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TOOL TEST!
(See page 52)

Kitchen Island

Pre-made parts make it super easy to build!

(page 28)

4 Hot new tools for perfect joinery
(page 48)

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(page 34)



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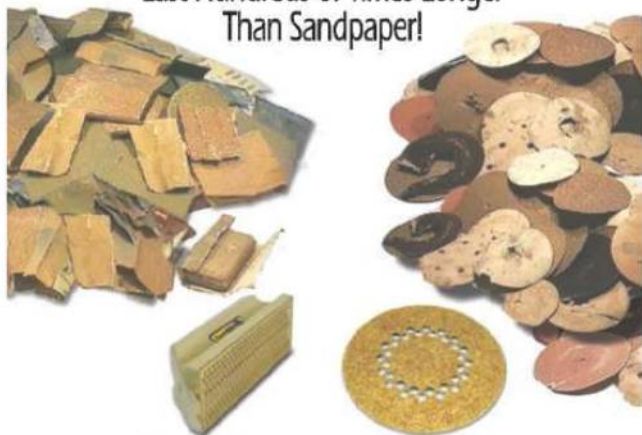
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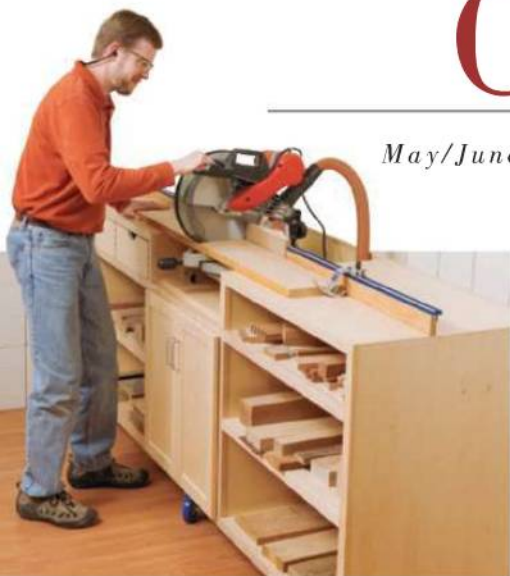
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Create a low-cost, lightweight enjoyable addition for your yard.

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How Do You Create Endless Cabinet Door Making Possibilities?



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Letters

Discerning or Dismissive?

AN OPEN EXCHANGE OF IDEAS . . .

I love getting readers' letters. When one of our readers takes the time to write and offer their feedback regarding our magazine, my staff and I always take the time to read it. Sometimes those letters find their way into print in the magazine. Each issue, we try to select and print the best and most representative offerings of the communications we receive. Those of you who have been reading this department for a while know we are more than willing to print letters that are critical of our efforts (even letters that take yours truly to task). And we're also happy to print responses to the letters that we published — as is the case with several in this issue's offerings. So read and enjoy, and perhaps you'll be moved to write!

—Rob Johnstone



Table Saw Review

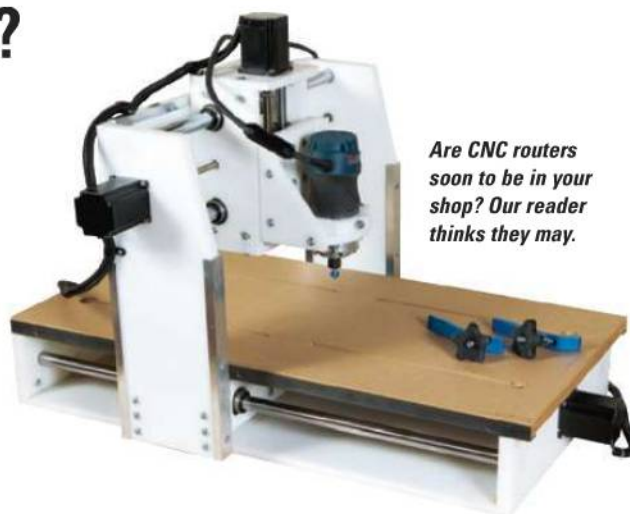
I have read your review of table saws ["Cabinet Saw (R)Evolution," *February 2010*] and am not sure why you spent the time doing the article. It should be expected that a saw costing over three thousand dollars would surpass a saw costing one third of that.

How can you compare a Jaguar to a VW? Of course the Jag will be best, but who will sell the most to the average person? So, what matters if you judge the Jag best?

David Bartle
Scottsburg, Indiana



Was the table saw review in our February issue useful information or a foregone conclusion?



Are CNC routers soon to be in your shop? Our reader thinks they may.

I have just read your tool review in the February issue. I am confused as to the purpose of these strange-looking saws.

The question I have is: why is the table extended so far to the right of the saw? Unless you're crosscutting plywood, I see no need for it. Ripping plywood would only take a table four feet wide. I have seen routers mounted in the right wing table, which would give an extra use for it [but] it seems a lot to pay for this extra feature.

Along with jointers, the large table saw is one of the tools that is a mystery to me and may not be needed in the small shop.

Kenneth Hersman
Custer, Washington



I am glad that someone measured for comparison the amount of sawdust left in the saw cabinets. However, nothing was mentioned about the amount of sawdust thrown out of the cabinet. I was disappointed that you requested the models from the participating companies. The models you received might not be representative of what we might buy. I am sure that most companies fine-tuned the saws before you received them. A truer test is to buy the models from the marketplace without them knowing who you are.

Paul Johnson
Flemingsburg, Kentucky



Ch- Ch- Changes

You asked [*February 2010* Editor's Note] if we feel things are changing and where do you think we are headed.

Being roughly twice your age, I have been fortunate to see lots of changes in

Letters continues on page 8 ...

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and out will come a side board with all the cuts and dovetails done, face boards all routed and drilled, etc. Granted, the CNC machine might be able to do a better job, more consistent and faster, but where's the fun in that? But I guess I shouldn't say anything — I cut my

dovetails with a jig and router instead of by hand!

David L. Allen
Gowanda, New York

Woodworking Snobs?

I disagree with your editor's decision to print the letters disparaging many beginner woodworkers, another magazine and IKEA [Letters, *February 2010*]. One of them said that he completely understood the magazine's need to appeal to a variety of skill levels, then went on to say that you should leave the dimension furniture projects to the sorry DIY publications! It seems that many are not so much interested in woodworking as in being better than others.

Dave Mathis
Greeley, Colorado

Letters continues on page 10 ...



woodworking methods and tools and feel absolutely certain there will be many changes for the better in the days and years ahead. Many commonplace tools we now use didn't exist a few years back such as the plunge router, biscuit cutter, digital calipers, random-orbit sanders, doweling joiners, variable-speed drills, grinders, lathes, and the list goes on and on.

I expect to see more laser cutting tools, chemical smoothing to reduce sanding, vibrating planes, the demise of fractions with the shift to metric, diamond-dust-tipped saw blades with much smaller teeth, fewer adhesives with much broader range.

As more and more persons get into woodworking, we will see others as dedicated to excellence as Sam Maloof and new methods of joinery, such as Scott Morrison's glorified lap joint [both, *Shop Talk*, *February 2010*]. The best is yet to come.

Roger Tumbleson
Lake Havasu, Arizona

I agree that change is the only constant. The biggest change I think is soon coming is the use of CNC machines to do practically everything except assembly and finish of a project. Take a drawer, for example. You will stick in a board of the proper thickness

MAY/JUNE 2010

Volume 34, Number 3

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Woodworker's Journal (ISSN: 0199-1892), is published in February, April, June, August, October and December by Rockler Press Inc., 4365 Willow Dr., Medina, MN 55340. Periodical postage paid at Medina, Minnesota and additional mailing offices. Postmaster: Send all address changes to *Woodworker's Journal*, P.O. Box 8572 Red Oak, IA 51591-1572. Subscription Rates: One-year, \$19.95 (U.S.); \$25.95 U.S. funds (Canada and other countries). Single copy price, \$5.99. Reproduction without permission prohibited. Publications Mail Agreement Number 0861065. Canadian Publication Agreement #40009401.

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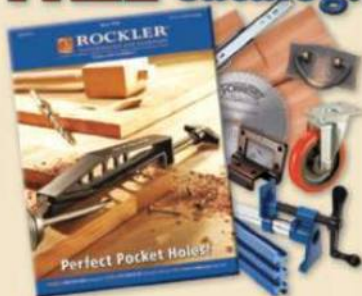


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In your magazine of February 2010, there [was a] letter penned by Bill Horn. He alluded to the Queen Anne Highboy [December 2009] as a worthy project. I, too, would be happy to be capable of creating such a fine piece of furniture. However, age and glaucoma, although under control, will make that another wish.

Bill also, along with William Pearman, III, was not fond of the October 2009 project, i.e., the red box bed. As for the worthiness of the red box, I recall the old adage about beauty is in the eye of the beholder. How many woodworkers can identify with the work of Krenov [or] Maloof to name two greats? How many people who watch football games really know the ins and outs of the game, but still watch?

It would be interesting to know how many woodworkers decide to construct the red box.

C. J. Conley Jr.
Massillon, Ohio

In the February issue, William “Dub” Pearman expressed displeasure at the inclusion of the project on the cover of the October [2009] issue. I would have to “Dub” Mr. Pearman a woodworking snob. This arrogant, elitist attitude is really harmful to the growth of woodworking as

a hobby. He states that he completely understands the magazine’s need to appeal to a wide variety of skill levels, yet his snobbish, arrogant and insulting remarks clearly show that his business knowledge is reciprocal to his professed woodworking skill. As in most hobbies, the number of beginners and novices involved exceeds the number of experts by at least 5 to 1. A single project designed for the rank beginner is not below the caliber of this magazine, but shows that you are trying to help beginners and novices gain the experience and skills to attempt more advanced projects. I applaud the magazine for including everyone interested in woodworking and providing projects for all skill levels.

Don Lewis
Hendersonville, Tennessee

Staining Plywood

I just finished reading “Staining Hardwood Plywood” in the February 2010 issue. The theory that Rob Johnstone advances as to why plywood and solid wood produce different staining results appears plausible, but I suspect the big difference in staining results is much more complicated than how the veneer is sliced off the log with a sharp knife.

The little bit that I know about the making of veneer, it is much more complicated than spinning the log and planing off a thin layer of wood. Wood in its natural state just does not plane off very easily in a continuous ribbon. It shears and splinters, and does all kinds of uncontrollable things. And so the wood first needs to be softened up by cooking the

log in a chemical bath. While the log is still steaming, then it is mounted in a huge spinning lathe.

Thus, because other foreign agents are already cooked into the wood fibers, veneers just don’t absorb the stain and varnish in the same way that solid wood does.

Bradley Schultz
Cornucopia, Wisconsin

I was reading the article on the difference in shade from plywood to hardwood. My solution is simple. You don’t have to spend hours in the store matching grains, etc.



Readers advance their opinions as to how to stain plywood.

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Dave Arnett
Camillus, New York

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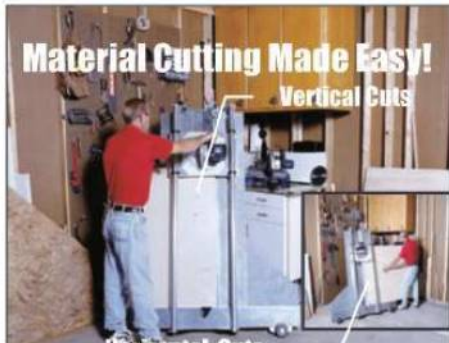
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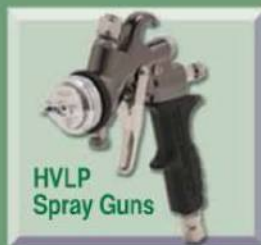
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Questions & Answers

Woodworking; Plane and Safe

THIS ISSUE'S EXPERTS

Betty Scarpino is a woodturner whose pieces are in the Smithsonian. She also serves as the editor of the American Association of Woodturners' *American Woodturner*.

Ian Kirby is a master woodworker and the star of the DVD *Using a Hand Plane with Ian Kirby*.

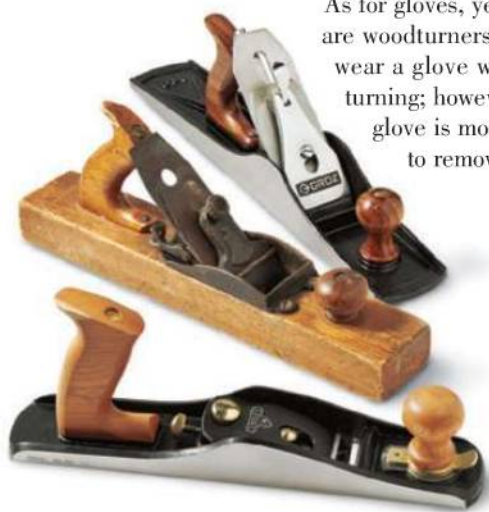
Michael Dresdner is a nationally known finishing expert and the author of *The New Wood Finishing Book*.

Q I am new to the art and pleasures of woodturning and recently wondered about the safety of using leather gloves while working on a lathe. This thought came to me after my bowl gouge got a catch on a walnut blank. The blank shattered and a rather large splinter sliced right through the underside of my hand. Afterwards, as I wondered about what I could have done differently to protect myself, I realized that I've never seen anyone marketing gloves for this purpose or seen anyone who uses gloves while turning on a lathe. Is it a safe practice to use leather gloves while roughing out or turning a blank, or am I being too much of a wuss?

Rose Gehring
Beech Grove, Indiana

A Your concern is well-founded. Hazards abound when combining a swiftly moving piece of wood with a turning tool and your hands so close to the action. Before I start, however, I'm wondering if you wear a faceshield when you are turning? Safety goggles are not sufficient when turning wood. I always wear a faceshield!

As for gloves, yes, there are woodturners who wear a glove while turning; however, the glove is modified to remove the



Is it safe to wear gloves when you are using a lathe? The answer is yes, as long as they are the right kind of glove and fit properly.

fingers, covering just the palm and knuckles. These gloves look like golf gloves, and in fact, if you golf, try one of your old gloves. Whatever glove you wear, make sure it fits snugly on your hand.

Any item of loose clothing can become tangled in a spinning piece of wood, so make sure that what you wear is not in jeopardy of contacting the wood. There are specialty smocks for woodturners. Not only are they safe, they are designed to keep sawdust from your clothing. Additional turning information can be found at www.woodturner.org.

— Betty Scarpino

Q I have several planes but really never know which one is the right one to use. I see that the No. 3 has a steeper slope than my bench plane. When do you use, say, a No. 3 vs. a No. 5? And, when sharpening, what angle should be used?

Tim Simms
Plymouth, Michigan

A The range of your question — “right one to use,” “steeper slope,” “sharpening what angle” — could just as well be expressed as, “Tell me all I need to know in order to sharpen and use a hand plane.” Don't translate this comment as being flip or unkind. Quite the opposite: because of your interest in hand planes, I urge you to read, research and practice sharpening and using them. Arguably, they are the most versatile and useful tools in your pursuit of working wood.

As a neophyte, the how's and why's of the tool are not intuitive, but the answer to most of your questions can be found in books, articles or CDs. The most important thing is to use the tool and, if you don't get the outcome that you know is possible, then focus on solving that piece of the skill.

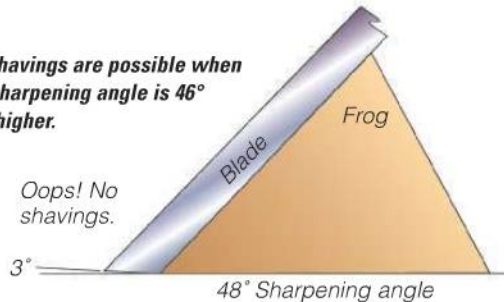
As to the specifics of your letter, “Which is the right one to use”: Assuming we are dealing with ordinary bench

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the angle, the longer it will stay sharp in harder woods. In practice, sharpen at 40 degrees and don't vary this angle until you are sufficiently adept at sharpening to do so.

—Ian Kirby

Q Is there a length of time that is too long between sanding your project and then spraying? As a weekend woodworker, I end up sanding

Continues on page 14 ...



Winner!

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Stumpers

Splitting the Difference



*A tisket, a tasket:
the mystery tool
relates to barrels
and baskets.*

What was it for, the mystery tool from the February 2010 issue with the three-part split end? As you might have

guessed, it was for splitting

something into three parts.

"The tool is a willow splitter," said **Robert Weber** of Alden, New York. "It divides willows into three sections."

Of course, the tool that belongs to the great-grandfather of Knoxville, Tennessee **Oliver Cook's** wife wasn't necessarily limited to splitting willows — and why would you want to, anyway?

According to **Andrey Mudragel** of Levittown, New York, "three-way splitting of willow branches (or any other suitable roots or tree branches)" is "for basket weaving."

But what — what's Oliver Cook's tool made out of? Metal, right? **Russell F. Ellis, Jr.**, of Springfield, Massachusetts, puts a different spin on the tool's identity, although he does say, "A basket maker used a similar tool called a cleaver. It's smaller and made of wood."



Our February mystery tool's end was designed to create splits in wooden baskets and barrels.

So what does Russell say is the answer to our mystery? His response: "The tool is a cooper's splitter. It is used to split white oak saplings for making wooden barrel hoops. The splitter is usually made of solid iron."

Derek Wills of the United Kingdom also rolled out the barrel making idea, saying the "gadget looks like a tool used in coopering."

Cleaving the wood rather than sawing it retains the strength of the medullary rays and adds that strength to a barrel's staves. And, since there's some speculation that barrel making grew out of basket making, it's possible that strength gets imparted to the basket parts, too. We'll agree to split the difference for this tool — which is not, by the way, a butter churn. (Sorry, **Paul Petersen** of Kent, Washington.)

—Joanna Werch Takes

Winner! Andrey Mudragel of Levittown, New York, wins a **Porter-Cable 15 Amp Circular Saw (Model PC15TCSMK)**. We toss all the Stumpers letters into a hat to select a winner.

Questions & Answers continued

my project and cleaning up the shed on one weekend, to minimize the dust, and spraying on the following weekend. Is a week too long?

Ivan Banks
Western Australia

A No, a week is not too long, but less time is better. In addition to cleaning and roughing, sanding leaves exposed hydroxyl groups on the wood's surface. They help bond with both finish and glue, but when exposed to air, oxidation closes these groups off.

There are a few problem woods, like rosewood, which exude resins after sanding. I doubt a week would be a dealbreaker even with them when it comes to finish adhesion. But I make a point of lightly sanding such woods immediately before gluing and, because glue and finish adhere in the same ways, before finishing as well.

One more consideration. Airborne dust will settle on the piece in a week: it should be removed. One alternative you might consider is to do your major sanding, clean up the shop, and then the next week, do a very light hand sanding with 320 paper. It will raise little dust, and you can quickly remove both it and any settled airborne dust with a lightly dampened cloth. For me, that would represent the best of both worlds.

— Michael Dresdner

Contact us by writing to "Q&A," Woodworker's Journal, 4365 Willow Drive, Medina, MN 55340, by faxing us at (763) 478-8396 or by emailing us at: QandA@woodworkersjournal.com. Please include your home address, phone number and email address (if you have one) with your question.

What's This?



This issue's mystery tool sits on a bench belonging to Fred Steffens of Eau Claire, Wisconsin.

Know what it is?

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Tricks of the Trade

Common Products Solve Shop Problems



Drill Press “Safety Dog” Jig Eliminates the Spins

When a drill press catches on a workpiece and spins it, it's an injury waiting to happen. That's why I designed this plywood jig. A pattern of stopped holes in the jig allows me to position two metal “safety” dogs in various configurations so I can sandwich my workpieces between them. I used 1/2"-diameter bolts with the threaded ends cut off to create the dogs.

The jig has a long leg (at the left end in the photo) that braces against the drill press column during use. A large dowel in front gives me a convenient handle to position the jig and workpiece for precise drilling. Provided the leg of the jig is firmly positioned against the column, I've found that no further clamping is required.

Dick Ayers
Barron, Wisconsin

Safety First

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

Drier Belts, Better Seams

I don't have a climate-controlled shop. Over the years I've discovered that, during humid months, the moisture in the air sometimes loosens the glue seams on my belt-sander belts, causing them to break and come off during sanding. Here's my easy fix: I now store my belts in resealable freezer bags. It keeps the glue seams dry and tight so they last much longer.

Danny Hopper
Greenbrier, Arkansas



Half-Gallon Jug Makes Handy Thinner Skimmer

After cleaning a brush with thinner, you'll notice that the heavier solids eventually settle to the bottom and leave the clear thinner at the top. Here's a trick that will allow you to put that solvent to good use again and create a handy brush cleaner while you're at it. Cut off about the top third and spout of a half-gallon milk jug, leaving most of the

handle intact. Fill it partway with thinner and soak your brush as usual. Then go ahead and set the jug aside and wait several hours. When the thinner separates, use the jug like a funnel to pour the solvent off into a storage container, leaving the solids behind.

Norman C. Fox
East Stroudsburg, Pennsylvania



Bar Clamp Becomes Quick Jobsite Caliper

During a recent fireplace mantel rebuild, I needed to take an accurate inside measurement of an assembled frame in order to replace a raised panel. The existing panel, and the rounded-over edges of its opening, made it difficult to take the reading with my tape measure. Instead, I grabbed a bar clamp and used the flares on the bottom

of the jaws to serve as a quick-and-dirty caliper. I spread the jaws open until the outer edges of the flares contacted the panel opening. Then I carefully removed the clamp and measured the flares for an accurate reading of the opening. It was just the tool I needed!

Ted Goodlander
Tega Cay, South Carolina

Keep Water in the Loop

Usually the water filter in my air compressor line has sufficient capacity to keep the air dry, but when I'm spraying a really large project, it fills up rapidly. In these situations, here's an easy modification that reduces the frequency of draining the filter—it's actually an old auto-body shop trick I've adopted for woodworking. I install an extra 25-ft. air hose between the compressor tank and filter, coiling it flat on the floor. This intermediate hose cools the air from the compressor and collects some of the condensation before it reaches the filter. It's important that this hose remains flat on the floor to prevent any large slug of water from carrying over.

Father Chrysanthos
Etna, California



Winner!

In addition to our standard payment (below) **Norman C. Fox** of East Stroudsburg, Pennsylvania, will also receive a Stanley-Bostitch CPACK300 Combo Kit for being selected as the "Pick of the Tricks" winner. We pay from \$100 to \$200 for all tricks used. To join in the fun, send us your original, unpublished trick. Please include a photo or drawing if necessary. Submit your Tricks to Woodworker's Journal, Dept. T/T, P.O. Box 261, Medina, MN 55340. Or send us an email: tricks@woodworkersjournal.com

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Participants of the Naked Table Project enjoy their maple — from visiting the saplings in the forest from which their lumber came to sitting down to a feast at their newly completed tables.

Setting the Kitchen Tables



Naked Table Weekend Project

50 Maple Tables and Going Strong

The kitchen table, says Sabrina Brown, represents a tradition of both nourishment and nurture. For Charlie Shackleton, a woodworker all his life and furniture seller for over 20 years, “I knew a table was the easiest thing to do, and the most wanted item.”

Both of those views come together in the Naked Table Project, a weekend table building experience run through ShackletonThomas, the family business that sells Charlie’s furniture and his wife Miranda Thomas’s pottery.

At a Naked Table project, people gather at the Shackleton Thomas workshop to make kitchen tables. So far, over 50 maple tables have been created — available in either rectangular or oval styles — by participants who prepare the finish, sand all the parts (cut previously on a CNC router), glue them together, apply the finish, and attach the

top — before concluding their weekend with a meal of locally harvested food served upon the tops of the tables they have just built.

The program is designed, Charlie said, to “attract not just people learning to be fine furniture makers. The skill levels required attract all sorts of people.” The program’s also designed to highlight the concept of sustainability — not surprising when it was developed partly as a result of Charlie’s attendance at a meeting of the Sustainable Woodstock [Vermont] organization.

Although he claims to have been half asleep when he thought of the idea, a conference exercise sparked the connection in his mind



From assembly to finish (using a dairy-based polyacrylic from Vermont Natural Coatings), Cecilia and Bill Hoyt create their kitchen table.

photos by Jan Gilbert Fox

between these tables and the notion of sustainability. “It’s a very interconnected story,” he said. The personalities of the tree farmer, forest ranger, chainsaw wielder, skidder, the trucker who takes the log to a sawmill, the kiln drier are all within 15 miles of his Vermont location and are all local, interesting people, he said. The Naked Table events incorporate meetings among the participants and these resource providers.

During the day of the workshop, participants like Sabrina actually visit the forest

Kitchen Table

“We laugh, we pray, discuss
the day and ‘round it goes.
Plans are made and bills are
paid and a candle glows
At our table, our kitchen table.
And Lord knows what each
passing season will send,
But we know we’ll meet here at
our table, our kitchen table.”
lyrics by Kristen Karen Smith



McKey and Jim Berkman get actively engaged in the process of building their kitchen table.

the wood for their tables came from (see photo at far left), and are given the g.p.s. coordinates of a sapling that marks the symbolic replacement of the tree that was cut for their table — marking wood as one of the most sustainable resources, Charlie noted, since it can be

regrown. Tracing the circle from where the trees for the tables were cut to the location of the replacement saplings, “was kind of a spiritual thing,” Sabrina Brown said — another of the aspects Charlie Shackleton is trying to capture in this project.

“It’s connecting people to nature, to making things by hand,” he said, “using handwork to also connect with each other.”

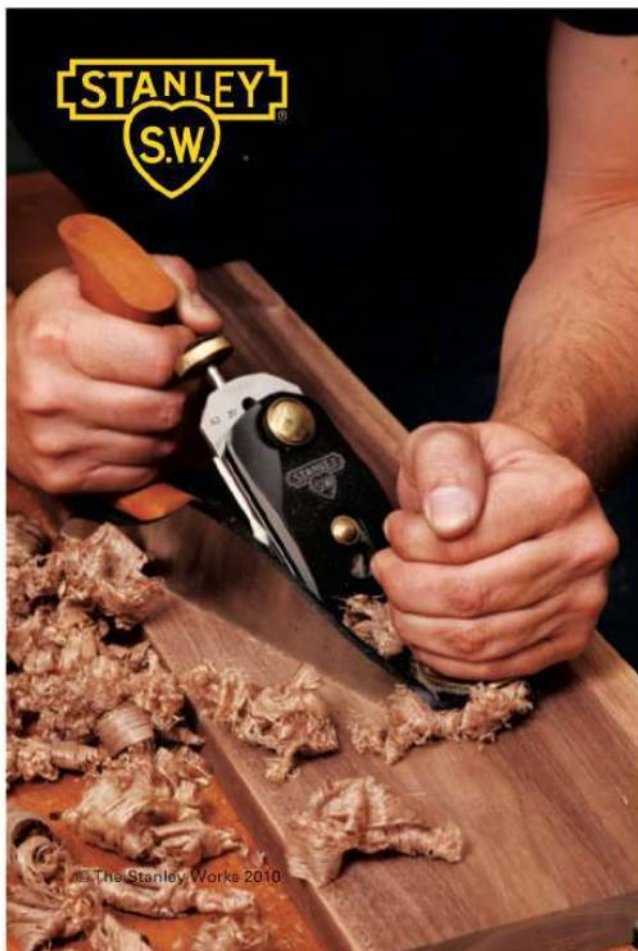
The day after she and husband Fred Haas loaded their table into their vehicle and brought it home, Sabrina said, most of their five grown children and their grandson gathered around it for a traditional New England dinner of roasted chicken and fall vegetables. Replacing an old kitchen table that came from a rental property, the new table “is really important to us,” she said. “We created something special in our home.”

— Joanna Werch Takes

Shop Talk continues on page 20 ...



For further information on upcoming Naked Table projects, visit www.nakedtable.com or call 802-672-5175.



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Korean Woodworking *Midwest Meets Far East*

Last winter, the Weisman Art Museum in Minneapolis, Minnesota, presented a selection of beautiful Korean furniture. The exhibit was unique in a couple of ways. First, it was curated by the installation crew of the museum. The selection and presentation of the pieces was actually determined and controlled by the crew. So, while there may have been flashier examples of Korean furniture, the crew selected pieces that they felt displayed exceptional craftsmanship. The second way the presentation was unique is that it was just a small slice of the museum's collection of Korean furniture — which is thought to be the largest collection outside of Asia. The furniture came to the Weisman, a teaching museum for the University of Minnesota, as a bequest from a U of M professor. From 1967 to 1978, Professor Edward Reynolds Wright, Jr. spent time in Korea after the conclusion of the Korean conflict — helping with the reconstruction efforts. He became fascinated with the beautiful furniture that he found there and began to purchase the best examples he could find. Later, in 1988, he donated the collection to the University, where it has become part of the Weisman's permanent collection.

Korean furniture has much to do with storage and less to do with chairs and tables, because the Korean people traditionally sat on the floor rather than on benches and chairs as we do in the West.

— Rob Johnstone



The Edward Reynolds Wright Collection of Korean furniture is considered to be the foremost sampling outside of Asia. With items dating from 1392 to 1910, the collection has nearly 200 pieces of furniture.

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Woodturning

Drilling on the Lathe

By Rob Johnstone

A drill chuck makes a sweet addition to your lathe.



With the bowl blank spinning, the author bores a hole dead center in the wood. He sets the depth of the boring with the graduated scale on his tailstock.

There are some gadgets and gizmos that simply complicate our lives (many of which are sold late at night on the TV). And then there are some that, once you have used them, you cannot imagine getting along without. I will suggest that if you have not yet mounted a drill chuck in the tailstock of your lathe, you are missing a “can’t live without it” accessory.

Will you use it every time you turn on the lathe? Well, if you primarily turn bowls, as I do, the answer is pretty much, “yes.” If you are turning hollow vessels shaped like a vase, the answer is — “yes.” Candlesticks ... “yup.” It is actually surprising how many times the simple act of

drilling a hole dead center in the middle of your turning blank can be a benefit.

The chuck mounts in your tailstock on a Morse taper — either a #1 or #2, depending on your lathe. Your owner’s manual will indicate which taper is right for your tool. Of course, you can mount it or dismount it, as needed.

Using the Chuck

If you are removing a lot of material, a Forstner bit is a great option. The spur keeps the bit feeding straight into the stock, as do the squared-up cylindrical sides of the bit. I also know woodturners who use paddle bits for the same task. One downside to the paddle bits is that their

guide spur is very long by comparison to a Forstner bit, and you always need to take the length of the spur into account as you bore. Be sure to advance the bit a short distance and then back it out to assist waste removal.

Sometimes I prefer to use a cutter that does not have the spur protruding past the flat surface of the bored hole. In those circumstances, I use a router bit (a bowl carving bit) chucked into the lathe-mounted drill chuck. It gives me a smooth-bottomed boring that I can shape my bowl bottom to meet. It is a small trick, but one that a moderately skilled turner like myself can take good advantage of.



Mounting a drill chuck in your tailstock is easily done. First, you must check your manual to determine what type of taper is right for your lathe.



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Solid Wood Edge Banding

By Bruce Kieffer

Edging plywood is a tedious but necessary task for many projects. Our author's tips and tricks will make this seemingly difficult task much easier.

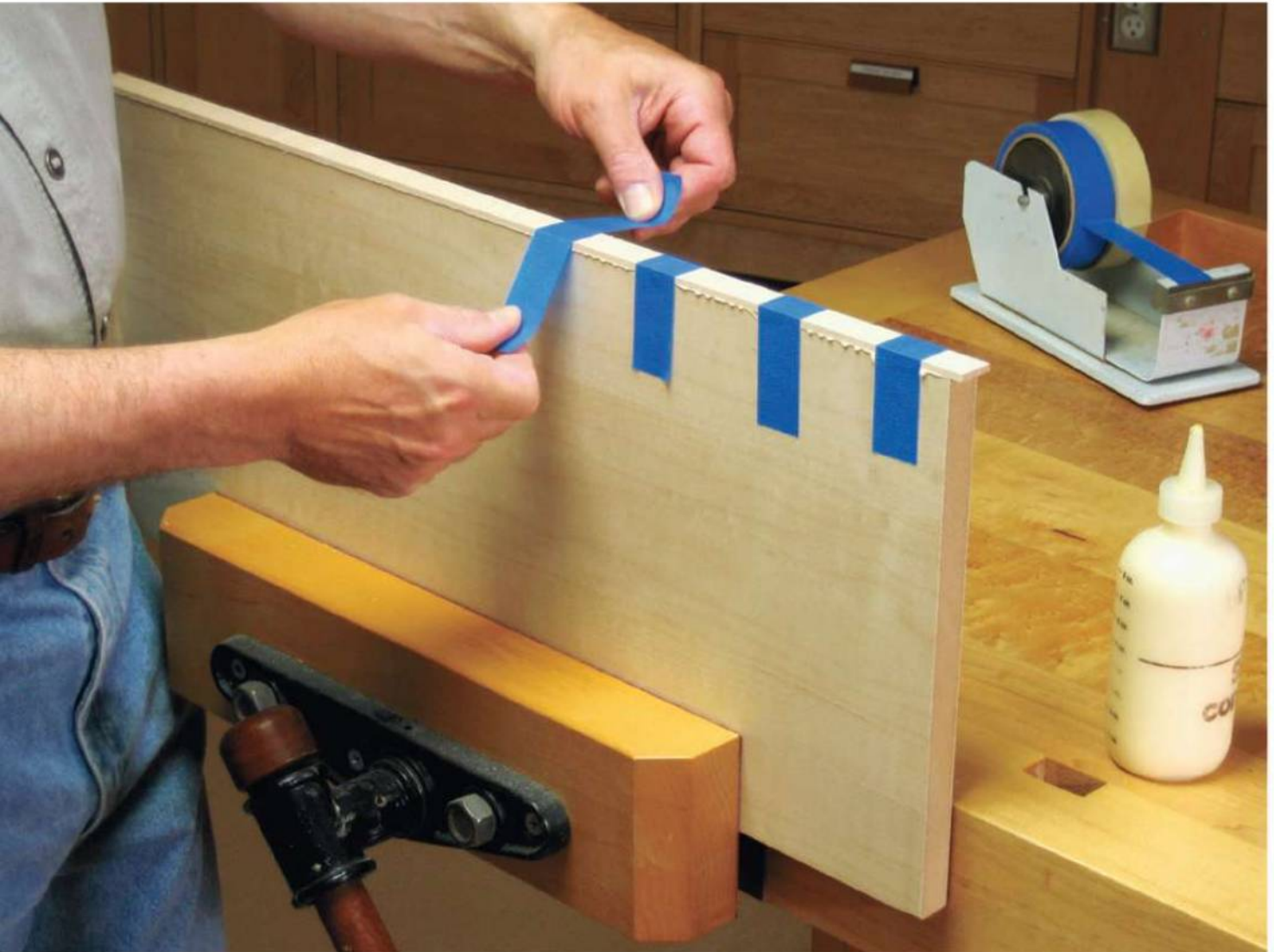
I asked some of my woodworker friends how they went about gluing solid wood edging to plywood, and I was surprised to learn that every one of them used a different technique, and very few were completely happy with their results. Their main complaints were: how long the process took (much too long, according to them) and sanding through plywood veneer when flushing up the edge strips. On the flip side, we all agreed that solid wood edging beats the

heck out of iron-on edging for looks, durability and perceived value.

I've done more edge banding than I care to admit. The good news is that, along the way, I've developed better and faster ways to do the work. I've also made a lot of mistakes! Hopefully, my experience will save you time, money and potential headaches. If you're new to this edge banding stuff, then I strongly suggest you practice on scrap wood until you get the hang of it.

Make the Edging Strips

Cut your solid wood edging strips 1/8" to 1/4" thick, 1/32" to 1/16" wider than your plywood stock and 1" longer than the plywood piece it will be glued to. Plywood thickness varies greatly. Measure the thickness of every piece you plan to use to determine its consistency. Also, edging strips thicker than 1/4" are best glued and clamped in place. And, except in a few very rare situations, strips thicker than 1/4" are simply not required.



Ask 10 woodworkers about their edge gluing technique and you're likely to get 10 different answers. The author, a professional woodworker and long-time contributor to the Journal, uses masking tape to "clamp" his edge strips to the plywood. He recommends spacing the pieces of tape about 2" apart so there are no gaps in the joint.

You will gain nothing in terms of strength or protection. The exception comes when you wish to shape the edge in some way.

The closer your strip width is to your plywood thickness, the easier it will be to sand the strip edges flush with the plywood face veneers. But don't use less than 1/32" extra. No matter how good you are at aligning the strips, you'll never get it perfect without some overhang to work with. In my experience, the worst thing that can happen is to get a strip edge aligned below the level of the plywood face veneer. You can't recover from that. In that case, your workpiece will need to be remade.

Apply the Edging Strip

Once you have the strips prepared, cut to length and width, clamp your plywood piece upright in a vise. Apply a thin bead of yellow glue near each side of the plywood edge where the solid edge strip will go. Place the edge strip in the glue and slide it around a bit to smear the glue over both surfaces. Align the edges of the strip so there are equal amounts of overhang on the ends and on the sides.

Next, apply 5"-long strips of 3/4"-wide masking tape over the joint at 2" intervals (photo at left). I prefer 3M brand tape for this. I use their blue painter's tape or regular masking tape. Both work fine. In my experience, I've found that other brands break too easily. You need a tape that stretches slightly without breaking. Pull the tape ends over the edge strip with equal pressure; otherwise the edge strip will show a gap in one of its glue lines. This usually happens on the back side if you're not careful. Double-check

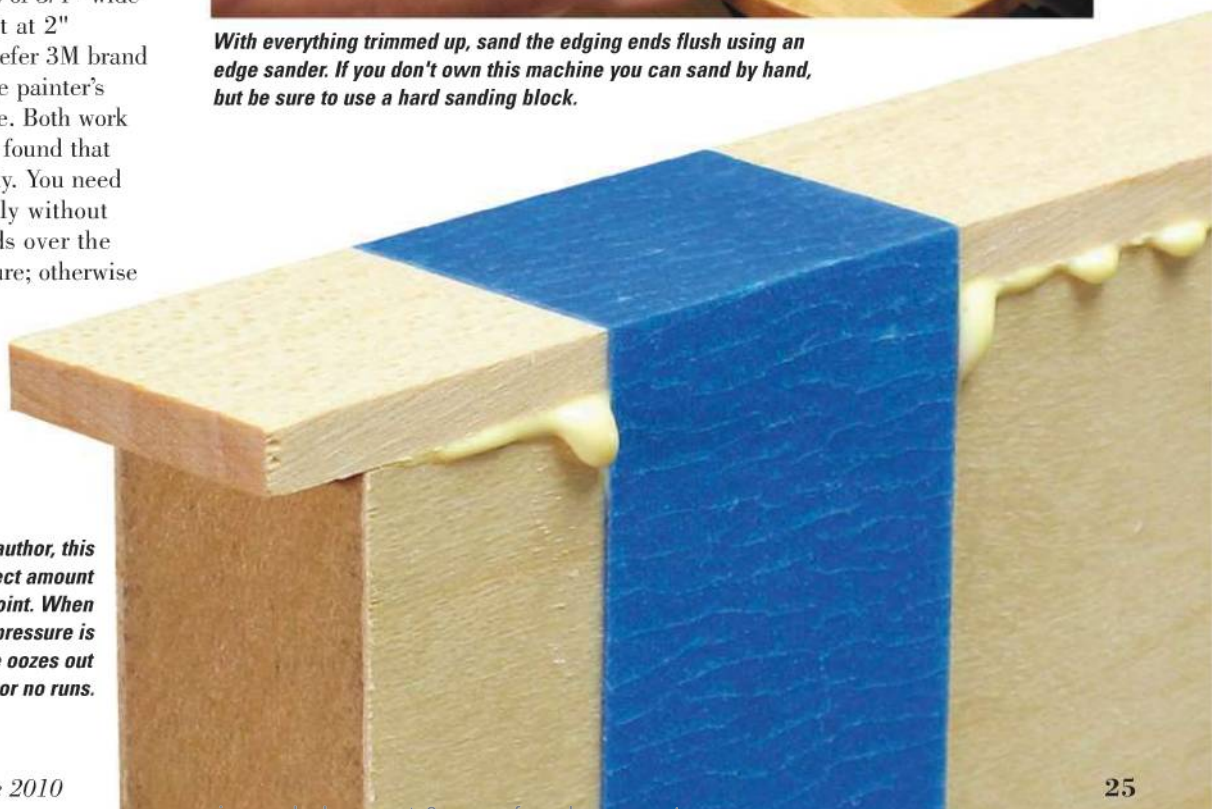


Once the glue sets, try this simple band saw fence setup. It makes quick work of trimming the edging ends. The right side of the clamped-on fence is aligned parallel and just slightly right of the saw blade.



With everything trimmed up, sand the edging ends flush using an edge sander. If you don't own this machine you can sand by hand, but be sure to use a hard sanding block.

According to the author, this photo shows the correct amount of glue to use on a joint. When the masking tape pressure is applied, the glue oozes out slightly, with few, or no runs.





If need be, you can remove excess overhang using a palm-style router and a flush-trim router bit. Set the bit height just slightly greater than the thickness of the edging strip. If you have never tried this, a practice run on a scrap board would be a prudent idea.

the edge strip's side-to-side alignment after applying each piece of masking tape. You can shift the edge strip a bit side-to-side at this point by hand if necessary. You've applied the correct amount of glue when there's a slight amount of glue ooze at the joint (photo at bottom, previous page).

Clean Up and Trim

Set the piece aside and wait 10 to 15 minutes after the tape is applied and

until the glue skins over, then remove the tape and carefully scrape away the excess glue. Trim away the edge strip overhanging ends using a band saw (top photo, previous page).

Use an edge sander to sand the edging ends flush with the plywood (middle photo, previous page). Use a 120-grit or finer sanding belt and just "kiss" the wood against the running belt; otherwise you will excessively reduce the length of the plywood.

If some of your edging strips are grossly overhanging the plywood face veneers, then it's best to add a step of flush trimming with a router and flush trim bit (photo above). Set the router bit so the cutter is just a hair beyond the bottom edge of the glued-on strip.

Some folks think this type of routing is too difficult because the router base must be balanced on the face of the 3/4"-wide edge strip. I have no trouble doing this and, with a little practice, you shouldn't either.



Applying Hot-melt Veneer Tape

Although not as durable as the method described by our author, in some circumstances, a hot-melt veneer tape can be appropriate — facing the edges of internal shelves or dividers in a cabinet, for example.

The process is very simple to master. You can purchase veneer edge tape with a heat-activated glue from woodworking specialty stores and websites (rockler.com is a good choice). Once you have the veneer tape in hand, you cut it to appropriate lengths and hold it in place on the edge of your board and use a heat source to activate the adhesive. A clothes iron works great, but there are also specialty tools, like the one Bill Hylton is using in the photo at left, made just for this task. After you have run the iron over the tape and stuck it to the edge, burnish it down by rubbing it hard with a block of wood or a J-roller. Then you need to trim the excess from the tape with a specialty tool, trim router or even just a block of wood with sandpaper.

— WJ Staff



Use a belt sander with a 150- or 180-grit belt to sand the edging strips flush to the plywood faces. You're done when the squiggly pencil line starts to disappear. While there is the inherent danger of sanding through the plywood's veneer, if you take this step slowly, it will save you time.

Use two hands to hold the trim router firmly on the edge of the workpiece, and move the router slowly.

Sanding

OK ... Here's the tricky step. You get this far and now you need to belt-sand the edging flush with the paper-thin veneer. I know you're saying "right!!!" but it can be done. To do so, you need to use a

150- or 180-grit sanding belt, and you have to be very good with your belt sander. A slow sanding speed helps, too. Don't over sand (photo above). I suggest that you practice on scrap wood, and if you just can't make this work, then you can flush the edges using a cabinet scraper instead. The process will take much longer, but you'll get good results at the end of the day. The last step is to

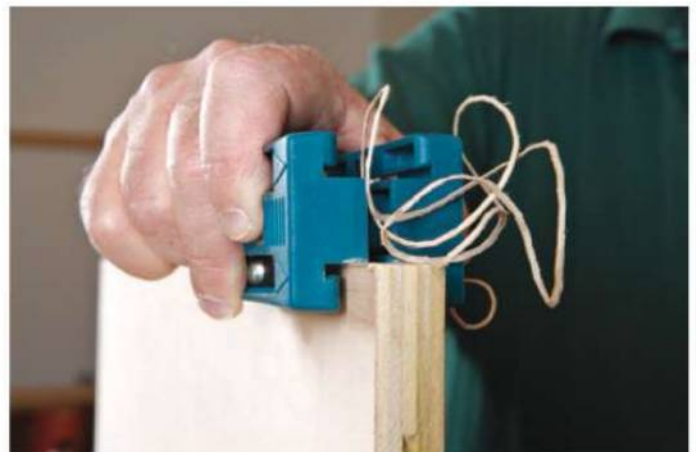
finish-sand the face of the plywood and edging using an orbital sander.

If you give these steps a try, I think you will have good success and get the job done in the least amount of time. Good luck and good woodworking.

Bruce Kieffer is a custom furniture maker in Minneapolis and a frequent contributor to Woodworker's Journal.



After the hot-melt adhesive has been activated by an iron of some sort, burnish the veneer tape to the edge with a block of wood or a J-roller. This will adhere the veneer tape to the edge much more securely.



After the tape has been burnished and cooled down, trim off the excess edges with a razor tool or similar device. It's a good idea to form a micro-chamfer on the tape edges to help keep it from peeling off later.

Build a Kitchen Island

By Brad Becker

A kitchen island can make a very nice upgrade to your home, adding both utility and value. If you have the room for it, an island like the one I've built here can even improve the efficiency of your cooking workflow, not to mention adding a cozy place for two people to sit and enjoy a meal. This plan has many "kitchen virtues" built into its design. Tons of roll-out storage in the lower compartment, utensil storage in the upper drawers, a spacious food preparation area on the butcher block countertop and an eating area on the raised counter section. In addition to the practical elements, it is also very stylish, with solid cherry arched raised panels featured on the doors and walls of the cabinet and highly detailed turned legs at the corners. "Whoa," you might be thinking, "I don't know how to make legs like that and I am not even that comfortable making raised panel doors, much less ones with arched panels and matching rails." Well, here is some good news: you don't actually need to know how to do any of that to proceed with this project ... and here is why.

A Builder's Challenge

Not long ago, publisher Larry Stoiaken challenged me to come up with a kitchen island design that was practical and very stylish but one that even a novice woodworker could build. At first I thought it was one of those pie-in-the-sky ideas a publisher will float out there from time to time, with little to come of it later. (In my experience, our publisher has a tendency to imagine projects in his mind's-eye that woodworkers find just about impossible to pull off in an actual shop.) But then I had a talk with editor-in-chief Rob Johnstone and we started to see some real possibilities. After his experience last issue completing a cabinet "makeover," Rob realized how many ways there are for woodworkers to go when it comes to completing a home project. These days you can buy a lot of items "custom-made to order" — like decorative legs,



Store-bought! Butcher block tops, pre-assembled door panels, drawer fronts and turned legs were all purchased to keep this project within the reach of any woodworker.

drawer faces and that sort of thing, and this approach to woodworking really got us thinking. If a person has the skill to build a simple melamine box, perhaps we could dress up the outside of it with pre-made components and come up with a fancy island that almost anyone could put together. I was almost embarrassed at how easily the project design came together ... but I let Larry sweat for a few days before I gave him the sketch and the ideas. (Just like Scotty on *Star Trek*, let everyone think you can work wonders by making a task seem much harder than it actually is ...)

Now I am not going to try to fool you: this is a much more expensive way to build a cabinet than starting from raw wood and building every component yourself, but the advantages to this method are obvious. And, it is also a lot less expensive way to acquire a cabinet than hiring your local cabinetmaker. After much discussion, the approach we settled on was to purchase as many items as possible — if you have the skills, you can substitute labor for any one of those items, be it the butcher block top, the panels, the drawer fronts or even the turned legs. What I'll describe is an approach that even a raw novice can undertake. Where you go with the project is completely up to you!

How do you create an island that makes it look like you've taken your woodworking skills to the next level? Try augmenting your project with some beautiful wood parts — we're talking ready-made doors, fluted legs and butcher block tops — just for starters!

The doors, drawer faces and panels in the Project Parts box below are sized specifically for this kitchen island. If you wish to modify the dimensions, you will need to change the size of those parts. You can order custom-made parts to any size you like at rockler.com. Specify part number 11162 and follow the ordering directions.

Starting Right at the Top

I purchased two butcher block tops to make the top and counter (pieces 1 and 2) and used all of the material up. One piece was ripped to form the counter and its leftover was glued to the other piece to form the top. Since this material comes with a slight roundover on its edges, you'll need to trim the full piece a bit before gluing it to the cutoff. That way the roundover won't show up in the middle of your glue-up. To avoid extra sanding, be very accurate as you align the pieces when you clamp them together.

Once you remove the top from the clamps, chuck a 1/4" roundover bit in your router to go around the entire top and counter (both the tops and bottoms) to ensure that this detail is consistent on both pieces. Now sand the top and counter through the grits and set them aside so you can turn your attention to the pieces that will complete the top subassembly.

Project Parts

The following supplies are available from Woodworker's Journal.

Side Panels (4) #33964	\$101.10 ea.
Back Panels (3) #38924	\$104.47 ea.
Doors (2) #39101	\$111.12 ea.
Drawer Faces (2) #32319	\$20.80 ea.
Butcher Block Tops (2) #25541	\$179.99 ea.
Drawer Slides (3 sets) #35601	\$23.49 ea.
Door Knobs (2) #34389	\$3.59 ea.
Drawer Pulls (2) #34348	\$3.99 ea.
35mm Cherry Plugs (3 sets) #38119	\$4.99 ea.
Cherry Legs (4) #43524	\$124.99 ea.
Door Hinges (2 sets) #33370	\$6.99 ea.

To purchase products online, visit www.woodworkersjournal.com and click on the "WWJ Store" tab. Or, to order by phone, call 800-610-0883 and mention code WE064.



The inner three holes on the countertop house large 7" bolts with washers and nuts. The outer three holes are for 3" woodscrews (and, in fact, the center outer hole is just for looks).



Start with the staggered top and casework

The Top Subassembly

The counter supports and apron (pieces 3, 4 and 5) will serve to elevate the counter and bring the top pieces together as one subassembly. The shaping details for the outer supports are in the *Drawings* at right. Now is the time to machine them, along with the inner support and the apron. The apron fits into dados in the outer supports, and the inner support fits into its own dado in the middle of the apron, as shown in the *Drawings* at right. After test fitting the parts, glue the pieces together.

Now you've arrived at one of the trickier aspects of this project. The

counter will bear a lot of weight during its lifetime, so I thought it best to bolt it right to the top. But it's about 7" from the top of the counter to the bottom of the top, which means drilling in series. Here's how I did that: First, use the *Drawings* to lay out the six 35mm holes on the counter's top for the large tapered plugs (pieces 6). Using a 35mm cup hinge bit, drill all six holes to a depth of 3/4" and then line up the counter, the support subassembly and the top (see *Drawings* at right). A couple of wooden handscrew clamps came in really handy here. Firmly attach one wooden handscrew clamp to each outer counter support and then use smaller bar clamps to hold them in position on the top. Carefully line up the counter on top of the supports, clamp

them in position and, using a 1/2" brad point bit, drill through the center of the inner three holes until you're slightly into the support pieces. Switch to a countersink bit for a moment and drill through the outer two holes (the outer center hole is just for looks) until you're into the supports. Then remove the counter and switch back to the 1/2" brad point bit to extend the three inner holes, this time through the supports, just into the top. Finally, loosen up the wooden handscrews, remove the support subassembly, and use your brad point bit one last time to complete the 1/2" hole right through the top. Once you've done that, you'll have to flip the top over and use your 35mm bit to countersink the three bolt holes from the other side to keep the nuts and washers at the end of the bolts contained. Blow away the chips and bring the counter, the support subassembly and the top together as its own subassembly, using the three bolts (pieces 7) and the two long wood screws (pieces 8), as shown in the *Drawing* at right. Glue 35mm plugs (pieces 6) into all six top holes (leaving them just a bit proud) and, once the glue dries, sand them flush to the counter.

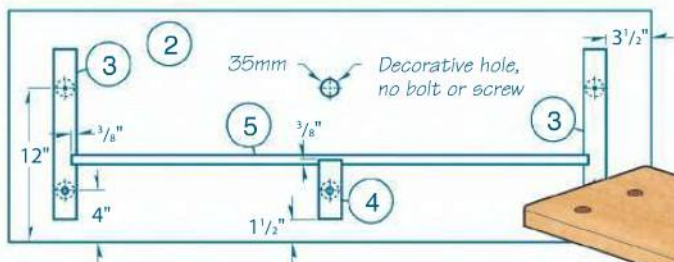
Moving on to the Casework

The next step is to make the casework and add the face frame to it. The casework itself couldn't be easier. Two sides, a top, bottom and middle divider, a small drawer divider and the back (pieces 9 through 12) come together with a series of dados and rabbets; follow the details in the *Drawing* at right. Using your nail gun (or you can screw it together if you don't own a nail gun) and glue, assemble the carcass and then attach the back, which conveniently helps to square everything up.

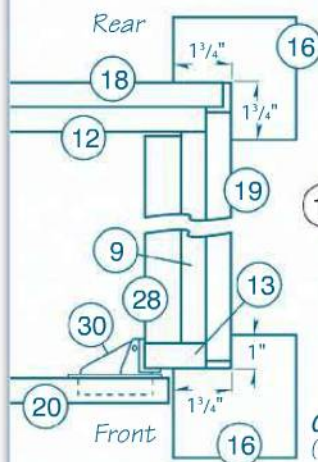
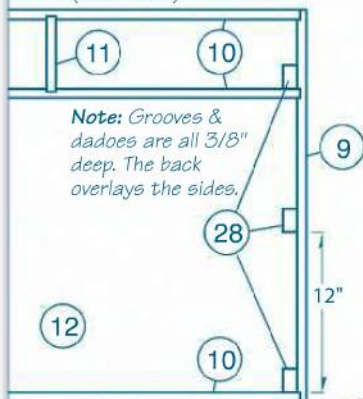


A set of ratchet wrenches are used to keep the bolt assembly buried in the counter and top, as shown at left. Two long wood screws will ensure a tight fit between the outer supports and the top (top photo). Once the top was completed, the author moved on to the casework, which was kept very simple.

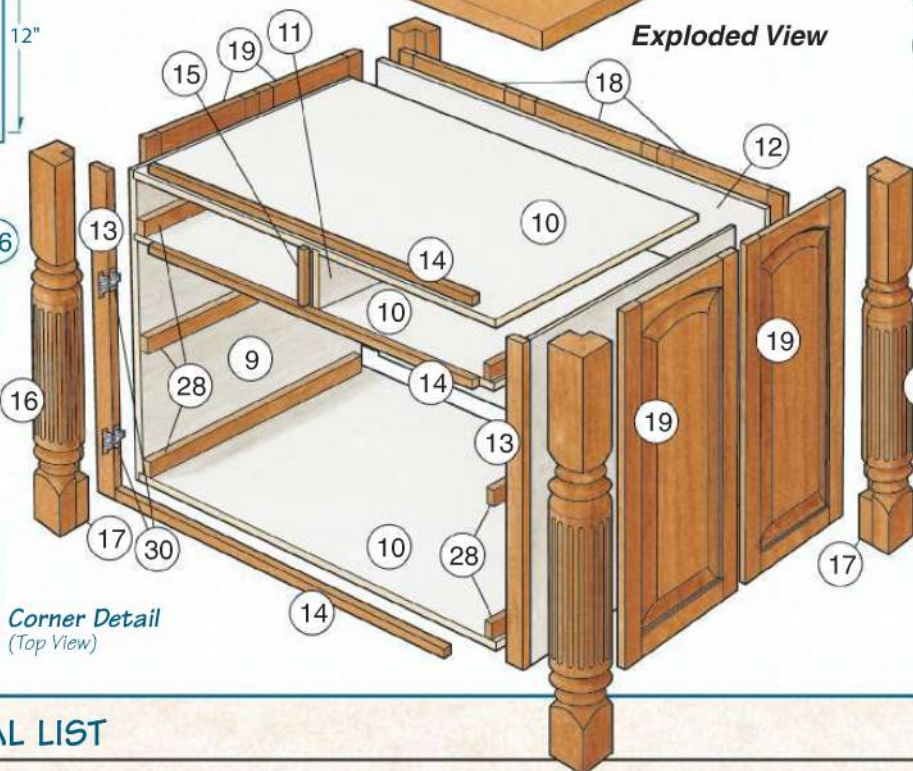
Counter Assembly (Bottom View)



Case Assembly (Front View)



Corner Detail (Top View)



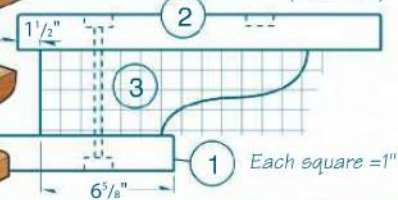
Drawer (Top View)

Note: The pullout shelves are made just like the drawers, but require no faces.

Drawer (Side View)

Dimensions: 7 1/8", 1 1/2", 3 1/4", 1 1/4", 1 1/4"

Counter Assembly (Side View)



Rear Leg (Top and Front Views)

MATERIAL LIST

	T x W x L		T x W x L
1 Top (1)	1 1/4" x 33 5/8" x 50"	17 Leg Fillers (4)	1 3/4" x (1" & 1 1/4") x 4"
2 Counter (1)	1 3/4" x 18" x 50"	18 Back Panels (3)	3/4" x 14" x 31 1/4"
3 Outer Counter Supports (2)	1 3/4" x 4 1/4" x 13 1/4"	19 Side Panels (4)	3/4" x 13 1/2" x 31 1/4"
4 Inner Counter Support (1)	1 3/4" x 4 1/4" x 4 5/8"	20 Doors (2)	3/4" x 18 3/4" x 24 3/4"
5 Counter Apron (1)	3/4" x 4 1/4" x 40 1/4"	21 Drawer Faces (2)	3/4" x 6" x 18 3/4"
6 Large Plugs (3 sets) #38119	35mm	22 Drawer Fronts & Backs (4)	1/2" x 5" x 17"
7 Bolts, Washers and Nuts (3 sets)	Hex Head, 3/8" x 7"	23 Drawer Sides (4)	1/2" x 5" x 21"
8 Large Wood Screws (2)	3" x #10	24 Drawer Bottoms (2)	1/4" x 16 1/2" x 21 1/2"
9 Casework Sides (2)	3/4" x 25 1/4" x 31 1/4"	25 Pullout Shelves, Fronts & Backs (4)	1/2" x 3 1/2" x 35 1/2"
10 Casework Top, Bottom, Middle (3)	3/4" x 25 1/4" x 39 1/2"	26 Pullout Shelves, Sides (4)	1/2" x 3 1/2" x 21"
11 Casework Drawer Divider (1)	3/4" x 6" x 25 1/4"	27 Pullout Shelves, Bottoms (2)	1/4" x 21 1/2" x 35"
12 Casework Back (1)	3/4" x 31 1/4" x 40 1/2"	28 Slide Supports (6)	1 1/8" x 2 1/4" x 25"
13 Face Frame Stiles (2)	3/4" x 1 7/8" x 31 1/8"	29 Full-extension Slides (4 sets)	22", White
14 Face Frame Rails (3)	3/4" x 3/4" x 39"	30 Face Frame Hinges (2 pairs)	European Style
15 Face Frame Middle Stile (1)	3/4" x 3/4" x 5 1/2"	31 Drawer Pulls (2)	3" Antique Brass
16 Front and Back Legs (4)	3 3/4" x 3 3/4" x 35 1/4"	32 Door Knobs (2)	1 1/4" Antique Brass

Make a simple face frame and fit the legs to the case



The legs are machined with an extra-long rip fence in place, and the cabinet support pieces are glued into the bottom leg rabbets to support the weight of the cabinet. It's important to keep in mind that the rabbets on the back two legs are slightly different in size from the rabbets on the front two legs.



A Simple Face Frame

The face frame was built “in place,” which really simplified matters. Cut the stiles, rails and middle stile to width (pieces 13, 14 and 15) and then glue and nail the left side in place, followed by the top, the middle stile, the middle rail, the bottom rail and, finally, the right stile. Each piece can be positioned in place and marked as you go ... the good news is that the joinery is covered by the legs and drawers!



The Purchased Parts

Up to this point, the only real “purchased” items have been the butcher block top and counter and the large plugs. If the thought of taking on all the upcoming leg work and frame and panel work gives you pause, relax (if you can do that while simultaneously pulling out your wallet). The legs (pieces 16 and 17) and the panels, which are just raised panel doors mounted to the carcass (pieces 18 and 19), are “store-bought.” (See our Project Parts box on page 29). The panels arrived fully



assembled, ready for finishing. The legs did require a little work, as shown in the series of photos at left. You can't tell from those photos, but that's an extra-long fence on the table saw, which helps to keep the legs square during these cuts. Without it, the legs would want to work their way away from the fence (as the square portion at each end is disengaged or encounters the fence). With the longer auxiliary fence, that's not a problem.

Notice in the *Drawings* on page 31 that the rip cuts in the back legs and front legs, while the same on one plane, are different on the other. This accommodates the width of the doors, which have yet to be added to the mix. It will also affect the dimension of the leg fillers (pieces 17), which end up supporting the entire weight of the piece. Since there are two kerfs involved in creating these long rabbets, it was impossible to simply use the cutoff. Make sure your filler piece is correctly oriented for grain match and get as close as possible with your color. Clamp and glue these pieces to the legs, as shown in the two bottom photos at left, and sand them smooth.

With the legs ready for assembly, turn your attention to the panels. I suggest starting on one side, toward the front, and attaching the side panels (pieces 19) from the inside, with screws. Use a couple of washers to keep the panels about 1/8" apart (creating a reveal) and don't worry if they're short on the backside — the legs will cover that. On the back, I placed the middle panel first and then the two outer panels (pieces 18), not worrying about a larger gap at the ends because, again, the legs will cover it.



Add the doors, drawers and pullout shelves

Now you're ready to install the legs, as shown in the top two photos at left. As mentioned earlier, the two back legs have different dimension rabbets than the two front legs (see *Drawings*), so make sure you have everything well marked.

Doors, Drawers and Pullout Shelves

As was the case with the legs and panels, the doors and drawer faces (pieces 20 and 21) for this project are "store-bought." I did end up making the drawers and the pullout shelves myself, because they were really easy and, aside from the grooves for the bottoms, involved very little machining. Follow the *Material List* on page 31 and cut all the parts to size for these subassemblies. Start with the drawers (pieces 22, 23 and 24), first cutting the pieces to size and then forming the 1/4" groove for the bottom, as shown in the *drawings*. The dimensions are such that you simply capture the bottom as you glue up the surrounding pieces. The pullout shelves are much the same story, just larger. Again, cut the front and back, sides and bottoms (pieces 25, 26 and 27) to size, mill the grooves for the bottom and glue the pieces together.

You're going to need slide supports (pieces 28) on each side, so the shelves can clear the doors and the drawer faces can extend to the full width of the doors. I installed three on each side, as shown in the *Drawings*. With the supports installed, you're ready to attach the full-extension slides to the supports, the drawer divider and the pullout shelves and drawers. Follow the directions on the package and, when everything is moving well, attach the drawer fronts and doors. The hinges for the doors (pieces 30) were positioned strategically to miss the pullout shelves, as shown in the *Drawings*, and the drawer fronts are screwed in position from the inside of the drawer in slightly oversized holes, which allows for adjustment.

Finishing Up

Install your pulls and knobs (pieces 31 and 32), and you are ready to move on to the finish. I used Butcher Block oil for the top and counter because it's food safe and then I turned to Nordic Oil for the base pieces. Cherry really looks great with an oil finish, and the patina will get richer as the years march by.

Brad Becker is a professional woodworker and regular contributor to the Journal.

The four side and three back panels are kept 1/8" apart to create shadow lines and break up the stiles. Because the legs cover quite a bit of the panel ends, the author points out that this piece is very forgiving for beginners. Just make sure that the gaps between the panels are uniform.



Portable Gazebo

By Lars Dalsgaard



Disassembled, the gazebo components do not take up much space. They can be stored in a shed or garage.

Our octagonal gazebo can be placed anywhere as long as it is on a level surface. Decks and patios are ideal locations, but a flat, grassy area will work, too.

A gazebo is a nice finishing touch to any backyard, providing a new vantage point from which to enjoy your gardens and a focal point when looking at your landscaping. Gazebos also provide shade from the sun and shelter from rain, giving you more hours to enjoy the outdoors. The only drawback — especially for gazebos in the classic octagonal style — is that they are complicated to build and expensive to buy.

My design eliminates the fancy joinery that's usually associated with an octagonal roof and walls. Instead, I used hinges to join the walls and a patio umbrella for the roof. As a result, my gazebo is quite easy to build for around \$200 (perhaps a little less), plus the cost of the umbrella. An added bonus: it's relatively lightweight and portable. If you want to move this gazebo to a new location or take it down for the winter, it is not difficult to do.

The finished project breaks down to four hinged pairs of wall panels and eight trim boards. The wall sections join together with 12 wingnuts, and it takes less than 30 minutes to raise or take down the gazebo. Nevertheless, the structure is very stable, even under windy conditions. To be on the safe side, I used a heavy concrete umbrella base of about 90 pounds, and I fastened the umbrella's ribs to the hooks on the sides with elastic line as shown in the plans and photos.

Framing the Walls

Building the walls is made easier because all eight sides have the same overall dimensions, and seven of them are identical. This means that for every part, you only need to measure once — and then transfer the marks to the other workpieces.

I used 5/4 stock for the posts (pieces 5) and the cross members (pieces 6). The arch panels (pieces 1) are cut from 3/4" exterior-grade plywood. The remaining framing is from 2 x 2 lumber, which you can rip from 2 x 4s if you so choose.

Once you're done with measuring and marking, cut all the parts to size. This saves time and makes creating uniform pieces a bit easier. I marked the 27½" radius on the arched panels using the simple homemade compass shown in the photo on the following page. I then made the curved cuts with a jigsaw, but a band saw would work as well. All the other cuts can be made with a handsaw and miterbox, a portable circular saw, or, for best results, a table saw. Whichever you choose, you will



The author used a patio umbrella for the roof and hinges to join the eight wall panels, vastly simplifying his construction. Vertical trim hides the otherwise unsightly joints and also bolsters stability.



The width of the wall panels creates a circumference calculated so a 10-foot-diameter umbrella makes an overhang of about 4". When buying an umbrella, be certain that you understand the actual diameter of your purchase.



The author created balustrades sporting a classic cross pattern. The sides are identical except for the entrance, which is, of course, made without the railings. This summer project will add a classic element to your backyard.



Purchase a 10-ft.-diameter patio umbrella of adequate height. To check its height, place the umbrella in its stand, and measure to the underside of the umbrella, about 4" from the edge. It should be at least 82". If it's too tall, trim the post to avoid a gap between the top of the walls and the umbrella.



The author drew an arc on one of the arch panels using a homemade compass. The radius, from the nail to the end of the stick, should be $27\frac{1}{2}$ ". He traced the arc on the remaining panels using the first as a template and cut them with a jigsaw.



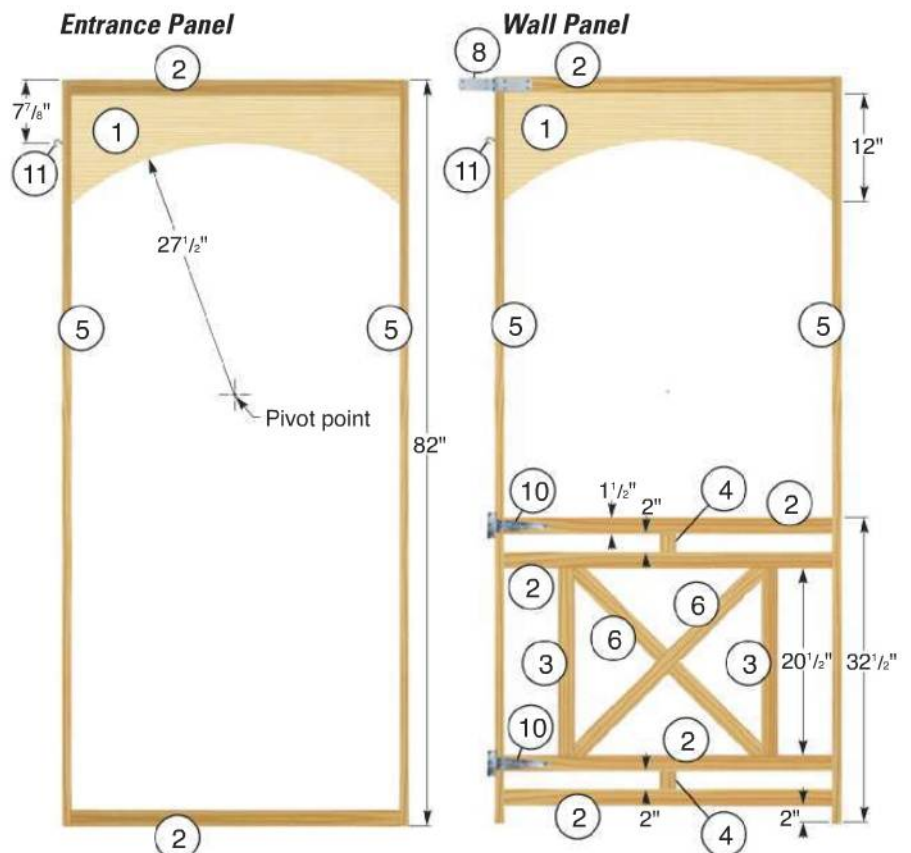
To speed the process along, after marking the rail locations on one post, the author transferred them to the remaining posts using a square and a pencil.



The easiest way to assemble the sides is on a sheet of plywood or composite board that has square corners. Begin by clamping one post so it aligns with the edge of the sheet. Attach the rails (with the blocks already installed where appropriate) to the post with screws.

save yourself a lot of trouble if you make certain that they are all perfectly square cuts.

Assembly of the walls works best on a large worktable. Sawhorses, topped with a sheetstock panel such as plywood, work great. Just be sure to use a sheet that you have checked to make sure the factory-made corners are indeed square. Begin by screwing the blocks (pieces 4) to the rails (pieces 2) as shown in the *Drawings*. Align one post with the edge of the work table, and then clamp the rails with the block assemblies (see the *Drawings* for details) in position relative to the posts and balusters (pieces 3). Screw the rails to the posts and then to the balusters. Then screw the outboard rails to the blocks and to the posts. See the photo, above right.





To make the side rail subassemblies, start by screwing the two balusters between the two rails with wood screws. Note the blocks mounted to the rails.



To accurately cut the miters on the cross members, mark a centerline as shown above. Place them under the frame and mark where they must be cut. You will need to form the half-lap joint where they intersect.

For measuring the cross members (pieces 6), it's easiest to first draw centerlines. Then lay them under the assembled wall and mark the angles. They should, of course, be close to 45 degrees. Make the cuts and position them, one over the other, inside the square opening. Mark the area where they overlap. Here, you'll have to make notches in order to fashion the half-lap joints. It's easy to do this. Simply make a series of cuts halfway through each cross member. Switch to a sharp wood chisel to carefully clear out the waste. I found that I could clean these joints out by hand (no tapping with a hammer). Please take care never to have the chisel pointed toward your hand or body. It can easily slip and cause a nasty gouge if you are not careful.

Install the rails (pieces 2) at the top of the subassemblies

next. Then install the arch panels (pieces 1). Use a few 3/8"-thick strips of scrap wood to support the panels in a centered position during assembly.

The entrance wall is identical in size to the others, except there is no balustrade assembly.

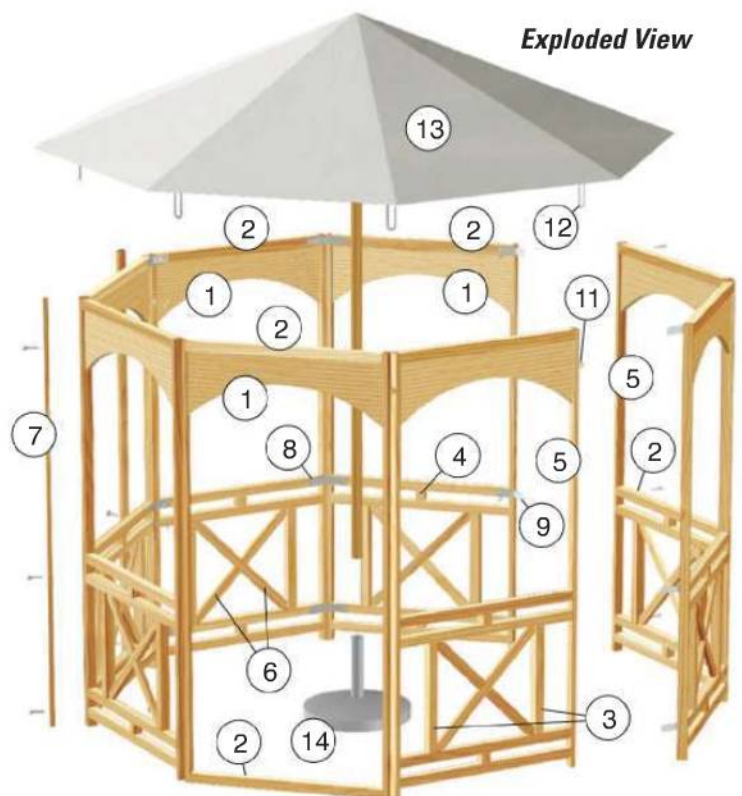
Install the Hinges

Before you install the hardware, take time to paint the parts. I chose to prime the wood with a good quality white primer and then filled holes and seams with latex spackle and caulk. I followed with two coats of white exterior enamel. You can choose any color that you wish — but that pure white enamel offered what I thought of as a classic look.

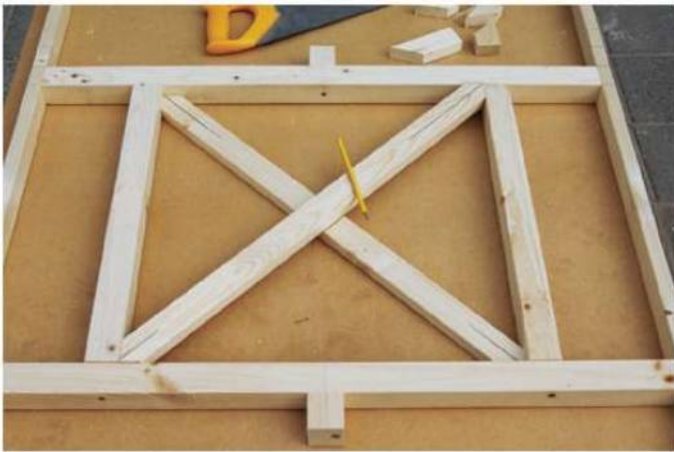
MATERIAL LIST

T X W X L

1 Arch Panels (8)	3/4" x 12" x 36" exterior plywood
2 Rails (37)	1 1/2" x 1 1/2" x 36" fir or pine
3 Balusters (14)	1 1/2" x 1 1/2" x 20 1/2"
4 Blocks (14)	1 1/2" x 1 1/2" x 2"
5 Posts (16)	5/4" x 1 1/2" x 82"
6 Cross Members (14)	5/4" x 1 1/2" x 30" (cut to fit)
7 Trim (8)	3/4" x 1 1/4" x 82"
8 Strap Hinges (10)	1 3/8" x 8" (measured open)
9 Strap Hinges (10)	1 3/8" x 6" (measured open)
10 T-hinges (4)	3" x 7" (measured open)
11 Screw Hooks (8)	Steel
12 Elastic Cord (8)	1/4" x 18"
13 Patio Umbrella (1)	10 ft. Dia.
14 Umbrella Base (1)	90 lbs.



Exploded View



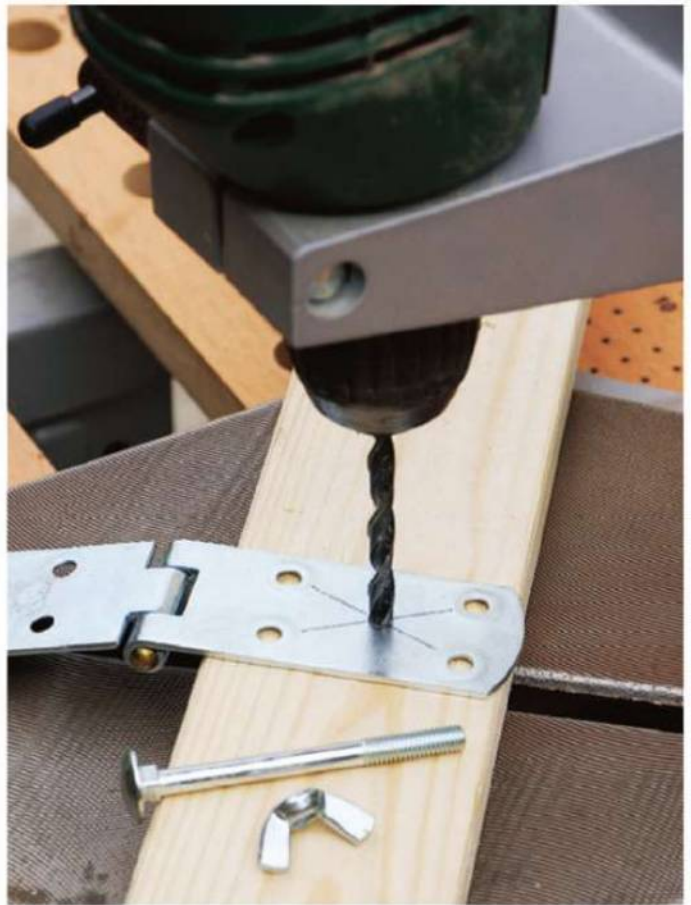
After cutting the angles on the crosspieces, the author put them in place, and marked where the cuts for the half-lap joints must be made.



To make the half-lap, the author sliced cuts halfway through the pieces with a circular saw and switched to a chisel to chop out the waste.



The crosspiece subassembly was fastened to the balustrade frame using two 3" galvanized flathead wood screws in each corner.



The author used 6" strap hinges to join the paired walls to each other, but first he drilled a 5/16" hole at the middle of one leaf of each hinge.

With the painting done, you can move on to installing the hinges. Divide the wall panels into pairs and use 8" strap hinges (pieces 8) to join each pair of panels together. The only exception to this is for the pairing of the entrance panel and its adjacent wall panel. Here, use T-hinges (pieces 10) instead of strap hinges as shown in the *Drawings*. You will need to bore one hole in each of the 6" strap hinges (pieces 9) as shown in the photo above. Install three of these hinges on the inside of one post for each pair of panels. You'll use these extra holes you've just drilled in the hinges to join each pair of wall panels to one another with bolts and wingnuts. (You'll also need to bore a hole in two of the T-hinges in the same manner as you just did for the 6" strap hinges, for the same reason — joining the entrance panel to a paired panel set.) Now drill a pilot hole into the edge of the same rails you attached the hinges to, to install a screw hook (pieces 11) for securing the elastic cords later. Position these screw hooks 10" down from the top end of the rails. Twist the hooks into place.

Erect the Gazebo Walls

Stand the wall panels on the gazebo site of your choice. Arrange them so the entrance wall faces in the direction you prefer and so you have a perfect octagon. A simple trick to ensure "octagon-ness" is to make sure the distance between opposite corners around the octagon's perimeter is equal. Once you have it right, clamp the still-loose hinge leaves to their mating posts. Bore holes through the posts at the holes you previously drilled in the hinges. Tap carriage bolts through each pair of hinges and post holes (from the outside face in), and secure the connection with washers and wingnuts.



Using the clearance holes in hinge leaf he drilled previously, the author bored 5/16" pilot holes through the rails for the carriage bolts.



To connect the paired panels together, the author employed carriage bolts and wingnuts. All of the hardware should be galvanized.

Raise the Roof

Installing the umbrella (piece 13) is simple. Place the umbrella base (piece 14), as well as the table you want to use, at the center of the gazebo. Lift the top half of the umbrella clear of the walls, open it, and secure it to the lower umbrella post. Tie off eight loops of elastic cord (pieces 12), one per umbrella rib, and hook them onto the previously installed screw hooks. Now you can proceed with installing the eight vertical trim boards (pieces 7), once again using carriage bolts, washers and wingnuts.

By the way, it pays to buy a patio umbrella of good quality. The gazebo will last many years, and you'll want an umbrella that will, too. I chose a 10-foot diameter, wood model with eight sides, making the gazebo big enough for four to six chairs and a small table. (The distance from inside wall to inside wall is about 9½ feet. You can opt for an 11-foot umbrella—and a bigger gazebo—but you will have to increase the width of the wall panels accordingly.)

Here's a note of caution: just because an umbrella has a listed diameter of 10 feet does not mean it will actually be that size. Sometimes the manufacturer uses round numbers, or measures over the peak of the umbrella. If you buy your umbrella first, you can always adjust your panels to suit.

This project is a nice summer effort that doesn't take weeks to complete. It can help you enjoy your backyard and your woodworking hobby too.

Lars Dalsgaard is a woodworker and photographer who lives in Denmark.



When the author was ready to raise the roof, he set the umbrella base exactly at the center of the gazebo, put the table in place and then set up the umbrella by coming down from the top.



Eight 18" lengths of elastic cord looped over the umbrella's eight ribs help keep it in place even in high winds. The lines are tied together with square knots, and pulled onto the screw hooks.



Trim pieces provided the gazebo with a more finished look. They also help to make the unit more stable. Place the trim pieces over the joints between the walls. Secure them from the inside with washers and wingnuts.





Track and Flip Stop



Optional Scrap Bins



Dual Dust Collection

Ultimate Miter Saw Stand

By Chris Marshall

Accuracy, tearout prevention, storage and dust collection are key features of this hardworking shop fixture.

For all sorts of cross- and angle-cutting tasks, a miter saw is a woodworker's friend. But, to really maximize its potential, you need a good home base for your saw — and that's what this project delivers. It addresses what I feel are a miter saw's biggest needs. The stand is a full 8 ft. long, in order to provide generous support tables on either side of the saw. They'll help you cut down long stock with ease. I've equipped the support table





Moveable Saw Platform



Tool-activated Switch



Heavy-duty Casters

fences with Kreg's aluminum track system and flip stop, for setting up precise cutoff lengths or carrying out repetitive cutting jobs. You'll also notice that the saw is mounted on a center platform that slides back and forth and locks in place. It enables you to mount a back-up board directly to the saw's metal fences for tearout-free cutting, then align the saw flush with the project's fixed fences. When you need to tilt the machine for bevel cuts, just pull the platform forward of the

fences and tip the saw as usual. No versatility lost here.

While a miter saw's bag captures some sawdust, a shop vacuum works much better, so I've sized the stand's enclosed cabinet to fit a vac with up to a 16-gallon capacity. The saw turns it on, thanks to a tool-activated switch inside. And, although you can't see it in this large opening photo, a trough behind the saw helps collect whatever the shop vac doesn't. A chamber runs behind the left support table, with openings on both ends, so you can hook up your dust collector and whisk the trough clean.



Shelf dados kick off the carcass machining process.

Six fixed shelves give you plenty of room for cutoff storage; I've even added two pull-out bins to mine that store those shorter scraps I can't bear to throw away. Plus, heavy-duty casters make the cart easy to roll around when necessary.

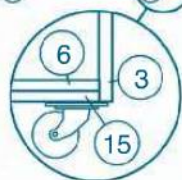
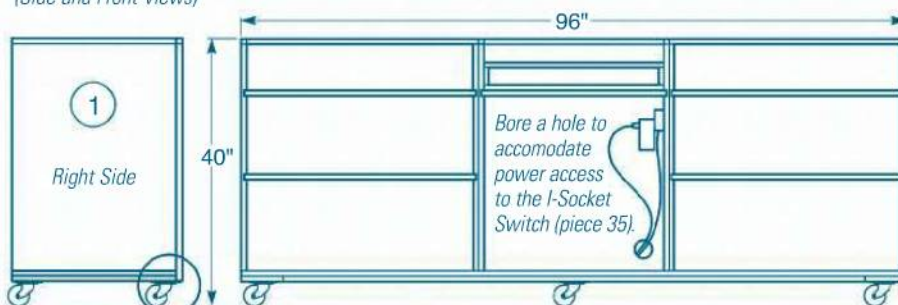
Ready to build one of these souped-up stations for your shop? Let's get started!

Assembling the Carcass

Follow the *Material List* dimensions on the next page to make six panels for the sides and dividers (pieces 1). I cut the two outer side panels to final size right away, but notice that the dividers are doubled up to form the walls of the inner cabinet. So, I cut two dividers to dimension, glued them to slightly oversized mates, and then used a flush-trim bit in my handheld router to bring them to a perfect matched fit. Take these four components to your table saw to mill dados for the four fixed shelves, plus the center panel that supports the saw platform.

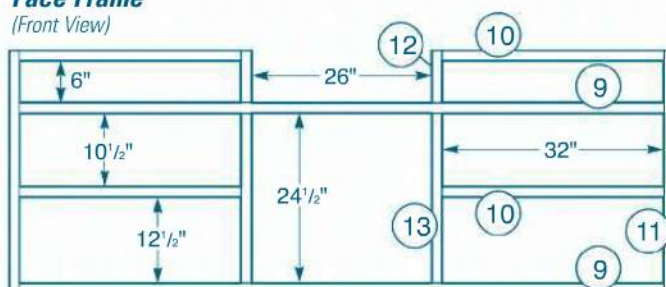
Mill dados in the sides and divider panels to house the cabinet's fixed shelves.

Carcass (Side and Front Views)



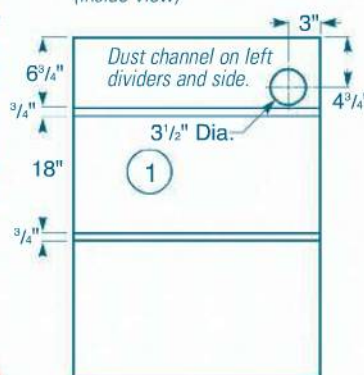
Note: The back panel is flush to the lower edge of the bottom cleat. The skirts are applied after assembly.

Face Frame (Front View)

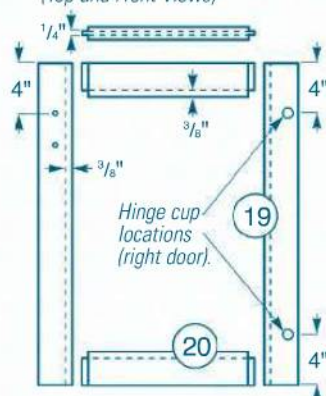


Sides/Divider Panels (Inside View)

The dust chamber wall (piece 8) is located 5/8 inch from the back edge of the side panel. The 3 1/2 inch holes for the dust channel are bored at both ends of the channel.



Door Stiles and Rails (Top and Front Views)

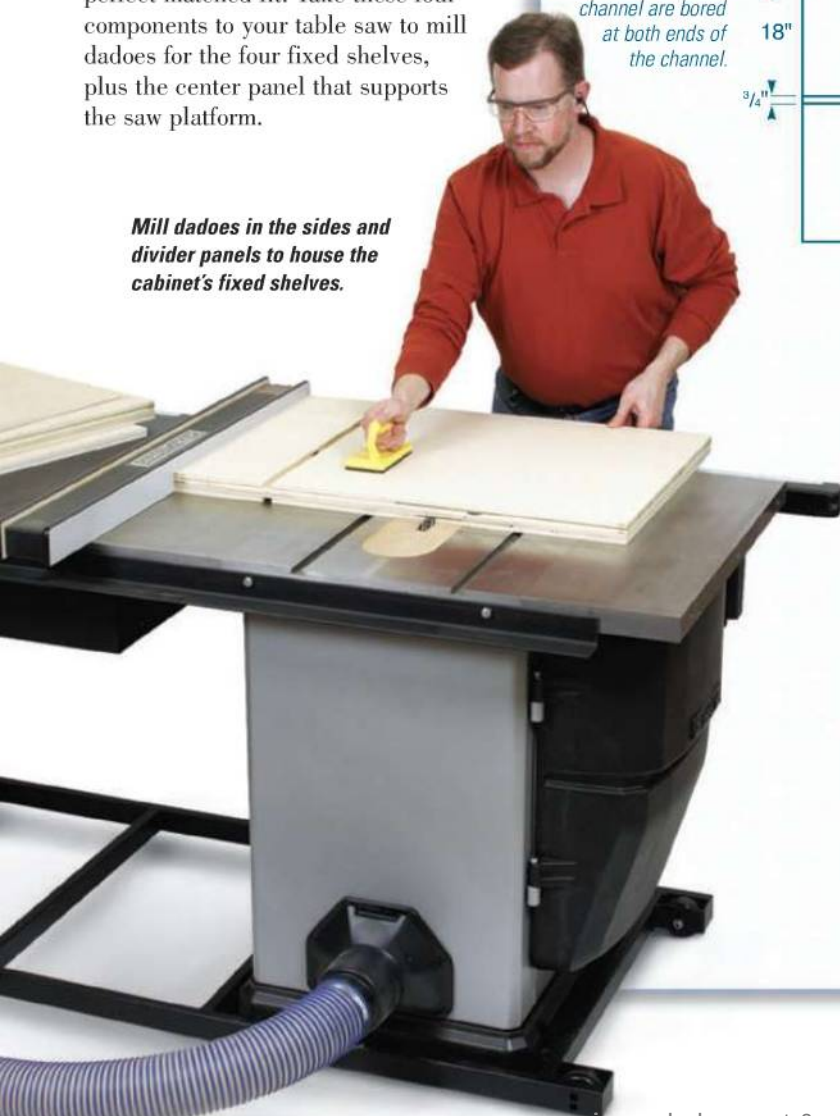


Miter Saw Stand Hardware

The following supplies are available from Woodworker's Journal.

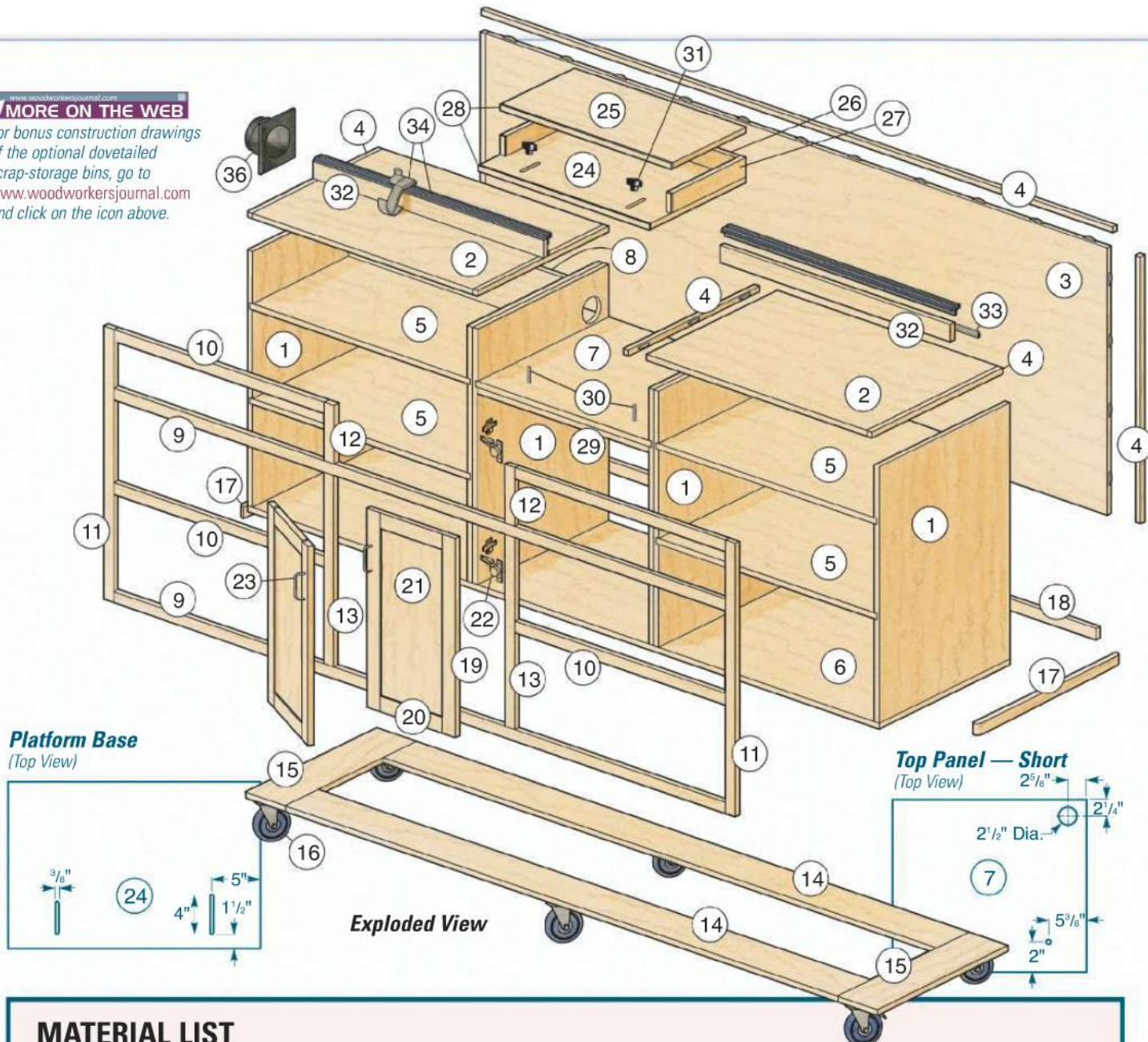
4" Caster (locking) #23030	\$37.99 pr
4" Caster (swivel) #22410	\$27.99 pr
1/2" Overlay Face Frame Hinges #55910	...\$6.99 pr
4" Satin Nickel Wire Pulls #23074	\$5.29 ea
Hanger Bolts (8 pack) #24430	\$3.29 pk
Knobs #71514	\$1.79 ea
i-socket Switch #20890	\$36.99 ea
Kreg Top Trak (2 required) #26358	\$34.99 ea
Kreg Flip Stop #21938	\$29.99 ea
Self-Stick Rule (L to R) #69116	\$9.99 ea
Self-Stick Rule (R to L) #69124	\$9.99 ea
Dust Right Combo Port #28666	\$5.99 ea

To purchase any of these products online, please visit www.woodworkersjournal.com and click on the "WWJ Store" tab. Or, to order by phone, call 800-610-0883 and mention code WE061.



MORE ON THE WEB

For bonus construction drawings of the optional dovetailed scrap-storage bins, go to www.woodworkersjournal.com and click on the icon above.



MATERIAL LIST

	T x W x L		T x W x L
1 Sides/Divider Panels (6)	3/4" x 23 3/4" x 32 3/4"	19 Door Stiles (4)	3/4" x 2" x 25 1/2"
2 Top Panels — Long (2)	3/4" x 23 3/4" x 33 1/2"	20 Door Rails (4)	3/4" x 2" x 10 1/4"
3 Back (1)	3/4" x 34 1/4" x 94 1/2"	21 Door Panels (2)	1/4" x 10 3/16" x 22 3/16"
4 Edging (1)	3/4" x 3/4" x 260 1/2"	22 Hinges (4)	1/2" Overlay Euro-style
5 Fixed Shelves (4)	3/4" x 23 3/4" x 33 1/2"	23 Door Pulls (2)	4" Wire
6 Bottom (1)	3/4" x 23 3/4" x 96"	24 Platform Base (1)	3/4" x 17 1/4" x 26"
7 Top Panel — Short (1)	3/4" x 23 3/4" x 26 3/4"	25 Platform Top (1)	3/4" x 13 1/4" x 26"
8 Dust Chamber Wall (1)	3/4" x 6 3/4" x 32 3/4"	26 Platform Back (1)	3/4" x 2 1/2" x 24 1/2"
9 Face Frame Long Rails (2)	3/4" x 1 1/2" x 93"	27 Platform Sides (2)	3/4" x 2 1/2" x 13 1/4"
10 Face Frame Short Rails (4)	3/4" x 1 1/2" x 32"	28 Platform Edging (1)	1/4" x 3/4" x 57"
11 Face Frame End Stiles (2)	3/4" x 1 1/2" x 35"	29 Hanger Bolt Backer (1)	3/4" x 6" x 26"
12 Face Frame Center Stiles — Short (2)	3/4" x 1 1/2" x 7 1/2"	30 Hanger Bolts, Washers (2)	5/16" Dia. x 3"
13 Face Frame Center Stiles — Long (2)	3/4" x 1 1/2" x 24 1/2"	31 Knobs (2)	T-style
14 Long Bottom Cleats (2)	3/4" x 6" x 84"	32 Fences (2)	3/4" x 2 1/4" x 35"
15 Short Bottom Cleats (2)	3/4" x 6" x 23 3/4"	33 Fence Brackets (2)	3/4" Aluminum Angle
16 Casters (2 locking, 4 swivel)	4" Dia.	34 Tracks (2) and Flip Stop (1)	Kreg Fence System
17 Side Skirt Boards (2)	3/4" x 1 1/2" x 26"	35 i-Socket Switch (1)	Electrical Outlet
18 Back Skirt Board (1)	3/4" x 1 1/2" x 96"	36 Dust Port (1)	4" Plastic



Attach thick edging strips to the long top and back panels with #20 biscuits (top photo). The author constructed the carcass as two subassemblies of shelf banks, building one side at a time (above).



Screw- and brad-reinforced butt joints speed the assembly process along.

Refer to the *Drawings* to cut two large holes in the left divider and side panel for the dust chamber openings. A 3½"-diameter hole saw in your drill press will do it nicely. Ease the edges of these holes.

Set these panels aside, and cut the long top panels and back panel to shape (pieces 2 and 3). Although my buddy Bruce Kieffer favors thinner edging for his plywood projects (see his article on page 24), I like the durability and look of thicker edging. So, I wrapped the ends of the top panels, as well as the top and ends of the back panel, with beefier strips (pieces 4). Attach them with glue and #20 biscuits.

While the glue dries, you can proceed to cut the cabinet bottom, fixed shelves, short top panel and dust chamber wall (pieces 5 through 8) to shape. Bore a hole for your shop vac hose in the short top panel near the back right corner. As tempting as it may be to dive into the big assembly, the smarter approach is to sand all the inside surfaces of the cabinet panels now and finish them while the faces are still fully accessible.

The carcass actually goes together quickly; you can form the joints with #8 countersunk wood screws or 2" brad nails. No glue is really necessary. Here's the process I followed, building one end of the cabinet, then the other: Screw the side panel to the bottom panel, then fasten the back panel to these two with more screws. (*Note: The back panel extends below the bottom panel by 3/4" to allow room for the bottom cleats, later.*) Slip the shelves into their

dadoes in the side panel, and set the divider into place. Drive screws through the divider's top dado to pin it to the top shelf, and lock the shelves to the side panel with more brads. If you're starting with the left bank of shelves, fit the dust chamber wall into position on the top shelf; attach it to the divider and top shelf with screws and to the side panel with brads. Now, repeat this whole assembly process on the other end of the cabinet for the side, shelves and divider.

When all of these components are fastened, slide the short top panel into place between the dividers. Attach the dividers, short top panel and shelves to the bottom and/or back panels with screws. Finally, seal the joints of the dust chamber with a bead of caulk before capping off the shelf banks with the two top panels. Use countersunk screws driven down into the dividers, sides and dust chamber wall, as well as through the back, to secure these joints. Cover all of the screw holes with wood plugs, and sand them flush when the glue dries. Your project is rolling along nicely now.

Adding the Face Frame & Wheels

The face frame is a straightforward assembly. I built it entirely with pocket screws. But, before you rip and crosscut all of the face frame components (pieces 9 through 13), let me make a suggestion: while the *Material List* specifies that all of the face frame parts are 1½" wide — which on a perfect carcass will work just fine — make the short top and long bottom rails about 1/16" wider and the end stiles about this much wider and 1/8" longer than listed. That way,

Fit the face frame parts directly on the cabinet and mark their joints before assembling the frame with pocket screws (third photo from top). Clamp the face frame to the cabinet and attach it with 2" brads (bottom photo).

you'll build in some "fudge factor" to adjust the finished frame on the carcass when it's assembled. Cabinetmakers do this all the time. Trim and fit your face frame parts right on the carcass, holding them in place with clamps as needed, so you'll be assured of their exact placement. Once all of the parts are created, label every joint carefully to keep their orientation clear before removing the loose rails and stiles and boring your pocket screw holes. Assemble the face frame with screws on a large work-surface. Then set and clamp it into position on the cabinet, and nail it home. Remove any overhang on the top and sides of the face frame with a trim router, block plane or belt sander.

At this point, you're nearly ready to tip the project upright — and you can leave it that way for the remainder of the construction process if you install the long and short bottom cleats (pieces 14 and 15) and the six casters (pieces 16) now. I glued and nailed the cleats in place and mounted the casters with 1" lag screws and washers. Grab a buddy to help you right the stand onto its wheels. Add the side and back skirt boards (pieces 17 and 18) to hide the ends and edges of the bottom panel and cleats; I rounded the ends of the side skirt boards first at my disc sander before gluing and nailing the skirting in place.

Building and Hanging the Doors

After all this big-panel construction, the doors will probably come as a pleasant reprieve. Cut the stiles, rails and door panels (pieces 19 through 21) to size, and head to your table saw to mill the panel grooves and stub tenons that hold the doors together. If your door panel plywood is slightly thinner than 1/4" — and these days, it usually is — cut the rail and stile

grooves to fit the panels snugly. Make the stub tenon thickness on the ends of the rails match the groove width, and mill the tenons 3/8" long. Sand the door parts thoroughly before gluing and clamping them together. Follow the instructions that come with the 1/2" overlay Euro hinges (pieces 22) that will mount these doors to the face frame. You'll need to bore pairs of 35mm hinge cup holes into the door stiles, attach the hinge hardware and then mount the hinges and doors to the cabinet. It's easier to do than you might think. Once the doors are in position on the project, adjust the hinges to align the doors with one another. Go ahead and install the door pulls, too (pieces 23).

Making the Saw Platform

It's time to outfit your saw for its new home, and that means building the moveable platform. Cut the platform base (piece 24) to size, and mill two slots for hanger bolts with a 3/8"-diameter straight or spiral bit in your router table. Now, glue strips of edging (pieces 28) to the base as well as to blanks of plywood for the platform top and sides (pieces 25 and 27). Trim the edging flush. Before you cut the sides and back (piece 26) to final width, verify this measurement considering the exact height of your saw's base; you want to make sure the saw will meet the support tables flush when mounted on the platform. Sand and finish the platform parts now before screwing or nailing it together.

Drill holes in the platform to suit your saw's mounting configuration, and bolt the saw to the platform. I used carriage bolts, washers and

Install a pair of locking swivel casters on the front corners of the cabinet with short lag screws and washers. The other four casters do not need to be locking style.



All of the door joinery can be tackled at the table saw with a dado blade. Here, the author cuts stub tenons on the ends of the rails after plowing the panel grooves.



A drill press is the best tool for boring 35mm stopped holes in the door stiles for hinge cup hardware. Use a clamped fence to secure this operation as well as to index the hole positions.





The author mounted his saw to the platform with carriage bolts and locking nuts (left). Use the platform's slots to help determine where to locate and install the hanger bolts (inset). Wrench them into place with a pair of nuts tightened against one another.

nylon lock nuts. Now, set the platform into place on the cabinet, and use the slots to reference where to drill pilot holes for the hanger bolts (piece 30). Locate the bolts $4\frac{1}{2}$ " from the front of the cabinet. Before drilling those holes, fasten a backer board (piece 29) up inside the cabinet to give the hanger bolts a thicker mounting substrate. Install the hanger bolts.

Adding the Fences

The fences consist of three parts: a wooden body (piece 32), a strip of aluminum angle (piece 33) that secures it to the cabinet and, of course, the Kreg aluminum flip-stop track on top (piece 34). Cut and assemble these fence parts with #10-3/4" panhead sheet metal screws to create two long fence units. When mine were ready, I mounted them $9\frac{1}{2}$ " back from the front edge of the support tables with more panhead screws. That fence placement enables my 12"-diameter miter saw to crosscut stock to its full capacity. It also allows enough room in the hanger bolt slots to move the platform backward for attaching backup boards to the saw fence or forward for opening the saw's fences to make bevel cuts. You may need to adjust the location of these two fixed fences to suit your saw's styling and cutting range.

Wrapping Things Up

Whether you build scrap bins for your project like I did is up to you; you might want to devote the entire shelf space to longer cutoffs. If you do build bins, I sized mine to $15\frac{1}{4}$ " x 18" and used through dovetails for joinery. There are measured drawings for the bins online. See page 43.

As far as electricals go, I think Rockler's i-Socket (piece 35) is a great add-on to this stand, because it activates the vacuum every time you squeeze the saw's trigger. But, you'll need to install a receptacle and long cord inside the cabinet to plug in the i-Socket, or use a power strip. I chose the former option and wired my outlet with a length of 12-gauge extension cord and male plug. It can handle the start-up amperage of both tools.

With all of the inside details now completed, give the outside of your project a thorough sanding, and apply finish to whatever surfaces are still bare. Install the dust port (piece 36) over the dust chamber hole on the left side of the cabinet with a bead of caulk to create an air seal, and attach it with four screws.

Whew, this was a big project, but one you won't regret building. Now you've got a full-duty miter saw station and a handsome shop addition to boot. I hope you enjoy using it!

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



Assemble the three components of each fence unit with panhead screws (middle photo), then install them on the support tables with more screws. Align them carefully with one another first using a long straightedge (left photo).

Install the dust port over the dust chamber opening with a bead of caulk and four screws (right photo).

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Today's Shop

Loose Tenon Joinery Options

By George Vondriska

Here are five tools that make loose tenon joinery a breeze.



If you've ever used dowels to join wood, you already have experience with loose tenon joinery. Loose tenons can be used any place you'd use a traditional mortise and tenon and, with some of these tools, many other places, too.

The five tools in this story make joinery much easier than a doweling jig. With prices ranging from \$30 to \$775, it's up to you to pick which makes the most sense for your shop and your checkbook. (Note: the biscuit joiner I used represents biscuit joiners as a group, rather than being evaluated as an individual model.)

Loose Tenon Variations

The loose tenons vary among the five tools, as shown in the top right photo, next page. The Freud machine bores holes for dowels. The Festool, beadLOCK and JessEm tools make wide and deep slots, and biscuit joiners cut wide but relatively shallow slots. From a strength-of-joint perspective, I like the deep mortises I can get from Freud, Festool, beadLOCK and JessEm. All four of these tools provide deeper penetration into the mating pieces than a biscuit joiner does. Deeper penetration provides greater resistance to racking and breaking. Imagine kids jumping on the bed you assembled with loose tenons. Long tenons (deep mortises) make more structural sense than short ones.

How They Work

Let's have a look at the basics of how these different tools make their mortises.



There are two versions of the beadLOCK jig available, but their basic functions are similar. Each allows you to drill a series of overlapping holes, as shown in the photo at right. You'll drill three holes with the drill guide in position one, then two more with the guide side shifted to position two. Stops make it easy to hit both positions perfectly. The three holes on the left end of the guide are used when drilling one part of the joint, and the other three holes are used when drilling the mating part. The drill guide in the Basic beadLOCK has just three holes.

The two JessEm Zip Slot Mortise Mills also rely on a handheld drill, but it's used differently. The drill bit that comes with the Mills looks a lot like a router bit. Make a mortise by pressing down lightly on the running drill and moving the jig's handle back and forth. Each pass back and forth becomes progressively deeper, creating a mortise in the workpiece.

There are a variety of ways to use biscuit joiners and the Freud and Festool machines, but the most common is to register off the fence, as shown at bottom right. An index line on the tool is aligned with the layout line on the work, and you're ready to cut. Depth of cut is controlled by a plunge stop on the tool.

Making Assembly Easy

Three of these tools — biscuit joiners, JessEm and Festool — allow you to cut a mortise that's longer than the loose tenon material. This allows for



The beadLOCK system relies on a movable drill guide, which allows you to drill five overlapping 3/8" holes by using the guide in two positions.



Run the drill, press down lightly, and move the handle back and forth to make a mortise with the JessEm Zip Slot Mills.

some side-to-side adjustment, while maintaining accuracy up and down. Imagine you're using a number of loose tenons to fasten a solid-wood edge to plywood. If you miscut the position of any one of the mortises, you may not be able to assemble the joint. On biscuit joiners you get what you get; you can't control the length of the mortise. With JessEm and Festool, you can control the width so that if you want a tight fit, you can make that happen. If you want a slightly longer mortise, you can make that happen, too.

The Freud FDW710K machine doesn't make elongated cuts, but then, it doesn't really have to. Along with the Festool Domino, the Freud has been designed to make accuracy much easier. With them, you can make one cut, then seat a spring-loaded pin on the machine in that cut to locate it for the next cut. Indexing is pretty automatic. The pin is built into the FDW710K, and it is an accessory (\$60) for the Domino. This spring-loaded pin is a great feature that means you only have to lay out the position of one joint, from which you can accurately index for other cuts.

Reinforcing Miters

Three machines — biscuit joiners, FDW710K and the Domino — allow you to reinforce an angled cut, as shown on page 50. These tools have fences that can be set at a variety of angles. JessEm and beadLOCK, on the other hand, are designed to be used when the edge you're cutting the mortise into is perpendicular to the face.

Continues on page 50 ...

Each of these tools creates a slightly different mortise. The Freud FDW710K, Festool Domino, the beadLOCK and JessEm provide the deepest tenon penetration.

This setup (below) is common to the Freud FDW710K and Festool Domino, as well as to biscuit joiners. A layout line is used to locate the machine, and the running tool is plunged into the work. The fence controls the distance from the face of the piece to the mortise.



Today's Shop continued



The Freud FDW710K, Domino and biscuit joiners can be used to add loose tenons to an angled surface, like this miter.



Case joinery requires mortises in the middle of a piece, and in an edge. This can be done with biscuit joiners, the Freud FDW710K machine or with the Festool Domino, but not with the others.



Two boring bits on Freud's FDW710K Doweling Joiner make quick work of drilling equally spaced shelf pin holes.

Joining Small Stuff

The last thing you want is for a mortise to show through the edges of your workpiece. The narrowest piece any biscuit joiner can be used on, even using a small #0 biscuit, is 2 1/8", as shown in the far right photo, next page. So, if you want to use loose tenons to assemble a 1 1/2"-wide face frame, biscuits aren't your answer. All of the other machines will do it. On the FDW710K, one boring bit can be removed so you can locate the single remaining hole wherever you want for tighter spacing. beadLOCK and JessEm tenon material can be ripped to provide narrower pieces for shorter mortises. And the narrowest Domino tenon is about 3/4" wide.

Some biscuit joiners are capable of accepting a smaller diameter cutter that will allow biscuit slots in narrower pieces — but if the machine wasn't designed for this, it can't be done. If you're in the market for a biscuit joiner, this is a feature worth looking for.

If you're looking to create a butt joint in a case, you'll need mortises in the middle of a piece. Biscuit joiners, along with the FDW710K and Domino, will do this work, allowing you to use loose tenons in place of dados.

Summing Up

With the range of prices on the tools in this article, there's got to be something here that fits

The ubiquitous biscuit joiner certainly has its place in a shop, but other tools here bore deeper mortises for making stronger joinery.

your wallet. So, let's sum up the features and benefits.

You just can't go wrong with the beadLOCK Basic Kit. It's inexpensive, and you'll get lots of joinery out of it. But, as with the other beadLOCK jig and the JessEm Pocket Mill, you'll be testing your eyes each time you locate the jig on your layout lines.

The large Zip Slot Mill is easy to index on your work, and can cut a versatile array of mortise sizes.

The beadLOCK Basic and JessEm Pocket Zip can't get a mortise in the center of a 4 x 4. Any of the other tools can.

Biscuit joiner models are plentiful, there's probably one in your price range, and they're pretty intuitive to use. But, as you've seen, they've got their limitations.

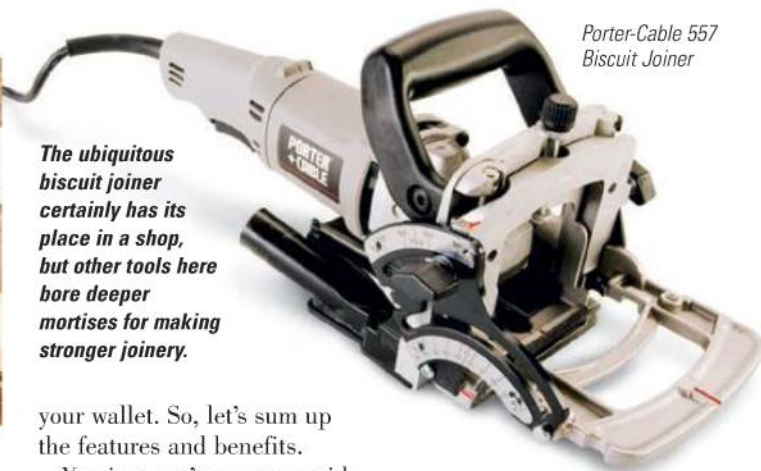
The Festool Domino and Freud FDW710K take a bigger bite out of your checkbook but provide more functionality. The ease of indexing from one cut to another is a great benefit, and you'll certainly get the most versatility out of these machines.

The beadLOCK system relies on a movable drill guide, which allows you to drill overlapping 3/8" holes by using the guide in two positions.

beadLOCK Basic



Porter-Cable 557 Biscuit Joiner



beadLOCK

The beadLOCK Pro costs about \$120, while the Basic Starter Kit is about \$30. Each kit comes equipped to make 3/8" mortises, and additional drill guides are available for 1/4" and 1/2" mortises. They're under \$20 each for the Basic Kit and \$40 each for the Pro.

The Basic Kit uses shims to control the position of the holes relative to the face. On the Pro, this is done by sliding and locking the drill guide assembly into position. Adding all the shims to the Basic will make the center of your mortise about 1 1/8" from the face, on center. The Pro allows you to get to the center of a 4 x 4 (nominal). Index lines on the jig must be aligned with layout lines on your work to properly position the guides.

Along with drill guides, the Pro provides mortise paring guides. Drill the holes, swap the hole guide for a paring guide, and use it to guide a chisel to change from

beadLOCK Pro



overlapping holes to a conventional mortise.

I like the large tenon material (deep penetration and lots of glue surface) this system uses. You can also choose not to drill the overlapping holes and simply use the headLOCK tools as doweling jigs.

Aligning the jigs across the thickness of the material is easy, but you'll need to lay out and position the jigs on all your layout lines.

Biscuit Joiners

Prices range from about \$100 to \$999. The Porter Cable 557 shown here costs about \$210.

Biscuit joiners have been around and getting attention for a long time. They're fast and easy to use. My two biggest complaints with them are their shallow penetration into the mating pieces and the length of the slots, which limits their use on narrow parts. I'd love to see side-to-side indexing added to biscuit joiners, like that found on the Freud and Festool machines.

Festool Domino

The DF 500 Q shown here runs \$775. The Domino consists of a single router-bit-like cutter. When the machine is turned on, the cutter spins and oscillates side to side. Like a biscuit joiner, the cutter is plunged forward into your material, resulting in a mortise. The unit comes with a 5mm cutter. Additional

cutters are available at about \$35 each, up to 10mm.

The Domino is very fast and easy to use, and it cuts deep mortises, providing the speed and ease of use of a biscuit joiner, while overcoming a biscuit's shortcomings. Accessories are available such as the Trim Stop, \$50, that makes it easier to locate small parts on the machine, and the Handrail Fence, \$60, which lets you put a tenon into hand rail corners.

Freud

The FDW710K shown here is available for \$329. Freud's Doweling Joiner operates like a biscuit joiner, but it uses two boring bits to make holes a perfect 32mm apart. It provides a very fast and accurate way to dowel parts together and can also be used as a boring machine, such as for making shelf pin holes. The hole spacing also lends itself to installation of European hardware.

This machine comes with 1/4" bits. Additional bits are available, up to 1/2", for \$8 or \$28 each. While this machine doesn't use the large loose tenons the other tools use, it

does offer additional versatility as a boring tool. Keep an eye on this machine, as I've heard that some changes are on the way.

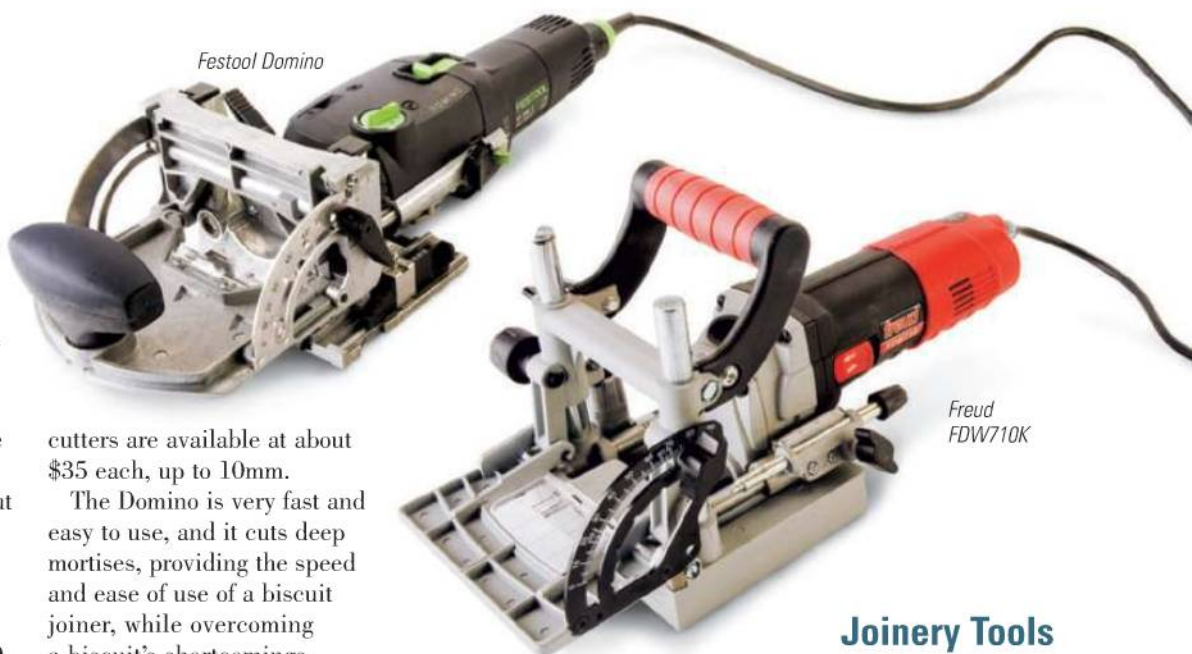
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The Zip Slot Mortise Mill runs about \$250, and the Pocket Zip Slot Mortise Mill is about \$100. The Pocket Zip Slot comes set up to make 1/4" mortises, while the Zip Slot is set up to make 3/8" mortises. Bushing and drill bit sets for 1/4" and 1/2" mortises are available for the large mill, at \$25 and \$33 each. The Pocket Zip is limited to 1/4" mortises.

Setting the mortise position relative to a face is easy with both jigs. The Pocket maxes out at 1" from the face to the center of the mortise; the large mill at 2". When using the Pocket Zip, you set the jig to a layout line to position it on your work. The larger Zip includes a built-in ruler and stop system that makes repeatability much easier.

You can move the handle to each extreme of its travel and simply drill a hole, using either Zip Slot jig as doweling jigs, which works well. The drilling process is slow compared to biscuit joiners, Freud, and Festool.

George Vondriska is proprietor of the Wild Earth Woodworking School, www.aboutwildearth.com.



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How do loose tenons stack up on narrow pieces? This bottom workpiece is 2 1/2" wide, and the slot for a #0 biscuit is busting through the edges. The other tools would all be better choices for narrow stock.

Oscillating Spindle Sanders

By Sandor Nagyszalanczy

These modern benchtop machines can save you time and effort in your shop. Which of these feature-rich spindle sanders is right for you?



Craftsman 21500



Delta SA350K



General International 15-220M1



RIDGID EB4424



Triton TC450SPS

If I had to compile a short list of “my least favorite things to do in the woodshop,” then sanding would certainly be somewhere up near the top of the list, along with searching for lost tools and cleaning out the shop vacuum. Let’s face it, sanding wood surfaces smooth is usually a tedious, dusty business. Luckily, there are modern machines like the oscillating spindle sander to help make sanding less of a chore.

If you’re not familiar with this simple yet ingenious machine, an oscillating spindle sander (OSS) has an abrasive-sleeve-fitted rubber drum on a metal spindle sticking up through a metal table. As the motorized spindle and drum rotates, a mechanism oscillates it up and down repeatedly. The oscillation distributes the sanding load onto a greater area of the drum and thus reduces performance-robbing heat and clogging of the abrasive. Better still, the motion reduces sanding scratches, for a smoother final surface on the workpiece.

In the woodshop, an oscillating spindle sander is the perfect tool for sanding curved edges, especially concave edges on parts like shapely legs, rocking chair rockers or the arching frame

of a bed headboard. An OSS can tackle convex or straight edges and narrow faces on smaller parts as well. You can also sand a curved slot or other open shape cut in the middle of a workpiece, as long as you can slip it over the end of the sanding drum.

A decade ago, most OSS units were full-sized, freestanding machines. But unless you plan to do some pretty heavy sanding day in and day out, it’s more practical and affordable to buy a benchtop OSS model. These portable machines are easy to set up and use when needed, then stow out of the way when sanding is done. To find out which of the current crop of benchtop machines are best for small shops, I tested five models with a thrifty-woodworker-approved street price under \$500: The Craftsman #21500, Delta SA350K, General International 15-220M1, RIDGID EB4424 and Triton TC450SPS. I wanted to include the JET JBOS-5 (a tool which looks extremely similar to the General 15-220M1), but the company was not able to supply a test unit in time for this review. Also, I asked Grizzly to send their model G0538 to be included in the test, but they chose not to participate in the review.

Commonalities and Differences

All five sanders are compact machines with either cast-iron or cast alloy tables and plastic or sheet metal bases. Two models, the General and RIDGID, have tilting tables that allow you to sand beveled edges; the other three have fixed tables. Four of the five employ a capacitor start induction motor, the kind used in stationary power tools; only the Triton uses a universal motor, the kind found in portable power tools. Each machine has its own unique oscillating gear mechanism.

All OSS models feature interchangeable sanding drums of various diameters, for sanding concave curved areas of various radii (see photo below). Selecting the largest diameter sanding drum that fits the radius of the workpiece makes it easier to



An oscillating spindle sander’s interchangeable drums let you set up the machine to effectively sand concave curved edges of different diameters.

sand curves smoothly. The five benchtop models come with drums/sanding sleeves ranging from 1/2" (5/16" for the General) to 2" or 3" in diameter. The RIDGID also comes with an oscillating belt sander assembly that interchanges with the sanding drums. All six models have on-board storage for the sanding drums, table inserts (these fill the space between the table and various diameter sanding drums), wrenches and accessories.

Testing 1, 2, 3...

I spent a considerable amount of time putting each of the five benchtop OSS models through its paces, sanding miles of serpentine edges in both hard and soft woods. I also sanded curved beveled edges with both models that feature tilting tables. I wanted to evaluate how easy the unit was to use and how much effort it took to change sanding drums. Naturally, I wanted to see how the machines compared in their sanding performance, both how strongly their motors ran during heavy sanding and how smoothly power was delivered via their oscillating mechanisms. I was also curious to see if machines with longer spindle strokes and/or faster oscillations per minute sanded more aggressively or not. Finally, I considered other features, such as each model's weight and portability, as well as the effectiveness of its built-in dust control. Here's what I discovered.

Craftsman 21500

This attractive model has a silvery plastic base and a round 18"-diameter fixed cast-iron table. It features slots and recesses to house all the accessories (drums/sleeves, table inserts, washers and locknut), and the stuff stays in place nicely — doesn't fall out when the unit is moved. It's also the only OSS with a built-in cord storage that keeps the cord neat and out of the way during transport and storage; nice. The Craftsman is physically larger than most of the other sanders, so it's a bit bulkier to store.

*Continues on
page 54 ...*

Portable, powerful and durable, today's oscillating spindle sanders are useful tools for almost any woodworking shop.



Tool Review continued



Craftsman 21500

Table size and construction / tilt: 18" dia. round cast-iron / non-tilting

Motor type / amperage: Induction / 2.6 amps

Stroke length / strokes per minute (spm): 1" / 30 spm

Sanding drum length: 4½" long

Sleeve diameters: 1½", 3¼", 1", 1½", 2", 3"

Weight: 52 lbs

Price: \$279

www.craftsman.com • (800) 349-4358

Despite its small 2.6-amp motor — the lowest amperage motor in the group — the 21500 performed with surprising power, bogging down only a little when sanding thick hardwood workpieces using the 3" drum. The unit does vibrate a bit more than the General — the smoothest in this group. The Craftsman has a small impeller on the spindle under the sanding drum that aids dust collection when connected to a shop vacuum. The unit did an excellent job of sucking up

fine dust from around the drum through the slots cut in the table inserts.

Drum changes were easy with the Craftsman, thanks in part to its spindle-locking nut, with a star-shaped knob that allows changes without a wrench. The 21500 also comes with matching sets of table inserts and a complete set of washers, each of which works with a specific diameter sanding drum. A sleeve on the bottom of the locking nut fits perfectly into the hole in each washer, thus centering it automatically; very nice!



A rubberized knob locks a sanding drum on the Craftsman's spindle, allowing quick, tool-less changes from one drum diameter to another.

General Int.'l 15-220M1

With its all-sheet-metal base, heavy cast-iron tilting table and powerful motor, the General International 15-220M1 is the heavy hitter in this group. At 81 pounds, its hefty weight makes it more of a stationary machine lacking a floor stand than a portable benchtop machine.

Unfortunately, its price also sets it apart from the other four sanders in this group: It's \$122 more than the next-closest-in-price Delta.

Another thing that distinguishes the General from other OSS machines is its spindle setup: To change to a sanding drum of a different diameter, you remove and replace the entire spindle/drum assembly. Each assembly has a threaded end just below a short tapered section (centering the spindle) that screws into a socket atop the motor/gearbox assembly. The good news is that spindle changes don't take any more time than drum changes do on other OSS models. Plus, if you

should be unlucky enough to bend a spindle (it happened to me once when I was sanding inside a curved cutout, and the drum caught the part and slung it around violently) you simply replace the spindle, instead of having to send the entire machine out for repair.

In keeping with its serious machine character, the General's spindles are 1" to 1½" longer than the other four models. These longer spindles are most useful if you plan to sand thick workpieces, especially with the table tilted (when sanding thinner parts with all OSS machines, reversing the sandpaper sleeve on the spindle lets you get twice as much life out of it). The smallest of the General's five standard spindles is only 1¼" in diameter, which I found very useful for cleaning up tight curves on delicate fretwork and scroll-sawn parts. I wish that the other spindle/drums were more evenly spaced in regard to diameter: There's too small a difference between the

General International 15-220M1

Table size and construction / tilt: 14½" square cast-iron / 0-45° tilt

Motor type / amperage: Induction / 7.5 amps

Stroke length / strokes per minute (spm): 15/16" / 29 spm

Sanding drum length: 6" or 5½" long

Sleeve diameters: 1/4", 1/2", 5/8", 1½", 2"

Weight: 81 lbs

Price: \$468

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Sanding drum changes on the General involve swapping out the entire spindle/drum assembly (photo, left). With its table tilted and its special throat plate, sanding beveled edges on the General 15-220M1 is very easy.

1/2" and 5/8" drums and too big a jump between the 5/8" and 1½" diameter drums.

Also, the biggest drum is only 2" in diameter, which I didn't

find as useful for sanding larger-diameter curves as the 3" diameter drums supplied with other OSS models.

Continues on page 56 ...

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When it comes to sanding performance, the 15-220M1 simply leaves the other four models in the dust. Its large 7.5-amp induction motor and oscillating mechanism's sealed gearbox deliver tons of silky-smooth power that makes the machine a pleasure to use even when sanding the thickest, hardest workpieces with gusto. I liked the General's oversized paddle On/Off switch, which allows you to turn it off with a quick bump of a fist — no searching for a tiny off switch when something goes wrong and you need to turn the tool off in a hurry. My only disappointments were with the General's table. Although the table surface is beautifully finished, at 14½" square it felt a bit undersized when I was sanding larger workpieces. The tilt mechanism worked fine, and I liked the adjustable stop for setting the table square. However, the handles and locking hardware felt just a bit undersized for

the machine's otherwise heavy-duty nature.

Triton TC450SPS

The least expensive OSS in the group, the Triton is physically the smallest and most compact sander I've seen. This makes the unit very easy to lift and carry, but it's important to clamp or bolt the base down before use.

One of the first things I noticed about the TC450SPS is its unusual table that's shaped a bit like a canned ham. The spindle is offset in the tabletop, close to the front at one end, which puts smaller workpieces within easy reach. The wider end of the table is farther from the spindle, and hence better supports larger/longer stock. This ingenious arrangement keeps the table small while still offering good functionality. All that said, I still liked the larger tables on other sanders better, as they offered better overall support.

Triton TC450SPS

Table size and construction / tilt: 14½" x 11½" cast-iron / non-tilting
Motor type / amperage: Universal / 3.5 amps
Stroke length / strokes per minute (spm): 5/8" / 58 spm
Sanding drum length: 4½" long
Sleeve diameters: 1/2", 3/4", 1", 1½", 2", 3"
Weight: 32 lbs
Price: \$149
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The Triton's small worktable has an unusual shape with an offset spindle to provide more support for large workpieces at the back of the table.

The Triton's the only OSS in this group that uses a universal motor — the kind used in portable power tools (a handheld router, for example). The motor's high-RPM whir and belt-driven spindle assembly made it seem much louder than the other OSS models in the group; loud enough that it made me don earmuffs. Although the Triton's motor amperage is rated the same as the Delta's, it definitely didn't sand with as much power. Couple that with its short 5/8" spindle stroke — the smallest stroke of any sander in this group — and the Triton had the overall weakest sanding action. It's certainly adequate for lighter sanding jobs, and its low price and compact size might make it a good choice for wood hobbyists and DIYers with limited budgets and workspaces.

RIDGID EB4424

With its large rectangular cast-alloy tilting table, the RIDGID EB4424 looks different than the other OSS models, for a good reason: It comes with a unique 4x24 belt assembly that interchanges with a standard set of drums. The assembly slips onto the RIDGID's spindle to transform the machine into an oscillating belt sander. The large, flat surface of belt makes short work of sanding both convex and straight parts with ease. Because the belt has lots more surface area than a sanding drum, it's less apt to clog with sanding swarf and the abrasive wears out less quickly than drum sleeves. RIDGID doesn't include a 3" sanding drum with the unit, instead relying on the 3" diameter roller at the fat end of the belt to

Continues on page 58 ...



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“Let’s face it, sanding is a tedious, dusty business. Luckily, there are machines like oscillating spindle sanders to make it less of a chore.”

handle large concave sanding jobs. It works pretty well, except that the roller’s orientation relative to the table leaves little support for some large or long workpieces.

To sand beveled and chamfered workpieces, the RIDGID’s table tilts up to 48°. A rubber overmolded locking knob makes tilt table adjustments very comfortable. A simple detent device helps set commonly-used tilt angles: 0, 15, 22.5, 30 and 45

degrees. However, it lacks any positive engagement, so I’d use a protractor if sanding angle is critical. The table can be used with sanding drums, but it’s far more practical to use with the belt assembly. A miter slot in the table accepts any miter gauge or accessory with a standard 3/4" x 3/8" bar. Although a gauge is not supplied, it’s very handy to be able to accurately guide workpieces, say when sanding square or mitered ends on long parts.

The RIDGID’s 5-amp induction motor does a fine job of powering both the sanding drums and belt assembly; I didn’t feel it was wanting except when I sanded the ends of some 3x3 oak parts with the belt and really pushed hard. Although the unit’s sanding action was reasonably smooth, there was a certain amount of vibration produced at the top and bottom of the spindle’s stroke even when a drum or belt was simply idling.

Like the Craftsman, the RIDGID features tool-less changes for its sanding drums and belt assembly. A bright orange graphic on the lock nut’s knob offers a helpful reminder that the nut is reverse threaded and thus “lefty tightly, righty loosey.” The RIDGID’s long table insert, which fills the large tapered space left when the belt assembly is swapped out

for a sanding drum, is a thin plastic plate that was a bit warped, so it couldn’t be completely leveled.

The EB4424 has a good sized dust collection port, which must be connected to a shop vacuum during sanding. Otherwise, the sanding dust collects around the drum and table very quickly. The RIDGID’s plastic base has recesses molded into it that allow it to be mounted atop a pair of sawhorses — ingenious and handy.

RIDGID EB4424

Table size and construction / tilt: 18 1/2" x 16 1/4" cast alloy / 0-48° tilt

Motor type / amperage: Induction / 5 amps

Stroke length / strokes per minute (spm): 3/4" / 60 spm

Sanding drum length: 4 1/2" long

Sleeve diameters: 1/2", 3/4" 1"; 1 1/2", 2", 4" x 24" belt

Weight: 40 lbs

Price: \$199

www.ridgid.com • (800) 474-3443



A miter slot in the EB4424’s cast alloy tilt table allows you to use a standard miter gauge to guide parts past the sanding belt or drum.



The RIDGID’s unique belt assembly fits over the sanding drum spindle and transforms the benchtop machine into an oscillating belt sander.

Delta's oscillating spindle sander features a unique mechanism that smoothly moves its entire induction motor and spindle mechanism up and down.



Delta SA350K

Table size and construction / tilt: 18" dia. round cast-iron / non-tilting
 Motor type / amperage: Induction / 3.5 amps
 Stroke length / strokes per minute (spm): 7/8" / 60 spm
 Sanding drum length: 4 1/2" long
 Sleeve diameters: 3/4", 1", 1 1/2", 2", 3"
 Weight: 45 lbs
 Price: \$346

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A fabric dust bag on the SA350K offers a convenient way of catching dust, but for best collection, all power sanders should be connected to a shop vacuum.

shapes. There are no corners for parts to hang up on, and a round table supports large or long parts regardless of their orientation.

The overall fit and finish of the Delta is very good, and I liked the removable storage trays that house the sanding drums, table inserts and accessories. The Delta doesn't include a 1/2"-diameter sanding sleeve with their OSS. That's odd, since all the other models — even Delta's old B.O.S.S. models — include one (fortunately, you can buy a regular 1/2" x 4 1/2" sanding sleeve that fits directly onto the SA350K's spindle).

In use, the Delta exhibited strong, smooth sanding performance, thanks to its 3.5-amp motor, sealed gearbox and mostly metal oscillating mechanism, which features bronze bearings to guide its motor and spindle assembly up and down. This

is unlike the mechanisms on all the other OSS machines, which move only the spindle assembly up and down. Even though the Delta's stroke is very slightly shorter than the Craftsman's, it sanded with a little more aggressiveness, perhaps due to its rapid 60-strokes-per-minute oscillation — twice as fast as the Craftsman.

The SA350K is the only OSS that includes a dust bag, and it actually provides decent dust collection, thanks to a small fan at the base of the spindle. This lets you run the sander without a shop vacuum — convenient if you're working outdoors or away from the shop. But the woven fabric doesn't trap fine, respirable particles. For best collection, I recommend connecting the Delta — or any of the other models — to a shop vacuum or dust collector whenever possible.

Which One's Best?

So there you have it, five very different benchtop oscillating spindle sanders, each with its own particular blend of construction, features and performance. Curiously, unlike other power tool categories I've reviewed (belt sanders, cordless drills, etc.), one thing that really struck me about these sanders was just how truly different most models were from each other. While the Craftsman and Delta share the most family resemblance, the General, RIDGID and Triton are very different beasts indeed. The fact that all five models worked relatively well inspired me to go ahead and make suggestions about each one: If you have the need for a really heavy-duty machine and your shop space and wallet are ample, I have no reservations about recommending the sturdily constructed General 15-220M1. If, on the other hand,

your sanding needs (and budget) are small, the affordable Triton TC450SPS will likely serve you well. And if a versatile benchtop sanding center is at the top of your wish list, the RIDGID EB4424's dual-duty oscillating spindle and belt setups offer a lot of bang for the buck.

But which model gets my vote as the "Best Bet?" While the Craftsman 21500 offers an attractive machine for the money, I have to give the nod to the Delta SA350K. Its slightly larger motor, good dust collection and beefier oscillating mechanism that delivers smoother sanding performance, all at a moderate price, make it a great overall choice.

Sandor Nagyszalanczy is a furniture designer/craftsman, writer/photographer and regular contributor to Woodworker's Journal. His books are available at www.sandorsworkshop.com

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If spring has sprung, it's possible, just possible, that you have hobbies that may sometimes take you outside the shop. If one of those hobbies is fishing, you may find it fun to combine your two interests with the new book from **Fox Chapel Publishing**, *Making Wooden Fishing Lures* by Rich Rousseau. The book (ISBN # 978978-1-56523-446-8) includes plans for 11 lures (surface, floating/diving and sinking), plus info on wood and paint selection, and attracting certain species of fish. It's also sprinkled with "fishy facts" — such as, for instance, that most fish can spot blue and purple lures in deep water. The book's priced at \$19.95.

When you are in the shop, there inevitably comes a time when you have to clean up after yourself. **Trend's** new *Tool & Bit Cleaner* is supposed to make that task easier when it comes to your tools. You spray it on, then wipe it off, to remove resin, pitch and other gunk from your saw blades, drill bits,

Painter's Pyramids® Finishing Turntable™



Making Wooden Fishing Lures book

files, etc. It's formulated to lift the dirt away from the tool, rather than eating through it, with a composition that is biodegradable, nontoxic and nonflammable — plus offers rust and corrosion protection. An 18-oz. bottle of Tool & Bit Cleaner costs \$11.65.

Keeping stuff clean while you're finishing it is one advantage of the *Finishing Turntable™*. From the makers of the **Painter's Pyramids®**, the Finishing Turntable supports, elevates and rotates your projects on a lazy Susan-like base so that you get easy access to lower edges, don't have to touch the project with your hands to move it (thus avoiding smudges) and are able to apply touchups without waiting for a coat to dry. You can use it for stripping, staining, painting, routing and finishing projects by hand, brush and spray applications. The Finishing Turntable costs \$49.99 and is currently available at rockler.com.



Trend's Tool & Bit Cleaner

Requests from woodworkers with small shops, who wanted a wide jointer, led

Grizzly to create the G0706 12" Jointer, which has a combined table length of 60". Those tables include cast-iron infeed and outfeed tables that can be adjusted independently.

The fence, too, is cast-iron, with positive stops at 45°, 90° and 135°.

The 3hp motor drives an indexed cutterhead outfitted with 60 carbide inserts, each of which has four sharp edges that can be loosened and rotated to a fresh edge without extra knife-setting. Other amenities include a pedestal-

Continues on page 64 ...





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What's In Store continued



Grex® Genesis.XBi airbrush



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mounted On/Off switch, heavy-duty steel cabinet and a 5" dust port. The G0706 has a street price of \$2,195.

The *Portable Carpentry Workshop* from **Rolling Trades** is also an invention that grew out of practicality: it was developed by a carpenter who was sick of spending so much of his time on setup of his tools. Now, Leon Cona's PCW can also help those woodworkers who work on a jobsite — even if it happens to be, say, your driveway or backyard.



Rolling Trades' Portable Carpentry Workshop



Grizzly G0706 12" jointer

The rolling workbench/cabinet stores a table saw, miter saw, router and more in a lockable cabinet with an internal power strip that allows the tools to work from a single plug. It features an extension table, telescoping arms and sliding configurations that help support lumber, allowing you to cut up to 4x8 sheet goods without assistance. The PCW measures 28" wide and 66" long and costs \$4,850.



MicroStop from MicroFence

When you finish a project, except for the finishing, **Grex®**'s new *Genesis.XBi airbrush* lets you blast lots of paint through the .5 mm nozzle, but retain control of fine lines due to the tapered design. A patent-pending feature is the Quick-Pull™ handle, which lets the user flush the nozzle without removing the rear cap — while still being able to use the pre-set adjustment knob

for paint volume and trigger control. The plug-in siphon bottle is designed for quick color changes (perhaps using Grex's Private Stock™ paint, a water-based acrylic blend that uses proprietary nanotechnology to create sprays as smooth as urethanes). Suggested retail for the Genesis.XBi airbrush is \$185.98, while Private Stock paint is sold in 1 fluid ounce bottles for \$4.98.

And, although you never want to stop woodworking, sometimes you need a stop on your tools.

MicroFence's new *MicroStop* is designed as a portable stop or adjusting mechanism that will work on nearly any woodworking machine. Although designed specifically for use with table saw cross slides, it also functions with chop boxes, band saws, shapers, router tables and more (sometimes with accessories to increase the reach of the anvil). The basic MicroStop sits on an aluminum plate machined square (which is predrilled for mounting to your table's surface). Packaged with 3" shafts that allow 1¼" of anvil movement with up to 1" of micrometer travel the MicroStop is available for \$129.95.

— Joanna Werch Takes



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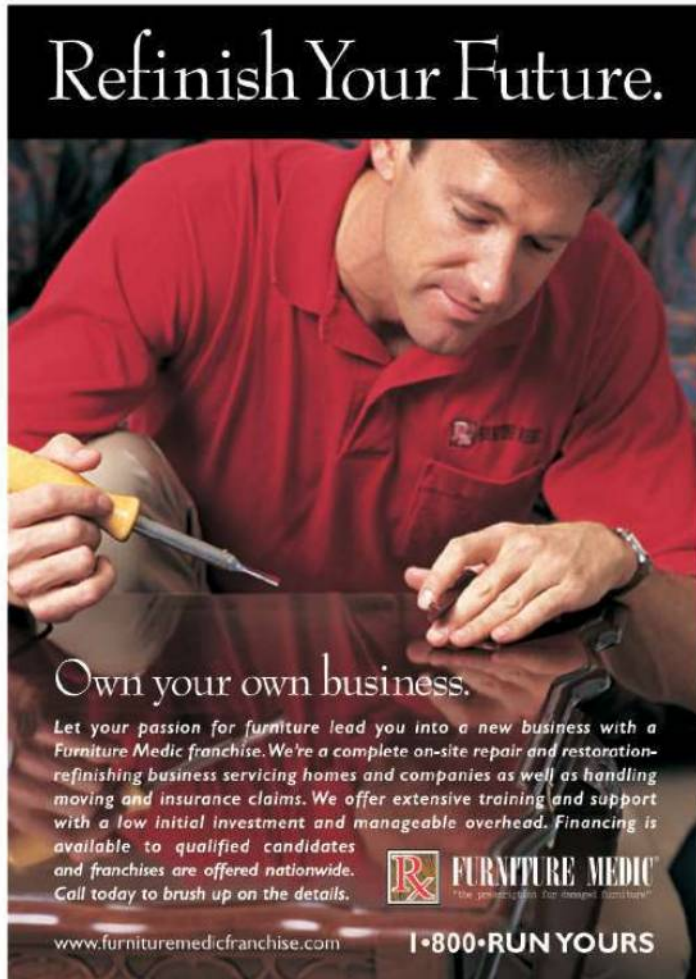
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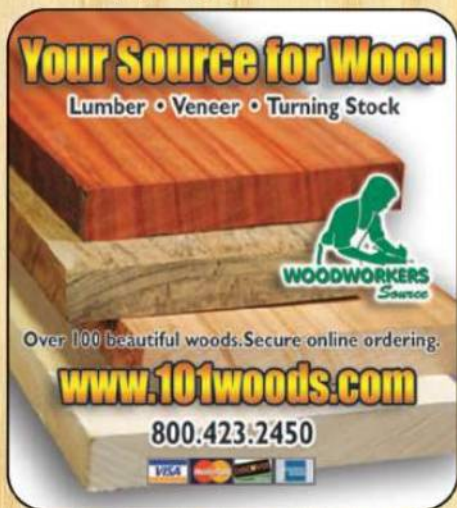
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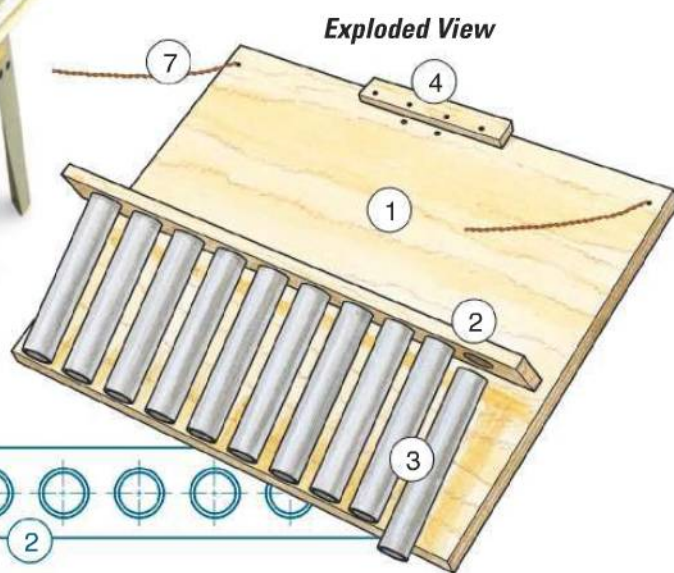
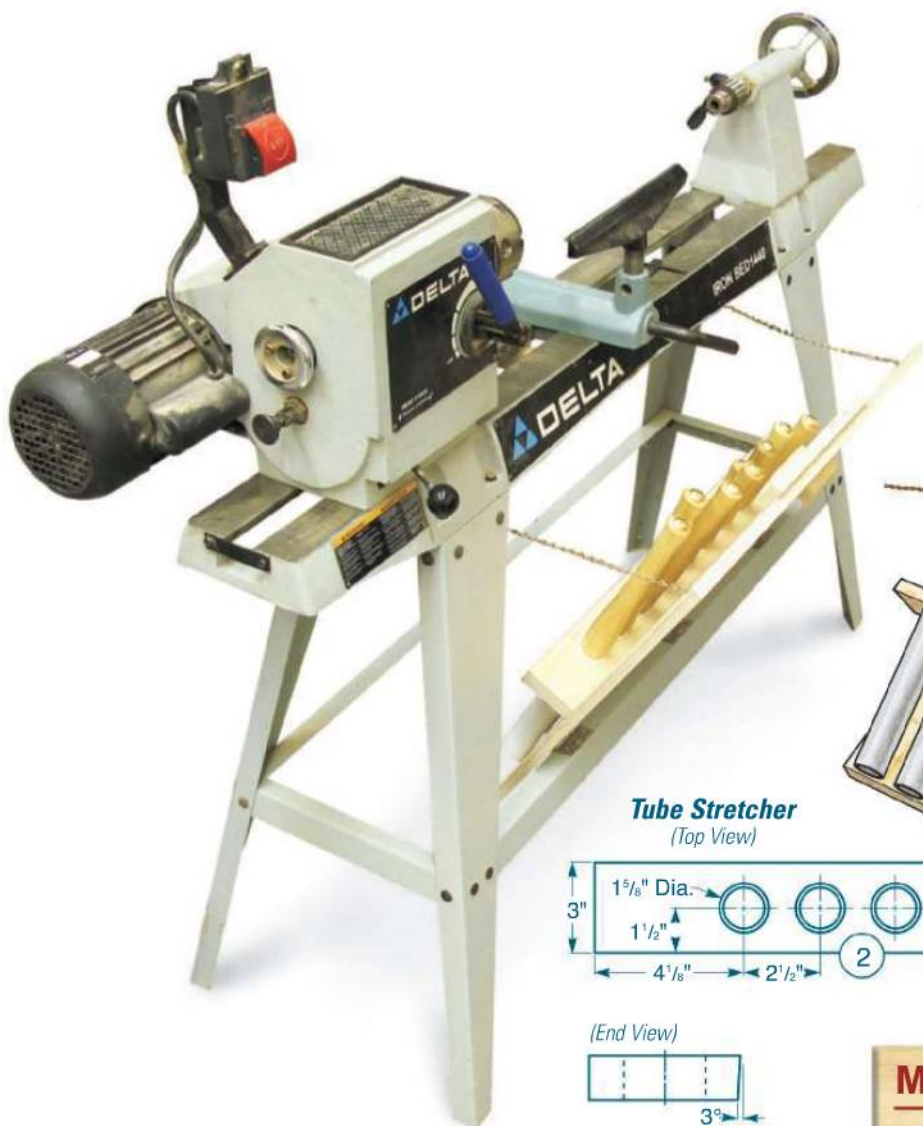
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Jigs & Fixtures

Turner's Tool Holder

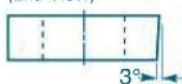
By Chris Marshall



Tube Stretcher
(Top View)



(End View)



When you're in the middle of a turning project, it's handy to have all of your lathe tools within easy reach. This tip-out tool holder, which began as a "Trick of the Trade" submitted years ago by reader James Mossinghoff, can bring that convenience to most open-stand lathes. It converts unused space between the legs into practical storage for 10 tools. PVC tubing holds each tool stationary and prevents the cutting edges from contacting one another. The holder is made to fit our Delta 1440 lathe shown above. Be sure to measure your own lathe's stand and adjust the *Material List* part sizes as needed.

The Tool Holder

Get this project underway by cutting the main panel and tube stretcher (pieces 1 and 2) to size. Then, tilt your table saw blade to 3° and bevel-rip one long edge of the stretcher. This beveled edge will enable the bottoms of the tubes to rest against the main panel when assembled. Bore ten 1½"-diameter holes through the stretcher, spaced evenly along its length. Sand the panel and the stretcher up through the grits at this point to prepare them for further assembly. Step to your

miter saw and cut your PVC pipe into ten, 10" lengths (pieces 3).

You may need to sand down one end of each tube slightly so they will fit into the stretcher holes. Mount the tubes in the stretcher with epoxy.

MATERIAL LIST

	T x W x L
1 Main Panel (1)	5/8" x 21½" x 30¾"
2 Tube Stretcher (1)	7/8" x 3" x 30¾"
3 PVC Tubes (10)	1½" OD x 10"
4 Tilt Stop (1)	5/8" x 1½" x 12"
5 Pull (Beech) (1)	3/4" x 3/8" (# 23127*)
6 Hinges (3)	1" x 2½" (# 27833*)
7 Chains (2)	18"

* Available at rockler.com



Once the tubes are installed in the stretcher, mark its position on the inside face of the main panel (left). Attach the stretcher with glue, clamps and brads, as shown in the photo below (left). A chalk line can be used to provide a simple reference to help center the brads.



Once the adhesive sets, determine the position of the stretcher on the main panel. Line it up so the bottom ends of the tubes are flush with the bottom of the panel, and draw a pair of reference lines to mark

the stretcher's location. Secure the stretcher to the panel with glue, clamps and a few brads.

Cut the tilt stop (piece 4) to size and center it on the inside of the top edge of the panel. Extend the stop a bit past the panel edge to create an overlap, and screw it in place. (Note: Remember, this is for our Delta 1440 lathe ... your requirements may end up eliminating or resizing this piece.) Next, fasten the pull (piece 5) to the outside face of the panel about 1½" below the top edge. Apply your choice of finish now.

Installing the Project on Your Lathe

We used three hinges (pieces 6) to mount the tool holder to the lower stretcher of our lathe stand. You'll need to locate the hinges on the outside face of the panel so the tilt stop will make contact with your lathe bed with the hinges mounted to the lathe's stretcher. Center one of the hinges left and right, and space the other two about 2" in from the panel ends.

A pair of chains (pieces 7) will stop the tool holder when you pull it open. Fasten one end of each chain about 1½" in from the top corners of the inside face of the panel with #8 x 5/8" wood screws or equivalent panhead screws.

It's time to fasten the hinges to the metal stretcher. We used a single pop rivet through each hinge to make these connections and to minimize extra drilling, but you could also use machine screws and nuts. Now, tip the tool holder out from the lathe about 10", and locate positions on the back legs of your lathe to install the other ends of the chains. Drill these two holes, and loop the end links through them to wrap up the project.

Chris Marshall is Woodworker's Journal's field editor.



Position the tilt stop so it overlaps the top of the main panel on the stretcher side, by 1/2" in our case. Fasten it in place with screws.



Drive the screws provided through the inside face of the main panel to secure the wooden pull to the other face.



The panel tips open on three hinges mounted to its outside face and to the lathe's metal stretcher. We used a combination of wood screws and pop rivets to make these connections.



Attach the two support chains to the main panel with short screws. Thread the endmost links on the other ends of the chains through small holes drilled in the lathe stand's rear legs (see inset).

Finishing Thoughts

Sandpaper, Scrapers and Planes

By Rob Johnstone

When is one wood-smoothing approach better than the next?

Sanding Tips

- Use good quality sandpaper.
- Don't skip grits. A rule of thumb is to start with 80-grit and move successively up to 180-grit.
- Plan a consistent sanding pattern for your project, so you don't skip over an area.
- After each pass, make sure you have removed the scratch marks from the previous pass.
- If you use a power sander, it's OK to sand across the grain, but the last pass should be done by hand in the direction of the grain.

A smooth, uniform surface is one of the most important components required to achieve a beautiful finish. A poorly prepared surface can be the true culprit in undermining the results of a finish. As with many woodworking tasks, there is more than one technique that will deliver a well-prepared piece of wood ready for a finish to be applied.

The three most common processes for smoothing wood are sanding, scraping and cleaning up the surface with a hand plane. (In this article we are primarily talking about smoothing solid wood.) Is one of these methods superior in delivering a suitable surface for finishing? The answer is no; all of them can make a smooth, finishable surface. So, the question becomes: is one of the methods faster or easier

or more forgiving than the others? Here the answer is less cut-and-dried — and the qualified response is that it depends on the task at hand.

Sandpaper and Sanding

Certainly the most common practice for smoothing wood is sanding. It can be done by hand, but most of us use a power sander of some kind. Sandpaper, in all its many varieties, is basically a substrate of some sort of paper — the quality of that paper varies — with rocks glued to it. (OK, “rocks” is really not an accurate way to describe today's modern abrasive materials, but you get the idea.) With sandpaper, you remove and smooth wood fibers by abrading them. After you have sanded off the

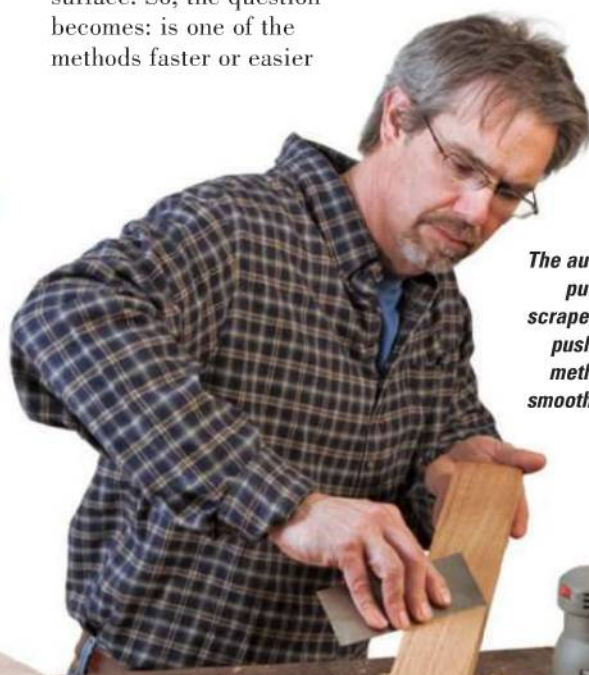
machining marks and other surface flaws with a coarse-grit paper, the primary goal of each successively finer size of grit is to remove the scratch marks that the previous sandpaper put into the wood. It is an effective system when done properly, and the results are predictable and can be made to be uniform. The biggest problem with sanding is that many woodworkers sand ineffectively and therefore get inconsistent results. For example, random-orbit sanders and vibrating pad sanders are designed to be moved across the wood at a rate of about 1 inch per-second. Run your finger from the top to the bottom of this page and count slowly to 11 — that will give you a good idea of what speed to move a sander.

Sanding is effective when done right, and it's easily mastered. The materials are easy to come by and reasonably priced. It is also the most practical method for smoothing curved and shaped forms. For that reason, it is likely the best overall method of surface preparation available to woodworkers.

Scrapers and Planes

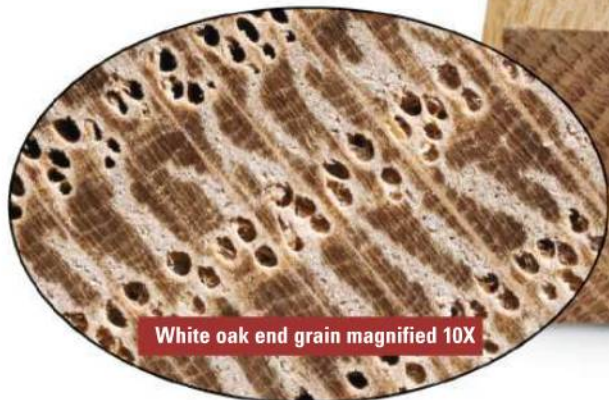
Scrapers and planes differ from sandpaper in a couple of significant ways. First, they cut the fibers of the wood

The author prefers pulling a card scraper instead of pushing it. Both methods yield a smooth, finishable surface.



MORE ON THE WEB

To view a video on how to sharpen a card scraper, go to woodworkersjournal.com and click on the **More on the Web** icon shown above.



White oak end grain magnified 10X

Wood is composed of various types of structures and fibers. Sanding abrades those fibers while scrapers and planes slice through them. Each of these approaches will leave a smooth surface, but the surfaces will receive stain and finish differently.

rather than abrade it. Second, while surface preparation is something these tools do, it is not their only task: planes and scrapers also shape wood. The most significant point to be made about smoothing wood with planes and scrapers is that they perform this task best on flat aspects — curves and other shapes are not

easily dealt with. If you are smoothing squared-up rectilinear stock, a properly set up plane or a sharp cabinet scraper are superior tools for the task. They produce a smooth, ready-to-finish surface much more quickly than sandpaper. In fact, if you watch someone who is proficient with a bench plane smooth a piece of wood, it is truly amazing. But that is one aspect of these tools — they require some skill, both in sharpening and setup as well as in use. While not difficult to master, there is a learning curve to overcome.

Mix and Match?

As I've said, sandpaper abrades, and planes and scrapers cut. All prepare acceptable surfaces to apply stain and finish. But one thing to avoid is putting a planed or scraped panel next to a sanded piece; i.e., a planed flat panel surrounded by stiles and rails that have been sanded. If you apply stain to these pieces, it will likely be absorbed differently, and their appearance will be markedly off. If you must join pieces of wood that have been variously prepared, I recommend a final hand sanding to ensure a uniform surface.



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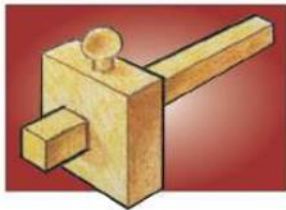
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Marking Tools

By Ian Kirby

Essential components to hand tool woodworking



When doing hand tool woodworking, marking out a rabbet or mortise is best done using a variety of marking tools.



If you are going to work wood using hand tools, then all of the traditional marking tools are essential. It is a short list: pencil, marking knife, marking gauge, cutting gauge and mortise gauge. If you are going to work wood using machine tools, they are largely redundant because they are replaced by fences, guides and stops of one sort or another.

Of the five tools, the pencil is unique. It serves two purposes, and it is the only one that doesn't incise the wood. It makes a mark which will position the workpiece — as in face side and face edge mark — left piece, right piece — 1: 2: 3: and so on. It's very good at this. Its other purpose is that it will make a mark that you intend to cut to. It's very bad at that. The line has considerable thickness so the accuracy offered by the other marking tools is not achieved. On the other hand, if you are working construction, it is "near enough."

Because the other marking tools incise the wood, they make a more finite line. However, they need a guide to be effective. For example, the marking knife is used in conjunction with a try square to knife shoulder lines. It's also used to mark pins from tails when making a dovetail joint. The three gauges require a straight workpiece edge from which to work. You could think of this as the flip side of a table saw fence. They both require a straight edge from which to operate. The saw fence is fixed and the workpiece moves. In hand work, the fence-gauge moves but the workpiece remains still.

Recently, whilst reading a well-known British author's book, I was surprised to find that he sharpened the spur on a marking gauge so that it had a knife edge. His claim is that the one gauge will do the work of two. I have also seen this claim from the makers of gauges made from

a slim metal rod. It is poor advice. Here is why: the grain on some species will influence the knife edge to wander when used with the grain, especially if you are something of an aspiring woodworker. The knife of a cutting gauge is flat on one side with a sharpening bevel on the other side, making it the proper tool for this task — it will resist the influence of the grain. The sharpened single spur is insufficient for this task and will be more affected by the difficult wood grain. One point: the incision the cutting gauge makes reflects its single bevel knife edge and, to be properly used in some operations, it needs to be turned over.

For more detail on how to best use these marking tools, visit our website: just follow the directions at left.

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