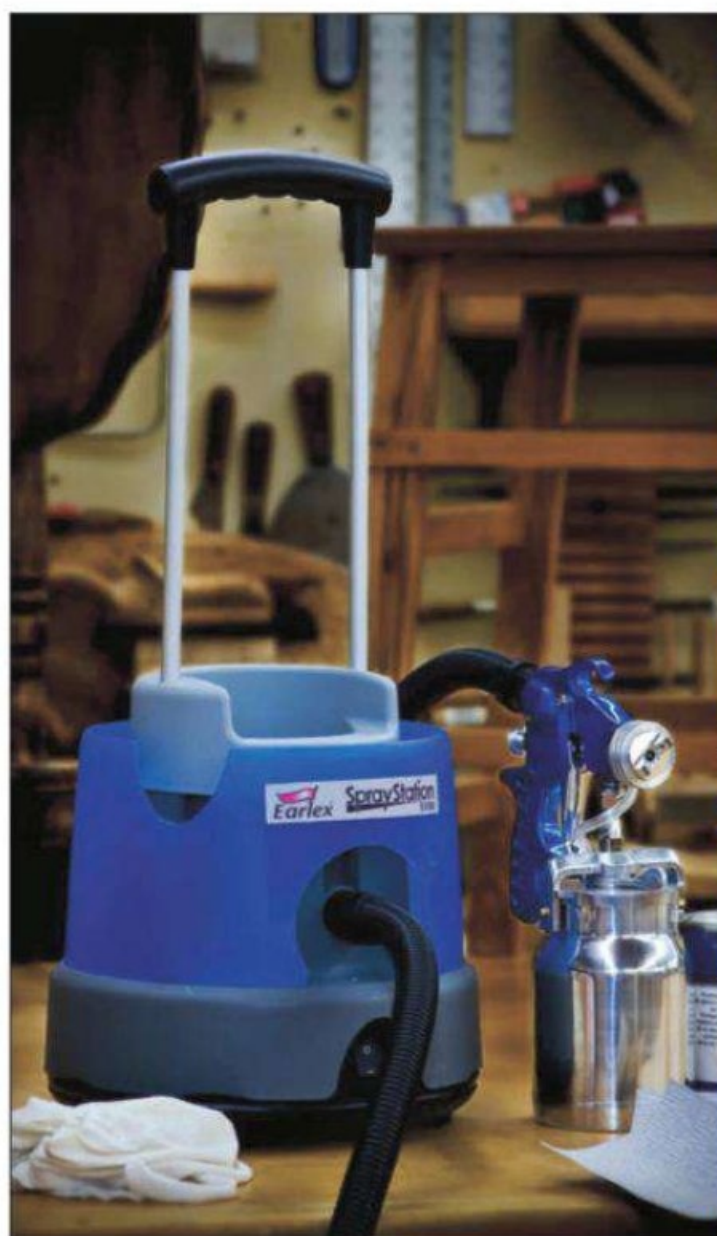
Serge Duclos
Delson, Quebec



Winner!

In addition to our standard payment (below), John Cusimano of Lansdale, Pennsylvania, will receive a Lamello Vario Box 440 Piece Set of Biscuits and Joining Elements from Colonial Saw for being selected as the "Pick of the Tricks" winner. We pay from \$100 to \$200 for all tricks used. Send your original, unpublished tricks with a photo or drawing to Woodworker's Journal, Dept. T/T, P.O. Box 261, Medina, MN 55340.

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Questions & Answers

Table Saws: Fences and Inserts

"I'm so old that I think the USA was just a twinkle in the founders' eyes when I was born, but I'm a newborn when it comes to woodworking."

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*.

Q Some time ago, in some magazine (not yours, I can assure you), was a piece about making a zero-clearance insert for a saw. Now I am so old that I think the USA was just a twinkle in the founders' eyes when I was born, but I'm almost a newborn when it comes to woodworking. But even I knew a zero-clearance insert was something I needed. It seems 1/2" MDF is almost the correct size for me to use, and I started out following the instructions very carefully. Then I came to the part about the adjustment screws, and I couldn't believe my eyes when it told me to put the adjustment screws in — but there was no mention of how!

As I said, 1/2" MDF is almost perfect for me, but I can still feel it when the wood goes over the insert. I am hoping that your experts can tell me how to finish the inserts I have made.

Peter Ritchie
Ashland, Virginia

A Peter, we are always willing to get in the game when our competition drops the ball! Shop-made zero-clearance inserts are remarkably useful and not at all hard to make, but as you pointed out, they must be level with the saw table's top. The good news is that there is a simple solution to your situation. The inserts that are provided by the saw manufacturers are usually leveled to the saw top by adjusting set screws. Just take those set screws out (or you could buy a matching set from a local hardware store; they're pretty cheap), drill holes into your MDF insert blank (use the manufacturer's insert to mark the hole locations), and drive the set screws into the holes. They will

"self thread" as long as you don't bore the holes too small. A bit of test fitting is the best way to go with this.

— Rob Johnstone

Q I am a beginning woodworker and need advice on what is a good beading bit for the edges of drawers, shelves, etc. I am also looking for a way to join drawer corners without the use of dovetails (I just bought a PORTER-CABLE 4212 dovetail machine and haven't learned to use it yet). I appreciate any help you can give me.

Tony Licata
Eden, North Carolina

A From time to time, I like to use a 5/16"-diameter traditional beading bit for the bottom edges of table aprons and shelves. It cuts a semicircle with an adjacent flat shoulder. I think it adds a nice shadow line while softening the hard edge of the workpiece. But if by "beading" you mean the much broader category of profiling bits, then any number of bits can spruce up the edges of drawer faces and so forth. Roundovers, chamfers, coves and ogees are just a few of many; buy a starter set of bits and you'll probably get one of each of

Continues on page 16 ...



To level a shop-made zero-clearance insert made from MDF, simply swap out the set screws from the insert provided with the table saw.





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Questions & Answers



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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.



Winner!

For simply sending in his question on filling cracks with epoxy, Dennis Pryor of Jefferson City, Tennessee, wins an

Osborne Miter Gage by Excalibur (from General International).

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

the standards. You should really experiment with several different styles to see which profiles you prefer — "good" really is in the eye of the beholder here. Plus, what suits one project may not look as good on the next. As far as dovetails go, instead of shying away from dovetailing your drawers, dive in and learn that new P-C dovetailing jig! Go for it ... the end result is worth your effort.

— Chris Marshall

Q In your February 2012 issue, under the "Thumbs down on safety" caption of the *Reader's Survey*, you described "the European style with fore-and-aft adjustable fence" as being the safest rip fence. Could you please clarify your description? Do you mean how wide the base along the

rail is? What makes this type of rip fence safer than others? It is important to me because I am considering whether to purchase a table saw with a UNIFENCE.

Jeff Walker
Ann Arbor, Michigan

A Master woodworker Ian Kirby taught me the importance of the fore and aft fence feature, best exemplified here in the States by the UNIFENCE, several years ago. When you rip solid wood, oftentimes stresses are released that distort the shape of your stock. If that distortion pushes against your saw fence, the result can be binding and even kickback. But pulling the fence face back (shown in the photo above, right) allows the wood to distort without binding — an obvious safety feature. Also, if you are cutting off small parts on your table saw (using your miter gauge), pulling the fence back keeps the cutoff from binding against the fence as well. So my answer to your question is, yes, this fence is safer to use than those without this feature.

—Rob Johnstone

Q The article about filling cracks with epoxy ["Filling Cracks With Epoxy," *October 2011*] generated this question: I inherited my parents' 60" heart-pine table with a 33" lazy Susan, which was built about 60 years ago. The wood came from a tenant house which may have been 40 years old at the time. And all this may be irrelevant to my question.

It was built in south Georgia where the wood originated ... we later maintained it was built by a carpenter who usually built barns.

Spaces developed between the planks, which were filled with a plastic of some sort that roughly matched the reddish pine. Having been in an air-conditioned house since it was built, the filler has dried and fallen out, leaving cracks between the length of a couple of the boards. The cracks are wider than a penny but not two pennies. (How is that for precision?)

What do you recommend, considering my talents are limited? Note that I am asking for a solution to repair, not refinish.

Dennis Pryor
Jefferson City, Tennessee

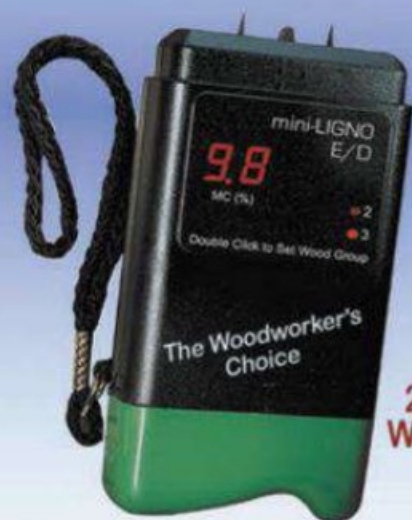
A beading bit is one of many profiling options for adding decorative details to your woodworking.

Continues on page 18 ...

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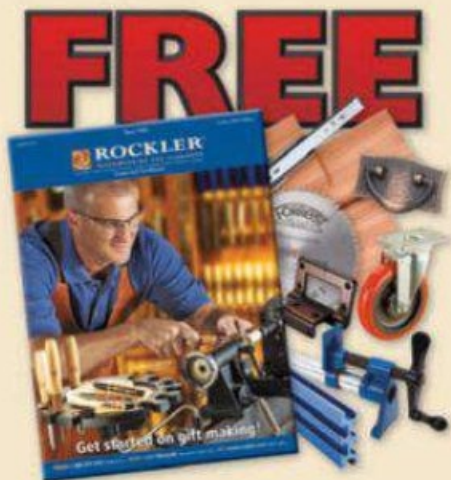


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Stumpers

Mixing Things Up

Is it a shop resource or a kitchen aid? Woodworkers' opinions seem to differ.



What's This?



David Gwinner of Dallas, Oregon, bought this tool thinking it was a tenon cutter for a brace — then discovered the cutter was horizontal. Do you know what it is? Send

your answer to

stumpers@woodworkersjournal.com

for a chance to win a prize!

Back in our December 2011 issue, **Bryan Augsberger** of Orlando, Florida, asked us to identify his mystery “thingamajig.” In response, **Fred Leonard** of Hot Springs, Arkansas, tried to insult the WJ staff by impugning, “If you ever get out of the woodshop, you might recognize the Stumper.” (Sorry, why would we do that?)

Besides, **Kirby Bonds** of Phoenix, Arizona, recalled “seeing a device like this in my grandfather’s tools. He was a furniture refinisher and used this to mix small batches of stain and paint for exact color matches. The domed cover would keep the paint or stain in the can as he would vigorously turn the crank to mix.”

Brian Crispin of Mansfield, Texas, also commented about the “paint mixer: some poor housewife probably had to give up her whisk for the prototype.”

Um ...

You know how woodworkers’ spouses sometimes complain about the misappropriation of kitchen items? Seems that Kirby Bonds’s grandfather could have been Exhibit A.

Nikki Hathaway of Fonda, New York, for one, was “surprised when I saw this egg

beater in the *Woodworker’s Journal*. The one we had in the late ’40s also had a red handle and a glass bowl.”

Keith Bell of Conroe, Texas, elaborated, “The crank raises and lowers the screen-mesh; the faster one cranks the quicker it will ‘blend’ the egg yolks and whites;” while **Clay Munn** of Chino, California, noted, “The large disc on the upper section is a splash guard.”

J. David Carlson of Cary, North Carolina, said, “The shaft sits at an angle to the vertical so that the rotating element incorporates air into the cream or egg as it spins. The part pictured would normally come with a glass bowl.”

Stamped on the bottom of his bowl, in raised letters, said **David M. Moore** of Lawrenceville, Georgia, is “Androck Made in the USA.” David was “about three or four when I was given the task of whipping cream in the Androck mixer while ‘helping’ my mother in the kitchen. Because of my enthusiasm for the assignment, I not only whipped cream, but also discovered how butter is made.”

—Joanna Werch Takes

Winner! Dennis Fost of Waretown, New Jersey, wins a PORTER-CABLE 18V Lithium Ion Drill/Driver (Model PCL180CDK-2). We toss all the Stumpers letters into a hat to select a winner.



Questions & Answers continued

A I assume the table will remain indoors in air-conditioning, so we need not anticipate massive (outdoor) wood movement. That makes things a bit easier.

A penny is .057" thick, or about 1.5 mm. That’s the upper end of what I would consider filling with most putties, and two pennies (3 mm) is more than I’d risk with anything other than epoxy, and even then I’d think twice. I prefer to fill large cracks by gluing in shims of matching wood with matching grain direction.



However, that means you must finish the raw wood shims to match their surroundings afterwards.

The other option is to use colored epoxy. Tape the bottom of the cracks so the epoxy does not drip out the bottom, and carefully tape the finish on either side of the crack. Clean any old putty or glue out of the cracks with a folded piece of sandpaper, even if it means removing a modicum of wood. It must be clean.

Glue in wood shims with epoxy or any wood glue, or fill the void with colored epoxy. Level the repair carefully once the glue is cured, and apply touchup finish as needed.

—Michael Dresdner

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McKoy's Carvings Take Flight

From his South Carolina studio (seen above), Grainger McKoy creates lifelike bird sculptures — including “Sanderlings,” seen at right in model form and, opposite page, completed. The wing, above, is an enlarged pintail duck wing in “recovery” position.



Feathers *In Accurate Carvings*

Most sculptors, says Grainger McKoy, begin in clay. For him, though, “Everything begins in wood.” It’s been that way for over 40 years.

Grainger grew up in a log cabin his parents built in the early 1950s. “Because of that, I had wood all around me: the interior of the cabin, plus we heated with wood.” When he was 12 or 13 years old, his grandmother gave him an old decoy that he placed on his bureau, “and I thought I wanted to carve a bird. I told my mother I wanted to carve a bird, and I needed some dry wood. She held me up to cut off a log sticking out from the cabin, and that was my first bird.”

Since then, Grainger has made over 100 sculptures, some of which have 12 or 13

birds on them. His focus has always been on birds, he said, because “I enjoy birds. I like the outdoors, and feathers have always appealed to me more than fur.”

Primarily using basswood due to its uniformity and stability, Grainger’s “whole process is a process of material removal,” he said. “I like to remove the material as fast as I can to get to my idea. I use band saws, air-driven tools, a pocketknife — anything that’s out there, I will use. I’ve used chainsaws, anything that will speed the process.”

He has the same attitude toward the birds that are his models: “If a bird gives me something, I use it,” Grainger said. “If he has nice mandibles, I will open ’em. If he has talons, I will spread ’em. I was just observing this morning a redtail hawk killing

a crow, with hundreds of crows in the trees all around raising a ruckus. The prey was flopping in his talons, and all his cousins were up in the trees. I was thinking of a sculpture right then when I was observing that: I was sketching it in my mind.”

Grainger, who has lived in the Southeastern United





States his entire life, observes birds but doesn't necessarily consider himself a "birdwatcher." Rather than seeking new species via travel, he carves the species he's familiar with, and notes that "songbirds don't quicken my spirit as much as game birds, or birds that I've eaten."

With a degree in zoology, however, he does care about accurate depictions of the birds in his work. "If a bird has 10 feathers on its wing, I honor that; I don't put 11. I want to honor the bird and its Maker: it would dishonor God if I dishonored the bird."

That same attitude pervades his approach to his material. "I don't ask wood to do something it can't, and I don't ask a bird to portray something it can't. It's a good marriage." For example, the internal support for many of Grainger's sculptures is metal. "You can't ask wood to do something metal does better."

On the other hand, Grainger has used his woodworking skills to make some of the cabinets and bases his sculptures rest upon, and, although he has done castings in bronze and sterling, his original model is always made in wood. "Even if it's cast in metal, it still begins in wood. I've tried clay, but it just isn't my medium. Clay doesn't smell as good as wood, and you can't throw scrap clay in the fireplace."

He has sometimes left elements of some sculptures unpainted to show the wood, when the shape of the bird suffices for the sculpture, but likes that it works well when painted, too, to show details.

Reflecting on his career of carving birds, Grainger said, "The essence of birds is flight. I think it's just the awesomeness of the beauty of a bird, and its wings, and how God made it, and just acknowledging that."

— Joanna Werch Takes



"Black Skimmer" (above) was Grainger's first "reflective" sculpture.



Grainger witnessed the bird fight seen above in "Red-Shouldered Hawks and Copperhead Snake."



Easy Knockdown Bookcase for Small Space

As an author, I have a sizeable personal library, so when I recently decided to relocate from a condominium with built-in bookcases to a much smaller townhouse, I needed a lot of shelves — freestanding, affordable and fast!

These were not the first bookcases I had ever built. From experience, I knew that the biggest single challenge in designing an 8'-wide bookcase is how horizontal shelves and vertical supports will intersect. After much pondering, I hit upon the perfect solution: the vertical supports would be in the form of 1½" dowels penetrating the shelves from top to bottom, bearing the weight by means of shelf-support pins. After this idea, the rest of the design quickly fell into place.

The materials list was straightforward: five sheets of 4' x 8' plywood, eight 8' dowel rods, enough edge trim for 14 shelves and four side panels, as well as six 8' lengths of molding to add a touch of class to the lower sections.

In this design, the key to the rigidity lies in the two 8'-high side panels that have 1¼" x 1¼" "ribs" attached

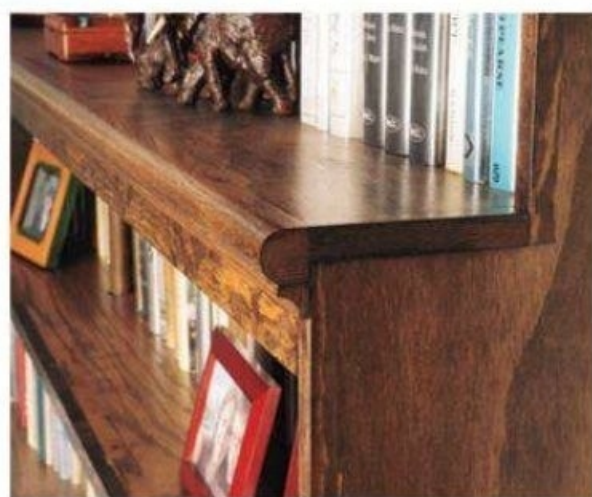


Bernard Botes Krüger incorporated another trick into his bookshelf: instead of using spoon shelf supports, he trimmed pop rivets to length for the perfect substitute: "the thick shaft of the rivet goes into a hole of the exact same diameter, leaving only an unobtrusive 3/4" pin protruding to support the shelf."



The author wanted a bookshelf for an 8' x 8' wall space that was elegant yet affordable, simple and sturdy — and easy to transport.

Notched side panels and an angled base (right) accommodate wide baseboards — and earthquakes.



on the inside, to which first a 4' x 8' back panel and then the lower three shelves are screwed. At that point, the unit immediately becomes a stable piece of furniture and the rest is easy: the narrower top shelves simply slide in over the dowels and are supported by shelf supports inserted in small holes drilled at the desired heights into the side panels and dowels.

The final product exceeded all my expectations. I ended up with two elegant pieces of furniture, yet by removing only 12 screws each, one can be reduced to a "pile of planks," facilitating their removal through the standard 6' 8" doorways and narrow staircases of rental apartments. Also, since it is as a general rule

more attractive to leave a certain amount of open space in bookcases, my "dowel rod" design offers the possibility of rearranging shelves easily or eliminating sections entirely to make way for pictures, *objets d'art*, or a clock mounted on the wall.

— Bernard Botes Krüger



Both of Bernard's bookcases cost less than \$150 to construct, including supplies. They easily disassemble to fit through a doorway.

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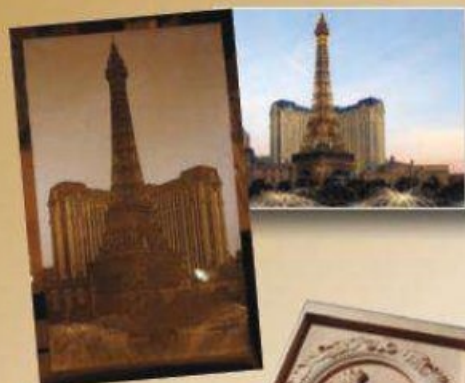
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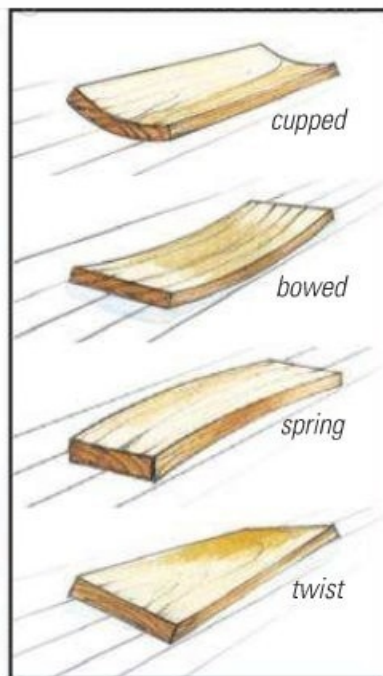
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happens when lumber is not dry and what they should avoid doing." One key area, for example, is the EMC Chart [Equilibrium Moisture Content]. "The key part of the whole problem is how wood reacts to the relative humidity of the air: they both have to match. The EMC chart tells you when an equilibrium is reached and matching is happening."

The site also contains information about moisture content as it relates to old growth lumber, hardwood flooring, laminate panels and more. For instance, the greater spaces between growth rings of second growth lumber act as sponges, absorbing and losing moisture at a faster rate. Grete recently added a feature to the site about mold, and will continue to update it.

"What makes wood so special" says Heimdinger, "is that every board has a different growth ring design." The different orientation of the growth rings, she adds, "causes wood to shrink and warp unpredictably," often to the dismay of the woodworker, cabinetmaker or floor installer.

Moisture Problems in the Shop *Site Provides Answers*

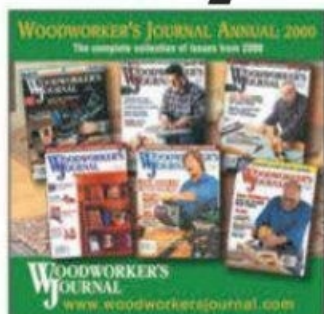
For woodworkers having a problem or a question with wood moisture, the new website moistureproblems.info is designed to provide answers.

Grete Heimdinger has been in the industry for 30 years and, when she goes to woodworking shows as a representative of moisture meter company Lignomat, she

says, "Usually, if people talk to me, they have a serious wood moisture problem." That, she adds, is the only reason they buy moisture meters.

For those who are experiencing shrinking and warping of the wood as it changes moisture content, Grete created the site as "a summary that explains what

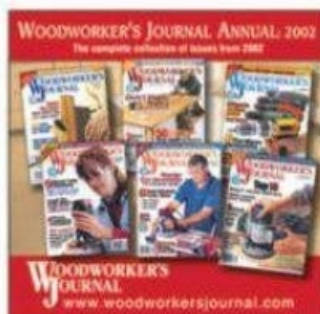
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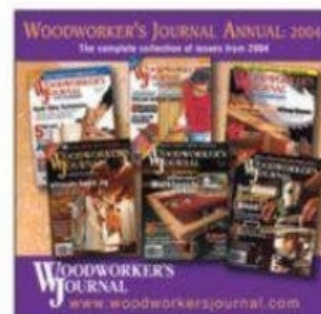
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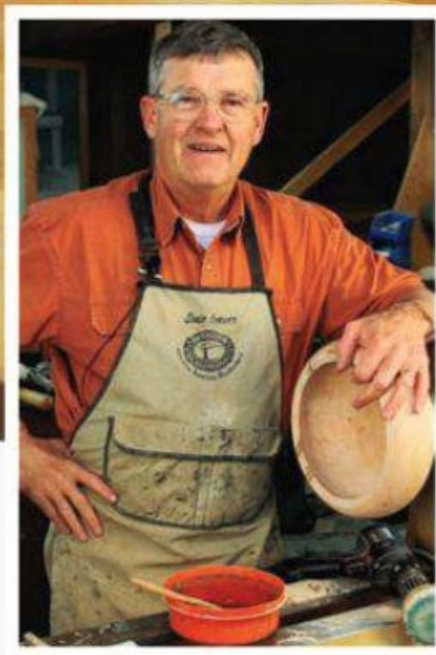
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Woodturning

Carving Texture and Patterns into Bowls

By Ernie Conover



One of the design limitations you run up against as you turn a bowl is that you end up with absolutely circular details. Unless you take a spin at adding a bit of shape and texture by carving ...

In their drive for the perfect art form, bowl turners are constantly experimenting with shape. This can range from entirely functional to pure art that is not very usable at all. An artistic technique that I really like is carving designs into the outside or rim of a bowl. You do not have to be an “artist” to do this sort of carving, you just need to be able to lay out a pencil grid and to tap a gouge with a mallet.

Carving breaks the absolutely circular nature of a turning,

lending pattern, texture and beauty to the finished vessel. It does not require many fancy tools, carving patterns or textures; all you need is a

gouge or two, a veining tool and a mallet. (The mallet you can spindle turn yourself from a piece of firewood!)

In general, I get by mostly with a #8 x 25mm (1") gouge and a veining tool.

I learned the techniques I outline in this article from Al Stirt of Enosburg, Vermont. Al pioneered the use of carving and texture to accent bowls. If you ever have the chance to take a workshop class with him — do so! His website is: <http://alstirt.com>

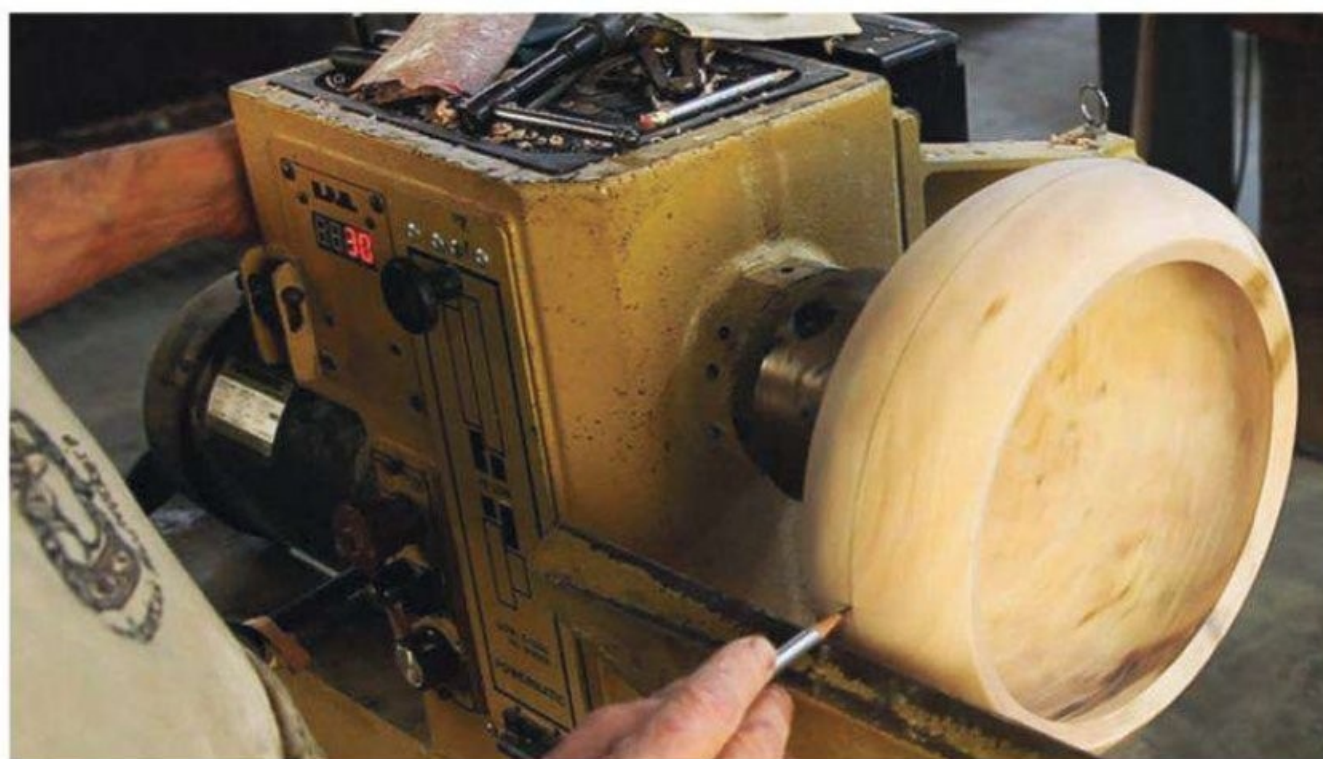
For successful carving, you have to



The author finds that he does the lion's share of his bowl carving with a #8 x 1" gouge and a veining tool.

think about shape. Traditional half-round bowls do not lend themselves as well to carving, for you have to have a low viewing angle to see the outside wall. Bowls that form a cone have steep, nearly vertical walls or are closed forms (the rim is smaller than the interior), which will display carving much better. Here, I will demonstrate on a closed form, which has a raised doughnut look. The interior under the rim must be scraped, for you cannot get in this area with a bowl gouge. Scraping the area found just under the rim (down to the largest diameter) to a constant wall thickness is challenging. Most beginners leave the wall too thick in this area, giving the bowl a clunky feeling. The wall should be at least $\frac{3}{8}$ " thick, with $\frac{1}{2}$ " being better for deep carved flutes. Sand the bowl to about 120-grit.

Although you can carve dry wood, it is much easier to tap a gouge through green wood. Luckily, many bowl tuners start with green wood. Carving green wood means that you can even carve rock-hard maple with ease. Do not complete the bottom of the bowl; rather, leave the chucking recess or glue block and faceplate you turned it on in place. If your lathe has indexing, draw as many pencil lines vertically up the wall of the bowl as you can. I do this by using the tool-rest as a straightedge at each index point. If your lathe only has 12 index positions, you can lay out more lines by raising



Mark the upper and lower limits of your carving space as well as a center line (above). Then use the indexing stop to help draw a grid pattern.

When the grid pattern is completed, use the pattern to form S-shaped curves onto the side of the bowl. Don't worry about perfect curves — you'll adjust them as you carve.

or lowering the tool-rest. Next, draw a band by spinning the bowl against a pencil to delineate the point above the base where the carving will start. I also draw a band at the largest diameter (top photo) and just under the rim. Then use the grid marks to draw an "S" curve (bottom photo). Draw them freehand, and do not worry if things are not perfect. Carving will fix everything.

Shop-made Bowl Vise

Holding a bowl during carving is always a challenge. These days I have a patternmaker's vise at the end of my bench that is well-suited to the task. I cut a board to go against the

rim of the bowl and interpose a piece of leather between them before tightening the vise. Previously, I used a right-angle plate built out of veneer-core plywood and held the bowl against it with a wood strip secured by threaded rod and wing nuts. You can see that setup in the top photo on the next page. Note that I have left the faceplate and glue block on the bowl until after carving.

Carving gouges are sold by sweep and width with #1 being straight and a number 10 being a highly dishd gouge. As I said earlier, a #8 by 25mm does about 90% of my carving. I make most of my flutes about $\frac{3}{4}$ " wide

MORE ON THE WEB

For a video of the author demonstrating the techniques for carving turned bowls, visit woodworkersjournal.com and click on the "More on the Web" tab shown above.



This simple setup for holding your bowl while carving is made from a plywood piece with threaded rods going through it, and a smaller board drilled for the rods, as shown above. Squeeze the bowl between the pieces. The plywood extends below the circumference of the bowl so that it can be captured in a vise, securing it for carving.

Likely the first contemporary turner to work with carving as a design element was David Pye, professor of furniture design at The Royal College of Art (1948-1974). He developed a machine called the "fluting engine."

("about" is the key word here), but don't be afraid to experiment with other flute widths and gouge sweeps. There is as much room for artistic expression in carving as in the turning process itself!

Carving is pretty straightforward, as long as the tools are razor-sharp. Do not try to take too much material with any pass. Cut a shallow

trough up the center of your layout, then deepen and widen it gradually. Final passes may have to be on opposite sides and in opposite directions to get crisp, smooth carving. You must pay careful attention to grain direction, for as you carve around a bowl, you alternate from pure end grain to pure face grain and every combination in between. Carving direction is usually

the same as outside faceplate turning: from lesser diameters to greater diameters (uphill, as shown below). That being said, once a flute is to almost final size, you often have to make a final pass on one side of the flute in one direction and a final pass on the other side of the flute in the opposite direction to get clean cuts. Think of it as shaping the opposite sides of a U-shaped



Keep track of grain direction as you carve. Carve "uphill" and don't try to take too much wood off with each cut, refining the shape as you go.



Sometimes refining the shape requires you to carve on the opposite edges of the same trough from different directions to get a clean cut.

trough. To get the best results, you carve one direction on one side of the trough and the other direction on its mate. Stopping the carving just shy of the rim looks really nice and is a good scheme for your first bowl.

Veining Alternative

If this sort of carving daunts you, try creating simple texture with a veining tool. Simply take parallel straight cuts to create texture, as shown in the photos at right. Start it close to the edge and then continue down for any distance below the rim to create an interesting look.

You can even cut across the rim if you wish.

Carving pleasing shapes onto a bowl is a great way to take your pieces to the next level. As with almost all aspects of woodworking, practice will improve your results. Take your time and start with simple forms and experiment. Who knows where you might end up?

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



Adding a simple repetitive texture around the rim of a bowl is an easy thing to do and can be a great first step into the technique of carving turned bowls.

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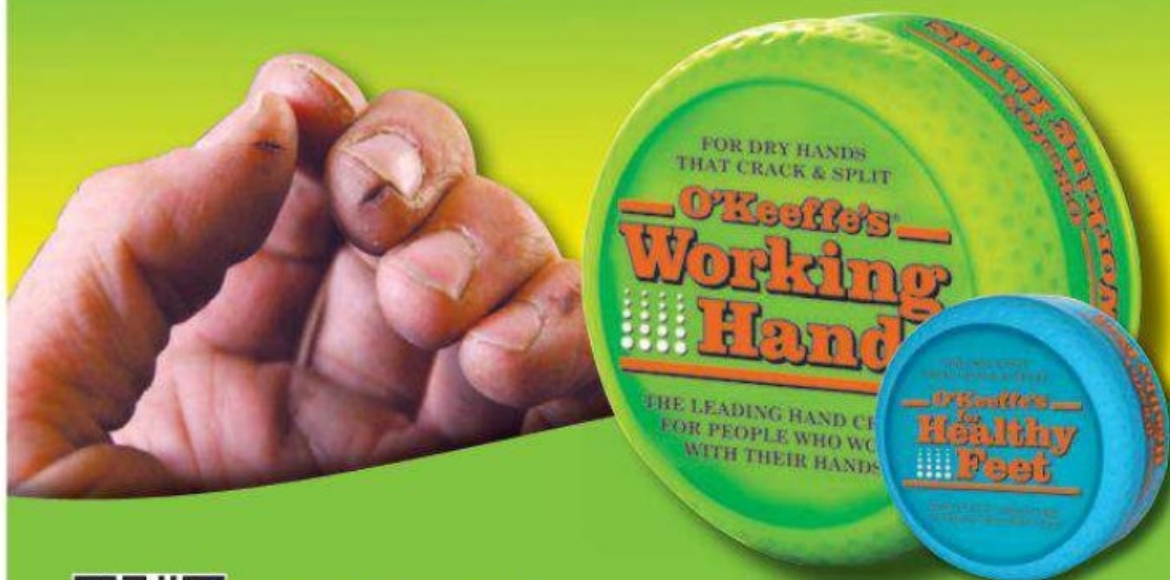


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Reader's Survey

What Do You Think?

Clamps are one of the most numerous items in any woodworking shop. Coming in a wide array of shapes, sizes, styles and materials as well as brands and functions — it is not an exaggeration to say that it is nearly impossible to woodwork without them. In this third “What Do You Think?” survey, we decided to find out what opinions woodworkers harbor about this shop stalwart.



Clamp favorites: What's on your top 10 list?

Bar, pipe and pistol grip clamps are most often used on big clamping jobs, but our survey revealed that smaller C-clamps and spring clamps top the list, making up **23%** of the clamps found in most woodworkers' shops.



Are you Clamp Savvy?

It's a traditional and time-honored technique: **80%** of woodworkers say they regularly use clamping blocks to properly direct clamping pressure during their glue-ups.

The Urge to Buy: Is Resistance Futile?

Although most woodworkers own many, many clamps, **65%** confessed that they bought clamps in the last two years. Apparently, it's hard to get enough of a good thing!

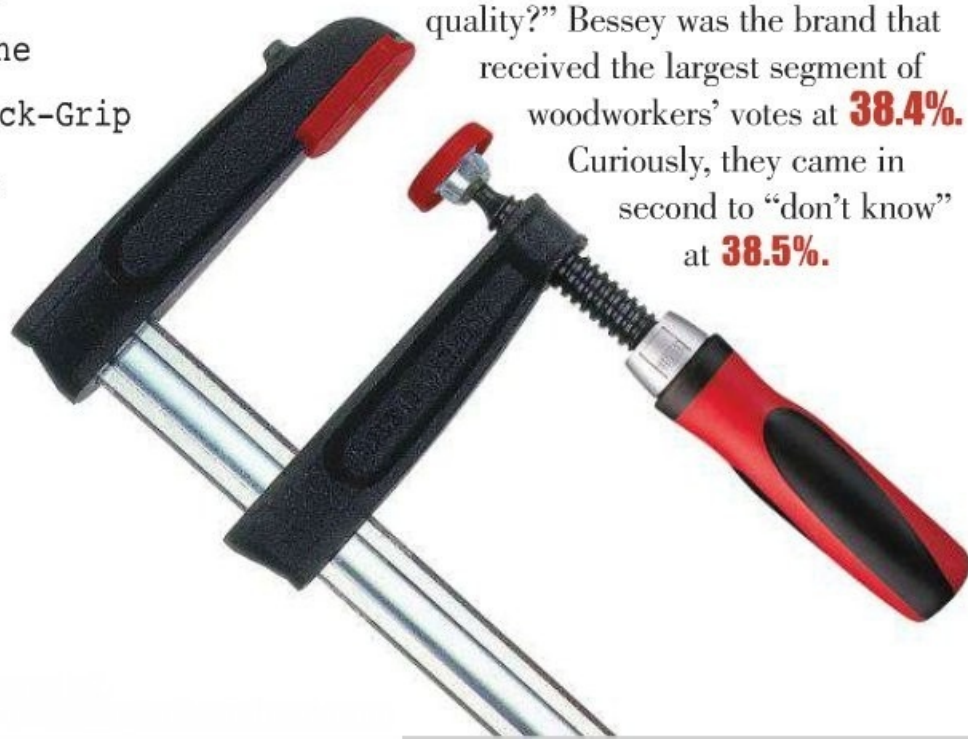
Is Tradition Overrated?

When asked “If you had to choose only one type of

clamp to be in your shop, which would you choose?” woodworkers leaned heavily to the relative newcomers of the K-Body® and Quick-Grip styles of clamps. Those two combined were selected by **47%** of all responders.

Confused By Quality?

When they were asked “Which brand delivers the best quality?” Bessey was the brand that received the largest segment of woodworkers' votes at **38.4%**. Curiously, they came in second to “don't know” at **38.5%**.





How confident are you in your clamping skills?

Apparently knowledge is power. About **80%** of woodworkers acknowledged that they would like to know more about how to clamp properly.



What will be your future favorite?

When asked "What style of clamp do you want more of in your shop right now?" more responders (**32.2%**) chose the K-body, square-head style than any other.

Cliché or a sad fact of life in the shop?

The old saying "you can never have too many clamps" seems to be more than just a truism.

54% of woodworkers say that they regularly do not have enough clamps to complete a specific clamping task.



How do you store your clamps?

When it comes to organization, **39%** of woodworkers say they store their clamps on a shop-made rack. But not everyone is that organized... **2%** admitted that they store their clamps "in a pile."



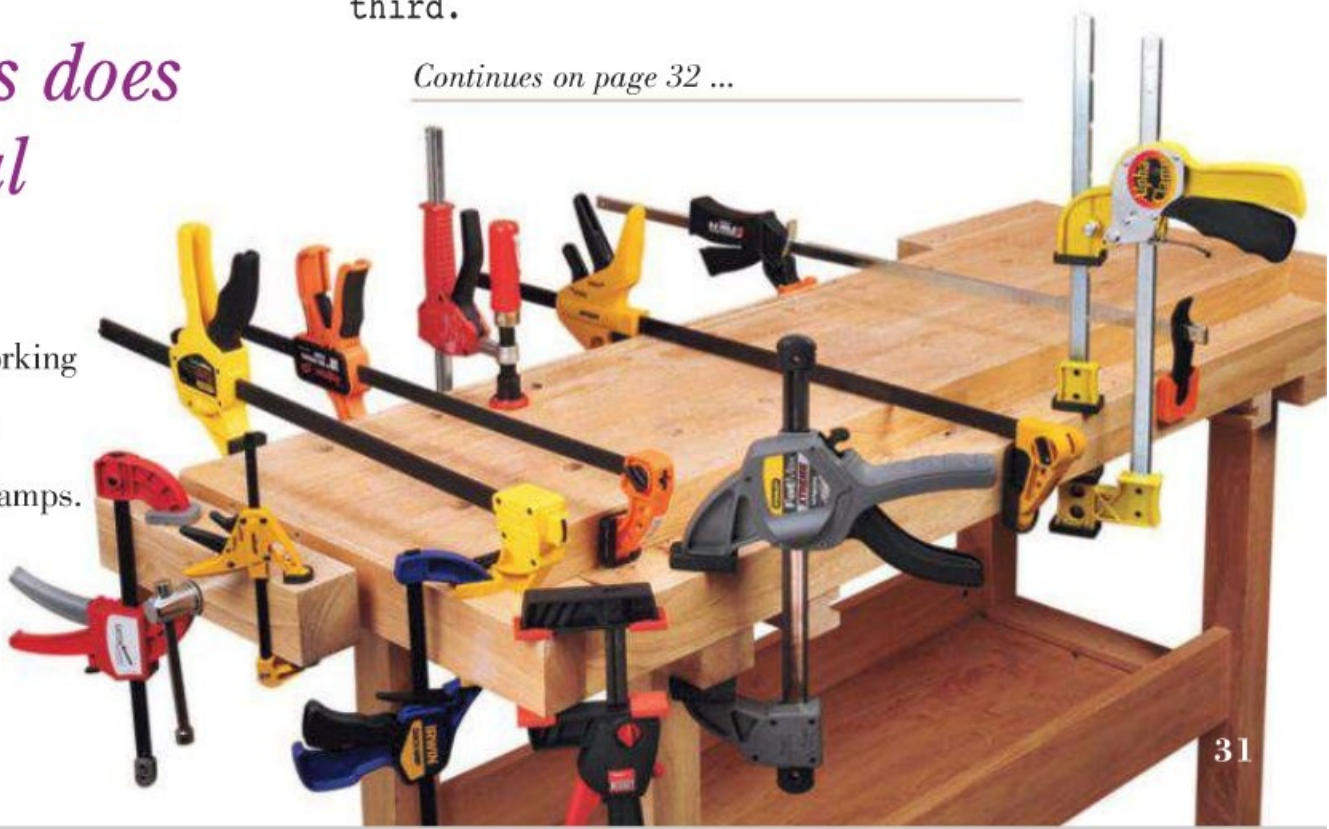
What is your favorite brand?

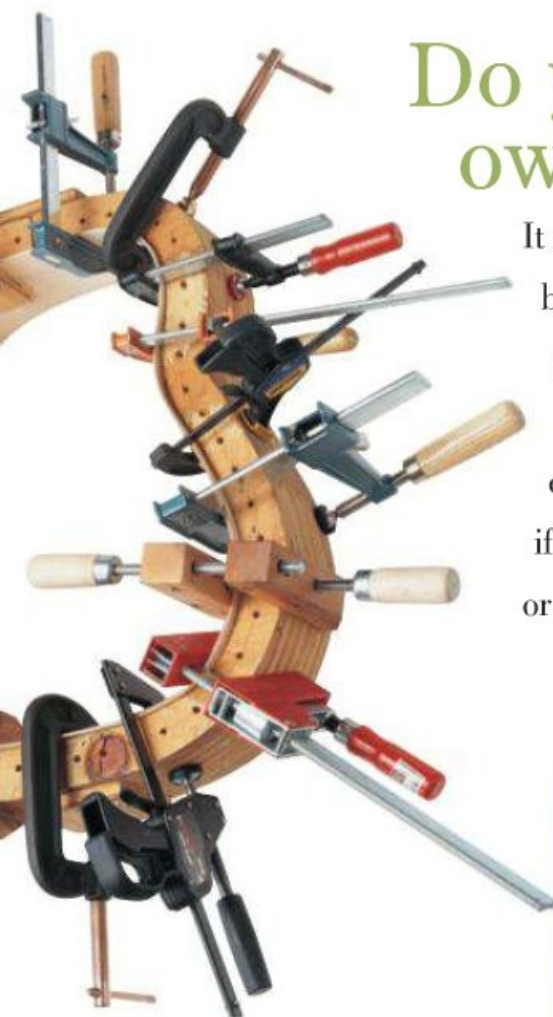
When asked "Which clamp do you own?" IRWIN (**19.6%**) edged out BESSEY (**15.1%**) as the #1 choice. "Other" came in third.

Continues on page 32 ...

How many clamps does it take to be a real woodworker?

It's not necessarily a measure of woodworking prowess, but **47%** of woodworkers responded that they own 30 or more clamps. (12.5% said that they have more than 60 clamps in their shop!)





Do you actually own a clamp?

It seemed a little obvious, given our audience, but we had to ask: Turns out **.02%** of our survey responders simply don't own a clamp. Curiously, the standard deviation on our survey is .023%, so we're not sure if we're dealing with a real woodworker or some sort of clamping deviant.



Piping Up For Butt Joints

When it comes to fabricating butt joints, **36%** of woodworkers chose pipe clamps as the most effective type of clamp.

Do you use cloth clamps?

They're more common than you might suspect... **70%** of woodworkers own and use band clamps. The rest must be clothophobic.

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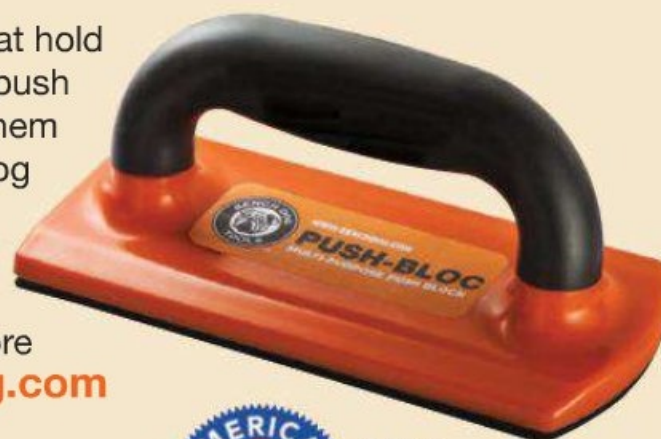
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Stickley Hall Table

By Dave Munkittrick

This classic design is built using exceedingly practical construction techniques — further embracing its Arts & Crafts heritage.



Every woodworker knows the story: You're at the lumberyard and suddenly there it is, the most beautiful plank of wood you've ever seen (until the next beautiful plank comes along — we're a fickle lot). Like a child with a stray cat, you just have to bring it home.

That's what happened when I saw this plank of ribbon stripe African mahogany. My trip home from the lumberyard was spent rehearsing an answer for the inevitable question: "You spent how much on that board?!" Fortunately for me, we were in need of a Stickley-style hall table, and this plank was the perfect choice for it.

As you'll see in the *Drawings* on page 37, I put the table together with pocket screws so there's no tricky joinery to fuss with. Pocket screws make construction go quickly, and they allow you to sand and prefinish the individual parts before final assembly. The disassembled table can also be knocked down and shipped flat, and it can be assembled at its destination with only a screwdriver.

While I used mahogany, it would be entirely consistent with Stickley furniture if you decided to use another species, such as quartersawn red or white oak. Even flatsawn material is fine. Don't feel like you need to search for the same lumber as I used ... unless of course you're hankering for a good reason to head to the lumberyard anyway.

Harvesting the Parts

My first step on this project was to let my precious plank acclimate to the shop. Be sure to give your stock a week or two in your shop as well — it needs to reach a level of moisture equilibrium so that any potential distortion will become apparent before you start working it. I set my plank on edge so that both faces were exposed to the ambient air.

The next order of business was to plan my cuts. Mistakes in wood like this are costly, and I didn't want any regrets. I used chalk to lay out the necessary cuts on my plank. Chalk is easy to erase with a stiff brush. Take your time and plan



The author chose the workpieces for this table carefully, chalking out their rough proportions on a huge plank of ribbon stripe mahogany before rough-cutting them to size. Above: the wood is allowed to acclimate to his shop.



your cuts with a pleasing grain pattern in mind. Prioritize those pieces that will become the tabletop and shelf — they're the most visible.

Rough-cut the stock into the necessary pieces, leaving each slightly oversized. I like to use a jigsaw because it's safe to manage when sizing down large planks like this one and square cuts are not important at this point.

Preparing Top, Shelf Blanks

Take some time to consider the orientation of the stock you'll use for the tabletop and shelf, once you've surfaced it flat, smooth and to thickness. The goal, as always, is to make those glue lines as invisible as possible and to get a pleasing grain pattern. Mark the parts to keep their arrangement clear, then glue up your blanks for the top and bottom shelf. Be sure your joints are well aligned to minimize sanding later.

Once the glue cures, pull the clamps off of your panels and use abrasives to flatten them, rather than a hand plane. Ribbon stripe mahogany can be tricky to machine because the grain flows in opposing directions. I've found in the past that it's almost impossible to plane without tearout. If you have a lot of sanding to do to flatten the seams between the board edges, start with a belt sander, then switch to a random-orbit sander until the blank is flat and smooth.

Even slight imperfections will show up on a finished tabletop, so my method for creating a dead-flat top involves a pencil as well as a sanding block. I cover the blank with pencil swirls, then start sanding (see the photo on the next page). The low spots show up pretty quickly as the pencil marks that remain when the high spots are gone. Keep sanding until all the pencil marks are erased, and your top will be perfectly flat.



After gluing up blanks for the top and shelf (left), the author uses his shop-made "hand abrasive planer" (above) to surface them smooth and to help tame the wood's reversing grain (right).



You might be wondering what that apparatus is that I'm using to sand my tabletop here (center photo, above). It's nothing more than a block of solid maple that's been jointed flat and sized to fit a 4 x 24-in. sanding belt. Cut the belt at the seam and attach it to the ends of the maple with small wood blocks and screws. A handle fashioned from a 2 x 4 completes what I affectionately call my "hand abrasive planer." Its broad base serves the same flattening

function as a jointer plane — very effective. Sand up through the grits, smoothing your panels to 180-grit.

With the panels flat and smooth, set the bottom shelf aside for now. Draw the circle for the tabletop on its blank. I used trammel points clamped to a long piece of scrap to serve as an oversized compass ... sooner or later, every woodworker should own a pair of these handy devices. Now rough-cut the top to shape with a jigsaw. Be sure to save the off-cut corners to make the feet later; your blank should be large enough to accommodate them.

There are a number of ways to cut a large round top. A band saw works well,

but I don't like sanding out all the blade marks. I prefer to use a plunge router mounted on a trammel to cut tops to finished size. With a sharp spiral or shear-cutting straight bit, a router leaves a smooth, perfectly round edge that requires very little cleanup sanding.

You can make a router trammel from a piece of 1/2" plywood wide enough to easily mount to your router's base. It needs to be about a foot or more longer than the circle's radius. Cut a hole through one end of the trammel for the router bit to pass through, and mount the base to the board with screws. Drill a pivot point on the trammel equal to the table radius when measured from the inside cutting edge of the bit. Use a



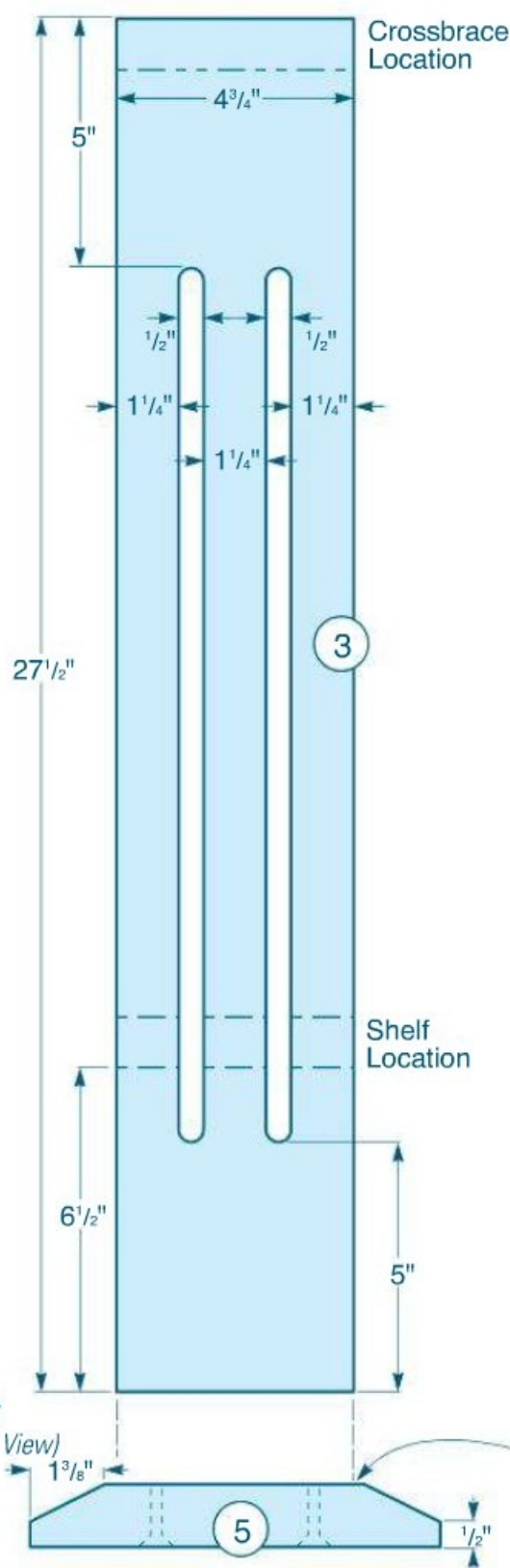
The author laid out the top with a set of trammel points (left), then rough-cut the shape with a jigsaw (center), leaving about 1/8" to be trimmed. Spacers (top right) hold up the top while it is milled to its finished diameter — with a plunge router mounted to a shop-made trammel jig (bottom right). The trammel jig will help you form a perfect circle.



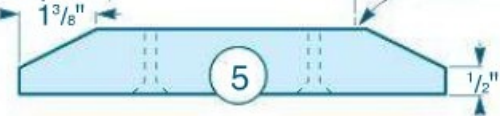


Crossbrace
(Side View)

Leg
(Front View)



Foot
(Front View)



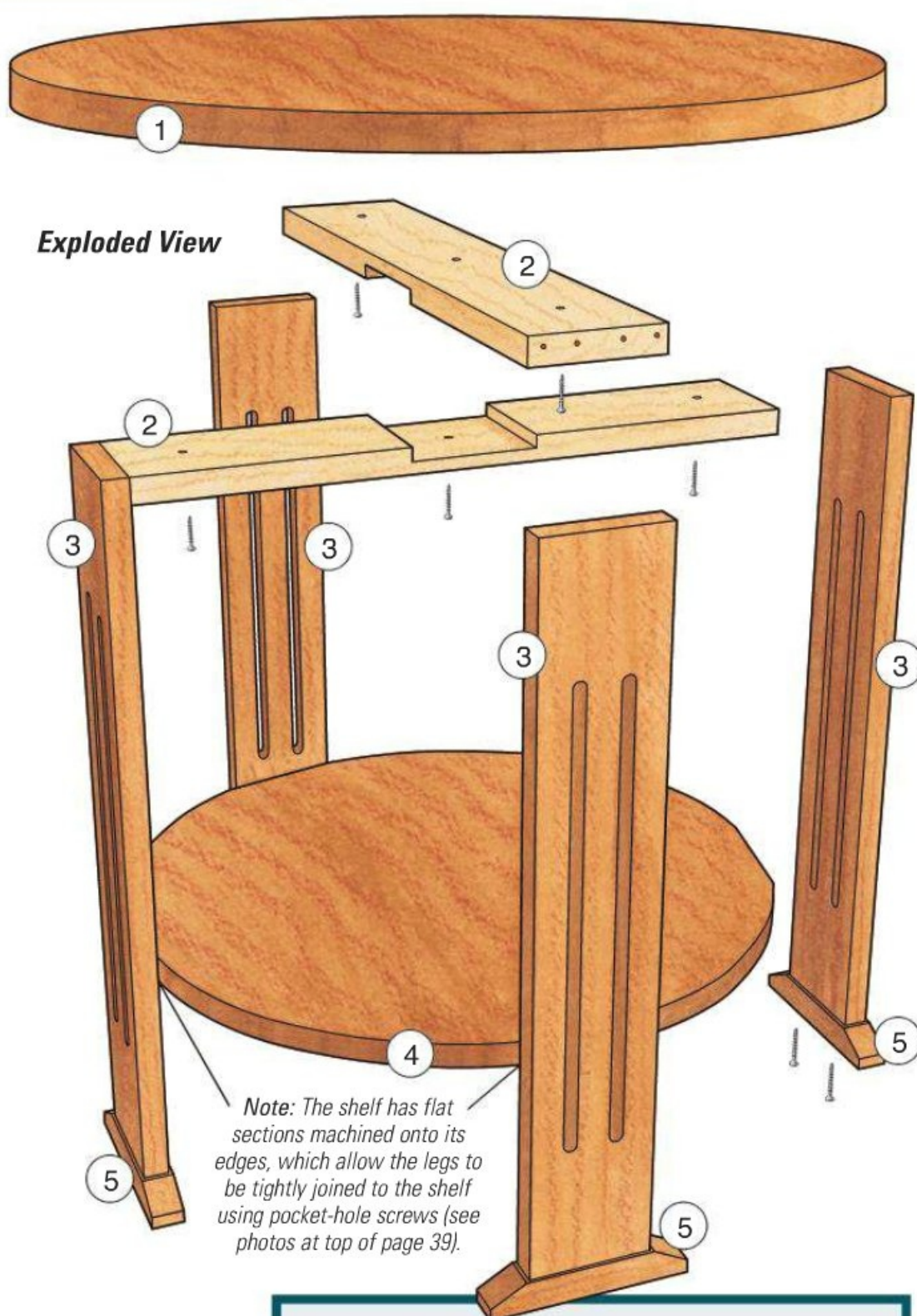
Note: There is a 1/8" reveal around the top of the feet where they meet the legs.

Crossbraces and Legs

In the *Drawings*, above, you'll see that the tabletop fastens to the legs by means of a pair of crossbraces that intersect in a half-lap joint. They're next up on your list to make. Surface some stock for the two crossbraces, then rip and crosscut them to final size. Install a wide dado blade in your table saw, and raise it to cut exactly halfway through the thickness of the crossbraces. Mark the position of each half-lap joint on the bracing, and make a series of side-by-side passes over

the blade to hog away the waste. If you work carefully, the braces should slip together snugly so their faces are flush when they're interlocked.

Time for some drilling to prepare the crossbraces for final assembly. Plan to mount the crossbraces to the tabletop with five screws: one at the centerpoint and one in the middle of each crossmember about two inches from their ends.



Note: The shelf has flat sections machined onto its edges, which allow the legs to be tightly joined to the shelf using pocket-hole screws (see photos at top of page 39).

MATERIAL LIST

	T x W x L
1 Top (1)	1 1/4" x 29 3/4" Diameter
2 Crossbraces (2)	1" x 4 3/4" x 24 3/4"
3 Legs (4)	1" x 4 3/4" x 27 1/2"
4 Shelf (1)	1" x 25 1/4" Diameter
5 Feet (4)	1 1/4" x 1 1/4" x 7 3/4"

finish nail, dowel or screw as the trammel's pivot point. Mount the trammel to the underside of the tabletop with the pivot driven into a shallow hole.

Now, elevate the panel so the bit will clear your bench and the router can swing in one continuous motion. Bench Cookies® are ideal as they keep the top from shifting when the cut is made, but other spacer blocks could work also.

Turn the router on, plunge the bit down to cut through the blank, and swing the trammel all the way around the circle. I fed my router counterclockwise.



The author attached the legs to the cross-braces with pocket screws. They make strong connections and yet enable the table to be dismantled easily for finishing or transporting.

Drill these countersunk holes now. Find your pocket-hole jig and stepped bit so you can bore four angled pilot holes at each brace end for pocket screws that will attach each of the four table legs.

Speaking of table legs, head to your jointer and planer to prepare some 1x stock for them. Cut the legs to final size, and take a breather to study the *Drawings* for the pairs of leg slots you'll need to mill next. I could have laid these 8½"-long slots out and cut them on my scroll saw, but I wanted to make them

arrow straight and avoid having to sand out saw marks on their inside edges.

It didn't take long to conclude that my router table would solve both issues easily, but I still needed to consider the best procedure to follow. While a 1/2" straight or spiral cutter could cut the slots in one pass, I knew that even a new bit would likely leave chatter, and I would be back to a tedious sanding job. Instead, I split the job between the drill press and the router table. First, I drilled two 1/2"-diameter holes through the end points of each slot, to ensure perfectly rounded slot ends. Then I chucked a 3/8" upcut spiral bit so I could pass it through the starter hole easily and begin each router pass safely. The undersized diameter of my router bit meant that each slot would take three passes to complete (I'll explain how and why shortly), but the ultra-smooth edge along the walls of the slots would be worth the extra cuts.

On your router table, install the bit and raise it high enough to pass through the leg workpieces. Position and lock the router table fence to center the bit inside one of the 1/2" slot holes; this setup removes the majority of the waste in the first pass. Turn the router on and slowly feed each leg from right to left to hog out

"The disassembled table can be knocked down and shipped flat, and it can be assembled at its destination with only a screwdriver."

the center portion of the eight slots. As you complete each pass, turn the router off and let the bit stop before lifting the leg off. No need to change your fence setting to switch from one slot to the other on each leg. Just flip it over to rout the centered cut for the second slot.

Once all eight "first cuts" are done, it's time to shift the fence for the second routing pass. Unlock and reposition the fence so the bit aligns with the outside edge of the 1/2" hole on one of the slots. This setting will widen the slots and form the outside wall in the same maneuver. To start these cuts, shift the leg so the bit is centered in the slot again and can spin freely. Turn on the router, push the leg against the fence to engage the bit and feed from right to left. Flip the board over to cut the outside wall of the opposite slot. Repeat for all four legs.

Use the same process for milling the third and final slot cuts. Reset and lock the fence to define the inside walls of the slots as well as to bring the slots to final width.

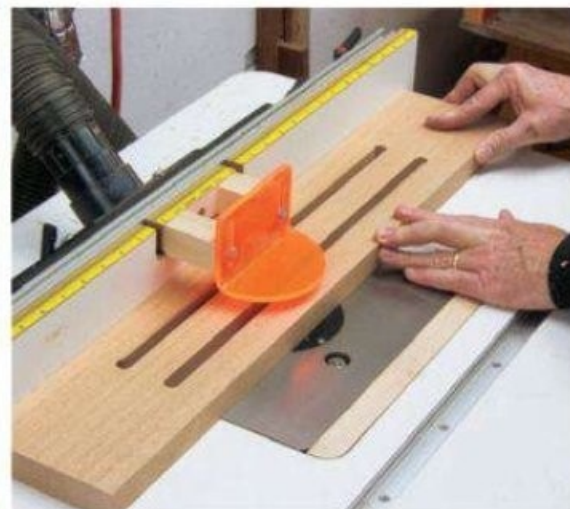
When the dust settles from all of this routing, go ahead and fasten the cross-braces to the legs temporarily with two of the four pocket screws at each leg joint to create the table framework.



To start the legs, drill 1/2" holes at the beginning and end of each leg slot. A fence and a stop ensure accurate hole placement.



Next, rout a slot between the drilled end holes. Set the fence so the bit is first centered in the hole. Flip the leg over to cut the second slot.



Two additional light cuts finish the slot edges and bring them to final width. The fence must be reset for these inside and outside slot cuts.



Center the crossbrace/leg assembly on the shelf blank layout and mark its location (top left). Transfer the "flats" to the shelf blank at the ends of the crossbraces (top center), and trim them to shape at the router table against a fixed straightedge (bottom center). Mark the pocket-hole locations on the shelf while it's held in place by spacers clamped to two legs (right). Finish your assembly by attaching the feet to the legs with screws (bottom right).



Machining the Lower Shelf

It's time to retrieve that second blank you reserved for the shelf. If you haven't done so already, sand it smooth and flat. Now reset your trammel point compass and draw the shelf diameter of 25¼" on the blank. Center the crossbrace assembly on your shelf outline and check to be sure the outside ends of the braces just intersect the perimeter of the circle. If the circle size is correct, mark the positions of the crossbraces and legs where they touch the circle to serve as reference points (see top left photo). Now unscrew the legs and, holding the crossbraces carefully so they're aligned with their reference points on the shelf, trace a line across their ends to create four "flats" where the round shelf will attach to the flat leg faces (see top center photo). Grab your jigsaw and rough-cut the shelf blank to shape, steering the blade wide of your circle layout lines.

Use the router trammel jig, with its pivot point reset to match the shelf radius, to finish-cut this workpiece round just as you did for the tabletop. Now, as to those flat areas that remain to be cut, here's my simple solution: I attached a long scrap of hardboard inside the circle to serve as a straightedge. Align it flush with each of the lines you drew for the flats. I tacked mine down to the shelf with a couple of short brads (if you want to avoid their puncture holes, use double-stick tape or dabs of hot-melt glue instead of brads), then zipped off the waste with a piloted flush-trim bit in my router table (see bottom center photo, above). Guide the bit's bearing along the

straightedge and feed the workpiece from right to left — easy and spot-on.

Final Assembly and Finishing

Let's bring this hall table together! Attach the crossbraces to the underside of the tabletop with five screws. Be sure to widen the two screw holes on the ends of the brace that runs across the grain of the top to accommodate the top's seasonal expansion and contraction. Fasten the legs back onto the crossbraces, this time driving pocket screws into every mounting hole.

You still need to position the shelf on the leg framework. I did this by attaching a couple of 19"-long spacer boards to two of the legs with spring clamps. Rest the lower shelf on these spacers, and swivel the shelf so its grain direction matches the pattern of the tabletop. Mark four pocket screw locations for each of the legs on the shelf bottom (see top photo, right), and bore these holes. Drive screws to install the shelf on the legs.

Round up those offcuts you saved for the table's feet. Rip them to width on the table saw, and cut them to length. Notice in the *Drawings* that the top corners are clipped off with a pair of bevels. Create these at the band saw or on a miter saw. Drive a pair of 3" countersunk flathead wood screws through each foot to attach them to the bottoms of the legs.

Give your table a final sanding to break any sharp edges and then disassemble it for finishing. You can topcoat

your table however you like, but Michael Dresdner offers a great way to "pop" the grain of ribbon stripe mahogany on page 70. After the finish cures for a week or so, polish off your table with a coat of wax and find a likely hall location for it to live.

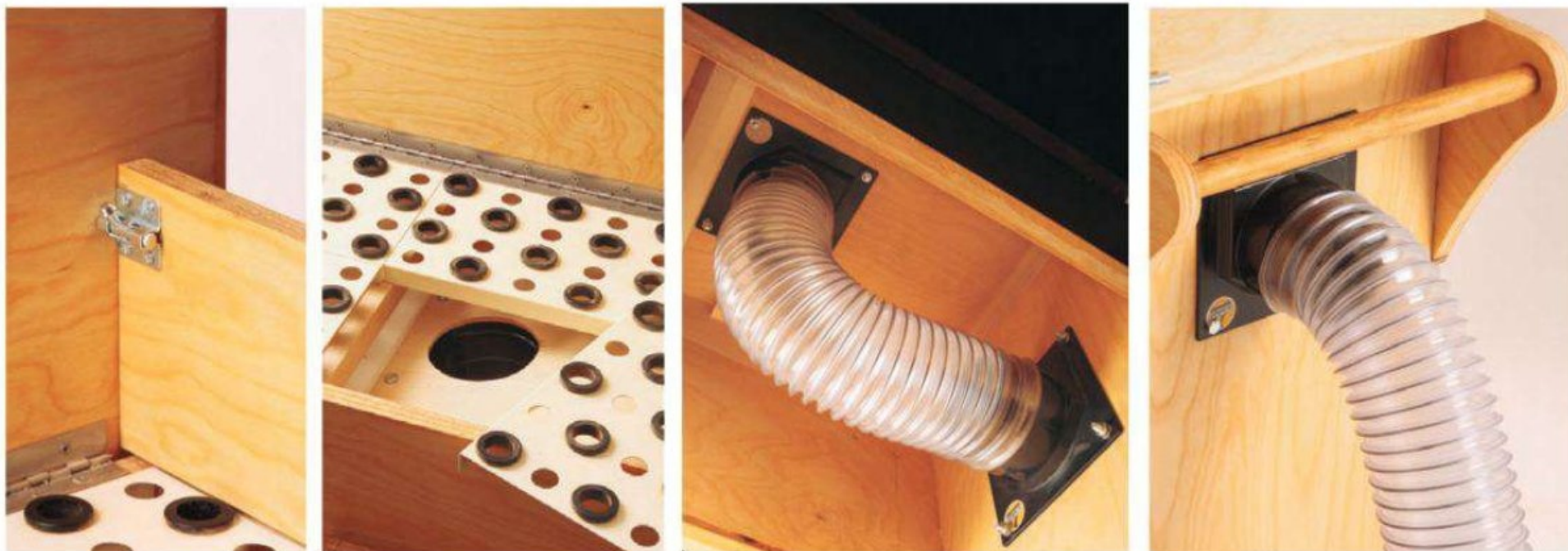
Dave Munkittrick is a cabinetmaker and furniture builder who works out of an old pig barn in River Falls, Wisconsin.



Downdraft Sanding Cart

By Frank Grant





Right-sized, loaded with features and ready for double-duty in your shop, this downdraft table is designed around specialty panels that hold your wood steady and protect it while sanding. The upright back and sides effectively confine the dust and direct it down into the vacuum chamber.

Sanding is not one of life's little pleasures. One of the reasons I personally learned the skills associated with using a hand plane was to cut down on the amount of sanding I had to do as a furniture maker. But, like bifocals and high-fiber supplements, sanding is unavoidable in the long run — which is why this little downdraft sanding cart is so useful.

That this cart is truly effective is not an accident. Working with the staff at *Woodworker's Journal*, we tried many different approaches and gadgets in mock-ups and prototypes before we got to this simple configuration. (Contributing Editor Sandor Nagyszalanczy's expert advice was especially useful in this effort.) It's designed to be connected to a standard 4" dust collector hose. The end wings and back (which, when lowered down, becomes the top) tip up to create barriers that block the dust as it is literally thrown from the sander. Curiously, we found 1/4-sheet sanders (like the ones reviewed starting on page 60) to be some of the dustiest. The downdraft table panels — four steel plates with holes and rubber non-slip grommets pre-installed — allow the dust to be sucked down into the vacuum chamber. If you team up this table with a random-orbit sander that has its own dust collection system, your overall dust collection will be remarkably effective (although not 100% dust-free).

The other features that make this little cart even more useful include an aluminum-covered top that, when folded down, can be used for any number of shop tasks; storage in a drawer and on an open lower shelf; a handy little jig for tearing sandpaper into perfect quarters to fit jitterbug sanders; and two casters that allow you to move the unit around with ease. I think it will make a great addition to nearly any woodworking shop.

Starting Out

I used standard 3/4" birch plywood to make the majority of the components of this cart. There is some 1/4" plywood that forms the bottom of the vacuum chamber and a bit of solid hardwood on some of the edges (I used cherry) — but any type of veneer core plywood will do, and the hardwood is your choice as well. It's a shop project ... but, hey, it can still look nice!

Use the Material List on page 44 to cut out the front, back and ends (pieces 1, 2 and 3) of what I call the vacuum chamber — the top section that will eventually slide down onto the base. These pieces are butt-joined using biscuits and glue. I put the sides up against the locked fence on my table saw (see photos below) to give me a 90° secure setup for slicing the biscuit mortises. When the pieces are prepared, go ahead and glue and clamp them



The sides and ends of the vacuum chamber are joined with biscuits and glue. Our author uses the flat top of a table saw and its rip fence to accurately place and cut the biscuit slots — a practical and effective shop trick. He used biscuit joinery throughout this project.



A circle-cutting bit forms the opening for a dust port in the bottom of the vacuum chamber. The bottom is made of two 1/4" plywood pieces.



The chamber end cleats have a 7° angle groove plowed down their length. The groove is 1/4" wide to fit the plywood bottom pieces.



The vacuum chamber's bottom is a bit tricky to assemble and install. Start by using strong tape to join the pieces. Glue the joint and flex as shown.



With 1/4" spacers in place and 1" spacers positioned inside the vacuum chamber, slide the bottom subassembly down until it stops on the 1" spacers. Screw it in place.



"That this cart is truly effective is not an accident ... We tried many different approaches and gadgets in mock-ups and prototypes before we got to this simple configuration."

together, checking for square as you do. Note that the front is 1/4" taller than the back. Next, cut the chamber's end and front and back cleats and bottom pieces (pieces 4, 5 and 6). I used a circle-cutting bit in my drill press (top photo at left) to form the opening for the dust port into one of the bottom pieces. Check the *Drawings* for the location. Plow grooves into the chamber's end cleats at a 7° angle, using a 1/4" dado head (second photo at left).

I found the best way to assemble and install the angled bottom into the vacuum chamber was to use a really strong tape (duct tape or its equivalent). Adhere a strip to the underside of the bottom pieces, as shown in the third photo at left, apply glue to the seam, and then flex the bottom into a slight V. Get ready for assembling the bottom and installing it into the chamber by flipping the subassembly upside down and setting it on three 1/4" spacers, as shown in the photo, bottom left. These spacers accommodate for the front's extra height. In addition, place 1" scrap blocks inside the chamber subassembly positioned against each end. The reason will become clear in a moment.

Install the chamber end cleats so their grooves fit over the ends of the thin bottom subassembly, and push the whole thing down (photo, bottom left) until it stops on the 1" scrap blocks you just placed. Then drill pilot holes and drive screws through the chamber end cleats as shown in the inset photo below. The four front and back cleats that support the chamber bottom are added next. I installed these using a simple "rub joint," moving them gently back and forth until the glue tacked and grabbed.

Once the glue has cured, turn the chamber over and install the glue blocks and center support (pieces 7 and 8). The metal downdraft table panels rest on the center support and the chamber end cleats when you are using the cart. The last pieces to make and install on the vacuum chamber are the end wings and the top. Cut them to size from 3/4" birch plywood. Trim the edges of the top with cherry hardwood and sand it flush (pieces 9 through 11). Now take a few moments to drill and secure the

magnets (pieces 12) to the back panel (see *Drawings*) using epoxy. Fasten the piano hinge to the top edge of the chamber back (piece 2), then attach it to the underside of the top so the panel will stand up at 90° to the chamber when open. Transfer the positions of the magnets to the underside of the top, and mount the magnet washers. When that's done, install the end wings to the chamber with more lengths of piano hinge (piece 13), positioning them so they are tight against the top when in the upright position. Attach the barrel latches (pieces 14 — available at your local hardware store) to the wings and then mark and drill holes into the underside of the top to accept their barrels. You are almost done with the vacuum cham-



The author made a template to the exact shape of the base front and back curved ends. He transferred the shape to the pieces and rough cut the shape using a band saw. Note that he stayed outside of the pencil line. He refined the cuts to match his template using a pattern-routing bit.

ber. Position one of the dust ports (pieces 15) over the opening you made on the angled bottom, mark and drill its mounting holes and use short hex-head bolts, washers and nuts to install it. Put the vacuum chamber aside for now and move on to building the base.

Constructing the Base

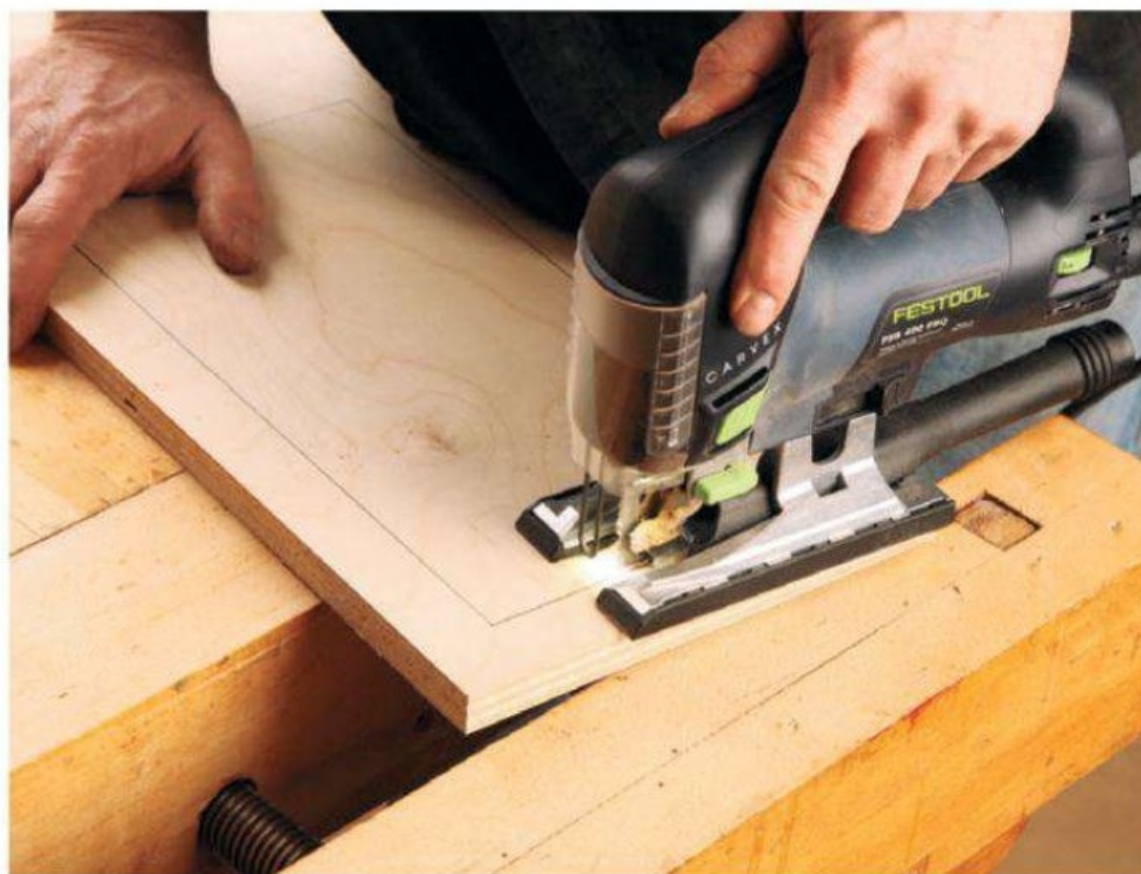
Construction techniques used in making the rolling base are stone simple, but still sturdy and practical. Start by cutting out the tall and short ends, front and back panels, lower shelf, handle and the divider (pieces 16 through 21).

Grab the base front and back and get ready to shape their ends. I made a template from MDF to the exact shape of the end (see the *Drawings* for details). By forming the shape on a template, I could fair it up and get it just right. If I made a mistake, I could just start over on another piece of MDF — I wouldn't have wasted a good piece of stock. Once the template was accurate, I transferred the shape onto the handle panels, stepped to the band saw and rough cut the shape just outside of the pencil line (photo, top left). Then I chucked a pattern-routing bit into my router table. Attaching the template to the pieces with double-sided tape, I could carefully rout the shape, as shown in the photo at top right. It left a nice smooth edge. Repeat the process on the other panel. Next, I selected one of the pieces to be the front and receive the drawer opening. I marked out and rough cut the opening with a jigsaw, as shown at right. I made another template to exactly the drawer opening size and template-routed that opening as well. Routing leaves the edges smoother than the jigsaw can. The pieces still need a pair of stopped holes drilled on their inside faces for the handle, plus some cherry trim along their lower edges. You also need to cut the bottom curve on the tall end piece and use the circle-cutting bit to bore a dust port hole through it. Do that final prep work now, and you'll be ready for assembly.

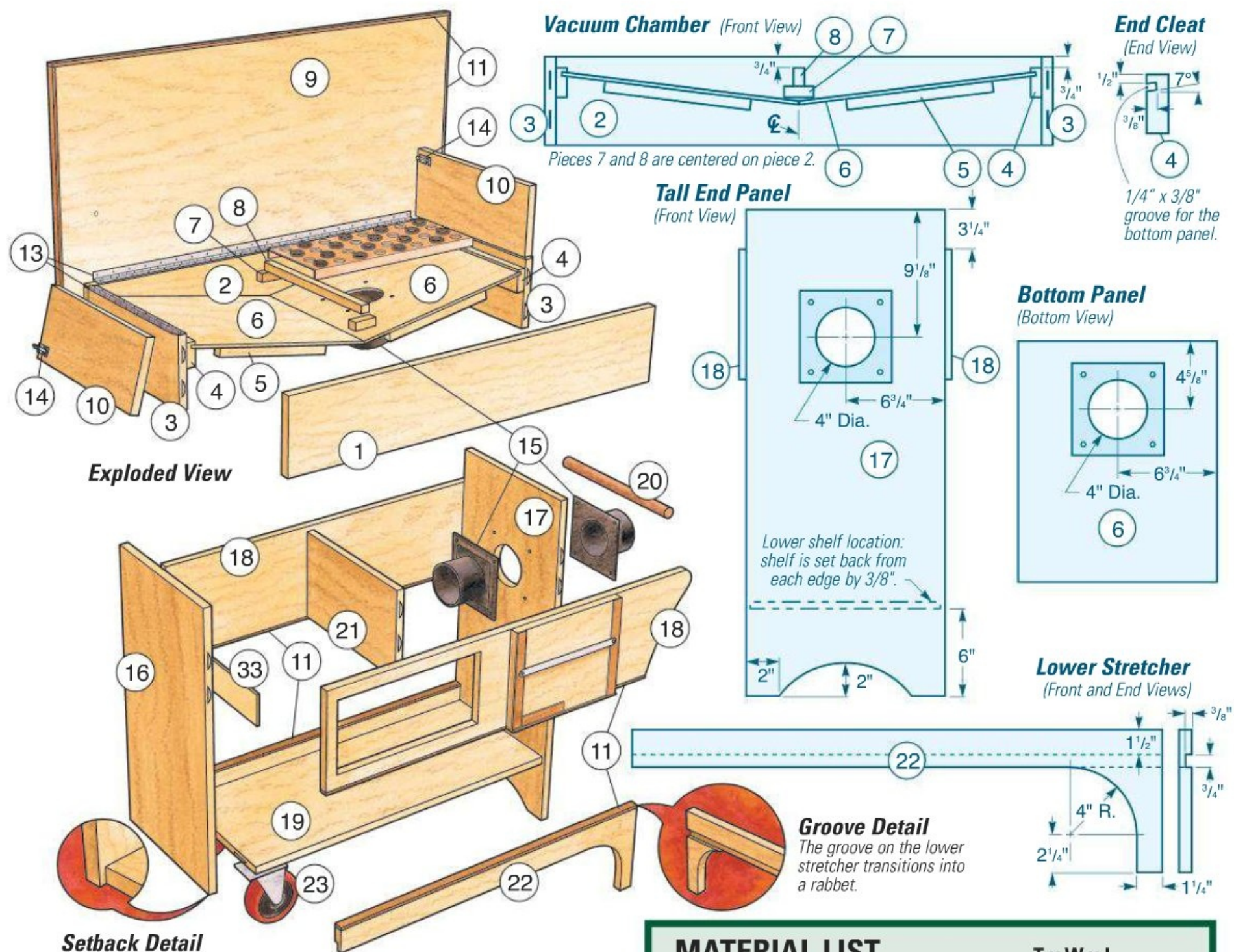
Get out your pencil and marking tools, because it is time to warm up your biscuit cutter. Mark out and locate the biscuit slots. When they are cut, dry-fit the base subassembly together so you can verify the fit and practice your clamping procedure. At this point,

I would recommend finding a friend to help with the gluing and clamping, and it might be very helpful to pre-glue the biscuits into the panels so you don't have to handle them during glue-up. (While it's not required, if you have a nail gun handy, well ... you will find it very handy!)

While the subassembly is drying, make the lower stretchers (pieces 22). I started by cutting blanks and milling a 3/4"-wide x 3/8"-deep groove along the lengths of their inside faces. I stepped to the band saw to cut the stretchers' bottom profiles to shape. Align these cuts so they turn the groove into a rabbet where the curved edge straightens out (see *Drawings*), and sand these cuts smooth. Add some hardwood trim to their top flat edges before fitting the stretchers against the bottom shelf and gluing them in place with biscuits. When the glue dries, attach the two casters (pieces 23) to the bottom shelf with short lag screws and washers.



The drawer opening is roughed out with a handheld jigsaw. While it would be acceptable to only use the jigsaw to form the opening, the author chose to take the extra step of pattern-routing the opening to final size. It leaves smoother edges.



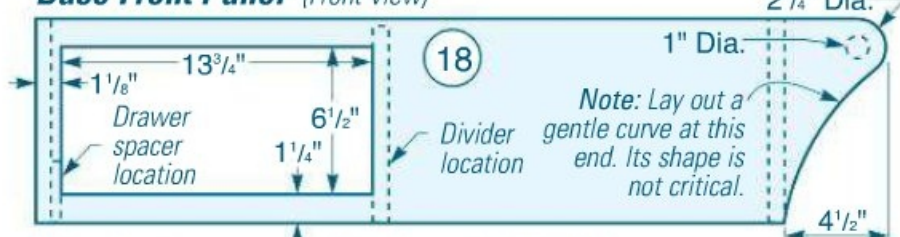
Setback Detail

3/8" setback accommodates rabbet and groove on lower stretcher.

Back (Back View)



Base Front Panel (Front View)



Note: The drawer spacer and divider are flush to the drawer opening.

Downdraft Cart Hard-to-Find Hardware

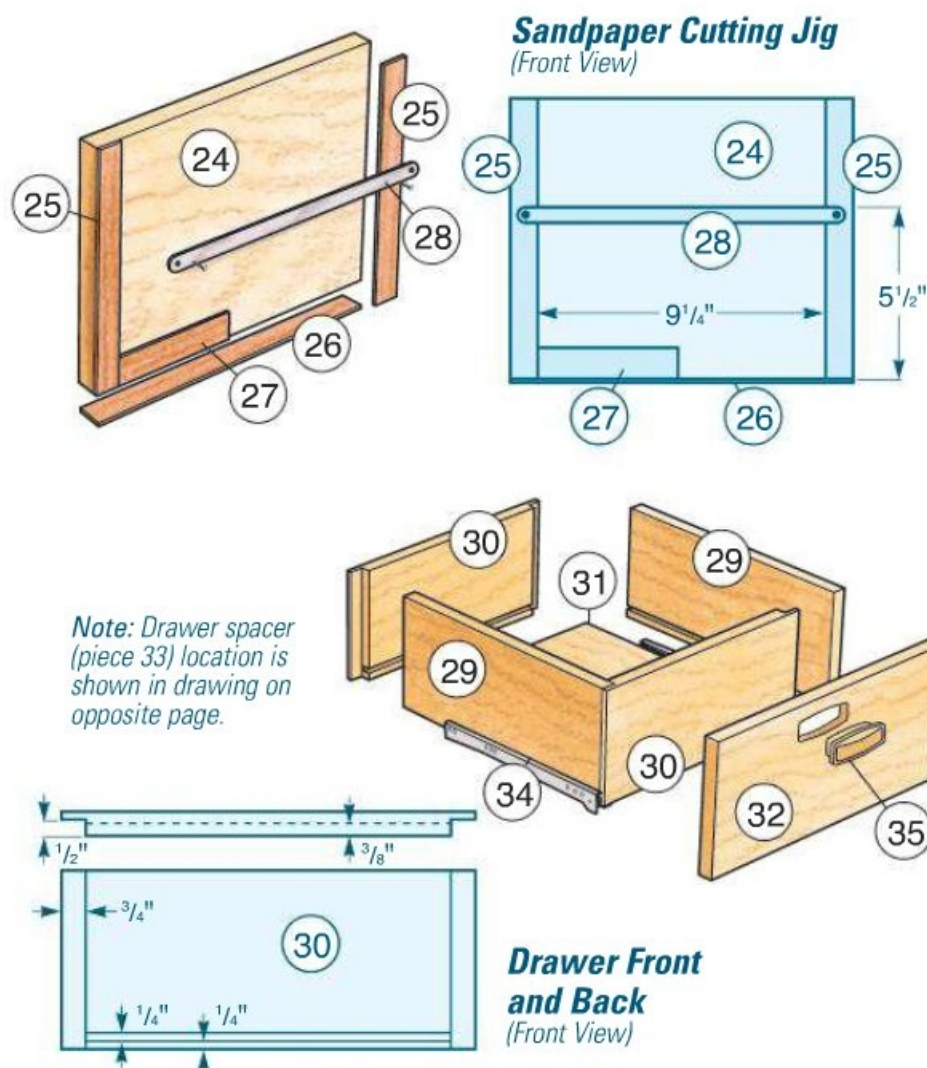
The following supplies are available from Woodworker's Journal.

- 3/4" Rare Earth Magnets (1) #37554\$20.49 pk.
- 3/4" Rare Earth Magnet Washers (1) #33972.....\$6.99 pk.
- 36" Piano Hinges (2) #36843.....\$23.99 ea.
- 4" Dust Ports (3) #28666\$6.39 ea.
- 5" Plate Casters (1) #26413.....\$33.49 pr.
- 1" Dia. Handle Dowel (1) #21105\$7.69 ea.
- Drawer Handle (1) #22327\$9.69 ea.
- Blum 12" Drawer Slides (1) #34827\$5.19 pr.
- Downdraft Table Panels (2 sets) #25077.....\$25.99 ea.

To purchase products online, visit www.woodworkersjournal.com and click on the "Store" tab. Or, call 800-610-0883 (code WJ1223).

MATERIAL LIST

	T x W x L
1 Front (1)	3/4" x 6 1/4" x 34 1/2"
2 Back (1)	3/4" x 6" x 34 1/2"
3 Ends (2)	3/4" x 6" x 13 1/2"
4 End Cleats (2)	3/4" x 2" x 13 1/2"
5 Front, Back Cleats (4)	3/4" x 3/4" x 10"
6 Bottom Panels (2)	1/4" x 13 1/2" x 16 3/8"
7 Glue Blocks (2)	3/4" x 3/4" x 2"
8 Center Support (1)	3/4" x 1 1/4" x 13 1/2"
9 Top (1)	3/4" x 18 1/2" x 38"
10 End Wings (2)	3/4" x 6" x 14 1/2"
11 Cherry Trim (1)	1/4" x 3/4" x 254"
12 Magnets, Magnet Washers (2 Pr.)	3/4" Dia.
13 Piano Hinges (2)	1 1/2" x 36"
14 Barrel Latches (2)	1 1/2" x 1 1/2"
15 4" Dust Ports (3)	3" x 6 1/4" x 6 1/4"
16 Short End Panel (1)	3/4" x 13 1/2" x 27"
17 Tall End Panel (1)	3/4" x 13 1/2" x 33"
18 Base Front and Back Panels (2)	3/4" x 9" x 37 1/2"
19 Lower Shelf (1)	3/4" x 12 3/4" x 31 1/2"
20 Handle (1)	1" Dia. x 14 1/4" Dowel
21 Divider (1)	3/4" x 8 1/2" x 13 1/2"
22 Lower Stretchers (2)	3/4" x 8 1/2" x 31 1/2"
23 Casters (2)	5" Plate Casters



MATERIAL LIST

Sandpaper Cutter

	T x W x L
24 Base (1)	3/4" x 9" x 11"
25 Side Trim (2)	1/8" x 7/8" x 9"
26 Bottom Trim (1)	1/8" x 1" x 11"
27 Front Bottom Trim (1)	1/8" x 1" x 4 1/2"
28 Hacksaw Blade (1)	Standard

Drawer

	T x W x L
29 Drawer Sides (2)	3/4" x 5 1/2" x 13 3/8"
30 Drawer Front and Back (2)	3/4" x 5 1/2" x 12 3/4"
31 Drawer Bottom (1)	1/4" x 12" x 13 3/8"
32 Drawer Face (1)	3/4" x 7" x 14 1/2"
33 Drawer Spacer (1)	3/8" x 3" x 13 1/2"
34 Drawer Slides (2)	Blum 12"
35 Drawer Pull (1)	Wooden Inset

Adding the Sandpaper Cutting Jig and Drawer

Build the sandpaper cutting jig next. Cut pieces 24 to 27 to size and assemble them with glue, as shown in the *Drawings* above. Secure the hacksaw blade (piece 28) with #4 screws, and mount the jig to the cart with screws driven from the inside.

The last major bit of work is making and mounting the drawer. Cut the drawer parts (pieces 29 to 32) to size. The drawer box sides and ends have 1/4" grooves formed on their inside faces for the bottom, while the front and back have rabbets cut as shown in the *Drawings*. Glue and clamp the drawer parts together. While it dries, secure the drawer spacer (piece 33) in place as shown on the *Drawings*. (The spacer is needed to help mount the left drawer slide.) Mount the slide hardware (piece 34) to the drawer box and carcass, and slide it together to hang the box. The drawer face requires a routed recess to accept the drawer pull (piece 35), which you can install now. Center the drawer face on the box and attach it with two screws driven through from inside the drawer. Way to go, you're almost done!

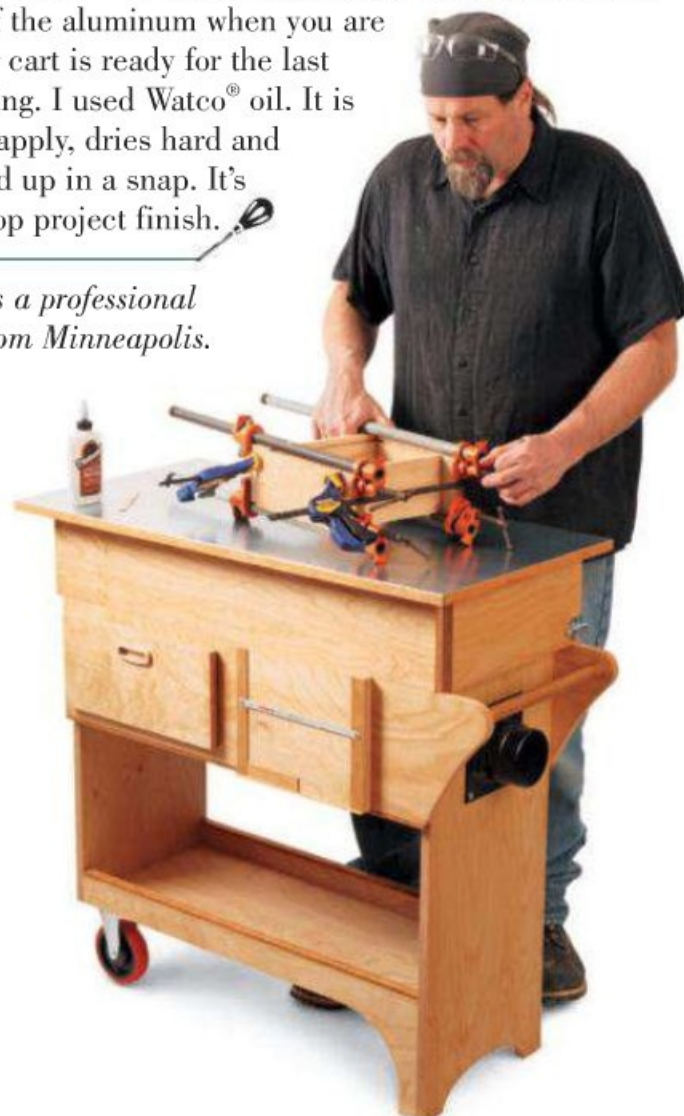
Grab two more dust ports and mount them "back to back" on both faces of the tall end panel with bolts, nuts and washers. Drill some countersunk pilot holes on the inside faces of the cart ends to prepare for attaching the vacuum chamber. Grab the vacuum chamber and slide it down into position on the cart. Lift the cart up onto a bench, and drive screws through the pilot holes to attach the vacuum chamber to the cart. Now cut a length of flexible dust collector hose to fit between the dust port on the bottom of the vacuum chamber and the one on the inside face of the cart's tall end. Secure it with tubing clamps.

Two things remain to be done. First, glue a thin sheet of aluminum to the cart's top using contact adhesive. (Most big box stores sell sheet aluminum.) Trim it to fit with a carbide chamfering bit in a router — it works surprisingly well. Sand off any sharp edges of the aluminum when you are done and your cart is ready for the last step — finishing. I used Watco® oil. It is really easy to apply, dries hard and can be touched up in a snap. It's the perfect shop project finish.

Frank Grant is a professional woodworker from Minneapolis.



The storage drawer and sandpaper cutting jig are bonus features on this cart, as is the aluminum-covered top (at right), which provides a useful working surface.



Simple Knife Block

By Rob Johnstone

Use up some leftover wood and save the edges on your kitchen knives!



The thought goes through my head on a regular basis: “Why should I buy one of those, when I could make one in a snap?” and that is the reason that I have never owned a knife block. Fortunately, my charter membership in the procrastinator’s club (meeting schedule to be announced later) did not stop me from getting into the shop recently and making this version for my knives. It was fun to make, only took a day to fabricate (even with breaks for glue-up) and works like a charm.

If you are interested in building a knife block, the steps and *Drawings* we show here will teach you how to make it, but you will need to adjust the slot measurements and placements to accommodate the knives and accessories you own.

This unit is made of four pieces of solid wood. Cut them to length and width and get ready to cut some slots, using a standard full-kerf saw blade. This will leave you with openings that will fit the vast majority of knife blades. As you can see in the *Drawings*, by matching up the slots cut into piece 1 with the slots cut into the thicker piece 2, you can adjust the size of the knife openings. Align the openings by laying out and cutting all of the slots in piece 1 first and then using that piece to set up the rip fence for each matching cut in piece 2. The small 3/8"-square opening for the honing steel was formed with multiple cuts from the saw blade, versus switching over to a dado head or moving to the router table.

Totally Table Saw

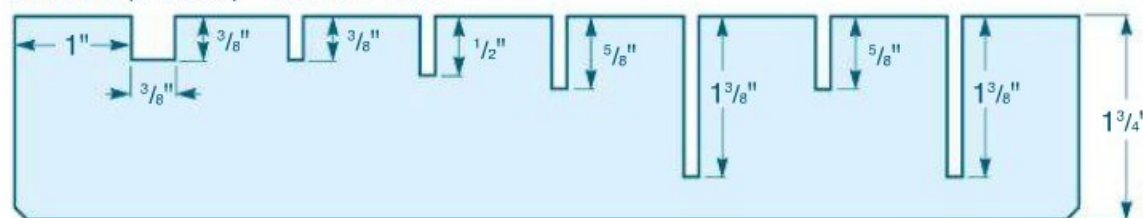
Point of fact: I made all the cuts for this project on my table saw. Piece 3 was made in the same manner as piece 1. This section was made to hold a set of steak knives and is an optional feature. You can include it or not, depending on your collection of knives. Piece 4 (which is glued together to make the final roughly triangular “chunk” that forms the base) is made from three pieces of 1 3/4"-thick lumber. To be safe, I used a small sled with fences attached on my table saw (see photo, center right) to secure them as I cut.

Once I had glued these three pieces together, I added a notch (see *Drawings*) to hold a scissors — of course, if you don’t have a scissors, don’t make the opening. It would look silly.

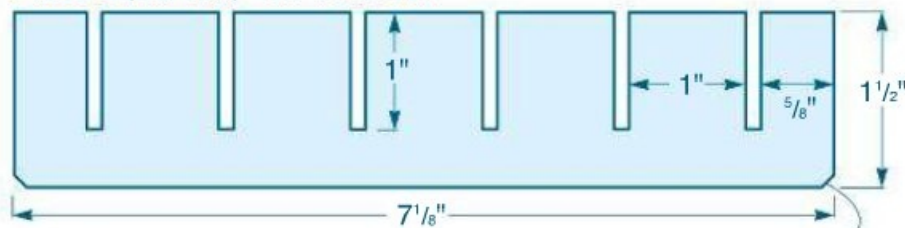
Piece 1 (End View) $3/4" \times 9 1/8" \times 9 3/4"$



Piece 2 (End View) $1 3/4" \times 9 1/8" \times 9 3/4"$

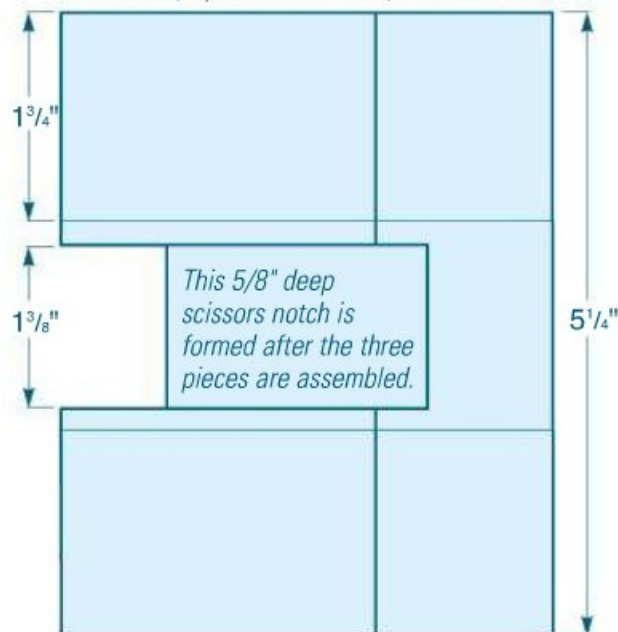


Piece 3 (End View) $1 1/2" \times 7 1/8" \times 6 3/4"$



The outer corners have a $3/16"$ wide, 45° chamfer.

Piece 4 (Top and Side Views) $5 1/4" \times 4 1/8" \times 4 1/8"$



Note: The knife slot dimensions and placements are suggestions only. Their size and location will depend on the knife set that you own.

Once the clamps are tight, pull the strips out. (Be careful; even when they're oiled, they might want to stay stuck!) Now, once again step to the table saw and cut the 45° angle onto the bottoms of the knife-holding pieces. The glued-up subassembly of pieces 1 and 2 will need to be cut in a two-step process on the table saw because a 10" table saw blade will not slice through the whole piece on a 45° cut. Cut halfway through it, then flip it to the opposite face to finish the cut. With the blade still set at 45° , cut the chamfers onto the edges of the knife-holding pieces as shown on the *Drawings*. Then, sand your parts smooth, but be careful not to burn the end grain as you are doing so.

With that done, glue piece 3 to the subassembly (pieces 1 and 2) with their mitered ends aligned. Be sure it's centered. Once the glue dries, do the same thing with piece 4. Scrape off any excess glue and then apply an oil finish. I used Watco® Natural — three coats and that is it — you've got yourself a knife block, and you didn't resort to buying it retail!

Rob Johnstone is the editor in chief of Woodworker's Journal and default president (they haven't held elections in 23 years) of the local procrastinators' club.



Here, the author is cutting the slots into piece 1. This piece can then be used to set up the rip fence spacing for the matching cuts in piece 2.



Make yourself a sled, like the one shown above, to safely cut pieces 4. A second cut is then made on each piece, as illustrated at left.



To help keep pieces 1 and 2 aligned during the glue-up process, use oiled $1/8"$ -thick pieces of plywood placed into the knife slots.

Now it's time to glue the knife-holding pieces together. Careful application of your glue is important; you don't want globs of it getting into your knife slots. Alignment is important as well. As you can see in the photo (bottom right), I used small slats of $1/8"$ -thick plywood, well oiled so glue would not stick to them, to help me keep pieces 1 and 2 properly aligned during the glue-up.

Today's Shop

Benchtop Router Tables Strike a Balance

By Chris Marshall

Yesterday's so-called "starter" router tables have evolved into serious contenders for profiling, joinery, panel raising and template work. It's time to rethink the role of these compact options.



**Bench Dog
ProTop
Contractor**

Must-have details on a benchtop router table

- ➔ Adjustable fence facings
- ➔ Convenient plate leveling
- ➔ T-tracks for featherboards, jigs
- ➔ Interchangeable insert rings
- ➔ Dust collection
- ➔ Full-size miter slot

Twenty-some years ago when I got much more serious about woodworking, "real" router tables in my mind were those that stood on the floor and looked like a stationary tool. Benchtop router tables, by comparison, seemed more like toys. While their price tags made them affordable for a new woodworker, and portability was certainly a plus, they tended to be lean on features and made of thin, rattly metal castings and plastic. Most didn't have insert plates to make router removal easy; their fences were crude, and some came with teeny miter gauges that fit into undersized slots. Who could trust the accuracy of a puny miter gauge? All in all, benchtops seemed like something you



Bosch RA1171



**MLCS
Portable**



An Editor's Six-Pack

While there are many more benchtop models on the market than you see here, our field editor Chris Marshall "cherry-picked" a half dozen top-shelf options equipped with some of the nicest features you'll find in this category. Prices for this grouping range from about \$140 to \$234, so there's a quality table to be found for most shop budgets.

bought to make do until you could afford one of their bigger, better brothers.

Well, I'm happy to report that our fervent love of routers and routing over the last two decades has nudged router table manufacturers to step up their game. And they've done just that. Today's premium benchtop router tables come with features you'll find on a floor-standing table, with the added advantage that they're *still* portable — perfect for the small shop, fit in a car's trunk and useable anywhere. But don't pigeonhole them to just the occasional hobbyist or jobsite user. Take a closer look at their features, and you

CONTROLS

might discover that a compact router table supports everything you want your router to do. It may be all the router table you require for your woodworking.

If you do a web search, there are a lot of benchtop router tables for sale — many more than shown here. Some models have come further than others in terms of feature improvements, so it would be an overstatement to say that all benchtops are equally good. They aren't. Let's see what makes a quality portable router table tick these days and what features you should keep in mind when choosing one for your shop.



Craftsman's Professional Router Table (model 61181) comes with an On/Off switch that powers two receptacles — one for the router and the other for a shop vac.

Convenient Controls

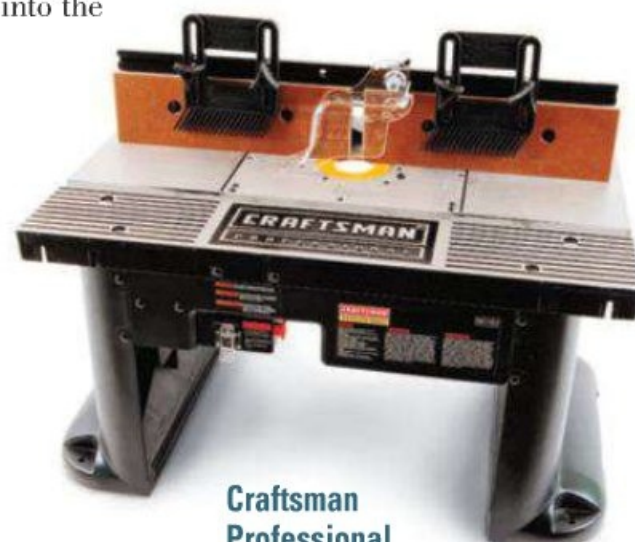
Many full-sized router tables come with an On/Off switch mounted within easy reach during use. That's convenient as well as a safety feature. Just plug the router into the



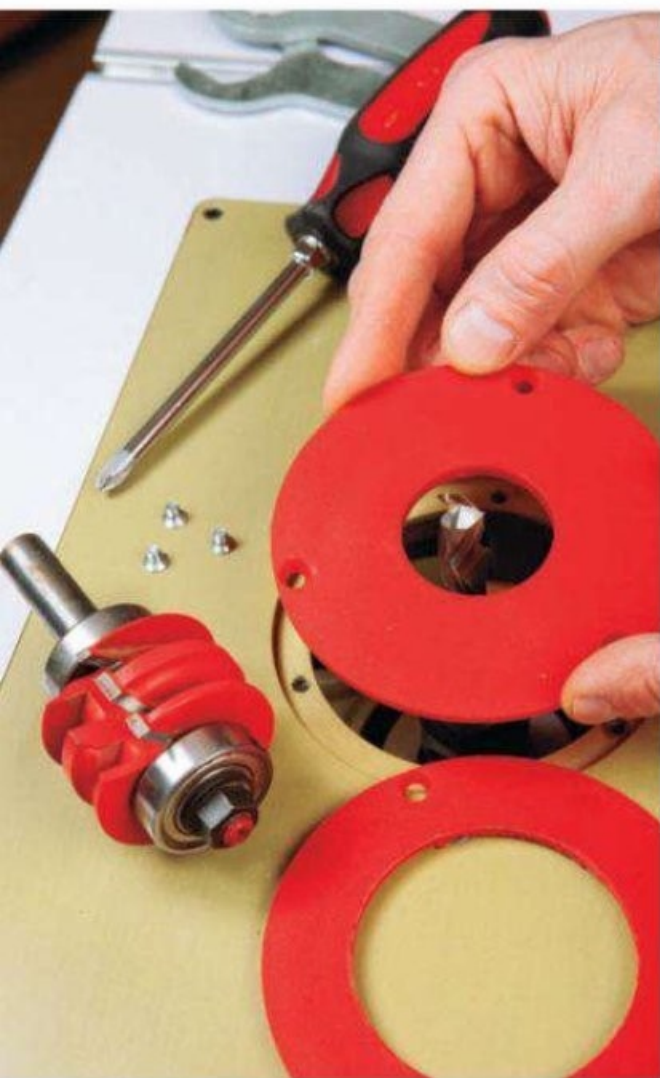
Freud RTP1000



Kreg
PRS2000



Craftsman
Professional
G1181



INSERT PLATES

switch, and you never need to grope under the table to power it up or down. Both the Bosch and Craftsman tables shown here come with a safety switch as well as a second receptacle for plugging in a shop vacuum for dust collection. Flipping the switch activates both the router and the vac. And, both of these control switch examples have a “remove to lock” key to prevent accidents from unauthorized users.

An On/Off switch isn't a make-or-break feature, but it's a sensible detail to have. I'd like to see more portable tables equipped with a switch.

No Anemic Insert Plates

An insert plate is the aluminum, phenolic or acrylic platform onto which you mount your router in the table. The plate fits into a shallow recess in the tabletop, making it easy to remove the router from the table by lifting the plate up and out. In some instances, you might even leave this plate attached to the router for handheld use to double as a bigger base.

Full-size router tables, almost without exception, have insert plates in their tables. So do all of the benchtop tables shown here. In fact, they use the same size insert plates as their larger cousins do.

Advantages to this crossover feature? I think there are several. Some insert plates on router tables are pre-drilled with one or even several fastener patterns to suit popular routers. You don't have to fuss around with laying out and boring clearance holes and countersinks for screws. The accurate layout work is already done for you; as long as your router fits, just screw it to the plate and you're ready to go to work.

My preference for insert plates is that they also have interchangeable rings with various sized holes to fit around the different bit diameters. These rings help support a workpiece as close

as possible to the cutter, which improves accuracy as well as safety. Some insert rings snap in and out, while others are held in place with a turn of a wrench or using tiny screws. I like the type that are secured without screws, because the tiny fasteners are easy to lose in a pile of shavings. That said, I would choose a plate with rings and screws over one without rings, hands down.

Another subtle feature to look for in an insert plate is a starter pin; it fits into a hole in the plate and acts like a fulcrum for initiating curved cuts when the fence is removed. Otherwise, a bit can grab and eject the workpiece violently, putting your hands at risk. Most of these tables have a starter pin — and any plate can be fitted with a bolt or dowel to serve the purpose.

An insert plate bears the weight of the router, so it has to be thick enough to remain flat. This new crop of benchtop tables have sturdy plates that range from 1/4" or thicker aluminum to 3/8" phenolic. They're suitable for any size router you own, up to a 3+hp machine. So, while these units are portable, you can use them for everything from light roundovers and profiling to joinery cuts and full-fledged panel raising. Their small size doesn't compromise a broad range of routing functions.

Table Manners

Floor-standing router tables do have a leg up on benchtops when it comes to tabletop



Quality insert plates have inter-changeable rings to accommodate various bit sizes (top) and starter pins for initiating cuts on curved workpieces (bottom right). Some plates are pre-drilled with mounting holes to suit one or many popular router models (bottom left).

Today's Shop continues on page 52 ...

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Kreg equips its table with Allen screws for insert plate leveling (above). Craftsman's aluminum table (below, left) is impervious to moisture, for routing indoors or out. Bosch (far right) provides featherboards that attach to the miter slot and fence's T-track. Bench Dog's 3/4" miter slot (bottom right) accepts a full-size miter gauge, with Allen screw adjusters that take up any side-to-side play.



size. A benchtop table averages about 16" x 24", whereas a standard sized stationary router table is about 8" larger in both dimensions. Still, when using a benchtop router table, I've really only wanted more real estate when working with wide panels or large workpieces that want to tip off the front edge. And oftentimes, that work can be done more easily with a handheld router on a workbench anyway. I don't see

the smaller table size as a major drawback, but it is a factor when routing larger panels or long boards.

The tables on the models shown here, with the exception of Craftsman's aluminum top, have an MDF core faced with laminate, top and bottom. Thicknesses average 1" to 1 1/4", so they are comparable to full-size tables. That heft provides the rigidity and flatness you need. Bench Dog's table is thinner, at about 9/16", but it's reinforced with metal braces underneath.

In terms of other table details, Kreg offers a dimpled worksurface on its

laminate to reduce contact surface and, in turn, extra friction. It's a unique feature I plan to try for a while, to see

TABLES

if the reduction in surface friction is noticeable. Craftsman's aluminum table could be a sensible choice if you need a router table to be weather-resistant as well as portable. The table won't swell like MDF if you happen to forget it in a truck bed on a rainy day.

I appreciate that all of the tables in this sample group have 3/4" miter slots, so you can use a full-size miter gauge in them. They'll also accept workholding devices like featherboards or other shop-made jigs. Whatever fits in a table saw miter slot will fit here, too. That's handy.

Another point to note in table design is how the insert plate can be made flush to the rest of the tabletop. Router tables typically have a system of screws that allow the plate to be incrementally adjusted up and down until it's even with the table. Sometimes these adjuster screws are accessible from above — as with the Freud, MLCS and Craftsman tables here. Other styles involve manipulating the screws from underneath — Bench Dog and Kreg use

this approach. Either method works fine, and you won't need to readjust the plate very often. Some tables have adjusters that are only accessible with the plate removed. Bosch is one example, and it's the least convenient leveling style.



Here's a departure unique to the benchtop category: the insert plates lock into their table recesses either with several more screws or, in the case of MLCS's table, rare-earth magnets. In a full-size router table, the plate just sits in its recess, but that's impractical for these compact tables that are designed to be "on the move."

Fence Finesse

A sturdy, flat fence that locks securely to the table is essential to any router table, and the fences provided on these benchtops are first-rate. They all have a pair of moveable facings that slide side to side so you can position them to suit a variety of bit diameters. The closer the fence facings are to the



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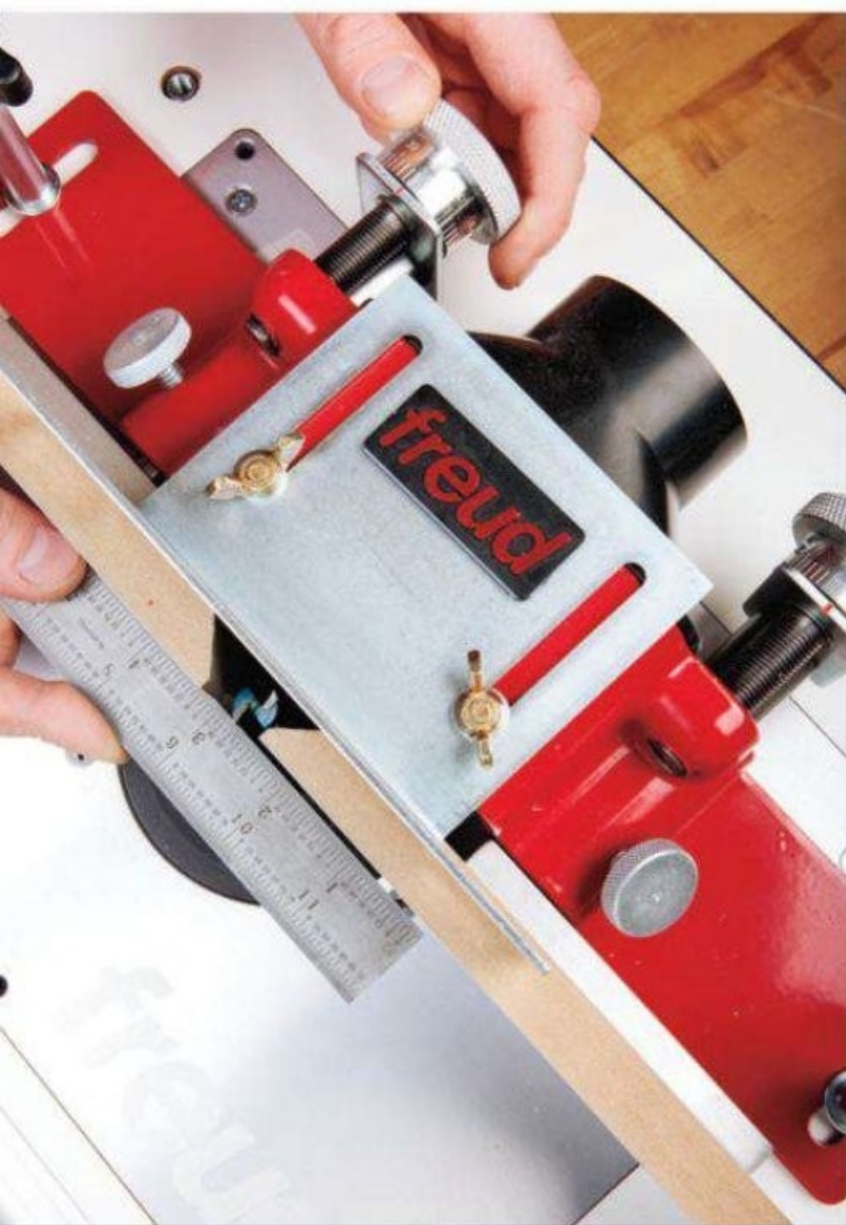
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FENCES



Freud adds precision to edge jointing operations, thanks to two micro-adjust controls on the fence's infeed and outfeed facings (left). MLCS's tall fence offers ample support for vertical panel-raising (right).

cutters, the safer the cut becomes, and dust collection improves as well.

You can also offset the outfeed facing on these fences with shims or other spacers to set it up for edge jointing. It's a useful feature if you don't own a jointer, and a few of these tables even come with the shims to do it. I really like Freud's fence, which has a pair of knurled micro-adjust knobs for fine-tuning the offset — no extra shimmiing is required.

Freud's would be an even better fence if it also had T-tracks like those provided on the other fences here. T-tracks make featherboards and bit guards easier to install. Featherboards and other workholding aids are a must for some routing situations,

such as slot cutting or when making sliding dovetails, where the bit is buried inside the workpiece and the wood must remain tight against the table and fence. Bosch and Craftsman provide a pair of featherboards with their tables, a very nice addition.

Fence height is one aspect of benchtop units that could still use some improvement, in my opinion. At about 3" to 4" high, I wish they were even taller. MLCS is headed in the right direction with the fence supplied on its Portable model. The facings are 6" tall — nearly double the height of the competition — and that will be very useful when standing panels on edge or end for panel raising. A heavy shaping operation like panel raising may seem unfeasible

for a small router table. But if you use a vertical-style panel-raising bit, the job can be done accurately and safely even with a mid-sized router. A really tall fence provides better vertical support for the panel to help keep the cuts consistent. Install a doubled-up featherboard in the miter slot (like the one sold by Rockler shown in the right photo, this page), and you've got a compact system for shaping door panels. Then switch to rail and stile bits to make the door frames, too.

One other word of advice about router table fences: buy one with dust collection. A 2½" vacuum port is pretty standard nowadays on most router table fences, and all six of these tables have it. If you already do a lot of table routing, you'll probably agree that "at the source" dust collection in the fence is remarkably efficient. It's the best way to clear the debris when you're routing with the fence in place.

Base Options

You have several options to choose from in benchtop router table bases. Some models, like the Bench Dog and Bosch units shown here, have fully enclosed cabinets. If you're woodworking in a basement shop or early on a Saturday morning, everyone within earshot will appreciate the noise of a screaming router. Put a router inside one of these plywood or MDF bases, and the decibels definitely decrease. A "cabinet" type base helps contain dust

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BASES

and debris, and the added mass is beneficial for dampening router vibration during use.

Enclosed bases make for a heavier table, however. If you need to move your router table around the shop a lot or transport it to where you're working, a metal legset may make more sense. It will shed some pounds. Rubber feet are a plus to keep the table stationary, or clamp the legs to a bench. For the ultimate in compact storage, Freud's RTP1000 router table has a metal base that folds up like a TV tray. With the insert plate removed, you could literally hang this one on the shop wall when it's collapsed flat.



Enclosed bases (top) provide dust collection as well as sound and vibration dampening, but a metal leg base (right) sheds pounds and improves portability.



Ready for "Real" Work

I hope you'll find this short overview a great starting point for your own homework about benchtop router table options. Here's a tool category that is reinventing itself to satisfy our serious routing tasks. I'm

pleased to see the changes. Today's premium models are still compact and portable, but now they're more capable than ever.

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



Pocket-sized Table Routing

Last summer, Rockler (rockler.com) launched this miniature router table that's designed to fit a trim router. It features a 11½" x 15½" vinyl-wrapped MDF table and a locking fence with bit guard. A round acrylic insert plate comes pre-drilled to suit the screw patterns of many popular trim routers. The table also has a pair of mounting holes for attaching a clamping strip, so it can be secured to a workbench, sawhorse or countertop. Here's a low-cost way to maximize the utility of your pint-sized trimmer.



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With two new products, the *Through-the-Wall Dust Right™ Port Kit* (item 42401) and the *3-Way Dust Collection Junction* (42289), **Rockler Woodworking and Hardware** has made it possible for woodworkers to arrange dust collection for multiple tools, in multiple rooms. “Keeping the dust collector in another room or a sound-insulated room,” said Rockler vice president of product development Steve Krohmer, “lowers shop noise and frees up floor space.” The *Through-the-Wall Dust Right Port Kit*, priced at \$14.99, consists of stepped fittings for Rockler’s Dust Right Handle or a standard 4" hose, as well as 4" x 12" pipe that can be trimmed to size to go through any wall. The *Three-Way Dust Collection Junction* allows you to split the main line to your dust collector into a total of three branch lines, for multiple tools. All ends of the *Three-Way Dust Collection Junction* (priced at \$16.99) have a 4" outer diameter and a 3¾" inner diameter.

Woodworkers these days are apt to have multiple batteries — in multiple voltages. The *M18™ & M12™ Multi-Voltage Charger* (item 48-59-1812) from **Milwaukee Electric Tool Corp.** will charge the Lithium-Ion batteries for both the company’s 12-volt and 18-volt lines, in the same charger. It’s a sequential charger, with slots for both sizes of batteries. Put a



Rockler’s 3-Way Junction (above) and Through-the-Wall Dust Right Port Kit (below)



12-volt in first, and it will charge that battery to full capacity, then immediately switch to charging the 18-volt; put the 18-volt in first, and the order will be reversed. Charge time for compact batteries is 30 minutes; for extended-capacity batteries, it’s 60 minutes. The *Multi-Voltage Charger* is priced at \$59.

extension cord starts.

The couplers — there are two, in case you’d like to add a second user — are the easy-to-use universal push-to-connect type. The noise rating is 83 dBA, and the suggested retail price is about \$260.

EMGLO® Compressors’ new *Heavy-Duty Four-Gallon Stacked Tank Contractor Air Compressor (E810-4V)* has a 1.1hp motor that produces 4 standard cubic feet per minute at 90 pounds per square inch. It weighs in at 56 pounds and sports an angled handle for easy maneuvering, while soft-start valves make quick work of cold weather or



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The tools in the *18-volt Lithium-Ion Cordless Combo Kit* (item 325928) from **Kobalt® Tools** are compatible with both Kobalt 18-volt Lithium-Ion and NiCad batteries. One of each type of battery, with an onboard fuel gauge, is included in the kit, along with a wall-mountable charger that will charge either type. Tools included in the kit are a drill/driver with variable speed ranges at 0-450 rpm and 0-1,600 rpm; a reciprocating saw with 0-3,000 strokes per minute and a stroke length of 1½"; a circular saw with 2½" cutting capacity at 90° and 1¼" at 45°; and an LED worklight with 180° pivot and 240° rotation. The tools, batteries, charger, bit and blade fit into a tool bag included with the kit, at a suggested price of \$269 (sold through Lowe's®).

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Rust-Oleum Ultimate Polyurethane

The latest invention from **RTS Engineering** is the *Domino Self-Centering Guide*, which lets you change positions on your Festool Domino without tools or measuring. The Self-Centering Guide is infinitely adjustable from ¾" apart to 5¼" apart, with a steel coupling cable that



RTS Engineering's Domino Self-Centering Guide

keeps both stops always centered around the Domino mortise location. Micro-ball plungers with stainless-steel balls control the detent positions for the stop arm's up and down positions. The stops are movable using a dovetail arrangement but, when clamped in position, they're rigidly drawn tight to the guide and firmly locked. The Domino Self-Centering Guide, available from Rockler, is made of aviation-grade aluminum and is priced at \$129.

If you're searching for a spot in your shop to stuff your supplies, the new **Stanley 3-in-1 Rolling Workshop** may be right up your alley. Each of the three storage containers in this system — a traditional toolbox with removable organizer, a large rolling bin, and an organizer — works as a stand-alone piece. You can also easily attach them together for convenient storage and portability. Pricing for the system is about \$38.

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Stanley 3-in-1 Rolling Workshop



Carter Products MAGFENCE II



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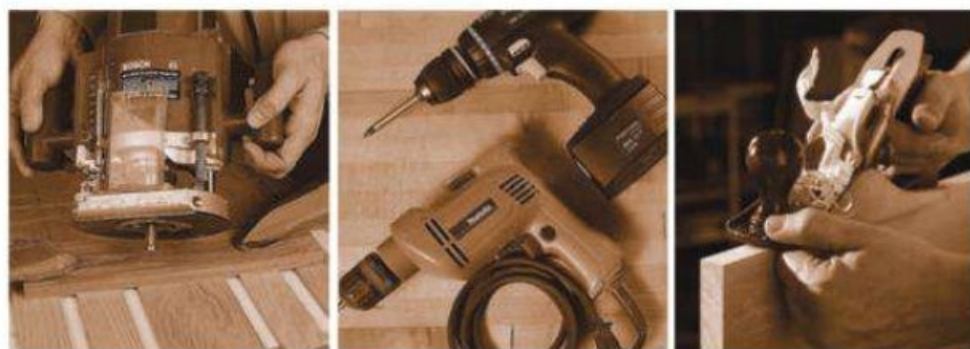
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Tool Review

Testing 1/4-sheet Palm Sanders

By Sandor Nagyszalanczy

These little “jitterbugs” have been around for a long time, and with good reason: they are handy and ultra-practical for sanding furniture projects.



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

They may not be as sexy and feature-packed as other power tools, but 1/4-sheet palm sanders are essential when it comes to smoothing wood projects in preparation for and during finishing. Also known as “finish” or “orbital” sanders (not to be confused with random-orbit sanders), palm sanders have a square pad

that accepts a quarter sheet of regular sandpaper. They are small, easy and safe to use, and best of all, most models are very affordable.

I recently set about testing a dozen different palm sanders built by 11 different

manufacturers: Bosch, DeWALT, Festool, Hitachi, Makita, Milwaukee, PORTER-CABLE, RIDGID, Ryobi, Sears (Craftsman) and Skil.

Although several models appear to be close cousins, all the sanders have features and performance characteristics that distinguish them.

Here are some of the things I looked for in each model and factors that I considered during my two weeks of testing:

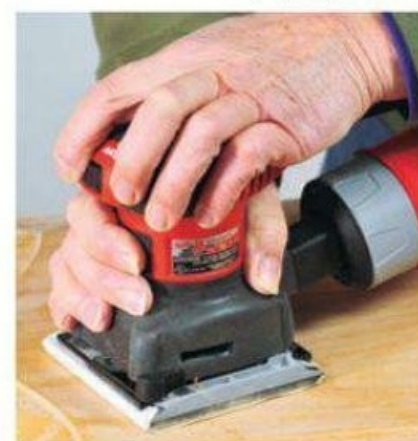
Power and Sanding Performance

With most power tools, bigger motors are usually better. But is a big motor really necessary in a palm sander that is designed to work best when you apply only light pressure to the tool during sanding? Smooth operation is also a key concern in an orbital palm sander, as too much vibration can lead to hand discomfort and even numbness.

Ease of Paper Change

All of these palm sanders except the Festool have clamps designed to take a quarter-sheet of regular sandpaper. This is an economical alternative that lets you use any kind of paper you like (garnet, aluminum oxide,

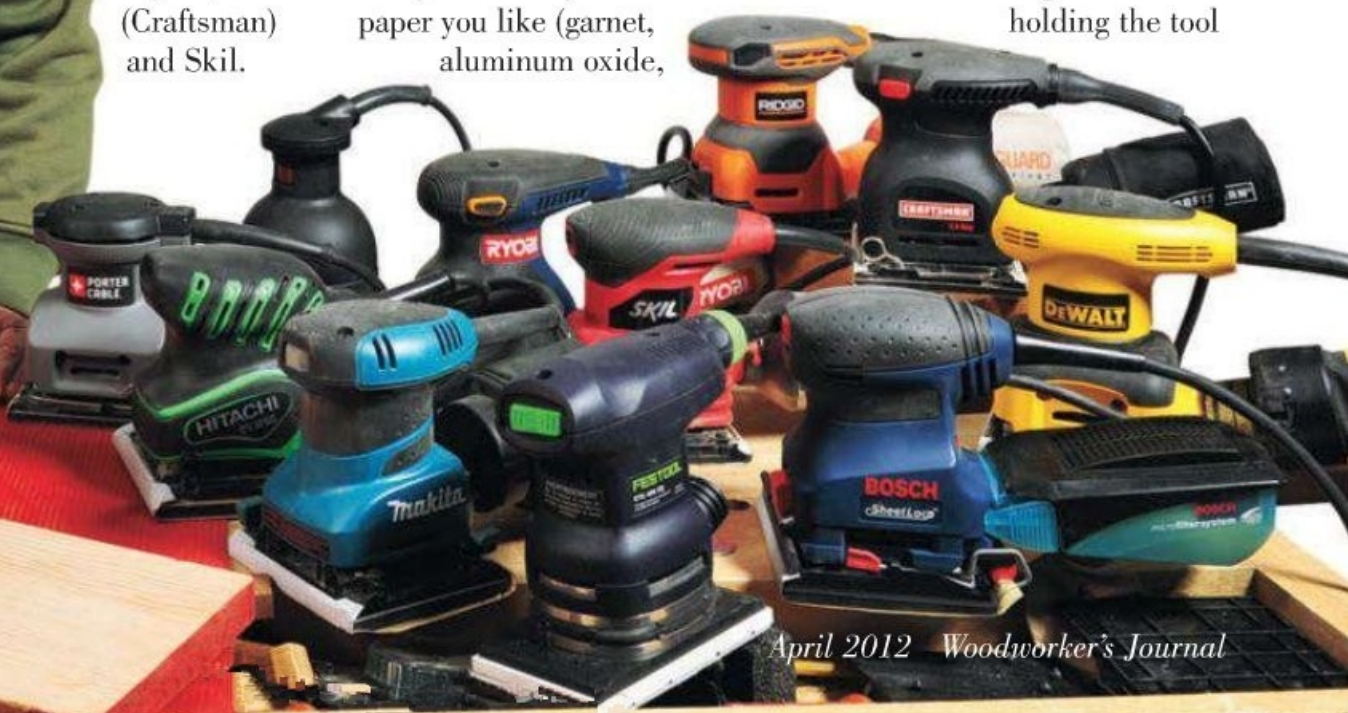
etc.) in lieu of special pre-cut sanding sheets (also available for most models). The wire levers on most models allow tool-less paper changes, but some mechanisms are easier to use than others. (The foam rubber sanding pads on most sanders also accept sticky-backed PSA sandpaper.)



Quarter-sheet sanders can be gripped from the top or by the barrel. This helps to avoid fatigue.

Ergonomics

The majority of palm sanders employ a twin-grip style body that lets the user hold the tool either by its top or around the waist. This lets you change your grip, either to suit the sanding situation or to avert the hand fatigue due to holding the tool



Bosch 1297DK

Street Price: \$48

Motor Amps: 2

Dust Bag: Canister with pleated filter

Hose Connection: 19mm or 1¼" hose adapters

Accessories: Fabric tool bag, vacuum hose adapters, paper punch plate

Weight: 2 lbs. 15.7 oz.



in the same manner for long periods. Rubber overmolds found on most of the sanders make gripping them more comfortable and ease vibration as well.



Dust collection is an important feature for any sander — even these smaller machines.

Dust Collection

Small as they are, palm sanders produce their share of fine dust. Happily, most new models come with built-in dust collection: A fan pulls dust through holes in the sandpaper that you make using a punch plate that comes with the sander. The fan then blows the dust into a fabric bag, disposable paper sack or a canister with a pleated filter. For more efficient dust collection, the majority of sanders have ports that allow you to connect the sander to a shop vacuum hose.

Bosch 1297DK

The 2-amp Bosch's motor creates a vigorous sanding action, despite the fact that it orbits its pad 12,000 orbits per minute (opm), rather than the 14,000 opm that nearly all other models run. The sanding action transmits only mild amounts of vibration to the user's palm, so it's quite comfortable to use. I liked the

1297DK's body shape and grip, which fit my medium-sized hand very well.

The Bosch sander's best feature is its "SheetLock" paper clamping system. Pressing a large red button at the front of the tool easily opens its front clamp. With one end of paper secured, a bent wire lever opens the rear clamp, which is a round rubber-covered bar. Pushing the wire lever back into place pulls the paper tight as the bar presses it against a rubbery seat that helps hold the paper firmly. This mechanism is terrific, and it makes paper changes nearly effortless.

For dust collection, the 1297DK has a large rear-mounted canister with a pleated paper filter that's part of Bosch's microfilter system. The filtration worked well, but the canister takes up quite a bit of room behind the sander. An adapter is included for connecting the Bosch to a vacuum hose.

DeWALT D26441K

With its 2.4-amp motor, the DeWALT packs plenty of finish-sanding punch in its

yellow-and-black body. It sanded aggressively, although when sanding large panels with coarse-grit papers, it was a little hard to control. Along with the PORTER-CABLE 342K and RIDGID R2501, the D26441K features user-replaceable brushes — a feature that any heavy-duty user will appreciate.

The DeWALT's body has an ample rubber overmold, but only the very top of the grip has a rubber insert. The sander's small rocker On/Off switch is covered by a rubber dust shield which keeps fine dust from fouling the switch. But the cover made the switch feel less positive and harder to manipulate. The DeWALT's wire paper clamp levers were easy to operate and held the sandpaper securely.

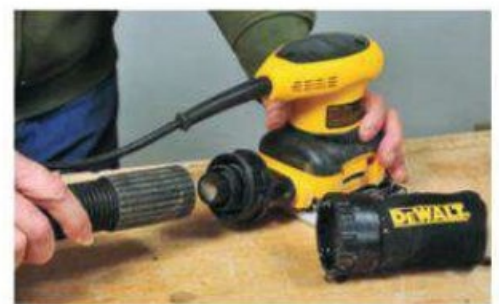
For dust collection, the DeWALT has a small cylindrical fabric bag that's supported by an internal spring. Remove the bag and you'll find connection flanges for two different diameter vacuum hoses — a handy feature.



The paper clamping system that Bosch uses is the best of the bunch — terrific, according to our author.

¼-sheet Sanders

produced a surprising amount of sawdust as discovered when we were testing our downdraft sanding cart, found on page 40.
— WJ Staff



The DeWALT D26441K has two different diameter hose connectors — a very practical feature.

DeWALT D26441K

Street Price: \$49

Motor Amps: 2.4

Dust Bag: Fabric bag

Hose Connection: 1" or 1¼"

Accessories: Fabric tool bag, paper punch plate

Weight: 3 lbs. 2.2 oz.



Tool Review continued



Festool RTS 400 EQ

Street Price: \$215
Motor Amps: 1.67
Dust Bag: Disposable paper bag
Hose Connection: 27mm
Accessories: Pad for PSA paper, plastic Systainer case
Weight: 2 lbs. 11.7 oz.



Festool's sander is the only unit in this test to feature a speed control.

Festool RTS 400 EQ

By far the most expensive sander in this test group — more than 10 times the cost of the low-cost Craftsman 11177 — Festool's RTS 400 EQ technically is not a 1/4-sheet sander: It accepts only the company's 5 1/4" x 3 3/8" rectangular hook-and-loop sandpaper. The Festool sheets are relatively expensive, but paper changes are a breeze — you don't have to fool with paper clamps, and the sheets come with dust holes already punched. I found that the slightly narrower and longer shape of the RTS 400 EQ's platen is very practical when you're sanding smaller parts and shaped parts, like moldings.

Despite its low 1.67 motor amperage rating, the Festool sanded with decent aggressiveness, no doubt aided by the pad's 5/64" orbit diameter (all the others, save the PORTER-CABLE 330, have 1/16" orbits). The tool produced extremely little vibration, so it was super

comfortable to use for long periods of time. The RTS 400 EQ is the only palm sander that features variable-speed control, with a dial that lets you set the speed anywhere between 6,000 and 13,000 orbits per minute. This could be useful if you needed to reduce sanding aggressiveness when sanding a finish or a delicate surface like a marquetry-covered panel.

The Festool's dust collection setup employs a disposable paper dust bag held in a plastic carrier that attaches firmly to the tool's dust port, which also accepts Festool's standard shop vacuum hose.

Hitachi SV12SG

Hitachi SV12SG has a very distinctive look with a low-profile body that's extensively covered in a heavy rubber overmold. Although this provides a very soft, grippy surface, I found the bulbous top a little cumbersome to hold. In use, the SV12SG puts out a moderate amount of vibration, with a sanding performance that was only average.

A pair of heavy bent-wire paper clamps firmly hold a quarter-sheet of sandpaper to the SV12SG's platen. However, the tool's foam rubber pad is relatively thick, so a regular quarter sandpaper sheet is barely long enough to work with the clamps. Interestingly, the Hitachi can be fitted with either a square sanding pad that takes hook-and-loop paper or a 5" round

pad, both available as optional accessories.

A polyester fabric dust collector bag mounts on the back of the Hitachi sander via a narrow oval-shaped flange. The bag has a full zipper on the back, which makes it easy to empty. But the mounting flange doesn't allow a vacuum hose connection, and there's no adapter available.

Makita BO4556

Compact and not too heavy, Makita's BO4556 palm sander has a twin-grip-style body, with ample rubber overmolds that I found comfortable to hold in either position. The Makita's 2-amp motor comes to life somewhat slowly, but at full speed transmits only light vibration to the user. It's a very smooth running sander that's pleasurable to use for extended periods. Something else I liked: Makita has managed to protect the tool's small rocker-style On/Off switch with a plastic dust cover, while keeping its operation crisp and positive.

Attaching a sanding sheet is a pretty easy job on the BO4556. The thick wire clamps provide positive registration of the end of the sandpaper sheet, so it's easy to secure. The Makita's platen features a nice 1/4"-thick neoprene sanding pad; most of the other sanders have thinner pads. I like a thick pad for finish-sanding smaller parts and details, such as moldings and shaped edges; the heavy foam allows the



The author found the Hitachi's body shape, although stylish, to be a bit ergonomically wanting.

Hitachi SV12SG

Street Price: \$45
Motor Amps: 1.7
Dust Bag: Fabric bag
Hose Connection: None
Accessories: Paper punch plate
Weight: 2 lbs. 6.7 oz.





Makita B04556

Street Price: \$49
Motor Amps: 2
Dust Bag: Fabric bag
Hose Connection: 3/4"
Accessories: Paper punch plate
Weight: 2 lbs. 12.7 oz.

sandpaper to bend and conform more easily to a curved surface.

The fabric dust bag that comes with the B04556 has a decent capacity, and its port fits Makita's smallish 3/4" shop vacuum hose. You can also fit an optional filter assembly that uses disposable paper bags.

Milwaukee 6020-21

The most powerful and second-heaviest palm sander in the review, the Milwaukee 6020-21 runs on a beefy 3-amp motor. Flip on the Milwaukee's crisply-operating switch and it snaps to life with the kind of start-up torque you'd expect from a small router. But its impressively powerful sanding action does transmit a good deal of vibration to the user's hand.

Milwaukee 6020-21

Street Price: \$50
Motor Amps: 3
Dust Bag: Fabric bag
Hose Connection: 1" or 1 1/4"
Accessories: Plastic case, paper punch plate
Weight: 3 lbs. 1 oz.

Also, this powerful sander seemed to want to spin, and it took a fair amount of effort to restrain it, even when doing light sanding on a flat surface.

The 6020-21 has a pair of fold-out levers to release the strong springs that secure the paper clamps themselves. The problem is that there isn't enough space to operate the lever at the back of the sander — the dust bag assembly gets in the way. This makes paper changes a tedious affair.

The 6020-21 has a cylindrical fabric dust bag that, just like several other sanders, has a spring inside to keep the bag extended. This is nice, because the spring allows the bag to deflect if you encounter a vertical obstruction, say the bulkhead inside a kitchen cabinet.

PORTER-CABLE 330 SPEED-BLOC

The PORTER-CABLE 330 SPEED-BLOC palm sander's distinct black bell-shaped body identifies it as a veteran tool found in countless cabinet and production shops.



Smooth, low-vibration operation, sufficient power and a nice group of features won this tool our Best Bet.

PORTER-CABLE 330 SPEED-BLOC

Street Price: \$88
Motor Amps: 1.2
Dust Bag: None
Hose Connection: None
Accessories: Tool for paper clamp
Weight: 3 lbs. 11.3 oz.

Although its motor is rated at only half the amperage of its sister model, the 342K, the model 330 still sands with enough gusto to make it a speedy performer for most sanding tasks. (For really heavy sanding jobs, I recommend switching to a random-orbit sander.) The body lacks a rubberized coating, but it still provides a comfortable grip and excellent control of the sander. It also limits the transfer of vibration to your hand.

The 330's paper clamps are heavier and grip paper tighter than on any other palm sander. The sander's stubby clamp levers are stiff and hard to use, so it's best to employ the included metal tool (or a screwdriver) to operate them.

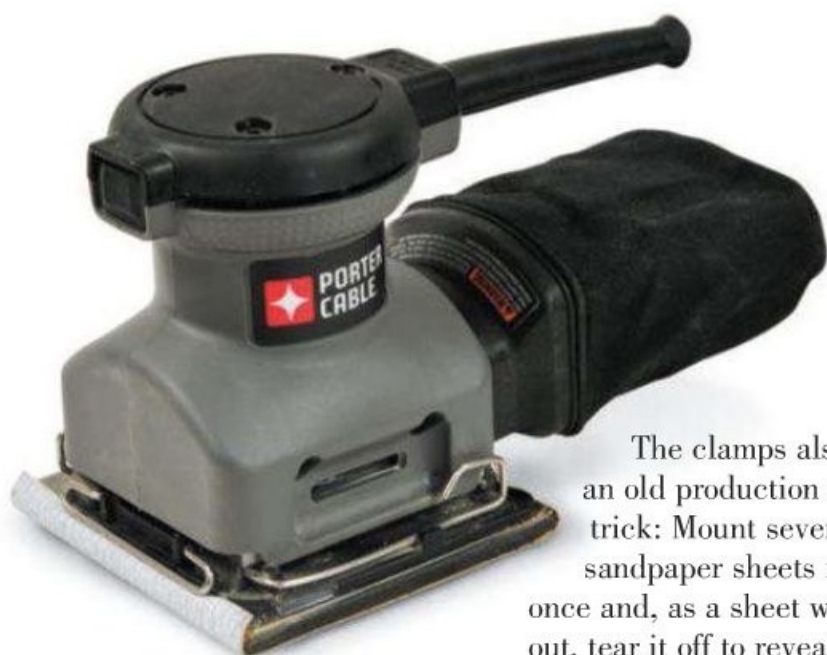


The old-school PORTER-CABLE 330 is found in countless workshops around the country.



The Milwaukee holds sandpaper solidly, but the dust bag interferes with operation of the rear clamp.

Tool Review continued



The **PORTER-CABLE 342K** is the company's most powerful sander rated at 2.4 amps.

The clamps also allow an old production sanding trick: Mount several sandpaper sheets in at once and, as a sheet wears out, tear it off to reveal the fresh sheet under it. Could be handy to try.

Since the **SPEED-BLOC** lacks any form of built-in dust collection, you need to work atop a downdraft sanding table and/or while wearing a dust mask to protect your lungs whenever you use it. On the up side, there's no need to punch holes in the sandpaper each time you change sheets.

PORTER-CABLE 342K

Street Price: \$51

Motor Amps: 2.4

Dust Bag: Fabric bag

Hose Connection: None

Accessories: Paper punch plate

Weight: 2 lbs. 8.5 oz.

PORTER-CABLE 342K

PORTER-CABLE's 342K is their most powerful model, with a 2.4-amp motor rating that matches the DeWALT and RIDGID sanders. The **PORTER-CABLE's** performance equaled its rivals, yet it ran a bit smoother and with less vibration. I didn't think the 342K's disc-shaped top grip was as comfortable as the teardrop-shaped grips found on other models. But it did provide excellent control of the tool, especially when sanding edges and narrow or small parts.

The 342K's thin foam rubber-covered platen and bent-wire lever paper clamps are very similar to DeWALT's. The clamps are strong and easy to use, but the dust bag assembly hangs so low in back that it's hard to see what you're doing when clamping the back edge of a sheet. I liked the sander's dust hole pattern, which is symmetrical both ways, so you don't have to orient the sander in a particular direction when using the punch plate — a small, but nice touch.

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RIDGID R2501

Street Price: \$50

Motor Amps: 2.4

Dust Bag: Fabric bag

Hose Connection: 1 1/4" or 2 1/4"

Accessories: Fabric tool bag, paper punch plate

Weight: 3 lbs. 1.5 oz.

The 342K does come with an ample-sized fabric dust bag, but it's mounted to a D-shaped port that has no adapter for connection to a vacuum hose.

RIDGID R2501

The orange and gray RIDGID R2501 sports a twin-grip-style body with soft-feeling rubber overmolds in all the right places. I really liked this sander's lower body grip, which offers a very comfortable holding position. The RIDGID's motor switches on with some authority, but it also sends a fair amount of vibration into the user's hand.

Keeping it under control while sanding a flat surface was, at times, a challenge that ultimately tired my hands during long sanding sessions. It took time to get used to the tool's back-and-forth sliding On/Off switch; once in a while I turned it off accidentally when I changed my grip on the tool.

The RIDGID's clamping system is remarkably similar to the Bosch's, but its front clamp employs a lever that must be lifted to open, so it isn't as easy to use. The paper punch that comes with the sander makes fairly small



RIDGID's paper punch creates many small holes, allowing for very good dust collection.

holes, but there are lots of them, so the RIDGID does a pretty good job of collecting dust. The rest of its dust system is similar to DeWALT's, with a spring-loaded fabric bag and a port that offers the connection for two different-sized vacuum hoses.

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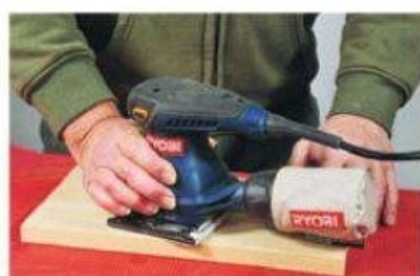
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Tool Review continued



The Ryobi's teardrop-shaped grip features a light to show that the tool is plugged in.

Ryobi S652DK

The Ryobi palm sander has a teardrop-shaped rubberized top grip that features a slide-through On/Off switch of the style that's found on the RIDGID. The top grip is pleasant enough to hold, but I found the S652DK's large body a bit too bulky to grip comfortably. There's also an indicator light on top of the S652DK to warn you that the tool is plugged in.

Powered up, the Ryobi put in a middle-of-the-pack sanding performance. Unfortunately, any motor power that wasn't transferred to the sanding pad seemed to end up in my hands. The S652DK vibrated so much that my palms felt sore even

Ryobi S652DK

Street Price: \$30

Motor Amps: 2

Dust Bag: Fabric bag

Hose Connection: 1¼"

Accessories: Fabric tool bag, paper punch plate

Weight: 3 lbs. 1.7 oz.

after only 10 minutes of use. I donned a pair of bike gloves with gel-filled palms in order to continue my testing while protecting my hands.

The Ryobi's platen and paper clamps are much like those found on other palm sanders, but its levers have rubberized plastic end caps that make them comfortable to use. The clamps operate smoothly and grip the paper effectively.

Sears Craftsman 11177

With a street price of just under \$20, the Sears Craftsman model 11177 is the least expensive palm sander in this article, and it's also the lightest. The Craftsman has a 2-amp motor that delivered sanding performance on par with the Ryobi. Its top grip is covered with soft rubber

which felt good on my bare palm. I also really liked its slide-through-style On/Off switch, which was easy to actuate, yet had enough tension to prevent accidental operation.

The 11177's sanding platen wasn't the best, with a thin aluminum plate covered with a thin, hard foam rubber pad. Its wire paper clamp levers worked well and have looped ends, which were easier on my fingers than the tightly bent ends on the Hitachi palm sander. However, it was a bit hard to tell how far to insert the sandpaper under one clamp so that there would be enough slack left to clamp the sheet at the other end.

The Craftsman's dust collection setup is much like the Ryobi's, with a dust bag mounted on a round plastic

Palm Sander Specifications

Make/Model	Street Price	Motor Amps	Dust Bag	Vacuum Hose Connection	Included Accessories	Weight
Bosch 1297DK	\$48	2	Canister with pleated filter	19mm or 1¼ in. hose with adapters	Fabric tool bag, vacuum hose adapters, paper punch plate	2 lbs. 15.7 oz.
DeWALT D26441K	\$49	2.4	Fabric bag	1 in. or 1¼ in. hose	Fabric tool bag, paper punch plate	3 lbs. 2.2 oz.
Festool RTS 400 EQ	\$215	1.67	Disposable paper bag	27mm hose	Pad for PSA paper, plastic Systainer case	2 lbs. 11.7 oz.
Hitachi SV12SG	\$45	1.7	Fabric bag	None	Paper punch plate	2 lbs. 6.7 oz.
Makita B04556	\$49	2	Fabric bag*	3/4 in. hose	Paper punch plate	2 lbs. 12.7 oz.
Milwaukee 6020-21	\$50	3	Fabric bag	1 in. or 1¼ in. hose	Plastic case, paper punch plate	3 lbs. 1 oz.
PORTER-CABLE 330 SPEED-BLOC®	\$88	1.2	None	None	Tool for paper clamp	3 lbs. 11.3 oz.
PORTER-CABLE 342K	\$51	2.4	Fabric bag	None	Paper punch plate	2 lbs. 8.5 oz.
RIDGID R2501	\$50	2.4	Fabric bag	1¼ in. or 2¼ in. hose	Fabric tool bag, paper punch plate	3 lbs. 1.5 oz.
Ryobi S652DK	\$30	2	Fabric bag	1¼ in. hose	Fabric tool bag, paper punch plate	3 lbs. 1.7 oz.
Sears Craftsman 11177	\$20	2	Fabric bag	1¼ in. hose	Paper punch plate	2 lbs. 3.3 oz.
Skil 7292	\$30	2	Canister with pleated filter	1¼ in. hose	Paper punch plate	2 lbs. 7.5 oz.

*An optional paper filter dust assembly is available

Sears Craftsman 11177

Street Price: \$20
Motor Amps: 2
Dust Bag: Fabric bag
Hose Connection: 1/4"
Accessories: Paper punch plate
Weight: 2 lbs. 3.3 oz.



port that also accepts a vacuum hose. The 11177's smallish fabric bag lacks a zipper, but is very easy to empty via its large mounting flange.

Skil 7292

Skil's palm sander has a very generous feature set, considering its low street price. A most unique feature is its "Pressure Control Technology": A series of LEDs that light up in response to how hard the sander is pressed down during operation. One or two green LEDs show that the correct amount of light sanding pressure is used, while yellow and red LEDs indicate excessive pressure. Some might consider this feature a gimmick, but I think some less experienced users will appreciate the feedback that the lights offer.

Overall, the Skil 7292 felt good in my hands, and I was impressed with its overall running smoothness. It didn't sand as aggressively as some models with higher amperage motors, but it didn't feel underpowered either.

The Skil's sandpaper clamps worked well, and it was easy to register the ends of the sandpaper when mounting a new sheet. My only complaint was that the wire clamp levers were somewhat difficult to release from their locked positions.

The 7292's dust collection setup features a clear plastic canister fitted with a small pleated-paper filter. The sander collected dust fairly effectively, and the clear plastic made it easy to see when it was time to empty the canister.

Picking the Winners

While motor power, easy paper changes and good dust collection are all important aspects of palm sander performance, ultimately, I just HATE having my hands go numb during long sanding sessions. Therefore, I winnowed down the field by first picking the smoothest running sanders: the Bosch, Festool, Makita, Skil and both PORTER-CABLE models. To further narrow the field, I eliminated the otherwise terrific Festool for simply

being too expensive and the PORTER-CABLE 330 for lacking dust collection. When I compared the final four sanders, it was much tougher to pick a clear winner. I really loved the Bosch's amazingly easy paper change mechanism, and I thought the Skil offered a lot of sander for only three sawbucks. But I ultimately gave the Makita my vote as the "Best Bet." This tool feels solid and comfortable, it's powerful enough to use for any finish sanding task, and best of all, it operates so smoothly that you can run it all day without ending up with tingly fingers.

Sandor Nagyszalanczy is a furniture designer/craftsman, writer/photographer and contributing editor to Woodworker's Journal. His books are available at Amazon.com.



The least expensive sander in the bunch, the Craftsman, had a very nice sliding On/Off switch.

Skil 7292

Street Price: \$30
Motor Amps: 2
Dust Bag: Canister with pleated filter
Vac Hose Connection: 1/4" hose
Accessories: Paper punch plate
Weight: 2 lbs. 7.5 oz.

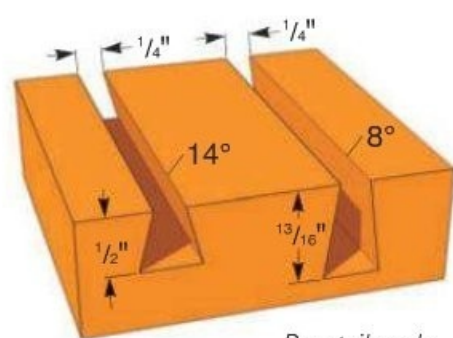


LED lights indicate the proper amount of pressure to apply as you use the Skil sander, a nice touch.

Router Joinery Basics: Sliding Dovetails

By Bill Hylton

Forming sliding dovetail joints is a task that hits the sweet spot of the handheld router. It's a joint every woodworker should learn.



Dovetail angle comparison

Bit Angles Really Matter

A 1/2" diameter, 14° bit (left groove) can cut only 1/2" deep because, at that point, the cutting head has tapered to a 1/4" diameter, its shank size. At the same spot on a 1/2" diameter, 8° bit, the width of the opening is about 11/32". If you wanted to narrow the opening to 1/4", you would have a 13/16"-deep dovetail.

MORE ON THE WEB

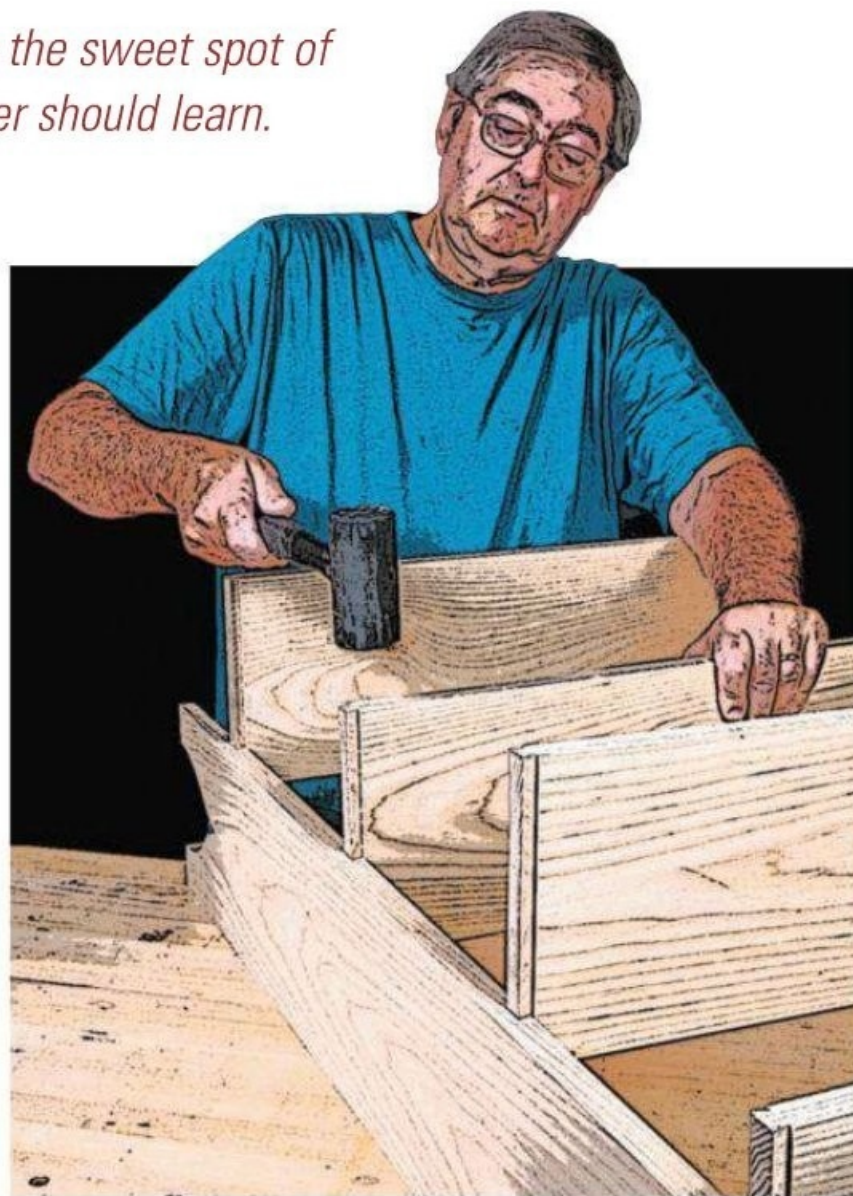
For further discussion of sliding dovetails, plus a video on the subject, visit woodworkersjournal.com and click on the "More on the Web" tab shown above. Or send a large SASE to Woodworker's Journal, Skill Builder 26, 4365 Willow Drive, Medina, MN 55340.

It's likely you've at least seen a drawing of the joint. It's a hybrid of the dado and the dovetail, with a groove in one part, a tongue on the other. Because both the groove walls and the tongue sides are angled like a dovetail, the joint has to be assembled by sliding the tongue into the groove: hence the "sliding dovetail."

Those canted walls give the joint a decided strength advantage over a dado. The joint mechanically resists tension, meaning that the tailboard can't pull away from the grooved board. Even without glue, the parts stay linked together. The wood must crush or break before the two parts separate.

This characteristic of the joint simplifies assembly routines. You won't have pieces fall apart while you're fumbling with clamps, so two hands usually are sufficient for assembling even multi-part casework, like a chest of drawers.

The joint has another singular advantage: If left unglued, it allows the parts to move without coming apart. A breadboard end is a great example. There, you apply a narrow strip of wood across the end of a glued-up panel to conceal its end grain and to keep it flat. The unglued joint allows the tabletop to expand and shrink across its width, even though the end strip isn't moving. Other applications abound:



Sturdy and practical, sliding dovetail joints are labor-intensive if made by hand, but use a router and they become relatively fast and easy.

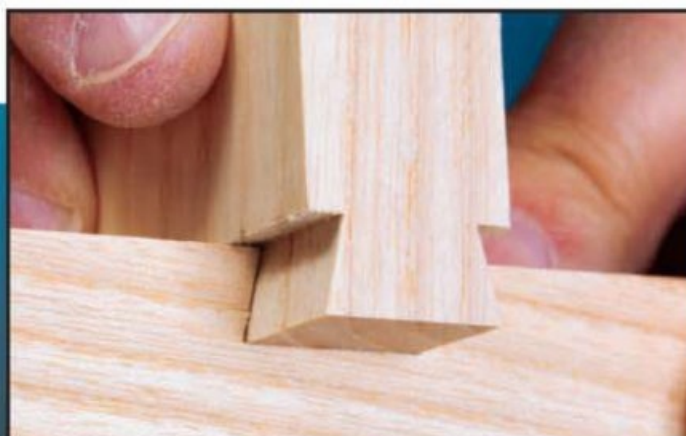
- Join shelves to bookcase sides.
- Build drawers, joining the sides to the front — and even the back — to the sides.
- Join aprons to table legs and rails to stiles in frame-and-panel pieces.
- Mount moldings and case tops with dovetail keys or butterfly keys, holding them tight to the structure but allowing the wood to move.
- Mount battens to tabletops, lids and doors to prevent them from bowing.
- Make drawer runners and guides.
- Construct extension-table slides.

Laborious to cut by hand, sliding dovetails are easy to produce with a router (or two). Each sliding dovetail joint requires two operations: first, cut the groove, second, cut the tail.

Both operations are done with the router, using the same bit for both cuts.

Grooves can be done with the router handheld or table-mounted. The location of the cut and the size of the cut itself usually will dictate which approach is optimum.

The tails, likewise, can be cut either way. The portable router generally requires jiggling to steady it on the narrow edge being worked.



A proper fit (photo above, right) is an essential component of a sliding dovetail joint. Be deliberate in setting up your cut. A short "fitting sample" (left) is a great way to check the length of your cut for accuracy.

As a consequence, most woodworkers cut the tails on the router table. There, you need nothing beyond all-purpose accessories like a push block and a featherboard or two.

Fitting the two pieces is a trial-and-error process. You want the fit tight, but not so tight that friction stalls the tail as it slides into the slot. On the other hand, you don't want the fit to be too sloppy,

however easy that makes the joint to assemble.

The usual fitting technique is to plow the groove, then creep up on a tail dimension that fits that slot using scrap material. If the actual groove is more than 3" long, you make a short "fitting" sample of it. You can slide this across the full-length tail to determine whether you have wide spots that will make assembly of the joint difficult.

Similarly, you should make a short "fitting" sample (photo, above left) of the tail, which you slide through the groove.

To get the groove as right as possible, try making two passes through it, making a special effort to keep the work against the fence on both passes. If you do get a bump on the first pass, you may trim off the high spot on the second. The same is true of the tail.



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Finishing Thoughts

Mahogany Two-Step

By Michael Dresdner

Ribbon mahogany provides a dramatic figure — but what if you could enhance its grain, making it even more exciting?

This beautiful table, built by Dave Munkittrick, appears in this issue on page 34.

CONTACT US

with your “Finishing Thoughts” by writing to Woodworker’s Journal, 4365 Willow Drive, Medina, MN 55340, or by emailing us at:

finishing@woodworkersjournal.com.

Please include your contact information with your thoughts or questions.

The Stickley table above and on page 34 is made of ribbon mahogany, a wood that grows in spiral bands of alternate direction grain. Cut through them, especially on the quarter, and you get ribbons of end grain emerging diagonally through the surface interspersed with bands of flat grain. When you look into the end grain bands, they look darker. Look from the opposite angle and the dark and light bands change places.

These bands will show up under any clear finish, but mahogany, and especially African mahogany, often has a wan, pinkish cast. Unfortunately, stain can diminish or muddy the contrasting bands by making

them both the same color, but there is a way to get both the color you want and prominent ribbons.

Accentuate the Positive

It’s common knowledge that dye, which consists of infinitesimal particles, will pop the figure in tight-grained wood, like curly maple, but it does just the opposite on large grain wood. It colors both pores and flats uniformly. Pigment, made up of much larger color particles, will collect in the pores, but since it also colors flats to some degree, it may not bring out the grain sufficiently.

However, if you color the background wood lighter and brighter with dye, then use pigment to make only the pores darker, you’ll end up with a lovely brown mahogany color with very prominent contrasting ribbons. The key is to separate the dye and pigment with a coat of sealer. That keeps the pigment exclusively in the pores, thus adding more contrast.

Process

Sand with 80, 120, 180 and 220 grits, then flood the wood with a dilute amber water-based dye. A small amount of Homestead Finishing Company’s Honey

Amber Transtint in water provides just the right color. Wipe it off completely and let it dry overnight. That will eliminate the pinkish cast that’s especially common to African mahogany.

Seal the dyed wood by spraying one thin coat of dewaxed shellac. Spray from an aerosol can of shellac, or use Zinsser® Bulls Eye® SealCoat™ in your spray gun, thinned 25% with denatured alcohol. When you apply the pigment, this sealer coat will restrict it mostly to the pores, keeping background wood light.

Do not sand the sealer. When it is dry, apply a dark cordovan-colored pigmented stain, either oil- or water-based, and wipe it off evenly. I used Black Cherry color Rust-Oleum® Ultimate water-based stain to finish the wood samples at left, but any pigment-based stain will work. Whichever you use, the sealer will keep the background light, but still let pigment collect in, and accentuate, the pores.

When the stain is dry, apply any clear finish of your choice, and admire your work from two different angles. That’s the best way to see the flashing ribbons of color you just helped bring out.

Shellac only



Dilute dye, shellac and stain



Ribbon mahogany with a simple clear finish is beautiful, but it can appear pink and lack depth (above left). Our author recommends a treatment of amber dye and thinned shellac, followed by a pigment stain (above right).

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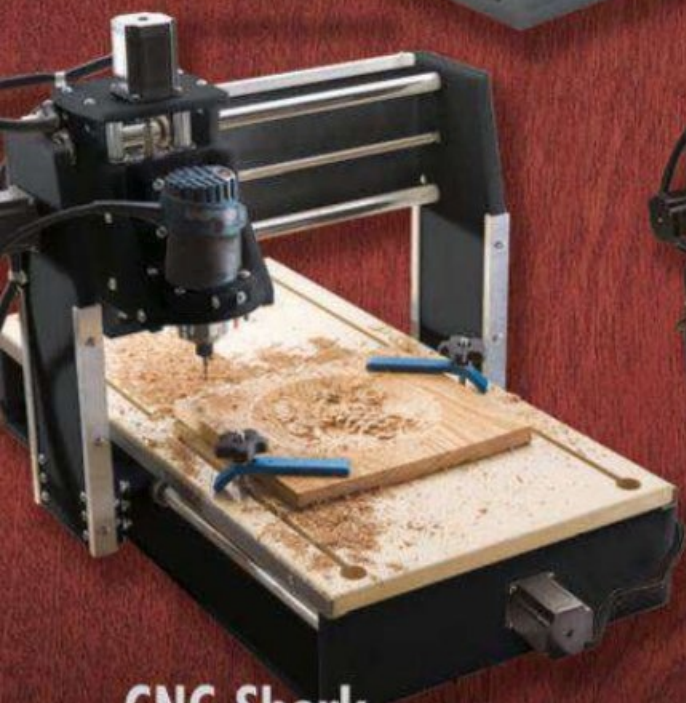
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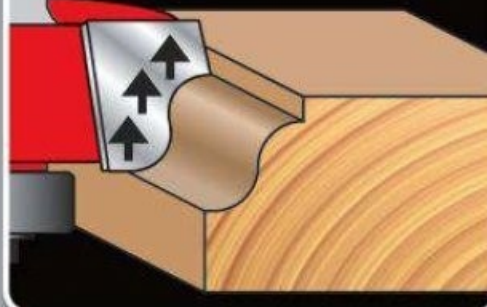


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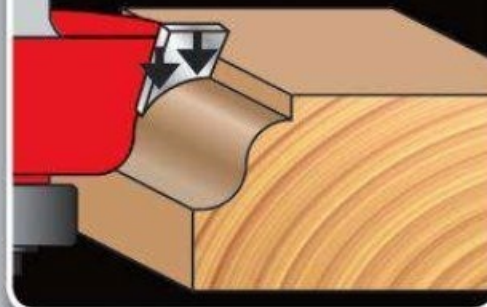


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