



WOODWORKER'S JOURNAL

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9 TOP-NOTCH AFTERMARKET MITER GAUGES!

Jig-based Joinery

Work super-fast and accurately page 51

PLUS: 3 great projects

- Mitering Jig
- Child's Cupboard
- Wall-hung Bookshelf

October
2007



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ANNUAL TURNER'S CHALLENGE!
Seasoned turners tackle green walnut
page 18



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Woodworker's Journal

Features

September/October 2007



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18 Turner's Challenge: Year Four

By Betty Scarpino

For the fourth year in a row, we've given identical blocks of wood to four turners to see what they can create. This year, the wood was green, but the turners were well seasoned.

34 Woodworking's 7 Dastardly Sins

By Sandor Nagyszalanczy

Sloth, greed, envy ... the traditional list can bedevil you, even in your shop. Turn your vices into virtues with help from an expert woodworker.

42 Child's Kitchen Cupboard

By Bill Hylton

"You can't say no to your mom" — especially when she asks you to build a duplicate of a family heirloom. It takes just a couple of days of shop time to create this child's cupboard that has stood the test of time.

58 Wall-hung Bookcase

By Ian Kirby

Built of select English oak and employing a master's book of woodworking tricks, this bookcase design almost comes with a "don't try this at home" warning. Sharpen up: this project will put your skills to the test!

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KNOTS, BLEMISHES, IMPERFECTIONS.

The last thing you want is a stain that covers them up.



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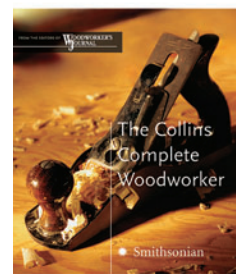
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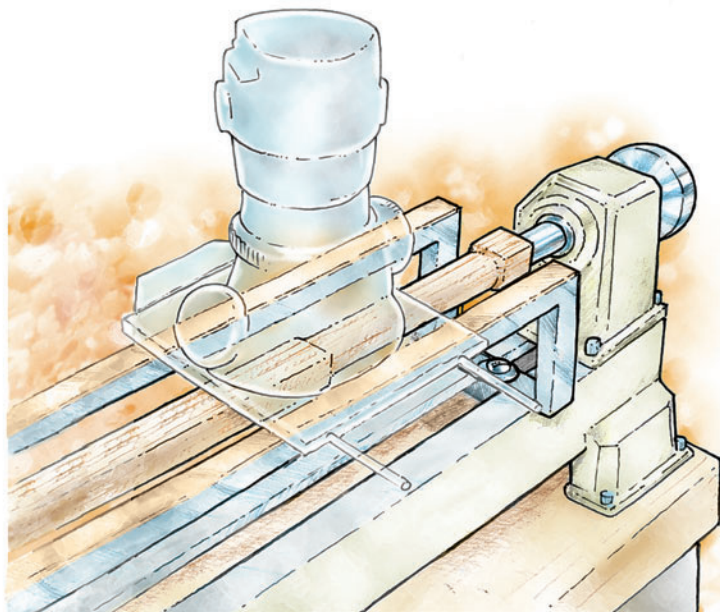
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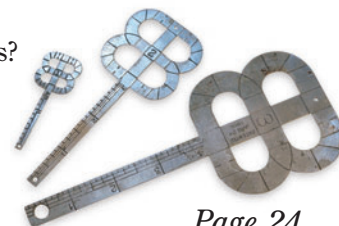
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New products for keeping your tools — and your woodworking skills — sharp.

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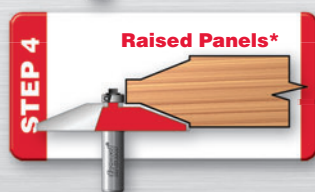
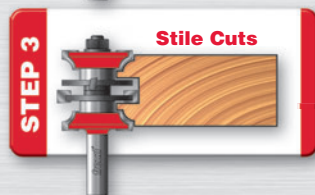
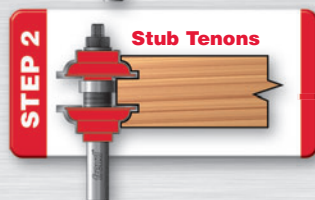
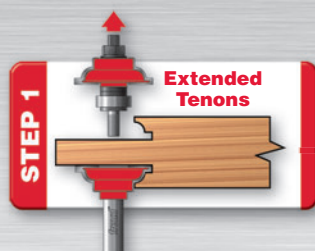
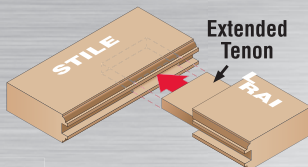
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This Month on the Web



More on the Web ... Ian Kirby's wall-hung bookcase in this issue is so finely detailed that you'll need the additional information available on the web to successfully recreate this project. And then, as a nice bonus to Betty Scarpino's turning article on page 18, we dug up and posted great pics from our last three "woodturner's challenges."



Recently . . .

Woodworker's Journal continues our web leadership with a revamping of our industry-leading eZine. Brand-new premium sections become available this fall, with tricks and photo posts from fellow woodworkers, quizzes and much more, including a top quality downloadable project in every issue!



Visit our home page to sign up for this new offering!

A recent issue (it comes out every two weeks!) featured the work of Mike McGlynn, our former contributing editor who recently passed away. Mike left an amazing body of work for us to pick from!



Resource Digest ... If you're looking forward to spending more time indoors (read: in the shop) this fall and winter, and thinking it's a good time to upgrade your tools — or even stock up on supplies — you'll want to check out the Resource Digest for all the info you'll ever need to research tool-buying decisions. Get a free plan while you're there, too: a Cherry Gun Cabinet just in time for hunting season.

Free woodworking Plan

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WWJ Blog ... Editor-in-Chief Rob Johnstone and Field Editor Chris Marshall engaged in a classic game of oneupmanship during a trade show in Las Vegas a couple of months back, using "dueling blogs" to try to outshine each other in finding the coolest new tools at the show. It's the latest trip, and the latest blog, for our staff travels in search of tools. Find this blog, plus those from Rob's previous trips, on woodworkersjournal.com!

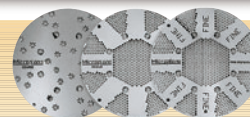
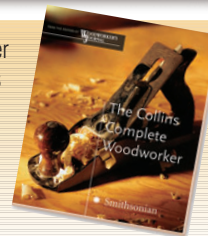


Asia Blog

Europe Blog



Quik-Link ... Looking for more information on a Leigh Super Jig? The Dremel WorkSharp WS3000? Any of the miter gauges featured in our Tool Review, or other What's In Store tools? (Or maybe on our new book?) Visit our home page and click on "Quik-Link" to find your way **directly** to the page that features any of the products we covered in this issue!



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Finding a Perfect Project



Rob Johnstone said he could complete Bill's project in about a day or two. It would take me two weekends.



Rob said he could complete Ian's project in about a year, but he'd have to quit his day job. There isn't enough time left in my life for me to complete Ian's project.

In this issue, we're featuring, among other things, projects from **Bill Hylton** and **Ian Kirby**. Now, Bill is no slouch in the shop. His projects have been featured in *Woodworker's Journal* many times, and they range from difficult to "easy weekenders." But one thing that Editor in Chief Rob Johnstone and I have always agreed on is that, whether a project in our magazine is easy to complete in a weekend or a terrorizing challenge that might take months to wrap up, it still has to pass the smell test of good design. Check out the photos at left, particularly the insets: Bill copied an old heirloom and used modern techniques to complete his work in a few days. There are a bunch of great woodworking ideas scattered throughout his article, including cutting a notch on a piece to save yourself the trouble of squaring up a routed groove (inset). It's all good woodworking, and Bill's project will most likely be in service a century from now, with a minimum of care. Ian's project, like Bill's, features another bunch of great woodworking ideas and some of the most intriguing joinery Rob and I have ever seen! (Inset: hand-cut

dadoes for wedged through tenons with ebony liners!)

So ... which one is better? Well, if your mom asks you to build a child's cupboard based on an heirloom that her dad made many years ago (like Bill's mom did) ... you better not show up with Ian's incredible hanging bookcase. What's great about woodworking (and most things worth doing) is that the ability to refine your skills never reaches a wall — but you can create a great variety of projects along the way.



**New contributing editor
George Vondriska**

With this issue of *Woodworker's Journal*, I'm happy to announce that **Rob Johnstone** has been promoted to editor in chief. (I'll have to root around to find new stuff to do.) It's also my pleasure to introduce our newest contributing editor, **George Vondriska**. George joins us this time with a review of aftermarket miter gauges (see page 76), and he'll be bringing you lots of tool and project news in the months ahead. George is a true "woodworker's woodworker," and we look forward to sharing his insights with you.

Larry N. Stoiaken

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The Real Torsion Box Experts



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needed an assembly table — one you could get around to all four sides. I solved this problem by building a 2' x 4' torsion box out of two sheets of 1/2" plywood and a core made from scrap lumber held together by Elmer's® glue and a bunch of flathead screws. The tabletop, when needed, rested on two trash cans. When the cars needed to go back into the garage, the trash cans went outside and the top against the wall. It served its purpose well, but it was lacking in stability.

When I finally got a dedicated shop area, I liked that top so well that I simply added some permanent 4 x 4 legs and have used it continuously for the last six years. It's taken everything I've thrown at it so far.

Thanks for the article — I'm a T-box fan. My only

comment is that in my experience, one does not have to be so meticulous about the construction techniques — I certainly was not, and it's holding up fine.

*Roger Clapp
Rolling Hills Estates, California*

I have a question and suggestion to improve on the torsion box shelf by Ian Kirby in your *June 2007* issue.

Question: How do you remove the shelf? Answer: you can't if it is built as depicted in your article!

However, you could if you were to leave access slots (invisible on most applications) on the bottom side of the shelf, just large enough to a place a deep socket and ratchet that would allow you to remove ledger board anchor bolts. This would allow for removal of the shelf for painting or if it's no longer wanted — without tearing the wall and shelf up. (You could conceal the slots with tight-fitting plugs pushed into place prior to attaching the shelf. These could be knocked up into the hollow interior if a need ever arose to remove the shelf.)

*Michael Plesh
Pasadena, California*

Sorry fellas, I think Mr. Kirby got his ponytail too tight on this one. There are many more practical ways to mount the shelf to the wall (i.e., removable). What happens when Ms. Homeowner comes home and wants it raised or lowered a few inches? I hope

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We ask that all letters, including e-mails, include a mailing address and phone number. We reserve the right to edit for length and clarity.



T-Boxing Match

I would have to disagree with the statement on the cover of the [June 2007] issue: "America's leading T-box expert". Perhaps if you qualified it with wooden T-box, I would agree. But the best, given what they have to work with, are honeybees. T-box, torsion box, honeycomb or egg crate — they are all different names for the same construction principle.

We get judo and karate from insects and flight from birds ... why not T-boxes from bees?

*Ralph E. Shartle
Cedar Hill, Texas*

I recently received my copy of your *June 2007* issue and, as I often do, found a comfortable chair, a cup of coffee and spent an hour perusing the issue. The article on torsion boxes dredged up some memories I thought you'd like to hear:

Back in the days when I filled my workspace with two cars, I had only a workbench against a side wall in the garage. I discovered that I





you're up on your wall repair skills. I think Ian knew ahead of time this would be an issue. Now show us how to take it down and relocate it when we move.

*K. Hopper
Springfield, Illinois*

What to Say on Spray Guns

Thank you for the excellent review of HVLP sprayers. In a concise way, you dealt with many of the major issues and considerations. (I was surprised there was no discussion about cleaning the equipment. Are they all equal?) In future articles, a chart comparing all units side by side would be helpful (à la *ConsumerReports.org*).

Thanks for the enjoyable magazine. Your liberal use of photos is great, and the writing clear and concise. I always find good ideas to use in my projects and shop. I also appreciate the Quik-Links and additional web content.

*Art Held
Skaggsville, Maryland*

Are We Crazy?!

After reading your article ["Circular Saws: A Woodworker's Secret Weapon," *June 2007*], I am amazed you would print [the technique of making chair seats with a circular saw].



There is little to convince me this could be safe.

How much positive control does the woodworker have over a circular saw in this process? I would not recommend this to anyone. I would love to know what makes you think this is a good procedure as outlined in the article.

*Jon Griffith
Albuquerque, New Mexico*

WJ Responds: Jon, please rest assured that I would never teach a technique that I knew to be unsafe (quite the contrary!). With that said, we may occasionally demonstrate techniques that go beyond a reader's comfort level. When that occurs, woodworkers must take care of themselves by making the choice not to overreach. Safety always starts with the judgment of the individual woodworker.

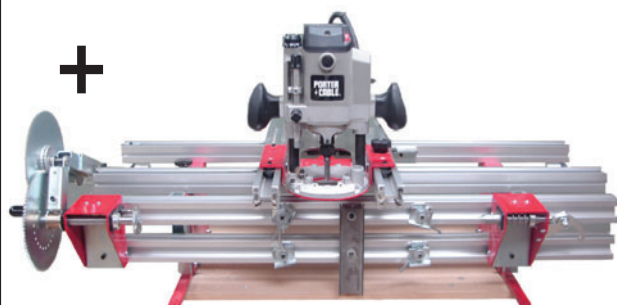
—Rob Johnstone

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.

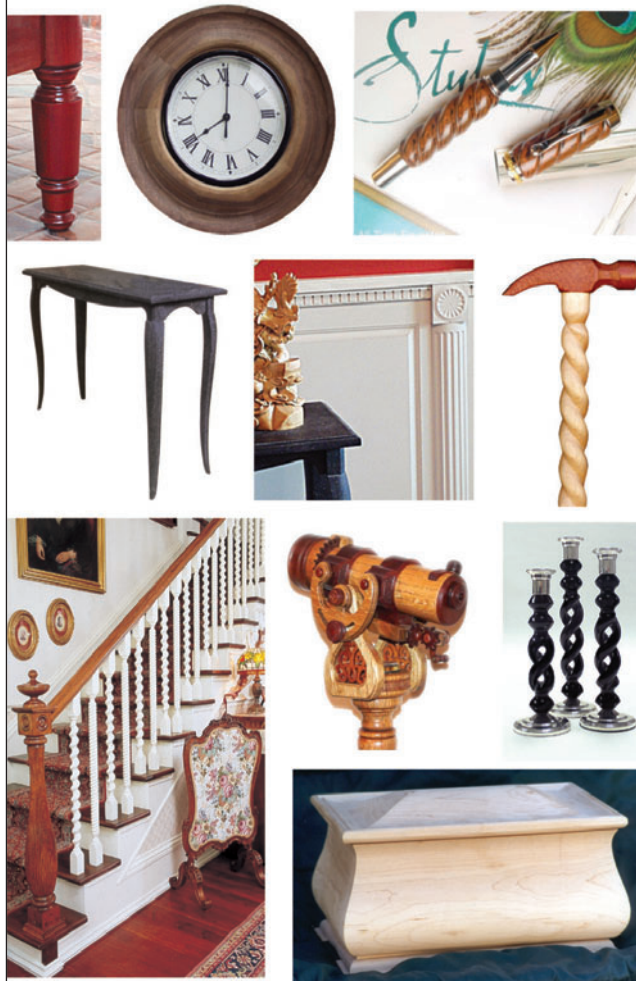
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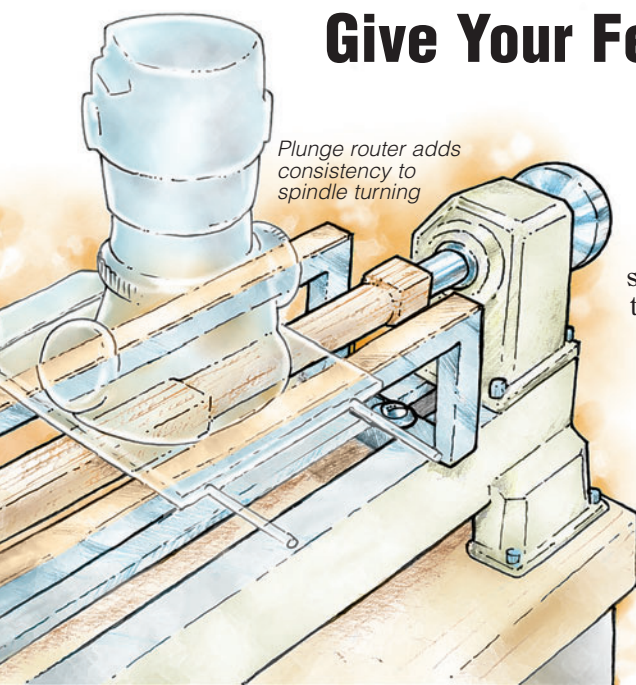
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Give Your Fence a Magnetic Personality



Plunge router adds consistency to spindle turning

Router Jig Turns Spindles

Turning chair spindles exactly the same size and with a consistent diameter used to be frustrating until I set aside my chisels and let this router jig do the job. It's simply a welded framework of steel tubing and angle iron that bolts to my lathe bed. I attached a couple of

strips of lauan plywood to the top of the jig for my router to slide on. To use the jig, I chuck a blank in the lathe and an upspiral bit in my plunge router. An edge guide attached to the router base keeps the tool centered over the workpiece. To turn each spindle, I plunge the bit down until it makes light contact with the wood, then I move the router from left to right with the

wood spinning at a low speed. A series of deeper passes brings the spindle down to size, and the router's depth stop makes the final setting repeatable for as many spindles as I need. The setup works very well.

*Larry Collins
East Ridge, Tennessee*

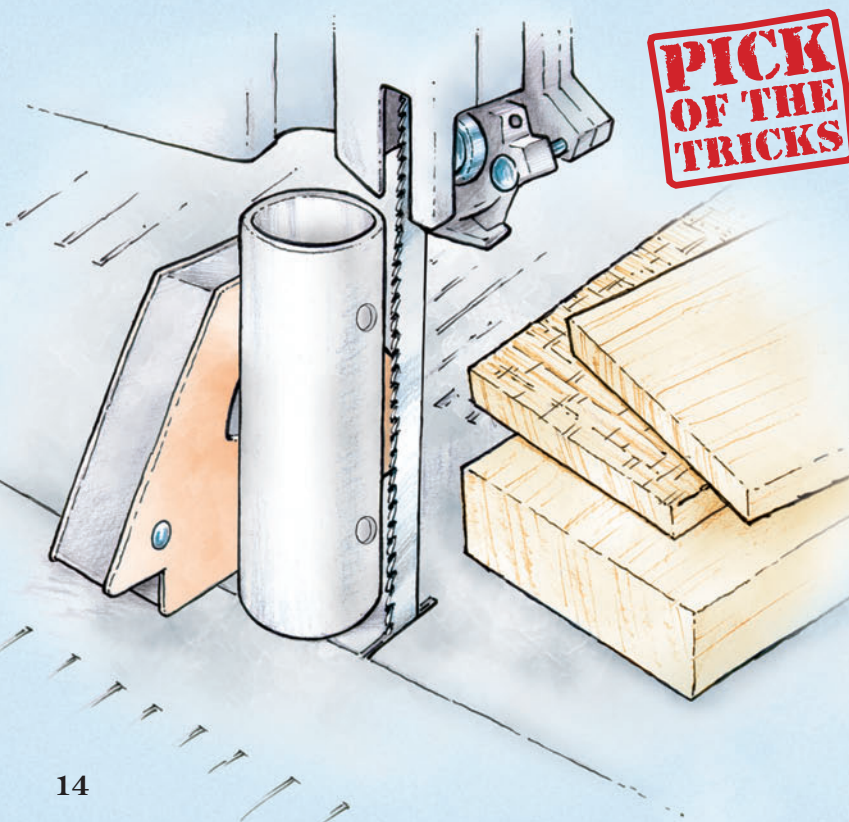
Third "Hand" for Changing Dust Bags

I used to dread emptying my dust collector bag, because it's hard to fit the bag back in place without it slipping off the rim at least a couple of times. What I needed was a third hand to help hold the back of the bag in place while I slid the rest of the cuff around the rim. I solved that problem with two wide strips of adhesive-backed Velcro® tape: one stuck to the metal rim and another to the mouth of the bag. A 1' length of tape should be all you need. Now, I just connect the Velcro first and pull the bag up and into place. It never slips off.

*Paul Theys
Green Bay, Wisconsin*



No-slip bag changes



PICK OF THE TRICKS

Magnetic Resaw Fence

"Point-style" resaw fences are usually made from scrap wood, but they can be hard to clamp exactly where you want them. I've got an easier solution that requires no clamping.

All you need is a welder's magnetic square (less than \$10 from wholesalers), a scrap piece of PVC pipe and a few fasteners. Drill holes through the pipe and magnet, then fasten the parts together with bolts, washers and nuts. The fasteners must be recessed inside the pipe.

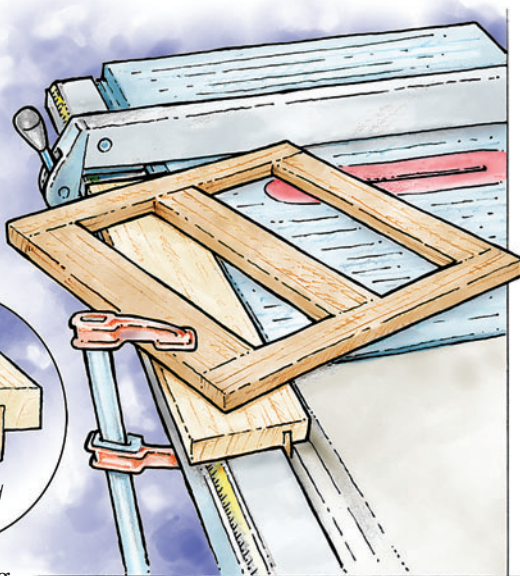
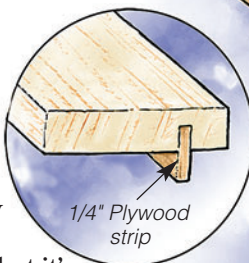
My magnetic fence stays right where I put it during use, and the PVC offers a low-friction surface for guiding the wood along. When you're finished resawing, just pop the fence free and stick it to the saw frame so it's easy to find when you need it again.

*Alfred DeVries
El Cajon, California*

Filler strips over the fence rail improve tabletop clamping.

Bridging a Gap for Better Clamping

A table saw makes a handy assembly and sanding table, but it's hard to clamp workpieces along the front edge unless your rip fence rails are flush with the table surface. To fix the problem on my saw, I bridged this gap with a couple of strips of scrap wood, planed to fill the space. I fitted and glued a second strip of 1/4" plywood into a kerf on the bottom of each filler to form a "T" shape, which keeps



the filler strips from falling off the saw. Now, my saw table is flush all the way to the edge of the fence rail — perfect for clamping. Whenever I need to move the rip fence, my filler strips slide right with it.

Rob Richards
Mystic, Connecticut



WINNER!

In addition to our standard payment (below) Alfred DeVries of El Cajon, California, will

also receive a **Porter-Cable 371K Compact Belt Sander** 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 of the Trade to Woodworker's Journal, Dept. T/T, P.O. Box 261, Medina, MN 55340. Or send us an e-mail:

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B Batteries and Soundproofing

THIS ISSUE'S EXPERTS

Chris Marshall is field editor of *Woodworker's Journal* and the author of six woodworking books, including *The Complete New Router Book* for Woodworkers.

Sandor Nagyszalanczy is a power tool expert and author of *Setting Up Shop* from Taunton Press.

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one) with your question.



WINNER! For simply sending in his question on shop noise, Robert Davis of Somerville, New Jersey wins a **Steel City 5 Speed Mini-Lathe (Model 60170)**. Each issue we toss new questions into a hat and draw a winner.



My battery shelf has the common "Triple-A," "Double-A," "C" and "D" size batteries on it. But, there aren't any "size B" batteries. Why?

*Sherwood Elkind
Englewood, Colorado*



Just like the pop-top soda can, bell-bottom jeans and 3/8" -shank router bits, battery sizes are somewhat driven by popular demand. As it turns out, there used to be a size "B"

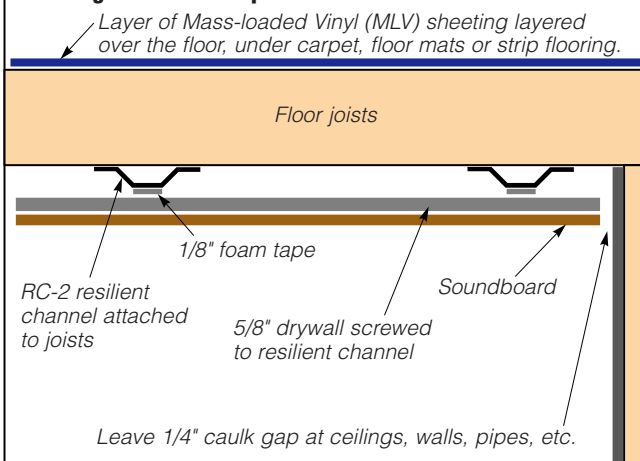


"B" cells ... fading away.

battery, but not enough consumer goods made use of it, so stores stopped carrying it. Consequently, it's not around in this country anymore, although it's still available in Europe.

— Chris Marshall

Reducing Basement Shop Noise



My shop is located in the basement of our home, so you could imagine the noise level in the upper areas when the machinery is running. What suggestions could you recommend that would help with the noise?

*Robert Davis
Somerville, New Jersey*



The best way to decrease your basement shop's din is to reduce the vibration coming up through the floor by isolating the shop ceiling from the floor joists. Start by stapling bats of fiberglass (or cotton fiber)

insulation between the joists. Now nail or screw strips of RC-2 resilient channel (available from your local acoustical supply, or from www.soundproofing.org) at 2' intervals, at a right angle to the joists. Stick a layer of 1/8" foam tape to the face of each channel strip and attach a layer of 5/8" drywall to the channels, using screws to hold it in place. Avoid driving screws directly over where the channel is attached to the joists. Use flexible caulk and tape to seal the seams between drywall sheets. Leave a 1/4" gap between the drywall ceiling and the walls, and fill that gap with flexible caulk. Screw a layer of sound board (e.g. Celotex, Homasote) atop the drywall (avoid screwing directly into channels), staggering the seams and taping and caulking them between adjacent sheets. For even greater sound attenuation, install a layer of MLV (mass-loaded vinyl; available at the URL above) sheeting on the floor above the basement.

— Sandor Nagyszalanczy

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Turner's Challenge:

When it came time for our 4th annual woodturner's challenge, all our author asked for was some green wood and some well-seasoned guild members. These Cincinnati area turners might just put the Ohio Valley Woodturner's Guild on the national map!

Free wood and walnut to boot! Add a chainsaw, four guys from Cincinnati, and let the fun begin! John Lannom, Joe Keeler, Gary Brackett and Dave Morrical got together earlier this year to cut up a good-sized walnut log into various chunks, each turner walking away with a custom-sized piece. The results are spectacular and unique to each turner.

Green-wood turning, right from the log to the lathe (see page 22), is a delightful experience, and in fact, that's the only way Joe and Dave's hollow turnings could easily be accomplished. Gary's natural-edge bowl cut like butter, and John's large, crotch-figure platter dried crack-free.

Skipping the kiln-drying process ensures that black walnut's rich, chocolate heartwood remains vibrant, while the delineation between sapwood and heartwood is distinct. Joe, Gary and Dave took advantage of this for their designs, while John decided to bleach the rim of his walnut platter to provide contrast for the intense crotch-grain pattern.



By Betty Scarpino

Year Four



Dave Morrical



Gary Brackett



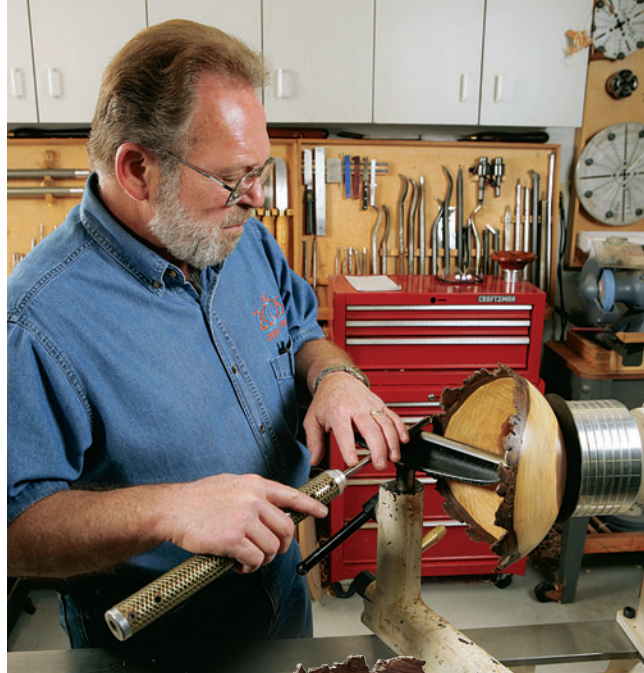
Joe Keeler



John Lannom



Dave Morrical demonstrates how to end-grain hollow a vessel. Depending on how narrow the vessel's opening is, much of this work is done "blindly" and by feel. It's a skill that can only be honed by many hours of practice.



Gary Brackett shows how he would turn the outside of his walnut, natural-edge bowl. Its thin walls and uneven shape pose challenges for tool control.



Turning Club Activities

Woodturning is the activity that brings these men together, and the Ohio Valley Woodturners Guild (OVWG) is a key ingredient. Each of my "challenge" turners either holds an office or has held one in the past. Dave, for instance, is the current president of the guild. As I talked with each turner, the conversation quickly came around to their club activities.

The second weekend in May found all four turners, plus four other club members, demonstrating their craft at the Appalachian Craft Festival at Coney Island on the Ohio River. Organizers of this three-day event supplied a tent for the woodturners, and they attracted large crowds throughout the weekend.

The other major event for OVWG is a semi-annual symposium, held this year in October. They limit attendance to less than 400, which keeps the affair manageable. It's a first-rate conference, with meals provided and demonstrators from all over the world.

Dave Morrical

Dave's first experience with a lathe was when he was a high school freshman. Additionally, his dad owned a Shoptsmith®, so Dave was around woodworking much of his younger life. He started his college career as an industrial arts major, but switched to business education and became a teacher in the public school system where he also coached soccer. He is now retired, and turning is his passionate hobby. He has been president of OVWG for four years, vice president for six years and treasurer for three. "It's a labor of love," he says.

Like so many others who were involved in turning in the early days, Dave first learned to turn using the scraping method. Bowl gouges, cutting and turning green wood happened for him in the early 1990s. He sells his

bowls and vessels through shows and to individuals. Cherry wood and Norfolk Island pine are his best sellers.

The tall, hollow vessel Dave turned for this story takes advantage of the sapwood by leaving a lovely contrasting oval on each side. The grain is oriented vertically, and hollowing it while it was green makes the process possible.

Dave's advice for beginners is to buy the very best equipment you can afford. If possible, be sure to try out friends' machinery before you buy your own.

Gary Brackett

Gary Brackett's traditional natural-edge bowl is one of those "how'd-he-do-that" wonders for those unfamiliar with woodturning. The process is fairly straightforward, but it becomes tricky as the bowl is turned thinner: near the rim, the tool hits wood twice and air twice on each rotation. Leaving the bark on is a challenge, and Gary accomplished that quite nicely.

Gary started turning wood in 1989 when he borrowed a friend's lathe to turn some tool handles. He immediately fell in love with turning, and it has been his hobby ever since. Gary is a self-employed manufacturer's rep for JET and Powermatic woodworking equipment in Ohio and Kentucky, so he does his turning on weekends. (As you might expect, Gary owns a Powermatic lathe.)

The Artesian Center in Moscow, Ohio, offers woodturning classes, and Gary occasionally teaches there. He also sells his work through their gallery. He primarily turns green wood, except for boxes and ornaments. In 1990, Gary first encountered green-wood turning at an American Association of Woodturners symposium at the Arrowmont School of Arts and Crafts in Tennessee.

The precursor to the OVWG was the Tri-States Chapter of Woodturners, and Gary was a founding member and



Joe Keeler sits on the bed of his lathe to hollow vessels. For our story here, turning was just the first step of the process. Then Joe whipped out the carving tools to add more details.



president of that organization for three years. Gary's advice for anyone wanting to learn woodturning is to start with a small lathe and get one-on-one instruction in the beginning.

Joe Keeler

In 1992, Joe retired from a career as an engineer and from working for Union Carbide in their purchasing department. His involvement in woodturning began at a craft fair in West Virginia where he met Bob Fleming, then took a class from him at Cedar Lake Crafts Center in West Virginia, a small craft school.

Joe makes a variety of turned items, which he also sells at local craft fairs. The design of his hollow vessel was inspired by John Jordan, a world-class turner. It is turned with the grain oriented horizontally, to create the sapwood detail at the top. It took Joe part of a day to turn the form, then several days to carve and sand.

Joe's basement shop is compact, but neatly arranged. Classical music plays in the background. His custom-built lathe boasts running boards. This way he can comfortably sit on the bed of the lathe when doing hollow turning, keeping him from having to twist sideways during the process of hollowing vessels.

"The mentoring program offered by the OVWG is a great way to learn proper use of woodturning tools," says Joe. "Practice the basics, then explore outside the envelope."

John Lannom

John is a retired chief design engineer, and his shop reflects his profession. Seven years ago, he moved his shop from his basement to a newly built, 650-square-foot outbuilding. One wall, full of purple, blue and red ribbons, gives a clue to John's abilities. He has won Best of Show from the local Hyde Park Art Show twice and several first



John Lannom turns the outside of a green bowl as it's held by the chuck. The wet shavings peel away in ribbons — a delightfully easy way to turn wood.



place ribbons from the Montgomery [Ohio] Kiwanis Art Exhibition. And there are more.

"Flat and parallel" used to be John's passion until he discovered woodturning, but he rarely makes furniture these days and only for his grandchildren. Twelve years ago, John's wife, Carol, gave him a mini lathe for Christmas, so he decided he ought to learn how to turn. He looked for woodturning instruction online, discovered a local member of the Guild and took lessons. His advice for beginners is to join a woodturning club: "You will save yourself time, money and aggravation by getting professional instruction."

John does five or six craft fairs every year in the Ohio area, and Carol enjoys going with him. Although he never initially intended to sell his turnings, the volume of what he produces certainly requires an outlet!

John's large walnut platter is reflective of his mastery of woodturning. The clean lines and elegant form are ideal for accentuating the beautiful crotch-grain pattern.

Good Folks, Great Turning

On the drive back to Indianapolis from Cincinnati, photographer Shawn Spence and I talked about John, Joe, Dave and Gary, and our experiences that day. We couldn't help but marvel at their positive attitudes, enthusiasm for life, and generosity. It speaks volumes for woodturners!

Hopefully, these guys will inspire you to grab a green chunk from the next downed tree in the neighborhood and give it a whirl. Imagine the possibilities ...

Betty Scarpino lives and turns in Indianapolis. Her web page is www.bettyscarpino.com.

(Check out "Harvesting Green Wood" on the next page...)

Tips for Harvesting Green Wood

“Green” wood is any type of wood that has just been cut and is still full of moisture. Harvesting can take place throughout the year, with springtime providing the most moisture within the wood, but also the potential for less stability for some species when drying. Winter is the perfect season.

The problem of warping and cracking while the wood dries is vastly decreased when green wood is turned directly after harvesting. This is especially true for bowls and hollow vessels. Additionally, green wood is easy to cut; it simply falls away with ease as the tool cuts the fibers.

Each log should be cut to lengths in sections that relate to the diameter of the log, then cut in half lengthwise, removing the pith and at least one inch on each side of the pith. The diameter of the log determines the maximum diameter of a bowl or vessel. Bowls, plates and platters are usually turned on a log section with the grain oriented flat.

In general, hollow vessels are turned with the grain vertical. Often the entire log diameter can be



This entire cross-section of walnut log can be used to turn a hollow vessel — the approach Dave Morrical took with his piece.



Splitting a cross-section down the middle opens possibilities for making a bowl, plate or vessel.



Here's the first peek at the crotch-grain pattern John Lannom used for his platter.

used. In this case, the pith is turned away, except for a small section in the bottom of the vessel, which can be removed and the hole plugged.

After chainsawing, bring the turning blank into your shop, mount it to the lathe, and watch the shavings fly!

At this point, there are two options: either turn the entire object thin enough to prevent cracking, or leave the object just thick enough so it can be re-turned after a period of drying. The turned object will shrink and warp, and if there are small cracks near the pith, areas of bark inclusions, or knots, these areas will be susceptible to cracking. Bark inclusions or knots are usually fine, but I always eliminate pith-area cracks to begin with, even if that results in a smaller piece of wood.



Dave Morrical, John Lannom and Gary Brackett with the walnut log from which they turned their bowl, vessel and platter.

If your half-log sections and turning blanks are going to be saved for later, coat the ends with a liquid wax end-coat sealer. Store them away from excessive heat, and avoid direct sunlight and exposure to insects. The bark can be left on or removed; however, if you suspect insect infestation, remove the bark.

This bounty from nature can result in a variety of species not available from lumber outlets. My three favorite harvested woods are persimmon, Osage orange and dogwood. I keep my stash of harvested, dried wood stored in a secret location!

—Betty Scarpino



John, Dave, Betty and Gary examine the results of one of John's large, green-turned bowls, made of maple.

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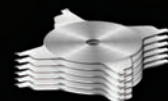
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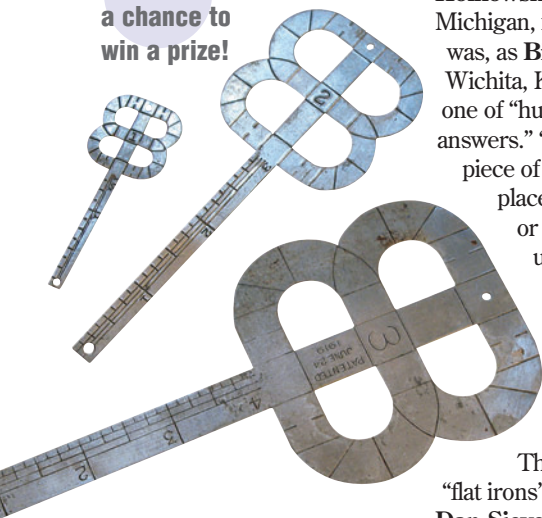
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What's This?

Floyd Hershberger from Ocala, Florida, sent in the set of tools below. Neither he nor any of his friends know what they are. We do know that they're 2½", 5" and 7" long. Do you know what they are? Send in your answer for a chance to win a prize!



If you have your own woodworking mystery tool (or the answer to this issue's entry), send it to Stumpers, c/o Woodworker's Journal, P.O. Box 261, Medina, Minnesota 55340. Or send us an e-mail: stumpers@woodworkersjournal.com

Hot Topic

Getting a Handle On It

The handle of this object — A relic from the past — Is actually a handle Of an iron that had been cast. You clipped it on a hot one, And then when it got cold, You swapped it for another — That's what I've been told.

*Brian Somerville
Christchurch, New Zealand*

Pressing Memories

Poetry aside, Brian's identification of the Stumper tool belonging to **John Hoinowski** of Gaastra, Michigan, from our June issue was, as **Bill Barnes** of Wichita, Kansas, predicted, one of "hundreds of correct answers." "The main metal piece of the iron would be placed on top of a wood- or coal-fired stove until it was hot, then the handle would be clipped on to use the iron," said **Liz Beutler** of Munroe Falls, Ohio.

The irons were called "flat irons" or "sad irons," and **Dan Sieve** of Union, Missouri, knew why. "'Sad' comes from the old English word 'sadd,' meaning 'heavy,'" he told us.

The removable wooden handles were "a revolutionary invention by Mary Potts," **Sidney Taylor** of Juneau, Alaska, told us. "The older irons, prior to this invention, had iron handles, and the ironer would have to use a heavy potholder to pick up the iron and use it," said **Judy Allen** of Silver City, New Mexico.



Mrs. Potts, above, was the 1870s inventor of removable handles for cast-iron irons.



Anton T. Sheridan of Grandville, Michigan, "always wondered how our ancestors knew when the iron was hot enough, but not too hot. Perhaps that is what separated the good operators from those with oblong burn marks on their Sunday shirts."

Homemakers didn't always succeed, as **Skip Kreibach** of Leroy, Kansas, related. "The expression 'having too many irons in the fire' comes from having iron burn marks on one's clothes. [With] too many irons, each would spend more time on the stove, getting excessively hot. The overheated iron tended to leave a scorched impression on the cloth."

Like most *Stumpers* mysteries, the iron saw more activities than its primary use. "This type of iron also did double-duty as a bed-warmer," said **David Johnston** of Olathe, Colorado. **Gary Riecke** of Lincoln, Nebraska is one of



many who used his as a doorstop. It's also, says **John Cargill** of Elkton, Maryland, "a great weight when gluing up woodworking projects!" Or, as **Bob Haynes** of Clio, Michigan, says, "the iron without the handle makes a great little anvil for your workbench."

Overall, John's iron handle brought back memories — and observations. **Bob Peel** of Crown Point, Indiana's, iron belonged to his great-grandmother, "who was born in 1873 and lived until 1970. Long enough to see and appreciate the invention of both the electric iron and 'wrinkle-free' clothing. Or, at least, the widespread acceptance of wearing clothes with wrinkles."

— *Joanna Werch Takes*



WINNER! *John Cestkowski of Watersmeet, Michigan, wins a WorkSharp 2000 Tool Sharpener. We toss all the Stumpers letters into a hat to select a winner.*



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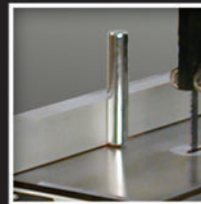
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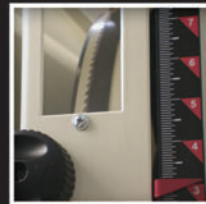
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said, and made clay impressions of the moldings.

From their notes, they reproduced the mortise and tenon joinery on the desk's base, the dovetails in the drawers and the bird's-eye maple hammered veneer facings applied with hide glue. All of the carving on the desk was done by hand. Fred also

made the hinges for the desk lid by hand, fabricated the brass closure for the bottom door and created a stamp to match the original design which went around the letter writing pad.

A hardware issue was probably the most difficult aspect of recreating the desk, Fred said: over the years,

the original wooden pulls on the desk's bottom doors have gone missing and been replaced with brass. Fred and Rob traced the outlines from the original pulls and speculated from there what they would have looked like.

In fact, the National Trust asked them to make the desk look much like it did when Lincoln used it, Fred said. "We did not add distressing to the desk to mimic an old one." The only "aging it up" occurred in the application of a hand-rubbed shellac finish.

The Lincoln Cottage is scheduled to open to the public in February 2008. For more information, call 202-829-0436 or you can visit the web site found at www.lincolncottage.org.

Woodworking Historic Reenactment

Lincoln's "Traveling" Desk Comes to Life

The original desk where Abraham Lincoln likely drafted the Emancipation Proclamation now resides in the Lincoln Bedroom at the White House, but Pennsylvania woodworkers Fred Hoover and Rob McCullough have created an exacting reproduction to be on display at the Lincoln Cottage, managed by the National Trust for Historic Preservation.

Fred and Rob, who had previously done restoration work in the Lincoln Bedroom itself, spent about an hour photographing and measuring the original desk — which, amazingly from our modern perspective, traveled with the Lincolns when they stayed at the cottage outside Washington, D.C. "We took really detailed notes," Fred



Two woodworkers recreated the desk where Abraham Lincoln drafted the Emancipation Proclamation. The original black walnut desk (above) continues to reside in the Lincoln Bedroom in the White House.



Moreland, a country-western musician, also includes "cowboys, Indians, eagles and coyotes — Southwestern stuff," in his regular carvings.

Sawing and Singing

Chainsaw Art Supports Singer

As a boy, Texas musician Doug Moreland occasionally made small carvings with knives. "I would carve maybe a donkey for Christmas," he said. It must have stuck with him. He grew up, started a band, and one day ended up visiting a friend who was a chainsaw carver and let Doug try it. "I carved a couple bears," he said, and "a light went off in my head."

Doug and his entire band quit touring for a while and took up chainsaw carving to earn enough money to get back into the music business. They did so — and now, rather than a T-shirt, hat or other sort of momen-



Chainsaws are music to the ear of this Texas tune-maker. Big things — like the 12' Uncle Sam — are among Doug Moreland's favorite sort of chainsaw art carvings.

ing the new *The Doug Moreland Show* CD, they'll be making an extra stop in Germany — where they'll take a tour of the Stihl chainsaw factory.

For more info, visit the web site www.dougmoreland.com or call 512-280-1530.

to, a fan can go home from a concert with a chainsaw-carved barstool, cactus or pair of cowboy boots. Ever the entrepreneur, Doug is also planning to open a store at Cattlelacs, where he operates his music business, to sell some of his larger carvings.

As he and his band tour this summer, promot-

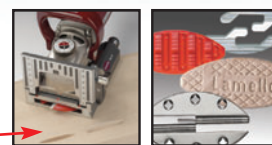
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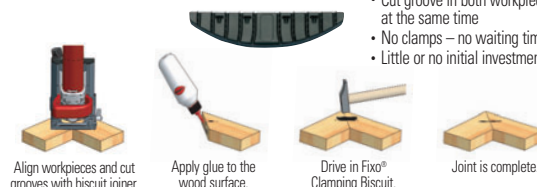
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Woodworking's Seven Dastardly Sins

By Sandor Nagyszalanczy

I'm not exactly what you would call a religious guy, but I recently perused a copy of 13th-century philosopher Thomas Aquinas's groundbreaking *Summa Theologica*, a book about the nature of sin, evil and redemption. Some of it was disturbing: I forgot that in the Middle Ages, they burned people at the stake for transgressions that wouldn't be considered exciting enough today to air on late-night TV. But the most interesting part of the book was Aquinas's discussion of the seven deadly sins of pride, envy, gluttony, lust, anger, greed and sloth. Although first penned in the 6th

century, this list of human foibles seems just as relevant in this age of global warming as it was in the "warming at the stake" days of the Middle Ages.

Being more interested in woodworking than in theology, it occurred to me that the seven sins Aquinas identified as paving stones of the road to hell reflect human behaviors that pose problems and challenges for woodworkers as well as regular folks. These seven "dastardly sins of woodworking" can lead to frustrating tangles with tools, consternation with botched projects and generally just a bad day in the woodshop. I thought it would be fun to explore each of these



sins and offer up some observations, some stories and some suggestions that, hopefully, will prevent you from going astray, and help to keep you on the virtuous path to trouble-free enjoyment of woodworking.

Sin: Envy

Most people I know are easily starstruck, and they end up comparing themselves with their heroes (I wish I could sing like Elvis). There's nothing wrong with admiring, emulating or even imitating people who are at the top of their game. When it comes to woodworking, just consider all the rocking chairs that look an awful lot like the classic designs of Sam Maloof. What's more, a healthy dose of inspiration can serve as powerful motivation for self-improvement. I remember watching master cabinetmaker (and fellow Hungarian) Frank Klausz cut and chisel out the pins and tails on a pair of 6"-wide drawer sides in about a minute flat. His hands knew just the right angle at which to hold the saw, and his eyes accurately gauged the spacing without any guides or jigs. I found his demo so inspiring that I went home and practiced on my own hand-cut dovetails until I managed to get pretty good at them.

It's one thing to be inspired by others, but entirely another to allow the envy of their triumph to ruin our enjoyment of our own woodworking pursuits. The real dark power of envy is that yearning for things that lie beyond reach (skills, money, power, etc.) tends to grind our hopes and aspirations into dust. Two examples I've experienced: at an exhibit of fine furniture at an upscale craft gallery, I overheard a woodworker say to his friend, "I'll never build furniture this nice ... I might as well sell all my tools and take up stamp collecting!" I also once spoke to a fellow who said, after watching *The New Yankee Workshop*, "I can't possibly afford a shop full of machines [like Norm has], so I might as well not bother getting into woodworking in the first place."



Envy

Motto: Why couldn't I be one of the great woodworking stars?

Telltale signs: Shrine in workshop dedicated to woodworking luminary; Considers attending workshops and seminars to be a form of worship; Person perennially unhappy with his own level of ability.

Cure: Learn to find pleasure in small accomplishments — putting a sharp edge on chisels, cutting box joints that fit together snugly — and use inspiration provided by others as incentive to better your skills.



Pride

Motto: I'm better'n you ... and I know it.

Telltale signs: Person endlessly boasts about any and all accomplishments; Often heard saying things like, "You've probably never seen a shop as nice as mine, because few people know as much about woodworking as I do ..."

Cure: Eat lots of humble pie. Revel in the deeds of others, and learn from their ways of doing things.

The first line of defense against the sin of envy is to never forget that the most powerful woodworking tool you can possess is a strong sense of determination. I've seen plenty of woodworkers use only basic skills and simple tools (combined with a heaping helping of ingenuity) to create some pretty amazing work.

Sin: Pride

Being proud of what you do is a good thing, right? If you've done something meritorious — inlaid a complex pattern, designed an elegant cabinet, applied a perfect French polish finish — why not feel good about it? Unfortunately, the world seems full of people who are so full of pride that they've crossed over from healthy self-confidence into irritating arrogance.

I've had the dubious pleasure of meeting many such woodworkers, most of whom were only too happy to regale me with long-winded tales of how terrific their latest carving, woodturning or cabinetmaking project was. As I listened to these guys drone on and on, I'd find myself thinking things like, "I'm surprised that this guy isn't wearing a medallion on his chest that says 'God's gift to woodworking.'"

My worst encounter was at a woodworking show. As we stood in front of a tall padauk dresser a rather snooty guy was exhibiting, I pointed out that the dovetails joining the carcass were rather poorly cut and fit. Instead of offering excuses, this guy had the audacity to tell me that he had actually intended to cut them that way, saying that he didn't like the look of "overly precise" joinery. He then went on to tell me that the glue spots visible in the finish were due to figure in the grain of the wood. I was speechless.

The message I would have loved to tell such a prideful woodworker (if I could've gotten a word in edgewise) is this: No matter how terrific you really are at what you do, there's always someone out there who is as good or better at it. Someone you could learn something from — if you'd just take the time to look and listen.

Sin: Gluttony

Thin might be in, but the glutton will tell you that "fat is where it's at." Beneath the barrage of media ads for diet pills and miracle exercisers, there's a steady drone of corporate encouragement for us to indulge in gluttony and super-size practically everything we eat, buy or do.

But while quadruple-patty burgers and gallon-sized soft drinks can appease the largest hunger and thirst, gluttony's practice of excess does little to please in the woodshop. For example, flooding lots and lots of glue all over the edges of two boards you're clamping together may seem like a good thing. After all, you want the joint to be strong, right? But the river of goo that squeezes out all over the wood, the clamps, the bench and you provides a quick reminder that, just as when sipping potent potables at a party, it's prudent to know when enough is enough. Likewise, anyone who's used nails or screws to assemble a project knows that there's often a fine line between using just enough fasteners to make a solid connection and too many that split the wood. Over-designing and over-building a piece are other kinds of shop gluttony, resulting in furniture and cabinets that look busy rather than elegant and are heavier than they need to be.

When it comes to finishing wood, most people know that applying a single, too-thick coat of finish at once, rather than several thin coats in intervals, invites trouble: At best, the dried finish ends up looking uneven and gloppy; at worst, the finish might not dry at all underneath.

One of my own finishing misadventures involved the heavy-handed application of a Danish oil finish on a wine rack I'd built from some spectacular curly-figured Hawaiian koa wood. I tried to follow the directions, which encouraged me to flood the wood with the oil, reapplying it to any areas that had soaked it in. The wood drank the oil up as if koa were some kind of parched desert species visiting an oasis for the first time. After using up half the can, I let the oily wine rack sit a while, then wiped it dry. I thoroughly mopped the surface with an old beach towel until it had a pleasant sheen and set about cleaning up. But when I admired my handiwork a few minutes later, there were damp spots all over the wood! A stray dog marking his territory? An incontinent bat up in the shop's rafters? I wiped the surface dry again. Ten minutes later, the dogs and bats were back. Again I wiped and waited, and again the spots returned. Closer inspection revealed that after every wipe-down, fresh oil was welling out of the koa's open pores. Later, I learned that this happens with Danish oil, if you apply too much to open-pored woods, like koa, oak and mahogany. The lesson here is that with glue, oil finish, fasteners, as well as most other things in life, moderation is far more virtuous than excess and usually leads to better results.



G luttony

Motto: If enough is good, too much is way better.

Telltale signs: Purchases glue and wood finish by the barrel; Prefers over-the-top styles like baroque and rococo over simpler, cleaner designs.

Cure: Discover the joys of moderation: Apply just enough glue to create beads of squeeze-out when clamping. Reject over-building in favor of light-but-efficient construction.



Lust

Motto: He who dies with the most latest, greatest, coolest tools wins!

Telltale signs: Waist-high stacks of tool catalogs in bathrooms and den; On first-name basis with every salesman at local tool store; More electronic gadgets in the shop than at Radioshack®.

Cure: Spend more time learning to use effectively the tools you already have. Enjoy the simple pleasures of using basic hand tools.

Sin: Lust

Let's face it, cool new tools and clever gadgets make woodworking more interesting and fun for most of us. But constantly lusting after the latest technological marvel or patented wonder device can turn you into a tool junkie with a slim wallet and a lot of cool stuff you don't know how to use or have the time to bother with. Occasional indulgence in tool lust seems unavoidable. Just don't forget that sidestepping the purchase of three \$30 "gotta have" gadgets leaves you a bankroll big enough to buy one good handplane, set of high quality drill bits, layout square or other essential shop item you'll be using decades from now, long after the gadgets have disappeared under a thick blanket of dust.

There's one particular pitfall that's really hard not to tumble into. Here's the scenario: You're at a local woodworking expo, wandering the aisles admiring every shiny new tool and miracle accessory. Your pants pockets are bulging with bills screaming to be spent. You come across a fellow demonstrating a "revolutionary" new joinery system. He swears that with just a basic router and his device, you could build a Philadelphia-style highboy or Wooten patent desk in no time at all. After his seductive patter draws you in, his well orchestrated demonstration is mesmerizing: He appears to effortlessly set up the jig, plunge the router into splinterless stock, and create picture-perfect joints that mate with surgical precision. He makes it all look soooo easy that by the time his cute assistant comes around to complete the sale, your wallet floats out of your pocket

faster than bubbles rising in a glass of light beer.

But alas, the spell is broken once you reach home and discover that the manual for your new *Jigmaster 8000* is thicker than a Cleveland phonebook and written in a language that's a patchy mixture of Korean, English and Esperanto. Just setting the thing up requires the patience of a saint and a strong knowledge of differential calculus. After getting lost somewhere around "super-easy step" 219, you decide that the jig would make a handsome addition to the shelf you store your paint cans on.

The moral of this tale of tool lust is that for everything you get in life, you must give something. For all the enjoyment you might get out of a new tool or accessory, you must learn how to use the tool (and remember how to set it up and use it years after the purchase) and take the time to maintain it (sharpen it, adjust it, etc.).

Sin: Anger

If I could cite a single cardinal rule for woodworking, it's that one should NEVER EVER EVER work in the shop when upset, cross, annoyed, angry, bitter, huffy, incensed, irate, ill-tempered, furious, peeved, uptight, wrathful or just plain mad. You're not only prone to make more mistakes, but working angry can make your usually restful pastime feel like a bad day at the office. At worst, anger can lead to ruined tools, wasted wood or even an accident that'll ruin more than just your day.

If you're like me, you depend on the sanctuary of your workshop to help you deal with the frustrations and annoyances of day-to-day existence. Just the smell of sweet shavings and the whir of well-tuned machines can soothe the mood and calm the nerves (woodworking as therapy isn't as cheap as psychiatry, but you don't have to make an appointment). Unfortunately, even one angry thought can engender a foul mood that'll distract your attention and zap your enthusiasm. If you find your train of thought steaming from pleasureville to the land of malice and mayhem, it's time to put on the brakes and take a time-out. Return to the shop when you can focus on what you're doing — especially when you're using power tools with razor-edged bits and blades passing within inches of your vulnerable flesh.

One of the most insidious aspects of anger is that it's cumulative. When any little thing goes wrong, it seems that everything goes wrong from then on. This usually starts out with a minor blunder, like a miscut part, a misplaced tool or dust that lands on a drying finish. Add up a few of these little irritations, and soon you're on the verge of a full-blown meltdown. And God save the poor spouse or friend who wanders by the shop about the time you're launching a chisel, hammer or stream of expletives into the air.

Sin: Greed

Unless you have a lot of space, time and money, being a greedy woodworker isn't such a good thing. Greed inspires us not only to acquire more things than we need — tools, machines, wood, hardware, etc. — but to hoard these things as well. Commonly known as the “packrat” disease, hoarding behavior ranges from mild (most of us have at least a board or two of some insanely beautiful wood that we can't stand to actually cut up and build something out of) to obsessive (how many pounds of brass hardware does it take to fill up an entire four-drawer filing cabinet?). Even those of us not operating in acquisition mode have our packrat moments, especially when it comes time to do a little spring cleaning in the



Anger

Motto: @#%*%\$^+#!

Telltale signs: Constant stream of curses whenever work is in progress; Thrown tools and objects frequently flying around shop; Person's face contorted into a permanent scowl.

Cure: Count to 10, take a powder, enroll in a yoga class or do whatever it takes to reduce your blood pressure and put a smile back on your face. Remember: The worst day doing woodworking is usually better than the best day at your daily grind.



Greed

Motto: Gotta have it all, gotta keep it all.

Telltale signs: Often seen at flea markets loading carts full of old rusty hardware which might be needed someday; Sagging shelves and bins bursting with stuff fill most of workshop; Never, ever seen throwing anything away.

Cure: Occasionally, do a triage to separate the things you need from the ones you don't and then hold a garage sale or do a dump run. Use those precious boards or antique hardware to actually build something once in a while.

woodshop. Can't you just hear yourself saying, "I can't throw out these 1" x 3" teak scraps; I might decide to build a miniature boat out of 'em someday."

There are actually two downsides to being a woodworking packrat: 1. Over the years, you end up spending a lot of bucks to buy stuff you don't have a use for now, and likely never will have a use for. While you're shop-rich, your poor children end up running around wearing empty "Shop Towel" boxes on their feet. 2. Unless you're lucky enough to own a huge shop, you may end up adding on to your existing shop (or renting a storage locker), just to have a place to keep all your junk (er, "supplies"). Even if your shop is the size of a blimp hangar, you still have to find places to store all those treasures and take the time to organize them so you can actually find something on the rare occasion you decide to use it. Plus, some things just don't last forever: finishes and glues go bad; lumber is vulnerable to problems from heat, improper storage and more: I visited a woodworker some years ago with wide lovely planks he had stashed away for "someday." But an army of borer beetles chose his stash for their condominium complex, reducing sturdy planks into a heap of bug-riddled firewood.

Here's a good idea: Some years back, the *Wall Street Journal's* wine column proposed a special "Open That Bottle Night" where wine lovers and collectors were encouraged to prepare a special meal and open a bottle of wine that previously seemed too precious to drink. How about instigating the same practice for woodworkers? Once a year (or even every few years), why not build a project from one of the special boards that's secreted away in your wood rack? Or it could be a piece, like a hutch or dresser, that uses antique brass pulls you bought years ago. Even if the project isn't for what you'd normally consider a special occasion, just using special materials in the piece tends to make the piece special. Better still, how about a building project aimed at someone or some group who really needs it? Building a bunch of wooden toys from beautiful hardwood and donating to "Toys for Tots" or a similar organization at Christmas time could go a long way towards crossing "greed" off your list of dastardly sins.

Sin: Sloth

If you haven't seen your dust-and-chip-strewn shop floor since *M*A*S*H* was on prime-time TV, and your shop cleaning and organizational philosophies can be summed up by the word "*mañana*," then you're surely guilty of woodshop sloth. A shop with piles

of scraps to step around, machine and benchtops to unclutter, misplaced tools to endlessly search for isn't exactly a pleasure to work in. Filthy shops are unsafe and unhealthy as well: 1. Mountains of sawdust and small scraps are just waiting for a small spark from a grinding wheel or electrical junction box to set them ablaze. 2. The fine, lung-choking dust that coats every surface is stirred into the air every time you take a step or brush off a tool table. 3. Piles of tools, loose power cords, stray clamps, etc. pose a significant tripping hazard. 4. Disease-carrying vermin love to live in unemptied trash bins, old cardboard boxes, etc. Ultimately, making friends with your shop vacuum and putting things back where they belong every now and again will help make your shop a happier place to be, as well as a more efficient place to work.

Other dastardly aspects to being a slothful, lazy woodworker can spoil every aspect of the woodworking experience. A quick rundown:

Measuring and layout: Too much trouble to double-check the sizes of parts before cutting them out? Dwell on the counterproductiveness of this approach as you remake parts that were accidentally cut the wrong size.

Cutting: What do you call project parts cut out on a table saw fitted with a miter gauge not adjusted for squareness and a blade not sharpened since the Nixon administration? *Firewood.*

Joinery: Can't be bothered cutting tight-fitting joinery for a blanket chest or jewelry box? No problem. That's why hardware stores sell wood putty.

Sanding: Too lazy to carefully sand the surface of a project with successively finer grits, thoroughly sanding with one grit before moving on to a finer one? You didn't really want the final surface to look clean and smooth ... or did you?



Sloth

Motto: Never do today what could be put off until tomorrow.

Telltale signs: Shop entrance blocked by stacks of boxes, tools and piles of debris; Half-finished projects lying in corners and beneath benches; Sound you hear in shop isn't sawing, it's snoring.

Cure: Take a good multivitamin, sip a latte or chug an energy drink as often as necessary to get some pep back in your step. Clean and organize your shop once a year, whether you think it needs it or not.

Assembly: It's a lot of trouble to "dry fit" parts together and check to make sure all the joints close and you have all the supplies you need before you attempt an actual glue-up. Besides, you'll get lots of exercise and excitement madly scrambling for clamps, wiping up rivers of spewing glue and trying to pound ill-fitting parts together if you don't dry assemble first.

Finishing: It takes a little extra time and trouble to create a finish sample before you apply a coat or two on your precious project. But one swipe with the stain can reveal lots of problems (blotching, sanding scratches) that the extra effort can prevent.

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Rebuilding the Past:

By Bill Hylton

Our author reproduces a family heirloom and puts sweet smiles on his granddaughters' faces. A couple of days of shop time is all it will take you to complete this easy-to-build pine play cupboard.

In 1920, a patternmaker named John Kitzmiller built a replica of a kitchen cupboard for his seven-year-old daughter, Mary. The 3½-foot-tall cupboard was a stepback design, with three drawers and a compartment with a door below the counter and a pair of doors closing over shelves above the counter. The cupboard was very simply constructed, using pine, nails and steel hardware.

When I was born in the mid-'40s, my mother Mary still had the cupboard. It was in the bedroom I shared with my sister and was part of our playroom furniture. As we grew up, my sister continued to use the cupboard as her jewelry/curio cabinet. When she set up house on her own, she left the cupboard behind.

So, when my wife and I had a daughter, my mother gave her first granddaughter the cupboard. It was in Becky's bedroom as she grew up, and it stayed there when she went away to college.

Now it's in our living room, a repository for dolls, art supplies and other playthings my granddaughters head for whenever they visit. My sister still treasures that cupboard, regarding it as rightfully hers. About a year ago, having nurtured guilt over giving away her daughter's cupboard and

knowing her life was near its end, Mom appealed to me: "You're the woodworker in the family," she said. "Make a copy for your sister."

Well, you can't say no to your mother, no matter how old you are. So I took a fresh, close look at the

cupboard, and I realized what a great project it would be. The joinery is simple, and the design forgives less-than-perfect execution.

Getting Started

For me, the first task was to measure the piece and draw plans. As I did, I

made some changes, using dadoes in the case rather than cleats and beaded shiplaps between the back boards rather than butt joints.

One bit of guesswork involved the upper doors. The original had a pair of doors closing over the shelves. At some point, they'd been removed, and now they're gone. I extrapolated their height from the puttied-over holes for the hinge screws.

Shopping for hardware came next. I looked online and in several print catalogs to find suitable pulls and latches. But for a long time I was stumped by the hinges. Eventually I spied them in a home center: brass rather than steel. They're the exact size and pattern my grandfather bought almost 90 years ago.

Because the original was made of white pine, that's what I used. I bought

A great-grandfather's handiwork (below) becomes the prototype for this next iteration of a play cupboard.



A Child's Kitchen Cupboard



some 1x white pine — the kind sold at home centers — but also some clear 4/4 pine. Dryness is sometimes a problem with the dressed 1x material, so I limited its use to the thin boards — back, drawer sides and so on. For the 3/4" cupboard sides, door frames, and drawer fronts, I used the 4/4 material.

It will be tough to make this cupboard unless you have access to a jointer and a planer. The shelves and back boards are 1/2" thick. The drawer sides and backs are 9/16" thick. The door panels and drawer bottoms are glued-up panels of solid wood. Obviously, there's a lot of stock to joint and plane to its correct thickness.

Regardless of the stock source or species chosen, it's always good to cut the parts to rough sizes at the start. By "rough" size I mean about 1/2" wider than specified on the cut list and about 1/2" longer, too. Write the part names of the ends of the pieces. Face-joint and plane the stock, but don't reduce it to the final thickness. Leave it at least 1/16"



Most lunchbox planers will surface stock down to 1/4", but not all. I use a shop-made planer board to elevate the stock and thus bypass minimum thickness limitations. The jig is a double-thickness of MDF — heavily waxed — with low guide-rails for the stock and a cleat that catches on the planer's infeed table.

thing you want is for a part to cup or twist after it's reduced to its final dimensions — or for a part you've precut to the *Material List* dimensions to end up too short for the cupboard you've built.

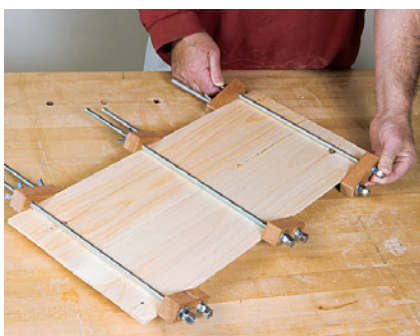
Constructing the Case

Case construction is straightforward for the most part. You have to edge-glue short and long boards to make the L-shaped sides. Glue up blanks for the counter, bottom and divider also. Dadoes and stopped dadoes will join these parts.

The sides and the counter have inside corners. Since you have to edge-glue two boards to form each of them, it's easiest to create those corners where the pieces meet.

To guarantee exact placement of the short side panels on the long ones, I cut most of the dadoes in the long parts before glue-up. I stuck a piece of scrap into the dado for the counter and butted the short panel against the scrap when I glued the two together to make up each side.

Afterwards, I trimmed the bottom edges, laid out and cut the bootjack shape to create feet, chamfered the top front corner and routed the



These shop-made clamps are efficient for gluing up thin stock. Each clamp is made with two lengths of all-thread, jam nuts, wing nuts, and two small wood blocks. As you tighten the wing nuts, tip each clamp so both rods are against the stock. This keeps the panel flat.

"fat." Stack the parts with stickers and let the wood settle in for a week or two.

Then, as you use the parts, dress them to final thickness and trim to final width and length. The last



To ensure the cuts align, lay out the dadoes on the long side panels with the two pieces clamped edge-to-edge. Measure from the bottoms up and make a single tick-mark for each pair of cuts. Use that mark to locate your square, and scribe across both sides. Set the square to the length of the stopped dadoes and mark across its end so that all the stopped cuts are the same length.

stopped dado for the bottom panel.

The counter's critical dimension is the length of its short element. It's got to be the same length as the shelves and bottom. So, I clamped a stop block to the saw and cut those parts to length at the same time.

I left the front element of the counter overlong. When I edge-glued the two pieces, I marked the middle of each and roughly aligned those marks. After the glue set, I trimmed the counter so the long element extended beyond the short an equal distance (approximately 1 5/8") at each end.

Because most of the dadoes are stopped, I cut all of them with a router. The 1/8" depth is doable in one pass on the router and sufficiently deep for a strong assembly.

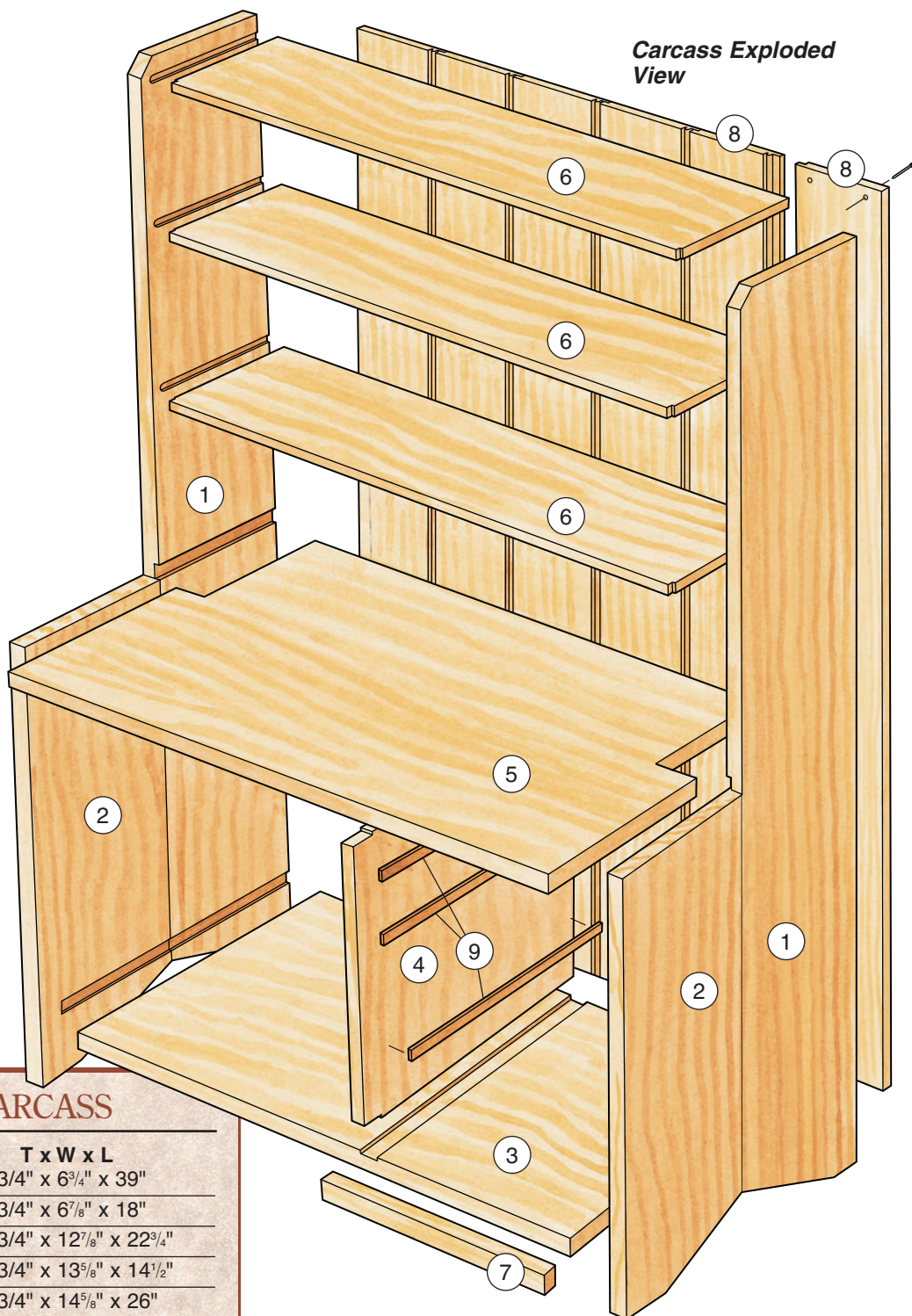
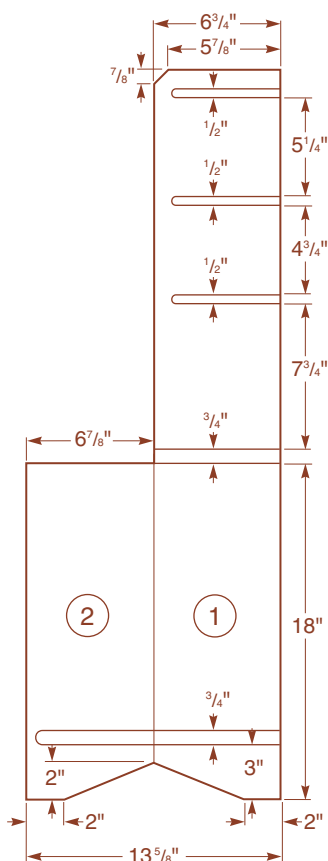
It's easy enough to rout stopped dadoes to a mark. What's harder is getting a tidy-looking assembly. I stopped the dadoes about 1/8" shy



Glue the short side to the long after the shelf and counter dadoes are cut. The short side's top end must be flush with the counter dado in the long side. Tuck a scrap into the dado and slide the short side against it. Keep the piece in contact with the scrap as you tighten the clamps.

Carcass Exploded View

Side Panel (Inside View)



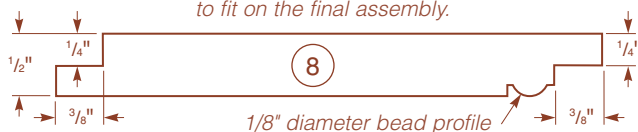
MATERIAL LIST CARCASS

	T x W x L
1 Long Side Panels (2)	3/4" x 6 3/4" x 39"
2 Short Side Panels (2)	3/4" x 6 7/8" x 18"
3 Bottom (1)	3/4" x 12 7/8" x 22 3/4"
4 Divider (1)	3/4" x 13 5/8" x 14 1/2"
5 Counter (1)	3/4" x 14 5/8" x 26"
6 Shelves (3)	1/2" x 6" x 22 3/4"
7 False Rail (1)	3/4" x 1" x 9 3/4"
8 Back Strips (6)	1/2" x 4 3/8" x 39"
9 Drawer Runners* (6)	1/2" x 1/4" x 13 7/8"

* Adjust dimensions to fit grooves.

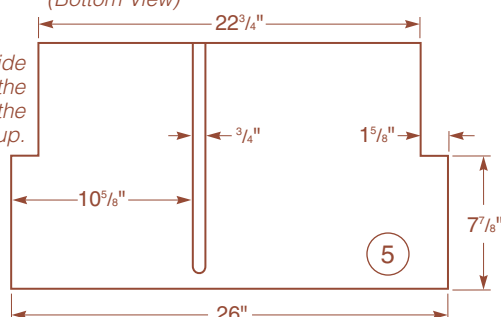
Back Strip (End View)

The edges of the back strips that overlay the side panels are left square and trimmed to fit on the final assembly.



Counter (Bottom View)

Form the inside corners of the counter during the glue-up.





Tidy Joints: The “Notchural” Way!

Clamp the bottom and counter edge-to-edge (left) to rout the dados. Routing both dados in a continuous pass ensures that they’ll align and the divider will be square.



The simplest way to fit the shelves, bottom and divider to the rounded-end stopped dados (right) is to relieve their ends on the router table (above). Set the bit height to match the dado depth. Stand the piece on end, support it with a square scrap, and trim the front corner.



of the width of the part to be housed. That is, I cut the dados for the 6"-wide shelves only 5 $\frac{7}{8}$ " long. Then I trimmed off the front corners of the shelf. The trimmed corner fits around the rounded end of the dado and conceals it. (See *photos* above.)

When the joints all are cut and the parts are carefully sanded, assemble and clamp the case. While the glue cures, make the back boards.

Cutting rabbets to create the shiplap joints is a router table operation, and so is milling the bead details (see *photos*, opposite page).

At this point, you can install some of the back boards, but leave them off in the drawer bay area. I nailed three or four in place at this stage. Attach the back boards with brads driven into the back edges of the shelves, counter and bottom panel.

Making the Drawers

Only after the case is assembled should you build the drawers. Begin by holding the drawer fronts at the cupboard’s opening for them and marking each for crosscutting. You want a nice, tight fit from side to side. Then stack the three fronts in the opening to determine how much each should be trimmed in width (for drawer height). You



Begin assembly with a side elevated on scraps (clearance for the counter overhang). Clamp the divider between the counter and bottom. Join this subassembly to the side. Stand the shelves in place and add the second side.



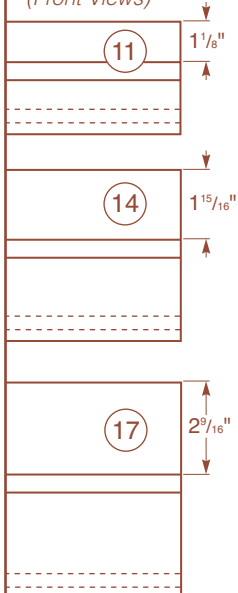
Once the second side is in place, set the assembly upright and apply more clamps to secure the parts until the glue sets. Check your glue-up to assure that it is square, adjusting as needed.

Routing a Bead Detail

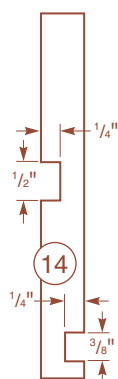


A small bead on the rabbet's shoulder masks the seam between boards, which will open seasonally as the boards expand and contract. Use an edge-beading bit in your router table, extending it to reach up past the rabbet. You only need to form the bead profile on the inside face of each board.

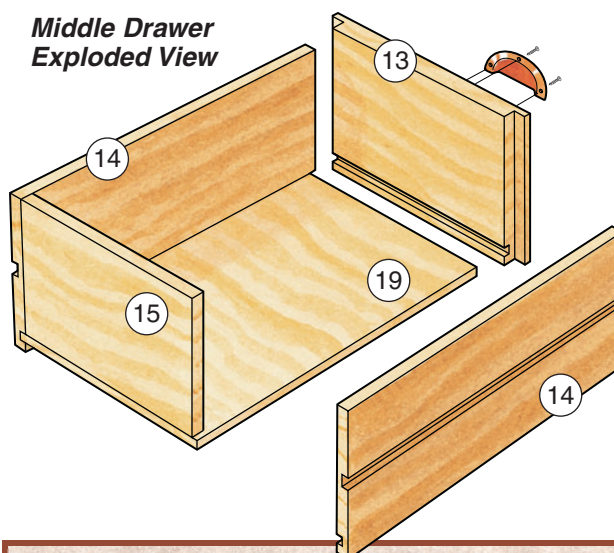
Drawer Sides (Front Views)



Drawer Side (Groove Dimensions)



Middle Drawer Exploded View



MATERIAL LIST DRAWERS

	T x W x L
10 Top Front* (1)	3/4" x 3 1/8" x 8 15/16"
11 Top Side* (2)	9/16" x 3 1/8" x 13 3/8"
12 Top Back* (1)	9/16" x 2 3/4" x 7 13/16"
13 Middle Front* (1)	3/4" x 4 3/4" x 8 15/16"
14 Middle Sides* (2)	9/16" x 4 3/4" x 13 3/8"
15 Middle Back* (1)	9/16" x 3 3/8" x 7 13/16"
16 Bottom Front* (1)	3/4" x 6 1/8" x 8 15/16"
17 Bottom Sides* (2)	9/16" x 6 1/8" x 13 3/8"
18 Bottom Back* (1)	9/16" x 5 5/8" x 7 13/16"
19 Drawer Bottoms* (3)	3/8" x 13 3/8" x 8 1/4"

* The drawer front dimensions and those of their related pieces must be adjusted to fit your drawer openings.

want the fronts to fill the opening from bottom to top without gaps.

Rip the drawer sides to width so they match the height of the respective fronts, and crosscut them to length — 1/4" less than the front-to-back depth of the drawer bay.

I kept the drawer joinery simple. The fronts are rabbeted to hide the sides, and the back corners are butt joints. Plow the drawer runner grooves in the outside face of the drawer sides. Once you've cut the drawer bottom grooves, cut bottom panels to fit, and assemble the drawers with glue and finish nails. Bear in mind that the grain of the bottoms must run side-to-

side so the stock will expand out the back, rather than pushing the sides apart. Fit the drawers individually to the bay. Sand or plane the

drawer sides, if necessary, to increase side clearance. Then stack the three drawers in the bay to assess the vertical clearance between them and the case. As

long as you can fit the stack of three into the bay, you are fine. You'll fine-tune the clearances after installing the drawer runners.

Make the runners by planing a 2-plus inch wide scrap that's at least as long as the drawer sides so it fits comfortably on-edge in a runner groove. Rip six strips from it that are slightly less in thickness than the groove depth.

The drawer runner installation is shown in the *photos* on the following page. Slide all



Cut the drawer fronts to fit your case. Mark the piece for final crosscutting by holding it in place. Catch one end against the divider, as shown, and guide a marking knife along the side to accurately mark the front's top edge.



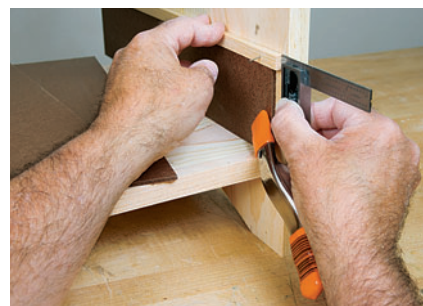
Before assembling the drawers, fit the sides to the drawer bay. Stack one side for a bottom, middle and top drawer against the cupboard side. You want to be able to slide them in and out without excessive play. Check how they fit when stacked against the divider, too.



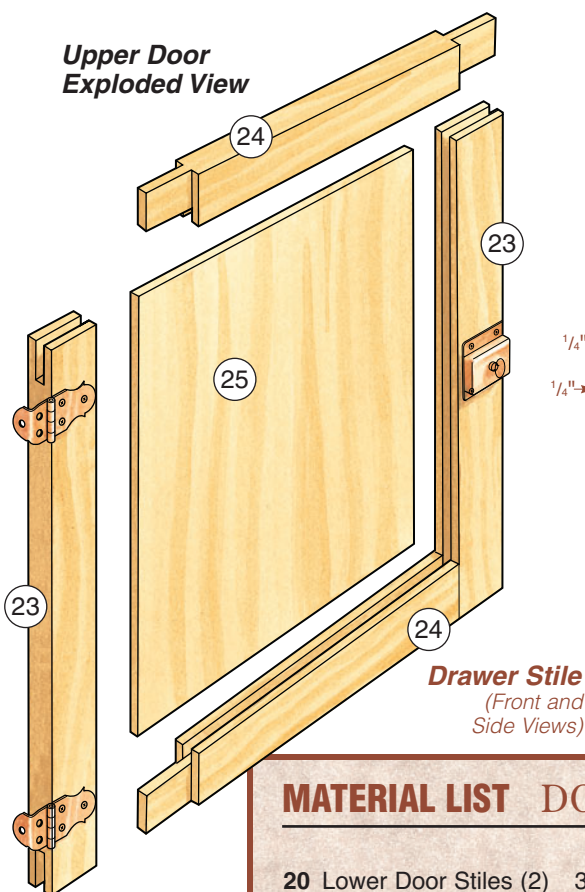
Install the drawer runners before completing the cupboard back. Fit the assembled drawers in the bay and transfer the locations of the runner grooves to the cupboard side. These locations are where you will mount the drawer runners in the communal drawer opening.

three drawers in the drawer bay and transfer their groove locations to the case side using a pencil.

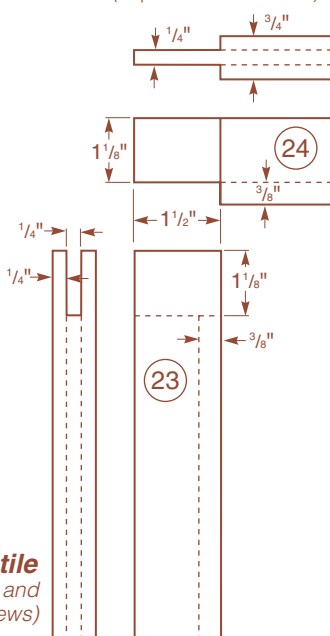
Measure from the bay's floor to the uppermost runner location. Cut a 12"-wide scrap of plywood or hardboard to that length to use as a mounting gauge. Clamp it against the side, and rest the runner on its top edge. Tack the runner to the side. Move the gauge against the divider and attach the matching runner. Measure from the bay floor to the middle runner, cut down the gauge, and attach the middle runners. Repeat to attach the bottom runners. (You can now attach the



Start a small nail or two into the runner before setting it on the "mounting gauge." Use a small adjustable square, set to the thickness of the drawer front at the groove, to position the nose of the runner. Then tack the runner to the side. Trim the runner flush at the back.



Drawer Rail
(Top and Front Views)



rest of the back strips if you want.)

Starting at the top, slide a drawer onto its runners and assess its fit. Plane material off the drawer's top edges, if necessary, to improve the fit. Add the second and third drawers, following the same fitting process. Now you're getting close to the completion of the project.

Making the Doors

The final components to make are the doors. I scaled the width of the door frames to accommodate the latches, which are slightly larger than those my grandfather used. The rails and stiles, cut to final length, are grooved for the thin, flat, solid-wood panels and assembled with slip joints.

MATERIAL LIST DOORS

	T x W x L
20 Lower Door Stiles (2)	3/4" x 1 1/2" x 15 1/4"
21 Lower Door Rails (2)	3/4" x 1 1/2" x 12 5/8"
22 Lower Door Panel (1)	1/4" x 10 3/8" x 13"
23 Upper Door Stiles (4)	3/4" x 1 1/2" x 13 1/4"
24 Upper Door Rails (4)	3/4" x 1 1/2" x 11 1/4"
25 Upper Door Panel (2)	1/4" x 9" x 11"

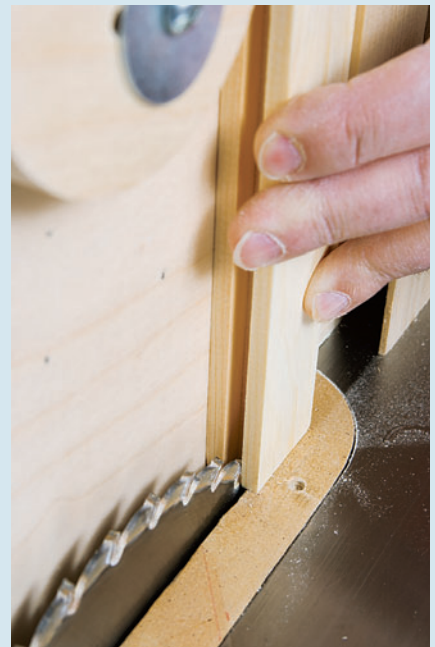
Slip-joint Door Joinery Made Easy with a Tenoning Jig



Cut the shoulders using the miter gauge to feed the work. Butt the piece against a stand-off block clamped to the fence to ensure all the cuts are uniformly placed. Use one of the rails to set the blade height of the groove.



For the tenon cuts, the author used a shopmade tenoning jig that straddles the rip fence. A quick pass cuts the first cheek. Release the clamp, spin the piece, and re-secure it to cut the second cheek.



Before cutting the slip-joint slots in the stiles, reset the blade height using a tenon as your gauge. Shift the fence so it just skims the inside wall of the panel groove. Then make two passes to cut the deep tenon slot.

The slip joint (also known as an open mortise and tenon) is a great alternative to the more traditional form of the mortise-and-tenon. As shown in the *photos* above, you cut both halves of the joint on the table saw using a tenoning jig.

Once the doors are assembled, install the hardware, beginning with the hinges. You'll need to bend one leaf of each hinge to wrap around the cupboard side's edge, as shown in the *Drawings*. As I dealt with this task, I realized that my grandfather surely did the same thing. When he bought them, his hinges didn't have a bend either.

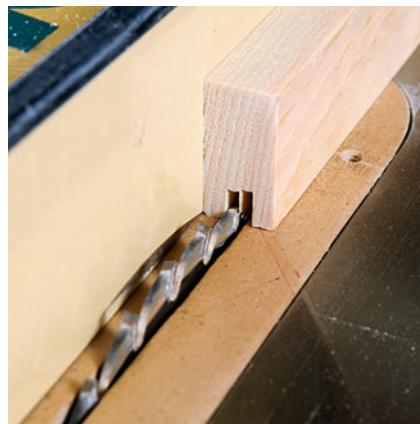
With the hinges in place, mount the latches, including the little one that you mount inside to keep the right-hand upper door closed. Mount the drawer pulls.

I actually don't know what finish the cupboard originally had. My earliest recollection is orange paint. Then it changed to black paint. My wife stripped the paint and applied

polyurethane years ago. Whichever route you take, remove the hardware, apply the finish, and remount the hardware.

New Heirlooms Continue On ...

That's not the end of it, of course; certainly it hasn't been for me. I



Rip a centered panel groove in the rails and stiles. Set the fence and make a cut. Turn the workpiece so the second face is against the fence and cut again. After cutting all the grooves, you can rip out any wispy waste by resetting the fence and making a third pass.

completed my reproduction and was able to show it to my mother before she died. My sister was surprised and thrilled to get it. And I found everyone's reactions to the little cupboard I made very rewarding.

Now I've completed a second one — you see it here with my granddaughters Claire and Helen (though it's going to their little sister Grace). A third is under construction for, well, I'm not entirely sure for who.

What's been particularly satisfying for me is being a contributor to this multigenerational heirloom. It's sappy, perhaps, but I do feel a bond to a grandfather I never met (he died long before I was born). And I still feel the hug my sister gave me that day last summer. Hopefully, Gracie's cupboard will be passed to her daughter (the fifth in the line!) in 25 or 30 years.

Bill Hylton is an author, woodworker and frequent contributor to Woodworker's Journal.

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Joinery: Quick and Strong

By Chris Marshall

There's always more than one way to join two or more pieces of wood together. Sometimes speed is just as important as strength — here are three slick ways to be quick.

Look behind the centerspread for details on three quick methods of joinery.

There's always more than one way to join two or more pieces of wood together. Sometimes speed is just as important as strength — here are three slick ways to be quick.

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Three Quick Ways to

Fine-tuning a fancy joint to that perfect friction fit can be a satisfying experience. The extra effort is what's it's all about. But, sometimes simply getting the job done is more important than savoring the effort. Where a dovetail joint might be overkill, a pocket-hole joint might be just the ticket for bringing quick conclusion to a sweet project. And, while a twin-tenoned apron joint may impress your woodworking pals, a double dowel joint just might save the day on the home front and provide all the strength your "honey-do" task requires.

No-fuss Pocket Screw Joints

Pocket screw joints are as sturdy as they are easy to make. You use a drilling jig and stepped bit to bore steeply pitched, counterbored holes in one joint member. Then, drive a couple of self-tapping screws into these holes to draw the joint together. The result is a surprisingly strong, reinforced miter or butt joint that requires no glue. Once the screws are driven home, you're finished.

Pocket screws are the fastest way I know of to build face frames, and with a little creativity you can

Pocket Screw Joints



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use them for most casework joinery — assembling backs to sides, building shelf panels from narrower stock, attaching edge banding or toe kicks, fastening hang strips ... the list goes on. Pocket screws are also great for other furniture applications, such as joining legs and aprons, sneaking screws into tight spots or fastening picture frame miters.

It's not difficult to get started making pocket-hole joints. For example, the ultra-basic pocket-hole jig set shown here comes with everything you need to get started. The jig has hardened steel sleeves to reinforce the drill bit holes and a screw clamp to hold workpieces securely. You also get a stepped drill bit and stop collar, a 6" square drive bit and a handful of panhead screws. In three easy steps, I bet you'll be a pocket screw convert.

Versatile Dowel Joinery

Dowels may not be as fashionable as pocket screws these days, but they're still good solutions when you don't want to see oval holes with screws buried in them. They're sometimes the best choice for situations where a joint must be both strong and fastener-free. Dowels are also helpful for keeping joint parts



aligned during glue-up, especially when you're clamping odd-angle joints. Adding dowels to a cross-grain butt joint creates a mechanical connection where glue alone could fail.

There's a trick to making successful dowel joints: you need a jig that registers parts precisely. If dowel holes are even slightly askew, the joint parts will be thrown

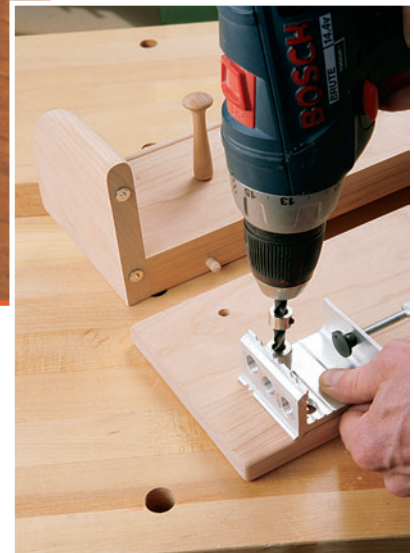
Pocket-hole joints are sturdy and simple to make with a drilling jig. By drilling steeply pitched counterbores in one joint member, you can drive self-tapping screws into the other without pilot holes. The joints are ideal for leg-and-rail connections, cabinet construction or for those tight-squeeze spots. All pocket-hole jigs work on the same basic principle and are must-have shop helpers.



working

**For the Professional
and the Do-It-Yourselfer**

Dowel Joints



Dowels add mechanical strength to butt joints and can help keep miters lined up during clamping. They also create invisible connections when appearance matters. Dowels as means to join wood have been used for hundreds of years — but they continue to be an up-to-date joinery solution in both professional and home workshops.

out of alignment or, worse, the joint won't close at all ... vexing problems either way. Here's where a simple jig can save time and frustration. Pointed notches on the working edges of a jig like the one shown above center your drill bit automatically. Just knife a thin layout mark across the joint where you want the dowel to be, and registering the drill bit is easy.

Doweling jigs will have one or more drilling configurations. In terms of versatility, the more ways you can clamp and drill, the better. Look for a jig that has interchangeable drill bushings for 1/4", 5/16" and 3/8" drill bits. These bushings can be threaded into the side of the jig for drilling holes in edge or end grain. Or, they can be screwed into the end or inside

pocket for drilling face-grain holes. Tighten the clamp or just hold the jig in place, and drill away. Slip in the dowels and clamp. It's pretty straightforward.

When you need to build a "blind" joint, turn to the steel dowel points that typically accompany these jigs to make registration less of a headache. Just drill holes for one side of the joint, insert the correct dowel points and press the parts together to prick centerpoints on the mating piece. Then you can drill the matching holes using the depressed holes as your markers. Even if you're mostly a "mortise-and-tenon" sort like I am, you'll find that a doweling kit will be helpful to have on hand when only a dowel joint will do.

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Flattening waney or crooked edges is usually a job for other machines, but these jointer clamps make it quick and safe to do on a table saw. Just mount the clamps to a guide board to create a flat reference edge (1) and then clamp the stock to the guide to make your rip cut (2). The guide board can also add a margin of safety for your hands when beveling or ripping narrow stock close to the blade (3).

Creating Long Butt Joints

Unless you have a jointer or band saw, it's tough to flatten waney-edged or crooked boards to prepare for squaring and glue-up. And we all know that guiding a wayward edge along a rip fence is a recipe for disaster. What's a woodworker to do? Maybe you've tried the "quick and dirty" method of nailing or screwing your rough stock to a piece of straight scrap to create a mock flat edge for sawing. It works, but you end up with fastener holes to cut away ... not ideal.

I've found General's slick little double-sided clamps solve the problem of straight-line ripping more elegantly. The clamps simply attach to the edges of both a guide board and your workpiece. The guide can be made from any straight-edged scrap with a shallow rabbet cut along one edge to accept the clamp lips.

Using the jig is a no-brainer: clamp your waney or crooked stock to the guide board, set the saw fence for the first rip cut, and push the works through. You'll get a dead-flat edge every time, with no extra waste. The clamps work on any length stock up to 2" thick.

Chris Marshall is Woodworker's Journal's field editor. He builds projects and reviews tools for the Journal from his shop in Sunbury, Ohio.

Straight-line Glue Joints

2



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A Wall-Hung Bookcase

By Ian Kirby

Deceptively simple in appearance, this complex project is made all the more challenging by its material, English brown oak, and its joinery, through-wedged twin mortise and tenons.

I designed this bookcase to house a small collection of cookbooks in regular use. As with all furniture forms, there are two parts to the design solution. One is the functional, and the other is the aesthetic — which also supports the piece's function.

Book storage and retrieval is a problem we have all faced and solved many times. It is so important and common that a groundbreaking innovation for the task is quite unlikely: The choices are open shelves or cupboards with glazed or paneled doors. I opted for open shelves, so the remainder of the design solution was devoted to what I wanted it to look like, which is affected by its size, proportion, materials and how they come together.

In this case, the size and proportion was constrained by where the bookcase was to go in the house. The site for the bookcase was a span of wall 34" wide between two windows. Now, knowledge was in hand of the number of books to be stored, the site and hence — size and proportions. From here on out, one can determine the remaining details of materials and joinery.

The desire was to build in English brown oak, which presented its own set of challenges relative to finding suitable stock. For more on that adventure, see the sidebar (page 60). I also decided to use a challenging joinery system: through-wedged twin mortise and tenons, typical of the English Arts and Crafts tradition that I grew up practicing in the formative years of my woodworking career.

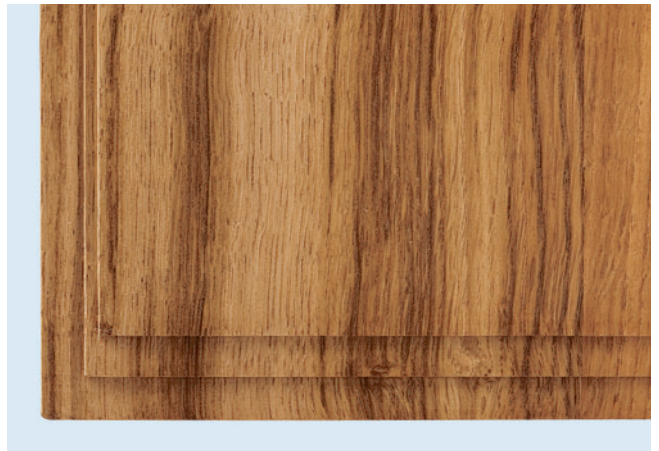
Another hallmark characteristic of that tradition is the finish. Finishing begins at the selection stage and ends with shellac and wax in order to best retain what you chose by way of color.

General Design of the Joint

Let us begin with the nature of the wedge, which we usually think of as something driven hard and tight as a forcing action; however, force is not what goes on here.



Details derived from the design process find themselves expressed in the construction and the aesthetics of the furniture piece. Here, the overhang of the shelf declares a strong connection to the joints.



The shelf end is enlivened by the varying dimensions of the rebates (rabbets here in America) and the shadows they cast. Shape is defined by the interplay of light and shadows as well as the material used.



No aspect of the bookcase is ignored during the design process. Even the humble bookcase back is rich in detail. As shown here, the proportions of the back slats are also defined by "rebates" and shadows.

The Art and Science of Wedgery

First, the square-cut mortise is formed with a taper on each end wall (as seen in the illustration below) and the wedge is accurately made to just fill that taper. As well, we saw a kerf down each edge of the tenon. When the wedge is inserted into this kerf, it actually bends the narrow section of the tenon into the tapered void of the mortise. This elegantly simple system engages the powerful tensile strength of the wood. When made right, there is no crushing of the tissue of either the wedge or the bent-over edges of the tenon. The wedges are glued, as is the rest of the joint.

Design Specifics

A mortise and tenon joint can be used in two ways in furniture making: one, a frame joint typically joining a rail and stile or rail and leg; or, two, a case joint to join wide boards as required for this project. Of course, it can't be used on the corners of a case like a dovetail because

there must be an overhang. Traditionally, boards joined this way use two tenons side by side separated by their own width. They are aptly known as “twin tenons.”

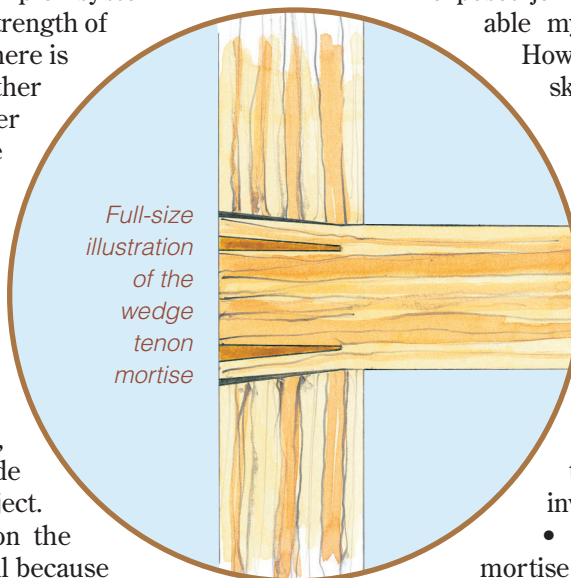
Through-wedged Twin Mortise and Tenon Joint

Being an exposed joint, it may bring to mind another exposed joint that is surrounded by a considerable mystique — the through dovetail.

However, the two joints require different skill sets and, because, the mortise and tenon involves many more steps and tools, I would argue it is more difficult to master.

Emphasizing these distinctions is not meant to provoke a reaction from dovetail aficionados but to emphasize the mechanics and geometry of the joint's design, which can be summarized as follows:

- Make a through mortise and tenon as though no wedge were involved.
- Open the outside ends of the mortise a given amount and slope this



The Quest for English Brown Oak



I wanted to build this project out of highly figured English brown oak, but where was I to find it? My longtime friend, Ellis Valentine, suggested a lumberman by the name of Sam Talarico (www.talaricohardwoods.com). Sam is one of the rare lumbermen to stock English brown oak on “this side of the pond.” So I climbed in my car and drove from Connecticut all the way to Pennsylvania.

The wood in this yard is bought as logs which are cut first on the quarter into four pieces. Each quarter is then converted into boards to best yield quarter and riftsawn material. It was the rift sawn part that I wanted, displaying straight grain with very little evidence of rays.

Selecting wood when it's roughsawn can be a challenge, but here the depth of character was clearly evident as we flipped over board after board. To my delight, the brown was streaked with areas of creamy white, proof that an attack by a fungus called *Fistulina hepatica* was well advanced. Its common name is beefsteak fungus, and it's what transforms English oak into English brown oak. As the fungus invades the living tree, it causes it to go quickly brown. The color change can be quite dramatic soon after infection, with little change in the physical properties of the wood, but after a long period of infestation the converted boards become brittle in places. Because I chose my material from a log with pale color stripes — characteristic

The author, accompanied by Pennsylvania lumber merchant Sam Talarico, selects some exceptional boards of his favorite species, English brown oak.



The length of the wedge is the length of the kerf plus one third. I determined its angle and set a sliding bevel to it. The wedges are sawn with first a sloping cut marked with the sliding bevel, then a vertical cut marked with a try square. The total: 28 saw cuts = 28 wedges.

opened end to within 1/8" of the inside face.

- Make saw cuts down each side of the tenon to within 1/8" of the shoulder.
- Accurately saw wedges from a board which is as thick as the mortise is wide.

Wedgery

There are several details to consider when choosing wedge material. Since it's driven home with a hammer, you might think the wedge should be a hard hardwood. In fact, almost any wood will do if it's made and driven correctly, which brings us to a decision that most woodworkers confront at the outset: "What color do I want the wedges to be, since they can emphasize the through joint?" My choice was to use lighter-colored



Wedges are not a mere expedient, but an exactly made component of this technically difficult joint. Note that there is *no* evidence of crushing on the bent-over portion of the tenon. Such distortion would be the result of incorrect geometry of the wedge or gradient on the mortise. Small they may be, but their accurate construction is one of the keys to this traditional furniture joint.

wedge wood, maple, so that the wedges are discovered only as you get closer to the

work. Whatever choice you make, keep in mind that the wedges will also emphasize any execution errors on your part. For instance, if you didn't saw the kerfs all exactly the same distance from the edge of the tenon, or if you didn't open the mortises all by the same amount, those errors will clearly show in the end grain pattern.

As well, if you drive one wedge home before you insert the second wedge, you will likely distort the tenon piece and push it into the second wedge space. For this reason, you need to insert both wedges at the same time, then drive them home by hitting one, then the other, until they are seated.



of a long fungus attack — I paid the price for this preference as the project went along.

As shown in the photo above, the boards are numbered as they are cut from the log, which gives the best shot at grain and color matching. It also means, if you are buying from Sam, that you are not allowed to cherry-pick boards: if you want #5, you must also buy #1 through #4.

As we laid out the pieces from the second quarter of the log, numbered 2:1, 2:2 and so on, I said without hesitation, "I'll take the lot!" At no point, until the bill was presented, had a price been attached to my desire for this "diseased material." And at no point from then until the project was hung on the wall did I consider that \$36/bf was not money well spent.



Photo left: One-quarter of the log reassembled to show how the boards are numbered to ensure optimal color and grain matching by the buyer. Photo right: One reason why Harvest the Parts and Prepare the Stock are such critical stages: you have to select around obstacles like shotgun pellets.

Curiously, this tree suffered attack by more than just fungus (see photo above right). Many of the oak trees that are cut for lumber in England grow as part of a hedgerow or in a small copse of a dozen or so trees. In that location, they are at times in the firing line of a farmer or local out to bag a pheasant, a hare or some other delectable.

This tree must have been in a particularly desirable hunting spot, for it had over half a dozen pellets from a 12-gauge in various places. The one which I dug out had a companion to the right, and the two together were on the left end of shelf #3. The whole area was sawn off later to make way for the back slats. Elsewhere on the piece I was obliged to retain the "countryside nature" of the material.

—Ian Kirby

A Case of Rigorous Craftsmanship

This bookcase is remarkable in so many ways. It is a quintessential example of design in the British Arts & Crafts tradition. It is also a design with such demanding joinery that few people will be able to execute the project as Ian built it. (I'm no slouch in the shop, but I don't know what sort of convincing it would take to talk me into tackling this piece.) At first glance, it looks so simple. Quite pleasing to the eye, just a few beautiful pieces of wood assembled to hold a few choice cooking volumes.

But that first glance is a liar.

Consider that beautiful wood as a starting place. A wise man once told me that the more beautiful a



creature is ... the harder they are to work with. He was talking about horses and dogs (what were you thinking he meant?), but it is a true statement when it comes to this wood. The very parasite that caused it to become so lovely, also caused the wood to become brittle and exceptionally unforgiving. In the hands of the uninitiated, it would

be so much rotten wood, rather than a rare gem in the hands of a master. And, using that challenging stock, Ian chose twin-wedged mortise and tenon joinery. When properly constructed and housed in a dado (or captured in a housing, as Ian would put it), it is an exasperatingly rigorous piece of work, much more difficult than hand-cut dovetails. Detail upon detail is added and expertly executed so that the remarkable whole is an example of workmanship: rightful design, rightful materials and rightful methods of work. That is why it expresses the British Arts & Crafts tradition so well.

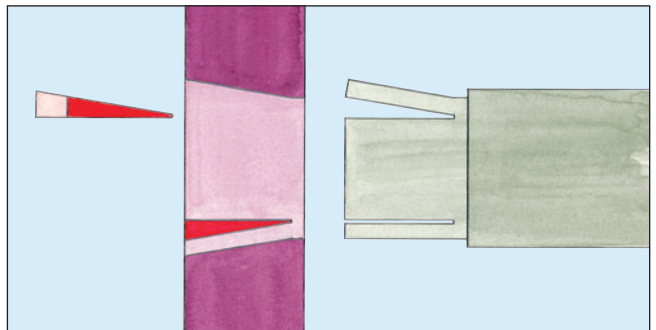
But in truth, it remains a simple bookshelf. It could have been built of MDF, screwed together and painted — and it would have been a beautiful and useful piece. So why exert the energy and effort to build it as Ian chose to do? In my opinion, this decision is not driven by hubris or an inflated ego — it comes from an innate desire for beauty and quality. To create a world that soothes and satisfies rather than jars and jangles. Quality and workmanship are similar in that they are both, in and of themselves, their own reward. So, while an MDF shelf would serve and even be pleasing to look at — this work of craft in brown oak is enriching.

—Rob Johnstone

The most common error I've observed is to make the wedges too large and drive them too hard. This visibly compresses the bent-over portion of the tenon. Although unattractive and poor workmanship, the joint will hold because the compression won't matter.

Gradient of the Wedge

Because the wedge bends over a portion of the tenon, you must determine the gradient of the wedge. Because of the many variables involved — species, proportion of early to late growth and so on — it is neither possible nor necessary to use any other measure than an empirical one. In my experience, a gradient of 1 in 8 serves well. Less bending — say, 1 in 10 — is fine, but more — say, 1 in 6 — is greater than most species will tolerate.



The gradient of the wedge and its corresponding mortise wall is best determined through experience. The wedge — the length of the kerf cut plus a third — will bend the tenon edge to fit the mortise shape.

The Wedge Kerf in the Tenon

There are three points which help make the wedged joint a success.

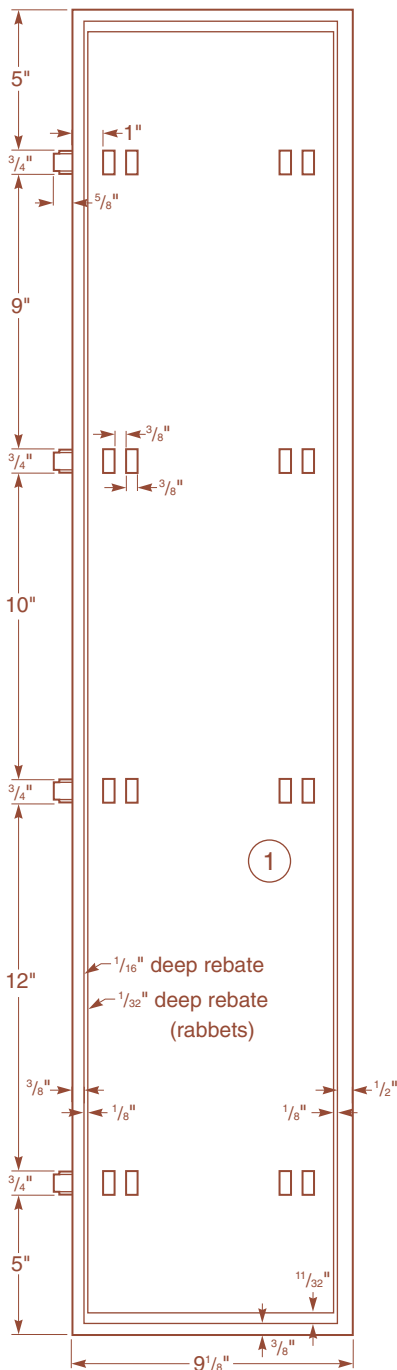
- The most important is that no matter how long or short the tenon, a gradient of 1 in 8 has the same bending effect, so it's worth drawing a section through the joint to see what it will look like on the surface. That being said, it's unreasonable to expect more than 1/4" of the edge of the tenon to bend into the wedge void without rupturing at the base. So, depending on the job in hand, keep the kerf 1/4" or closer to the edge of the tenon.

- Next, don't begin the taper on the edge of the inside of the mortise. Instead, start it 1/8" to 1/4" from the edge, leaving a flat (see the illustration above) surface which will act as a buttress to support the bending tissue.

- Finally, don't saw the kerf to the bottom of the tenon; rather, stop it 1/8" to 1/4" from the bottom to better allow the fibers to bend.

Book Case Elevation

(Side View)



Exploded View



Section Back/Bottom

Back Slats (Front and Side Views)

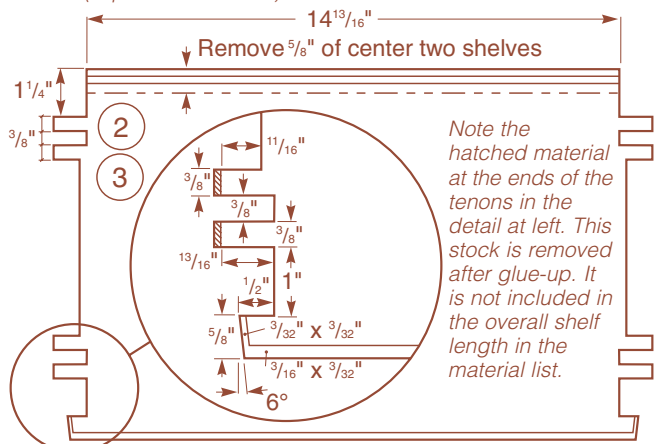
MATERIAL LIST

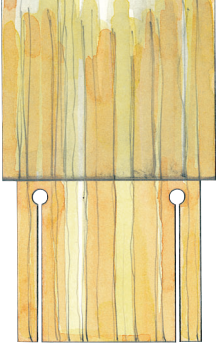
	T x W x L
1 Ends (2)	3/4" x 9 1/8" x 44"
2 Shelves top & bottom (2)	3/4" x 9 3/4" x 15 3/4"*
3 Shelves center (2)	3/4" x 9 1/8" x 15 3/4"
4 Back Slats* (4) version #1	9/16" x 3 9/16" x 33"
5 Mounting strip (2)	5/8" x 2 1/4" x 14 3/16"
6 Cover strip (2)	1/2" x 1 7/8" x 14 3/16"

* Two versions made, one with 4 back slats, the other with 5. Adjust number and width to fit 14 3/16" space.

Shelf

(Top and End Views)





The “Mystery” Hole Explained!

There is a mysterious tradition of terminating wedge tenon kerfs with a small drilled hole. Do you need to add this hole?

The Unnecessary Hole

Before moving on to some of the complexities of joint-making and gluing and clamping, there is a detail I must clear up. Not infrequently, when describing the making of this joint in books and magazines, authors recommend that a small hole should be drilled at the bottom of the kerf sawn into the tenon and explain that its purpose is to prevent splitting of the material beyond the kerf when the wedge is driven. Although the illustrations are neat and orderly, nothing about this hole is correct. First, the only way to actually make an accurate hole is to use a drill press to prevent the bit from wandering into the kerf. Second, it reduces the already slender amount of wood at the base of the kerf. Third, and even more critical, is that it exposes a larger area where splitting could occur.

But more importantly, the hole argument completely ignores the fact that if the dimensions and the geometry of the opening in the mortise, the kerf in the tenon and the wedge are made correctly, *no splitting will occur*. And finally, this ill-conceived hole cannot overcome the splitting potential of a badly made joint.

It's possible that this technique may have been mistakenly imported from the craft of silversmithing, where it actually works. When a crack occurs in the edge of the metal, usually in the course of raising a vessel, the silversmith will drill a small hole at the end of it that will indeed prevent it from going farther as beating and forming the metal proceeds.



The author made the tenons by sawing straight down the line with the saw teeth held horizontal. The solution to the problem of where to place the cut relative to the lines comes from knowing how tightly or loosely you set the mortise gauge to the mortise chisel.



The fungus had denatured the wood to such an extent that even a very sharp mortise chisel presented too great an angle as it was driven, causing collapse and tearout of the tissue. The solution for achieving clean cuts came from a bevel-edge bench chisel sharpened to

about 20°. The downside is that it's too thin to accurately lever out waste like a mortise chisel. It's the levering action which reams the side walls of a mortise smooth and parallel.

Using the bench chisel meant lots of close cuts, followed by a careful cleaning of the waste from the side walls. This is an unorthodox technique the author considers only when confronted with such awkward material.



Remove the waste between the tenons with a coping saw. The waste at each end is removed with a backsaw and the workpiece held horizontal in the vise. The coping saw cuts on the pull stroke, so the teeth point toward you when you insert the blade.



The author marked the position of the wedge kerf with a marking gauge to get them all alike. You must saw both kerfs at the same time and keep the saw blade horizontal.



Here the author made a housing (dado in the U.S.) using a hand router, a slow but effective process. You have to knife two lines inside the finished line because the router cannot sever end grain fibers. The procedure: knife the lines, remove the waste, knife the lines deeper, remove the waste, and repeat until you get the depth you want. He completed the housing accurately with a wide chisel.



Building the Bookcase

Up to this point in the narrative, I have focused on the complexity of the wedged mortise and tenon joint. Now it's time to walk you through the remaining steps ... which, while exacting in their nature ... are secondary in their complexity in comparison. This will need to be an abbreviated description, but there is a full step-by-step outline on the *Woodworker's Journal* web site.

Shaping

While the surface of the English brown oak was prepared by using a pair of hand planes, an 04-1/2 and 07, nearly all the shaping on this piece — front edges of shelves, outside faces of ends, and back slats — was done on a table saw. To understand how this could be accomplished, refer to *Drawings* for dimensions.



The traditional method of making a board fit the housing is to make the housing narrower than the board thickness by a short 1/32", then plane the board to fit. The planing removes the machine marks and leaves the surface ready to polish. In the planing, the author uses a vernier and a straightedge to assist in accuracy. It sounds slow, but isn't. Careful planing results in a very accurately fitted joint.



The back slats are held dry in a groove top and bottom. The author gapped them to the thickness of a business card and held them with one screw on center on the middle two shelves.



Due to its irreversible nature, gluing and clamping, in general, isn't a skill that you can practice. In this case, you can glue and clamp the four shelves of one side one at a time. That's pretty good practice for the fifth glue-up, which is the second side all at once. You must remember to slide the back slats in place first.

Making the Back

The back of this bookcase is not an afterthought or mere expedient to protect my kitchen wall from the ravages of a wayward cookbook. The back provides an essential element in the bookcase's functionality and is entirely in keeping with British Arts & Crafts tradition construction methods. The back slats are held loose in their groove, with a space of about $1/32''$ between pieces. They are secured with screws driven into shelves #2 and #3.

I prepared the slats to size, beginning with their thickness which is $9/16''$. Their length was determined by the opening between the top and bottom shelf plus $1/2''$. The width of the shelves was determined by the stock on hand and by aesthetic preference.

The procedure followed to make them was to groove shelves #1 and #2 to the dimensions in the *Drawings*. Then I sawed $9/16''$ off the backs of shelves #2 and #3. Next step was to knife (mark with a knife) the end shoulder lines on the back slats. Then it was time to gauge the "tenon." This entailed forming the tenon on the table saw, taking steps to fit the tenon properly. Again, on the table saw, I formed the edge rebates (rabbets to you Yanks!). Last step was to form end rebates, cleaning them up with a shoulder plane. None of these steps are difficult.



It's impossible when working alone to position the clamping blocks and control the clamps at both sides: it's at this stage that a helper is essential (above). The wedges have glue on them and so initially slide in easily (inset at left). Alternate striking first one, then the other. At the end of their travel, the note of the hammer blows will change to the "clunk" of a hammer hitting a solid object.



The author first planes the tenons flush, then planes the whole surface to a finish that is ready for polishing.

You must saw off the excess wedge and tenon after the glue has cured. Ian uses a Dozuki saw and lets the thin back act as a spacer and guide to prevent the teeth touching the workpiece. The bookcase is resting on a sawhorse and clamped to the workbench at each end. The squareness and solidity of the bench plays an important role in the cleaning up process, especially on large projects, and is therefore another important aspect of bench design.

Clean up and Polish the Parts

The shelves are planed to fit the housing. The outside of the ends were planed to a finish before the rebates were made. Most of the cleanup planing has been done.

I ragged on one coat of shellac, denibbed the surfaces with worn fine sandpaper, and applied bleached beeswax.

All surfaces that could not be planed after glue-up are finished before the glue-up is performed. One more note: The squeezed-out glue on these internal surfaces is left to dry, then removed with a chisel, leaving a clean corner or surface.

Gluing and Clamping

Here I return to a point noted earlier: Whereas gluing and clamping a through dovetail can be accomplished by one person and one clamp, the through-wedged mortise and tenon needs two people and a minimum of four clamping blocks and four clamps. A friend, David Grosz, helped with the glue-up and later with hanging the bookcase on the wall.

The clamping blocks must be at least as long as the width of the pieces. They are positioned on each side of the exposed joint with about an inch of clearance. This allows you to get the hammer head in between the clamps to drive the wedges. However, the clamping in



Mounting the bookcases to the wall is the final task. A cover strip top and bottom will hide the square drive stainless steel screws that David is driving home.

this case needed to be done with caution because over-tightening on this compromised and brittle wood could have very easily distorted the sides to the fracturing point. One positive piece of news regarding this joinery method is that once the wedges are driven, the clamping rig can be undone and moved on to the next joint: once wedged, no springback will occur.

Mounting the Bookcase

I fitted the top and bottom shelves with a 5/8" x 2 1/4" mounting strip glued to their back edges. These were drilled and countersunk to accept the holding screws. A friction-fit cover strip hides the screw heads. The bookcase wasn't wide enough to reach the span of two wall studs. We did capture a stud on the left side, but then we opened the sheetrock and inserted a holding pad on the right side for proper support.

This bookcase was a pleasant project to build for many reasons,

not the least of which was recalling the memories of my youthful employment where I learned the essence of the British Arts & Craft traditions.

Ian Kirby is a master woodworker and designer. He is also a frequent contributor to Woodworker's Journal.

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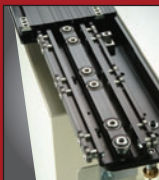
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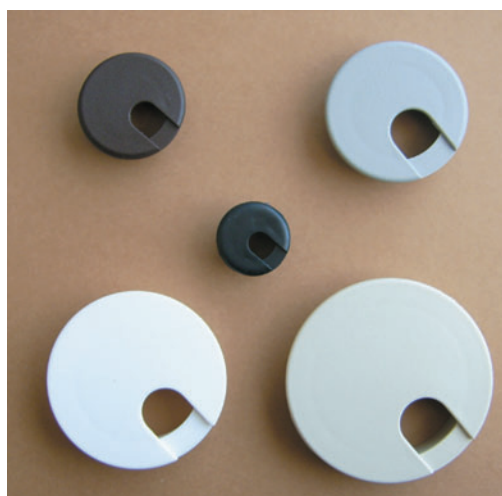
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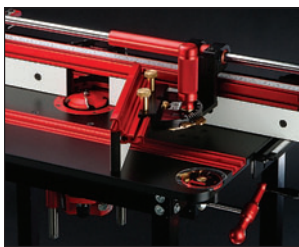


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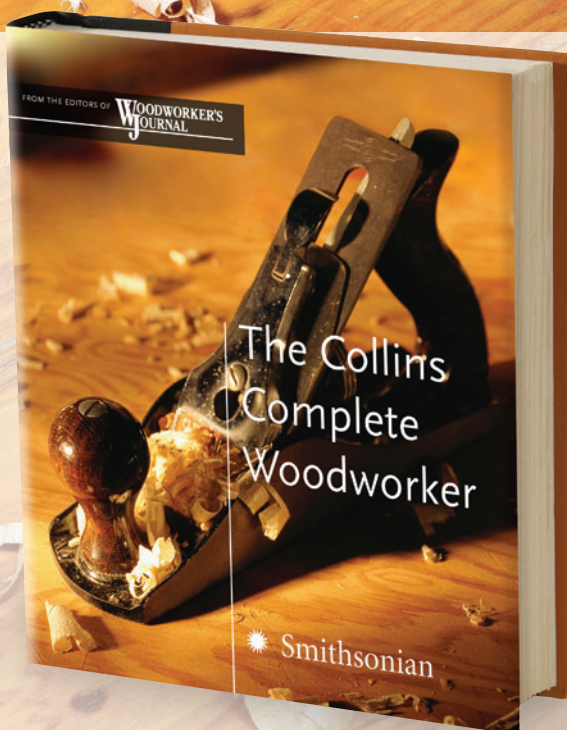
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Aftermarket Miter Gauges

By George Vondriska

Would you like to turn your table saw into a precision crosscutting machine? It is easy to do, just add one of these aftermarket miter gauges.

The standard issue miter gauges included with most table saws, while workman-like in many regards, suffer from a variety of ailments making it difficult, if not impossible, to use them for cuts that demand extreme accuracy. When I first opened my woodworking school, we did every crosscut we needed, from face frames to chair legs, on a table saw equipped with an aftermarket miter gauge. Aftermarket miter gauges allow an extremely high level of accuracy by bringing lots of great features to the table (saw).

The criteria I used in this test included ease of operation, the accuracy of the pre-set stops

and — most important to me — the ability to cut any angle I wanted. This meant being able to adjust to settings between full degree increments. This review will help you “learn all the angles,” and get a higher degree of understanding



Woodworking educator and writer George Vondriska, in his first article with *Woodworker's Journal*, takes on the topic of aftermarket miter gauges.



INCRA

Model: Miter 3000SE

Price: \$223.00

Phone: 972-242-9975

Positive stops: Every 1/2 degree

Bar Adjust: From above

Extendable fence/length: Yes/48"

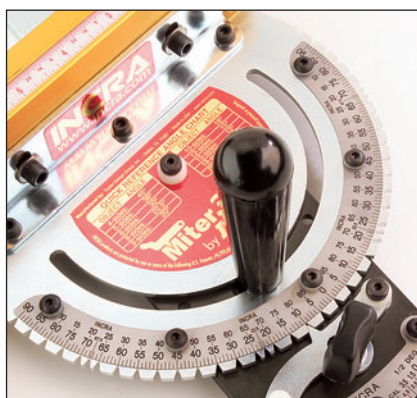
Stop/ruler: A

Angle Range: 0° - 90° L and R

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Incra Miter 3000SE

This is a beautifully engineered piece of equipment providing an amazing 364 positive stops. Setting angles in 1/2-degree increments is very easy and very accurate,



The easy and accurate operation of Incra's 3000SE rack-and-pinion design is a result of sophisticated design and engineering.

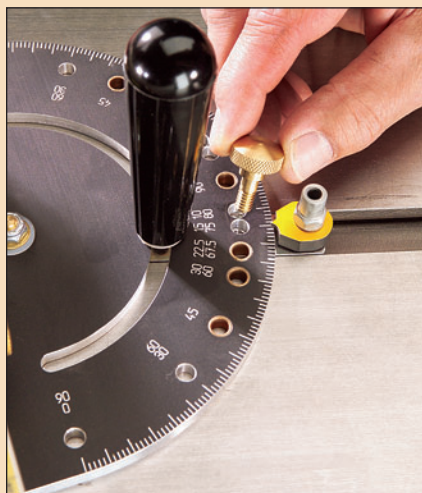
accomplished by the two “rack-and-pinion” systems on the head. One indexes the head in five-degree increments, the other for one-degree and 1/2-degree increments. As shown at left, the head is set to 10.5 degrees. You can hit smaller divisions by not letting the index point seat all the way into the rack. The 3000SE has the longest fence in the test, and the direct read ruler works with the fence extended. The stop works great, and easily

continues on page 78 ...

Tool Review continues on page 78 ...



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Accuracy comes from the indexed head. The positive stop is used to position the head, and a locking handle keeps the head rigidly in place.

of these precision instruments. Then you can figure out which miter gauge will cut it in your shop.

Why A Miter Gauge?

All woodworking requires the ability to do accurate crosscuts. 90° cuts are common; 45° cuts aren't unusual, and some cutting operations require that you split hairs to half a degree. An after-market miter gauge capable of making these cuts costs a fair bit of dough, and you might wonder why you should invest in one instead of buying a miter saw.

Miter Saw vs. Miter Gauge: Accuracy

All of the miter gauges in this review have positive stops at commonly used angles such as 90°, 45°, 30°, and 22.5°. These stops are more accurate than those on standard miter gauges and are comparable to what's found on most miter saws. Some miter gauges go beyond the common stop positions and allow you to easily set the miter

provides repeatable results. This is the only flip stop that can be used for repetitive length cuts on angled parts since it will not allow the sharp point of a mitered piece to creep under it.

Remove the extra set of discs and the bar will fit into the undersized slots found on some Sears/Craftsman saws. One small complaint: the lock on the fence extension requires an Allen wrench (included). It would be nice if it were tool-free. This is one of my "Best Bet" selections.

Incra V27

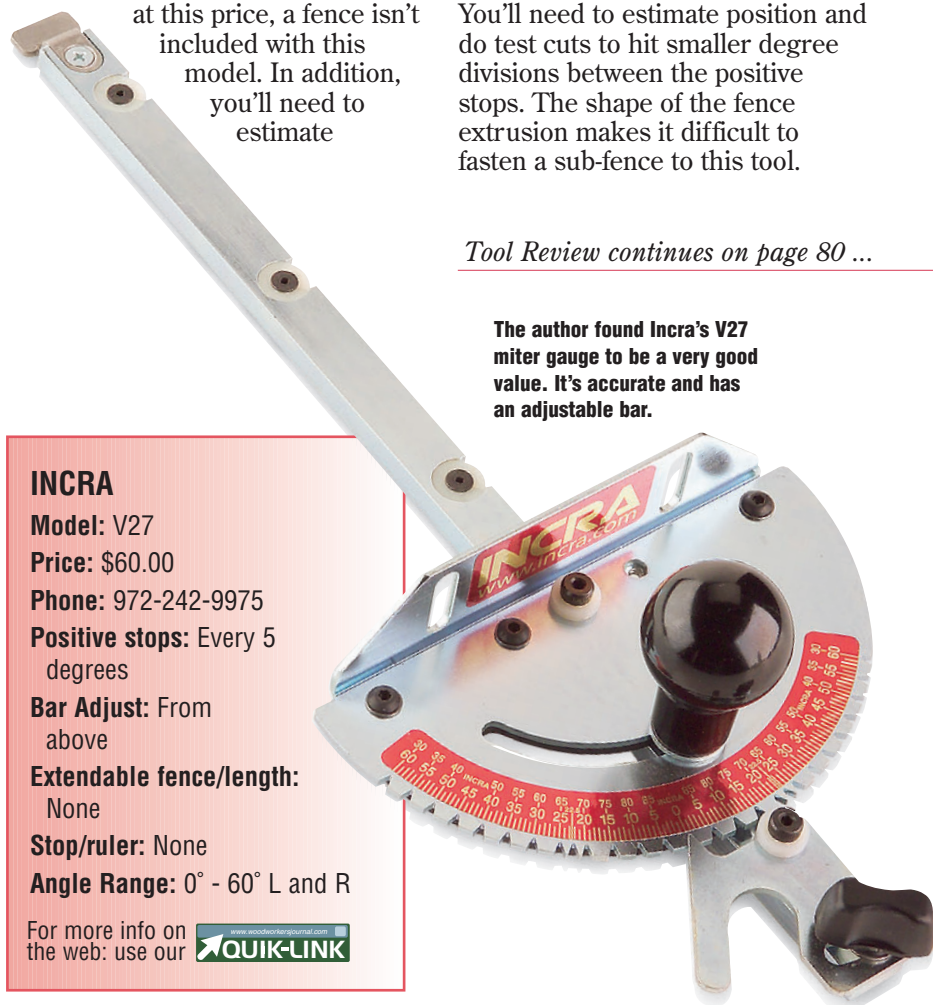
The V27 is a great value. With 27 positive stops, this would be a solid addition to a router table or band saw. As you might expect at this price, a fence isn't included with this model. In addition, you'll need to estimate

position and do test cuts to hit smaller degree divisions between the positive stops.

JDS Accu-Miter 24-26

The Accu-Miter (see *photo* on page 80) has the feel of a beefy tool. The hold-down clamp, available as an accessory, helps when handling long stock, but is a little fussy to set for just the right clamping pressure. The fence extends to a generous 46" and contains a stop for repetitive length cuts. Since the telescoping fence is smaller than the main fence, however, it doesn't provide support for the material. The direct read ruler continues to work when the fence is extended, but is a little harder to accurately read than other gauges in this test. You'll need to estimate position and do test cuts to hit smaller degree divisions between the positive stops. The shape of the fence extrusion makes it difficult to fasten a sub-fence to this tool.

Tool Review continues on page 80 ...



The author found Incra's V27 miter gauge to be a very good value. It's accurate and has an adjustable bar.

INCRA

Model: V27

Price: \$60.00

Phone: 972-242-9975

Positive stops: Every 5 degrees

Bar Adjust: From above

Extendable fence/length: None

Stop/ruler: None

Angle Range: 0° - 60° L and R

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continues on page 80 ...

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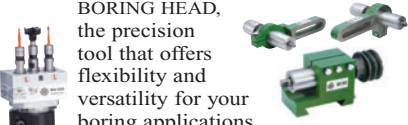


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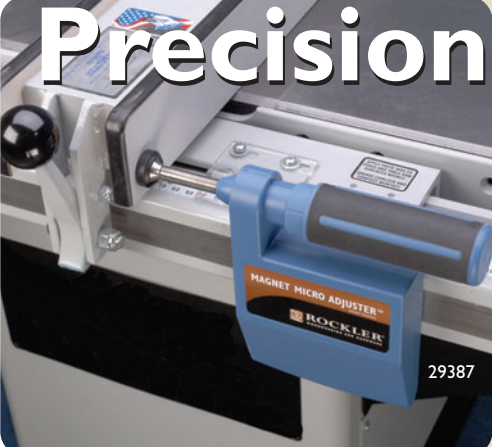
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gauge in 1/2-degree increments. This feature is not common in miter saws.

Cutting Capacity: Numbers will vary depending on your table saw, but on many saws you'll be able to cross cut at least 12 inches without the head of the miter gauge coming off the front of the saw table. That's comparable to the capacity of a sliding miter saw, most of which cost more than the miter gauges in this review.

Getting ALL The Angles: If you're comparing a miter gauge to a miter saw, remember that you should be looking at compound miter saws. Angle the blade on your table saw, couple it with a quality miter gauge, and you can easily make compound angle cuts.

Using What You've Got: If you're doing any woodworking at all, you've probably got a table saw. For some woodworkers, especially those with space constraints, it makes more sense to crosscut on a table saw than to add another tool, and its footprint, to their shop.

The Downside: When it comes to rough cutting long material into shorter lengths, a miter saw with long extension tables is a better and easier choice than a miter gauge on a table saw. But consider that a jigsaw or circular saw will also make short work of rough cutting your stock.

Going to Grandma's house to work on the deck or install trim? Hauling your table saw and miter gauge won't be quite as easy as hauling a miter saw.

There's a small convenience factor involved since you'll be

With a 46" extendable fence and an optional hold-down clamp, the JDS Accu-Miter is a feature-rich tool.



JDS ACCU-MITER

Model: Accu-Miter 24-46

Price: \$220.00

Add \$55 for hold-down clamp

Phone: 800-480-7269

Positive stops: 0°, 15°, 22.5°, 30°, 45°

Bar Adjust: From above

Extendable fence/length: Yes/46"

Stop/ruler: B

Angle Range: 0° - 50° L and R

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JessEm Mite-R-Excel

One of my two favorites in this test, the Mite-R-Excel is another nicely engineered miter gauge. It looks, feels and works great, and has 180 positive stops. Setting angles in 1/2-degree increments is easy and accurate, accomplished by two locator pins. The center locator pin indexes the head in five-degree increments. Use the second pin to lock the head in 1/2-degree

settings. Set the head in 1/10th degree increments by using the vernier scale at the bottom of the head. The direct read ruler provides readings even when you've extended the fence.

Tool Review continues on page 82 ...



JESSEM

Model: Mite-R-Excel

Price: \$225.00

Phone: 866-272-7492

Positive stops: Every 1/2 degree

Bar Adjust: From above

Extendable fence/length: Yes/36"

Stop/ruler: A

Angle Range: 0° - 45° L and R

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continues on page 82 ...

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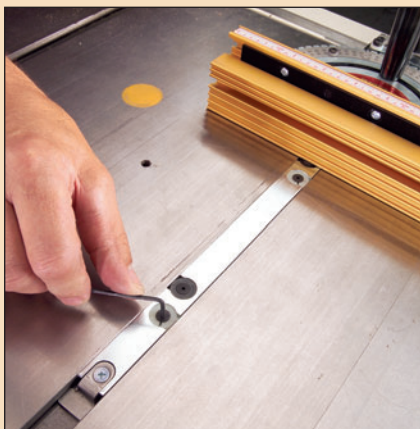
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The miter gauge bar should be adjustable so it perfectly fits the miter gauge slot. It's easiest when the adjustment can be done from above so you don't have to remove the miter gauge from the saw to tweak the fit.

using one tool, the table saw, for both crosscutting and ripping. It's great, given the budget and the space, to have a dedicated tool for each job. But if you plan your work — a good idea in any circumstance — you'll be fine doing all your cutting on the table saw.

The quality of cut will only be as good as the quality of your table saw. Adding a great miter gauge won't do anything for a saw that has blade runout or isn't properly tuned up. On the other hand, if your miter saw is a wreck, cut quality will be compromised, too.

What To Look For

A number of features come together to allow aftermarket miter gauges to do what they do.

Indexed Head: The heart of a quality miter gauge is the head (see *photo* on page 78). The positive stops must be rock solid and accurately machined. On some miter gauges (Incra 3000SE, JessEm and ProMiter) the positive stops (or readout in the Pro-Miter's case) can be used for any angle

Kreg Precision Miter Gauge

This gauge provides good value and works nicely. The number of positive stops is limited, but the vernier scale on the head works well once you get used to it. The instructions for the vernier are good. As shown in the *inset photo* below, the head is set to 10.5 degrees. The vernier eliminates some of the angle estimation required by other gauges in this test. This gauge's fence contains one of the easiest to read stop systems. My only complaint is the lack of an extendable fence on this tool.

Osborne EB3

The EB3 (*photo*, page 84) changes the rulebook on how miter gauges are set. Instead of a protractor head, the arms create a triangle. The triangular support works well. The fence and stop extend to a generous 43 inches, but the ruler does not extend with the fence, so you'll also need to measure to the

blade when making those cuts. You'll need to estimate position and do test cuts to hit smaller degree divisions between the positive stops.

Salazar Solutions ProMiter-100

If you want to take all guesswork out of setting angles, Salazar Solutions has the solution. Their

Tool Review continues on page 84 ...

KREG

Model: Precision Miter Gauge

Price: \$140.00

Phone: 800-447-8638

Positive stops: 0°, 10°, 22.5°, 30°, 45°

Bar Adjust: Side

Extendable fence/length: No/24"

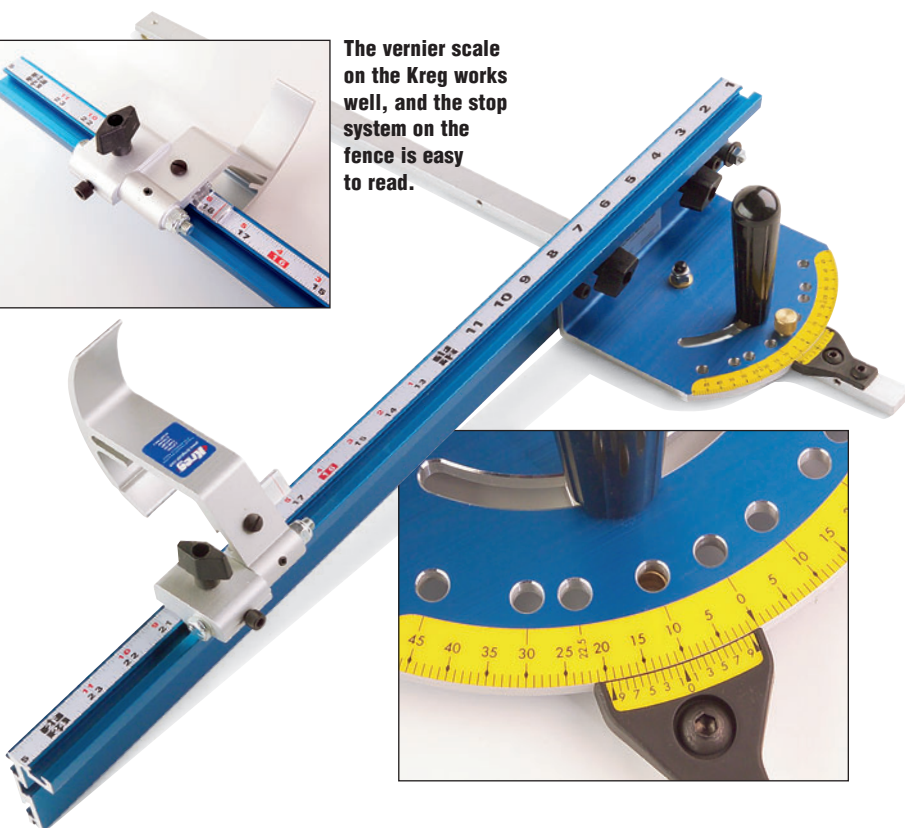
Stop/ruler: A

Angle Range: 0° - 50° L and R

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The vernier scale on the Kreg works well, and the stop system on the fence is easy to read.



continues on page 84 ...

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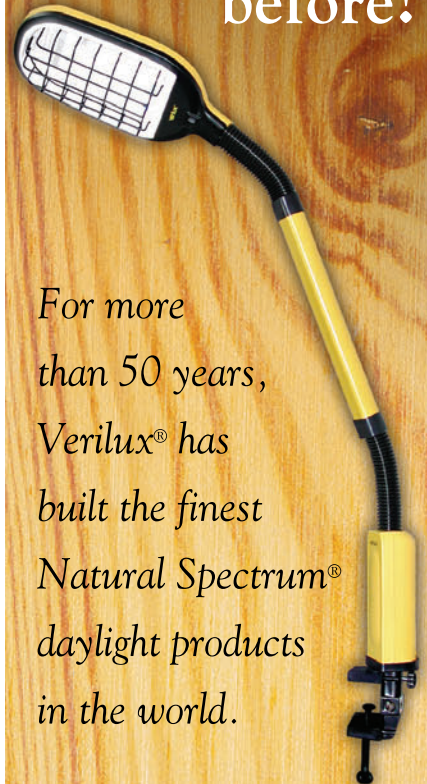
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An extendable fence provides support when you're cutting long pieces. It allows you to use the stop to cut multiple pieces to the same length.

and go beyond commonly used settings to allow half-degree, or finer, angles to be easily achieved. This provides a real benefit in ease of setting. On the other miter gauges, you'll need to approximate the angle using the miter gauge's pointer, and then make test cuts to check for accuracy.

In listing the positive stops for each miter gauge, 0, which is how it reads on the tools, refers to the head being 90° to the blade.

Adjustable Bar: A miter gauge bar should be adjustable in width so it perfectly fits the table saw slot (see photo page 82). One of the problems with a standard miter gauge is that it wiggles within the table saw slot. Slop between the bar and slot destroys accuracy. Although there's slight variation in how the bars get adjusted, they all provide good wiggle removal.

Extendable Fence: An extendable fence (see photo above) adds lots of ease and convenience any time you cut material more than 24" long.

miter gauge (see *photo* on page 86) is digital, reading in 1/10-degree increments. You'll need to do an initial calibration to set it to 90 degrees. Once that's done, the tool provides accurate, repeatable, bulletproof results. As you can see, the accuracy and ease of use come at a "sticker shocking" price compared to other miter gauges in this group. At this price, I'd like to see an extendable fence and direct read ruler. Salazar Solutions says an extendable fence will be available soon.

Rockler Sure-Loc

The Sure-Loc™ (see *photo* on page 88) uses a unique rack-and-pinion system between the head and bar.

The cogs are machined in 1½ degree increments and positively lock the head at the setting. So, you can positively lock the head at any angle that's evenly divisible by 1.5 degrees. You can set the head at 90 degrees and 91.5 degrees, but you can't set the head at 91 degrees. The usual suspects of 10, 15, 22.5, 30, 45, and 60 degrees can be positively set.

At \$105, the Sur-Loc is second only to Incra's V27 as price leader in this category (and the V27 does not include a fence). The Sur-Loc works great at what it does, but the

Tool Review continues on page 86 ...



OSBORNE

Model: EB3

Price: \$135.00

Phone: 800-852-9655

Positive stops: 0°, 15°, 22.5°, 30°, 45°

Bar Adjust: From above

Extendable fence/length: Yes/42"

Stop/ruler: B

Angle Range: 0° - 45° L and R

For more info on the web: use our



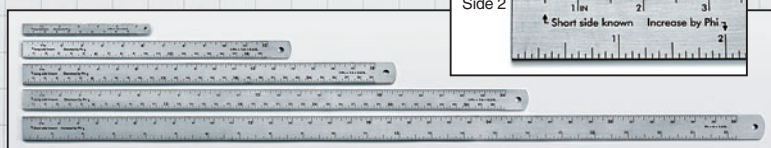
Osborne's innovative and accurate system for setting the angle of their miter gauge is unique in this market.

continues on page 86 ...

Phi (Golden Ratio) Rules



To scale a measurement, you simply find on the lower scale the identical measurement from the top scale.



Phi (or the golden ratio as it is also known) is a value of approximately 1.618, used by architects and designers to give their work aesthetically appealing proportions. In woodworking, tabletops are often about 1.6 times longer than wide, chair backs are usually 1.6 times taller than the seat height, and drawer proportions are often based on Phi.

These rules simplify Phi calculation, with inches marked on the top edge and Phi-scale graduations on the bottom. One face converts a known long measurement to an unknown short measurement; the other does the opposite. The hardened stainless-steel rules have ground edges and black-filled etched markings. Excellent layout aids.

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12" Phi Rule, each*	06K30.12	\$ 3.95
18" Phi Rule, each*	06K30.18	\$ 6.95
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TOOL REVIEW

Direct Read Stop And Ruler:

You'll come to love a stop that you can position, lock and rely on to provide accurate length cuts (see *photo* page 84). Once calibrated, you'll never have to measure between the stop and saw blade again. In this test, the miter gauges got a grade of A, B or C depending on how easy it was to precisely set the stop.

Angle Range: All of these tools will take you to at least 45°. On some, you'll note the angle range goes to 90°. This means the head is capable of swinging to a point where it's parallel to the bar. A larger range of angles provides more versatility.

continues on page 88 ...



21st century digital accuracy is the exclusive province of Salazar Solutions' ProMiter-100.

low price will cost you a couple of minor features. For starters, it won't allow you to make cuts that require settings a fraction of a degree off. And, unlike other miter gauges in this test, the stop

SALAZAR SOLUTIONS

Model: ProMiter-100

Price: \$464.52

Phone: 719-337-8112

Positive stops: 0°, 15°, 22.5°, 30°, 45°

Bar Adjust: Side

Extendable fence/length: No/24"

Stop/ruler: No ruler

Angle Range: 0° - 55° L and R

For more info on the web: use our



Tool Review continues on page 88 ...

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* When tested using the same input force. Quick-Grip is a registered trademark of Irwin Industrial Tool Company.

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Magswitches

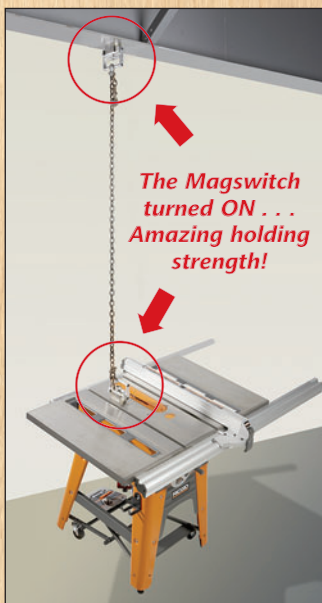
Super strong magnets used in woodworking tools are changing how things get done . . .



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Lock your work ANYWHERE on your table – There's no miter slot limitation!



The Magswitch table featherboard with vertical attachment.



Fence featherboard doubles as left feed table featherboard.



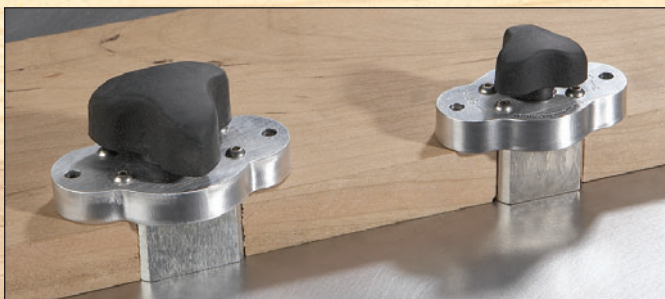
Magswitch featherboards allow for control on wider pieces.



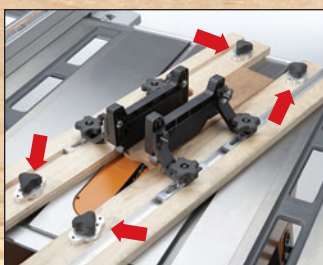
A dual-hold vertical attachment holds wood snugly and safely!

MagJigs

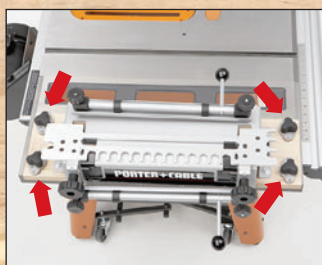
More versatile, faster, & easier than clamps!



A hole through your jig allows for versatile, fast and strong clamping. If necessary, MagJigs can be secured with screws.



Clamping complex jigs anywhere on a table is a cinch.



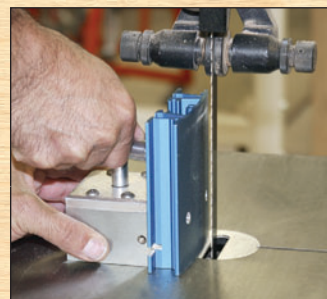
MagJigs are versatile; they can be moved from set-up to setup.

MagSquares

Uses limited only by your imagination.



Versatile workholding anywhere on a steel table.



Pre-tapped holes for mounting accessories like a resaw fence.

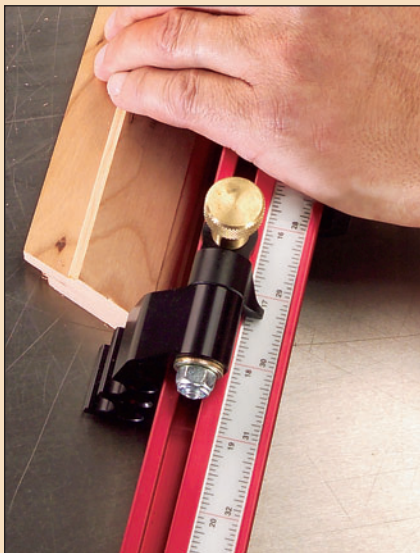


A MagSquare used to attach a bracket to a support fence.



Magswitch Squares are great for general use around the shop.

TOOL REVIEW



A good stop/ruler combo allows you to set it and forget it, without measuring from the blade to the stop.

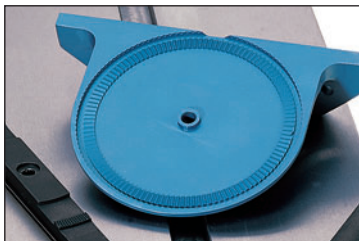
The Test Results

For standard performance I'd expect from an aftermarket miter gauge, each of these tools provided good results. The fence faces were all perpendicular to the table saw top. The positive stops precisely located the miter gauges at each of the positive stop angles. All of the miter gauges have adjustable bars that work well.

Still, a few rose to the top. I really liked the miter gauges that go beyond the basic angles and allow you to perfectly position, instead of approximate, ANY angle you need. For instance, a five-sided object requires 36° angles. The Incra 3000SE, JessEM, and ProMiter miter gauges allow you to confidently set the tool to 36° with no quibbling about whether it's accurately set. The Kreg and Woodhaven miter gauges provide good solutions for hitting other angles, but not positive stops.

It was difficult to choose Best Bets from this group. In the end, I settled on the Incra 3000SE and JessEm Mite-R-Excel. Both provide a wide range of positive stops at a reasonable price and great extension fences with direct read rulers.

— George Vondriska



Solid-aluminum machined interlocking "cogs" create an ultra-secure setting mechanism on Rockler's offering.

has to be removed, rather than simply flipped up out of the way when not being used.

Woodhaven 4996KX

This miter gauge has a large number of positive stops. Although it doesn't have a vernier for setting additional angles, it comes with Woodhaven's MiterMatic. This is an easy-to-use device that, using alignment pins, accurately indexes the head at 45° (four sides), 36° (five sides), 30° (six sides), 25.71°

WOODHAVEN

Model: 4996KX

Price: \$242.00

Phone: 800-344-6657

Positive stops: 0°, 10°, 15°, 22.5°, 30°, 45°, 60°

Bar Adjust: Side

Extendable fence/length: No/24"

Stop/ruler: B

Angle Range: 0° - 90° L and R

For more info on the web: use our



Woodhaven's miter gauge comes complete with their MiterMatic setting gauge (inset).

ROCKLER

Model: Sure-Loc™

Price: \$105.00

Phone: 800-279-4441

Positive stops: Every 1½ degrees

Bar Adjust: From above

Extendable fence/length: No/22"

Stop/ruler: C, no ruler

Angle Range: 0° - 90° L and R

For more info on the web: use our



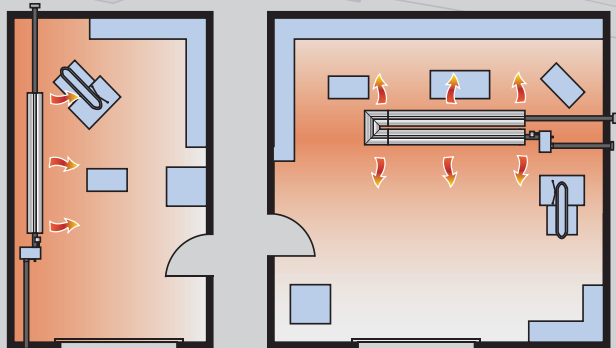
(seven sides), 22.5° (eight sides), 20° (nine sides), 18° (10 sides), 15° (12 sides), 12.85° (14 sides), 12° (15 sides), 10° (18 sides), 9° (20 sides), 7.5° (24 sides), 6° (30 sides). An MDF sub-fence and two additional styles of stops are also included, one of which can be used for repetitive length cuts on mitered materials.

George Vondriska is the founder and proprietor of the Wild Earth Woodworking School in Hudson, Wisconsin and a contributing editor to Woodworker's Journal.

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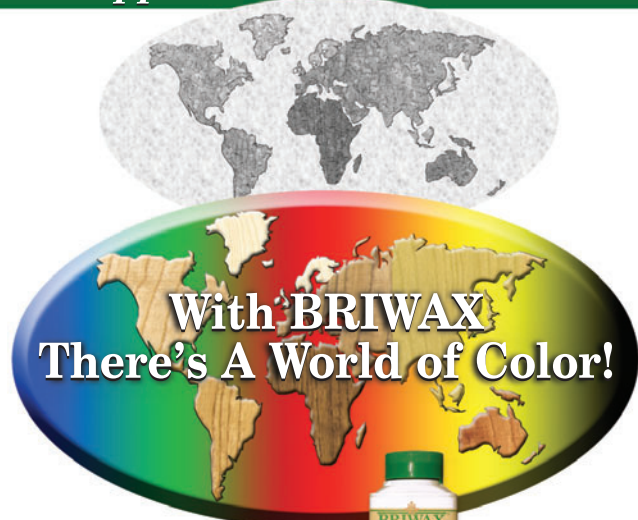
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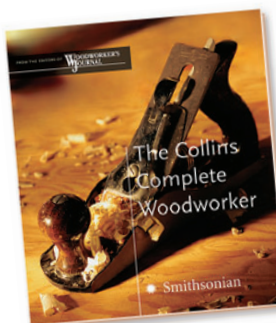
Sanding System Fits Any Shape

The **Guinevere Total Sanding System** from King Arthur Tools comes with inflatable rubber dome- and drum-shaped heads that conform to the shape of your work. A 1/2 HP, 300-watt motor powers the system's flexible shaft or fixed chuck. Sanding sleeves come in four grit sizes. Suggested retail price is \$285.95 for the kit.



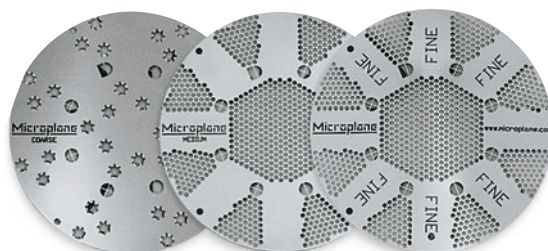
Sharpen All Your Tools: Flat or Curved

The folks who invented Drill Dr. now offer the **Work Sharp WS3000** to sharpen all your tools. It uses glass wheels affixed with PSA abrasive, adjusts to multiple bevel angles and lets you see the edge you're sharpening. Suggested retail price is \$199.



All Things Woodworking

Woodworker's Journal teamed up with the Smithsonian to create **The Collins Complete Woodworker**, a comprehensive resource on wood and woodworking in all its aspects. Price is \$29.95.



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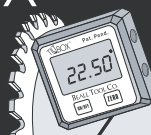
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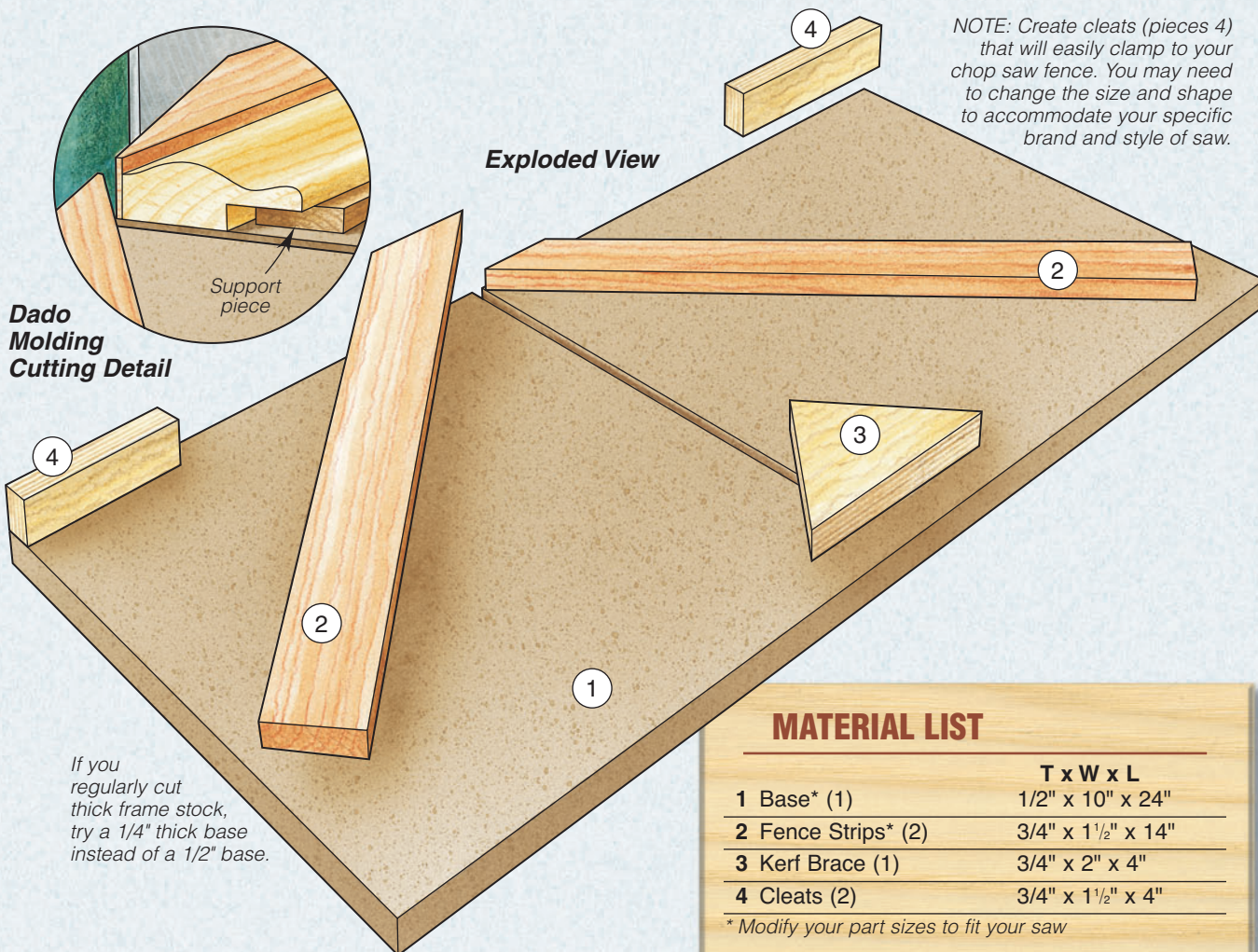
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Creating Perfect Miters

By Sandor Nagyszalanczy



Five Great Mitering Tips

- Always use appropriate safety gear.
- Always test your cuts with scrap lumber.
- Clamp large items in place before cutting.
- Use a 60-tooth (or more) saw blade for smooth cuts.
- Use a support piece when cutting dadoed moldings (see detail above).

Cutting perfect 45° miter joints can be challenging, but this clamp-in-place jig simplifies the process. Just leave your saw at 90° — the jig fences set the miter angles.

Unless your miter saw, sliding compound miter saw or radial arm saw is really accurate and easy to adjust, it's more efficient to cut miters by leaving the saw set for a square cut and using the frame miter jig shown here. The jig has a pair of fences mounted on a base plate that position frame members at 45° to the left and right of the blade. This allows you to cut miter joints on flat or shaped frame stock and moldings to make picture frames, cabinet face frames, shadow boxes and more.

To make the jig, first cut the base from 1/2"-thick plywood or MDF, making it as long as your saw table and a couple of inches wider than the saw's crosscut capacity (because the jig reduces your saw's cutting depth slightly, use 1/4" hardboard for the base if you plan to cut really thick frame pieces). Next, rip two 1 1/2"-wide wood fence strips from straight-grained stock, and miter-cut the end of each at 45°.

Position and clamp the jig atop your saw. Then, with the saw set perfectly at 90°, cut a kerf partway across the base. Use a drafting triangle to align one of the fence strips at 45° to the kerf, with its mitered end just touching the kerf. Glue and nail the strip in place. Using a large, accurate framing square, position the other fence strip at 90° relative to the first fence, and glue and nail it down. To strengthen the jig's base, glue a triangular block of wood to the base at the end of the kerf to serve as a brace. Finally, glue and nail a couple of cleats to the back edge of the base. These make it easier to clamp the jig to the miter saw's fence. Before clamping the jig to the saw, set the saw blade in the base plate's kerf to position the jig precisely.

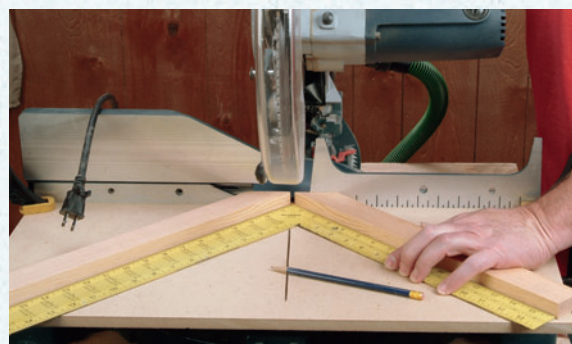
TIPS FOR USE: For perfect picture frame joints, the parallel frame members must be exactly the same length as well as being accurately mitered to 45°. Cut the frame members to length before mitering them. Then you can use the adjacent fence as an end stop to position the miter cuts on each end. For a few more handy mitering tips, check the bulleted list in the box at left.

Sandor Nagyszalanczy is a writer, photographer and furniture designer/craftsman. His Complete Illustrated Guide to Jigs & Fixtures is available at: www.sandorsworkshop.com or from the Taunton Press by calling (800-888-8286).

Two fences oriented at 45° to the blade allow you to cut both halves of a miter joint while leaving the saw set for a square cut.



Rip two fence strips to width from straight-grained stock, then miter cut one end of each to 45°.



Cut a kerf partway across the jig base. Use it as a reference for attaching the first fence strip. Locate the second fence off the first with a framing square.



To prepare the the jig for use, lower the blade into the kerf slot to register position. Then you can clamp the cleats to the saw fence.



Yankee Screwdriver, page 27



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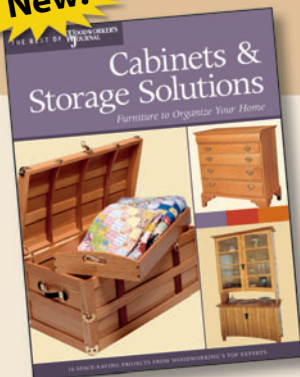
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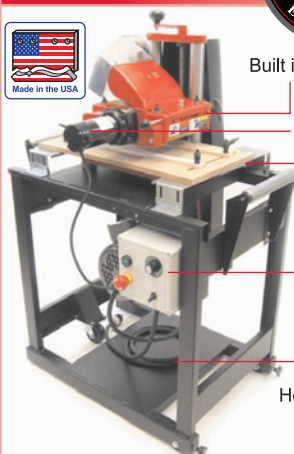
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By Michael Dresdner

ABOUT MICHAEL DRESDNER

Michael Dresdner is a nationally known finishing expert and the author of *The New Wood Finishing Book* from Taunton Press. When not writing about woodworking, he is an active community theater participant.



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Q I had an unfortunate situation happen in my basement workshop: a water pipe split and sprayed hard water over a portion of my shop. Regretfully, the water landed on a project that was ready for glue-up. The wood is red oak, and wherever the water touched the wood, the wood turned a dark purple. I have tried to sand it with 100-grit sandpaper, but I am not one hundred percent sure that all of the water spots have been removed. Before I proceed to glue-up and finish it, do I have to do anything else?

— Tom Schleicher
Valparaiso, Indiana

Michael Responds: Wood high in tannin, such as oak, is prey to mineral stains from hard water or contact with metals. Fortunately, there is a very easy fix while the wood is still raw. Simply wash the surface with a 10 percent solution of oxalic acid. Make sure you apply it over all surfaces and not just over the stains.

Here's proof positive of how well oxalic acid works on a sample of iron-stained oak. The black staining disappears completely without altering the wood's normal color or streaking the grain.

When it is dry, either vacuum off the white residue or wipe it off with a damp cloth. In this dilute liquid state, oxalic acid is fairly benign and is, in fact, one of the naturally occurring ingredients in rhubarb. But, as a concentrated powder it is considered toxic and irritating to mucous membranes. Wear eye protection and a dust mask while handling the powder or when sanding the wood, and wash your hands before eating.

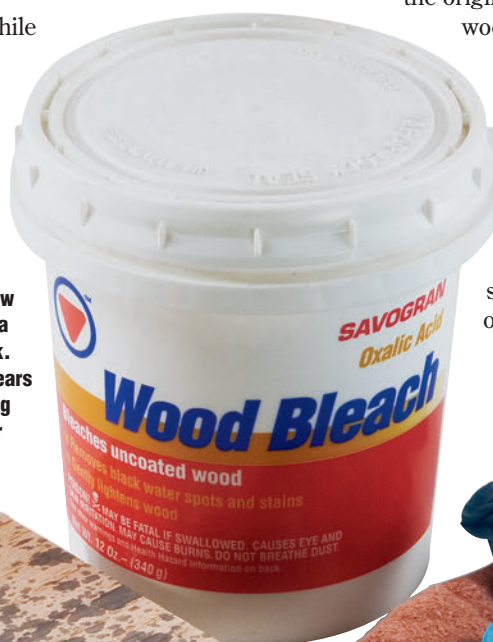
Q I have an old barn that is still standing, although barely. I would like to try to save some of the wood to make tables or something for my children. How do I clean or get the wood to look like this picture of a kitchen island

made of reclaimed pine?
<http://www.napastyle.com/store/product.jsp?sku=2757>
— Edward McCraw
McColl, South Carolina

Michael Responds: The picture shows roughsawn and weathered barn wood that was selectively sanded, cleaned, stained and sealed. The top, for instance, was sanded thoroughly to make it smooth, while the drawer front, legs and apron were hit-or-miss sanded to make them smooth on the edges with a rough center.

Once you get your barn wood in the shop, remove all nails and other metal. Clean it by scrubbing all surfaces with trisodium phosphate (TSP) and water, using a bristle brush to dislodge dirt. If you want to restore the original color of the

wood, wash all surfaces with a 10 percent solution of oxalic acid, but only after all metal has been removed. Oxalic acid will reverse the characteristic silvery gray surface oxidation and



“Plan well before you cut or joint the wood so you do not destroy the weathered sections you wish to keep.”

remove any iron stains around the nail holes. Let the wood dry overnight, then wash off any acid residue with plenty of clean water.

Those two wash processes will prepare the wood so you can stain it whatever color you choose, then finish it. However, I would advise using Zinsser SealCoat™ as your first coat of clear finish after the stain dries, then switch to whatever finish you prefer. Don't be surprised if the rougher sections will absorb more stain and more finish than the

sanded ones. Because the wood will respond unevenly, it is wise to make samples first. Fortunately, with a whole barn, you'll have plenty of scraps to try out.

You will need to machine areas where joinery occurs, but you can leave the weathered parts rough, or sand them just enough to feel decent but still exhibit saw and aging marks. If you

chose not to remove the gray with oxalic acid, be aware that sanding will also remove the gray, but only where the sandpa-

per hits. The key will be to plan well before you cut or joint the wood so you do not destroy the weathered sections you wish to keep. If you lose some weathering accidentally, you can mimic it by scrubbing the cut surface with a wire brush, then staining to mimic the surrounding gray areas.

continues on page 106 ...



WINNER! For simply sending in his question on restoring a piano, Dan Sanchez of Longmont, Colorado wins **Olympic's Interior Wood Finishing Kit**. Each issue we toss new questions into a hat and draw a winner.

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A Sign of Progress

I moved to New York City in time for the 1976 Bicentennial, a celebration complete with tall ships and fireworks. After a half decade apprenticing and finishing in Miami, I was ready for the big time, and I soon landed a job in one of the top shops in the city.

Riding the subway to work one morning, I noticed one of the patriotic ads commissioned for the Bicentennial — a poster of the classic John Trumbull painting of the signing of the Declaration of Independence over the caption, “America needs more work that’s good enough to sign.” Wowed by its inspirational truth, I swiped it to hang in my home, a benign bit of delinquency born more of admiration than larceny.

At the time, I was a work in progress. I could already do both new and “antique” clear and painted finishes, gold leaf and even *faux bois* (or “fake wood”) grain, but my biggest challenge was realistic fake marble. Mine always came out looking contrived.

My boss, John, a master at that arcane craft, took me under his wing and set about to teach me with his own inimitable style, a combination of demonstration and harangue. “Hey, Picasso,” he’d yell at me, “loosen up and stop painting pictures. The faster you go, the more natural the marble will look.”

When I finally got the hang of it, John rewarded me by letting me in on his secret. Hidden within the marble veins, he always added his signature, adroitly blended so that no one would ever notice. This time, he let me sign, and I took it as proof that I had finally earned the coveted designation of a true New York finishing expert.

The next day, I brought in the purloined poster and hung it in the shop.

Q A few years ago, we had a grand piano restored and refinished. During shipment, it was damaged and two round divots were imprinted on the piano. These divots are the size of a quarter and 1/8" deep. The color and finish are intact, but the dents are visible. The wood is marbled rosewood with a clear finish. One finish vendor recommended clear filler and a clear coat over the repaired area. Someone else recommended that I try steaming them out, but will it do more damage than good?

— Dan Sanchez
Longmont, Colorado

Michael Responds: It is almost certain that trying to steam out the dents will do more damage than good for two reasons. First, steaming works well on raw wood, but not on finished wood, because the steam has a very hard time getting through the finish. Second, the amount of heat you need for that process can damage some finishes, possibly severely. All things considered, the other option might be a better one, though I must warn you that it is a very slow, difficult process.

First, contact your refinisher to ensure that whatever he or she used is compatible with lacquer. If not, replace the lacquer in my description with the same finish that’s on it now. With the surface horizontal, carefully add several drops of clear lacquer to the dented impression. Let it dry, during which it will shrink substantially. Repeat, leaving a day or two between each application until the finish is hard. Eventually, the impression will be filled just proud of level to the surrounding area. Let it cure fully for several weeks, then sand the area flush using a succession of 600- to 1200-grit papers. Restore the sheen using automotive rubbing and polishing compound.

A faster method is to use burn-in sticks, but these take some skill and practice and bring with them the possibility of further damage. If you feel brave, you can buy an electric hot knife and burn-in sticks at many woodworking specialty stores, but definitely practice on finished scrap first. It is quite easy to burn the surrounding finish.



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