

TAUNTON'S

Fine Woodworking

3 bench jigs for
small parts, p. 65



**Wedged tenon is
strong and stylish**

**Foolproof
tabletop finish**

**Sleek cabinet fits
under today's TVs**

TOOL TEST

**Heavy-duty
plunge routers**

**Expert helps
3 readers refine
their designs**

Oct. 2010 No. 214



www.finewoodworking.com

HOW SMART IS THE NEW SMART DUST COLLECTOR?

Let's just say, Mr. Einstein would have appreciated it.



How's this for smart? The SMART system has infinitely variable performance, automatically adjusting suction to maximize dust collection at each woodworking tool. For shops like yours, there's simply never been anything like it. It's a breakthrough in dust collection technology that is unlike all traditional collectors.

You'll like the thinking behind our filtration system too. We thought it would be smart to combine the power of our high-efficiency cyclone with the proven performance of HEPA filtration. Greater than 99% of waste is pre-separated, and clean air is returned to the shop through GE H12 certified HEPA filter media.

And you can stow the shop vacuum away, because the Smart Dust Collector does it all, regardless of the size of ports or hoses. For large, 4-6" dust ports, it provides much more air volume and pressure, 2 to 3 times that of a standard dust collector. And for small diameter hoses or woodworking tools with 3" or smaller dust ports, you'll get high suction, similar to a shop vacuum. It's a best-of-both-worlds design that collects the most dust possible.

Safety is enhanced as well, as this revolutionary unit includes a patent-pending Flame Guard Arrestor, with both passive and active fire safety features.

Learn more. Get smart.
Contact Oneida, the experts
in dust collection innovation.



IT'S A TOUCH
OF GENIUS

Order online at www.oneida-air.com
Call 800.732.4065 for your FREE catalog!

READER SERVICE NO. 71



With the right Bit you're almost done

Over 1,000 Bits
to Choose From

RouterBits.com

Order Online or Call our Sales Team Today!

TylerTool 1-800-222-8404

www.RouterBits.com is a Division of Tyler Tool Company

READER SERVICE NO. 64

Connecticut Valley School of Woodworking

Bob Van Dyke - Director

Sign up for
Summer Classes with:

Steve Latta • Bob Van Dyke
• Mario Rodriguez • Roland Johnson
• Will Neptune • Mickey Callahan
• Charles Bender • Kevin Rodell



249 Spencer St.
Manchester, CT 06040
860.647.0303
www.schoolofwoodworking.com

READER SERVICE NO. 77

Plug In Anywhere.

SawStop's Professional Cabinet Saw
Now in 120v, 1.75HP



**AWARD WINNING SAFETY AND
DUST COLLECTION FOR EVERY SHOP**

The SawStop Professional Cabinet Saw - it stops on contact with skin, preventing serious injuries. It sets the standard in its class for quality and durability, and offers unmatched 99% dust collection with the optional blade guard. And now with a 120v, 1.75HP model*, the Professional Cabinet Saw is available to everyone.

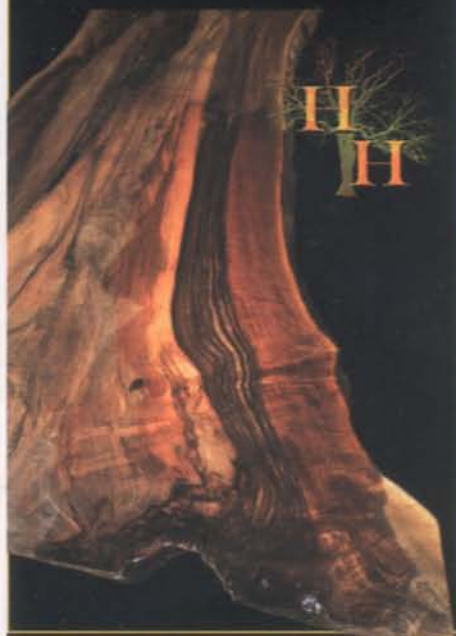
*20 amp circuit recommended.

www.SawStop.com

READER SERVICE NO. 68

www.finewoodworking.com

WWW.HEARNEHARDWOODS.COM



HEARNE HARDWOODS INC

200 WHITESIDE DRIVE

OXFORD, PA 19363

888.814.0007



FLITCH CUT TABLE TOP SLABS,
EXOTIC & DOMESTIC LUMBER,
FIGURED WOODS, BURLS,
BOOKMATCHED MATERIAL,
CUSTOM MADE HARDWOOD
FLOORING, OVER 130 SPECIES
& 1 MILLION FEET OF
HARDWOODS IN STOCK

READER SERVICE NO. 44

SEPTEMBER/OCTOBER 2010

contents

14

OVER-THE-FENCE
PUSH STICK

up front

6 On the Web

8 Contributors

10 Letters

14 Methods of Work

- Push stick stands at the ready
- Set a plunge router to cut hinge mortises
- Jig holds burnisher at proper angle

18 Tools & Materials

- Vise hardware is a home run
- New blades for track-guided saws

24 Fundamentals

Avoid shortcuts and do your finest work

21

GREAT BRUSHES FOR
WATER-BASED FINISHES



features

28

COVER
STORY

The Versatile Trestle Table

Learn wedged-tenon joinery and design a table that suits your needs

BY GARY ROGOWSKI

34

TOOL
TEST

Heavy-Duty Plunge Routers

3-hp routers make deeper cuts than mid-sized models, and feel more solid in your hands

BY GREGORY PAOLINI

40

Tabletop Finish With a Hand-Rubbed Feel

Brush on polyurethane for protection, then wipe on the final coats for a silky surface

BY MARK SCHOFIELD

46

Sleek Console Built for Today's TVs

Low enough to fit under a flat screen, big enough to store piles of components and media

BY ANATOLE BURKIN

54

Mitered Edging Made Easy

Most articles skip over this tricky process—until now

BY PETER SCHLEBECKER

60

A Visit to the Design Doctor

Hank Gilpin has the answers for 3 frustrated furniture makers

BY MATT KENNEY

65

Make Short Work of Small Parts

With bench hooks and hand tools, fitting fine pieces is as easy as 1, 2, 3

BY MATT KENNEY

70

Secret to a Sheraton Leg? Divide and Conquer

BY MARIO RODRIGUEZ

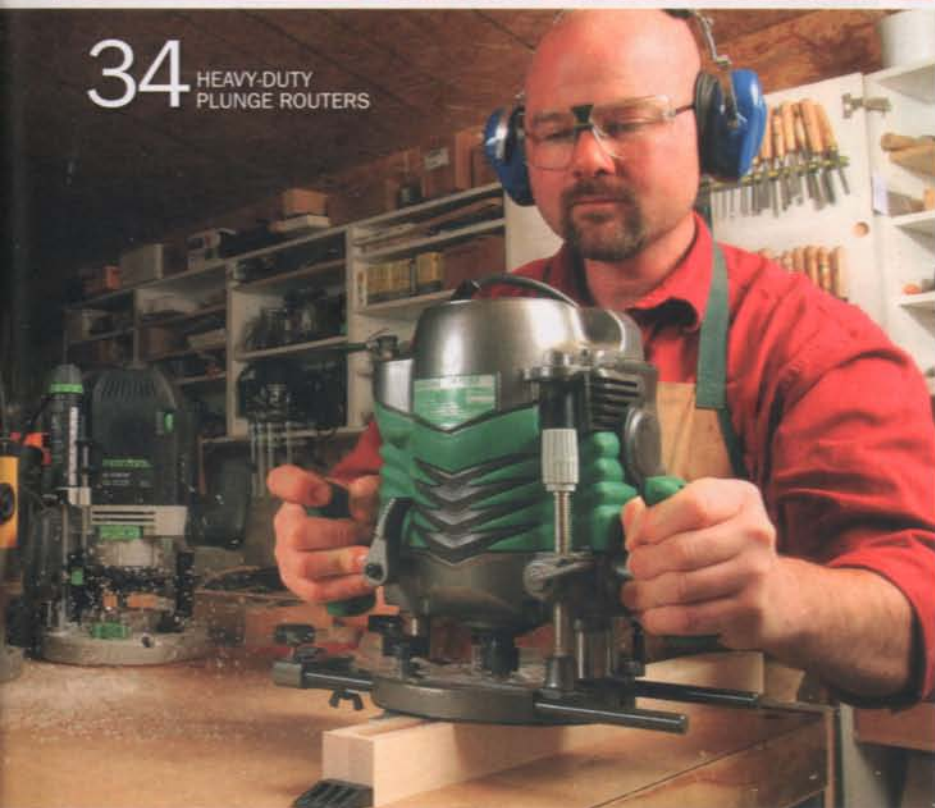


CONSOLE FOR
TODAY'S TV'S **46**



84 APPLIED
FRETWORK

34 HEAVY-DUTY
PLUNGE ROUTERS



in the back

76 Readers Gallery

80 Q & A

- Use a long push stick when ripping narrow boards
- Use a bench chisel to square mortise corners
- Adding quarter columns to case clocks

84 Master Class

Applied fretwork adds color and texture

88 Finish Line

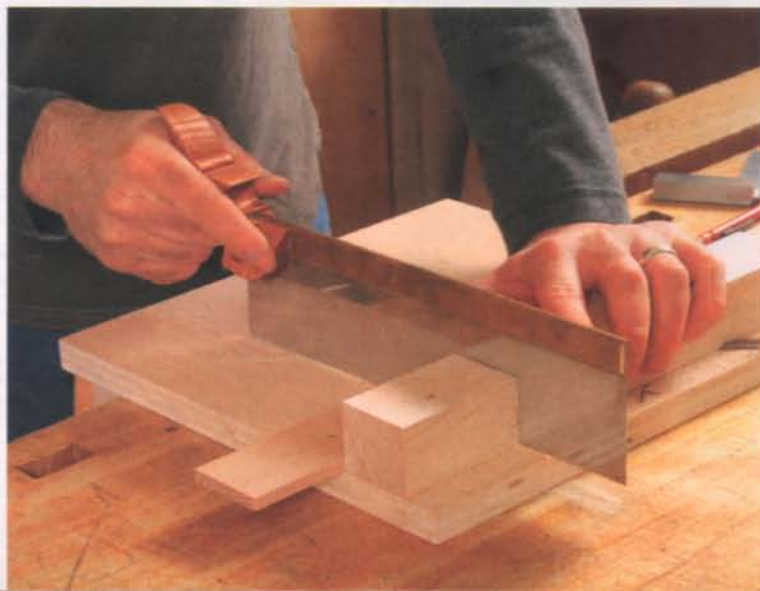
6 finishing fixes

97 How They Did It

The back cover explained

Back Cover

Song of the Chainsaw



65
FITTING
SMALL PARTS



The Taunton Press
Inspiration for hands-on living®

on the web

THIS MONTH ON **FineWoodworking.com/extras**

Visit our Web site to access free Web tie-ins, available July 31. While you're there, don't miss our collection of free content, including tool reviews, an extensive project gallery, and must-read blogs.



What NOT to Do

Spot woodworking blunders and boost your shop know-how with our new game.

Free eLetter

Get free plans and more by signing up for our eLetter at FineWoodworking.com/newsletter.



VIDEO: Small Parts: Fast and Safe

Watch the saw hook and shooting board in action ("Make Short Work of Small Parts," p. 65) in an excerpt from our video series on box making.

Got Jigs?

Enter yours in a new contest for a chance to win a set of Rockler Bench Cookies.

Become an online member

Access more than 500 exclusive project and technique videos by subscribing to FineWoodworking.com. You'll also get more than 30 years of archives at your fingertips, including 1,400-plus articles and project plans.

VIDEO WORKSHOPS

Make an Entertainment Center

Watch every step of this project ("Sleek Console Built for Today's TVs," p. 46) in a new video series. It features:

- Joint-making with Festool's Domino system
- Plywood handling tips
- Quick-to-make drawers

August 18: Build a Trestle Table

Catch every bit of the action as Gary Rogowski crafts this piece ("The Versatile Trestle Table," p. 28) in front of our cameras. Lessons include:

- Sturdy wedged joinery
- Smart router-cut mortises
- A handy jig for angled drilling



Fine Woodworking

Editor Asa Christiana

Art Director Michael Pekovich

Managing Editor Mark Schofield

Senior Editor Thomas McKenna

Associate Editors
Steve Scott
Anissa Kapsales
Matthew Kenney
Patrick McCombe

Senior Copy/
Production Editor Elizabeth Healy

Associate Art Directors
Kelly J. Dunton
John Tetreault

Administrative Assistant Betsy Engel

Shop Manager William Peck

Contributing Editors
Christian Becksvoort
Garrett Hack
Roland Johnson
Steve Latta

Consulting Editor Jonathan Binzen

Methods of Work Jim Richey

FineWoodworking.com

Senior Web Producer Gina Eide
Web Producer Ed Pirnik

Fine Woodworking: (ISSN: 0361-3453) is published bimonthly, with a special seventh issue in the winter, by The Taunton Press, Inc., Newtown, CT 06470-5506. Telephone 203-426-8171. Periodicals postage paid at Newtown, CT 06470 and at additional mailing offices. GST paid registration #123210981.

Subscription Rates: U.S. and Canada, \$34.95 for one year, \$59.95 for two years, \$83.95 for three years (in U.S. dollars, please). Canadian GST included. Outside U.S. and Canada, \$41.95 for one year, \$73.95 for two years, \$104.95 for three years (in U.S. dollars, please). Single copy, \$7.99. Single copies outside the U.S. and possessions, \$8.99.

Postmaster: Send address changes to *Fine Woodworking*, The Taunton Press, Inc., 63 S. Main St., PO Box 5506, Newtown, CT 06470-5506.

Canada Post: Return undeliverable Canadian addresses to *Fine Woodworking*, c/o Worldwide Mailers, Inc., 2835 Kew Drive, Windsor, ON N8T 3B7, or email to mnfa@taunton.com.

Printed in the USA





Total control at your fingertips.

The New Bosch MR23EVS Router Series. The first modular router system with Trigger Control™ power switches in the base handles, giving you unprecedented control. Built to the rugged standards that Bosch is known for, the new MR23EVS routers feature 36 innovative enhancements that put them far ahead of the competition. Afterlock™ microfine depth control. Always-on LED lighting. Highest motor rating in their class. Ergonomic handles for ultimate comfort. Advanced above-table depth adjustment. Get your hands on the new Bosch series routers. When you're ready for precision, power and ease of use in a router, pull the trigger on Bosch. To see the video, go to: boschtools.com/totalcontrol



BOSCH
Invented for life

Enter to Win the Bosch Total Control Sweepstakes at boschtools.com

READER SERVICE NO. 57

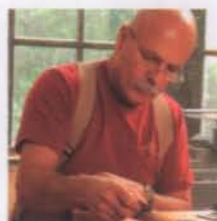
contributors

Anatole Burkin (*"Sleek Console Built for Today's TVs"*) is addicted to horsepower. Roaring routers, motorcycles, and other weapons of auditory destruction fill his garage. That might explain why his hearing is failing. However, lasers have improved his vision, he says, and he retains a keen sense of smell, all the better to hunt and gather new varieties of small-batch bourbon. The former editor-in-chief of *FWW*, Burkin is vice president of digital content for The Taunton Press.



Tim Coleman (*Master Class: "Applied fretwork adds color and texture"*) failed woodshop in high school. "I loved woodworking, but they weren't doing anything interesting," the Massachusetts resident says, "so I skipped class a lot." He came back to the craft after college, when he heard a talk by James Krenov in 1986. "He completely changed my view of what woodworking was all about. I was hooked for life." To see his work, go to timothycoleman.com.

Not long ago, a film crew visited the Philadelphia Furniture Workshop to scout locations for a commercial with a woodworking theme. A crew member spied instructor **Mario Rodriguez** (*"Secret to a Sheraton Leg? Divide and Conquer"*) in his usual shop attire (right). "That looks perfect!" the man enthused. "Is that a costume?" Rodriguez laughs telling the story. But when it comes to furniture making, he does more than just look the part.



Michael Miller (*Finish Line: "6 finishing fixes"*) has been a professional wood finisher for 22 years, working initially for custom cabinet shops, and traveling all over the country to touch up and refinish pieces. Recently he started his own repair and touch-up business. His other interests include music and singing. His five eldest daughters recently made their first commercial recordings (living near Nashville, music is in the air).

Part of what makes *Fine Woodworking* great is that expert furniture makers write the articles. But that doesn't mean the editors don't have a good idea from time to time. Associate editor **Matt Kenney** (*"Make Short Work of Small Parts"*), a hand-tool devotee, likes to make cabinets with a lot of small drawers and boxes with fitted trays. A desire to keep his fingers led him to make and fit those little parts with hand tools and clever bench jigs.



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

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

Fine Woodworking

Advertising Director Peter Badeau
203-304-3572
pbadeau@taunton.com

Senior National Account Manager Linda Abbett
203-304-3538
labbett@taunton.com

Associate Account Manager Kimberly Parrilla
203-304-3590
kparrilla@taunton.com

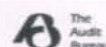
Advertising Sales Assistant Heather Sims

Director of Advertising Marketing Kristen Lacey

Senior Marketing Manager, Advertising Karen Lutjen

Marketing Associate Megan Kolakowski

Member Audit Bureau of Circulation



Senior Consumer Marketing Director Beth Reynolds, ProCirc

Senior Consumer Marketing Manager Melissa Robinson

Senior Manager Web Marketing Robert Harlow

Senior Online Product Manager Michael Stoltz



The Taunton Press

Inspiration for hands-on living®

Independent publishers since 1975
Founders, Paul & Jan Roman

President Suzanne Roman

EVP & CFO Timothy Rahr

SVP & Chief Content Officer Paul Spring

SVP, Creative Susan Edelman

SVP, Technology Jay Hartley

SVP, Operations Thomas Luxeder

SVP, Taunton Interactive Jason Revzon

VP, Digital Content Anatole Burkin

VP, Editorial Development Maria Taylor

VP, Single Copy Sales Jay Annis

VP & Controller Wayne Reynolds

VP, Finance Kathy Worth

VP, Human Resources Carol Marotti

VP, Fulfillment Patricia Williamson

VP, Digital Marketing Nick Rozdilsky

Publishers of magazines, books, videos, and online
Fine Woodworking • Fine Homebuilding
Threads • Fine Gardening • Fine Cooking
www.taunton.com

WHITECHAPEL LTD

Four centuries of beautiful hardware from the world over for furniture cabinet and home.

1(800) 468-5534 whitechapel-ltd.com



READER SERVICE NO. 47

www.RADARCARVE.NET Wood Carving Duplicators

- Furniture
- Gunstocks
- Millwork
- Decoys
- Musical Instruments
- Propellers
- Carved Figures

Incredibly accurate



Thousands of uses! 505-948-0571

est. 1978 HIGHLAND Woodworking

fine tools & education



The Wood Slicer® LEGENDARY RESAWING BLADE

- CUTS SMOOTHER
- STAYS SHARP LONGER
- WORKS FASTER
- SOUNDS QUIETER
- MAKES VENEERS

"Best All-Around Performer"
Rated by Fine Woodworking

800-241-6748

highlandwoodworking.com



BUILD a Maloof-Inspired Rocking Chair

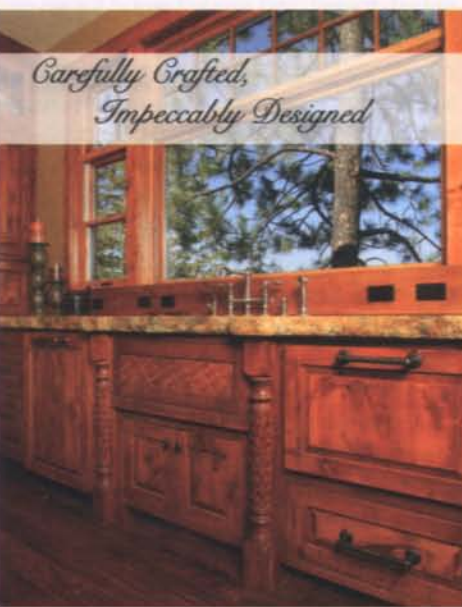
THE WOODWORKING
PROJECT OF A LIFETIME

Our new 103-minute DVD plus 48p full-color illustrated book plus full-size plan set provide you with step-by-step instructions, giving you everything you need to know to build your own Maloof-Inspired Rocking Chair.

SAMPLE THE DVD at:

charlesbrockchairmaker.com

READER SERVICE NO. 75



*Carefully Crafted,
Impeccably Designed*



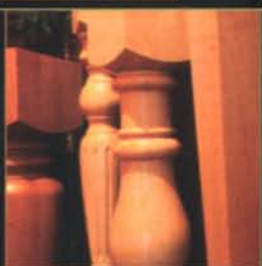
Osborne Wood Products, Inc. has a large selection of wood turnings and components. Visit us online to see our product offerings and place your order.

- Table and Island Legs •
- Bun Feet •
- Corbels •
- ...and much more!

Visit us at IWF in Atlanta
August 25-28
Booth # 2019

866.350.2575

www.osborneturnings.com



READER SERVICE NO. 42

www.finewoodworking.com

STRONG BOND

WITH LESS CLAMP TIME.



High strength with a shorter clamp time along with no dyes for a natural finish makes Gorilla Wood Glue ideal for your woodworking and building projects.

FOR THE TOUGHEST JOBS ON PLANET EARTH.®

GORILLATOUGH.COM

1-800-968-3438 Made in U.S.A.

© 2009 Gorilla Glue Company

READER SERVICE NO. 31

SEPTEMBER/OCTOBER 2010

Spotlight

ISSUE NO. 213
July/August 2010
p. 19



READERS DIVIDED BY TABLESAW VERDICT

The huge judgment entered against Ryobi by a Massachusetts jury is ridiculous. The user (Carlos Osorio) was operating the saw with no blade guard, splitter, or rip fence. Although Mr. Osorio may not have been aware of the dangers of these missing safety devices due to his inexperience, that is not the fault of Ryobi (manufacturer of the portable tablesaw being used) or One World Technologies (Ryobi's parent company). It is excessive to ask that all saws be equipped with flesh-sensing technology. Well-made woodworking tools are costly enough, without adding a sensor and brake mechanism that will increase the cost of the tool by hundreds of dollars.

—CHERI HERSCHELL, ZELIENOPLE, PA.

The validity and ethics of the major tool manufacturers not incorporating flesh-sensing technology can, and should, be debated. But what's amazing to me is that One World's lawyers were unable to sufficiently educate the jury on safe saw operation to be able to demonstrate the ridiculousness of Mr. Osorio's behavior.

—MICHAEL SINGER, Felton, Calif.

As a retired hand surgeon and an active woodworker, I am interested in woodworking injuries from both a professional and a personal viewpoint. My article on woodworking injuries in *FWW* #36 confirmed in a small study that the tablesaw is the most dangerous tool in our shops. The study also confirmed that the majority, if not all, of the injuries sustained on the tablesaw occurred when there was no guard in place.

It would seem that the solution would be to always use a guard. However, most of us who are serious woodworkers will admit that we do not always use a standard guard because, in many tablesaw operations, there is no perfect guard. That is, there wasn't until SawStop founder Stephen Gass's groundbreaking technology. In my opinion, every manufacturer of saws should incorporate this technology. Prevention is a better solution than the best surgery.

—JEFF JUSTIS, Oxford, Miss.

The bar has been raised! Instead of complaining about the legal system, we should be rejoicing that it has done what neither the legislators, public safety regulators, industry trade groups, nor tablesaw manufacturers have done: Enforced the new safety standard created by Mr. Gass's incredible invention. Judging from the responses on *FineWoodworking.com*, the woodworking community is incensed by

Air filters not as effective as claimed

I just received issue #213 and was horrified by the article on air filters. The second paragraph concludes with the following: "Particles smaller than 1 micron are exhaled as you breathe and are not considered a health hazard." This statement should have fired off a warning bell. A simple Google search will be rewarded by thousands of results, all of which contradict that sentence in the article. Contrary to the statement that such particles are harmless, it seems that sub-micron particles cling to surfaces by molecular adhesion. These tiny particles can be drawn far deeper into the lungs because they escape the gross filtration systems provided by the human body, and may even be absorbed directly into the blood stream and organs.

—MICHAEL J. VENABLES, Santa Rosa, Calif.

Your article about air filters was not clear about the tolerable and safe level of exposure to wood dust. After the testers sawed, routed, and sanded wood for seven minutes, the best filters took eight additional minutes to clear the air of dust, leaving up to 4 mg/m³ (milligrams per square meter) of the most dangerous dust hanging in the air in the meantime. That is too much exposure, according to most experts.

After a brief Internet search, I found a research article by the Ohio State University Extension's Department of Food, Agricultural and Biological Engineering, and learned the following:

"In 1985 OSHA was petitioned by the United Brotherhood of Carpenters and Joiners of America of the AFL-CIO to create a standard to protect workers from wood-

Assistant/Associate Editor wanted

Fine Woodworking magazine seeks a journalist with a passion for woodworking. You'll be based in our Connecticut headquarters, but you'll travel monthly to visit talented furniture makers around the country. Photography and video skills are a plus. Go to <http://careers.taunton.com> to apply. Attach a cover letter, resume, and pictures of your woodworking projects and shop space, if possible.

Fine Woodworking

To contact us:

Fine Woodworking
The Taunton Press
63 South Main Street,
PO Box 5506, Newtown,
CT 06470-5506
Tel: 203-426-8171

Send an e-mail:

fw@taunton.com

Visit:

www.finewoodworking.com

To submit an article proposal:

Write to Fine Woodworking at the address
above or
Call: 800-309-8955
Fax: 203-270-6753
Email: fw@taunton.com

To subscribe or place an order:

Visit www.finewoodworking.com/fworder
or call: 800-888-8286
9am-9pm ET Mon-Fri;
9am-5pm ET Sat

To find out about Fine Woodworking products:

Visit www.finewoodworking.com/products

To get help with online member services:

Visit www.finewoodworking.com/customerservice

To find answers to frequently asked questions:

Visit www.finewoodworking.com/FAQs

To contact Fine Woodworking customer service:

Email us at support@customerservice.taunton.com

To speak directly to a customer service professional:

Call 800-477-8727 9am-5pm ET Mon-Fri

To sell Fine Woodworking in your store:

Call us toll-free at 866-505-4674, or
email us at magazinesales@taunton.com

To advertise in Fine Woodworking:

Call 800-309-8954, or
email us at fwads@taunton.com

Mailing list:

We make a portion of our mailing list available
to reputable firms. If you would prefer that
we not include your name, please visit:
www.finewoodworking.com/privacy
or call: 800-477-8727 9am-5pm ET Mon-Fri

For employment information:

Visit www.careers.taunton.com

The Taunton guarantee:

If at any time you're not completely satisfied
with Fine Woodworking, you can cancel your
subscription and receive a full and immediate
refund of the entire subscription price. No
questions asked.

Copyright 2010 by The Taunton Press, Inc. No
reproduction without permission of The Taunton
Press, Inc.

CENTER for FURNITURE CRAFTSMANSHIP



Teaching
Creative Excellence

WORKSHOPS
STUDIO FELLOWSHIPS
TWELVE-WEEK INTENSIVES
NINE-MONTH COMPREHENSIVE

Rockport, Maine
www.woodschooll.org

Supergrit® SANDPAPER

HOOK & LOOP DISCS	
2" \$18/100	3" \$20/100
4 1/2" or 5" 5 or 8 Holes \$15.00/50	
6" 6, 8, or 16 Holes \$17.00/50	
9" \$1.50 ea	12" \$2.75 ea

ABRALON® 3" & 6" Polishing H&L Discs	
Grits 360 to 4000	
ABRANET® 3", 5" & 6" Mesh Discs	
Grits 80 to 600	

BELTS—A.O. Resin	
1 x 30 \$.85	4 x 24 \$1.40
1 x 42 \$.90	4 x 36 \$1.80
3 x 21 \$1.00	6 x 48 \$3.80
3 x 24 \$.90	6 x 89 \$7.00

SHEETS—9" x 11", A.O.	
50D, 80D	\$16/50
120C, 150C	\$26/100
180A, 220A	\$23/100
ABRASIVE ROLLS	

RED HILL CORP.
P.O. BOX 4234
GETTYSBURG, PA 17325
WWW.SUPERGRIT.COM
READER SERVICE NO. 15

CleanStop NO CLOG... NO BURN... JUST THE BEST COUNTERSINK ON THE PLANET



- Stainless steel for long life.
- Individual or 4 piece set.
- Clutch action polymer cap.

"...excellent chip-clearing capability"
"Every hole was drilled cleanly in one shot..."
Fine Woodworking Tools and Shops Winter 2008-09
Patent #5,795,110, other patent pending.

1-800-321-9841 (Mention Code fww20102)
Or online: pro.woodworker.com/fww20102

READER SERVICE NO. 74

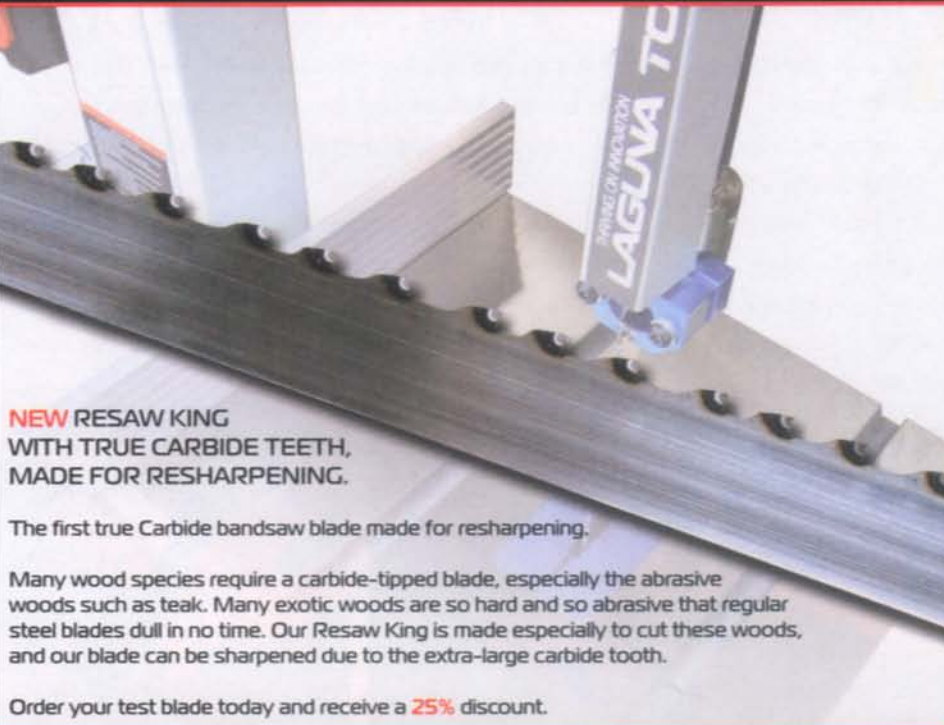
Vacuum Presses

for all your veneering and laminating needs.



Vacuum Laminating Technology
800-403-2344 707-961-4142
www.vacuum-press.com

ANOTHER INNOVATION FROM LAGUNA



NEW RESAW KING WITH TRUE CARBIDE TEETH, MADE FOR RESHARPENING.

The first true Carbide bandsaw blade made for sharpening.

Many wood species require a carbide-tipped blade, especially the abrasive
woods such as teak. Many exotic woods are so hard and so abrasive that regular
steel blades dull in no time. Our Resaw King is made especially to cut these woods,
and our blade can be sharpened due to the extra-large carbide tooth.

Order your test blade today and receive a 25% discount.

THRIVING ON INNOVATION
LAGUNA TOOLS
17101 Murphy Avenue, Irvine, CA, 92614
www.lagunatools.com
800.234.1976
949.474.1200

READER SERVICE NO. 56

the decision. Responses invoke the right of all citizens to choose whatever type of saw they desire. What is happening here is that a much greater level of safety protection has become available. Saws can now be manufactured that won't cut off fingers. In the 1970s, seat belts became the new standard of safety for automobile manufacturers. Now they must include antilock brakes and antiskid technologies to meet the 21st-century standard.

Some woodworkers will say that if they cut off a finger, so be it; it is their right to equip their shops as they will. This argument is specious, because serious injuries are costly not just to the injured, but to all of us. Much of the medical and rehabilitation care administered to an injured woodworker comes from public funding and insurance company payments. These costly payments get shifted to the rest of us. The disabled woodworker may have to go on welfare to collect enough to pay his/her bills. Again this adds to the public debt.

—HERB HEDEEN, Chicago

Editor replies: *This is a complex issue, and these responses leave out a few key facts. There are two main types of tablesaw injuries: kickback and hand-to-blade contact. Recently, Underwriters Laboratory (UL) addressed the first hazard directly, and the other indirectly, by requiring that all new tablesaws include a European-*

style riving knife that moves up and down and angles with the blade, and therefore can stay on the saw for almost all operations. Most of these new riving knives are easy to remove when necessary, as are the blade

covers attached to them. Therefore, they are much more likely to be used than the older splitters and covers, preventing kickback and reducing the incidences of hand-to-blade contact. Every saw manufacturer has complied with the UL mandate, including SawStop.

Last, aside from paying a higher initial price, a SawStop owner must also replace the brake cartridge (\$80) and the blade each time the device is triggered, which can happen accidentally. Also, it is yet to be seen if the SawStop technology will be feasible in a portable, job-site saw—the most popular type of tablesaw and the type that Mr. Osorio was using.

Online Extra: How They Won

Newly released court documents show how Carlos Osorio's legal team managed to convince the jury and win this case. For details, go to FineWoodworking.com/extras and click on Patrick McCombe's blog.

dust levels deemed unsafe by the union. The union's proposed standard for wood dust set exposure limits at 1 mg/m³ for hardwoods and 5 mg/m³ for softwoods. The Forest Industry contended that the union's request would cost wood products manufacturers up to \$1.5 billion per year and would ultimately reduce the number of manufacturers in the wood industry. After reviewing the health evidence presented, OSHA's finding was that a personal exposure limit of 1 mg/m³ for hardwoods was not warranted. However, the National Institute for Occupational Safety and Health (NIOSH) has established a recommended exposure limit for wood dust, all soft and hardwoods except western red cedar, of 1 mg/m³.

I conclude that even with these air "cleaners," a woodworker's exposure to dangerous dust will be over the limit.

—MICHAEL MELKONIAN, Charlotte, N.C.

Editor replies: *Both readers make good points. We should not have stated that particles smaller than 1 micron are not considered dangerous. We based that on an OSHA document, but our subsequent research agrees with Mr. Venables'. The test was sound, however, as the author's dust meter detected particles down to 0.1 microns. As for the dust hanging in the air, Mr. Melkonian is right that even the best units left up to 3 mg/m³ in the air for 10 or more minutes total, and that most health authorities consider that to be unsafe. However, it is important to note that in order to throw a verifiable amount of dust into the air, we ran our machines with no dust collection in place. With proper dust collection, I expect that the ambient dust levels would have been significantly lower.*

Although the article did say up front that dust collection is the first line of defense, we should have pointed out that not any dust collector will do. It should be sufficiently powerful, well-designed, and effectively connected to each machine and other source of dust, with filtration down to 0.5 microns or less. We recommend that woodworkers spend their money first on proper dust collection at the source, before considering an air filter for mopping up any dust left in the air.



All new saws have riving knives. In our recent review of portable tablesaws (FWW #209), the type Carlos Osorio was injured on, we found state-of-the-art riving knives and blade covers, designed to stay on the saw for most types of cuts, and come off in a snap when necessary.

Big News From Forrest

4 New Blades For Discerning Woodworkers

Forrest sets the standard for excellence with these new top-quality blades:

• **Woodworker II 48-Tooth Blade** for general-purpose applications. Features a 20° face hook, a 25° bevel, and sharp points for clean cross-grain slicing and quiet, smooth cutting.

• **"Signature Line" Chop Master** for quiet, precise cutting and less splintering. Features 90 teeth, a -5° hook to control the feed rate, and re-designed angles with 10" or 12" diameters and 5/8" or 1" center holes.

• **2-Piece & 4-Piece Finger Joint Sets** with reversible, interlocking 8" blades. Ideal for rabbets and grooves. Blades have 24 teeth and standard 5/8" bore. Reversible for 3/16" and 5/16" cuts or 1/4" and 3/8" cuts.

• **Thin Kerf Dados** for clean cutting of 3/16" to 1/4" grooves in thin plywood and man-made materials. Available in two-piece and three-piece sets for table or radial arm saws.



Our blades are U.S.A.-manufactured and have a 30-day, money-back guarantee. Custom sizes available. Order from Forrest dealers or retailers, by going online, or by calling us directly.

FORREST
The First Choice of Serious
Woodworkers Since 1946

www.ForrestBlades.com 1-800-733-7111 (In NJ, call 973-473-5236)

© 2010 Forrest Manufacturing Code FW

READER SERVICE NO. 32

RESIDENTIAL COMMERCIAL INSTITUTIONAL



CABINET BOXES, DRAWER BOXES, Contemporary FRONTS, CLOSET SYSTEMS and more...

Modular or Custom Configured

Flat Packed, Ready for Easy Assembly

Thermofused Melamines Wood Veneers on MDF .5 to 3mm Thick Edgebands Functional Hardware



CabParts, Inc.

970.241.7682

To learn more or to download a free catalog
www.cabparts.com



HIGH QUALITY COMPONENT MANUFACTURING

READER SERVICE NO. 28

WHEN YOUR PASSION TURNS TO PERFECTION



TURN TO POWERMATIC®

The award winning PM1800 bandsaw sets a new standard for perfection with an array of innovative features including:

- Tension lever has full tension, partial tension, and blade release settings
- Micro-adjustable, tool-less bearing guide system
- Heavy duty T-style rip fence
- Large 24" x 24" cast iron table

To learn more about these features, visit your local Powermatic® dealer or:

www.powermatic.com



MODEL PM1800

The Gold Standard Since 1921™



©2010 Walter Meier (Manufacturing) Inc. The color GOLD is a registered trademark of Walter Meier (Manufacturing) Inc.

READER SERVICE NO. 45

Best Tip Push stick stands at the ready



Originally trained as an engineer, Paul Morrison spent 20 years behind a desk before pursuing his woodworking passion full-time. For his unique woodworking business (thewoodcycle.com), he and his co-workers seek out the ugliest logs they can find and process them into beautiful furniture and art.

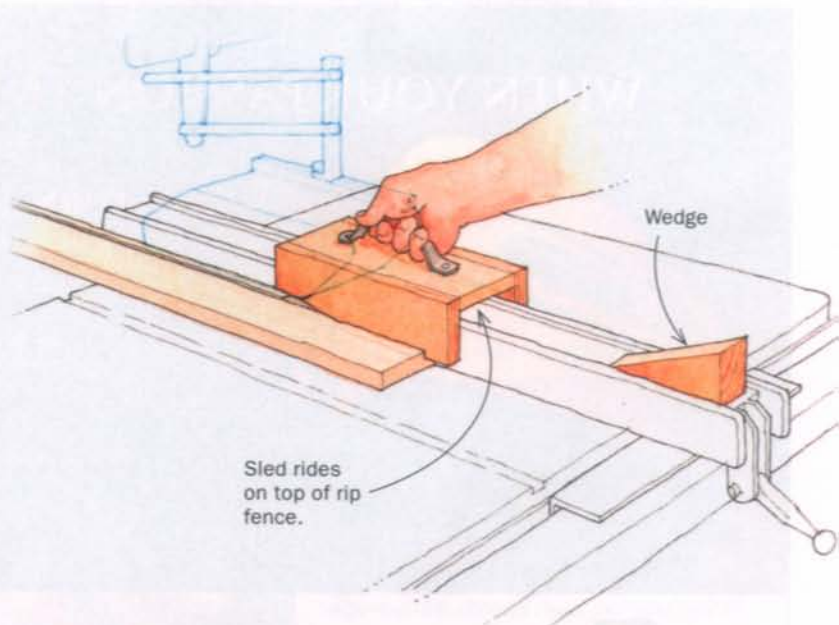
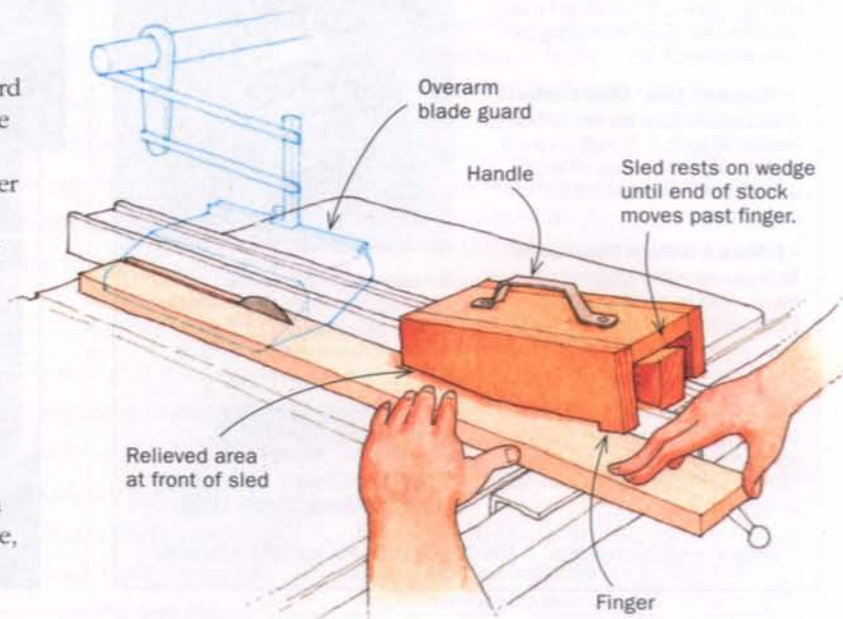
At my small commercial shop, we removed the factory tablesaw guard and installed an over-arm blade guard for safety reasons. Even so, the battle between the blade guard and rip fence becomes problematic the closer the two get. For narrow rips, we found ourselves either removing the guard or fighting with it.

To solve this problem, we developed a push stick based on a sled that fits over the rip fence. The unit has $\frac{3}{4}$ -in.-thick sacrificial plywood sides, with a $\frac{1}{4}$ -in.-long finger on the back edge to provide the push-through even on very thin rips. When resting fully on the fence, the finger just touches the table. In use, the unit pushes the stock both down and forward.

The other side of the sled is the same but reversed, so the sled is ready to go regardless of which way it is grabbed. A large door handle on the top keeps your hand well clear of the blade. The sled works for any ripcut, but it's especially useful for ripping narrow stock. For those jobs, the side of the sled slides under the guard, which rides up and over it. The handle (and your hand) stays clear to the right. If the sides get chewed up by the blade, we simply replace them.

To keep the sled handy but out of the way for $\frac{3}{4}$ -in. and thinner stock, we hot-glued a wedge to the top front of the rip fence, and we curved the leading edge of the sled to provide 1 in. of clearance above the table when the sled is resting on the wedge. When pushing stock through the saw, the sled rests on the wedge until it is needed to push the tail end through. For thicker stock, we simply set the sled nearby until needed.

—PAUL MORRISON, Oregon, Wis.



A Reward for the Best Tip

Send your original tips to Methods of Work, Fine Woodworking, PO Box 5506, Newtown, CT 06470, or email fwmow@taunton.com. We pay for every tip we publish; the best tip also wins a 12V driver kit from Bosch (model No. CLPK21-120).



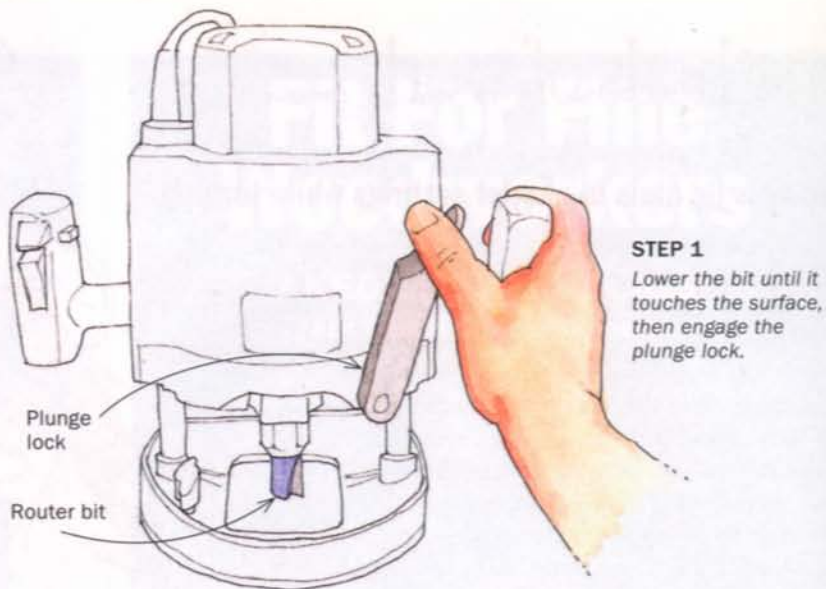
Quick way to set a plunge router to cut hinge mortises

While reading the April 2010 issue (*FWW* #211), I noticed how Doug Stowe set his router bit to the correct depth to cut a hinge mortise. Here's another way that's quick and accurate. It works on a plunge router equipped with a depth gauge.

First, chuck the bit in the router. Place the router on the workpiece and plunge the bit until it just touches the surface. Engage the plunge lock. Next, place a corner of the hinge on top of the depth-gauge stop and lower the depth-gauge rod on top of it. While firmly holding the rod down with finger pressure, lock the rod securely with the thumbscrew. Now you can release the plunge lock and set the hinge aside. The router is now set to cut a mortise to the exact thickness of the hinge.

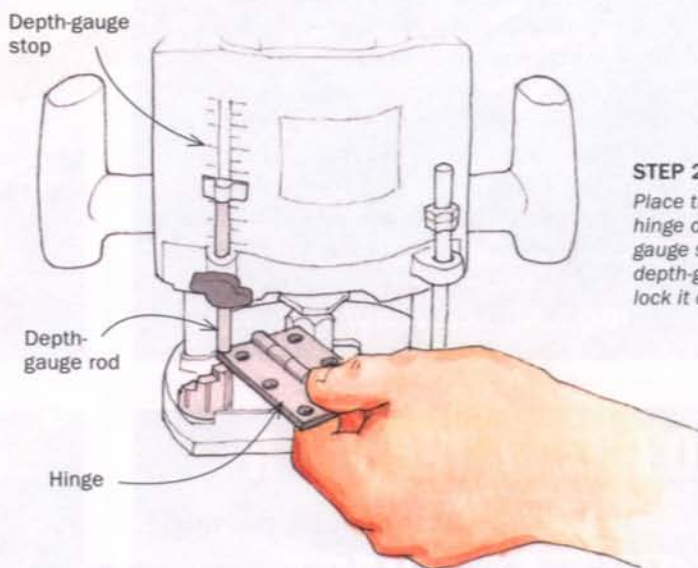
This same basic technique, combined with a feeler gauge, can be used to add or subtract a bit of depth. To set the hinge proud of the surface, place a feeler gauge on the workpiece before lowering the bit to the surface. To set the hinge slightly below the surface, place the feeler gauge on top of the hinge before setting the router's depth-gauge rod.

—MICHAEL E. TAYLOR, St. Thomas, Pa.



STEP 1

Lower the bit until it touches the surface, then engage the plunge lock.



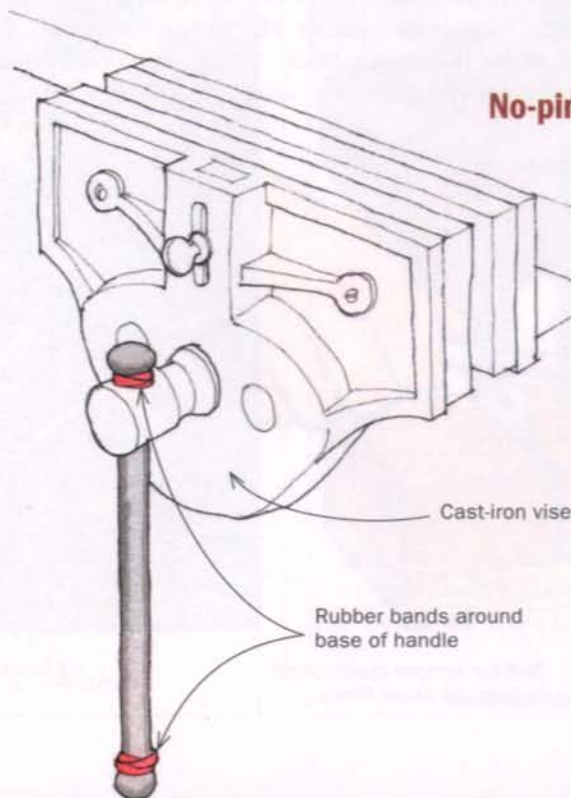
STEP 2

Place the corner of the hinge on the depth-gauge stop, lower the depth-gauge rod, and lock it down.

Quick Tip

I don't have running water in my basement shop, but I often have a need for the wet stuff. So, for about \$3, I bought an empty 32-oz. plastic spray bottle at my local hardware store and filled it with water. With the spray bottle within easy reach of my workbench, along with a roll of paper towels, I can easily give my hands a quick wash. Plus it's handy for wiping up excess glue and keeping my safety glasses clean and dust-free.

—TOM BEGNAL, Kent, Conn.



No-pinch vise handle

My bench vise is a substantial cast-iron model with a beefy metal handle. When the handle drops vertically, it is not only noisy but also painful if your fingers are in the way. After pinching my fingers one time too many, I softened the impact by wrapping the ends of the bar with rubber bands. It works great.

—OZZIE TATONE, Dundas, Ont., Canada

No-fuss jig dials in caliper settings while turning

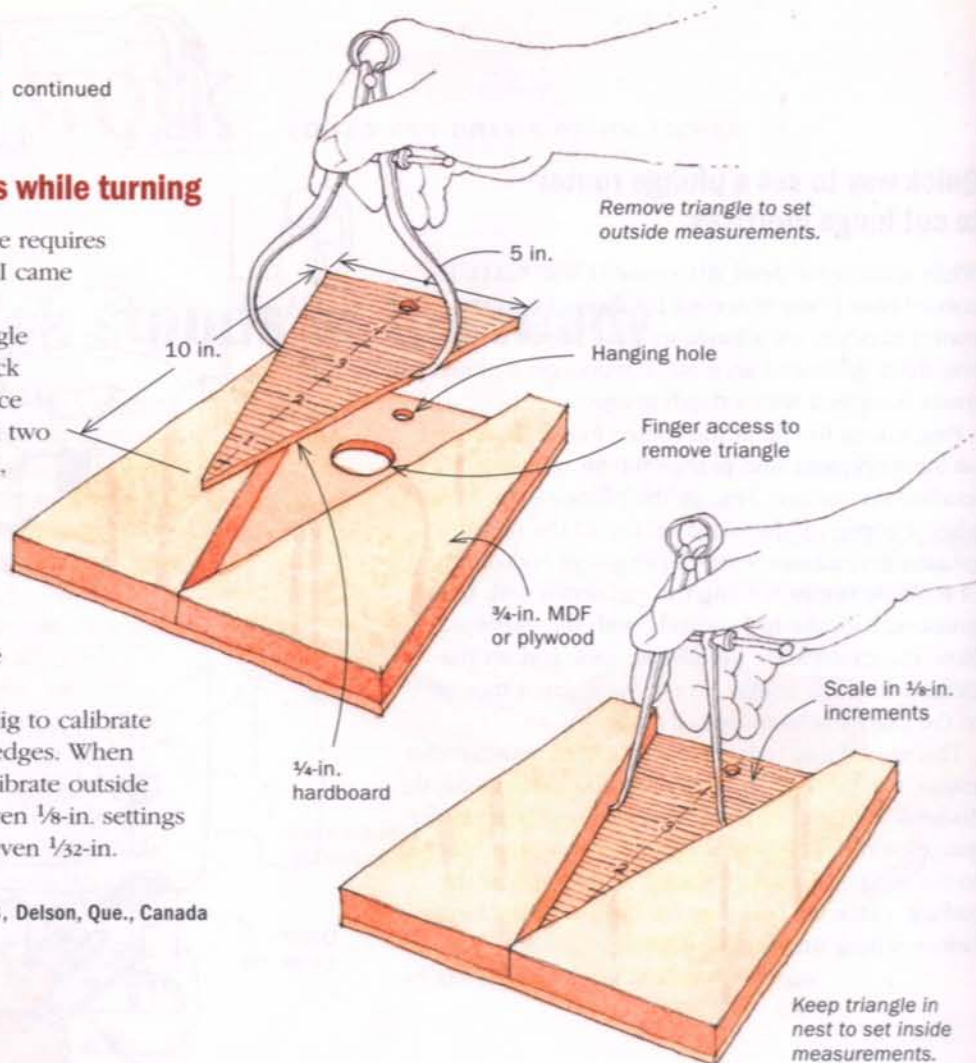
Any turner will tell you that turning a spindle requires lots of caliper settings. To ease this process, I came up with this double-duty V-gauge.

To make the gauge, cut an isosceles triangle (10 in. tall with a 5-in. base) from $\frac{1}{4}$ -in.-thick hardboard. Rest the triangle on another piece of $\frac{1}{4}$ -in.-thick hardboard, and glue and nail two $\frac{3}{4}$ -in.-thick scrap strips of MDF or plywood, one on each side of the triangle. After the glue dries, cut the gauge to the rectangular shape, as shown.

Next, draw lines across the triangle to designate different widths in steps of $\frac{1}{8}$ in. If you've done everything right, these lines will be $\frac{1}{4}$ in. apart.

When the triangle is in its nest, I use the jig to calibrate for inside measurements against the $\frac{3}{4}$ -in. edges. When the triangle is out of the nest, I use it to calibrate outside measurements. You can use the lines for even $\frac{1}{8}$ -in. settings or eyeball between the lines for $\frac{1}{16}$ -in. or even $\frac{1}{32}$ -in. accuracy.

—SERGE DUCLOS, Delson, Que., Canada



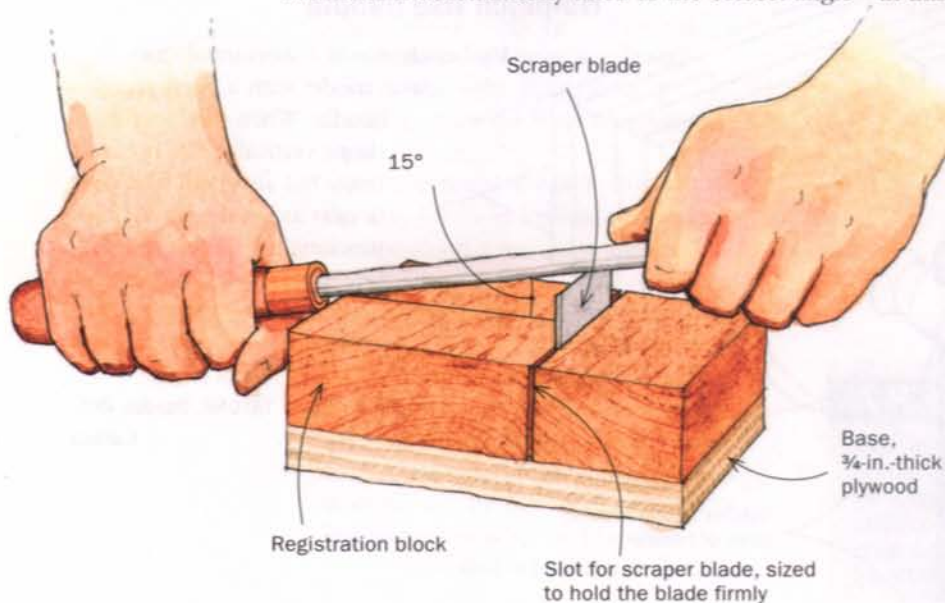
Jig holds burnisher at proper angle

I recently purchased a scraper plane with instructions that call for sharpening the blade with the burnisher held 15° from horizontal. I quickly discovered this is easier to write than to do. So I came up with a jig that allows me to burnish the blade accurately and quickly. The jig consists of two blocks of wood glued to a base with a slot between them to house the scraper blade. When resting on the registration block and the blade, the burnisher is automatically tilted to the correct angle—in this case 15° .

The width of the registration block depends on how much the blade projects above the blocks. My blade projects $\frac{5}{8}$ in., so the width of the registration block is about $2\frac{1}{4}$ in. Use a protractor and a full-size drawing to determine your jig's length. If your blade gets shorter over time through repeated sharpenings, you can trim the width of the block a bit to maintain the correct angle. In use, I either clamp the jig to my benchtop or in my vise.

As to variations on this theme, you can size one side of the jig for burnishing a hand scraper at 5° and the other side for the scraper plane at 15° . Or you can make two slots in one jig to give you four different burnishing angles.

—ALEJANDRO BALBIS, Longueuil, Que., Canada



JDS Cyclones



3HP Cyclone

2300 MAX CFM SS Gallon Drum

\$1799.00

2HP Cyclone

1700 MAX CFM 35 Gallon Drum

\$1299.00



For more information call:
800.480.7269
www.jdstools.com



READER SERVICE NO. 12

Fit For Fine Woodworkers

AKEDA DOVETAIL JIGS

For Fast, Flawless Joinery

Adjustment-Free • Consistent • Repeatable



AKEDA

16" and 24" Variable Layout Models
Priced From \$330. Visit:

www.akeda.com

Ready for the next level?

Berea Brand Pen Kits!

- High Quality
- Original Designs
- Reasonably Priced

Visit us at:

www.bereahardwoods.com,
call us at 1-877-736-5487 or
e-mail us at bereahard@aol.com
18745 Sheldon Rd.
Middleburg Hts., OH 44130

THE BereaHardWoods CO. Inc.

A STRONG CASE FOR AMERICAN CRAFTSMANSHIP



Basic 7 pc.
Router Bit Set #401

Tested #1 by
Fine Woodworking Magazine
in a head to head router bit test
of 17 different brands.

Whiteside Machine Co.
Claremont, North Carolina



800-225-3982
whitesiderouterbits.com

"American Made for the American Woodworker"

READER SERVICE NO. 26

tools & materials

WORKBENCH

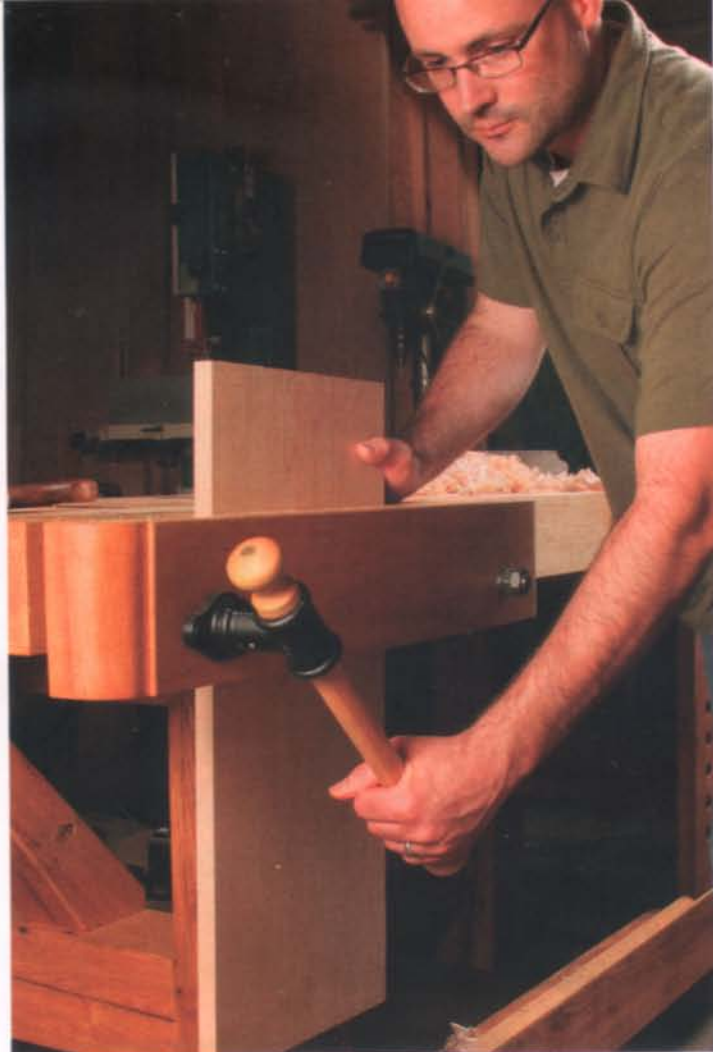
Vise hardware is a home run



WHEN I EVALUATED VISE HARDWARE in *FWW* #205 ("14 Bench Vises"), I chose the \$230 Veritas Twin Screw as best overall. But now that I've tested Lie-Nielsen's version, I have a new favorite. Admittedly, \$285 is a lot to spend, but I think a good bench vise is the most important tool in my shop and what you get from Lie-Nielsen is extremely well-made hardware that will likely last your lifetime and your grandkids' too.

Lie-Nielsen's vise has a couple of major advantages over the Veritas. First off, the wooden jaw completely encloses the chain mechanism. I've nicked the aluminum chain cover on the

Veritas while cutting half-blind dovetails, which isn't good for the cover or the saw. Lie-Nielsen's sealed design also prevents dust and dirt from gumming up the works. In



Front vise. With heavy-duty acme screws mounted in massive steel hardware, Lie-Nielsen's front-mounted vise is built for a lifetime of service. It holds wide and narrow stock equally well.

addition, Lie-Nielsen's single handle takes up less room and is easier to work around than the pair of handles on the Veritas.

You can make the wooden vise jaws yourself (it's a pretty simple pattern) or buy hard maple jaws from Lie-Nielsen (lie-nielsen.com). They're available in 8-, 12-, 18-, and 24-in. sizes and they sell for between \$60 and \$90. The jaws I tried were perfectly machined and nicely finished.

Lie-Nielsen also has a tail vise (\$275 for the hardware and \$130 for the jaw) that's better than any I've used. I had a chance to try it on a friend's bench, but unfortunately, my narrow shop doesn't have enough room to open a tail vise to a useful length. So I guess I'll have to wait until I have a bigger shop to buy one for myself.

—Matt Kenney is an associate editor.



Tail vise. The tail-vise hardware rides in grooved slides. One of the slides is adjustable so you can fine-tune the fit between the moving steel plate and the slides it rides in.



WHITE OAK

■ MATERIALS

Heat-treating makes wood dark all the way through

IT'S QUITE LIKELY YOU'VE NEVER HEARD of thermally modified wood, but the process makes common wood species take on a whole new look and the color change goes all the way through. It's available in 4/4 to 8/4 thickness. Thicker blanks for turners are also available.

The heat-treating process warms the wood from 185°C to 212°C (depending on the species), which changes the color and improves its decay resistance.

After treatment, hickory and ash have color closer to exotics like ipé and wenge. Maple takes on a walnut hue. Oak takes on a fumed look, while birch, alder, and aspen take on a reddish color closer to cherry. Although heat-treating makes the wood decay-resistant (equal to red cedar), it does little to protect it from the sun, so you'll want to treat outdoor projects with a UV-resistant finish or the material will gray.

Thermal modification adds about a dollar a board foot to the lumber's normal cost, excluding shipping. Contact seasonwood.com for further details.

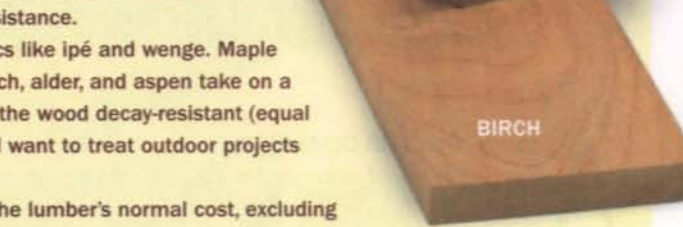
—Charles Peterson is a woodworker in Gales Ferry, Conn.



HICKORY



MAPLE



BIRCH

Fume-free oak. This box looks like it's made from fumed or stained oak. Actually, the oak has been heat-treated, a process that darkens the wood throughout its thickness and makes it resistant to decay.

■ BLADES

New blades for track-guided saws

FIVE YEARS AGO, I BOUGHT a Festool TS 55 track saw that I use for cutting cabinet-grade plywood (Tools & Materials, *FWW* #187). I've always been happy with the performance of my Festool blades, but when Freud and Forrest recently introduced blades that fit the TS 55 track saw, I had to try them. The new blades also fit the Makita and DeWalt track saws, but because the Festool requires a slightly smaller blade (6¼ in. vs. 6½ in.), the depth of cut is somewhat sacrificed on the other saws.

I pitted the two new blades against a brand-new Festool blade in several ripping and crosscutting tests. All three blades cut better than my worn

Festool blade and left a smooth surface. None of the blades showed any wear, but the Forrest and Festool had a bit of pitch buildup.

The Festool blade sells for \$61. The Forrest is \$91 (forrestblades.com) and the Freud is \$50 (amazon.com). Since all three blades offer equal performance, I'd choose the Freud because it costs less and has a pitch-resistant surface.

—Mark Edmundson is a professional woodworker in Sandpoint, Idaho.



Sharp teeth. New 160 mm blades from Forrest and Freud are sized for track saws like Festool's TS 55. The Freud performed as well as the others, and costs less.



ROUTER BITS

Rout glass doors with full tenons

AMANA TOOL HAS DEVELOPED a matched pair of cope-and-stick router bits that produce true divided-light cabinet doors with mortise-and-tenon joints.

The first bit shapes the decorative sticking with a rabbet for the glass. A second bit makes the corresponding cope and cuts tenons for joining frames.

They're available in two sizes: one for material from $\frac{3}{4}$ in. to $\frac{7}{8}$ in. thick (No. 55360; \$138) and a second for material

from $\frac{7}{8}$ in. to $1\frac{1}{2}$ in. (No. 55362; \$168). Both sets require mortising the frame members in a separate operation.

Precise layout of the stiles and rails is essential, but when the mortises are placed accurately, the set creates strong, clean-looking joints. Shims are included for any misalignment, but I didn't need them as the parts fit together perfectly.

There is one drawback with the bit profile: Used with $\frac{3}{4}$ -in. stock, it leaves only a $\frac{1}{4}$ -in. rabbet for the glass, so

Strong connection.

Unlike most cope-and-stick bit sets, which produce stub tenons, Amana's new set for divided-light doors makes real tenons for stronger frames.

typical $\frac{1}{4}$ -in. glass stop won't fit behind the glass. Otherwise, the set is an accurate and efficient way to make divided-light cabinet doors. For information, go to amanatool.com.

—Roland Johnson is a contributing editor.



MACHINES

Latest SawStop runs on 120-volt power

SAWSTOP'S NEWEST Professional Cabinet Saw has a $1\frac{3}{4}$ -hp motor that runs on 120-volt power. The saw has the same cabinet and many of the same features as the 220-volt Professional Cabinet Saw (FWW #209), but its motor is more closely related to the one on SawStop's Contractor Saw, which had plenty of power in a past test (FWW #199). The new saw is available with 30-in., 36-in., and 52-in. rip fences, with prices starting around \$2,300 (sawstop.com). All the tools in the SawStop lineup have a unique blade-stopping brake meant to prevent injury.

—Patrick McCombe is an associate editor.

■ FINISHING

Brushes for waterborne finishes

UNTIL NOW, IF YOU WANTED TO BRUSH A WATERBORNE FINISH, you could use a nylon or polyester brush that holds a lot of finish but tends to leave brush marks. Alternatively, you could use a fine-filament Taklon brush, but these require frequent reloading (dipping).

Under the Gramercy brand, Tools for Working Wood (toolsforworkingwood.com) is now selling brushes with synthetic filaments even finer than Taklon and with perhaps five times as many bristles as an equivalent-size Taklon brush. The short filaments (1 $\frac{3}{4}$ in.) give the brush a solid, stiff feel. Also, instead of springing back straight, the bristles maintain their curve even when you lift the brush off the surface. This takes some getting used to. However, this brush holds a lot of finish, lays it down nearly devoid of brush marks, and cleans as easily as a Taklon.

I compared the 2-in. size (\$30) to the equivalent Taklon brush (\$25) from Homestead Finishing. Both brushes left smooth surfaces, but the Gramercy brush held more finish for fewer reloads.

The 1-in. and 3-in. brushes cost \$16 and \$50.

—Mark Schofield is the managing editor.



Smooth finish. Available in 1-, 2-, and 3-in. sizes, Gramercy's brushes for waterborne finishes hold a lot of finish and release it slowly for a smooth, even coat.

Why aren't you building Beaded Face-Frames?

Beaded Face-Frames are a great way to add detail to your cabinetry work. Problem is... they're difficult to build and take a lot of time and effort! Until now. Thanks to our Precision Beaded Face-Frame System, anyone can build beautiful face-frames quickly, easily, and more affordably than ever before!



Visit www.kregtool.com today to watch the video and learn more!

Kreg

Multiple Routed Profiles Available!

www.kregtool.com | 800.447.8638

READER SERVICE NO. 33

www.finewoodworking.com

Q.V.P.

Air-Powered Vacuums

Electric Vacuums

Flip-top Frame Press

Vacuum Bags

Accessories

Complete Systems

VAKuum Pressing Equipment



Super-Pro 5 CFM automatic vacuum system with a 8'6" x 52" Poly bag only \$795

FREE 2 Hour Instructional DVD

800 547-5484 www.qualityvak.com

Quality VAKuum Products, Inc. 43 Bradford Street Concord, MA 01742
Phone - (978)369-2949 Fax - (978)369-2926 E-Mail - qvp@qualityvak.com

RAZOR SAW

It cuts FASTER! EASIER!
MORE ACCURATELY!

Order now, only \$31.00 - Free Shipping

Craftsmen around the world have discovered the secret of better quality work. The Razor Saw cuts by pulling and will give a cleaner, more accurate cut in half the time. Purchase a RAZOR SAW now and we will include our 100 page catalog of the world's finest woodworking tools. Or send \$5.00 for a two year subscription to our Catalog.

The Best handsaw for ALL woodworkers!

www.japanwoodworker.com

THE JAPAN WOODWORKER

1731 Clement Ave. • Alameda, CA 94501 • 1-800-537-7820

READER SERVICE NO. 8

Stay on top of the most inspiring, useful woodworking information anywhere.

FREE
14-day trial
membership

Fine Woodworking Online Membership

Now you can get timely, shop-tested advice on new projects, design ideas, tools, and techniques with your *Fine Woodworking* online membership. Here are some of the exclusive benefits you'll enjoy.

Search our online archive of over 1,300 articles from *Fine Woodworking* magazine.

Get special monthly offers, including downloadable eBooks and discounts.

What's New for Members alerts you to new features on the site.

Video Workshop series with expert demonstrations on special projects and techniques.

Fine Woodworking Online Member Page

Learn about the latest premium content just for members as well as member-only special offers, exclusive member giveaways, and a sneak peek of what is coming. Be sure to bookmark this page so that you don't miss a thing. Not a member yet? Click here to [Start your FREE 14 day trial](#).



Free Sketch-Up Plan

THIS MONTH:
Members can download
this Sketch-Up plan for free
Dovetail Toolbox plan
(A \$12.95 value)

[download now >](#)

What's New for Members

Fast Fix: Build a Simple Miter Saw Stand
This simple miter saw stand solution is great for tight spaces and even tighter budgets. For a limited-time only, watch this episode for free. Brought to you by Delta. [watch the video >](#)

Video Workshop: Build a Small Tool Cabinet
Follow along with Fine Woodworking contributing editor Garrett Hack as he goes step by step through making an elegant wall-hung cabinet, with lessons on sliding dovetails, custom molding and inlay, and doors and drawers. [watch the video >](#)

Video Workshop: How to Build a Bed
Learn how to build a classic Mission-style bed and pick up tips for designing and constructing any style bed, including installing bed bolts, and sizing a bed for common mattress sizes. [watch the video >](#)

Story Stick for Accurate, Repeatable Cuts
Learn how to use a story stick to accurately repeat cuts and map out joinery for an entire project on one piece of wood. Measure once and cut 100 times! [watch the video >](#)

A Clear Finish for Maple
Peter Gedrys shows you how to preserve maple's pale, natural look with a water-based finish. [watch the video >](#)



VIDEO workshop series



Play Video



Read the Current Issue Online >
Winter 2009/2010 Issue no. 207

This Month's Member Giveaway



This month 5 lucky Online Members will randomly be selected to receive one of the following prizes from Jet:

- 1000 CFM Air Filtration System
- Benchtop 12-in. Drill Press
- Bench Top Mortise Machine
- Compound Miter Saw
- 14-in. Bandsaw

No entry necessary. Check back in early December to find out who the lucky Online Members are.

Coming Soon for Members

In December



A New Video Series: Fast Fix: Quick, smart solutions for your shop. Plus, watch two episodes for free. Brought to you by Delta, with John White

News

Stanley Works to Acquire Black and Decker
The combined company will merge top brands including DeWalt and Porter-Cable and create a tool powerhouse with an estimated worth of \$8.4 billion. [read more](#)

Events

JAN

January 21, 2010
Hand v. Power Tool Showdown: Tenons
Newtown, Connecticut (and Live on the Web!)

Online access to the latest issue of *Fine Woodworking* magazine.

Automatic entry in monthly members-only giveaways.

Get timely alerts on upcoming events and news.

To enjoy all this and more go to

FineWoodworking.com/Join

and start your 14-day FREE trial.



The Taunton Press

CMT ORANGE TOOLS™

The "best seller" from Europe



X-TREME PERFORMANCE

Contact your local dealer today.
Incredible offers are ready for you!

CMT USA, Inc.
Toll-free 888.268.2487

www.cmtusa.com
info@cmtusa.com

TM, CMT, the CMT logo and the orange color applied to the surfaces are trademarks of C.M.T. UTENSILI S.P.A.
© C.M.T. UTENSILI S.P.A.

READER SERVICE NO. 66

You Did It Yourself!



Raised Panel Doors,
Dovetail Drawer Boxes, or
Complete Cabinet Kits
from



Scherr's
Cabinet and Doors, Inc.

(701)839-3384
Fax (701)852-6090

email: info@scherrs.com

www.scherrs.com

READER SERVICE NO. 20

Hartville Tool SINCE 1972
OHIO'S LARGEST TOOL STORE!

100 PC. Rare Earth Magnet Value Pack
Item # K10369

SAVE 60% Only! \$15.98
Reg \$39.99
Offer Valid for 90 days

Special Value Pack Includes:
45 ea. 1/4" Magnet # 10369
30 ea. 3/8" Magnet # 10370
25 ea. 1/2" Magnet # 10371

FREE SHIPPING! FREE Catalog!
On Orders Over \$99 (Lower 48 States)

hartvilletool.com
800-345-2396

READER SERVICE NO. 7

THE DREAM TEAM

The Felder 700 Series –
versatility and industrial quality

FELDER

...perfection in woodworking!

OPEN HOUSE in Delaware, October 21st - 23rd 2010 + Fall Specials



Bandsaw FB 600

Planer-Jointer AD741

Saw-Shaper
KF 700 S Professional

VIDEO
online

FELDER
Quality and Precision
made in AUSTRIA



FELDER-GROUP USA
www.felderusa.com

East: Tel. 866-792-5288 salesinfo@felderusa.com
West: Tel. 800-572-0061 west@felderusa.com
S. CA: Tel. 866-714-6005 s.ca@felderusa.com

READER SERVICE NO. 38

Avoid shortcuts and do your finest work

BY ASA CHRISTIANA

We're all busier these days, feeling the pressure for quick results in every area of life, even in the last place we woodworkers should tolerate it—the shop.

So we take shortcuts—at least, I do. I trick myself into believing I can skip vital steps that prevent mistakes but slow me down. I ignore the quiet voice in my head that tells me I am gambling.

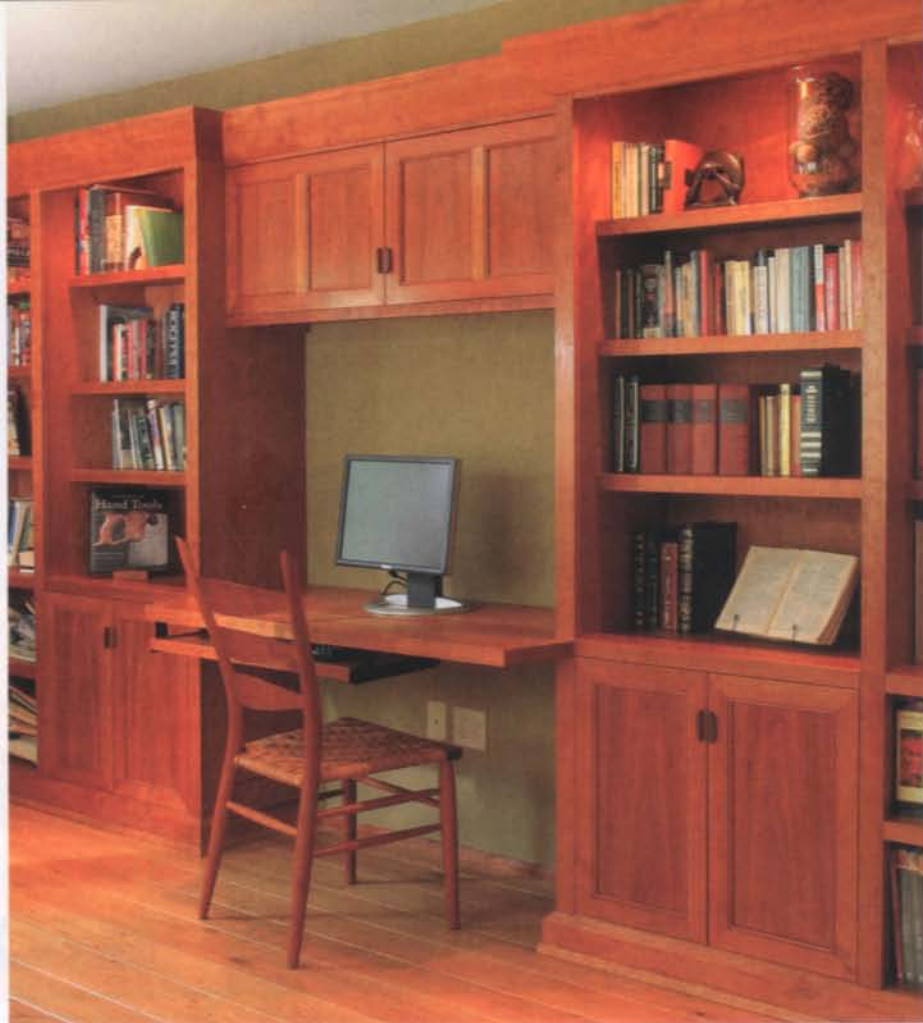
Temptation arises at every stage of a project, from choosing what to build to buying lumber and milling it, from cutting joints to assembly and finishing. And a mistake at any stage can show in the final product.

On the other hand, if you go the extra mile, you'll appreciate the gorgeous surfaces, tight joints, and flawless finish for years to come. I've never regretted taking my time on a piece.

The payoff

If you are a hobbyist like me, don't put yourself on a deadline. Leave those for your day job. Take a breath, clear your mind, and let that quiet voice guide you. It will warn you about every shortcut, and you'll be surprised at what you can accomplish.

—Asa Christiana is the editor.



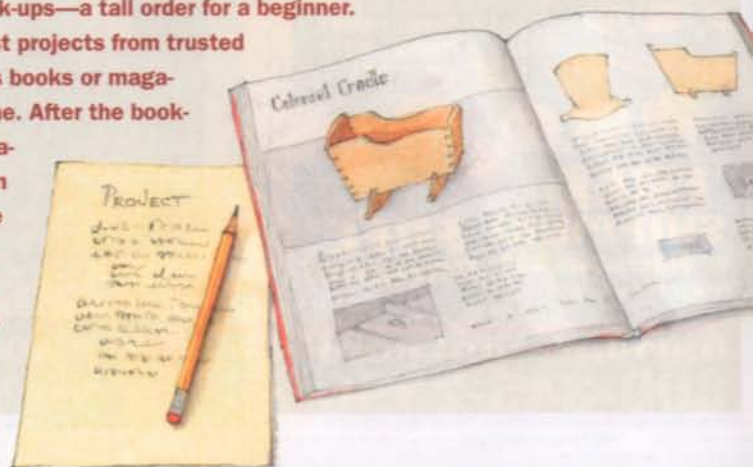
No shortcuts here. By carefully selecting materials and paying close attention to milling and joinery, Christiana built very square cases and doors for his built-in home office, featured in FWW #166. That made it much easier for contributor Tony O'Malley to install the entire unit, attach the face frame and moldings, and hang the doors.

Spend time on design

When I was starting out, I couldn't wait to begin cutting and building, so I designed pieces without much forethought. As a result, my work wound up with proportions, moldings, and other elements that I didn't like. I keep my first bookcase well hidden in a basement playroom.

If you're creating a design from scratch or even from a photograph, you'll need to iron out the details before you buy lumber. The best approach is to make scale models and mock-ups—a tall order for a beginner.

So build your first projects from trusted sources, such as books or magazines like this one. After the bookcase, I built a cradle from a plan in a book. That one came out great, and sits proudly in my daughter's bedroom.



Don't skimp on wood

We all get sticker shock at the lumberyard, but it's not worth the savings to buy subpar wood, or just enough to cover your cutlist. The ugly trade-off comes when you are forced to accept defects in the finished piece, or make the long drive to get more wood later.

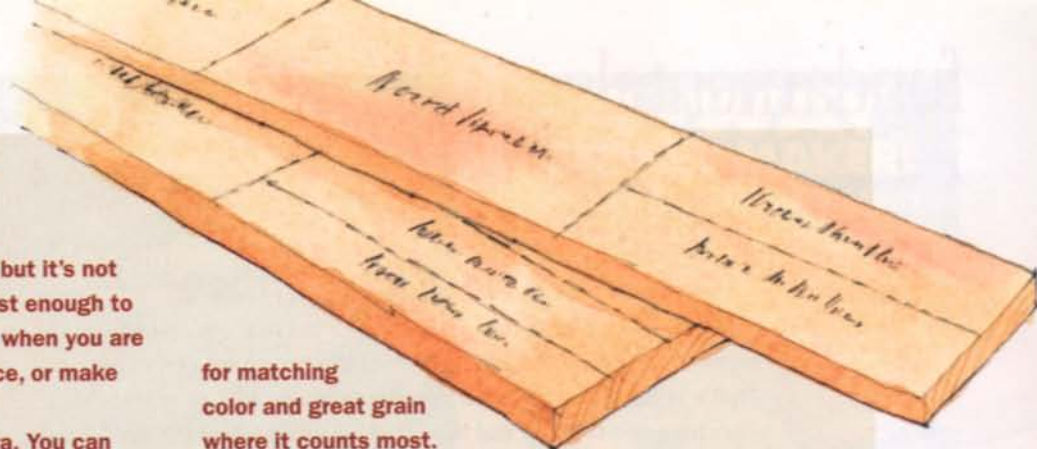
You won't regret buying 10% or 20% extra. You can cut around defects, reject a board that warps severely or looks worse than you thought it would, or replace one if you make mistakes (you will).

Before you open your wallet, though, take care at the lumberyard to find the right board for each part. Look

for matching color and great grain where it counts most.

Then use a lumber crayon to mark each board for the parts it will yield.

Also, if you buy your wood already surfaced, take extra care to make sure that each board is straight, flat, and smooth before putting it in the take-home pile.



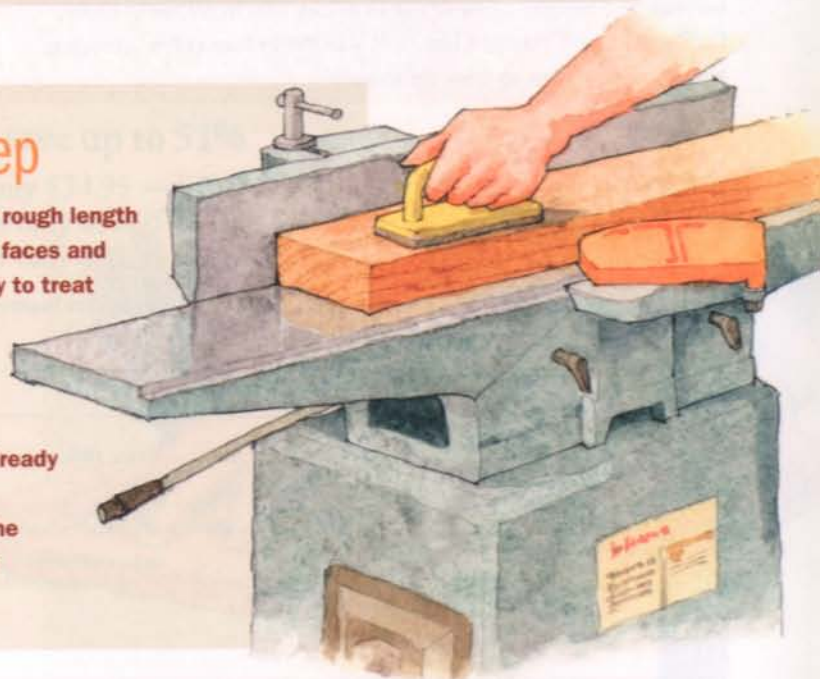
Milling is the most important step

You need patience and attention to detail when cutting pieces to rough length and width, then jointing and planing them to achieve flat, parallel faces and square corners. These tasks are crucial, but dull, and it's too easy to treat them like a speed bump on the road to building your project.

You might decide, for instance, to skip the step of milling your stock slightly oversize and letting it acclimate (and move) for a few days before bringing it to final dimension.

You might choose not to bother marking which faces you've already milled, and end up with lumber that is not straight or square.

Attention to these details will make you much happier when the work is done. It's also worth remembering to mill extra pieces as replacements or test parts.



Pause for a sharpening session

If I don't sharpen my hand tools at the beginning of a project, I tend to avoid it when I'm in the thick of things later. So I try to make do with dull tools, swearing when they dive too deep or tear at the wood. I end up with torn-up surfaces and joints that don't fit well.

I've learned to commit to a sharpening session early on. At a minimum, I hit my block plane, smoothing plane, and scraper. If there are any mortises and tenons, I also sharpen my shoulder plane and chisels.

If you don't know how to sharpen blades well, stop now, read a few articles, buy the gear you need, and learn to use it. I recommend a high-quality honing guide and waterstones, getting the final polish on an 8,000-grit stone. Once you use a truly sharp tool, you'll know what all those hand-tool nuts have been crowing about.

Check the bits and blades on your power tools, too. They should be free of gunk and sharp to the touch.



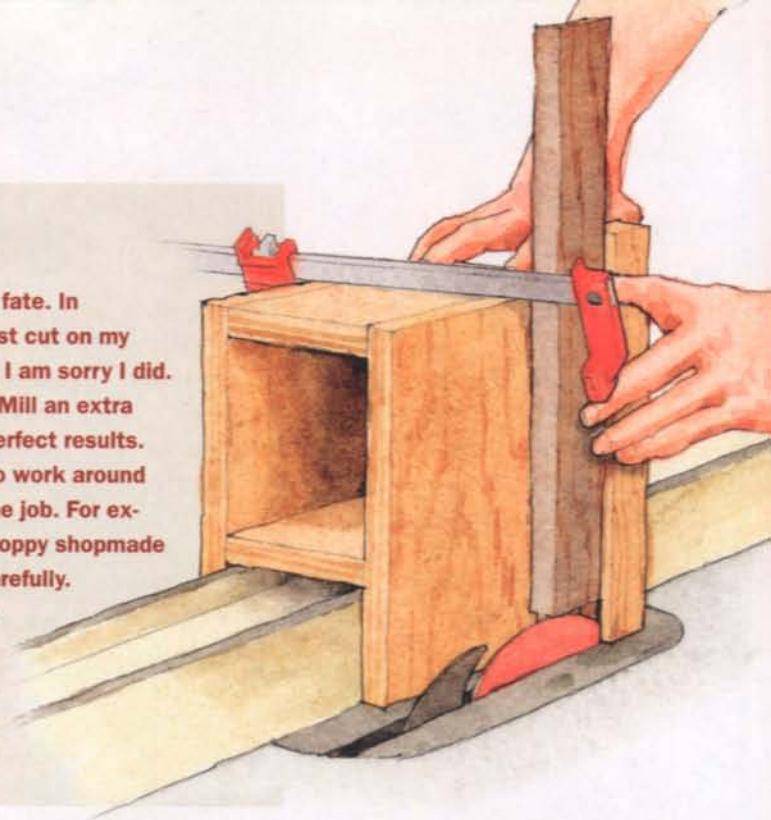
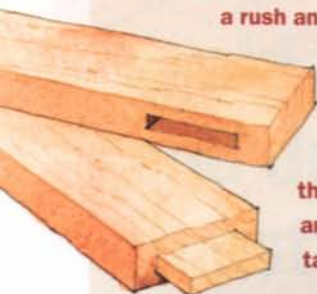
Joinery requires some prep, too

Cutting joinery is another place where I sometimes have tempted fate. In a rush and overconfident, I sometimes try to make the first cut on my actual workpieces. And about 50% of the time, I am sorry I did.

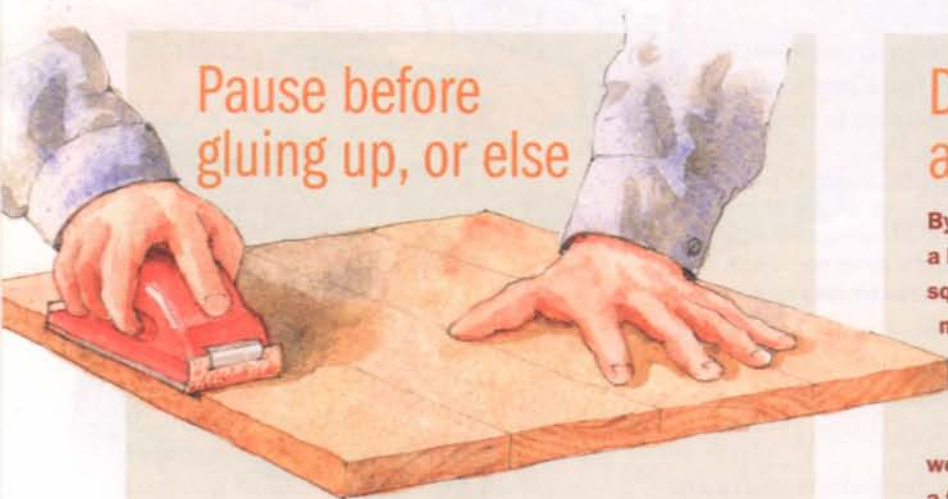
That's where extra lumber can come in handy. Mill an extra part here and there to dial in your setups for perfect results.

Another trap I sometimes fall into is trying to work around the fact that I don't have the right tool or jig for the job. For example, I used to struggle to cut tenons with my sloppy shopmade tablesaw jig until I finally made a second one—carefully.

Sometimes you need a certain tool for best results. I use spiral upcutting bits for mortising. Until I got serious and bought a few of these pricey bits in different sizes, I struggled with straight bits that wouldn't clear chips, stopping every five seconds to blow them out.



Pause before gluing up, or else



Once all the joinery is cut, I can't wait to get the whole thing glued up so I can show my wife what I've been doing in the shop for weeks.

At that point, two huge temptations arise: avoiding a bunch of sanding and scraping, and not doing a dry-fit to test the clamping setup. Skip either, and you'll be sorry.

Some beginners try to skip surface prep—either in part or entirely—leaving behind jointer, planer, and tablesaw marks that become painfully obvious once a finish is applied.

Once the surfaces are prepped, don't rush into a glue-up. Stop to do a real dry-fit, and you won't have any surprises once the glue is spread and the clock is ticking. You don't want to be caught scrambling around the shop for a missing clamp or caul, or be forced to pull apart a whole assembly that doesn't fit right.

Don't run out of gas at the finish

By now the surface should be mostly prepped, with just a bit of touch-up to do after the clamps come off and the squeeze-out is scraped away, but you still need to apply a nice finish. Once again, you'll be tempted to dive right in, slapping finish on the real piece. Don't.

Stop, take a breath, and make a test panel. A test panel is simply a piece or two of extra project wood, used to test the finish. Even if you are using a finish you've already mastered, you shouldn't skip this step, because each board can respond differently to a finish. You should try out most or all of any process, coat by coat, on some scrap. If you are unsure of your surface-prep method, try that out too.



Got our magazines? Get our books and DVDs

*Great offers
Now online*



Now at www.taunton.com/Shop



The Taunton Press



*Have you ignored
the facts?*

*What woodworkers
need to know.*

www.titebond.com/TBIIIvspolyurethane



READER SERVICE NO. 46

PHASE-A-MATIC

NEED
3-PHASE
POWER for
your woodshop?

1-800-962-6976

CNC
available



PHASE CONVERTERS

www.phase-a-matic.com

READER SERVICE NO. 6

4-WAY MONEY MAKER!

Molds • Planes • Sands • Saws



12", 18"
and 25"
Models
Available

Call now
for FREE
DVD!

Now, turn a \$5 rough board into \$75.00 worth of molding in less than a minute. Make over 500 standard patterns plus high-profit curved molding, tongue & groove, any custom design. QUICKLY CONVERTS from **Molder/Planer** to **Drum Sander** or power-feed **Multi-Blade Rip Saw**. 5-Year Warranty, Made In USA. **FREE 60-DAY TRIAL.**

NEW! 3-Side Molding System

Add a Woodmaster Router Station and turn your Woodmaster into a multi-side molder. Handles flooring, paneling, tongue & groove all in one pass!



Call Today for FREE FACTS!
800-821-6651 EXT. PJS1

www.woodmastertools.com

Woodmaster Tools, 1431 N. Topping Ave., Kansas City, MO 64120

READER SERVICE NO. 25

Leigh 24" D4R Pro

Dovetail Jig



**NEW
FEATURE!**

Single pass
half-blind
dovetails

**NEW
FEATURE!**

FINGER/BOX



THROUGH



HALF-BLIND



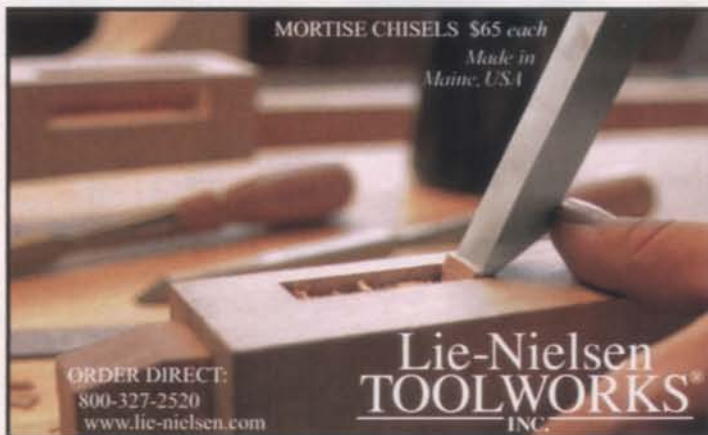
SLIDING

Now you can rout all of these joints—right out of the box!

Imagine the Possibilities... visit leighjigs.com



MORTISE CHISELS \$65 each
Made in
Maine, USA



ORDER DIRECT:
800-327-2520
www.lie-nielsen.com

Lie-Nielsen
TOOLWORKS
INC.

READER SERVICE NO. 76

Moisture Meters

Everybody
should have a Moisture Meter!

Recommended:

Pinless
LIGNO-SCANNER D:

-ACCURACY
-QUALITY
-DURABILITY
-2-YEAR WARRANTY



**BEST OVERALL
CHOICE**

For more details see
Fine Woodworking
Jan/Feb issue
2010
page 64.

LIGNOMAT USA : www.lignomat.com
Call 800-227-2105 for expert advice

READER SERVICE NO. 16

The Versatile Trestle Table

Learn wedged-tenon joinery and design a table that suits your needs

BY GARY ROGOWSKI

With a simple form that allows many variations, the trestle table can look contemporary or classic. The trestles, the stretcher that joins them, and even the top can be shaped in myriad ways. The design offers easy access for diners, with no table apron to knock a knee against and more chair room on each side. And it is expandable, scaling up easily from this kitchen-sized table to a large dining table.

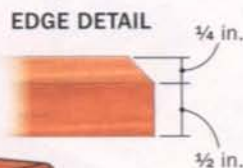
A key feature on many trestle tables, including this one, is the wedged joinery for the stretcher, which

is rock-solid even though it's called "knockdown." With a through-mortise-and-tenon joint, the stretcher locates and holds the trestles upright. In a marvel of engineering, the wedges lock everything together, preventing the table from racking along its length. I know of no stronger joint. It's also good looking: The projecting tenons and the wedges add another design element.

In this article, I'll focus on the stretcher joinery—the most challenging aspect of the project. Executing the

The trestle design is centuries old, yet its rock-solid construction and easy access for sitting remain unequalled. It can be made in any size—from breakfast to banquet table—and its wedged through-tenons let you break down the base for easy transport. What's more, it

is a designer's playground, with the feet, posts, stretcher, through-tenons, wedges, and tabletop each offering room for interpretation. I like this smallish version, sized to be a desk or a kitchen table for four.



1 in. TABLETOP

C/H

Pegs,
3/4 in. dia.

3/4 in.

Technical drawing of a wavy wooden piece. The drawing shows two views: a top view and a side view. The top view is a horizontal rectangle with a wavy top edge. The dimensions are: total length 33 3/4 in., total height 4 1/2 in., and the height of the wavy section 3 in. The side view is a horizontal rectangle with a wavy side edge. The dimensions are: total length 33 3/4 in., total height 4 1/2 in., and the height of the wavy section 3 in.

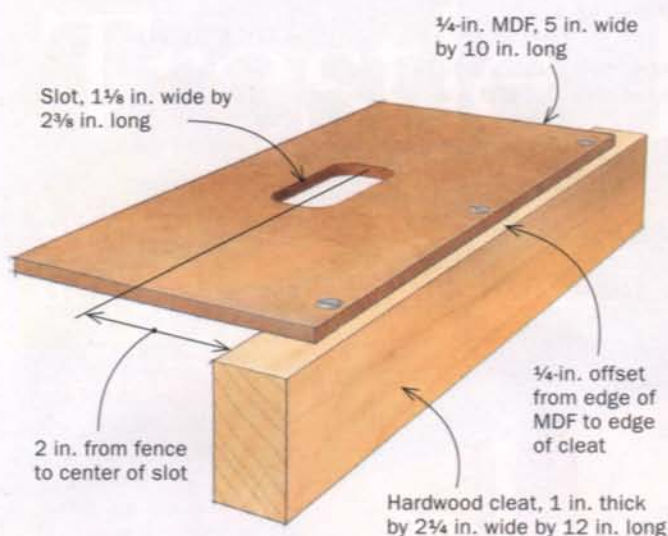
STRETCHER DESIGN

The stretcher can be simple and straight or curved like the ones shown. With a wider post, you could even run two stretchers. After the joinery is cut, the shapes can be bandsawn or routed with a template and bearing-guided bit.

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

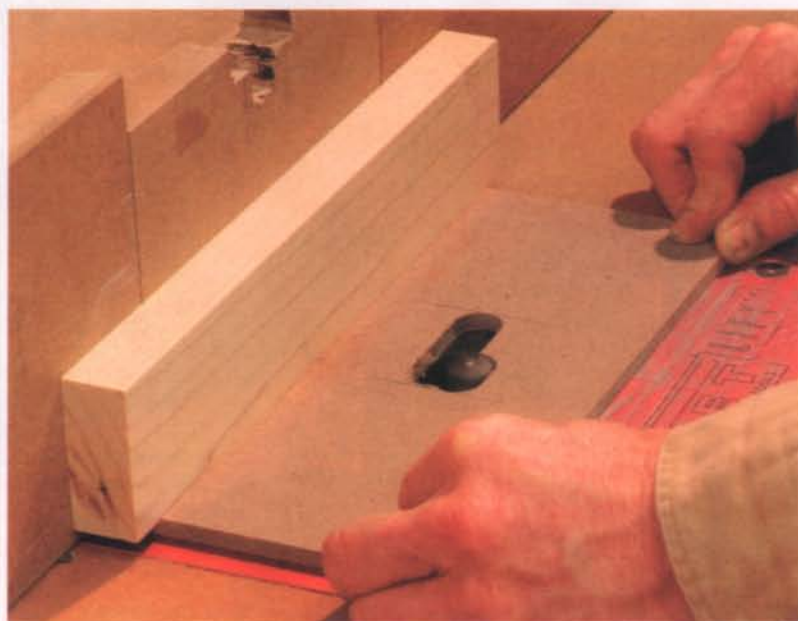
Cut a flawless wedged-tenon joint

1. ROUT THE THROUGH-MORTISES



A TEMPLATE TAMES THE TASK

A simple template, used with a guide bushing, makes it easy to cut through-mortises to the right size, in the right place.



How to make the template. Drill a hole in the MDF, then move to the router table. The jig's cleat rides the table's fence, so the slot is cut parallel to the cleat. Start the router bit in the drilled hole and go from there. Reposition the fence for a second pass and a bigger mortise.



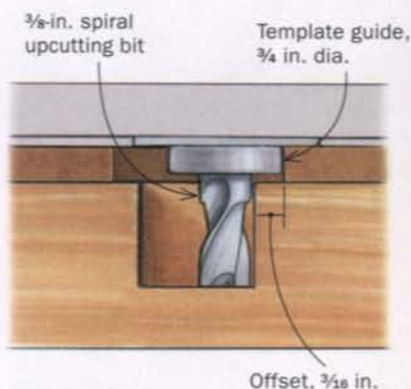
Offset the layout. The template slot is bigger than the mortise, so make a separate registration mark to locate the template accurately and carry that mark around to the other side.



Router the mortise. With the template in place, cut halfway through the stock. Then flip the board end for end (below) to ensure that the jig is clamped to the same reference edge for the second cut.

TEMPLATE GUIDE

A guide bushing rides the template's rim and shields it from the spinning bit. Be sure to factor in the bushing diameter when sizing the slot in the template.



Clean up with a sharp chisel. Chop the corners square, working in from both faces.

2. SAW THE THROUGH-TENONS



Cut the shoulders on the tablesaw. Use a miter gauge with a long fence or a crosscut sled to manage the long stock.



Move to the bandsaw. Use a test cut to adjust the fence for drift. Leave the cheeks slightly fat for trimming and cleanup.



Clean up the cheeks. Plane away the saw marks and adjust the fit. Use a shoulder plane to get into the corners.



Cut the tenon to width. Again, leave the tenon slightly oversize. Make the adjoining cut with a handsaw to remove the waste.

joinery successfully relies on careful fitting of the through-tenons and the wedges to their respective mortises.

How to cut large, clean mortises

Furniture construction is like painting a floor. Careful planning keeps you out of the corners. In this case, it's important to lay out and cut the large through-mortises in the posts *before* shaping the posts to preserve a parallel reference edge for guiding the router.

I use a template guide bushing and a simple shopmade mortising jig to rout mortises. The jig consists of a 1/4-in. MDF routing template attached to a fence that registers against the stock. The jig centers the mortises on the width of the posts, but you'll still need to do a little layout. First, measure from the top of each post to mark the tops and bottoms of the mortises. Use a square to carry the lines around to the board's opposite face, then check the edges of both boards side by side to ensure that the marks line up. Then, because the jig's slot is slightly larger than the mortise itself, make a separate registration mark to locate the jig accurately.

Clamp the mortising template securely in place on the outside face of the post. To cut the mortises, I use a plunge router and a 3/8-in. spiral-fluted bit. It's possible to rout all the way through the post or stop short of full depth and clear the remaining waste with a chisel. But for a technique that will work for posts of greater thickness, start by routing away—in shallow passes—about half of



Clean up the shoulder. Using the tablesawn shoulders as a reference, walk the chisel's edge across the hand-sawn section to establish your line, then chop away the waste.

the mortise depth. Then remove the template, flip the workpiece, reattach the template on the opposite face, and finish the cut.

After routing the mortises, chop them out square, working in from both faces. Now you can shape those posts.

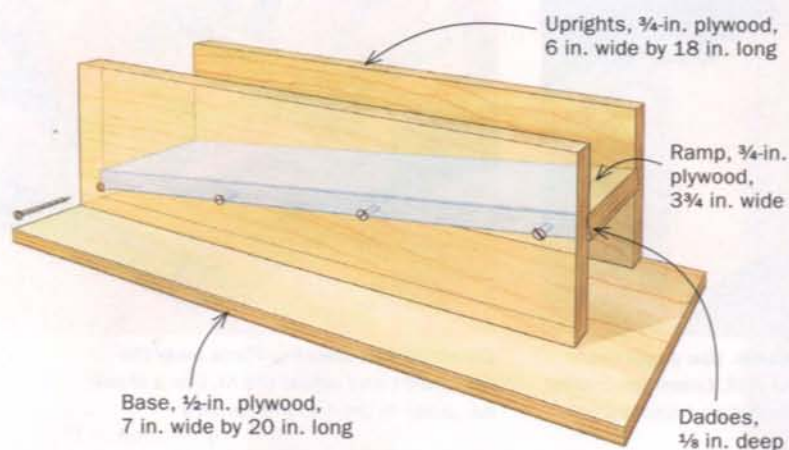
Cutting tenons on a long board

The size of the stretcher makes it generally difficult to handle. For example, it's too long to support safely in a tablesaw tenoning jig. Whatever tenoning method you use, it needs to be clean and accurate—all the more so because the tenon's fit will be visible where it exits the big through-mortise.

As with the big posts, joinery comes before shaping. After laying out the stretcher shape and tenon location, I cut the shoulders on

Wedged-tenon continued

3. DRILL THE WEDGE MORTISES



DRILLING JIG

Rogowski built this simple jig to secure the stretcher at an 8° angle for drilling out the wedge mortises. The jig clamps to the drill-press table and the work is clamped to the jig.



Support the cut. Place a block underneath the tenon to prevent the blowout where the drill bit exits the cut.



Start at the ends. Where holes overlap, make sure the bit's centering point hits wood so it locates properly.



Position the jig. The jig stays put on the drill-press table. Slide the workpiece in the jig to reposition it, and clamp it in place for each new hole.

the tablesaw, using a miter gauge with a long fence or a crosscut sled with a long stop-block attachment to hold the work and locate the cut. To cut the tenon cheeks, I use the bandsaw with a roller stand for infeed support and a 6-tpi blade for a smooth surface.

Before cutting the tenon to width (height), I clean up the cheek cuts, trimming the tenon to the proper thickness. To keep the cheeks flat near the shoulder, I use a shoulder plane, but I'll switch to a block plane for quicker stock removal near the tenon ends. Remember that the last 2 in. or so of the tenon won't be housed in the assembled joint, so that section can have a slightly looser fit.

I also cut the tenon to width on the bandsaw, again leaving it just oversize and cleaning up with hand tools until it slides through the mortise with no gaps showing on the outside face.

The wedge mortises

The last step in making the tenon is to create the mortise for the wedge. In addition to cutting the mortise straight through the entire



Layout line is a visual reference. Mark the angle on the tenon's cheek and sight down the line while chopping away the waste.

4. CUT THE WEDGES AND ASSEMBLE



Bandsaw is safer than tablesaw. Rogowski uses a simple jig made of $\frac{3}{4}$ -in. MDF with an 8° notch cut into it.

width of the tenon, the trick here lies in cutting the outer end of the mortise at an 8° angle. The secret is that the inside wall of the mortise is buried in the post and doesn't need to be chopped out square, so you can cut the entire mortise at 8° on the drill press. If your drill press doesn't have a tilting table, use a jig like the one on the facing page.

Mark out the wedge mortise with a center line in the tenon thickness. Mark the mortise end at $\frac{3}{4}$ in. past the post, but have it start $\frac{3}{8}$ in. inside the post. In this way, the wedge won't bottom out against the back side of the mortise. Using a brad-point bit, drill the holes at each end of the mortise first. Work slowly and clear out the waste often. Then drill out the middle section. To chop out the remaining waste, clamp the stretcher on the bench and use layout lines on the tenon at the 8° angle or a sliding bevel placed on the bench to sight against for chopping. Chop in toward the center of the mortise from both the top and bottom, flipping the workpiece as needed. Chamfer the wedge mortise on both top and bottom so the wedge slides through more easily.

I cut the wedges on the bandsaw using a simple holding jig. Set a sliding bevel to the angle of the mortise and mark out the shape of the wedge on a piece of $\frac{1}{4}$ -in. MDF. Carefully cut out that shape and file the edges straight. Glue another piece of MDF to the bottom of this template to hold the workpiece in place. Make up wedge stock at the proper thickness and length and at roughly the correct width. Then set the bandsaw fence to cut out the wedge. Clean up the wedges with a bench plane, holding them in a vise or in the jig on a shooting board. □

Gary Rogowski runs the Northwest Woodworking Studio (northwestwoodworking.com) in Portland, Ore.



Tap the wedges home. When the wedges are tightly driven, they pull the tenon shoulders firmly against the post for an assembly that won't budge.



VIDEO WORKSHOP

Available August 18: Watch Rogowski build this table from start to finish in a members-only video at FineWoodworking.com/extras.

Heavy-Duty Plunge Routers

3-hp routers make deeper cuts than mid-sized models, and feel more solid in your hands

BY GREGORY PAOLINI





Whenever practical, I rout my mortises, and there's no better router for the job than a plunge router with a

big motor. The raw power lets you remove more waste in a single pass, and the increased mass means the router is easier to control and cuts more smoothly. But a big plunge router is great for more than just mortises. I use mine for template routing, profiling edges, and cutting dadoes and rabbets. That's why I was glad to say yes when *Fine Woodworking* asked me to test all the heavy-duty plunge routers on the market.

It takes a lot of power to breeze through deep mortises, so I looked only at routers with 3-hp motors. That's a lot of torque and power to have between your hands, so the routers needed soft start to tame torque at startup and variable speed so that the motor can be slowed down for large-diameter bits.

Also, I wanted all of the routers to work with guide bushings, making them more flexible for template routing than if you had to rely on bearing-guided bits. Fixed-base routers weren't considered because they aren't suited for routing mortises. In the end, I tested eight plunge routers: the Bosch 1619EVS, DeWalt DW625, Festool OF2200, Freud FT3000VCE, Hitachi M12V2, Makita RP2301FC, Porter-Cable 7539, and Triton TRA001.

Power and cut were not an issue

The primary reason to use a powerful 3-hp plunge router is to hog away waste more quickly. But all of that power is worthless if the cut ends up burned or bumpy. To get a sense of the power in these routers, I routed mortises in hard maple. To test cut quality, I routed two edge profiles (a roundover and an ogee) in cherry, which is prone to burning. To ensure that I was testing routers and not router bits, I equipped every router with its own set of new Whiteside router bits, which have been top performers in previous tests (*FWW* #137, #191).

All of the routers had enough power to rout the mortises with ease. I even used them to rout mortises 1 in. deep by 1/2 in. wide by 3 in. long in one pass. Cut quality wasn't a problem either. Every router left behind a surface free of chatter and

Smart design makes the difference

THE THINGS YOU DO MOST SHOULD BE EASY TO DO



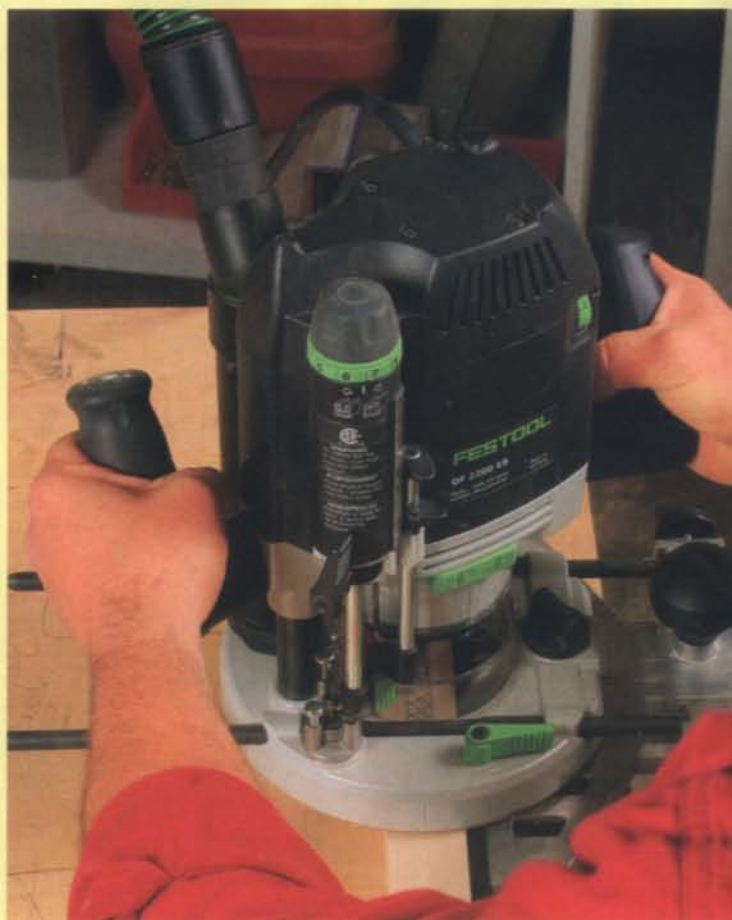
Bit changes are easiest on the Triton. The spindle locks automatically. That frees up one hand to hold the router body for more stability.



Trigger switches are convenient and safe. Both hands grasp the router when it starts. The Freud (shown here), Festool, Bosch, and Porter-Cable routers all have one.



Two smart ways to adjust speed. With Hitachi's thumbwheel (left), both hands stay on the handles during speed changes. The Porter-Cable marks speed with RPM (right), so it can be set exactly to a bit's required speed.



Festool puts your hands at a comfortable angle. That means your wrists are straight. Not only is this more comfortable, but it also gives you more control.

burning on the edge profiles, which I also cut in a single pass.

It comes down to ease of use, comfort

The increased power of big plunge routers comes at a price. They also are heavier, and if that mass isn't easy to control, the router won't be easy to use. I took note of how comfortable the handles were, how easy it was to reach and use the power switch and plunge lock, and how smoothly the router plunged and came back up in all situations.

I also spent time doing basic router tasks like changing bits, adjusting bit height, and adjusting the height of the turret stops. If any of these tasks are a pain, you will quickly tire of using the router.

The routers' edge guides and guide-

bushing systems also got a close look. A problem with either one causes frustration and costs time, money, and material. I also evaluated each router's dust collection, because without effective dust collection, a router is a messy tool. As it turned out, dust collection is a problem for all of the routers except the Festool.

Considering all of these factors, one router stood out: the Festool OF2200. It's my choice for best overall. Ergonomically, it was the most comfortable router to use. Dust collection is excellent. The guide fence is the best of the bunch, with a great micro-adjustment knob. On the downside, the Festool's scale is metric only. I don't mind that, but I know others will.

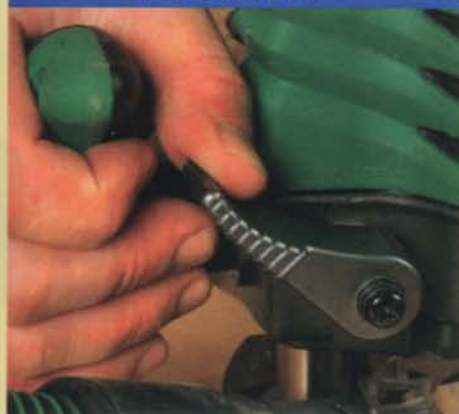
However, the Festool OF2200 isn't for everyone. The router costs \$800. Add the

accessory kit that includes the edge guide and guide-bushing system, and you're up to \$1,100. That led me to think about which router I would pick if I excluded the Festool from consideration. Again, the choice was obvious. The strangely futuristic-looking Hitachi M12V2 is a great router. It handles well, plunges smoothly, and has simple micro and macro height adjustments. Its edge guide (included) is very good, and the router comes with a proprietary guide bushing (none of the other routers come with a bushing) and an adapter for Porter-Cable-style bushings. I have only one gripe about the Hitachi. Its dust collection doesn't work.

Gregory Paolini is a professional woodworker in Waynesville, N.C.

PRECISION PLUNGES ARE THE SUM OF MANY PARTS

LOCK LEVERS



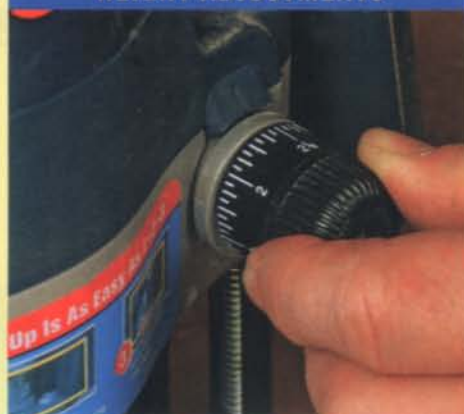
Levers control plunge on most routers. The best ones, like on the Hitachi, can be reached without letting go of the handle, and require little force.

PLUNGE STOPS

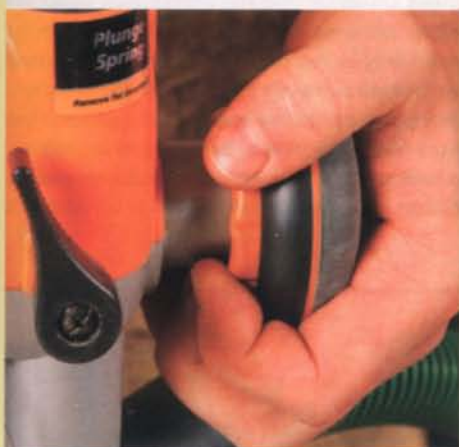


Adjustable plunge stops are more versatile than preset ones. They give precise control over how much material is removed on each pass. All but the Bosch have them.

HEIGHT ADJUSTMENTS



Height adjustments are easy on the Bosch. Loosen the lock and twist the knob. The depth rod raises and lowers on a rack-and-pinion gear.



Triton offers a second way to plunge. Pull in the orange lock collar and twist the handle to lower the body on a rack-and-pinion gear. It's a nice way to get precise plunge control.



Bosch's turret has preset stops. There is $\frac{1}{8}$ -in. difference between the six stops. This saves setup time, but can be a bother if your plunge depth isn't a multiple of $\frac{1}{8}$ in.



Festool offers very fine micro-adjustments. The numbered and audible detents on the knob are separated by 0.1 mm.

EDGE GUIDES SHOULD HAVE FINE ADJUSTMENT

Better than a bump with your hand. All but the Triton offer micro-adjusters. After rough setting the guide and taking a test cut, you can dial in the perfect distance.



Festool's micro-adjust knob is even better. The fence is captured on the screw so that it moves both in and out with adjustments, and the knob is graduated.

Heavy-duty plunge routers



Festool OF2200

festoolusa.com

Street price: \$800

Weight: 17 lb. 4 oz.

The excellent angled grips on this router ensure that your wrists remain straight, which leads to greater control. The dust collection is far and away the best of the bunch. It left just a few chips in the mortises I routed, and it was flawless when routing edge profiles. The Festool also has the smoothest plunge, the best plunge lock, and easy micro and macro height adjustments. The edge guide is superb and the ratcheting spindle lock works very well. Finally, it was one of only two routers that have an automatic spindle brake, a nice extra when you have a lot of stopping and starting to do. On the down side, the drop-down dust shroud can make it hard to see the bit on deeper plunges. Also, the accessory kit that contains the edge guide and guide bushing system adds \$300 to an already lofty price.

AUTHOR'S
CHOICE
BEST OVERALL



Hitachi M12V2

hitachipowertools.com

Street price: \$225

Weight: 15 lb. 4 oz.

This router plunges smoothly and handles very well. A good edge guide, a proprietary guide bushing, and an adapter for PC bushings are standard, which is great given its cost. Adjustments to plunge depth settings are easy, and switching between macro and micro adjustments is simple. You need only flip a well-placed lever. The plunge scale is easy to read. A dial to adjust the motor's speed is embedded in the right handle, right where your thumb can make quick adjustments. On the down side, the router's dust collection is ineffective (as it is on most of the other routers). The spindle lock worked fine, but the wrench is stamped from thin steel and uncomfortable to use.

AUTHOR'S
CHOICE
BEST VALUE

Bosch 1619EVS

boschtools.com

Street price: \$310

Weight: 13 lb. 4 oz.

At first, this router was uncomfortable, as the plunge-locking lever dug into my wrist. But after repositioning the lever, which required removing it first, I found it comfortable. All of the control buttons and knobs are well-placed and intuitive to use. The router handles very well and plunges smoothly, and the plunge lock works great, holding heights without budging. The \$40 accessory edge guide is second only to the Festool's. Bosch's proprietary bushings work fine. A baseplate adapter is supplied with the router, but the bushings are not. The spindle lock worked well and bit changes were easy. A nice drop-forged wrench is supplied with the router. The dust-collection attachment works well, but makes bit changes difficult.



Makita RP2301FC

makita.com

Street price: \$350

Weight: 13 lb. 12 oz.

With lights in its base, this router had great overall visibility and sight lines. I also appreciated the very aggressive spindle brake, as it minimized the time wasted between mortises. The plunge lock worked well, and the depth rod and turret system were easy to adjust. However, the plunge mechanism was weak, and I occasionally had to help the router back up. The power switch was a nuisance, too. To turn the router on, you must first depress a lockout switch meant to prevent accidental starts. If you don't immediately release the safety switch, the router is locked on and turning it off can be a nuisance.



DeWalt DW625

dewalt.com

Street price: \$303

Weight: 13 lb. 6 oz.

With good balance and ergonomics, this router handled well. I especially liked its slick phenolic baseplate, which made it easy to steer the router for edge profiling. It plunges smoothly, and the locking lever works easily and holds the height tightly.

The stops on the turret are simple to adjust to allow for variable plunge steps. Adjustments to the plunge depth, both macro and micro, are easy. Bit changes presented no problems, as the spindle lock worked and the wrench was beefy and drop-forged. The dust collection worked very well when I was mortising, but not so well while I was edge profiling. Unfortunately, the edge guide was disappointing, as its fence casting wasn't straight. And visibility became an issue on deep plunge cuts.



Freud FT3000VCE

freudtools.com

Street price: \$350

Weight: 13 lb. 6 oz.

Plunges on this router are smooth and the plunge-lock mechanism works very well. A large power trigger mounted on the right handle is easy to work with two fingers. I had no trouble seeing the bit during use. On the negative side, even though macro and micro plunge depth adjustments were easy, the depth indicator could not be zeroed. That means you must pick a random measurement to use instead and do the math to figure out how much you've plunged. The opening on the dust shroud is small and interferes with any profiling bit that has a moderate diameter. I could not raise most bits high enough to stand the router on its base. Also, the edge guide interferes with the baseplate, making it difficult to adjust.



Porter-Cable 7539

deltaportercable.com

Street price: \$377

Weight: 17 lb. 4 oz.

All of the adjustments are easy to make on this router. Motor speed is changed with a slider on top of the motor. It has a trigger switch on the handle, and the turret system is easy to zero and adjust. The baseplate opening is sized for Porter-Cable guide bushings, which is nice. However, it also means that you have to replace the baseplate to use profile bits with a diameter larger than the opening. The optional edge guide is sturdy, but the weight of the long aluminum extrusion sometimes pulled the router off plumb. The optional dust-collection baseplate works well, but we had trouble finding one to buy. There is no spindle lock.



Triton TRA001

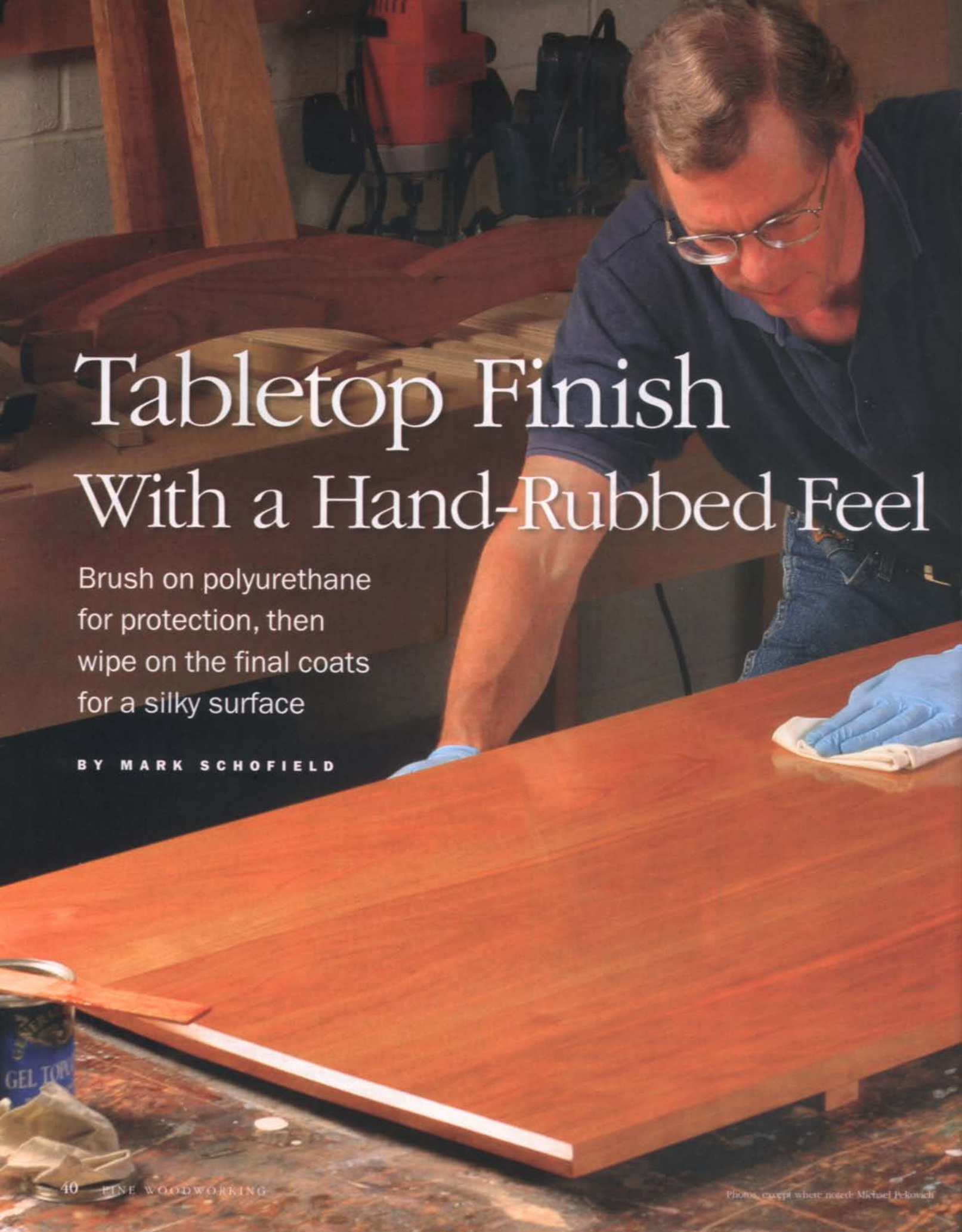
tritontools.com

Street price: \$270

Weight: 13 lb. 14 oz.

Although this router has a standard plunge lever, you can also rotate one of the handles to raise and lower the body with a rack and pinion. The more I used it, the more I liked that option. The round handles are very comfortable. And bit changes were the easiest by far on this router, because the spindle is self-locking. The dust-collection setup looks impressive, but it is overpowered by the motor cooling fan, which sends dust and chips all over. The edge guide is actually an alternate baseplate, which is unique, but it did not glide easily over wood. Also, this is a top-heavy router, which made mortising tricky.



A man with glasses and a blue shirt is working in a workshop. He is wearing blue gloves and using a white cloth to rub a finish onto a large, smooth wooden tabletop. The workshop background shows various tools and wood pieces. The title text is overlaid on the left side of the image.

Tabletop Finish With a Hand-Rubbed Feel

Brush on polyurethane
for protection, then
wipe on the final coats
for a silky surface

BY MARK SCHOFIELD



After my article "One Editor's Foolproof Finish" appeared in *FWW* #196, several readers asked whether the wipe-on finish I described would be suitable for kitchen cabinets or dining tables. I replied that while you could build up the extra protection these surfaces need by wiping on many more coats of the gel polyurethane, it would be far quicker to brush on several coats of liquid polyurethane and then switch to the wipe-on gel for the final few coats. In this way, you get the rapid build of a brushed finish, without any brush marks or dust nibs in the final surface.

This approach to a durable yet smooth finish is so foolproof, we decided to share it with all of our readers in this step-by-

step article. By the way, because it starts with a quick washcoat of shellac, it is also a great finish for pieces made from blotch-prone woods, such as this cherry dining table by Gary Rogowski (see "The Versatile Trestle Table," pp. 28-33). The table also demonstrates how this finish can be used in tandem with my original wipe-on-only Foolproof Finish: I used the durable finish on the tabletop, where food and liquids will be a hazard, and on the feet, which are likely to be rubbed by shoes. But I used the simpler finish on the rest of the piece.

Sand carefully, then seal

Although this won't be a high-gloss finish that magnifies every ripple or void in the

START WITH A COAT OF SHELLAC

A thin washcoat of shellac reduces blotching. Use pre-mixed shellac or dissolve some flakes in denatured alcohol, but avoid waxy shellac, which will prevent the subsequent coat of polyurethane from adhering.



Wipe on a thin coat.

Make a couple of passes to seal the wood with shellac. Whether you use a French-polishing-style pad or folded-up cotton cloth, adding the shellac with a squeeze bottle is quick and controllable.

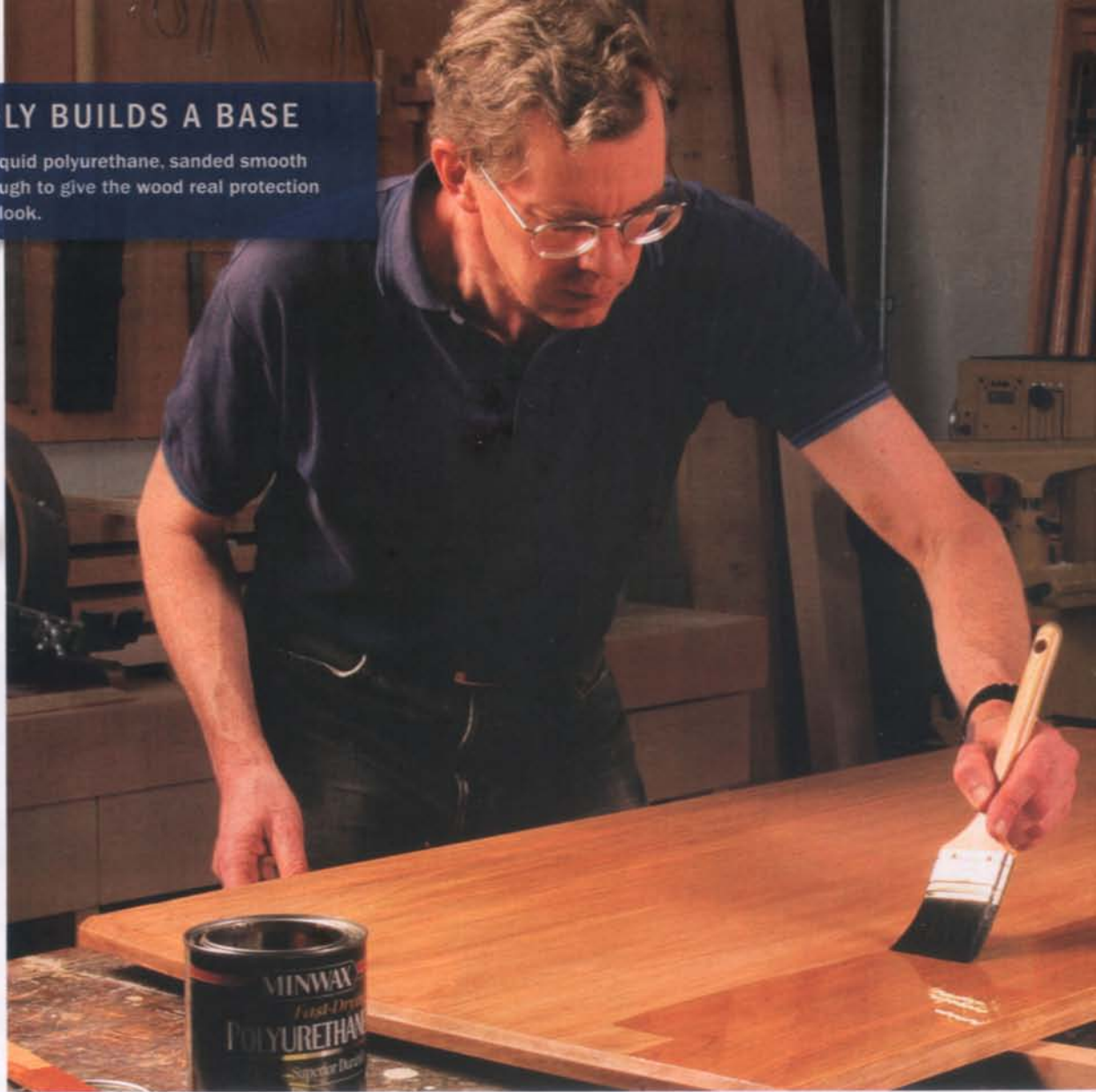


BRUSHED POLY BUILDS A BASE

Three or four coats of liquid polyurethane, sanded smooth between coats, are enough to give the wood real protection without a thick, plastic look.



A light touch. Lay on a coat of polyurethane starting a few inches from one edge and brushing off the opposite edge. Use a light touch, holding the brush at about 45° to the surface. After the first pass, land the brush just inside the far end and return, smoothing the strip of wet finish until you cover the small dry area and go lightly off the end. By brushing off the ends and not onto them, you avoid having finish run down the edges.



surface, we're still dealing with an eye-catching large, flat surface, so good preparation is essential.

To learn how to flatten and smooth a tabletop using handplanes and a scraper, see Bob Van Dyke's Fundamentals: "Creating an attractive tabletop" in *FWW* #210. If you are more comfortable with a random-orbit sander, start at P100 grit and work your way up to P220 grit, then hand-sand with the grain using the final grit. Remove the dust using a vacuum or compressed air to clean out the pores.

The next step is to apply a thin coat of shellac to the whole piece. As well as greatly reducing the likelihood of blotching, the shellac gives the wood a slightly warmer tone and lets you build a sheen faster with the gel finish. You may have heard that polyurethane will not adhere

to shellac. This is true if you use shellac containing wax, such as Zinsser's clear or amber Bulls Eye Shellac. Polyurethane will adhere perfectly to dewaxed shellac such as Zinsser's SealCoat or your own mixture using dewaxed shellac flakes.

Mix a 1-lb. to 1½-lb. cut (dilute the SealCoat by about a third with denatured alcohol). You can apply the shellac with a natural or synthetic filament brush, but I find it just as quick (and easier on vertical surfaces) to wipe on the shellac with a cotton cloth. It also requires less sanding afterward.

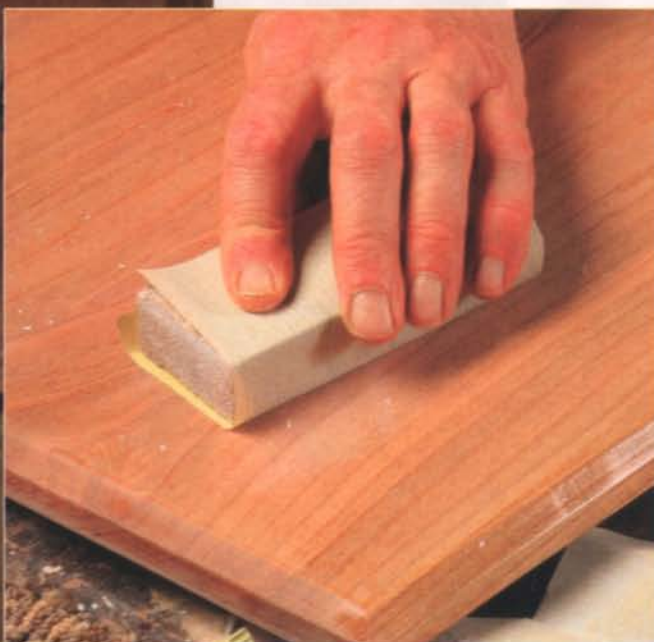
Let the shellac dry for two to four hours depending on the temperature and the humidity, and then lightly sand the surface with P320-grit paper wrapped around a cork or cork-faced block. All you are doing is removing any particles, dust nibs, etc. to

leave a smooth surface. Wipe and vacuum away the dust.

Brush polyurethane to add toughness

Because you won't be brushing on the final coats, you don't need a really expensive brush that leaves a perfect surface. A \$10 to \$20 natural-bristle brush, 2 in. or 2½ in. wide, works fine for most surfaces. If you have no experience brushing finishes, or if your attempts have been below par, this is a painless way to build your brushing skills and confidence.

You can use any brand of oil-based gloss polyurethane, even those recommended for floors, but the viscosity between different brands varies greatly. The Minwax Fast-Drying Polyurethane I used is about the consistency of 1% or 2% milk and can be used straight from the can. If your finish



How to sand efficiently. Fine P320-grit sandpaper has a short life span, so move to a fresh piece as soon as it stops cutting. A quick way to unclog the sandpaper is to wipe it on a remnant of carpet. Stiff and coarse weaves work best. Don't try to sand out every small depression in the surface.



Layers of protection. The subsequent coats of polyurethane are applied in the same way. Moving the brush slowly (above left) minimizes bubbles in the finish. You are not looking for a perfectly flat surface, but high points and depressions should be well covered with finish (below left).

is closer to heavy cream, then thin it with mineral spirits.

You need to apply a roughly equal thickness of finish to both sides of the top to prevent uneven moisture changes, which cause cupping and warping. Start with the underside of the table, a good place to practice your brushing technique where the appearance is less important. Brush on three coats. You don't need to sand between coats as long as you apply the next coat within 24 hours.

As soon as the underside is finished, start on the top. Let the first coat cure overnight, then sand the surface with P320-grit paper. Use stearted paper, which is designed to resist becoming clogged with finish. Most sandpaper is stearted (it has a slightly white, opaque look) but avoid garnet paper designed for bare



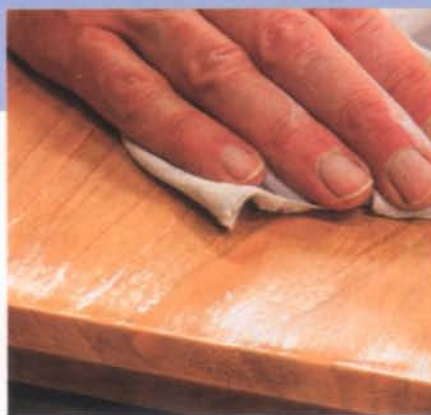
WIPE ON A FEW TOPCOATS

Thin coats of quick-drying, wipe-on gel poly give the top surface a medium sheen devoid of dust nibs and brush marks.

SANDPAPER AND STEEL WOOL SMOOTH THE TRANSITION

Final sanding.

Use P400-grit sandpaper to smooth the final coat of brushed-on poly. Don't try to sand down to a perfectly flat surface. To dull the small, shiny depressions and leave the surface with an even sheen, rub the surface with good-quality 0000 steel wool.



wood. Even stearated paper clogs fairly quickly, so follow finishing expert Jeff Jewitt's advice and wipe the paper frequently on a carpet remnant.

Don't overuse the sandpaper. It is meant to be disposable, and you'll get much better results if you switch to a new piece as soon as the paper no longer feels rough or becomes clogged almost instantly.

When the whole surface feels smooth to the touch, including the edges, remove the dust with a vacuum. You should apply a minimum of three coats. Sand intermediate coats with P320-grit paper, but sand the last one with P400-grit.

Unlike a high-gloss, rubbed-out finish, you don't need to make the surface dead-flat before applying the satin gel poly, so don't try to sand away all the small, shiny depressions. However, the shininess will show

through, so after sanding rub the surface with the grain using Liberon 0000 steel wool to dull these spots and to give the whole surface an even scratch pattern. Use raking light to check your progress. It is worth ordering the Liberon steel wool (highland-hardware.com) because it lasts longer, produces better results, and sheds less than the product found in hardware stores.

Gel poly removes topcoat terror

After you carefully vacuum away all the remnants of steel wool, the surface should look pretty good—smooth, with a fairly even sheen. Normally, you would brush on the final coat of polyurethane and leave it, risking dust nibs and brush marks. With my approach, you'll top off the surface by wiping on and buffing off several coats of gel finish. These super-thin coats dry so

quickly, dust doesn't have time to settle on them. Again, the brand doesn't matter: I've had good results with Bartley's Gel Varnish, Petri's Gel Poly Finish, and the one I'm using here, General Finishes' Gel Topcoat. They are all satin polyurethane turned into a gel.

Take a piece of cotton cloth about 4 in. square and dab some gel varnish onto it with a small stick. Wipe the gel onto the surface in a circular motion. Don't try to cover more than 2 or 3 sq. ft. before immediately coming back with a larger piece of clean cotton cloth and buffing the surface in quick strokes with the grain. If you wait too long and the surface becomes sticky, wipe on a little more gel to reactivate the finish and then immediately buff the surface. What you are doing is obscuring the fine scratches left by the steel wool.



However, you are applying an extremely thin coat of finish, so be prepared to apply at least three coats. The directions on the can will probably say to wait overnight between coats, but in warm, dry conditions, eight hours is plenty.

For the areas of the table that don't need the extra protection of the brushed-on polyurethane, just wipe on the gel finish as described above. Four or five coats should be sufficient to get a sheen that matches the brushed areas.

Adding a coat of wax is optional. On pieces likely to be handled regularly, I use it as much for the feel as any extra protection. But on a dining table likely to be wiped frequently with a damp cloth, wax is a waste of time. □

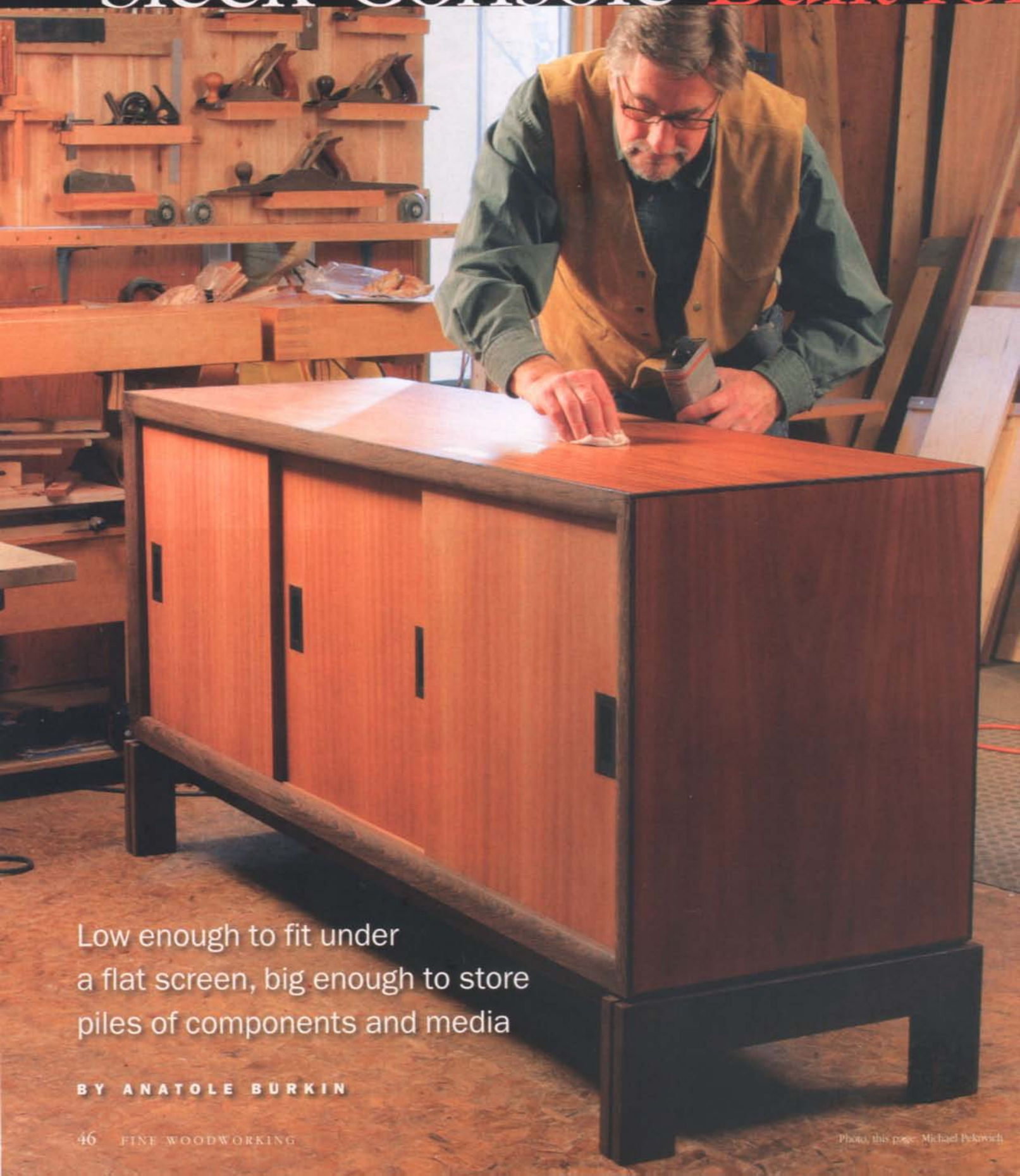
Mark Schofield is the managing editor.



Tips for gel poly. Use a stirring stick to place some of the thick finish on a small piece of cotton cloth (above left). Dipping the cloth is too messy. Apply the gel in a circular motion until you've covered a few square feet in an even layer (below left). Buff off the surplus finish right away using quick, firm strokes and turning frequently to a fresh section of cotton cloth. Repeat until the whole tabletop is done. Look at how happy you'll be with your flawless finish (bottom).



Sleek Console Built for



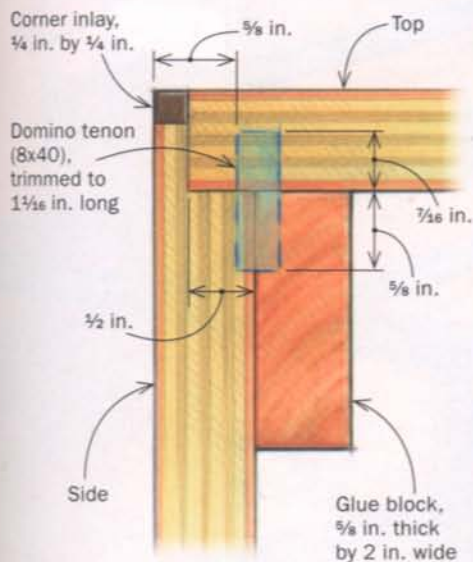
Low enough to fit under
a flat screen, big enough to store
piles of components and media

BY ANATOLE BURKIN

Today's TVs

■ SUPER-STRONG CORNER JOINT FOR PLYWOOD

DETAIL OF CASE CORNERS



Glue blocks beef up the corners. The glue blocks, attached to the top and bottom of each side, increase strength against racking.



More tenons, more strength. Festool's Domino creates rows of slip-tenon joints in minutes. In the sides, Burkin moved the mortises partway into the glue blocks to accommodate the rabbet that follows.

I was the last man on my block, maybe in the entire country, to buy a wide-screen digital television. Like many people, I used to hide my television in an entertainment armoire, but the latest flat-screen televisions have a modern look that I find attractive. Also, it takes a pretty huge cabinet to contain them. So instead of hiding the TV, I hung it on the wall and decided to build a sleek entertainment credenza to go under it.

Made of 3/4-in.-thick sapele plywood and solid sapele and wenge, the piece fits into the modernist style—with its clean, crisp lines, no exposed joinery, no frame-and-panel doors, just long expanses of beautiful sapele grain framed by darker wenge.

Style, however, does not trump function. This credenza offers plenty of storage. Inside are three compartments hidden by three sliding doors. The center section holds the electronics: DVD player, receiver, cable box, and a laptop. The outer sections have banks of drawers to store CDs, DVDs, and other accessories, like headphones and cables. If you don't own a lot of CDs and DVDs, you could easily eliminate the drawers and use that space to hold game consoles or other electronic



Use a dado set to rabbet the sides. Bury the blade in a sacrificial fence to dial in the width. Place an offcut from the glue-block stock under the workpiece to stabilize it.



Trim the top. After cutting the mortises in the top and bottom, trim those parts to fit inside the rabbets in the sides.

MODERN CREDENZA, MODERN CONSTRUCTION

The joinery for this modern entertainment credenza was assembled using a modern tool: Festool's Domino machine. But you can easily adapt the design for router-cut mortises and make your own slip tenons.

Tenons, $\frac{3}{4}$ in. thick by $\frac{3}{4}$ in. wide by $1\frac{1}{2}$ in. long (8x40 Dominos, trimmed)

Rails, $\frac{3}{4}$ in. thick by 3 in. wide by 65 $\frac{1}{2}$ in. long

Partitions, $\frac{3}{4}$ in. thick by 17 $\frac{3}{4}$ in. wide by 22 $\frac{1}{2}$ in. tall (including $\frac{1}{4}$ -in.-thick sapele edging)

Wenge corner inlay, $\frac{1}{4}$ in. by $\frac{1}{4}$ in.

Stiles, $\frac{3}{4}$ in. thick by 3 in. wide by 17 $\frac{1}{2}$ in. long

Sides, $\frac{3}{4}$ in. thick by 21 in. wide by 24 in. tall (including inlay)

Four slip tenons per leg (8x40 Dominos)

Felt pad

Domino tenons, 8x40 ($\frac{3}{4}$ in. by $\frac{3}{4}$ in. by $1\frac{1}{2}$ in.)

Plywood panels, $\frac{1}{4}$ in. thick by 17 $\frac{1}{2}$ in. wide by 18 in. tall

Center panels, 8 $\frac{3}{4}$ in. wide

Doors, $\frac{3}{4}$ in. thick by 21 $\frac{1}{4}$ in. wide by 21 in. tall

Attach the base to the case with $\frac{3}{4}$ -in. bolts and washers.

Lower track, $\frac{3}{4}$ in. thick by 1 $\frac{3}{4}$ in. wide

Top and bottom are $\frac{3}{4}$ in. thick by 21 in. wide by 65 $\frac{1}{2}$ in. long, including inlay in rear

Rabbet, $\frac{3}{4}$ in. wide by $\frac{1}{2}$ in. deep

Face frame, $\frac{3}{4}$ in. thick by 1 $\frac{1}{2}$ in. wide

Sapele edging, $\frac{1}{4}$ in. thick

Runners, centered in door, $\frac{7}{32}$ in. thick

Inner cross stretchers, $\frac{3}{4}$ in. thick by 2 $\frac{1}{2}$ in. wide by 13 in. long

Slip tenons in base are all 8x40 Dominos.

*Shelves (not shown), $\frac{3}{4}$ in. thick by 17 $\frac{1}{2}$ in. wide by 21 $\frac{1}{4}$ in. long

Outer cross stretchers, 2 in. wide

Stretchers, $\frac{3}{4}$ in. thick by 3 in. wide by 62 $\frac{3}{4}$ in. long

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



VIDEO WORKSHOP

Watch Burkin build this cabinet from start to finish in a members-only video at FineWoodworking.com/extras.

gear or even change the overall dimensions. The design is quite versatile.

Start with the carcass joinery

Rough-cut the plywood to manageable pieces using a circular saw and an edge guide. Make the final cuts using the table-saw and a sled. You'll need to cut the top and bottom $\frac{1}{2}$ in. longer than shown in the drawing. I did this to make the joinery simpler to cut. These two pieces will be trimmed $\frac{1}{4}$ in. on each end after cutting the mortises. Use a block plane to clean up any sawmarks on the edges.

Next, use a dado set to rabbet the back of all four carcass parts. Glue blocks on the inside corners strengthen the case and provide a stable platform when routing the mortises in the sides. Mill up the blocks and glue them flush to the top and bottom edges, and $\frac{1}{2}$ -in. back from the front edge to allow for the face frame.

Cut mortises for the

slip tenons—A fence-equipped

router works fine to cut the mortises for this project, but I splurged last year and bought a Festool Domino joiner (to get the lowdown on this machine, see Tools & Materials in *FWW* #190), which makes really fast work of mortise-and-tenon joinery. The tool cuts a deep mortise in one plunge, like a biscuit joiner. I used the Domino's medium-thickness bit and

Upper track, $\frac{1}{2}$ in. thick

Groove for runner stops $\frac{1}{2}$ in. from edges.

Door pulls, Bauerware L08-31-BRZ 102 x 51 mm, bronze plated (center door has two)

Filler strips around drawer pocket, $\frac{3}{8}$ in. by 1 in.

Blocking for slides allows drawers to clear face frame on sides of case.

Vertical filler strip is notched to fit over glue blocks.

Edge banding, $\frac{1}{4}$ in. thick

Drawer front and back, $\frac{1}{2}$ in. thick by $17\frac{1}{8}$ in. long

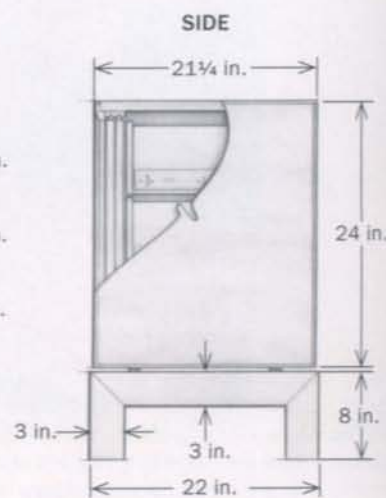
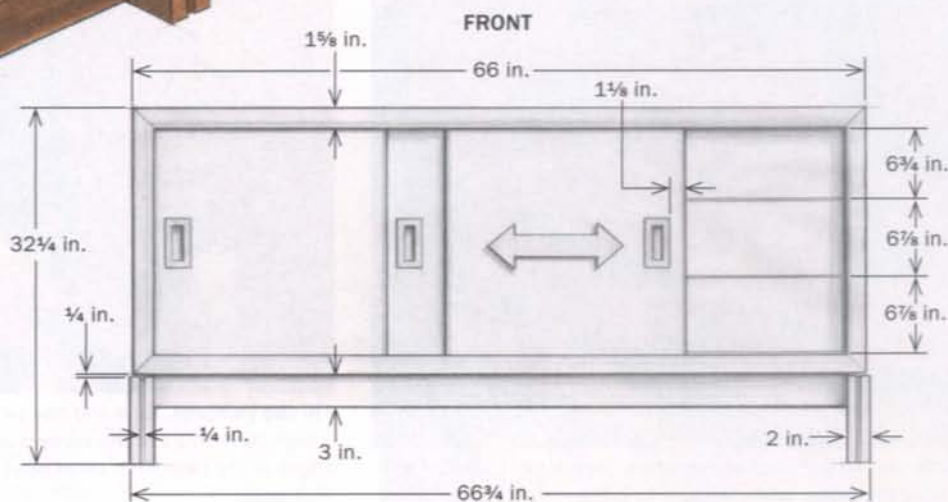
Drawer slides, Accuride 3832 TR, 16 in.

Glue blocks are set back $\frac{1}{2}$ in. from front of case.

Drawer side, $\frac{1}{2}$ in. thick by 16 in. long

Drawer bottom, $\frac{1}{4}$ -in.-thick plywood

False drawer front, $\frac{5}{8}$ in. thick by $19\frac{1}{8}$ in. long



Case assembly

Before clamping the entire case together, glue the tenons into the sides and partitions. Then dry-fit the case to get the parts to mate perfectly.

■ GLUE UP THE CASE, THEN ADD THE CORNER TRIM

Cut the partition joinery. To align the mortises in the top and bottom, use a spacer board to guide the Domino joiner. Reference the spacer board off the side, which should be dry-fitted in place.



tenons, set to cut as deeply as possible into the sides, but just shy of blowing through the top and bottom panels.

No matter what tool you use, mark out the joinery using a story stick. Once that's done, go ahead and start cutting mortises. Use the outside faces of the carcass components as reference points for the fence of your router or Domino.

I put 1/4-in. wenge inlay in each corner of this plywood case, which not only adds a nice contrast but also offers a more durable edge. The rabbet joints are designed to leave a pocket for this inlay.

Rabbet the top and bottom of the sides using a dado set, sneaking up on a good fit. You will have removed some of the mortise depth, hence the deep initial cuts. Next, trim 1/4 in. off each end of the top and bottom to accommodate the rabbets.

Finally, cut the partitions to size and drill the shelf-pin holes in them for the adjustable shelves. Add the solid-wood edging on the front, and cut the mortises in the



Get the glue on. Begin by gluing the slip tenons to the vertical members. Then apply glue to the mortises of the top and bottom. Clamp along the edges and use cauls to bring home the partitions.



Fill the rabbets. Glue and nail (or tape) the wenge inlay strips to the corners and back edges of the case. Trim them flush after the glue dries.

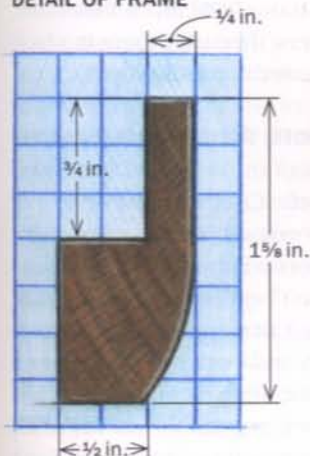
■ MAKE AND INSTALL THE BACK



Glued-in panels create a rigid assembly. A sturdy back helps strengthen the case against racking. The two outer panels are glued into their grooves; the two center panels (not shown) are removable. The frame is connected with slip tenons and screwed into the cabinet.

■ MITERED WENGE FRAME FOR THE FRONT

DETAIL OF FRAME



Roundover on the router table. Rout the profile on the stock before cutting the miters. Fair the shape with handplanes, scrapers, and sandpaper.



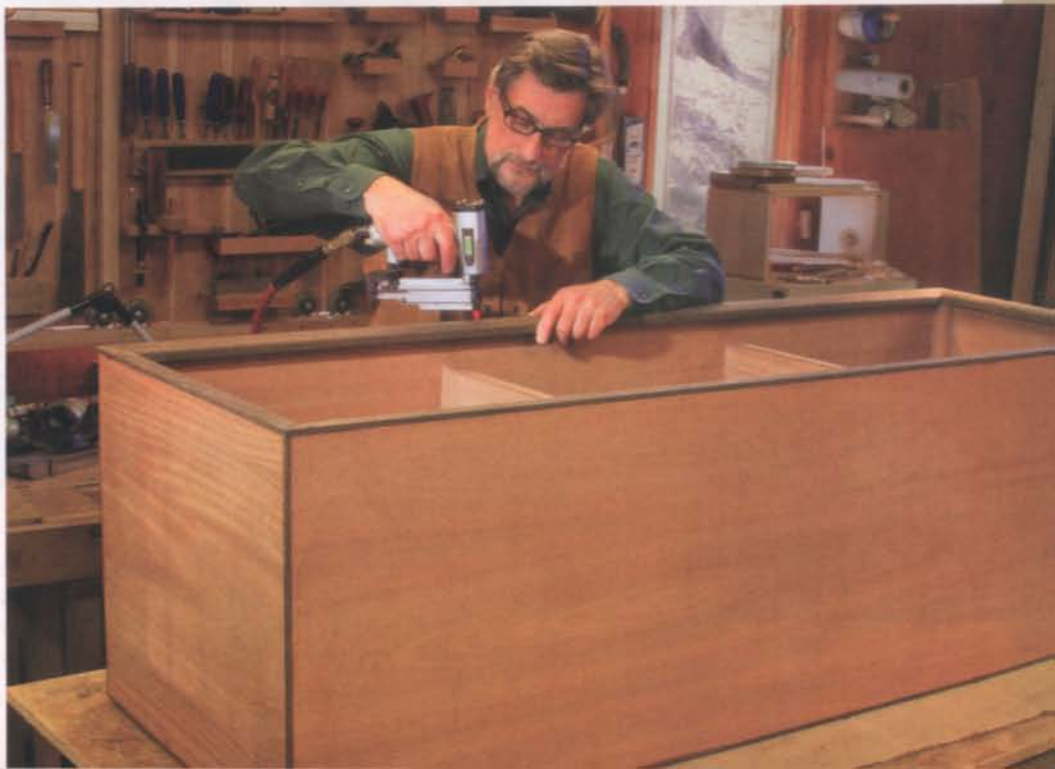
Sled makes better miters. After rabbeting the back of the stock, cut the miters using a sled. Place a scrap piece in the rabbet to support the workpiece (above). Glue the frame to the front. Rather than fussing with clamps, Burkin used pins to hold the pieces in place (below). Pieces are cut, fit, and nailed one at a time.

partitions and the top and bottom for the slip tenons.

Dry-fit and glue up the case

When it comes to gluing up the case, a dry run is critical. It gives you a chance to rehearse the steps, check the joints, and be sure you have enough clamps at the ready. Because the rabbets effectively reduce the depth of the mortises on the sides, stock Domino tenons have to be trimmed.

Glue the tenons into the sides and partitions, then fit them to the top and bottom. Assemble the case, making sure to check for square. For the inlay along the top, bottom, and back, mill up strips of wenge just a hair over 1/4 in. square and glue them in; I used a pin nailer instead of clamps to



Smooth sliding doors

DOOR AND TRACK DETAIL

Upper track, ½ in. thick by 1¾ in. wide

Splines project ⅜ in.

Slots, ⅞ in. wide by ½ in. deep

Sapele edging, ¼ in. thick, protects plywood and improves sliding action.

Splines project ⅜ in.

Lower track, ¾ in. thick by 1¾ in. wide



Make tracks. The top track is thinner than the lower track. After cutting the grooves on the tablesaw, screw the tracks inside the case.



Install the runners. Rout stopped grooves in the top and bottom of the doors. Dry-fit the runners, then check the fit and action of the doors. You may have to adjust the height of the runners to get them to fit nicely. Once that's done, glue them in.

hold the pieces in place. The pins are set deep enough to be out of the way later when I planed the inlay flush.

Add the back—The back assembly is a solid-wood sapele frame with ¼-in.-thick sapele-faced MDF (or plywood) panels. The end panels are fixed; the center panels are removable for easy access to wiring.

Plane the frame assembly to fit the carcass, then screw it in place. I didn't glue the frame, figuring that in a few years I might want to change the inside of the case due to technology updates.

Attach the front face frame—A solid wenge face frame decorates the front of the case. The frame is mitered and rabbeted to fit over the plywood. I also shaped the front face with a massive roundover bit (2⅞ in., Freud No. 99-027) to soften the look of this otherwise squarish credenza.

Mill up the frame pieces, rabbet them, miter the corners, then glue them in place. Again, a pin nailer comes in handy.

Tackle the doors, drawers, and shelves

The sliding doors are ¾-in. plywood edged with solid sapele. Cut the plywood to size and apply the edging. The corners of the doors will be mostly hidden, so don't bother mitering the edging. Cut stopped grooves in the top and bottom edges using a slot-cutting bit in a router table. Insert runners or guides of resawn solid sapele, but don't glue them yet.

Make the tracks from solid stock. Note that the top track is thinner than the lower track. Cut the grooves on the table-saw, making them a hair wider than the guides for smooth operation. Screw the tracks in place. The doors are inserted from the front by tipping them into the center bay (without shelves in place), then lifting them to engage the top track first, and dropping them into the lower track. You may have to adjust the height of the splines to get the doors to fit.

There should be a slight gap, ⅛ in. or so, between the front



TIP LIFT AND DROP

The doors are inserted from the front by tipping them into the center bay (without shelves in place). Lift the door to engage the top track first, then drop it into the lower track.

Big case needs a strong base

and rear doors, as well as the face frame. Once you have the doors fitted to your liking, glue the guides into the doors.

I used bronze-finished metal pulls because I like a bit of metal on a modern piece. After excavating the mortises for the pulls, I used epoxy to bond the metal to the wood.

To continue the clean look inside, the drawers have no pulls. Instead, I chose full-extension touch-release slides that pop out the drawer when you push on the front. The slides provide smooth action and full access to the drawer. The drawers are 1/2-in. sapele plywood edged with solid sapele, with solid sapele false fronts. Shelves are 3/4-in.-thick sapele plywood edged with solid wenge on the front.

Solid-wood base can handle the load

The case sits on solid wenge legs joined with stretchers, all laminated for extra thickness (I could find only 4/4 stock locally). The legs are slightly proud of the case on the front, sides, and rear, and the stretchers are inset to give the illusion that the case is floating. To add a shadow line, the center lamination is 1/4 in. narrower than the outside pieces. It is glued flush to one side, and indented 1/4 in. on the show face. Plane and sand the show edge before glue-up, because it won't be easy to do later.

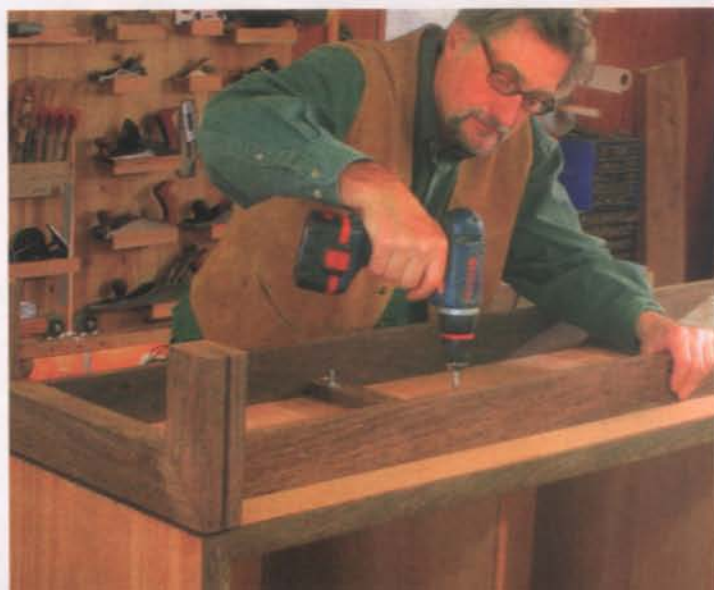
Building the base is straightforward. The corners are mitered and joined with quadruple slip tenons. A pair of stretchers 1/4-in. proud of the top of the legs join the leg assemblies. Four short cross-stretchers provide support and attachment points for the case.

For the finish, a Danish Modern look goes well, nothing too glossy or grain filling. Good choices are wipe-on finishes such as Minwax Poly or Waterlox. Wax the door bottoms and guides for smooth action. □

Anatole Burkin, former editor-in-chief of Fine Woodworking, is the vice president of digital content for The Taunton Press.



Tenons brace the corners. Each miter gets four slip tenons (left). Glue up the mitered feet first (above), then attach them to the stretcher assembly (below).



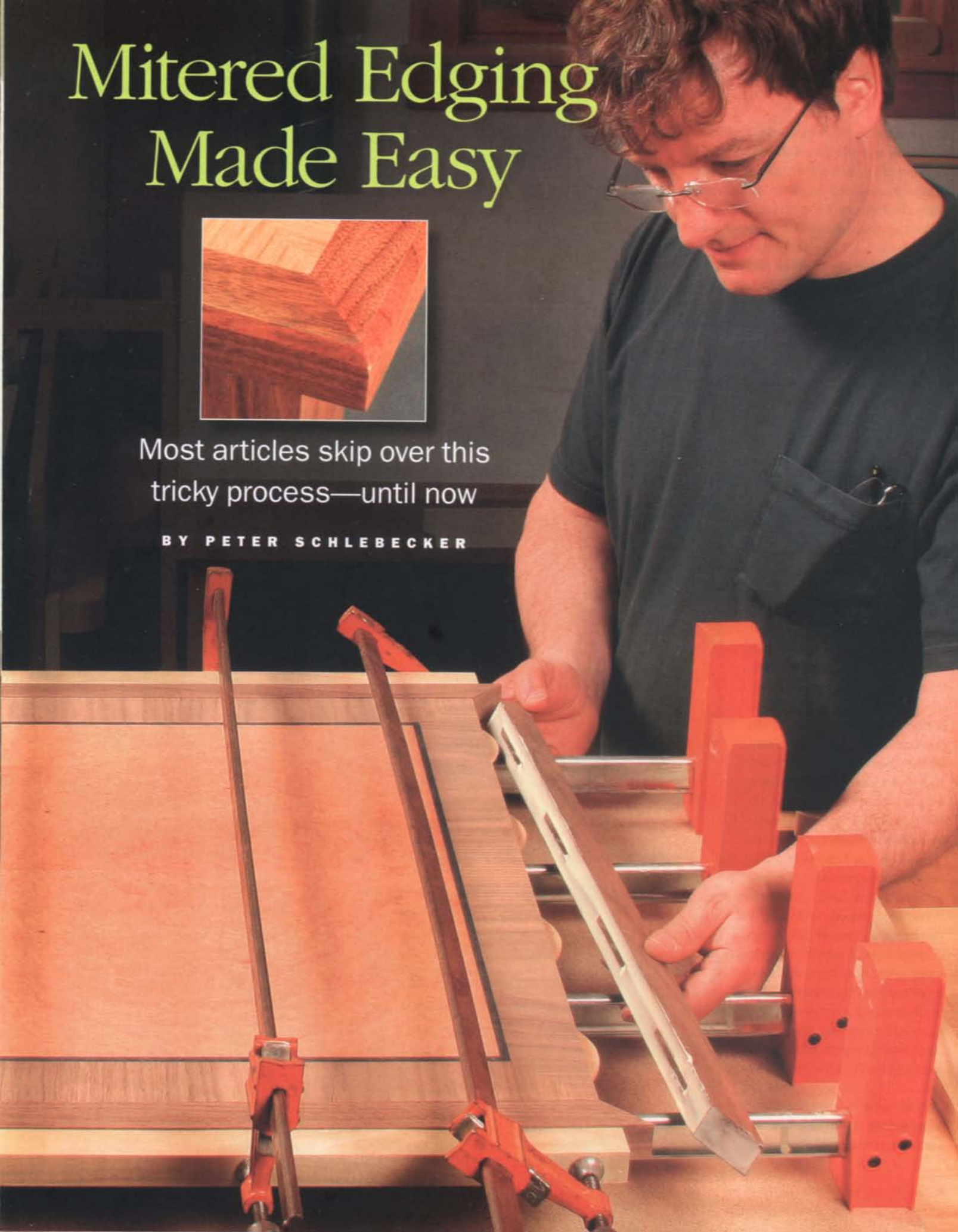
Bolt the base to the case. Drill clearance holes through the base and bottom of the case, then bolt the assembly in place.

Mitered Edging Made Easy



Most articles skip over this tricky process—until now

BY PETER SCHLEBECKER



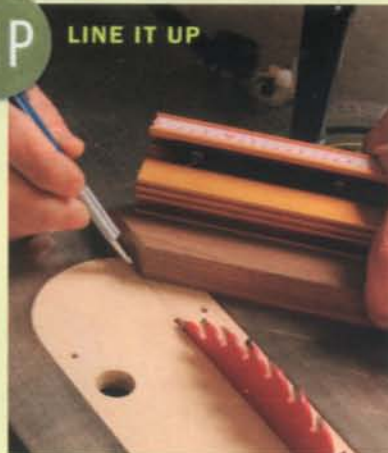
FIT THE FIRST PIECE

On the first piece, you'll cut 45° angles on each end and focus on fitting the length to the panel. But on subsequent pieces, you'll custom-fit each angle to the last one until you reach the final corner.



Start with 45° angles. The first miter cut is the easiest, because you don't have to measure for length. Just cut a 45° angle on one end.

TIP LINE IT UP



After you make your first cut, but before you move the workpiece, pull back the miter gauge and use the end of the piece to mark a line on the throat plate. Use this mark to align workpieces perfectly for subsequent cuts.

When I teach veneering at the Center for Furniture Craftsmanship, students often need to apply a solid edge with miters to the beautifully veneered panel that they have just worked hard to make. Sometimes the panel is not perfectly square, so getting those miters to close up perfectly on all of the corners requires some attention. Here is a step-by-step procedure that will work every time. This method also can be used to edge plywood, make frames, and apply moldings. And it works for angles other than 90°, as in hexagons and octagons.

The secret lies in perfecting one joint at a time as you work your way around the piece. The quick "tacking" nature of yellow glue and its ability to temporarily "swim" or shift helps in this process. I prefer Titebond Original or Elmer's Wood Glue. You can lightly clamp a piece, fine-tune its location, and then lock down the clamps. By the time the next piece has been cut to fit, the clamps can be temporarily removed to accommodate the next glue-up.

I'll walk you through the process for a square or rectangle, where the angles are 45°. If you are working on a hexagon or octagon, you'll have to adjust the miter angles (60° for a hexagon and 67.5° for an octagon). Always use edge stock that is 1/16 in. thicker than the panel. This way, you don't have to worry about attaching



Position and mark for the second cut. Hold the edging in place, eyeballing and feeling that the mitered corner lines up perfectly (left). Strike a pencil line on the edging (below) where the second corner ends. Then trim away the other end at 45° until both ends line up.



ATTACH THE FIRST PIECE

Use biscuits so you only have to worry about alignment in one direction.



Two tips for biscuiting. A $\frac{1}{32}$ -in. shim taped to the base of the biscuit joiner compensates for the edging being thicker than the tabletop (left). Schlebecker made a quick jig to hold the narrow edging in place while he cut biscuit slots (right).



Glue allows time for adjustment. With the biscuits in place, you only have to worry about aligning the edging horizontally and not vertically. Before the glue sets completely, you can slide the edging back and forth until the miters line up exactly with the corners of the panel.



Cauls are essential. There should always be cauls at both ends of the clamps. The cauls prevent damage and distribute the pressure evenly over the length of the edging to get a tight joint line with no gaps.



the edging flush on the top and bottom. Apply it slightly proud of both the upper and lower surfaces and trim it flush later.

It looks best if the grain runs right around the corners, so use one long piece of wood and waste as little material as possible between pieces. Once you cut the first piece to size, the remaining piece will already have the correct angle, and it can be tempting to just flip the piece and use it for the next side. Don't give in to that urge, because you will flip the grain and the corners won't match. Fitting one long strip of edging around the piece will give you three matched corners, but the final corner won't match. Put that corner at the back of the piece if you can.

First edge first

I cut the stock for the first edge to fit corner to corner precisely, with 45° angles on both sides (see photos, p. 55). To cut the miters, I use a quality miter gauge on a tablesaw with a zero-clearance fence, but you could use a tablesaw sled, a sliding tablesaw, or even a well-tuned chopsaw.

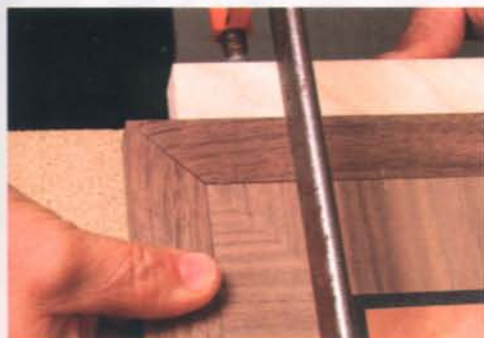
When the corners of the miters line up perfectly with the corners of the panel, glue the edging into place, using biscuits or splines to help with alignment. Clamp pressure should be moderately strong. Begin with light pressure, which allows the edging to "swim" before it tacks. You can adjust the positioning before the full pressure is put on and the glue goes into full



Get rid of squeeze-out right away. Use a slightly damp rag to remove glue so it won't get in the way of fitting the next miter. This also lets you see that the corner of the panel is aligned with the mitered angle.

THE NEXT TWO SIDES

On each of these pieces, leave the stock long, custom-fit one end to the adjacent miter, and cut the other end to true 45°.



Tweak the first end to fit perfectly. Cut the next piece at 45°, and hold it up to the existing miter. If the miter appears open in any way (left), change the angle slightly on the miter gauge (above), and recut the miter until the fit is perfect. Now mark and cut the other end to length.

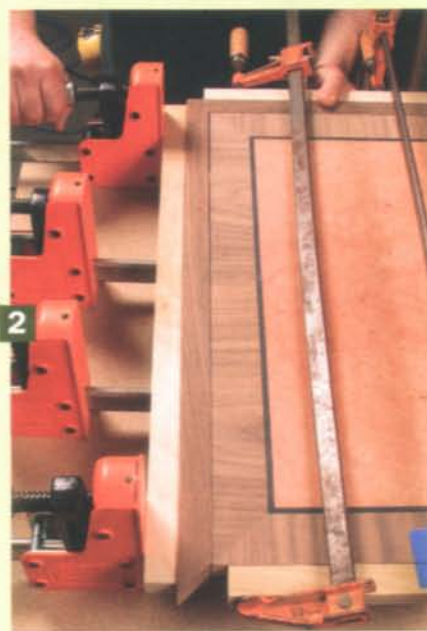
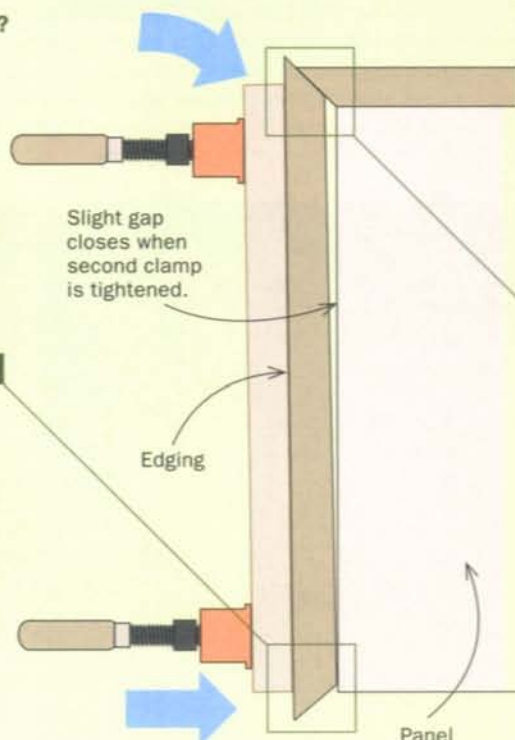


TIP MITER STILL WON'T CLOSE? "SWIM" IT INTO PLACE

After applying glue, position the new half of the miter joint too far along the miter you are matching, then push it down with clamp pressure.



Leave it short at the far end. Leave this end temporarily a little short and apply light clamping pressure to hold it there.



The second clamp pushes the piece into place. Put clamp pressure close to the miter to force it to close evenly. Then sock down the first clamp.

tack, but you have only about a minute. Apply pressure as close to the center of the edge thickness as possible, to avoid gaps at the top or bottom edges.

Fit the next pieces one miter at a time

Cut the next adjacent side piece with a 45° angle, and then hold it up to the existing miter. Keep this piece slightly long. If the miter appears open in any way, take the piece back to the saw, change the angle slightly on the saw fence, and repeat the

process until the miter is perfect. Holding this piece in place, mark the location of the miter on the opposite end and cut it at true 45°. Again, make sure all the corners are precise, sneaking up on it and eyeballing the final fit. This piece can now be biscuited, glued, and clamped in place.

Repeat the process on the third side. You'll have to temporarily remove the clamps that were used for the first piece to inspect and glue the third piece in place. The glue tacks so quickly that this is not an

issue. When the third piece fits well, you can glue it on with the clamps holding the opposite edge in place, too.

Even with the joint cut properly, it is difficult to force the two sides of the miter together. Here's a trick: Slide the edging over toward the miter joint just a little too far during the glue's "swim" period, with light clamping pressure at the opposite end of the edging and none at the miter end. The miter will ramp up the opposing surface a little bit and cause a gap between

THE FINAL SIDE

Because you are matching miters on both ends of this piece while cutting it to perfect length, there is a slightly different approach.



Fine-tune the first angle. Cut a 45° angle on a test piece that is shorter than the side. Match the angle to the existing miter. Then cut one end of the edging.



Mark the length, perfect the angle, and cut the final miter. Holding the edging against the panel with the first miter bumped against its mate, mark the second side for length (above). Moving back to the test piece, find the precise angle for the last mitered corner (right) and then cut that angle on the final piece, leaving it slightly long.



the edging and the panel. Tighten the far clamp a bit, apply a clamp close to the miter, and watch the pressure force the miter surface to slide down the opposing miter until the gap closes. Tighten the far clamp and the rest of the clamps on this piece, too. This should give you tight miters with even pressure inside the joints.

The last side is different

The fourth side requires an extra test piece of the same dimensions but cut a little shorter. Cut 45° miters on the test piece and slide it up to one of the miters on the fourth side. If needed, adjust the angle on the saw until the joint fits perfectly. Without changing the setup of the saw, cut that angle on the end of the actual piece of edging that will go in this spot.

Now take the test piece to the opposite and final corner to see if it fits, and adjust as necessary, leaving the saw angle at that setting. Put the actual piece of edging in place on the panel with the first miter in the corner, and get a mark for the last miter. Now take this piece to the saw and cut the last miter, but leave the piece a little long. Test the fit. Go back to the saw and take off a very small amount from the last miter. It may take a few tries to sneak up on the perfect fit, which should be just a little tight so that the clamps will pull the



Sneak up on the fit. The miters should match perfectly, but there will be a gap along the length of the edging where it meets the panel. Go back to the tablesaw and shave off a little at a time until you get the length just right.



piece snug against the panel. Biscuit, glue, and clamp this piece in place.

How to trim it flush to the panel

After the glue has hardened, take off the clamps and begin planing the edge flush to the panel. This is scary because you could rip or sand through the veneer. I hold the leading surface of the plane sole on the panel with the following surface hanging over the edge, and I skew the plane (see photo, above). I use a handplane set for a medium cut until I get close, and then take

light passes with a sharp blade, followed by a card scraper. Sand with a random-orbit sander in a tight circular motion. Don't use a belt sander. Finally, smooth the outside of the edged panel (up the mitered corners if necessary), using handplanes or sandpaper blocks. Always work from the corners to the middle to avoid catching the end grain and breaking off a corner. Now you can add a profile. □

Peter Schlebecker teaches woodworking at The Center for Furniture Craftsmanship in Maine.

FLUSH THE EDGING TO THE PANEL

A series of careful steps will ensure that you don't sand through the veneer as you level the edging.



Start quickly, finish slowly. Set a handplane to remove material quickly, and then take light passes to go the rest of the way. Follow that with a card scraper (above) and light sanding (below). Be careful not to sand through the veneer on the panel.



Profile the edge? One reason for using solid-wood edging is that you can profile it. Now is the time to do that with a router or handplane.

A Visit to the Design Doctor

Hank Gilpin has the answers for 3 frustrated furniture makers

BY MATT KENNEY



Constructive advice. Stephen Harding (left) drove up from Delaware to spend a day with Hank Gilpin, who helped him improve the design of his bookshelf.

There are two big challenges in furniture making: mastering the craft's tools and techniques, and developing one's sense of design. Many of us spend most, if not all, of our time tackling the first. That's a shame, because all the technical skill in the world cannot save an unattractive piece of furniture.

That's what led me to ask Hank Gilpin, an accomplished furniture designer and maker, to help some of our readers by critiquing furniture that they had built and drawing an improved version of each piece. He gladly agreed, and I posted a call for submissions on FineWoodworking.com looking for a few brave souls with interesting furniture and thick skins. In the end, Gilpin picked three pieces, made by Mike Flaim of Milford, Ohio; Stephen Harding

of Newark, Del.; and Brian Havens of San Jose, Calif. Harding was close enough to drive up to Gilpin's Rhode Island shop for a face-to-face session.

You might not envy these three. After all, many of us leave a part of ourselves in every piece we build, and criticism about something we have such a personal connection to can sting. But that's not the way they see it. Harding was particularly pleased with the outcome of his day with Gilpin. As he listened to Gilpin's advice, he began to understand how to free his sense of design, and says that he left energized, ready for his next project.

Matt Kenney is an associate editor.

Consider every detail



According to Gilpin, Stephen Harding's bookshelf with drawers is a case of unrealized potential. He liked the basic design but thought it fell down on its details. For example, Harding used quartersawn stock for the shelf and the lower rail. As a result, the front edges of these parts have unappealing plainsawn grain. Harding

also made some missteps in construction. The grain on the walnut drawer dividers runs in the wrong direction, so their movement runs counter to the movement of the shelf and lower rail. After meeting with Gilpin, Harding said he learned two big lessons. First, Gilpin told him to draw more before he begins to build—up to 100 (!) sketches for every piece—as he considers and refines every detail, which is lesson No. 2.

BEFORE

GILPIN'S TAKE

The **sides should be proud** of the shelf and lower rail. Even if you get them flush initially, they eventually won't be because of seasonal movement. And accidental details like that are a sign of poor planning.

The shelf and lower rail should have a **true curve** on their front edges. Harding left a flat in the center of the curves to match the drawer front.

Cut the **drawer fronts from a single board** for continuous grain from side to side.

The **sides should have a consistent taper**, beginning just above the shelf and continuing to the top. On the original, the front edge is thinner than the back.

The **contrast** between the dark brown end grain of the walnut drawer dividers and the red-oak drawer fronts **is too strong**. Make the dividers from red oak instead, **and change the grain direction** to vertical so that the dividers move with the other parts rather than against them.

An arc on the top of the sides adds refinement.

Use **riftsawn boards** for the shelf and lower rail, so the grain on the top and the front edge is straight. The flatsawn grain on Harding's piece is too bold.

The through-dovetails are a nice touch, but **use three tails rather than two**.

For a sturdier base and a more refined look, **give the sides feet** by beveling the inside face and cutting an arc into the bottom.

Steer clear of the standards

For this audio equipment cabinet, Mike Flaim took design cues from a similar piece his wife had seen in a catalog of mass-produced furniture. As a result, the cabinet lacks personality. All of the pieces visible from the front are the same width. Even the negative space at the bottom is roughly that same width. Gilpin's simple solution was to vary the widths. He would also taper the legs and give some shape to the lower rail to further enhance the custom feel of the piece. The varied color of the parts, made



BEFORE

ORIGINAL

Lacking variety in the dimensions of its parts, the cabinet looks mass-produced.

Increase and bevel the overhang.

Top and shelf appear to be the same thickness.

These parts are close to the same width as the space beneath the cabinet.

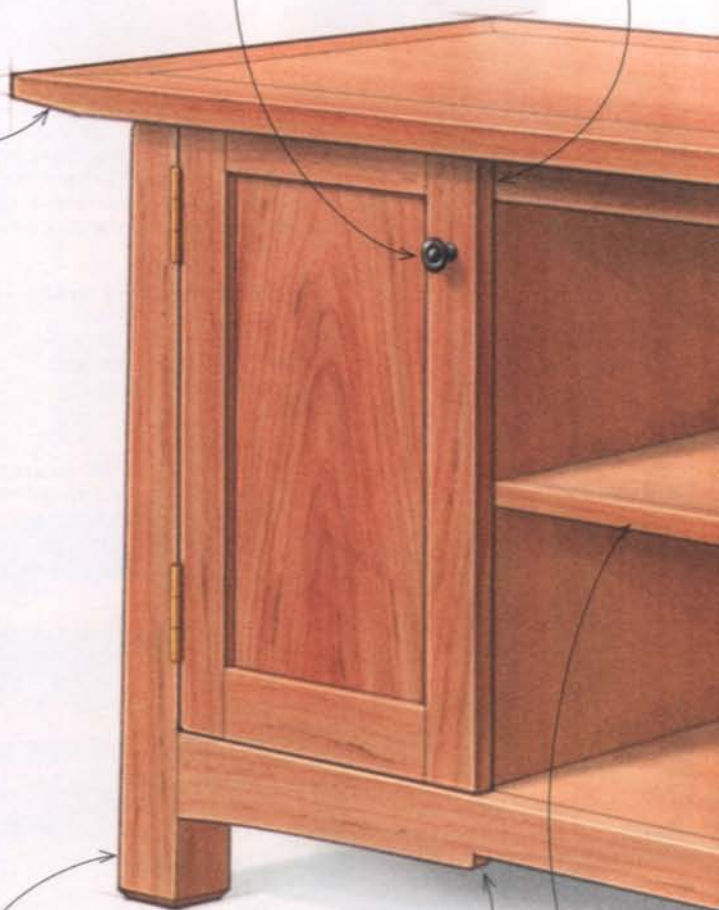
Raise the pulls so that they are easier to reach.

The doors should close over the top rail.

Taper the legs, leaving them slightly wider at the bottom.

Lighten the piece by **adding a slight curve** to the bottom edge of the lower carcass rail and **terminating the taper in a step** that transitions to a narrower section in the middle.

Make the shelf a bit thinner.



from multiple boards, adds to the factory feel and drowns out the beautiful cathedral grain of the door panels. Gilpin recommended finding a thick board large enough for all of the most visible parts so that the color would be consistent. That would also allow Flaim to control the grain on the door frames especially. Using riftsawn lumber, with its straight grain, would cause the frames to step back from the door panels, rather than compete with them.



Furniture design, the Gilpin way

For the better part of a day, Gilpin discussed design and technique with Harding, offering him some great general advice on both counts. Here's a distilled version:

- Design to please yourself, regardless of who the client is.
- Limitations are good. It's far easier to design a cabinet to hold three specific pieces of pottery that will be hung in the kitchen and made from that specific stack of cherry in the shed, than it is to design "a wall cabinet."
- Be deliberate about every part. Nothing should be accidental or done after the fact. Ad-hoc design choices look sloppy and out of place.
- Engineer as you design. Open a book about joinery and consider how parts will be held together. Every detail of construction should be worked out by the time you're done designing.
- Creativity begins with a question. Ask yourself, "What can I do to make this more interesting, more fun, or different?"
- Keep complete control over grain and color. This starts at the lumberyard, so know how to read end grain and what it tells you about how the face and edge grain will look.





BEFORE



As Gilpin pointed out to Harding, the difference between good and great furniture is

often in the details. However, it is possible to overdo them. That's the case with the jewelry cabinet that Brian Havens made for his wife. There are three dramatic but competing elements on the front: the veneer, the door pulls, and the inlaid Japanese characters. Gilpin advises designers to resist the temptation to overload a piece with dramatic focal points. He said Havens would have been better served by choosing two of the three. Or better yet, turn the inlays into door pulls! Gilpin also noted that the base and cabinet seem out of synch, as if the cabinet was placed on a low table that wasn't part of the design and just happened to be there.

Clean up the front by removing one of the three details. One option is to remove the Japanese characters.

GILPIN'S TAKE

Another option is to use the letters as pulls.



Widen the base so that the piece is not top heavy.

Leave the thickness of the cabinet bottom as is.

Thicken the ebonized trim in keeping with the overall proportions of the piece.

Split the apron in two and add two vertical dividers. These pieces tie into the thickness of the other ebonized elements.

Make the legs thinner with a more graceful curve.



Make Short Work of Small Parts



With bench hooks
and hand tools,
fitting fine pieces
is as easy as 1-2-3

BY MATT KENNEY

After years of making small boxes with delicate trays and cabinets with small drawers, I've found that the safest, fastest, and most precise way to make and fit small parts is with a backsaw, a handplane, and three bench jigs. The jigs—a planing stop, a saw hook, and a shooting board—are easy to make, last a long time, and come in handy for a wide range of jobs.

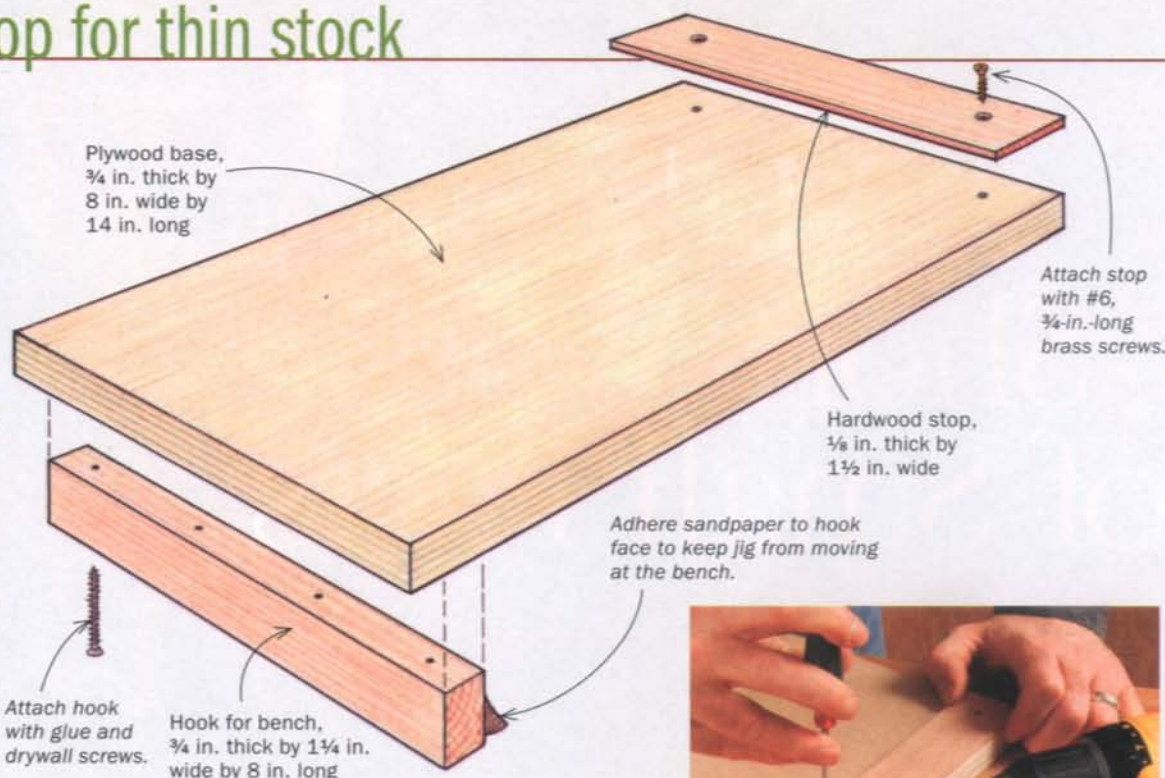
Each of these jigs is useful by itself, but they really shine when used together. I line them up on my bench and go quickly from one to the next. It makes for a quiet, safe, and efficient workstation. And the fit and finish of my small parts is better than ever.

I'll show you how to make the jigs—and then how to use them—as I make and fit the parts for a jewelry box.

Matt Kenney is an associate editor.

A planing stop for thin stock

This planing jig provides rock-solid support for hand-planing small parts, from miter keys to box lids. The base hooks over the edge of the workbench while the $\frac{1}{8}$ -in.-thick stop prevents the workpiece from sliding. Its low profile won't interfere with thin stock, and it's secured with brass screws, which will do less damage if they contact the plane iron. A strip of P220-grit paper on the hardwood hook keeps the jig from sliding sideways. I use high-quality veneer-core plywood for all three jigs, because it stays flat over the long haul.



Online Extra

To watch a video of Kenney using his jigs in our series on box-making, go to FineWoodworking.com/extras.

Thin stop, tall hook. Screw on the two cleats and you're ready to go (right). The screws that secure the stop are countersunk so they won't hit the plane iron should it pass over them.



1 SURFACE SMALL PARTS EASILY

After bandsawing or tablesawing small stock to size, the first step is to remove the saw marks and plane them to thickness.



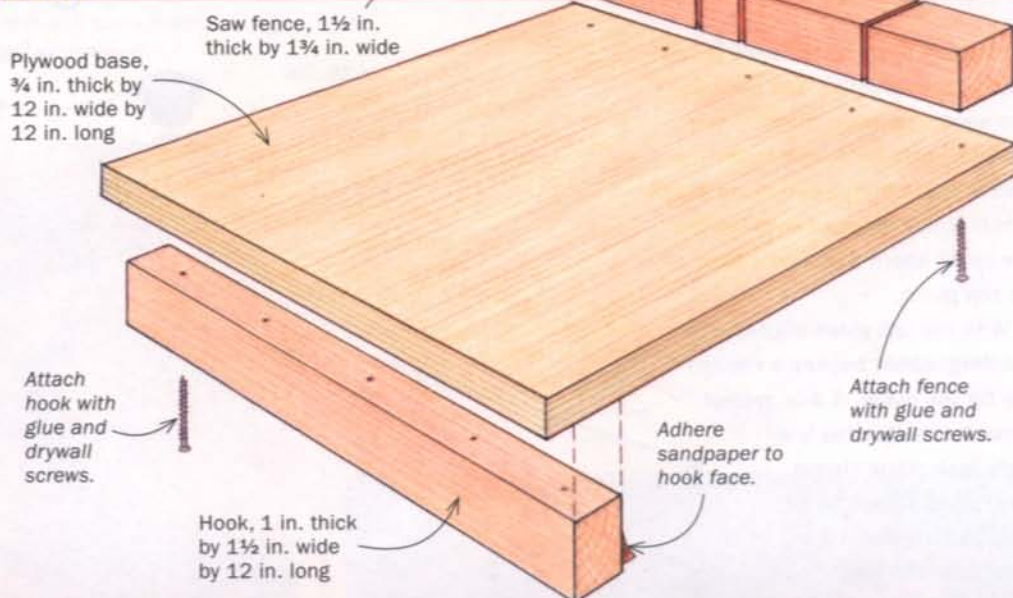
Plane to thickness. A great job for the planing stop is bringing corner keys to thickness (above). Handplaning is the ideal way to sneak up on a perfect fit (right).



Smooth thin panels and refine joinery. Box lids and other thin panels are easily surfaced at the planing stop (above). With the edge of the panel overhanging the jig, fine-tuning a rabbet is simple and accurate (left).

A versatile saw hook

Like the planing jig, the saw hook is designed to sit on a workbench, providing a stable platform for rough-cutting small parts to length—more quickly and safely than a power tool. Instead of a shallow stop, it has a taller fence that holds the workpiece steady. The fence has 90° and 45° kerfs that guide the sawblade. When making the jig, don't worry too much about getting the sawkerfs perfect. This jig is only meant to get parts close to the right length and angle. For a perfect fit, use a low-angle plane and a shooting board (see next page).

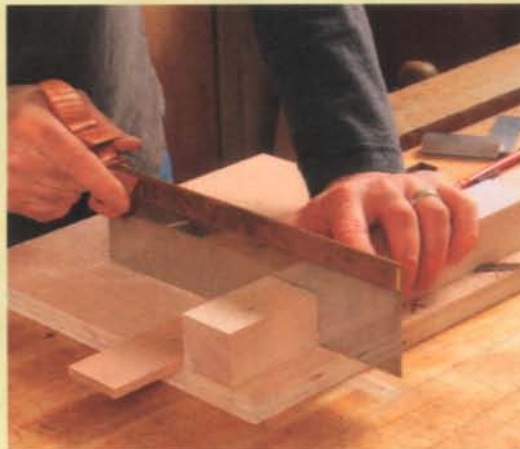


Fence gets three cuts. After attaching the fence and hook, lay out the 90° and 45° cuts in the fence with a marking knife and square (left). Then make a shallow groove with a chisel (center) to guide the backsaw. Cut the kerfs with the same saw you'll use to cut stock (right).



2 THEN CUT THEM TO LENGTH

With the parts smooth and straight, rough them quickly to length on the saw hook.



Mark and cut. For the sides of this jewelry tray, Kenney measured directly from the workpiece (left), then cut the parts at the saw hook (right). Generally, it's best to leave the pieces a little long and then square the ends and fine-tune the fit at the shooting board (see next page).



45° too. The same goes for miters. Here, Kenney trims the waste off the corner keys he planed on the previous page.

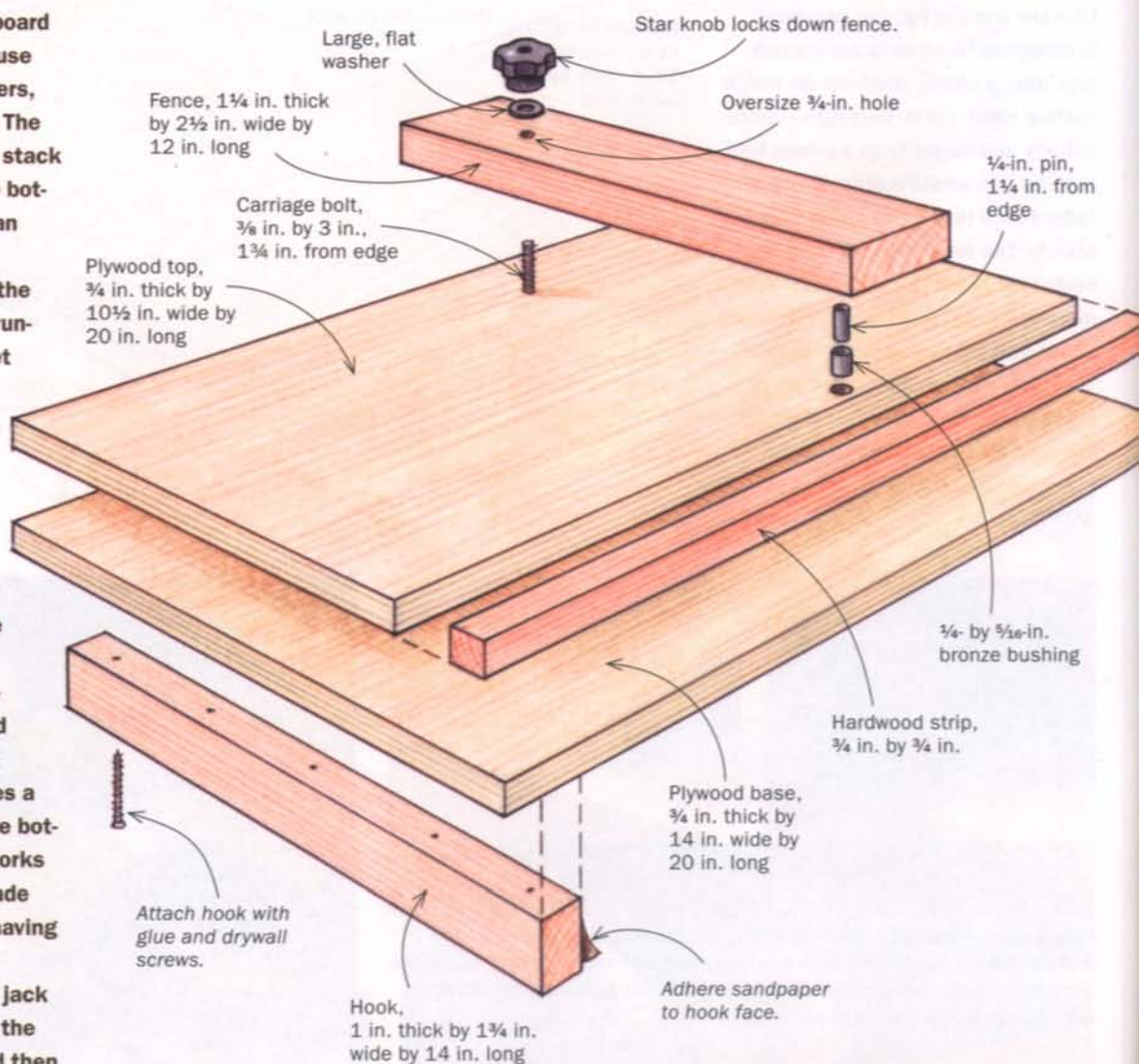
Shooting board is the most valuable jig

Of all these jigs, the shooting board is the most versatile. You can use it to square up ends, plane miters, and trim parts for a perfect fit. The base is made from a two-piece stack of $\frac{3}{4}$ -in.-thick plywood with the bottom piece about 3 in. wider than the top piece.

With the left sides aligned, the resulting rabbet becomes the runway for the plane. A 3-in. rabbet works for the Veritas low-angle jack plane shown here, but it should be adjusted so it's about 1 in. wider than the height of the plane you'll be using.

A strip of $\frac{1}{2}$ -in.-thick hardwood glued to the left side of the rabbet keeps the plane blade from cutting into the plywood (which would dull it). And since the plane blade is not as wide as the plane body, it leaves a narrow ridge of hardwood at the bottom of the runway. The ridge works as a depth stop to keep the blade from reaching and endlessly shaving away the hardwood strip.

Whenever you sharpen your jack plane, you'll need to trim away the ridge with a shoulder plane and then re-establish a new ridge with the newly sharpened jack plane.



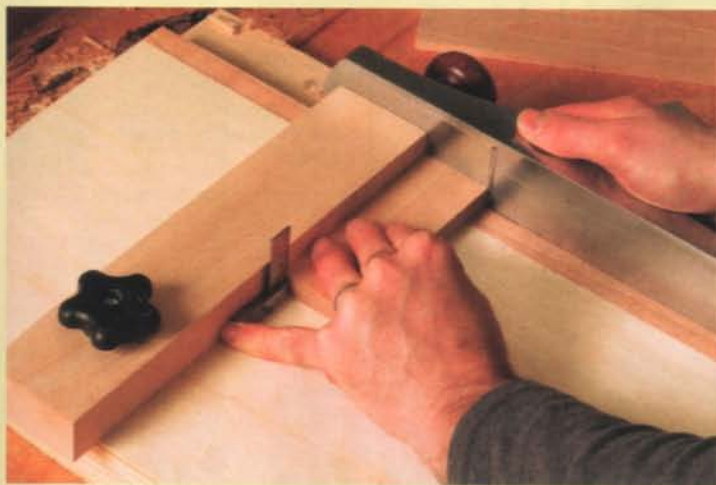
Adjustable fence will always be true. A $\frac{1}{4}$ -in. (I.D.) bronze bushing (left) and a tight-fitting steel pin serve as the pivot point for the fixed end of the fence. The adjustable end has an oversize hole that fits over a carriage bolt (center). Once squared, the fence is locked down with a threaded knob (right).



3 NOW FINE-TUNE THE FIT

After you've planed your pieces smooth and sawn them to rough length, the shooting board does the really important work.

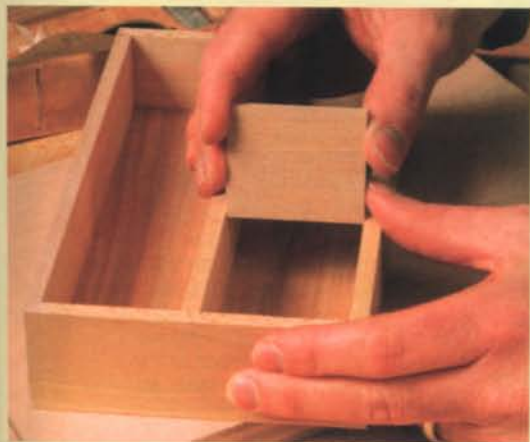
PLANE ENDS AND EDGES SQUARE



Shoot in pairs. After aligning the opposite ends, squaring pairs of parts at the same time ensures they're exactly the same length.



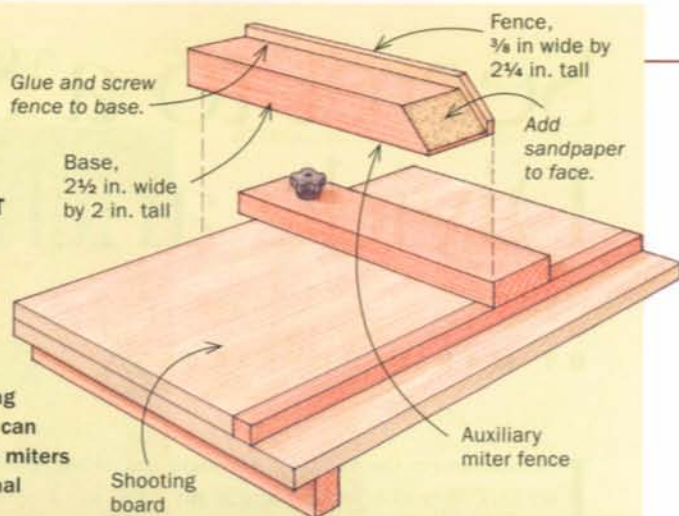
Joint edges safely. You can joint the long sides of small parts at the shooting board, too. And it's safer than a jointer.



The perfect fit. With the work-piece slightly oversize, plane one end square and then take a pass or two on the opposite end. Continue planing and test-fitting until you get a snug fit (left).

MAKE PERFECT MITERS

By adding a 45° auxiliary fence to the shooting board, you can make tight miters with minimal fuss.



Simple jig makes miters too. Clamp the miter jig to the shooting board's fence, so it doesn't shift sideways.



Plane the miter. A firm grip and P220-grit sandpaper glued to the jig prevent the stock from moving as the miter is planed perfectly true.

Secret to a Sheraton Leg? Divide and Conquer

BY MARIO RODRIGUEZ

I'm always on the lookout for small but challenging projects, so this Sheraton table caught my eye. It's a stylish piece, compact and delicate. But it was the turned legs that really grabbed me. The top portion is turned to a tight stack of perfectly formed rings. Below the rings are 12 carved, tapered reeds that end neatly in a small ring and reel at ankle height. Under the ring and reel, the leg swells to a smooth bulb, and finally ends in a narrow tip.

All that turning made me hesitate. I've never considered myself a turner, more like a furniture maker who turns a little. So how did I create the four ornate legs you see in the photo? I did it by dividing each one into three separate sections—upper rings, center reeds, and foot—connected by simple mortise-and-tenon joinery. Doing so let me make multiple copies of each section, discarding any single part that wasn't up to snuff without losing the rest of my work.

This safety net also makes the project a great opportunity to grow as a turner. The work can be done on a small lathe, and each section features different details and treatments, requiring a range of skills and techniques.

Straight joints make a straight leg

For this approach to succeed, all the parts must line up correctly: Any misalignment will draw attention to the joints. This means the mortises and tenons must be drilled and turned so they are perfectly straight and concentric with the turned profiles.

For the top and foot, I drill the mortise first and then use it to mount the workpiece on the lathe. In this way, the workpiece rotates around the center of the mortise as the piece is turned. On

The TOP section is turned with two sets of rings, grouped to match the width of the drawer faces.

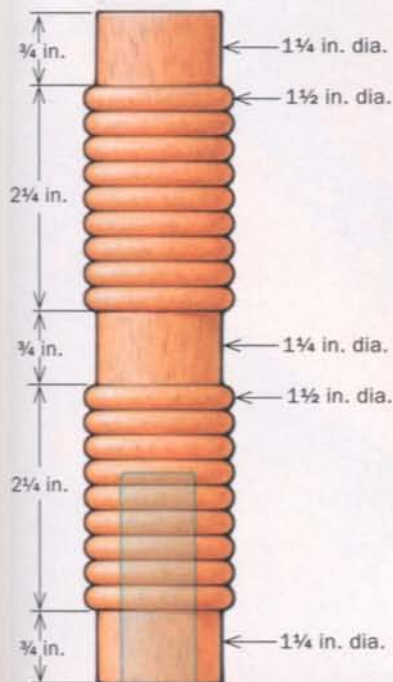
The CENTER section is tenoned on both ends. The upper portion begins with a ring that aligns with the bottom of the case. A series of turned shapes gives way to a long, straight taper into which the reeds are cut.

The reeds in the center section die beautifully into the BOTTOM section. Another series of traditional details leads to the elongated taper at the foot.



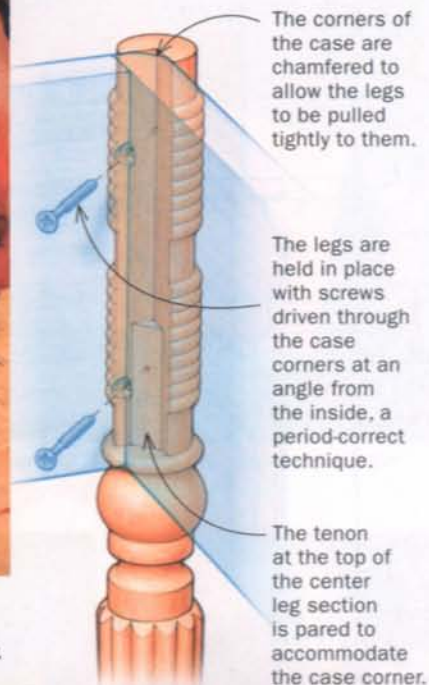
The top section is notched to join the case

TOP SECTION



Notch the blank. Cut away one quarter of the leg. Then, to make the blank whole for turning, glue in a piece of scrap. A layer of kraft paper makes the scrap block easy to remove later.

ATTACHING THE LEGS TO THE CASE



Drill a round mortise. Clamp a right-angle jig to the drill-press table. This helps ensure that the mortise runs straight.



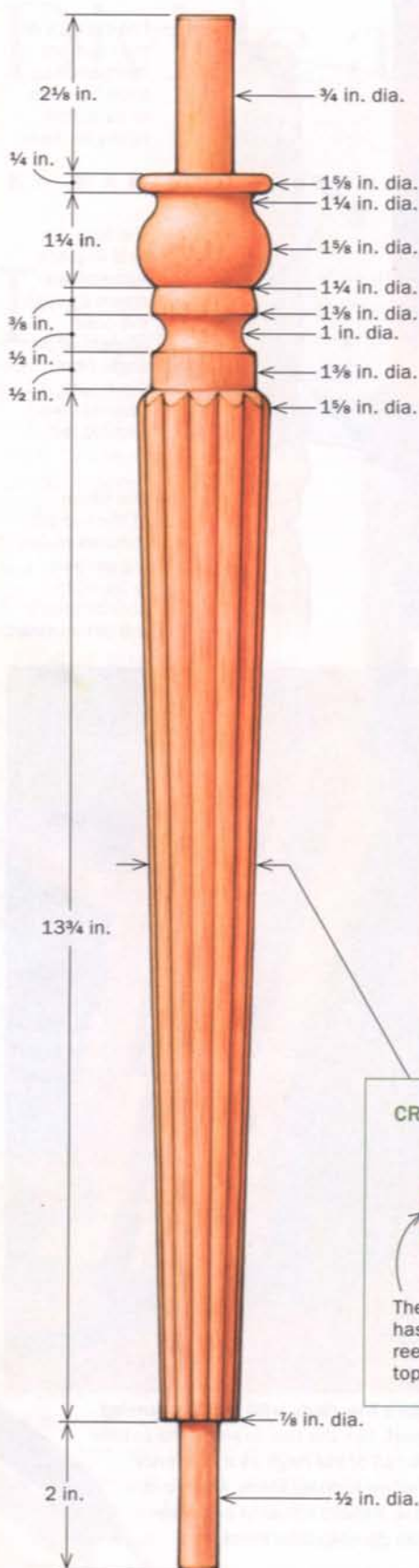
A shopmade fixture holds the work. The workpiece mounts on a mandrel turned to fit snugly in the mortise. The mandrel is held in a chuck. The opposite end of the workpiece is held with a live center in the tail stock.



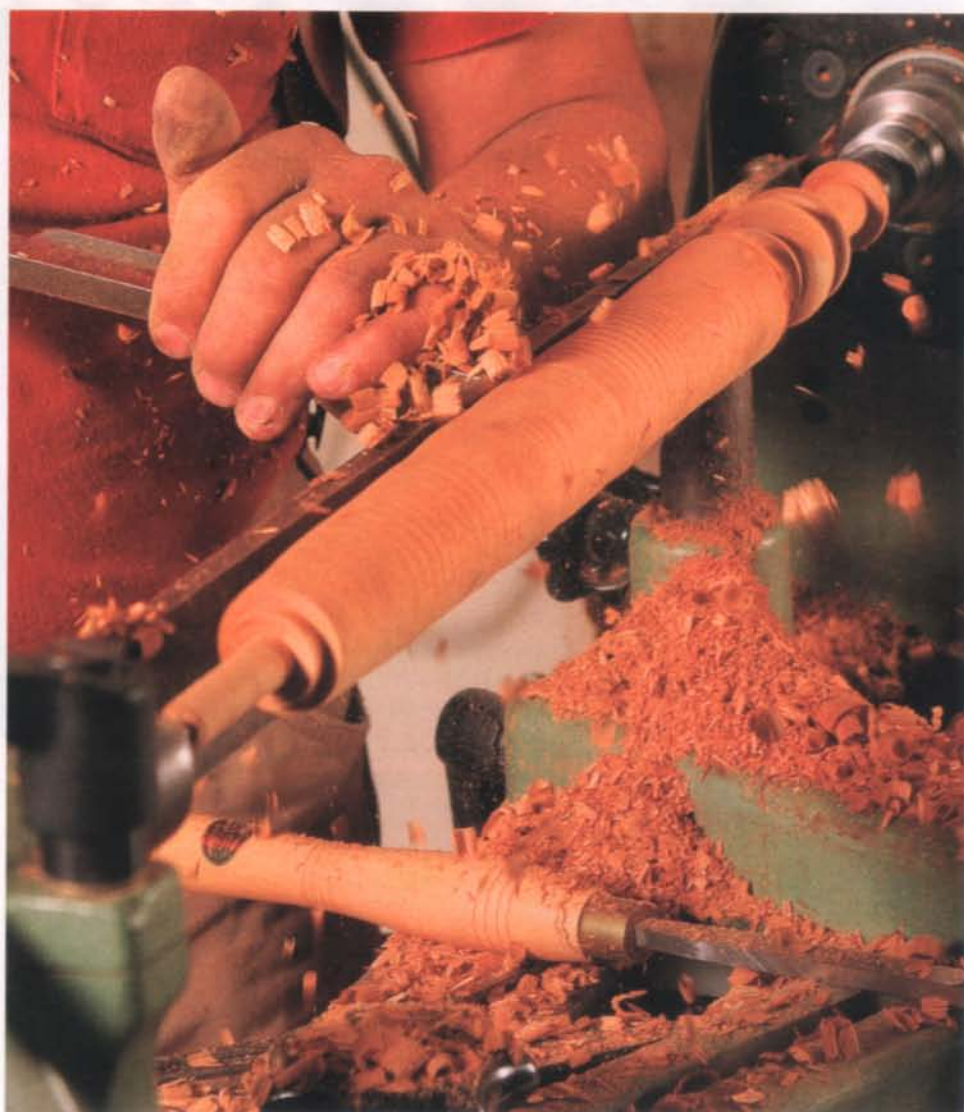
Turn the rings with a bead-cutting tool. Use the tool to score the outline for all of the rings as a reference before forming them. Afterward, use a sharp chisel to pry away the glued-in filler block.

The center section is tapered and reeded

CENTER SECTION



CROSS SECTION



Get ready for reeding. Turn the details at the top of this post. Then use a spindle gouge to cut a straight taper, from 1 5/8 in. dia. to 7/8 in.

the middle portion, the tenons are turned with the rest of the workpiece and so share the same centerpoint.

Mortise the top and foot before turning—I begin with the blank for the top portion. I cut away one long corner of the blank, measuring 3/4 in. by 3/4 in. When the table is assembled, this recess fits around the corner of the case. For now, I fill in the missing section with a piece of scrap and glue it in with thick paper placed between the scrap and the workpiece. This allows me to easily remove the fill-in piece after drilling my mortise and turning the rings, without damaging the top section.

I use a mortiser or a drill press with a right-angle guide and a sharp Forstner bit to drill the mortises. After drilling the mortises, I mount the blank on the lathe by fitting the mortise onto a shop-made mandrel chucked into the lathe's jaws. I secure the other end with the live tail stock.

After turning the blank round, I use a sharp 1/4-in. beading tool to mark out and cut clean, exact rings. Afterward, I lightly sand

REEDING JIG

Anchored to the lathe bed with clamps, the jig is a plywood box with an adjustable-height rail on each wall. The router rides on the rails, which are set above the workpiece, parallel to its taper.



Point-cutting roundover bit

Size the box to accommodate router base with no play. A snug fit ensures straight reeds.

3/4-in. plywood

Guide rail

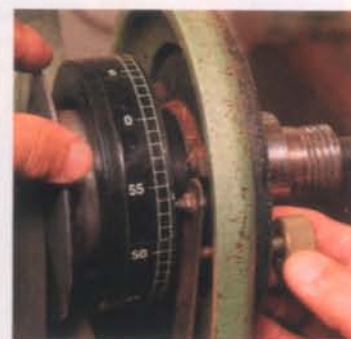
Glue blocks

Slots allow vertical adjustment of router guide rails.

Hardwood cleat centers jig on lathe bed.



A box for reeding. Before mounting the workpiece between the lathe centers, Rodriguez clamps the reeding jig to the lathe bed.



Rout the reeds. Start with a light cut and be sure the jig's rails are aligned properly. Use the lathe's indexing head (above) to lock the workpiece in position at 30° intervals. The bit leaves flat-topped reeds (below) that must be rounded (see next page) to create the finished appearance.



the rings with P220-grit paper and use a handful of shavings to burnish them to a smooth finish.

Although the patterns and dimensions are different, the foot is mortised and turned in essentially the same way.

Two jigs take the risk out of reeding

After roughing the entire center-section blank to a cylinder, mark out and use a parting tool to turn the tenons. To ensure precise diameters and a snug fit, I use open-end wrenches to gauge the tenon thicknesses as I work. This is crucial, as any play in the joinery would definitely affect the appearance and registration of the parts and might cause the joints to fail.

Afterward, turn the pattern of coves and beads at the top, then use a spindle gouge to turn the rest of the piece to a taper measuring 1 5/8 in. dia. at the top and 7/8 in. at the foot end.

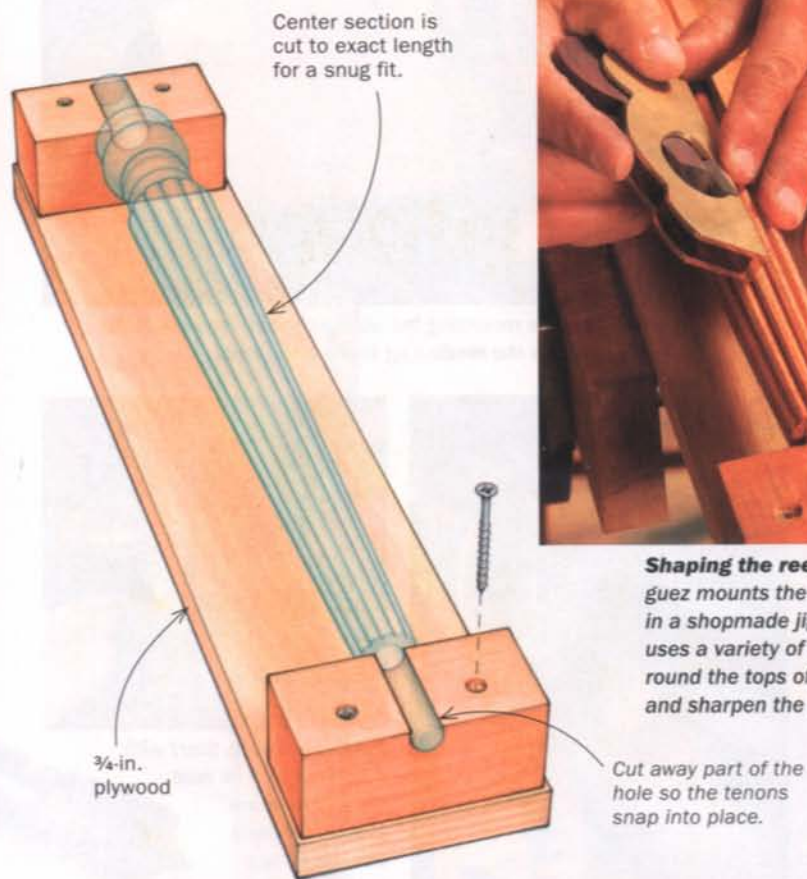
Rout the reeds on the lathe—To cut the reeds, I made a simple jig that supports and guides a router as it travels along the length



Refine the reeds by hand

BENCH JIG

To hold the workpiece while refining and smoothing the reeds, Rodriguez created this simple jig by mounting a pair of drilled blocks on a piece of flat stock.



Shaping the reeds. Rodriguez mounts the workpiece in a shopmade jig, then uses a variety of tools to round the tops of the reeds and sharpen the grooves.



Create a flat on the tenon. The tenon will be exposed by the cut-away portion of the leg. The flat surface lets the legs marry to the beveled corners of the case.



of the leg. The jig surrounds the workpiece, which remains secured between centers on the lathe. But because the leg tapers, this jig has adjustable tilting guide rails.

With a $\frac{3}{4}$ -in. straight router bit loaded into a trim router, adjust the rails so the router bit just touches the leg at both ends. With both the router and the lathe running, pass the router up and down the length of the leg. This removes any rough spots on the surface and produces a perfectly concentric taper. Now you're ready to reed the leg.

First, plot a cross-section of the leg on a scrap piece of plywood. In this case, 12 reeds fit around the leg. The 12 reeds will be situated with an indexing head built into the lathe headstock. Because the reeds taper, it's impossible to cut full and complete reeds with the router. The best you can hope for is straight partial reeds that you can finish with rasps and files.

Use a point-cutting roundover bit and set it for a light cut. Remember, the smaller diameter at the foot end still has 12 reeds, but they are cut to a slightly shallower depth. Lock the leg into position with the indexing head and cut a single reed, then

Finish with the foot

rotate the leg until all 12 reeds are cut.

Refine the shapes at the bench—To finish shaping the reeds, I made a benchtop jig to hold the work and provide easy access to the full length of each reed. This is another great advantage of building the leg in three parts: I can shape and sand the reeds straight through without interference on either end. This produces clean, perfect, and smooth results along their entire length.

I use a shoulder plane and detail files to remove the sharp edges of each reed, carefully rounding the tops. Then I use a knife-edge file between the reeds to sharpen and deepen their profile.

For a smooth finish, I use a set of small rubber sanding shapes, changing them frequently to match the taper of the reeds toward the small end.

Mix and match parts before glue-up

After preparing all the leg sections, test the fit of the different parts. Each section should slip in snugly, without any play or pressure at the joint. Sight down the length of each leg; it should be straight and appear as if turned as a single piece. You may find that the mortise in the top section wasn't perfectly drilled, causing the leg to cant in or out of alignment. If so, the cutout corner can be fine-tuned for a straight and square fit.

Another advantage to this method is that it lets you select the best-looking parts for the front legs and put the lesser parts on the back legs. You also can rotate each section for the best appearance, color, and grain orientation.

When you're satisfied, mark the alignments with a pencil tick on a strip of masking tape. Next, take everything apart and carefully cut a shallow notch along each tenon to let excess glue escape instead of pooling in the mortise and preventing the joint from going together. Apply glue to the sides of the mortise and gently slide the sections together. Just before the joint closes, rotate the pieces and align the pencil ticks. If you've done careful work, you won't even need to clamp the leg assembly. □

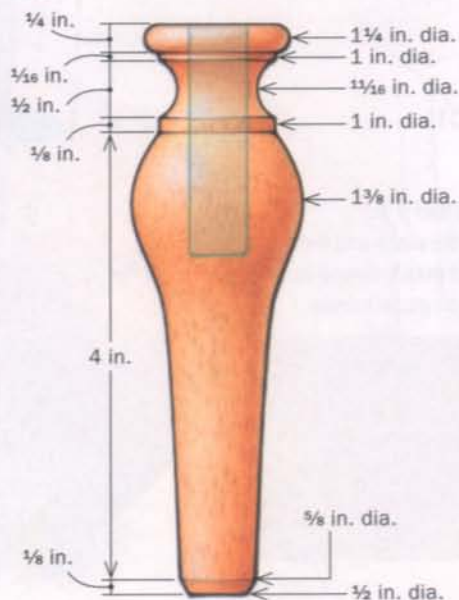
Mario Rodriguez is a longtime contributor who teaches at the Philadelphia Furniture Workshop (philadelphiafurnitureworkshop.com).



A graceful foot. Use the shopmade mandrel again to mount the foot blank on the lathe, using the tailstock and a live center again to stabilize the piece. The foot is shaped using a parting tool and a variety of spindle gouges.



FOOT



readers gallery

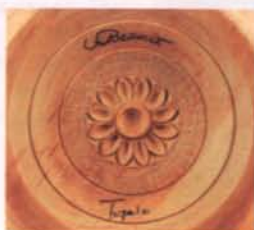


GREG BROWN
Northwood, N.H.

Brown's mahogany and bird's-eye maple sideboard reflects a combination of Federal influences. The main form can be attributed to a Seymour-style dressing table, the grape-leaf carving comes from Thomas Whitman's work, and the rest of the carving and details are Samuel McIntire. Finished with shellac and wax, the sideboard is 20¾ in. deep by 58 in. wide by 38 in. tall. PHOTO: LANCE PATTERSON

WILL BELLUCCI
Rapid City, S.D.

This tupelo vessel is 8 in. tall and 9 in. in diameter. Bellucci turned the piece and then carved the rows of beads and petals around its perimeter. On each of his turnings, he carves a unique flower on the bottom. The finish is wipe-on polyurethane. PHOTOS: RACHEL SCHEFFEL



Submissions

Readers Gallery provides design inspiration by showcasing the work of our readers. For submission instructions and an entry form, go to FineWoodworking.com.



RODNEY DIAZ

Southbury, Conn.

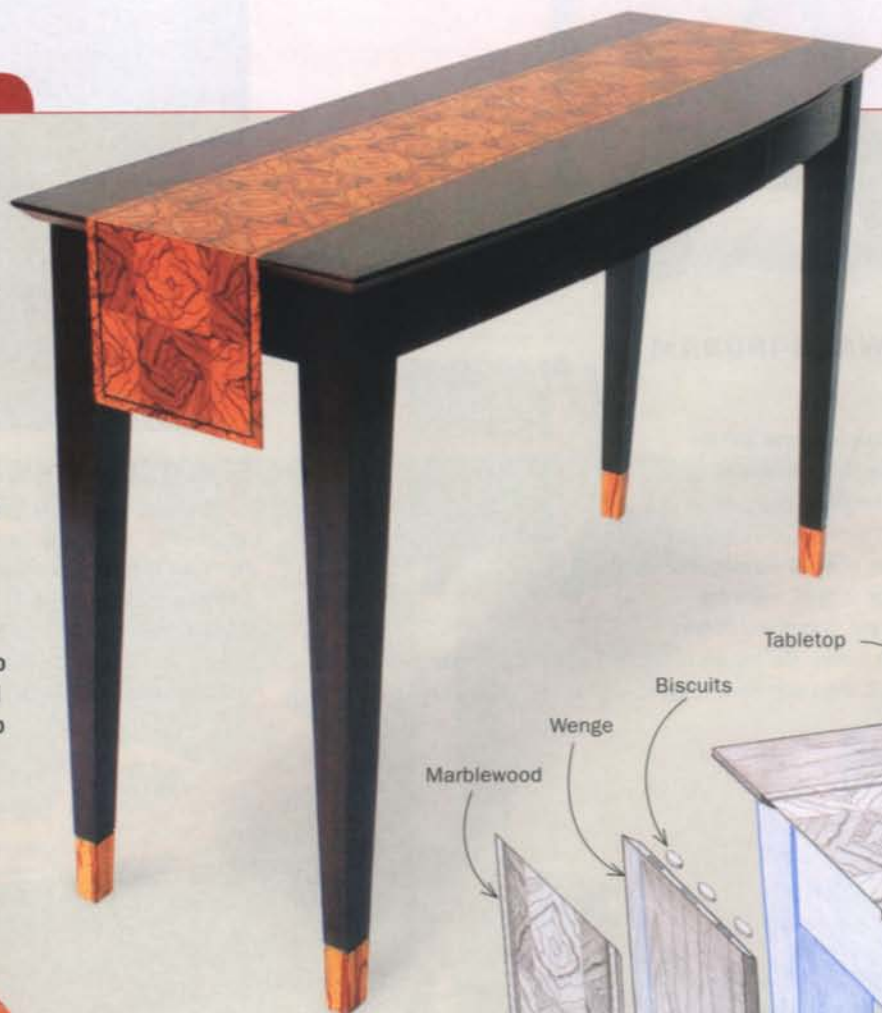
This maple and pine lap desk is based on one in Christian Becksvoort's *The Shaker Legacy* (The Taunton Press, 2000). Diaz adjusted the size (14 $\frac{3}{4}$ in. deep by 18 $\frac{3}{4}$ in. wide by 6 $\frac{1}{2}$ in. tall) to accommodate a 17-in. MacBook Pro under the lid and in front of the ink-bottle drawer (hidden on the far side). The curly maple came from 50-year-old firewood found in a 19th-century barn. The finish is aniline dye, Waterlox Original, amber shellac, and amber wax.

DESIGN SPOTLIGHT

JIM WALLACE

Cedar Park, Texas

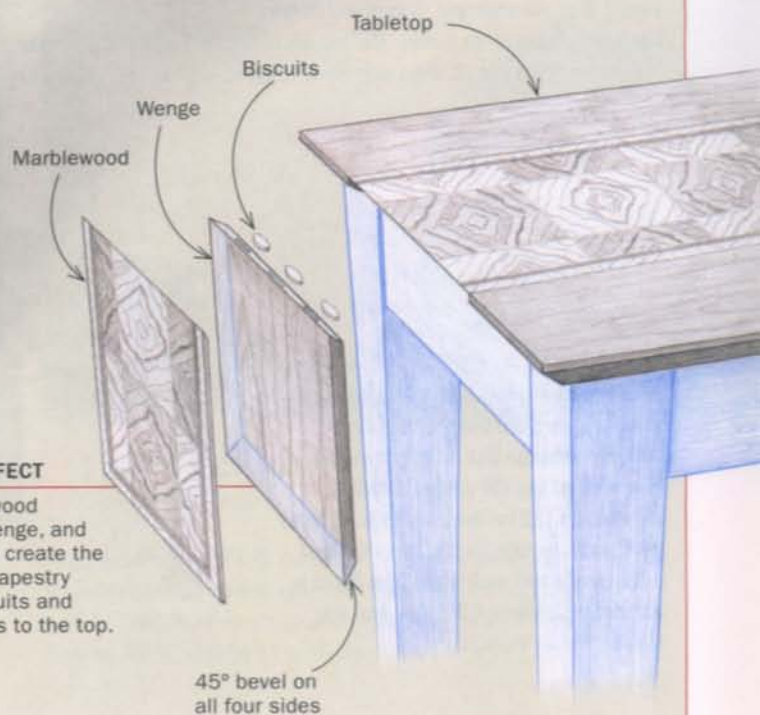
This wenge and marblewood table is Wallace's version of Charlie Durfee's bow-front hall table (*FWW* #204). The table, 18 in. deep by 50 in. wide by 32 in. tall, was shown at the annual Kerrville Texas Furniture Makers Show, where it received the Judges' Special Award and the People's Choice Award. The idea for the tapestry came from the end-grain pattern of the marblewood, which reminded Wallace of the lace doilies resting on his grandmother's tabletops. At first, his veneered tapestry only spanned the top, but he evolved the design so the pattern would fold over the top and down the sides.



Looks like lace. Wallace started with a 2-in. by 2-in. block and took $\frac{3}{32}$ -in. slices from the end, creating small tiles. He arranged those slices in fours to make a rosette-like pattern, and then inlaid those larger tiles in the top.

CREATE THE DRAPED EFFECT

Wallace glued the marblewood pattern onto $\frac{5}{8}$ -in.-thick wenge, and then beveled the wenge to create the illusion that only the thin tapestry wraps over the edge. Biscuits and glue attach the side pieces to the top.

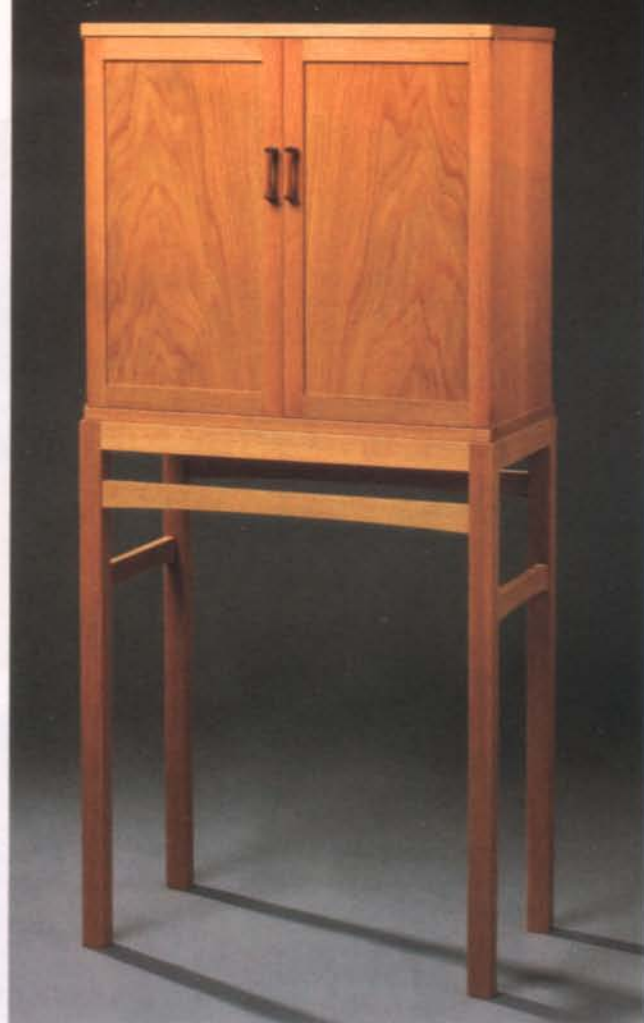




ALISON SWANN-INGRAM

Tampa, Fla.

Influenced by falling maple leaves and the Chinese empire, Swann-Ingram created the maple branches and seeds on this cabinet (18 in. deep by 24 in. wide by 28 in. tall) through a combination of wood-burning and carving. The walnut top is dyed, while the walnut legs are ebonized. Shannon Andrews hand-forged the silver leaves. The interior is finished with red gloss lacquer, and the maple doors are finished with clear lacquer. PHOTO: STEVEN WIDOFF



MICHAEL SWIFT

Cooperstown, N.Y.

Made while Swift was a student at the Center for Furniture Craftsmanship in Maine, this cabinet on a stand (14½ in. deep by 25½ in. wide by 58 in. tall) is inspired by the work of James Krenov. The cabinet is mainly white oak, with jatoba details and Spanish cedar drawer bottoms. The finish is shellac. PHOTO: JIM DUGAN

CRAIG DuBOSE

Charlottesville, Va.

Commissioned by clients in St. Louis to build a Chinese-inspired hall table, DuBose didn't see them face to face until he delivered this mahogany table. They worked out the design details, dimensions (32 in. deep by 96 in. wide by 36 in. tall), woods, and finishes through a series of email exchanges. The finish is aniline dye, Waterlox Original, and wax.

PHOTO: PHILIP BEAURLINE



THE FURNITURE SOCIETY CONFERENCE, 2010

This year's conference, held at the Massachusetts Institute of Technology in Cambridge, included two juried exhibits: "Six Degrees of Separation" was open to furniture makers who live in or graduated from a school in New England. "Outdoor Furniture"

invited studio furniture makers to give their perspective on what often is a mundane industry. Here are a few of the pieces from the two shows. For more information on The Furniture Society, go to furnituresociety.org.

BART NISWONGER

Worthington, Mass.

Though the piece is based loosely on Émile-Jacques Ruhlmann's designs, Niswonger added a topographical element to this cherry and ash sideboard (17 in. deep by 55 in. wide by 34 in. tall) by playing with texture and color. He created the hills and valleys by making a series of cove cuts in two directions on the tablesaw. To finish the sculpted areas on the left, he sandblasted them to open the grain, then used a sealer. Then he rubbed acrylic paint into the wood, wiped off the excess, and finished with a gloss varnish topcoat.



HAYAMI ARAKAWA

West Newton, Mass.

This mahogany outdoor bench (14 ft. dia. by 28 in. tall) was designed to encourage clear, open, intellectual conversation, and will be placed on the MIT campus. All the joinery was done with Festool's Domino joiner, and the finish is Watco's Exterior Danish Oil.



LIBBY SCHRUM

Camden, Maine

While experimenting with curves, Schrum took the design of this unfinished white oak outdoor bench from a rough sketch to a model, and finally to its finished form. The bench is 17½ in. deep by 56 in. wide by 17½ in. tall.

Use a long push stick when ripping narrow boards

Q: Is it safe to rip 1/8-in.-wide strips between the rip fence and blade?

—ED PIRNIK, Stamford, Conn.

A: WITH THE RIGHT PUSH STICK, it's a safe cut. Make the push stick from a piece of 3/4-in.-thick MDF that is at least 3 in. wide and a little longer than the board being ripped. The length of the push stick makes it easy to hold the entire strip down as it passes the blade. Its width buries the blade in the push stick and keeps your hands far from the blade.

A tab on the back pushes the stock. To make it, cut a notch on one edge that is just shallower than your stock is thick and not quite as long as the push stick. After you rip the first narrow strip, a thin tab is left on the inside of the push stick. Here's the reason for making the push stick from MDF: The tab on a plywood stick would curl up and be cut off on the second pass, but the tab on an MDF stick will not curl.

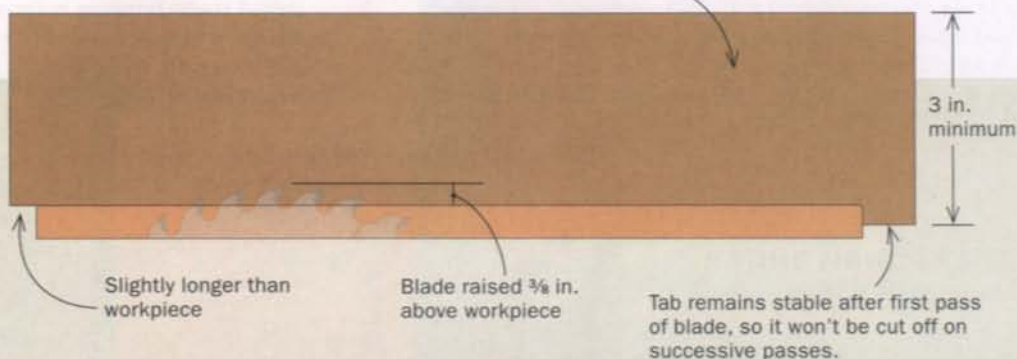
You also should use a thin-kerf blade and a zero-clearance insert with a riving knife or stub splitter. Set the blade about 3/8 in. above the stock and keep the splitter lower than the blade.

—Steve Latta is a contributing editor.

Ask a question

Do you have a question you'd like us to consider for the column? Send it to Q&A, *Fine Woodworking*, 63 S. Main St., Newtown, CT 06470, or email fwqa@taunton.com.

Push stick, made from 3/4-in.-thick MDF



Get better control with a long push stick. You can apply downward pressure over the entire workpiece and keep it from lifting up.



Hands clear the blade. The full push stick buries the blade and keeps your hands well away from it for a second level of safety.



MDF stays straight. The narrow section left after the first cut won't curl into the kerf and get cut off.

Use a bench chisel to square mortise corners

Q: I use a drill press to make mortises. What is the best way to square the corners, a bench chisel or a corner chisel?

—VERYL WILLIAMS, Springfield, Pa.

A: CORNER CHISELS SEEM LIKE A GREAT IDEA, but they are unnecessary. When squaring a mortise, the most challenging job for a chisel is cutting the end grain, and that's where you should start. Choose a bench chisel the same width as the mortise. Begin with shallow cuts to prevent the chisel from being forced outside the mortise by the wedging action of its bevel. Then take much stronger cuts to remove the waste quickly. After the end grain has been cut, use a wide chisel to pare the sides of the mortise.

—Michael Pekovich is Fine Woodworking's art director.



Set the chisel on the layout line and start soft. This will keep the chisel from straying outside of the line. After forming a small shoulder, you can really whack the chisel and cut through the end grain quickly.



Take care with the sides. Because the strength of the joint comes from how well the tenon cheeks mate with the mortise sides, the sides should be vertical and smooth.

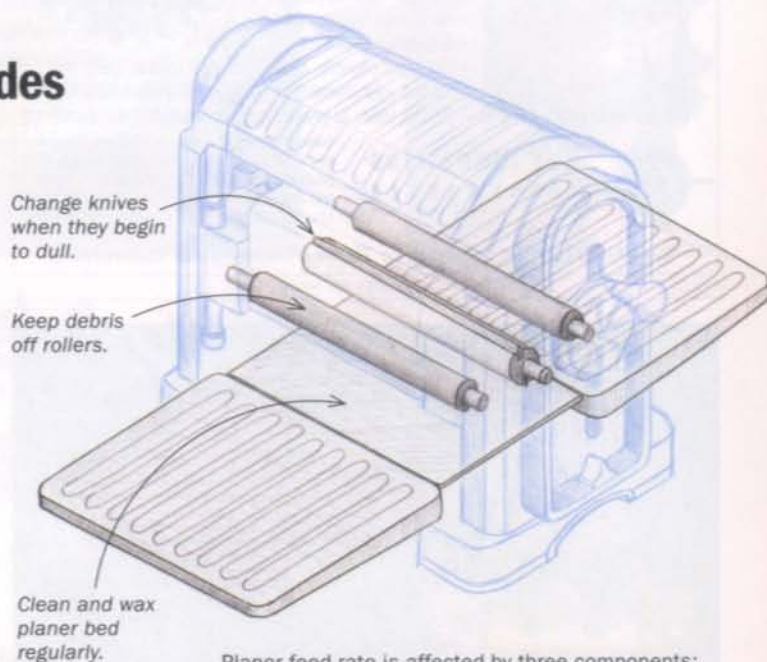
Slow feed rate signals dull planer blades

Q: I take light cuts with my portable power planer. However, when I send a piece of lumber through the planer, it often comes to a stop and I must push it through. When the board comes out, it has black marks on its surface. What's wrong with my planer?

—LOU VERDA, Granville, Ill.

A: IT'S TIME TO CHANGE YOUR BLADES. Dull blades can significantly slow a planer's feed rate and, if especially dull, can actually cause friction burns. You also should clean the rollers, and clean and wax the table. Quick tip: Taking a lot of shallow cuts accelerates wear, so take heavier cuts. A portable planer with sharp knives can remove at least $\frac{1}{16}$ in. per pass on all but the hardest and widest boards.

—John White is a former shop manager for Fine Woodworking.



Planer feed rate is affected by three components: The knives, rollers, and bed work together to feed wood through. A problem with any of the three can slow the feed rate.



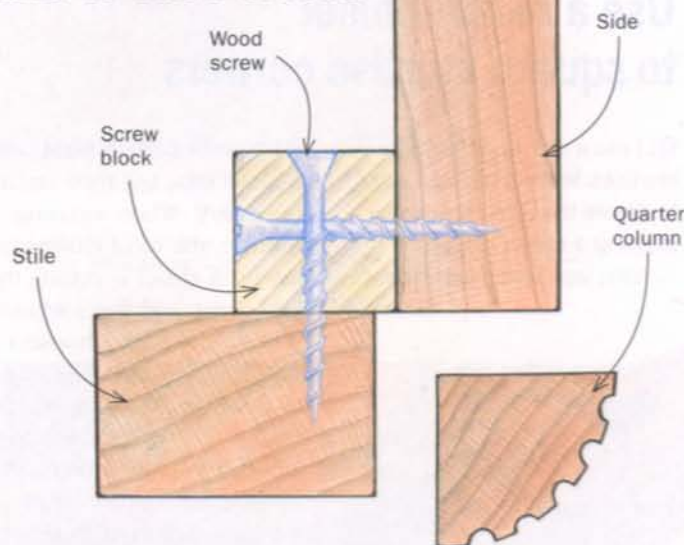
Q: I like Jeff Headley's technique for making quarter columns ("How to Add Quarter Columns to Your Furniture," *FWW* #211). Can it be used on a piece of furniture, like a grandfather clock, that doesn't have rails?

—GARY LEACH,
Bloomington, Ind.

Adding quarter columns to case clocks

A: QUARTER COLUMNS CAN BE ADDED to areas without rails, such as the waist and base of a tall case clock. The column still needs a notch, but glue blocks replace the rails. First use screw blocks to align the stiles with the sides, forming the notch. Use one at the top and another at the bottom. On long sections such as the waist of a tall clock, screw a third block in the middle. Now fill in the space with a series of glue blocks. After the glue sets, replace the screw blocks with glue blocks.

—Jeff Headley is the owner of Mack Headley and Sons, period furniture makers near Winchester, Va.



NO RAILS? NO PROBLEM

The stile and case side can form a notch for the quarter column. But instead of rails, the notch is supported by glue blocks. Put screws in some of the blocks to keep the case parts aligned. If the screws bother you, replace those blocks later with glue blocks.

Operate 3-phase woodworking machines from single-phase!



- Immediate delivery
- Two year warranty
- True 3-phase output
- Whisper quiet operation
- No-charge tech support, 24-7
- Regulated output for CNC Machines
- The most capacity at the least cost, guaranteed!
- Protect your investment - Insist on PhaseMaster®
- Visit us today at www.kayind.com & IWF Booth #7118

NEW!
Turn-on 3-phase
with wireless
remote.



Kay Industries
PHASEMASTER®
Rotary Phase Converters

General Offices
604 N. Hill St.
South Bend, IN 46617
800-348-5257
574-289-5932 (fax)

Western Region
4127 Bay St. #6
Fremont, CA 94538
510-656-8766
510-657-7283 (fax)

The World Leader in Single to Three-Phase Power Conversion

READER SERVICE NO. 9

Finest Quality Reproduction Brass and Iron Hardware



Since 1932, Ball and Ball has been manufacturing the finest quality antique reproduction furniture hardware, builders' hardware, lighting fixtures, and fireplace accessories available. Call for our 108-page catalog, available for \$7.00. (Cost refunded on first order.) Check us out on the web at our new site, www.ballandball.com.



1.800.257.3711 | EXTON, PA | BALLANDBALL.COM

READER SERVICE NO. 34

WoodRat®



A stack of classic drawers properly dovetailed with through dovetails for the backs and half-blinds for the fronts, with both tails and pins cut in one pass so that it's very quick and there's no chisel work.

Feed the sides by hand to cut the grooves for the bottoms and, if needed, thickness the boards to fit the grooves. Finish by drilling neat holes for each drawer. All this happens in such an easy work-flow that the pleasure you have in making the piece is only matched by the delight of the one who puts it to good use.

See the Movie
go to www.woodrat.com

READER SERVICE NO. 78



Season after season, year after year, generation after generation, our National Forests that give us beauty to behold and places to play also provide clean water to drink, clean air to breathe, wood for our homes, and a place to live.

But millions of acres of our National Forests have been lost to insects, disease, and devastating fires. Many areas need to be replanted. And soon.

Now the Arbor Day Foundation asks for your help in replanting our National Forests. So that seasons from now, and generations from now, we will still have forests to enjoy...



...and a place to live.

Visit arborday.org.

See what we're doing. See how you can help.

 **Arbor Day Foundation**
Nebraska City, Nebraska 68410

Woodworker's Supply

If you are in a woodworking business... this could be the most valuable tool in your office™.

Please call 1-800-321-9841 for your 800 page catalog.
Mention code *fwwe10*

FREE to woodworking businesses.

visit us at pro.woodworker.com/fwwe10

READER SERVICE NO. 73

Go online for product information

Find our advertisers' web sites quickly and easily on our online Advertiser Index at

www.finewoodworking.com

Fine
WoodWorking

Inside Passage School of Fine Woodworking

founded on the teachings of **James Krenov** & Robert Van Norman

One & Six Week Artisan Programs
Nine Month Craftsman Program

1.877.943.9663

www.insidepassage.ca

READER SERVICE NO. 2

CORRADI®

GOLD

PRECISION RASPS
made in Italy

- TRULY - leave NO scratches!
- very aggressive; very smooth
- cut all the way to the tip and edges

Visit www.corradishop.com

READER SERVICE NO. 60

MORE INNOVATION FROM LAGUNA

Sliding & Router Table

European tablesaws always have a sliding table. Our new Sliding Table attachment will turn almost all American-style cabinet saws into a European-style panelsaw. On the other side of the saw, we now offer a cast iron tabletop router table conveniently built into your tablesaw.



Pro Panelsaws

Our new Pro Series Sliding Panelsaws feature sliding tables from 4' to 9' capacity with two motors.

Call today for more information.

THRIVING ON INNOVATION
LAGUNA TOOLS
17101 Murphy Avenue, Irvine, CA, 92614

www.lagunatools.com

Se Habla Español
800.234.1976
949.474.1200

READER SERVICE NO. 79

Applied fretwork adds color and texture

USE THIS INNOVATIVE TECHNIQUE TO DRAW ATTENTION TO OVERLOOKED SPACES

BY TIMOTHY COLEMAN



I am fascinated with patterns. I see them everywhere—in nature, on fabrics, on buildings, on playing cards—and I am always looking for ways to use them in my furniture to create surfaces that have depth and texture. One way I achieve this is to use my scrollsaw to cut fretwork-like patterns in veneer and apply them to table aprons. This technique produces a surprising amount of depth and shadow using a minimal amount of thickness. I also use a contrasting wood underneath, adding even more interest and flair.

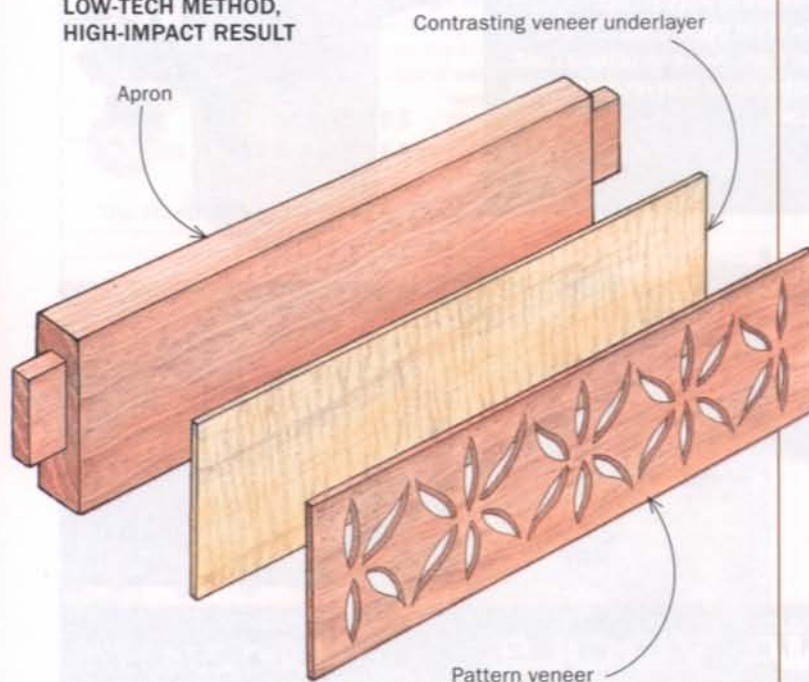
The materials and tools involved are few and simple. I begin with veneer resawn to $\frac{1}{16}$ in. thick on the bandsaw (you also could lay up sheets of commercial veneer to get the right thickness). I use a handheld fretsaw or a scrollsaw to cut the patterns, and follow with a knife, small files, and sanding sticks to clean up after cutting. Pressing the underlayer of veneer and the fretwork pattern onto the apron involves MDF cauls and hand clamps. This is low-tech woodworking at its finest.

Where the contrast comes from

For the best effect, you want the surface under the pattern veneer to be a contrasting wood. I typically use two layers of veneer (an underlayer and the pattern) to create the contrast. However, you can eliminate the underlayer of veneer and apply the pattern directly to the apron if the apron wood is a contrasting color.

For stability, you should orient the grain of the veneer(s) with the grain of the apron. Using a thick apron (1 in.) will eliminate the need for a

LOW-TECH METHOD, HIGH-IMPACT RESULT



Make the fretwork

RESAW THICK VENEER

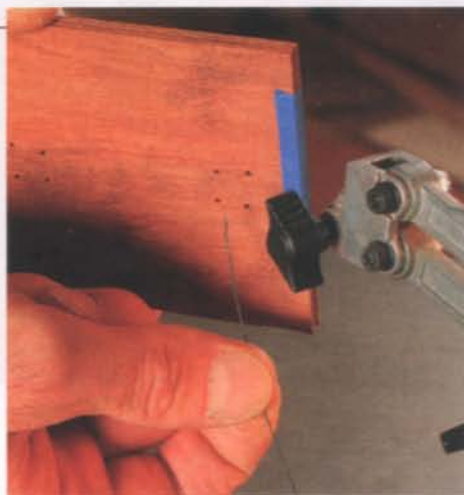


Veneers should be just over $\frac{1}{16}$ in. thick. Resaw both the underlayer and pattern veneers (left). Clean up the material with a cabinet scraper and sandpaper, holding each piece in place with double-stick tape (above).

CUT AWAY THE WASTE



Use a stencil. Cut the pattern into card stock and trace it on the veneer. Make the veneer (and the pattern) oversize to allow the veneer to be trimmed after it's applied to the apron.



Make the cutouts. Drill holes through the cutout areas to make way for the scrollsaw blade. Cut slowly and carefully on the line. To create a repetitive pattern on multiple pieces, tape the layers of veneer together, and cut them all at once.

backer veneer, which is usually applied to prevent a veneered panel from warping. If the apron you're using is $\frac{3}{4}$ in. thick or under, it couldn't hurt to add the backer. One other note: I cut all the joinery in the apron before applying the pattern.

Thick veneer works best

For this technique, the pattern veneer should be $\frac{1}{16}$ in. thick to emphasize the layered effect and create a strong shadow. The thick veneer is also easier to cut with the scrollsaw.

You also could glue together multiple layers of thin veneer to create thicker material. Some woodworkers would recommend orienting the plies cross-grain for stability. But I keep the grain running in the same direction and have had success. When glued and pressed between pieces of $\frac{3}{4}$ -in.-thick MDF, the assembly comes out quite flat. Cut the veneer slightly wider and longer than the exposed face of the apron. You'll trim it flush after it's applied to the apron.

Lay out the pattern

For some people, patterns are not always easy to see, but you just need to look around; they are everywhere. Wonderful

CLEAN UP



Fine cuts need fine tools. Clean up the sawcuts in each pattern using a knife and needle files. Coleman likes to bevel the edges of the cutouts with the knife and do the final smoothing with fine needle files.

Assemble the veneers

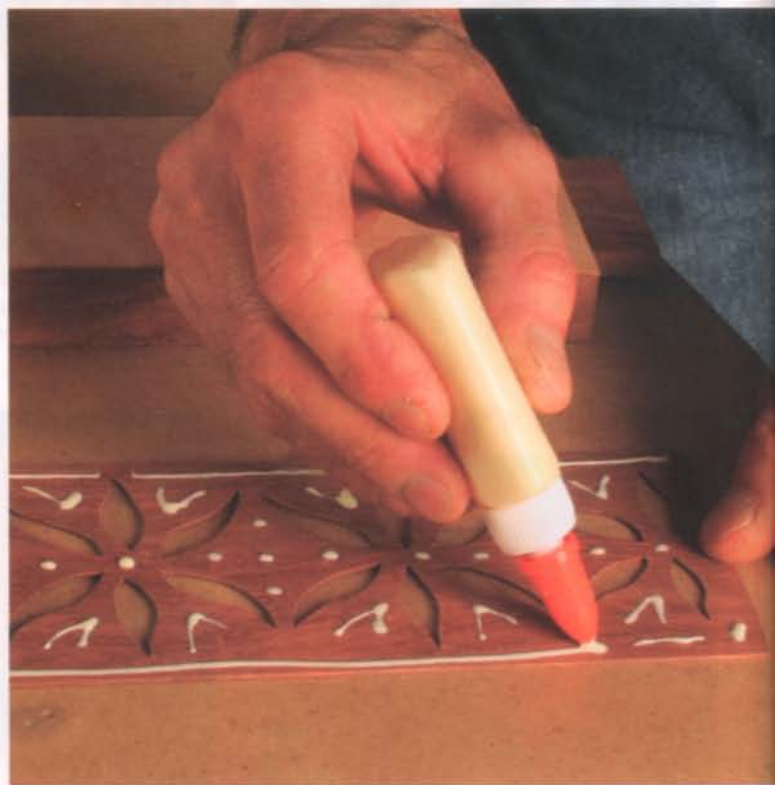
CONTRASTING LAYER FIRST



Glue and clamp the underlayer to the apron. Apply an even layer of glue to the underlayer veneer and the apron. Use MDF cauls and lots of clamps to apply even pressure across the surface. Wrapping the top caul in newspaper prevents the caul from sticking to the veneer.



NOW GLUE ON THE PATTERN



patterns can be manmade, such as those seen in fabrics or in architecture, or natural, like leaves or plants. If you need inspiration, check out *The Grammar of Ornament* by Owen Jones (The Ivy Press Limited, 2001; available at Amazon.com). If you're doing this for the first time, I would suggest a simple pattern that does not have any delicate or thin elements that could break easily.

If you are using a repetitive pattern—one that will appear more than once on a piece, which often happens on table aprons—draw it on card stock, cut it out with an X-Acto knife, and use the card as a stencil on the veneer. Sometimes I make a scrollsawn sample of the pattern as practice, and this can serve the same purpose as the paper cutout. If the pattern is not repetitive, I draw it directly on the veneer, or use graphite paper to transfer it from my sketchbook to the veneer.

The right blade ensures clean cuts

I have used a fretsaw and a homemade scrollsaw to cut patterns, but an electric scrollsaw is fast and easy.

The key to a good cut is using the right blade. When cutting individual patterns, I use a fine, 28-tpi skip-tooth blade; for stacked cuts, I use a coarser 20-tpi blade. The skip-tooth arrangement helps clear the chips from the thicker workpiece.

I aim to saw the pattern right on the line, but any deviations

Don't be sloppy here. Because it will be hard to clean up squeeze-out on the interior of the pattern, apply glue so the squeeze-out occurs on the outside. Place little dabs on interior elements of the pattern, and finish with a heavier coat around the perimeter (left). Use a small paintbrush to spread the glue (below).



Tape and clamp. Put the pattern veneer on the apron and tape it in place so it won't move when it's clamped up (above). Use cauls to protect the pattern and plenty of clamps to spread pressure evenly across the surface (right).



can be cleaned up afterward using a carving knife and fine files.

Use care when gluing the pattern to the substrate

Take a deep breath and approach this step carefully. I use Titebond II as the adhesive or Titebond Extend for a bit longer open time. Before applying the underlayer of veneer, sand the apron surface smooth.

I use a vacuum veneer press for much of my veneer work, but clamps and cauls work fine for a small surface. Apply a uniform coat of glue on the underlayer veneer, place it on the apron, and put the sandwich between two 3/4-in.-thick MDF cauls. After the glue dries, lightly sand the underlayer, then glue the pattern veneer to the apron. Apply glue sparingly, then lay the pattern veneer *carefully* onto the apron, using blue tape to keep it in place. Put the sandwich between the cauls and clamp it up.

Once the assembly comes out of the clamps, trim the veneer layers flush to the apron, and refine the surface with a light scraping and sanding with P220- and P320-grit paper.

When applying a finish, put on light coats to prevent pooling inside the cutouts. To reach tight spots, use a fine, narrow brush.

Tim Coleman makes furniture in western Massachusetts.

Trim everything flush



Scrape the top and bottom. Coleman uses a cabinet scraper to bring the veneer edges flush with the apron edges (above), and a sharp chisel to trim the ends of the veneer (right).



6 finishing fixes

A PRO SHARES HIS GO-TO TOOLS AND TECHNIQUES

BY MICHAEL MILLER

Some people enjoy finishing. A few might even prefer finishing furniture to building it. For the two of you who just said, "That's me!"—you're reading the wrong article. For most of us, finishing is a necessary evil: We need a great finish to bring out the best in our best, but we don't love the process and we dread a mistake. I've made more than my share of mistakes through the years, and I have picked up a few tips and tricks that will help you keep your sanity when the inevitable happens. I'll go from glue-up to touch-up, and by the end I hope you'll share my belief that everything (well, almost) is fixable, and you'll be able to approach your finishing with less fear and more fun. I know these tips will prove as useful to you as they have to me.

Michael Miller is a professional finisher near Nashville, Tenn.



Repair, don't replace

Sometimes mistakes happen before you even begin finishing, but with the right repairs only you will know what happened. It's heartbreaking to drop a furniture component and see a piece crack or break off, but sometimes the chemical companies smile on us and develop the perfect product for a specific problem.

One such wonder is cyanoacrylate glue, which you probably know as "Super Glue." To repair a crack or split, simply squeeze a conservative amount of glue onto one of the pieces, push the two parts together, and spray on an activator. Also known as an accelerator, this catalyst comes in a pump bottle or an aerosol and speeds up the glue's setting. Wait a few seconds (the cure time will be different depending on the viscosity of the glue), and the pieces will be bonded. Unlike yellow glue, cyanoacrylate dries clear and very hard, so you can sand off the excess right away and it won't show under a clear finish. However, you'll need to dye or stain the piece before using this type of glue.

If you are dealing with a small piece, you can avoid getting glue on your skin by using a blunt but pointed tool as a clamp while you spray on the accelerator. This method also works on finished pieces, but use extreme care with the glue, because you have to remove all the excess when you're finished and you don't want to have to apply more finish because of the repair.



A super glue. Cyanoacrylate glue comes in different viscosities: Thin gets down into cracks, thick is good for vertical surfaces, and medium works well when gluing two parts where the glue can be applied to a horizontal surface, such as gluing cope-and-stick trim back on (above). While holding the two glued parts together (left), spray on the activator, which cures the glue instantly.

Got gaps? Make some filler

Sometimes your joinery skills come back to haunt you with embarrassing gaps in tabletops or carcasses. Even if you can clamp the gap closed, glue is unlikely to hold it. No problem, just fill it. Here's a simple recipe for the best sandable filler known to man. Collect fine sanding dust from the same wood as the piece you're repairing. Create a slurry using the sanding dust and a small amount of a fast-drying finish such as lacquer or dewaxed shellac. Simply force it into the joint as you would any other filler. The advantages to using a finish to make the filler (instead of the traditional choice of glue) are twofold: The paste dries faster and harder than a glue-based one; and it contains the same combination of materials as the final product—finish and wood—so it's virtually invisible when used under a clear finish.



Shopmade filler. Save sanding dust from your project and mix it with either lacquer or shellac to form a stiff filler.



Fill the gap. Use a putty knife to force the filler into the open joint. The color difference will disappear when the filler dries and finish is applied.

Removing sanding marks and glue stain



Poor sanding revealed. An oil-based stain will reveal cross-grain scratches such as those on this frame.



Re-sand while wet. While the finish is still wet, sand the wood with the last grit you used (left) until all the cross-grain scratches are removed. Wipe more stain onto the bare wood (above) and blend it into the surrounding area.

Poor sanding is the culprit behind a lot of poor finishes. Two main problems are swirl marks (from an orbital sander whose paper hasn't been changed frequently enough) and cross-grain scratches. Either problem may hide until a stain or a clear finish is applied. Don't panic. If you're using an oil-based stain or clear coat, sand with the grain while the finish is still wet, using the last grit you used. Sand until the scratches or swirl marks are gone. Then reapply the stain or finish and you should have no blending issues. If you're using a faster-drying finish, like lacquer or shellac, wait until the coat has dried, sand, and then reapply.

Another surface-preparation problem is dried glue, which is very easy to miss, especially on lighter woods. If you've missed some, use the same repair as you would on swirl marks. However, there is a great new product on the market to prevent this from happening. Franklin International's Titebond II Fluorescent Wood Glue contains a dye that shows up under a black light so that you can find every last trace of it during cleanup and sanding.



Try fluorescent glue. A black light will reveal any traces left on the surface.

Shave away drips and runs

Don't rush your finishing. One of the most common mistakes is applying too much finish too fast, causing drips and runs. Then when you try to sand away the problem, you usually sand through the finish in the areas surrounding the drip or run. Meet your new best friend, the single-edged razor blade. It is, without a doubt, the most-used tool in my repair kit. For a drip or run, I use it as a miniature cabinet scraper. Just hold it between your thumbs and forefingers, flex it a little, and shave down the spot until it's level and glassy smooth.

There are several benefits to using a razor blade: Unlike sandpaper, which conceals the work area, a razor lets you see how much finish you are removing. The flex of the blade allows you to concentrate on the area you want to remove without disturbing the good finish surrounding it. Finally, a razor leaves a smooth surface that blends in with the next coat.



Drip tip. If you drip some finish onto a partially cured surface, don't try to wipe it off or blend it in. Instead, let it dry (above). Then use a single-edge razor blade like a cabinet scraper to bring the drip level with the surrounding surface.



Touch-up for sand-through

Coloring pens.

Blendal sticks come in many tones and can be used to touch up areas where you have sanded through the finish (right). Eyeliner pencils can add color to small areas (far right).



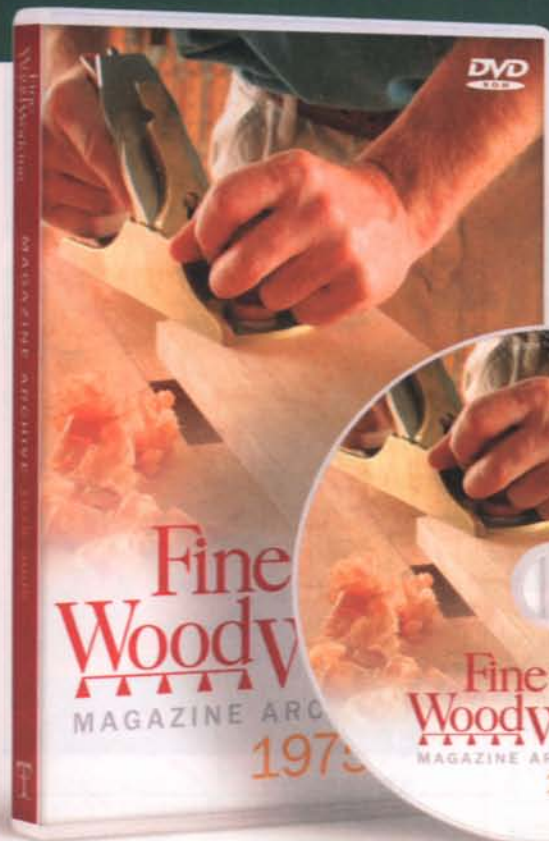
When sanding an intermediate coat of finish, it's very easy to sand through the finish on corners and edges if you're not careful—and sometimes even if you are. If you've dyed or stained the wood, you now have the problem of matching the bare wood to the surrounding color. I do this with a couple of products.

My first choice is Mohawk's Blendal sticks. Similar in shape to crayons, they are a soft wax blended with aniline dye as a coloring agent. You use the stick just like a crayon and lightly rub the surface with your finger to blend colors. These work great on edges, corners,

and any other areas that need spot color adjustments. Don't leave the color too thick or it could invite adhesion problems. Instead, layer color and coats of lacquer or shellac until you've reached the required shade.

When Blendals aren't available, head to the drug store's makeup department (yes, guys, I said makeup) and sort through the eyeliner and lip liners. They come in quite a few shades that match many finishes, and in the hands of a good finisher, they are like magic wands. Again, be careful not to apply too thick a layer.

Every woodworker's dream resource in one invaluable little package



Save hundreds of dollars! Get 208 issues in one handy place.

Our new Archive Collection DVD-ROM gives you quick computer access to nearly every article, section, department and ad, reproduced in its entirety.

**HUGE
savings**

Expertise you can't duplicate

- 208 issues beginning with issue #1
- Thousands of ideas and projects
- Pages, words and photos exactly as printed
- Crisp, clear on-screen images

Easy to browse

- Flip through page by page, with a click
- View in thumbnails to spot covers and images

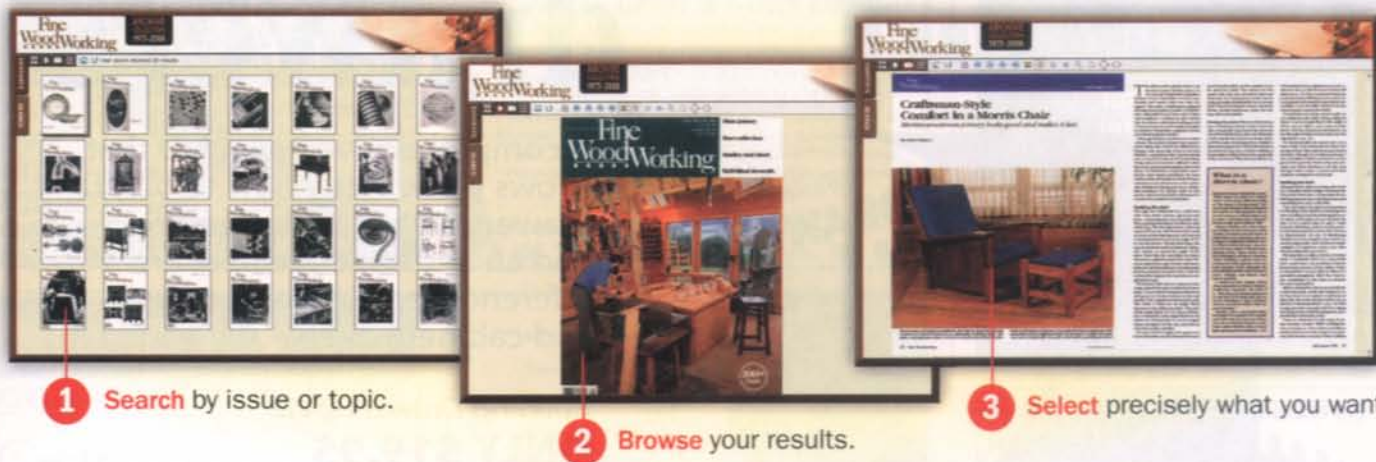
User friendly

- Print individual pages or spreads
- Compatible with your PC or MAC

Product #011303

**The most inspiring collection of woodworking ideas
since the Morris Chair was created.**

Easy to browse. Easy to love!



Order today. Only \$149.95

Call 800-888-8286 mention offer: MW80041 or visit FineWoodworking.com/2009

PAST PURCHASERS: UPGRADE NOW If you purchased last year's version of the archive and would like to purchase an update, please call customer service toll free at: 866-242-4297, M-F, 9:00-5:00 EST.

Plus shipping and handling. Payable in U.S. funds.

 **The Taunton Press**
Inspiration for hands-on living®

Filling holes after finishing

To make repairs where the finish is already in place, I often use wax sticks. They come in many colors, making it easy to match the color of any finish. For small voids such as nail holes, simply rub the stick back and forth until the hole is filled and then wipe off the excess with a cloth.

For larger holes, cut a plug from the end of a stick and knead it until pliable. Next, press the lump of wax into the void, pushing it from side to side to ensure good adhesion. Now, return to your razor blade and start shaving away the excess until the wax is just above the surrounding surface. Switch to an old credit card or hotel room key card and scrape away the remaining surplus. Although slower than the razor blade, this won't damage the surrounding finish.

Give the wax a few minutes to harden and then, using a cloth wrapped around a cork-faced block, lightly buff the area to remove any wax from the adjacent wood and to bring up the shine. Wax sticks are great fillers but they are soft, limiting their use on high-traffic surfaces like tabletops.



1



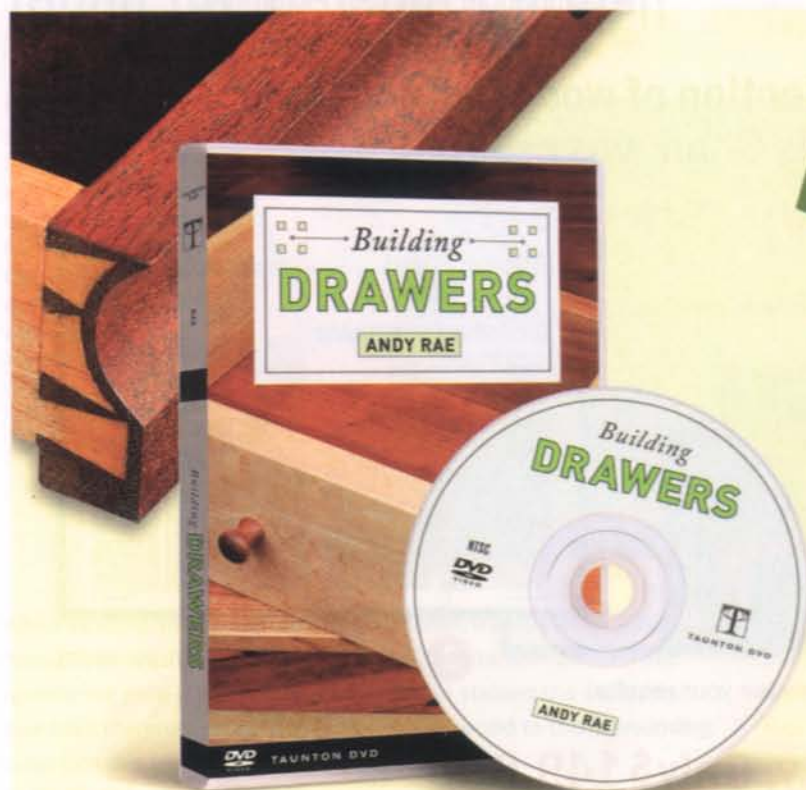
2

Fill and smooth.

Colored wax sticks can be used to fill knot and nail holes after a finish has been applied (1). Use a razor blade to shave away the bulk of the surplus plug of wax (2). When the plug is almost level, switch to a credit card to bring it flush with the surface. Then wrap a cloth around a felt or cork-faced block and buff the plug and the surface to an even shine (3).



3



Product #061057



The Taunton Press

Learn how a pro builds *beautiful* drawers

A comprehensive new DVD that shows you exactly how to build drawers with speed, precision and an aesthetic touch. A great reference for trim carpenters and cabinetmakers.

Building Drawers DVD
ONLY \$19.95

Plus shipping and handling. Payable in U.S. funds.

Order now!

Call toll free 800-888-8286, offer code: MW800043

Go to FineWoodworking.com/drawers

Clamps 4 feet with only 1 clamp at each end! Good caul, Duff!



BOWCLAMP
"good caul"

973-395-1588 bowclamp.com

**Banner Hill School
Of Fine Woodworking**

Woodworking classes for all skill levels.

For further information please contact us at:
Banner Hill School of Fine Woodworking
P.O. Box 607 ~ Windham, NY 12496
(518) 929-7821
www.BannerHillLLC.com

Diefenbacher Tools



800 • 326 • 5316
Free Hand Tool Catalog
www.diefenbacher.com

NORTHWEST SCHOOL OF WOODEN BOAT BUILDING

Now offering a **COMPOSITE wooden boat building**

Port Hadlock, WA
360-385-4948
VISIT OUR WEBSITE
www.nwboatschool.org

Associates Degree in Occupational studies*
Waterfront campus
*Accredited School, ACCSCT

Use The Ultimate Wood Screw!



See our site for free catalog

SCREW PRODUCTS INC.
screw-products.com

NORTH-BENNET-STREET-SCHOOL
AN EDUCATION IN CRAFTSMANSHIP

Craft your own career

in: • Cabinet & Furniture Making • Carpentry • Preservation Carpentry • Piano Technology • Violin Making & Repair

Financial aid for qualified students. Accredited member ACCSCT. Non-accredited workshops 1 week to 3 months also offered.

Boston • (617) 227-0155 • www.nbss.org

Peter Sefton Furniture School

A new career in a year? fast-track your furniture making skills in England

"Learn the art of fine furniture design and the skills of custom English furniture making on our intensive 9-month course. We're the only private Furniture School in the UK dedicated solely to teaching this specialist craft."

Find out more at www.peterseftonfurnitureschool.com

THE NORTHWEST WOODWORKING STUDIO

A School for Woodworkers
With Gary Rogowski



Mastery Programs
Classes for All Skill Levels
Portland, Oregon 503.284.1644
www.NorthwestWoodworking.com

COOK WOODS cookwoods.com
TOLL FREE 877.672.5275

180+ SPECIES OF EXOTIC AND DOMESTIC INSTRUMENT SETS, LUMBER AND BLOCKS

NEW DEULEN JOINTER/PLANER SHARPENER



360-573-0305
ExoticWoodVeneerPlus.com

Groff & Groff Lumber
Exceptionally Fine Furniture & Instrument Grade Woods

PREMIUM WALNUT, CHERRY, CURLY CHERRY, BIRDSEYE AND TIGER MAPLE

Sawmill Direct • Slabs to 40" Wide • 75+ Unusual Native & Imported Species • Matching Flitches • Burls & Turning Blocks
Order 75 Domestic and Imported Species 4/4 - 16/4 • Custom Flooring & Wainscoting • No Order Too Large or Too Small
858 Scotland Road, Quarryville, PA 17566
www.groffslumber.com
1-800-342-0001 • 717-284-0001 • Fax 717-284-2400
National & International Shipping

"We specialize in the finest examples of domestic and exotic veneers as well as burls, crotches and highly figured woods."



berkshire veneer
COMPANY INC.

Selling The World's Finest Veneers Isn't Our Job, It's Our Pleasure.

29 LOCUST HILL ROAD | GREAT BARRINGTON, MA 01230 | info@berkshireveneer.com
TOLL FREE: 1-877-836-3379 | FAX: 413-644-9414

TONS OF FIGURE

Muterspaw Lumber
937-572-WOOD
www.crlumber.com

\$ for the fewest figures \$

WWW.MAKERS-MARKS.CO.UK

TRADITIONAL BRONZE, BRASS & STAINLESS STEEL LABELS
NO MINIMUM ORDER

Hands on Instruction for All Skill Levels
Mario Rodriguez - Alan Turner

For more info on Courses: 215.849.5174
Philadelphia Furniture Workshop
PhiladelphiaFurnitureWorkshop.com

lmi.com

- Fine woods and parts for instrument makers
- Customizable Guitar Kits
- Specialty tools and finishing supplies found nowhere else.
- Helpful Staff...Quick Delivery

800-477-4437
LUTHIERS MERCANTILE INTERNATIONAL, INC.

GUILLEMOT KAYAKS
WOODEN BOAT PLANS BY NICK SCHADE



WWW.KAYAKPLANS.COM/F

Turn logs into lumber.



8 models to choose from

Live life to the MAX.
Wood-Mizer 1.800.553.0182
www.SawBoards.com

A Woodworking Vacation in Western Montana



Chidwick
School of Fine Woodworking
ChidwickSchool.com

Lumber • Veneer • Turning Stock

Your Source for Wood



WOODWORKERS Source

www.101woods.com

800.423.2450

VISA **Oregon Black Walnut** MasterCard

GOBY WALNUT PRODUCTS

Wide lumber - 4/4 through 16/4
Turning - Carving Stock
Gunstocks - Veneer
Instrument Grade Lumber
No Minimum Order

5315 NW St. Helens Rd.
Portland, OR 97120

(503)-477-6744 Web Site: www.gobywalnut.com

New England's Largest Selection
of Unique Lumber and Burls

Specializing in Slabs up to 7' wide



Berkshire Products, Inc.
884 Ashley Falls Rd, Sheffield, MA
413-229-7919
www.BerkshireProducts.com



**THE FURNITURE INSTITUTE
of MASSACHUSETTS**

Study with *Fine Woodworking* author
Philip C. Lowe • Classes range from 1 day
to 1 week to 2 and 3 year mastery programs.
• See new class schedule on:

(978) 922-0615 www.furnituremakingclasses.com

Cabinet Hardware, Glass Mosaic Tile, Ceramic Sink
* High Quality Stainless Steel Bar Pull, Bin Pull and Cabinet Knob



Contempo Living Inc
1220 Santa Anita Ave Unit A, South El Monte CA 91733
Order Online or Call 626-450-0560
www.contempolivinginc.com

Custom Dovetail Drawers

by Eagle Woodworking



Trust us to create and deliver the finest quality
custom dovetail drawers.

Call: 800-628-4849 EagleDovetailDrawers.com

See the Pen Wizard on You Tube!

The **Beall PEN WIZARD**

Raises the art of pen turning to a new level



THE BEALL TOOL CO.
541 Swans Road N.E. Newark Ohio 43066
1-800-331-4718 www.bealltool.com Dept FW

N CUSTOM ROUTER BITS,
SHAPER CUTTERS,
MOLDER KNIVES



custom ground
made to order

www.routerbitsonline.com 800.821.8378

HARDWOOD LUMBER

Burls
Blocks
Veneers
Decking
Flooring
Plywood
Millwork
Mouldings

**MORE THAN
100
SPECIES!**

ASK FOR
FREE
CATALOG!

M.L. CONDON COMPANY Inc.
250 Ferris Avenue, White Plains, NY 10603
Phone: (914) 946-4111 • Fax: (914) 946-3779
www.condonlumber.net



Furnituremaking Workshops

Jeff Miller, director

Small, hands-on classes
Masterful instruction

1774 W. Lunt Avenue
Chicago, IL 60626
773.761.3311
www.furnituremaking.com

Dovetail - Tenon - Carcass Saws

Adria



**BEST OVERALL
PRODUCT**

FWW #183
Page 64

www.AdriaTools.com

ALDERFER LUMBER Co.

PA's Finest Hardwoods

LIVE EDGE SLABS 570-539-2063
Figured and Curly Woods Mt. Pleasant Mills, PA
NO MINIMUM ORDERS www.alderferlumber.com

When Only The Finest Veneer Will Do...



Certainly Wood

Phone: 716-655-0206 Fax: 716-655-3446
www.certainlywood.com

SMALL ADS YIELD BIG RETURNS

for advertisers featured in the
Woodworkers Mart and Classified
sections of *Fine Woodworking*.
For more information call
800-309-8954

Keep your *Fine Woodworking* back issues looking brand new.



Store your treasured copies of *Fine Woodworking* in slipcases for easy reference again and again! Bound in dark blue and embossed in gold, each case holds more than a year's worth of *Fine Woodworking*. Only \$8.95 (\$24.95 for 3, \$49.95 for 6). Plus shipping and handling. Payable in U.S. funds.

To place an order using your credit card, call **1-800-888-8286**. Outside the U.S. and Canada call 1-203-426-8171.

The Chicago School of Violin Making
welcomes inquiries into its three-year
full-time program in violin making and repair.



Instruction is based on traditional hand methods and
emphasizes the achievement of quality craftsmanship.

3636 OAKTON STREET • SKOKIE, ILLINOIS 60076 • TEL 847-673-9545
FAX 847-673-9546 • www.csvm.org • info@csvm.org

Approved by Illinois State Board of Education

Gemini CARVING DUPLICATOR
"The Professional's Woodworking Secret"

- FAST
- RUGGED
- ACCURATE

New Video
Now Online

ALLRed
P.O. Box 331
Elbridge, NY 13500
Tel: 315.252.8502

VISIT OUR WEBSITE
www.wood-carver.com
service@wood-carver.com
315.252.2559

FAST DOVETAILS

Set up in under 5 minutes.
Order your Keller Dovetail System now!
(800) 995-2456

Made in the USA since 1976 • DVD/Video \$8.95 + \$2 p/h

www.fastdovetails.com

INDEX TO ADVERTISERS

Use reader service card - inside back cover.

For quick access to their websites, go to **ADVERTISER INDEX** at www.finewoodworking.com

Reader Service No.	ADVERTISER, page #	Reader Service No.	ADVERTISER, page #	Reader Service No.	ADVERTISER, page #	Reader Service No.	ADVERTISER, page #
18	Adria Toolworks, Inc., p. 94	22	Cook Woods, p. 93	12	JDS Company, p. 17	51	Philadelphia Furniture Workshop, p. 93
	Akeda Jig, p. 17	60	Corradi Gold, p. 83	8	The Japan Woodworker, p. 21	45	Powermatic, p. 13
	Alderfer Lumber Co., p. 94	39	Diefenbacher Tools, p. 93	9	Kay Industries, p. 82		Quality Vacuum Products, p. 21
5	Allred & Associates, Inc., p. 95	48	Eagle Woodworking, p. 94	35	Keller & Company, p. 95		RadarCarve.net, p. 9
34	Ball & Ball Reproduction Hardware, p. 82		Exotic Wood Veneer Plus, p. 93	33	Kreg Tool Company, p. 21	15	Red Hill Corporation, p. 11
59	Banner Hill School of Woodworking, p. 93	38	Felder Group USA, p. 23	56	Laguna Tools, p. 11		Router Bits Online, p. 94
67	The Beall Tool Co., p. 94		Fine Woodworking DVD Archives, p. 91	79	Laguna Tools, p. 83	64	RouterBits.com, p. 3
	Berea Hardwoods Co., p. 17		FineWoodworking.com, p. 22		Leigh Industries, p. 27		
63	Berkshire Products, p. 94	32	Forrest Manufacturing, p. 13	76	Lie-Nielsen Toolworks, p. 27	68	SawStop, p. 3
	Berkshire Veneer Co., p. 93	55	Furniture Institute of Massachusetts, p. 94	16	Lignomat, p. 27	20	Scherr's Cabinet & Doors, Inc., p. 23
57	Bosch Tools, p. 7		Furnituremaking Workshops, p. 94	40	Luthiers Mercantile Intl. Co., p. 93	14	Screw Products, p. 93
81	Bowclamp, p. 93	17	Goby Walnut Products, p. 94	37	M.L. Condon Company, p. 94	46	Titebond Wood Glue, p. 27
	Building Drawers DVD, p. 92	31	Gorilla Wood Glue, p. 9		Makers-Marks, p. 93		Vacuum Laminating Technology, p. 11
66	CMT USA, Inc., p. 23	61	Groff & Groff Lumber, p. 93	72	North Bennet Street School, p. 93	47	Whitechapel, Ltd., p. 9
70	C.R. Muterspaw Lumber, p. 93	3	Guillemot Kayaks, p. 93	29	NorthWest School of Wooden Boatbuilding, p. 93	26	Whiteside Machine Co., p. 17
28	CabParts, p. 13	7	Hartville Tool Woodworking, p. 23	30	Northwest Woodworking Studio, p. 93	19	Woodcraft Store, p. 99
	Center For Furniture Craftsmanship, p. 11	44	Hearne Hardwoods, Inc., p. 3	71	Oneida Air Systems, p. 2	25	Woodmaster Tools, p. 27
21	Certainly Wood, p. 94	75	Highland Woodworking, p. 9	42	Osborne Wood Products, p. 9	36	Wood-Mizer, p. 93
41	Chicago School of Violin Making, p. 95	2	Inside Passage School of Fine Woodworking, p. 83		Peter Sefton Furniture School, p. 93	78	Woodrat, p. 82
43	Chidwick School of Fine Woodworking, p. 93			6	Phase-A-Matic, Inc., p. 27	52	Woodworkers Source, p. 94
77	Connecticut Valley School of Woodworking, p. 3					74	Woodworker's Supply, p. 11
13	Contempo Living, p. 94					73	Woodworker's Supply, p. 83

CLASSIFIED

The Classified rate is \$9.50 per word, 15 word min. Orders must be prepaid. The WOOD & TOOL EXCHANGE is for private use by individuals only; the rate is \$15/line, min. 3 lines. FAX 203-426-3434, Ph. (866) 505-4687. For more information on advertising go to www.finewoodworking.com/classified Deadline for the Nov./Dec. issue is August 12, 2010.

Business Opportunities

WORKSPACE AVAILABLE FOR RENT in custom cabinetry shop. Spray booth, machinery included. Fort Greene, Brooklyn (718) 237-1619.

A UNIQUE WORK/LIVE PROPERTY for sale by owner on the coast in Mendocino County, California. www.woodshopforsale.com

Hand Tool

CRAFTSMANSTUDIO.COM Free Shipping over \$75 on 5000 professional quality hand tools. Sign-up for Newsletter Specials.

PETE NIEDERBERGER Used and Antique tools and parts. Special on 605 bedrock planes \$95 each. (415) 924-8403 or pniederber@aol.com Always buying!

BOB KAUNE-ANTIQUE & USED TOOLS. Since 1982. Hundreds of quality handtools. Stanley planes and parts. Visa/MC. www.antique-used-tools.com (360) 452-2292.

HIGHLANDWOODWORKING.COM, the world's largest selection of hand planes, plus thousands more fine hand tools.

Instruction

WHETSTONE SCHOOL OF LUTHERIE Learn to make acoustic guitars in beautiful Vermont. (802) 579-1661. whetstoneschool.com

LONG ISLAND SCHOOL of Classical Woodcarving & Woodworking. Lindenhurst, New York. www.web.me.com/walterc530 (631) 225-1666.

1:1 TEACHER-TO-STUDENT RATIO at fine woodworking school. NEW instructional woodworking DVDs now available. (519) 853-2027. www.passionforwood.com

THE SCHOOL AT ANNAPOLIS WOODWORKS, Davidsonville, MD. Turning, Carving, Furniture Making, etc. Weeklong and weekend classes for all skill levels. www.annapoliswoodworks.com (301) 922-0649.

BAMBOO FLY ROD MAKING CLASS. Professional shop setting. Call (530) 235-4058. www.hollowbuilt.com

WM PERRY STUDIO, TORONTO, fine woodworking classes. Individually tailored courses for private instruction and small-group seminars, in professional workshop setting. (416) 429-2323; www.wmperry.ca

COME TO LEARN IN SCOTLAND - The Chippendale International School of Furniture offers a 30-week intensive career program in Design, Making and Restoration. For further information phone: 011-44-1620-810680 or visit www.chippendale.co.uk

THE ACANTHUS WORKSHOP, LLC - Traditional woodworking education with lead instructor, Charles Bender, using conventional hand tools and modern machinery. Call (610) 970-5862 or visit www.acanthus.com

HANDS-ON COURSES in beautiful Maine. Beginner through advanced. Workshops, Twelve-week Intensive, Nine-month Comprehensive. Center for Furniture Craftsmanship (207) 594-5611, www.woodschool.org

PENLAND SCHOOL OF CRAFTS, in the spectacular North Carolina mountains, offers one-, two-, and eight-week workshops in woodworking and other media. (828) 765-2359; www.penland.org

Miscellaneous / Accessories

WOODSLICER.COM, resawing blade rated best-performing 1/2-in. bandsaw blade by *Fine Woodworking*. 800-241-6748.

ARTS/CRAFTS COMMUNITY --NC mountains near Penland School. Woodworking studios/galleries welcome! Green homes, forest trails, organic farm. www.highcove.com

Plans & Kits

FULL SIZE FURNITURE LAYOUTS Drawn by: Philip C. Lowe. Catalog \$3. (978) 922-0615. 116 Water Street, Beverly, MA 01915. www.furnituremakingclasses.com

Power Tools

LAMELLO BISCUIT JOINERS and Accessories/Parts/Repairs. Best prices, most knowledgeable. Call us for all your woodworking & solid surfacing needs. 800-789-2323. Select Machinery, Inc. www.selectmachineryinc.com

Wood

TIGER MAPLE, MAHOGANY, cherry, walnut, butternut, curly birch; plain and figured. Wide boards, matched sets, 4/4 to 24/4. 150-ft. minimum. (570) 724-1895. www.inionlumber.com

EISENBRAND EXOTIC Hardwoods. Over 100 species. Highest quality. Volume discounts. Brochure. 800-258-2587; eisenbrandhardwoods.com

APPALACHIAN HARDWOODS direct from sawmill. Quartersawn, flitches, crotch lumber. Herbine Hardwoods, Leesburg, VA. (703) 771-3067. www.herbinehardwood.com

FIGURED CLARO WALNUT slabs and planks, in dimensions suitable for small to large projects. CWD: 800-660-0203. www.woodnut.com

QUILTED, CURLY, SPALTED & buried maple, marbled, curly & crotch claro walnut, figured myrtlewood. Huge inventory of lumber, billets & blocks. 16,000 items photographed and priced. Visit our online store at www.nwtimber.net or call (800) 238-8036.

UN-STEAMED WALNUT, FIG. Cherry, Tiger Maple www.goodhopehardwoods.com

LONGLEAF HEART PINE (antique). Flooring-lumber-millwork. Red cedar lumber & paneling. Lee Yelton: (706) 541-1039.

SAWMILL DIRECT 100 species of exotics, turning, lumber, logs, slabs, musical instruments TROPICAL EXOTIC HARDWOODS OF LATIN AMERICA, LLC: Toll Free (888) 434-3031. www.anexotichardwood.com

QUALITY NORTHERN APPALACHIAN hardwood. Custom milling. Free delivery. Bundled, surfaced. Satisfaction guarantee. Niagara Lumber. 800-274-0397. www.niagaralumber.com

BIRD'S-EYE AND CURLY MAPLE, 4/4 to 12/4 lumber, flitches, turning squares and blocks. Black walnut, cherry/quartersawn, and curly oak lumber. Dunlap Woodcrafts, Chantilly, VA. (703) 631-5147.

LARGE CLARO WALNUT book-matched slabs, turning stock, raw and paper-backed veneer of burl and crotches. www.walnutwoods.net online store. Newton Woods. (559) 277-8456. Fresno, CA.

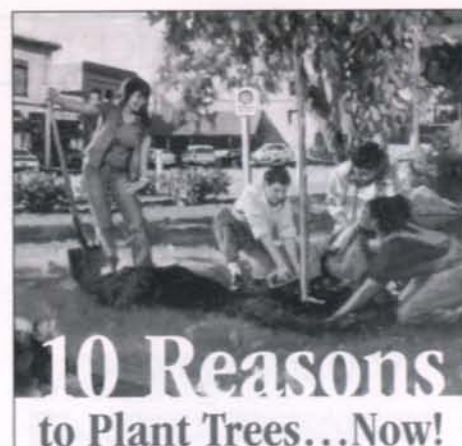
NORTH/CENTRAL VIRGINIA. Tiger maple, red cherry, quartersawn oak and sycamore, others. Matched sets, whole logs. Visit our new warehouse in Elkwood, VA off US 15/29. C.P. Johnson Lumber. (540) 825-1006, (540) 937-3059.

WOOD AND TOOL EXCHANGE

Limited to use by individuals only.

For Sale

Fine Woodworking various issues between 2-29; 30-199. Missing 1/2, 188. \$375. Woodsmith 24-185 in binders, \$300. Both plus shipping. Toronto area (905) 880-0316.



10 Reasons to Plant Trees...Now!

1. Trees conserve energy.
2. Trees help clear the air.
3. Trees bring songbirds close by.
4. Trees around your home can increase its value by up to 15% or more.
5. Trees help clean our rivers and streams.
6. Trees conserve energy in the winter.
7. Trees fight global warming.
8. Trees make your home and your neighborhood more beautiful.
9. When you plant trees you support Tree City USA where you live.
10. It's easy, and fun!

You will receive 10 free trees – Maples, Oaks, Pine, Spruce, Birch, Redbud, Dogwood, or other trees selected for your area. You'll also receive the Foundation's colorful bimonthly, *Arbor Day*, and The Tree Book. Your six- to twelve-inch trees are guaranteed to grow or they'll be replaced free of charge. Trees are shipped at the right time for planting in your area.

To receive your free trees, send a \$10 membership contribution to 10 Free Trees, Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, NE 68410, or join online at arborday.org.

Join now, and plant your Trees for America!

 **Arbor Day Foundation**
arborday.org

how they did it

Furniture by chainsaw

BY ANISSA KAPSALES

Howard Werner (see the back cover) wouldn't advise moving directly from cutting firewood to creating furniture with a chainsaw. He says it's his decades of experience working with the tool that allow him to safely create fluid, refined chairs, tables, and sculpture. Working with different chainsaw bodies and the sharpest blades, Werner moves deftly through a log, discovering the full design of each piece as it emerges. Once the initial carving is complete, Werner lets the piece dry for up to two years, and then refines it with more chainsaw work or, depending on the piece, a power plane, grinders, handplanes, and sandpaper.



The design stage



A level base. Werner spends a lot of time examining the log, envisioning the final piece before he decides where to make his cuts. After leveling the log, he can place a level against the side to mark a plumb line, ensuring that the first cut leaves the stump sitting squarely on the ground.



Marking out the seat. Chalk is easy to see and makes it easy to erase and start again. Werner uses his own body and a ruler to determine seat placement and symmetry, and lays out the outline of the seat on the stump.



how they did it continued

Shaping the seat



Cut from each side. With the tip of the blade, Werner draws the outline of the seat, following the chalk line (left). His experience allows him to use just the tip of the saw without it kicking back at him. Once the outline is cut, Werner cuts in deeper. He alternates from one side of the log to the other, plunging deeper each time until the cuts meet in the center. Working from both sides also helps keep things square and straight.



Level and refine. Once the large chunk of waste is removed from the seat, Werner uses a level and chalk to mark the high spots (center), and then goes back with the chainsaw (above) to even out the surface.

Cutting the base



Back to chalk lines. Almost as if it were a separate component, Werner starts the base only after he's finished forming the top of the seat. He again uses a ruler, level, and chalk to mark the layout.



Straight cuts define the legs. Flipping the piece over, Werner cradles it on the seat cutoff for stability, and makes straight cuts halfway through on each side to create the legs (center). To waste away material quickly in a place where two intersecting cuts won't take away a chunk, he makes multiple straight cuts, breaking off the thin sheets that are left and scraping the bottom clean with the chainsaw. Then, right side up, he cuts the final shape on the outside of the seat (right).



Pierced detail is last

Mark the square and cut straight through. With a firm grip, and engaging the bottom of the tip first, Werner pivots the saw into the cut and plunges straight through, repeating on all four sides until he can pull out the loose waste block.



WOODCRAFT®

For A Free Catalog Or To Find Your Local Woodcraft Store, Visit woodcraft.com Or Call 800-225-1153.

New Model FEIN MultiMaster Top Plus



With 40% more power than the competition and a soft grip handle, the new MultiMaster uses a broad assortment of accessory blades to handle hundreds of previously manual tasks. The MultiMaster doesn't rotate or orbit like other power tools. The secret? It oscillates - FAST!

- 250-Watt Variable Speed (11,000-20,000 OPM)
- QuickIn™ Quick-Action System For Tool-Free Accessory Change
- 40% More Power
- Dust Extraction System
- Soft Grip For Operator Comfort

*If individual accessories purchased separately.

**Includes
Over \$560*
In Accessories!**



10WW10P

QUALITY WOODWORKING TOOLS • SUPPLIES • ADVICE®

READER SERVICE NO. 19

Song of the Chainsaw

For many woodworkers, the craft's siren song is a whisper, coming from the throat of a handplane as long, aromatic shavings flutter to the workbench. For Howard Werner, the sweetest music is the roar of a well-oiled chainsaw, wielded outdoors while he's ankle-deep in sawdust. Werner's first carving tools were traditional ones, but when he was a student at Rochester Institute of Technology in the mid-1970s, Jon Brooks showed him how to carve with a chainsaw, and that was it for the mallet and gouge. Werner built his share of conventional

furniture, but eventually he sold his woodworking machines to concentrate on chainsawn work. He splits his time between similar outdoor setups



in upstate New York and Arizona: Each has a concrete pad with a high roof to keep him dry. He uses a forklift to move the logs, which can be 5 ft. or 6 ft. in diameter. Despite the scale, Werner works to close tolerances. He typically does full-scale drawings for each piece, making cardboard templates to guide the carving. He carves the logs green and leaves many pieces oversize by an inch or two, letting them dry for several years before carving the final surfaces.

—Jonathan
Binzen



Photos: Woody Packard (top two);
Howard Werner (bottom);
Anissa Kapsales (inset)

How They Did It Turn to p. 97 for a step-by-step look at how Werner turns trees into furniture.

Pro Portfolio To learn more about Werner's approach to woodworking and see a slide show of his work, go to FineWoodworking.com/extras.