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Essex County cupboard, p. 54



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SPEAKER PROJECT **44**



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BY VASKO SOTIROV



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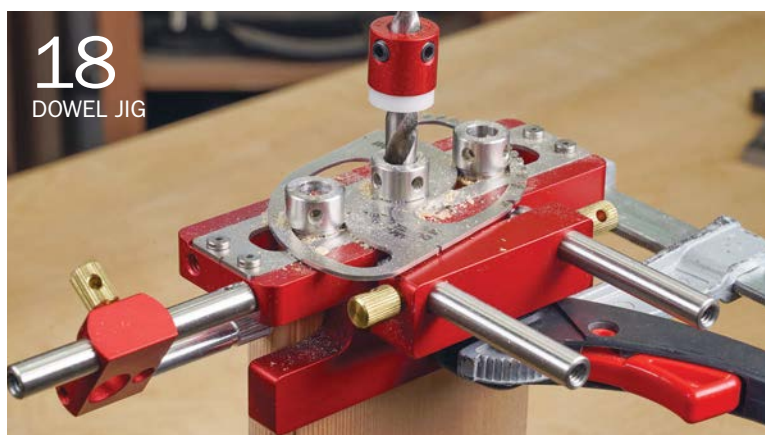
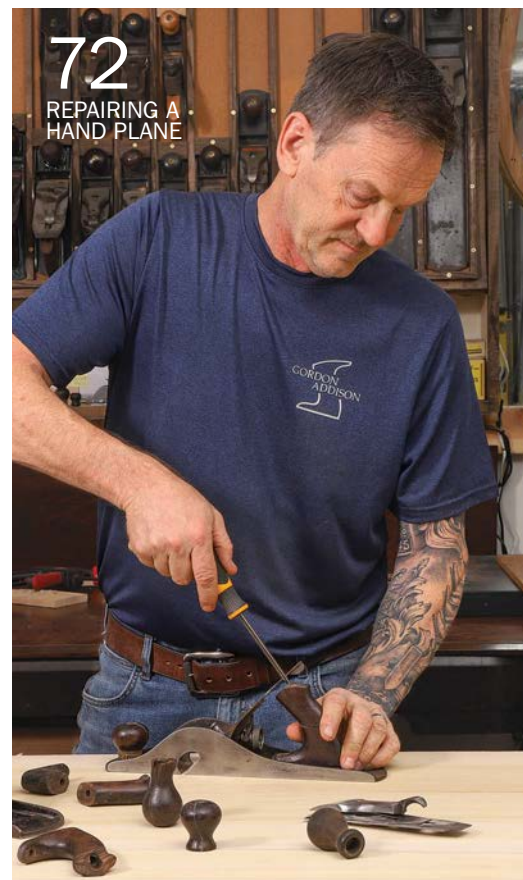
How to fix a hand plane's furniture

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From tree to table

Back Cover

Tansu Triad





SHAPER

PRECISION CUTTING SIMPLIFIED

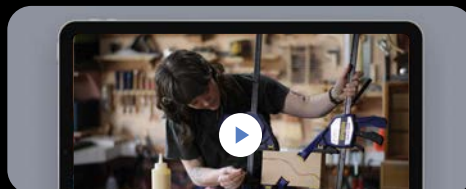


MASTERCLASS WITH ASPEN GOLANN



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In this free, seven-part video series, woodworker Aspen Golann bridges the gap between 18th century hand tool skills and modern techniques. Follow along as Aspen walks through concepts like the 5–7 rule, tapered laminations, hand tool skills, and how to create unique bending forms with Shaper Origin.



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VIDEO

Old-timey turning

Peter Follansbee (p. 54) gives us a fascinating glimpse into his turning process—as though it were 1684.

BLOG

Small but mighty

If Andrew Gibson's hi-fi speaker build (p. 44) isn't your style, Asa Christiana shows you how to build a pair of great-sounding bookshelf speakers with built-in Bluetooth. They're perfect for your shop, laptop, or TV.

VIDEO

One question

Mike Pekovich asks himself one question the first time he sets up any new table-saw cut: "Is the workpiece trapped between the blade and the fence, and if it is, does it have to be?" Find out why in this video.

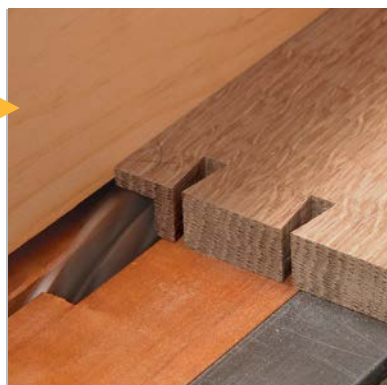
VIDEO

Recipe book

There are lots of ways to get an authentic Arts and Crafts finish. We share some favorites that have been featured in *Fine Woodworking*.



Scan for links



VIDEO

Metal head

On p. 72, Gordon Addison shows how to restore the gnarliest of wooden hand-plane totes. If your restoration project also extends to the metal bits, Rollie Johnson can get you started in this video series.

VIDEO WORKSHOP

Arts and Crafts coffee table

Watch as master furniture maker Kevin Rodel demonstrates how to build his elegant interpretation on a classic Limbert design. In this project series, you'll learn how to:

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contributors

Andrew Gibson ("Build Your Own Speakers") became interested in woodworking at age 10 while watching *The New Yankee Workshop*, *This Old House*, and *The Woodwright's Shop* on PBS. He studied history in college, hoping to become a history teacher, which would leave his summers free for woodworking. After graduating in 2008 at the height of the economic recession, he found teaching jobs hard to come by. So he committed himself to woodworking, landing a job at a cabinetmaking shop. That ultimately led to his current job at the Florida School of Woodwork in Tampa, where he is the program manager and resident instructor.



Gordon Addison (Handwork) has worked wood on the side for 40 years while serving as a training coordinator and product developer for large manufacturing companies, including Dart Container (makers of the ubiquitous Solo cup) and Apex Tool Group, a multinational maker of hand tools with brands such as Jacobs, Crescent, and Lufkin. Years ago he launched a side career building custom mantels and bookcases, but his singular focus these days in his garage shop in Sanford, N.C., is on restoring vintage hand planes.



In the 1990s, **Brian Reid** (Back Cover) studied woodworking under Ross Day in Seattle and then Robert Ingham at Parnham College in England. Robert (on the left) studied for a time under Edward Barnsley and taught at Parnham for 20 years. Brian, after running his own cabinet shops in Seattle and then Colorado, moved to Maine, and he's been building custom furniture there and teaching at the Center for Furniture Craftmanship for 20 years. He and his wife, photographer Monica Chau, live in Rockland.

Peter Follansbee ("Essex County Cupboard") inherited his father's shop full of power tools at 17. An artist, he first learned to use the table saw and other tools to make picture frames. He dropped out of art school in 1976. In 1980 he began to learn traditional woodworking in Jennie Alexander's second chairmaking course at Drew Langsner's Country Workshops. He gave away all of his power tools and spent over 20 years making reproduction furniture at Plimoth Patuxet Museums (then Plimoth Plantation) in Plymouth, Mass. In addition to woodworking, he enjoys spending time with his wife and two children and watching birds.



We are a reader-written magazine. To learn how to propose an article, go to FineWoodworking.com/submissions.

Fine Woodworking®

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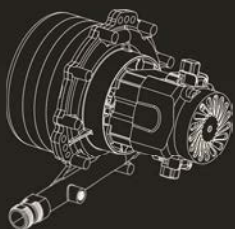


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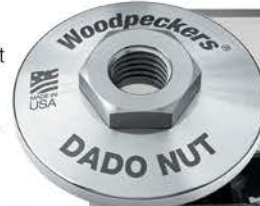
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From the Editor

Extra effort is not wasted effort

"Take your time." That's what I tell myself when things start to get a little out of control in the shop.

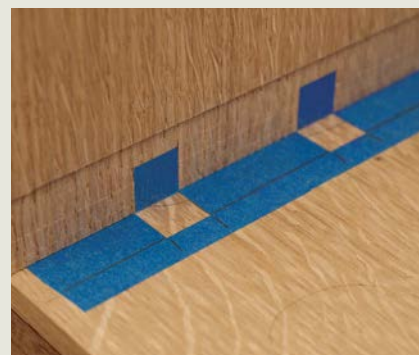
At the beginning of teaching a weeklong class, I warn the students that this is an artificial way to be working. Along with the stress of navigating an unfamiliar shop and practicing unfamiliar techniques, there is the issue of time. To start with, woodworking for 8 to 10 hours a day is not something most of us are used to. In addition, allotting an arbitrary number of days to complete a project is often not realistic. That notion of self-assigned deadlines can compromise the experience of working in our own shops as well.

Yes, we often have expectations of what we want to accomplish in an hour or an afternoon in the shop. Sometimes we hit the mark, and sometimes we fall short. The danger lies in trying to speed the process to fit the time we have. One big lesson I've learned is that trying to go faster rarely leads to something getting done quicker. A piece of advice I offer students is that it's going to take as long as it takes. Each of us has one ideal speed we work at, and trying to rush a process never ends up well. That's easier to say than to do in the controlled chaos of a typical class, I know.

Back in my own shop, when I find myself rushing, when I'm trying to decide which next task is the most important—that is, the one that will get me to the finish line faster—I try to take a break. When I'm working on a project for the house, I tend to work at a brisk pace. That pace leads to a process and workflow resulting in a level of work I'm generally happy with, but one that often falls short of what I'd consider to be "perfect." On other occasions—working on a commissioned piece, for example, where "perfect" is the goal—I find that it's not just a matter of trying harder but that it often involves rethinking the way I work. Something as simple as the way I use a marking gauge can make a difference. While steadying a board with one hand and scribing with the other leads to generally accurate results, clamping the board in place, though a bigger hassle and more time consuming, offers an extra level of control. As a result, I spent a far larger portion of a recent afternoon in the shop laying out some mortises and tenons than I normally would. Despite the extra clamping and unclamping added to my routine, I really didn't mind it. In fact, I enjoyed the time far more than if I had been rushing through the day. I was more in control during the process, and I was confident of the results when I was finished.

While we tend to focus on the quality of the end product while we are working, placing our sights on the quality of the time we're spending in the shop just may get us closer to that piece we were hoping to make.

—Michael Pekovich



Spending a few more minutes on a task can make a big difference. Taking the time to secure boards when scribing and clamping a spacer in place rather than holding it in place by hand results in a much better start to a project.



Stains and dyes under hard-wax oils

Thank you for an excellent article on hard-wax oil finishes (*FWW* #311). The article on a Shaker side chest in the same issue was eight pages long and had only a single sentence concerning the finish, which has a major impact on how one's project appears. Can a stain or dye be used in the normal manner under the hard-wax oil?

—GREG STRASSER, Gladstone, Mo.

Author Adam Godet replies: *As I noted, while many products are sold under the banner of hard-wax oils, they can vary a lot from one to another; so the rule of thumb here is to check the specifics. Several of the products we tested instruct users to apply material directly to raw wood; this is to allow the product to penetrate and bond to the wood fibers. Other products indicate on their websites that they can be used over a variety of other finishes. While we did not test them specifically, several of the products we did test offer color options in addition to the clear coats, and you might find what you're looking for via that route as well.*

Takes issue with Domino tip

In the August 2024 issue (*FWW* #311) you published a reader tip recommending that the ridges of Domino tenons should be planed off and a new groove cut. This is bad advice. The purpose of those ridges is to allow glue movement inside the joint. Why would someone spend time re-engineering this? The way to deal with an overly tight fit is to remove moisture from the Domino. Five or 10 minutes in a low-temperature oven will dry out the Dominos without compromising their design. The fit will be snug but not overly tight—you can still remove it with your fingers. Better yet, you don't need to spend time planing one

Domino at a time wondering why this is necessary for a thousand-dollar tool.

—ERIC FRIEDMAN, Berkeley, Calif.

Thoughts on bandsawn dovetails

Jim Kiger's technique for bandsawn dovetails (*Workshop Tips*, *FWW* #311) struck a chord with me, as I have been using this method for several years. However, I do have some slight modifications. I started out experimenting with the stop block for anchoring the workpiece to the jig but found that accurately resetting the bandsaw fence was time-consuming. Instead of the stop block, I glued a strip of very coarse sandpaper to the jig's face. By using a tight grip to clamp the workpiece against the jig, I could pass the workpiece through the bandsaw blade without slippage between the two. By relaxing the grip to allow slippage between the two, I could make fine adjustments to the cut, relying on the fence for coarse adjustments. This way the number of fence settings would be minimized, depending on the relative length of the jig and width of the workpiece.

—GERALD R. GUINN, via email

Clarity on grain at last

Peter Galbert, oh boy! I bought his book, ordered some tools, and made a couple of Windsors, but hey, be careful when you sit in them. That unwanted crack you just heard signaled wayward grain because I hadn't built with split green wood. His current expose (*FWW* #309, p. 36), another of your magazine's seminal works, has me understanding those cracks better, reflecting on failed steam-bends, and working out the steps for good-looking grain on the curved backrests I'll be cutting this week. Great insights—thanks so much!

—WILLIAM ANDERSON, via email

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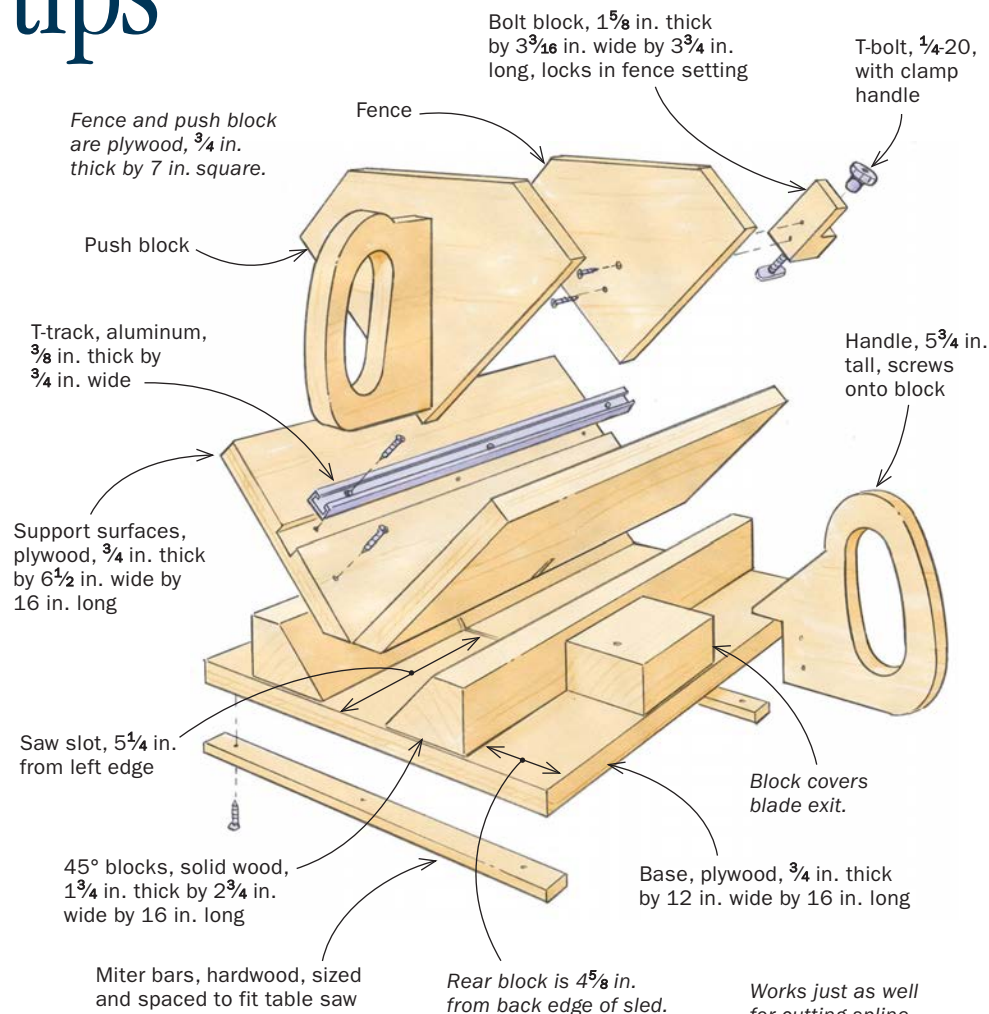
In *FWW* #301, Doug Stowe demonstrated an excellent table-saw sled for cutting spline slots in mitered boxes. Unlike other sleds, Stowe's is guided by miter-slot bars so it doesn't need to be held against the rip fence in use. This gives you one less thing to manage when using it.

I wanted my sled to work for mitered frames as well as boxes, so I made the adjustable fence larger and added a push block that presses the frame against the fence without risking my fingers. The tall fence and push block keep skinny frames stable and cuts accurate.

I made a couple of other improvements as well. To make the T-track less prone to denting, which tends to jam the T-bolt, I replaced Stowe's routed track with a metal one. And I added a large handle to keep my hand away from the blade.

The updated sled works wonderfully on all sorts of mitered projects. Thanks to Mr. Stowe for the inspiration.

—ROBERT ROEMER,
Bolton, Mass.



Use sled to slot corners of mitered frames.

Works just as well for cutting spline slots in boxes.

Best Tip



On evenings and weekends during his career as an engineering project manager, Robert Roemer restored a 1790s timber-frame home and built several wooden boats, among many other woodworking projects. Devoted to passing along traditional hand skills, he also built a 26-ft. by 45-ft. barn, where he teaches woodworking and boatbuilding, and a reproduction of a local blacksmithing shop, where he teaches that craft as well.

A Reward for the Best Tip

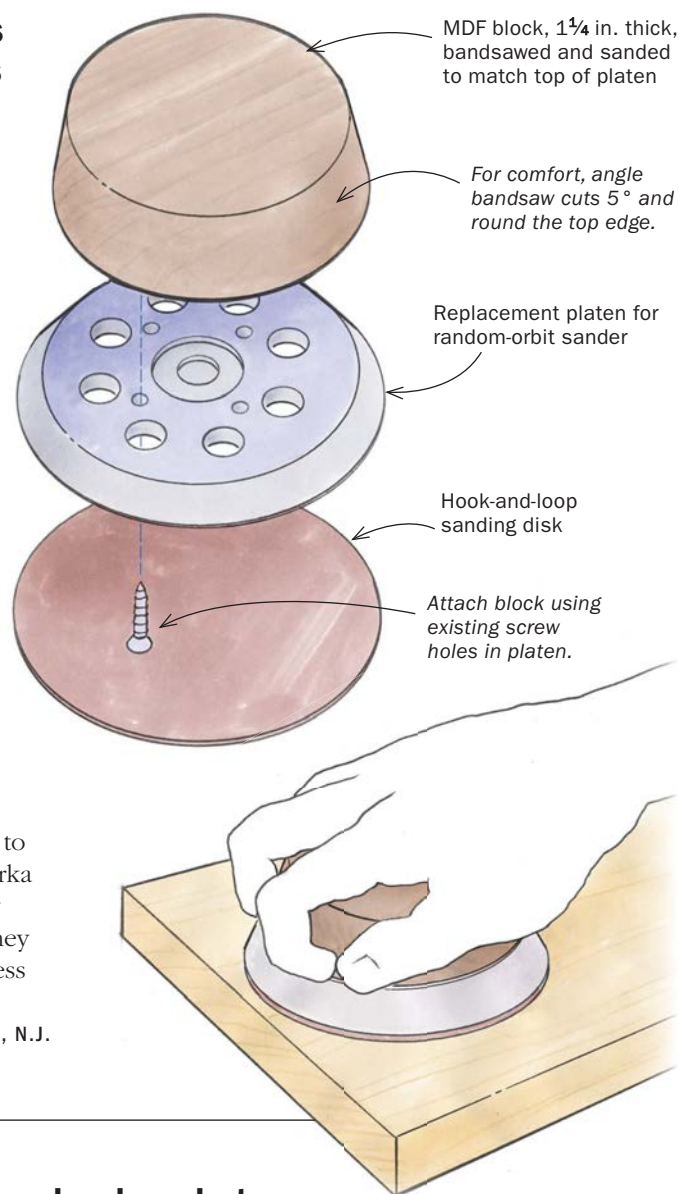
Send your original tips to fwtips@taunton.com. We pay \$100 for a published tip with illustration; \$50 for one without. The prize for this issue's best tip was a Knew Concepts Aluminum Coping Saw.



Sanding block takes hook-and-loop disks

I bought an extra platen for my 5-in. random-orbit disk sander and turned it into a sanding block. Replacement platens are inexpensive and widely available for many types of sanders. Like any good sanding block, they have a slightly flexible bottom. To make the platen easy to control, I traced it onto a thick MDF block, set my bandsaw for a 5° taper, and sawed along the line. Then I sanded the cuts smooth. The platens have screw holes for attaching them to the sander; I use those to screw the platen to the round block. I use Mirka Abranet disks on my new sanding block, because they last a long time and are less prone to clogging.

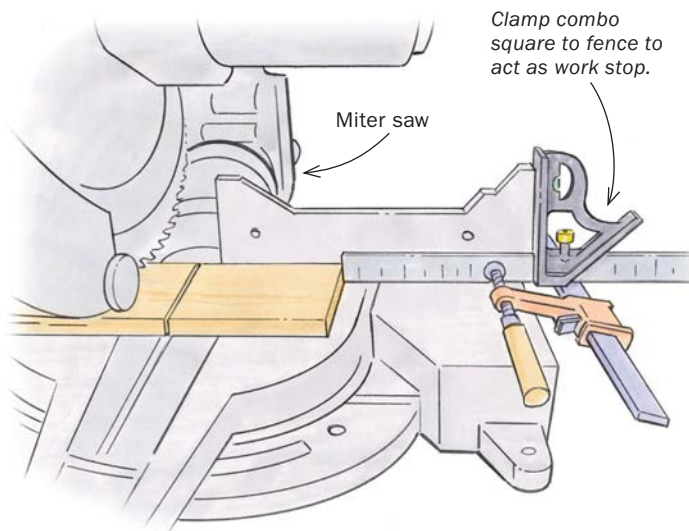
—JIM GREENE, Midland Park, N.J.



Combo square makes a handy work stop

Here's yet another use for your combination square. Clamp it to the fence on your miter saw, which turns it into a stable, accurate stop. This also works for stopped cuts on the router table. A 12-in. model works great, allowing a range of stop positions.

—ALLEN ARMSTRONG,
Portland, Maine



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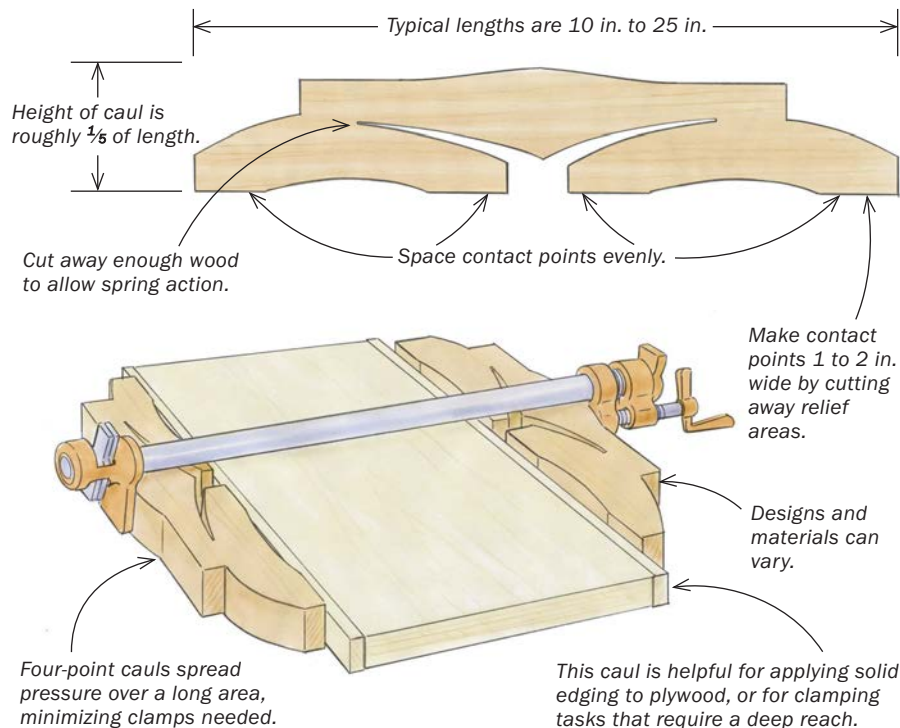
1.800.347.GLUE

Clever cauls let one clamp do the work of four

When I started woodworking 50 years ago, I had only two pipe clamps, which still serve me well. So I developed this 4-in-1 clamping caul that allows one clamp to spread pressure over a long area. Although I have a lot more clamps these days, I still reach for my 4-in-1s when I don't want to wrestle with multiple clamps, such as when I'm gluing solid edging to plywood panels. They are also handy for awkward glue-ups that require a deep reach.

The cauls create levers that exert even pressure at four contact points. They are easy to make from solid wood or plywood using a series of bandsaw cuts. Once you understand their basic design, you can make them in several lengths (and thicknesses) for a lifetime of use.

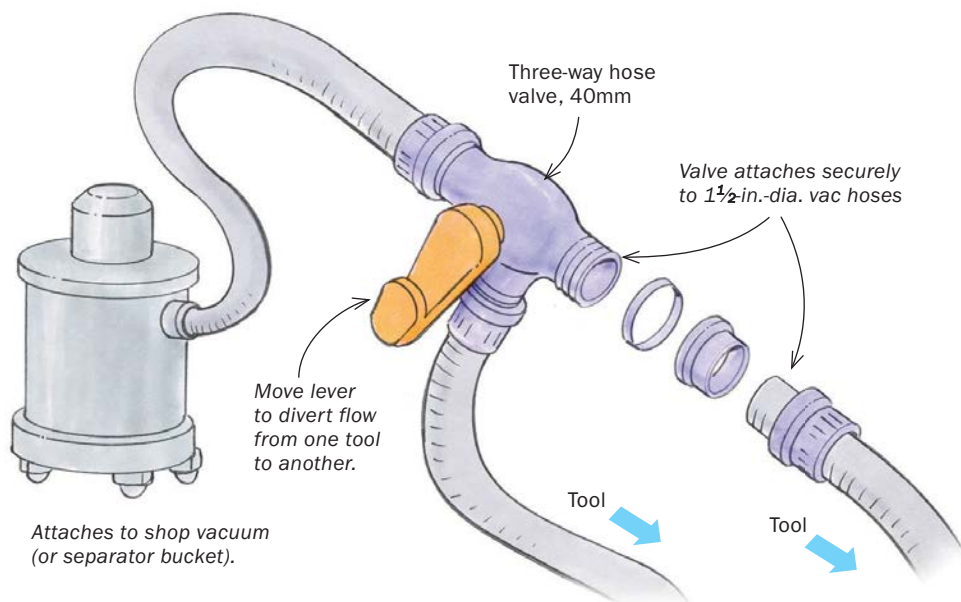
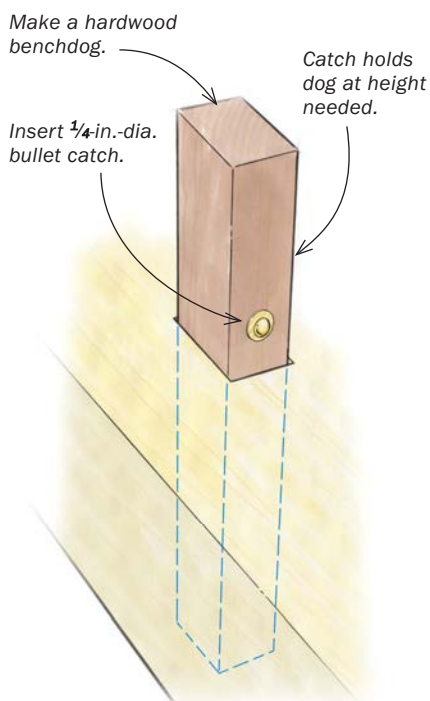
—ED CLER, Villa Grove, Ill.



Make your own benchdogs

If you have rectangular dog holes in your bench, you can make your own dogs by installing a bullet catch in a piece of hardwood. A 1/4-in.-dia. catch works great. You can also add a catch to an existing dog.

—CHARLIE JAMES, Williston Park, N.Y.



Three-way pool valve is a user-friendly blast gate

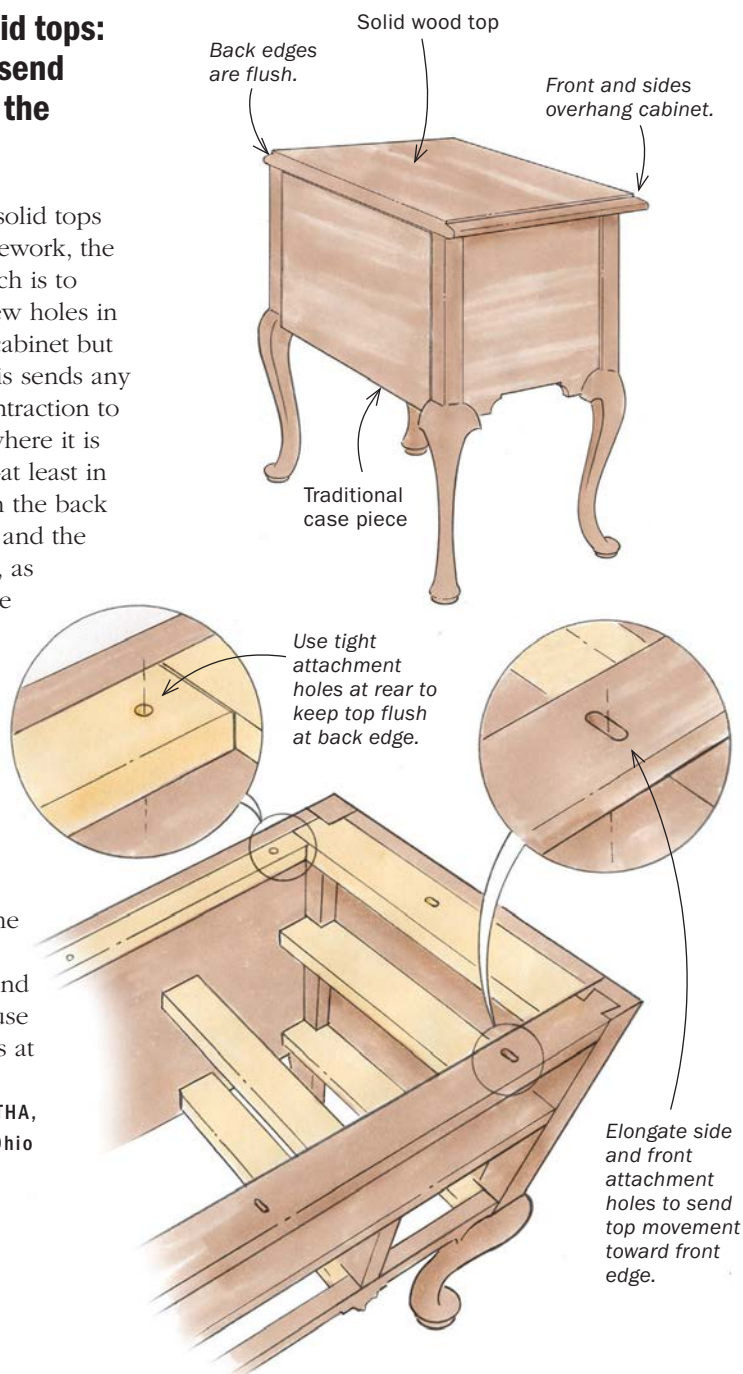
I wanted a blast-gate setup on my shop vacuum so I could keep it hooked up to my sander and drill press at all times. This is especially helpful if you have a dust separator attached to your vac, making it harder to move around the shop. I found a three-way water valve where pool supplies are sold, and it works perfectly. For 1 1/2-in. hoses, use a 40mm valve. Unlike traditional blast gates, which require you to open one gate and close the other, a single lever diverts the flow through the valve. It includes everything you need to attach it to the two hoses. The valve does force one of the air pathways to turn a 90° corner, which reduces the suction a little. So dedicate the straight path to the tool that needs the most flow. In my case, that's my sander.

—CHARLES MAK, Calgary, Alta., Canada

Attaching solid tops: Don't always send movement to the back edge

When attaching solid tops to traditional casework, the common approach is to elongate the screw holes in the back of the cabinet but not the front. This sends any expansion or contraction to the back edge, where it is less noticeable—at least in theory. But when the back edges of the top and the cabinet are flush, as on a Queen Anne lowboy I was building, I do the opposite, sending the movement to the front, where the overhang hides it. To do this, I elongate the attachment holes along the sides and front edge, and use regular-size holes at the back edge.

—JIM MURTHA,
Lancaster, Ohio



Quick Tip

Use a credit card as a saw guard

To flush-cut dowels without damaging the surrounding surface, I drill a hole in an old credit card, hotel card, or similar card, and place it over the dowel. Then I use a fine-tooth saw to cut off the dowels. The saw slides smoothly on the plastic. The card spacer leaves just a small bit of trimming for your chisel or block plane while leaving the surrounding surface unmarked.

—RODGER AHLBERG, Bennett, Wis.

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■ JIGS & FIXTURES

Innovative dowel jig from Woodpeckers



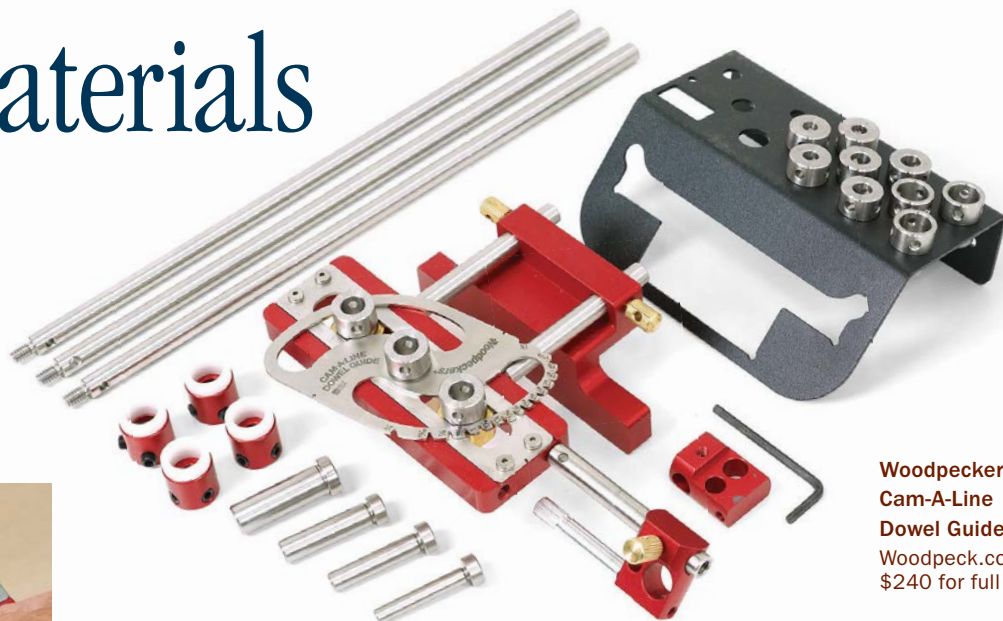
Dial in your spacing. As you move the cam, the bushings move closer or farther apart. Once you have the bushings spaced nicely on a joint, you tighten them to lock in the setting.



Versatile edge stop. The edge stop pivots under the jig to lock in the spacing between the last dowel and the edge or end of a workpiece. Threaded rods let you extend this stop and others in the kit.



Smart depth stops. The depth stops have low-friction rings that won't mar the bushings, plus two set screws for better purchase on the bit.



Woodpeckers
Cam-A-Line
Dowel Guide
Woodpeck.com
\$240 for full kit

PLENTY STRONG FOR MOST OF THE JOINTS woodworkers make, dowel joints are also among the easiest joints to execute, requiring only a jig and a cordless drill. And precise dowels are both widely available and inexpensive.

I've tried lots of dowel jigs over the years, and Woodpeckers' unique Cam-A-Line jig is my new favorite. Its big advantage is in its name: an ingenious cam system that draws three guide bushings as close as $\frac{3}{4}$ in. apart, center to center, or as far apart as $1\frac{3}{4}$ in.—while keeping them evenly spaced. Other dowel jigs have fixed spacing between the bushings, so you can end up with one less dowel in a joint than you want.

With the Cam-A-Line, you can optimize the spacing and number of dowels in workpieces up to $5\frac{1}{2}$ in. wide. Wider than that and you'll probably want more than three dowels. But the Cam-A-Line makes that easy too, with extension rods and registration pins that let you add holes to the array.

The fence has a large surface for clamping it to a workpiece, and it stays parallel to the jig when you adjust it. For smooth drilling be sure to keep the bit square to the jig in use.

Kits are available for four essential dowel sizes— $\frac{1}{4}$ in., $\frac{5}{16}$ in., $\frac{3}{8}$ in., and $\frac{1}{2}$ in.—but I recommend buying the kit that includes them all. The kits include a handy wall rack for storing the jig and all of its accessories.

—Asa Christiana is an editor-at-large.



Joints come together perfectly. The fence stays parallel to the jig when you move it, which ensures well-aligned joints, including offset ones like this leg-to-rail joint.



Edge-to-edge glue-ups. Registration pins, included for each dowel size, team up with the extension rods to space dowels evenly along the edges of boards.

???



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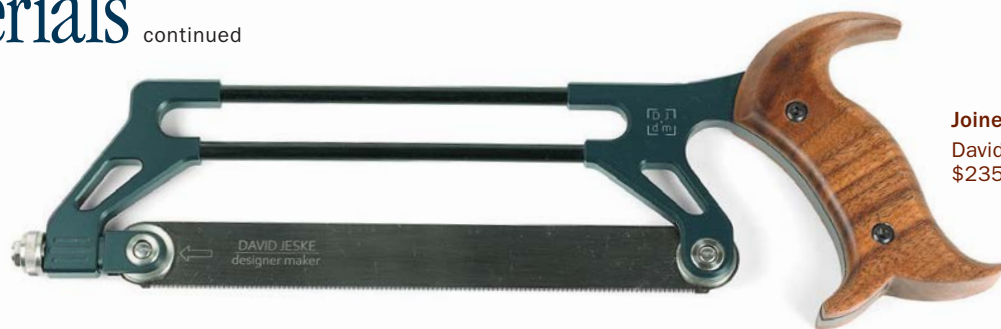
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■ HAND TOOLS

Dave Jeske reinvents the joinery saw



Joinery Saw
DavidJeske.com
\$235

WHEN DESIGNING A NEW HAND TOOL, it can be risky to reinvent the wheel. Sometimes the risk pays off, however. That's what happened with Dave Jeske's new joinery saw.

To create a quick, precise handsaw for smaller joinery cuts, Jeske took a thin, razor-sharp, Japanese-style blade and tensioned it in a frame made of carbon fiber and aluminum, adding a traditional wood handle. The result is a light, comfortable, agile saw that cuts quickly and tracks well.

While the thin kerf may turn off those who like to saw out dovetail waste with a coping saw (the kerf is too small for a coping-saw blade to turn sideways at the bottom), the thin blade makes it very easy to follow a line.

I used the saw to cut dovetails in poplar, a medium-density wood, and was very impressed with its speed and accuracy. Tenon cuts in ash were just as smooth, with the saw handling both ripcuts and crosscuts equally well. Even tough white oak was easy to cut. If you do damage or dull the blade, replacements are just \$25.

—Jeff Miller is a pro woodworker in Chicago.



Fast and accurate. The Joinery Saw by David Jeske, Designer Maker, slices smoothly and accurately through a wide variety of woods. It specializes in smaller joinery cuts.

■ MACHINES

Innovative scrollsaw at an attractive price

I'VE ENJOYED MARQUETRY from the beginning of my furniture-making career, and I've used a variety of scrollsaws along the way. A scrollsaw comes in handy for a range of other woodworking tasks too, including removing the waste in hand-cut joints, working on thin materials, and cutting tight curves.

Grizzly's latest scrollsaw, the 21-in., variable-speed G0969, is a great choice for all of the above. I made a variety of cuts, including fine marquetry, with the blade both straight and angled, and I was impressed.

Innovations and high points are many. Leading the way are an extralarge table and a saw head that tilts 45° in both directions. The tilting head lets the table stay flat during angled cuts, making workpieces easier to control than they are on saws with tilting tables. The included foot-pedal control makes things even easier, letting you keep both hands on the work.

The 50-watt motor is strong enough to power through 3/4-in.-thick pine without slowing, and vibration was minimal at all but the very highest speeds.

The Grizzly G0969 is a smooth, powerful, user-friendly scrollsaw at a very good price.

—Craig Thibodeau is a furniture maker in Altavista, Va.



Grizzly G0969 21-in. Variable-Speed Scroll Saw with Foot Pedal
Grizzly.com
Price: \$630



Angled cuts are easier. The head tilts on Grizzly's new scrollsaw, not the table, letting the work stay level. The dust port is very effective.



Marquetry champ. Vibration is minimal and the blade is held tightly, making precise marquetry cuts easy to achieve.

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Michael Burns 1941-2024

Perhaps you have heard of Michael Burns, but it is more likely you haven't. If not, you may be wondering why *Fine Woodworking* magazine, a publication that rarely features profiles or tributes, is including a tribute to a woodworker who has never written for the magazine and whose work has never been shown in its pages. Though very much out of the public eye, Michael had an impact that can't be denied—and not just on *Fine Woodworking* but on contemporary woodworking over the last four decades.

With a master's degree in agronomy from the University of California, Davis, Michael moved to Mendocino County in 1969 with plans to pursue a fisherman's life. The vocation didn't mix with his persistent, serious seasickness, so he began working as a carpenter and realized he had an affinity for woodworking.

At that time, James Krenov was exploring the idea of teaching in the United States and was holding summer classes with the Mendocino Woodworkers Association. Inspired by Krenov's teachings, Michael took some of those classes, and along with several other woodworkers he hoped to continue studying with Krenov. The group, including Krenov, came up with the idea for a permanent woodworking program. They approached the College of the Redwoods (CR) with the idea, planned the curriculum, and built the shop to house the program. Michael was instrumental in the creation of the CR Fine Woodworking Program; he began teaching part-time in its first year (1981), moving quickly to a full-time position. When Krenov retired in 2002, Michael became the director of the program until his retirement in 2011, when Laura Mays became the director. (In 2016, the program transferred to Mendocino College and was officially renamed the Krenov School.)



Father Burns. "Michael was the first, outside of family, to hold our newborn and declare the shape of her head beautiful." —Rebecca Yaffe

Poring over the *Fine Woodworking* archives, I found more than 100 articles written by dozens of Michael's students. There are dozens more whose work has appeared in the Gallery. While the Krenov School was built around James Krenov, Michael's leadership and presence nurtured something profound and extraordinary among the students and his fellow instructors—something that made it less an institution and more a home. From that environment came immense talent, creativity, and community. The woodworkers Michael Burns nurtured went out into the woodworking wilds and became prolific makers, authors, and teachers.

I am grateful to have known Michael during the year I attended CR (2006) and in the short visits I had with him when I'd return to Fort Bragg. But the real testament is in the words of the people whose lives intertwined with Michael's. And the real lessons are in the way Michael worked and lived.

—Anissa Kapsales



A consummate craftsman.

"Michael's signing-off catchphrase was 'Be happy in your work,' and I think he was in his, and I think he was happy in the way he lived his life, which was to me his greatest work." —Laura Mays

Julie Burns

Michael built a life of pleasure. He loved to cook for his family and friends, plant potatoes in his garden, fish for salmon, and work in his shop. But it was the woodworking school where he focused his energy and attention. There he found great satisfaction in the relationships he fostered with his students. He took his responsibilities as a teacher seriously, but he equally valued the exchange that exists in the teaching dynamic. He encouraged his students to teach him about their interests, skills, and lives outside of class. He enjoyed meeting their families and friends. He welcomed them into his life. He would invite them to our home and to his shop and find ways to spend time with them.

As a result, we both made many lasting friends with students over the decades he taught, starting from the first year. These friendships have enriched our lives, sustaining and supporting us both. Since Michael's death, this community of friends has rushed to comfort and assist me in every possible way. The woodworking school was and for me continues to be at the sparkling center of our social lives.

Michael never stopped being a teacher. He hired a young teenager, Eduardo, to help with chores around our home. Eduardo was drawn to Michael's shop and all it contained: the books, the tools, the woodwork itself. Michael began sharing his knowledge, and Eduardo absorbed it all. Soon Eduardo was making his own tools and designing small pieces. Michael had great respect for Eduardo's focus, eye, and skill. They worked together in the shop, and Michael relished Eduardo's companionship. The testament of Michael's regard for Eduardo's work is the final piece that Michael began. When he became too ill to complete *The Stairway to Heaven*, he asked Eduardo to finish it. Eduardo did so with grace and confidence.



A life of work and play. Michael and Julie (an accomplished quilter) both moved to Mendocino on the same day in 1969 but didn't meet each other until two years later at a mutual friend's wedding. They started their life together in 1976 and were happily married until Michael's death.

Mark Taylor

Michael and I were close friends in the time after he retired from the Krenov School, but that friendship really had nothing to do with woodworking.

Our bond, instead, was fishing, for which he had a great and lifelong passion. We shared a boat for the last 15 years or so and fished for salmon, rockfish, and crab out of Fort Bragg. Curiously—despite the length of time we spent together on trips out on the ocean—woodworking, teaching, and the craftsmanship he obviously possessed were rarely the subjects of conversation. Instead, we rode the roller-coaster of topics old men talk about—family, the fortunes of San Francisco sports teams, the absurdity of current events, ocean conditions, and how to keep the stupid boat afloat. Most of all, though, I remember how energized and happy he was when we were out there with our lines in the water. I think he was that way with all the facets of his life, whether they be family, woodworking, gardening, cooking, or chasing fish. He was a good woodworker, a good fisherman, and a good friend, and I'll miss him dearly.

Rebecca Yaffe

Krenov School '02, '03

It's difficult to pay tribute to Michael Burns in only a few paragraphs. Most importantly, the way he showed up in each place in my life is the way he resided everywhere—low-voiced, loving, curious, and intent on the moment, yet somehow casual or sideways about its potential import.

For example, his lectures became lessons not just for woodworking but for growing into adulthood: fixing what is wrong, not expecting it to start right but caring that it gets there, moving step by step, noticing what is at hand, trusting myself and acting on it. These lessons filter through in my current work as a nurse, as a parent, and as a person.

My last days with Michael were spent sitting vigil in the house with Julie. I saw him open his eyes for a moment and look at me, knowing he trusted me. I felt I became a nurse just to make that moment possible and easy.

This seems about me, but I'm trying to convey Michael's magical and quiet way of showing up and showing how, which affected so many lives, including his own. He seemed to know just how precious life is and how pleasurable it can be. He somehow divvied up his attention between his workshop, the school, his friends, his family, his sweetheart, his fishing, his garden, his

daily food making, and even his nap, and yet took away from none of them. Each thing was whole unto itself and yet connected by his particular way of making it right-sized, just so, precious, and beautiful.



A prolific maker. Like these boxes, most of Michael's work adhered to three principles: Make it small, sweet, and simple. He took a basic form and made it uniquely his.



faces of the craft continued

Laura Mays

Krenov School '02, '03

Like many before me, I came to the Krenov School lured by words. Krenov's books were half sense and half sensibility, a beautiful conglomerate of the pragmatic and the romantic. When I finally arrived at the school, what I found was a community, not a person. If Krenov was the wood and the words, Michael Burns, David Welter, and Jim Budlong were the joinery, the glue, and the finish. Michael Burns (or Mr. Burns, or "Father Burns," as he was alternatively and affectionately known) shepherded us along through the planning and fine details, buoying us through the delayed gratification of this kind of work, making a community from a disparate group of wood nerds. But it was really his life that I most admired: his relationship with his wife, Julie; with friends; with his work; with fishing.

When he retired and I took over his role at the school in the summer of 2011, Michael mentored me through my first tumultuous year, and I continued to turn to him for advice through the following years. No one else understood the complexities and subtleties of the role quite like he did. Michael continued as an unassuming, gentle but important presence in the school, befriending the new students, offering nuggets of wisdom. Once or twice in each school year he would invite the class over to a presentation of his new work, always a reminder of how small and simple can be so sweet.

Jim Budlong

Krenov School '84, '85

"Father Burns"—the memories flood through my mind, but ultimately they keep coming back to what a good soul he was. My first year I was intimidated by Krenov and relied not only on Michael's teaching support but the personal caring and friendship he provided. He was always there for everyone: students, friends, family, and all those he married, including Sue and me.

Over the years we shared so much: his understanding—and at times empathetic—friendship; the wins and losses of the Giants and Niners; the joys (and on rare occasions the tribulations) of all the students who passed through the program; Friday lunches as well as birthday lunches; the great staff Christmas parties at his and Julie's home; gardening successes and failures; his fishing stories; and, of course, the pleasures and frustrations of our woodworking. He was sorely missed at school when he retired, and now he will be missed by one and all forever. I am so lucky to have known him.



Eduardo Soria

Krenov School Summer Program '24

I was 15 when I met Michael. He hired me to stack wood and mow his lawn. Before I met Michael, I had no woodworking experience.

I was working for him for a month before I found out he was a woodworker, and the details and the smallness of his work amazed me.

Michael was truly a kind and generous man, not just with material things but with his time as well. When I told him I wanted to make a mallet, he went back into his shop and pulled out two pieces of wood and said, "Here, you can make it out of this wood."

Once, when we were talking about his family, he mentioned that his grandsons weren't into woodworking enough for him to pass on the knowledge. He said, "But you're like my grandson." We both laughed, but thinking about it now, he really did treat me like one. Most of the tools I have were gifts from Michael. He would always say, "Be my guest," and he really did mean it. I remember one time, before he got in his truck to give me a ride home, he said, "Eduardo, you're going to make it as a woodworker, because you get things done."

Michael asked me to help him finish this box, his final project. I was happy to help, but I was scared to finish it on my own.

He had made the main box and the base and wanted me to make the little trays that go inside. I needed his help, but he was weak and sick. I only needed one more day of work to finish the box—I was planning to show him the next day. I really wish Michael could have seen the finished box, but

I hope I did him proud. I am very grateful for all that Michael did for me and for the time I spent with him.



Stairway to Heaven. Michael's final box is made from red flower eucalyptus, bloodwood, and maple. Michael's apprentice, Eduardo, completed the two interior trays.



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faces of the craft continued

Ejler Hjorth-Westh

Krenov School '91, '92

It has been my good fortune to have touched many of the facets that made up the person Michael Burns, first as his student and later as his colleague.

Teacher, mentor, counselor, mediator, fisher, maker, friend—he was everything one could wish for, seeking a flourishing existence, and he shared generously with honest selflessness. Michael was ever jovial and even-keeled; few things could knock him off balance.

There was one time, though. We shared a passion for ocean fishing, and catching king salmon was highest on the list. On one such fishing trip in his boat out of Noyo Harbor, Fort Bragg, Michael hooked a large salmon, which he patiently and calmly reeled toward the boat, where I was ready with the net. Not 30 ft. away a large sea lion reared its head, assessed the situation, and immediately dove for Michael's salmon and made away with, leaving only the head on the hook. Michael completely lost it! I witnessed in stunned silence as he expertly employed the worst words and phrases in the English language, all while dancing a bizarre jig of contorted, pent-up rage: *Yaaaaaaaarrrh!* After a brief, tense moment, he cracked up, and a release of laughter ensued.

Only by fishing did I ever get to see this side of Michael Burns, which brought to full spectrum the complexity of the man. Lucky me.

Greg Smith

Krenov School '92, '93

Not long after starting my first year at the Fine Woodworking Program, I remember realizing that Michael was the community builder, the soul and glue that held the school together. He was not the reason I came to the school—I knew nothing about him—but he was instrumental in making it a place you really wanted to be. I was fortunate enough to share his shop for a couple of years after school. One day I was going on about how someday I was going to do this, or when things came together I would do such and such a thing. He stopped me and said, “But Greg, you’re living your life *right now*.”



Joie de vivre. “We were all lucky enough to experience the inspiration that comes from being around a truly talented woodworker and beautiful soul living his best life.” —Greg Smith



Instructors on break.
James Krenov,
Michael Burns,
Jim Budlong,
and David
Welter

David Welter

Krenov School '83, '84

While few could say they were drawn to the Fine Woodworking Program due to the presence of Michael Burns on staff, many survived the intensity of the program because of him. Early on he earned the nickname “Father Burns” from many, including James Krenov, due to his even-handedness, his counseling, and his consoling nature.

Michael was a fastidious craftworker who guided students of all levels, enabling them to strengthen their capabilities. His explorations in his private shop led to an expansion of the knowledge available to members of the course.

Despite a deteriorating relationship with Krenov, Michael managed to continue mentoring students constructively. After Krenov's retirement, Michael safeguarded the integrity of the program for a further 10 years. In his own retirement, Michael continued in his shop work and teaching until the very end.

Beyond the recognition of the emphasis on craft, the program is unique in bestowing a sense of community that spans the years. Michael's empathy and his caring and nurturing nature are values that persist.

Online Extra

To see the full tribute, go to
FineWoodworking.com/extras.

Todd Sorenson

Krenov School '01, '02

About a year after I graduated from CR, Michael Burns went on sabbatical, and I replaced him for one semester. I never returned to Seattle. I started helping in the summer classes and was part-time faculty for Michael's last five years when he went part-time. When David Welter retired, I took over for him.

Michael helped me survive my time at CR, especially at the beginning when I was so uncertain. He seemed genuinely interested in me and everyone else—both in our woodworking and in our personal lives. Michael was kind, generous, and funny. I used to think that we had a special friendship, but as time progressed it seemed like many people felt that way about him. He had a lot of room for all of us.

In the end, we just were friends, in work and play. I saw him almost every day. I worked with him, fished with him, and hung out with him and Julie. He married Heidi and me in our kitchen. He was there for the birth of our girls.

Michael was old enough to be my father, but I never really felt that way about him, even though he carried the “Father Burns” nickname forever. He was always so youthful in his attitude. He was the epitome of cool: always dressed better than most, with great hats; always changing his hairstyles, keeping it fun. Sweet man.

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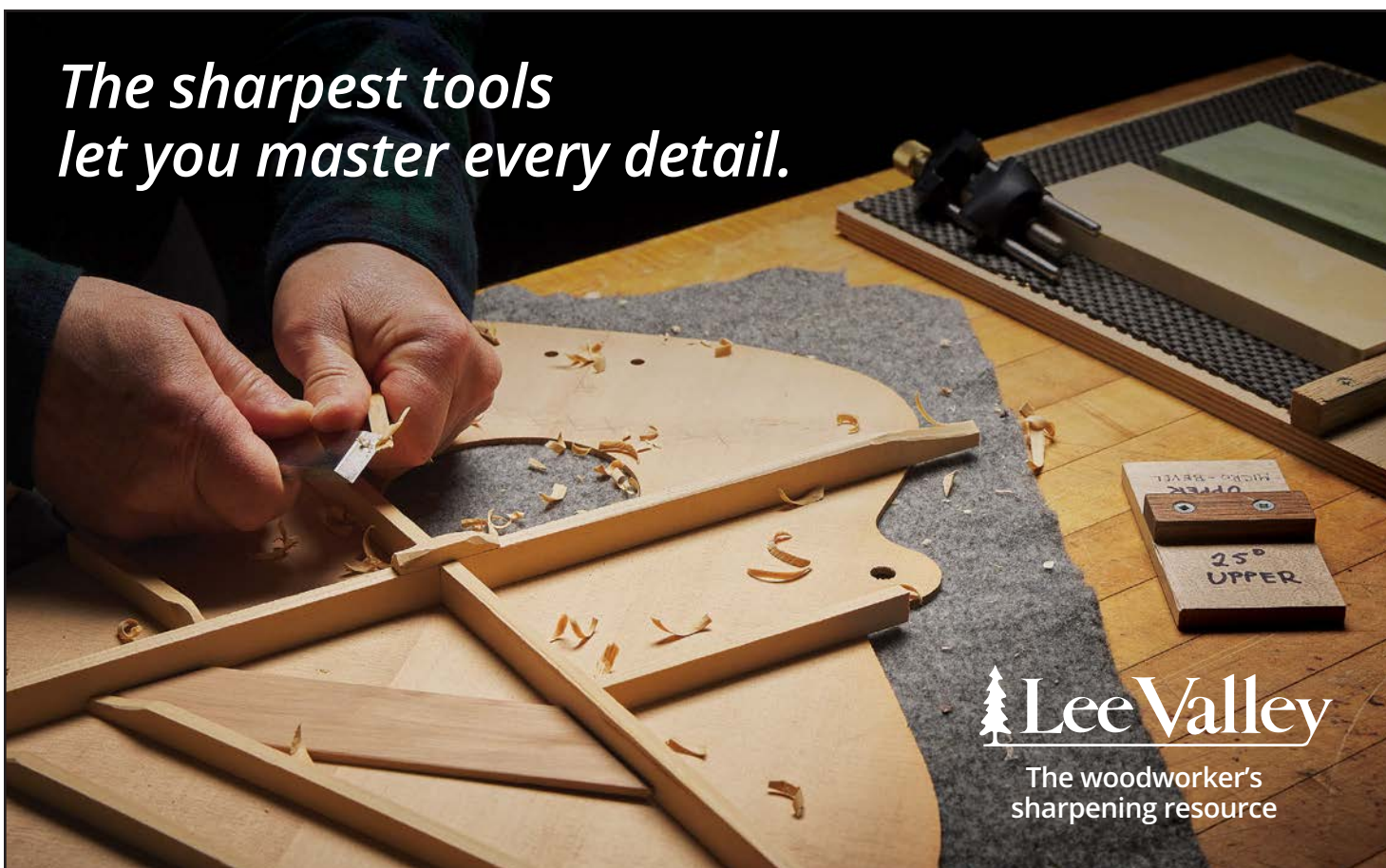
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I designed this bookshelf toward the end of a school year, and I was thinking about what might make a good gift for a graduate. I wanted it to be a substantial piece, so Arts and Crafts styling with tusk tenons, corbeled stretchers, and solid white oak made sense. I tilted the sides to create an attractive stance, and I designed the whole piece so it would be easy to disassemble. The frame-and-panel back is the only component that is glued. Tusk tenons down below and bridle joints and buttons up top keep the case rigid yet make it simple to take apart and transport as a stack of flat parts.

To disassemble the bookcase, just loosen the buttons under the top and turn them 90°. Lift off the top. Remove the upper stretchers. Loosen the tusks and spread the sides a little. Then pull the back up and out. Remove the tusks, and then the bottom shelf and the kick can be removed. Reassembly is just as simple.

Tapered Arts & Crafts Bookcase



Two decorative details cinch the case. Tusk tenons below and corbeled stretchers on top lock the knockdown bookshelf tight. With the tusks removed and the top and stretchers lifted off, the shelf can be disassembled and packed flat.

Tusk tenons cinch the tilted sides in this handsome, knockdown piece

BY JOHN HARTMAN

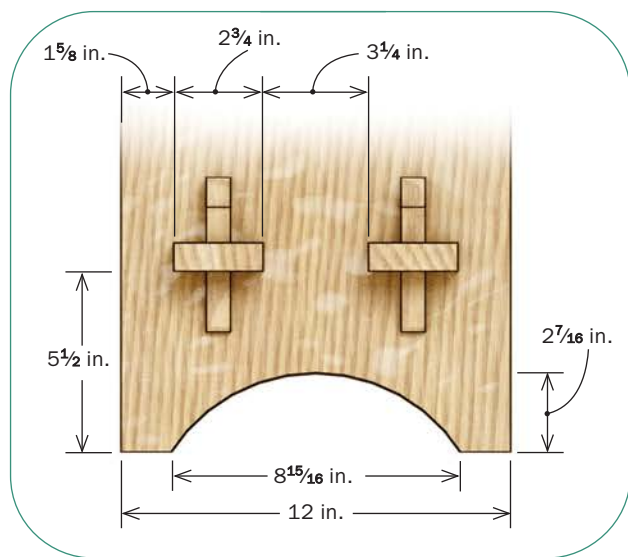
Tackling the tusk tenons

The most challenging part of the construction is cutting the through-tenons on the bottom shelf and the through-mortises in the sides. Because the case sides are canted 3°, the mortises and the tenon shoulders must be angled to match. I cut these joints with a plunge router and built two ramped template-routing jigs to guide the process.

In the finished bookcase, the bottom shelf is inset from the case sides; however, the jigs I made depend on lateral symmetry in the parts and the joinery. So in order for one jig to work for both case sides, and for the other jig to work for both ends of the bottom shelf, I did the joinery while the sides and the bottom shelf were the same width. Once the joints were cut and fitted, I cut



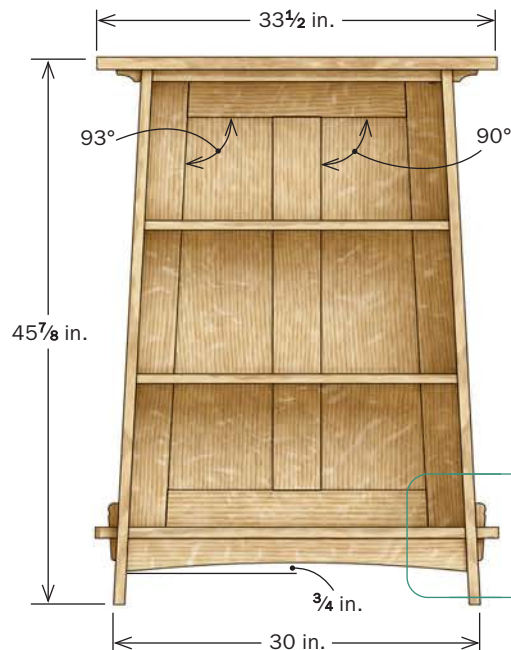
WHITE OAK ARTS AND CRAFTS BOOKCASE



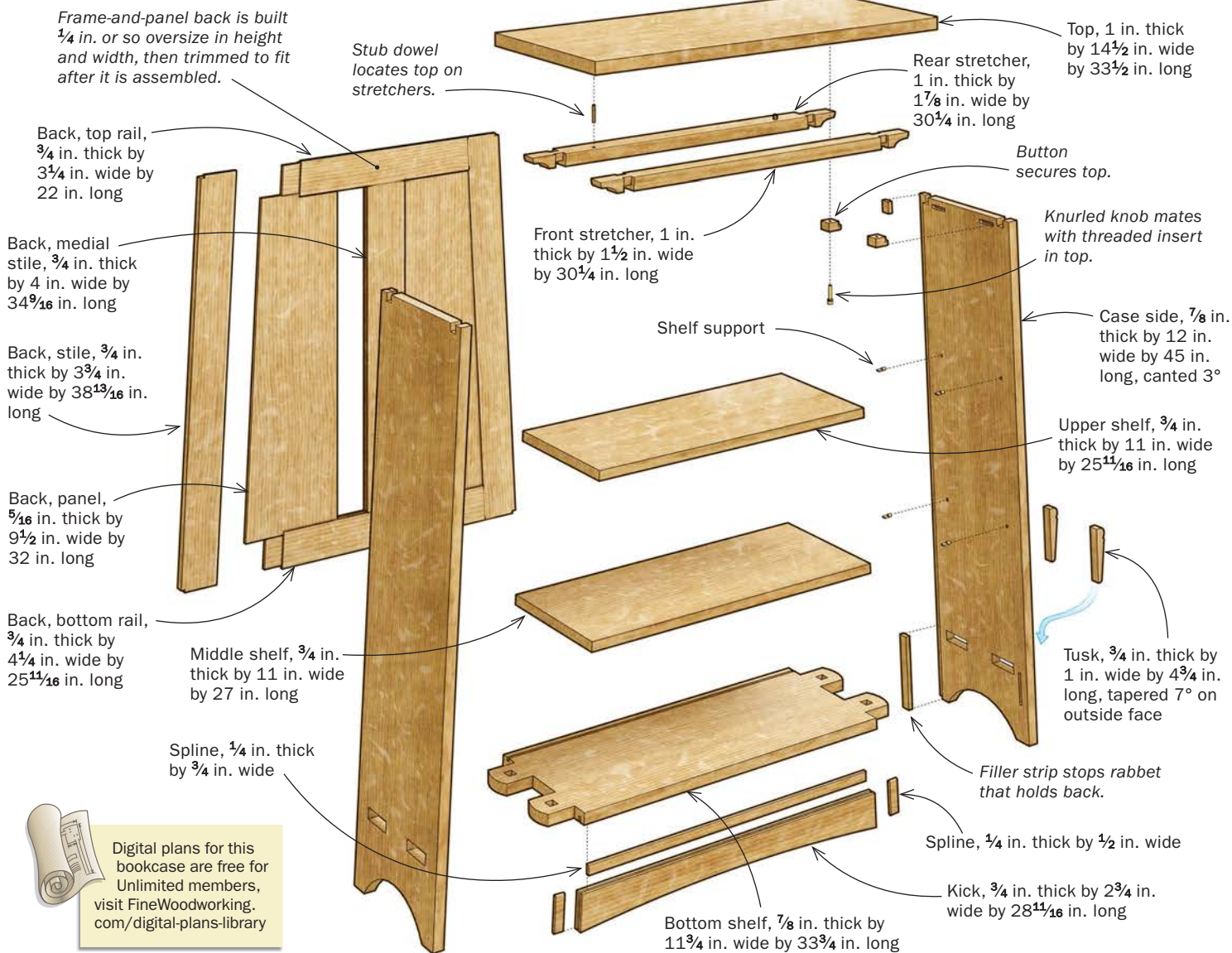
SIDE DETAIL



SIDE VIEW



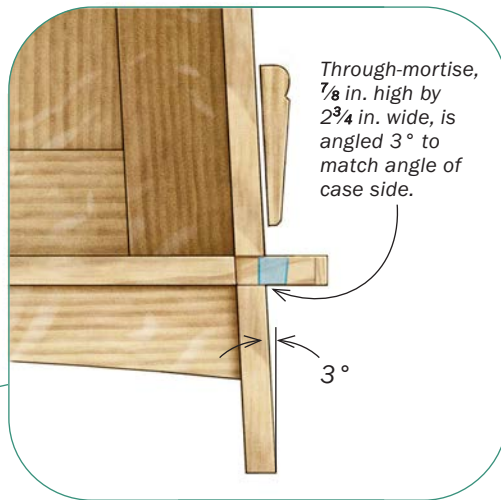
FRONT VIEW



Digital plans for this bookcase are free for Unlimited members, visit FineWoodworking.com/digital-plans-library

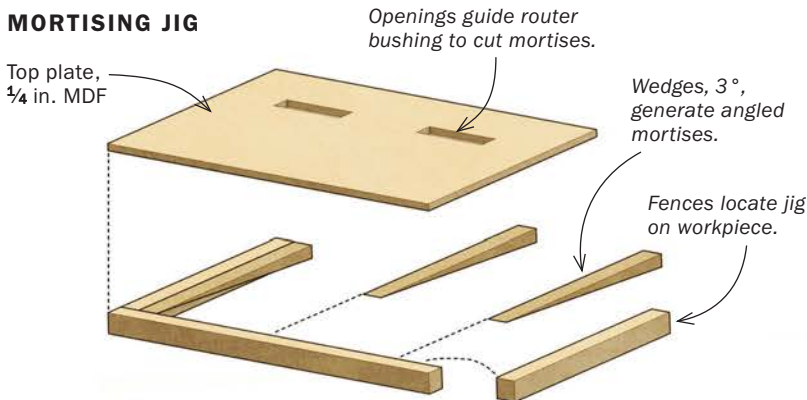
SIDES

The case sides are canted 3°, giving the bookcase its distinctive stance and requiring that the through-mortises be angled too. To cut them with a plunge router, Hartman made the template-routing jig in the drawing below.



ANGLED-ROUTING JIG FOR THROUGH-MORTISE-AND-TENONS

MORTISING JIG



ROUTING SEQUENCE

Start with a large plunge router using a 1/2-in.-dia., 3 1/2-in.-long upcut spiral bit.

Make the final passes using a smaller plunge router with a 1/4-in. by 3-in. upcut spiral bit.



the bottom shelf to final width, removing 1/4 in. from the front edge.

The jigs have three components: a template, wedges to generate the angle of cut, and fences to locate the jig on the workpiece. I made the templates from 1/4-in. MDF to maximize the reach of the router bits, which have to make through-cuts. When I did the routing I set a sacrificial scrap of MDF beneath the work to protect my bench and get a clean cut on the exit side.

I made the openings in the templates 1/16 in. larger than I needed the routed areas on the workpiece to be, because I would be using straight bits with router bushings and the combination would make cuts 1/16 in. from the template. When cutting the mortises in the



Rabbet for the back. With a dado set partially buried in a sacrificial fence, Hartman creates the rabbet in the case side that will accept the back.



Shaping the foot. Having carefully sawn the cutout at the bottom of the case side to the layout line with a jigsaw, Hartman smooths the shape with an oscillating spindle sander.



Stop that rabbet. Instead of cutting stopped rabbets on the case sides, Hartman makes a simpler through-cut on the table saw and fills the bottom few inches with a short patch.

BOTTOM SHELF WITH TUSK TENONS

Rough out the through-tenons. At the bandsaw, Hartman removes most of the waste between the through-tenons.



Template jig tightens up the tenons. Hartman uses a plunge router to fine-tune the tenons. Like the mortising jig, the tenoning jig he built has 3° wedges so the shoulder angle will match the cant of the case sides. Fences on three sides of the jig locate it on the workpiece.



case sides, I first used a large plunge router with a 1/2-in.-dia., 3 1/2-in.-long upcut spiral bit (Whiteside #RU5150) to waste most of the wood. I followed that with a finishing pass using a smaller plunge router with a 1/4-in. by 3-in. upcut spiral bit (Amana #46577). With both routers I made the cuts in three passes of increasing depth.

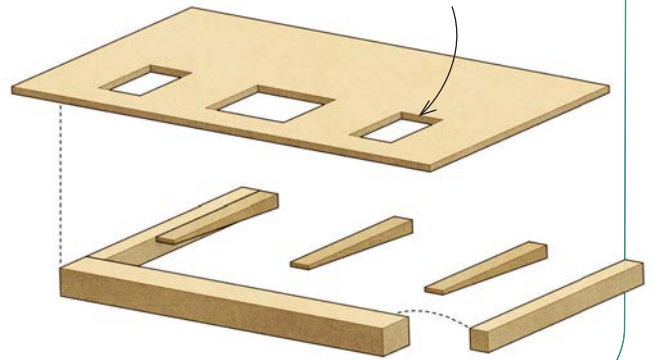
For the tenons I did the rough wasting at the bandsaw. Then, using the ramped jig for the tenons, I went directly to the smaller router for the finishing passes. After that, I rounded over the edges of the tenons with a 1/8-in.-radius router bit to match the rounded corners of the mortises.

Make way for the tusks

With the through-mortise-and-tenon joints cut and fitted, the tenons get through-mortised themselves to accommodate the tusks. First, I make the tusk blanks, tapering them at the tablesaw in a jig with a 7° notch.

TENONING JIG

Openings guide router bushing to waste wood between tenons.



Twin grooves. With a dado blade on the table saw, Hartman grooves the bottom shelf to accept the back and the kick.





Tusk mortises start by machine. After dry-fitting the through-tenons in the case sides to facilitate layout of the tusk mortises, Hartman cuts them with a hollow-chisel mortiser.



They end at the bench. Hartman clamps an angled guide block to the tenons as he chops the outer wall of the tusk mortise. The tusk is tapered at 7°; since the case side is canted 3°, the guide block is angled at 4°.



Tapered tusks safely sawn. To cut his 7° tusks safely, Hartman made a jig from two layers of MDF. The top layer has a toggle clamp and a 7° notch to fit the tusk blank; the bottom layer supports the blank, enabling it to be clamped.



Custom fitting. A clean fit of the tusks is key both functionally and visually. Hartman fits each one individually, tweaking with a handplane where necessary, and labels each to its mortise.

Then, with the case sides and bottom shelf dry-fitted and clamped, I draw a line on the tenons where they protrude from the sides. (After disassembly, I'll move this mark back $\frac{1}{8}$ in. for clearance.) To locate the outer face of the mortise, I lay a tusk on its side and make a mark corresponding to the thickness of the tusk when it is halfway home.

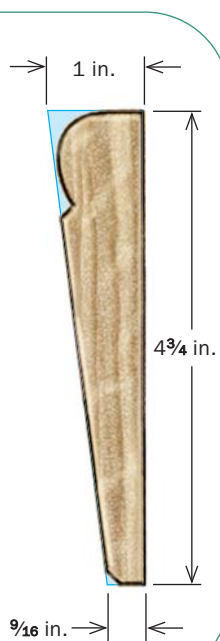
I start the tusk mortises on my hollow-chisel mortiser, using four overlapping passes with a $\frac{1}{2}$ -in. chisel to chop a hole $\frac{3}{4}$ in. square. Next, to cut the angled outer face of the mortise, I move to my workbench and use a chisel with a 4° guide block.

Stretcher session

The stretchers, with their tightly fitting housed bridge joints, hold the top of the bookcase together. To lay out the bridles, I fit the bottom shelf and the sides together, tighten the tusks, and clamp in a pair of triangular braces with a 3° tilt to firm up the case. Then I place the stretchers upside down across the tops of



Paper template. Once the tapered tusks are fitted, Hartman traces a paper pattern to define their decorative shape. He'll follow the layout lines with careful bandsaw cuts and clean up with an edge sander and some filing and hand-sanding.



LOCKING STRETCHERS

Bridle location.

With the tusk tenons assembled and a pair of 3° braces clamped inside the case, Hartman begins the bridle joint layout by scribing the location of the sides on the stretcher.

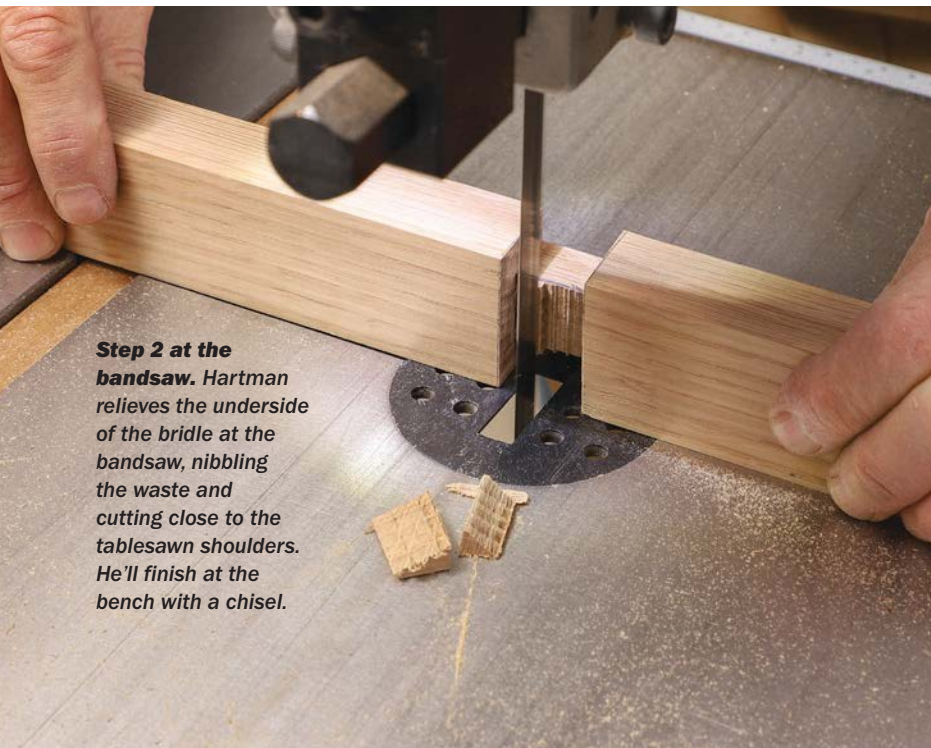


Sloping shoulders.

To cut the slanted shoulders of the bridle joints on the stretcher, Hartman uses a 3° wedge against the miter gauge. He first saws to the layout lines, then cleans the waste with multiple passes.



Step 2 at the bandsaw. Hartman relieves the underside of the bridle at the bandsaw, nibbling the waste and cutting close to the tablesawn shoulders. He'll finish at the bench with a chisel.



the case sides and mark them with a pencil where they cross the sides. The notches in the stretcher need to match the slope of the case sides, so I use a 3° wedge as I make the cuts on the table saw. Then the notch on the underside of the stretcher is cut with the bandsaw and trimmed to fit with a chisel. With those cuts made, I place the stretchers in position on top of the sides and mark the sides for their notches. I use a handsaw and chisel to cut these.

Fitting the kick

The kick, which is strictly for show and not needed to support the beefy bottom shelf, will be joined to the case with splines that get glued into the kick but are left dry in the case sides and shelf. Before adding the splines, I cut the kick to fit the assembled case. Next, at the table saw, I cut grooves in the kick's ends and along its top edge, and then glue oak splines into the grooves.

Bridle transfer.

With the stretcher bridles finished, Hartman positions the stretcher and transfers the joint to the case sides.



Notching for the stretcher. Cutting the bridle notches in the sides begins at the bench with a handsaw. Hartman then moves to the bandsaw to remove the waste before returning to the bench to clean up with a chisel.



MAKE THE KICK

Kick start. With his handy 3° wedge against the fence, Hartman cuts one angled end of the kick at the chopsaw. Then, with the angled end fitted to the carcass side (below), he marks the other end for its angled cut.



Then I rip the bottom shelf to final width, trimming off the front edge so it will be inset from the case sides. Now I can cut the groove for the kick spline along the underside of the bottom shelf's front edge. To cut the short stopped grooves in the case sides for the kick splines, I use the hollow-chisel mortiser.

Machine the curves

I like to make all the curved cuts after completing the joinery. I made full-size digital drawings for this project and had them printed on 36-in. by 48-in. paper at Staples. I cut out the curved details from the drawings and used these paper patterns to lay out the arches at the bottom of the sides and the kick, and the decorative shapes on the tusks and the ends of the stretchers. Depending on the piece, I roughed out the curves close to the lines with a jigsaw, bandsaw, or scrollsaw. Then I smoothed them with a spokeshave or sander.



Triple grooved. With a dado blade and a fingerboard at the table saw, Hartman mills grooves along the top edge and the two ends of the kick.



Spline time. Solid splines are glued into the kick's three grooves. Afterward, the bottom edge of the kick will be bandsawn to a shallow curve and smoothed with a spokeshave and scraper.

FRAME-AND-PANEL BACK



Angled frame tenons. The frame-and-panel back is tapered to match the case. Here, using his 3° wedge against the miter gauge, Hartman cuts the rail tenon at the table saw with a dado blade. The rip fence acts as a stop for the shoulder cut.



And angled panels. The back panels, their outside edge cut to the familiar 3° angle, get dropped into place dry.



Template for a trapezoid. Instead of trying to measure the opening for the back, Hartman created a template of the shape by inserting four strips of $\frac{3}{4}$ -in. MDF into the rabbets and grooves where the back will be fitted, then hot-gluing the strips to each other at the corners.

Special fitting for the frame-and-panel back

Because the frame-and-panel back is trapezoidal and sits in rabbets in the case sides and grooves top and bottom, it's tricky to fit. To solve that problem, I built the back $\frac{1}{4}$ in. oversize in height and width and used a template to trim it to fit. I made the template using 3-in.-wide strips of $\frac{1}{4}$ -in. MDF. I fit the strips into the rabbets and grooves and joined them at the corners with hot-melt glue. I then removed the template and attached it to the assembled back with double-stick tape. Riding the template against an L-fence on the table saw, I trimmed all four sides to shape.

Once the back was cut to size, I milled tongues along its top and bottom edges with a dado blade. This worked well, but because of clearance issues you can expect that you'll need to adjust the fit with hand tools.



Peg it. Hartman glues the frame and locks it tight with drawbore pegs.



Template in practice. Having built the back slightly oversize, Hartman used double-stick tape to attach the trapezoid template to the assembled frame. Then, with an L-fence clamped to the table saw's rip fence, he ran the template against the L-fence to cut the back to final shape.

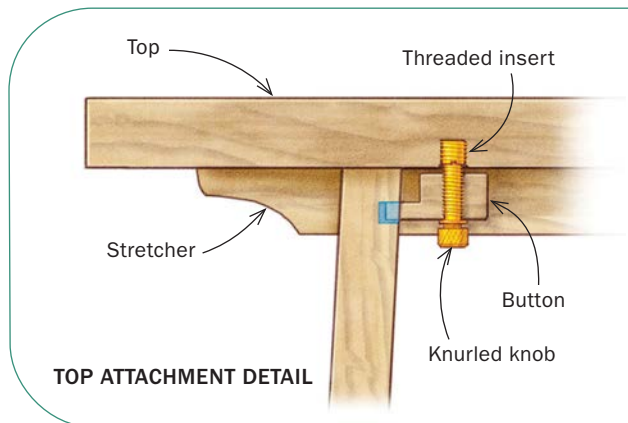
ASSEMBLY, VERY DRY



Backing in. With the sides slightly loose, Hartman fits the back into the side rabbets and drops the tongue at the bottom into its groove.



Lockdown. Fit the stretchers into their notches, pressing them down flush with the sides. Then knock home the tusks to lock the sides tight.



A twist under the top. To attach the top, Hartman made buttons that twist into slots cut into the case sides. Bolts with knurled knobs fit into threaded inserts to secure the buttons and make the case easy to knock down and reassemble.

Topping

To make the bookcase easy to disassemble and reassemble, I put locating dowels in the back stretcher and secured the top to the sides with buttons and thumbscrews. The buttons attach the top but also keep the bridle joints locked together. After installing the buttons and thumbscrews, I cut the adjustable shelves to fit and the bookcase was complete. □

Longtime FWW illustrator John Hartman takes a breather from his drawing table by spending time in his woodshop in West Springfield, Mass.



Hard Maple

Learn what each brings to the table

For much of the year, maple trees blend in with the rest of the forest. In the fall, they explode with an array of marvelous colors. Like its leaves, maple lumber can range from plain and unassuming to stunningly expressive. It's also strong and tough, with tight grain, lovely blond color, and beautiful varieties across North America and Europe.

While hard maple gets most of the attention, soft maple should not be overlooked—or relegated only to secondary components like drawer boxes and internal framework. Soft maple is stronger than its name implies, its color can be very charming, and it's just as likely as hard maple to have beautiful figure.

As a group, the maples offer an unmatched variety of figure.

There is curly striping and quilted bubbles, bird's-eye and burl patterns, bold streaks of color left behind by beetles, and wild patterns made by fungi, who love maple as much as woodworkers do.

Two categories

Hard maple lumber comes primarily from one species, sugar maple (*Acer saccharum*), but also from black maple (*Acer nigrum*). The better hard maple trees grow in the cooler areas of North America, such as the Northeast, upper Midwest, and southeastern Canada. But good trees can also be found in adjacent regions.

Soft maple lumber, on the other hand, comes from any of three species: red maple (*Acer rubrum*), silver maple (*Acer saccharinum*), and bigleaf maple (*Acer macrophyllum*). Red and silver are harvested in the eastern, central, and southern United States, as well

Where maple grows

Varieties of soft and hard maple grow across North America and Europe.



HARD MAPLE

Sugar maple, which accounts for most hard maple, grows throughout the northeastern United States.



SUGAR MAPLE



SOFT MAPLE



BIGLEAF MAPLE

vs. Soft Maple

BY DAN BOLLOCK

as eastern and south-central Canada. Bigleaf maple comes from the Pacific Northwest.

Another soft maple worth mentioning is box elder (*Acer negundo*). Smaller in size than other North American maple trees, it is not sawn commercially into lumber. However, bowl turners love the red streaks in the log, at least initially, as they tend to fade a bit with time.

Europeans import maple from the U.S. and Canada, but they have their own species too. Norway maple (*Acer platanoides*) is the most notable, growing throughout Europe, where it is sawn into boards. While its color and grain are similar to hard maple, Norway maple can be termed hard or soft, because its hardness is somewhere between the two.

Telling the groups apart

The lumber of soft and hard maples has subtle color dif-

ferences that can be difficult to distinguish. The color of hard maple is usually lighter and more uniform, while soft maple tends to have a touch of gray, and sometimes brown streaks or spots.

A better way to distinguish the two types is weight and density. Hard maple trees grow more slowly than their soft maple counterparts, so their growth rings tend to be smaller and their grain tighter. Hard maple weighs 44 lb. per cubic foot, while soft maple weighs 33 to 38 lb. per cubic foot, depending on the species. You can weigh the two, of course, but experience will allow you to tell the difference simply by lifting a board at the lumberyard.

If you weigh the lumber, you'll find the differential to be around 25%. So, for example, at 12% moisture content a ¾-in.-thick by 6-in.-wide by

6-ft.-long board of hard maple will weigh approximately 8 lb., while a soft maple board of the same size will be around 6 lb.

If you don't have a feel for their relative weights, a close look at the end grain will clear up any confusion. All maples

have rays that run perpendicular to the growth rings. These are visible with the naked eye on the quartersawn face of a board. If you look

Soft maple comes from three North American species.



RED MAPLE



SILVER MAPLE



EUROPEAN MAPLE

Norway maple, with a density somewhere between hard and soft maple, grows throughout Europe.



NORWAY MAPLE

Lots to offer the woodworker

Strong and blond, with a wide variety of grain patterns, maple has been a favorite of furniture makers for centuries.

at the end grain with a 10x jewelers loupe, however, you'll see that hard maple has both thinner and thicker rays, while the rays in soft maple are more uniformly sized.

Hard maple is a workbench favorite. With its extreme toughness and tight grain, hard maple is great for workbenches, especially their tops.



Key characteristics for woodworkers

Hard maple is an extremely tough wood; that's why it is used for gym floors and bowling-alley lanes, as well as workbenches and furniture. Its Janka hardness is 1,450 lb., which falls between white oak (1,360 lb.) and hickory (1,820 lb.). (Janka hardness measures the force needed to push a 11.28mm-dia. steel ball into the wood to a depth of half the ball's diameter.)

Due to hard maple's toughness, and maybe its sugar content as well, the table saw



Consistent color emphasizes form. At a distance, Rex Alexander's Craftsman-style dining table looks minimalist and sculptural. Take a step closer and there's curly figure everywhere, with dense bird's-eye figure in the spindles.

and router tend to leave burn marks on it. A faster feed rate, plus sharp bits and blades, will help.

Don't let the "soft maple" moniker fool you into thinking it is a lightweight, or that it shouldn't be used for furniture. Its Janka hardness is 950 lb.—exactly the same as cherry—making it plenty strong yet easier to cut than hard maple.

Traditionally, hard maple has been more expensive than soft maple. As more cabinet and furniture manufacturers have turned to the softer subgroup, however, the prices of soft and hard maple have become about the same.

Heartwood vs. sapwood—

Like most species, the maples have sapwood and heartwood of distinctly different colors. Unlike most other woods, however, the sapwood of both hard and soft maple is the preferred lumber and draws the higher prices. That's because

maple sapwood is creamy white, while the heartwood is a darker tan with reddish-brown streaks.

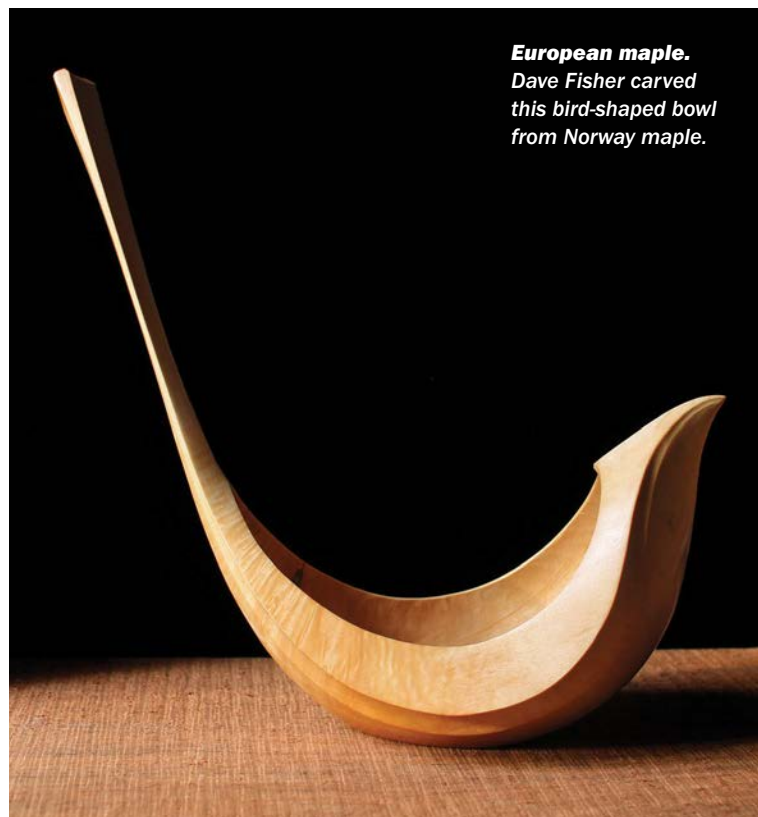
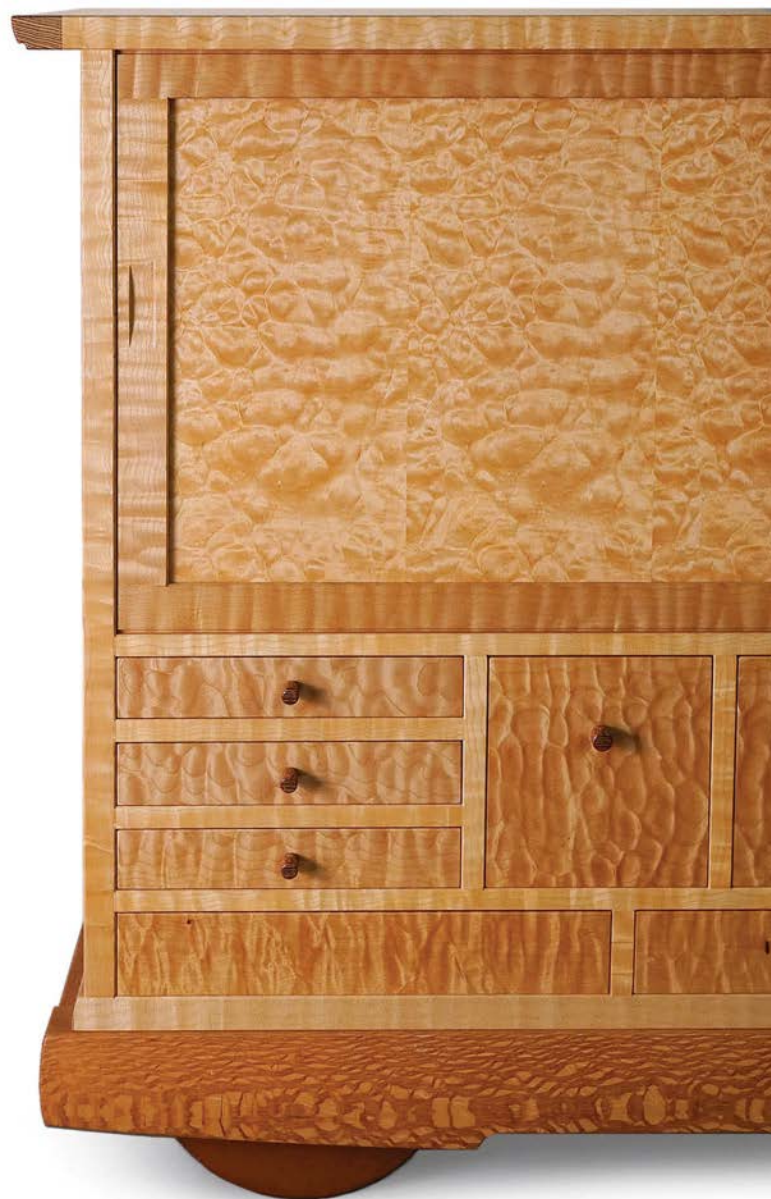
Lucky for us, forest-grown maple trees tend to have a very small heartwood section, sometimes as small as 2 in. diameter. Urban maple trees, on the other hand, tend to have much larger hearts—up to half the diameter of the log.



Soft maple plays well with others. Soft maple works well for furniture frames and other secondary uses, like the drawer boxes in Art LaMan's mahogany tool box.

And it can explode with figure.

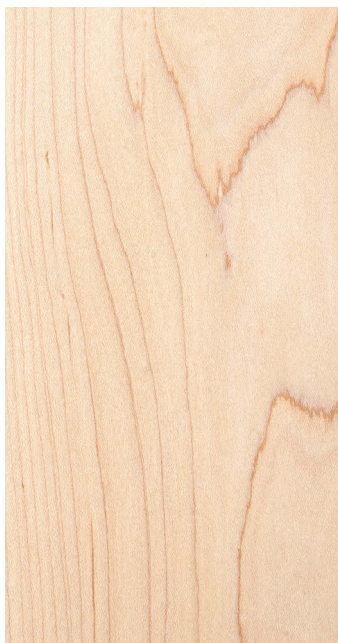
Aaron Levine built this cabinet from bigleaf maple with spectacular quilted figure (the base is lacewood).



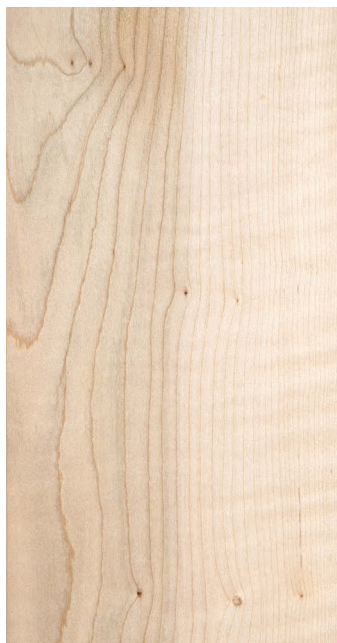
European maple. Dave Fisher carved this bird-shaped bowl from Norway maple.

Unmatched variety

As a group, the maples offer a wide variety of looks, with boards ranging from plain to highly figured and colored.



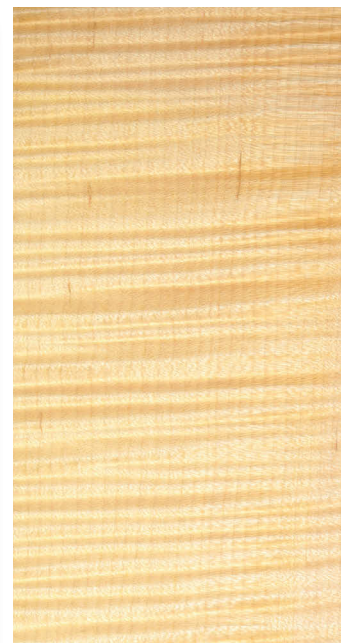
Hard maple is calm and quiet. Most hard-maple lumber comes from sugar maple. This unfinished, unfigured sample shows its grain and consistently blond color.



Color varies in soft maple. As you can see in this unfinished sample, soft maple can look just like hard maple and/or have grays and browns mixed in.



Heartwood vs. sapwood. Compared to the lighter-colored sapwood, the heartwood of all maples is darker tan, often with reddish streaks. But it has its own rustic charm.



Curly maple is beautiful and challenging. A coat of oil pops the curl in this red-maple sample. The changing grain direction makes curly maple tricky to hand plane, but sanding works well.



Quilting is another form of curl. It occurs most strikingly in bigleaf maple.



Fun with fungi. Spalting fungi leave lovely color patterns in dead logs. If the wood is cut and dried before the rot has gone too far, it will be plenty strong enough for turnings and accent areas.



Ambrosia maple. Ambrosia beetles attack a variety of maples, leaving telltale entry and exit holes and gray/tan streaks. Unlike spalted maple, ambrosia maple is always sound.

Having said that, maple's dark, streaky heartwood offers a rustic look that's perfect for some pieces.

Inside the amazing world of maple figure

Maple's myriad grain patterns are prized by luthiers, wood turners, box makers, and furniture makers alike. At least one type of maple figure, bird's-eye, is seen only in hard maple. Others, like quilting and curl, are seen mostly in the soft maples.

Spalting fungi and ambrosia beetles, on the other hand, leave their unique patterns in both hard and soft maples.

Curly maple—While most of the curly maple in lumberyards comes from red (soft) maple, it can occur in hard maple as well. Curly maple has undulating growth rings, caus-

Wondering what you have? Check the rays

While hard and soft maples can sometimes be tricky to tell apart, a close look at the end grain removes any confusion.



ing the grain to ripple along the length of the log. The rippling grain creates patterns of dark and light stripes on the board, usually perpendicular to its length.

Curly maple stripes can range from narrow and numerous to wide and limited. Subtle differences in striping have given rise to names like fiddleback, tiger stripe, flame, and ripple. These unofficial names are confusing, however, as industry pros can have different definitions for each.

Quilted maple—Quilted maple has a bubbly figure pattern that is prized for the solid bodies of electric guitars. It occurs primarily in bigleaf maple (a soft variety) and rarely in other species.

The bubbly stripes can vary from dime-sized to quarter-sized, tightly spaced to farther apart. The more bubbles, the more expensive the lumber.

Bird's-eye maple—Another popular type of maple figure is bird's-eye. It develops in a small percentage of sugar maple (hard maple) trees in the upper Midwest, northern New England, and Canada. The figure is thought to be caused by branch buds that didn't develop. The dimpled eyes range between $\frac{1}{16}$ in. and $\frac{3}{16}$ in. diameter, and from few and scattered to numerous and dense.

Fungus and bugs—Spalting is internal coloring caused by wood-eating fungi that attack dead trees.

Ambrosia beetles also attack a variety of maple trees, leaving gray and tan streaks scattered throughout the white sapwood. If the little bug holes bother you, you can fill them with epoxy or cyanoacrylate (CA) glue.

—
Dan Bollock has a master's degree in wood products, and he operates a student workshop at Purdue University.

All maples have rays. These run perpendicular to the growth rings, making them visible on the quartersawn face of a board. But the rays are slightly different in hard and soft maple.



Grab a loupe. An inexpensive 10x magnifier, called a loupe, works well for identifying wood. The loupe at right has built-in LEDs. A common razor blade can be used to shave end grain cleanly for easier identification.



Regular vs. irregular rays. Hard maple (left) has both wide and narrow rays, with the widest being close to the width of its pores. Soft maple (right) has rays of more uniform width, which are slightly smaller than its pores.

Build Your Own



THE MAIN BUILD IN THIS ARTICLE

Hi-fi audio. Retailers like GR-Research offer world-class components and instructions for a range of high-end speakers, like this compact but powerful pair. "Passive" speakers like these are connected with wires to a separate amplifier or receiver, as part of a high-end audio system. The article covers this build in detail.

As a furniture maker and luthier with a passion for music, I've had a lot of fun building my own audio components, especially speakers. These projects have given me the chance to learn a number of new skills and concepts. Speakers require a unique approach to material selection, airtight joinery, and careful soldering.

What makes these high-end DIY speakers possible is the range of retailers selling excellent parts kits. These kits include the speakers themselves (drivers) and all of the electrical/electronic parts you'll need, along with detailed instructions on how to assemble them and build the boxes. My favorite retailers include DIY Sound Group, GR-Research, and Parts Express.

The kits we chose for this article include only the electrical components, leaving the customers to build the boxes. While many companies also offer precut box parts, to be glued up and finished as desired, those take away part of the fun for me.

Go with a parts kit—If you have a deep interest in electronics

and acoustics, you can select and purchase the drivers, crossovers, wires, capacitors, and other electronics separately. For most of us, however, a high-quality parts kit is the way to go. These ensure that components are matched properly, and they include instructions for a properly designed speaker box, another critical component.

More sound for less—I've built a number of speakers using parts kits like the ones cited below, and in each case the speakers I built perform much better than premade speakers sold at a similar cost.

For example, to get audio quality similar to that produced by the high-end bookshelf speakers featured in this article—built using a \$400 component kit from GR-Research—you would likely need to spend \$1,000 or more on off-the-shelf speakers. In fact, that's what GR-Research charges for a completed pair using the same kit.

With all but the most basic speaker kits, some soldering is involved. But don't be intimidated; this type of soldering requires very simple tools and is easy to learn.



Speakers

Use a high-quality component kit and get great sound for less

BY ANDREW GIBSON



Two other types to consider

Parts kits are also available for powered speakers, with built-in amplifiers that let them connect directly to smartphones, computers, and TVs.



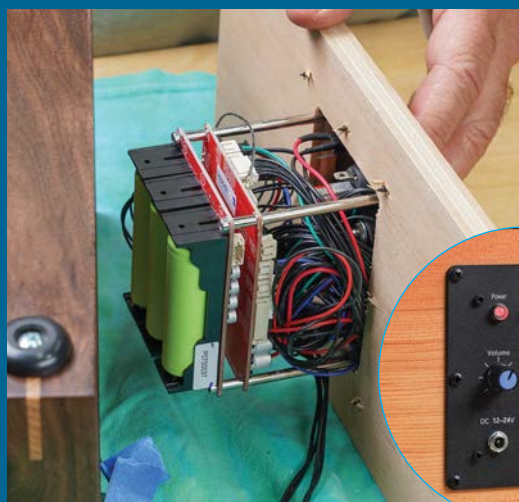
BLUETOOTH BOOKSHELF SPEAKERS



The components for these bookshelf-size speakers include a small amplifier and both wired and Bluetooth connections, so the speakers can be connected directly to a TV, phone, or computer. Gibson added grills to these speakers. The speakers were made using the C-Sharp kit (\$190) from Parts Express. A small control panel attaches to one of the speakers.



PORTABLE SPEAKER



The Large Portable 100W Bluetooth Ammo Box Speaker Kit from Parts Express (\$130) includes everything you need for a portable Bluetooth speaker for the workshop, beach, or backyard. The container is up to you. We aren't presenting the steps involved in this build, but the included instructions make it relatively straightforward.



Anatomy of a hi-fi speaker

Gibson built this pair of compact yet high-performing speakers using the X-Bravo parts kit (\$345) from GR-Research. Being “passive” speakers, they require wired connections and a separate amplifier.



SMART APPROACH TO CABINET CONSTRUCTION

High-end speakers should be airtight, with a sound-deadening box. This makes MDF a great material choice. Veneer it to add beauty, and use miter joints for a seamless look. Solid corner strips are rounded to allow sound waves to disperse without interference.

Lots of possibilities

For this article I built two different types of speakers, and my editor, Asa Christiana, built a third. The three parts kits demonstrate the wide range of possibilities for speakers. There are also parts kits available for other high-end stereo components.

The main project in this article is a pair of compact but high-quality speakers that can go anywhere in your home. Called passive speakers, this type must be powered by a separate amplifier or receiver.

While there are even higher-level kits available, priced into the thousands for true audiophiles, the X-Bravo kit I used produces speakers that pair well with high-end audio components and/or a home-entertainment system.

Powered bookshelf speakers—The second build, which uses the C-Sharp kit from Parts Express, is a pair of powered bookshelf speakers. The term “powered” means that they have an amplifier built in, so you can attach them directly to your TV, computer, phone, or CD player. This kit also includes a Bluetooth module for a wireless connection.

For more information on this build, see our free companion article at FineWoodworking.com/312.

Portable speaker—

Last is the even more compact and portable Bluetooth speaker that Christiana built. This is perfect for use in the backyard, at the beach, or in your workshop. There are fewer restrictions on the container design for this type of kit, so flex your creative muscles and come up with something cool. The kit, from Parts Express, is designed to go inside an ammo box, so your container doesn't even have to be wood.



What's in the box. These are the parts for one speaker. The electronic components are soldered together and mounted on a thin MDF board. The tube is an air port that goes in the back of the speaker box.

Veneer the panels

Gibson used shopsawn veneer, which is thicker than commercial veneer. That let him glue on clamping blocks to assemble the miter joints and then remove the blocks without fear of sanding through the veneers.

Dial in your resawing setup.

Use a fresh blade, at least $\frac{3}{8}$ in. wide, with three or fewer teeth per inch, and center it on the upper wheel. Saw the veneers a little over $\frac{1}{8}$ in. thick.



Plane them smooth. It helps to place an auxiliary table in your planer, made of MDF or melamine, with a small cleat to keep it from sliding through the machine. Flex the veneers as they enter the planer to keep them from being pulled up into the cutterhead.



Join veneers if necessary. To create wider veneers, join strips. Stretch blue tape across one side of the joint, fold the joint open, spread glue on the edges, fold the panel flat again, and then stretch tape across the other side.



Applying the veneers. Gibson used polyurethane glue here, which doesn't introduce much moisture to the assembly. Spread glue on the MDF, give it a light mist of water, and lay down the veneer, holding it in place with blue tape. Do the same on the other side of the panel.



Clamp the sandwich. Add a sheet of plastic to each side to resist glue; add more of the $\frac{3}{4}$ -in.-thick MDF on both sides to spread clamping pressure; and place clamps 6 to 8 in. apart.



Back through the planer. After the glue has cured, plane both sides evenly, bringing the panel down to $\frac{7}{8}$ in. thick in the process. Use the table saw to clean up the edges.

Build the box parts

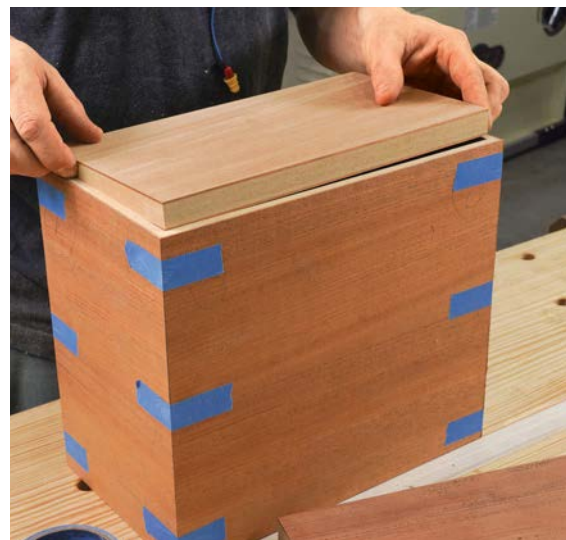
The sides go together with miter joints, and the fronts and backs drop into a rabbet. Then solid corner strips are added to hide the veneer edges and allow the corners to be rounded.



Miter the sides. Cut the parts to exact size, and use a crosscut sled to cut the miters. Use a stop block to ensure that the cuts end right at the edges of the workpiece.



Rabbet the sides. Bury a dado set slightly into an auxiliary fence, and cut the rabbets on the table saw.



Cut the fronts and backs to size. Dry-fit the sides with blue tape, and trim the front and back panels until they drop into their rabbets.

Cut the openings

The front and back panels need openings of various shapes, depending on the speaker design. If you can't cut them with a Forstner drill bit, use a router and template to do the job.

Make a template for the driver holes. Drivers need large holes, sometimes rabbeted. Use a circle cutter in the drill press to make templates, factoring in the offset between the router bit and the guide bushing you'll be using.



Two-step template. The smaller driver needs a rabbeted hole, which is notched. So this template has two different circles for routing the same driver hole. Place a sacrificial board under the workpiece, and use double-stick tape to attach the template in each position.



There is nothing different about the techniques needed for this type of build, so we'll just show you the components and the result.

How speaker components work together

For a speaker to reproduce sound effectively, all of its components need to work together well, including the boxes.

Crossovers filter the signal—The crossover is a set of electronic parts—capacitors, resistors, and inductors—that filter the signal from the amplifier, breaking it into different frequency ranges and sending those signals to different-size speaker cones, or “drivers.”

Drivers create the sound—The driver is the part that we typically think of as the speaker. It moves air in waves that we perceive as sound. Drivers come in different sizes, designed to reproduce different frequency ranges. Tweeters reproduce higher frequencies, woofers reproduce mid-range frequencies, and subwoofers reproduce bass frequencies.

The two pairs of bookshelf speakers we built are “two-way” speakers. This means that they have a tweeter and a woofer, with the latter handling both low- and mid-range signals. There are also speaker designs that use single, full-range drivers, and there are 2.5-, 3-, and 4-way designs, usually on the higher end.

The box is the foundation—The third component is the box, or cabinet, and its

Finish up the box

After the box is glued up, the front and back edges are rabbeted to accept solid-wood strips, which are rounded on the router table.

Attach clamp blocks.

After stretching blue tape across the joints, Gibson uses CA glue to attach 45° MDF blocks (near right). Hold each one in place for 15 seconds before moving on. To stiffen the box, the X-Bravo design includes a dowel that connects one side to the other. Drill for this dowel ahead of time, and insert it during assembly (far right).



Glue and clamp the parts. Spread yellow glue on the miter joints, close up the box, and tape the last corner closed. Then spread glue in the rabbets, add the front and back panels, and clamp lightly across the miter joints. Add more clamps to tighten the panels in their rabbets.



Rabbet the corners. After assembly, the front and back edges get a $\frac{3}{8}$ -in.-square rabbet for solid corner strips.



Glue in the corner strips. These are cut a bit thicker than $\frac{3}{8}$ in. Dry-fit them to dial in the miter joints, and attach them with glue and blue tape.



Round the corners. After the glue dries, plane and/or sand the strips flush, and use a $\frac{3}{8}$ -in. roundover bit to round them.

Build the crossover

The electronic components are soldered together and then attached to a small MDF base, which is screwed into the bottom of the box.

Plan the layout. Cut a piece of $\frac{1}{4}$ -in. MDF narrow enough to fit into the large driver hole, and read the X-Bravo instructions to understand how the parts should be arranged and connected. Position the parts as tightly as possible, and mark and drill holes for zip ties.



Solder the connections. Twist the wires as shown, add flux, and solder the joints. The solder should flow along the entire joint. Check the opposite page for more soldering advice.



Tie down the parts and attach the finished crossover. Once their joints are soldered, lock down the main parts with zip ties that pass through holes in the base board (left). The panel slips through the larger driver hole and is screwed to the bottom of the speaker box.

shape, materials, and construction are critical for getting the best performance from high-quality crossovers and drivers.

The air inside the box acts like the shock absorbers on a car. As the driver cones move in and out, the trapped air behind them keeps the cones from bouncing out of control.

As the driver cones are pushing sound outward, they are also making sound waves inside the box. If those waves bounce around too much in there, they can push back on the cones and cause distortion. Think of children jumping on a trampoline. If they all jump at different times, the bounces are unpredictable. A well-designed speaker box allows the driver to act as though there is only one child on the trampoline, with all frequencies happening at the same volume.

Soldering basics

Look for a soldering iron with adjustable temperature that can reach 700°F, and set it to 650°F for the tasks shown here. The solder itself comes in a number of varieties and sizes. I like 63/37 or 60/40 “no-clean solder,” which has flux compound added to help it flow and bond with the parts being joined, so it’s less critical to clean the parts beforehand. A thin 18- to 22-gauge (0.7 to 1.2mm) solder is ideal for electronic connections like these. Do not use plumbing solder, which contains a corrosive type of flux that will damage electronics over time.

The key to successful soldering is to heat the metal parts being connected and let those melt the solder, drawing it around them as it does. Don’t apply heat directly to the solder and then try to apply it to cold parts; it will not flow and bond them. If the solder globs up and/or doesn’t flow, you might need to add flux or heat the parts longer before applying the solder.

—A.G.



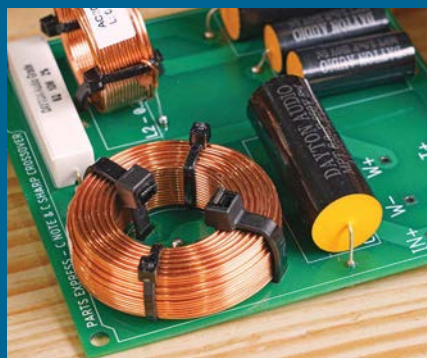
Step 1: Tin the iron. Melting a little bit of solder on the tip of the iron helps the iron transfer heat to whatever you touch.



Step 2: Add some flux. For wire-to-wire connections like these, it helps to add a small amount of liquid flux to the joint.



Step 3: Heat the joint and add solder. Apply heat to the joint for a few seconds, and then melt solder into it. Be sure to heat the wires and let them melt the solder, rather than trying to melt solder onto a cold joint.



Circuit-board connections. Push the component wires through the board, and hold the soldering iron in place for an extra moment (far left) to allow solder to flow through the holes. Then flip the board to check that it did (near left).

The details matter here. If the internal shape and overall volume of the cabinet are changed, that can have a significant effect on the system. The front of the box also matters; shaped correctly, it will help the sound waves radiate smoothly into the room.

Powered speakers have a built-in amp—Powered, or active, speakers include a small amplifier, which is typically installed in one of the speakers but powers both. The amp needs a power source, such as a cord or battery pack, and some have both.



Kester 1544 liquid soldering flux, \$15

60W soldering iron kit with adjustable temperature, \$10

60/40, 0.81-mm, flux-core solder wire, \$7

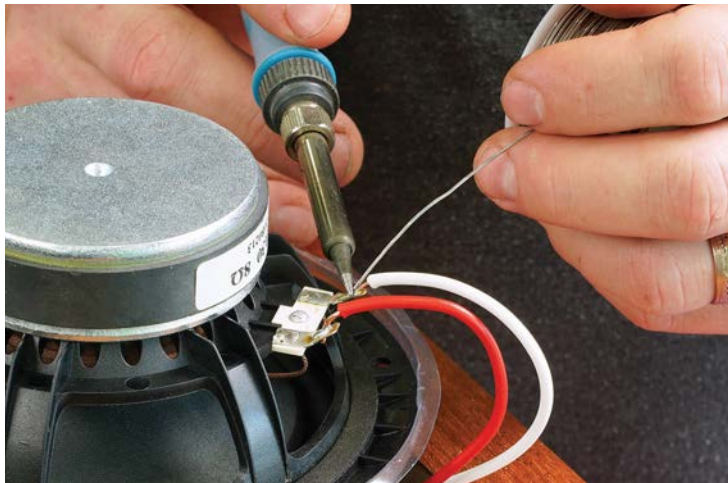
Finishing touches

Once the boxes and crossovers are done, the rest is easy.



Add acoustic foam. This self-adhesive foam (from Parts Express) lines the box to prevent echoes inside. It's easiest to position the pieces with the backer attached and then peel it off with the pieces in place.

Add the drivers. Leave the speaker wires extralong, and solder them to the drivers. Then screw the drivers carefully in place. Drill pilot holes to help you avoid slipping with the screwdriver and puncturing the driver cones.



Solid construction approach for most speakers

Because the electronic components in these kits have been carefully matched to each other, we don't have to worry about their design or compatibility. But the speaker boxes are another story.

For the two higher-end pairs of speakers, I went with the exact internal sizes recommended by the designers who put the parts kits together. I also followed some of their recommendations for materials and joinery. That still left me plenty of room to add custom touches that make the speakers look like fine woodworking.

Whether custom-built or purchased, speaker boxes need to be airtight. That's difficult to do with solid wood, which shrinks and expands. The boxes also need to be strong and stiff. If a box resonates like a guitar, it will absorb some of the drivers' energy and cause distortion.

To build airtight boxes with as little resonance as possible, I used MDF covered with shopsawn veneer. Christiana, on the other hand, used a mix of solid wood and plywood for his boom box, because that kit has less-exacting acoustics.

MDF is an ideal substrate for veneering, and it has great acoustic properties for speakers. Luckily, our speakers are small enough that normal clamps, used in conjunction with MDF clamping cauls, will work great for applying the veneer. So you won't need a vacuum bag.

To join the veneered parts, I prefer mitered corners with glued-in front and



Two more components, and then feet. The port is simply pressed into its hole, and the speaker-wire cup is screwed in place (left). Self-adhesive felt circles are all it takes to keep speakers from rattling, but these speaker feet (Amazon.com) look and perform even better (above).

Grills are a nice option

Speaker grills hide the drivers and add a measure of protection. They can also affect the sound a little bit, but that's only a factor on very high-end speakers.

Grills can be as simple as a pair of mitered frames, with speaker cloth hot-glued into a rabbet on the back side.

The design details are up to you. These grill frames have a slight inward taper on their front faces, and shallow arcs along their inside edges.

Grill fabrics, widely available in a variety of looks and colors, are another way to personalize the look.

—A.G.



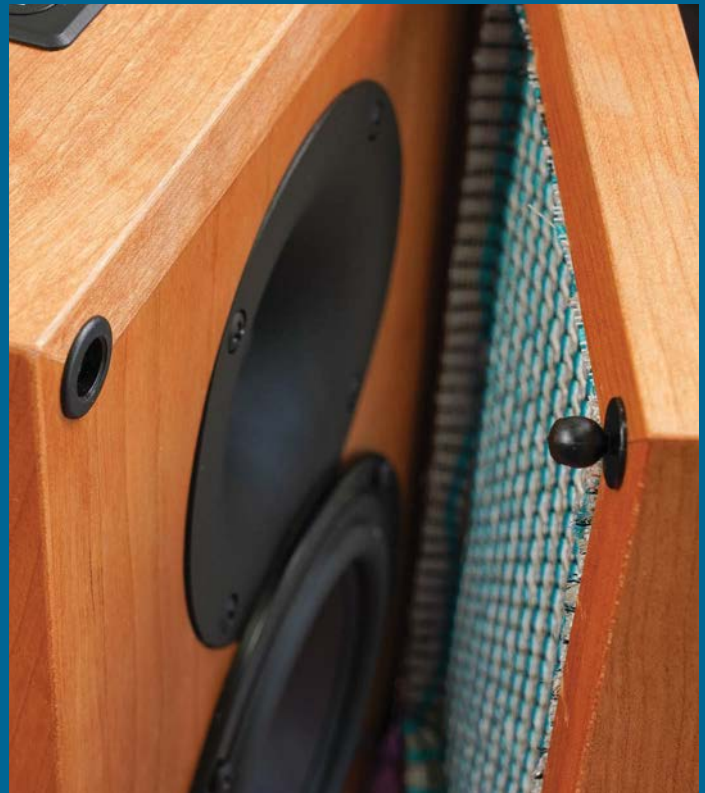
Shape the parts. Bevel the edges of the parts, rabbet them for the grill fabric, and bandsaw curves along their inside edges.



Smooth the sawcuts. After mitering the ends of the parts, plane and/or sand them smooth.



Add the fabric and install the grill guides. To anchor the grill fabric in the rabbets, squirt a bead of hot-melt glue into the corner, and push the fabric into the rabbet using a paint scraper, holding it there while the glue cools. Start at the centers of the short sides and work toward the corners, applying glue by folding back the fabric (above). Then do the same along the long edges. Next, install the grill guides (right). These inexpensive but handy guides (from Parts Express) include a little knob and a small receiver that click together, making it easy to attach and detach the grills.



back panels. The mitered corners join the veneered parts seamlessly, and the MDF substrate lets me glue the front and back panels into rabbets or grooves without having to worry about expansion.

I used $\frac{3}{4}$ -in. MDF to build the box and then veneered it with quartersawn sapele veneer—with ribbon figure. Commercial veneers would also work for this project, but I sawed mine on the bandsaw, leaving them a little over $\frac{1}{8}$ in. thick. To assemble

the miter joints, I glued on angled clamping blocks, which I sawed and sanded off after assembly. It would have been easy to sand through thin veneers, but that danger was eliminated with shopsawn veneers.

So the panels don't warp, the veneer is applied to both sides of the MDF, equalizing the tension it applies. While I often use a vacuum bag to apply veneers, many woodworkers don't own one. So for this article I used a simple sandwich that

includes a layer of plastic to resist glue, a couple layers of $\frac{3}{4}$ -in. MDF to spread clamping pressure, and a pile of F-style clamps. As for the adhesive, I like polyurethane glue. Yellow glue also works, but polyurethane glue dries harder, so the veneer won't creep, and it introduces little to no water, which helps with stability. □

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Essex County Cupboard



I recently got the chance to build a reproduction of a cupboard I've been studying for over 25 years. The original was made during the 1680s in Essex County, Massachusetts, and is part of a large group of joiner's work that stands head and shoulders above most other New England works of the same period.

The cupboard consists of two cases. The upper case is a trapezoidal cabinet with a door and an overhanging rectangular cornice supported by large turned pillars. The lower case has four full-width drawers, the middle two recessed behind two pillars. The decorative scheme includes about every technique used in English joinery of that period—applied moldings and turnings, carved patterns, faux-architectural enhancements, painted accents.

The cupboard was likely built for storage, with the drawers holding linens, tablecloths, clothing, etc., and the upper case and top surface storing and displaying plate—pewter, silver, earthenware. Another function of this cupboard was to establish status; a costly piece, it would have been displayed in the hall, the most public room in a 17th-century New England house.

I work in a small shop without electricity, so I made the cupboard without power tools. I split the stock for it green from a log.

Riving and planing the stock

Working with a log with a diameter of about 24 in., I start splitting 6-ft.- to 8-ft.-long sections, first splitting them in half, then quarters, eighths, and sixteenths. I do this work with a sledgehammer and steel and wooden wedges. It goes even better with help. The sixteenth sections are still beastly heavy, but they're manageable enough to move to the shop, where the more-specific splitting begins.

After crosscutting a section I begin laying out my next splits. Ideally, the best way to approach splitting the stock is in halves and halves again. Equal mass on each side of the split helps keep things running evenly. But some sections are too thick for two pieces and too thin for four. A section, or bolt, from a perfect log can be split in thirds—on a good day. I needed drawer parts and thin panels in the range of 6 in. to 8 in. wide by 24 in. long and was able to split bolts into thirds for them with a pretty good success rate. I removed the sapwood and bark—the sapwood is useless, and removing it helps you see the progress of your splits.

The face of every board is on the radial plane of the log. Oak (and most other ring-porous woods) splits very predictably along its medullary rays and perpendicular to them, along the growth rings (the radial and tangential planes, respectively).

To split a section into thirds, I tend to work from both ends, aiming for things to connect in the middle. I lay out the divisions on both ends. I stand the bolt upright on a chopping block and use a froe and wooden club. I lightly tap the froe to begin scor-

ing the fibers on the end. As soon as a split begins, I remove the froe and repeat on the next line. Once that split has begun, I flip the piece end for end and repeat. These steps begin to separate the fibers along the radial plane. Now I pick one of the splits, reinsert the froe, and begin to strike it with a bit more emphasis. I watch the progress down the edges of the bolt. When the split begins to wander, I stop, remove the froe, and come from the other end. The game is connect the dots.

Once you have the third board split off, the remaining section is split in half, an easy job with good wood. This is froe-and-club work, made easier when you can trap the bolt in a brake of some sort—often just the crotch of a tree or, in my case, some horizontal rails attached to a large tripod. The brake allows you to exert pressure that helps direct the split. When it runs out, move the thicker side down and push against the thin top side as you lever the froe. When it goes well, I can think of no woodworking that's more fun.

Some of the splits might be uneven in thickness. Hatchet work (a large single-bevel side hatchet is ideal, but a double-

bevel will work) removes excess stock quickly before going to the planes. Planing radially riven, green oak is as easy as planing clear white pine. I flatten a face, square an edge to it, then determine the thickness and width for the second face and second edge.

I plane the stock twice. First, rough out the board slightly oversize. Green wood planes easily, but its finish is not as smooth as drier wood. Sticker the boards in the shop for a few weeks, then lightly plane them again to finished dimension and surface condition.

Tried-and-true joinery

The case joinery is all mortise-and-tenon; the format is frame-and-panel. The trapezoidal upper case has stiles shaped to help create



If there's a 17th-century decorative technique not featured in this nifty piece, we can't think of it

BY PETER FOLLANSBEE

From log to milled stock

Most of Follansbee's stock is riven oak. Selecting the right log is not half the battle, but it is an absolute must. Straight-grained and knot-free are key features. Large diameter is important too.



Inspect the bolts (log sections). Select the parts each bolt will yield. Then split off the waste—sapwood and bark—with steel and wooden wedges and a sledgehammer.

the truncated octagonal footprint. Both rear and front stiles have five-sided cross-sections so the ends of the rails can be cut at 90°.

I tested the fit of the joinery several times until I arrived at a sequence that allowed one person to assemble this odd shape. Connect a rear stile and its side rails and panel, then drop the front stile onto the other end of those rails. Do this for both side sections. Then set the rear panel and the two long rear rails on their backs on the bench. Slide one end of the rear rails and panel into a rear stile. Then bring the other side assembly onto the other end of the rear rail-and-panel assembly. There's enough wiggle room to slip the shorter front rails into their mortises in the front stiles.

Upper case floor and door

The floor of the upper case is made of thin oak boards, riven and planed ahead of time so they're nice and dry at assembly. Their grain runs front to back, and they are scribed to fit into the trapezoidal case frame, sitting in rabbets in the front and side rails and on top of a lower rear rail. The joint between the floor boards is a V-shaped variant on a tongue-and-groove. I install the boards at each end first, then move inward toward the middle.



In thirds. Short, perfect stock can sometimes be split into thirds rather than the more typical halves. That's always a gamble, but when it pays off it saves stock and labor. To make two side-by-side splits, mark out on both ends the tapered even thickness of the desired parts.



Using a froe and club. Follansbee starts each split on both ends of the bolt. Light blows from the club coax the splits open. A careful game of connect the dots follows the fibers down the length of the bolt.

Opening the split. Sometimes a wedge, either steel or wooden, helps make the connection between the top and bottom splits.





The perfect log. When you find perfect logs, which are rare, they are the greatest thing. This radial plane is flat along its length and width.



Excess thickness. Most splits are tapered in thickness. You can rive off some of the excess with the froe. Jam the stock into the bars of a riving brake and work the froe forward as you push down on the handle to open the split. Use a piece of scrap to keep the split open behind the froe, making it easier to advance.

The frame-and-panel door tucks into a rabbet in the hinge stile and butts against stops set into the lock stile. Its hinges are a wooden pintle arrangement. I bored $\frac{1}{2}$ -in.-deep, $\frac{3}{8}$ -in.-dia. holes into the top and bottom of the hinge stile and corresponding holes in the top and bottom rails. The hole in the bottom rail is about $\frac{1}{2}$ in. deep; the one in the top rail runs right through the rail. A short pin fits in the bottom of the stile; the fit should be neither tight nor loose. Tilt the door into place, then drop a longer pin through the top rail to catch the door. The door doesn't sit parallel to the cupboard's front frame, but slightly angled to it. Once all the moldings are applied to the door, you only notice its angled face when you go looking for it.

Moldings

There are various moldings applied to the cupboard. Many of them are $\frac{3}{8}$ in. thick and about $\frac{5}{8}$ in. wide. To make those, I plane a board $\frac{3}{8}$ in. thick and about 6 in. wide by 20 in. to 30 in. long. I lay it on a planing board with a stop, and plane a molding along one edge. I use a molding plane that Matt Bickford custom-made for me, or a scratch stock. Once the first molding is done, I rip that strip off the edge of the board, re-joint the board, and run a new molding. Repeat until the board is too narrow to hold. Then make another. The moldings need their sawn edge jointed too. A few swipes across a plane inverted in a vise finishes them off.

The molding located just under the lower case's top boards has a zigzag, sawtooth decoration cut in it. I laid out the pattern with



Prep for planing. Keep your leg tucked behind you for stability and safety. Make scoring cuts at an angle, working from the bottom toward the top, but not all the way. Then lightly swing the hatchet from the top down to break off the scored fibers. Repeat until you reach the desired thickness. Flip the stock end-for-end to finish the full length.



A scrub plane follows the froe and hatchet. It starts to bring the riven, hewn blank toward something flat and smooth. Jam the workpiece against the iron-toothed bench hook or planing stop.



Edge jointing. Here the board is pinched against the edge of the bench in a wooden screw/crochet. Its front end sits on a holdfast, its back end on a peg in a sliding deadman.

Trapezoidal upper case

While the shape isn't typical, the joinery is. The upper case has mortise-and-tenon joints and frame-and-panel parts between the rails and stiles. A tongue-and-groove variation keeps the back and floor boards together, and a pintle hinge keeps the door swinging.



Start at the side. Small, angled blocks hold the five-sided stiles while you insert the side rails. Slide the beveled panel into the grooved edges of the rails and stile and then add the front stile.



Coax the trapezoid into shape. With the rear frame on its back and the side frames connected to it, add the front rails to the front stiles. Follansbee pushes against a strip of wood fixed to the bench to bring the joints together.

a miter square and an awl, then chopped it with a 1-in. chisel. Two vertical cuts define the triangle, then paring cuts with hand pressure remove the chips and create the sawtooth motif. Some period versions of this have the proud teeth painted black.

Applied turnings

There's a lot of turned work on the cupboard. I use a pole lathe; the action is provided by a foot-treadle below and a 12-ft.-long sapling in the ceiling above. A cord tied to the sapling wraps around the workpiece and runs down to the treadle. Each kick of the treadle spins the turning toward the tool, then the pole springs it backward. Then comes another kick. I often reserve a short section on the turning as the place the cord wraps around.

On the pole lathe there's no drive center; the work spins on two iron points. If you were to glue up your blank the way most

modern turners do, fixing it between the lathe's points could split it along the glue line. To get around this, I glue up a pair of maple blanks with a $\frac{3}{16}$ -in.-thick center strip between them. The lathe's points engage the sacrificial center strip. It's a job for hide glue because you need to be able to take the pieces apart once they've been turned. When the turning is done, I steam it over a pot of boiling water to soften the hide glue. Once it's loose, you can slide a putty knife in there to separate the turnings from the center strip. It's like magic.

Moldings abound

From different profiles and widths to zigzag patterns, there is no shortage of decorative moldings. Hand planes, scratch stock, and chisels create the molding features in the cupboard.



DIY moldings. On a planing board with a stop, plane the applied moldings from a wide panel. A dedicated molding plane makes the first part of this particular molding, an ogee with two fillets. Next, a scratch stock cuts a large bead beside the ogee to bring the molding's width to $1\frac{1}{8}$ in.



Ripped off. After you rip the molding from the board, rejoin the edge of the board and plane the next molding. Joint the sawn edge of the moldings before you miter and fit them.



Glue free. No glue means there's no hurry in the assembly. Once the joints are knocked into place, drive the tapered pins into the drawbored holes in each joint.



Get your V-groove on. Floorboards and drawer bottoms are made from $\frac{1}{2}$ -in.-thick oak panels. Their edges have a V-shaped joint, a variation on the tongue and groove. Use a scratch stock to scrape in the groove part of the joint (above left). Match the groove (above right). Plane the bevels to form the tongue section. Use a scrap with the groove to test the fit.



Fit the upper-case floorboards. The boards sit in rabbets in the side and front rails and on top of the rear rail. Scribe and cut the end boards to fit the angled sides. The middle boards are square ended; spring the last two in place.

Lower case assembly

By the time I'm ready to assemble the lower case, it's been through several test fits. I begin by setting the bottom drawer frame: two thick stiles/blocks connected by a rail and with a thin narrow shelf on top of them. Then I fit the turned pillars' bottom tenons into holes I've bored in that shelf. A similar unit that creates the top drawer frame then drops down onto the pillars' upper tenons. The rear section (an assembled frame-and-panel) is laid down on its back. I insert the side frames and panels into the rear stiles, then wrestle the front section onto the tenons



of the side rails. It would go even easier with a helper, but I've stubbornly done it myself again and again.

Paint adds contrast

Period paints were made with pigments mixed in linseed oil, with lead added mostly as a drier. I use linseed oil, citrus thinner, and some artist's drying medium. Into that I mix dry lampblack pigment. I usually mix it together in small batches with a brush; today's pigments are mixed so fine that they dissolve easily. Thin coats are best; I did two coats on the turnings and moldings.

The applied decoration on the angled upper side panels is a faux-architectural tour-de-force: three turned arches across the top with pendants and molded pillars. Small maple keystones and imposts break up the arches. Turned ovals and circles accent each transition. Each panel has nearly 50 pieces fixed to it to create the design. They're glued on with hot hide glue, and some have small iron sprigs (headless brads) fastening them as well. I think the sprigs just hold the pieces in place while the glue sets. Rather than have a blacksmith make the sprigs, I clipped the



Zigzag dentils. For the molding at the top of the lower case, lay out the pattern and chop all the angled cuts. With the chisel bevel-up, pare away the lower triangles.



Door swings on a pintle hinge. A fixed pin fits into a hole in the bottom of the door stile. To install the door, tip the door in on its bottom pin (top), then tilt it in place and drop the other pin through the top rail into the hole in the top of the stile (above).

Turnings all around

In addition to the four large pillars, there are turned drawer pulls and several oval and round decorations and lots of pairs of applied half-turnings. Examination of period applied turnings shows them to be less than half-cylinders. How they got to be that way is a debate that Follansbee has retired from.



Pole-lathe blank preparation. Use hide glue to attach strips of maple to a sacrificial middle strip, which the points of the lathe will engage. Without it, the pressure of the points could split the piece on the glue line.



A pole lathe is a simple affair. A sapling mounted in the ceiling (in this case, out of view) has a cord tied to its end. The cord winds around the workpiece and connects to a foot treadle. Press on the treadle, the pole bends, and the workpiece turns toward you. That's when the cutting happens. Let up the pressure with your foot, and the pole springs back and reverses the workpiece. You don't have to remove the tool; it won't cut on the backstroke. Then repeat.



Online Extra

To watch a video of Follansbee's pole lathe in action, go to FineWoodworking.com/312.

Turning tips. Keep the tool rest close to the action. Sharp tools and light cuts are the keys to success.



Breaking the blank apart. After turning, steam the blank until the glue softens. Then slip a putty knife between the turnings and the middle strip. Cut off any waste. Here, the bottom section of the turning was reserved as a place to wrap the cord.

The lower case comes together

Think of the front as having three separate units: the top and bottom drawer frames, and the two recessed middle drawers behind the pillars.



Assemble the lower case. The case back and sides are largely straightforward frame-and-panel units. The case front is another matter: It has a lower drawer frame consisting of thick square stiles connected by a small rail and topped with a thin shelf. On top of that, turned pillars are set into holes in the shelf. Next, the top drawer frame sits on the pillars' top tenons. This whole unit gets wriggled into place on the side rails' tenons.



Keep things from sliding off as you work. Applying the moldings and turnings to the side panels of the upper case is a balancing act. Propping the cupboard against the bench renders the panel pretty level.



Hide glue secures the ornamentation. The key is to keep the glue warm as you work.



Glue, or glue and sprig. Much of the flat work is just glued in place, but many of the turned elements are glued and sprigged—that is, held on with headless iron brads. Follansbee uses an 18-gauge modern brad (with its head snipped off) as the bit in an eggbeater drill. A tiny Tremont cut nail secures the turnings. The cut nail is also sans head.

heads off the smallest cut nails I could get. They just about disappear against the black paint. Flanking the panel are large applied turnings on the faces of the stiles, glued and sprigged in place.

Connect the two cases

The upper case just sits on the lower case's top boards. A short rectangular tenon at the bottom of each rear stile drops into a corresponding mortise chopped in the top boards. After the main

Ornamentation becomes the focal point

The contrasting moldings and turnings are purely decorative. They are all glued in place, and the turned pieces also get tacked in place.



Online Extra

To see how Follansbee mixes and applies paint to the decorative elements, go to [FineWoodworking.com/312](https://www.finewoodworking.com/312).

Link the top and bottom cases. The upper case's rear stiles have a registration tenon on the bottom. It fits in a corresponding mortise chopped in the top of the lower case. Turned pillars will support the overhanging cornice. Each pillar has a round tenon on the bottom that fits a hole bored in the lower case's top.

trapezoidal cupboard section is in place, the rectangular cornice connects to the rear stiles with a mortise and tenon. And the front pillars support the front overhang. The tenons of those pillars fit round holes bored near the front corners of the lower case's top. Gravity keeps it in place. It's heavy enough to stay put. □

Peter Follansbee, author of Joiner's Work (Lost Art Press, 2019), does his woodworking in Kingston, Mass.



Harlequin Box

The design of this box is both simple and complex. At the core, it is a plain mitered cube. The bottom of the cube, sitting in dados in the sides, is placed higher than normal to create a hidden lower compartment. A small open-topped box, or tray, fits into that compartment from below and is held in place with magnets. It protrudes $\frac{1}{4}$ in. or so from the bottom of the cube, which is just enough to create a little pedestal that visually separates the box from the surface it rests on.

The more complex aspect of the piece is the veneer work, particularly the bold geometric marquetry on the outside. The pattern begins with hundreds of small strips, and every component has to be as close to perfectly sized as possible, because any discrepancy across all the small bits would be compounded as the design is assembled.

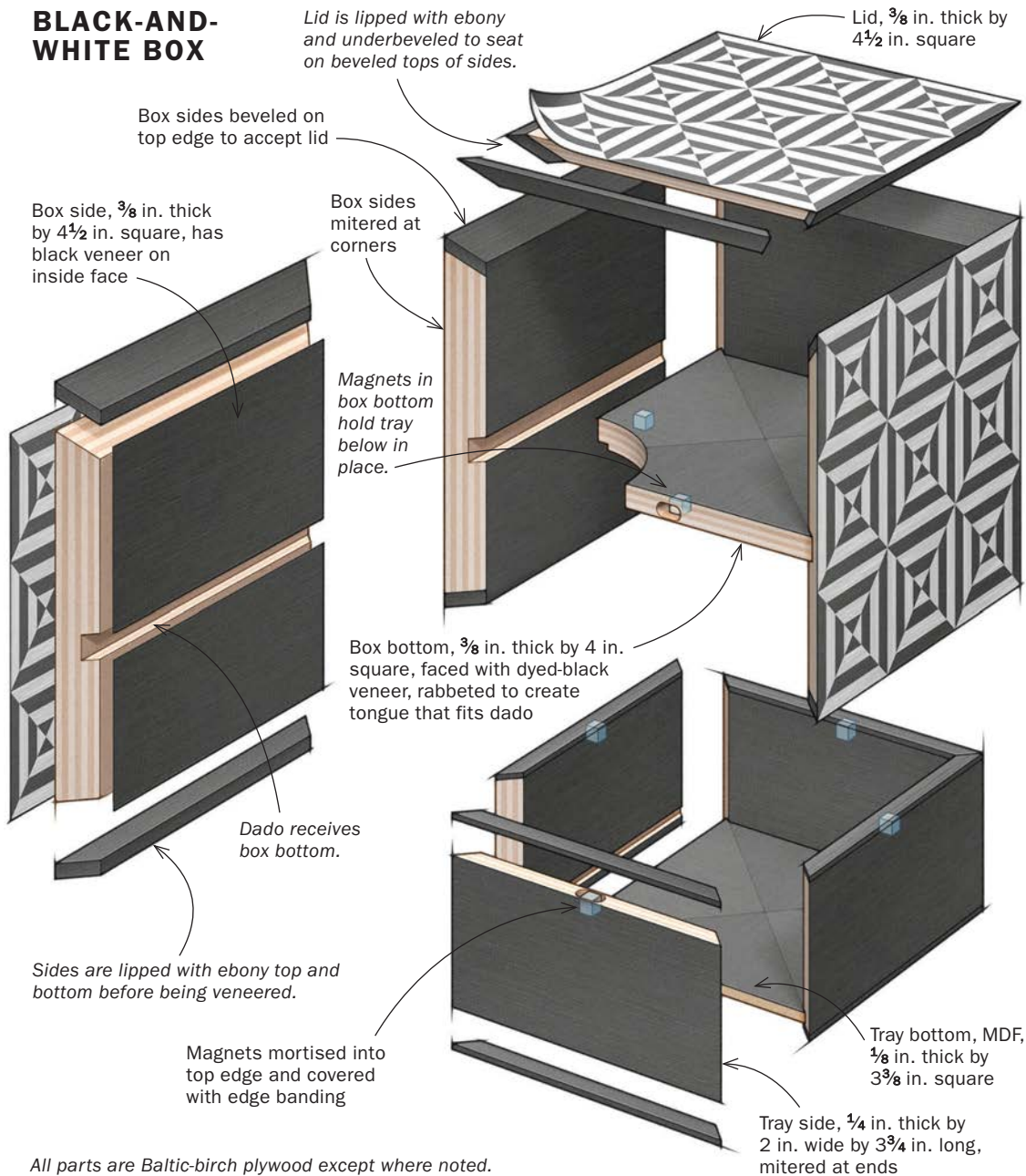
Making marquetry

Although I could have sawn my own veneer for this project, I chose to use commercially produced dyed veneers because of the purity of their colors. I start the decorative veneer work by making scores of narrow veneer strips. They then get edge-glued into black-and-white bands four strips wide, and from those bands I cut dozens of small triangles. I edge-glue pairs of triangles, and then pairs of pairs, making squares. Finally, to create each marquetry panel, I glue nine squares together in a three-by-three grid.

Geometric marquetry gives this mitered black-and-white box an optical buzz

BY VASKO SOTIROV

BLACK-AND-WHITE BOX



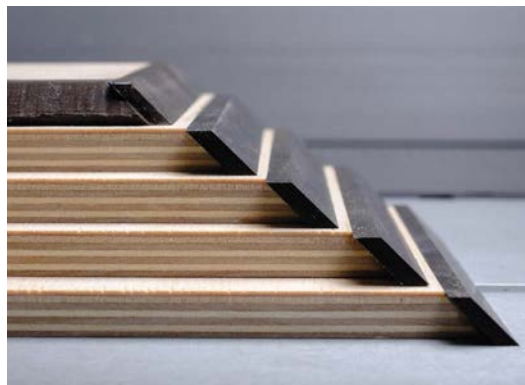
All parts are Baltic-birch plywood except where noted.

To cut strips of uniform width with ready-to-glue edges, I used my sliding table saw. I cut strips from four sheets of veneer at a time. To immobilize the stacked veneers and achieve tearout-free results, I sandwiched them between two sacrificial pieces of $\frac{5}{8}$ -in. MDF and screwed the MDF boards together at the ends. You could use the same approach with a crosscut sled and a stop block on a regular table saw.

There is waste involved in this technique compared with cutting with a knife, as the blade's kerf consumes some veneer with each pass, and every rip also produces two narrow MDF cutoffs that are difficult to repurpose. But I think the excellent results and the time and hassle saved justify the procedure.

Triangulation

When I'd cut all my strips, I edge-glued them into four-strip-wide bands. The next step, cutting small triangles from these black-and-white bands, is perhaps the most exacting part of making the veneer pattern. Perfect triangles are fundamental to getting matching squares later that can be assembled into the overall grid without distortions or misalignments.



Miters and bevels define the main box. The birch plywood box sides meet in miters at the corners. The sides are beveled on their top edge to receive the lid, which has a corresponding underbevel. The top and bottom edges of the sides are lipped with ebony.



Black diamonds. All the horizontal surfaces of the main box and the secret tray that tucks underneath the box sport a diamond pattern of black-dyed veneer with the grain in each quadrant running toward the middle.

Harlequin squares



Sawing perfect strips. The veneer strips must be flawlessly consistent or the accumulated error will spoil the marquetry pattern. To cut the strips, Sotirov stacks four sheets of dyed veneer (two white, two black) on a piece of $\frac{5}{8}$ -in. MDF and tapes them in place. Then he screws another piece of MDF on top. He rips strips from the whole package at the table saw; each pass produces four strips of veneer and two MDF waste pieces.



I made a quick and simple jig that solves most of the problems. It's just a solid-wood triangle block paired with an MDF base, a fence, and a toggle clamp. The important part is the triangle block, so I took my time to make it as perfect as possible, using a miter saw with a micro-adjustment fence. I cut the veneer using a wide chisel with its back against the triangular guide block.

After cutting each triangle, I flipped the band over before cutting the next; this generates an alternating color scheme. Because the chisel produces a slight bevel on the waste side of each cut, I trimmed off a tiny strip to remove the beveled edge before cutting the next triangle.

Assemblages

Next, I started joining all the triangles. I did the work on a small piece of MDF with a low fence, which helps with alignment. After gluing up all the pairs of triangles, and then joining those pairs into squares, I created the nine-square panels for the sides and lid of the box. Working with such small elements demands precision and delicacy. I found a pair of tweezers essential for lifting and positioning the triangles. The type of tape is also important: You want something that has enough holding power but doesn't leave any residue or tear the veneer fibers when you take it off.



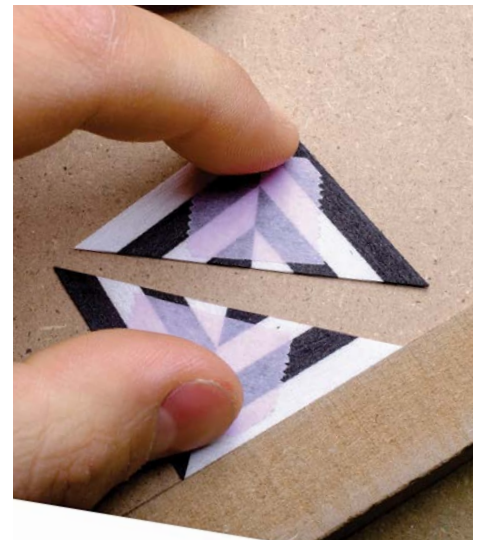
Strip gluing. Sotirov begins the marquetry pattern by making a batch of four-strip bands. He stretches tape across the joints on one side, then turns the band over and folds each joint open to apply a thin bead of glue. He removes excess glue with a putty knife, then covers both faces of the band fully with tape and weights it down under a stack of MDF to dry.



Black-and-white building blocks. To cut the triangles that constitute the basic element of his pattern, Sotirov uses a small, stepped, MDF bench jig with a toggle clamp and a triangular piece of solid wood that serves both as a clamping caul and a chisel guide. He uses a chisel wide enough to cut the full width of the band in one chop and flips the band edge for edge to cut the subsequent triangle.

Assembling the squares.

A small scrap of MDF with a low fence is Sotirov's assembly platform as he tapes and glues first pairs of triangles and then pairs of pairs, which produce the squares at the heart of the marquetry pattern. Individual veneer strips are $\frac{3}{16}$ in. wide; each of the nine squares is $1\frac{1}{2}$ in. by $1\frac{1}{2}$ in.



Small squares beget large ones.

Using the same taping, hinging, gluing, and pressing sequence, Sotirov assembles nine small squares into the larger sheets that will decorate the box's sides and lid.



Veneering the cube

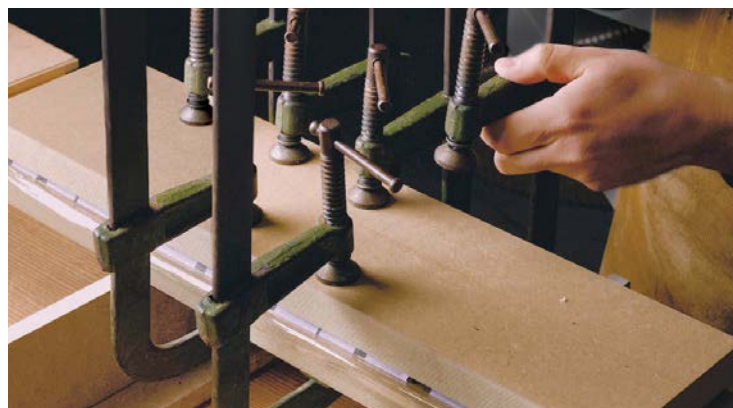
With the panels of veneer ready, I set them aside and made the box parts. The substrate is birch plywood, and the top and bottom edges of the sides and all four edges of the lid got lipped with solid ebony. After gluing that on, I trimmed it flush to the plywood at my router table. The panels, which were still slightly oversize at this point, were now ready to be veneered: geometric motif on the outside faces and black veneer on the inside ones! To press the veneer, I used F-clamps and $\frac{3}{4}$ -in. MDF cauls covered with clear plastic wrap to resist the glue.

With commercial thickness veneer, sanding is usually the best way to prepare marquetry panels for finish. But getting black dust into the pores of the white veneer would have turned the pristine white a dirty gray. So I opted to use a low-angle, bevel-up smoother sharpened just right. I made a planing stop that held the panels at a diagonal while I planed them; this way the grain direction of each little segment was presented at a 45° angle to the plane stroke, instead of having some parallel to it and some perpendicular. The flattening process worked flawlessly. Alternatively, you could use a sharp card scraper.

Once the marquetry panels were glued on, I applied the black veneer to all the parts of the cube and the tray. I ran the grain vertically on all the vertical surfaces. For the horizontal surfaces, I created an arrangement of triangles meeting in the center, each with its grain flowing toward the centerpoint.



The box comes together



Pressing the panels. Sotirov glues the marquetry onto all the sides in one pressing. After applying a light coat of glue to the plywood substrate with a notched spreader, he tapes the marquetry panels in position. He uses $\frac{3}{4}$ -in. MDF cauls faced with packing tape and applies pressure gradually with a series of F-clamps.

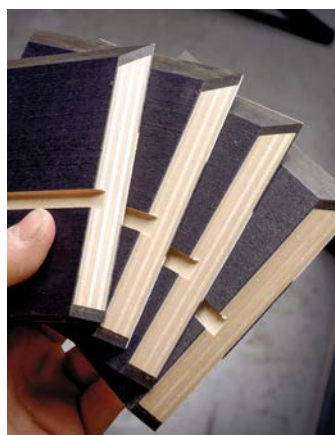
Box building

With the veneering finished, I started constructing the box. I mitered the sides, beveled their top edge to receive the lid, and cut the dado for the box bottom. I rabbeted the bottom to make a tongue sized to the dado. I also cut a mortise into each edge of the bottom and glued in the magnets for holding the tray in place.

For assembly, I laid the four box sides outside face up and used a straightedge to align them. Then I taped them tightly together. After flipping them over, I used more tape to mask off about $\frac{1}{8}$ in. along the inner edge of the miters to limit glue squeeze out. I used a little brush to spread the glue on one miter per corner. Then I quickly peeled the masking tape from the miters and folded the sides into a cube, capturing the bottom. Even pressure was provided by three strap clamps and MDF cauls that also protected the marquetry from damage.



Sand me not. Concerned that sanding dust from the black veneer would turn the white veneer gray, Sotirov opted to use a razor-sharp, low-angle, bevel-up smoothing plane to prepare the marquetry for finishing. He made a simple bird's mouth planing stop from a scrap of $\frac{1}{4}$ -in. MDF. Alternatively, a scraper could be used for the flattening.



Machining after marquetry. With the veneering of their inside and outside faces complete, the sides get mitered and trimmed to final size, then dadoed for the box bottom.



Mortises for secret magnets. The bottom of the main box gets magnets on four sides. Secured in small routed pockets with CA glue, the magnets will hold the secret tray in place.

Box assembly.

Before glue-up, Sotirov applies dewaxed shellac to the parts, avoiding glue surfaces. He then lines up the sides, marquetry face up, and stretches tape across the joints. After flipping the parts and applying glue to the miters and the dado, he inserts the bottom and folds the sides into a cube.



Custom cauls.

Four squares of 1/4-in. MDF protect the marquetry while serving as cauls to distribute pressure from three stacked band clamps.

When the box was cured, I adjusted the fit of the lid, which rests flush with the sides. It has no handle; the box is sized so your fingers span the lid, and you simply pinch it lightly and lift.

Next came the tray, which is built the same way as the cube—mitered sides and a bottom in a dado. Since all parts are veneered, it's tricky to get a piston fit between the tray and the cube, so I postponed building the tray until the main box was complete. Then I could size the sides of the tray from a real measurement.

The very last step was to lightly chamfer all the sharp corners. They are beautiful and crisp but also fragile. I used a small sanding block made of MDF with a fine-grit paper glued on it. □

Vasko Sotirov works wood in Bergamo, Italy.



Tray sides in progress. After being cut to rough size and veneered, the tray sides get magnets glued into their top edges. Next, they'll get edge-banded, mitered at the ends, and dadoed for the tray bottom.

Inverted

insertion. Sotirov sizes the tray's parts very carefully before assembly to achieve a piston fit in the main box. And he trims the tray gingerly after assembly to perfect the fit.



Surprises. Once complete, the box's marquetry produces a powerful optical effect. And the secret tray protrudes just far enough from the box to create a foot and a shadowline.



Inspiration for our readers, from our readers

COLLIN HENRIE

Lititz, Pa.

This piece, inspired by Glen Huey's spice-box design, piqued Collin's interest with the amount of detail it packs into a small space. All the parts came from a single curly maple board with tight, uniform curls. Behind the door are 11 drawers with three secret compartments. Two dye colors were used to add depth to the figure.

CURLY MAPLE, POPLAR, 10D X 17½W X 19½H

Photo: Light Studio



ANJALI LOHIA

New Delhi, India

The shadows cast on Anjali's bedroom wall every morning by a blossoming plum tree in the garden inspired her to make this cabinet as an ode to the beauty of spring. The painting on the sliding doors is *Cherry Blossoms* by Matsumura Goshun (18th century), which was giclée-printed on mulberry paper.

MAPLE, WESTERN MAPLE, 12D X 23W X 46H

Photo: Todd Sorenson



ARNALDO POLITANSKI

Boston, Mass.

Arnaldo modeled this chair after a similar rocking chair he had seen in a magazine article years before. He used Danish cord to weave the seat and back rest.

BEECH, 38D X 23½W X 37H

Photo: Lance Patterson



Show your best work

For submission instructions and an entry form, go to FineWoodworking.com/rg.

REID ERIC ANDERSON

Kihei, Hawaii

This piece is a reproduction of the Thorsen house sideboard. Anderson laser-cut the inlay pieces and hand-carved them into the door panels. The pearl was cut with a CNC and then hand-carved and sculpted. Handwork brought all the details together for this piece.

MAHOGANY, EBONY, BRASS, PEARL,
22D X 78W X 36H

Photo: Ben Hutchinson



WILLIAM O'CONNOR

Londonderry, N.H.

William's inspiration with this table was to incorporate as many new techniques, methods, and skills into one project as he could. The tabletop lessons were basic veneering, sand-shading, banding, cross-banding, and inlaying elliptical and quadrant fans. The splay-legged base introduced compound-angle joinery. And the legs offered a lesson in offset turning.

BUBINGA, HOLLY, ZEBRAWOOD, POPLAR, WALNUT,
22D X 46W X 18H

Photo: Lance Patterson

HARRY VERSTRAATEN

Victoria, B.C., Canada

The spalted maple for this vase came from a local tree that had blown down. Harry decided on the wavy handle to add some whimsy to the formal appearance of the piece. By extending the legs of the arches beyond the bottom, he lifted the vase off the base, adding some depth and shadow.

SPALTED MAPLE, WENGE,
6D X 6W X 13H



MYRL PHELPS JR.

Danbury, N.H.

Myrl made this Chinese coffer while he was David Uphill Brown's student at the Center for Furniture Craftsmanship in Maine. The piece later won first prize in the Guild of New Hampshire Woodworkers exhibit.

CHERRY, QUARTERSAWN SYCAMORE, 20D X 36W X 30H

Photo: James Dugan



WAYNE HALABOURDA

Victoria, B.C., Canada

Wayne calls this piece *Tipsy*, because it conveys dancing, a sprightliness, the life of the party. He set out to design and make a dynamic, lighthearted cabinet that pushes the boundaries that define form and function.

WALNUT, SPALTED AND CURLY WESTERN MAPLE, EBONY, LEATHER, 18D X 31W X 48H



AARON WHITE

Dallas, Texas

The design of this wall shelf is an updated version of New Mexican furniture that Aaron calls Southwest Modern. The shelves are dadoed into the sides, and he added decorative cut nails. The hand-carved texture on the sides is reminiscent of the rough-hewn handwork of frontier craftspeople, though with sharper, more intentional facets.

WALNUT, 6½D X 15W X 21H

Photo: David Nix



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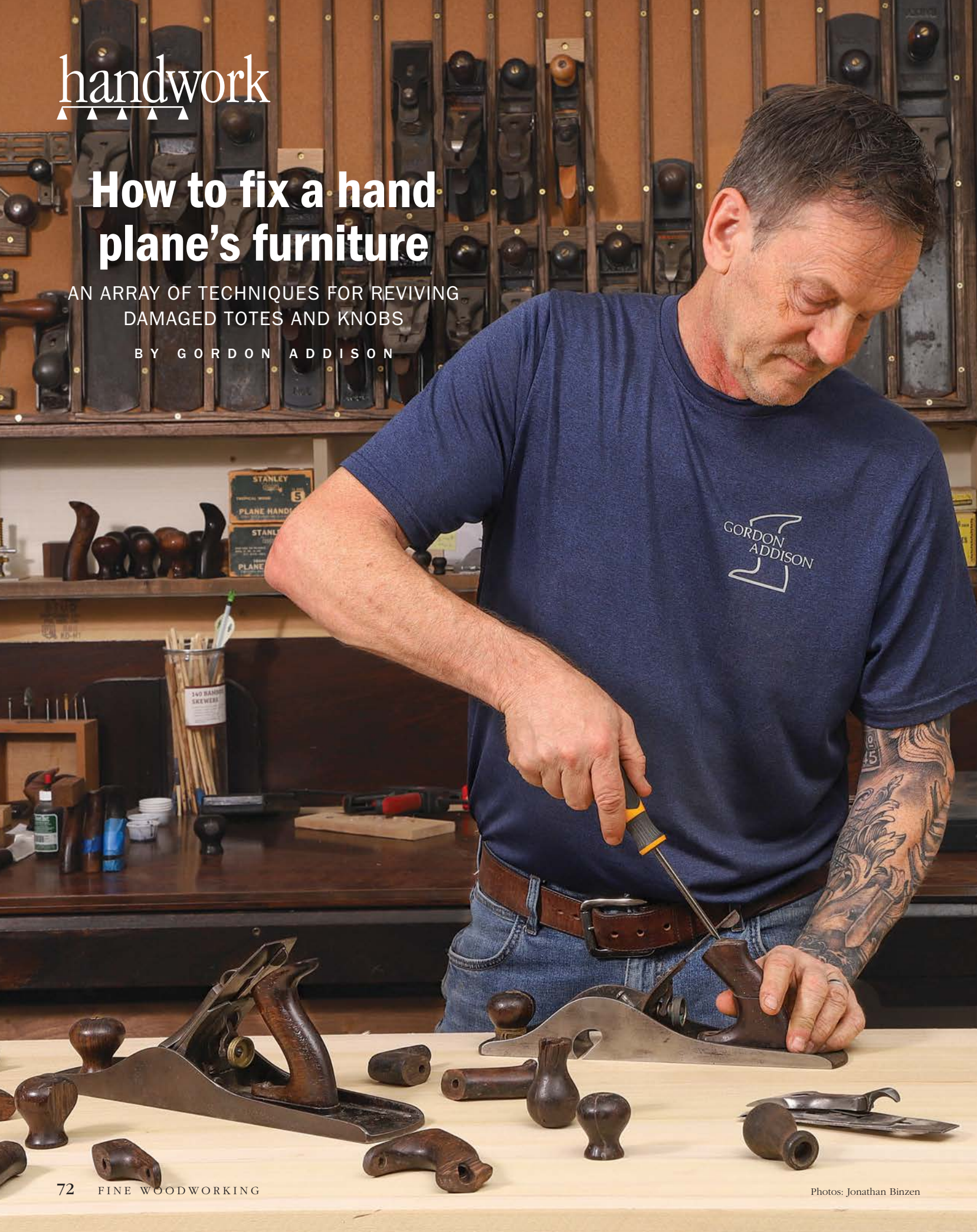
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handwork

How to fix a hand plane's furniture

AN ARRAY OF TECHNIQUES FOR REVIVING
DAMAGED TOTES AND KNOBS

BY GORDON ADDISON



Over the past 20 years I've become pretty well obsessed with Stanley-style hand planes. After collecting and repairing quite a few for myself, I began fixing the furniture—the handle, or tote, and the knob—on Stanley planes for many other woodworkers and collectors. The story usually starts with “I bought this at a yard sale” or “I’ve inherited my grandfather’s tools.” Whatever the particular case may be, a lot of people seem to agree that vintage hand planes are a joy to use and collect. Most planes that have survived decades of use, however, have some issues. Quite often the tote and knob will be nicked, split, chipped, or fully broken. But with a few straightforward techniques almost any damage can be repaired. This article focuses on resolving the most common problems you’re likely to face in putting an old plane back into service, or simply back into beautiful shape.

Admire it or use it

There are two restorative paths: One leads to the collector’s shelf, the other to the user’s till. I do both types of work. Restoring the furniture on a museum-quality plane leans more toward preservation and involves reversible adhesives, minimal changes, and retaining as much of the original wood, finish, and patina as possible. Repairing totes and knobs for everyday use can be a bit easier, as we strive for strength and durability first, and visual appeal second. This article includes some techniques that could be helpful in a full restoration, but it focuses on repairs for “user” planes.

Identification of species

For many years, Brazilian rosewood was the primary wood used for totes and knobs on metal-bodied hand planes. But for more than 30 years now, this beautiful tropical wood has been listed on the Convention on International Trade in Endangered Species (CITES) treaty with the highest level of concern.

Totes

CURE FOR A COMMON CRACK



Mix and color the adhesive. For almost all repairs of the furniture on user planes, Addison glues with System Three G2 epoxy, which he mixes and then colors with a tiny dab of TransTint.



A split in the toe of the tote. To remedy this minor defect, which is common in vintage planes, Addison tapers one end of a dowel and twists it into the screw hole at the toe of the tote. This opens the crack in the toe enough to deliver some epoxy using a syringe bottle.



Light clamping. Moderate pressure from a light-duty quick-release clamp is adequate to close a repair when using epoxy.

A CLEAN BREAK

Prepare for epoxy. For a tote that has split right through, Addison cleans any debris or old glue from both surfaces with a sharp pick; then he uses a Dremel tool to texture the surfaces to give the epoxy greater purchase.



Do the glue. Before applying epoxy, Addison makes a custom clamping caul to fit the tote's horn; it provides a clamping surface parallel to the base of the tote. He uses hot glue to attach the tote to the caul to stabilize it during clamping.



Easy peeling. While the epoxy is drying but not yet fully cured, it is flexible enough to be peeled off cleanly with a chisel wielded gingerly.



Manufacturers transitioned away from rosewood, using beech, cherry, and domestic whitewoods, which were then painted.

But rosewood totes and knobs remain the most coveted, and for good reason. Since no more new rosewood is forthcoming, I place my emphasis on salvaging and reusing what is already in the field. Even badly broken or damaged rosewood totes are useful as “donor” stock for making patches and repairs.

Select the adhesive

I use PVA and CA glues for some repairs, but for rosewood totes and knobs, my first choice is almost always epoxy. With epoxy I know the adhesive will cure, the bond will be tenacious, and the assembly won't require clamp pressure to ensure permanent adhesion. Using a slow-cure epoxy, which will seep



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A ROUGH BREAK

Align the halves.

To repair a broken tote whose parts don't mate cleanly, Addison first aligns the top and bottom by fitting a dowel into the bolt hole. Then he hot-glues the tote to a piece of plywood that will act as a table-saw sled (far right).



Divide and reconnect. Making several stopped passes on the table saw, Addison cuts a clean swath through the tote, creating a pair of flat, parallel glue surfaces. With the halves of the tote still hot-glued to the sled, he epoxies in a patch cut from another damaged rosewood tote.



Tune the patch. Before shaping the patch, Addison drills out the alignment dowel and bolts the tote to a workholding fixture that he clamps in a vise. Using a series of rasps, files, and rifflers, he shapes the donor piece to match the contours of the tote. He aims to remove little or no wood from the original tote.

Online Extra

To learn two more tote tips, go to FineWoodworking.com/extras.

into the fibers, further increases the strength of the joint. Of course, it is necessary to secure the parts while the adhesive cures, but this can be done with shopmade fixtures or painters' tape as well as with traditional clamps. The epoxy I use is System Three G2, which is made for oily woods. G2 offers good open time, and it's tintable, which helps the joint line disappear.

Prep the surfaces

It should come as no surprise that even the best adhesive will fail if the surfaces being bonded are not clean. With planes that have been in service for more than 100 years, it's common to find totes and knobs that have previous repairs. Dirt, debris, and old glue must be removed to achieve the best bond.

When using CA or PVA glue, the mating surfaces need to be well matched. Clean, flat surfaces are best because they allow the glue to work as intended and afford control when applying light pressure with a clamp or fixture.



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Knobs

CLAMSHELL CRACK

Split knob. Knobs will sometimes develop splits along the grain. When they do, Addison says, they often can be “pried open like a clamshell.”



Rough out the middle and fill with epoxy. Knobs that crack open this way often won't close perfectly. To get closure on the whole glueline, Addison carves away some wood with a Dremel tool, leaving only the perimeter untouched. Then he fills the shallow cavity he's created with epoxy.



Epoxy, on the other hand, does not require perfectly matched surfaces. When preparing a tote or knob for repair with epoxy, I will often texture the mating surfaces using a carving tool. This rough surface allows for maximum adhesion. Just be careful not to alter the parting line, as this may inhibit your ability to hide the repair.

Shaping tools

Repairs to broken plane furniture often involve adding fresh wood, which needs to be shaped after gluing. You may be tempted to use benchtop power tools to shape the wood you've grafted on, but I avoid power tools from this point until the repair is complete. The idea is to shape the new material without ever contacting the original rosewood. With power tools you run the risk of removing too much stock, so I prefer a cabinetmaker's rasp, riffler files,



Duplex pressure. Quick-release clamps with cushioned jaw pads grip nicely even on curved surfaces. Addison exerts just enough pressure to close the glueline.



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A MISSING CHUNK

Flat face. To fix a knob with a chunk missing from its edge, Addison hot-glues the knob to a sled and creates a flat at the table saw. Then he epoxies a patch piece to the flat (far right).



Manual removal. With the knob attached by its bolt to a shopmade workholding fixture that's held in a vise, Addison files the patch to within $\frac{1}{16}$ in. or so of the surface of the knob. Initial waste removal was accomplished with a bandsaw.



and a handful of common files to get the perfect shape. Hand tools afford the control and finesse required as you match a new part to the geometry of the old one. Trust me when I say patience is a virtue; taking your time is essential in this work.

Finish the furniture

Once I have a newly repaired tote or knob fully shaped and lightly sanded, I mount it on a stick so I can easily turn it 360°. The initial light spray coat of satin lacquer will be the first real peek at the repair. The lacquer will sometimes highlight a flaw or imperfection, and now is the time to lightly sand and make adjustments. Once you're happy with the finished product, spray on multiple coats of satin lacquer and lightly scuff with #0000 steel wool. Then apply a coat of paste wax. The lacquer adds depth and brings out the grain, while the paste wax provides a satin appearance and a satisfying, grippy feel.

Gordon Addison repairs and uses hand planes in Sanford, N.C.

Turn that knob. To bring the patch into round with the knob, Addison turns it on his mini lathe, working very judiciously. To mount the knob, he made a stepped jam chuck for the headstock's four-jaw chuck and a plug that fits into the knob's bolt hole and provides purchase for the live center in the tailstock.



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From tree to table

BY STEPHEN TUTTLE



On a beautiful fall afternoon my daughter and I are riding bikes over smooth, newly paved roads; there is little traffic as we pass by fields, seeing a few new houses and many lots for sale. Some cherry trees that had stood for over a century on the perimeter of what was a farmer's field have recently been felled. They have been hauled off, but I spot a large log lying in the weeds. It is 2 ft. wide at the base but curves to a wider crotch; perhaps that is the reason it was left behind. But this is a promising log. A little part of me regrets finding it, though, knowing the work it represents if I get my wish. But the part of me that feels just riding by would be a waste acts, and when we get home I make the call. I meet the owner on site, and he agrees to let me have the log for the hauling.

I arrive the next day with my chainsaw mill: a 10-ft. aluminum channel guide bar, a small chainsaw, plenty of fuel and bar oil, and the usual chainsaw paraphernalia. I start by cutting 30 in. off the butt end to eliminate some of the curve. The rest of the log is 5½ feet long. After removing the bark, I get sawing and mill the log into 2-in. planks. With my rig cutting nearly to its full 24-in. capacity, it is slow going. I refuel after each board and resharpen after two. I'm excited, though. The figure is beautiful, and the crotch does not have the bark-lined crack down the middle that is prevalent in cherry.

This is hard work to do alone. The boards, heavy with water, are too much for my weak back to lift. I walk them or lift just one end at a time to get them into my small truck. At home I apply a sealant to the end grain of all the pieces to retard the drying and sticker the planks with the rest of my stash. They will lie under old metal roofing for many seasons. The day is spent and so am I. Reeking of chainsaw exhaust and certain there is sawdust in all my pores, I'm nevertheless glad I made the effort.

On a quiet winter evening two years later I get an idea for a coffee table design, and I remember those cherry planks. Within a day or two I've brought them into my shop, where they stand for the next month. I frequently stop and stare at them, turning them, standing different pairs together, wondering at their best use. Flaws have

developed during the drying: a deep crack on one side of the crotch, a loose knot near the middle. Should I choose the best board for the table top and live with its imperfections, or saw clear wood from two planks and make a book-matched top? I finally decide on the latter and once again set steel teeth to the wood. A bandsaw follows a snapped chalkline to remove bark edges, and a circular saw cuts boards to length. Then I fire up the planer and plane boards to thickness.

With the surfaces cleaned up I stand the two 10-in.-wide boards next to each other and wonder if my initial choice was wrong. That fabulous crotch figure is so concentrated at one end that it looks odd, out of balance. Reluctantly, I decide to eliminate the crotch wood and use just the straight-grained section. I know this is the right choice, but it is such a far cry from my original vision that my enthusiasm for the project wanes.

But my idea for the base carries me on. For this I was hoping to express the transition from a tree's natural form to a machined one. Over several days at the jointer, table saw, chopsaw, and biscuit joiner, I make two large leg blanks, each one glued up from 10 pieces 16 in. long. I carve the outer surfaces with an array of gouges and mill the concave inner surface with a router in a shop-made jig.

Each step, from chainsawing to sandpapering, makes this rough material a little smoother, a little more refined, a little closer to an idea. I sand the entire thing for several days and finally apply a finish. It is so smooth it begs to be caressed. The swirling figure speaks of a living thing.

At times woodworking is such noisy, hazardous, almost violent work that when a project is finished, when it finally comes to rest like this table before me, I imagine the tree letting out a long sigh of relief as it settles into its reincarnation. I love this stuff.

Stephen Tuttle shapes trees in Warriors Mark, Pa.

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Tansu Triad

After studying woodworking in the mid-1990s at Parnham College, in Dorset, England, Brian Reid returned home to Seattle with a gift from his teacher, Robert Ingham: a stack of planks from a flitch-cut yew tree. In the ensuing years Reid built furniture in Washington, then Colorado, and now in Maine, yet never touched the yew. “I carried that log through 10 moves,” Reid says. “For many years I thought I wasn’t good enough to use it.” When he found himself with a six-month residency at Purchase College in New York in 2017, however, the time came. He built the first of three tansu there (top photo) using solid yew for the carcase and shop-sawn yew veneer for the drawers and doors. Riffing further on a theme of Asian forms and proportions, he built a second tansu in English sycamore accented with birch-bark panels and elk-horn pulls. And for a third tansu he dipped into another special stash—of ink-black bog oak, also brought from England—to create a parquetry pattern of overlapping ripples as of two stones tossed into a pond. Reid reflects on building them: “It was joyful. Being alone at Purchase I worked from 8 a.m. to 8 p.m., seven days a week. I told friends who wanted to visit, ‘Nope, I’m busy.’” And how did it feel to use his precious wood? “I think these are the best things I ever made.”

—Jonathan Binzen

