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Fine WoodWorking

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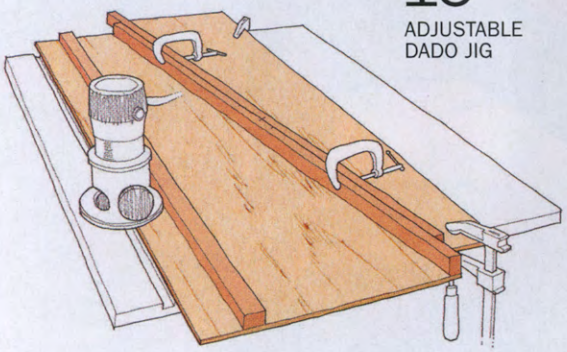

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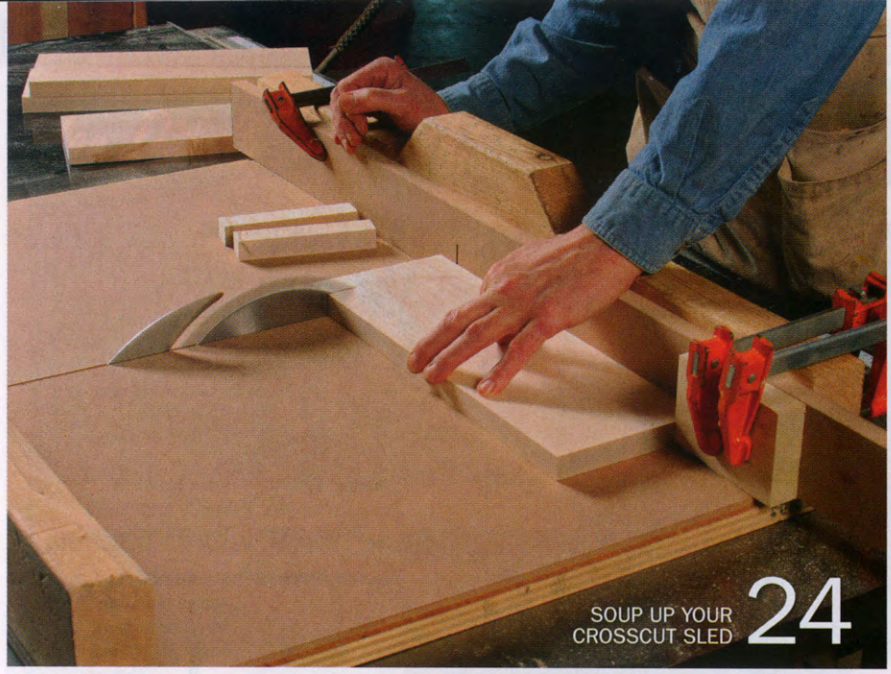

in the back

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on the web

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Visit our Web site to access free Web tie-ins, available April 7. While you're there, don't miss our collection of free content, including tool reviews, an extensive project gallery, and must-read blogs.

VIDEO:

Shopping for a Smoother

Find out what to look for and peek behind the scenes of our tool test (pp. 42-47).

VIDEO:

Building with Garry Bennett

Get in the classroom and watch how Bennett constructs his "un-trestle table" (pp. 76-81).

Grooving Plane Giveaway

Go online for a chance to win a pair of Matt Kenney's shopmade planes (pp. 30-34).

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VIDEO

Master the Bandsaw

Turn any bandsaw into a precise slicing machine with tips from expert Michael Fortune. Series includes lessons on:

- Bandsaw setup
- Resawing
- Cutting curves

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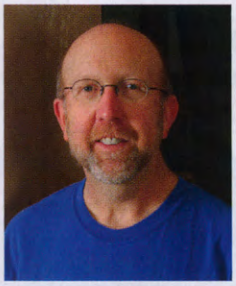
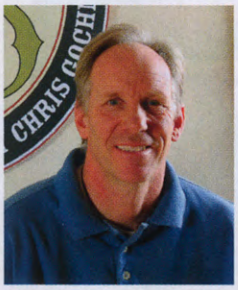
contributors

A guitar-making course was what spurred Stephen Hammer ("Dining Table with Two-Way Drawers" and "Half-Blind Dovetails in Half the Time") into woodworking. He worked for a contractor in New York City and later completed the 12-week intensive woodworking course at the Center for Furniture Craftsmanship in Rockport, Maine. In 2001, he opened a shop in Brooklyn, N.Y., making high-end furniture and cabinetry. After the birth of his two daughters, he and his wife moved to Connecticut.
The tool you can't live without? "My computer CAD program and my great grandfather's No. 3 Bailey smoothing plane. If I could save only one tool in my shop, it would be that one. It still has the original laminated blade."



Brian Sargent *(Master Class)* is new to the magazine, but his love of woodworking goes back 30 years. He mastered carpentry at a technical high school and in the Army Corps of Engineers, worked in a few cabinet and furniture-making shops, and then ventured out on his own in 1994. Working solo has allowed him to embrace his love of natural forms, and his furniture often includes sculptural lines and flowing curves. He is chairman of the New Hampshire Furniture Masters Association.
If you weren't a woodworker you'd be ... "A National Park ranger."

Craig Thibodeau *("A Chessboard Made Easy")* recently moved his shop to an old industrial building with more power, more space, and high ceilings, which has allowed him to take on larger and more complex projects. He just began furnishing a new client's home with 12 freestanding and built-in pieces in maple and cherry, featuring floral marquetry.
Proudest moment as a woodworker? "Watching my kids build things in the shop."



Despite the recession, **Chris Gochnour** *("Tool Test: Smoothing Planes")* had a great year, making a long anticipated move to a new woodworking studio two miles from his home. Building the shop was a labor of love, but it was not easy. He was forced at times to work in his old garage shop and new space simultaneously, a logistical problem he hopes never to repeat. Fortunately, with his new workshop complete, his family has a place to park their cars, and all of his tools are in one place.
The tool you can't live without? "My trusted Disston #4 backsaw."

For more information on our contributors, go to FineWoodworking.com/authors.

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Spotlight

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MORE TIPS FOR THE ULTIMATE FINISH

Michael Pekovich's article, "Wiping Varnish: The Only Finish You'll Ever Need," is the best finishing article you have ever printed. My finishing evolution basically mirrors his, with one exception. I work mostly with oily woods—rosewoods, ziricote, bocote, and so on—and I've learned to prefinish them with dewaxed shellac to seal in the natural oils. I've also tried this approach on other woods, and now I use it for everything because it builds the finish significantly faster.

I rag on two or three coats cut 50/50 with alcohol, and sand lightly between them. I can get the sealing done in one hour because shellac dries so fast. By the way, finishing the interior parts before assembly greatly reduces the pain.

One other trick I have discovered is to use microfiber cloths cut into patches for wiping rags. I fold the rough edges into the center of the pad, and I don't get any of the lint residue that cotton rags leave behind.

—JERRY FAULRING, Adamstown, Md.

The author does not mention the fact that oxygen and Waterlox react very quickly, turning the leftover finish in the can into jelly. Also, you may not pour the Waterlox back into the can once you have poured it out. In Step 2, he has poured the Waterlox into a plastic container, but that, too, is a no-no. Plastic will not keep out the oxygen.

—STEVEN HARRIS, Narberth, Pa.

Michael Pekovich replies: It's true that Waterlox dries more quickly than other wiping varnishes, and a partially filled container will skin over or even turn to jelly. I always pour a small amount of finish into an open plastic container for easy access, but not much more than I think I'll need. As for the finish in the can, the manufacturer's website (waterlox.com) recommends two solutions. The one I typically rely on is to transfer the unused portion in the can into a smaller glass jar, which reduces the amount of oxygen in contact with the finish. Their other recommendation is Bloxygen spray (Bloxygen.com), which replaces the oxygen in the container with an inert gas.

Used bandsaw not a bargain

I agree with Roland Johnson ("Used Machines Can Be a Steal," *FWW* #218) that buying used machines is a great way to save money and get a heavy-duty machine you could not otherwise afford; I have done it myself multiple times with great success. But I have to take issue with his bandsaw example. This sounds to me like exactly what not to do when buying used. For about the same (or even less) money he could have bought a new 17-in. machine, with a bigger, 2-hp motor, a warranty, and modern features like dust-collection ports, a covered motor and blade, a miter gauge included, etc. What he bought for $250 turned into a $925 kit of parts that he had to source and assemble himself.

—SETH WALTER, South Windsor, Conn.

Roland Johnson replies: *Restoring this bandsaw was as much about recycling as it was about getting a fantastic bandsaw for a very fair price. I find great joy in taking a derelict piece of classic machinery and returning it to its glory. Secondly, cast iron will always be stouter than a welded-sheet-steel machine, and no one manufactures a cast-iron-frame, 16-in. bandsaw anymore. This saw is an absolute gem: It's heavy (around 450 lb. without the motor and base—even the wheelhouse doors are cast iron), and it has zero flex in the upper guide post for great resaw ability, 12 in. of resaw capacity, a true 1½-hp double-capacitor motor (U.S.-made), and top-notch ceramic guides. There is a good dust port under the lower door (I plan to add one under the table), and I added a paddle switch for safety.*

More tips for buying used tools

Like Roland Johnson says, "Used Machines Can Be a Steal." This is because they were designed by old-timers working in shops for years. I wonder if some of the computer-age

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designers and product engineers have ever cut a board.

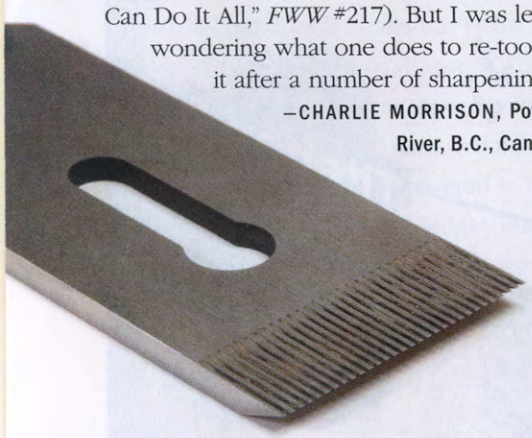
Here are a couple of tips. Johnson recommends listening to a bearing using a long screwdriver. There is a better way. Cut a broomstick 18 in. long. Grasp it around the top with your thumb sticking up. Now stick the thumb in your ear. I used this method for years in a steel-rolling mill to check the condition of roller bearings. Also, Johnson struggled to get his new bandsaw tires onto the wheels. Heat them in hot water and they'll go on much easier.

—MONROE MECHLING, Steubenville, Ohio

Resharpening a toothed plane blade

Having burned many calories over a scrub plane, one of my favorite tools, I was interested in the description of the Lie-Nielsen toothed iron in Christian Becksvoort's article ("One Bench Plane Can Do It All," *FWW* #217). But I was left wondering what one does to re-tooth it after a number of sharpenings.

—CHARLIE MORRISON, Powell River, B.C., Canada



Christian Becksvoort replies: *Don't worry, you'll still burn calories with the toothed blade, but it will leave a smoother surface than the scrub plane. And you will be able to sharpen the bevel for years to come. The channels between the teeth extend ¾ in. up the back side of the blade.*

How to nail without splitting wood

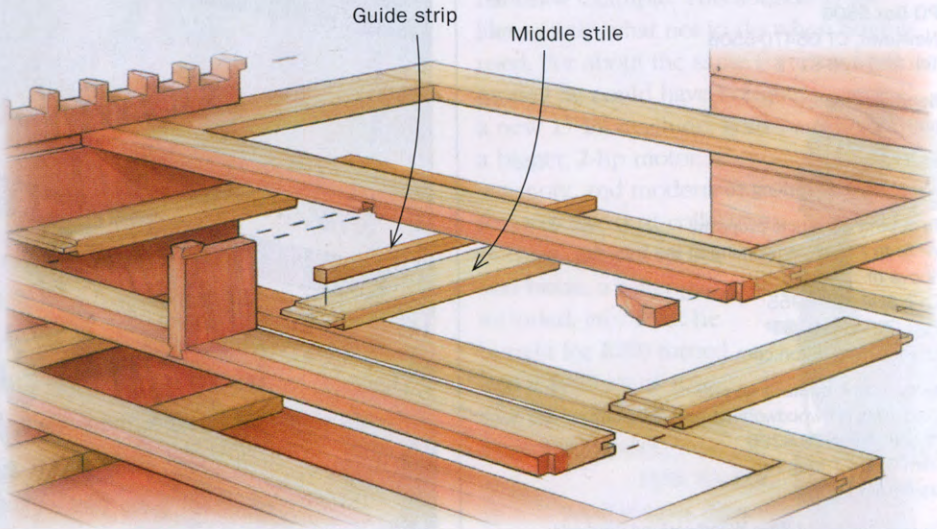
In "Two Nailers You Need" (*FWW* #217), most of the photos showing use of the finish nailer or brad nailer have the nailer being held parallel to the wood grain of the pieces being nailed. The article mentions that the speed of the air-driven nail makes it less likely to split the wood. While that is true, if you hold the nailer perpendicular to the wood grain, the wedge-shaped tip of the nail will be across the grain, which makes it even less likely to split. When I nail close to the end of a board (or nail very thin moldings) I always try to position the nailer across the grain, and very rarely have any problem with splitting.

—DAVE MARTIN, St. Paul, Minn.

Correction: Tool chest missing some parts

"The North Bennet Street Tool Chest" (*FWW* #216) is a very nice project, but it has two fundamental flaws. For one, the middle partition does not continue all the way back, which would prevent side-to-side movement of the drawers on both sides of it. Also, with no guide strip on the outside of the drawers, they will rub against the inside of the cabinet. This would not be an issue except that the case continues out with a lip, where any wear will be noticeable.

—DAVID BRAY, Damascus, Md.



Drawing: Bob La Pointe

Steve Brown replies: *I neglected to mention a simple guide strip that goes between the two drawers in the top level. It sits on a middle stile of the divider frame below those drawers. It doesn't help that we also left that middle stile out of the exploded drawing. In any case, both are clearly needed for the drawers to function well. Just mill the strip to the same thickness as the partition, and then, once the divider frames and partition are glued in place, you can mark the guide strip location and just glue it onto the top face of the divider stile, being sure to keep it flush with the thickness of the partition and square to the front edge of the divider. In other words, be sure that the widths of both drawer spaces are the same in the back as they are in the front. It really doesn't need to be more complicated than that.*

As for the drawer sides marring the insides of the case sides over time; it was a conscious choice to keep the scope of the project from getting more involved than it already is. But on other student projects, we use the very strategy you mention. Thanks for your interest and for reading the article more carefully than the editors and I did.

About your safety

Working wood is inherently dangerous. Using hand or power tools improperly or ignoring standard safety practices can lead to permanent injury or even death. Don't perform operations you learn about here (or elsewhere) until you're certain they are safe for you. If something about an operation doesn't feel right, find another way. We want you to enjoy the craft, so please keep safety foremost in your mind.

EDITED AND DRAWN BY JIM RICHEY

Best Tip

Platform takes guesswork out of compound-angle holes

Tom Collins was inspired to start woodworking at age 4, when he followed his dad around his shop. He has developed his woodworking skills by building furniture, working on his home, and studying magazines, books, and videos. He says his passion for the craft is fueled by his need to create and his quest to improve and refine his skills.

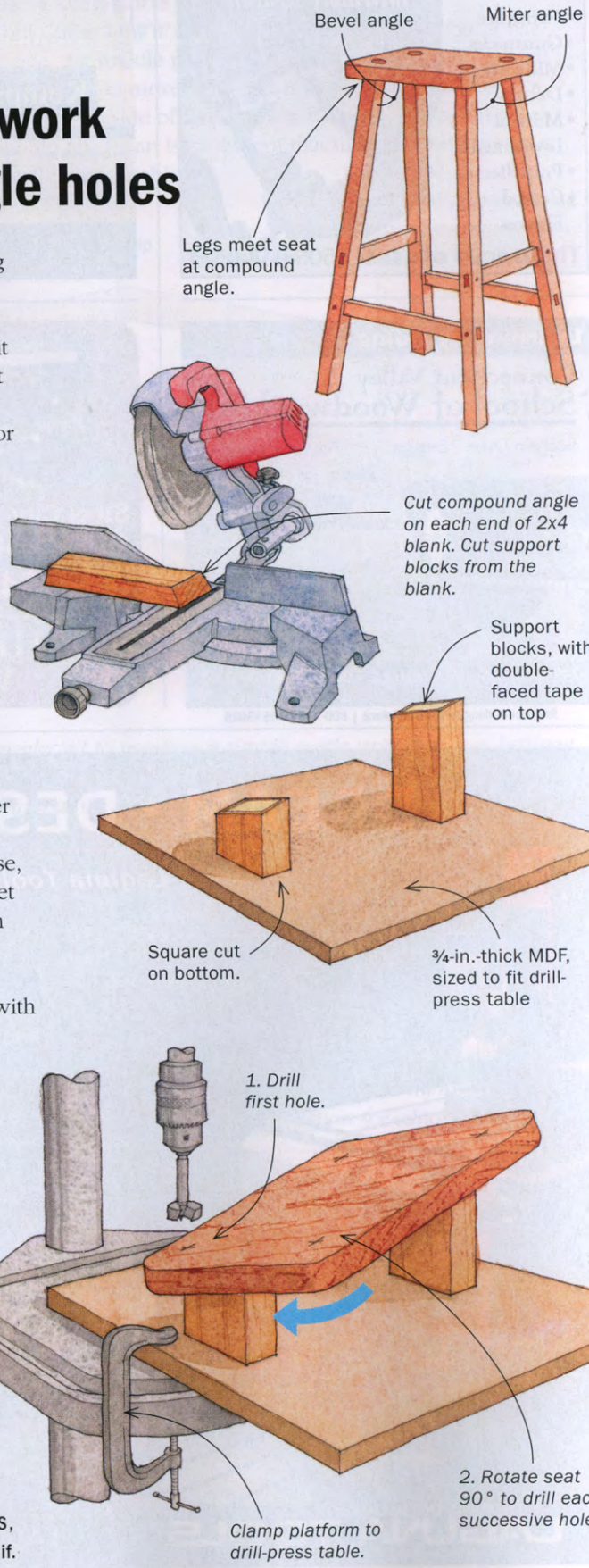
Getting ready to build a stool recently, I was having trouble figuring out a way to drill the compound-angle holes in the seat for the legs. Thinking about the process, I spied my compound-miter saw, and it hit me: I could use the saw to make a platform that holds the seat at the correct angle for drilling.

Consult your plans to calculate the two angles for the holes (for this stool, the angles are the same). Set the miter to match the front-to-back angle and the bevel for the side-to-side angle. Trim both ends of a short 2x4 at the compound angle. Return the saw to its 90° settings and then cut off one end of the beveled 2x4 about 2 in. long. Attach this cutoff along one edge of an MDF base with double-faced tape. By the way, the compound angle also can be cut using a miter gauge on the tablesaw.

For the second support, temporarily place the seat flat on the first block and measure how long the second block needs to be to support the other side of the seat. (A larger seat may require more supports.) The measurement just needs to be close, as you can change the position of this block to get an exact fit. Now cut the second block and attach it to the base with another piece of double-faced tape. Finally, mark the hole locations on the seat and attach the seat to the blocks—top side up—with more tape.

Using a Forstner bit, drill the first hole on the low end of the platform. Take light cuts and clear chips frequently, especially when you're about to break through. Once the first hole is done, simply rotate the seat 90° to cut the remaining holes. Be aware that on seats where the two parts of the compound angle are not equal, you'll only be able to drill two diagonally opposite holes, then flip the blocks over and re-attach them to drill the last pair of holes.

—TOM COLLINS, Chatsworth, Calif.



A Reward for the Best Tip

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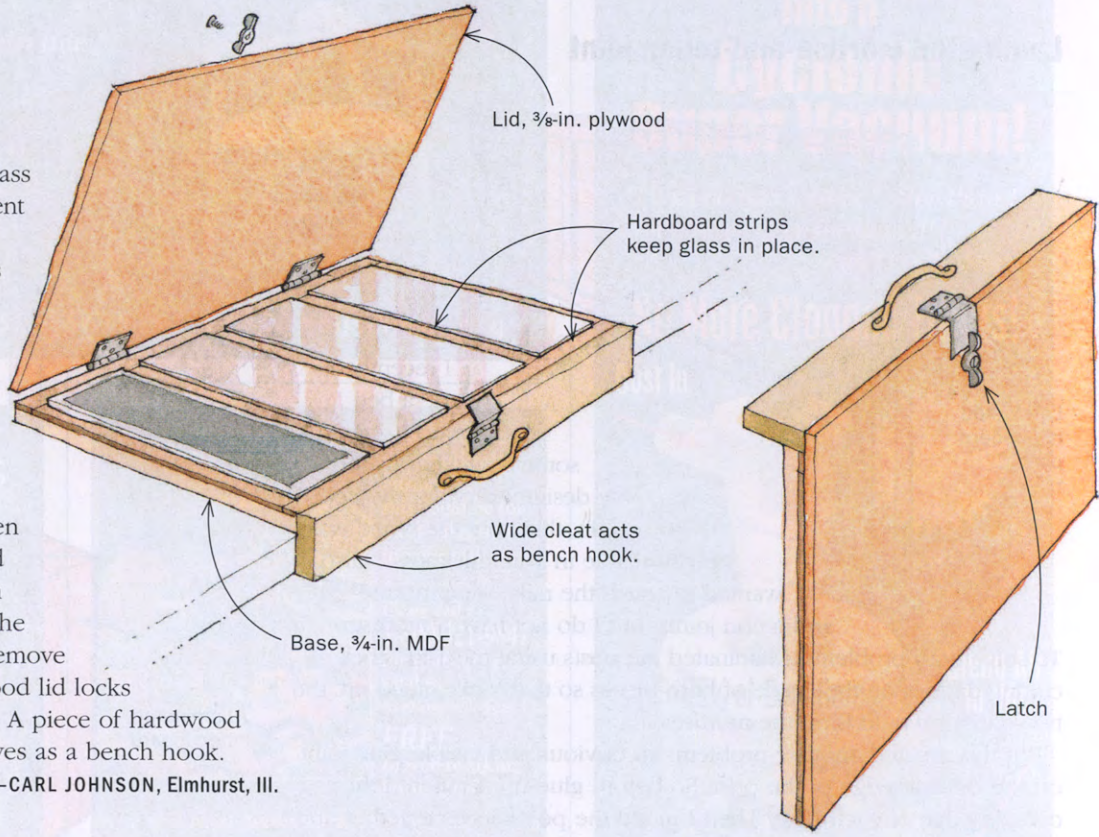
Benchtop caddy is great for sandpaper sharpening

I use wet-or-dry abrasive paper on glass for sharpening. But storing the different components separately was making the process inefficient. So I made this simple caddy that holds four pieces of glass and grades of abrasive. I can quickly take the caddy from storage, place it on the bench, open the lid, and begin sharpening.

The ¾-in. MDF base holds the glass pieces, which fit snugly between thin strips of hardboard screwed and glued to the base. The strips are thin enough to give me a fingerhold on the ¼-in.-thick glass, in case I need to remove any of the pieces. The hinged plywood lid locks in place with a clasp and twist latch. A piece of hardwood attached to the front of the base serves as a bench hook.

—CARL JOHNSON, Elmhurst, Ill.



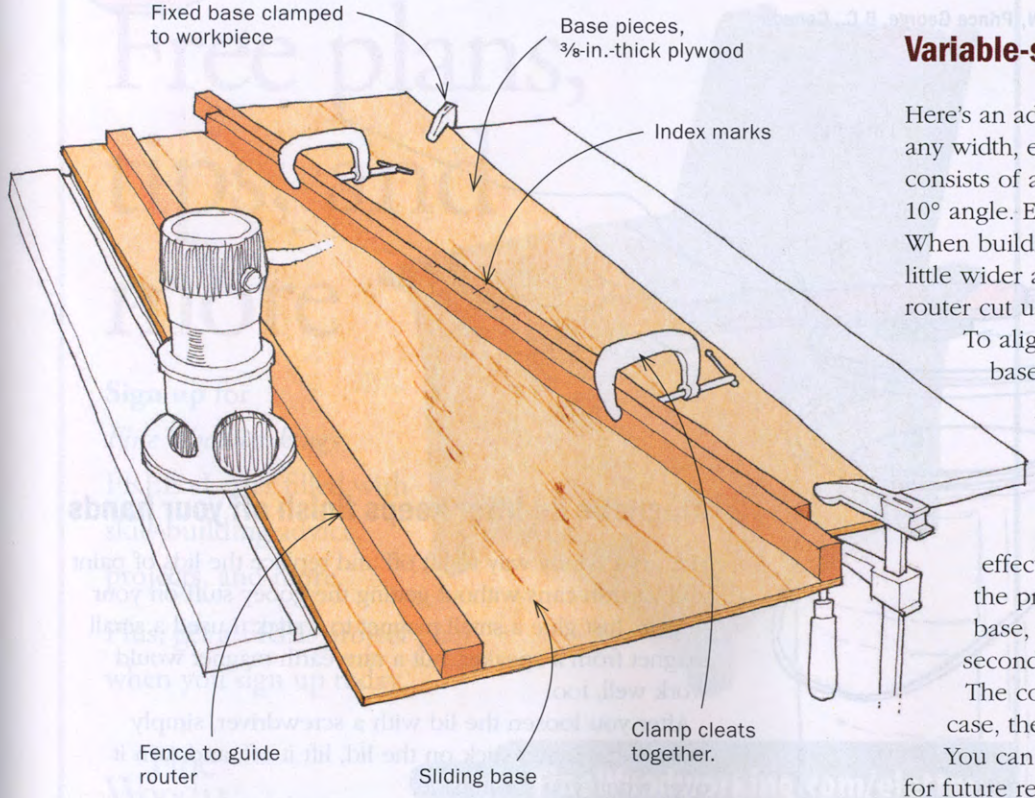
Variable-size dado fixture for a router

Here's an adjustable jig that allows you to rout a dado of any width, even ones that don't fit standard bit sizes. It consists of a fixed base and a sliding base that meet at a 10° angle. Each base has a 2-in.-high cleat for clamping. When building the fixture, first make the sliding base a little wider at the fence and trim it to size with the first router cut using the bit you will use as a standard.

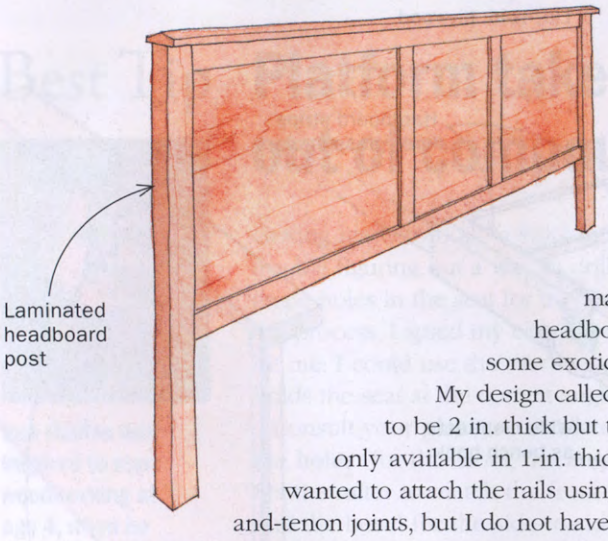
To align and cut the dado, first clamp the two bases together. Place the router bit edge of the jig directly on the cut line, clamp the fixed base to the workpiece, and rout the first pass of the dado. Now remove the cleat clamps and adjust the sliding base for the second pass by moving it up or down, effectively moving the router cut left or right of the previous setting. After positioning the sliding base, reclamp across the cleats and make the second pass.

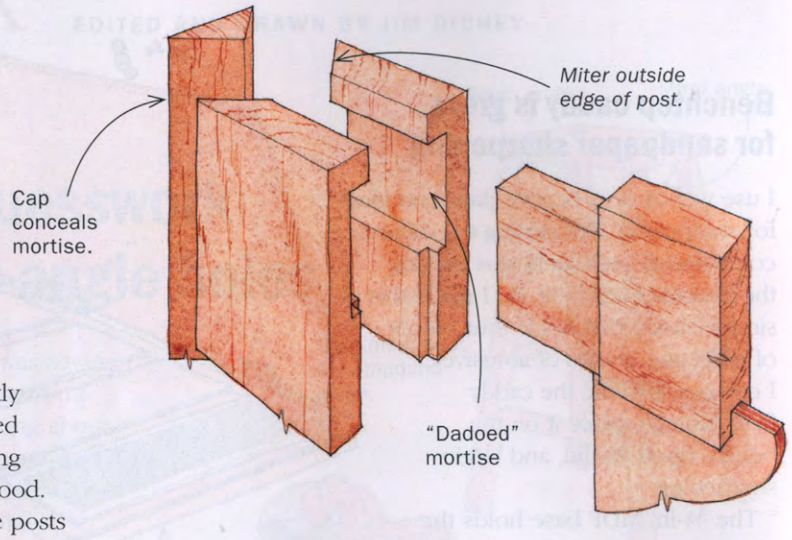
The concept can be applied to any size jig. In my case, the jig was 50 in. long and roughly 18 in. wide. You can place index marks on the clamping cleats for future reference.

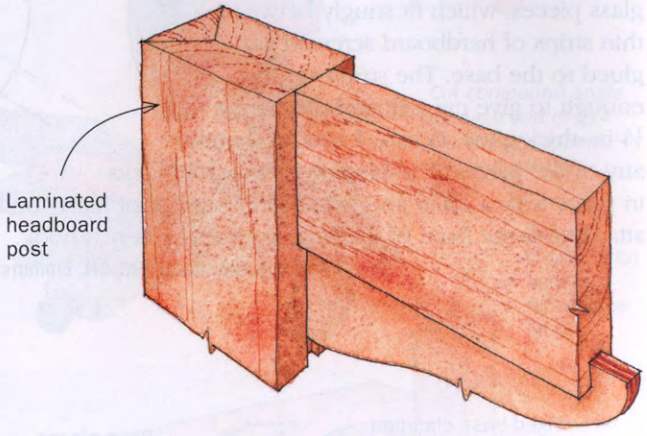
—RON TANCREDE, Jacksonville, Fla.



Laminated mortise-and-tenon joint







I recently made a bed headboard using some exotic hardwood. My design called for the posts to be 2 in. thick but the wood was only available in 1-in. thickness. I also wanted to attach the rails using mortise-and-tenon joints, but I do not have a mortiser. To solve both problems, I laminated the posts using the 1-in. stock, cutting dadoes on the inside of both pieces so that, once glued up, the two dadoes would form the mortises.

But this created another problem: an obvious and visible glue joint on the outside edge of the post. So before glue-up, I mitered the outside edge of each post. Then I glued the post pieces together and filled the recess along the mitered edge with a triangular-shaped cap.

Once everything was glued up, I had a perfect mortise-and-tenon joint in a post that looks like a piece of solid 2-in.-thick hardwood.

—DAN ADAMSON, Prince George, B.C., Canada

Quick Tip

Whenever I need to set a router bit or a tablesaw blade to an exact height, I take a twist-drill bit with a diameter equal to the height I want and lay it down with the end of the shank against the blade as I adjust the height. When the top of the blade aligns with the shank of the bit, I'm there. I check the alignment by eye and then double check by running a finger across the blade to the drill shank.

—J. KAYE, Phenix, Va.

Magnetic lid lifter keeps finish off your hands

Here is a handy way to lift off and replace the lids of paint and varnish cans without getting the gooey stuff on your fingers. Just glue a small magnet to a stick. I used a small magnet from a speaker, but a rare-earth magnet would work well, too.

After you loosen the lid with a screwdriver, simply place the magnet-stick on the lid, lift it off, and turn it over when you set it aside.

—CHARLIE GARDNER, Mesa, Ariz.

Quick Tip

When I'm using commercial drawer slides, if I build the drawer box too narrow, I just shim out the drawer slides with a piece of veneer or veneer tape. It's simple, quick, and nearly undetectable as the strip is hidden by the drawer slide member.

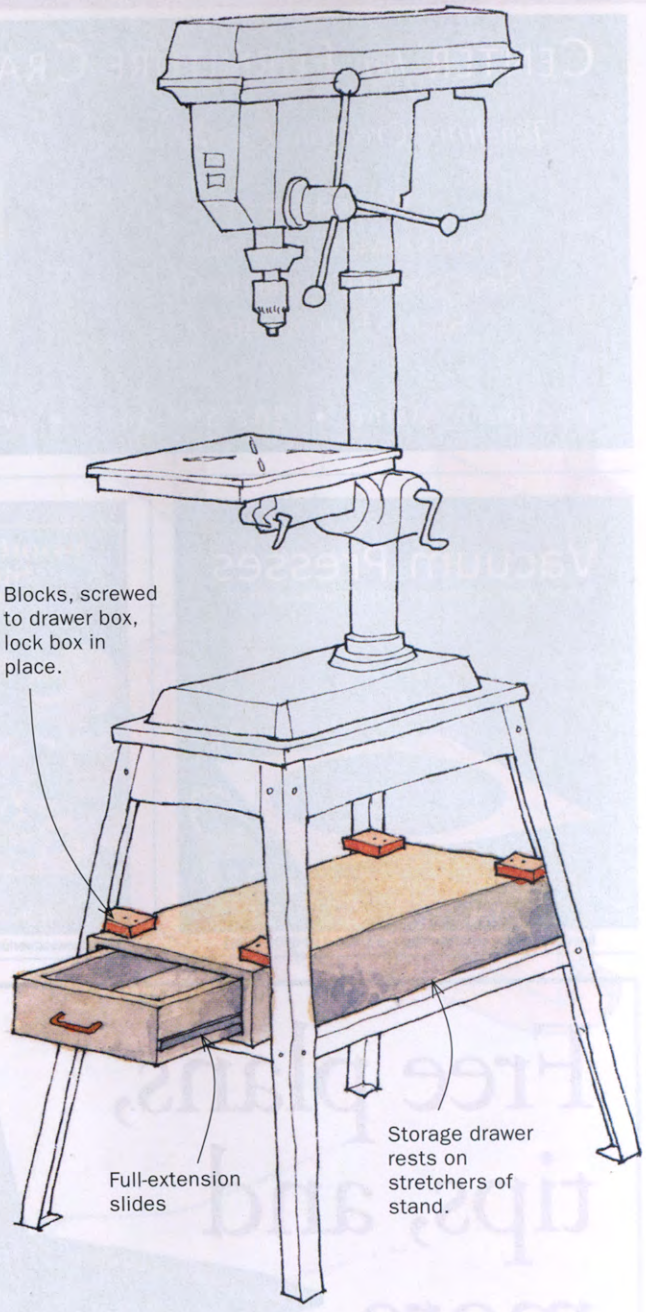
—KEN DILLE, Austin, Texas

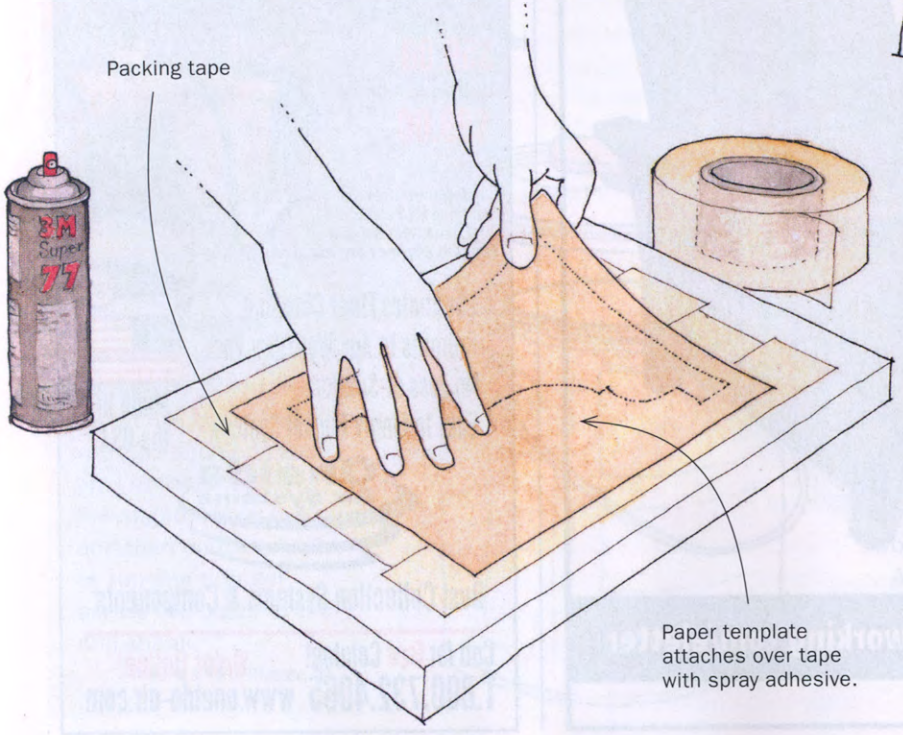
Tool-stand drawer makes most of wasted space

In my continuing efforts to optimize the storage space in my basement workshop, I came up with the idea of putting a drawer under the tools I've mounted on splayed-leg stands.

This setup not only provides a handy drawer, but also a useful shelf without using a bit of extra shop space. The shelf case slips between the splayed legs, sits on the stretchers (or lower on the mobile stand), and locks in place with blocks screwed into the four corners. I used 5/8-in. melamine to make my drawer, but any sheet goods would work fine. My only purchase was the full-extension drawer slides.

—SERGE DUCLOS, Delson, Que., Canada





Easy-to-remove paper templates

Lots of woodworkers use spray adhesive for attaching paper templates to wood. The stuff works, but I've always found it a pain to remove the template after the cut is complete, especially for small or intricate parts. And the adhesive leaves a nasty residue on the wood.

Here's my solution: First, use packing tape to cover the area where the template will be placed. Now spray the template with adhesive and attach it to the workpiece on top of the tape.

When you are done with the cut, peel up the tape along with the paper template. Simple and clean.

—JAY SULLIVAN, Washington, N.C.

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■ HAND TOOLS

Quality chisels at a sweetheart price

WHEN STANLEY STOPPED MAKING ITS 750 SERIES of socket chisels more than 40 years ago, the demand didn't stop. Revered for their quality and price, these chisels have been widely sought-after on the second-hand tool market for years. Now Stanley has revived the 750 series, offering a great tool with a price that's within reach.

The new 750s are manufactured in Sheffield, England, from high-carbon, chrome steel (the originals were made in the United States). They are precisely machined with clean and consistent beveled edges, 30° factory-ground bevels, and reasonably flat backs.

The chisels required a few minutes of sharpening and flattening before use. Most of the blades in the set had very flat backs, but some needed a bit of extra work to flatten. Overall, I gave the set a B for flatness. One other thing you'll need to do is lightly hammer the handles into the sockets.

What appeals to me most about the new 750s is their form. They are shorter than other chisels I own. The short length, combined with an easy-to-grip hornbeam handle, gives you nimble, fingertip control over the tool, a plus when you're chopping and trimming dovetails.

The chisels are light, too, making them perfect for chopping tasks that require holding the blade with one hand while tapping with the mallet. It's easy to register mallet blows against the handle.

To gauge the edge retention of the blades, I put the chisels through a rigorous performance test on cherry and white oak. Using a mallet, I trimmed the ends of the boards. I also drove the tip of the chisel into the wood repeatedly, simulating the dovetailing process. The edge retention of these chisels is very good.

Despite the high quality, the tools come at a reasonable price. You can buy them individually, but a better value is to purchase sets of eight (⅛ in., ¼ in., ⅜ in., ½ in., ⅝ in., ¾ in., 1 in., and 1¼ in.) or four (¼ in., ½ in., ¾ in., and 1 in.). The sets are sold with a nice suede tool roll.

When compared with the other chisels I reviewed in 2008 (*FWW* #200), the Stanleys rank among the best. They are well made, have great form, and offer great value.

—Chris Gochnour is a hand-tool expert near Salt Lake City, Utah.

Stanley Sweetheart Chisels, 750 Series
$220 for a set of eight; **$130** for a set of four; **$30** to **$35** individually; highlandwoodworking.com

Vesper Tools Sliding Bevels
4-in. sliding bevel: **$146** for brass, **$200** for wood infill; 7-in. sliding bevel: **$170** for brass, **$242** for wood infill; 10-in. sliding bevel: **$283** for wood infill; vespertools.com

■ MEASURING AND MARKING

The high price of perfection

THE BIGGEST CHALLENGE IN MAKING A SLIDING BEVEL is to create a locking mechanism that holds the blade firmly without interfering with the use of the tool. On most models, it doesn't take much to knock the blade off angle, but the sliding bevels from Vesper Tools of Australia lock tight with a simple twist of a knurled brass knob. The locking mechanism holds the blade more securely than any other bevel I've used, and it is always out of the way.

In addition, the fit and finish of the tool is flawless. The beefy stainless-steel blade fits like a glove to the solid or wood-infilled brass body. The solid body is less expensive, but I prefer the feel and balance of the infilled one.

It's rare to come across a perfect tool, but Vesper's sliding bevels come pretty close. If you can afford one, you won't be sorry.

—Michael Pekovich is *FWW*'s art director

Photos: staff

QuikJig revolutionizes pocket-hole joinery

I BUILD A LOT OF CABINETS, and I often use pocket holes for the face frames and toe kicks because the joints are plenty strong and are quick and simple to make. Now Porter-Cable has made the job even easier with the QuikJig.

The first thing I noticed was the tool's mass, which adds stability to this benchtop tool. But the jig's simple setup and convenient features make it a real winner.

First, installing the stop collar on the drill bit is easy to do using an onboard jig. What's more, the setup works for any thickness material you need to drill (from ½ in. to 1½ in. thick). Screw spacing is simple to adjust (from ¾ in. to 1⅜ in. on center) using an easy-to-grip knob on the side.

QuikJig by Porter-Cable
Model No. 560
$230;
woodcraft.com

The clamping mechanisms are very strong and held narrow ¾-in.-wide stock in place without shifting. An adjustable stop keeps the workpiece aligned and makes easy work of repeat cuts in material of the same width and thickness. If you are drilling stock that's wider than the jig, you need to unthread the stop completely and slide it out of the way, a cumbersome process; I'd prefer some sort of quick release. Aside from that detail, this beautifully engineered jig is a snap to set up, and after that, lightning fast to use. The jig has a removable dust port, which helped prevent chips from building up and interfering with the job.

Drilling pocket holes in a long piece held vertically can be awkward, but the QuikJig takes care of that, too. You can simply flip down the jig and support the workpiece with a standard 2x4.

Although the price tag on the QuikJig may turn away casual pocket joinery users, those who rely on pocket screws will value all that it has to offer.

—Mark Edmundson is a furniture maker in Sandpoint, Idaho.

Long board? No problem. *If a piece is too unwieldy to drill vertically, flip the jig down and put a 2x4 under the workpiece for support.*

Set it, and forget it. *Once you install the stop collar on the bit using the onboard jig, you won't have to do it again.*

Dial in the hole positions. *Set the hole spacing by rotating the large knob on top of the jig.*

One-shot clamping. *The rotating clamp handle both locks the stock and automatically sets the drilling depth.*

Drill, baby, drill. *Drilling goes very quickly, and a handy scale on the side tells you the screw length you need for your setup.*

■ DUST CONTROL

One company, two ways to capture dust

ON THE TABLESAW

IF YOU HAVE A BENCHTOP TABLESAW or contractor saw with no dust port, the Dust Cutter II will help you breathe easier.

The Dust Cutter II is basically a zippered nylon bag that attaches to the bottom of a benchtop or contractor tablesaw with hook-and-loop fasteners. You also could mount it permanently through the existing bolt holes in the saw's base. Installation took me less than 30 minutes.

The manufacturer mentions three ways to catch dust with the bag. You can simply let it collect in the bag and empty it using the zipper, or you can leave the bag unzipped and let the dust drop into a container placed under the saw. However, with both of those options, a lot of sawdust simply goes airborne. The best method is to hook up a dust collector or shop vacuum to the 2½-in.-dia. dust port on the bag. In that mode, the Dust Cutter II is a great tool to help control dust on benchtop and contractor tablesaws.

—Tom McKenna is senior editor.

Keen Products
Dust Cutter II
$40;
woodcraft.com

Suction helps. *The Dust Cutter II works best when hooked up to a vacuum or dust collector.*

FROM YOUR ROUTER TABLE

Keen Products
Dust Router
$40; woodcraft.com

No escape. *The Dust Router catches particles above and below the table.*

ROUTER TABLES MAKE A HUGE MESS. Even if you have a dust collector hooked up to a port in the fence, you still get a pile of shavings and dust underneath the table. Keen Products has come to the rescue with the Dust Router.

The Dust Router is designed to catch dust above and below the table, but the genius part happens below. A soft silicone collection cup that fits around the router collet catches any dust particles not picked up from above (through the fence)and funnels them to the dust collector.

The cup is flexible, so it won't impede raising and lowering the router. It also won't interfere with bit changes above the table. However, if you need to reach under the table with your wrench, the cup will deny access. That means you'll have to remove the motor from the base for bit changes—an inconvenience.

I used a large ogee bit on some pine, white oak, and poplar, and the Dust Router caught nearly all the dust being spewed. Only a smattering of chips made it to the floor and the tabletop. Overall, the tool works great.

The package includes the cup and mounting plate, T-connector, and all the hoses and hardware you'll need to install the system. The Dust Router will work on any router table, even a simple one made from plywood. If you have a router lift, however, I'd recommend checking with the manufacturer about the installation and operation.

—Roland Johnson is a contributing editor.

■ MACHINES

New benchtop planer features insert cutters

A fresh edge. *The planer features two-sided insert cutters made from high-speed steel.*

INSERT-TOOTH TECHNOLOGY IS BECOMING ALL THE RAGE with planers and jointers. The small, precisely placed cutters produce a more uniform flat surface than long knives, which tend to leave undulations behind. As a bonus, the cutters can be changed quickly and easily.

General International has joined the fray with a new 13-in. benchtop planer that features a stagger-tooth spiral head with 26 two-sided high-speed-steel cutters. The cutterhead planes with less noise and lower power demand, which means it can take slightly heavier cuts than its straight-knived counterparts.

I put the planer through its paces for about a week, planing hardwoods, softwoods, and figured woods. Overall cut quality is good. But there's a lot more to like about this tool. First, the cutterhead moves exactly 1/16 in. with one full turn of the depth-adjustment crank handle. That allows you to dial in the depth of cut with precision, say, when planing a shelf to fit a dado.

General International 13-in. Planer
Model No. 30-005HC M1
$650; visit general.ca for retailers

The machine also features a turret-style thickness stop for standard thicknesses of 1/8 in., 1/4 in., 1/2 in., and 3/4 in. A gauge on the front quickly shows how much material you are about to plane off, so you can avoid making too heavy a cut.

A dual-sized dust-collection hookup (2½ in. and 4 in.) matches easily to either a shop vacuum or dedicated dust-collection system, a very convenient feature. Power is rated at 2 hp and can be run on a 120-volt circuit. Handles on the sides make lifting the 59-lb. planer easy.

Overall, this is a solid performer. —R.J.

Soup up your crosscut sled

FRESH FACES AND SMART STOPS MAKE A BIG DIFFERENCE

BY STEVE LATTA

Crosscutting furniture parts to length seems like an easy job, but—as with the entire milling process—small inaccuracies can lead to complications like openings that aren't square or joints that won't close. Most furniture makers make their critical crosscuts on the tablesaw, using either a miter gauge or a crosscut sled. I showed how to get more from your miter gauge in *FWW* #205, but the best tool for precise crosscuts is the sled. A well-made crosscut sled carries the workpiece and controls tearout. It can handle much larger workpieces. And with a variety of stop blocks, it's also great for producing matching multiple pieces.

Once you've built a sled (see my version in Rules of Thumb: "Tablesaw carriage jigs," *FWW* #160), you'll be on your way to making clean, accurate crosscuts. But there is more to the story.

How to tame tearout

For any crosscut you make on the sled, there are a couple of steps you can take to reduce tearout dramatically. Because of the way the blade spins, tearout happens on the rear and bottom faces of the workpiece. So you need to ensure that the blade opening in the sled's deck and rear fence fits snugly around the blade that you are using. If the blade opening is worn at all, or if you've switched to a narrower blade, attach a rear auxiliary fence made of ¾-in. MDF and a new deck made of ⅛-in. or ¼-in. MDF or plywood. I attach and replace these auxiliary pieces as needed to ensure the best cut. Cut a fresh kerf through them and the sled will virtually eliminate tearout. But just to be safe, try to position workpieces so that the most important surface is on top. For example, cut drawer fronts face up.

Cutting a single piece to length

When crosscutting a single piece, I follow one of two strategies to locate the cut. If the kerf slot on the sled's auxiliary fence stil closely fits the blade I'm using, I'll use the slot as a reference point for the cut. After squaring one end of the stock, make a

Photos: Steve Scott; drawings: John Tetreau

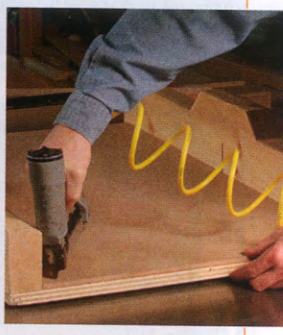
A well-kept sled eliminates tearout

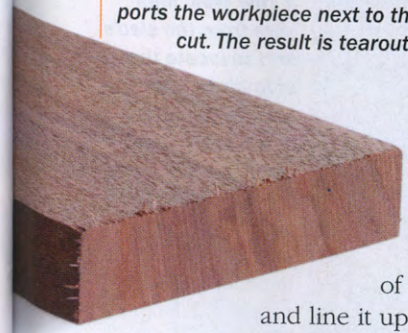
PROBLEM

Over time, the blade opening becomes enlarged, leaving a gap around the blade. When this happens, the sled no longer supports the workpiece next to the cut. The result is tearout.

SOLUTION

New deck. *Tack in place a new base layer made of ¼-in. MDF or plywood.*

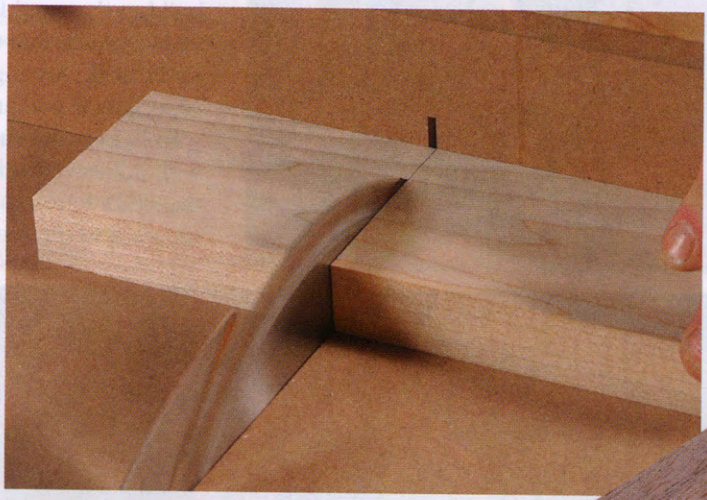




pencil mark on the top back edge of the workpiece and line it up with the edge of the kerf slot. After any crosscut, slide the workpiece away from the blade before pulling the sled back to you.

If the kerf slot is worn, I often make what I call a "sliding cut." After squaring an end, mark the length on the lower front edge of the stock where the blade will make first contact. Start the cut to the waste side of the line and make a shallow cut with the carbide tooth tips so that you can just see stock being removed. With the teeth still in the cut, slide the stock until the cut lines up with your mark; then complete the crosscut.

Fresh fence. *Make the auxiliary fence from ¾-in. MDF. Just clamp it on. Making the fence extra-long (as shown) isn't necessary, but it accommodates a stop block for longer workpieces.*



The payoff. *The zero-clearance openings support the wood fibers where the blade exits the cut, helping eliminate tearout. As a bonus, you can trust the edge of the kerf when aligning your cuts.*

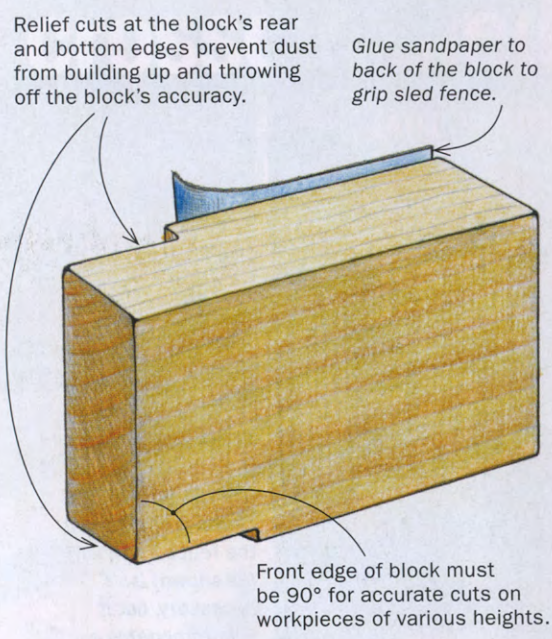
Cutting multiples: The magic stop block

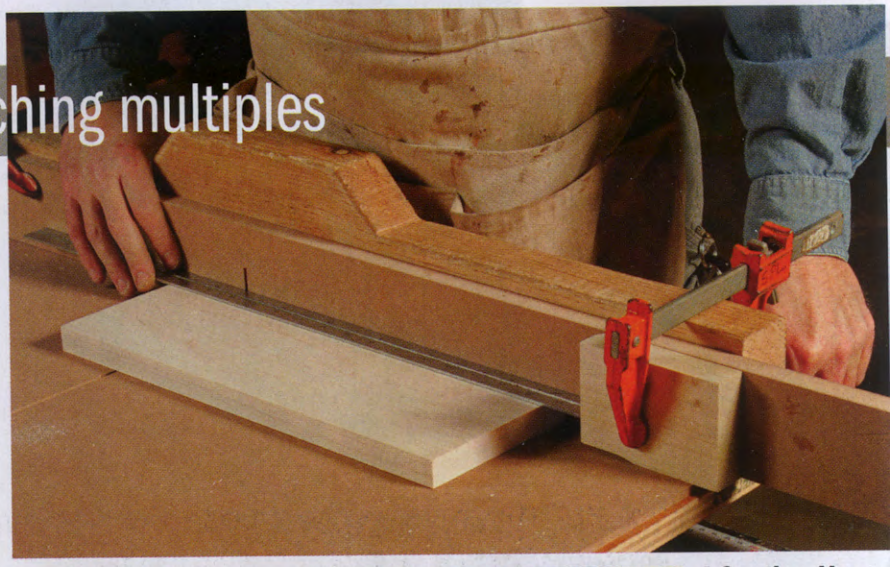
The idea when cutting multiple pieces to the same length is just that—making sure that each piece exactly matches its mates. Cut that second rail just a fraction of an inch too short, and your door frame will not go together squarely. Clamped securely to your sled's fence, a stop block holds the squared end of each workpiece at exactly the same distance from the blade, ensuring precisely matched parts.

It might seem like any piece of scrap would work as a stop block, but once again, the details matter. The block should come from milled stock, with flat faces and square edges and corners. It should be no taller than the sled's fence and

Add a stop block for matching multiples

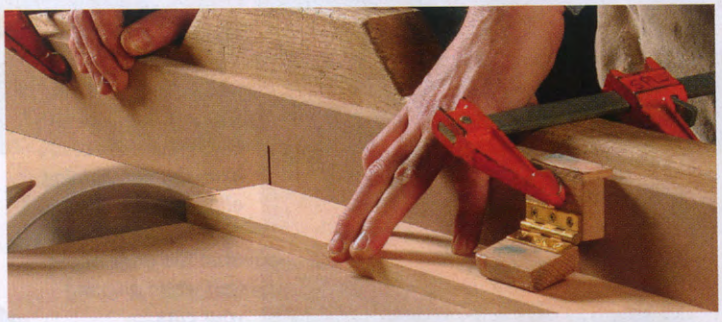
A BASIC BLOCK
for most work



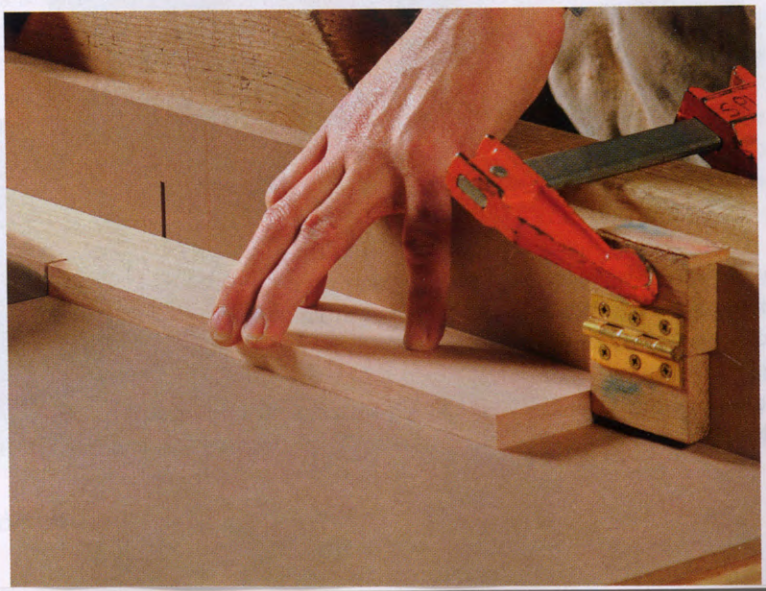


A few tips. *Measure from the sled's kerf to locate the stop block, but elevate the ruler to avoid the relief cut under the block (above). Also, make sure the block is square to the sled's deck for accurate cuts in stock of any thickness.*

A HINGED BLOCK
for added convenience



The author's favorite. *A hinge lets you swing the lower half out of the way when squaring the first end of a piece, then drop it into place for cutting to final length. A lip at the top references against the top edge of the sled's fence, squaring the block every time.*



wide enough to accommodate a couple of clamps. Make the block thick enough (¾ in. to 1 in.) to provide a solid stopping surface. Relief cuts at the rear and bottom corners prevent dust buildup that could throw off a cut's accuracy.

Also, check that the block's stopping surface is square to the sled's deck. An angled block can give you an inaccurate cut, especially if you are cutting workpieces of varying thicknesses.

To help make sure that the block stays put, cover the back with adhesive-backed sandpaper. This helps the block bite into the sled's fence and resist sliding. Second, use two clamps to secure it to the fence. This limits any tendency for the block to slide or pivot, important when cutting large numbers of pieces. Last, remember to gently slide the workpiece into place against the block. Don't bang it home or you risk altering the length of the cut.

To set the block in the right place, use a steel rule if possible (a tape is less accurate) to find the appropriate distance from the blade's teeth. When you have many workpieces to cut, make sure you organize them in a way that helps you keep track of the work. I always stack the workpieces to my right with the squared end away from me. I re-stack the cut pieces to my right but

Hook-style block. *Two clamps hold this block in place. Latta adds a deep-reach clamp to help hold the long workpiece against the sled's fence.*

farther away than the working stack. You might organize your work differently. The point is to make your system consistent, so you can rely on it.

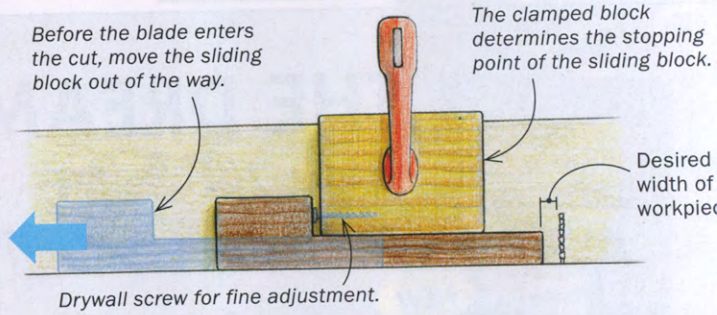
Special stop blocks: the long and short of it

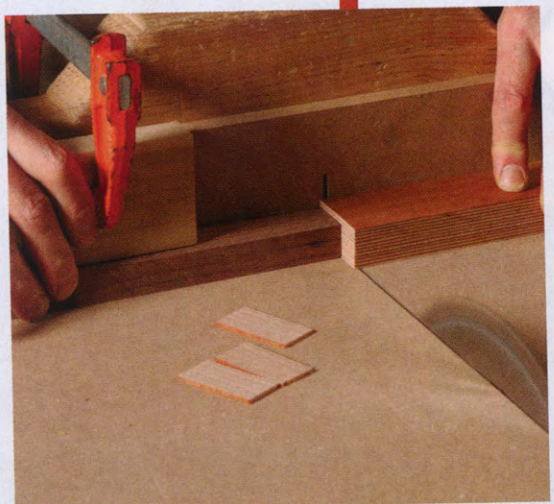
Sometimes you need to cut a workpiece to a length that is longer than your sled's width. This leaves you with no place to attach a conventional stop block. The solution is a hook type of block designed to extend beyond the sled's reach. The block, which can be cut on the bandsaw from ½-in. or ¾-in.-thick plywood, is notched at the far end to hook over the end of the workpiece.

To locate the block, lay out the cut on the workpiece, align the mark with the kerf, and secure the work temporarily by clamping it to the sled's fence. Now set the stop block in place and use a pair of clamps to hold it fast.

I use a different type of stop block when doing certain types of small work—cutting material for bandings, for example. For this type of work, the block acts to precisely control the length of the offcut without trapping it next to the spinning blade.

To accomplish this, I use a stopping jig on the right side of the blade. This jig lets me slide a stop block precisely into place while locating the workpiece and then slide it back out of the way before beginning the cut. With this jig, I can make multiples of very thin pieces. □





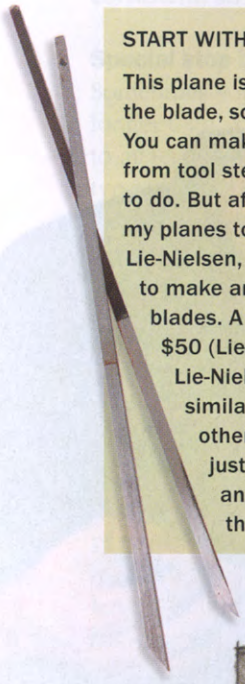
Cut short pieces safely. *This sliding block controls the length of the offcuts, ensuring slices of equal thickne but allowing them to fall freely away from the blade. Put the sliding block in place, and bump the workpiece against it (left). Then pull the block away before making the cut (right).*

Contributing editor Steve Latta teaches woodworking at Thaddeus Stevens College in Lancaster, Pa.

Make a pair of grooving planes

A FAST, QUIET WAY TO CUT GROOVES IN SMALL PARTS

BY MATT KENNEY



START WITH THE BLADES

This plane is built around the blade, so get that first. You can make your own from tool steel, as I used to do. But after I showed my planes to Thomas Lie-Nielsen, he offered to make and sell the blades. A pair costs $50 (Lie-Nielsen.com). Lie-Nielsen sells similar blanks in other sizes. You'll just need to bevel and heat-treat these yourself.

When I make a cabinet with small drawers or a box with trays, I enjoy the time at my workbench making and fitting the parts with hand tools and a few bench jigs ("Make Short Work of Small Parts," *FWW* #214). Unfortunately, the efficiency and tranquility of my work were always interrupted when it came time to make grooves for the bottom panels, a task I did at the router table or tablesaw.

One day it hit me: The grooves I use for small tray and drawer bottoms are always the same size and are inset the same distance from the edge, so I don't need a power tool that can cut grooves of various widths or has an adjustable fence. A molding plane that cuts a groove rather than a profile would be a simple solution. So I made a pair of grooving planes with integral fences. A pair is needed so that you can always cut with the grain. They plow a perfect groove in about a minute, with no setup needed. By the way, you can make your set larger if you wish, and use it for full-size drawers.

Body is a three-part sandwich

I like using planes, not making them, so I made these using a simple technique popularized by James Krenov. A middle piece, cut in two to form the bed, throat and mouth, is laminated between two sides. (On this plane, the middle piece also acts as the skate, controlling the depth of the groove.) Because you cut apart the middle piece at the tablesaw, it is easy to get

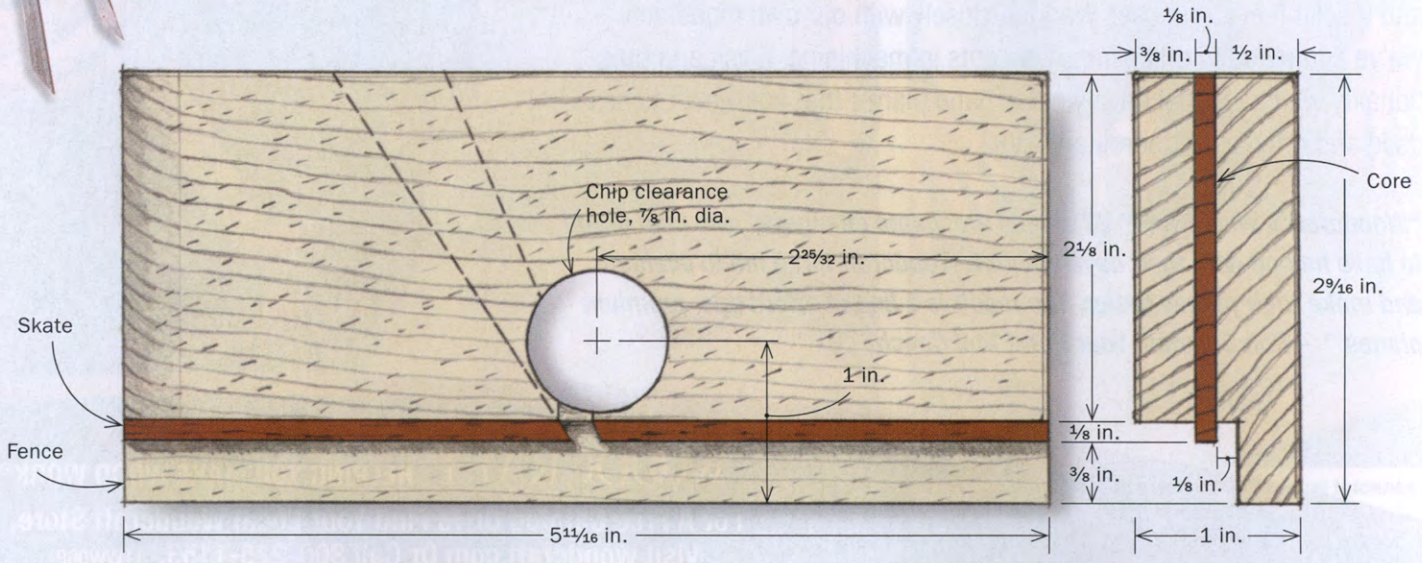
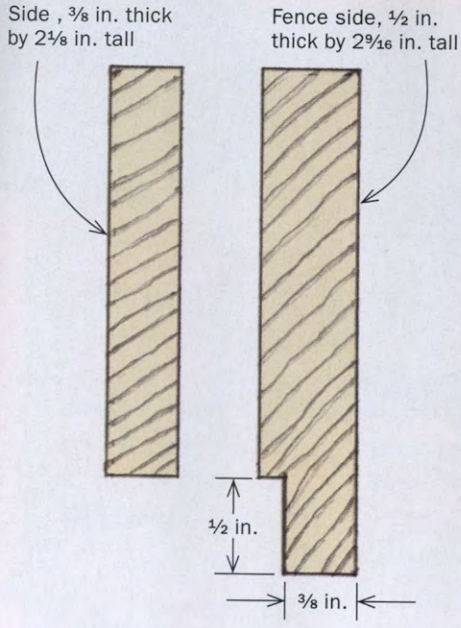
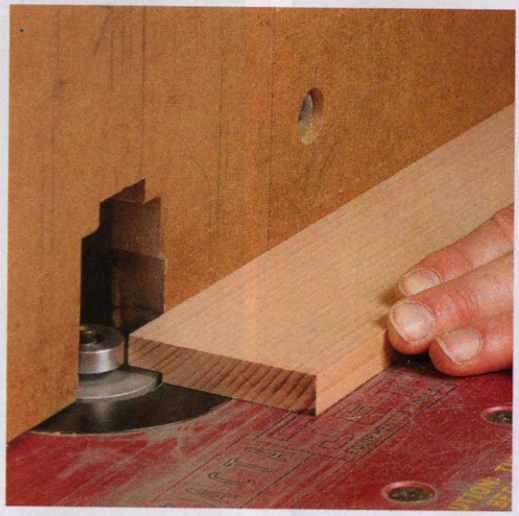


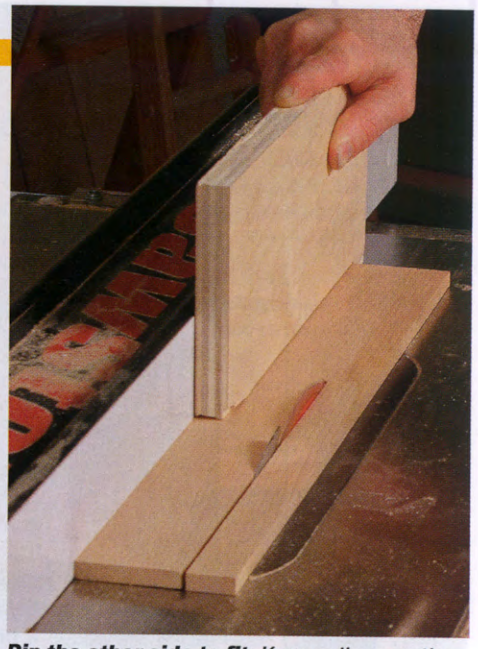
Photo (this page) and drawings: Kelly J. Dunton

Start with the sides





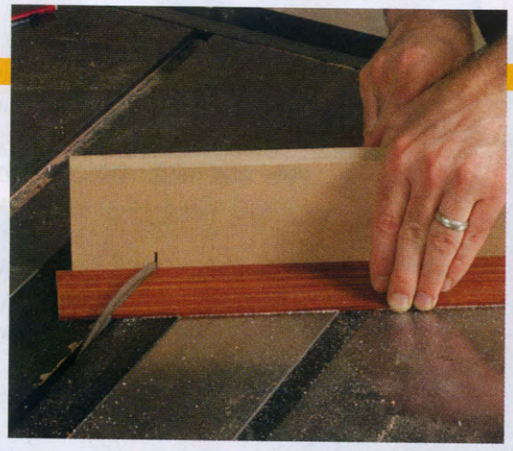
Rabbet one side. *Once you rip the piece to width, use a router table to create the rabbet that will act as the fence.*

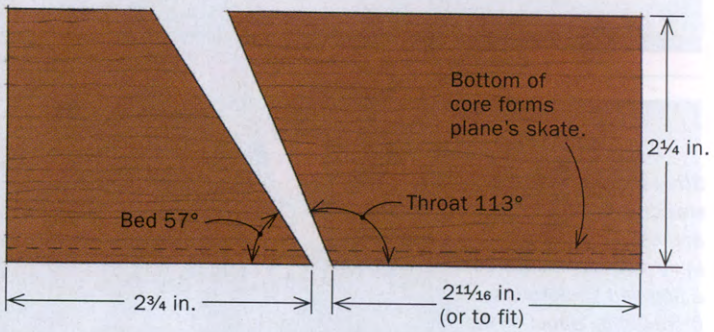


Rip the other side to fit. *Kenney lines up the tablesaw fence with the top of the rabbet to get the exact width of the narrower side, and then rips that side to size.*

Add the core

Cut the core into two parts. *Square up one end of the core and then set the miter gauge to the bed angle. Cut the bed to length. Cut the throat angle, and then crosscut the throat piece to size.*





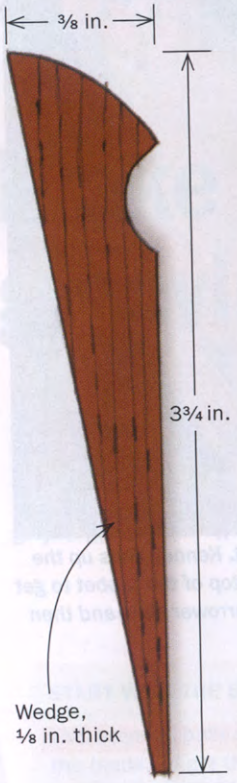
Glue the bed to the fence side. *Before tightening down the clamp, let the glue tack up slightly and feel around the edges for the precise alignment.*

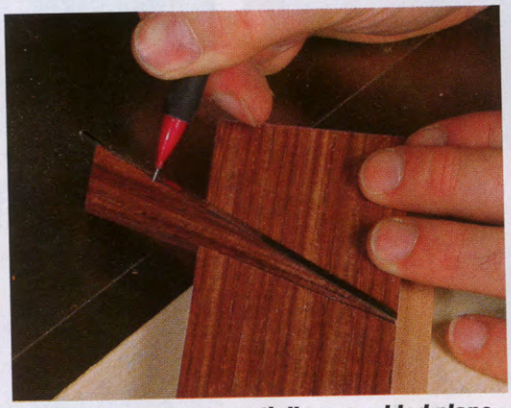
Set the blade in place to mark the throat opening. *Leave enough clearance for the blade to fit through, plus about ¹⁄₆₄ in. for chip clearance.*

Pencil line and outside edges guide placement. *Glue the throat piece in place, eyeballing it and feeling for alignment.*

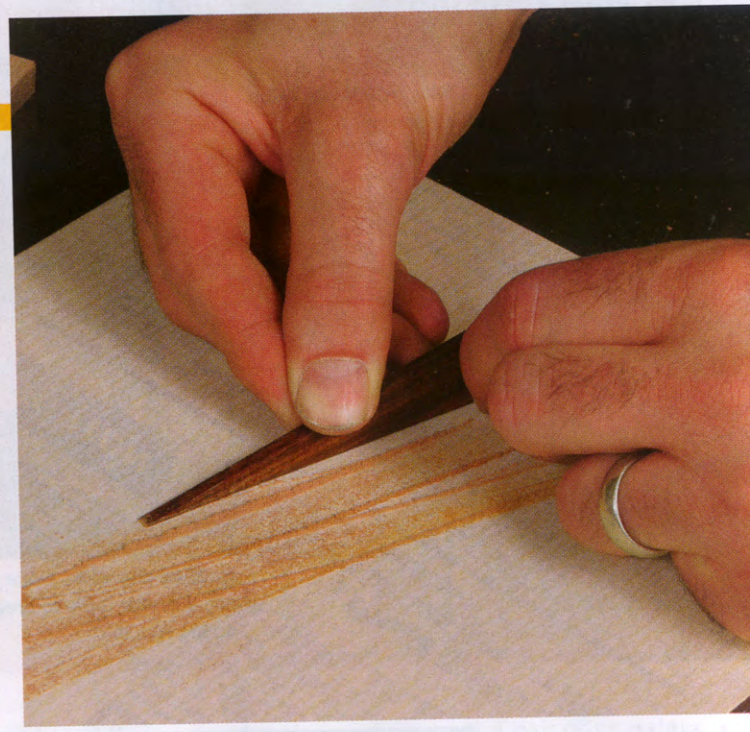
Photos, except where noted: Anissa Kapsales

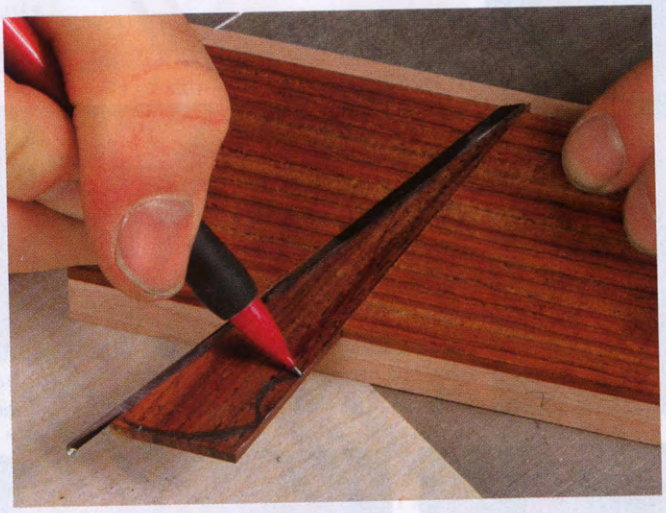
Make and fit the wedge



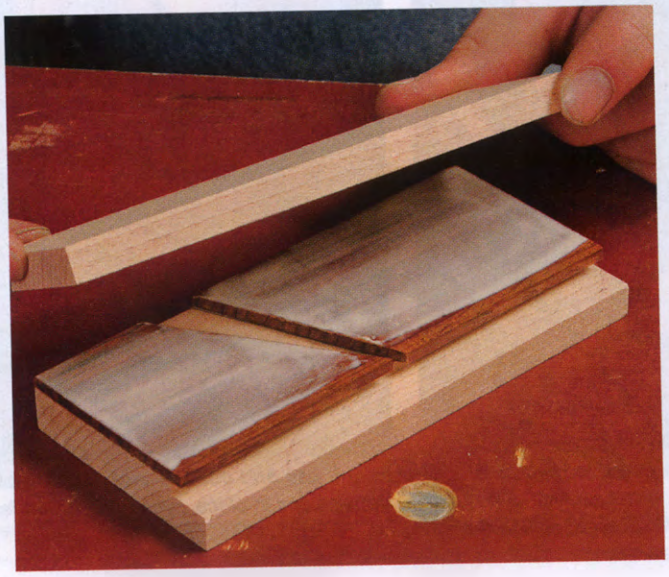


Fit the wedge in the partially assembled plane. *Test-fit the wedge. If the angle isn't quite right, mark the wedge and tweak the angle to fit using sandpaper on a flat surface. Test the fit and repeat as needed to get a tight fit along both the front of the throat and the blade.*





Shape the top of the wedge. *Mark the shape and cut it out on the bandsaw, and sand it to a finished smoothness. It should be about ½ in. below the top of the blade. Kenney adds a finger notch.*



Add the second side. *After the wedge is finished, glue on the second side, again waiting for the glue to tack slightly and aligning the pieces by feel before clamping.*

a perfectly formed bed, throat, and mouth. Mortising and filing are not needed.

I use beech for the sides, but you could use any hard, stable wood. I start with a 5/4 board about 18 in. long because I make two planes at once and it is safer milling a longer board. Resaw the board into two pieces, just over ½ in. and ⅜ in. thick. After jointing the resawn faces, plane the boards to final thickness. I rip the thicker, wider board to width, rout a rabbet on the side that will have the fence, and then rip the other side to width. At this point, I crosscut both pieces twice. This breaks apart the two long pieces, leaving me with the four sides of two planes.

Now joint and plane a core piece from any hard, durable wood, so its thickness is equal to the blade's width. At the tablesaw, crosscut the stock to form the bed and throat pieces.

Fit the wedge and add finishing touches

Start by gluing the bed and throat pieces to the side with the fence. Line up the top, back, and front edges with your fingers to ensure that the bed and throat are at the right angles. Clamp them in place, taking care that no glue ends up in the throat. Begin to

Online Extra

Go to **FineWoodworking.com/extras** for a chance to win a pair of Matt Kenney's grooving planes.

Finish up

Big hole helps clear shavings. *Use a Forstner bit at the drill press to cut a hole that meets the bed but does not cut into it. To help the chips reach the hole, saw a slot that lines up with the mouth.*

make the wedge from the same piece of stock used to make the bed and throat pieces. Cut it oversize at the bandsaw and tweak the fit with sandpaper. After fitting the wedge, cut the top. You'll cut it to length (at the bottom) after you finish gluing the body together. Glue on the second side of the plane body.

After removing the clamps, drill the chip-clearance hole. It also makes a great finger hold, so chamfer its edges for comfort. I used a trim router and chamfer bit, but a file or sandpaper works. Next, round over the edges of the plane. Now, take a few light shavings off the skate on the side that doesn't face the fence so that it won't bind in the groove. Then cut back the bottom tip of the wedge so that shavings don't get jammed in the mouth. Cut it, plane a groove, and repeat until the plane is clearing shavings without trouble.

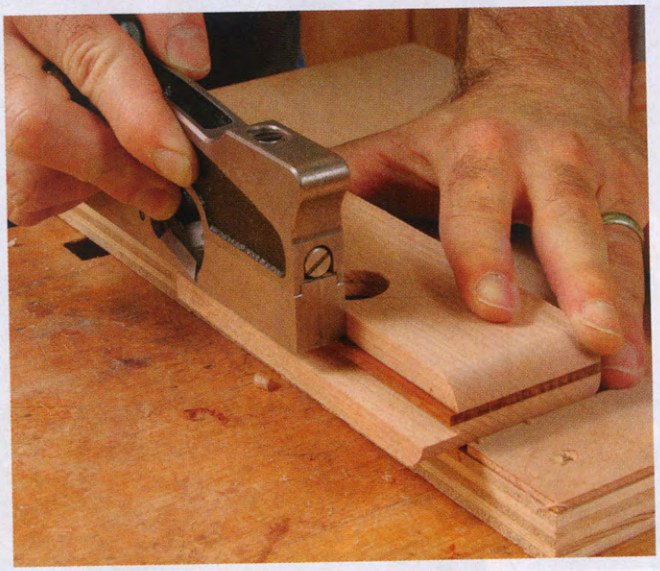
I finish the plane with two thin coats of Tried & True Danish oil, wiping off the excess after each.

Using the plane

There is no learning curve here. Use a sharp blade, set for a slightly heavier cut than for a smoothing plane. I work against a planing stop, holding the workpiece with my hand. Take the first passes slow and use your lower fingers to press the fence against the edge of the board being grooved. After the groove has been started, you can speed up. However, you should still apply pressure to the fence. □

Matt Kenney is an associate editor.

Round over sharp edges. *On the back end of the plane, where your hand wraps around it, Kenney uses a ½-in.-dia. roundover bit in a router table. A backer board prevents tearout on the end grain and improves the plane's stability as you guide it past the bit. He breaks the rest of the sharp edges with sandpaper.*



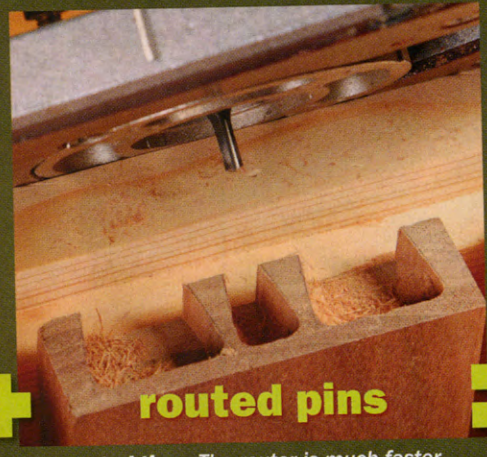
Keep the skate running smoothly. *Use a shoulder plane to take a few light shavings off the skate, and don't forget to wax the skate before use.*

Half-Blind Dovetails in Half the Time

Get the hand-cut look with the speed and consistency of machines

BY STEPHEN HAMMER

Zip, zip. *A simple jig delivers accurate and uniform tails every time. You also get narrow pins and variable spacing.*



No wasted time. *The router is much faster than a chisel and mallet, and it guarantees uniform depth.*

Clean up and enjoy. *After a few minutes of paring, the joint goes together without any trials or tribulations.*

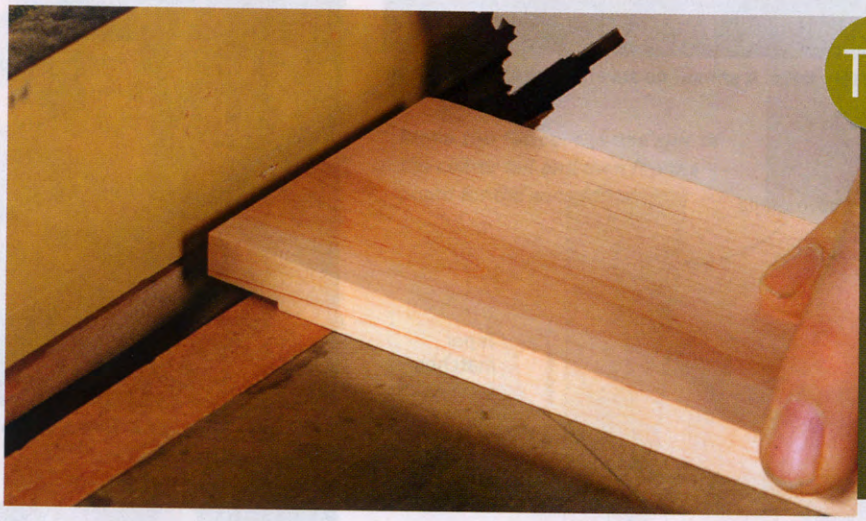
No joint says "handmade" more than half-blind dovetails with delicate pins, so I use them on drawers as one way to distinguish my furniture from the furniture churned out by factories. However, because traditional techniques for making dovetails rely heavily on hand tools, they can eat up a lot of shop time. Time is something a professional furniture maker can't waste, so I developed a method for cutting the joint with a bandsaw and a router. It gives me the best of both worlds. I get the refined look of a hand-cut joint, but I achieve it with the speed and consistency only power tools can offer.

I start by cutting the tails at the bandsaw, using an incredibly simple jig—it's really just a tapered board with a stop—to hold the drawer side. It slides against the fence and lets me cut every tail quickly and with a consistent slope. Then I cut the pins with a handheld router and a straight bit, working freehand right up to the scribe lines. Only the corners of the pin sockets are left to clean up with a chisel, and fitting the joint takes only a bit of paring. Even if you're not as worried about time as I am, you'll enjoy perfect joints with very little fuss.

DOVETAIL LAYOUT IS SIMPLE

Because you'll be using the bandsaw jig on the following page to cut the tails, you need to lay out the tails just once.

Mark the length of the tails. *Use a marking gauge with a knife-type cutter to scribe all four sides. Do this on all the drawer sides. By the way, Hammer turned his pin gauge into a knife gauge by filing a bevel on the pins.*



TIP

RABBET THE SIDES FOR EASY ALIGNMENT

Use a dado blade to cut a shallow rabbet on the inside face of the drawer sides, right up to the scribe line. This will make it easy to align the parts when marking the drawer front later.

Cut tails with a bandsaw, not a backsaw

First, use a marking gauge to scribe shoulders on all four sides. I use a "cutting gauge" with a sharp knife because a cut shoulder line is one of the telltale signs of hand-cut dovetails. It also is more precise than a pencil line and serves as a guide for your chisel when you're paring down to the line.

Then cut a shallow rabbet, about 1/16 in. deep, across the inside faces of the sides, under the tails. I use a dado set in my tablesaw, setting the fence so that it cuts right up to, but not past, the shoulder line. There are three reasons for the rabbet. First, a clean shoulder on the inside contributes to the overall attractiveness of the joint. Second, the rabbet's shoulder helps to align the side to the front when you transfer the tails. Finally, the shoulder also can be used as chisel guide when you're paring away the last bit of waste between the tails.

Next, lay out the spacing for the tails—you only need to do this on one of the sides. The

Now lay out the tails. *Do it on one drawer side only. You'll use that piece to line up the cuts for all of the others.*

Photos: Matt Kenney; drawings: John Tetreault

BANDSAW THE TAILS IN MINUTES

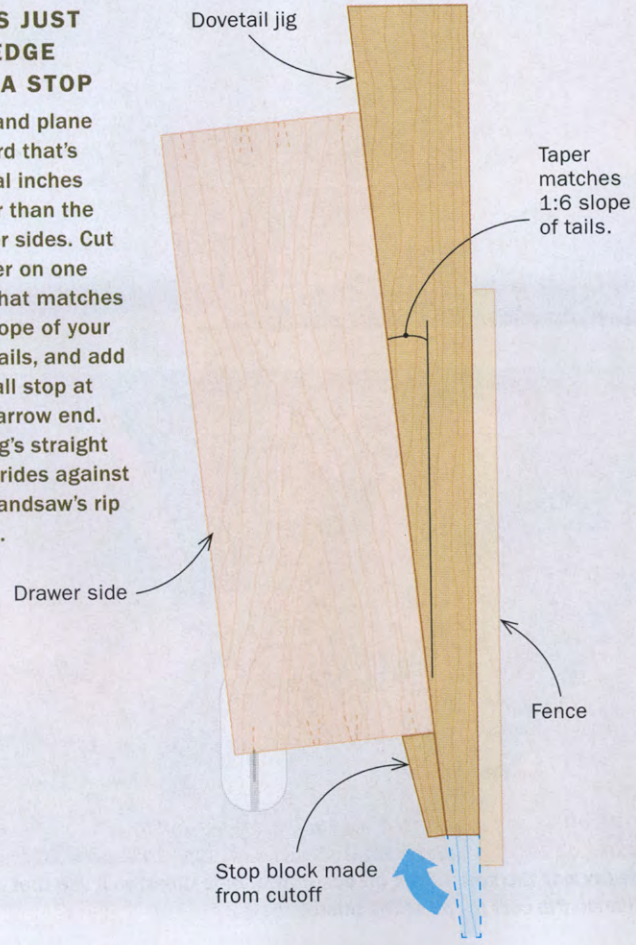
You could cut the tails freehand at the bandsaw, but you'd have to lay out every workpiece and then risk straying from the line. Hammer uses a tapered jig that rides against the rip fence to ensure perfect cuts on stacks of drawer sides.

MAKE THE BANDSAW JIG

Taper the jig to match the tails. *It should be several inches longer than the drawer sides.*

JIG IS JUST A WEDGE AND A STOP

Joint and plane a board that's several inches longer than the drawer sides. Cut a taper on one side that matches the slope of your dovetails, and add a small stop at the narrow end. The jig's straight edge rides against the bandsaw's rip fence.



tail cuts are made using a jig that's guided by a fence. Use the marked board to set the fence, and all the other unmarked boards can be cut using the same settings.

The jig that holds and guides the drawer sides is nothing more than a piece of wood that is straight on one side and tapered on the other side to match the slope of the tails. Make sure it is sturdy enough to be used over and over again. I use a 1:6 slope for my tails, which gives them a traditional look. Lay out the taper on a board at least 2 in. or 3 in. longer than the drawer sides and then cut it at the bandsaw. Clean it up on the jointer or with a handplane, then glue on a stop at the narrow end of the board.

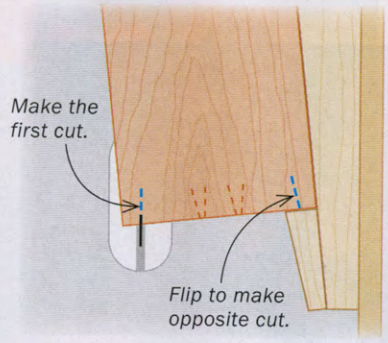
Before using the jig, adjust the bandsaw's fence to compensate for the blade's drift. Place the jig against the fence

Joint the taper for a clean edge. *It's fast and accurate. You also could use a handplane.*

Glue on a stop. *Put it at the narrow end, which leads into the blade, so that the jig can handle drawer sides of any length.*

PUT THE JIG TO WORK

You need to reposition the bandsaw fence only three times to make all six cuts—on both ends of the drawer side, if desired.

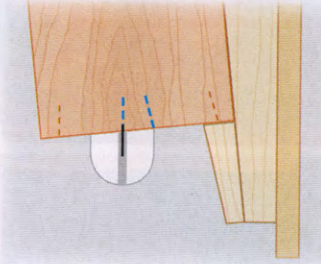


First position. *Set the fence and cut down to the shoulder (left). Flip the board for a second cut (right). And make the same cuts on your other drawer sides before moving the rip fence for the next cut.*

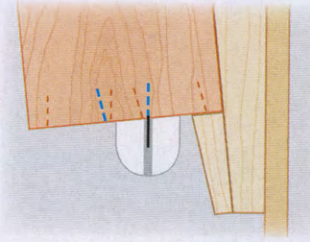
and put the marked drawer side in place, making sure that it is against the stop. Set the fence so that the bandsaw blade lines up with the first tail cut from the edge of the drawer side. You'll make two cuts with the fence in this position, one on each side of the drawer side. Make the first cut, pushing the jig and side together. Then flip over the drawer side and make the first cut in from its other edge. Now make the same two cuts on the drawer's other side.

If you are doing multiple drawers, make the tail cuts on every drawer side before adjusting the fence for the next cut. Put the marked drawer side in the jig so that you can see your layout lines, adjust the fence, and make the first cut on the next tail in. Flip the board and make the next cut. Continue to adjust the fence and make cuts. At first, you're cutting one side of the tails, but when you pass the middle you begin to cut the other side of the tails.

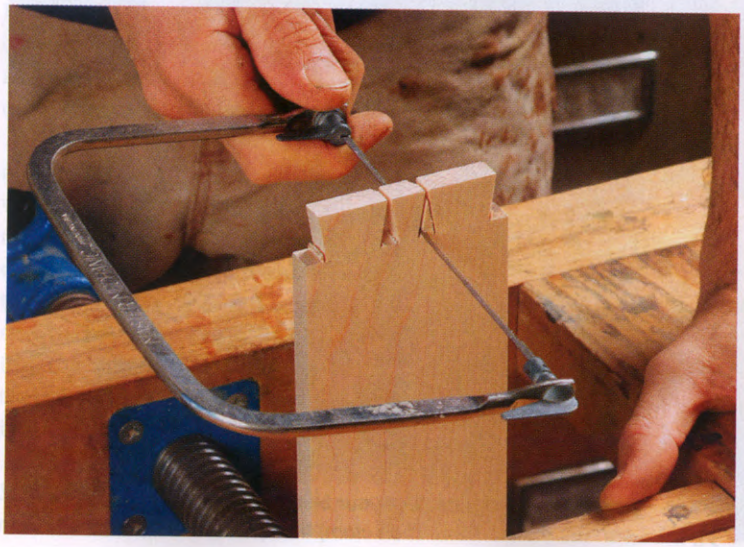
After all of the tails are cut, remove the waste between them with a coping saw, leaving about 1/16 in. of waste above the shoulder line. Use a chisel to pare it away. Pare first from the outside, starting in the scribed shoulder

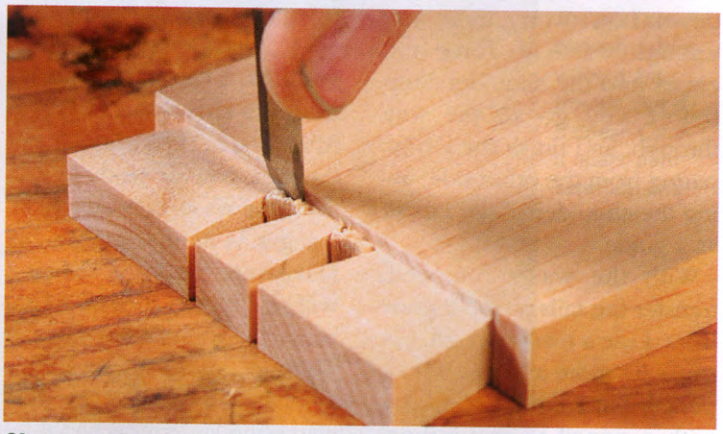


Move the fence. *Cut one side of the center tail and then flip the board for the second cut.*



Final cuts. *Move the rip fence one more time for the last tail cuts.*





Clean out the waste with a coping saw. *There really is no faster way to get the job done (left). Leave just about 1/16 in. for paring. Pare from both sides, starting on the outside face. On the inside face, you can use the rabbet's shoulder to guide the chisel (above).*

POWER THROUGH THE PINS WITH A ROUTER

If there's one thing machines do better than hand tools, it's the grunt work, like removing the waste between pins. Not only does a router do it with ease and efficiency, but it also is very accurate.

Transfer the tails. *Hammer clamps the drawer front in a vise and pushes the rabbeted underside against it. The side doesn't move and the transfer is dead accurate (right). Mark the length, too. Taking it directly from the drawer side (below) is more accurate and easier than using a marking gauge.*

line and chopping straight down. Don't worry, there isn't enough waste to force the chisel into the shoulder. Stop before you go all the way through, and finish the job by paring from the other side, using the shoulder of the rabbet as a guide.

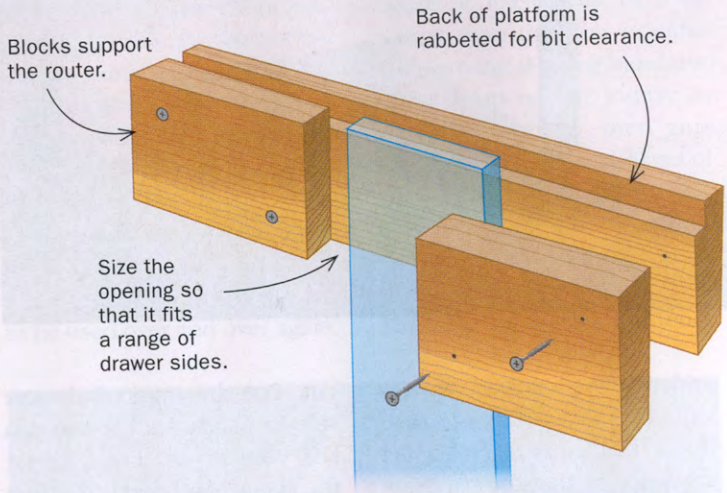
With the waste removed, transfer the tails to the drawer front. I use a marking knife because it's more accurate than a pencil, but I darken the lines with a pencil to make them easier to see. Next, use a marking gauge to mark the depth of the pins on the inside face of the front. Set the gauge directly from the thickness of your tails.

For pins, a router is mightier than the chisel

After you're done laying out the pins, you are ready to rout away the waste between them, using a ¼-in.-dia. straight bit. Make sure the bit is sharp; it will be easier to control. To improve the router's stability as I rout the pins, I clamp a simple jig to the drawer front and then clamp the jig into my shoulder vise. Set the bit depth so that it reaches the shoulder line you marked with the gauge earlier.

MAKE A PLATFORM FOR ROUTING

There is no way you could balance a router on the end grain of a board and rout accurately. Make this three-sided jig and clamp it to the drawer front to create a large surface for the router to ride on. The back rabbet prevents you from routing into the jig as you move from socket to socket.



Router jig is easy to set up. *Use your benchtop to bring the top of the jig level with the drawer front. Then clamp it in place.*

Set the plunge depth. *After zeroing out the bit, place a tail between the stop and the turret on the base for an accurate setting.*

Rout freehand. *The jig offers enough surface area to keep the router stable. Shine some light into the work area to improve visibility (left). After a bit of practice, Hammer discovered that he could rout right up to the layout lines without any trouble (above). It helps that long grain is easy to rout.*

Tips for clean paring. *Pare down the back first. It's easier to get a straight cut with the workpiece and chisel vertical than with the workpiece horizontal on the bench. On the pin walls, work across the grain (right). Use a chisel wide enough to pare the entire wall in one pass.*

Rout the first socket, cutting as close to the layout lines as possible. Rout the remaining sockets in the same manner.

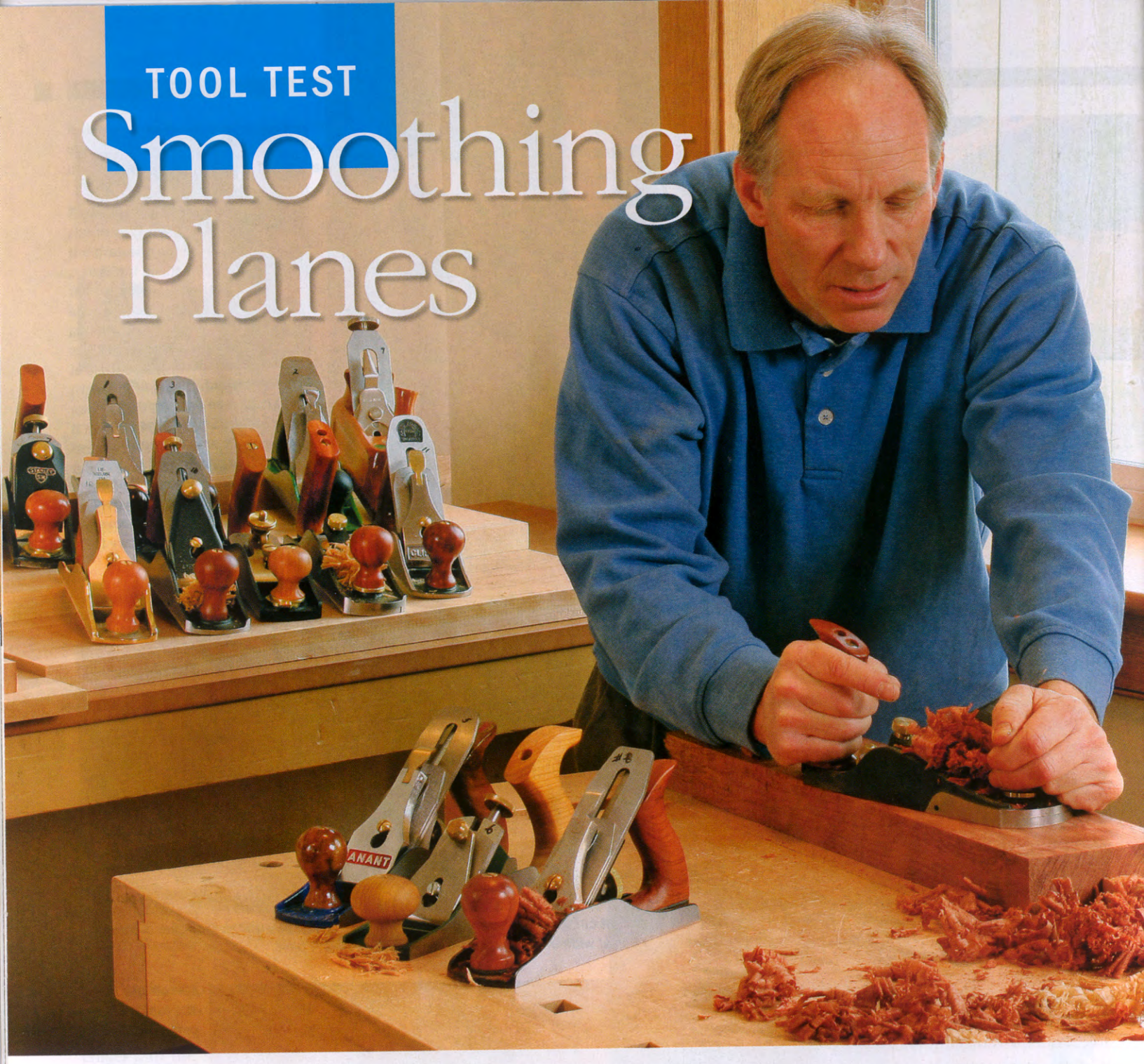
After the waste has been removed, clean up the sockets with a chisel. Again, because there is so little waste left, you can place the chisel right on the shoulder and pare straight down. Test the joint's fit, paring the pins as needed (but that shouldn't be much) until it comes together. □

Stephen Hammer designs and makes furniture in New Britain, Conn.

Check the fit. *The joint should come together without any trouble. But if it doesn't, pull it apart, pare carefully, and try again.*

TOOL TEST

Smoothing Planes



It's the most important hand tool in the shop, and there are more great choices than ever

BY CHRIS GOCHNOUR

If there is one handplane that every woodworker should have, it is the smoothing plane. It is, in essence, a finishing tool, stepping in where machines and rougher hand tools leave off. Properly tuned and sharpened, a smoothing plane can leave a pristine finish on almost any board. Yet it is still compact enough to be ideal for general planing jobs like fitting and trimming parts.

Because the smoothing plane is so essential, it's important that you purchase the best one you can afford. To help you make this critical choice, I put 14 smoothing planes ranging in price from $33 to $350 through their paces, testing both of the common styles: bevel-down and bevel-up. First, I judged the overall condition out of the box. Then I sharpened the blade and put the plane to work. If needed, I diagnosed and tried to correct any

A winner for every budget

When it comes to craftsmanship and performance, you can't go wrong with any of these five planes. And there's one for every budget.

The Clifton No. 4 is a finely detailed, superb performer. It handled every test with ease and elegance, leaving perfect surfaces in its wake. It's a hefty tool, but it's perfectly balanced. The thick blade holds an edge well and has a stout, two-part chipbreaker that keeps the blade flat and in full contact with the frog. Blade adjustments are easy and convenient. The only downside is that the back of the blade needed lapping before putting it to use, a minor inconvenience.

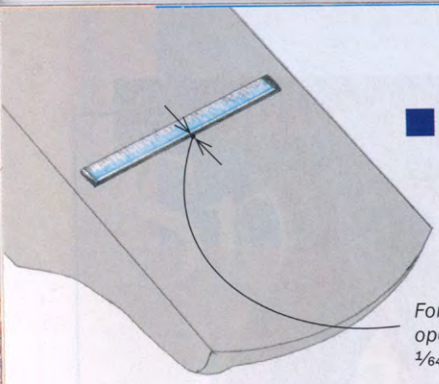
The Lie-Nielsen No. 4 is a well-crafted tool and a fabulous performer. For this review, I chose the cast bronze version over the ductile iron because the bronze looks great, won't rust, and adds nice heft to the plane. That heft, perfectly balanced, helps the plane power through any cut. It feels smooth and steady in action, with blade adjustments that are easy and precise. The back of the blade arrived perfectly flat.

The Veritas No. 4 is a finely crafted tool. The machining is accurate, clean, and smooth, and the blade was lapped perfectly flat, but I was disappointed with the thin, old-style chipbreaker (see p. 45). To make mouth adjustments, the frog is moved forward or backward, with no need to remove the blade. Blade adjustments, made with a Norris-style mechanism, are easy but less convenient and precise than the separate lever and knob on the Clifton and Lie-Nielsen above.

Among the bevel-up smoothers, the Veritas was best. I reground the factory-shipped blade from 25° to 33° to achieve a 45° cutting angle, essentially converting it to a smoother. Like all bevel-up smoothers, the blade requires more camber to eliminate tracks, and getting it right takes finessing. If you add an extra low-angle blade, you can have both a smoother and a low-angle plane for working end grain. The plane also works well on its side, with a shooting board.

The WoodRiver No. 4, V3, felt and performed like a first-rate tool with excellent results. The machining is clean and accurate, and in use, the plane didn't disappoint. Frog adjustments are made without removing the blade—a plus—but they are finicky because the frog does not travel in a machined slot to keep it aligned laterally. It was the one detail where the plane came up short. Once the frog is set, however, blade adjustments are smooth and effective.

Photos, except where noted: Kelly J. Dunton; facing page: Thomas McKenna



For fine cuts, open the mouth 1/64 in. to 1/32 in.

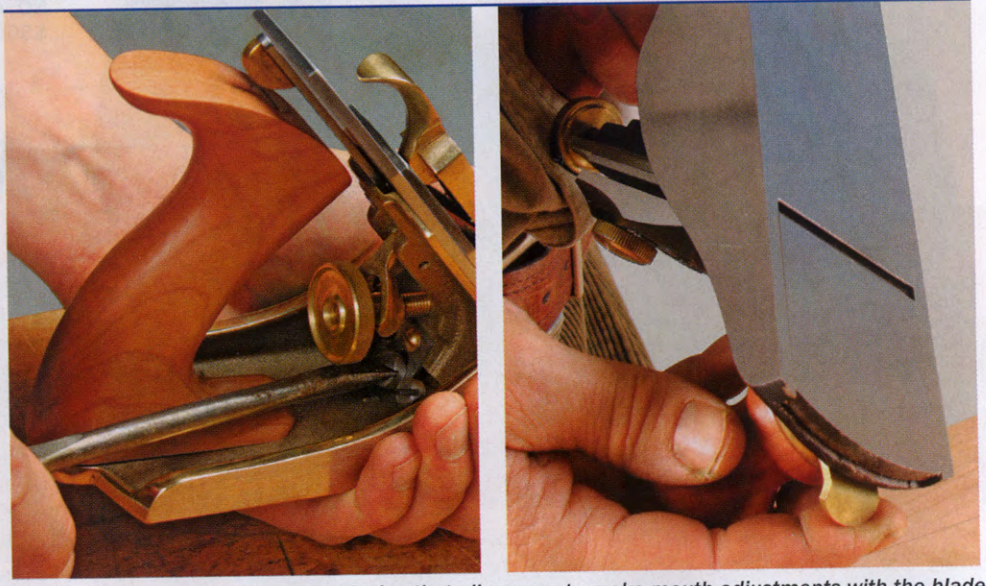
MOUTH ADJUSTMENTS SHOULD BE EASY

How big a shaving you can take depends partly on the mouth opening. On most smoothers in the review, the opening is set by moving the frog. Others set the opening with an adjustable shoe at the front of the plane. Adjustments are quicker and easier if you can make them with the blade in the plane.

INCONVENIENT

Remove the blade. *With some planes, like the Kunz Plus No. 4, you have to remove the blade assembly to access the frog-attachment screws on top, then move the frog with a screw in back.*

THESE TWO TYPES MAKE IT SIMPLE



On the fly. *You can't beat a plane design that allows you to make mouth adjustments with the blade installed. On some bevel-down planes, like the Lie-Nielsen (left), the frog-attachment and adjustment screws are in the back, so you don't have to remove the blade to access them. Bevel-up planes, and the bevel-down Stanley Sweetheart, feature an adjustable toe (right), another convenient method.*

problems with the tool. Not all of the planes needed help.

First a sharpening

A plane must have a razor-sharp blade to work well, and it's a bit much to ask manufacturers to ship them that way. So before use, I honed each blade. I started with 150-grit sandpaper on a granite block and progressed using Japanese waterstones, beginning with 1,000 grit, then 4,000 grit, and ending with 8,000 grit. And I gave each one my usual subtle camber (slightly relieved corners) to eliminate blade tracks (bevel-ups needed more camber). Bevel up or down, I honed each blade to an effective cutting angle of 45°. The ECE Primus was the only exception among the bevel-down planes, as its blade is bedded at 50°.

Then a torture test

I used three boards for my tough test: pine, cherry, and white oak, each 1½ in. thick by 20 in. wide by 30 in. long. I planed the face of each panel: pine first, then cherry, then white oak. I made the first series of passes diagonally across the surface. I made the second series with the grain to clean up the diagonal plane marks. I made the final series of passes with the grain and with the blade set for a lighter cut. After that, I judged how the final surface looked and felt.

Next, I used each plane on the face grain of some figured bubinga to see how it responded to a challenging, dense, and figured hardwood.

The final test was to plane the end grain of the first three panels. I took five passes

Bevel-up or bevel-down?

Up, like a block plane. *Bevel-up planes, like the Veritas low-angle smooth plane, are simple and versatile. However, the blade must have a more pronounced camber to prevent track marks, so sharpening takes some practice.*

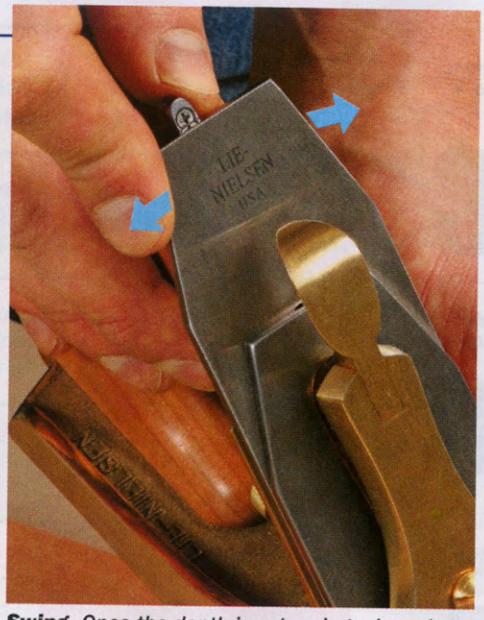
Down is traditional. *All bevel-down planes have a chipbreaker atop the blade, which curls chips forward and works to prevent tearout.*

TWO WAYS TO ADJUST THE BLADE

Once you have the mouth opening set, you'll want to adjust the blade for a gossamer-thin shaving that spans the full width. These depth and lateral adjustments should be simple and precise. Some planes have one mechanism for each adjustment, while others use one for both.

1. SEPARATE KNOB AND LEVER

Twist. *On most planes in the review, you set depth of cut by turning a knob located behind the blade.*



Swing. *Once the depth is set, swing a lever behind the blade to make lateral adjustments.*

2. ALL-IN-ONE ADJUSTER

Twist and swing. *A Norris-style adjuster handles both types of adjustment. Gochnour finds this style less convenient because it's easy to ruin one setting while adjusting the other.*

on the pine, five passes on the cherry, and then 25 passes on the white oak, in an effort to dull the blade. I then took a final, telling pass on the edge of a white oak panel to see how well the plane was still cutting. The performance of each plane is noted in the chart on pp. 46-47.

The envelope, please...

After weeks of testing, I was impressed with the overall performance of these planes. I'm happy to report that there is no shortage of high-quality smoothing planes out there for any budget.

Among this impressive group, however, two planes rose above the rest: The Clifton No. 4 and the Lie-Nielsen No. 4. They tied for Best Overall. Both are fabulous performers.

I had a more difficult time choosing Best Value. After much retesting, I whittled the list down to the WoodRiver No. 4, V3 and two from Veritas: the No. 4 and the low-angle smooth plane. You couldn't go wrong with any of these planes, so the Best Value is a tie among the three.

Chris Gochnour is a furniture maker and hand-tool expert near Salt Lake City.

Chipbreakers: Thicker is better

Bevel-up planes don't have chipbreakers, but all of the bevel-down planes do. The chipbreaker's job is to deflect shavings up and out of the plane and support the blade close to the cutting edge, which helps reduce tearout and dampen vibration. To do these jobs well, the front of the chipbreaker must meet the back of the blade seamlessly.

Many of these planes use an old-style chipbreaker made from thin pressed steel, which typically requires a good amount of tuning. In the last decade, I've seen a new style of chipbreaker: thicker, machined dead-flat, with a beveled edge at the tip that is easy to fine-tune for a perfect fit with the blade.

My favorite in this group is a two-piece design (unique to the Clifton). If you sharpen freehand, it is great because you simply lift off the front section and sharpen away. The design also doesn't flex the blade, so in theory it stays in full contact with the frog, providing maximum support.

14 smoothers, head to head

A great smoothing plane has precise components that are well machined. In use, you want the plane to be easy to set up and adjust, to leave a pristine surface, and to have a blade that will stand up to rigorous use.


Anant Kamal No. 4


Clifton No. 4


ECE Primus 711


Footprint No. 4


Groz No. 4


Kunz Plus No. 4


Lie-Nielsen No. 4


Lie-Nielsen No. 164 Low-angle Smoothing Plane


Stanley Bailey No. 4


Stanley Sweetheart No. 4


Veritas Bevel-Up Smoother Plane


Veritas Low-Angle Smooth Plane


Veritas No. 4


Wood River No. 4, V3

MODEL/SOURCE	STREET PRICE	WEIGHT	BLADE MATERIAL
Anant Kamal No. 4 highlandwoodworking.com	$60	4 lb. 2 oz.	0.117-in.-thick high-carbon steel
BEST OVERALL CHOICE **Clifton No. 4** toolsforworkingwood.com	$300	4 lb. 7 oz.	0.130-in.-thick hand-forged high-carbon steel
ECE Primus 711 toolsforworkingwood.com	$200	2 lb. 7 oz.	0.110-in.-thick chrome/Vanadium
Footprint No. 4 woodcraft.com	$55	4 lb.	0.080-in.-thick high-carbon steel
Groz No. 4 rockler.com	$33	3 lb. 4 oz.	0.075-in.-thick high-carbon steel
Kunz Plus No. 4 traditionalwoodworker.com	$200	3 lb. 15 oz.	0.135-in.-thick high-carbon steel
BEST OVERALL CHOICE **Lie-Nielsen No. 4** lie-nielsen.com	$350	4 lb. 13 oz.	0.125-in.-thick A2/Cryo
Lie-Nielsen No. 164 Low-angle Smoothing Plane lie-nielsen.com	$265	3 lb. 12 oz.	0.180-in.-thick A2/Cryo
Stanley Bailey No. 4 rockler.com	$75	3 lb. 14 oz.	0.082-in.-thick high-carbon steel
Stanley Sweetheart No. 4 rockler.com	$180	4 lb. 14 oz.	0.125-in.-thick A2
Veritas Bevel-Up Smoother Plane leevalley.com	$220	4 lb. 14 oz.	0.185-in.-thick A2
BEST VALUE CHOICE **Veritas Low-Angle Smooth Plane** leevalley.com	$195	4 lb. 9 oz.	0.120-in.-thick A2
BEST VALUE CHOICE **Veritas No. 4** leevalley.com	$200	4 lb. 11 oz.	0.125-in.-thick A2
BEST VALUE CHOICE **Wood River No. 4, V3** woodcraft.com	$120	5 lb.	0.125-in.-thick A2

Online Extra

To learn more about the details that make a great plane, watch the video at **FineWoodworking.com/extras.**

EDGE RETENTION	CHIP-BREAKER	EASE OF ADJUSTMENTS	FIT AND FINISH	OVERALL RATING	COMMENTS
Good	Old style, 0.115 in. thick	Depth: Very good Lateral: Very good Mouth: Fair	Good	Good	Of all the planes under $100, the Anant performed best; chipbreaker needed tuning for a better fit with the blade.
Very good	Two-piece, 0.125 in. thick	Depth: Excellent Lateral: Excellent Mouth: Very good	Excellent	Excellent	Almost ready to go out of the box (blade needed lapping); unique, two-piece chipbreaker was author's favorite.
Very good	New style, 0.120 in. thick	Depth: Excellent Lateral: Fair Mouth: Good	Very good	Very good	Glides easily on its slick lignum vitae sole but light weight didn't provide much inertia; most precise vertical adjuster of any plane in the test—absolutely no backlash; left- and right-hand models available.
NA*	Old style, 0.075 in. thick	Depth: Very good Lateral: Very good Mouth: Fair	Poor	Poor	Too much blade deflection and chatter on white oak and bubinga panels and on cherry and oak end grain; poor machining and casting.
NA*	Old style, 0.075 in. thick	Depth: Good Lateral: Very good Mouth: Fair	Fair	Fair	Too much blade deflection and chatter on the bubinga and cherry and white oak end grain.
Very good	New style, 0.095 in. thick	Depth: Fair Lateral: Fair Mouth: Good	Good	Good	Blade adjuster was a weak spot: too much backlash in vertical adjustments, and lateral adjustments had to be fine-tuned by tapping blade with a hammer.
Excellent	New style, 0.125 in. thick	Depth: Excellent Lateral: Excellent Mouth: Very good	Excellent	Excellent	Exceptional quality; needed only to hone the blade to put the tool to work; Lie-Nielsen sells higher-angle replacement frogs for this plane.
Excellent	None	Depth: Excellent Lateral: Fair Mouth: Excellent	Excellent	Very good	Bevel-up design; vertical adjuster is integrated into lever cap, making blade replacement after sharpening more cumbersome; however, adjuster nut is located in a convenient spot; blade requires more camber to eliminate tracks.
NA*	Old style, 0.075 in. thick	Depth: Very good Lateral: Very good Mouth: Fair	Fair	Fair	Too much blade deflection and chatter on bubinga panel and cherry and white oak end grain; sole needed significant lapping.
Very good	New style, 0.110 in. thick	Depth: Good Lateral: Good Mouth: Excellent	Very good	Very good	Frog is cast into plane body, a rock-solid design; adjustable mouth makes for precise mouth adjustments.
Excellent	None	Depth: Very good Lateral: Good Mouth: Excellent	Excellent	Excellent	Bevel-up design; blade is wider (2¼ in.) than others tested and quick and easy to remove and replace; has convenient adjustable mouth; set screws on body help hold lateral adjustments; handled end grain tests the best; blade requires more camber to eliminate tracks.
Excellent	None	Depth: Very good Lateral: Very good Mouth: Excellent	Excellent	Excellent	Bevel-up design; square sides make plane suitable for use with a shooting board, versatility the other Veritas bevel-up plane does not have; set screws on body help hold lateral adjustments; blade requires more camber to eliminate tracks; when removing the blade, the adjustment mechanism sticks to it and lifts out, a minor nuisance.
Excellent	Old style, 0.075 in. thick	Depth: Very good Lateral: Very good Mouth: Very good	Excellent	Excellent	Frog and tote are one piece, a strong design; mouth adjustments are easily made without removing the blade; set screws on body help hold lateral adjustments.
Excellent	New style, 0.110 in. thick	Depth: Excellent Lateral: Excellent Mouth: Good	Very good	Very good	Machining is clean and accurate; depth and lateral adjustments were great, but mouth adjustments were a bit fussy.

*Unable to complete test; see comments.

Dining Table with Two-Way Drawers

A sleek, sturdy design for a versatile table

BY STEPHEN HAMMER

Many of my favorite designs began with a challenging request from a client, and that was definitely the case with this table. The client wanted a dining table that would double as a worktable with a lot of storage, so I added double-fronted drawers accessible from either side. That required a drawer with half-blind dovetails at both ends, and a support system that could handle the extra stress of deep drawers when fully loaded. So I designed a table with upper and lower drawer stretchers that have the vertical dividers mortised in solidly. In addition, I wanted a clean design that would emphasize the beauty of the wood, and in this case tie into the eclectic setting that would be its home. I chose walnut because the table would be paired with a set of walnut Nakashima benches.

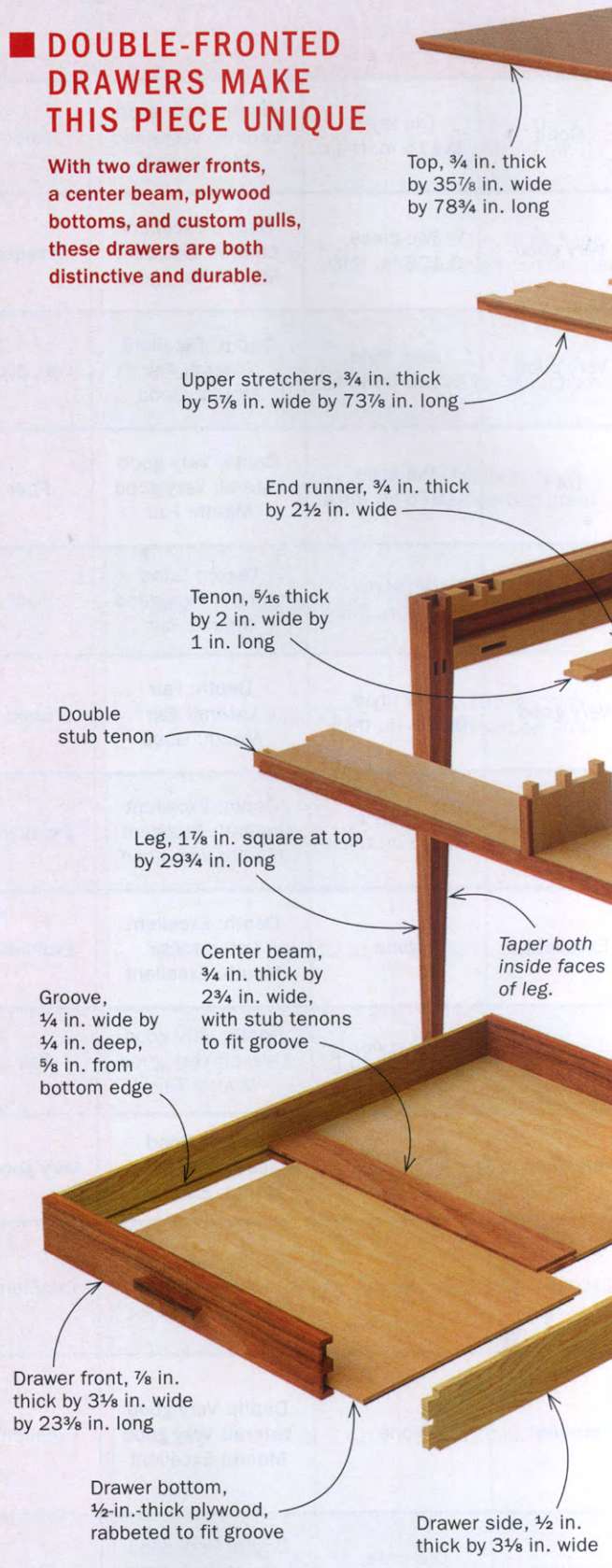
The table has the usual parts: legs, stretchers, dividers, runners and kickers, aprons, and drawers. But because it is built like a torsion box and the drawers have double fronts, the how-to is more like a cross between a chest of drawers and a basic table. Keep track of the joinery and work in the right order and you'll have no trouble reproducing this versatile dining table.

Mortises, and lots of them, are the key to this construction

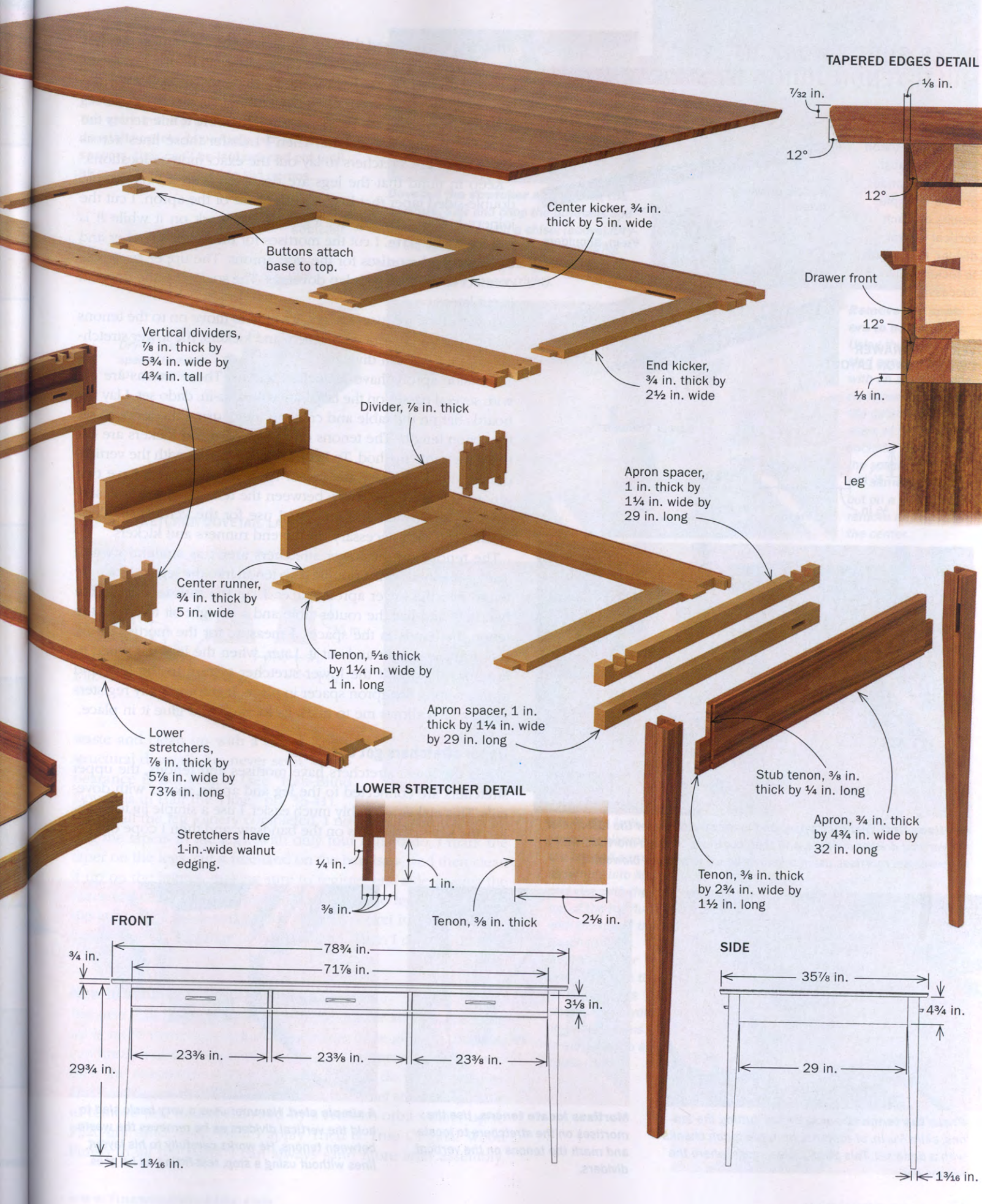
To begin, I go to my hollow-chisel mortiser and mortise the legs and stretchers, about 52 mortises in all. The upper and lower

DOUBLE-FRONTED DRAWERS MAKE THIS PIECE UNIQUE

With two drawer fronts, a center beam, plywood bottoms, and custom pulls, these drawers are both distinctive and durable.

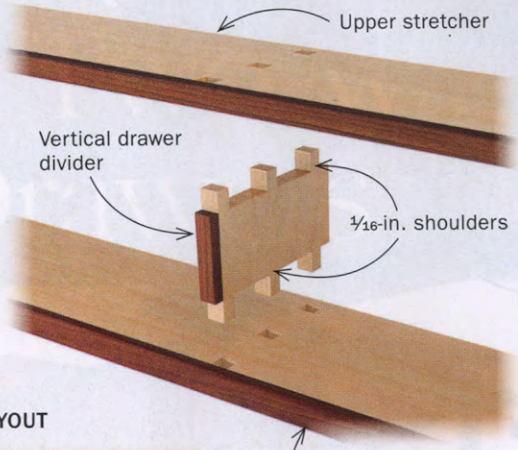


Photos: Matt Kenney; drawings: Stephen Hammer

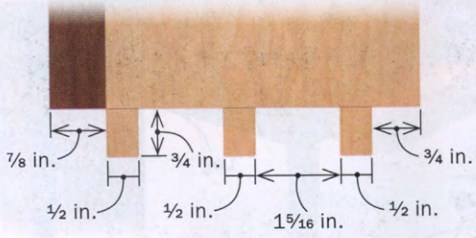

TAPERED EDGES DETAIL
7/32 in.
1/8 in.
12°
12°
12°
1/8 in.
Drawer front
Leg
Center kicker, 3/4 in. thick by 5 in. wide
Buttons attach base to top.
End kicker, 3/4 in. thick by 2 1/2 in. wide
Vertical dividers, 7/8 in. thick by 5 3/4 in. wide by 43/4 in. tall
Divider, 7/8 in. thick
Apron spacer, 1 in. thick by 1 1/4 in. wide by 29 in. long
Center runner, 3/4 in. thick by 5 in. wide
Tenon, 5/16 thick by 1 1/4 in. wide by 1 in. long
Apron spacer, 1 in. thick by 1 1/4 in. wide by 29 in. long
Lower stretchers, 7/8 in. thick by 5 7/8 in. wide by 73 7/8 in. long
Stretchers have 1-in.-wide walnut edging.
LOWER STRETCHER DETAIL
1/4 in.
1 in.
3/8 in.
Tenon, 3/8 in. thick
2 1/8 in.
Stub tenon, 3/8 in. thick by 1/4 in. long
Apron, 3/4 in. thick by 4 3/4 in. wide by 32 in. long
Tenon, 3/8 in. thick by 2 3/4 in. wide by 1 1/2 in. long
FRONT
3/4 in.
78 3/4 in.
71 7/8 in.
3 1/8 in.
29 3/4 in.
23 3/8 in.
23 3/8 in.
23 3/8 in.
1 3/16 in.
SIDE
35 7/8 in.
4 3/4 in.
29 in.
1 3/16 in.

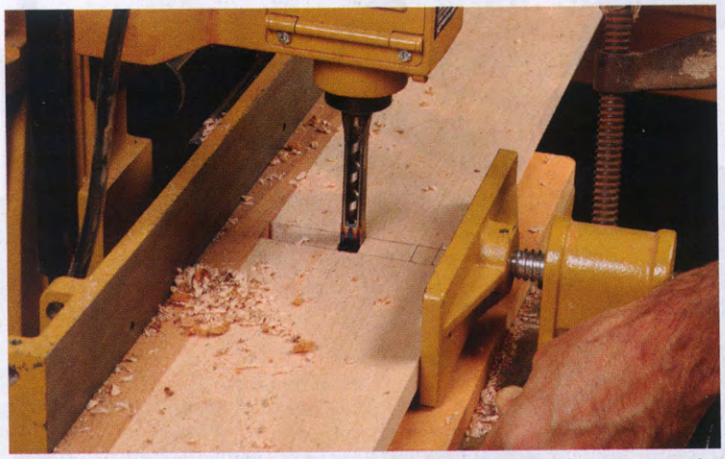
MAKE SHORT WORK OF MULTI-TENON JOINTS

The bulk of the joinery is mortise-and-tenon joints. The most challenging ones are the multiple tenons on each vertical drawer divider. Here's how to tackle them successfully.



VERTICAL DRAWER DIVIDER TENON LAYOUT





Mortises first. *Mark the upper and lower stretchers for the location of the vertical drawer dividers, and then cut these through-mortises with a hollow-chisel mortiser, using a backer board to prevent blowout.*

stretchers are mortised through their faces for the vertical dividers that separate the drawers. Take extra care that all these mortises line up top to bottom, because their alignment is critical or the vertical dividers will be crooked. To do this, I clamp all four pieces together and, using my square as a guide, score a line across the inside edge of the stretchers. Then I transfer those lines across the faces of the stretchers to lay out the exact mortise locations.

Keep in mind that the legs are designed with a very simple double-sided taper that begins at the base of the apron. I cut the joinery before tapering the leg, so I can work on it while it is still flat and square. I cut the mortises for the lower stretcher and the haunched mortises for the side aprons. The upper stretchers connect to the legs with lap dovetails. The socket for the dovetail is cut later.

Now that the mortises are cut, it's time to move on to the tenons on the aprons, the drawer runners and kickers, the lower stretchers, and the vertical dividers.

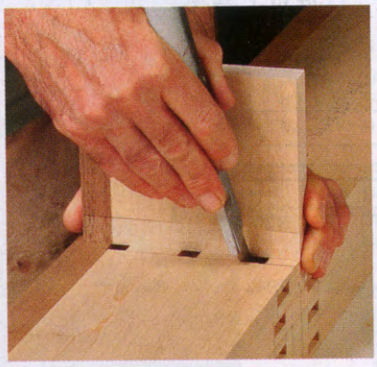
The side aprons have haunched tenons. These tenons are cut with several passes on the tablesaw with a ½-in. dado set. I lay the boards flat on the table and crosscut them, using the fence to set the tenon length. The tenons on the runners and kickers are cut using the same method. To keep from interfering with the vertical drawer divider joinery, the center runners and kickers have two tenons. I remove the waste between the tenons on the tablesaw with the same sled and method I use for the vertical dividers, below. This isn't necessary on the end runners and kickers.

The tenons on the lower stretchers aren't as straightforward. They are joined with a double stub tenon into the leg and a single tenon into the lower apron spacer. I cut the stub tenons on the bandsaw and use the router table and a straight bit to create the tenon that lands in the spacer. I measure for the mortise in the lower apron spacer and cut it. Later, when the legs are glued to the apron, I dry-fit the lower stretcher system to the legs and apron, setting the apron spacer in place. It automatically registers itself, which allows me to mark its location and glue it in place.

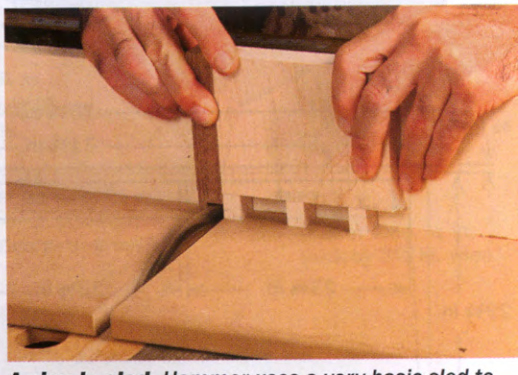
Upper stretchers get dovetails

While the lower stretchers have mortises and tenons, the upper stretchers are connected to the leg and apron spacer with dovetails. This makes assembly much easier. I use a simple jig to establish the sides of the tails on the bandsaw, and then I cope out the

Graze the tenon cheeks. *Before cutting the tenons, skim 1/16 in. of material from the tenon cheeks with a dado set. This gives a clean edge where the tenons end.*



Mortises locate tenons. *Use the mortises on the stretchers to locate and mark the tenons on the vertical dividers.*

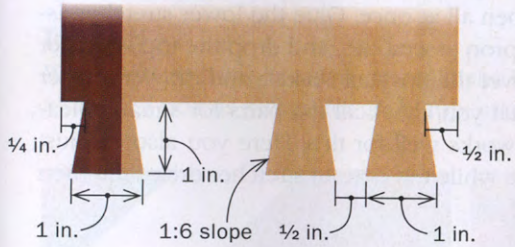


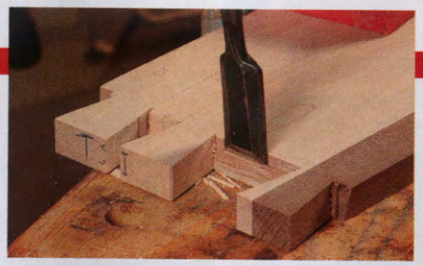
A simple sled. *Hammer uses a very basic sled to hold the vertical dividers as he removes the waste between tenons. He works carefully to his layout lines without using a stop, test-fitting as he goes.*

WAIT TO DO THE UPPER STRETCHERS

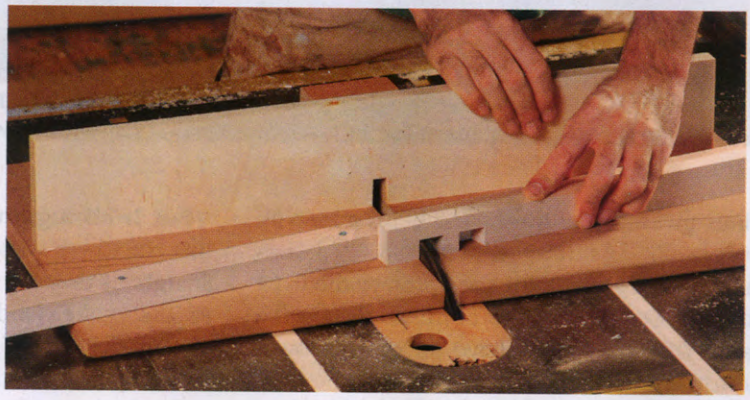
Unlike the lower stretchers, the upper stretchers get dovetailed into the legs and apron spacers. The quirk in the process is this: Because the dovetail sockets go partially into the apron spacers, they can't be laid out and cut until after the legs are glued to the aprons.

UPPER STRETCHER DOVETAIL LAYOUT



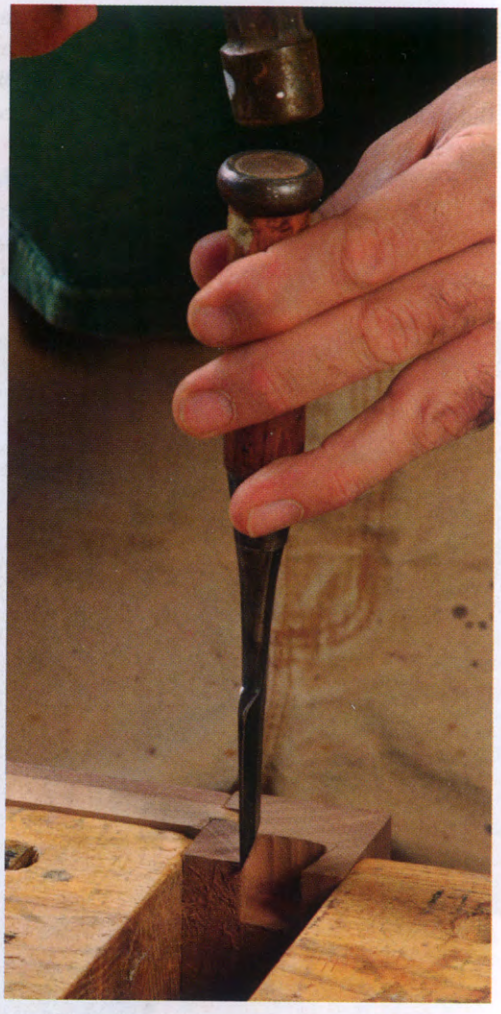


Dovetail the stretcher and lay out the sockets. *Saw and chop the dovetails and clean to the line with a chisel (above). Dry-fit the apron spacers into the apron/leg assembly and mark the dovetail locations in the leg and spacer (right).*



Remove the spacers to notch them. *Using the tablesaw sled again, this time with an angled fence, Hammer makes the cuts to form the sides of the dovetail sockets. Then he runs the spacers through the same dado setup but on a 90° sled to remove any waste in the center.*

Create the sockets in the legs. *Hammer clamps the leg-and-apron assembly into his end vise with the top of the leg flush with the top of the bench (above). With the router base sitting on the bench, he routs close to the layout line, then cleans to the line with a chisel (right).*



waste and clean up with a chisel. These structural dovetails are never seen, so appearance is not critical (see "Half-Blind Dovetails in Half the Time," pp. 36-41).

With all the leg joinery completed, I now feel comfortable cutting the tapers in the legs. With only four legs to do, I mark the taper on the legs, cut it freehand on the bandsaw, and then clean it up on the jointer, making sure to register one side against the fence to keep the taper square. Later, after the legs are glued to the aprons, I'll mark and cut the dovetail socket in the top of the leg post, using a plunge router freehand. Then I clean it up with chisels.

How to simplify a complex glue-up

Because there are so many parts in the drawer system, this glue-up is more complicated than the average table glue-up. But you can break it into manageable stages: the leg/apron assembly, and then the stretcher assembly. Before glue-up, do a final sanding and finishing of the table parts. I use a finely set smoothing plane to remove mill marks, followed by a random-orbit sander up to P320-grit sandpaper. Then I apply Tried & True Original Wood Finish to all the parts. I can always sand more after assembly,

MANAGE THE GLUE-UP IN STAGES

This is a little trickier than your average table glue-up, so it's best to take it in steps. The legs are already glued to the aprons, so you'll need to glue in the apron spacers, make two frames of the stretchers, runners and kickers, and then piece it all together.

Glue in the spacers. *Clamp the apron spacers into the leg-to-apron assembly.*

Create two frames. *The two lower stretchers are connected by the drawer runners. The two upper stretchers are connected by the kickers.*

but this step saves time, gives a nicer finish, and helps a lot with glue cleanup.

Attach the aprons to the legs—Gluing the apron to the front and back legs is straightforward, and the mortises dictate the alignment of the parts. The side aprons have upper and lower spacers glued to them that allow the drawers to clear the legs, which are thicker than the aprons. However, I do not attach and cut the joinery in these spacers until the legs are glued to the aprons. It is easier to cut the joinery when they are separated from the apron, but I need the leg/apron assembly together to mark the exact location of the joinery on the spacers. With the joinery done, the spacers can be glued in place.

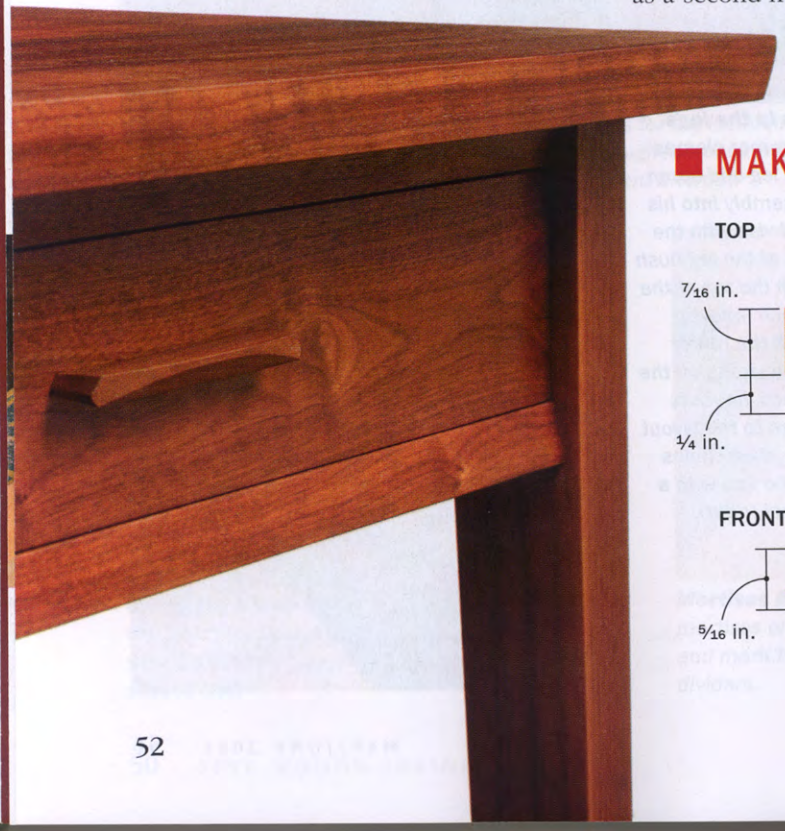
Two sets of stretcher frames, upper and lower—This is where things get a little complicated (but just a little). I glue up the front and back lower stretchers with the drawer runners as one frame, then the front and back upper stretchers with the drawer kickers as a second frame.

Put it all together—Next, glue the vertical drawer dividers into the lower stretcher frame. You have to make sure they stay straight as they are drying, so you can use a slow-dry glue such as Titebond Extend and work on gluing the upper stretcher assembly right away, or you can take the pressure off the glue-up and simply dry-fit the top in place until the dividers are dry.

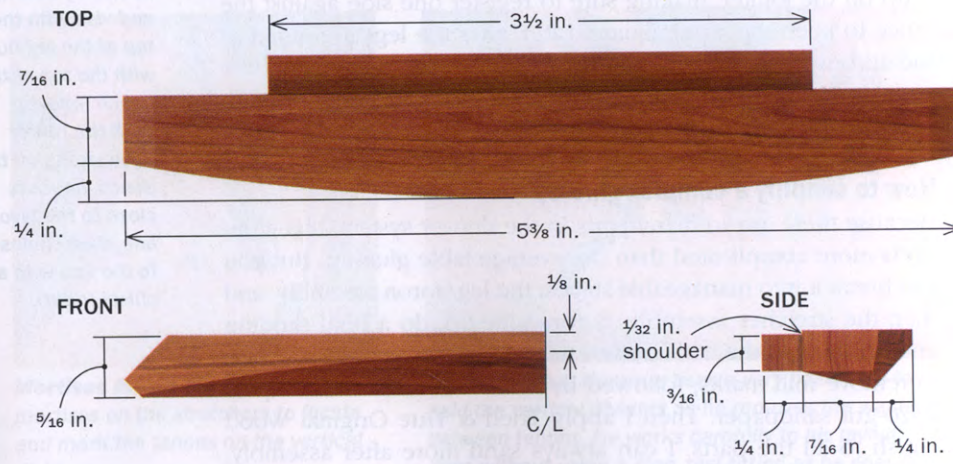
The final steps happen all at once. Glue the lower stretcher assembly into the leg/apron assemblies, and drop the top stretcher assembly into place over the dovetail sockets and drawer divider tenons. It is critical that you check all the parts for square. Measuring the diagonals works well for this. Here you also can just dry-fit the top in place while the bottom stretcher dries, and then add the top.

Quick and easy drawer construction, even with two fronts

With the base assembled, it is time to focus on the drawers. I combine power tools and handwork to create consistent dovetails efficiently while keeping a hand-cut appearance (see "Half-Blind



MAKE HANDSOME HANDLES



Add the lower frame to the legs. *One long clamp on each side is enough to pull it all together.*

Drop the vertical dividers in place and top it off. *With the vertical dividers glued into the lower stretchers, you can dry-fit the top stretcher assembly until the vertical dividers are set, and then glue the top assembly in place. Or use glue with a longer open time and do it all at once.*

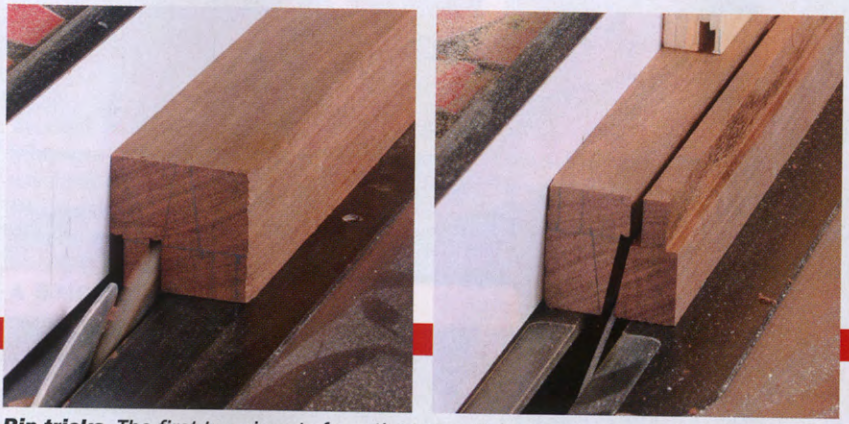
Dovetails in Half the Time," pp. 36-41). I use quartersawn white oak for the drawer sides. Its hardness lets the drawer slide easily and with little wear. It also contrasts with the walnut to show off the dovetails. Custom walnut handles are the finishing touch. By the way, I didn't use a catch to register these drawers, but if you are interested in bullet catches, see p. 56.

Top it off

With the base complete, you can make the top. I made mine from a series of boards picked for grain appearance and glued up side by side using biscuits for alignment. After cutting the top to final size, I shaped the edge with a 12° bevel that matches the bevel on the stretchers. Wooden buttons secure the top to the frame.

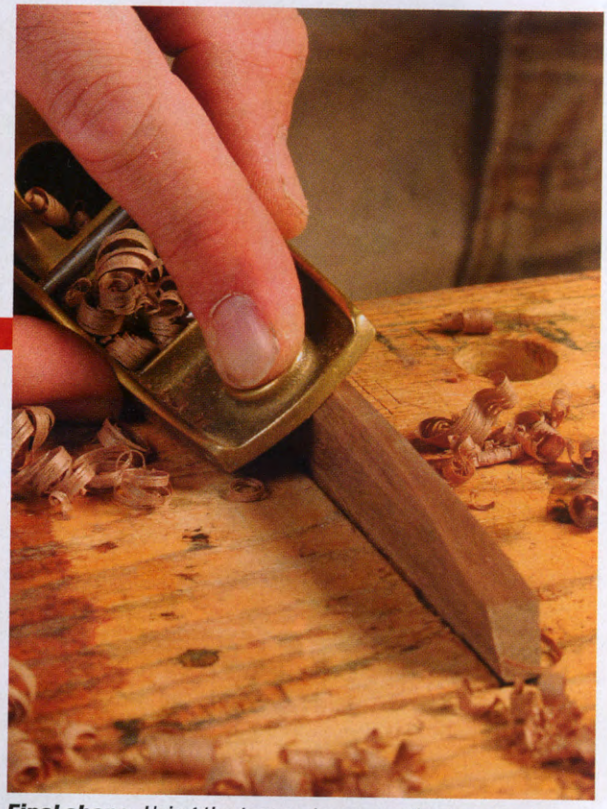
To finish the top, I use a finely set smoothing plane to take out all the milling marks, and then sand it up to P320 grit. I then apply several coats of Tried & True Original Wood Finish wiped on and rubbed off by hand. Even though all parts were pre-finished, I go over the entire piece again with a final few coats. □

Stephen Hammer designs and makes custom furniture in New Britain, Conn.



Rip tricks. *The first two rip cuts form the tenon (left). Leaving the angled cheek cut for last lets the handle stock fall away from the blade (right).*

A few crosscuts. *Multiple crosscut passes waste away material to create the tenons. Then raise and angle the blade to cut the handles to length.*



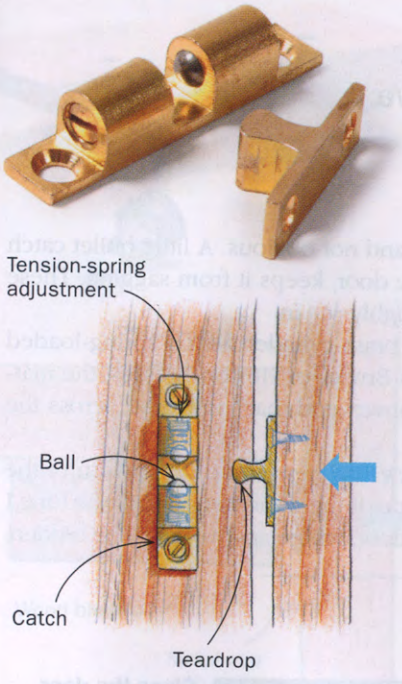
Final shape. *Using the tenons to secure the handles in a vise, do the shaping with a block plane.*

Case Closed

How to use off-the-shelf hardware to close cabinet doors in style

Browse through the clunky catches offered in some catalogs and it would be easy to conclude that a shopmade catch is the only tasteful way to keep a cabinet door closed. After all, the goal is a catch that will hold a door securely closed but be unobtrusive. But some commercial catches are simple and discrete enough to be at home in fine furniture. In this article, three of our contributing editors show you their techniques for making elegant use of different commercial catches. We'll also show you how to make a simple catch using hidden rare-earth magnets.

Photo, bottom left: Courtesy of MIchael Fortune



Double-ball catch: Adjustable power where it's needed

BY STEVE LATTA

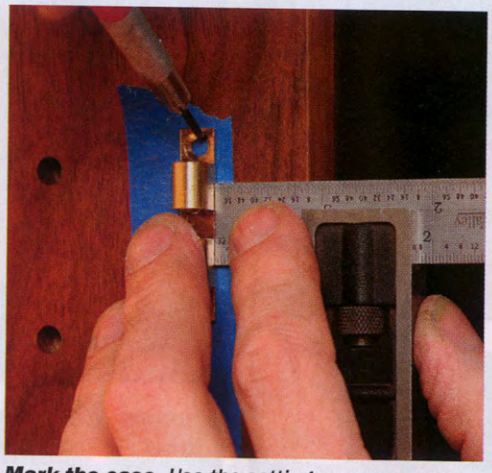
Among all the contemporary catches I've seen, I like the double-ball variety for its versatility, appearance, and ease of installation. And, like the bullet catch, you can even install them when the cabinet back is already in place.

In general, it's good to place the catch close to where the door pull is located, but because these catches have the ability to pull a door into a frame or against a stop, you can place them selectively to alleviate a slight twist in the door caused by a poor glue-up or wood movement. Place them at the top, bottom, or along the edge—wherever the pressure is needed. I typically use them on inset doors, but they've performed well for my students on overlay doors, too. They are relatively attractive as far as hardware goes and, being brass, can be easily antiqued or polished. They are easy to install and easy to adjust. You can adjust the tension spring and, if need be, reshape the tear-drop portion for a smoother feel. The cost is minimal and they are readily available. A note of caution, however: I've seen the quality of many of these units decline over the years. I like the versions from Lee Valley and Whitechapel.

Steve Latta is a contributing editor.

INSET THE CATCH

Measure the door. *To ensure that the door will close flush to the cabinet, use a combination square to measure from the front of the door to the edge of the catch's mounting plate.*

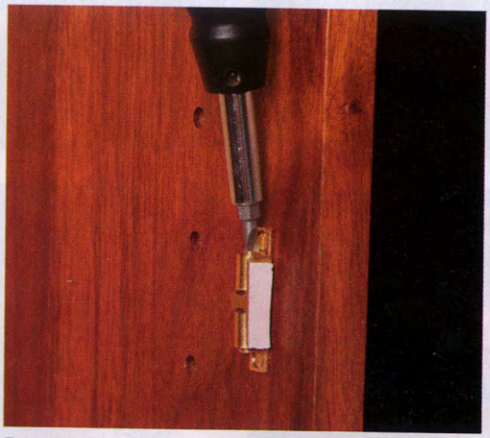


Mark the case. *Use the setting on your square to transfer the inset depth for the catch and mark the top hole's location for drilling. Painter's tape helps make the mark more visible.*

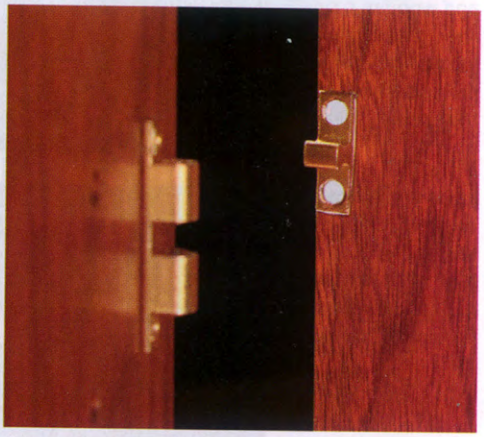
Mount the catch. *After securing the top of the catch with a screw, use the square to align the bottom and then mark the second hole for drilling.*

A STICKY TRICK

Apply double-stick tape. *Latta has a simple tool for finding the exact location of the mating teardrop: double-stick tape.*



Put the mating pieces together. *Set the teardrop into the catch and then loosen the tension spring so the teardrop will release easily.*

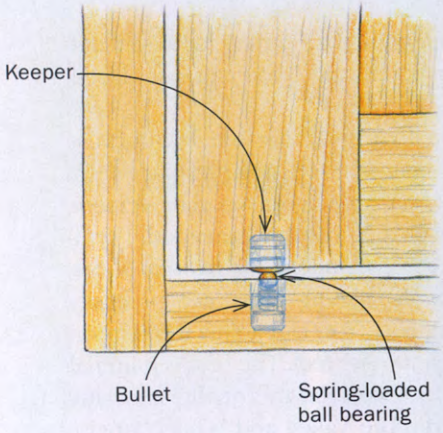


Close the door firmly, then open it. *The double-stick tape will adhere to the door, placing the teardrop in the perfect location for mounting.*

Photos, except where noted: Steve Scott; facing page, bottom right, and drawings: John Tetreault

Bullet catch: Discrete and supportive

BY GARRETT HACK



I like a catch that holds a door shut and is quiet, gentle, and not obvious. A little bullet catch does all of that, plus, when located at the bottom of the door, keeps it from sagging. These catches hold best if the gap around the door is small, roughly 1/16 in.

A bullet catch has two parts: The "bullet" is a compact brass cylinder with a spring-loaded ball bearing at one end. On nicer catches, like those from Brusso or Horton Brasses, the mating "keeper" piece is a shorter cylinder with a slightly convex end that's indented across the center to capture the ball bearing.

A good place for the catch is centered both on the door's thickness and on the width of the outer stile. It's possible to mount the bullet on the underside of the door, but most of the time I put it in the bottom rail of the case, with the keeper in the door, where any wear will be hidden.

Garrett Hack is a contributing editor.

Drill the hole. *Mark the hole location with an awl to help seat the brad-point bit and locate a pre-drilled guide block. The block helps keep the bit vertical and prevents tearout. Mark the hole depth on the bit with a piece of painter's tape.*

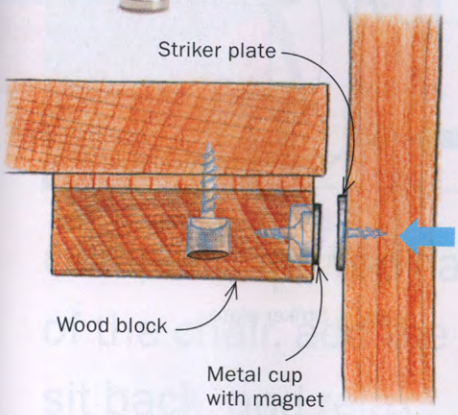
Set the bullet in place. *First, double-check the hole's depth (Hack uses the sliding end of a dial caliper); the cylinder can be difficult to remove. A few taps with a hammer and wooden block should help seat the ball so that its collar is flush with the case.*

Layout trick is on the ball. *Cover the ball with pencil lead to help mark its location on the bottom of the door.*

Close the door to mark the location. *A strip of masking tape on the strike area will make the pencil lead visible.*

Where the pencil line stops, drill your hole. *Dimple the spot with an awl to receive the drill bit. Use the same pre-drilled guide block as you did for the bullet, and again double-check the depth of the hole.*

Install the catch. *The indentation should run side to side, to trap the ball in the center of the catch. The rim should be flush with the bottom of the door. If you've drilled too deep, pry or tap the keeper loose and shim it with tape.*



Rare-earth magnet: Blend it into the woodwork

BY MICHAEL FORTUNE

To create a simple but effective catch, I like to mount a rare-earth magnet in a piece of wood shaped to reflect the overall lines of the cabinet or a detail such as the handles.

The block is typically from 4 in. to 8 in. long, and I attach it with #6 round-head screws and slightly oversize holes, so there is a degree of adjustability. Two deep counterbores hide the screw heads. Major woodworking suppliers like Rockler, Woodcraft, and Woodworker's Supply sell the magnets and hardware: a metal cup that securely cradles the magnet so it doesn't pull out, and a striker plate that screws into the door.

I often use darker contrasting woods in my furniture, so I'll use a block of wood in the same species or even ebonize it. When I do this, I also color all of the magnet hardware black with Brass Black metal finish, available at Amazon.com and sporting-goods stores. Sand the surface lightly first to prepare it for the coloring treatment.

Michael Fortune is a contributing editor.

Drill the holes before shaping the block. *Use a Forstner bit to drill a recess for the magnet and its mounting cup.*

Shape the block. *Use double-stick tape to attach an extension block that lets you cut and sand the block safely.*

Attach the block. *Fortune mounts the block under a shelf or the top (the cabinet is flipped here), slightly behind the edge to accommodate the striker plate.*

The magnet sits in a cup. *The metal cup is sold with the magnet and is held in place with a flathead screw.*

No glue needed. *The magnet seats itself in the cup, and it stays put.*

Attach the striker. *Reference marks transferred from the case help locate the striker plate, which consists of a steel screw and a small washer.*

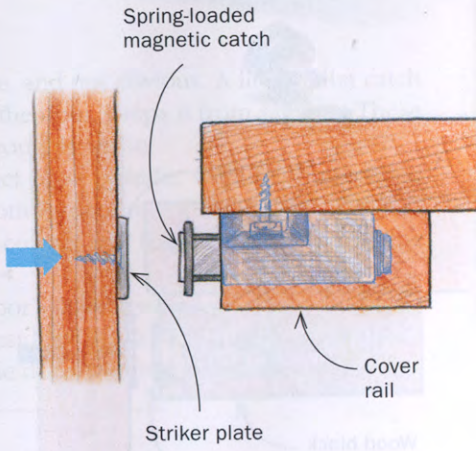
Photos, this page and p. 58, except where noted: Matt Kenney

Touch latch: Replaces door handles

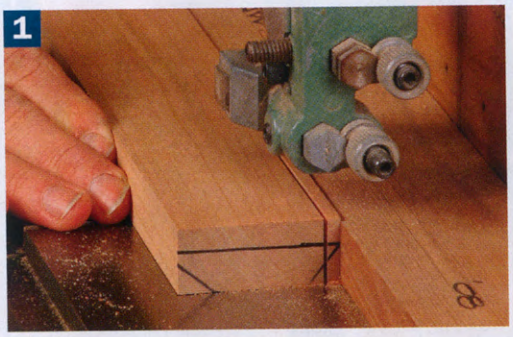
BY MICHAEL FORTUNE

When a cabinet's design would be compromised by surface-mounted handles, I use a commercial touch latch. The latch uses a spring-mounted magnetic catch that releases when the door is pushed inward slightly, so no door handles are required.

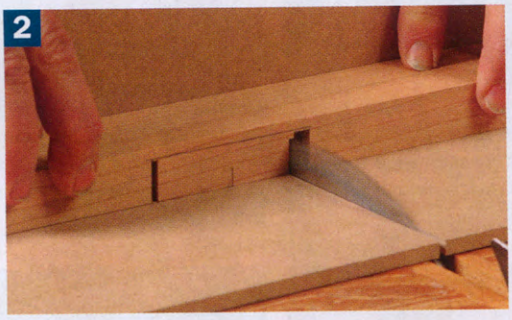
These latches—available as single or double units at Woodcraft, Richelieu Hardware, and other cabinetry suppliers—are made of plastic and, while they work well, they're a little too ugly to leave in plain sight. I fix this by fashioning an elegant cover for the latch, made from solid stock that harmonizes with the cabinet. This cover rail typically matches the length of the rail or shelf to which its attached. Installing it is a matter of mounting the latch and accurately locating the openings in the custom cover.



Michael Fortune is a contributing editor.

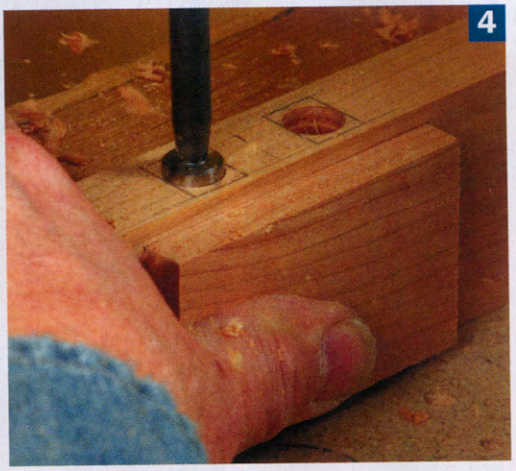


Cut away the front and rear faces. *After milling the solid-wood block that will house the latch, Fortune rips a thin strip—a little less than ⅛ in. thick—from each edge.*

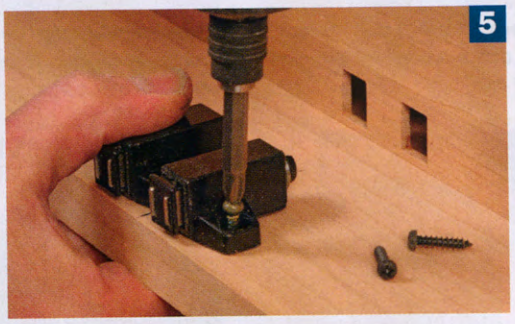


Create a home for the latch. *Use repeated tablesaw cuts to excavate a cavity to house the latch mechanism.*

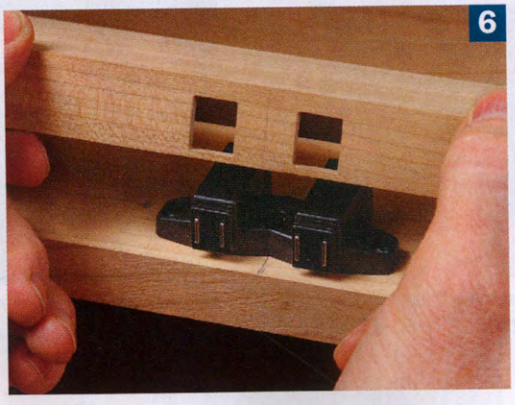
Hide the hole. *With the cavity created, glue the front and rear edge strips back into place. This encloses the hollowed-out opening.*



Let the plungers through. *Fortune uses a Forstner bit to drill clearance holes through the front face for the two latch plungers. Insert a wooden block into the cavity to prevent blow-out during drilling and when squaring up the holes with a chisel.*



Attach the latch. *Mount the latch on the underside of a cabinet rail or shelf. Set the catch back from the rail's edge to make room for the striker plate.*



Install the cover rail. *The clearance holes should fit over the latch plungers, with the plunger faces slightly proud. Countersunk screws hold the cover rail in place. A striker plate is mounted on each door using reference marks transferred from the case.*

Photos, this page, bottom right; p. 57, bottom center; and all product shots: John Tetreault

Windsor Rocker Without Special Tools

Part 2
CONTINUED FROM *FWW* #218

Complete the top half of the chair, add the rockers, sit back, and relax

BY PETER GALBERT

You are halfway through the construction of this beautiful rocking chair, which combines Windsor-chair joinery with contemporary design. After all the hard work shaping and steam-bending the parts, drilling and sculpting the seat, and completing the leg joinery, the squat, four-legged stool you have at this point in the project may not seem worth the effort. But most of the hard work is behind you, and what lies ahead is the fun part.

Join the arms to the seat and back posts

The two frames formed by the seat, arms, arm posts, and back posts form a very strong connection between the chair's seat and back. Finish shaping the lower half of the back posts with a spokeshave, but leave the top portion until after you have chopped the mortises for the crest rail. Mark the location of the arm's mortise on each back post.

Select dry stock with matching grain for the arms. Transfer the pattern to the top and inside of each rectangular arm blank. Extend the center line down both ends of the arm and scribe a horizontal line ⅝ in. from the top face all the way around the blank to create centers for turning. This is offset turning, so make sure that the piece doesn't strike the tool rest. Turn the tenon until the line on the inside of the curve nearly vanishes.

Dry-fit the arm and back post—Cut a test block roughly matching the length and thickness of the arm and drill a ½-in.-dia. hole

THE PROGRESS SO FAR

PARTS IN THE WORKS

In Part 1, we steam-bent the back posts, the spindles, and the crest rail. These parts remain rough-turned or shaped, but the back-post tenons have been finish-turned and fitted to the seat.

ASSEMBLED PARTS

Also in Part 1, we sculpted the seat, then drilled and reamed the tapered holes in it. We also turned the legs and stretchers, cut slots for the rockers, and then glued and wedged the legs into the seat.

PARTS TO BE MADE

The only major parts still to be made are the two arms, made from blanks with matching grain, and the rockers, which are cut from quartersawn stock.

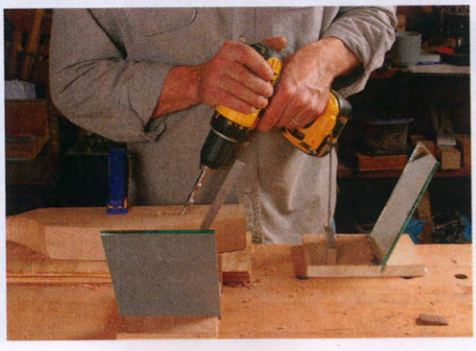
Make and fit the arms

1. ROUGH THEM OUT FIRST

Rough-turn the tenon. *Bandsaw the top profile for each arm, mount it on the lathe using the center points at each end, then mark the centerline of the tenon (above). Turn the tenon (right) until the line drawn on the inside almost disappears.*

2. DRILL THE ARM-POST MORTISE

Check the angle. *The mortise in the arm needs to be angled so that the arm tenon is at the correct height on the back post. Start with a test block drilled at 62°. Adjust the angle from there.*



Drill the arm-post mortise. *In the same way that you drilled the leg mortises in Part 1, drill into the arm for the arm post with the bevel gauge set to the test-block angle.*

at 62° for the arm post. Ream the test block until the underside of the block is aligned with the baseline of the arm tenon on the arm post. The reamer used for the seat mortises may not fit this smaller hole, but a plumber's 6° reamer used to de-burr pipes (available at hardware stores) works fine. Now see if the other end of the test block centers on the location of the mortise in the back post. If you're close, you can tweak the angle when you drill the arm. If not, make another test block and try again.

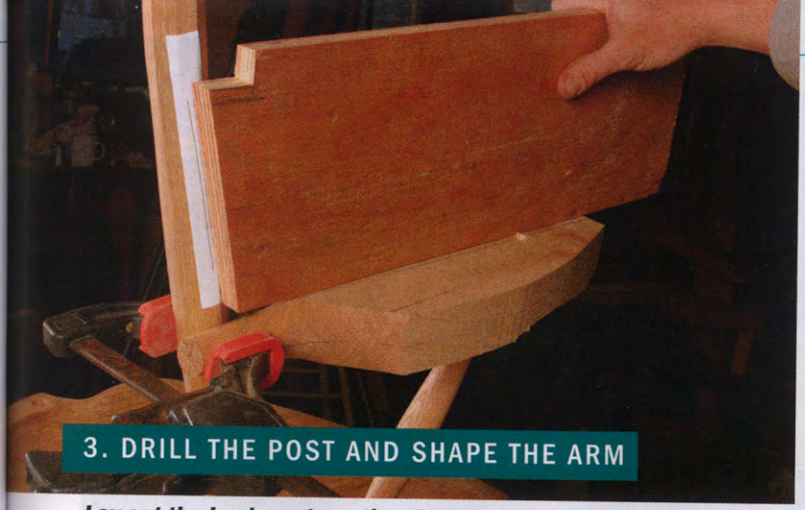
Drill the mortise at 62° (or whatever angle worked on the test block), using the centerline as a sightline. Cut away a section of the underside of the arm down to the layout line on either side of the arm-post hole. This will enable you to ream the hole until the bottom of the arm just touches the arm post's baseline. Ream both arms at the same time to ensure matching angles. Once both arms are seated, note the actual height of the mortises on the back posts.

The mortises in the back posts directly face the arm posts. To find this point, place a large rubber band around the back post at the height of the mortise and stretch it across to the point you reamed down on the arm post. Measure halfway across the gap at the back post end of the rubber band to find the center, and check the alignment by visually centering the arm post on the back post. To find the correct angle of the mortise in the back post, use the same block with a 85° angle cut on one end. Set the block on the arm and mark the angle on the outside of each back post. Place the roughed-out arm tenons into the top of the shopmade kiln (see plans in Part 1) and let them dry for at least 24 hours.

Drill the mortise in the same way you drilled the mortises in the legs, using the V block holder and keeping the line marked on the posts parallel to the benchtop with the mortise location pointing straight up. Drill the mortise with a ⅞-in. to ⅜-in. stepped bit (morriswoodtool.com/Counterbores) until the shoulder is about ⅛ in. below the surface of the post. It's important to note that the obtuse, or larger of the two angles, is toward the top of the

Ream to fit. *Bandsaw down to the layout line on the underside of the arm so you can see when the arm post is home. That way, when you ream the mortise, you can be sure that the arm will enter the post at the right spot.*

Photos: Mark Schofield; drawings: Bob La Pointe

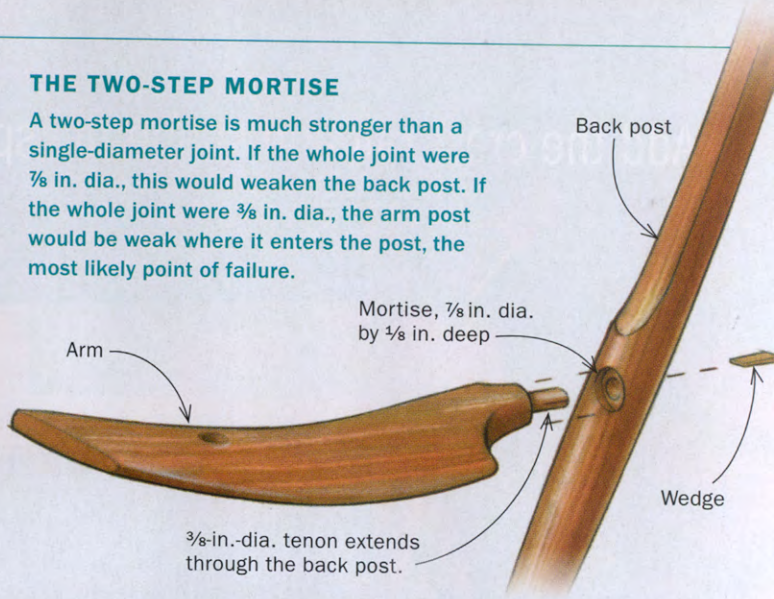


3. DRILL THE POST AND SHAPE THE ARM

Lay out the back-post mortise. *Place the same board used to lay out the leg stretchers onto the arm and trace a line on a piece of tape on the back post.*

THE TWO-STEP MORTISE

A two-step mortise is much stronger than a single-diameter joint. If the whole joint were ⅞ in. dia., this would weaken the back post. If the whole joint were ⅜ in. dia., the arm post would be weak where it enters the post, the most likely point of failure.



Drill the mortise. *Angle the post until the line you just drew is parallel to the benchtop. Using the angled board and a mirror, drill a stepped mortise through the post with two brad-point bits.*

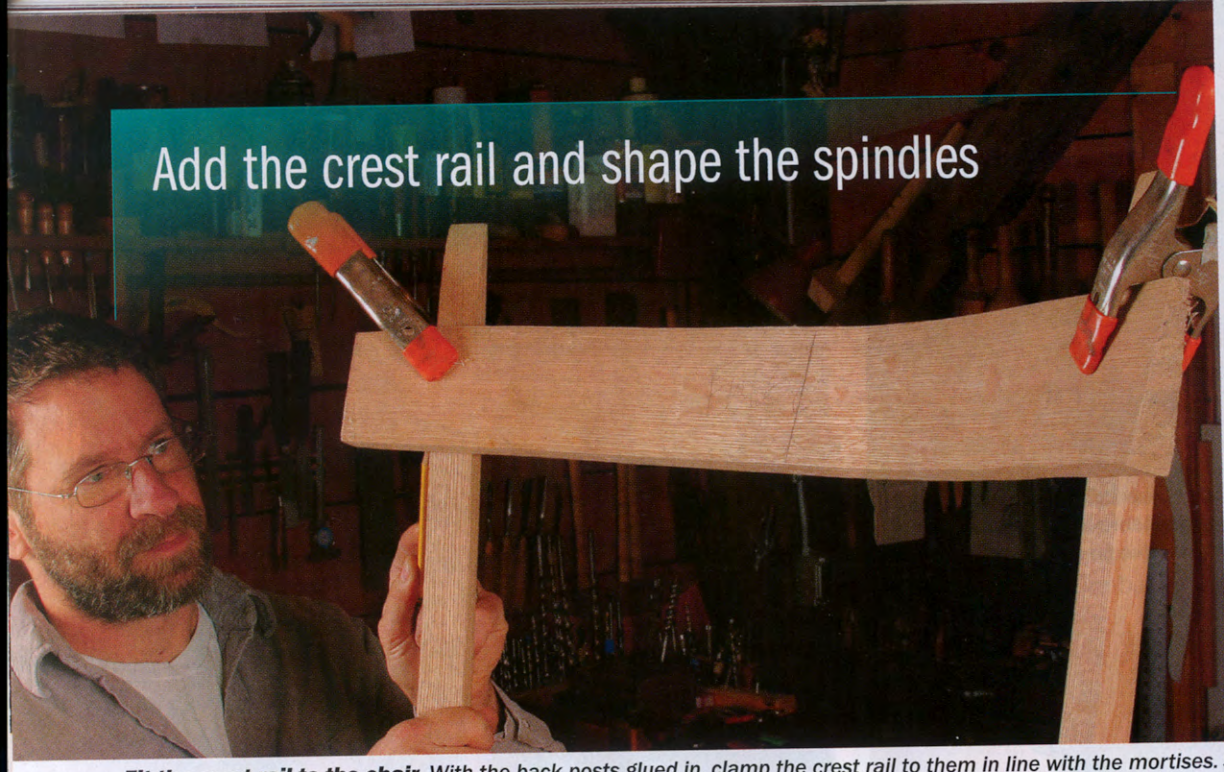
At arm's length. *With the stepped mortise drilled, measure from the bottom of the wide part of the mortise to the midpoint of the arm post.*

Two-step tenon. *Mark the location where the tenon steps down and then turn it on the lathe. A shopmade gauge aids accuracy.*

Shave your arms. *Mark the centerline of the arm. With the joinery complete, sculpt the arms using a drawknife, spokeshave, files, and sandpaper.*

Four-way glue up. *The back post, arm post, and arm need to be glued and wedged all at one time. Use a clamp to ensure the stepped arm-to-back-post joint fully closes.*

Add the crest rail and shape the spindles



Fit the crest rail to the chair. *With the back posts glued in, clamp the crest rail to them in line with the mortises. Slide the rail back and forth to find the best fit and then mark out the tenons (left). The scalloped ends of the crest rail transition into tenons that enter the back posts (right). Because the posts need to be splayed later when inserting the crest rail, having a tenon that fits tight on four sides is awkward. So leave a slight gap above the tenon.*

Start on the spindles. *Use a template to lay out and then bandsaw the profiles on the bottom of each spindle. Then use a spokeshave to create round tenons.*

chair. This mortise also can be drilled with the combination of a 7/8-in.-dia. Forstner bit for the shoulder and a 3/8-in.-dia. brad-point bit for the mortise, as long as the tip on the brad-point is long enough to correctly center in the dimple left by the Forstner.

Place the back post in the seat and measure the distance between where the arm-post tenon exits the arm and the shoulder of the rear-post mortise. Use this distance to mark the shoulder on the arm's super-dry tenon. Finish-turn the shoulder and tenon.

Shaping the arms and the back posts—Bandsaw the side profile on each arm, then tape the waste back on and cut the top profile. Draw a midpoint line around the sides of the arm to give a reference point for shaping. I shape the arms with drawknives and

Point of contact. *Number and dry-fit the spindles into the seat. Draw an oval (above) across all the spindles where the sitter's back will make contact (have someone sit on it to lay out the oval). Narrow the spindles above and below the oval and smooth the fronts and backs using a drawknife (right), a spokeshave, and a scraper.*

Space the spindles. *Because the spindles splay outward from the center, mark the location and angle where they enter the crest rail.*

spokeshaves while holding them in a shave horse, but you also can secure the arm in a vise or with clamps. While the tops of the arms will be sanded smooth, I leave clean spokeshave facets on the underside for the sitter to discover.

While the tops of the back posts still have flat sides, cut the mortises near the top for the crest rail. Now you can round the rear of each back post and start to taper the tops. Leave a ¼-in.-wide flat section on each top, as it helps to rest the chair on these points when assembling the rockers.

To dry-fit the arm/posts assembly, place the arm post in the seat and slide the back post onto the arm while dropping the arm and back post into position. To disassemble the joint, twist the arm post in the seat, and lift up the back post and arm. If all the joints look good, go ahead and glue both assemblies, adding wedges to each joint. I use a clamp to draw the arm all the way into the joint.

Shape and fit the crest rail and the spindles

Once the crest rail has been set in the final form and has spent a couple of days in the kiln, you can begin shaping it and making the tenons. Clamp the crest rail across the front of the back posts in line with the mortises. If there is any twist or misalignment, shave the crest

Drill the crest rail. *For stability, clamp the crest rail to the angled bending form. Drill each angled hole for the spindles, starting nearer to the back of the rail to avoid breaking through the tapered front.*

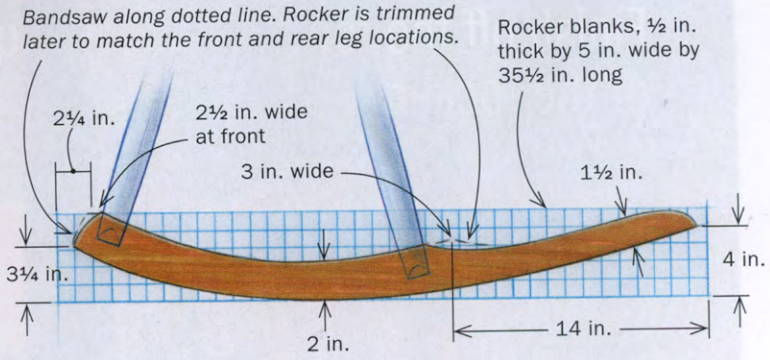
Back support. *Dry-fit the spindles, then bend a thin strip of wood against their widest part. Alter the angle of individual spindles until you get a smooth, flowing curve.*

Mark the location. *Place masking tape on the top and base of the spindles to show the correct depth of each tenon. Then mark the orientation of each spindle so that you keep the flowing curve after glue-up.*

All together now. *Glue the spindles into the seat, glue in one end of the crest rail, then glue the spindles into the rail (left). Then splay the back posts and glue in the other end of the crest rail. Install a small wedge (above) to close the gap above each tenon, and trim it flush later.*

How splayed are the legs? *Use a bevel gauge to discover the angle of the rocker slots versus the ground. If the front and back legs on the same side have different angles, average the readings.*

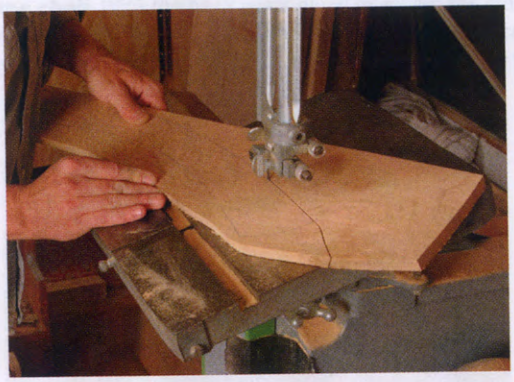
ROCKERS



until it sits flat against the back posts. Mark the back of the rail where it meets the outside of the posts to get the location and angle of the tenons. Even though the crest mortises don't go all the way through, the extra length is easily taken up by the flexibility of the posts, and the extra splay looks good in the final piece.

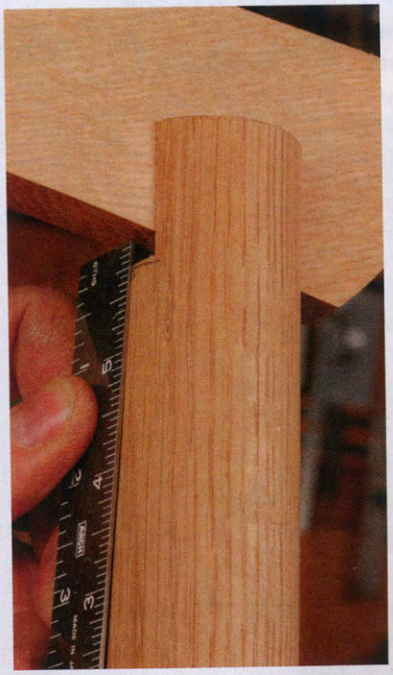
Lay out the cove and recessed area on each end. Bandsaw the cove and then use a drawknife and spokeshave to remove the bulk of the recessed area. Leave the tenon parts a little thick and scrape them to final thickness when smoothing the crest. Cut the tenons about 1/16 in. shorter than the mortises to ease installation.

It is now time to work on the spindles. Lay out and then bandsaw the recesses on the bottom ends, then shave the tenons round. Once all of the spindles are dry-fitted into the seat, number the sequence and then draw an oval on them that roughly encloses where the sitter's back will make the most contact. Shave from these marks to the ends and facet the edges. Then shave, scrape, and sand the fronts and backs. Dry-fit the crest rail and mark the spindles where they intercept it. Cut the spindles to length including 7/8 in. for the top tenons, and then finish shaping them.



Bevel the rockers. *Set the bandsaw table at the angle of the rocker slots and bevel the bottom edge of each rocker. Bandsaw the top edge square.*

A rocker that rolls. *Use a pair of straightedges to align the rockers and set them at the correct depth in each slot.*



Measure the gap and deepen the slots. *Discover which rocker is farthest from the bottom of the slot and measure the distance (left). Mark this distance on either side of the other three legs, remove the rockers, and then chop down to the line (right) to bring all four slots level.*

The spindles splay out from the center, so they require angled mortises in the crest rail. Evenly space the spindles and then mark their angle in the back of the crest rail. To keep the crest rail vertical and stable, clamp it to the final bending form and use the mirror technique (see Part 1) to drill each hole at the required angle.

To orient the spindles in their holes, hold a thin strip of wood along the curve at the mid-back region to make sure that they align smoothly where the greatest body contact and weight will be. Mark this alignment on masking tape attached to the bottom of the spindles and the chair seat.

Glue the spindles into the seat and let them dry. Then, in quick succession, glue them into the crest rail, glue one end of the crest rail into a back post, and finally spread the back posts to seat the other end of the crest rail. Glue a wedge into the gap above each crest-rail tenon and peg the crest-rail-to-back-post joints.

It don't mean a thing if it ain't got that swing

Balancing the rockers for the smoothest motion is vital to the success of the chair. Being pulled too far back or pitched forward will leave the sitter struggling to stay in the chair.

The bottom of each rocker is beveled to match the splay of the legs. Measure the rocker slots with a bevel gauge and then tilt the bandsaw table to this angle. Lay out one rocker using the design provided and then cut it on the bandsaw, beveling just the bottom curve. Fair the curve using coarse sandpaper on a curved block of wood and plane or scrape the sides until it slides into the slots. Trace this rocker onto the other blank and repeat the process.

Turn the chair upside down and line up the front of each rocker with the front legs. Use winding sticks to see if the rockers are in the same plane. They almost never are, so tap a rocker out of the slot until they are in plane. Tap a wedge in from both ends of the gap, tape the rockers to the chair legs, then turn the chair over and see how it feels to sit in. If the rocker needs to rock back more, simply tap the rockers out of the front slots. Once you're happy, mark where the rockers enter the legs. Remove the wedges, measure the largest gap between the rocker and the bottom of the mortise, scribe the distance on all sides of the other legs, and pare to the line. Once the joints are set, shape the rest of the rocker tops, bevel the ends of the legs, and then glue and peg the rockers.

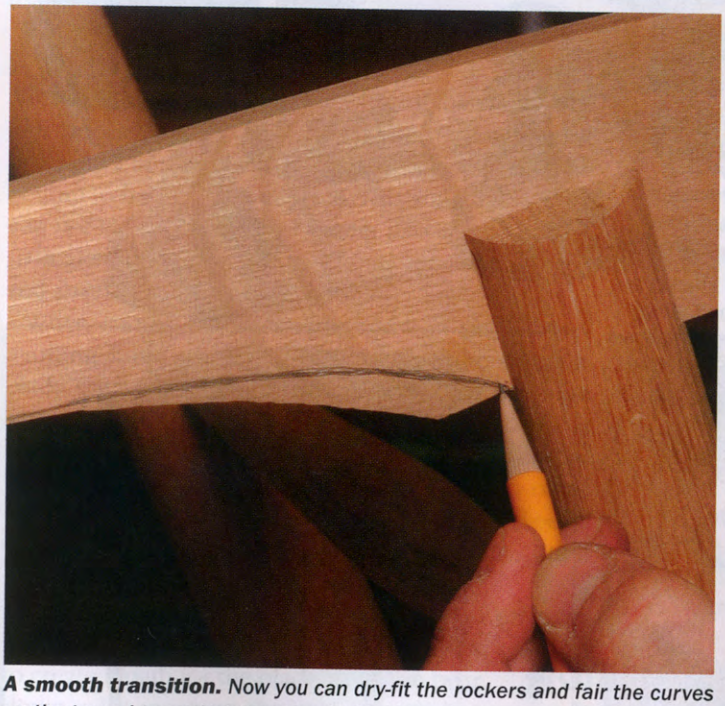
A fumed finish

Before applying a finish, fine-tune the shape.

I fume the chair with janitorial-strength ammonia (see "Fumed finish made easy," *FWW* #211), followed by four coats of an oil/varnish mix. □

Peter Galbert makes Windsor chairs in upstate New York.

To purchase digital plans and a complete cutlist for this chair and other projects, go to FineWoodworking.com/PlanStore.



A smooth transition. *Now you can dry-fit the rockers and fair the curves on the top edge so that they terminate at the legs.*

Final details. *Bevel the ends of the legs, then glue in the rockers and peg the joints.*

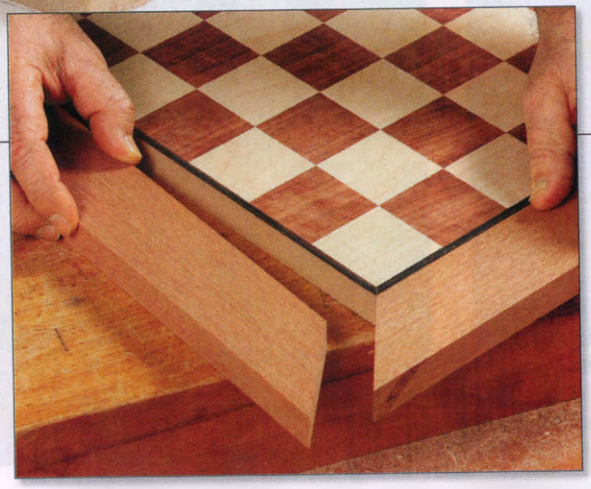
A Chessboard Made Easy

Go with veneer every time

BY CRAIG THIBODEAU

TWO WAYS TO USE IT

Chessboard or chess table? *Add solid-wood edging for a simple chessboard that can be stowed away, or incorporate the veneered panel into a table design of your choosing, like Thibodeau's Art-Deco-style game table at right.*

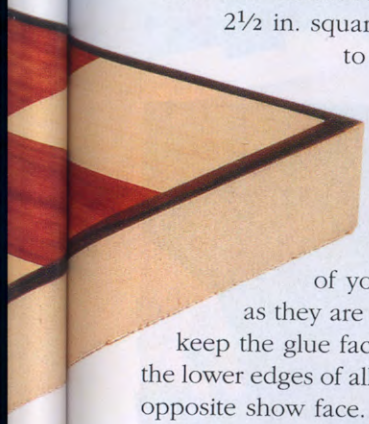


Photo, this page (bottom right): Craig Thibodeau

At some point in your woodworking life, you'll probably make a chessboard. The classic parquet pattern adds fun and function to an ordinary table. And a stand-alone chessboard makes a great gift.

If you haven't worked with veneer, you may be tempted to make your game board from thick squares of solid wood. Don't. You'll have to contend both with wood movement and weak end-grain joints. Veneer is much easier to cut accurately, and is easy to apply to a stable MDF substrate. Also, veneer is available in hundreds of beautiful species and grain patterns. By the way, the following technique works for other parquetry patterns, too, such as diamonds.

Standard chessboard squares range from 2 in. to 2½ in. square, but you can size the squares to fit the chess pieces you have on hand.



Veneer taping 101

Because of the V-groove that a knife or veneer saw leaves behind, it's important to keep track of your "glue face" and "show face," as they are called. When cutting the veneer, keep the glue face on top, which guarantees that the lower edges of all of your cuts meet cleanly on the opposite show face. And generally, as you assemble any veneer pattern, you bring the pieces together by using blue masking tape on the glue face, and then thin moisture-activated veneer tape goes on the show face. When the veneer tape is dry, you peel off the masking tape and you are ready to apply the veneer to a substrate.

Simple jig ensures accuracy

Start by making a straight block of hardwood or plywood roughly ¾ in. thick by 20 in. long. Rip it precisely 2 in. wide, and stick coarse sandpaper to the bottom to help keep it in place. This will be the guide you use to cut the strips of veneer into equal squares, so make sure the sides of the jig are truly straight and parallel.

When cutting with the veneer saw (a single-bevel marking knife or razor also works), make sure the blade stays 90° to the cutting guide so you will have square edges on the strips. If you decide to use a more delicate veneer for your squares, such as burl or heavily figured woods, it may be necessary to cover the face of the veneer with a layer of veneer tape to prevent chips and breakage along the cut line. Cut a sample strip or two to check.

Using your guide, cut one straight edge on each piece of veneer. Start with a light pass just to create a path for the blade, and then bear down a bit more on the next few strokes until the waste veneer falls away cleanly. Next, align one edge of the guide with the

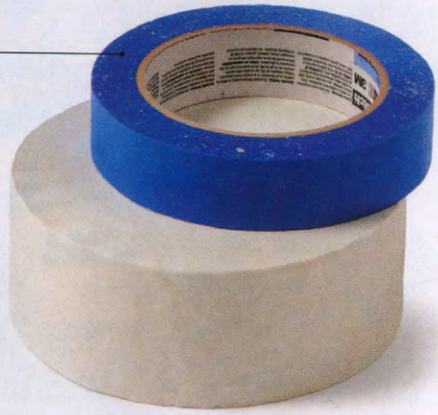
A SHORT LIST OF SUPPLIES

VENEER

Standard commercial veneers work great for this project. For the 2-in. grid you see at left, you'll need two pieces of contrasting veneer, each about 10½ in. wide by 18½ in. long. If need be, you can cut the strips from a narrower stack of matching veneer. For a more decorative pattern, try alternating the grain direction of one color. Use an even darker wood for the banding at the edges, and don't forget to veneer the back to prevent the panel from warping. Any species will do there.

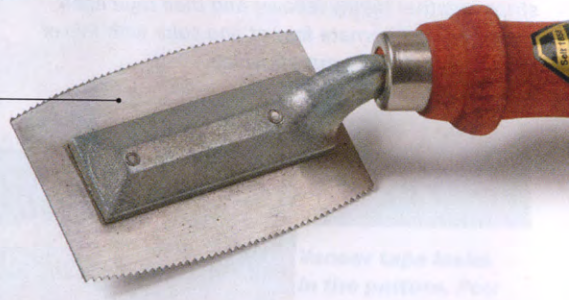
TAPE

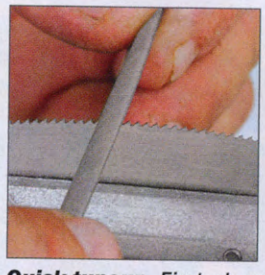
For initial assembly, you'll need blue masking tape. It has some stretch to it, so when you pull on it as you apply it, it draws the pieces together tightly. It also peels off easily. Moisture-activated veneer tape goes on next and stays on until the veneer is applied. I prefer the wide, thin variety (34-gram, 50 mm veneer tape; from veneersystems.com), which covers more ground and is easier to remove after your panel is done and dry.

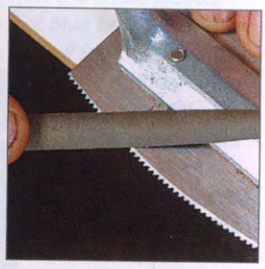


VENEER SAW

You can use a razor knife or a sharp veneer saw to do the cutting, but I greatly prefer the veneer saw because it cuts quickly, and doesn't tend to follow the grain of the veneer and wander off the cut line. Veneer saws are inexpensive, but they require a quick tuneup (see photos, right) with a fine file. It only takes a few minutes, and then you are ready to make perfect cuts.







Quick tuneup. *First, sharpen the teeth with a fine file (left), following the angles already established. Then bevel the outside edge (right) to bring each tooth to a sharp point. Last, knock the burr off the back.*

Online Extra

To watch a video on sharpening a veneer saw, go to **FineWoodworking.com/extras.**

Photos, except where noted: staff

From strips to stripes to squares

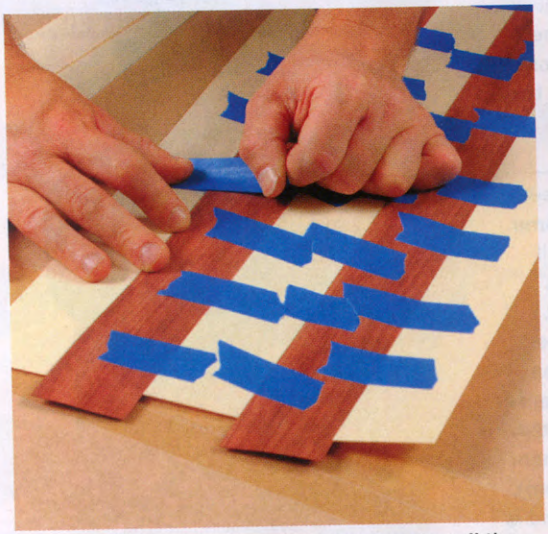
PRECISE STRIPS

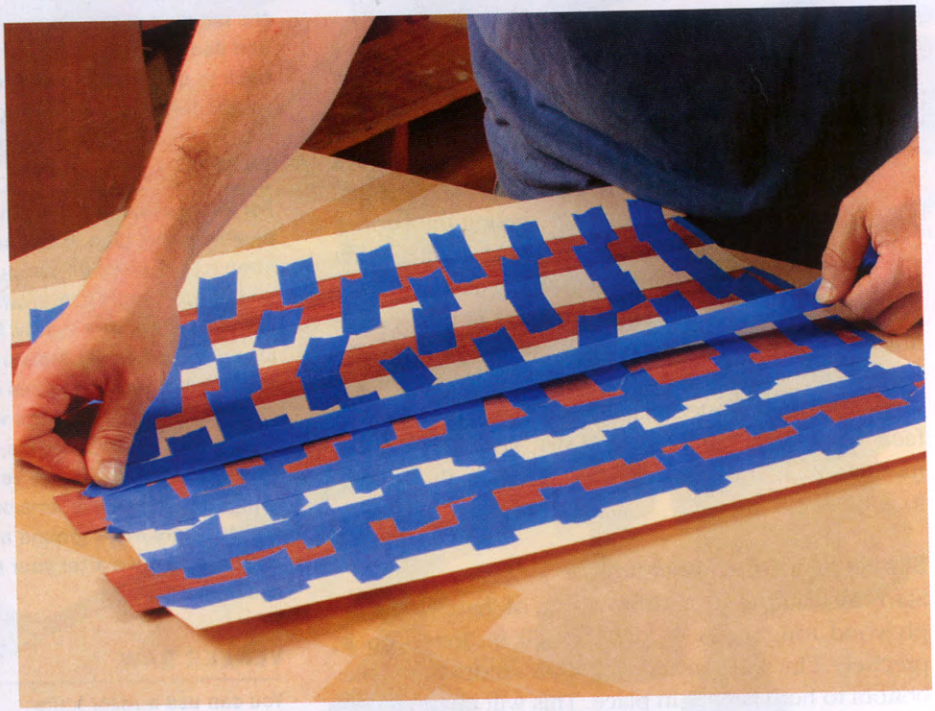
Straightedge doubles as a template. *Make a plywood guide exactly as wide as your desired squares, and use it to guide a sharp veneer saw. Glue sandpaper on the bottom to keep the guide from slipping. For each new strip, line up the guide with the edge you just cut, and simply saw along the opposite side.*

cut edge of the veneer and cut the first 2-in. strip. Repeat this process, using the straightedge as the sizing guide, until you have four dark strips and five light strips or five dark and four light—it doesn't really matter. Ensure that all of the strips have clean edges free of tearout and chips, and replace any damaged strips.

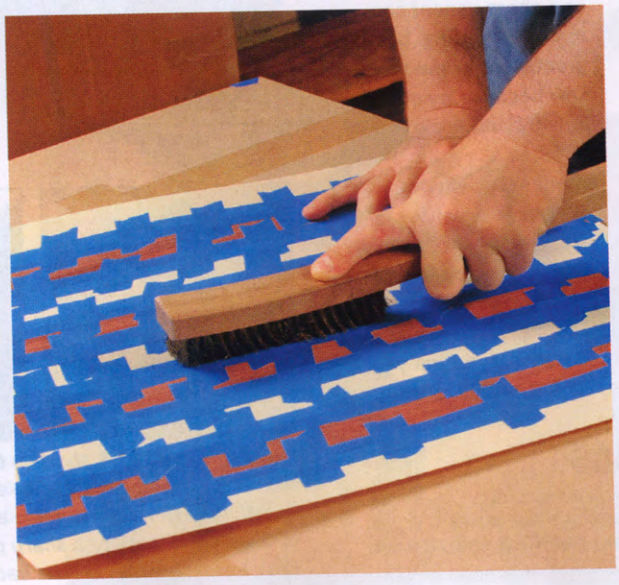
Strips become squares

Now use blue masking tape to create an array of alternating strips, applying the tape on the glue face, where you did your cutting. Start by just taping across the joints every 2 in. or so, and then run long pieces of tape along the joints.





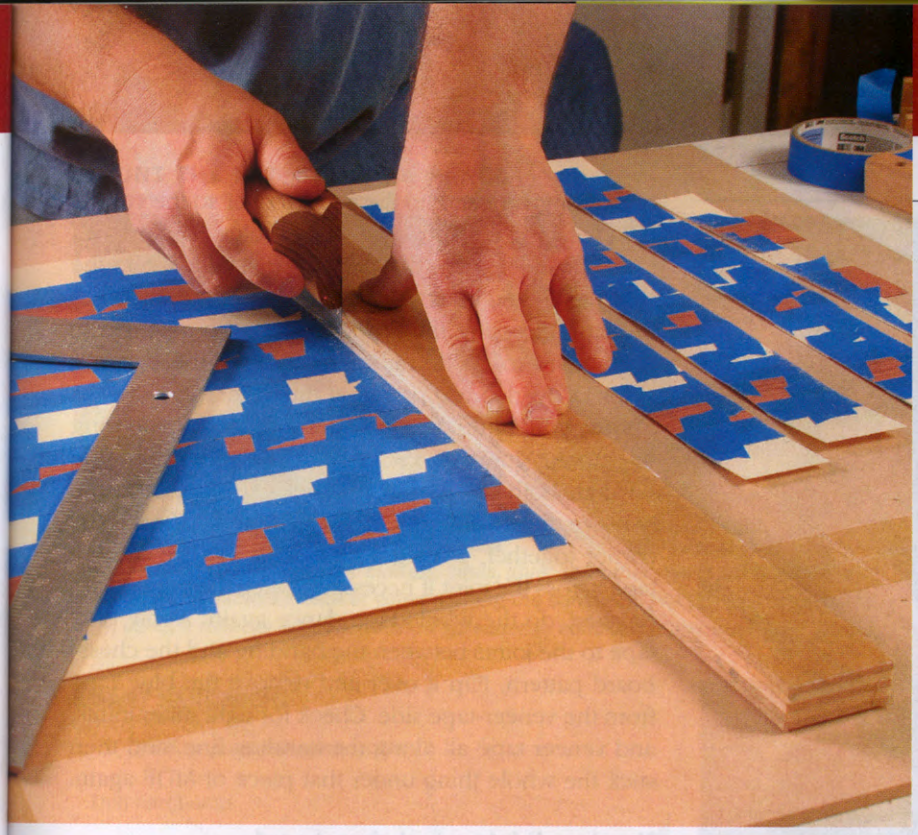
Tape the strips together. *Use blue tape to pull the strips together tightly (above) and then tape each seam (right). Alternate four of one color with five of the other; it doesn't matter which.*



Burnish for a better bond. *Here's a tip for both blue tape and veneer tape: Burnish them with a brass-bristle brush after applying, and they will hold much better.*

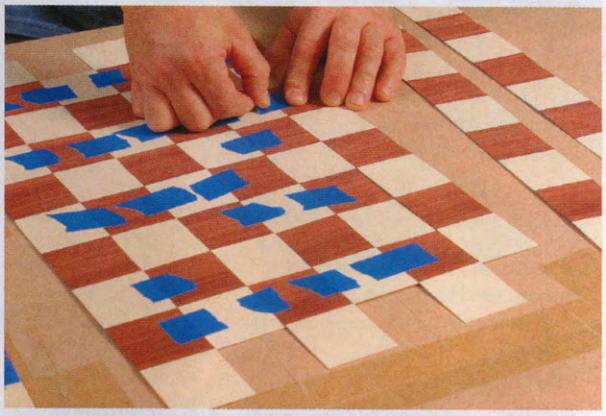
The next step is to square off one end of the veneer sheet. This is critical, so use an accurate square to line up your guide. Now use the guide to crosscut 2-in.-wide strips from the veneer sheet until you have eight equal strips of alternating squares.

All of the strips now need to be flipped over to the show face so you can see the veneer and align the squares when taping. Just flip one strip at a time end for end so they stay in order and the grain remains aligned. Now slide every other strip down one square to create the chessboard pattern. Use more blue tape to join the strips one at a time, being careful to align the intersections of the squares. Use enough tape to hold the joints together but don't run tape along the entire joint at this time. Peel away the overhanging squares that remain outside the playing surface and you have your chessboard pattern. These blue tape strips on your show face are



THE CHESSBOARD EMERGES

Crosscut the strips. *Use the guide again, setting up the first cut with a framing square.*



Blue tape for assembly. *Keep the strips in order as you create the chessboard pattern. Work on the show face, which allows you to see the alignment clearly. Just a few pieces of tape are fine here, and then flip to the glue face and put blue tape both across the seams and along them.*

for alignment only, so your taping is far from over. It goes quickly, though.

Whole lotta taping

To get the veneer tape where it belongs, you need to flip the pattern over again and cover the other side with blue tape, pulling it across the joints first and then putting long strips along the joints.

Now flip it over once more and remove the small amount of blue tape from the show face. Then apply moist veneer tape to this face one long strip at a time, making sure the strips overlap slightly and cover the entire chessboard. When all the wet strips are in place and burnished, place the entire veneer assembly under a piece of MDF or plywood for a few hours. Otherwise the wet tape will distort the veneer and pull the squares apart as it dries.

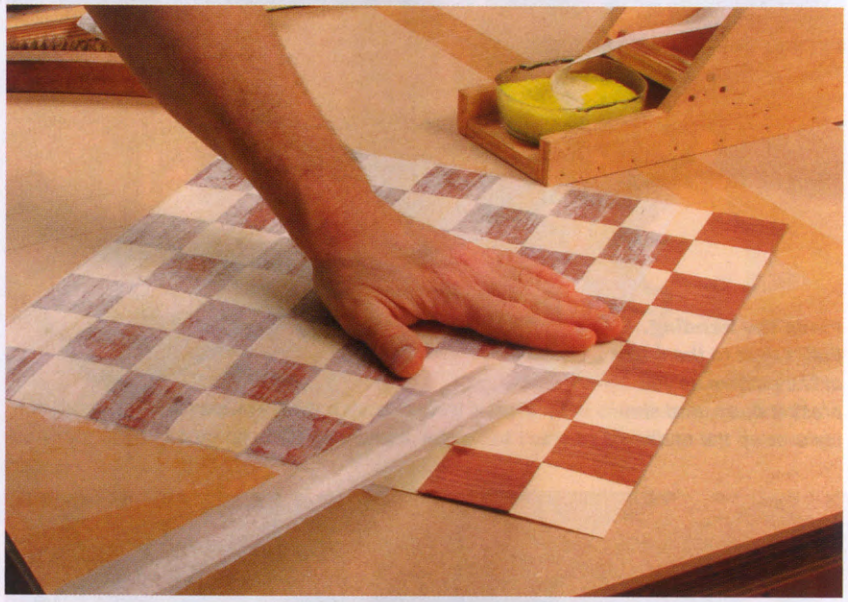
After the tape has dried, trim off any overhanging pieces with a razor knife, and remove all of the remaining blue tape from the glue face.

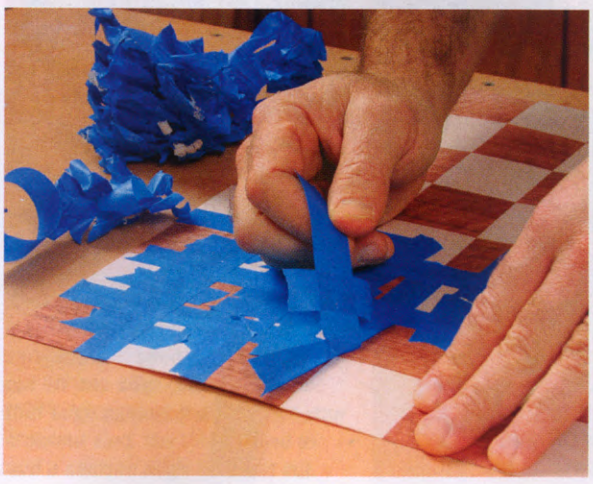
Tips for a handsome border

A nice way to create a transition between solid-wood edging and chessboard squares is to add a decorative veneer banding, in a color that contrasts with both chessboard colors and the edging. Black is an easy choice, but any contrasting veneer will create a transition.

Before you add any decorative banding, it is likely that the outside edges of the chessboard pattern will need to be straightened slightly. Line up the straightedge with each side of the pattern and trim just enough veneer to clean up any misalignment of the squares.

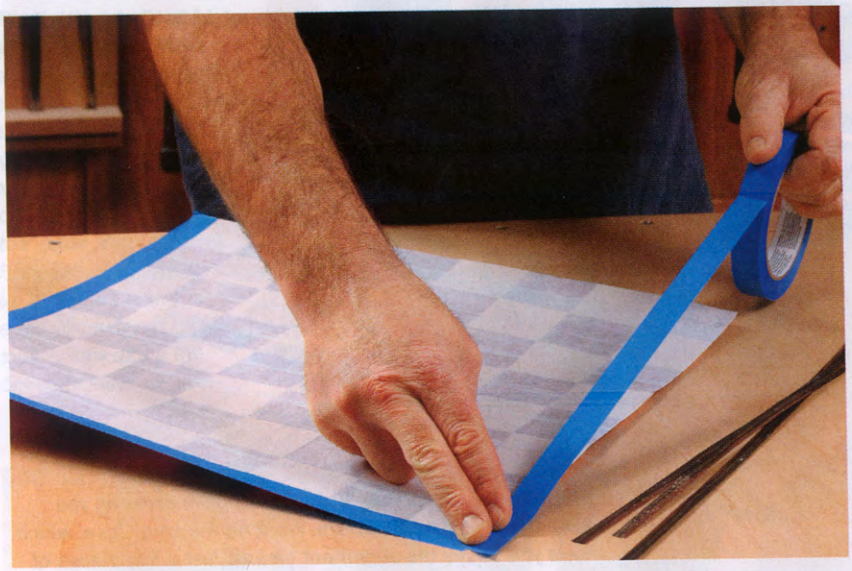
Now, using your guide, slice four ¼-in.-wide strips



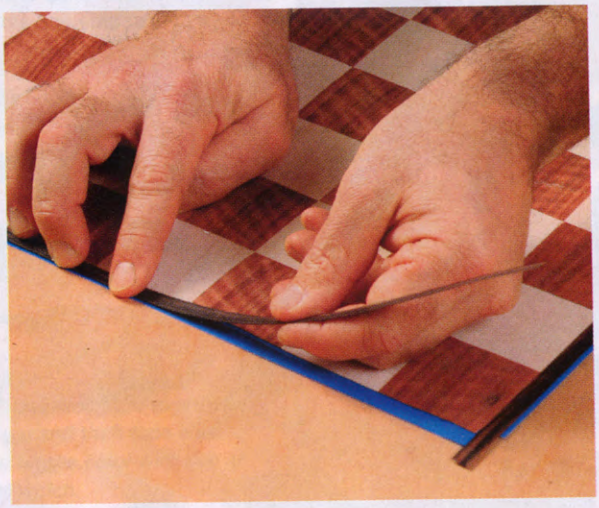


Veneer tape locks in the pattern. *Peel off the small pieces of blue tape from the show face. Then veneer-tape the entire surface (above), overlapping the pieces slightly and trimming away the excess. Draw the tape across a wet sponge to dampen it. After the veneer tape has dried, remove the blue tape from the opposite face (left).*

ADD MITERED BANDING

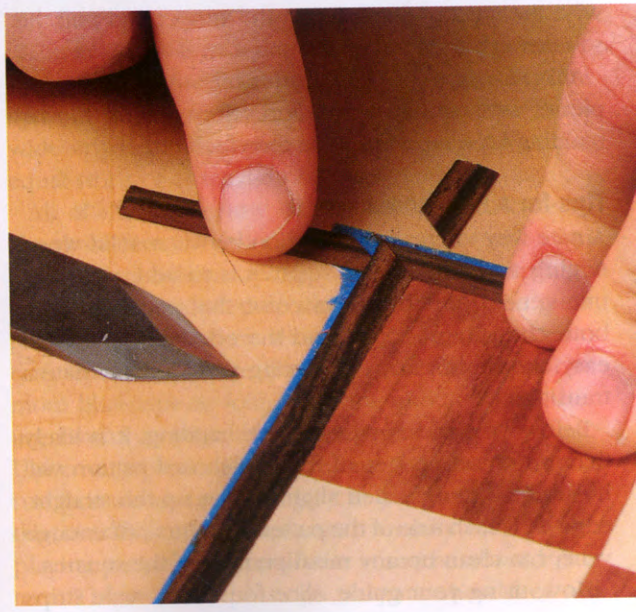


Blue tape again. *Put a strip around each edge of the show face, leaving about half of the tape overhanging. Then flip the pattern over.*



Place the banding. *Pull it tight to the edges of the pattern as you press it down, and simply overlap the ends.*

Cutting guide strikes again. *Line up your cutting guide with the corners of the overlap, and use a sharp knife to cut through both layers (right). Remove the waste pieces, and you should have a perfect miter (far right). Do the blue-tape dance again to get veneer tape on the show face and you are ready to lay up the panel.*



of banding veneer. Flip the pattern over so the veneer tape is facing up and lay a strip of blue tape around the perimeter leaving about half overhanging. Flip the sheet again and begin sticking the banding strips onto the tape, pressing the banding strips up against the chessboard to create tight joints. Allow the banding strips to overlap each other at the corners.

Now you miter the corners simply by aligning the cutting guide at 45° on each corner and cutting through both pieces of banding with a razor knife. Remove the excess pieces, and then press the mitered corner together, pulling it tight with a piece of blue tape across the joint if necessary. Once the corners are finished, do the whole tape dance again. Apply blue tape to the joints between the banding and the chessboard pattern. Flip it over and remove the blue tape from the veneer-tape side. Check for tight miter joints, and veneer tape all along the banding line, and then stick the whole thing under that piece of MDF again.

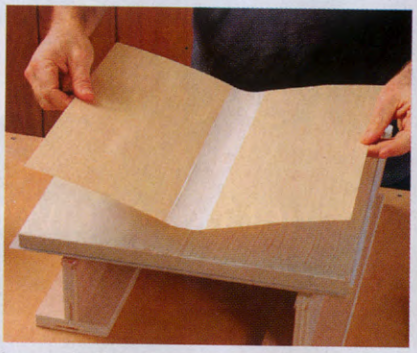
Now turn it into a real chessboard

Cut your MDF substrate as close as possible to the size of the veneer pattern but not smaller, and join and cut a backer veneer too. Normal yellow glue works fine, and the panel is small enough that you can use clamps to do the pressing, as opposed to a vacuum bag. Scuff-sand the MDF on both sides to help with adhesion.

Use MDF or particleboard cauls for the glue-up, a layer of thin cardboard to spread the pressure, and thin plastic sheeting to resist the glue. You'll need plenty of clamps, and either some deep-reach versions or bowed cauls to get pressure in the center of the panel.

Apply an even layer of glue, and then carefully place your veneer (tape side up) on the substrate and press it all over to help secure it. Then quickly tape it in place

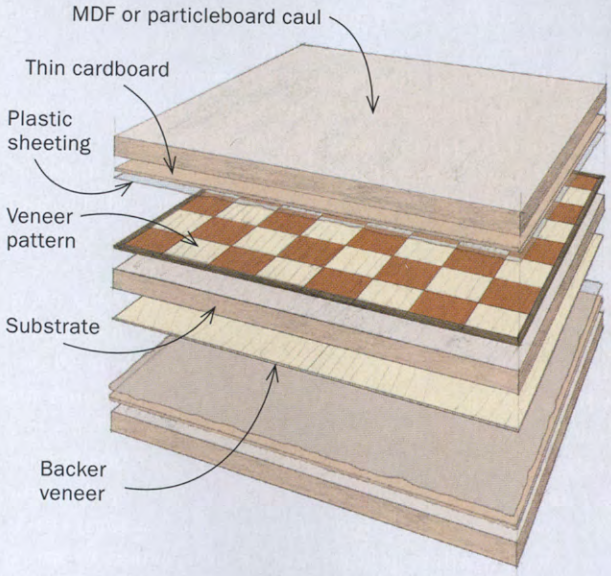
MOUNT THE PATTERN ON A PANEL



Veneer both sides. *Get your clamps, cauls, glue, and other materials together, and start with the backside veneer when making the sandwich. Put glue on the substrate only, using a roller or a finely notched spreader to control the amount.*

Lock it down quickly. *Wrap a few pieces of tape around the bottom and top veneers to keep them from curling or sliding around.*

SMART SANDWICH



You don't need a vacuum bag. *A vacuum bag is easier, but clamps and cauls will work, too. If you come up short on clamps, add extra cauls to distribute the pressure.*

with several pieces of blue tape wrapped from the backer veneer over the top of the chessboard veneer.

After the panel is dry, remove the veneer tape. Wet the surface with a sponge, allow the tape to soften, then peel and scrape it off. You'll also need to clean up the edges of the panel before gluing on solid-wood edging. I find it easiest to sand one edge flat with a hard block and some 60-grit paper, before placing that flat reference edge against the fence of a crosscut sled on the tablesaw. Trim 1/16 in. off each of the four edges, or whatever it takes to get the miters of the veneer edging to line up perfectly at the corners.

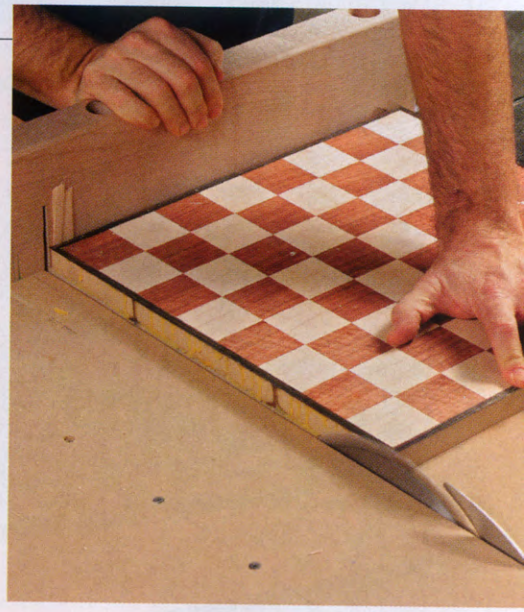
Then fit and glue mitered pieces of solid wood to the edges, just as you would with any veneered or plywood tabletop.

Chessboards are beautiful and functional, and look great in a variety of tables. □

Craig Thibodeau is a furniture maker in San Diego.

CLEAN UP THE EDGES

Use a crosscut sled. *Start by scraping and sanding the squeeze-out off one edge (above), and put that edge against the fence on your crosscut sled. You might need to add a shim to align this first cut.*

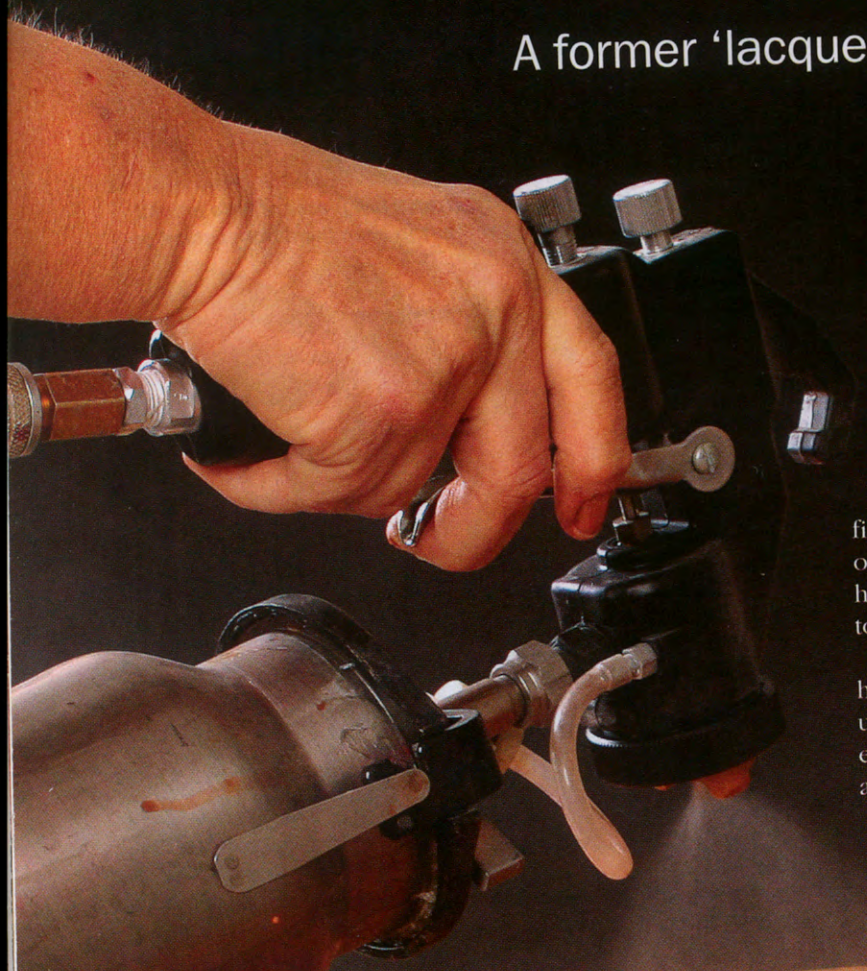


Drawing: Kelly J. Dunton

Switch to Spraying Water-Based Finishes

A former 'lacquer head' gives tips on going green

BY TERI MASASCHI



The first time I used a water-based finish, I promised it would be my last. In the late 1980s and 1990s, companies launched a mass of water-based finishes and used the consumer as the testing lab. I wasn't alone in finding the new finishes too difficult, too finicky, and too unpredictable.

Twenty years later, the air-quality laws are more stringent than ever and the end is approaching fast for many solvent-based finishes. The good news is that during this period, the formulators of water-based finishes have been busy. As a hardened "lacquer head," I never thought you'd hear me say this, but when it comes to water-based finishes, I like what I have used recently.

Switching to water-based finishes has been a relief: No more headache or solvent hangover at the end of a long day, and far less use of flammable solvents. However, the transition has not been easy, in part because solvent lacquer and water-based lacquer are as alike chemically as chalk and cheese (see "Lacquer: What's in a name?" on the next page). Therefore, fellow lacquer heads have to forget much of what they know and in some ways become novice sprayers again. However steep the learning curve, it is well worth the climb. And for newcomers to spray-

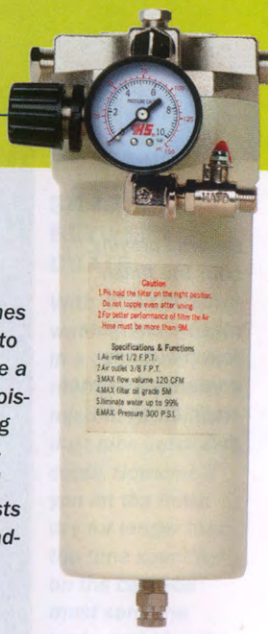
CHOOSE YOUR GUN CAREFULLY

Water-based finishes will corrode an aluminum cup. Instead, make sure the cup and the gun's fluid passages are either stainless steel or plastic. 3M's PPS system of plastic cups with disposable liners works well (far right).

ALUMINUM STAINLESS STEEL PLASTIC

CLEAR THE AIR

Water-based finishes are very sensitive to contamination. Use a filter to remove moisture and oil coming from the compressor. This combined regulator/filter costs $145 at homestead-finishingproducts.com.



ing, here is your chance to finally achieve professional-looking finishes without the need for an explosion-proof spray booth.

The right tools and conditions are critical

One thing that hasn't changed is that water-based finishes remain generally fussier than solvent-based ones. Your spray gun needs to have either stainless-steel or plastic fluid passages because water-based finishes corrode aluminum quickly.

Everything must be clean, clean, clean! Keep the surface contaminant-free, the gun dedicated to water-based finishes, the air source (if compressor driven) filtered to remove moisture and oil, and the spray gun's cup clean (a disposable lining is best).

I have sprayed solvent-based finish as low as 45°F and gotten away with it, but water-based finishes are more temperature sensitive. The safe range is about 60° to 80°F.

One thing you don't have to worry about is compatibility with no-load sandpaper, which has stearates to prevent the paper from gumming up. Stearates used to leave a waxy coating that fouled up water-based finishes, but modern stearates don't have this problem.

Anyone who has refinished old furniture is familiar with "fish eye," the shallow craters in the finish caused by contaminants, in particular silicone. You can add a fish-eye destroyer to solvent-based finishes but not to water-based ones, so if you are working on antique furniture, be prepared to use shellac as a sealer coat over the contaminants first. On most woods it isn't necessary to pre-raise the grain before spraying a water-based finish, but you should on gnarly or figured wood.

NO TACK CLOTH, PLEASE

Use a damp cotton or microfiber cloth to wipe away sanding dust. A sticky tack cloth can leave residue that will repel water-based finishes.

How to warm up the color

One of the main differences between solvent- and water-based finishes is the latter's cold appearance and inability to warm the wood. If you are finishing maple, birch, ash, or any white wood,

Not your dad's lacquer

For 80 years, nitrocellulose lacquer has been the benchmark against which all other finishes are found wanting. Each coat melts into the previous one, creating a single film of finish no matter how many coats are applied. This creates the dimensional and reflective sheen that allows you to look down into the beauty of the wood.

Trying to associate their new finishes with the industry standard, manufacturers started calling many water-based formulations lacquer. However, the ingredients of the two have nothing in common. Water-based lacquers usually consist of a glycol solvent, an acrylic resin, a glycol ether, and various leveling agents, defoamers, and other performance enhancers. This is not your father's lacquer but it will, most likely, be yours.

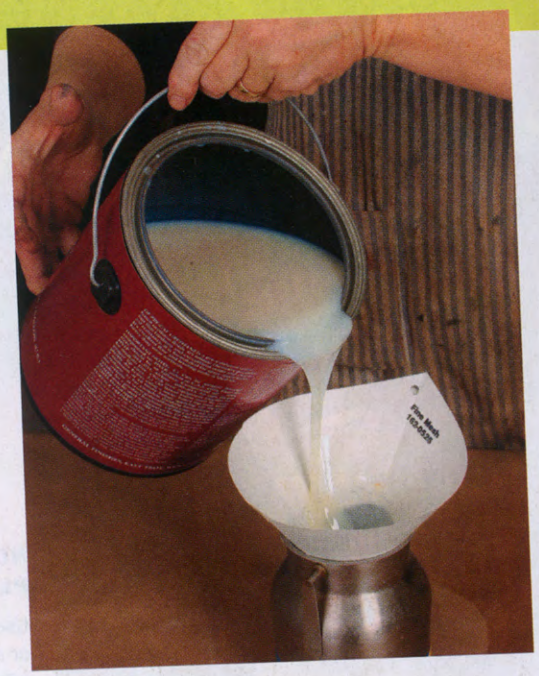
—T. M.

Photos: Mark Schofield

SECRETS OF SUCCESS

FILTER FIRST

Before spraying, pour the finish through a fine-mesh paint filter to remove any contaminants that could block the gun.



TIP

2 WAYS TO WARM UP THE COLOR

Seal first with tinted shellac. *If you don't like the cool look of a water-based finish on some darker woods, warm up the wood by applying dewaxed shellac tinted with a dye concentrate (homesteadfinishingproducts.com) as a sealer.*

Or tint the finish. *You can tint the finish with one or more dye concentrates (woodworker.com). If you use water-soluble dye powders, mix the dye in some warm water before adding it.*

water-based can be perfect. On cherry, walnut, mahogany, or figured woods (including maple), it isn't. You can solve the problem by tinting the coating with an amber dye to mimic the tone of solvent lacquers and oil-based products. But water-based finishes have a milky appearance at first, making it hard to judge the tone.

A better approach is to coat the bare wood with dewaxed shellac. You can tint light-colored shellac such as beige or blond, or use darker grades such as orange or garnet. This eliminates any need to pre-raise the grain. Also, if you wipe on a coat of oil to enhance a wood's figure, apply a coat of dewaxed shellac before using a water-based finish.

Big pluses: Faster build, fewer fumes

If the preparations for spraying water-based finishes are more elaborate than for their solvent siblings, the actual spraying is easier. Unlike solvent-based lacquers, which tend to be sticky and syrupy, water-based coatings spray thin and wet but have excellent "cling," which means fewer sags and runs. They dry in about the same amount of time as solvent-based ones—30 to 45 minutes. With any type of finish, the number of coats is subjective. However, because the solids content of water-based finishes is generally higher than for solvent-based ones, you will be pleasantly surprised after only the second coat. This faster build offsets the fact that water-based finishes cost 20% to 30% more.

Use a small setup for the gun, such as Accuspray's 0.043-in. needle and a No. 5 aircap. You could use a No. 7 aircap for a large surface. After prolonged spraying, crusted coating may build up on your

NO FANCY BOOTH NEEDED

If you don't have a purpose-built spray booth like this one, build a simple knock-down one. An exhaust fan draws air through the filters, pulling away overspray.

Online Extra

To learn how to make a simple spray booth, go to **FineWoodworking.com/extras.**

SAND BETWEEN COATS

With a quick-drying, water-based finish in a clean environment, you shouldn't need to sand away dust nibs between coats. However, if you let the finish dry for longer than the time specified on the can, you must sand the surface to give the next coat a mechanical bond.

BROWN BAG: A PRO'S SECRET WEAPON

You can use brown shopping-bag paper to smooth and polish the last coat of a satin or semi-gloss water-based finish.

spray gun. I apply a thin film of Vaseline on the horns of the air cap first, so I can flick off the buildup later with my fingernail.

Water-based finishes are safer—The moment when solvent finishes are the most dangerous is not when spraying them—you're wearing a respirator and the fan is drawing off the fumes—but when they have just dried. You've removed your respirator and are scuff-sanding the surface. The fan has been shut off, but all the solvents are lifting off the surface and hanging heavy in the air. This is incredibly lethal exposure. Water-based products give off gas, too, but are far less toxic. The gas has a smell similar to mild ammonia.

Rubbing out and cleaning up

Most water-based materials contain a blend of resins such as acrylics and urethanes that offers durability and clarity, and you can often get a perfect finish off the gun, particularly for a satin sheen.

However, if you want a polished-out surface, don't assume that these coatings are going to behave like solvent lacquer. Successive coats do not melt completely into the previous layer. In this way, water-based finishes are more like solvent-based varnishes or polyurethanes in that the finish builds in layers rather than melting into a single film. Consequently, there is a higher risk of "witness lines" when you polish through one coat into another.

The solution is to apply two or three coats and then completely flatten the surface. This will create numerous white witness lines, but they will disappear when the next couple of coats are applied. You can then polish the last coat with less risk of burning through the layers. Cure time for a successful rubout is the same as for solvent-based finishes: A minimum of 200 hours is preferable.

When you are done spraying, flush and clean the gun with water and ammonia, and then flush it with alcohol or lacquer thinner (you can't escape flammable solvents entirely).

Go ahead and use the new generation of water-based finishes. Just don't try them at the last moment! It is much less stressful to use test samples, and get a feel for these products first. □

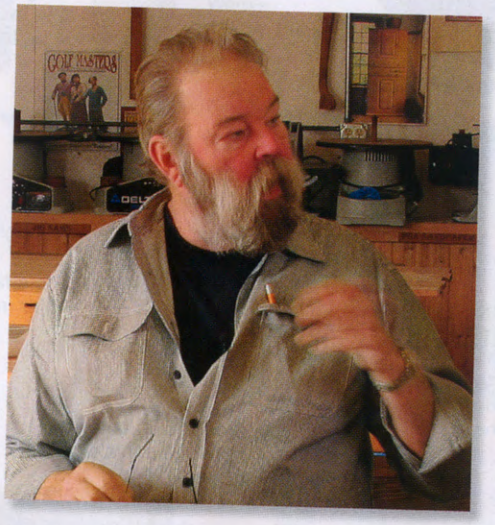
Teri Masaschi is a professional finisher who lives near Albuquerque, N.M.

Garry Bennett's Un-Trestle Table

Unconventional design is a portrait of the man

BY ASA CHRISTIANA

Garry Bennett has a few complaints. One is people using his middle name, Knox, which stuck somehow despite his best efforts. Another is people who know him only for his "Nail Cabinet," a fine case piece with a nail driven into it, which appeared on the back cover of *FWW* #24 and drew a small avalanche of letters, both pro and con. All I could get out of him on the subject was, "I planned to make a precious thing less precious."

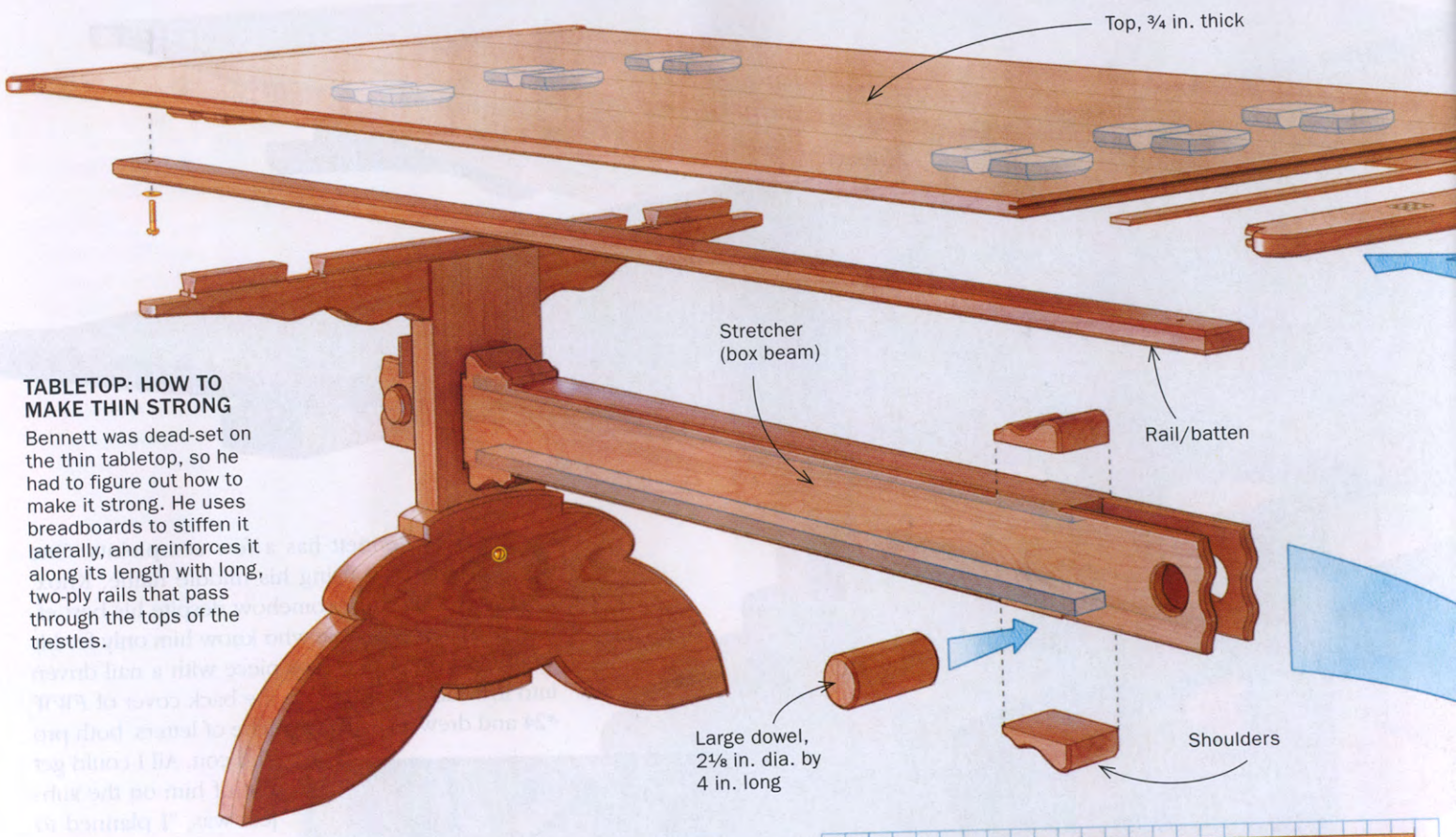


But what he seems most concerned about is the shrinking numbers of fellow studio furniture makers, those who attempt to make art and work purely on spec. "My kind of guys are dying off," he says.

To understand how Bennett has avoided commissions and been left alone to follow his muse, you have to know his story. Trained at California College of Arts and Crafts from 1958 to 1962, he worked as a sculptor, painter, and jewelry maker through the '60s and '70s. In 1967, he created a small line of "roach clips" on a whim, and sent samples to "head shops" (remember those?) around the country, trusting owners to return the proceeds or unsold product. Within weeks, he had a pile of cash and a stack of orders. Sometime later, he began to stamp out peace signs in his 70-man shop in Oakland, Calif. As the first business to mass-produce each of these hippie essentials, he made a lot of money. So when he turned his attention to furniture in the mid-'70s, Bennett had some advantages: a big nest egg, art training, metalworking skills, and plenty of space to work in.

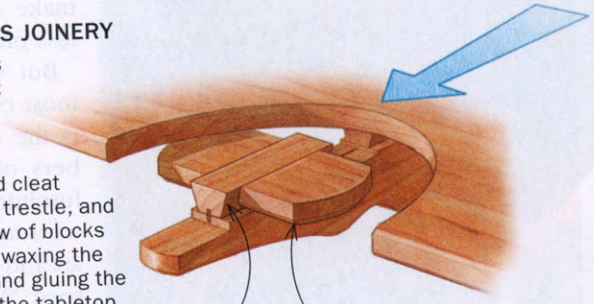
From the beginning, Bennett's funky, mixed-media

Photo, this page (table): Garry Chilluffo



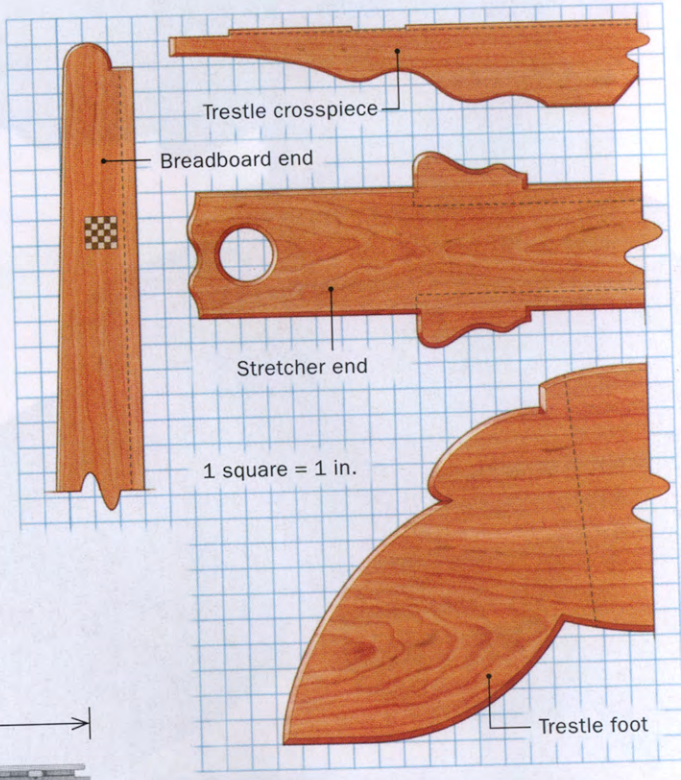
TABLETOP: HOW TO MAKE THIN STRONG

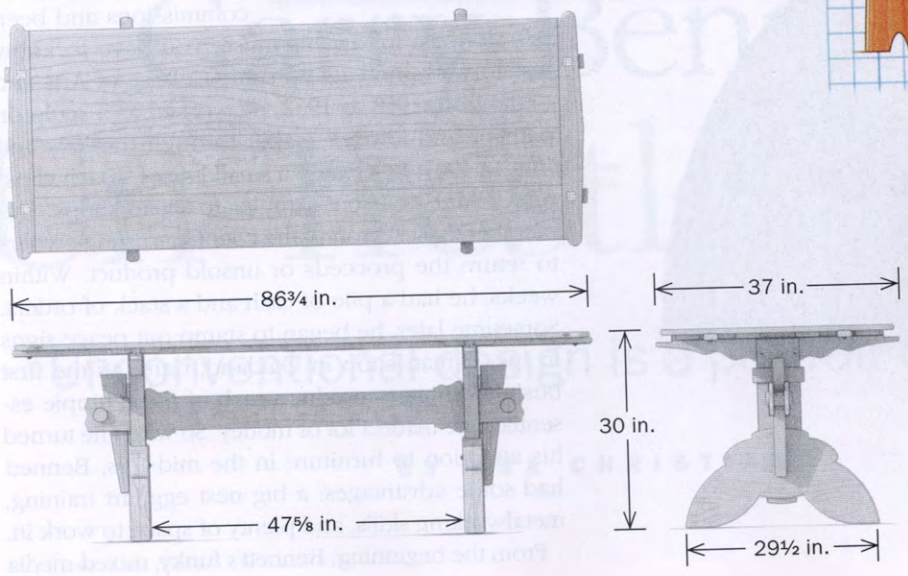
Bennett was dead-set on the thin tabletop, so he had to figure out how to make it strong. He uses breadboards to stiffen it laterally, and reinforces it along its length with long, two-ply rails that pass through the tops of the trestles.



MORE INGENIOUS JOINERY

The thin top poses another challenge: attaching the base. Bennett solved that by gluing a dovetailed cleat to the top of each trestle, and then nestling a row of blocks against the cleat, waxing the mating surfaces and gluing the blocks directly to the tabletop. This allows the tabletop to be slid off the base.





OVERALL MEASUREMENTS

Bennett works by feel, dry-fitting the base to see exactly how far apart the trestle should go and how big to cut the tabletop. But he never compromises function, and always designs the table for eight people: at least 7 ft. long, with the trestles roughly 4 ft. apart, leaving a comfortable overhang for a sitter at each end. The width is between 30 and 38 in.

Drawings: John Hartman; photos (facing page and p 77, right): Kelly J. Dunton

CHALLENGES ARE JUST OPPORTUNITIES

Bennett wanted a thin top, to focus attention on the base, but that choice created a number of construction challenges. He overcame each one, and also found innovative and eye-catching ways to handle the joinery below.

UNIQUE WEDGE SYSTEM

Bennett holds in his huge wedges with a large dowel. Without the removable dowel, it would be impossible to get the wedge into position. The dowel also means he doesn't have to create an angled mortise for the wedge.

BUILT-UP JOINERY

Rather than cut curved shoulders and a long tenon on the fat trestle posts, Bennett just glues on thin outer pieces, fitting them first to the curved feet, and then using a bearing-guided bit to cut the mortise in the post. The shoulders on the stretcher are added on, too, and the stretcher's box-like anatomy makes it easy to extend two sides for the wedge joinery.

A rare occasion

Aside from his shows at galleries and museums, it is rare to find Bennett outside his beloved Oakland, let alone teaching a class. But he has made a few exceptions over the years, each time to build a trestle table for charity.

The most recent of these events happened in 2008, at Marc Adams School of Woodworking, where he recruited some of the school's skilled regulars to help him build another example of his versatile table. "[The project] is conducive to a lot of people working on it, because it's big," he says.

Associate art director Kelly Dunton and I spent a week with Bennett in Indiana, taking notes for this article and shooting video to document Garry's generous, down-to-earth presence, and the heartfelt spirit of the event. —*A.C.*

Online Extra

For a free video of our wonderful week building this table with Garry Bennett, go to **FineWoodworking.com/extras.**

Audacious lines. *"Checkerboard Trestle Table" (1985) has especially beautiful curves, and an eye-catching stretcher.*

BENNETT'S CHANGEABLE TABLE

Garry Bennett built many versions of his trestle table in the 1980s, in materials ranging from wood to steel and aluminum, and together they offer a window into the furniture maker's fearlessness and imagination. They also show how an artist, once he or she finds a fruitful design, shakes it and works it over until every possibility has tumbled out.

Bennett came to furniture making via art school, as opposed to traditional woodworkers like James Krenov and Tage Frid, who entered through a classic apprenticeship. "Some people rely on technique too much," Bennett said. "It doesn't always look good, but, jeez, it's well put together." As for the future of fine furniture, he made one prediction: "It ain't gonna be all wood."

Fun with joinery. *The trestle joinery system is very versatile, as seen in this desk, table, and bench (from left to right). Bennett is as comfortable working metal and glass as he is wood, and he treats each material with equal thoughtfulness.*

Photos, this page: Greg Benson (top); Nicolay Zurek (bottom)

"THE WAY I WORK, I DON'T THINK A LOT," BENNETT SAID. "I WORK PRETTY EMOTIONALLY: 'THAT LOOKS GOOD, DO IT.'"

pieces were a big hit—a rare thing in the studio-furniture world. For 20 years, everything sold out. At 76, you can still find him in his studio every day, creating usable art, lubricating his muse with gin, and entertaining his artist friends.

Bennett's best piece?

Bennett's creativity extends from jewelry, where he made his start, to lighting and furniture in an ever-changing parade of materials and modes. But his trestle table hews closest to "fine" woodworking, and it is the piece he has repeated most often. It is also the one project he has taught at workshops.

With an art-school background, like fellow studio furniture pioneers Wendell Castle and Judy McKie, Bennett came at the trestle form the same way he came at the craft of woodworking, by ignoring its rules and standing it on its head. He traded in the usual thick top for a paper-thin one, setting it on a cartoonishly massive base. The result is an artist's playground, with curves and joinery that invite interpretation. "The way I work, I don't think a lot," Bennett said. "I work pretty emotionally: 'That looks good, do it.'"

Other than sketching curves directly onto his workpieces, Bennett uses no drawings as he builds: "I have an idea in my head, and just start working it." His focus always is lines and shapes, as opposed to wood or joinery. "I view all my work as line. When I'm working on a piece, I'm looking at it dead-end for line [from the end], dead-on for line [from the front] and three-quarter view [at an angle]."

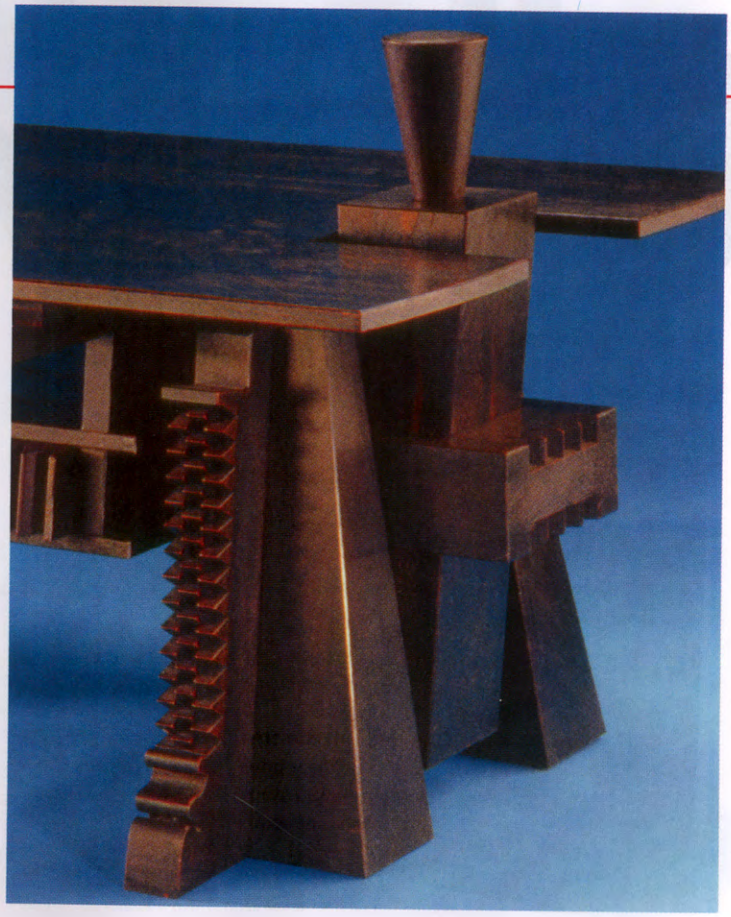
Follow in his footsteps

I spent the better part of a week with Bennett in Indiana, at both benches and bars, and it was one of the highlights of my career with *Fine Woodworking*.

While Bennett admitted it is much harder these days to sell artistic furniture made on spec, I left inspired to follow his lead, to trust my own intuition for both design and construction. As a hobbyist, with no pressure to make money from my work, I have no excuses.

In that spirit, Bennett is sharing his table design with you (see pp. 78-79), to inspire you to ignore the rules and dare you to create art. □

Asa Christiana is the editor.

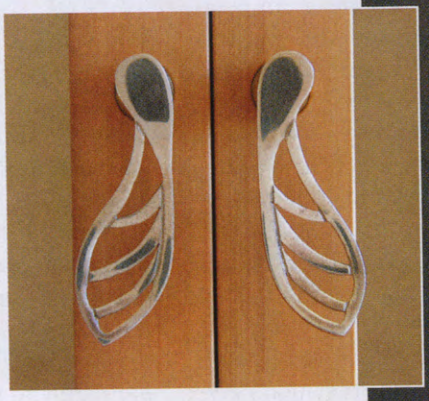


Photos, this page: Nicolay Zurek (left); M. Lee Fatherree (right)

readers gallery

BARBARA SHELTON
Victoria, B.C., Canada

James Krenov's work was the inspiration for this boxwood and sycamore cabinet on a kwila stand (10½ in. deep by 18⅛ in. wide by 52⅛ in. tall). The marquetry is sycamore leaves and seeds, made with sycamore wood, and the handmade silver pulls mimic the seeds as well. Shelton designed the pulls in collaboration with jeweler Erin Dolman, who made them. The finish is shellac. PHOTOS: INGEBORG SUZANNE (CABINET); MICHAL OPALSKI (PULLS)



MICHEL CHARBONNEAU
Saint-Denis-Sur-Richelieu, Que., Canada

Charbonneau's solid-birch cabinet is 18 in. deep by 32 in. wide by 36 in. tall. He says that the most time-consuming aspects of building the piece were carving the many rosettes and finishing it using aniline dye, gel stain, and a hand-rubbed varnish.

C.L. PHILLIPS
New London, Conn.

This Art Nouveau bed (67 in. wide by 85 in. long by 56 in. tall) is based on a design from the period by A. Landry, but Phillips modified it by using lighter woods (Swiss pear and bird's-eye maple instead of the walnut and ash in the original) and adding carved foliage and calla lilies. The finish is shellac.

ADAM WEBB
Whitianga, New Zealand

Webb wanted to convey a feeling of lightness and warmth in this contemporary take on a Shaker hall table. The table is 14½ in. deep by 59 in. wide by 34 in. tall. The cherry is finished with Danish oil; the maple with Briwax only.

PHOTO: DANIEL ALLEN

JOHN LEE
Maynooth, County Kildare, Ireland

This chest of drawers, made of European white oak, is part of Lee's series of sculptural furniture that combines dramatic curves and texturing. After he built the shaped cabinet, he added the flutes and sandblasted the wood to enhance the grain. The drawers open with a push-front mechanism. Finished with lacquer, the chest is 28¾ in. deep by 84¼ in. wide by 36¼ in. tall.

PHOTO: ROLAND PASCHOFF

readers gallery continued

MICHAEL DISANO
Fairfax Station, Va.

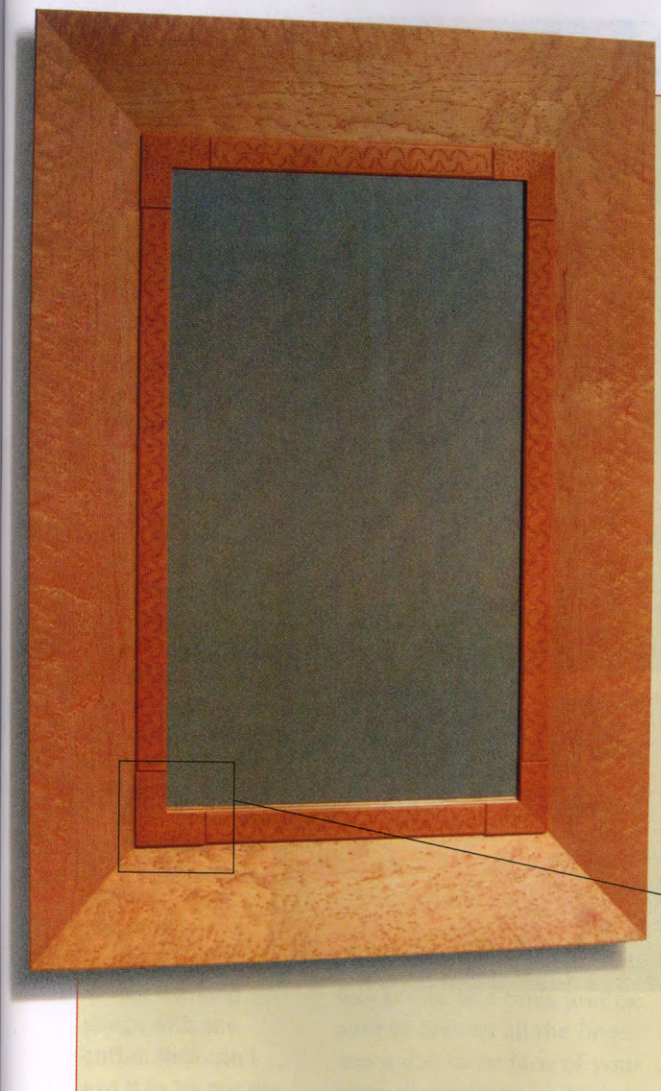
Disano built this cherry and poplar chest of drawers from plans by Carlyle Lynch (1909-1989). Lynch, a woodworker and teacher of woodworking, was known for creating detailed plans of outstanding pieces of 18th and 19th century American furniture. The chest, finished with Danish oil, is 20 in. deep by 39 in. wide by 62 in. tall. Lynch credits Thomas Elfe (mid 18th century) as the original maker. See Lynch's own article on building this chest in *FWW* #81.

ANNETTE KOEHNEN
Warmenhuizen, Netherlands

Koehnen built this chair from European ash during her second year at the College of the Redwoods. She wanted to learn chair design and also used this chair to learn bent-lamination and complicated joinery. Finished with Liberon Finishing Oil, the chair is 37 in. deep by 33 in. wide by 39 in. tall. PHOTO: JOHN BIRCHARD

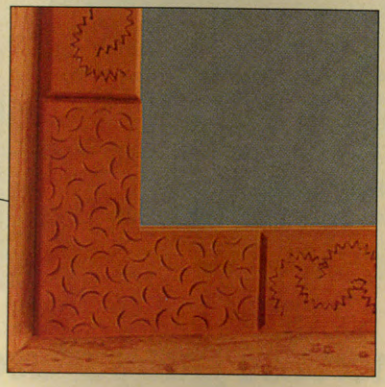
JERRY COUSINS
Weaverville, Calif.

Cousins had long wanted to build a curved-top chest with the lower panels inlaid with tulips, when he stumbled on the perfect piece of claro walnut for the top. He then knew he needed a different wood for the panels, one that would showcase the marquetry but not clash with the swirly walnut grain. He chose straight-grained afromosia. Finished with shellac, lacquer, and wax, the chest is 16 in. deep by 40 in. wide by 25 in. tall. PHOTO: DIANA SHEEN



TIMOTHY COLEMAN
Shelburne, Mass.

Coleman began creating stamped furniture years ago after moving his shop into a space formerly occupied by the Greenfield Steel Stamp Works. He found discarded steel stamps all over his new space, and began playing with them on wood to add detail and texture. For this bird's-eye maple and pear piece (3 in. deep by 24 in. wide by 32 in. tall), Coleman found a leather punch in an antiques store and sharpened it before putting it to work. This mirror is one of six, all from different woods with different patterns on the inner frames. The finish is shellac.



Unlimited potential. *Between wood choices and stamp combinations, the possibilities for unique patterns are endless.*

Simple how-to: *Hit the stamp with a hammer. Coleman tries to be as spontaneous as he can and works with a minimal amount of layout lines.*

RICHARD CHILL COTT
Ruskin, Fla.

Japanese gardens and tatami mats were the inspiration for Chill Cott's mahogany table (60 in. square by 30 in. tall). The tabletop layout reflects the rules for arrangement and size of tatami. These mats are always twice as long as they are wide, and according to tradition, can be laid out auspiciously or inauspiciously. To avoid an inauspicious layout that is said to bring bad fortune, the mats should not be placed in a grid pattern, and there should be no point where the corners of four mats touch. The finish is lacquer. The tiny tree was made by Chris Stiles, using manzanita branches, and Chill Cott found it in a gallery.

Q&A

Match dado set to your saw's power

Q: I am planning to buy a dado set. Should I get a 6-in. or an 8-in. set?

—ROBERT CARSON,
Boston, Mass.

A: I SPOKE WITH SOME OF OUR CONTRIBUTING EDITORS as well as with experts at Amana, Forrest, and Freud. Here is what I learned. First, check your saw's owner's manual. If it specifies a 6-in. dado set, then use that. However, if your saw can take either size dado set, but has an underpowered motor like those in smaller benchtop models, then choose a smaller dado set: It takes less power than an 8-in. set to make the same cut. On a 3-hp cabinet saw, definitely go for an 8-in. dado set. The increased cutting capacity allows you to make a wider variety of joints, like bridle joints deeper than 1⅛ in. (the capacity of a 6-in. dado set), and to use a sled to guide workpieces.

—Vlad Smishkewych is an associate editor.

Expand your joinery with an 8-in. dado set. *Seth Janofsky (top) uses a sled to cut box joints for a tansu cabinet. Because of the sled base's thickness and the length of the box joint, only an 8-in. dado set can handle this task. The same size set is also needed for deep bridle and lap joints (bottom).*

Set stringing deep to increase glue surface

Q: I am making a Federal-style table with stringing on the legs. What size should the stringing be, and how deep should I make the groove?

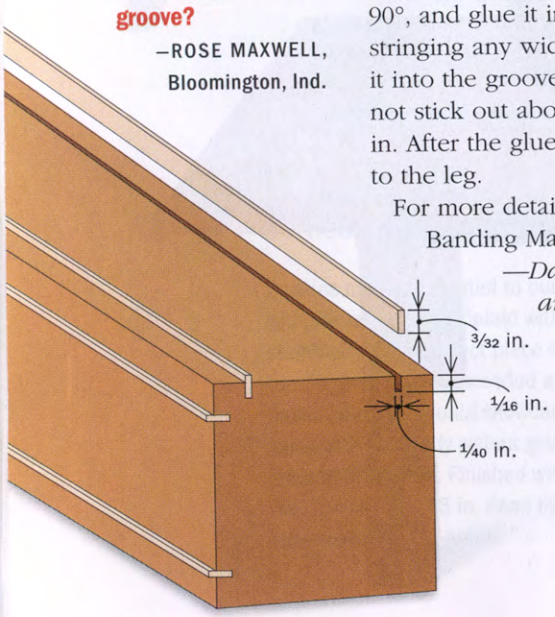
—ROSE MAXWELL,
Bloomington, Ind.

A: NARROW STRINGING LOOKS BEST, so it is typically made from commercial veneer: Strips are cut, turned on edge, and glued into the groove, which is only about 1/40 in. wide. To increase the glue surface, make the groove about 1/16 in. deep.

Cut a strip of veneer 3/32 in. wide, turn it 90°, and glue it into the groove. If you cut the stringing any wider, you'll have trouble pressing it into the groove. If it's any narrower, it might not stick out above the groove after it's pressed in. After the glue is dry, plane or scrape it flush to the leg.

For more detail, see my article "Stringing and Banding Made Easy," in *FWW* #166.

—Dan Faia is the head of the Cabinet and Furniture Making Program at North Bennet Street School.



MAKE STRINGING DEEPER THAN IT IS WIDE

Stringing is made from very thin veneer. Strengthen the glue bond by using a groove that is 1/16 in. deep.

Scrape it flush. *A sharp scraper brings the excess banding flush to the surface and leaves a crisp finish.*

Photos: staff; drawings: Kelly J. Dunton

For accurate joints, always mark from the same face

Q: I'm learning to cut mortise-and-tenon joints by hand, but I only have a marking gauge with one cutter. How can I use it to lay out the joint accurately?

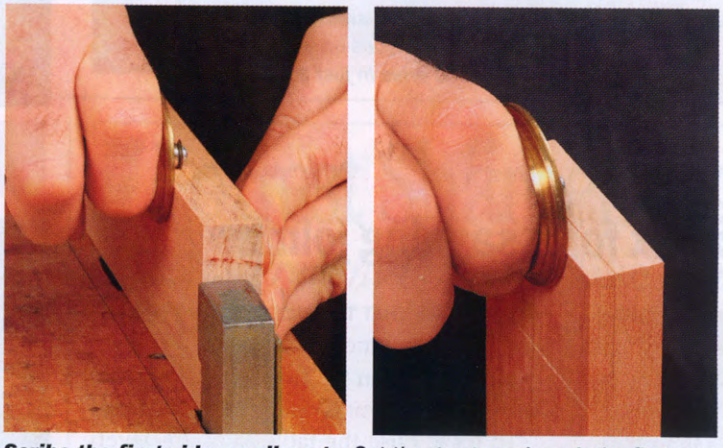
—ISMAEL SALAZAR, Schaumberg, Ill.

A: YOU DON'T NEED A TWO-CUTTER MORTISING GAUGE to lay out this joint. Just mark the two sides of the mortise and tenon one at a time, and be sure to lay out all the lines using the same face of your parts as a reference. That way, the joints will align perfectly even if your stock thickness varies slightly. Although it might seem intuitive to set your marks from each side to ensure a centered tenon, it is more accurate to mark all lines from the same face.

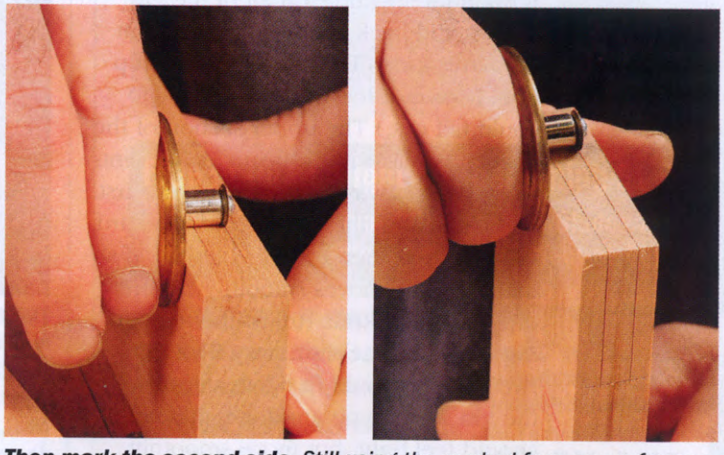
First, mark the front face of each piece using a lumber crayon. Next, set the marking gauge for one side of the mortise and mark all of the mortises. Keep the same setting on the gauge and mark the sides and top of the tenons. Then reset the gauge for the other side of the mortise—the distance between the two gauge lines should be a hair wider than one of your chisels. Now mark the second line on all of the mortises and tenons.

—Garrett Hack is a contributing editor.

Mark the face. *Using a lumber crayon, make a reference mark to keep the parts in order and facing the same way. Then start your layout by scribing the tenon shoulders.*



Scribe the first side on all parts. *Set the gauge and mark the first side of the mortises (left), then move to the first side of the tenons (right).*



Then mark the second side. *Still using the marked face as a reference, set the gauge to the other side of the mortise and mark all of them (left), then mark the other side of the tenons (right).*

Thinned shellac works better

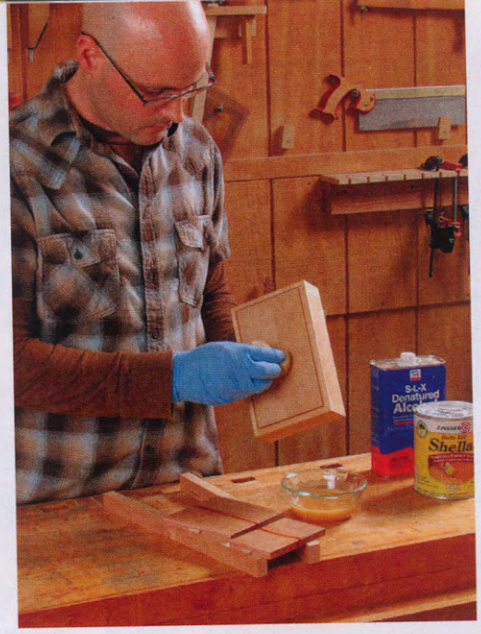
Q: I make small boxes and finish them with shellac. I pad on the coats and sand between them. However, the finish always gets thick and unattractive. Before I give up on shellac, do you have any tips for a better finish?

—JEFF CARMICHAEL, Corvallis, Ore.

A: DON'T GIVE UP ON IT YET. I used to have that same problem, but then I learned a simple and quick way to apply shellac that is perfect for boxes. The key is to use a very thin cut of shellac. I start with a 3-lb. cut and mix it 50-50 with denatured alcohol. Thinning it has two advantages. It doesn't build up as quickly and it dries much faster, so it's easy to get even coats without streaking. And in less than 30 minutes you can apply both coats of shellac, as well as wax, to a small box.

—Matt Kenney is an associate editor.

Great for small boxes. *Thinned shellac goes on without streaks and dries in just a few minutes.*

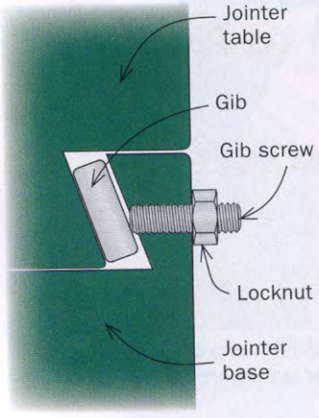


A trouble-free shellac finish. *Dilute a 3-lb. cut of shellac with an equal part of denatured alcohol. Apply it with a cotton pad. After the first coat dries, wet-sand it with P600-grit paper using mineral spirits as the lubricant. Pad on a second coat of shellac, let it dry, then buff it with 0000 steel wool. Finally, apply a thin coat of wax and polish it with a soft cloth.*

Quick fix for a sagging jointer

Q: The infeed table on my jointer is sagging. I've lost the manual and don't know how to fix it. Would you please explain how?

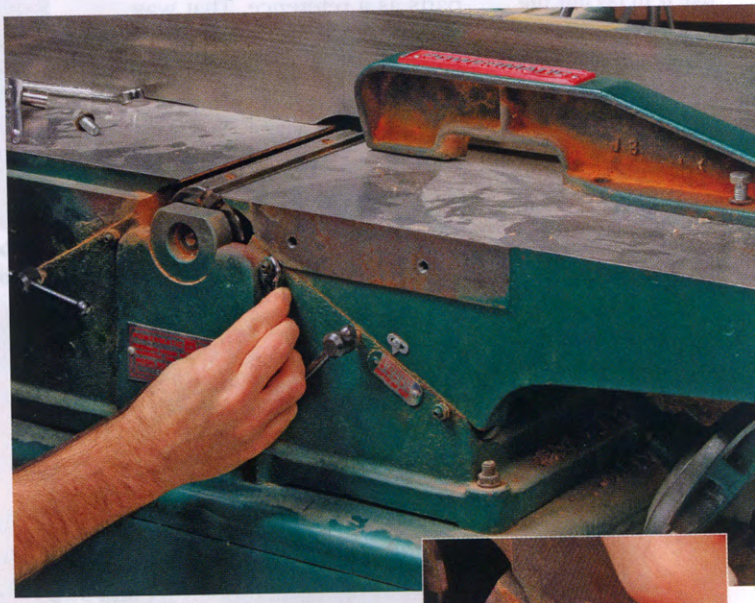
—DAN HEINZ, Normal, Ill.



A: THE FACT THAT THE TABLE IS SAGGING tells me your machine has dovetailed ways with gibs. When the screws holding the gibs in place work loose, the table sags.

To fix it, raise the table until it is level with the high point of the blades' arc. Loosen the locknuts on all of the gib screws and back out the screws about a quarter turn. (Take care with the top one: Loosen it too much, and the gib could fall out.) The upper section of the dovetail is most responsible for preventing sag, so adjust the top gib screw first. Tighten it until the table's height is hard to adjust and then back the screw off so that the table moves smoothly. Secure the screw's locknut. Adjust the remaining screws in the same way. The top two screws should fit tightest against the gib. When you are done, the table should feel tight, but move smoothly.

—John White is the former shop manager at Fine Woodworking.



Tighten the travel. *Loosen the locknuts first. Then slightly back out all of the gib screws, but keep the top one tight enough to hold the gib in place. Next, starting at the top, tighten the gib screws. Then back them off slightly, so the table moves smoothly. Last, secure them with the locknuts.*

Ten-cent solution for hollow-chisel woes

Q: I've just purchased and set up a hollow-chisel mortiser. However, when I turn the machine on, it makes a screeching noise and then when I cut a mortise, the chips clog the chisel and burn. What am I doing wrong?

—ARTHUR LANEY,
Pittsburgh, Pa.

A: BY THE SOUND OF IT, your auger bit must have little or no room to turn within the hollow chisel. The bit is fatter at its tip and needs to stick out from the end of the chisel a little. To set this clearance properly, I use the "dime trick": Simply install the chisel with a dime between the chisel and mortiser and tighten it in place. Then, using a scrap as a pad, push the bit up until it is seated against the chisel and tighten it. Finally, loosen the chisel and push it up as far as it goes—the space where the dime used to be will create the necessary clearance. While you're at it, put a square against the fence to ensure that the chisel is properly aligned.

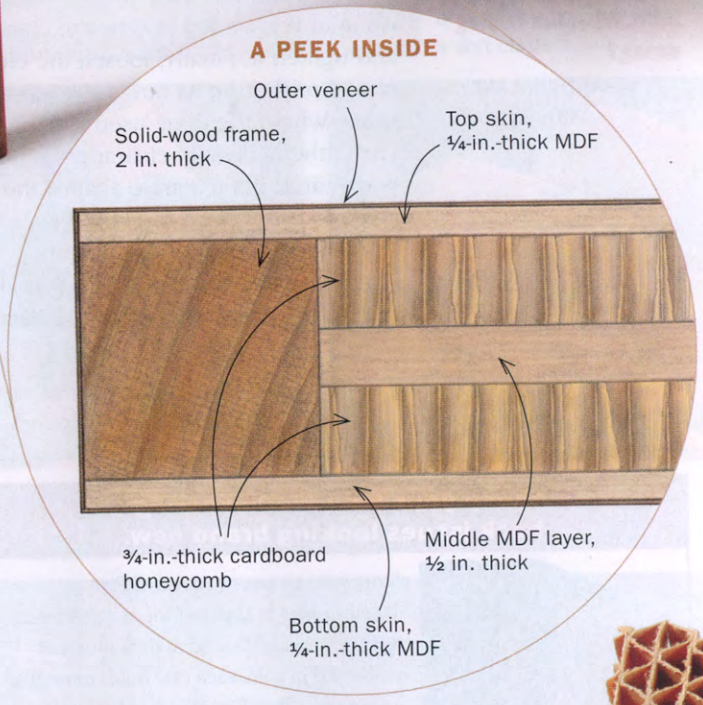
—Michael Pekovich is Fine Woodworking*'s art director.*

Set it, raise it, and square it. *First, set the hollow chisel at the correct clearance using a dime. Then raise the auger bit up firmly into the chisel and tighten it. Finally, reset the chisel by raising it fully and simultaneously squaring it to the mortiser fence.*

How to make thick, light tabletops

TORSION-BOX DESIGN WORKS FOR ANY SIZE TABLE

BY BRIAN L. SARGENT



From conference tables to coffee tables, many contemporary designs use thick tops—2 in., 3 in., even 4 in. thick. However, making these from solid wood presents problems. They are tremendously heavy, and they require a lot of expensive wood and labor to flatten them.

The solution is the torsion box. With it, you can make thick tops that are flat, stable, strong, and fairly lightweight. I'm not talking about the old way of making torsion boxes, where you build a solid wood frame and fill it with a latticework of crosspieces. I'm talking about a relatively modern take, with the labor-intensive latticework core replaced with resin-impregnated cardboard that resembles a honeycomb. The stuff is easy to cut, easy to use, and very lightweight, but you do need a vacuum bag.

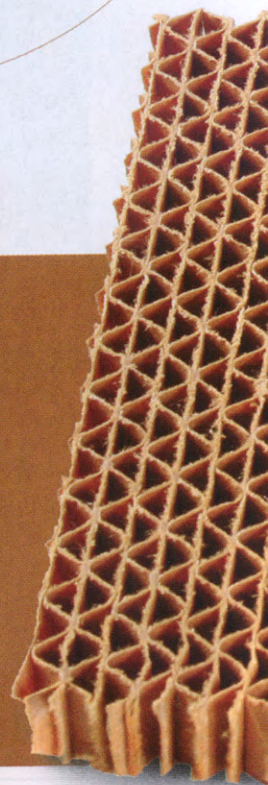
The honeycomb helps create a perfect substrate for my favorite veneers. You often see it used in large pieces, like

Prep the parts

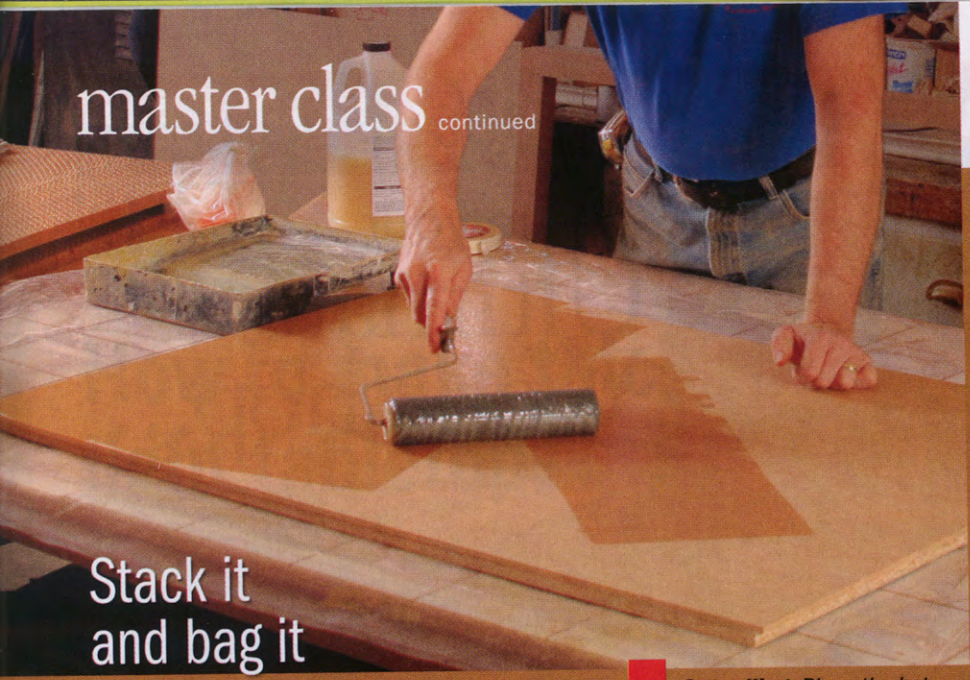
Cut all the interior pieces for a snug fit inside a mitered frame. The top and bottom MDF skins are cut a hair oversize and trimmed flush later.

Frame it. *The honeycomb core requires a supporting frame made of solid wood.*

Fill it. *The cardboard honeycomb is easy to cut with a utility knife and straightedge.*



Photos: Thomas McKenna; drawings: John Tetreault



Stack it and bag it

To reduce the stress of assembling the parts, Sargent mixes Unibond 800 to get an open time of at least 45 minutes.

1 ***Get rolling.*** *Place the bottom MDF skin on a melamine caul, then apply Unibond 800 to the interior of the skin.*

2 ***Lay on the frame.*** *Place the frame on the bottom skin. The frame should sit about ¼ in. inside the skin edges. Both top and bottom skins will be trimmed flush later.*

conference tables, but you can use it to make a top of any size or any thickness. Once you've used this honeycomb core, you'll never build a latticework torsion box again.

What is this stuff?

Resin-impregnated honeycomb sheets are available from Vacuum Pressing Systems (vacupress.com) in 2-ft. by 4-ft. sizes and in ½-in., ¾-in., and 1-in. thicknesses ($12, $17, and $20, respectively).

The honeycomb is placed within a solid-wood frame and glued between two MDF skins. The honeycomb sheets can be glued using any woodworking glue, but I use Unibond 800 (vacupress.com), a two-part urea-formaldehyde resin. Unibond gives me plenty of open time, and it experiences very little creep and shrinkage, which makes for extremely stable tops. For this application, I use a 4-to-1 ratio of resin to powder, which gives me an open time of about 35 to 45 minutes (with a shop temperature close to 70°F). The entire assembly is glued together in a vacuum bag.

The photos on these pages show you how to build a 2½-in.-thick top, but the process is the same no matter what thickness top you are making.

Make a cardboard sandwich, then put it in a bag

First, you need to build a solid-wood frame the same thickness as the core materials. Darryl Keil, owner of Vacuum Pressing Systems, says a good rule of thumb is to make the frame about as wide as it is thick. The frame should be made from a stable species, such as poplar or quartersawn mahogany (used here) to minimize wood movement. I miter the frame to avoid having to glue edge veneer over end grain.

Once the frame is glued up, cut the top and bottom skins

5 ***Last layer of honeycomb.*** *Apply glue to the top of the middle MDF panel and then add the top layer of honeycomb. Press it down flush with the top of the frame.*

6 ***The topper.*** *After rolling the glue onto the bottom of the top skin, place it on top of the frame and core. Adjust it for an even overhang.*

7 ***Last caul.*** *Once the top skin is on, add the top melamine caul.*

3 **First layer of honeycomb.** *Place the first layer of honeycomb inside the frame. Press it firmly against the bottom skin and snug it into the corners.*

4 **MDF is next.** *After rolling glue onto the bottom of the middle MDF panel, lower it into the frame. Press it down so it sits flat.*

about ¼ in. larger than the frame. Making the skins oversize makes assembly less fussy. They'll be trimmed flush before the veneer is applied.

Now cut the layers of honeycomb and the middle panel of MDF to fit inside the frame. The honeycomb can be cut with a utility knife and a straightedge. I tend to cut it a bit oversize and compress the material to fit inside the frame. Once all the parts are cut, dry-assemble the top to make sure everything is fitting well. I use a ½-in.-thick melamine caul on the top and bottom to help spread clamping pressure and protect the assembly's top and edges from dings. For efficiency, assemble the parts on top of the bottom caul.

Start with the bottom panel, using a foam roller to apply an even coat. Put the frame in place and then the first layer of honeycomb. Next, roll glue onto one side of the middle MDF panel and put it inside the frame. Apply glue to the top of that panel (making sure to get glue into the corners), add the next layer of honeycomb, and glue and install the top MDF skin. Now put on the top caul and use masking tape on all four corners to hold the sandwich together.

Slide the assembly into the vacuum bag, seal it up, and lower the vacuum pressure to 15 hg. If you have a pump that can't be adjusted, simply unscrew the filler jar in the line, releasing air until the gauge reads 15 hg. Leave the assembly in the bag, under pressure, for at least five hours. When you remove the assembly from the press, stand it up on edge or place it on stickers for 12 hours so that air can circulate around it. This way it will dry evenly and stay flat. After flush-trimming the top and bottom skins, you're ready to apply the veneer.

Have fun with your designs and this process. □

Brian L. Sargent makes furniture in New Hampshire.

8 **In the bag.** *Use masking tape to hold the top and bottom cauls in position (inset), then slide the sandwich into the vacuum bag.*

9 **Trim the edges.** *After the assembly dries, trim the top and bottom skins flush with the wood frame. You now have a perfect substrate for veneer.*

WOODWORKERS MART

See advertiser index on page **97** for more information.

WOODWORKERS MART

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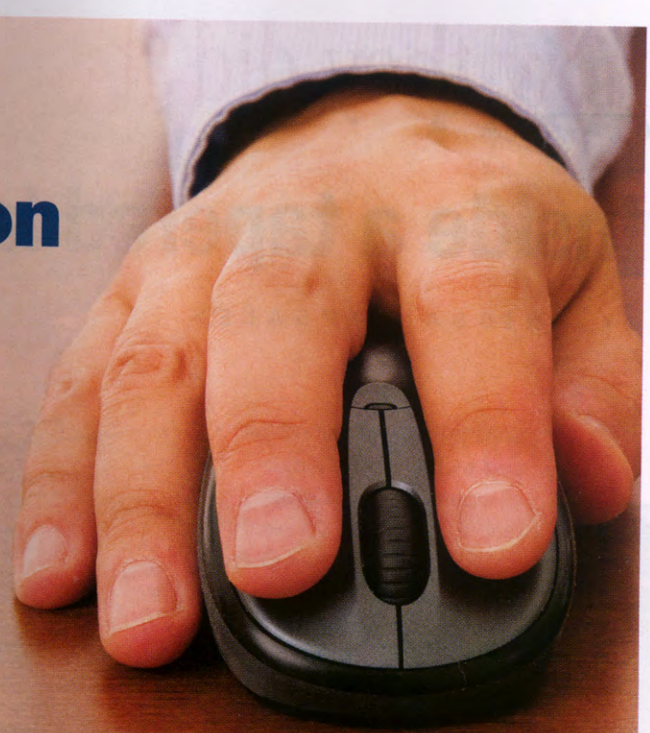

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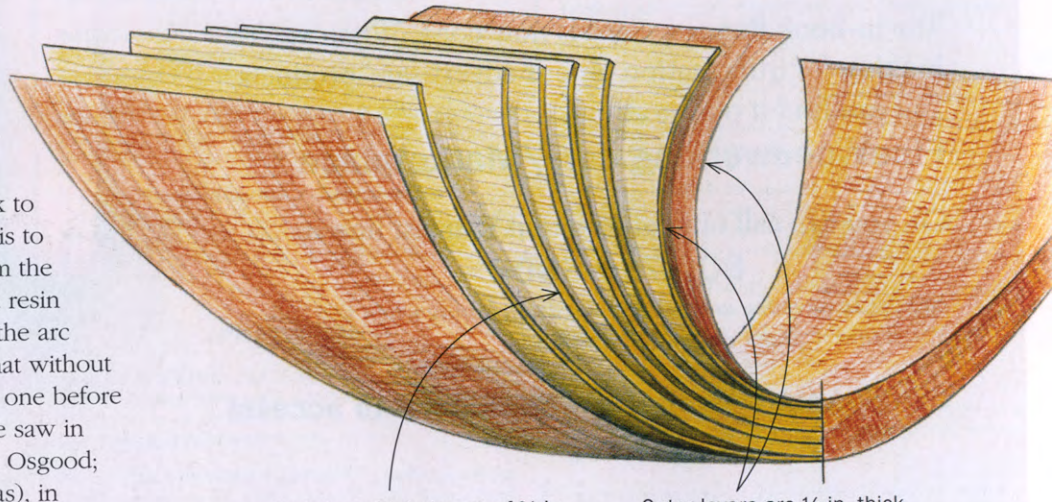
how they did it

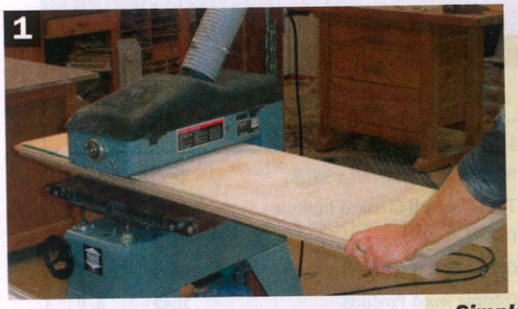
Inside a tapered lamination

BY ANISSA KAPSALES

TAPERED LAYERS ENHANCE THE SHAPE
A core of tapered bending plywood combines strength with a graceful look.

Lured by the dramatic look and technical challenges of curves, Enrico König (see the back cover) nearly always incorporates a deep bend in his furniture. The trick to pulling it off without sacrificing strength is to use laminations: The strength comes from the many layers and the rigid gluelines (urea resin glue or epoxy) between them. To avoid the arc looking clunky, he tapers it, and to do that without cutting through the plies, he tapers each one before laminating. König uses a tapering sled he saw in *FWW* #14 ("Tapered Lamination" by Jere Osgood; available at FineWoodworking.com/extras), in conjunction with a drum sander.





Simple sled. *König uses a shopmade sled and a drum sander (1) to taper the layers of bending ply. He uses a strong form with plywood ribs inside layers of bending ply glued and nailed on (2). He presses all the layers at once (3), including the veneer, using 1/8-in. vinyl-coated MDF cauls. Brads in the waste areas keep it all aligned.*

Crosscut first, then trace, cut, and finish. *Before cutting the sides of the lamination, he cuts its beveled ends. He does this on the tablesaw with a jig that holds the piece upright (4). For the curved sides, König uses a router on a pivoting arm to create a template, and then traces the curves onto the workpiece (5). Then he uses a jigsaw to cut away the waste (6). Last, he routs the edges clean with a top-bearing bit and the same template (7).*

Photos: Goran Basiric (top), Enrico König; drawings: John Tetreault

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Vaulted Veneer

When he started making furniture in the 1990s, Enrico König says he was "a bit of a solid-wood snob. I figured veneered work was inferior." With a background in carpentry and a lucrative seasonal job running a tree-planting crew in his native British Columbia, König taught himself woodworking in the winters. His tastes ran to Arts and Crafts furniture and traditional solid-wood joinery. But when he had the idea for a table with an arched base, he began exploring bent-lamination and veneering with increasing excitement. Using a vacuum bag to glue up thin sheets of bending plywood, he found he could create a range of arched forms that were both strong and striking. He made tapered arches by sending individual sheets of bending ply through a drum sander on a sloped fixture. He loved the new shapes he was making and also loved the ability veneer gave him to play with grain patterns. These days, making furniture full time in his Vancouver shop, he admits, "I've officially become a veneer enthusiast."

—Jonathan Binzen

Photos: Goran

How They Did It Turn to p. 98 to see how König pulls off the tricky tapered laminations used in his table.

Pro Portfolio For an audio slide show featuring more of König's cur work, go to FineWoodworking.com/extras.