

TAUNTON'S

Fine Woodworking

Tool Test: Router combo kits

December 2004

No. 173

Build a tilt-top table

The right way to sand wood

Fitting drawers

5 tips for better bandsawing

Impressive moldings with router bits

How to keep finishes fresh



\$7.99/Canada \$8.99



3 94115 56525 7

BEN'S BACK!

It's bigger and better than ever!



More cold, hard cash. It's your choice.

\$100



Purchase one of 21 qualifying products, and we will send you a \$100 rebate on the purchase of a second JET®, Powermatic®, or Performax® machine with a retail purchase price of \$399 or more.

OR

Receive a \$50 rebate for the purchase of:

A.) One of 11 Grant's Group of tools priced \$349.99 or below.
B.) The purchase of \$50 or more of JET, Powermatic, Performax or Wilton accessories.

\$50



Purchases must be made between September 1, 2004 and December 31, 2004 to qualify.
For all the promotional details ask your local distributor, or visit us at our website – www.wmhtoolgroup.com.

Look for the green tags...



JET POWERMATIC®

WMH TOOL GROUP, Inc.

READER SERVICE NO. 58

WANT THIS?



A clean, sharp hole every time. No chips, no splits, no errors. It takes skill and a sharp drill bit. And that takes the **Drill Doctor®** drill bit sharpener.

GET THIS.



- Restores bits to factory sharp
- Fast and easy to use
- Sharpens most bits—even split point
- Diamond sharpening wheel
- Powerful 20,000 rpm motor
- Sturdy carrying case available

Drill Doctor®
The Drill Bit Sharpener

**Work Smart.
Work Sharp.**

www.DrillDoctor.com • 1-888-MYDRILL • Available at Sears, Home Depot, Lowe's, woodworking catalogs, on-line, and wherever fine tools are sold.

READER SERVICE NO. 7

ACCUSQUARE
www.mulecab.com

ACCUSQUARE commercial quality Rip Fence fits Powermatic, Jet, Sears, Grizzly, and most other saws. Put life and **ACCURACY** back into your saw!

FACTORY DIRECT LIFETIME WARRANTY
Quality CNC machined steel
Accurate Aluminum extrusions
Simplicity of design ...

gives the **ACCUSQUARE** the **STRENGTH** to stand up to rugged everyday use & provide the **ACCURACY** you need!

RELIABILITY - ACCURACY - GUARANTEED

Dual Hairline cursor - Extra Wide Tapes - Pick your Target

www.mulecab.com TOLL FREE 1-877-684-7366
Email: accusquare@rogers.com

READER SERVICE NO. 164

We Manufacture and Stock

Moulding Knives

in HSS and Carbide

Next Day Delivery
Over 700 Patterns for Woodmaster, Belsaw, Williams & Hussey and more.

Custom Knives a Specialty
Log on to www.mouldingknives.com
Great Prices, Unsurpassed Quality
Fast Delivery

Toll Free: 1-866-499-8399 ext. 227

A complete product line of

minijet 3 & 2 Liter pressure tank

Whether you're a one man shop or a large company we have the right HVLP or RP (reduced pressure) VOC compliant spray equipment to suit your needs. Sata Technology is known worldwide as the leader in quality and performance.

SATA

Call 800-533-8016
www.satausa.com - prod@satausa.com
Distributed nationwide by Dan-Am Company

Top Quality Finishing Equipment

- HVLP
- RP (reduced pressure)
- ROB or Automatic
- Air Assist

Call 800-533-8016 for FREE industrial brochure and the name of your nearest dealer

Demonstrations available on inquiry, Call today

READER SERVICE NO. 137

Departments

- 6 Contributors
- 8 Letters
- 14 **Methods of Work**
Workbench extension lengthens clamping capacity; Shop-built sharpener; Clip-on light for router
- 22 **Notes & Comment**
Ancient lumber; Steel price hike affects tool prices
- 26 **Rules of Thumb**
Three ways to raise a panel
- 32 **Tools & Materials**
Ridgid's new contractor's saw; Highlights from the International Woodworking Fair
- 92 **Current Work**
A gallery of our readers' woodworking
- 100 **Questions & Answers**
A finish free of brush marks; Controlling plane-blade chatter; How can I bend ebony?
- 108 **Master Class**
Low-tech method for veneered columns
- 121 **Finish Line**
Keep your finish fresh



How to make drawers fit perfectly, p. 80



Carvings that personalize furniture, p. 86



Sanding basics, p. 40



On the Cover:
Contributing editor
Mario Rodriguez crafts
an elegant, Federal-style
tilt-top table.
See p. 72
Photo: Matt Berger

Articles

40 Sanding Basics

Combine power- and hand-sanding for good results with no wasted time

BY DAVID SORG

46 18th-Century Pipe Box Provides Elegant Storage

Simple construction makes this an easy project

BY LONNIE BIRD

50 TOOL TEST Router Combo Kits

A pair of bases with an interchangeable motor gets you two different machines for little more than the price of one

BY TOM BEGNAL

56 Built-Up Moldings

Construct impressive moldings with just a router and off-the-shelf wood

BY ALAN CHARNEY

60 Flattening Tabletops

Surface large slabs and panels without big machines

BY ROB HARE

65 Use a belt sander to finish the job

66 Five Tips for Better Bandsawing

No-hassle approach delivers smooth, straight cuts

BY MICHAEL FORTUNE

72 Tilt-Top Table

Elegant project builds hand-tool and machine skills

BY MARIO RODRIGUEZ

80 Fitting Drawers

You don't need a perfect drawer or case to get perfect results

BY PHILIP C. LOWE

84 Fitting problem drawers

86 Personalize Your Furniture

Three decorative carvings that are easy to do and require few tools

BY CHARLES SHACKLETON

ON OUR WEB SITE: Watch the author demonstrate his carving techniques



Flatten large slabs without big machines, p. 60



Router combo kits, p. 50

Visit our Web site: www.finewoodworking.com



The Taunton Press
Inspiration for hands-on living®

Contributors

When **W. Patrick Edwards** (Master Class and back cover) was commissioned to build a 15-ft. marquetry table in the 1970s, he discovered a shopmade scrollsaw—*le chevalet de marqueterie*—that the French had kept secret. Later, after 20 years restoring antique furniture, Edwards decided to apply to study with Pierre Ramond at École Boulle, in Paris, the only trade school teaching classic French marquetry techniques and the use of the chevalet. Upon Edwards' graduation, Ramond encouraged him to start the American School of French Marquetry, which he did. For more about Edwards and his work, see the back cover or visit www.wpatrickedwards.com.



With a master's degree in fine arts, **Rob Hare** ("Flattening Tabletops") has taught drawing and sculpture, and worked as a sculptor, designer, general contractor, cabinetmaker, and, for the past 14 years, as a furniture maker. Working



primarily in wood and forged steel, he has earned a reputation for his elegant and innovative designs and has been featured in both *Fine Homebuilding* (#20 and #103) and *Fine Woodworking* (#124).

When **David Sorg** ("Sanding Basics") isn't shopping for new colors of sandpaper, he often can be found pestering hardware-store clerks for parts that don't exist to renovate his turn-of-the-century Victorian house. "Thank God for putty and paint," he said when asked about the quality of his woodwork. "Eventually, I can get most anything smooth and shiny." Sorg also has produced a videotape series on wood finishing and decorative painting, titled *Fine Furniture Finishing*. The series can be found in public libraries or on his Web site at www.finefurniturefinishing.com.

Alan Charney ("Built-Up Moldings") has designed and made all types of furniture for his family for nearly 25 years. As a result, every room in the house is filled with his work. His one rule is that each proposed piece has to have something that he has never tried, or even has a clue how to do. "Worries seem to disappear when I'm in the



shop figuring out a new process or technique," he said. When Charney and his wife, Joyce, aren't taking care of their 31 acres near Middlebury, Ind., they are riding their tandem bicycle. They rack up more than 1,500 miles per year riding to restaurants and bakeries around their area. Their motto: "We ride to eat."

Charles Shackleton ("Personalize Your Furniture") grew up in Ireland and is a descendant of the Antarctic explorer, Sir Ernest Shackleton. Even in childhood he enjoyed studying furniture and making small pieces. After art college, Shackleton came to America to work as a glassblower for Simon Pearce, but the urge to build furniture never left him. He started out in his basement before moving his growing business to a converted mill in Vermont. To see more examples of how he incorporates carving into his work, go to www.shackletonthomas.com.



Michael Fortune ("Five Tips for Better Bandsawing") designs and builds furniture for homes across North America. His well-equipped workshop is featured in *The Workshop* by Scott Gibson (The Taunton Press, 2003). Fortune teaches at a number of woodworking schools, offering intensive workshops on how to design and build curved furniture. He also provides technical and design expertise for companies in North America and abroad. Currently, he is assisting several manufacturers in Guyana, South America. When not traveling, Fortune has a 500-ft. commute to his workshop, from his 180-year-old log home.

Fine Woodworking

EDITOR **Anatole Burkin**

ART DIRECTOR **Michael Pekovich**

MANAGING EDITOR **Asa Christiana**

ASSOCIATE EDITORS

William Duckworth, Thomas G. Begnal, Mark Schofield, Matt Berger, Steve Scott

ASSISTANT EDITOR

Marcia Ryan

SENIOR COPY/PRODUCTION EDITOR

Thomas McKenna

COPY/PRODUCTION EDITOR

Julie Risinit

ASSOCIATE ART DIRECTORS

Kelly J. Dunton, Rodney Diaz

SHOP MANAGER **John White**

EDITORIAL ASSISTANT **Jennifer Deeds**

CONTRIBUTING EDITORS

Tage Frid (1975–2004), Christian Becksvoort, Mario Rodriguez, Gary Rogowski, Mike Dunbar, Garrett Hack, Roland Johnson

CONSULTING EDITOR **Chris A. Minick**

METHODS OF WORK **Jim Richey**

INDEXER **Harriet Hodges**

PUBLISHER **David Gray**

SR. MARKETING MANAGER **Marissa Latshaw**

MARKETING MANAGER **Ellen Kracht**

SINGLE COPY SALES MANAGER **Mark Stiekman**

ADVERTISING MANAGER

Linda Abbett

SENIOR NATIONAL ACCOUNT MANAGERS

John Dyckman, William M. McLachlan

ACCOUNT MANAGER

John Lagan

AD SALES SUPPORT SUPERVISOR

Marjorie Brown

SENIOR AD SALES SUPPORT ASSOCIATE

Christina Kryzanski

WOODWORKING BOOKS & VIDEOS

EXECUTIVE EDITOR **Helen Albert**

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.

Printed in the USA

HOW TO CONTACT US:

Fine Woodworking

The Taunton Press, 63 S. Main St., PO Box 5506,
Newtown, CT 06470-5506 203-426-8171
www.finewoodworking.com

Editorial:

To contribute an article, give a tip, or ask a question, contact *Fine Woodworking* at the address above or:

Call: **800-309-8955**
Fax: **203-270-6753**
Email: **fw@taunton.com**

Customer Service:

For subscription inquiries, you can:

- Visit our subscriber service section at:
www.finewoodworking.com
- Email us: **fwservice@taunton.com**
- Call our customer support center:
To report an address change, inquire about an order, or solve a problem, call:
800-477-8727
To subscribe, purchase back issues, books or videos, or give a gift, call:
800-888-8286

Advertising:

To find out about advertising:

Call: **800-309-8954**
Email: **fwads@taunton.com**

Member Audit
Bureau of Circulation



Retail:

If you'd like to carry *Fine Woodworking* in your store, call the Taunton Trade Company at:
866-505-4674

Mailing List:

Occasionally we make our subscribers' names and addresses available to responsible companies whose products or services we feel may be of some interest to you. Most of our subscribers find this to be a helpful way to learn about useful resources and services. If you don't want us to share your name with other companies, please contact our Customer Service Department at:

800-477-8727

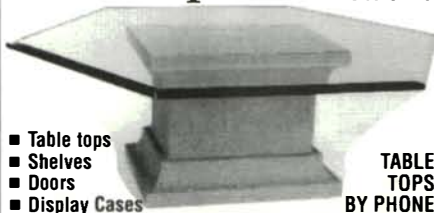
The Taunton Guarantee:

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 2004 by The Taunton Press, Inc. No reproduction without permission of The Taunton Press, Inc.

Heavy Glass Table Tops

FACTORY
DIRECT
DISCOUNT
PRICING



- Table tops
- Shelves
- Doors
- Display Cases
- Entertainment Centers
- Tempered Glass

TABLE
TOPS
BY PHONE

SATISFACTION
GUARANTEED!

WGB ■ SHAPES ■ THICKNESSES ■ EDGE DESIGNS

Use Reader Service For FREE Catalog

SALES 1-800-288-6854

READER SERVICE NO. 176

LAUNSTEIN HARDWOODS

Manufacturer & Distributor of
3/8" SOLID HARDWOOD FLOORING

Pre-sanded and ready to finish. Available in
RED OAK, WHITE OAK, ASH, HICKORY, HARD
MAPLE, CHERRY, WALNUT

Choice of 4 widths and 3 grades

Unlimited choice of mouldings
Most orders shipped within 24 hrs

LAUNSTEIN HARDWOODS

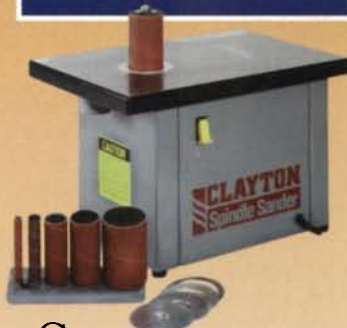
384 S. Every Road,
Mason, Michigan 48854

PHONE **517-676-1133** FAX **517-676-6379**

www.launstein.com

READER SERVICE NO. 11

THE STANDARD IN SANDERS



Clayton Spindle Sanders are built in the USA with precision balanced spindles, oversized bearings, and a premium Baldor Induction Motor.

- Benchtop and full-sized, professional models
- Large table surface
- Built-in dust port
- Quick-change drums

Clayton tackles the toughest sanding jobs...smoothly.

FREE COLOR CATALOG,
call: 1-800-971-5050

CLAYTON
Spindle Sanders

ROYAL OAK, MI 48068-0520
READER SERVICE NO. 30

Saw-Jaw

- Safely Install, Remove and Store Circular 10" Blades
- Protects Costly Blades

For video demo and ordering info:
www.saw-jaw.com • 1-800-SAW-9366
HIQOL L.C.
Money Back Guarantee



READER SERVICE NO. 144

Amana Tool®
High Performance Cutting Tools



Router Bits
Router Bit Sets
Saw Blades

Woodland Tool Supply Co.

shop online at

www.woodlandtools.com

READER SERVICE NO. 154

inside PASSAGE

SCHOOL OF FINE WOODWORKING

Join woodworker Robert Van Norman and guest craftsmen and women at a school founded on the teachings of James Krenov.

36 Week Craftsman Program
Summer Courses
Co-operative Opportunities
Gallery

Located on the scenic
Sunshine Coast, near
Vancouver, Canada.



inside
PASSAGE



www.insidepassage.ca 1 - 877 943 9663

READER SERVICE NO. 110

Letters

Bar-clamp alternative

I've made custom furniture part-time for 15 years, and I've never owned a ¾-in. bar clamp (*FWW* #172, pp. 62-68). I use ½-in. Pony clamps on galvanized pipe and have never had a problem with them. They're cheap, light, and with different-size bars, you can make any length you need. Why do we need a clamp with 2000+ lb. of force? I believe that the clamp is only there to hold the pieces together until the glue dries, not to force the joint to fit.

—Bill Murrey, via email

CAD as a woodworking tool

It was with great interest that I read Gregory Paolini's "CAD on a Budget" (*FWW* #172, pp. 54-57). I've used CAD in my shop for 14 years and always wondered why more hobbyists and small professional shops don't embrace this powerful technology. I hope that Paolini's article will encourage people to try CAD.

Emphasizing the 3-D aspects of these programs is, however, not necessarily a useful way to judge their relative merits. While 3-D looks cool, I find it of limited use on a day-to-day basis for furniture and cabinetmaking. My recommendation is to choose your CAD program on strength, breadth, and ease of use of the 2-D functions—those are the ones you'll use day in, day out. If you want a 3-D drawing to visualize a piece, I find it faster and more useful to make a sketch by hand on paper using pencil, charcoal, and artist's materials. An "artist's sketch" will give you a far better feeling for the piece than a mechanical drawing. Also, with practice, you'll learn to "see" 3-D when looking at a 2-D drawing, making drafting the 3-D image superfluous.

CAD is a rich toolbox. While you can get up and running in a day or two of practice, you should expect to spend considerable time learning all the little tricks to use these programs efficiently. Richer programs take more time to learn but end up saving you time because of their greater functionality.

—Kim Carleton Graves, Brooklyn, N.Y.

Regarding the article concerning CAD programs, using a 500-MHz processor to test these programs is a lot like testing

tablesaws with cheap steel blades: They simply do not render meaningful results. A 2-GHz computer with 512 MB of memory and a Windows XP operating system can be purchased today for less than \$500 and would greatly improve the performance of the programs tested. I, for one, would like to know which of these programs would perform best on an average home computer.

If asked to name the most important power tools in any shop, I would have to list the computer as one of the top five.

—Jim Stewart, Richmond, Va.

Nails and fine furniture

Yet another "I hate nails" extremist is heard from. Fred Blum (*Letters*, *FWW* #172, pp. 8, 10), as well as woodworkers of any type, should travel to any nearby major art museum and study the furniture collections.

In any period or style you can name, nails of various types were used when needed. Mostly, the load-bearing carcass was made with joinery, but nonstructural elements were tacked on. If the past masters used screws and nails, why should I turn up my nose at them?

Blum is also wrong about wire and cut nails. Wire nails split wood readily, particularly near a board end. Cut nails cut the wood fibers, which then bend down and wedge against the edges of a cut nail. Any carpenter will tell you a cut nail is far harder to pull than a wire nail.

What all woodworkers forget is that it is not how the item was made, but how well it was cared for afterward. Good work or poor, I have seen many fine old pieces that are junk simply because they were stored in a bad environment. For any one museum piece, there must be dozens of like items that went to the dump because of neglect.

—Edward Mattson,
Ardsley, N.Y.

While I enjoyed Mike Dunbar's article on nails (*Rules of Thumb*, *FWW* #171, pp. 88, 90, 92), I felt a need to make some further suggestions about clinching. This is a technique that we use regularly at Historic Richmond Town to attach hardware as well as to join pieces of wood, such as when building batten doors. We start by adding a point to the

Tremont nail, drawing it out on an anvil. We clamp our pieces together, mark out a nail pattern, and drill pilot holes. The material should be clamped so that you are nailing the secondary piece to the primary (show) piece, for example, through a batten into the door, so that the head of the nail is seen on the secondary piece of material.

First, we drill through both pieces with a bit that's smaller than the shank of the nail, and then through the secondary piece with a bit the size of the shank. We elongate the hole with a wiggle of the drill to account for the difference in width of a cut nail's wider facet. The nail is then driven through, paying attention to the orientation of the grain. If the nail twists, it should be straightened. The piece then is flipped over. The last ¾ in. to ½ in. of the tip should be bent with pliers toward the bottom of the project or away from the edges, again following the grain of the wood, this time on the primary piece. The nail then should be hammered around into a curl. Holding a block of steel, such as the rounded face of a 2-lb. sledge, against the nail head, bend the nail in the same direction as the curl and carefully flatten it into the wood. If the head backs out, it must be resunk and then supported with the sledge, and the tail flattened again. The result will be clean, even nails, front and back, on your project.

—Matt Hankins, Staten Island, N.Y.

Learning routing the hard way

Here's a tip for people who use the 3-hp DeWalt plunge router in a router table.

About your safety:

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

—Anatole Burkin, editor

HEARNE HARDWOODS, INC.

Specializing in
Pennsylvania Cherry

Plain & Figured Cherry from 4/4 to 16/4
Also: Premium Walnut, Figured Maple, wide
planks & a large variety of exceptionally fine
domestic & imported woods including free form
slabs, turning blanks, burls, & instrument lumber.

National & International Shipping

200 Whiteside Dr., Oxford, PA 19363

ph 610-932-7400 fax 610-932-3130

www.hearnehardwoods.com

Toll Free 1-888-814-0007

READER SERVICE NO. 50

Lowest
Prices
Guaranteed!

FREE CATALOG!

Your Source For
Essential, Unique,
& Hard To
Find Tools!



CODE
FW173

800-345-2396

hartvilletool.com

READER SERVICE NO. 161

AGAZZANI

Sale!

- 7 models Available from 16" to 36"
- Resaw Capacities from 10" to 21.5"
- Computer Balanced Cast Iron Wheels
- Durable Vulcanized Tires
- High Rigidity Frames
- Foot brake with Micro Switch
- Made in Italy since 1938



"This is a truly great tool..."
- Mark Duginske, Author
"The Bandsaw Handbook"

**EAGLE
TOOLS**

800-203-0023
www.eagle-tools.com



GENERAL

WOOD MAGAZINE
**TOP
TOOL**

READER SERVICE NO. 78



Model CP23.30

23 Gauge Invisible Pinner



Shoots into all hardwoods

Fine point nose for ease aiming

Shoots from 1/2" to 1-3/16"

Holds 200 Pins

Comes with carry case



Made in Canada
One Year Warranty
\$179 (US) includes UPS Shipping

Tel 604.876.9909 Fax 604.876.3914
www.cadextools.com

READER SERVICE NO. 179

FREE!

Furniture Parts CATALOG



Table Legs
Bun Feet
Kitchen & Bath Turnings
Table & Vanity
Base Kits
Ready to Finish

OVER
100!
Styles!

Call for a
free color catalog
800.843.7405

www.
tablelegs.com

BOX 329, ST. JOHNSBURY, VT 05819

CLASSIC DESIGNS by MATTHEW BURAK

READER SERVICE NO. 191

Overnight Miracles

Build or fix anything to last forever.

"Well, nearly anything."

Contact us soon for
product and price
information.

Toll Free:
866-EPOXY IT (376-9948)
Fax: 989-671-9921
www.epoxyheads.com

Address:
P.O. Box 2280
Bay City, MI 48707




EpoxyHeads

**TWO PART
EPOXY**

Glue & Coating
Home & Industry • Repair & Fabrication

1 gallon

Resin Part A Resin

READER SERVICE NO. 3

Recently, when I changed from a ¼-in. bit to a ½-in. bit, I didn't realize the ¼-in. adapter sleeve was still in the collet. When I installed the ½-in. bit, it pushed the adapter down into the empty space beneath it.

Upon starting the router, I thought all hell had broken loose. I was convinced something was wrong with the large bit I had just installed. After replacing the \$135 bit, I went through the same routine. It wasn't until I took the router out of the table that I could see what was happening. Stupid, but easy to do.

—Steven Hunn, via email

Shocked by antique finish

I am often educated, fascinated, or amused by what I read in *Fine Woodworking*. I had not expected to be shocked as I was by the article in the October 2004 issue, "An antique painted finish" (FWW #172, pp. 117-118).

The only reason that I can imagine for going to the trouble to burn paint and apply roofing cement (roofing cement!) to create fake grime is to fool a potential buyer about the real age of an item. The antiques market is full of fakes; you have provided a guide for making more.

There must be something better to write about.

—Gary Licht, Montville, N.J.

EDITOR REPLIES: We don't endorse the practice of faking antiques. The truth is, a competent antiques dealer should be able to differentiate a modern antique finish from the one we published. And many woodworkers prefer to give their classic pieces an old-time look.

Sandpaper grading explained

The article "A Durable Tabletop Finish" (FWW #171, pp. 55-59) was intriguing but contains photographs that might mislead some readers. The author recommends using 320-grit sandpaper for scuffing and before the final wiped-on coat, with 600 grit used to flatten the surface. I believe the author intends this to be paper graded by the American standard (CAMI), but the photos on pp. 57 and 59 show Klingspor paper. Klingspor grades its paper by the European standard (FEPA), and indeed the "P" prefix is clearly visible on the

sandpaper in the photos. The P600 shown is roughly equivalent to American 360 (according to the article on sandpaper in FWW #125). Readers buying the sandpaper shown in the photos will have a hard time duplicating the smooth, even sheen the author achieves. As a general rule, your readers might find it helpful if the text of the articles indicates whether the author intends the grits mentioned to be CAMI or FEPA.

—Ken Rose, Palo Alto, Calif.

EDITOR REPLIES: You are correct in assuming the author was referring to the CAMI scale. The incorrect brand of paper was shown in the photo. We regret the confusion.

ABCs of fire extinguishers

While thumbing through FWW #170, I reread the Q&A on fire extinguishers (p. 98). In the Air Force I learned a way to remember which type of extinguisher to use on what type of fire. Maybe this memory aid will help someone as it did me.

- A class "A" fire produces ash; i.e., wood and paper
- A class "B" fire produces a boom; i.e., flammables
- A class "C" fire involves current; i.e., electrical.

—JC Harbottle, Leland, Mich.

A note of thanks

As I read through the most recent edition, I was impressed by the fine work put out by your magazine. I found the articles helpful and well-written. I especially enjoyed the photo gallery of other folks' projects, as each piece is a work of beauty. My gratitude goes to the editors, writers, and woodworkers who craft your magazine. Well done.

—Christopher Young,
Whitehorse, Yukon, Canada

Tansu door variation

I'm just completing a set of Japanese Tansu cabinets with 14 sliding doors, so I was interested to see Seth Janofsky's article "Sliding Doors for Furniture" in the September/October 2004 issue (FWW #172, pp. 58-61).

To avoid having the upper rabbet show on the front door, I build the tracks and

doors slightly differently. At the top of the door, I cut the rabbet on the inside edge; at the bottom of the door, I rabbet the outside edge. Then I position the upper track so that it is closer to the front of the cabinet, the same amount as the depth of the upper rabbet.

—Dennis Shapson, Shutesbury, Mass.

Corrections and clarifications

In Current Work (FWW #171), the lidded vessel on p. 85 was incorrectly attributed to Klaus Kloepper. The maker's name is Klaus Kloeppel.

The student pictured in the article "Oregon school offers training from afar" (FWW #172, p. 24) was misidentified. His name is Dave Lacey.

Several readers contacted us to point out that the photo on p. 67 of "Bar Clamps, Head to Head" (FWW #172) does not demonstrate the ideal clamping approach. Indeed, the effect of the inaccurate jaws on steel bar clamps could have been minimized or even eliminated by the use of properly sized clamping pads or cauls. The intent of the test, however, was to highlight the differences between clamps, not to seek ways to minimize them.

The article "Perfect Mortise-and-Tenon Joints" (FWW #172, pp. 69-75) specified a pair of hold-down clamps from the Adjustable Clamp Co. Each clamp includes a ¾-in. threaded rod that measures about 3¼ in. long. In the text, however, we failed to mention that the threaded rod as supplied was too short for the jig. To properly adapt the clamps to the jig, the ¾-in. threaded rod was replaced with one that was 6½ in. long. Also, you need to epoxy a nut on one end of the rod so that it can slip into a notch in the clamp (not shown in the illustration).

Writing an article

Fine Woodworking is a reader-written magazine. We welcome proposals, manuscripts, photographs, and ideas from our readers, amateur or professional. We'll acknowledge all submissions and return those we can't publish. Send your contributions to *Fine Woodworking*, P.O. Box 5506, Newtown, CT 06470-5506.

New 2" Rotary Shaper

Maximum RPM is 2500

"Dealer inquiries encouraged"

Non-clogging Replaceable Blades!

Microplane® sharper cutting tools are manufactured using a patented process which creates an extremely sharp cutting surface. The razor-sharp teeth cut cleanly to create tiny shavings that fall to the surface instead of clouding the air with dust.

Microplane
SHARPER CUTTING TOOLS

1-800-555-2767 • www.microplane.com

READER SERVICE NO. 45

...an incredible journey in Craftsmanship.



... to explore the art of fine woodworking.

... to discover professionals who will help create your dream.



Rosewood
STUDIO

Located just outside Ottawa, Canada

School of Fine Woodworking

www.rosewoodstudio.com
Toll Free 1-866-704-7778

READER SERVICE NO. 2

FREE TOOL CATALOG

Visit us on the internet at highlandhardware.com



highland hardware
TOOLS FOR WOODWORKING

Our comprehensive tool catalog gives you more than just manufacturer's specs. We provide detailed tool descriptions, useful tips & techniques and a schedule of seminars & hands-on workshops.

CALL FOR FREE TOOL CATALOG
1-800-241-6748

READER SERVICE NO. 42



BUILD A BETTER BANDSAW

guides
stabilizers™
tires

quick-release™ tension toggle

www.carterproducts.com
toll-free: 888.622.7837

READER SERVICE NO. 37

When Close Isn't Good Enough

The shoulder plane's art is precision – taking joinery from a close fit to a perfect fit. For this level of accuracy, you need a tool that can give you controlled and exceptionally precise cuts. To meet that need, our designers created this family of shoulder planes that all have precise control mechanisms, squareness of sole to body, and blades that will hold an edge. Plus, recognizing that this style of plane can be difficult to grip, we added our unique pivoting knob and body through-hole to keep the tool safely and comfortably in your hand. All have Norris-style

adjustment mechanisms, blade set screws, and trapped adjustable toes for precise set-up. The blades are 1/8" thick A2 tool steel; the bodies, ductile cast iron. Patent pending.

05P41.01F Medium Shoulder Plane **\$139.00**

05P42.01F Bullnose Plane **\$129.00**

05P43.01F Large Shoulder Plane **\$169.00**

Shipping & N.Y. sales tax extra.

Lee Valley & veritas®

Lee Valley Tools Ltd., 814 Proctor Ave., Ogdensburg, New York 13669

For more details on the three styles, visit us online or call to request a free catalog. **1-800-683-8170**
www.leevalley.com

READER SERVICE NO. 184

INNOVATION THROUGH & THROUGH

PORTER-CABLE® continues to
prove its cutting-edge innovation
and design with these latest tools.



7-1/4" MAG-SAW™ KIT

Change blades without changing gears. This award-winning, first-ever **Quik-Change™** circular saw provides a fast and hassle-free system for changing blades making you more productive on the job site.

Available in blade-left and blade-right models with or without a brake.



VARIABLE-SPEED DUAL ACTION TIGER SAW® KIT

A revolutionary rotating back handle puts an end to turning your body to get more leverage. Plus an extra-heavy-duty 11.5 AMP motor for maximum power for all cutting capacities and blade clamp **Quik-Change™** for keyless blade change in seconds.



FINISH NAILER/BRAD NAILER COMPRESSOR COMBO KIT

Have everything on hand with this special edition two-nailer combo kit complete with both Brad and Finish Nailers and 2 peak HP, .8 HP running 6-gallon pancake compressor. Also includes an adjustable depth-of-drive, jam-release mechanism and non-marring nose tip.

For more cutting-edge
innovations from PORTER-CABLE®,
visit porter-cable.com.



PORTER-CABLE, MAG-SAW, DUAK-CHANGE and TIGER SAW are registered trademarks of Porter Tools Group, Inc. © Porter Tools Group, 2004.

READER SERVICE NO. 139



The Taunton Press

Inspiration for hands-on living®

INDEPENDENT PUBLISHERS SINCE 1975

TAUNTON, INC.

Founders, Paul and Jan Roman

THE TAUNTON PRESS

President & CEO John Lively

Editor In Chief Sue Roman

Chief Marketing Officer Sarah Roman

Chief Financial Officer Timothy Rahr

Chief of Operations Thomas Luxeder

Publisher, Magazine Group Jon Miller

Publisher, Book Group James Childs

DIRECTORS

Creative Director Susan Edelman

Human Resources Director Carol Marotti

Technology Services Director Edward Kingston

Controller Wayne Reynolds

Marketing Director, Magazines Diana Allwein

Promotion Director Steven Turk

Fulfillment Director Patricia Williamson

TAUNTON TRADE COMPANY

Treasurer, Timothy Rahr

TAUNTON DIRECT

President, Sarah Roman

TAUNTON NEW MEDIA

Publisher, Thomas Falconer

THE TAUNTON STAFF

Books: *Marketing:* Melissa A. Possick, Audrey Locorotondo. *Editorial:* Maria Taylor, Helen Albert, Kathryn Benoit, Peter Chapman, Barbara Cole, Steve Culpepper, Robyn Doyon-Aitken, Maureen Graney, Julie Hamilton, Pamela Hoenig, Carolyn Mandarano, Jennifer Peters, Amy Reilly, Erica Sanders-Foege, Kathleen Williams. *Art:* Paula Schlosser, Nancy Boudreau, Sandra Mahlstedt, Wendi Mijal, Tinsley Morrison, Lynne Phillips, Carol Singer, Rosalind Wanke. *Manufacturing:* Thomas Greco, Laura Burrone.

Business Office: Holly Smith, Gayle Hammond. *Legal:* Carolyn Kovalski. *Magazine Print Production:* Philip Van Kirk, Nicole Anastas.

Distribution: Paul Seipold, Frank Busino, David DeToro, Leanne Furlong, Deborah Greene, Linnea Ingram, Frederick Monnes, Raymond Passaro, Chad Piche, Thomas St. Cyr, Alice Saxton.

Finance/Accounting: *Finance:* Kathy Worth, Susan Iadarola, Brett Manning, David Pond, Jeanne Todaro. *Accounting:* Patrick Lamontagne, Dorothy Carbone, Lydia Krikorian, Judith O'Toole, Elaine Yamin, Carol Diehm, Margaret Bafundo, Dorothy Blasko, Susan Burke, James Post, Lorraine Parsons, Priscilla Wakeman.

Fulfillment: Diane Goulart. *Client Services:* Jodi Klein, Donna Capalbo, Nancy Knorr, Michele Ladyko. *Customer Service:* Ellen Grassi, Michelle Amoroso, Bonnie Beardsley, Katherine Clarke, Alfred Dreher, Monica Duhancik, Kimberly Eads, Margaret Hicock, Eileen McNulty, Patricia Parks, Deana Parker, Patricia Pineau, Ellen Stacy, Betty Stepney. *Data Entry:* Melissa Dugan, Michelle Berry, Anne Champlin, Mary Ann Colbert, Barbara Lowe, Debra Sennefelder, Andrea Shorrock, Marylou Thompson, Barbara Williams, Brian Wilcox.

Human Resources: Linda Ballerini, Christine Lincoln, Dawn Ussery.

Information Technology Services: Applications Development:

Heidi Waldkirch, Carole Ando, Gabriel Dunn, Robert Nielsen, Linda Reddington, Lawrence Sullivan, John Vaccino.

Desktop and Network Support: Kenneth Jones, Michael Colonari, Michael Lewis, Jay Ligouri, Joseph Manganello.

Marketing: Dominique Clancy, Nancy Clark, Nancy Crider, Ellen Williams Kracht, Marissa Latshaw, Kathy Lewis, Karen Lutjen, Heather Reynolds, Mary Lou von der Lancken. **Public Relations:** Tonya Polydoroff, Jodi LaPoint, Janel Noblin.

Operations: Joseph Morits, Roberta Calabrese, John Gedney, Sally Kirwan, Jennifer Liscursi, Susan Nerich, Jeannette Pascal.

T Room: Michael Louchen, Geraldine Benno, Anna Pendergast, Norma-Jean Taylor. **Maintenance:** Alvin Jack, Lincoln Peters.

Promotion: William Brady, Stace Caseria, Mary Beth Cleary, Michele Mayernik, Sandra Motyka, William Sims. **Promotion Print Production:** Diane Flanagan, Cathy Bloomberg, John Cavallaro, Dawn Viglione.

Taunton Creative and Editorial: Creative: Robert

Goodfellow, W. Kathy Martin, Sarah Opdahl, Pamela Winn.

Editorial: Jefferson Kolle. **Photography:** Scott Phillips. **Video:**

Gary Junken. **Prepress:** Deborah Cooper, Richard Booth,

William Bivona, David Blasko, James Chappuis, Richard

Correale, William Godfrey, Brian Leavitt, Chansam

Thammavongsa. **Advertising Production:** Laura Bergeron, Tracy Goodpastor, Steven Molnar, Patricia Petro, Kathryn Simonds, Martha Stammer.

Taunton Direct: Nannette Dorsey, Nicole Carpenter, Robert Harlow, Michelle Kuhr, Jorge Londono.

Taunton New Media: Leslie Kern, Jodie Delohery, Christopher Casey, Mark Coleman, Ruth Dobseavage, Jennifer Wheeler.

Taunton Trade Company: John Bacigalupi, Allison Hollett, Trina Bayles, Diana Mackey, Eve Pison, Elizabeth Quintiliano. **Single Copy Sales:** Mark Stiekman, Valerie Droukas.

TAUNTON MAGAZINES

Fine Woodworking • Fine Homebuilding

Threads • Fine Gardening

Fine Cooking • Inspired House

Our magazines are for people who are passionate about their pursuits. Written by practicing experts in the field, Taunton Press magazines provide authentic, reliable information supported by instructive and inspiring visuals.

TAUNTON BOOKS

Our books are filled with in-depth information and creative ideas from the finest authors in their fields. Whether you're practicing a craft or engaged in the creation of your home, Taunton books will inspire you to discover new levels of accomplishment.

WWW.TAUNTON.COM

Our website is a place where you can discover more about the interests you enjoy, converse with fellow enthusiasts, shop at our convenient on-line store or contact customer service.

EMPLOYMENT INFORMATION

To inquire about career opportunities, please e-mail us at tauntonjobs@taunton.com or visit our website www.taunton.com. You may also write to The Taunton Press, Human Resources, 63 S. Main St., PO Box 5506, Newtown, CT 06470.

CUSTOMER SERVICE

We are here to answer any questions you might have and to help you order our magazines, books and videos. Just call us toll-free at 800-477-8727.

The Taunton Press, Inc., Taunton Direct, Inc., Taunton Trade Company, Inc., and Taunton New Media, Inc., are all subsidiaries of Taunton, Inc.

TWIN LASERS. THINK OF THEM AS LANDING LIGHTS FOR YOUR BLADE.



Stop guessing where your blade will land with the new TwinLaser™ Miter Saw from PORTER-CABLE®. Unlike a single laser, our bright TwinLaser™ shows the exact cut-line on both sides of the blade kerf. You'll know precisely how much wood you're taking out every time.

Plus, our lasers aren't just bolt-on attachments, they're actually machined right into the upper housing. And it's the only fully adjustable laser system, which means more accuracy with any blade and every cut. So get twin lasers and eliminate the guesswork. For the dealer nearest you, or to join our Performance Crew® loyalty

club, visit porter-cable.com.



"Two lasers are better than one", RICK ARNOLD and MIKE GUERTIN
of Fine Homebuilding "12-inch Compound Miter Saws," July 2004, No. 164: 68-73.

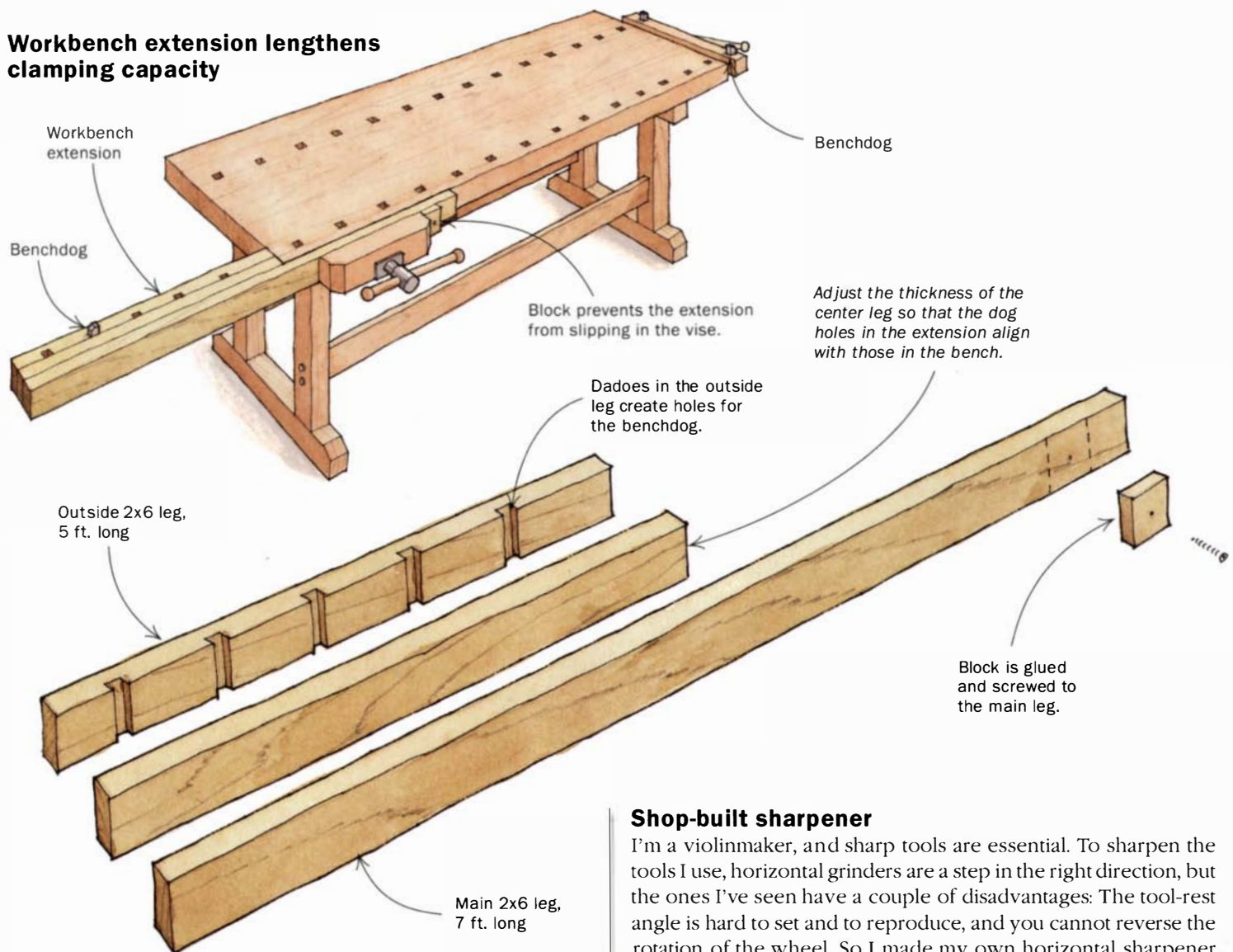
**PORTER
CABLE**

REDEFINING PERFORMANCE®

Methods of Work

EDITED AND DRAWN BY JIM RICHEY

Workbench extension lengthens clamping capacity



A few years ago, one of my customers wanted a 12-ft.-long tapered flagpole. My plan was to make an octagonal blank and then use a handplane to shape it into a tapered cylinder. But the pole was 5 ft. longer than my bench, and that introduced a clamping problem.

My solution was this workbench extension that effectively lengthened clamping capacity by several feet. Now that I have the extension, I use it whenever I have a workpiece longer than my bench, such as bedposts, tabletops, and countertops.

—Aurelio Bolognesi, Hardwick, Mass.

Shop-built sharpener

I'm a violinmaker, and sharp tools are essential. To sharpen the tools I use, horizontal grinders are a step in the right direction, but the ones I've seen have a couple of disadvantages: The tool-rest angle is hard to set and to reproduce, and you cannot reverse the rotation of the wheel. So I made my own horizontal sharpener from a reversible-gear motor, a sanding disk, and a wooden box. It takes standard grinding wheels and performs beautifully.

The gear motor, which turns at a much slower speed than conventional electric motors, powers the sharpener. I used a parallel-shaft, reversible, AC gear motor (Bodine 34R-W series, Model No. 0480), which is rated to run at slightly less than 125 rpm. For the gear motor to work properly, you have to wire a separate switch to do the reversing. Be sure to use a switch that has three positions—clockwise, off, and counterclockwise—not just two positions. If you switch directly from clockwise to counterclockwise while the



A new reward for the best tip

When a customer wanted a 12-ft.-long tapered flagpole, Aurelio Bolognesi realized he had a problem: His bench was too short to allow him to plane the full length of the pole. His solution is shown above. For his winning tip, Bolognesi receives a pair of 14-in. tenon saws (one rip, one crosscut) made by Adria Toolworks (www.adriatools.com); a total value of \$300. Send your tip (along with a photo or sketch) to: Methods of Work, Fine Woodworking, PO Box 5506, Newtown, CT 06470. If published, we pay \$50 for an unillustrated tip, \$100 for an illustrated one. And if your tip is picked as the winner, you get the tenon saws, too.



How Do You Add Beautiful Cabinetry To Any Room?



Freud Set # 97-210

Add Freud's New Ogee Raised Panel Bit Set with Backcutter to Your Shop.

Revolutionary 2+2 Four-Wing Cutter Design



2 small cutter wings cut downward on the wood fibers for a precise cut.



2 large cutter wings shear upward for an extremely smooth cut profile – even on cross grain.



Easy and Flawless Panel Routing Virtually Eliminates Sanding!

Now, the most popular raised panel profile is available in Freud's **97-210 Ogee Profile with Backcutter Raised Panel Door Bit Set**. Finally, you can create classic, distinctive raised panel projects with a full 1-1/2" wide reveal. This new set is just part of Freud's new line of patented, high-quality raised panel router bit sets with backcutters that enable you to create flawless raised panels for cabinetry, walls and more with virtually no rework.

The exclusive 2+2 design combines a patented backcutter. In one step, you can cut the panel profile and back cut for a flawless raised panel flush with the frame on both sides. These revolutionary router bit sets also include matched ogee style rail and stile bits with shims for a perfect fitting frame.

Freud develops and manufactures its own application-specific **MicroGrain Carbide with Titanium** to maximize bit performance for long life and a superior finish. With these sets, there is virtually no sanding required. Just rout your rails, stiles and panel then, glue and clamp—you're done.

Added features of these sets include:

- Freud's trademarked **Perma-SHIELD®** Permanent Non-Stick Coating to prevent heat build-up and corrosion.
- A bonus video on CD for woodworking professionals and enthusiasts provides instructions on how to create raised panel doors simply.
- Educational poster with easy to follow instructions and illustrations.



Red router bits are a registered trademark of Freud America, Inc.
U.S. Patent No. 5,899,252

ISO 9002

CERTIFICATE REGISTRATION # 12 100 010

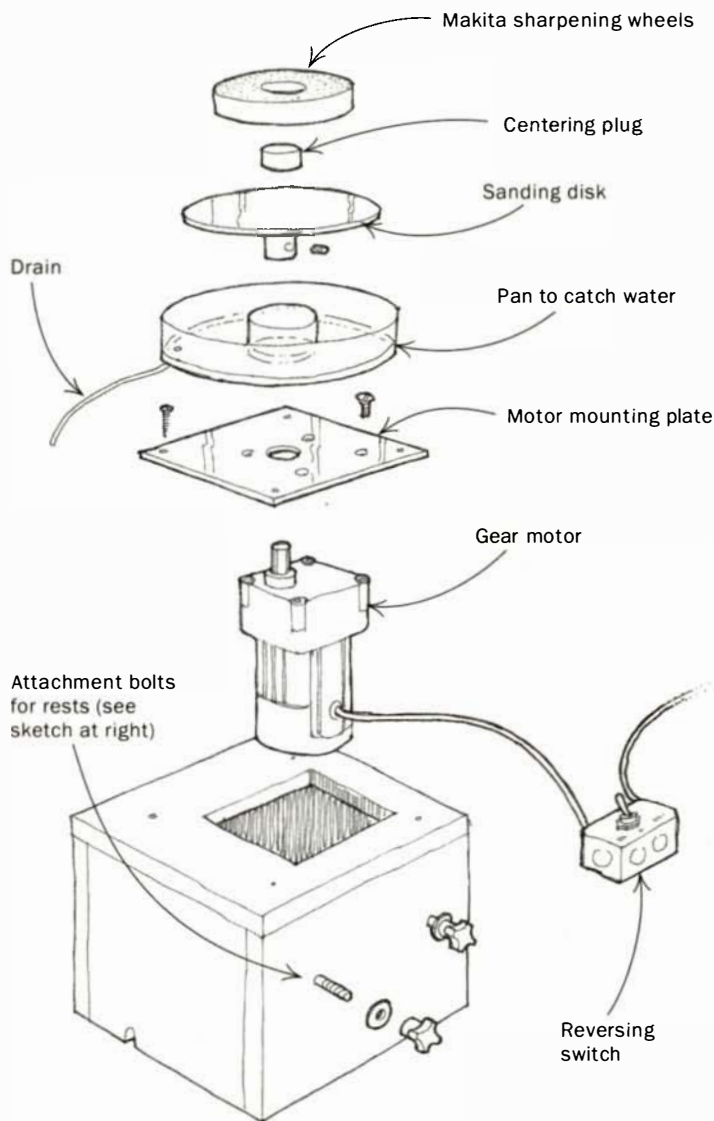
freud®
Precisely what you need.

Whether you're a woodworking enthusiast or a professional craftsman, Freud has a router bit set for you.

To learn about Freud's full line of router bit sets, visit www.freudtools.com
(U.S.) 1-800-472-7307 (Canada) 1-800-263-7016

Methods of Work (continued)

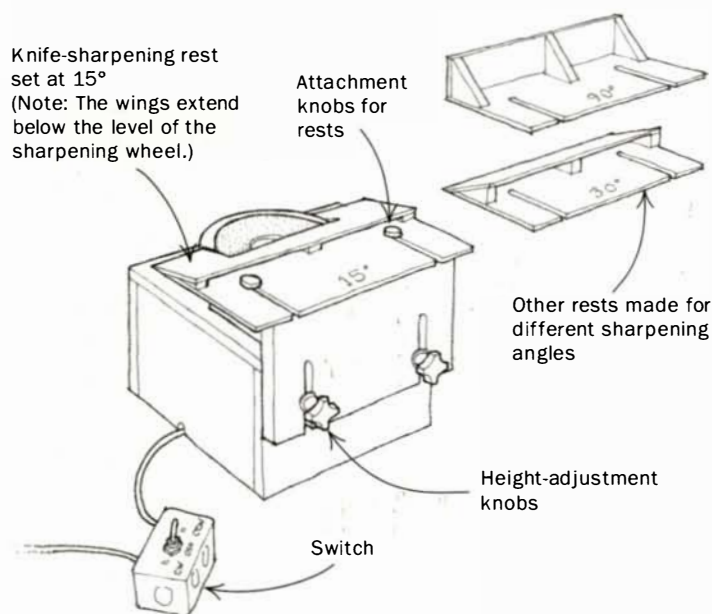
motor is turning, you could damage it. When using the sharpener, there'll be water near the motor, so use a three-prong plug and ground the green wire to the motor's case.



I screwed the motor to an aluminum mounting plate, attached to the wooden box (see the drawing above). On the shaft of the motor, I mounted an ordinary 8-in.-dia. sanding disk (available from Woodcraft Supply for about \$16), and simply tightened a setscrew to fasten the disk to the shaft. Abrasive sharpening wheels fit on top of the sanding disk.

I use 1,000- and 6,000-grit sharpening wheels made for the Makita No. 9820-2 blade sharpener (available from Highland Hardware). For fine polishing, I also use an 8-in. Plexiglas disk with a sheet of 0.5-micron (approximately 9,000-grit) abrasive film on an adhesive back (available from Lee Valley) attached to the disk. The Makita wheels have a $\frac{3}{4}$ -in.-dia. center hole plus a little tab. I screwed a $\frac{3}{4}$ -in.-dia. plug to the center of the sanding disk and made a depression in it to catch the tab. If you find this drive arrangement unsatisfactory, it is easy to install a pin or a key so the wheels won't slip on the sanding disk.

I simply enclosed the gear motor within the wooden box and built several interchangeable tool rests—one for each sharpening angle that I use (see the drawing below). The number of rests you need may vary. I needed four: one at 15° to sharpen my knife, one at 30° for my instrument-plane blades, one at 45° for round-edge scrapers, and one at 90° for straight-edge scrapers. The 15° rest for my knife extends down below the level of the grinding surface on each side of the wheel for support. The rests pop on or off in seconds, and they can be adjusted to place the cutting edge of the tool at just the right location.



One more thing: As I'm sharpening, I dribble water onto the abrasive wheel through a tube from an old plastic milk bottle. I installed a pan to catch the water and keep it from flinging across the room or dribbling down into the bearings of the motor. The pan is simply a ring of Plexiglas with strips of flexible plastic glued to the inside and outside edges to form raised lips. This pan is mounted under the sanding disk to catch the water.

To use the sharpener, I first set the rotation so the wheel turns into the edge of the cutting tool, which pushes the tool against the rest and holds the angle well. With the 9,000-grit abrasive paper, I reverse the motor so the disk turns away from the edge.

—David Golber, Medford, Mass.

Quick tip: One day, by mistake, I dropped a 6-in. self-adhesive sanding disk on the floor of my shop and discovered that the disk provided very solid, nonslip footing. So I placed two of the disks at the front of my table saw where I stand. The disks improve my footing, and they're easy to replace when they wear out.

—Steven Coleman, Tucson, Ariz.

Using band clamps for squaring during glue-up

Here is a simple technique to pull a case square after you've applied glue and clamped it together. Pass a band clamp behind the clamps diagonally across the case in whatever direction you need to pull the case to square it up. If a lot of force is needed to square up a case, then use the ratchet mechanism of the band clamp. More

Take the guesswork out of machine setup.

The **Mini-Mantis™** makes precision depth of cut setup easy on your router and table saw.

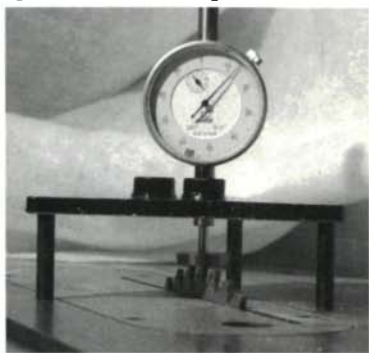
Only
\$49.95+ SH.

Visit us online at:

www.allendesignsllc.com

Phone: (513)-489-3181 or

E-mail: info@allendesignsllc.com



READER SERVICE NO. 135

DOWELMAX

PRECISION ENGINEERED JOINING SYSTEM



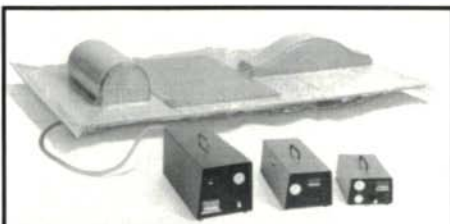
Dowelmax creates strong accurate joints of virtually any configuration and size.



The double and triple CHD joints shown are stronger and more precise than a typical mortise and tenon joint. Additionally they can be completed in approximately five minutes with no measuring.

www.dowelmax.com Toll Free 1.877.986.9400

READER SERVICE NO. 165



VENEERING and CLAMPING with VACUUM

VACUUM PRESSING SYSTEMS, INC.
553 RIVER ROAD
BRUNSWICK, MAINE 04011
WWW.VACUPRESS.COM
800-382-4109

The leader in vacuum technology for woodworking offers a complete line of innovative products for:

- VENEERING
- LAMINATING
- CLAMPING

NEW products include:
Flip Top Frame Presses,
Inflatable Bladders
and Videos

READER SERVICE NO. 92

Routerbits.com

Bits, Blades, Books & More...



Shop Online For
Whiteside Router Bits
Systematic Saw Blades
Fisch Forstner Bits
Bench Dog

Call For Your Free Catalog

1-888-811-7269

www.Routerbits.com

READER SERVICE NO. 88

Give the Gift that's Meant to Collect Dust!



Make it a holiday to remember.

Gift certificates available.

Dedicated to Dust Collection Since 1993.

Call Us Today for FREE Catalog!

1.800.732.4065

Online Ordering!
www.oneida-air.com

Oneida Air Systems, Inc. 1001 W. Fayette St., Syracuse, NY 13204

Made in USA



<http://www.maoshan.com>

Maximum Return with a Bargain Price!

Features:

- ◆ Equipped with a 3HP motor for heavy duty cutting.
- ◆ Tilting of saw blade up to 45° by scale, using the handwheel.
- ◆ Table extension up to 950mm cutting width.
- ◆ Rip fence with micro metric fine adjustment with digital readout.
- ◆ Electrical equipment 400V/50HZ.

E-mail: maoshan@ms15.hinet.net

Fax: +886-4-2279-2667

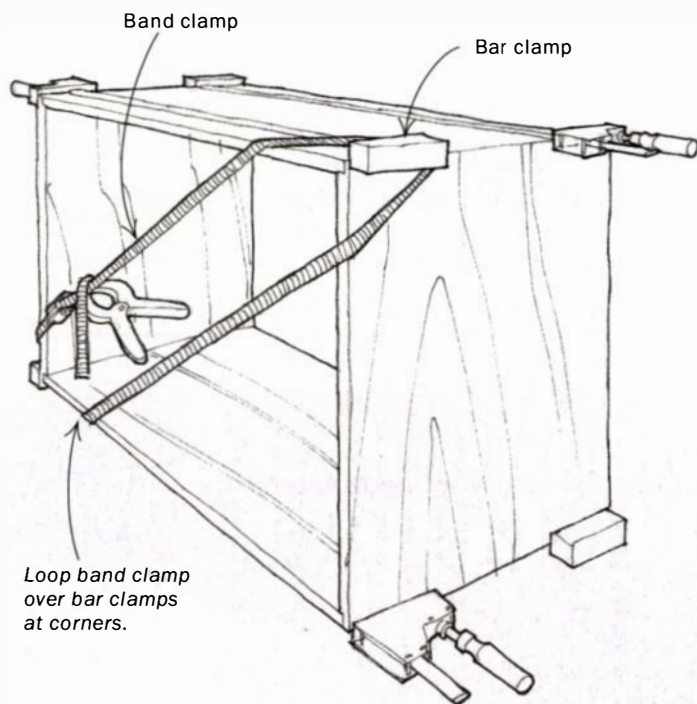
UL

SP

READER SERVICE NO. 13

READER SERVICE NO. 162

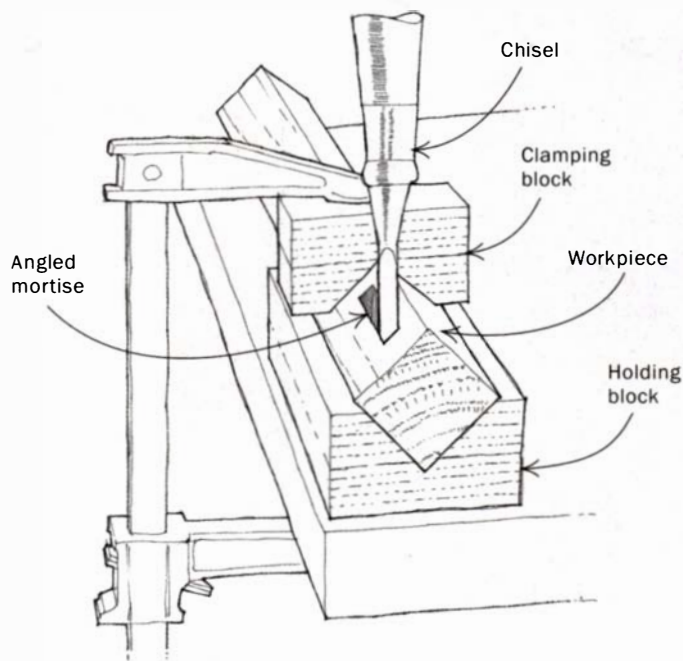
Methods of Work (continued)



likely, however, a small amount of force is all you'll need. So you simply can pull on the two ends of the band clamp until the case is square, and then snap on a spring clamp to hold the band clamp in position.

—Marshall W. Fletcher, Dover, Del.

Holding a workpiece for angled mortises



I recently built a corner table that required mortises to be chopped into the legs at a 45° angle to the square face of the leg. First, I clamped the workpiece square to the benchtop and held the chisel at 45°. That didn't work. After chasing my workpiece all around the benchtop, I finally built a jig that solved the problem.

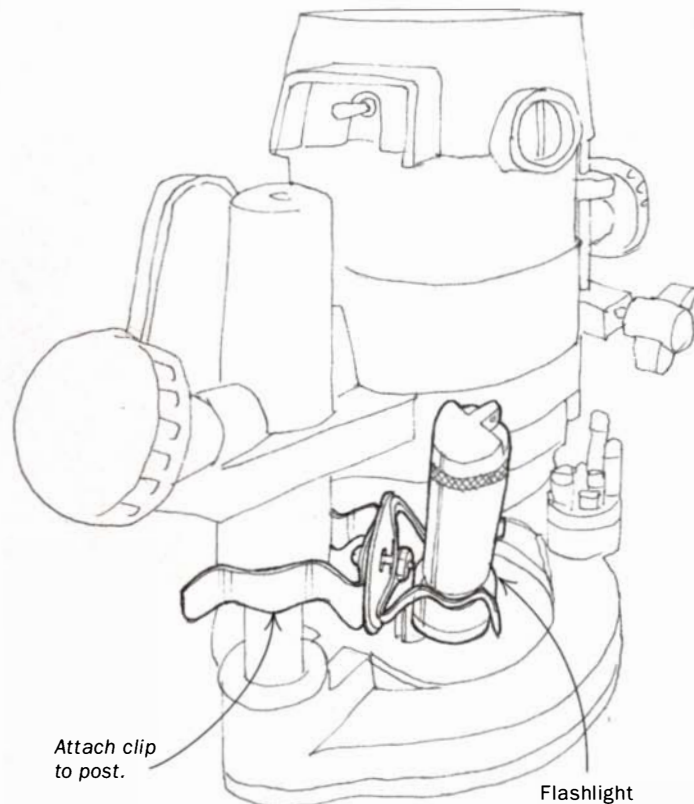
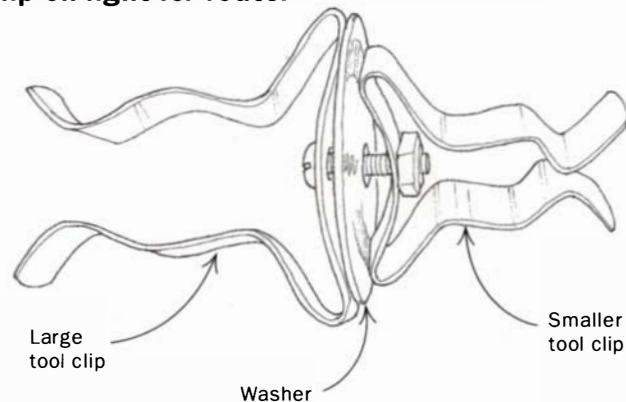
I made the jig by laminating pieces of plywood to form a blank

2 in. thick by 3½ in. wide by 14 in. long. Then I cut a 45° groove 1 in. deep down the length of the blank and cut off a 2-in. section to serve as a clamping block.

I mount the stock to be mortised in the holding block of the jig and clamp it to the bench. Because the workpiece is held at 45°, I can hold the chisel 90° to the bench and chop the mortises the usual way.

—Tim Uli, Topsham, Maine

Clip-on light for router



Even with good eyes and good lighting in the workshop, there are times when you need more concentrated light on a workpiece. Because my router does not have an on-board light, I made one with a small flashlight and two tool clips (available at www.toolclip.com). One clip holds the flashlight, and the other snaps onto the post of my plunge router. Attach the two clips back to back with a small bolt.

—Mark Thorsell, Golden Valley, Minn.

Upside down

in a router table you can raise even the heaviest router effortlessly using just one hand, while the other hand's free to check the bit depth.



or the right way up



in the WoodRat the PlungeBar controls the vertical axis with fine precision and is used at every change of action. It also helps make an effective precision mortiser.

Price \$39.95 A range of six PlungeBars fits virtually every Plunge router.

WoodRat® PlungeBar™

Call toll free 1-877-WOODRAT

Buy online at www.woodrat.com

READER SERVICE NO. 180

BUILD YOUR BEST WITH MILLER DOWEL



SUPERIOR FASTENERS FOR SOLID WOOD JOINERY

SIMPLE
fast and easy to use

STRONG
solid, longer-lasting joints

ECONOMICAL
minimal tools required

VERSATILE
use in any woodworking project

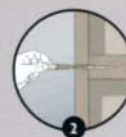
UNIQUE
the only natural fastener designed for insertion from the outside

EXCELLENT RESULTS
an appealing and durable alternative to metal fasteners

Miller® Dowels are currently offered in multiple sizes and are intended for use with a corresponding TruFit™ Drill Bit. Available in Red Oak, Birch, Black Walnut, Cherry and others.



1
DRILL STEPPED PILOT HOLE



2
ADD GLUE & INSERT



3
TAP & FINISH

U.S. Patent Nos. 6,267,527, D456,700, D484,781

TM 2004 Miller is a trademark of the Miller Dowel Company

WWW.MILLERDOWEL.COM

TOLL FREE: 866-WOODPEG

FURNITURE • CABINETRY • DRAWERS • FRAMES WOODCRAFT • MILLWORK

READER SERVICE NO. 155

Fine Woodworking invites you to

Learn authentic 18th century methods of building case furniture.



THE 2005 COLONIAL WILLIAMSBURG CONFERENCE

Making Case Furniture—Desks and Bookcases

Here's your opportunity to discover the secrets to making 18th century desks and bookcases from Colonial Williamsburg Historic Trades cabinetmakers and *Fine Woodworking* experts.

During the 7th annual conference at Colonial Williamsburg, skilled woodworking experts will give you the insight and know how to design and construct faithful reproductions of bookcases and other cases exactly as they were made 200 years ago.

Up-close, expert instruction, technical insights, and more.

Don't miss your chance to get informative, detailed instruction and to ask questions on desk design and construction—from drawers and fallboards to interiors.



Colonial Williamsburg
WILLIAMSBURG, VIRGINIA

2 SESSIONS

January 12-15 and 16-19

For more information call:

Colonial Williamsburg

Continuing Education

800-603-0948 or 757-220-7255

Visit:

www.colonialwilliamsburg.org

Email: dchapman@cwv.org

Fax: 757-565-8921

Fine
Woodworking

I'm Bill Carroll,
call me & I'll show
you how you can
own a Woodcraft
franchise



When I think about owning my own business ...

Bring your woodworking skill, your love of tools, and your expertise and we'll show you how you can turn your passion for woodworking into your life's work.

...I think of Woodcraft



WOODCRAFT®
Helping You Make Wood Work®

800 344-3348 or e-mail:
bill_carroll@woodcraft.com

1177 Rosemar Road
P.O. Box 1686
Parkersburg, WV 26102-1686 Dept. F04WW12Q

READER SERVICE NO. 148

Tried & True

Delmhorst –
serving woodworkers
for nearly 60 years.

Woodworkers trust Delmhorst moisture meters for accurate results to ensure the quality of each and every project.

DELMHORST
INSTRUMENT CO.®

When accuracy is the point.
1-800-222-0638 delmhorst.com

READER SERVICE NO. 29

Step Up

Step up to our Tempest 14" impeller cyclone.
It's powerful, efficient, economical, quiet,
clean, and completely configured!

- Full 5-year motor/blower warranty
- Fits under an 8' ceiling
- Powerful 2HP motor blower
- 14" aluminum impeller
- Includes two 1/2-micron filter cartridges, mounting brackets, and cleanout drum

TEMP142CX
SUPER SALE \$735
(plus shipping)

Call 1-800-377-7297 for our
free catalog filled with dust
collectors, lathes, accessories,
pen-project kits and much more!

www.pennstateind.com

PennState Industries

Ductwork planning service available.

READER SERVICE NO. 178

The Marvel 60 Variable Speed Plunge Router

INTRODUCTORY OFFER!



FREE! Clear Base Plate
and Brass Template
Guide Kit.

With lots of power for
routing large diameter
bits. 3 HP, 15 amp

- Variable Speed Motor with Electronic Feedback (10,000-22,000 RPM)
- Micro Adjustable for Plunge Cutting
- Soft Start Technology eliminates "kick" at start up

FREE SHIPPING!
\$179⁹⁰
ORDER ITEM #2046



MLCS
1.800.533.9298
mlcswoodworking.com
MLCS LTD., BOX 4053 FG, RYDAL, PA 19046

READER SERVICE NO. 177

Again...

We take bandsaws
to a new level.



LAGUNA TOOLS

800.234.1976

We listen, and we do not accept the stagnant norms of our industry.

We developed the ceramic Laguna guide because you asked for it.

We invested in a new blade manufacturing company because you needed the perfect blade.
Our new line of bandsaws features American made Baldor motors among other innovations.

READER SERVICE NO. 190

Notes & Comment

Ancient lumber from New Zealand and South Carolina

You may have been excited to pick up some lumber reclaimed from a neighbor's barn, but those boards are young compared with some of the wood surfacing recently. In the last few years, excavators in South Carolina and New Zealand have pulled workable logs from soggy ground that has preserved some of them for up to 50,000 years. This wood is now reaching the market.

For more than 30 years, excavators at a South Carolina sandpit had been ignoring the logs they were hitting 40 ft. below the surface. In June 2003, Ricky Cox sent a sample of the unearthed wood to the University of Georgia for carbon dating. The sample was at least 44,000 years old, notable even to the Smithsonian Institution.

The wood is related to modern bald cypress, a species known for its decay resistance. It can be used both outdoors and indoors in many of the ways modern cypress is used, including furniture. Like modern cypress, the ancient wood has a regular, straight grain, but its growth-ring structure appears tighter than that of many modern samples.

Cox said he plans to sell the wood at \$100 a board foot through J. Alexander Wood Products (jawp@directus.net; 828-439-



A gem in the rough. Salvaged from peat bogs, ancient kauri is said to have an iridescent, lit-from-within appearance when polished.



9761). Keith Smith of J. Alexander anticipates interest from artists and firms involved in high-end architectural millwork. He also said the wood varies in strength, with the average board as strong as yellow poplar.

But ancient lumber is, so to speak, nothing new. In the late 1980s, New Zealanders started putting ancient kauri logs on the market. The logs, long buried in the peat swamps of New Zealand, appear at the surface as the swamps drain. Excavators are brought in to dig out the well-preserved logs, some as large as 8 ft. in diameter.

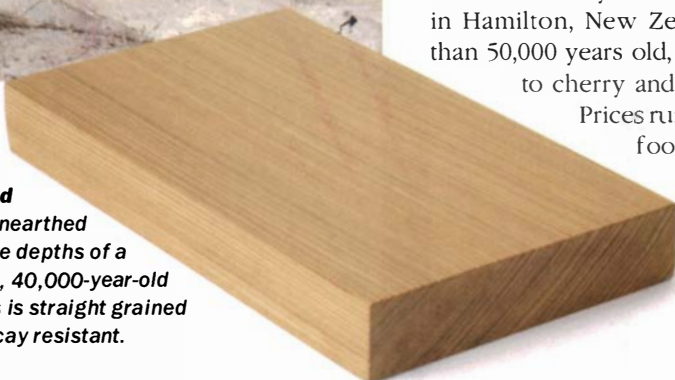
Wisconsin cabinetmaker and co-owner of Ancientwood, Ltd., Robert Teisberg described the wood as having a unique iridescence and coloration. Teisberg said that when finely sanded (past 600 grit) and polished, the wood seems to glow, as if there were a light behind it. The wood, carbon-dated by the University of Waikato in Hamilton, New Zealand, to be more than 50,000 years old, machines similarly to cherry and is just a bit softer.

Prices run about \$25 a board foot. (For more information, go to www.ancientwood.com.)

—Matthew Gardner



Out of its sand trap. Unearthed from the depths of a sandpit, 40,000-year-old cypress is straight grained and decay resistant.



Steel price hike affects tool prices

After months of climbing steel costs, tool manufacturers and distributors have begun raising prices on stationary power tools. Scott Box, vice president of WMH Tool Group, which owns Jet and Powermatic, said, "There is an overall average price increase of 8% for both Asian and domestic products." In August, street prices for Jet and Powermatic cabinet saws were about \$1,700 and \$1,950, respectively, and were set to go up.

Box said costs for cast iron (for which scrap steel is used) were still rising in the first half of 2004 but appeared to be stabilizing as of late summer.

Steel isn't the only culprit, though.

Christian Chénier, vice president and part owner of General International, said costlier paint, plastics, and oil also are behind an increase in his company's prices. A General cabinet saw priced at \$1,949 before July 1 now retails for closer to \$2,100.

—Marcia Ryan, assistant editor

Forrest Blades

Quality Blades for America's Craftsmen

Serious woodworkers demand perfection. That's why so many of them choose Forrest saw blades.

Forrest quality is legendary. Our proprietary manufacturing process, hand straightening, and unique grade of C-4 micrograin carbide give you smooth, quiet cuts without splintering, scratching, or tearouts. In fact, independent tests rate our blades as #1 for rip cuts and crosscuts.

Forrest saw blades are simply the best that money can buy. They're made in the USA by the same family-owned business that's been producing and sharpening them for over 55 years. And they're backed by a 30-day money back guarantee. It's no wonder that serious woodworkers give them such high praise!

"Your blades are without question the best by miles, and I have tried them all."
Bob Jensen—Fridley, MN

"These are the finest blades I have ever owned and you should be proud of your quality product."
Patrick T. Hankard—South Windsor, CT

"[Forrest blades] cut true, with no vibration. I was a carpenter by trade for over 60 years and continue to be an active woodworker. So, I can say with confidence that Forrest blades are the best."
Carl Stude—Burbank, CA

The message is clear. If you're looking for quality, performance, and value, it pays to choose Forrest blades every time.

Our Most Popular Blades:



Woodworker II – This award-winning, all purpose blade is the finest of its type. It turns big jobs into easy-to-handle ones.



Dado-King – The world's finest multi-tooth dado set. It works effectively in all directions—with the grain or across it.



Chop Master – Produces perfect miters every time—with no bottom splinters. You get smooth edges on all types of wood.



Woodworker I – Great for table and radial saws. It trims and crosscuts all woods up to 2" and is ideal for plywood.



Duraline Hi A/T – Our best blade for birch and oak ply veneers. It also delivers a clean cut on melamine and vinyl over particle board.

Forrest blades come in a wide variety of sizes and are available for practically every application. Call or send for our complete list of products.

Three Convenient Ways To Order

We back our blades with a 30-day money back guarantee. So, choose the method most convenient for you and order today:

- Visit one of our fine-quality dealers or retailers.
- Call us toll free at 1-800-733-7111. (In NJ, 973-473-5236) Ask about special discounts, free shipping on orders over \$275, and discounts for blade sharpening.
- Contact our internet store: www.stores.yahoo.com/forrestman

FORREST

The First Choice of Serious Woodworkers Since 1946

© 2003 Forrest Manufacturing

Code FW

DULUTH TRADING



Holy Cow! Bucket Master™
is better than a tool box!
You could say that again...
if we had a
bigger
ad



We stock wonderful, useful Equipment and Goods designed and tested by Tradesmen for Builders and ardent Do-It-Yourselfers. Get a Free Catalog at 800-505-8888 or order on line - www.DuluthTrading.com

READER SERVICE NO. 134

Bargain Books

America's biggest catalog selection!

- **Save up to 80%** on current books, recent overstocks, imports, reprints.
- **Woodworking and Workshop Skills**, Arts & Crafts, Do-It-Yourself, Sports, Biography, History, Travel—over 67 subject areas.
- **You'll love the savings** on a wide selection of new releases and best sellers, as well!

Free Catalog:

1-800-677-3483

Edward R. Hamilton, Bookseller
529 Oak, Falls Village CT 06031-5005

www.erhbooks.com/fsg

READER SERVICE NO. 19



We Manufacture
& Service

**SHAPER KNIVES
MOULDER KNIVES**

Williams & Hussey
Profile Knives

We now distribute
FREEBORN
Cutters

FOLEYBELSAW • MOULDER HEADS

RBI & WOODMASTER KNIVES

LOCK EDGE COLLARS

ROSETTE CUTTERS

CUSTOM ROUTERS &

CUSTOM CUTTERS



Quick Turnaround Time
Top Quality Products
at Competitive Prices

W. Moore Profiles LTD.

1 Commercial Drive,
P.O. Box 752, Florida, NY 10921
www.wmooreprofiles.com

1-800-228-8151

Serving the Industry for over 10 Years - Fax (845) 651-1097

READER SERVICE NO. 120

FELDER'S New Series 700

Built in Austria, designed for the American Woodworker!

The best European combination machine has been specifically enhanced to complement American woodworking techniques. The new 700 series has larger more robust fences, dado capacity with revolutionary dado cutter-head, plus all of FELDER'S previous outstanding features. The best of both worlds in one machine!

New high-performance features:

- Dado capacity and a revolutionary cutterhead.
- New and improved rip fence system with fine adjustment
- Advanced X-Roll sliding table system with remote start, amazingly smooth and precise action with 6 year warranty!
- Enhanced crosscut fence and stop system



Perfect dado results

www.felderusa.com
FELDER
... und Sie machen mehr aus Holz!

FELDER USA

2 Lukens Drive, Suite 300 **EAST** **WEST** 1851 Enterprise Blvd.
New Castle, DE 19720 West Sacramento, CA 95691
Call 866-792-5288 Call 800-572-0061

Call now for your
new catalog and free Video
866-792-5288

READER SERVICE NO. 138

ROCKLER®
WOODWORKING AND HARDWARE

Build it your way.

We have what you need — hardware, wood, tools and know-how.



Win a PT Cruiser Woody!

Register online to win a 2005 PT Cruiser Woody!



Visit: Rockler.com/go/pt19

JesseM
Tool Company

THE NEW
Rout R Lift FX™

- Precision Height Adjustment
- Above the Table Bit Changes
- 3 versions for 2HP Multi-Base Router Kits
- The First 2HP Lift at a 2HP price
- New Cam-Lock Clamp for Quick Motor Changes



A Great New Lift For Your Multi-Base 2 HP Router Kit



Visit us at www.jessem.com
call: 866-272-7492

Barrie, Ontario Canada, North America

READER SERVICE NO. 12

The Woodworker's Dream!

Over 40,000 Woodworking Products



**BEST PRICES • WIDEST SELECTION
ALL FROM STOCK**

Call For Our FREE 900+ Page Catalog!

Outwater Plastics Industries, Inc.

1-888-772-1400 (Catalog Requests)
1-800-631-8375 (Sales & Product Information)
1-800-888-3315 (Fax)
New Jersey • Arizona • Canada
www.outwater.com

READER SERVICE NO. 56

**12" Tilting Arbor Table Saw
Extremely Affordable
Unbelievable Quality**

European riving knife safety!
Superior dust collection design!
Professional precision and repeatable accuracy!!

PK 300V TABLE SAW

- 3.6HP, 1-ph 230V (S1)
- 52" rip and crosscut
- Scoring unit built in



- Full Dado capability
- Professional sliding table

ROJEK

for a lifetime of woodworking

TM
TECH-MARK, INC.

Let us make you a believer! Call toll-free: **800-787-6747**
7901 Industry Dr., North Little Rock, AR 72117
Fax: 501-945-0312 • Website: www.tech-mark.com
COMBINATION MACHINES • SHAPERS • JOINTERS • PLANERS • SLIDING TABLE SAWS • SLOT MORTISERS

Easy
Financing
Available!

READER SERVICE NO. 167

Three ways to raise a panel

Frame-and-panel construction is among the woodworker's greatest inventions. Not only does it solve many of the problems we encounter with wood movement, but it also looks good, creating visual interest by adding shadow lines and reflecting light across different planes.

There are almost as many ways to cut raised panels as there are tools in the workshop. While the shaper is probably the most efficient, many woodworkers don't own a shaper. Depending on the piece I'm building and the number of panels I have to cut, I use one of three methods—hand tools, a router table, or a tablesaw outfitted with a panel-raising jig. Whatever method you choose, start with a panel that is sized to the opening in the frame plus the depth of the grooves—minus just a little in the width to account for wood movement.

The panels built for this article actually are both raised and fielded: The bevel makes it a raised panel, and the shouldered step up to the center, known as the field, makes it fielded.

A traditional look with hand tools

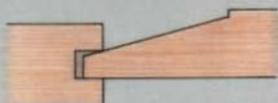
If you're not in a rush, are aiming for a traditional look, or simply want to hone your hand-tool skills, raising panels by hand is a good option. The only tools you'll need are a cutting gauge and a rabbet plane (a Stanley No. 78, a Record No. 778, or similar).

Start by laying out the field and tongue. Scribe layout lines on the face of the panel with a cutting gauge, then deepen them with a marking knife and a straightedge. Now scribe the edge of the panel to determine the thickness of the tongue. The goal is to plane away the material on a bevel with the two scribe lines as your boundaries. When laying out the bevel, aim for an angle that is between 15° and 25°. Use shallower angles with larger panels to increase the width of the bevel.

The first cut is a simple rabbet, establishing a shoulder to separate the bevel from the field. Set the depth stop on the rabbet plane to cut a rabbet about 3/8 in. deep, and adjust the

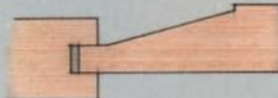
TWO TYPES OF TONGUES

BEVELED TONGUE



When cut with hand tools or on the tablesaw, the tongue is an extension of the bevel.

FLAT TONGUE



A raised panel cut with a router bit has a flat tongue, which allows the panel to shrink and expand more freely inside the frame.

METHOD 1

RAISE A PANEL BY HAND

Lay out the field and bevels with scribe lines and handplane them to completion.



Establish the bevel. Use a marking gauge to lay out the tongue thickness (above) and the field (right) with scribe lines.



Plane a rabbet and then cut the bevel. Cut the cross-grain ends first, with scrap material on the trailing edge to prevent tearout as the plane exits the panel. After cutting the rabbet, readjust the fence to cut the bevel, working down to both the tongue thickness and the shoulder of the field, holding the plane at an angle.



Check the fit as you go. Stop before the tongue bottoms out in the groove. If all sides are raised equally, the intersecting bevels will create a straight line at the corners.



WHITECHAPEL LTD



315 PAGE COLOR CATALOG \$5.00
1-307-739-9478 whitechapel-ltd.com



NOW YOU CAN ORDER ON-LINE!

- Oxford Premium Spray Lacquers
- Oxford Hybrid Varnishes
- Oxford Polyurethanes
- Homestead Dyes
- Mirka Abrasives
- Spray Equipment
- Polishing Materials

or call 1-800-752-9922

www.targetcoatings.com

READER SERVICE NO. 112

FREE TOOL CATALOG!

Your Best Work Starts With Us...

With over 8,000 of the finest woodworking tools in the world, Woodcraft can help you work more efficiently and skillfully than ever. Call for your Free copy today.

1-800-542-9115

WOODCRAFT®

www.woodcraft.com

560 Airport Ind. Park, Dept. 04WW12T
PO Box 1686, Parkersburg, WV 26102-1686

READER SERVICE NO. 149

MAKE YOUR SHAPER AND MOULDER KNIVES
with the new **VIEL PROFILE COPYING GRINDING MACHINE**

VHS VIDEO \$9.95 (credited against machine purchase)

- Grinds knives directly in the toolholder
- Makes distortion-free profiles

\$749.00 Only

CALL **1-800-915-2601**

VIEL TOOLS INC.
P.O. BOX 660, MADAWASKA, ME. 04756-0660

READER SERVICE NO. 171

Let's face it:
most dovetail jigs
are a pain...

except one:

The Keller Dovetail System...

The only dovetail system that is simple, fast and accurate.

Fast setup. No test cuts. Precision joinery. Unlimited widths. Classic and variable spacing. Compound, acute and obtuse angles. Curved dovetails. Box joints. Made in USA since 1976. 20-yr. warranty. 30-day money-back guarantee.

VIDEO: \$8.95 + \$2 P/H

KELLER & CO. Dept. F24
1327 I Street, Petaluma, CA 94952
(800) 995-2456 (707) 763-9336
www.kellerdovetail.com

The Keller Dovetail System
Simply the best.



READER SERVICE NO. 26



Fast, easy and extraordinary!

CMT's exclusive new 3D Router Carver™ System



Ask about our money-saving Classical Starter Set

Classical Cabinet Door



Classical Drawer



Who says that intricate carving requires an artist's touch or the skill of a traditional woodcarver? Thanks to the patented 3D Router Carver System, anyone with a 1/2" collet plunge router can create dozens of beautiful designs easily, accurately and with complete repeatability. Rout 3-dimensional carvings on doors, drawers, cabinets, furniture or just about any flat wooden surface in minutes. Ask for your free 2004 - 2005 CMT catalog for details, then visit your CMT Distributor to get in on the fun!

The 3D Router Carver System is protected by U.S. Patent No. 5,146,965

Ask for a free catalog & a distributor in your area
888-268-2487 • www.cmtusa.com

CMT USA, Inc. • 307-F Pomona Drive • Greensboro, NC 27407



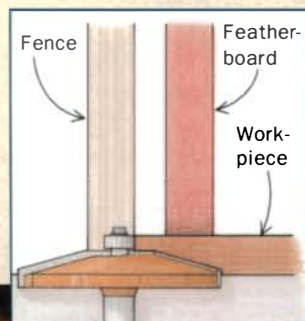
READER SERVICE NO. 141

Rules of Thumb (continued)

METHOD 2

RAISE A PANEL AT THE ROUTER TABLE

Panel-raising router bits come in two styles, both of which create a flat tongue and a bevel. With each bit, take multiple passes and increase the depth of the cut with each pass.



HORIZONTAL ROUTER BIT

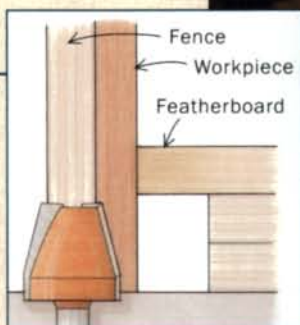
These large-diameter bits require a variable-speed router set at 10,000 rpm. Use a featherboard to keep the panel flat against the table.



Cut the long-grain sides after the cross-grain ends to clean up any tearout. Use a push block and a steady feed rate on the final pass for a smooth finish.

VERTICAL ROUTER BIT

These bits should be run between 18,000 rpm and 22,000 rpm. Use a featherboard to keep the panel snug against the tall fence.



Take light passes with a vertical panel-raising bit. They tend to produce a rougher surface than a horizontal bit, but a card scraper or sandpaper will clean things up.



fence so that the width of the rabbet reaches the scribe lines on the panel's face. Begin by planing the cross-grain ends. Use a backer board to prevent tearout where the plane exits the workpiece. However, if there still is tearout, you can clean up the unsightly edges when you plane the long-grain sides. There's no need to use a backer board as you plane the long grain.

With a rabbet on all four sides, begin on the bevel. Again, bevel the cross-grain ends first and then finish up with the long-grain sides. Hold the plane at an angle and make passes until the bevel spans from the shoulder to the scribe lines on the edge of the panel. If you encounter a troublesome area, plane in the other direction using a rabbeting block plane registered against the shoulder. Finally, use a card scraper to smooth the bevel to a finish.

Two methods at the router table

When raising panels on a router table, you can use a horizontal router bit or a vertical router bit. Either method has advantages over using hand tools (or the tablesaw, for that matter)—the router bits cut a flat tongue on the edge of the panel, rather than a beveled tongue, allowing the panel to float more freely in the frame as it expands and contracts with changes in humidity.

Face on the table—Raising a panel with a horizontal router bit is safe and efficient, but it calls for a variable-speed router. Because panel-raising bits are so large in diameter, you'll need to dial back the router to about 10,000 rpm.

If you're raising multiple panels of the same size, you need to mark out only the thickness to be removed on the first panel. The width of the bevel is determined by the bearing on the router bit. Scribe a line on the edge of the panel to indicate the tongue's thickness. You are somewhat limited by the thickness of the panel. If it's too thick, the bit produces either an overly pronounced shoulder or a thick tongue. Alternatively, you can cut a rabbet on the back of each panel's edge to reduce the thickness of the tongue.

Start routing on the cross-grain ends and then raise the long-grain sides. Take three to five passes—depending on the density and thick-



A perfect fit. The flat tongue should fit snugly in the thickness of the groove.

NEW VARATHANE PREMIUM STAINS' FORMULA IS CLEARLY SUPERIOR.

Most stains are made with linseed oil. Varathane Premium Wood Stains are made with our proprietary, ultra-clear soya oil formula. Unlike linseed oil which can contribute unwanted color to stains, the clarity of



Varathane's soya oil formula allows the stain to reveal the beauty of your wood. The end result? All of Varathane Premium Wood Stains' 24 colors are considerably richer, clearer and brighter.

"WOULD YOU LIKE A NICE CABERNET?"

Or Traditional Cherry? Or Mission Oak? Varathane Premium Wood Stains are available in colors that wood enthusiasts most desire.

In fact, Varathane's colors are preferred more than 2 to 1 over Minwax®. From Natural to Dark Walnut, you're sure to find the right color for your wood finishing project.



THE STORY OF OUR SUPERIOR STAINS.

STARTING WITH A TOUR OF THE PLANT.



[THE SOYBEAN]



Varathane
— SINCE 1958 —
WOOD'S FIRST CHOICE™

And unlike other stains that often take up to six coats to achieve the color shown on the can, Varathane's colors can be achieved in as little as two coats. So you spend less time staining your project and more time enjoying it.



DISCOVER OUR SPECIAL TRIAL SIZE PACKETS TODAY.

Now Varathane has made finding the right stain color easy. Introducing new Varathane trial size packets, created to give you the confidence to find the right color the first time. These inexpensive and easy-to-use packets are available in all 24 colors. Each packet contains enough stain for you to test any color on your project, so you're always sure to find exactly the right stain color.



Visit www.woodanswers.com for more information.

Varathane -
Wood's First Choice.



Minwax® is a registered trademark of the Sherwin Williams Company.
*Source: Preference Test of the Varathane Line versus the Minwax Line of Interior Wood Stains. May 2003

Rules of Thumb (continued)

METHOD 3

RAISE A PANEL ON THE TABLESAW

Set the tablesaw blade to 90° and build a tablesaw jig that holds the panel at an angle. In this case, a 75° jig creates a 15° bevel. Before cutting the panels, make test cuts with scrapwood.



Establish the field. Score a $\frac{3}{16}$ -in.-deep shoulder around the field using the tablesaw.

ness of the wood—raising the bit with each pass until you reach the final depth. If you're raising more than one panel, rout each panel in order before raising the bit. To guarantee a clean cut, make sure your last pass is a shallow one, removing no more than $\frac{1}{16}$ in.

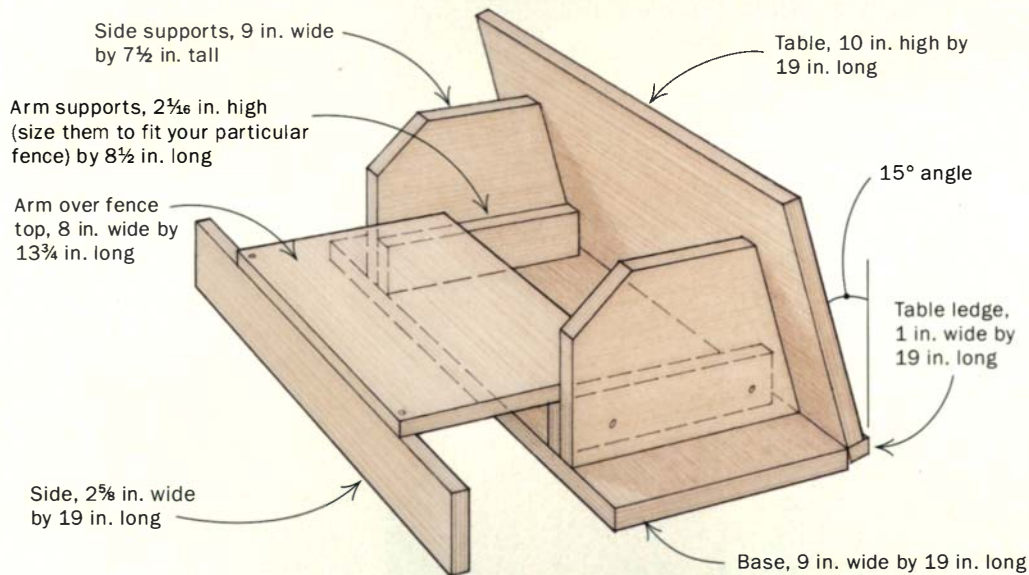
Face against the fence—You can raise a panel at the router table using a vertical panel-raising bit buried in a tall auxiliary fence. This method requires you to take light passes, and your router should be running at 18,000 rpm to 22,000 rpm, which is in the range of many single-speed routers.

Again, cut the cross-grain ends before the long-grain sides and take several passes, exposing more of the bit after each cut by

moving the tall fence. For safety's sake, use a featherboard mounted high on the panel to ensure that the workpiece stays snug against the tall fence as you cut.

BUILD A PANEL-RAISING JIG

This jig is relatively straightforward but makes raising a panel at the tablesaw speedy and safe. It's made of $\frac{3}{4}$ -in.-thick plywood and assembled with 1 $\frac{5}{8}$ -in. drywall screws. Build the jig first, then attach the arm so that it's snug over the tablesaw fence.



Panel-raising on the tablesaw

Finally, you can raise panels on the tablesaw. Similar to the hand-tool method, this method produces a beveled tongue.

Rather than tilting the blade to cut a bevel, I use a shopmade jig (left) that holds the panel at a 15° angle and straddles the tablesaw fence. It alleviates almost any chance of kickback and allows you to secure the panel to the jig with clamps so that your hands are out of danger when making the cut. Also, it is easy to adjust for different size panels. Just raise and lower the blade or move the fence.

Clamp the panel to the jig and cut.

Raise the blade so that it reaches the shoulder. Make the cross-grain passes before cutting the long-grain sides. A steady feed rate and a sharp blade reduce burn marks. Leftover marks can be cleaned up with a scraper.



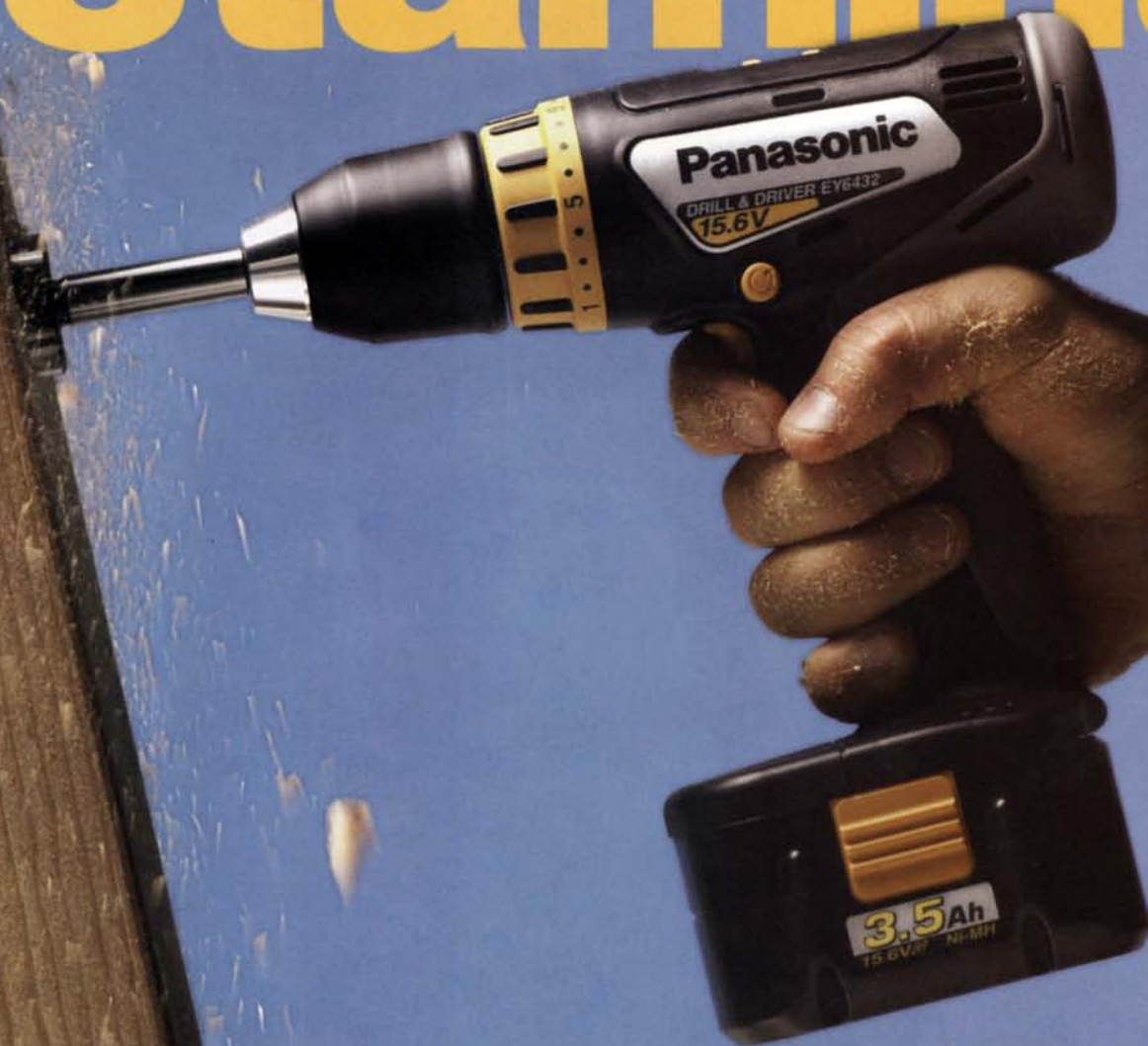
Raise the panel—Once you've built a jig to the specifications included in the drawing above, you can begin cutting the panel. First, cut a test bevel using scrap material that is the same thickness as the panel. Aim to create a tongue that fits in the groove of your frame and will leave some room inside the groove for the panel to expand. Then measure the width of the bevel to determine the location of the shoulder.

Start by establishing the shoulder on the tablesaw. Set the tablesaw fence to the width of the bevel on your test cut, and raise the blade to about $\frac{3}{16}$ in. Then run all four sides of the panel through the tablesaw.

After establishing the shoulder, clamp the panel to the jig and align the fence for the correct tongue thickness. Raise the blade so that it just reaches the shoulder and begin cutting.

The tablesaw is far and away the fastest way to raise panels. If you have more than two or three panels, you'll make up the time spent building a panel-raising jig. And once you've built the jig, you can use it again and again. I use mine not only for raising panels but also for cutting wide chamfers on the top or bottom of small tabletops. □

stamina



When performance is your priority, rely on Panasonic professional cordless tools. Our new drill and driver features a **3.5Ah Ni-MH battery for the highest capacity available**, giving you the power and stamina to get the job done. It's also lightweight and ergonomic. Our new line of drill and drivers—they will last as long as you do.

Panasonic ideas for life

Check out our full range of cordless tools @ panasonic.com/stamina or call 1-800-338-0552

READER SERVICE NO. 108

Tools & Materials

Ridgid's beefier contractor's saw offers excellent value

Ridgid's new contractor's saw (model No. TS3650) is a true furniture maker's tool on a par, in all but horsepower, with full-size cabinet saws. It looks like any other contractor's saw, but many of the important details have been redesigned.

The trunnion assembly is a one-piece iron casting that is much stiffer than the small castings and connecting rods of the older designs. The pivoting arm that supports the saw's arbor also is a beefy casting, and it's attached to the main casting in a way that eliminates any play between the two. In another improvement, the main casting wraps around the blade, allowing fairly effective sawdust collection through a built-in 2½-in.-dia. port.

As on most contractor's saws, the trunnions are mounted to the underside of the table, but this saw also has a simple cam and lever built into the rear trunnion. The cam makes it possible to align the blade parallel to the miter-gauge slot in just a few minutes. Both the 45° and 90° blade-tilt stops are adjustable from above the table with setscrews on both sides of the insert plate. The blade-tilt and height controls worked smoothly, and one nice feature—not seen even on much pricier saws—is a blade-angle lock on the front trunnion.

The standard, vibration-prone V-belt drive has been replaced on this saw with a flat, automotive-style poly V-belt running on machined steel pulleys, which reduces noise and vibration. The motor is a 1½-hp, totally enclosed unit that should provide adequate power for most ripping operations.

The aluminum rip fence locks down at both ends, and it was sturdy, accurate, and slid smoothly on the rails. As shown above, the rails are set up for a rip capacity of 12 in. to the left of the blade and 36 in. to the right, but you can shift the rails farther right to expand the ripping capacity to more than 50 in. Out of the box, the fence was very close to parallel to the blade, but fine-tuning the alignment was a hunt-and-peck process.

Ridgid's designers improved many other functions of the



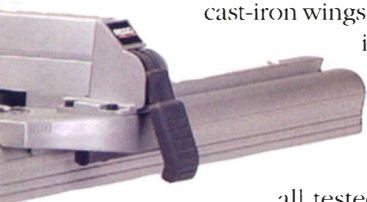
Adjusting blade alignment. A cam and lever on the rear trunnion make it easy to align the blade to the miter-gauge slot.



RIDGID TS3650

Street price	\$547
Motor	1½ hp/13 amps at 120v
Blade tilt	Left
Maximum rip capacity	36 in.
Runout at rim of 10-in. testing disc	0.001 in.
Blade alignment	0.002 in. out of parallel
Dust collection	Shroud around blade with vacuum port

machine. The miter gauge uses screws for adjusting the 45° and 90° angle stops. The saw uses two wrenches for blade changing—no more nicked fingers. The base has a built-in retractable caster system that worked better than any I've ever seen. The power switch has a large paddle handle (easy to turn off), and the switch can be mounted anywhere in a T-slot along the front fence rail. The two



cast-iron wings have large, open slots that make it easier to clamp accessory fences or featherboards to the tabletop.

Overall, the fit and finish of this saw were very good. The table flatness, runout, and initial alignment all tested out to be better than average. The machine had a nice, heavy feel to it because the steel used in the stand and base is thicker than that on many other contractor's saws.

On the downside, the splitter and guard assemblies were awkward to set up and difficult to align with the blade. The standard insert plate and an accessory dado insert plate are sturdy metal castings, but the plastic zero-clearance throat plates are flimsy.

The saw is sold at The Home Depot. At \$547, it is an impressive machine for the money.

—John White is Fine Woodworking's shop manager.



Retractable casters. A foot pedal controls a scissors lift that activates four retractable rubber wheels.

Hole-saw accessory ejects plugs

Removing a stuck plug from a hole saw is frustrating. Although there are ways to avoid a stuck plug, such as drilling halfway through from one side and then completing the operation from the reverse side, in many situations that approach isn't feasible.

Phantom Innovations has brought a plug-ejecting hole-saw arbor to the market. The Twister ezeOUT comes equipped with a ¼-in.-dia. brad-point pilot bit and accepts all common hole saws 1½ in. dia. and larger. After drilling, simply put the drill in reverse, grab hold of a knurled knob, and watch as a pair of rods ejects the plug. The brad-point bit increased the accuracy of hole placement when compared to the twist bits found in other arbors. When used on a drill press, the auto-eject feature must be operated manually, but it takes just seconds. The only drawback is that the plug-ejecting arbor is nearly 2½ in. longer than a standard arbor. That added length might limit its ability to drill in tight quarters.

Twister ezeOUT sells for about \$30. For more information, call 612-270-4223 or visit www.johnsspecialtytools.com.

—Eric Rimel is a student at the University of Idaho.



Ease out the plug. To remove a plug from a hole saw using the Twister ezeOUT, simply squeeze the drill's trigger.

The 2004 International Woodworking Fair

The biannual IWF show, held in August at the Georgia World Congress Center in Atlanta, had a record 1,372 exhibitors displaying the newest technology in machinery, supplies, and services.

For those who've made the trek to Atlanta before, you know only too well how exciting and—at the same time—exhausting this show can be. For those who have never been, you ought to make the pilgrimage at least once, just for the thrill of it all. The exhibitors run the gamut from the high-tech machines that have a footprint exceeding the square footage of some houses to the tiny booths occupied by a lone inventor who has risked his life savings on bringing a new woodworking widget to market. Not all of the products are new, of course; many of the displays featured well-established tools and machinery. What follows is a random selection of some products that caught the eye of the four editors from *Fine Woodworking* who attended the show.



Bosch's new impact drivers

The new line of Impactor fastening drivers (most other manufacturers call them impact drivers) from Bosch offers more torque than standard drills. The Impactor drivers are battery powered and come in 9.6v, 12v, and 14.4v sizes (models 23609, 23612, and 23614, respectively), offering 950 in./lb., 1050 in./lb., and 1150 in./lb. of torque, respectively. Each tool features a variable-speed trigger and a built-in LED work light for dim conditions, and comes with two batteries, a charger, and a carrying case (877-267-2499; www.boschtools.com).



Amana router bits solve the problem of loose panels

Amana Tools has introduced the In-Style & Rail System for shaping cabinet door frames with cope-and-stick patterns and cutting the groove for flat panels. This system is designed to accommodate varying thicknesses of plywood, and it enables you to adjust the cut of the groove to match the thickness of the plywood. The cutter sets are available in two sizes for ¼-in.- and ½-in.-thick plywood panels (cutting grooves from ¾ in. to ½ in. and from ¾ in. to 1½ in., respectively). Cutter patterns are

2004 IWF (continued)

available in three profiles, and the two-piece sets sell for about \$155 (800-445-0077; www.amanatool.com).

Jet adds convenience to dust collectors

Remote-control starters have been added to six of Jet's dust collectors. Now, users can keep a remote-control switch in their pocket or place it strategically in the shop, and with the press of a button, turn the collector on and off. A timer has been built into the electronics, allowing you to leave the shop and set the collector to run for 1 to 99 minutes before shutting down.

Jet also has upgraded its 18-in. bandsaw (reviewed in *FWW* #170) by adding a more powerful 1¾-hp motor and beefier trunnions, and by increasing the resaw capacity to 12 in. The saw sells for about \$1,250 (800-274-6848; www.jettools.com).

Delta Shopmaster sanding table

Delta has come out with an inexpensive downdraft dust-collection table (model No. AP075) designed to collect sanding dust at the source. It comes completely assembled with a port for a standard 4-in.-dia. hose, and it will work with a 1-hp or larger dust collector. Rubber pads on the bottom hold the Shopmaster firmly to a work-surface, and it comes with two adjustable stops that fit into grooves in the top of the table. The top is 20 in. by 40 in., and the unit sells for \$149 (800-438-2486; www.deltawoodworking.com).

Laguna offers sliding tables for bandsaws

For woodworkers who cut heavy timbers, resaw large logs, or simply prefer the safety of ripping with a bandsaw rather than a table-saw, Laguna is offering sliding-table attachments in three different sizes, at prices that range from \$850 to \$1,400 (800-234-1976; www.lagunatools.com). "We have essentially turned a bandsaw into a tablesaw by kitting it with our new sliding table system. This gives woodworkers the ability to cross-cut in addition to rip with our bandsaws," said Torben Helshoj, president of Laguna Tools.

Hitachi tools get a makeover

If you like the high-tech look of the latest athletic shoes, Hitachi's re-designed tools just might suit your tastes. Besides the bold graphics and colors, though, substan-



What they offer. Miller dowels come in a variety of wood species and three different sizes of stepped dowels, along with a separate drill bit for each size.

A better dowel system

When I first started making furniture, I was intrigued by the simplicity of dowel joints, but I soon discovered that they have some serious limitations. First, a dowel joint is weak because it depends entirely on a small amount of glued surface, some of it end grain. Second, driving a dowel home can be very difficult because the glue can grab too fast and seize up before the dowel is fully seated.

With its new system, the Miller Dowel Co. has reinvented how a dowel joint is made. Their modified, stepped dowel preserves the simplicity of dowel joinery, without the drawbacks experienced with plain dowel joints. The secret is that it changes in diameter in three equal steps over its length. A specially made stepped drill bit creates a hole through both pieces being joined, to match the shape of the dowels. Because of the steps, the dowel drops by most of its length into the matching hole before there is any resistance, and driving the dowel home takes little effort with a light hammer-blow.

Once seated, because the full-diameter head of the dowel seats before the other portions do, it works just like a screw head, pulling the joint tight. And because of the larger glued surface, you get a stronger joint. In working with these dowels, I found that the glue grabbed and held the dowel solidly as soon as I drove it home, allowing quick assembly for projects. The finished joint resembled a traditional plugged screw hole.

To test the strength of the dowels, I used them to build a large clamp-storage rack made of 2x6 Douglas fir that was still fairly green. The joints in the rack were all butt joints that depended entirely on the dowels for their strength. As the assembled rack dried out in the shop, the wood visibly shrank and cupped, but the joints stayed tight despite the stresses on them.

You can buy the dowels in three sizes and several wood species. They come in packs of 25 or 40, or in larger bulk quantities, and you can purchase the bits separately from most woodworking-supply catalogs. For more information, call 866-966-3734 (www.millerdowel.com).

—J.W.



Adams Wood Products, Inc.™

FURNITURE COMPONENTS

STOCK ITEMS • NO MINIMUM
CUSTOM COMPONENTS

FREE COLOR CATALOG

Featuring:

- Bed Posts
- Billiard Legs
- Bun Feet
- Cabinet Onlays
- Corbels
- Finials
- Island Legs
- Table Bases
- Table and Chair Kits
- Tapered Legs
- Turned Legs
- Queen Anne Legs



Bun Feet
4 1/2" HI



P.O. Box 728, Dept. Q45
Morristown, TN 37815-0728
Phone 423-587-2942 • Fax 423-586-2188
www.adamswoodproducts.com



READER SERVICE NO. 117

4-WAY MONEY MAKER!

Molds • Planes • Sands • Saws



12", 18"
and 25"
Models
Available

**FREE
30-Day
TRIAL!**

Now, turn a \$5.00 rough board into \$75.00 worth of trim in just minutes! Make over 500 standard patterns, curved molding, tongue & groove, any custom design. **QUICKLY CONVERTS** from Molder/ Planer to Drum Sander or power-feed Multi-Blade Rip Saw! **Variable Feed Makes the Difference!** Just a twist of the dial adjusts the Woodmaster from 70 to over 1,000 cuts per inch. Produces a glass-smooth finish on tricky grain patterns no other molder/planer can handle. Plenty of American-made "muscle" to handle money-saving, "straight-from-the-sawmill" lumber. 5-Year Warranty.

Prouder than ever to be MADE IN AMERICA!

Call Today for FREE FACTS!

800-821-6651 EXT. PJ13

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

READER SERVICE NO. 82

HIDA TOOL & HARDWARE

1333 SAN PABLO AVE. BERKELEY, CA 94702
510-524-3700 1-800-443-5512 hidatool@hidatool.com



Mitsukawa brand; ryoba & dozuki hardwood saws for furniture & cabinet makers.

Ryoba: 195mm & 210mm (21 teeth on cross-cut)

Dozuki: 210mm & 240mm (27 teeth on cross-cut)

Visit our website at www.hidatool.com

READER SERVICE NO. 47

The Best Wood Glue Ever

What makes Titebond® III Ultimate Wood Glue the best ever? It's waterproof, yet cleans up with water. It allows eight minutes of open assembly time and offers an application temperature as low as 47°F.



Plus it's vastly stronger, safer, easier to clean up and less expensive than polyurethane glues.

Titebond® III. We see it as a natural progression of tradition and excellence. You'll see it as the ultimate wood glue.

1-800-347-4583
www.titebond.com

READER SERVICE NO. 90

2004 IWF (continued)

tial mechanical changes have been made. For example, the new 12-in. compound-miter saw (model No. C12LCH) comes outfitted with a laser sight and a digital readout that displays the exact miter and bevel angle. It sells for \$369 (800-829-4752; www.hi-tachl.us/hpt).

Freud's antivibration, thin-kerf sawblade

Freud, which has been making carbide cutting tools for more than 50 years, has introduced its new antivibration, thin-kerf sawblade (No. LU83R, 10-in. 50T). Laser-cut, antivibration slots cut into it allow the blade to expand when it heats up during use, without distorting its shape. The blade is coated with what Freud calls Perma-shield—a nonstick coating that reduces friction, heat, gum buildup, and rust, prolonging the life of the blade. An additional benefit

of this design is that the blade generates a lot less noise when it is running. A 10-in. combination, thin-kerf blade sells for \$50 (800-472-7307; www.freudtools.com).

New router lift eliminates backlash and has a digital readout

The SmartLift Digital, from Jointech, uses a series of gears in a direct-drive system to raise and lower the router carriage, and it has a digital height gauge built into a ¾-in.-thick aluminum mounting plate. The lift is designed to eliminate backlash, and the digital encoder reads the actual position of the carriage, so you can be sure the router bit is exactly where the gauge says it is, to within 0.001 in. The lift is solidly built and features multiple insert rings to change the size of the bit opening. The mounting plate has corner leveling pads. The digital measuring system comes from Accurate Technology and is designed to resist dust contamination.

The SmartLift Digital soon will be available direct from Jointech for \$430 (210-377-1288; www.jointech.com). Lower prices may be offered at woodworking shows. As designed, the lift fits Porter-Cable, DeWalt, Bosch, and Makita fixed-base router bodies.

A new sustainably grown hardwood

Lyptus, a hybrid of two eucalyptus species that grows rapidly in sustainable forest plantations, combines the grain of mahogany with a range of color similar to the pulpwood and heartwood of cherry. Distributed by Weyerhaeuser in the United States and Canada, lyptus costs 20% to 40% less than mahogany and cherry.

Lyptus is appropriate for furniture, flooring, millwork, and cabinets, and is available as plywood and veneer, as well as solid lumber in thicknesses up to 8/4. Call 877-235-6873 or log on to www.weyerhaeuser.com/wbm to find a retail outlet near you.

No-hassle layout squares

With most layout squares, it is difficult to hold the square securely while marking a line. Pat Warner (www.patwarner.com), a frequent contributor to *Fine Woodworking*, is offering a layout square that solves this problem. Because of its size and balance, the square rests securely on a workpiece and allows you to use both hands to hold additional angle jigs or to reach for clamps.

The long and short blades, made of ¼-in.-thick aluminum, are reversible, with no loss in accuracy, and are parallel to each other. The blades can be removed and retrued if the tool is dropped. Warner guarantees that the square is accurate to within 0.001 in. The price, \$60, includes shipping.

—Philip Stivers teaches woodworking and cabinetmaking at Palomar Community College in San Marcos, Calif.



A straightedge for more than layout. The ¼-in.-thick aluminum blades also can be used as a fence for short router cuts.

Space-saving power-cord reel

For many woodworkers, extension cords sometimes make the shop floor look like a plate of pasta. Mounting power-cord reels keeps an extension cord neatly coiled on a spring-loaded winder until it's needed. Woodhead's new PowerHouse retractable outlet, designed specifically for residential applications, can be mounted on a wall or sunk flush into the wall, secured directly to the studs.

The unit I tested has a 25-ft., 14-ga. grounded cord rated for motors that draw up to 15 amps. A built-in circuit-breaker adds overload protection. The reel is contained in a sturdy 14-in.-square by 3½-in.-deep sheet-steel frame that mounts to a wall with four screws. A 38-in.-long cord plugs directly into a nearby electrical outlet to provide power for the unit. When pulled out, the cord locked in place, and a tug on the cord started the rewind, although sluggishly.

The PowerHouse costs \$49.95 and is available at The Home Depot.

—Tom Begnal is an associate editor.



A plug where you need it. The PowerHouse outlet mounts to the wall and has a built-in circuit breaker and retractable extension cord.

BRUSSO®

PRECISION HARDWARE



WWW.BRUSSO.COM 20 VANDAM STREET
NEW YORK NY 10013

READER SERVICE NO. 104

DEFINING THE BEST - WATERLOX

Tung Oil

n: a yellow oil pressed from the seeds of the tung tree
[syn: Chinawood oil]



Tung Oil has been in existence for centuries. It is pressed from the seeds of the tung tree. Waterlox original family formulas are handmade with tung oil and resin, creating a unique blend that bonds with the fibers of the wood surface. Since 1916, Waterlox continues to offer a durable and beautiful hand-rubbed look! It is easy to apply and can be maintained beautifully with little effort. Choose Waterlox for all wood surfaces: floors; woodwork; cabinetry; doors; windows and more!

Ask us about our Original Sealer/Finish, Satin Finish and High Gloss Finish. Contact us today by e-mail: info@waterlox.com, or call 1-800-321-0377.

Time Tested Finishes 

www.waterlox.com

READER SERVICE NO. 59

Cohasset Colonials

Early American Furniture Kits



Our new catalog is filled with authentic reproductions of Early American furniture, lighting, prints and more. Make your own antiques from our kits, or let us do the finishing for you.

Call 1-800-288-2389 for a Free Catalog

www.cohassetcolonials.com

Box 548-FW46 Ashburnham, MA 01430

READER SERVICE NO. 131

Woodworker's Supply

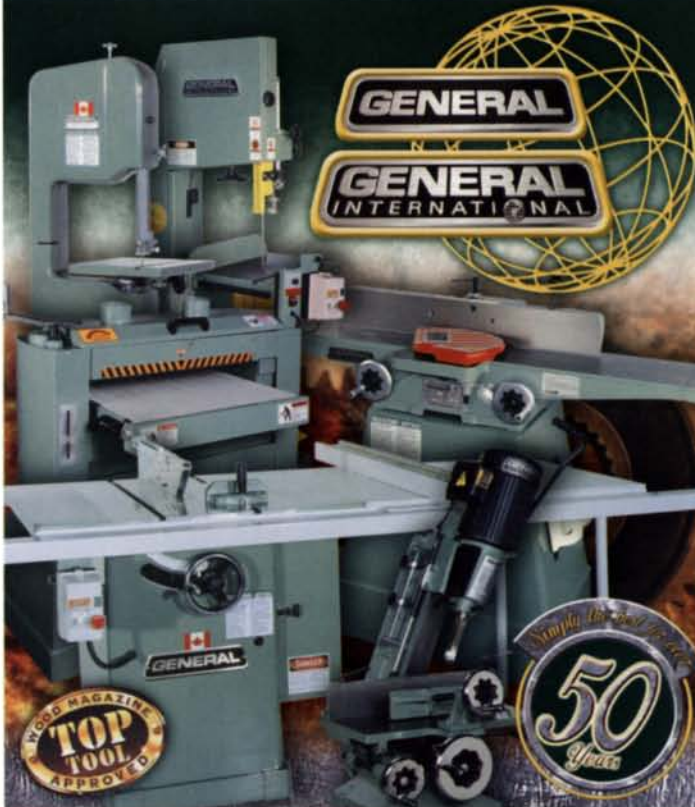
Since 1972
where the experts help their customers



OUR AWARD WINNING
Woodtek
6" X 48" BELT & 12" DISC SANDER

Call us at 1-800-645-9292
or visit us at woodworker.com

READER SERVICE NO. 116



GENERAL
NEW
GENERAL INTERNATIONAL

WOOD MAGAZINE
TOP TOOL
APPROVED

Simply the best in the world
50
Years

WWW.GENERAL.CA

READER SERVICE NO. 44

Free with every Mini Max USA Combination Machine...

World-Class Service



Buy a Mini Max USA combination machine, and not only do you get a great machine, you get a great company. We've built a business centered around you and your needs. So whether you already have one of our machines or are just considering one, give us a call. Discover how a world-class company can change your woodworking experience.

Toll Free 866.975.9663
www.minimax-usa.com



MINI MAX
-USA-



The Award-Winning CU300 Smart

READER SERVICE NO. 25

The Toughest Glue On Planet Earth



Bonds:
Wood, Stone, Metal,
Ceramic, & More!

Gorilla Glue is the versatile, interior/exterior adhesive ideal for most household fixes and building projects: furniture repair, crafts, woodworking, and general repairs around the house. Bonds wood, stone, metal, ceramic & more! Incredibly strong and 100% waterproof.

**REQUEST YOUR FREE
INFORMATION KIT!**
www.gorillaglu.com
1-800-966-3458

READER SERVICE NO. 48

SQUARE DRIVE SCREWS

- Square Drive Beats Driver Bit Slippage
- Hardened Steel for Extra Strength
- Deep Thread for Super Grip
- Stocking Over 750 Sizes & Styles

McFEELY'S
SQUARE DRIVE SCREWS

PO Box 11169 • Lynchburg • VA 24506
www.mcfeelys.com or 1-800-443-7937

READER SERVICE NO. 53



Beauty & Tone
at its Finest

BUILD A GUITAR

~Fine Woods & Tools for Guitarbuilders~

LMI

Luthiers Mercantile International
www.lmii.com • 800-477-4437 • Free Catalog

READER SERVICE NO. 21

SHAKER

Classic Furniture Kits

A fine collection of furniture which exemplifies the simplicity and beauty of Shaker design. Plus – Shaker oval boxes, clocks, lamps, baskets and much more.

Call 1-800-840-9121 for **FREE CATALOG**

includes Shaker Chair Tape samples

SHAKER WORKSHOPS www.shakerworkshops.com

Box 8001-FW44, Ashburnham, MA 01430



READER SERVICE NO. 132

Who Says Good Help Is Hard To Find?

Home shop or industrial plant, cabinet making, v-carving or 3D crafts – ShopBot CNC tools are perfect for every woodworker!



Starts at
\$5,995.00

www.shopbottools.com
888-680-4466



ShopBot

Tools for tomorrow today!

READER SERVICE NO. 159

Teardrop Trailer Plans

*Build your own classic camping trailer!
The ultimate woodworking project*

- NO WELDING REQUIRED!
- FULL GALLEY IN REAR

8' Cubby



Complete plans include built-in icebox, stove, water tank, 12V electric system, cabinets, floor hatch for porta-potty. Sleeps two inside the cabin, 4' x 8', 900 lbs.

Kuffel Creek Press • www.kuffelcreek.com

PO Box 2663 • Riverside • CA 92516 • fax 909/781-9409

READER SERVICE NO. 20

Gerstner®

CLASSIC HARDWOOD TOOL CHESTS
Made in America since 1906



For a full color catalog call:
H. Gerstner & Sons, Inc.
(937) 228-1662

www.GerstnerUSA.com/fw.htm

READER SERVICE NO. 14

MEASURE FROM HERE TO THERE WITHOUT EVER GOING THERE.



At the touch of a button, the Craftsman® Laser Guided Measuring Tool can tell you the distance from one wall to another. It also calculates square footage and volume. All of which comes in handy when you want to know how much paint to buy or how much new flooring you'll need. Available at Sears

Sears
Good life. Great price.

and Sears Hardware Stores.
Or go online at craftsman.com.

CRAFTSMAN®
MAKES ANYTHING POSSIBLE®



Sanding Basics

Combine power-
and hand-sanding
for good results
with no wasted time

BY DAVID SORG

The course of true love never did run smooth, according to Shakespeare, and smoothing wood true rarely causes love to course, it would seem. Boredom and fear are more common feelings among woodworkers when sanding their projects. But proper sanding is a crucial part of woodworking, so please read on for some tips and techniques that will turn your boredom into serenity, and your fear into fun.

I'll stick my neck out and state that no project should be finished without first being sanded. Even if you are a hero with the handplane or skilled with the scraper, you won't be able to get a surface that is uniformly smooth and with an even sheen. Inevitably, there will be tiny depth changes from adjoining passes of the blade, while the sole of the plane can burnish strips of wood that may show up after a stain or a clear finish has been applied.

Those who rely solely on power tools will inevitably be left with planer- and jointer-knife marks and fibers crushed by the feed rollers. Router tables can leave gouges and scratches, and assembly often produces

some errant glue splotches. All of these blemishes should be removed before a finish is applied, and sanding is the best way to achieve this. The most efficient way to sand a surface is with a combination of power-sanding and hand-sanding

Power-sanding comes first

Of course, you could do all of your sanding by hand, but why? Even if you use power sanders wherever practical, there will be enough hand-sanding on almost any project to give you plenty of hand-done satisfaction. Power sanders deliver results with much greater speed, and with minimal practice they'll also deliver a flatter surface than sanding by hand alone.

The good news is that unlike much of your other shop equipment, quality sanding tools will not cost you much. I strongly suggest you get a random-orbit sander. A pad sander also is useful, and I'll explain why a detail sander is optional. Don't forget a dust mask and hearing protection.

Fast stock removal with a random-orbit sander—Random-orbit sanders are wonderful machines. The pad has dual motion: It spins in a circle as well as in an eccentric orbit. These sanders are great for rapidly smoothing and leveling raw wood. Five-in.-dia., palm-held models are most common, but you also can buy 6-in.-dia., two-handed versions.

Most random-orbit sanders have holes in the pad (and, of course, in the sandpaper) for dust extraction. The sanding disks are backed with either pressure-sensitive adhesive (PSA), which is cheaper, or reusable hook-and-loop systems.

Older sanders need to be switched on when already resting on the surface of the wood, or they will spin too fast and gouge the wood when you try to bring them in

TOOLS FOR SANDING

Achieving a well-sanded surface in the most efficient way requires a combination of power-sanding and hand-sanding.

RANDOM-ORBIT SANDERS

These machines are great for removing large amounts of wood from large surfaces. They are less suitable for small areas, and their shape prevents them from reaching into inside corners.



PAD SANDERS

Less aggressive than random-orbit sanders, pad sanders are easier to control, which makes them suitable for narrower and more confined areas such as table legs and the insides of cabinets.

HAND-SANDING TOOLS

Sand by hand to finish the job. For flat areas, use a backing block made from cork or rubber to prevent your fingers from applying uneven pressure. To keep moldings crisp, use commercial rubber profiles or shop-made foam ones to back the sandpaper.

Sanding with power

POWER-SANDING FLAT SURFACES



WIDE PARTS

Again, a random-orbit sander does well here. Note: It is easier to sand parts such as table aprons before assembly.

LARGE PANELS

With their wide contact surfaces, random-orbit sanders are naturally at home on large panels.

NARROW PARTS

On smaller pieces such as the parts for a frame, a pad sander gives more control than a random-orbit sander.



for a landing. Most new models have electronic speed control, which allows you to lift the sander to apply it to an adjacent surface without having to turn it off and restart it each time.

Random-orbit sanders will do a speedy job on large surfaces and bring two pieces of wood into the same plane. However, at the edges of a workpiece, keep the majority of the pad on the wood, or you'll risk dishing or rounding over the edge. By the same token, keep these sanders moving; don't concentrate on one spot, or you could create a little bowl.

Orient your project, if you can, so that you're working horizontally. By letting the weight of the sander work for you, you'll

gain more control with less fatigue. Also, sand subassemblies before glue-up. It's much easier to sand a frame-and-panel, the aprons of a table, or a drawer's parts before they're assembled.

Pad sanders give more control in small areas—Pad sanders, also called palm sanders or finish sanders, use a simple orbital pattern, and the pad does not rotate, giving a much slower sanding action but greater control. The square pad allows the tool to get fairly close to inside corners (but beware getting it too close, where it quickly can chew up the adjacent surface). This type of sander works well on smaller surfaces like the edges of shelves

or table legs, as well as on the insides of cabinets and in other confined spaces.

The right grit from start to finish—

With either type of sander, I'd rather start with 150-grit than 120-grit paper on most pieces, even though it may take longer to remove some milling marks. For wood that is already in good shape, especially with thin-veneered sheet goods, I start with 180-grit paper.

Note: The grits I refer to here are based on the FEPA scale, which uses the prefix P, rather than the alternate CAMI, or C, scale. In the 150 to 220 range, the grits are nearly equivalent, but it's best to work with the paper from one scale.

Don't continue using a piece of sandpaper until the sand is all gone and there isn't anything left but the paper. That's a false economy if you're charging for your time; and if you're woodworking for fun, well, you're taking away a bunch of it. Move to a fresh section of sandpaper as soon as you feel it stop cutting or start to clog, or when it requires you to exert more pressure.

Having experienced this the hard way, let me assure you that it's very important to vacuum and/or blow off the entire piece between grits. I do both, then wipe it with a tack cloth. One piece of 150 grit being



CHECK YOUR PROGRESS

With the workpiece lit by a strong light, wipe the wood with some mineral spirits and check the surface for obvious scratches and rough areas.

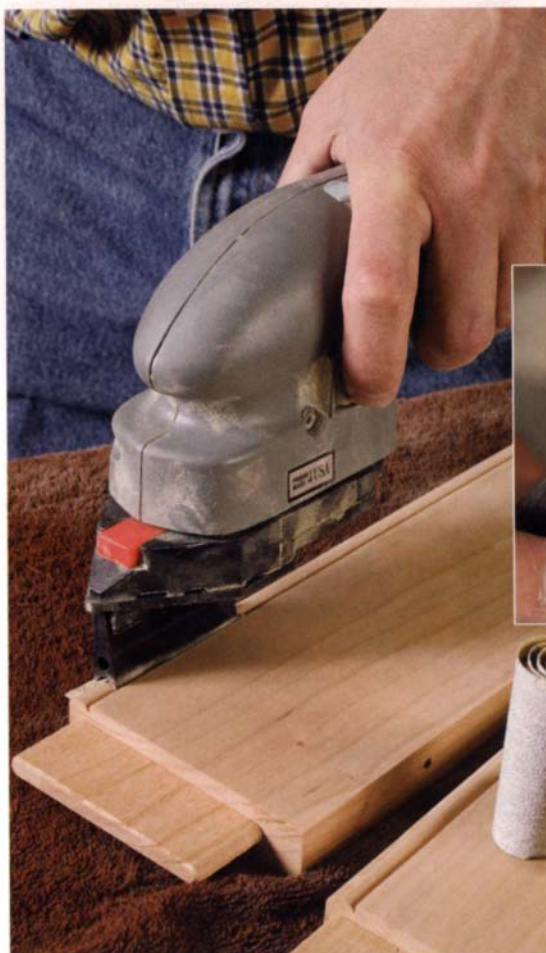
swirled around on your 220-grit pad will make you curse when you see the results.

Tips for efficient sanding—With a cabinet, begin sanding on the inside: If you start with the inside while you're fresh, you'll take a few extra minutes to do it right instead of skimping on it at the end.

For veneered plywood, you can start and stop with 180-grit paper if the inside will be minimally seen or used. Use a hand-sanding block on the corners and on any more visible areas such as solid-wood edging.

Devote more time to visible areas and those likely to be touched. Ending with 180-grit paper is fine for softwoods, but go to 220 grit for hardwoods. On end grain, go one grade finer so that it doesn't absorb the stain or clear finish as deeply.

How do you know when you're finished power-sanding? Wipe some mineral spirits on the surface and sight across the wood toward a strong light. Pay no attention to the beautiful color that appears; instead, look at the surface for telltale scratches, especially the ugly orbital kind. You would like to see a uniform appearance with no rough areas or single outstanding scratches. Sometimes it's easiest to see this right at the moment of evaporation, when the ruts of



SANDING DETAILS



A quicker way to sand moldings. Detail sanders come with an assortment of different pads designed to fit most molding profiles. The radius on this pad matches the bead of the apron (left). One disadvantage of detail sanders is that the adhesive-backed sandpaper frequently comes away from the pad (above).

Sanding by hand

HAND-SANDING FLAT SURFACES



FLAT AREAS

To maintain a flat surface, you should always use a backing block when sanding large areas.

END GRAIN

To lessen end grain's darker appearance when the workpiece is finished, burnish the wood and fill the pores by sanding end grain up to 320-grit paper.



EDGES

Break the edges on a project not only to reduce future damage but also to prevent finish from forming a mound at the edges.

the scratches will still be shiny with fluid while the top surface is dull with dryness. If you take this step, you'll avoid the agony that many experience when they apply a stain only to see the scratches jump out.

Sanding details and molding

After sanding the wide-open areas, how should you sand profiled areas? Manufacturers advertise detail sanders as the answer to sanding any shape and any confined space. These sanders come with a variety of pads designed to fit different profiles. Although I own a couple of detail sanders, I could live without them, mostly because it's too much trouble to constantly change the paper on them; by their nature, they put their sanding action into a small area of sandpaper that wears very quickly.

Most of the time I think it's quicker to do moldings, interior corners, and other small areas by hand. To keep the moldings crisp, use commercial rubber profiles that cover most convex and concave shapes, or you can make your own profile blocks from pieces of foam-insulation panel.

The end grain on raised panels requires a special sanding sequence to tone it into the rest of the panel. Start by sanding across the grain with 150- or 180-grit paper to deal with the rough texture. Then sand the en-



SANDING AFTER GLUE-UP

No matter how thoroughly you sand parts prior to assembly, there still will be small areas to touch up by hand-sanding with 220- or 320-grit paper. Areas where glue was removed with a damp cloth may need smoothing (top), or there may be two pieces that don't join in a perfect plane (bottom). To avoid cross-sanding where grain intersects, mask off one of the pieces.



HAND-SANDING DETAILS



Rubber profiles. Using a rubber pad that fits the molding helps keep the edges of the profile sharp.



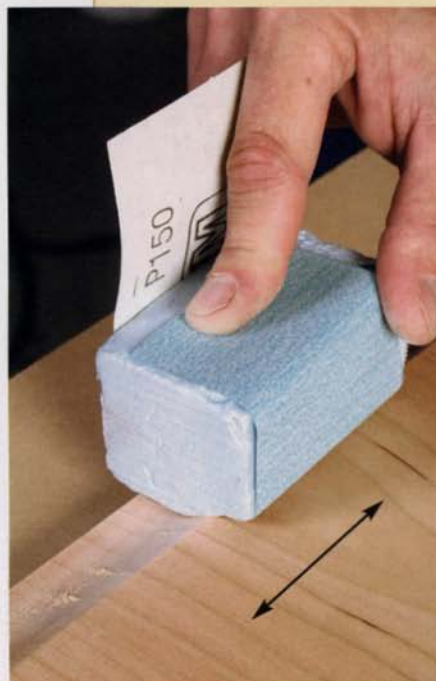
Sanding curves by hand. Contour the paper to fit curves in the wood.

tire profile on all four sides of the panel with 180- or 220-grit paper. Last, sand just the end grain with 320-grit paper, going with the grain in short strokes to eliminate any cross-grain scratches and to lessen the end grain's ability to absorb finish.

Final hand-sanding gives a finishing touch

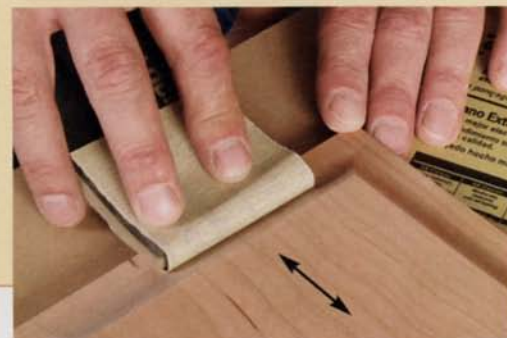
No matter how much you are able to use machines for the initial stages of sanding, you'll want to give each surface some final sanding by hand. Primarily, this is to get rid of the small orbital scratches left by the machines, replacing them with smaller, finer scratches that are all parallel to the grain of the wood and hence less noticeable.

You should back up the sandpaper with a sanding block wherever possible to maintain a flat surface. I find the palm-sized rubber blocks most convenient because



CURVE CONSCIOUS

Insulation foam shaped to match the panel's profile makes a good backing for sandpaper (above). The end grain may need to be sanded with paper that is one grade coarser than that used on the rest of the panel, in this case, 150 grit (left). Then sand the entire panel with 220 grit before removing any cross-grain scratches on the end-grain sides using 320-grit paper with the grain.



they also can be used for wet-sanding between coats of finish. Other choices include cork blocks or wood blocks faced with a sheet of cork.

If you plan to use a water-based stain or clear finish, there are a couple of extra steps. After the final hand-sanding, wipe down the piece with a damp sponge. After the wood dries, very lightly sand with the same-grade paper you finished with, but be careful to remove only the raised grain. Watch out for sandpaper coated with stearates: Although they do a better job at preventing clogging,

allowing the sandpaper to last longer and sand more smoothly, stearates are waxy and interfere with many water-based finishes, causing fisheyes on the surface. If you're planning to use a water-based finish, check with the manufacturer to see whether the finish is compatible with stearated sandpaper. Last, as I recommend for all finishing methods, test each sanding step on a sample board. □

David Sorg is a finisher and artist who lives in Denver, Colo.

18th-Century Pipe Box Provides Elegant Storage

Simple construction makes
this an easy project

BY LONNIE BIRD

Smoking was a popular social custom in the Colonies. As a result, Colonial craftsmen fashioned small, detailed boxes for holding long-stemmed clay pipes and tobacco. Today, these boxes are a great way to store items such as candles and matches.

Curly maple is authentic for this reproduction piece, but you can use any wood. Here's an opportunity to practice resawing, dimensioning and routing small parts, scrollsawing, and drawer making.

Cut the parts and assemble the case

The drawer front is $\frac{3}{4}$ in. thick, and the base is $\frac{3}{8}$ in. thick, but the rest of the stock needed to build this project is only $\frac{1}{4}$ in. thick.

After milling and sizing each part to its rough dimensions, rip $\frac{1}{4}$ in. from the forward edge of each side of the box, stopping at the drawer location. Then crosscut the ends of the stopped cuts to square them up. The front of the box will fit in these notches.

The next step is to lay out the scalloped shapes on the front, back, and sides. Cut the shapes on a scrollsaw, making relief cuts to each inside corner to avoid trapping the blade. To cut a smooth, fair curve, leave enough wood to support the blade on both sides. To cut the hole at the top of the back, use a $\frac{1}{2}$ -in. Forstner bit.

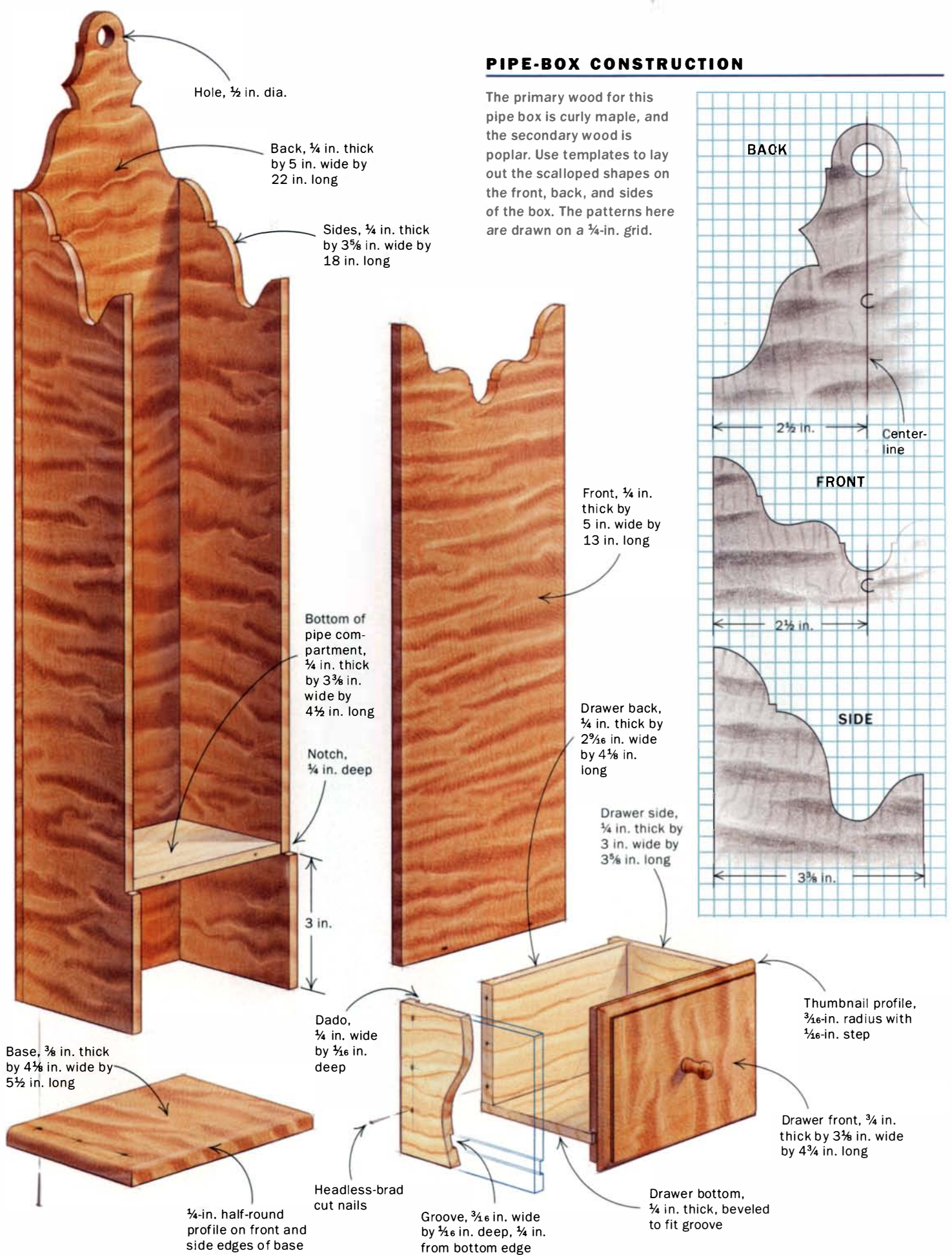
Now cut a $\frac{1}{4}$ -in. half-round profile along the side and front edges of the base. Leave the back edge square so that it can be mounted flush to the back of the case and hung flat against a wall.

Be gentle during assembly—Assemble the box by gluing the back and front to the

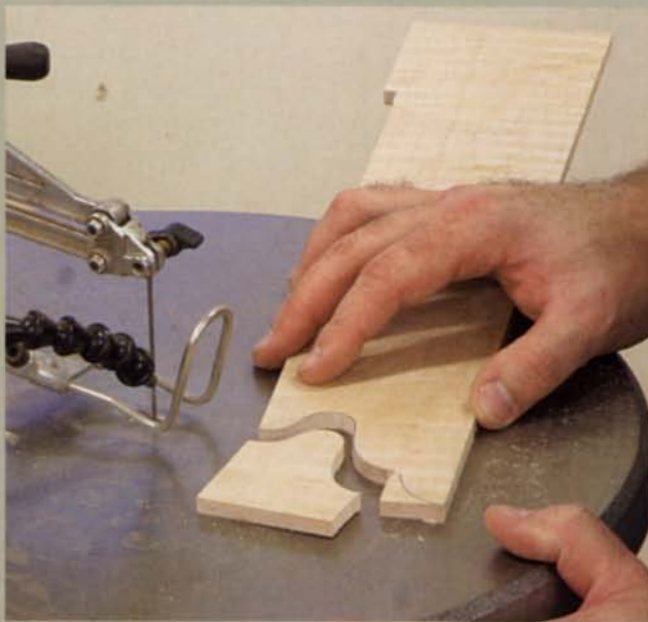


PIPE-BOX CONSTRUCTION

The primary wood for this pipe box is curly maple, and the secondary wood is poplar. Use templates to lay out the scalloped shapes on the front, back, and sides of the box. The patterns here are drawn on a $\frac{1}{4}$ -in. grid.



CUT THE SCROLLWORK AND ASSEMBLE THE CASE



With a scrollsaw and files, prepare the curves. Make relief cuts to the inside corners of the pattern, then cut each sweeping curve to the relief cut (left). Clean up the sawmarks with half-round bastard and smooth files (above).



sides, and clamp with light pressure. The face-grain joints where the sides meet the front and back are strong enough with glue alone. Trim the sides flush to the front and back using a card scraper. Then glue the base to the bottom of the case and drill pilot holes on the underside of the base for $\frac{7}{8}$ -in. headless brad cut nails.

Next, install the bottom of the pipe compartment. Dab a little glue above the drawer opening and then slide the bottom into place. To keep the compartment bottom square and perpendicular to the case sides while the glue sets, place $\frac{1}{4}$ -in.-thick plywood spacers along the inside walls of the drawer opening that are as high and deep as the opening. Once the compartment bottom is flat and in the right spot, drill two pilot holes in the front and back and then drive in the cut nails.

Build the drawer

The drawer is assembled with simple but long-lasting glue-and-nail construction. The front has a $\frac{1}{8}$ -in. lip on the top and sides (but not on the bottom) that covers the reveal around the opening.

Carefully measure the opening and add $\frac{1}{4}$ in. to the length of the drawer front and $\frac{1}{8}$ in. to its width, and cut the piece to size.

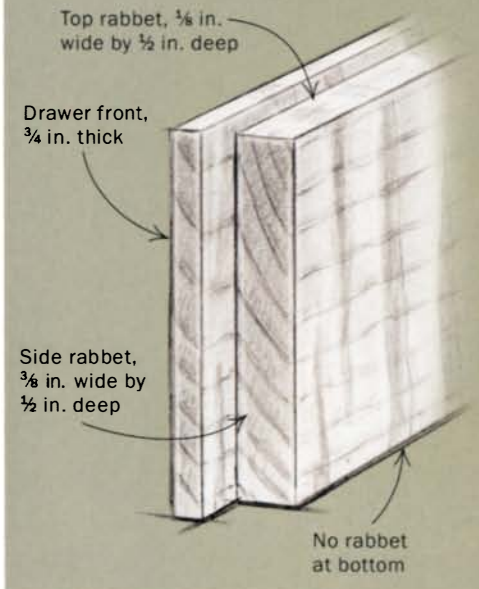
Use a router to cut the rabbets along the sides and top of the drawer front. Allow for clearance by cutting the top rabbet a little wider than the lip thickness, and the side rabbets a little wider than the overall thickness of the drawer side and lip: $\frac{1}{2}$ -in. clearance above and $\frac{1}{4}$ -in. clearance on each side of the drawer will leave enough



Gentle glue-up. Light clamping pressure is all that's needed for the front and back side joints (left). When installing the compartment bottom, use spacers to hold it square while the glue dries, then reinforce with nails set below the surface.

BUILD THE DRAWER WITH RABBETS AND CUT NAILS

The lip on the drawer front covers the top and side edges of the opening. The side rabbets are deep enough to accommodate the thickness of the drawer sides, and the thumbnail profile on the drawer front complements the one on the base.



Rout the rabbets and profile. Use a straight bit to rabbet the sides and top of the drawer front (left). Next, use a $\frac{3}{16}$ -in.-radius roundover bit to rout the thumbnail profile on the drawer face (above). Start with the left edge and work in a clockwise direction to remove any crosscut tearout. A zero-clearance fence helps reduce tearout.

space for a drawer this small. Next, with a $\frac{3}{16}$ -in.-radius roundover bit, cut the profile, with a $\frac{1}{16}$ -in. step, on all four sides of the drawer face.

Once the drawer front has been fitted to the opening, cut parts for the sides and the back. The width of the side and back parts matches the long edge of the side rabbet, and the length of the back matches the length of the top rabbet plus twice the depth of each dado. To prevent the drawer from striking the back of the pipe box, cut the back end of the drawer sides $\frac{1}{16}$ in. shorter than the depth of the opening.

Cut $\frac{3}{16}$ -in.-wide by $\frac{1}{16}$ -in.-deep grooves in the sides and the front for the drawer bottom. Then raise the blade slightly and rip the drawer back. The width of the drawer back matches the distance between the

top of the side and the top of the drawer-bottom groove. Finally, cut $\frac{1}{4}$ -in.-wide by $\frac{1}{16}$ -in.-deep dados into the sides for the back of the drawer.

After the drawer has been assembled, bevel the front and side edges of the drawer bottom, slide it into position, and drive a cut nail from the bottom into the drawer back. Glue the front edge and the first $\frac{1}{2}$ in. of the sides of the bottom to force the wood movement to the back of the drawer. Finally, cover visible nail heads with wood putty that will accept stain. Finish the box with an aniline dye, followed by several coats of amber shellac, and install a brass drawer pull to complete the project. □

For more information on Lonnie Bird's woodworking classes, visit www.lonniebird.com.



Pilot holes prevent splitting. Drill pilot holes after gluing and before nailing the sides to the front. Glue the back to the sides, drill pilot holes (top), and nail (bottom).



A traditional option

If you want a challenge, you can build the drawer for the pipe box using dovetails and add a Massachusetts shell carving. For more on making a dovetailed drawer, see *FWW* #157, pp. 78-83; for more on making a shell carving, see *FWW* #119, pp. 52-58.

Router Combo Kits

A pair of bases with an interchangeable motor gets you two different machines for little more than the price of one

BY TOM BEGNAL



Fixed-base mode

With the motor mounted in the fixed base, the router is relatively lighter and more compact than when it's in plunge mode (right). Plus, in the fixed-base mode, the router has a low center of gravity that makes it easier to control.

Plunge routers and fixed-base routers have more similarities than differences. Why, then, do many woodworkers purchase one of each? Because each type has its advantages.

A plunge router lowers, or plunges, a spinning bit straight down into the workpiece to start a cut, and then raises the bit out of the workpiece at the end of the cut. It also makes it very easy to lower the bit after each pass and make successively deeper cuts. Because the base of the router remains firmly on the workpiece, the plunge router is the best choice for making a stopped cut—one that does not extend all the way to the edges or ends of a workpiece. So any time a stopped cut is required, whether it's a groove, a dado, a rabbet, or a mortise, I reach for the plunge router. On the other hand, a fixed-base router is lighter and more compact than a plunge router with the same horsepower.

So it's my router of choice for the 90% of my work that doesn't involve stopped cuts.

The big drawback of owning both types of router used to be that you had to open your wallet extrawide to pay for them. But with the relatively recent advent of router combination kits, it's a lot cheaper to own both a fixed-base and a plunge router. These unique kits come with two bases and one motor to service both. The net result is two routers for not much more than the price of one.

What's new on the market

Currently, six manufacturers offer router combination kits. They include the Bosch 1617EVSPK, DeWalt DW618PK, Makita RF1101KIT2, Porter-Cable 895PK, Ryobi RE1803BK, and Skil 1825. Each has a motor that falls into the 2-hp to 2¼-hp range, which is enough muscle for most any task. Porter-Cable also offers another combo kit, model 693VSPK; it wasn't included in this review because it has a smaller (1¾-hp) motor.

All of these routers have variable-speed motors, so you can reduce the speed (rpm) when running large bits. To limit the tendency of a router to twist in your hand at start-up, all but the Skil have motors with a soft-start feature. Also, except for the Skil, each router has a constant speed-control feature that helps the motor maintain its speed even when the bit runs into a tough area or is asked to make a deep cut.

The bases in most of these combination kits, especially the plunge bases, are not exact copies of the manufacturers' dedi-



Plunge-base mode

Mount the motor in the plunge base, and the router immediately becomes well suited for making stopped cuts. That's because a plunge base allows the router bit to be lowered straight down into a workpiece and then raised up at the end of the cut.

Features at a glance



Sweet switch. A conveniently located toggle switch on the DeWalt allows you to keep both hands on the handles when turning the router on or off in plunge or fixed mode.



Best for bit changing. Lots of open space around the collet and a one-wrench changing system made the Ryobi a favorite when it came to removing or replacing a bit in either plunge or fixed mode.



A lock for the bases. The oversize lever on Porter-Cable's fixed and plunge bases helped make it easy to lock the motor in each base.

cated versions with the same horsepower rating. One exception is Makita, whose combination and dedicated routers are twins. The fixed bases of the Bosch and Porter-Cable combination kits are identical to the companies' dedicated routers, but the plunge bases differ. And both bases in the DeWalt, Ryobi, and Skil router combination kits differ from their companies' dedicated versions of each router.

As a general rule, when the bases on a combination kit and a dedicated router differ, the dedicated version is going to have the better features. At the end of the day, though, they both get the job done.

Each of these routers accepts bits with shanks of either 1/4 in. dia. or 1/2 in. dia. Except for the Ryobi and the Skil, all of the combination kits include both 1/4-in. and 1/2-in. collets. The Ryobi and Skil kits are sold with a 1/2-in. collet as well as an adapter for 1/4-in.-shank bits.

If you prefer a D-handle router for an extra measure of comfort and control, the Ryobi kit includes a D-handle base, while the DeWalt, Makita, and Porter-Cable are available with an optional D-handle accessory. DeWalt also sells a kit that includes a D-handle base along with a fixed and a plunge base (model DW618B3). And the Porter-Cable 894PK kit comes with a D-handle and a plunge base.

Combo kits put to the test

To compare performance, I gave each router combination kit a hands-on evaluation in the *Fine Woodworking* shop. First, I looked at how they performed in their fixed bases, and then I tested

them in their plunge bases. Finally, because routers often end up in router tables, I gave some consideration to how each behaved upside down.

In the process, I looked at motor-changing ease, along with comfort and convenience of the handles and controls. I also measured the routers for runout, vibration, and noise. Plus, I made test cuts to get a sense of power and cut quality. (For the results of each test, see the chart on pp. 54-55.)

Measuring vibration and noise—All routers vibrate in use; there's no way to avoid it. But a router with minimal vibration not only is going to make smoother cuts, but it also will feel better in your hands. In the vibration test, the Bosch, DeWalt, Makita, Porter-Cable, and Skil routers garnered excellent scores. The Ryobi came away with a grade of fair.

In use, all routers are noisy enough to require you to wear ear protection, but a relatively quiet router gets bonus points over one that sends the family dog fleeing to the neighbor's yard. When it came to noise, the Makita and Porter-Cable were relatively quiet, with a decibel (db.) rating of 86 and 87, respectively. The Bosch, DeWalt, Ryobi, and Skil were noisier, at 91 db., 93 db., 91 db., and 96 db., respectively. But those results compare to an average rating of 93.6 db. measured during the last *Fine Woodworking* router test a few years ago (see "Midsized Plunge Routers," *FWW* #149, pp. 46-53).

Cutting tests—Once a router is turned on, I want it to do mainly two things: cut without bogging down easily, and produce good-



Micro-adjust is best. With a micro-adjust dial reading to $\frac{1}{32}$ in., the Bosch fixed base proved to be the favorite for setting bit depth.

FIXED-BASE DEPTH ADJUSTMENT

In the fixed-base mode, depth-adjustment mechanisms come in two basic types: dials (left) and rings (below).



Eye strainer. The black-on-black depth-adjustment ring on Makita's fixed base makes your eyes work way too hard.

PLUNGE-BASE DEPTH ADJUSTMENT

Except for the Ryobi model, all of the router kits made bit-depth adjustments using some sort of multistop system that's part of the plunge base.



Multistop system. The Makita (shown) and Porter-Cable plunge bases have three adjustable stops to fine-tune plunge depths.



Thumb's the word. A unique system on Porter-Cable's plunge base lets you change to a new bit stop just by turning a shaft with your thumb.

quality cuts. To get a sense of motor power, I set up each router in its fixed base and installed a new $\frac{1}{2}$ -in.-dia. straight router bit. With the bit set to make a $\frac{1}{2}$ -in.-deep cut, I made several full-depth passes along the grain in poplar and red oak. Despite the heavy cut, all of the routers were up to the task, and none showed any signs of hogging down. By the way, Ryobi recommends not making any cuts that exceed a depth of $\frac{1}{8}$ in. per pass.

Next, I ran a simple test to see if there would be any noticeable difference in cut quality from one router to another. Starting with the fixed-base versions, I equipped each router with a new $\frac{1}{2}$ -in.-dia. straight bit. Then, with the base of the router held firmly against the fence, I trimmed $\frac{1}{8}$ in. of stock from the edge of $1\frac{1}{8}$ -in.-thick soft maple.

Then I changed the motors to the plunge bases, lowered the bit a full $\frac{1}{2}$ in. in a single plunge, and cut an 8-in.-long groove in the soft maple. After each cut I checked the groove with calipers to see how close the cuts came to the measured diameter of the bit. Any number beyond that figure represented a less-than-ideal cut.

All of the routers did well in both tests. As a result, I rated the cut quality for all of them as very good.

Checking for stickiness—Some plunge routers I've used have tended to stick somewhat as they move up and down. A sticky plunge action not only is annoying, but it also can affect the accuracy of a cut, mainly because the focus of concentration goes from the cutting process to getting the housing to plunge.

On each router in this test, I used a $\frac{1}{2}$ -in.-dia. straight bit to make three progressively deeper plunge cuts. While making the cuts, I

Router-table convenience

When the Porter-Cable is mounted to a router table in the fixed-base mode, a special wrench (included) lets you change bits and adjust the collet height from above the table.



was careful to note the stickiness factor. The Bosch router was the slickest operator here, with a comfortably smooth up-and-down sliding action; the DeWalt was almost as good. The Makita and Porter-Cable moved exceptionally smoothly when the same amount of downward pressure was applied to each of the handles. However, as soon as the pressure became unbalanced, with more pressure on one handle than on the other, the plunge mechanism immediately became sticky.

How the kits measured up

After reviewing the pros and cons of each router, I awarded Best Overall to both the Bosch and the Porter-Cable. If I had no plans to use a router table, I'd choose the Bosch. On the other hand, if the router were going to see regular use in a table, the Porter-Cable is an easy first choice.

The Bosch got high marks in many areas: handle comfort;



	Model	Price	Motor	Amps	Vibration	Quality of cut	Noise level	D-handle included	Edge guide included	Ease of base changes
BEST OVERALL CHOICE	BOSCH 1617EVSPK	\$230	2¼ hp	12	Excellent	Very good	91 db.	No	No, \$40 accessory	Very good
	DEWALT DW618PK	\$240	2¼ hp	12	Excellent	Very good	93 db.	No, \$75 accessory	No, \$40 accessory	Very good
	MAKITA RF1101KIT2	\$250	2¼ hp	11	Excellent	Very good	86 db.	No, \$138 accessory	No, \$22 accessory	Very good
BEST OVERALL CHOICE	PORTER-CABLE 895PK	\$270	2¼ hp	12	Excellent	Very good	87 db.	No	No, \$39 accessory	Excellent
	RYOBI RE1803BK	\$150	2 hp	9½	Fair	Very good	91 db.	Yes	Yes	Fair
BEST VALUE CHOICE	SKIL 1825	\$100	2¼ hp	11	Excellent	Very good	96 db.	No	No, \$15 accessory	Fair

fixed-mode bit changing; plunge-lock convenience; bit-depth setting in the fixed mode; and vibration. The Porter-Cable placed first or second in a number of other categories, including switch convenience in the router table; bit changing in the router table; housing lock; ease of changing from one mode to another; setting the bit depth in fixed, plunge, and table modes; vibration; and noise.

If a D-handle is important to you, the DeWalt and Makita are your best options; both offer a D-handle as an accessory. And like the Bosch and Porter-Cable, the DeWalt and Makita are routers built to run every day.

If you're on a tight budget, and if you run a router only a few hours a year, the Ryobi and Skil are worth considering. The Ryobi combination kit is the only one that includes a D-handle. And the Skil gets you both a plunge and a fixed base for less than I've paid for a few good router bits. Its low price makes it the Best Value. □

Tom Begnal is an associate editor.





DEWALT DW618PK

800-433-9258 www.dewalt.com



MAKITA RF1101KIT2

800-462-5482 www.makitausa.com

Router-table suitability	FIXED-BASE RATINGS				PLUNGE-BASE RATINGS					
	Handle comfort	Ease of bit changes	Ease of setting bit depth	Switch convenience	Handle comfort	Ease of bit changes	Ease of setting bit depth	Switch convenience	Plunge performance	Stop system
Very good	Very good	Very good	Very good	Good	Excellent	Very good	Good	Good	Excellent	Good
Very good	Good	Good	Good	Very good	Good	Very good	Good	Very good	Very good	Good
Very good	Good	Very good	Fair	Fair	Good	Very good	Fair	Fair	Fair	Very good
Excellent	Good	Good	Good	Good	Good	Very good	Good	Good	Fair	Excellent
Good	Fair	Excellent	Good	Good	Very good	Excellent	Fair	Good	Fair	Fair
Good	Excellent	Good	Good	Very good	Very good	Excellent	Fair	Very good	Fair	Fair



RYOBI RE1803BK

800-525-2579 www.ryobitools.com



SKIL 1825

877-754-5999 www.skil.com

Built-Up Moldings

Construct impressive moldings with just a router and off-the-shelf wood

BY ALAN CHARNEY

My shop is small, with only the most basic equipment. I also have limited sources of hardwood, confining me to $\frac{3}{4}$ -in.- or 1-in.-thick stock. However, these obstacles haven't stopped me from tackling ambitious projects, such as the crown molding on a secretary I built. Lacking thick slabs of wood and a shaper, I built up the molding from smaller strips, which I profiled individually using a router. When glued together, the individual strips formed a molding that looked like it was milled from one piece of solid stock.

Following my approach, using just a basic router, a few router bits, and a shopmade router table, you can create moldings of almost infinite variety, which will enhance the appearance of your work.

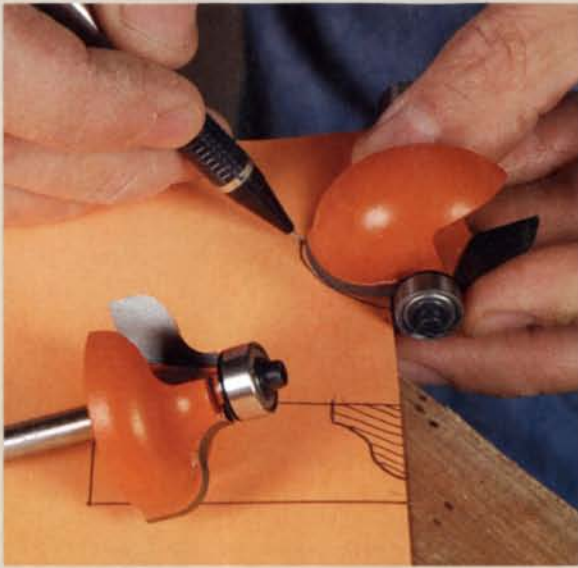
Make templates from the router-bit profiles

There are two ways to choose appropriate moldings for a project. One is to research the moldings traditionally used on the style of furniture you are building and to make something similar. The second way is to create your own design. A deep molding creates an elegant concave profile suitable for more formal, detailed furniture. A convex shape makes a bolder statement more suitable to heavier, country-style furniture.

After you have a general design, draw a full-scale rectangle that matches the height and depth of the molding. Then lay the router bits you intend to use against some thin cardboard and trace their



DESIGN THE MOLDING



Make templates. Trace the profile of each router bit on thin cardboard to create templates for the molding.

profiles with a pencil. Cut out each profile to create templates that can be arranged on the full-scale rectangle until you arrive at a design that matches your goal.

Play with the depths of cut and the positions of each cut, and also try flipping some bits by 90°. The most useful router bits are S-shaped, meaning they follow a curve, going from thick to thin. These include edge-forming bits, such as ogee, roundover, and cove bits, plus panel-raising bits. Round-nose and V-groove style bits also work well for creating profiles.

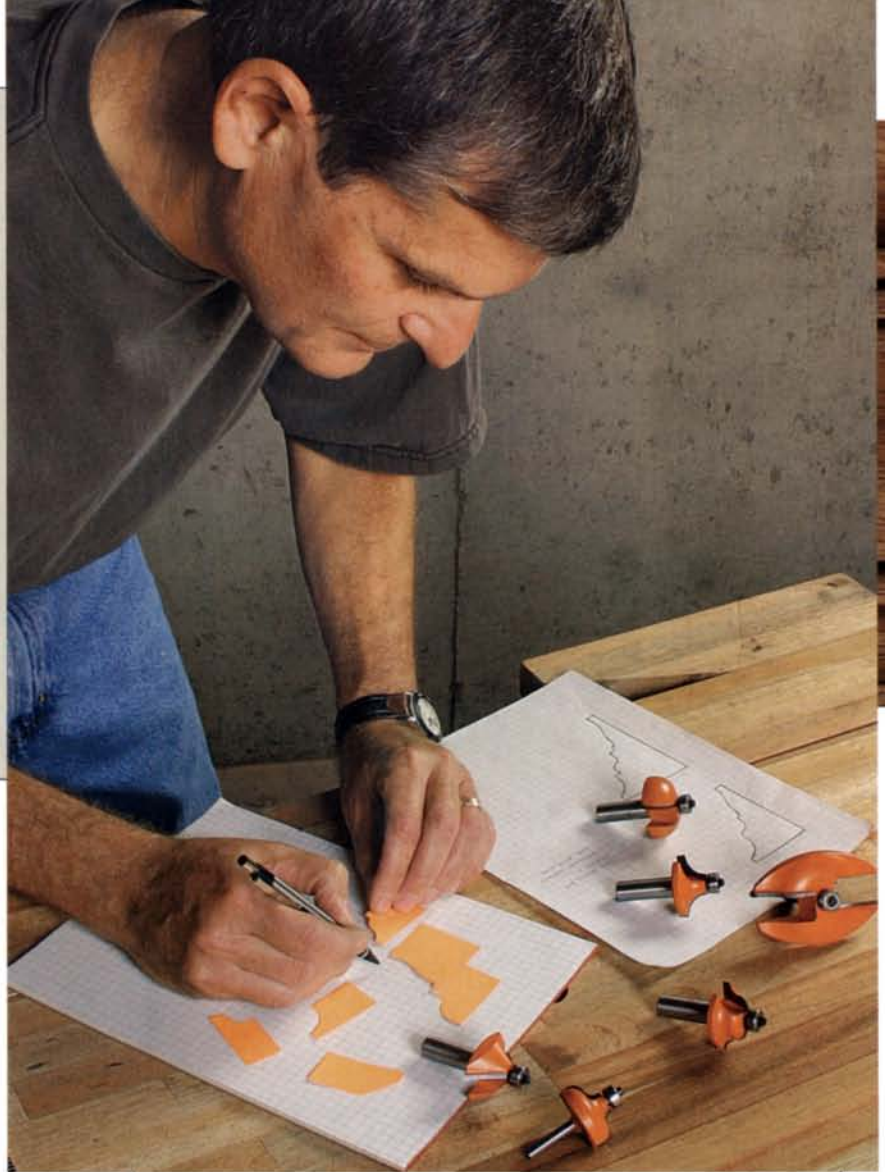
Choose stock with uniform grain and color

To make the molding look as if it were created from a single piece of wood, the strips need to match in color and grain pattern. The easiest way to achieve this is to take all of the strips from one wide board that is uniform in appearance. Another way is to use boards that were cut from the same tree, preferably in sequence.

Some router bits, such as panel raisers, have longer profiles and sometimes require a thicker board than I have on hand. If you need to join together two boards, matching the grain is crucial. Cut a straight-grain board in half, and then flip over one of the halves onto the other to create two adjacent layers with matching grain and color. You can use the same trick with figured boards, but because perfect grain-matching is almost impossible, you may have to rely on small steps, or reveals, between layers of molding to conceal contrasting grain patterns.

Cut profiles on the router table

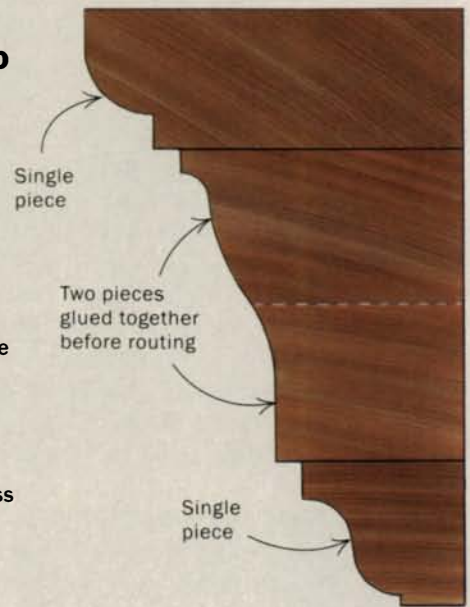
There is no need for an expensive or sophisticated router table. Mine has short legs that allow me to place it on top of my bench when in use and store it away when I'm done. Most of the bits I use have bearings, and often I use them without a fence. For safety's sake, however, you can use a fence for the first few intermediate cuts and then move it just beyond the bearing for the final cut. Make



Use the templates to build up different molding designs. Experiment with a combination of profiles to arrive at the perfect design for the molding.

DIVIDE THE DESIGN INTO SECTIONS

Divide the molding into slices that each router bit can cut. Solid lines divide the pieces routed separately, and the dashed line shows where two boards must be glued together to create the necessary thickness for a large router-bit profile.



ROUT THE PROFILES



Route the first section. The top section of the molding is a piece of wood large enough to be cut safely without the addition of a scrapwood backing block. For safety's sake, though, you can use a fence for the first few intermediate cuts; then move the fence beyond the bearing for the final cut.

Feed the stock from right to left when facing the router. Guide the workpiece free-hand, making several passes to remove only small amounts of wood each time. On only the last cut or two is the wood guided by the router bearing.

WIDE PROFILES



Align the workpiece and router bit. Instead of lowering the bit and creating a large hole in the router table, raise the workpiece by running it across a thin sheet of medium-density fiberboard (MDF) or hardboard clamped to the table.

NARROW PROFILES



Small boards need backing blocks. Because the lowest section of the molding is so narrow, a piece of scrapwood should be attached to it to keep fingers away from the router bit.

THE IMPORTANCE OF BACKING BOARDS

Because of the amount of wood to be removed by the panel-raising bit, this section requires that several pieces of scrapwood be glued to it for stability during routing.



Any wide piece of scrapwood can be used as a backing board for a narrow molding. But make sure the molding is held in the correct orientation to the router bit.



sure you have enough depth adjustment on your router, once it's mounted under the table, to get the profile you want.

Tips for router safety—To prevent the small strip from being thrown from the router with your fingers only inches from its 25,000-rpm spindle, glue scrapwood to the back of the workpiece, which makes the piece safer and more stable, as well as less prone to vibration and chatter.

Also, don't cut the full depth of the profile at once; instead, take several passes. As well, use earplugs and all required safety equipment. Make sure the router bit is tightened. Never push your fingers toward the spindle; make sure they push parallel to the wood's movement. This allows them to go past the spindle and not into the bit if the wood should shoot out suddenly.

Assemble the strips into one molding

After cutting the profiles, rip away the scrapwood backing pieces. Don't worry about getting an even surface on the back of the molding; that will come later.

Refer to the full-size drawing to determine the depth of the reveal between layers of molding. It is important that this small overlap be uniform along the length of the molding. The best way to ensure this at glue-up is to place a length of scrap on the bars of the clamps to shim one section of the profile (see the photos on the facing page). Also, put the glue bead toward the back of the overlapped surfaces to avoid squeeze-out in the reveal in front, where it is hard to remove.

Never glue up more than two pieces at once: This way you can concentrate on one overlap at a time to prevent mistakes. As you tighten the clamps, make sure the pieces don't slide out of alignment. Use as many clamps as necessary to prevent an unsightly gap from appearing in the middle of the molding.

Last, rip the finished molding to the correct width shown on the original drawing, establishing a flat back that can be glued or otherwise attached to your project. □

Alan Charney is an engineering manager and amateur woodworker who lives near South Bend, Ind.

GLUE UP THE STRIPS

Before the strips of molding are glued together, you need to rip away the scrap-wood backing blocks.



One step at a time. Glue together only two sections at a time (above) and check the joint carefully as pressure is applied. To establish the reveal between two sections of molding, use a spacer of the correct thickness (right).



Continue adding sections. Because any gaps between sections of molding will be conspicuous, use numerous clamps to apply even pressure over the whole length.





Flattening Tabletops

Surface large slabs and panels without big machines

BY ROB HARE

I build furniture that incorporates large slabs of wood. Early in my career, I had no access to large machines, so I developed a method for flattening large planks using winding sticks, a power planer, a marking gauge, a belt sander, and a palm sander. The process is so reliable and efficient that I continue to use it for most wide panels, even for small tabletops. While this article focuses on a thick, wide plank, a slight variation of the technique will work for glued-up panels and slabs, such as the top of a workbench or trestle table.

Inspect the slab before planing it

Begin by assessing the curvature and grain pattern of the plank to gain insight into how the tree has grown and how the wood has moved up to this point. Then sight down the surface of the rough plank to get a feel for where wood needs to be removed and how the plank might respond to being cut. Also, measure the edges, looking for variations in sawn thickness. Be aware that variations at the edges can be deceiving, leading one to think the plank is stressed and twisted rather than just unevenly sawn.

If the piece of wood is to be cut down in width or length, do that before attempting to flatten it. Try to eliminate the areas that are the most twisted or seem the most stressed, based on your initial survey. Leave an extra ½ in. of length and width on all four edges, to be trimmed off later. The additional surface area at the edges will add stability for the planer and sander.

Placing the slab on sawhorses keeps the



Too big for a jointer or planer. You can take all the warp or twist out of a large tabletop using handheld power tools.

READ THE SURFACE

A rough idea. Lay winding sticks at each end of the plank and sight over the tops of them to get a general idea of where cupping, bowing, and twisting are occurring.



work at a comfortable height. I often cover the sawhorses with moving blankets to protect the edges and surfaces of the wood. Do not clamp the plank to the sawhorses, which will restrict the wood and give inaccurate readings as the plank is being flattened. You can fasten stops to the horses or on your workbench to keep the workpiece from shifting.

Winding sticks are your guide

You'll need a set of three shopmade winding sticks, 1 in. wide by 2 in. thick, and 12 in. longer than the width of the plank. Winding sticks point out inconsistencies in a surface: twist, when the four corners of the surface are not in the same plane; bow, which is curvature along the length; and cup, which is curvature across the width.

To see how winding sticks work, lay all three at equal intervals across a known flat surface, such as a tablesaw or workbench top, and sight across the tops. Note how the top edges of all three sticks are parallel. Then place a 1/4-in.-thick scrap under the end of one stick and sight across them again. The difference should be easy to see.

Now you are ready to work on your rough slab or warped glue-up. Place a winding stick at each end of the workpiece, perpendicular to the grain. Lay the third stick across the middle and slide it end to end on the plank. You usually will see some cupping across the

width. Place the plank convex-side-up on the sawhorses, use a well-placed wedge to minimize rocking, and mark the high areas with a lumber crayon.

Power-planing is a gradual process

It is important to remember that, even though the plank may be considered dry, it will react (change shape) as wood is removed. Removing the outer growth rings from the convex side will relieve some of the pressure that has been causing the wood to cup, reversing the cupping as you work. It is easy to remove too much wood from one side and have a plank go from convex to concave. That is why flattening a slab is a process, involving partially leveling the high areas on one side, checking



Use a third stick to find high spots. Move a third winding stick up and down the plank to find high spots, and mark them with a lumber crayon.

Rough the slab to size. If possible, cut away the most stressed or warped areas. Also, leave 1/2 in. of extra material on each edge.



START ON THE CONVEX SIDE



Ease the ends of the planer blades. To avoid very deep ridges when power-planing, relieve the corners of the planer blades. Grind back the last $\frac{1}{4}$ in. of each corner by about $\frac{1}{16}$ in., but maintain sharpness.

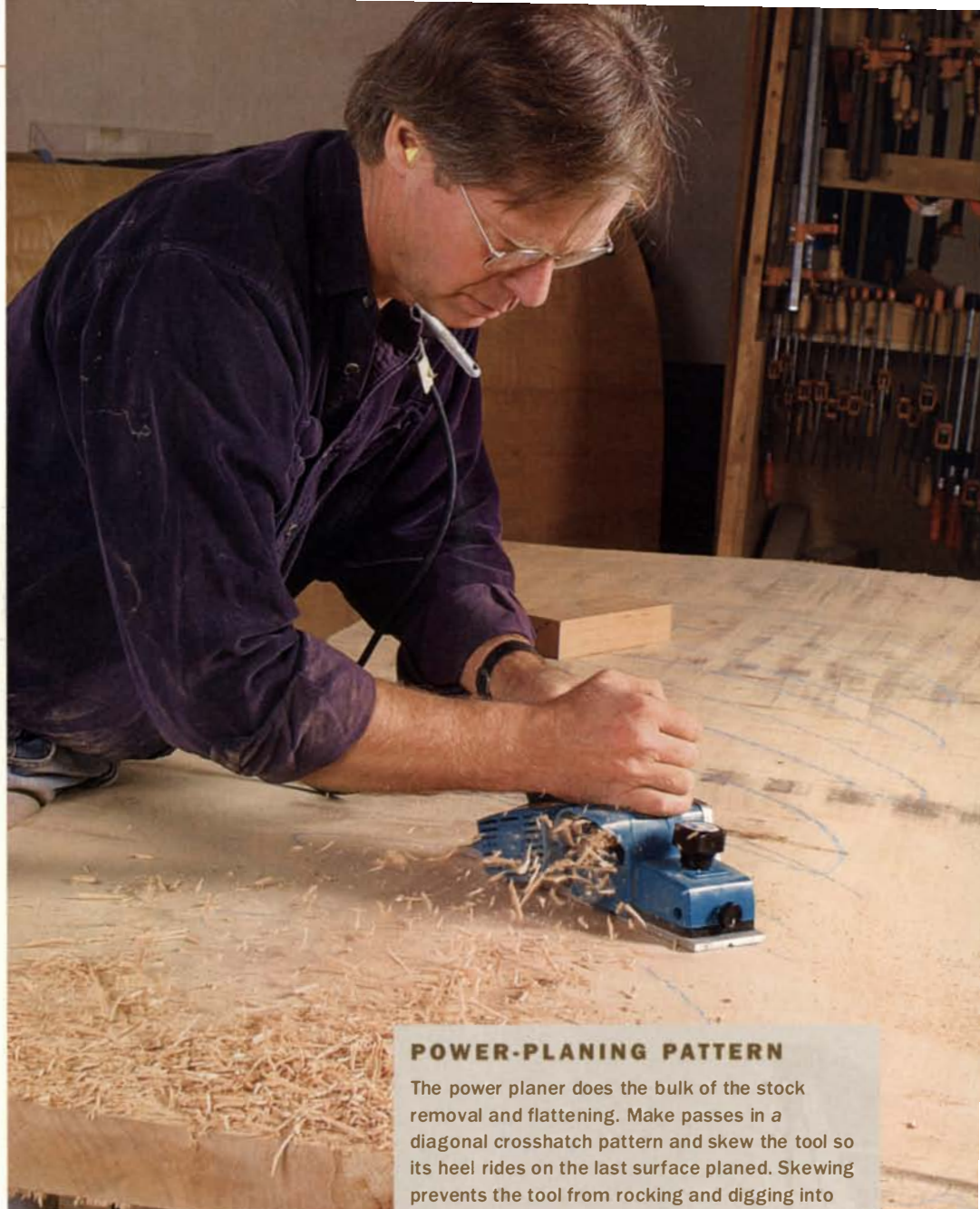
your progress, flipping the plank, and repeating the process.

The handheld power planer can remove a lot of volume in short order, so make a habit of planing less than you think is necessary. After each series of passes, sweep chips and dust off the top and check your progress using the winding sticks.

Each pass guides the next one—For flattening a large plank, I use a power planer that has a $3\frac{1}{2}$ -in.-wide base. It weighs only about 6 lb., so it remains easy to handle as I make pass after pass over a big slab. I relieve the ends of each blade about $\frac{1}{16}$ in., starting about $\frac{3}{8}$ in. from each end, to stop the corners from digging into the wood.

For the flattest possible cut, each stroke should slightly overlap the previous one, with the heel of the machine skewed slightly (see the drawing and photos at right). Also, make each series of passes from right to left so that the chips are ejected away from the area to be planed next. After making a series of cuts in one direction, make the next series perpendicular to the previous cuts. You should see a crosshatch pattern.

Flip the plank, and repeat—After taking off less than half of the necessary material



Hit the high spots. Make passes diagonally, skewing the planer so that its heel rides partially on the previous cut.



A second pass. This pass should be perpendicular to the first, creating a crosshatch pattern.

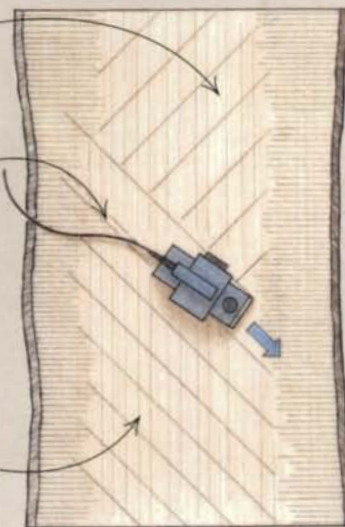
POWER-PLANING PATTERN

The power planer does the bulk of the stock removal and flattening. Make passes in a diagonal crosshatch pattern and skew the tool so its heel rides on the last surface planed. Skewing prevents the tool from rocking and digging into the surface and helps reduce tearout.

Make the first series of passes diagonally to the grain.

Overlap the previous cuts slightly, skewing the planer so its heel rides on the last cut.

Make the second passes perpendicular to the first.



SECOND SIDE AND BEYOND

Go to work on the flip side.

With some of the crown removed from the plank, it's time to flip the plank to begin removal of the cup.



on the convex side, flip over the plank so that the concave side is up. Check for flatness, mark the high spots, and plane them with the crosshatch pattern. Work the power planer from the center toward the edges. Again, take off less wood than seems necessary.

Now flip over the piece so that the convex side is up and check the surface again with the winding sticks. You'll find that the planing done on the opposite side has relieved some pressure and already improved the flatness of this initial side of the plank.

Repeat the process of planing the high



Use winding sticks again.

Planing done on the opposite side relieves stresses in the plank's interior, leaving less work to do on the cupped side.

Work from the center out to remove the high spots along the edges. Again, remove less than half of the high areas. Flip the plank and repeat the process repeatedly, creeping up on a flat, stable slab.



spots, inspecting with the winding sticks, remarking high spots with a crayon, and flipping the plank. It's helpful to spread this process over three days or more to allow the slab time to adjust. With large planks, you'll need a few breaks. Even a one-hour lunch break can result in visible change.

Note: It's important to check thickness throughout the process. Correct problems as you go, checking the surfaces with winding sticks and measuring thickness at

the edges to be sure you are working toward a flat slab of uniform thickness.

Continue to plane, inspect, and flip until both surfaces show no more than $\frac{1}{16}$ -in. variation in twist, bow, cup, or thickness. Take lighter and longer passes until there is just a hint of the original surface in the lowest area of each side of the plank. Inspect yet again with the winding sticks.

Scribe final thickness and take a few light passes—At this stage, if the plank is more than $\frac{1}{8}$ in. thicker than the desired finished thickness, continue to plane, inspect, and flip the plank until it is just $\frac{1}{8}$ in. oversize—again, remembering to proceed slowly. Be on the lookout for movement.

At this point, the grain patterns of both sides are visible. Select the top, or show, face of the plank. Then set a marking gauge $\frac{1}{8}$ in. beyond the finished thickness and scribe around the edges of the plank, working from the bottom edge upward, leaving the waste on the show face. Then, taking shallow passes with the heel of the planer riding on the previous cut, plane the show side to the scribed line.

Sand to final thickness

Begin with an 80-grit belt and work your way up through 100, 120, and 150 grits, moving the sander straight across the plank but keeping it in line with the grain, with each pass overlapping the last one by 50%. (See the drawings at right for my sanding pattern.) I usually trim the plank to size after sanding with 120-grit paper.

Finally, use a random-orbit palm sander, starting with 120 and 150 grits and finishing with 180 grit. Watch for belt-sanding marks you may have missed in earlier passes. If they are deep, you may have to retreat to 100 grit with the belt sander. The key is to use these machines uniformly. A belt sander can leave deep scratches, and a palm sander can leave dimples, both of which will show up dramatically when finish is applied.

If the plank must be stored before it is finished and tied into a piece of furniture, it can be stood on end or stickered; just make sure to leave room for free air movement on all sides. □

Rob Hare is a furniture maker who lives in Ulster Park, N.Y.



Scribe $\frac{1}{16}$ in. over final thickness. Pick a show face and scribe from the bottom of the plank for your final passes with the power planer. Hare uses a shopmade marking gauge to work around live edges.

PLANE AND SAND TO FINAL THICKNESS



Watch chip output to determine flatness. Set the planer to a lighter cut. If the surface is flat, the planer should send out a steady stream of fine shavings.

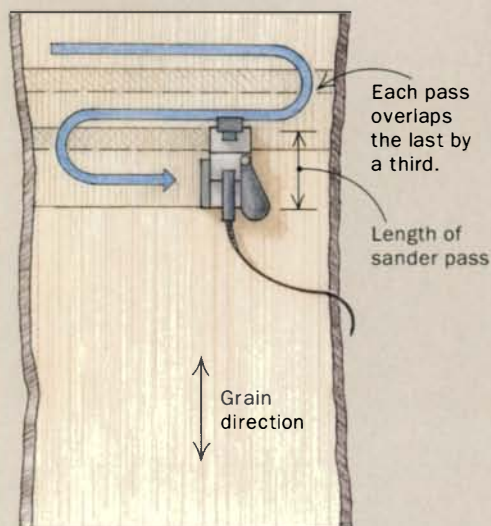
Use a belt sander to finish the job

A belt sander maintains the flat surface left by the power planer while removing the ridges. Progressing through successively finer grits removes the deep scratches left by the rougher sanding belts. In both cases the belt sander is always held in line with the grain and is never lifted. Finish with a palm sander, working through 120 to 180 grits.



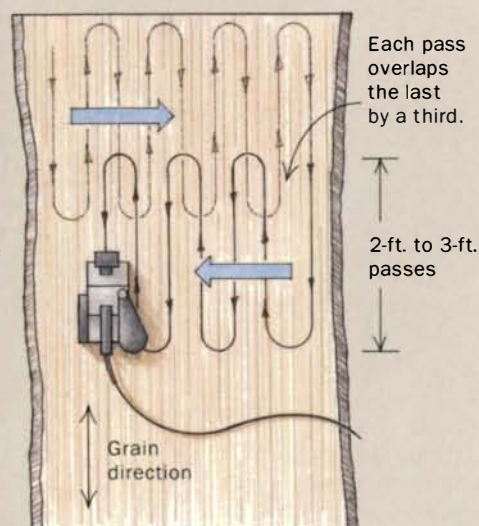
ROUGH SANDING (80 AND 100 GRITS)

Move the sander from side to side on the slab while keeping it aligned with the grain. Each pass should overlap the previous one by about a third.



FINE SANDING (120 AND 180 GRITS)

Make continuous 2-ft. to 3-ft. strokes in the direction of the grain, working your way across the slab. Each pass should overlap the previous one by about a third.



Five Tips for Better Bandsawing

No-hassle approach
delivers smooth,
straight cuts

BY MICHAEL FORTUNE

In my first year of design school in the early 1970s, I remember the shop manager telling me that the bandsaw was the most useful piece of equipment in a woodshop. This struck me as a dubious statement, given that we were standing in a workshop filled with state-of-the-art European woodworking equipment. But time and again he proved it.

After I graduated in 1974, my first purchase was a 15-in. General bandsaw.

However, I soon realized
I could achieve

Precise cuts are easier than you think. It doesn't take a high-end blade, high tension, replacement guides, or a special fence to get excellent cuts.



the accuracy and versatility I had experienced at school only if I set up the saw the way my shop manager did.

Once I figured out the keys to success, I came to rely on that bandsaw. With a single blade, I routinely cut smooth tenon cheeks, fine inlay stringing, and perfect veneers that use the entire height capacity of my machine.

I also do all of my ripping on that 15-in. bandsaw. The task is safer and requires less horsepower than the tablesaw, and the narrow kerf consumes less wood. New employees and students are surprised at first by my preference for ripping on the bandsaw, but they are converted quickly. Although I have three excellent industrial tablesaws in my shop, they are used almost exclusively for dadoing, squaring panels, and cutting shoulders on joints.

There are three key elements to getting the most from your bandsaw: blade type, blade alignment, and moderate tension. My approach contradicts some of the common advice for setting up bandsaws. It does not require high blade tension, special equipment, exotic blades, high horsepower, or continual fence adjustments to accommodate blade drift.

Start with a coarse blade

During teaching assignments, I run into many woodworkers experiencing difficulties with their bandsaws. They complain about severely cupped kerfs, poor tracking, and saws that seem underpowered, so their bandsaws are relegated to cutting curves in thin stock.

The number-one culprit behind all of these difficulties is a bandsaw blade that has too many teeth, with small gullets in between. Sawdust generated in the kerf must be removed efficiently. A tremendous amount of heat is created by the friction from the sawdust that is jam-packed in each small gullet right at the point where the wood fibers are being cut. The intense heat can cause the blade to lose its temper and dull prematurely. The heat and pressure buildup also can cause the blade to flex sideways and backward, creating a dished cut. A typical reaction here is to tighten the tension on the blade. But overtensioning the blade creates a whole new set of problems (see Tip 2).

My bandsaw does everything, every day: cutting joints, resawing wide laminates in exotic woods, making curved patterns in

Tip 1

A SINGLE BLADE CAN HANDLE MOST TASKS

A ½-in.-wide, 3-tpi blade—properly set up—will handle general ripcuts, resawing, and even cutting curves in thin stock, not to mention cutting precise tenons.

Standard ½-in.-wide carbon-steel blade

3 tpi

Large gullets clear chips efficiently. Finer blades, with more teeth per inch, have smaller gullets where chips get packed, causing the blade to cut poorly and to flex sideways.

RIPPING



RESAWING



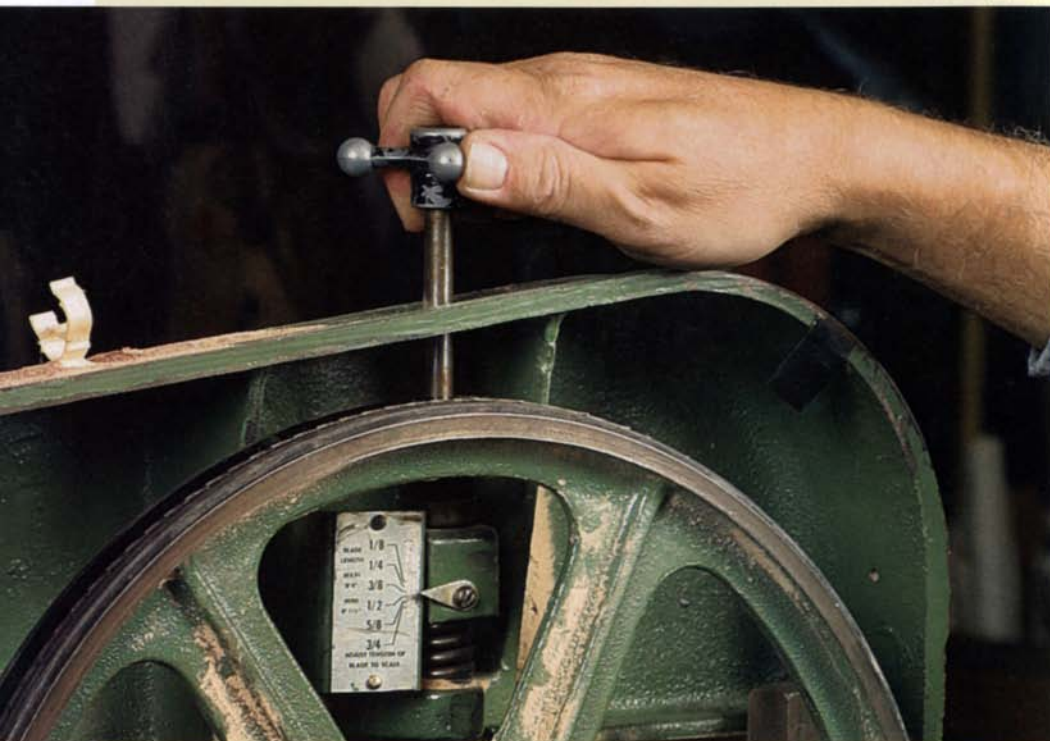
CUTTING CURVES



Tip 2

HIGH BLADE TENSION IS NOT NECESSARY

High tension eventually will groove the tires, pulling the blade out of alignment (for more on blade alignment, see Tip 3). High tension even can flex the machine's frame out of alignment.



Use less than the recommended tension. For a 1/2-in.-wide blade, turn the tension gauge (above) to the setting for a 3/8-in.-wide blade. The first step in overhauling a bandsaw is to check the tires for grooves (right). If necessary, replace them.



1/6-in.-thick stock. It is not practical to change the blade and the guide blocks for each situation, nor is it necessary, in fact.

With rare exception, a standard carbon-steel 1/2-in.-wide, 3-tpi, skip-tooth blade installed on my bandsaw performs all of the above tasks.

Blades are inexpensive, so keep a sharp one loaded—The blades I use are made by Starrett but are welded and distributed by BC Saw and Tool in Canada (888-251-2236; www.bcsaw.com). By delightful coincidence, these blades are rela-

tively inexpensive. It helps that I buy them in groups of 10, which earns me a 25% discount. For example, 94 1/2-in.-long blades, which fit a 14-in. bandsaw, cost about \$6.71 (U.S.) each, or \$8.95 if purchased one at a time. This is one of the rare cases when inexpensive equals good.

Unfortunately, not all blade distributors weld bandsaw blades properly. A poorly welded, misaligned sawblade will not give you the smooth and effortless results you are after.

Simply using a 3-tpi blade, with its larger gullets, will eliminate many problems.

Even 4 tpi is too fine a tooth pattern for general woodworking and resawing. If you want a fine cut, use a coarse blade, even on thin stock. In my experience, the old rule of thumb about having two teeth engaged in the stock at all times is bogus. The reason I use a 1/2-in.-wide blade is that it is stiff enough to resaw but flexible enough to follow a curve down to a 2 1/2-in. radius. A cautionary note: Cutting particle-board is extremely hard on carbon-steel bandsaw blades and can reduce their life by 75%.

High horsepower is another myth—

For most 14-in. bandsaws with a 1/2-in.-wide, 3-tpi blade, a 1/8-hp motor is fine. The same saw with a riser block in the column could use a 1/2-hp motor for big resawing tasks, but anything larger is overkill. If the motor is bogging down, you are either forcing the cut or using a dull blade.

Don't overtension the blade

It is important that the tires on the bandsaw remain in excellent shape. Grooves in the rubber tire on either the upper or the lower wheel will make it impossible to keep the blade on the centerline, in line with the rip fence. And the most common cause of grooves in the tires is overtensioned blades. Very high tension even can flex the saw frame out of alignment.

I slightly undertension my 1/2-in.-wide blade. Because of its excellent ability to clear sawdust, the blade is not inclined to flex, wander, or heat up. For the 1/2-in.-wide blade I adjust the tension scale to the 3/8-in. setting. If no scale is present on the machine, I tighten the adjustment knob (with the machine off and unplugged) until the blade deflects about 1/4 in. to the side without making my fingertips go white.

A side benefit of lower blade tension is that I seldom have to release the tension on the saw, as is commonly recommended to prolong blade life.

Align the blade to eliminate drift

When I bought my bandsaw in 1974, I set the fence parallel to the miter-gauge slot in the table, and I haven't had to adjust it since. The reason is that I use the tracking adjustment on the upper bandsaw wheel to align the blade (see the drawings on the facing page). A nightmare of fence adjust-

Tip 3

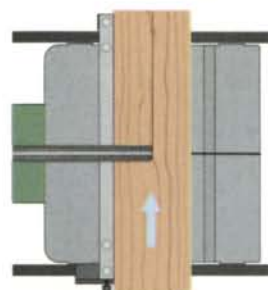
YOU CAN ELIMINATE BLADE DRIFT BY ADJUSTING THE TRACKING

Advice on blade alignment usually centers on the rip fence instead of the blade. You can eliminate blade drift by adjusting the position of the blade on the upper wheel.

ADJUST THE ALIGNMENT OF THE BLADE, NOT THE FENCE

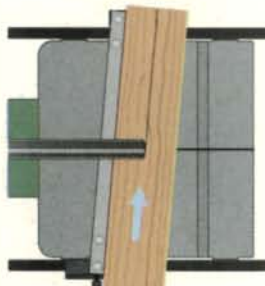
First, align the rip fence parallel with the miter-gauge slot and leave it there. Then eliminate blade drift by centering the blade on the upper wheel. The upper wheel has a slight crown on it. Therefore, if the blade is close to the front of the upper wheel, it will be angled on the wheels, causing the saw to cut to the right. If the blade is close to the back of the wheel, the reverse will be true.

CENTERED BLADE



Saw will cut straight.

BLADE TOO FAR FORWARD



The fence must be angled to the right for a straight cut.

BLADE TOO FAR BACK

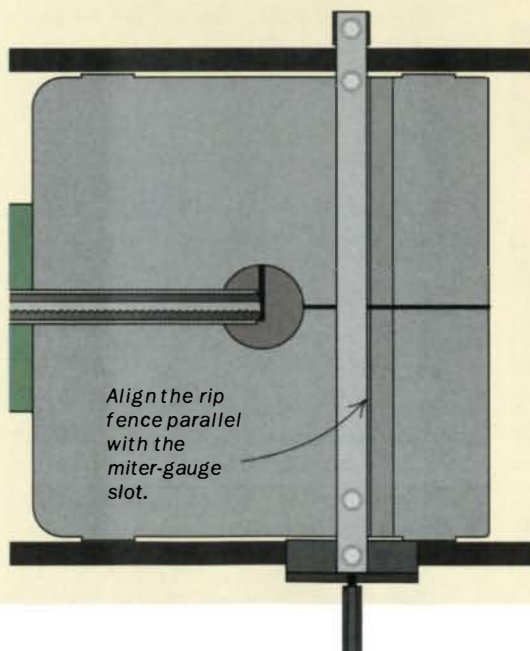


The fence must be angled to the left for a straight cut.



A simple adjustment. Adjust the angle of the upper wheel so the blade rides at the center, which on most small bandsaws is crowned slightly.

ALIGN THE FENCE JUST ONCE

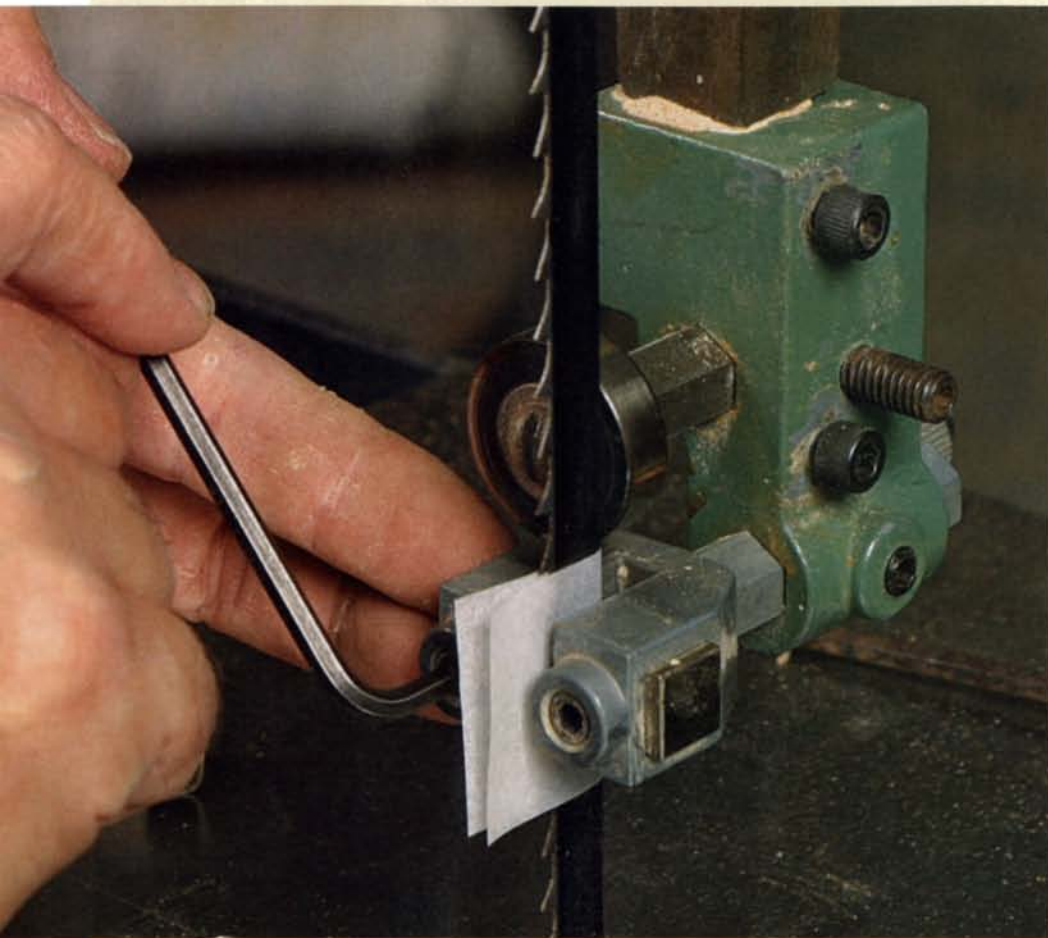


Now push gently and let the blade do the work. Pushing too hard will make the blade flex sideways, which will cause it both to overheat and to drift off line. With the blade, fence, and guides properly aligned and adjusted, the back of the blade should be centered in its kerf (inset).

Tip 4

REPLACEMENT GUIDES AREN'T NECESSARY

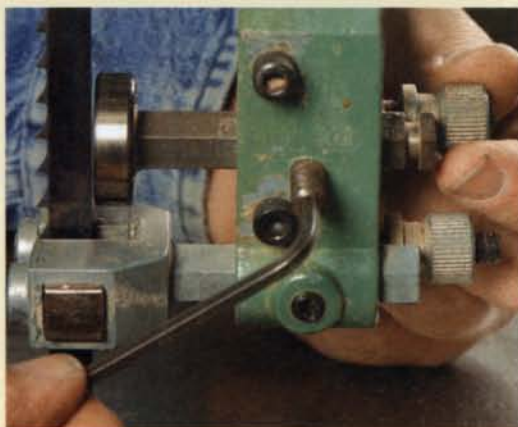
A set of metal guide blocks will keep your blades on track for many years. The key is to set them very close to the blade and just behind the gullets.



Closer than you might think. Many people use a dollar bill for setting the blocks, which keeps them 0.003 in. away from each side. Cigarette paper (or a feeler gauge) will set each block closer to 0.001 in. away, resulting in smoother, more precise cuts.



The blade weld must be smooth. A good sawblade company will weld blades precisely and grind the welded area flat. After setting the guides, turn the wheel by hand to be sure the weld passes through the guides smoothly.



Other important guide settings. The guide assembly should be adjusted so that the metal blocks remain just behind the blade's gullets. Then the thrust bearing is set $\frac{1}{32}$ in. behind the blade, as shown, so it contacts the blade only during use.

ments ensues if each new blade is allowed to track differently.

Simply by keeping the centerline of the blade (regardless of width) in line with the centerline of the upper wheel, I am able to keep the blade aligned correctly at the blade guides.

The relationship between tracking the blade on the centerline of the upper wheel and having the fence aligned parallel to the miter slot should produce a kerf with equal space on either side of the blade.

Much has been made in books and articles of the alignment of the two wheels to each other. In my shop and in my travels to schools around North America, I have never found this to be a problem. Tracking the blade properly on the upper wheel has always been enough, except in the case of a severely damaged bandsaw.

Now square the table and align the fence—The table is now aligned with the cutting direction, but it also should be adjusted so that it is square with the vertical line of the blade.

Last, the fence should be aligned parallel to the blade and square to the table. I use a $3\frac{1}{2}$ -in.-high birch plywood rip fence screwed onto the metal fence. I have shimmed the plywood with masking tape to get it perpendicular to the table. Taller plywood fences can be screwed to the existing plywood fence, but I use these only when I am resawing to the maximum capacity of my bandsaw, about $6\frac{1}{2}$ in.

Use metal guide blocks, set close

Again, simple is the way to go. When setting up my bandsaw in 1974, I took out the metal guide blocks and squared their working faces against the side of the wheel on my bench grinder, being careful to check the blocks for square. I have not had to replace them or resquare them since.

The sequence for setting the guide blocks is as follows. Unplug the saw, pull the guides well back, tension the blade, and then spin it a few times backward and forward by hand. Now turn on the saw and adjust the tracking of the blade to center it on the upper wheel.

Next, turn off the saw again, and bring the guide assembly forward so that the front of the blocks aligns with the back of the blade's gullets. Then adjust each guide

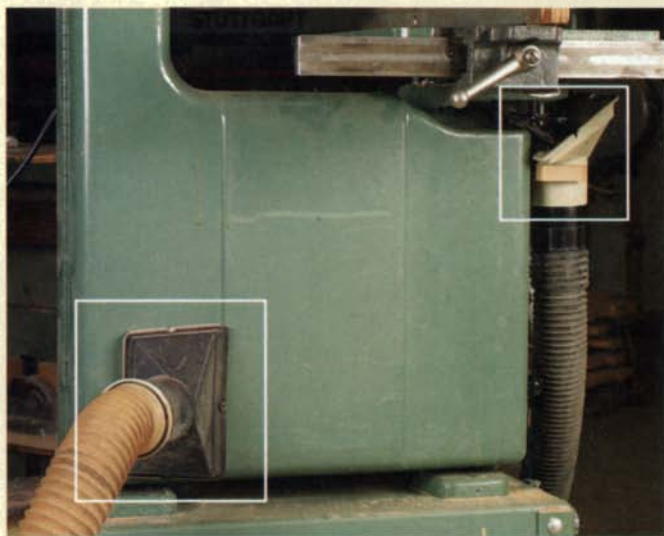
Tip 5

ADD DUST COLLECTION TO KEEP YOUR SAW RUNNING WELL

Sawdust extraction is very important. Wood dust will get compressed onto the lower wheel by the revolving blade. The resulting bumps will cause the blade to vibrate and wander off center.

Many saws provide for some dust extraction directly below the cutting area, but that isn't enough. Attach a second dust pickup at the lower left corner, where the air current generated by the lower wheel makes dust accumulate.

Also, attach a wooden brush with stiff natural bristles to the frame of the saw so that it continually cleans off the lower wheel. The lower dust port will catch the debris.



Collect dust at two points. Many bandsaws have dust collection below the cutting area, but Fortune also recommends installing a vacuum port at the bottom left of the lower wheel. If dust and pitch build up on the tires, the blade will not track properly. Install a brush (right) to remove dust from the lower wheel.



block to within the thickness of cigarette paper, or 0.001 in., of the blade. The Allen screw might pull the blocks in or out when they are tightened, so this process could require one or two attempts. With practice, you will be able to adjust the guides by eye, looking for the smallest crack of light between the blade and the guide blocks.

Last, bring the thrust bearing in the rear to within $\frac{1}{2}$ in. of the blade. This bearing is the only part that requires replacing, when it becomes stiff or scarred. But it is a standard part and can be bought in most automotive- or bearing-supply houses.

With the guide blocks set this close, and with the back of the gullets just aligned with the front of the blocks, there is no room for the blade to twist or for the teeth to hit the metal guide blocks.

If I thought there was some advantage to replacing the guides or the blocks, then I would, but I find the original system gives me excellent results. With the blade and fence aligned properly, the metal guide blocks are not rubbing constantly against one side of the blade or the other and creating friction heat.

The lower guides are set in the same way as the upper ones, though I often leave them backed slightly away from the blade, unless I am resawing particularly difficult wood. I have worked in several shops in Europe, and none of the bandsaws I used there had lower bearing assemblies.

Feed stock with mild pressure

With the saw properly set up, it is necessary to place only two of your fingers

against the workpiece: You should be able to use one finger to push the stock and the other to hold it against the rip fence. If you have to use the butt of your hand to push the stock, something is wrong—either the blade is dull or it is no longer tracking on the centerline of the upper wheel and is misaligned with the fence, causing the wood to bind.

Use mild but consistent feed pressure, allowing the blade to do the work. The sawdust must have a chance to be cleared from the kerf. For safety, once your pushing fingers are within 6 in. of the blade, use a push stick. □

Michael Fortune designs and builds furniture in Lakefield, Ont., Canada, and teaches throughout North America.

Tilt-Top Table

Elegant project builds hand-tool
and machine skills

BY MARIO RODRIGUEZ



As a woodworking instructor, I'm always looking for interesting and challenging projects to present in my classes. This Federal tilt-top tea table satisfies all of my criteria for an intermediate-level project: It's neat and compact with only a few parts, and the construction introduces stu-

dents to both machine- and hand-tool techniques. The bonus is that the finished product is graceful in design and fits into almost any interior space.

In the 18th century, many of these small tables were made with local hardwoods, and there are a number of period examples in maple, walnut, and cherry. My version is made of mahogany, which is available from most commercial suppliers in the required thicknesses, from 4/4 to 12/4. I find mahogany ideal for the turning required in this project, and it takes a finish beautifully.

Begin by turning the column on the lathe

The profile of the column is provided at half scale in the drawing on the facing page. The drawing can be enlarged 200% to full size on a copy machine and used as a pattern. Prepare the turning blank thick enough to accommodate a maximum diameter of roughly 2¾ in. I recommend using a solid piece, although gluing up two pieces is an option; however, you'll be left with a seam down the center of the column.

Prior to mounting the blank on the lathe, lop off the long corners on the bandsaw by either tilting the bandsaw table to 45° or holding the workpiece at 45° in a carriage. Once it's on the

lathe, rough the blank into a cylinder with an even 2¾-in. diameter. Use a parting tool and your pattern to set up the diameters of all of the various elements on the column. Establish all of the flats first, then turn the coves and beads with a spindle gouge and a skew chisel. Finally, sand the column smooth.

Turn column ends precisely—Two critical portions of the column require careful attention. The diameter of the tenon at the top of the column, which engages the pivot block, must exactly match the 1½-in.-dia. hole drilled through the pivot block. Because I make this table so often in my classes, I made a plywood gauge that gives me the right diameter. However, you can just as well use a set of calipers.

The other critical area is the bottom portion of the column where the legs are attached. This end doesn't have to be turned to a precise diameter; just make sure it's straight and uniform. Any dips or a taper will create gaps where the column receives the three dovetailed legs. A nonuniform surface also will have a detrimental effect on the fit of the legs.

Make a carriage for the sliding dovetails

The traditional and most effective method of joining the legs to the column is with sliding dovetails. Once the legs have been attached, the flair of the dovetails prevents the legs from loosening over time. The key to achieving snug and handsome joints is to cut the slots first and then make the dovetails to fit.

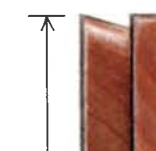
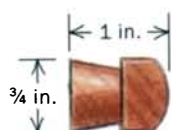
To cut the joinery, you'll have to remove the turning from the lathe. Set up each cut carefully. I built a plywood carriage jig (see the drawing on p. 74) that supports the column while I rout the dovetail slots. Each slot should be



MAHOGANY TEA TABLE

Mortise, $\frac{1}{2}$ in. dia. by $\frac{1}{2}$ in. deep, inset $\frac{1}{16}$ in. from top of cleat

TOP VIEW



$\frac{3}{4}$ in.



Top, $\frac{1}{2}$ in. thick by 15 in. wide by 17 in. long

Wedge

Tenon, $\frac{1}{2}$ in. dia. by $\frac{1}{2}$ in. long

Pivot strip, $\frac{5}{8}$ in. square by 7 in. long, including tenons

Rabbet, $\frac{5}{8}$ in. deep by $\frac{5}{8}$ in. wide

Brass catch attached flush to underside of top

Pivot block, 1 in. thick by 6 in. square

Cleat, $\frac{5}{8}$ in. thick by 1 in. wide by 12 in. long

Leg, $\frac{3}{4}$ in. thick at the top, tapers to $\frac{1}{2}$ in. thick at the bottom.

NOTE

The leg, the quarter view of the top, and the column profile are at half scale. To make full-size templates of the parts, photocopy the page at 200%.

$1\frac{1}{2}$ in. dia.

$2\frac{3}{8}$ in. dia.

2 in. dia.

$1\frac{1}{2}$ in. dia.

$2\frac{5}{8}$ in. dia.

$2\frac{3}{8}$ in. dia.

$1\frac{3}{4}$ in. dia.

$2\frac{3}{8}$ in. dia.

$2\frac{5}{8}$ in. dia.

$2\frac{3}{8}$ in. dia.

1 in.

$\frac{5}{8}$ in.

$\frac{3}{16}$ in.

$\frac{3}{4}$ in.

$5\frac{5}{8}$ in.

$\frac{1}{8}$ in.

$\frac{1}{2}$ in.

$3\frac{1}{4}$ in.

$\frac{5}{8}$ in.

1 in.

$\frac{1}{8}$ in.

$\frac{3}{4}$ in.

$\frac{5}{8}$ in.

$3\frac{1}{2}$ in.

$\frac{7}{8}$ in.

A JIG FOR ROUTING THE COLUMN

Stop, 1½ in. wide by 7½ in. long

Sharpened hex-head bolt, ½ in. dia. by 6 in. long

Inset hex nut

Back end, 6 in. wide by 4½ in. tall

Stop block, 6 in. wide by 5 in. long

Sides, 25½ in. long by 5½ in. tall

Router baseplate, 6 in. square

Cleats, ½ in. thick by 1 in. wide by 14½ in. long

Index block, 3½ in. dia., with 1½ in.-dia. mortise for column

Wood screw

½ in.-dia. dowel

Wood screw

Front end, 6 in. wide by 5½ in. tall

Bottom, 6 in. wide by 23½ in. long

Built from ¾-in.-thick plywood and modified off-the-shelf hardware, this jig is used to orient and support the column and guide the router when cutting the three dovetail slots for the legs.

120° apart on center, and the jig is equipped with an index block to align the column correctly for each slot. Match the 120° marks on the index block to a corresponding mark on the jig. A wood screw secures it in each position for cutting.

Cut the slots with three router bits—

There are three steps to cutting the dovetail slots. First, establish a flat edge on the column for the shoulder of the leg. Use a 1-in.-dia. straight router bit, and set up the cut to trim a flat surface just wide enough for the thickness of the leg. It's better to cut this a little too wide than too narrow. A wide flat can be rounded with a file, but a narrow flat will create a gap where the leg meets the column. The stop block on the router jig should be set so the dovetail slot stops just short of the column shoulder.

After cutting a flat edge for the three legs—rotating the column in the jig for each cut—switch to a 7/16-in. straight bit and hog out most of the waste for each slot. This second step reduces the stress on the router and the wear on the dovetail bit. Finally, change router bits again to a dovetail bit (mine is an 11° bit) and take a final pass on each slot. Set the column aside until you're ready to cut the dovetails on the table legs.

Shape the legs on the bandsaw

The three legs are rough-cut on the bandsaw and taken to their final shape with hand tools. To begin, enlarge the scale



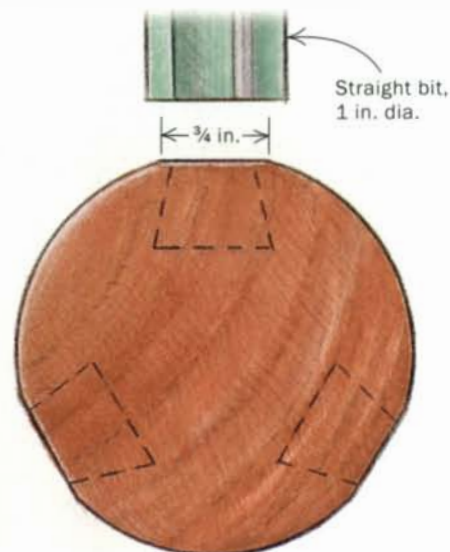
Mount the column in the router jig. First, insert the column into the index block and secure it with a wood screw to keep it from rotating within the block (left). Align the base of the column in the jig using the dimple created by the lathe and hold it in place by tightening the sharpened hex bolt (center). Finally, locate the column for routing by aligning one of the three scribe lines on the index block with the centerline on the jig and fasten it with a screw (right).



ROUT THE DOVETAIL SLOTS IN THREE STEPS

1. ROUT A FLAT SHOULDER

Trim a $\frac{3}{4}$ -in. flat centered over each of the slots so that the legs will join flush to the column.



drawing to 200% to make a template with $\frac{1}{4}$ -in.-thick plywood, and then draw the leg shape directly onto the three workpieces with the grain running lengthwise. I made the pattern about 1 in. longer than is found on period examples of the table so that it could be built for a standard 29-in. height. However, to build a more accurate reproduction, you simply can cut off the extra inch from the foot without greatly affecting the appearance of the table.

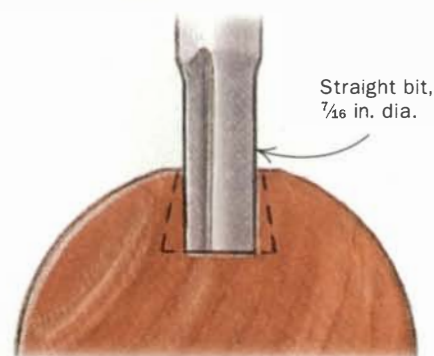
Once each leg has been rough-cut to about $\frac{1}{16}$ in. to the line, gang the legs together with a clamp and clean up the front and back edges with a spokeshave followed by a cabinet scraper. Clamping all three legs together makes it easier to keep the edges square, and it reduces tearout at the edges. Also, always cut in the direction of the grain with the spokeshave, even if it requires repositioning the legs in the vise.

Cut the dovetails—To cut the dovetails on the legs, set up the router table with a fence and the same dovetail bit used for the slots. Before cutting into the real legs, use a cutoff from the leg material of the exact same thickness and make test cuts to fine-tune the fit of the dovetail into the column base. Carefully pass the stock upright along the fence to cut one cheek of the dovetail. Flip it over to cut the other side. I



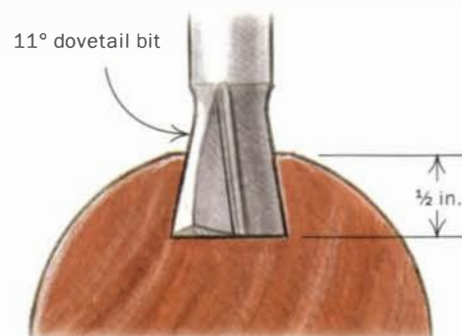
2. HOG OUT THE WASTE

Set the bit to cut $\frac{1}{2}$ in. deep and stop just short of the column shoulder.

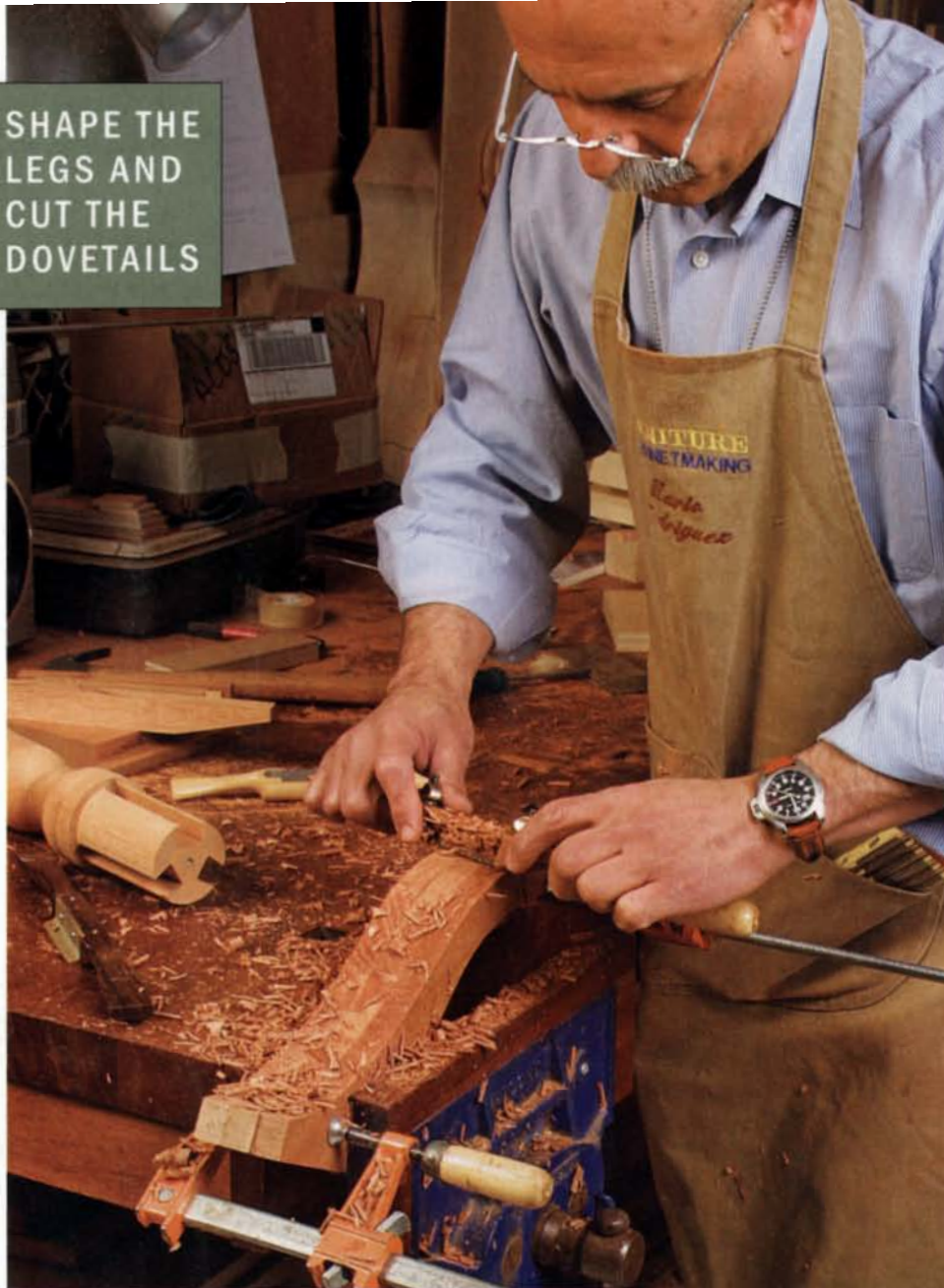


3. ROUT THE DOVETAIL PROFILE

Take your final pass and wait until the bit stops spinning before backing it out of the cut.



SHAPE THE LEGS AND CUT THE DOVETAILS



Shape all three legs at once. Gang the legs together with clamps and use a spokeshave and card scraper to clean up the bandsaw marks.

Make a jig for routing the dovetails. A jig, made using the leg template, supports the leg while routing. The sides of the jig ride on a supplemental fence screwed to the router-table fence. Put steady pressure against the fence as you rout to ensure a clean cut and tight fit.



made a jig using my leg template that rides along the router-table fence and holds the leg steady. If you discover that a dovetail doesn't fit right in the column, run it back across the bit and apply more pressure against the fence. It might take off just enough to make the fit easier.

Next, make a slight roundover along the front edge of each leg one at a time. Draw a pencil line down the center of the leg as well as lines on both sides that follow the profile of the leg about $\frac{1}{8}$ in. from the edge. Then use a spokeshave to round over the edge to your guidelines. Finish off to a nice profile with files, a scraper, and sandpaper.

Taper the legs—The three legs taper from $\frac{3}{4}$ in. thick at the dovetail to $\frac{1}{2}$ in. thick at the foot. I made a pair of sleds that help me create this taper with a thickness planer (see the top right photos on the facing page), though careful handplaning also would work. The first sled elevates the foot of the leg $\frac{1}{8}$ in., creating one side of the taper when it is run through the planer. The second sled raises the foot of the leg $\frac{1}{4}$ in., so when you flip it over, an even taper is cut on both sides. Be careful not to plane off too much, or you will damage the dovetail.

Create the tilting mechanism

The pivot system for the tilting tabletop consists of a pivot block that fits over the column tenon and two cleats that attach to the underside of the tabletop. Two round tenons extend off one end of the pivot block and are set into holes in the two cleats, allowing the tabletop to pivot.





Round the front edge of the legs. To guide your progress, mark the leg with a centerline and two guidelines along the sides about $\frac{1}{8}$ in. from the edge.



USE A PAIR OF SLEDS TO TAPER THE LEGS

Taper the legs with a thickness planer. Cut one side of the taper with a sled that raises the foot of the leg $\frac{1}{8}$ in. Use a second sled to taper the other side. This time the foot is raised $\frac{1}{4}$ in. so that it is evenly tapered.

Make the two cleats and then drill the holes for the round tenons, locating them as close to the top edge of each cleat as possible; I aim for about $\frac{1}{16}$ in. This will ensure that the tabletop lies properly against the pivot block when it is horizontal, and stands perfectly plumb when vertical.

There are two ways you can approach the pivot block. The traditional method is to cut the round tenons out of the pivot block with a single piece of wood. But the easiest method is to make a pivot block with a rabbet cut into one edge, and then glue in a separate strip sized to the dimensions of the rabbet with round tenons cut on each end. You will need to plane the pivot strip flush with the surface and the back edge of the pivot block.

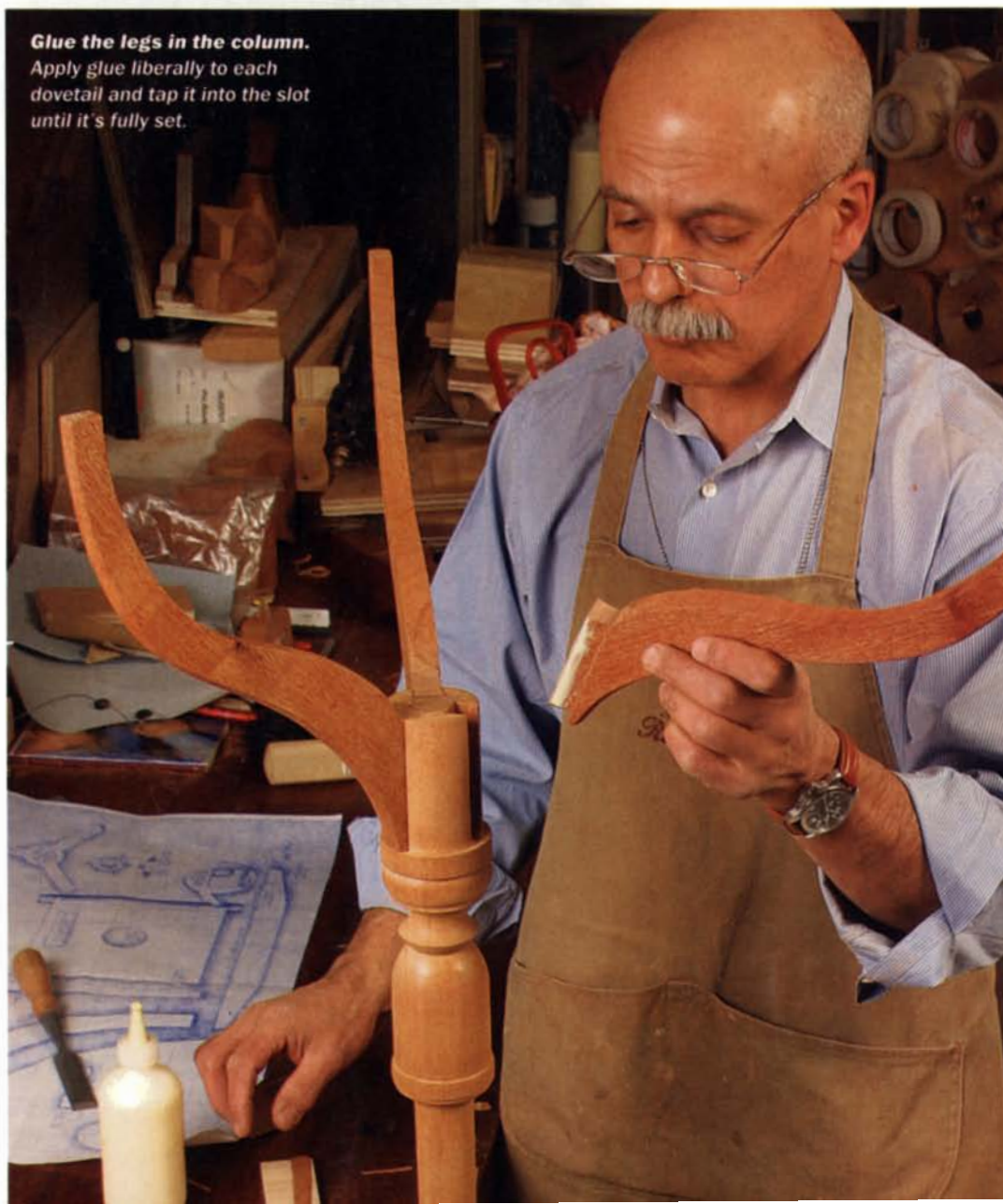
Turn the round tenons on the lathe, and aim carefully for a squeaky-tight fit in the cleats. As the top is tilted, there should be some resistance on the pivot. That way, when the top is vertical, it will stay there.

Prepare the oval top

The tabletop measures about 15 in. wide by 17 in. long, so you may have to glue up two pieces to make it.

Use the scale drawing to make a $\frac{1}{2}$ -in.-thick birch plywood template, trace an outline of the tabletop onto the workpiece,

Glue the legs in the column. Apply glue liberally to each dovetail and tap it into the slot until it's fully set.

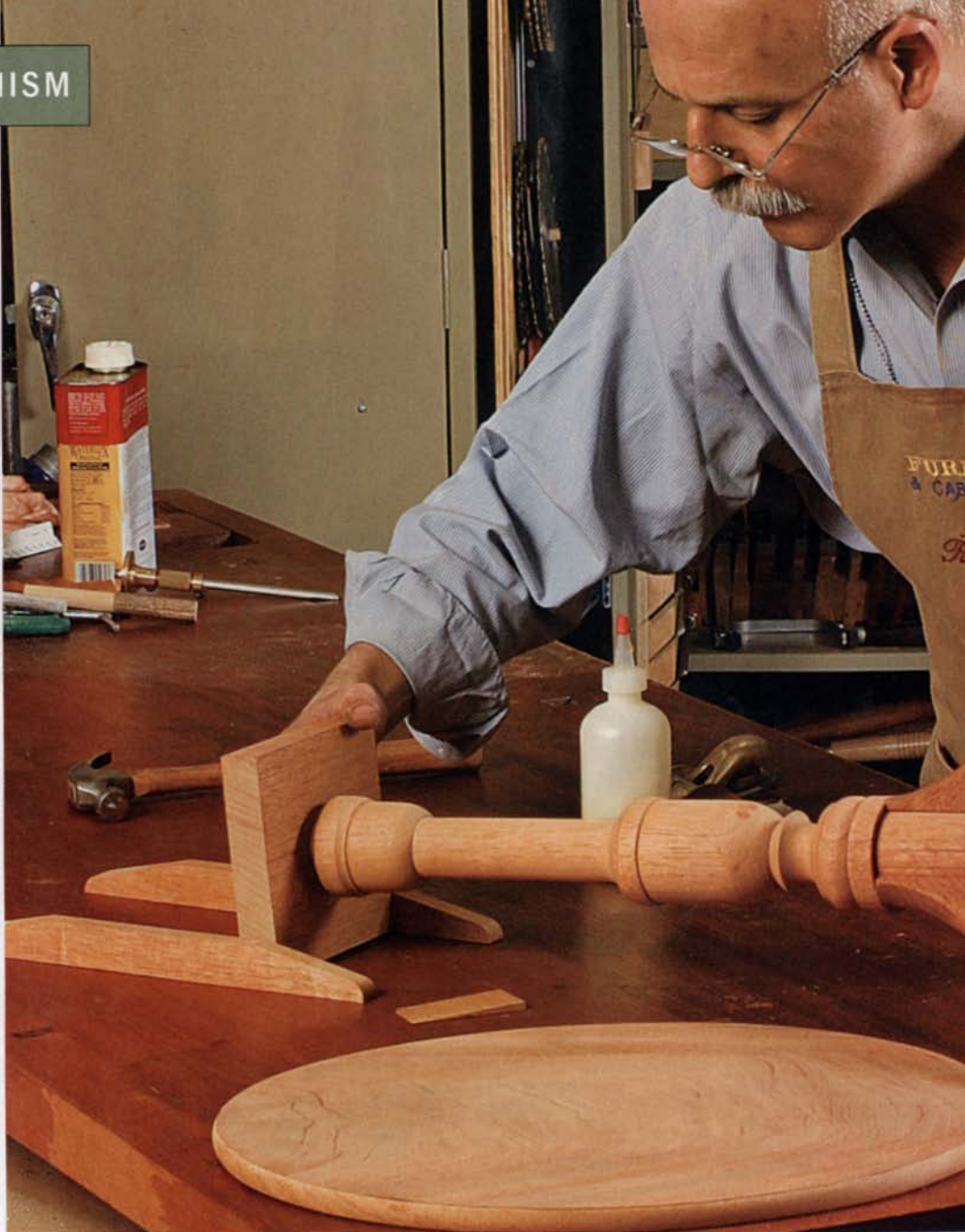


BUILD THE TILT MECHANISM



Assemble the pivot block. Glue a separate strip with round tenoned ends into a rabbet cut in the pivot block. Then round the corner of the block to allow the table to tilt properly.

Align the block before securing it. Align the pivot block on end while two legs are flat against the workbench. This will ensure that the legs are properly aligned with the oval top.



and cut it out on the bandsaw just outside of the line. Next, rout the oval shape on a router table with a bearing-guided bit (see *FWW* #170, pp. 72-75, on changing the direction of the cut to avoid tearout). The tabletop edges are slightly rounded over to match the rounded profile of the legs.

Assemble the table, apply a finish, and attach the hardware

Once all of the parts have been prepared, assembly should go pretty smoothly. First, attach the legs to the column, checking for a tight fit and a clean joint between the shoulder of the legs and the column. The legs should go on without incident if you care-

fully cut the dovetails on the router table. Although not required, you can reinforce the leg joints with a metal brace called a table spider—available from Horton Brasses (800-754-9127; www.horton-brasses.com).

Once the legs have been glued in place, use a wedge to attach the pivot block to the top of the column. Saw down the center of the column tenon to make a kerf for the wedge. It should run perpendicular to the direction of the grain on the pivot block so the block doesn't split when you drive home the wedge. The pivot block must be positioned so that when the tabletop is in the upright position, one leg is pointing straight back. This way the table can fit in-

to a corner. To achieve the proper orientation, set the column onto a workbench so that two legs rest on the workbench (above). Then attach the pivot block with the round tenons flat on the workbench.

Next, screw on the tabletop. With the top upside down on your workbench and the pivot block centered on it, set the cleats onto the pivot-block tenons with a $\frac{1}{16}$ -in. gap between. Then drive #8 screws through the cleats and into the underside of the tabletop.

All of the parts should be sanded through to 220-grit abrasive before assembly. I stained the table with a mixture of cherry and walnut Behlen Solar-Lux stains (Garrett

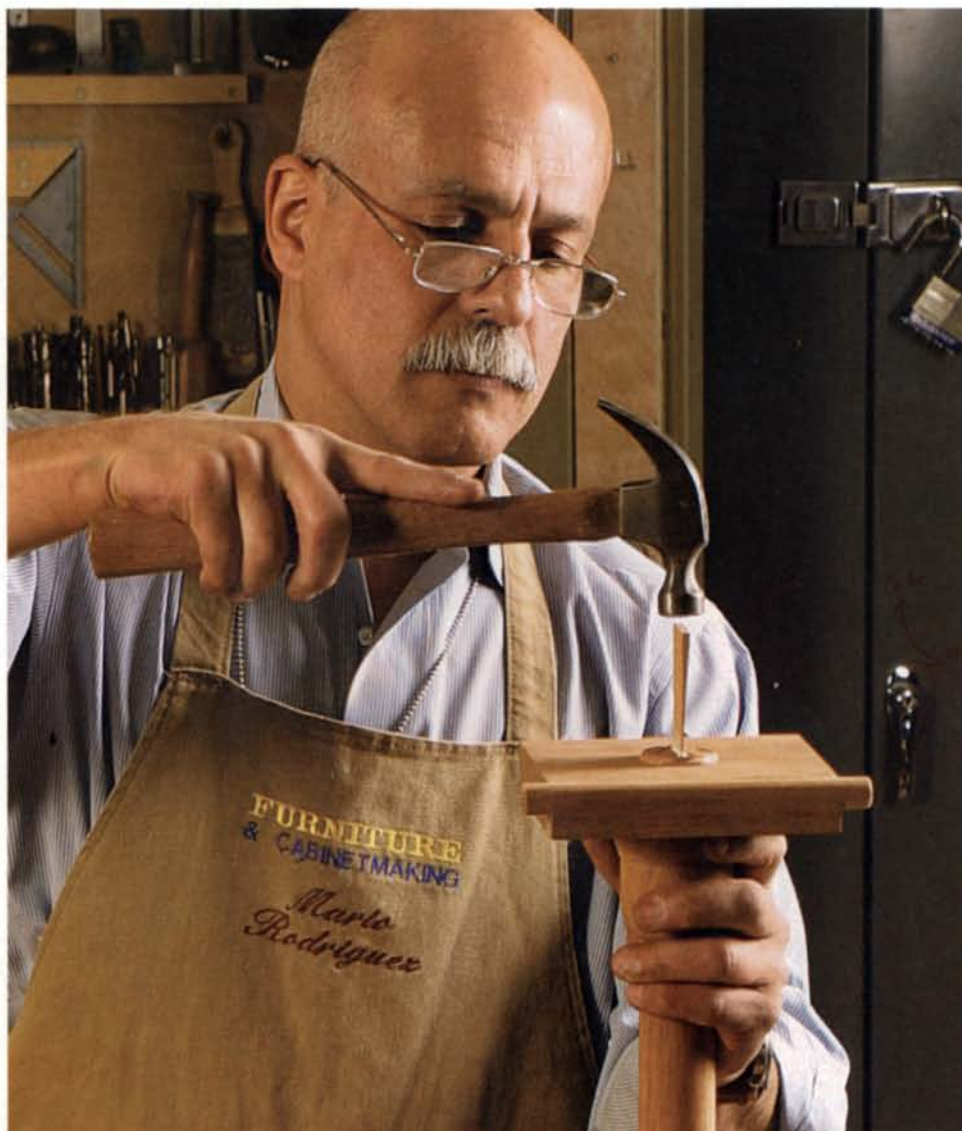


Wade; 800-221-2942; www.garrettwade.com). Then I brushed on several thin coats of shellac. Sand lightly after the first coat of shellac and allow each subsequent coat to dry thoroughly. Finally, rub out the finish with fine steel wool.

The last step is to apply a glaze coat. I used McCloskey glaze with raw umber Japan pigment added. Once the glaze dried, I waxed and buffed the table.

Finally, install a good reproduction catch (307-739-9478; www.whitechapel-ltd.com) to keep the top secure and level when the table is in use. □

Mario Rodriguez is a contributing editor.

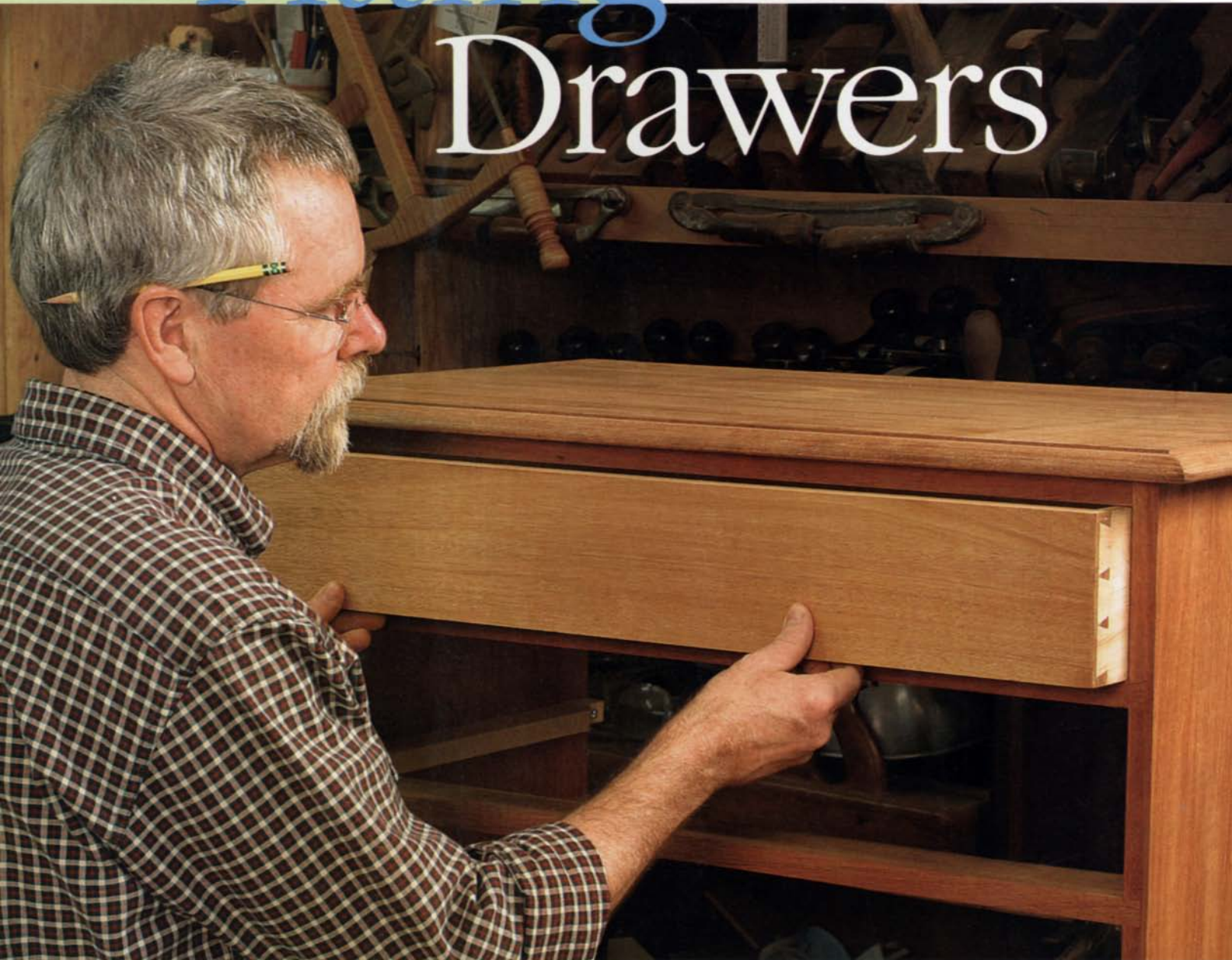


A wedge secures the pivot block. Orient the slot in the tenon perpendicular to the grain of the block to avoid splitting the block as you drive in the wedge.



Screw the cleats to the tabletop. Slide the cleats onto the round tenons of the pivot block and center the base assembly along the long axis of the tabletop. Attach the catch after the finish has been applied.

Fitting Drawers



You don't need a perfect
drawer or case to get
perfect results

BY PHILIP C. LOWE

A well-fitted inset drawer is one of the hallmarks of fine furniture, separating hand-crafted work from factory made. The hands and eyes go naturally to such a drawer, trying its piston fit and appreciating the fine gap around its edges. Articles and books have addressed the fitting of drawers, but most have focused on the best-case scenario, ignoring a common situation: fitting a slightly imperfect drawer into a slightly imperfect opening.

Ideally, a drawer should slide smoothly into place, with a thin, uniform gap all around and the drawer front aligned perfectly with the front of the case. However, there will be times when a case or a drawer box ends up a bit crooked, warped, or twisted. Sometimes fitting becomes problematic because a drawer divider has warped

FIT THE DRAWER PARTS BEFORE CUTTING THE JOINERY

The most important steps in fitting an inset drawer happen before the drawer box is even assembled.

1 FIT THE DRAWER SIDES

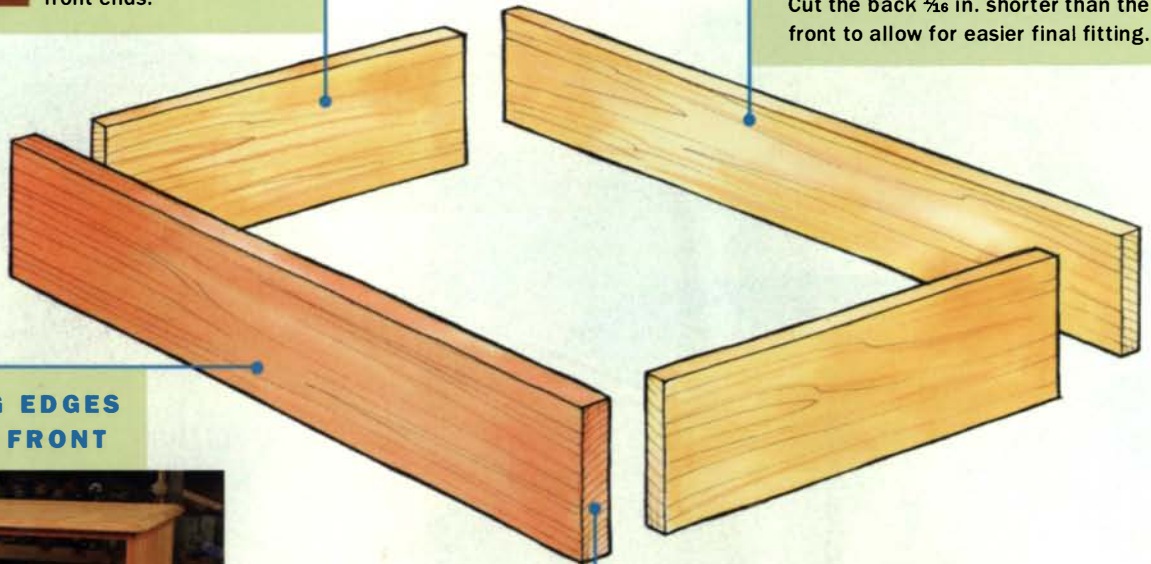
Plane the sides to fit the opening. Also, mark and cut them to length, allowing for the half-blind dovetails at the front ends.

3

4

4 CUT THE DRAWER BACK TO SIZE

Cut the back $\frac{1}{16}$ in. shorter than the front to allow for easier final fitting.



1

1 PLANE THE LONG EDGES OF THE DRAWER FRONT



Start with stock $\frac{1}{16}$ in. too wide. Before planing to fit, check the opening with a straightedge (top). If the dividers or the case is bowed, plane the long edges of the drawer front to match (bottom).

2

2 FIT THE ENDS OF THE DRAWER FRONT



Plane one end to fit the case (above). Then set the drawer front in the case and mark the other end for length at both the top and bottom edges (right). Aim for a snug fit at this point in the process.



FINE-TUNE THE FIT AFTER GLUING UP THE DRAWER

Provided you cut the drawer back slightly short as recommended and that the glue-up went well, only the front end of the drawer will need to be fitted to the opening.

1

GLUE UP THE DRAWER

Careful assembly is essential. Glue up the drawer box on a flat surface and measure diagonals to ensure that the box goes together square.

2

CLEAN UP THE JOINTS



Only this area needs to be planed to fit the drawer.

3

FIT THE FRONT OF THE DRAWER BOX



All but the last few inches of the drawer should slide in easily at this point. Level the dovetails at the front of the drawer box and continue planing those areas until you achieve a $\frac{1}{32}$ -in. gap at each end. Also, touch up the top edge for the same gap.



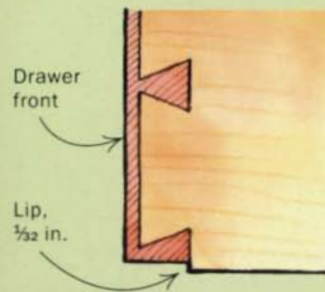
Lightly plane the bottom edges flush with each other (top) and then plane the rear dovetails flush (bottom).



4

PLANE THE BOTTOM OF THE DRAWER FRONT

Relieve the bottom edge of the drawer front. Use a rabbet plane to create a $\frac{1}{32}$ -in. lip (left and drawing below). This will create an even gap on all sides of the drawer (below) and prevent the drawer front from catching on the case.



slightly after the case was assembled. Regardless of the cause, it's possible to get perfect-looking results even when a drawer or case is less than perfect.

Fit the drawer front and sides before assembly

The process for fitting a traditional inset drawer begins while the drawer still is in pieces. The drawer front should be trimmed to fit the opening in the case—be it square or ever-so-slightly askew. The drawer front will then determine the shape of the drawer box.

Start by checking the drawer opening to see whether there is any bow to the dividers or case. If the dividers are straight, rip the drawer front $\frac{1}{16}$ in. oversize in width. If the dividers are not straight, you may have to leave the drawer front a bit more oversize.

Joint away the saw marks and then fit the drawer front to the height of the opening. If the case or horizontal drawer divider has a bow, start planing this shape from one end of the drawer front to the other. Then plane one end to fit the vertical member it must match (this could be out of square), checking it by sliding just that end into position.

Next, fit the other end of the drawer front. Place most of the front into the opening and use a knife to mark its length at the top and bottom edges. Connect these two marks with a straightedge. After squaring this line around the entire end, make a square crosscut on the tablesaw to the longest length if the scribe line is not square,

and then use a handplane to trim the end until it fits into the opening. Aim for a snug fit of the drawer front in the opening. You should be able to slide it into place without pushing very hard.

Once the drawer front fits perfectly, work on the sides and back of the box. Orient the grain of the drawer sides so that it will be easy to plane the outside faces from front to back during final fitting. When fitting the sides, follow this sequence: Joint the bottom edges straight and rip the sides $\frac{1}{16}$ in. wider than the opening. Remove the saw marks and plane the pieces evenly until they slide into the opening.

Now, resting the sides against the bottom of the drawer opening, slide them into place. Use the front edge of the case to mark the length of the sides, adjusting for joinery that will be at the front corners. If you're using half-blind dovetails, stop them at least $\frac{3}{16}$ in. from the face of the drawer front. This allows plenty of room for planing this face flush with the case later, especially if the drawer ends up slightly twisted or crooked. For that reason, I usually start with an extrathick drawer front, say $\frac{13}{16}$ in. or $\frac{7}{8}$ in.

As for the back of the drawer, a tried-and-true method is to



Fitting problem drawers

TWISTED DRAWERS

A twisted drawer is easy to spot. Place it on a flat surface (below) and look for a gap under one of the corners. It is best to remove as much of the twist as possible from the bottom of one drawer side before the final-fitting stage. Plane from the front of the drawer to the back, tapering the drawer side until the entire drawer sits flat. Then continue with the fitting process as usual.

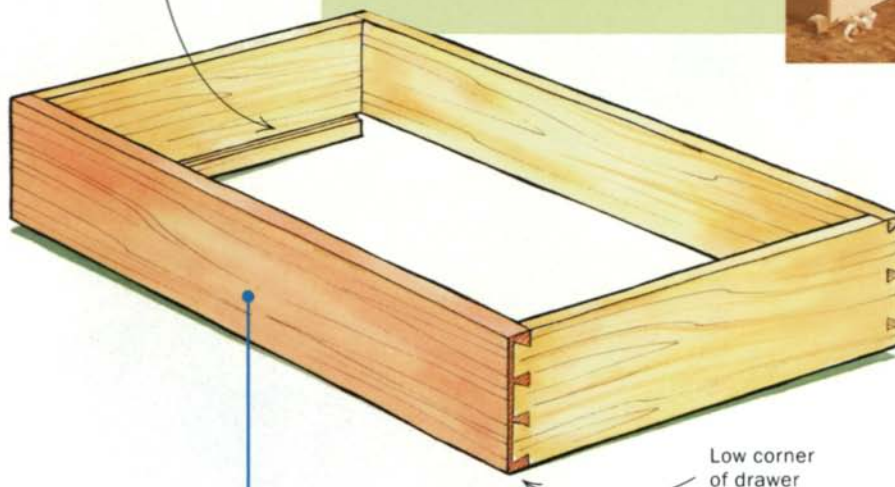
If the twist is more than slight, the situation gets more complicated. As you plane the bottom of one drawer side, the drawer front becomes tilted in the opening. To correct this problem, you may have to plane the front of the drawer surface to line it up with the opening.

1

PLANE THE DRAWER SIDE TO REMOVE THE TWIST

Locate the low corner of the drawer and relieve the opposite corner. Try to maintain a straight edge as you plane it, continuing until the drawer sits flat.

Plane the rear corner of this drawer side.



2

PLANE THE FRONT, IF NEEDED

If the drawer is tilted noticeably, you must plane the face to bring it plumb with the case front. Plane very carefully to maintain a flat face.

Plane the lower section of the drawer front.



cut the back $\frac{1}{8}$ in. shorter than the width of the opening. By cutting the back shorter, you intentionally make the drawer box a slight trapezoid, which makes for easier fitting. The slight play at the back also will allow you to adjust a crooked drawer in the opening so that its face ends up flush.

At this point, dovetail the drawer parts together and glue them up as square and as flat as possible.

Fine-tune the fit after assembly

Once the drawer has been glued up and the clamps have been removed, the final fitting begins. You should be able to handle most

problems at this point, ending up with a great fit. However, there will be times when a drawer ends up so twisted or crooked that it must be scrapped altogether.

First, check the drawer for twist. You can do this using winding sticks, or you can place the drawer on a flat surface, such as a saw table, to see whether it rocks. Sometimes I use the top surface of the cabinet or chest I am working on, if I know it is flat.

If the drawer is flat, the task of fitting it should be straightforward. The first steps are merely to clean up the joinery. Begin by taking a couple of consistent plane shavings to clean up the dovetails at the back corners. Also, lightly plane the bottom

CROOKED DRAWERS

Another problem that can occur at glue-up is a drawer box slipping out of square (forming a parallelogram in a top view). If the drawer front does not line up across the opening, you have a few options. If the misalignment is minimal, there might be enough play at the back of the drawer to correct the alignment by simply adjusting the drawer stops.

If the drawer can't be pushed into alignment, you will have to plane some material from the back corner, allowing the drawer box to pivot sideways and the drawer front to come back into alignment. Again, you will have to align the drawer stops to bring the drawer front square when it is pushed in.

Beware: If you have to remove too much material from a

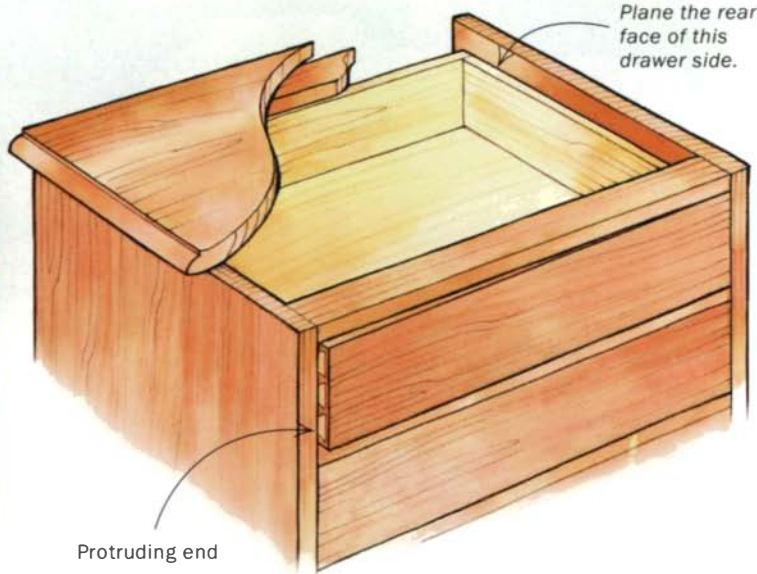
1

PLANE THE REAR CORNER

Locate the protruding end of the drawer. Then plane the back corner of the opposite side to allow the drawer box to pivot so that the front is flush with the case front.



Plane the rear face of this drawer side.



2

ADJUST THE STOP BLOCKS

Glue stop blocks to the front divider so they stop the drawer front when it is flush with the case.



drawer side, it can become too thin at the groove or rabbet that was cut to house the drawer bottom, weakening the construction. If you feel this happening, stop removing material from the back corner and begin planing the drawer face where it protrudes from the case.

I've also used a tight-fitting drawer bottom to push a crooked box back toward square, or tapered the drawer guide (when there was one). A last resort is to plane a taper into the actual case side, which can be a nightmarish task.

edges of the drawer sides flush with the bottom edge of the drawer front.

Because the back is shorter across than the front, the box should go into the opening almost all of the way. Then, with two or three passes of the plane at the ends of the drawer front, take off an even thickness. Maintain the angles of the ends as they were fitted to the opening, and the drawer should slide home.

If you push the drawer into its opening and notice that the front is not parallel with the dividers, see "Crooked drawers" (above). If not, continue planing to create a consistent, fine gap— $\frac{1}{32}$ in. or less—at each end of the drawer.

With the ends finished, work on the long edges. Plane away a consistent amount from the top of the drawer. Finally, use a rabbet plane to relieve the bottom edge of the drawer front. Take three or four shavings, leaving the drawer sides resting on the drawer runners but creating a consistent, fine gap all around the drawer front. The lip created by the plane also prevents the bottom edge of the drawer front from catching when the drawer is slid shut. □

Philip C. Lowe is a furniture maker and teacher in Beverly, Mass., where he runs The Furniture Institute of Massachusetts. For information on classes, go to www.furnituremakingclasses.com.

Personalize Your Furniture



DIAMOND BEADING

A trademark of my furniture is evidence of the hand-tool work that goes into each piece. It can be as subtle as the variations of a handplaned surface, or as deliberate as hand-carved embellishments. These details catch the eye, add a pleasing effect to the overall design, and make each piece unique.

Diamond beading, curls, and rosettes are three carvings that occur frequently in my furniture, in numerous variations. Cutting these designs mechanically would require an expensive and complex tool, but carving them by hand is done easily—even if you're a novice carver—and requires only a modest investment in tools.

While you must work to the nearest $\frac{1}{2}$ in. for a mortise-and-tenon, and to even tighter tolerances for a perfect dovetail, carving is your chance to cut loose from the bonds of the ruler and marking knife. You purposely are avoiding

Three decorative carvings
that are easy to do
and require few tools

BY CHARLES
SHACKLETON



CURLS

the perfect symmetry left by a machine and are seeking the unique marks left by a carver. I hope these examples will encourage you to take up carving and add an extra dimension to your furniture making. The only limit is your imagination.

A carved surface is all about texture

Many beginners try to achieve an almost flat surface, whether with multiple strokes of the carving tool or by sanding the wood. Everyone's taste varies in how textured a carved surface should be; I think you should aim for a surface with some inconsistency but not too much. I find that running my hands over the surface is a good way to locate rough areas that need another stroke of the tool. Above all, don't touch the carved wood with sandpaper after you put down your carving tools.

The author is the owner of Charles Shackleton Furniture in Bridgewater, Vt.

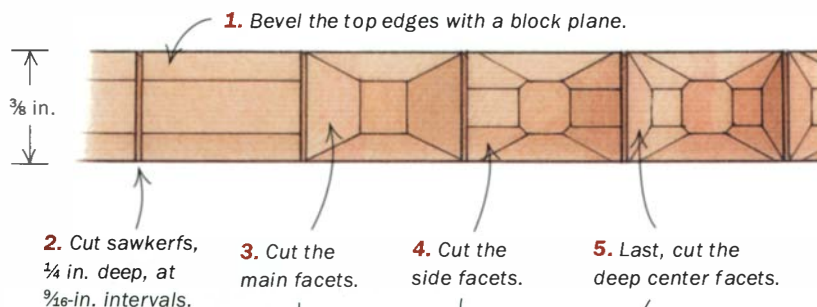


ROSETTES

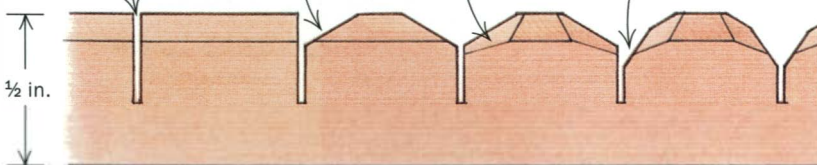
DIAMOND BEADING DRESSES UP MOLDINGS

A few simple tools—a block plane, a thin-kerf saw, and a $\frac{1}{2}$ -in. bench chisel—are all you need to form this diamond beading.

TOP VIEW



SIDE VIEW



This decoration started out as a crude rendition of a berry molding. That design normally is a string of pure round beads, but my version came out in a faceted, hand-carved form. Creating this carving is an incredibly satisfying, soothing, easy, and quiet process, and it doesn't take that long. Diamond beading can add sparkle without overwhelming a design.

I use variations of the diamond, including one that looks like a row of four-sided pyramids (see the photo on the facing page). I think a furniture maker in my shop misinterpreted the original idea, or perhaps got bored, and this new version was born. That's how ideas come about: They evolve through mistakes, misinterpretations, experimentation, or just playing around.

Start with a piece of wood $\frac{1}{2}$ in. thick by

$\frac{3}{8}$ in. wide, and slightly longer than you'll need, to allow for mitering. Bevel the two top edges with a block plane, but don't aim for perfect facets. Mark the length

every $\frac{1}{16}$ in. and cut down roughly $\frac{1}{4}$ in. with a thin-kerf saw.

With a $\frac{1}{2}$ -in. bench chisel, remove the wood in the order shown in the illustration. Some carvers perform the first cut along the whole piece before starting the second cut, for consistency's sake, but don't strive for perfectly matching beads.

Watch it on the Web

To see the author demonstrate his carving techniques, go to www.finewoodworking.com.

1. BEVEL THE TOP EDGES



2. DEFINE THE BEADS



1. Use a block plane to bevel the top side of a strip of wood. Aim for a multifaceted arc rather than a smooth curve. 2. Then define each bead by making $\frac{1}{4}$ -in.-deep cuts every $\frac{1}{16}$ in., preferably with a thin-kerf saw.

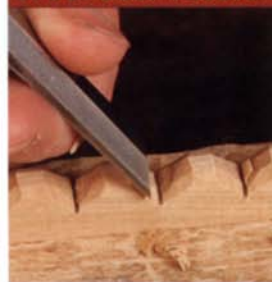
3. CUT MAIN FACETS



4. CUT SIDE FACETS



5. CUT DEEP FACETS



3. Using a $\frac{1}{2}$ -in. bench chisel, start the first cut a little over a third of the way onto the top of the bead, angled at about 30° toward the sawkerf. 4. Cut the two side facets with the chisel angled to each side of the bead. 5. Lift the chisel to about 60° and cut the final facet about halfway down the first cut.



CURLS ADD DIMENSION

I originally came up with this design for the arm of an upholstered dining chair. It gave the chair a look similar to the ram's horn curl on the top of a Greek Ionic column. Even though this chair was nearly twice the price of one of my side chairs, it sold well. It was almost as if the carving let the customer know how much handwork had gone into each piece.

With carving in general, you can use the profile of a tool to design the carving rather than designing the carving and then buying tools to execute it. Once you have a rough sketch of the carving, walk the gouge along the line, tracing the path with a pencil. Then cut along the line with a knife, lay the template on the wood, and trace the line onto the wood.

First define the outline of the curl by driving the gouge straight down into the wood with a mallet. Chisel away the waste, working from the outside of the curl toward the center. When cutting across or against the grain, take lighter cuts to avoid going too deep. The center of the curl can be slightly hollowed to avoid leaving a flat spot on the carving.

Deepen the outline until you reach a depth you find pleasing. The depth should be roughly uniform over most of the curl but gradually taper until it disappears in the center. When you remove wood where the curl joins the rest of the piece, try to have a slightly irregular transition from the smooth surface to the carved area. This will add to the pleasing hand-crafted appearance of the piece.



1. DESIGN WITH TOOLS IN MIND



2. DEFINE THE CURL

1. Use the sweep of a gouge you already own to draw the final shape of the curl. Then transfer the design to the workpiece by cutting around the curl with a knife and tracing the design with a pencil onto the wood. 2. Use a mallet to drive the gouge into the wood following the line of the curl. Don't try to cut down to the final depth at this stage.

Buy your carving tools as you need them

Resist the urge to buy an economical starter set of carving tools. You will end up hardly using some of them, while those you do use will cut poorly and never hold an edge. Instead, purchase top-of-the-line tools as you need them. I prefer the Pfeil brand (www.woodcarvingsupplies.com). The first number on the handle refers to the sweep, or curve, of the gouge, while the second number is the width of the tool in millimeters. Besides the sharpening stones you use with your bench chisels, you will need a leather strop and some honing compound. A few quick strokes on the strop will keep your tools cutting cleanly and effortlessly and will lengthen the time between each honing of a fresh edge.



Maintain a sharp edge. Hone the blade on a leather strop to maintain the perfect edge needed for effortless, clean carving.



3. RELIEVE THE CUT

Work your way around the curl, driving the gouge in from close to the edge up to the previously cut outline.



4. RECESS THE CENTER

To avoid leaving a flat section of wood that will detract from the carving, slightly recess the center of the curl.



5. AIM FOR A TEXTURE

This one gouge carved the curl from start to finish. The sharp edges of the curl can be sanded slightly, but the scalloped pattern left by the gouge should not be touched.



ROSETTES ADD ELEGANCE

mounted in a drill press. The former method offers more flexibility in terms of design and size, but if you don't possess turning skills, the drill press can produce blanks very quickly.

Once the blank has been cut or turned, divide it into four quadrants by drawing curved lines from the midpoint to the edge. At the edge, remove four triangles of waste by pushing down on the gouge and at the same time angling it toward the rim. Then use the smaller of the two gouges to cut the curving line from the center to each triangle. Don't make the line too pronounced; an oil finish will enhance the line when penetrating the cut wood. Last, with a sharp scribe or the edge of a chisel, scratch in the vein running down the middle of each leaf.

When mounted in shallow holes, the rosettes appear carved into the solid wood of the workpiece. I have used both large and small rosettes on the legs of coffee tables, as centers for drawer pulls on bedside tables, and to adorn kitchen dressers and mirror frames.

A lot of design originates from natural forms (evidence suggests that the Corinthian column evolved from the stem of the giant hogweed, or its Greek counterpart). Go for a hike and see what inspires you. There might be an idea hiding in a bush right outside your shop.

This rosette design may have originated as a dogwood flower or perhaps as a wild rose, but despite its intricate appearance, it is no more difficult to create than the previous two carvings.

This carving is deceptively simple because the majority of the profile is cut either on the lathe or using a cutterhead

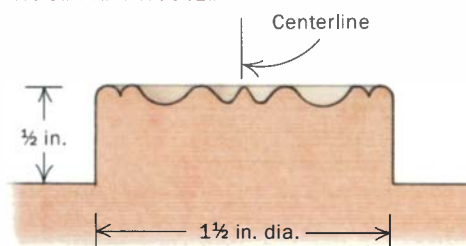


Highlighting a leg. By inserting the rosette into a perfectly matched hole, it appears that the leg itself was carved.

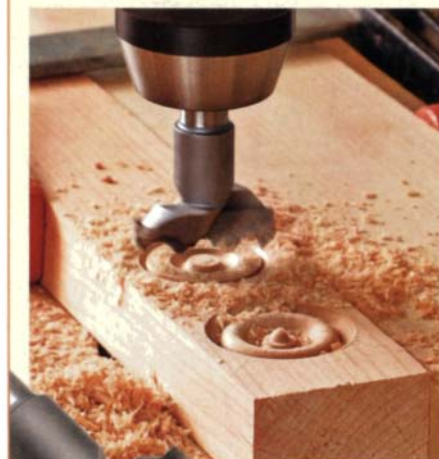


1. TURN ROSETTE BLANKS
Rosette blanks turned on a lathe have a limitless number of profile and size possibilities.

ROSETTE PROFILE



A drill-press option for cutting rosettes



If you don't own a lathe, mount a rosette cutter (www.mlcswoodworking.com) in a drill press. Use a fly cutter with the center bit removed to cut the outside of the rosette block, removing it from the blank.

2. MOUNT THE TURNINGS FOR CARVING

A carving's three dimensions are best illuminated with a bright light shining from one side. Here, Shackleton has prepared several blanks with double-faced tape on the lathe and mounted them on a piece of scrap board to ready them for carving.



3. DRAW IN THE FLOWER PETALS

Divide the face of the turning into four parts by drawing the curved outline of the petals.



4. CARVE THE PETAL CORNERS

Angle the gouge down and outward to cut away a small triangle of waste, which defines the corners of the petals.



5. DEFINE WHERE THE PETALS MEET

Push the curve of the gouge into the wood enough to show the edges of the petals.



6. ADD THE VEINS

Use the edge of a chisel to scribe the thin vein in the center of each petal.

Current Work

Current Work provides design inspiration by showcasing the work of our readers. For more details and an entry form, visit our Web site at www.finewoodworking.com. Send photos and entry forms to **Current Work**, *Fine Woodworking*, 63 S. Main St., Newtown, CT 06470, or email digital images to fw@taunton.com.

John Packard Sea Cliff, N.Y. ►

Packard had always wanted to make a round dining-room table for himself, and when the right materials came to hand, he built this figured mahogany one to complement a set of 19th-century Regency chairs he had purchased in Paris. The table (60 in. dia. by 30 in. tall) showcases satinwood, holly, and ebony bandings and took about 275 hours to complete. It has a rubbed-out lacquer finish. Photo by Steve Ogilvy



Greg Arceneaux Covington, La. ▲

This French-Creole style petite armoire (24 in. deep by 36 in. wide by 60 in. tall) is made of cypress. "From 1725 to 1825, this style was indigenous to the Mississippi River Valley," Arceneaux noted, "and now can only be seen in private collections and museums because there are so few surviving pieces." The armoire has a Danish-oil and wax finish.

Dan Gindling ► San Diego, Calif.

Gindling designed this chest of drawers to store CDs and DVDs in his home. The cabinet (19 in. deep by 22 in. wide by 64 in. tall) is made of urban walnut and quarter-sawn sycamore, and the top tray features three lights that illuminate the lower drawers. The piece is finished with polyurethane.



Frank Hickman ►
Shaker Heights, Ohio

Hickman's "great chair project" began with a curiosity of what a small production run would be like. Thirteen years and 22 chairs later, Hickman said he has more than satisfied his curiosity, having made 18 of these side chairs (25 in. deep by 18 in. wide by 46 in. tall) and four rockers. Sixteen of the chairs were constructed of walnut, and six of cherry. Hickman used linen seat covers and finished the chairs with tung oil.

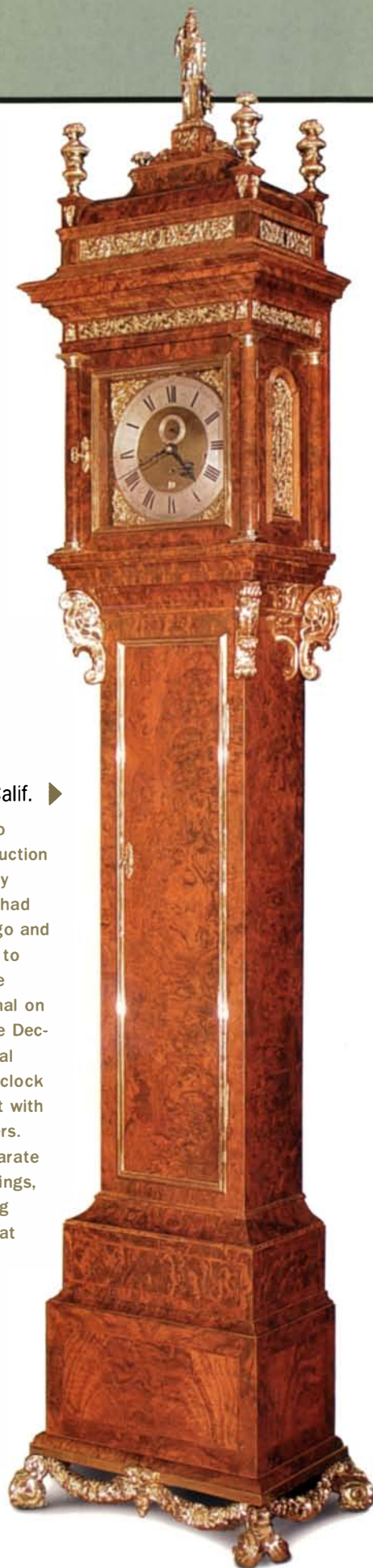


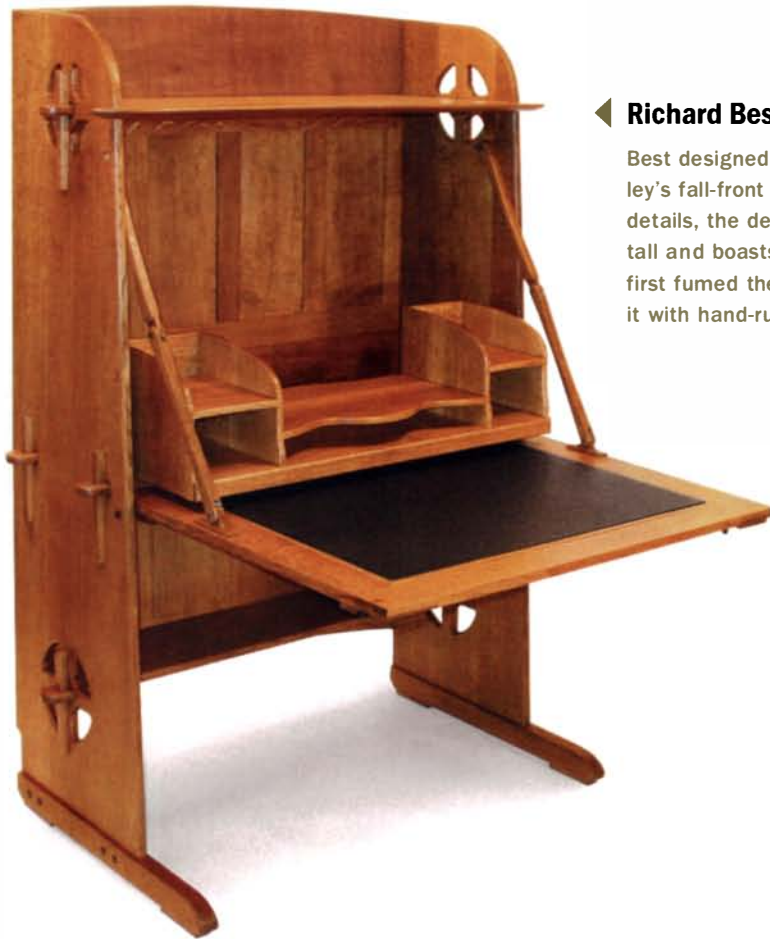
Barry Daggett Northampton, Mass. ▲

"I had book-matched several pieces of walnut crotch I had in my shop," Daggett said, "and began playing with the four pieces like a puzzle." Once he found the right balance among the pieces, Daggett let that configuration inspire the design of this walnut storage cabinet (20 in. deep by 40 in. wide by 32 in. tall). The piece features ebony pulls and is finished with an oil-based varnish and wax. Photo by John Polak

Craig Barnett Fresno, Calif. ►

Barnett was commissioned to build this Royal Clock reproduction (18 in. deep by 21 in. wide by 122 in. tall) for a client who had seen the original 30 years ago and had never gotten the chance to build it himself. Based on the Thomas Tompion 1699 original on display at the DeWitt Wallace Decorative Arts Gallery at Colonial Williamsburg in Virginia, the clock is constructed of solid walnut with walnut burl and crotch veneers. The piece showcases 97 separate castings and 12 milled moldings, each made of a silver bearing alloy plated with pure 24-karat gold. Barnett completed the clock in 1,600 hours. It has a shellac and lacquer finish.





◀ **Richard Best** Bowen Island, B.C., Canada

Best designed this computer desk after Gustav Stickley's fall-front desk. Crafted of white oak with ebony details, the desk is 18 in. deep by 42 in. wide by 60 in. tall and boasts a black-leather writing surface. Best first fumed the desk with ammonia and then finished it with hand-rubbed oil and wax.



Tor Faegre Evanston, Ill. ▲

"I like furniture that is light in weight, so light that it looks like it will float off," said Faegre, who got the idea for his "floating table" when he saw a grove of young cottonwoods springing up in a field. The peeled willow legs are nailed and glued to the pine tabletop. The table stands 16 in. deep by 44 in. wide by 36 in. tall and is finished with acrylic.



Mark Edmundson Sandpoint, Idaho ▲

Edmundson made the Twister cabinet (11 in. deep by 18 in. wide by 32 in. tall) for his favorite customer—his mother—who commissioned it upon her retirement. The front slats rotate 360° to reveal either a wenge or spalted-maple veneered surface, as well as an illuminated interior for displaying special objects. The interior is accessed through frame-and-panel doors on each side, and the veneered door panels also rotate 360° inside the frames to reveal a wenge or spalted-maple surface.



◀ **Jim Hartlage** Niskayuna, N.Y.

Based on an 1810 design, this maple and pine table (21 in. deep by 34 in. wide by 28 in. tall) keeps to traditional Windsor construction methods by having each of the four legs through-tenoned and wedged into the top. The underside of the thick top has a wide chamfer to make it look thinner. The table is finished with Lexington-green milk paint with an oil topcoat.



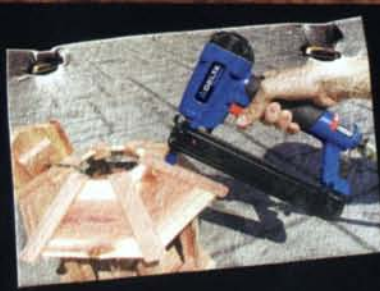
Scott Grove Rochester, N.Y. ▲

Grove describes his table (12 in. deep by 42 in. wide by 38 in. tall) as "discovering an antique in your grandmother's attic that's been covered with a sheet for years, and you pull it back and discover a missing link." The legs are fashioned from ebonized mahogany. The linenfold section of the top is carved spalted beech; the "uncovered" section consists of sterling silver, brass, copper, opal, onyx, mother-of-pearl, gold stone, lapis, malachite, amethyst, turquoise, and azurite set in epoxy resin. The piece is finished with lacquer and wax.



Loran Smith New Durham, N.H. ▲

When U.S. Senator Judd Gregg (R-N.H.) commissioned Smith to build this secretary (24½ in. deep by 41½ in. wide by 87¼ in. tall), he had a few requirements. The desk was to be built in the Dunlap style, instantly recognizable for its ties to New Hampshire; it was to be constructed of curly maple, with ball-and-claw feet and a carved state seal; and it was to have "lots of character." The latter was up to Smith, who incorporated eight fan carvings, flowered ogee moldings, and an amphitheater-style gallery, complete with a hidden drawer. The piece is finished with hand-brushed varnish.



DOES YOUR NAILING TECHNIQUE STICK OUT LIKE A SORE THUMB?

Fidgeting with nails, gluing and clamping can be a real pain. But whether you're installing crown molding, framing a bookcase, building a birdhouse or any one of dozens of other applications, DELTA® makes it easy – with a brand new line of nailers and staplers. They even come in combo kits with everything you need to get started. And prices start at under \$70. Plus you get the craftsmanship and dependability you expect from DELTA®. So get your project done faster, with a more professional look. For more information or to find the dealer nearest you, visit deltamachinery.com/nailer or call 800.438.2486 (US) 800.463.3582 (Canada).



DELTA is a registered trademark of Pentair Tools Group. © Pentair Tools Group, 2004.

DELTA®

YOUR ACHIEVEMENT. OUR TOOLS.™
READER SERVICE NO. 146

You Did It Yourself



www.scherrs.com

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



Scherr's
Cabinet and Doors, Inc.

531 S Highway 2 East • Minot, ND 58701
Ph. (701) 839-3384 • Fax (701) 852-6090
email: doormker@minot.com

READER SERVICE NO. 89

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 (catalog cost refunded on first order).



Ball and Ball
465 W. Lincoln Highway
Exton, PA 19341
Phone: 610-563-7530 • Fax: 610-563-7639
Orders: 1-800-257-3711
Visit our website - www.ballandball-us.com

READER SERVICE NO. 35

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

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. 174

Walking the talk.



Hand tools for the serious woodworker

800.426.4613 - 27 W. 20th St., #507 New York City

TOOLS FOR WORKING WOOD

www.toolsforworkingwood.com

READER SERVICE NO. 81

MOBILITY MADE EASY

DRAGGING A LITTLE LATELY?



Dragging machines around your workshop is hard on the machine, not to mention your back. The HTC-2000 adjustable mobile base is the solution. Easy foot action, 400 lb. capacity, expands from 12" x 12" to 36" x 36" or 20" x 52" rectangular. Stop dragging and start rolling today!



For your nearest dealer and FREE catalog, call toll-free 1-800-624-2027

© HTC Products, Inc. 2004



READER SERVICE NO. 31

Connecticut Valley School of Woodworking

Learning by Doing

Hands-on woodworking & furniture making classes for all skill levels—
Nights, weekends & week-long classes



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

at the Manchester **WOODCRAFT®**



READER SERVICE NO. 80

INNOVATIVE POWER TOOLS!



- 18" BANDSAW**
- 2-HP, 12.5 Amps, 220V
 - 2 speed (1510 ft./min. & 3220 ft./min.)
 - Quick release blade tension
 - 21" x 19" cast-iron table
 - Table tilts 10° left & 45° right
 - 12" cutting depth and a huge 18-3/8" throat
 - 2 - 4" dust ports
 - Blade tracking & tension windows



- 14" BANDSAW**
- 1-HP, 9 Amps
 - 2 speed (1445 ft./min. & 2950 ft./min.)
 - 16 x 20-1/2" cast-iron table
 - Table tilts 1° left & 46° right
 - 2-1/2" & 4" dust ports
 - 93-1/2" blades
 - Fence included
 - Optional miter gauge

Added features: Blade bearing guides reduce friction & extends blade life. Blade selection and diagnosis guide mounted inside the hinged doors. Tool holder & fence with resaw bar included.

This bandsaw is packed with extras; Double "T"-slot table, tire cleaning brush, balanced 9 spoke cast-iron wheels, blade selection chart & storage cabinet.

2-YEAR WARRANTY

RIKON
POWER TOOLS



17" FLOOR DRILL PRESS



34" RADIAL DRILL PRESS



NEW FENCE DESIGN
CALL FOR INFORMATION



6" x 48" x 10" BELT/DISC SANDER



10" DRILL PRESS

400 West Cummings Park
Suite 1200
Woburn, MA 01801

Tel: 781.933.8400 or 877.884.5167

Fax: 781.933.5005

Email: info@rikontools.com

www.rikontools.com

READER SERVICE NO. 183

Makita®

DEAD-ON ACCURACY

ACCURACY



Dual rails supported by dual linear ball bearings for a "Dead-on" cut that never needs adjusting

PRECISION



Single piece, precision machined aluminum base remains flat and true and never needs alignment

POWER



Dynamically balanced, direct drive motor with dual ball bearings never slips or bogs down like belt drive units

**12" DUAL SLIDE
COMPOUND MITER SAW
with LIGHT
LS1214F**

NEW

Visit us online at
MAKITATOOLS.COM



GET IT **FREE!** BY MAIL.

Purchase 12" Dual Slide Compound Miter Saw
LS1212 / LS1214 / LS1214F

GET

**12V Cordless
Impact
Driver
Kit**

Model 6914DWAE



UP TO

\$200 Value

Purchase 10" Dual Slide Compound Miter Saw
LS1013 / LS1013F

GET

**14.4V
3/8" Cordless
Driver-Drill
Kit**

Model 6228DWE



UP TO

\$150 Value

Offer good in U.S. only August 1, 2004 - December 31, 2004. See makitatools.com for redemption forms.

A finish free of brush marks

Q I use water-based polyurethane varnish, and the brush marks keep showing—in other words, I end up with a rough finish. Can you help?
—Hobart Belknap, Austin, Minn.

A Chris A. Minick replies: Brush marks in the finish film result when the finish dries before it has had a chance to level. Usually this is a result of insufficient wet-finish thickness or poor brushing technique or a combination of both. Apply a smooth, even layer of finish, the thickness of three sheets of paper, with a minimum of brush strokes. The brush marks at this thickness will flow together before the finish dries.

From the start, I always measure the viscosity of the finish. High-viscosity finishes show brush marks and streaks, while low-viscosity finishes tend to run, sag, and drip. With most finishes, a viscosity of roughly that of half-and-half cream flows well. Thinning the finish with the manufacturer's recommended solvent, which is water for water-based finishes, sometimes is necessary to achieve the proper brushing viscosity.

Before dipping the brush into the varnish, I wet the bristles in the solvent, which prevents dried finish from building up at the base of the brush. The material should flow from the brush onto the wood in an even sheet of wet finish. (For more on brushing techniques, see the drawing below and *FWW* #156, pp. 38-43.)

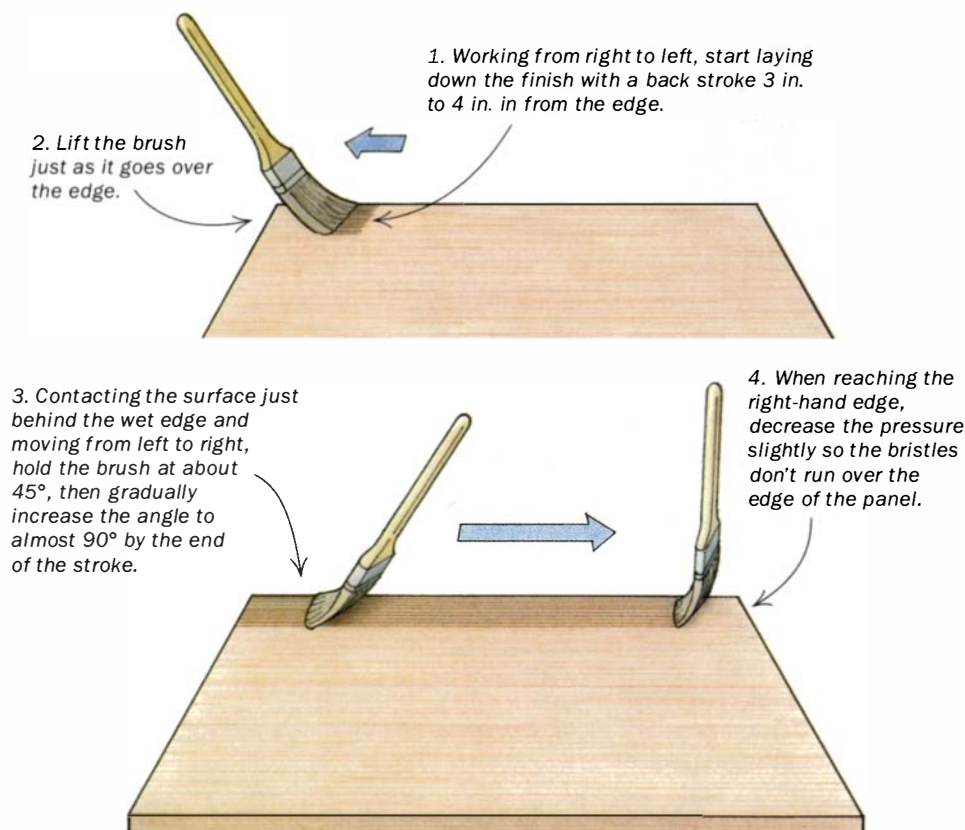
After coating the whole panel, level out the uneven areas by lightly dragging the bristle tips of the unloaded brush through the wet finish.

Between each coat, I normally scuff-sand with 220-grit paper to remove nibs or dust specks. Three or four coats of finish are about right for most projects.

[Chris A. Minick is a consulting editor.]

A COMPLETE SIDE-TO-SIDE STROKE

The first stroke is short, followed by a longer stroke in the opposite direction. By increasing the bristle angle of the brush at the end of the long stroke, more varnish from the reservoir flows onto the surface. Repeat these steps until the surface is covered.



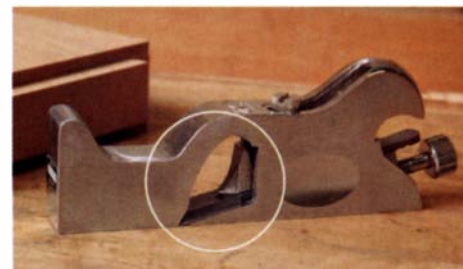
Controlling blade chatter

Q I recently purchased a shoulder plane and am having difficulty controlling blade chatter. When I clamp the blade in the tool, I find that the cutting edge is lifted off the frog. Any suggestions?

—Bryan Lyden, Port Orchard, Wash.

A Garrett Hack replies: A blade not firmly supported will flex and chatter. You might need to flatten the back of the iron, level the bed it rests on, reposition the screw cap that holds the iron snug against the bed, or all three. Try moving the screw cap first. Push it as far forward as possible so that it applies pressure close to the bevel of the cutting edge. To level the bed, disassemble the plane and, with a fine jeweler's or needle file, flatten any high spots or roughness. Take off as little as necessary and check the flatness often with a small straightedge. Last, make sure that the back of the iron is not convex but flat for at least the last ½ in.

[Garrett Hack is a contributing editor.]



Move the screw cap forward to eliminate blade chatter. The screw cap on this Stanley No. 92 (top) is positioned too far back from the cutting edge. Adjust it forward (bottom) so that the pressure is concentrated near the blade's bevel.

The Ultimate Molder!



- Straight, Round, Elliptical
- Simple, Easy, Safe
- 100 Standard Knives
- Custom Knives Available
- Quality Construction
- Made in the USA



**Williams & Hussey
Machine Co., Inc.**

800.258.1380 (USA)
603.654.6828

Visit us online at
www.williamsnhussey.com

READER SERVICE NO. 10

Our Most Important Accessory

When you buy a bandsaw from Mini Max USA, you get more than a top-quality machine. You get a top-quality company. We are passionate about making any experience you have with us a great one. So whether you have one of our bandsaws or are just considering one, give us a call. Find out just how good it can feel having a great company standing behind your machine.

Toll Free 866.975.9663
www.minimax-usa.com



READER SERVICE NO. 24

PRO-V



Professional

Vacuum Bagging Kit

Includes electronically controlled 5 CFM, vane type vacuum pump, 54"x109" seamless urethane vacuum bag and 10' of vacuum hose. **No compressor needed.**

888-342-8262 **VAC-U-CLAMP**
www.vac-u-clamp.com

READER SERVICE NO. 99

What price would you pay to protect your lungs?

THE NEW AIRSHIELD AIR CIRCULATING FACE SHIELD



The AIRSHIELD is an air circulating face shield for use with all woodworking applications, especially routing and woodturning.

Providing excellent protection from the inhalation of harmful dust with a pre-filter and fine dust filter.

The polycarbonate flip-up visor also protects eyes and face against the impact from flying debris.

Includes a rechargeable 4 hour battery which drives a quiet fan to keep a constant flow of filtered air flowing across the face.



FROM \$275.00

AD0424

trend
routing technology

www.trend-usa.com
Tel: (859) 485 2080 Fax: (859) 485-2286

READER SERVICE NO. 181

CUSTOM MILLED MOULDINGS

Can't Find It Anywhere?
Don't give up until you've checked our **NEW 256-pg. Moulding Catalog!**

Thousands to choose from
All Shapes — All Sizes

M.L. CONDON COMPANY Inc.

280 Ferris Avenue, White Plains, NY 10603
Phone: (914) 946-4111 • Fax: (914) 946-3779



\$40 plus \$10 s&h

READER SERVICE NO. 64

Looking for a nonyellowing finish

Q I'm building kitchen cabinets with quilted white-ash veneered panels. I'd like a clear and nonyellowing finish that brings out the grain. What should I use?

—Randy Osborne, Clyde, N.C.

A Jeff Jewitt replies: Acrylic and certain urethane finishes are clear and nonyellowing, and both types are available in water base and solvent base.

Most water-based finishes contain acrylic and what's called an aliphatic or linear urethane. One example is the Polycrylic Protective Finish by Minwax, available at hardware stores. For solvent-based finishes, the best choices are acrylic lacquers formulated with cellulose-acetate-butyrate (CAB-acrylic lacquer). One example is the Sher-Wood CAB-Acrylic Lacquer System, available at some Sherwin-Williams stores. However, unless you have adequate means of exhausting hazardous vapors, I'd avoid the use of solvent-based products.

To bring out the grain, use a sealer coat of dewaxed ultraclear shellac, available in platina, super-blond, and ultrapale grades, before applying the finish. All of the solvent- and water-based finishes mentioned will work fine over shellac as long as it's dewaxed. [Jeff Jewitt is a frequent contributor to *Fine Woodworking* on finishing topics.]



Shellac and acrylic for a clear and nonyellowing finish. Sealing with shellac will bring out the grain, and a water-based acrylic finish will keep white ash from yellowing.

Bandsaw blade tension

Q Could you share with your readers the psi tensioning values for the bandsaw blades that you tested (FWW #169, pp. 76-79)?

—John Grew-Sheridan, San Francisco

A John White replies: We tested the blades at the tension recommended by the manufacturers. We then looked for the optimum tension. With one exception, we found that the higher the tension, the better the blade cut. Based on this, we set the blade tension to 15,000 psi for demanding work such as resawing. The exception was the Highland Hardware Wood Slicer blade, which cut better at lower tensions. By the way, tension is one of the less important factors that affect the quality of a bandsaw's cut; the correct setup and a sharp blade are more important factors.

[John White is the author of *Care and Repair of Shop Machines* (The Taunton Press, 2002).]

How can I bend ebony?

Q I want to inlay ebony in a rabbeted edge of a demilune table. I cut some ebony into strips and made little bites with my chisel along their lengths to accommodate the bend. Even though this is a gentle bend, the ebony breaks. Is there an alternative?

—Stephen Wetmore, South Strafford, Vt.

A Garrett Hack replies: You can bend ebony several ways. The easiest is to bend a strip dry if you can. Two things will help: Cut a straight-grain ebony piece, slightly thicker and wider than your rabbet, and handplane it very smooth. Any cut or torn-out areas create weak places where the strip will snap. Make sure you can make the bend before gluing. When gluing, go slowly and evenly, holding the strip in place with masking tape as you move along the edge.

If this doesn't work, prebend the strip by wetting it. The moisture makes the ebony about twice as flexible. Wet a strip and bend it around the table edge (not the rabbet), protecting the edge with a layer or two of kraft paper, or bend it around a form of similar shape. Gently hold the strip in place with masking tape or a few clamps and let it dry overnight. After it has dried, glue the strip in place with yellow glue and bind it with masking tape.

[Garrett Hack is a contributing editor.]

Wet ebony is twice as flexible. Once you wet the ebony strip, ease it around a form, hold it in place with tape, and let it dry overnight. Once dried, the ebony partly holds the curve and bends to fit the demilune tabletop edge.



Hoffmann Dovetail Joining System

The proven way of efficiently joining wood at any angle!



Parts are automatically aligned when a Hoffmann Dovetail Key is inserted, eliminating offset corners and expensive repair work.

No additional clamping devices or fasteners needed.

Machines are available for every size shop.

HOFFMANN

Hoffmann Machine Company, Inc.
(631) 589-6322 www.hoffmann-usa.com

READER SERVICE NO. 62

VIRUTEX.COM

50 Hill St. # 509 Southampton NY 11968

800-868-9663

FAX: 631-537-2396

EDGE BANDERS

PRODUCTION HOT AIR PRE-GLUED
PVC, VENEER/POLYESTER, MELAMINE
MOTORIZED FLUSH TOP-BOTTOM END TRIM
POWER BELT FEEDER 15 FEET/MIN.
220 V.1 PHASE, 900 COLOR MATCH
1,2,3 MM TAPES-HDL STRIPS
NO COMPRESSED AIR



COMPLETE BANDING SYSTEM
EDGE BANDER
DOUBLE EDGE TRIMMER
END TRIMMER



ABRASIVE PLANER



LAMINATE-VENEER SLITTERS

MOTORIZED POWER FEEDER
50 FEET PER MINUTE, 30" WIDE CUT
INEXPENSIVE TWO WHEEL CUTTERS
NO WASTE, SAFE
NO NEED TO
USE
TABLE
SAW

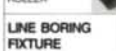


LAMINATE VENEER MITER CUTTER



CUTTER

WHITE VINYL
4.8" ROLLER
3.5" UPPER
ROLLER



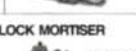
CURVE PLANNER

MOTORIZED
3" WIDE
18" CONCAVE
16" CONVEX



18x3" DOOR PLANNER

BENT FENCE



LINE BORING FIXTURE



DOOR HINGE ROUTER



LOCK MORTISER



EDGE LIPPING PLANNER

PRECISION FLUSH TRIM 2 1/4" WIDE
REVERSIBLE SELF INDEX CARBIDE BLADES FOR
PVC/HARDWOOD, SOLID SURFACE LAMINATE
1/8" CUT RATE CONTINUOUS ADJUST CUT
DEPTH GOOD ON CORNERS & AGAINST GRAIN
17 LBS STURDY



READER SERVICE NO. 40

NEW!

BROOKLINE

COLORPLY

DECORATIVE COMPOSITE LUMBER

Amazing new product for turning, carving, etc.

10 patterns • Variety of sizes/thicknesses

Brookside Veneers Ltd.
Cranbury, NJ 609-409-1311

colorply.com

READER SERVICE NO. 23

THE SOURCE FOR BANDSAW ACCESSORIES

Iturra Design : New 2004 Catalog

Free Catalog



- Introducing the **Quick Release** by Carter Products
- Our new **Blade Gage** bandsaw blade tension meter.
- **Lenox Pro Master** carbide-tipped and Bimetal blades
- **Bandrollers**, rip and re-saw fences, improved tension springs, tires, table inserts, circle jigs, and much more.
- History and comparison between **Delta** and **JET** bandsaws.

CALL 1-888-722-7078 or 1-904-642-2802

READER SERVICE NO. 27

NEW

SmartLift DIGITAL™

THE WORLD'S FIRST DIGITAL DIRECT-DRIVE ROUTER LIFT!

- No Belts
- No Pulleys
- No Chains
- No Sprockets

PERFECTLY ENGINEERED FOR PRECISION PERFORMANCE

The three most common complaints with existing Router Lifts are: Backlash, the fact that moving parts are exposed to sawdust & the frustration over making bit height adjustments. That all ends now!

Introducing the SmartLift Digital from Jointech. The world's first and ONLY Digital Direct-Drive Router Lift.



* Crank Handle, Three Rings and Start Pin are included.



Also available without Digital Encoder

The SmartLift Digital's Direct-Drive design uses a Patent Pending continuously self-adjusting anti-backlash mechanism that eliminates backlash now and forever. All of the moving parts of the SmartLift Digital's gear-to-gear-to-gear Direct-Drive system are enclosed inside of the Router Carriage Assembly thus eliminating sawdust from "gumming up the works". And with a precision Digital Absolute Encoder attached directly to the Router Carriage Assembly, every ounce of bit height adjustment is displayed in the digital display located on the lift's top plate in your choice of inches to .001" or millimeters to .01.

Imagine...No more backlash...No more gummed-up lifting mechanisms...No more guesswork when adjusting or repeating a bit height adjustment. Well, stop imagining...it's here...The SmartLift Digital. But then, what would you expect from the company that has been making precision and quality a part of woodworking for nearly 20 years? Call now to get your SmartLift Digital.

SETTING THE STANDARD ONCE AGAIN!

CALL NOW FOR SPECIAL INTRODUCTORY OFFER!

1-800-619-1288

www.jointech.com

Jointech is a registered trademark of Jointech, Inc. Patent Pending on SmartLift Digital.



Three precision S.S. lead screws provide unparalleled stability & accuracy to .001"

Manufactured by:

JOINTECH

READER SERVICE NO. 194



WOODCRAFT[®]
UNIVERSITY

There's a
Woodcraft University
location near you

Alabama
Birmingham Area

Arizona
Tucson

California
Orange County
Sacramento
San Francisco/Dublin
Santa Rosa

Colorado
Colorado Springs
Denver

Connecticut
Hartford Area
Orange

Delaware
Wilmington

Florida
Casselberry
Clearwater
Jacksonville
Fort Lauderdale

Georgia
Atlanta Area

Hawaii
Honolulu

Idaho
Boise

Illinois
Palatine
Peoria

Indiana
Evansville
Indianapolis

Kansas
Lenexa

Kentucky
Louisville

Maryland
Towson

Massachusetts
West Springfield
Woburn

Michigan
Canton
Sterling Heights

Minnesota
Bloomington

Missouri
St. Louis Area

New Hampshire
Portsmouth Area

New Mexico
Albuquerque

New York

Albany
Rochester

North Carolina
Charlotte Area

Greensboro
Raleigh

Ohio
Cincinnati Area

Cleveland Area
Columbus Area
Dayton

Oklahoma
Oklahoma City
Tulsa

Oregon
Eugene
Portland Area

Pennsylvania
Harrisburg
Philadelphia Area
Pittsburgh Area

Rhode Island
East Greenwich

South Carolina
Charleston

Tennessee
Johnson City
Knoxville

Nashville

Texas
Austin
Dallas Area

Fort Worth
Houston
San Antonio

Utah
Salt Lake City Area

Virginia
Richmond
Roanoke

Virginia Beach
Washington D.C. Area

Washington
Seattle

West Virginia
Parkersburg

Wisconsin
Appleton/Fox Cities Area
Madison

Milwaukee Area

Woodworker's Club:

Connecticut
Norwalk

Maryland
Rockville

WOODCRAFT[®]

For your local Woodcraft store,
visit www.woodcraft.com,
or for a free catalog, call
800 542-9115

Dept. 04WW12BE

READER SERVICE NO. 150

Q & A (continued)

How to secure stock between centers on a lathe

Q I recently purchased a minilathe for spindle turning. The manual instructs to always have the rim of the cup center embedded at least $\frac{1}{8}$ in. into the work. I attempted this procedure with a piece of Douglas fir, which split with just a dim circle appearing. I am convinced that some part of the lathe would be destroyed if I were to follow the manual's instructions. What do you think?

—M. Truman, Arroyo Grande, Calif.

A **Mario Rodriguez replies:** When I turn between centers, I follow a careful procedure to ensure that I have embedded the drive and tail centers properly.

After finding the centers of my workpiece by drawing crosshairs on the ends of the piece or blank, I stamp a strong impression of the drive center into one end with a second drive center that I keep with my lathe tools.

Next, I set the blank between centers on the lathe, making sure the drive center on the lathe engages the marked center on the blank. Then I carefully crank the tailstock center into the other end, until the rim of the cup center is slightly embedded, lock it down, and manually check for any play. Depending on the wood, the rim of the cup center can be embedded as little as $\frac{1}{32}$ in. For large hardwood blanks, I predrill the centers to allow the points to penetrate more deeply. Bearings on a lathe can withstand considerable pressure, but be aware that excessive pressure can cause stock to split and thin stock to bow.

When I'm satisfied that the blank is secure, I step to the side and turn on the lathe, then quickly turn it off. Finally, after rechecking the workpiece again, I'm ready to begin turning.

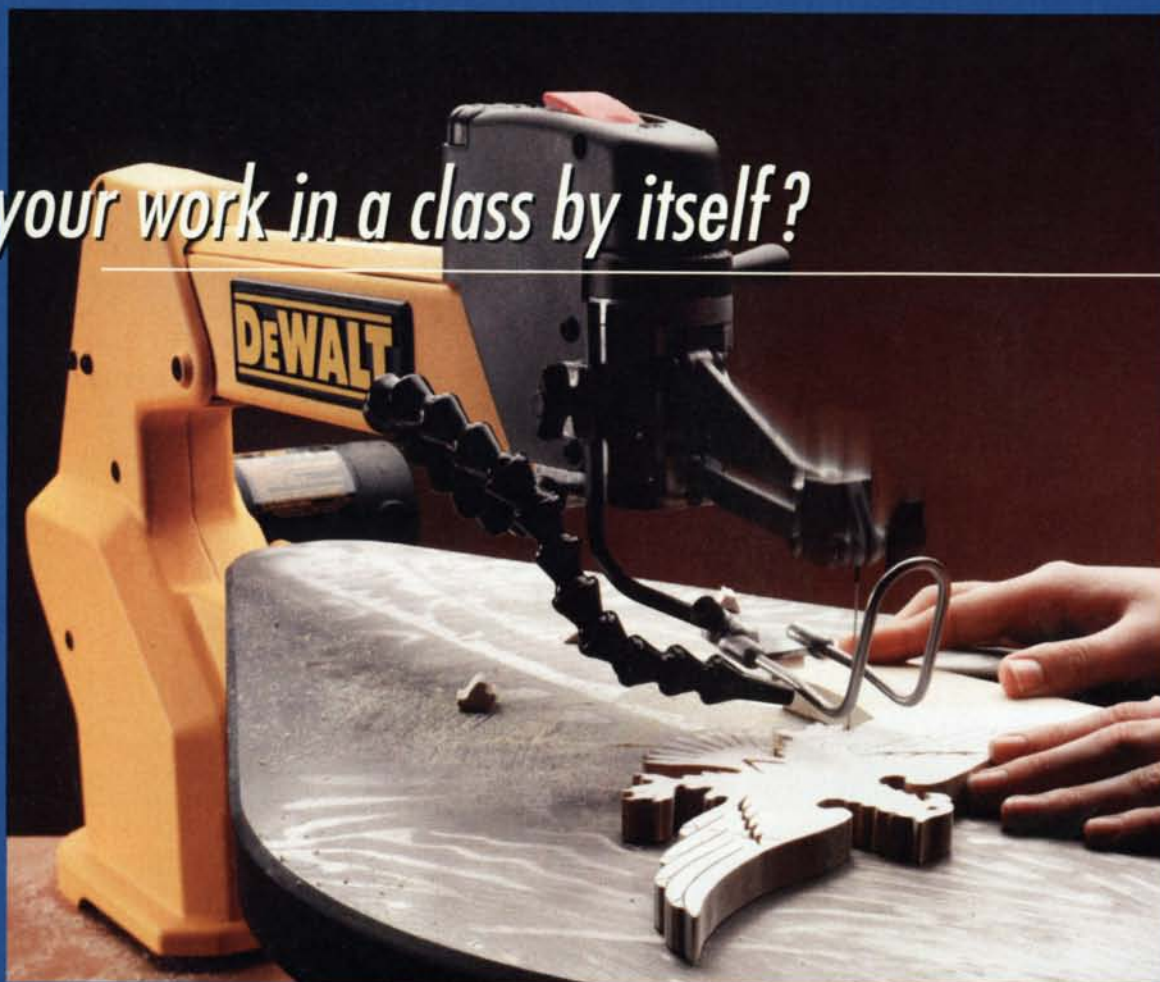
I follow the same procedure when using single-point centers on the tailstock, with the exception that the point is driven more deeply into the blank. [Mario Rodriguez is a contributing editor.]

SETTING UP A BLANK FOR TURNING

Before you position the blank on the lathe, imprint the drive center from the headstock assembly into the workpiece (right). Next, with minimal pressure, carefully crank the tailstock so that the rim of the cup center is slightly embedded into the workpiece and there is no play when you turn the blank by hand (below).



is your work in a class by itself?



WOODCRAFT®
UNIVERSITY

Go to the head of the class with skills you'll gain from the Woodcraft University College of Scroll Sawing.

Woodcraft University classes will improve your skills in Scroll Sawing, Power Carving, Sharpening, Joinery, Routing, Turning and Bandsawing. You'll learn from experienced artisans, share sharpening secrets, learn power tool techniques from recognized experts and much more.

Woodcraft University offers you the opportunity to learn in classes certified for continuing education credit.

Visit your local Woodcraft store, Woodworkers Club or www.woodcraft.com for class schedules and details on how to get your woodworking education started at Woodcraft University.

Experience the finest in woodworking tools, supplies and education at Woodcraft.



WOODCRAFT®
Helping You Make Wood Work®

RAZOR SAW

It cuts FASTER! EASIER! MORE ACCURATELY!

Order now, only \$25.95 post paid!

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 \$2.00 for a two year subscription to our Catalog.

The Best handsaw for ALL woodworkers!
www.japanwoodworker.com
Dept D2

THE JAPAN WOODWORKER

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

READER SERVICE NO. 192

Tool Storage Evolved.



VETO PRO PAC
TOOL BAGS THAT WORK



Call toll free: 877.847.1443
Order online: www.vetopropac.com

READER SERVICE NO. 51

Quality Pen Kits and Other Turning Kits



• Designers & Manufacturers • Wholesale & Retail

THE BereaHard Woods CO. Inc.

Manufacturer of quality writing instruments, components and kits.

CALL OR E-MAIL FOR FREE CATALOG

18745 Sheldon Rd. • Middleburg Hts., Ohio 44130 U.S.A.

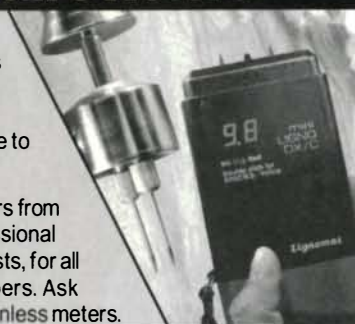
Ph: 216-898-8956 • Fax: 216-898-8962 • E-mail: bereahard@aol.com

READER SERVICE NO. 152

Wood Moisture Meters

Wood moisture is a crucial factor that determines usefulness and stability of wood. Lignomat offers pin and pinless meters, giving our customers a real choice to select the meter for their needs.

The versatile mini-Ligno pin meters from Lignomat are a favorite for professional woodworkers and serious hobbyists, for all woods from veneer to heavy timbers. Ask about free brochure for pin and pinless meters.



Lignomat USA Ltd. 800/227-2105 503/257-8957
PO 30145, Portland OR 97294 www.lignomat.com

READER SERVICE NO. 63

"...dovetail one, or a hundred drawers – perfect every time."

– Norm Abram,
New Yankee Workshop

Dovetail Joints

Mortise & Tenons

Made Easy

"...I know of no better or faster way to cut mortise and tenons..."

– Christopher Schwarz,
Popular Woodworking Magazine



No other jigs offer such versatility, precision and superb value for both the hobbyist or professional. The D4 Dovetail Jig routs through and half-blind dovetails up to 24" wide in boards up to 1 1/2" thick, with infinitely variable spacing of pins and tails – all on one jig. Plus it routs sliding and angled dovetails, decorative Isoloc joints, finger joints, and multiple mortise and tenons. And the new FMT Frame Mortise and Tenon Jig makes strong mortise and tenons simple. Joinery's never been easier.

Call For Your FREE Leigh Catalog 1-800-663-8932
www.leighjigs.com

LEIGH
Joining Tradition With Today

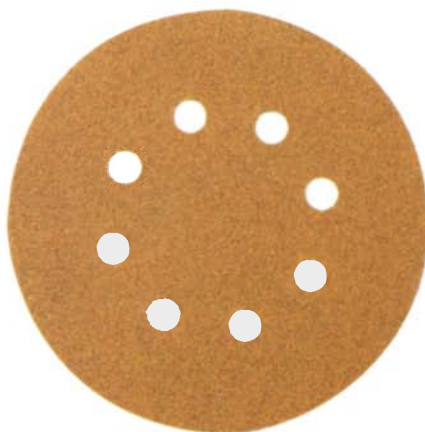


Great Moments in Woodworking History.



1810

Tabitha Babbitt introduces the circular saw.



1904

3M introduces sandpaper.



2004

Fine Woodworking introduces a new CD and DVD library.



ONLY \$19⁹⁵ EACH Plus Shipping and Handling

BUY BOTH FOR \$34⁹⁵

SAVE \$4⁹⁵

(#01A023)

Making Jigs & Fixtures (#011022)

Over 25 Years of Methods of Work

This new CD takes you through more than 450 tips—fully indexed and searchable. You'll find what you need and get back to your project quickly.

Video Tips, Volume 1 (#011021)

An easy-to-use DVD packed with 4 hours of informative video instruction. You'll come away with new know-how, no matter what your skill level.

To order call 866-288-4241 or visit www.finewoodworking.com/fwtips

**Fine
WoodWorking®**

Master Class

Low-tech method for veneered columns

BY W. PATRICK EDWARDS



Seamless columns, exotic woods. This entire desk, including the two sets of columns, is veneered with plum-pudding Cuban mahogany. For more on this piece, see the back cover.

During the early 19th century, American and European furniture makers commonly used veneered columns as both structural and decorative elements. When I began to restore antiques more than 30 years ago, I wondered how the columns were made. My research originally suggested that the turned columns were coated with hot animal glue, and then wrapped with veneer followed by wet jute webbing. When the column was rotated in front of a fire, the webbing would heat and shrink, effectively clamping the veneer in place.

Unfortunately, my early efforts to duplicate this method met with such dramatic failures that I abandoned the idea for 20 years. It remained one of the mysteries of the trade, and I continued to search for answers to the problem.

I joined an international conservation group in France about 10 years ago, which was researching how protein glues could be modified with urea to make them liquid at room temperature. A lightbulb went off in my head. Finally, I was able to see how the early woodworkers could easily wrap veneers around columns using animal glue. They modified the glue!

I began my own research and eventually found a glue recipe and veneering method that work perfectly. Using this method I have veneered a wide variety of columns, ranging from a diameter of about 1 in. to as large as 12 in. The process is simple and effective, and it adds a dimension to my work that makes it dramatic and unique.

Use elastic bands and liquid hide glue

After making my glue discovery, my next attempt at gluing veneer to columns employed rubber inner tubes cut into strips, but they left marks and produced uneven pressure. Then I discovered Rep Bands at

GET COLUMN AND VENEER READY



Turn a straight column and secure it well. Glue cloth-backed sandpaper to a square of plywood to make a low-tech smoother for turnings. To secure the column, make a set of extralong benchdogs (right), with a screw tip poking out of each. Also, tape off the tenon areas of the column.



Cut the veneer to size. Make a paper template rather than bending the dry, brittle veneer. The veneer should overlap $\frac{1}{2}$ in. at the seam.



NEW

Kreg
Precision Measuring Systems

Build precision into your shop...

New from KREG, a line of patented products that allow you to cross-cut workpieces with more speed and greater precision than ever before. Perfect for the Miter Saw, Tablesaw, Drill Press, and more.

Visit www.kregtool.com today for more details.

Kreg

www.kregtool.com
800.447.8638

The Blue Mark of Quality.

READER SERVICE NO. 145

SHAN™ Model 132-320A
6" Digital Caliper, only \$35.95



Now, a high quality, professional grade, precision digital caliper for your shop. Features include: Large LCD display, 4 way measuring, Manual on/off, Set Zero at any position, Resolution .0005", Accuracy $\pm .001"$, and 1 year warranty against manufacturing defects.

SHAN™ Precision, measuring products for woodworkers.

Visit us online at: WWW.SHAN-PRECISION.COM or
Contact: Allen Designs, LLC at 513-489-3181 or
Email: Sales@Shan-Precision.com

READER SERVICE NO. 9

Lie-Nielsen TOOLWORKS INC.
Heirloom Quality Tools™



P.O. Box 9, Warren, ME 04864
800-327-2520
www.lie-nielsen.com

No. 2 Bronze Bench Plane \$235

READER SERVICE NO. 86

BRIDGEWOOD

The BRIDGEWOOD® BW-10LTS
10" Table Saw

Great Features... Great Price!
Only \$1399.00

Box Trunnion The ultimate in trunnion design provides the strength and rigidity necessary for smooth and accurate cuts.

Trunnion Support Brackets front and rear are securely anchored by 4 bolts to assure maximum trunnion support. **Positive Stops** at 0° and 45° are built into the cast iron trunnion. This eliminates the flex and vibration of stops mounted to the cabinet frame.

Powerful 3hp 1ph or 5hp 3ph Motor.

Three V-belt Drive belts are match-ground to assure positive power transfer from all three.

Heavy Duty 50" Fence System
Large 28" x 34" Cast Iron Table.

T-slot Miter Gauge.

Laser Cut Cabinet Fits tight, stays tight. Durable powder-coat finish.

Large Hand Wheels Effortlessly and accurately adjust the **LEFT-TILTING ARBOR** to the desired angle (0° to 45°) and raise or lower the blade to the cutting depth.



Shown with optional laminate extension table and legs

Equipped with
SQUARE D
Schneider Electric
Magnetic Switch

WILKE
MACHINERY COMPANY
MACHINERY POWER TOOLS
1979 25 YEARS 2004

For information and a **FREE catalog** contact us by toll free phone:
1-866-764-8570
visit our web page:
www.wilkemach.com
write or visit our showroom:
3230 N Susquehanna Trail, York, PA 17402-9716

The Woodworker's Edge...

RW

Price: FOB, York, PA
Subject to change without notice

READER SERVICE NO. 65

VENEERING IS A 10-MINUTE JOB

Wet the veneer, warm the glue. Soak the veneer first in warm water, rolling it loosely so that it will fit into a large pot. Place the glue bottle in hot tap water to raise the glue above 80°F before applying it to the glue face.



Heat the column and apply glue. To maximize the working time, dampen the column and preheat it with a hot-air gun. Note that the tenon areas are wrapped with tape for easy glue cleanup. Brush on the warm glue quickly.



a medical-supply outlet. These 4-in.-wide elastic bands are sold in 50-yd. (part #A518015) and 6-yd. (part #A508805) rolls by Sammons Preston Rolyan (800-558-8633). I use the plum color, which is the strongest, and I cut lengths according to the job.

For liquid hide glue I use Old Brown Glue, which is a modified liquid animal glue that I make and sell (619-298-0864; www.wpatrickedwards.com). You also may experiment with Milligan and Higgins 192-gram glue (518-762-4638; www.milligan1868.com) by adding common urea (sold at chemical-supply outlets as a fertilizer) until it remains liquid at room temperature.

To thin it to a runny viscosity for this job, Old Brown Glue should be warmed above 80°F. A bath of hot tap water works fine. By the way, the bottled glue can be rewarmed many times without losing its effectiveness.

You also will need a single piece of veneer large enough to cover the column and a solid wood turning for the core. I prefer to use either poplar or Honduras mahogany for the core wood, depending on the quality of the project. Mahogany turns and takes glue slightly better than poplar.

To work properly, the veneer shouldn't have any cracks or flaws, and the grain should run lengthwise along the column. It is possi-

ble to use burl veneer or veneer with seams, but that method is too complicated to cover in this short article.

Turn a column and secure it to the bench

Turn the solid-wood column using normal lathe tools, producing either a straight column or a straight-tapered column. It is extremely important that the column be smooth, because any bumps or dips will telegraph through the veneer.

I mount most of my columns in metal capitals, which means that I turn slightly smaller tenons at each end of the column.

To hold columns for veneering, I made long, oak benchdogs and

drove a long wood screw into the tip of each one, with the point protruding on the face (left). I adjusted the clamping pressure to allow the work to be rotated with some resistance. Mount the column so that it is about 6 in. above the bench. Place newspaper under the column to protect the bench from drips.

Be sure to tape off the tenon areas to protect them from the mess.



Apply the veneer

First, wrap a paper template around the column to help you size the piece of veneer. Soak the veneer in a tray of hot water for about 15 minutes.

Remove the veneer from the hot-water bath and use paper towels to soak up the excess water on the surface. Next, apply a generous coating of glue (using a brush or a roller) to the glue face of the veneer. I also like to heat up the wood column, using a hot-air gun, before the glue. Now wrap the veneer around



Wrap the veneer. Making sure the veneer ends are aligned, hold it in place as you turn the column and wrap the banding. Anchor the elastic beyond the veneered area before wrapping it over the veneer. Overlap each previous wrap by half, creating a smooth double layer, and anchor the ends with tape.





Gladstone TOOLS™
www.gladstonetools.com

ORDER ONLINE: www.gladstonetools.com OR PHONE 1-800-243-0713

READER SERVICE NO. 175

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). Postage and handling additional. CT residents add 6% sales tax, Canadian residents please add 7% GST.

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



POWERMATIC
WE HAVE IT ALL IN WOODWORKING SUPPLIES

WoodWorkers Depot

2965 RAMADA WAY, GREEN BAY, WI 54304
1-800-891-9003 FAX (920) 336-8683
www.woodworkersdepot.com
PROFESSIONAL QUALITY AT A WAREHOUSE PRICE

GENERAL

DELTA
CMT JET
EQUIPMENT & TOOLS

READER SERVICE NO. 156

DAKOTA COUNTY TECHNICAL COLLEGE



Seeking an education in wood finishing?

Dakota County Technical College is the place to get it! People travel from across the United States to attend this unique nine month program and/or customized one week courses that prepare students for:

- ◎ Furniture Restoration
- ◎ Commercial Finishing
- ◎ Furniture Service Technician

1300 145th St. East • Rosemount, Minnesota • 55068

Call 1-877-937-3282 ext. 362 Visit www.woodfinishing.org

READER SERVICE NO. 91

Using the right moisture meter can assure quality workmanship!

Assure the quality of your finished projects with the Wagner MMC205 Digital Moisture Meter. Instantly and accurately measure the moisture content of rough to finish grade wood.

Includes The Wagner Moisture Measuring Reference Library CD!

- Identify Common Moisture Related Problems
- View the Moisture in Wood Video Library
- Access Nearly 1000 Species Corrections

Other models available for:
Reading Narrow Materials

Testing Waterborne Finish Cures

Measuring Dense or Exotic Species

Proud Members of:



See Our Complete Line of Moisture Meters on the Web at:
www.moisturemeters.com

Call Us Toll Free:
1-800-944-7078

© 2004 Wagner Electronics Products, Inc.

WIDE-BELT PERFORMANCE...AT ABOUT 1/3 THE COST!

FREE VIDEO!

30-Day RISK-FREE TRIAL!

"WOODMASTER [Drum Sander] Gets My Top Vote!"

— *Fine Woodworking Magazine* review vs. Performax® & Grizzly®.

- ✓ MAKE MONEY
- ✓ SAVE MONEY
- ✓ TOP EARNINGS

90% FASTER than slow hand sanding!

Studies show 60% of shop time is spent sanding. That's 3 days out of a 5-day work week! Now you can do the same work in

less than 4 hours: a **90% efficiency increase**.

2/3 Less cost than expensive wide-belt sanders!

Woodmaster's industrial-duty drum sanders fill the niche between slow hand methods and expensive wide-belt sanders...at about 1/3 the cost. And there's no sacrifice in quality!

Pays for itself...WHILE YOU USE IT!

Quickly pays its own way and keeps on paying you in reduced labor costs, higher quality & faster production!

WOODMASTER® DRUM SANDERS

- 4 models: 26", 38", 50" • Made in USA
- 5-Year Warranty • NOW ON SALE!

Call or write today for **FREE VIDEO & limited-time SALE OFFER!**

1-800-821-6651
Ext. DT03

WOODMASTER TOOLS, INC.
1431 N. Topping Ave.
Kansas City, MO 64120

☐ **YES! Rush FREE WOODMASTER DRUMSANDER INFO & VIDEO** plus facts on your current **SALE OFFER!**

Name _____

Address _____

City/State/Zip _____

FREE INFO!

READER SERVICE NO. 83

Master Class (continued)

TRIM THE SEAM AND ENDS

Cut a straight seam. Tape a straightedge over the center of the overlap and pull it against the tape to stabilize it. Use a veneer saw or sharp knife to trim through both layers of veneer.



first 24 hours, the animal glue remains flexible enough to allow the wood to shrink as it loses moisture.

After 24 hours the veneer will have shrunk enough to allow you to cut an accurate seam. First, remount the column in the benchdogs and remove the elastic band. Dampen an abrasive pad (3M makes these) with cold water to remove as much excess glue as possible at this point, to avoid later sanding. Wipe the surface dry immediately.

Place a straightedge along the center of the seam overlap and hold it in place with either spring clamps or tape. Using a veneer saw, cut along the straightedge through both layers of veneer. If you use a knife, watch its tendency to follow the grain.

Now use a warm iron or another heat source to heat the area along this cut. To test the temperature of your iron, hold it near your face. If it feels dangerous—warmer than hot tea—lower its temperature. When the glue loosens along the seam, reach under the veneer to remove the small scrap of veneer that remains, then brush a bit more glue under the seam, reheat the joint, and use a veneer hammer to press the joint closed. Replace the elastic band and place the column aside for another 24 hours. When the column is completely dry, remove the elastic band, and wipe off any leftover glue residue with a damp, cool abrasive pad. Finally, sand the dry surface. □



Heat the seam to loosen the glue. Use a veneering iron or a household iron on a low setting to heat the seam area (left). Remove the excess veneer. One piece will fall off the outside, but the other strip must be pried out from beneath the seam (right).



the column, holding it in place with your hands.

Start wrapping a length of the elastic band evenly from one end of the column to the other, allowing the excess glue to squeeze out onto the newspaper.

The start is critical. It helps to have a raw wood area—the tenon areas work well for this—in which to anchor the wide elastic band before it contacts the veneer. Also, don't allow the veneer to twist as you wrap the rubber banding; it will be impossible to cut the seam on a spiral.

Overlap each previous layer by almost half, so you get almost a double layer of banding along the column. If the wrapping doesn't go as planned, unwrap it and start again. You have about 10 minutes of open time before the glue starts to become gummy. The elastic band will not stick to the glue, and excess glue can be cleaned up with cold water.

Wait a day, and then fix the seam

Modified animal-protein glue is ideal for this application because it takes longer than synthetic glue to set up and cure. During the



Repair the seam. Apply warm glue again (above) and reheat the seam with the iron, then use a veneer hammer (right) to press it down as it cools. Rewrap the column with the banding and wait.



Trick for trimming the ends without splintering. Mount the column in the lathe and turn it by hand while stabilizing a sharp knife against the tool rest. Scribe lightly at first and then increase the pressure to finish the job.

Build Your Own Boat!

The world's most popular kit boats! Choose from 30 beautiful, easy-to-build kits.



Call
410 267 0137
or visit:



www.clcboats.com

READER SERVICE NO. 106

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).

Postage and handling additional. CT residents add 6% sales tax, Canadian residents please add 7% GST.

To place an order using your credit card, call

1-800-888-8286.

Outside the U.S. and Canada call 1-203-426-8171.

General 10" Table Saw

Millennium Addition

Call for Price and Availability



FREE

with saw purchase
Table, Board, Leg Set
& Carbide Blade

More General Machinery

15" Band Saw (#690-1) 1 1/2HP
12" Lathe (#160-2) 1HP
12" HD Lathe (#260-VD)
8" Jointer (#480-1)
15" Drill Press (#34-01)
14" Planer (#130-1) 3HP
20" HD Lathe (#26020-VD)



10320 Hickman Rd., Des Moines, IA 50325

1-800-835-5084

www.WoodsmithStore.com

NORTHWEST TIMBER

STEP UP TO THE FINEST FIGURED
MAPLE, AND WESTERN WALNUT ON THE PLANET

(541) 327-1000

by Toni Gilbert, Lewis Judy

photo by Eric Griswold



- **FIGURED MAPLE**, quilted, curly, spalted, burl, birdseye and figured flooring
- **CLARO WALNUT**, curly, marbled, crotch, burl and vertical grained
- **CURLY CHERRY**, Eastern
- **PORT ORFORD WHITE CEDAR VG** (OLD GROWTH SALVAGED LOGS)
- **MYRTLEWOOD**, musical grade, lumber and slabs

Visit our online store
WWW.NWTIMBER.COM



READER SERVICE NO. 128

Shed some light on your next purchase.

Our new *Tool Guide* is our biggest yet, packed with reviews of more than 300 tools from our editors, 6,000 tool users, and industry professionals. You'll hear what they prefer – straight from the hip and without bias, saving you time and money when selecting tools.

Order today by calling toll free 866-452-5181
or visiting www.thetoolguide.com/fw

Only \$9.99, plus \$3.50 s+h



The Taunton Press
Inspiration for hands-on living®

Available September 28, 2004. Product #015002.
Please add \$3.50 postage & handling. Payable in U.S. funds only.
The *Tool Guide* is not part of your regular subscription.



From the publishers of *Fine Homebuilding & Fine Woodworking*

Trend Airshield
Includes Battery Charger
Airware America
20219 240th St., Elbow Lake, MN 56531
3M Authorized Distributor
e-mail: airware@runestone.net
www.airwareamerica.com
Free Info **1-800-328-1792**
 Ideal for wood dust

SCHOOL OF WOODWORKING
DISCOVER the ART of
HAND TOOL WOODWORKING
1-12 day Courses to Advanced Levels
Catalogue of Courses • (254) 799-1480
In Central Texas www.cieschool.com

WEST SYSTEM[®]
BOATBUILDERS SWEAR BY IT,
and so will you.
Strong, waterproof WEST SYSTEM[®] Brand epoxy is more than a 2-part adhesive. It's a complete system of resin, hardeners, fillers and additives from which you can easily create the perfect bonding, coating and sealing agents for your wood or composite project.
For a free copy of the 30-page WEST SYSTEM[®] User Manual & Product Guide, write:
Gougeon Brothers, Inc.
Dept. 44, P.O. Box 908
Bay City, MI 48707
989-684-7286 www.westsystem.com

Gemini Carving Duplicator
"The Professional's Woodworking Secret"
 Fast Rugged Accurate
Visit our extensive website www.wood-carver.com
Allred & Associates, Inc.
2 South Street
Auburn, New York, USA 13021
+1 315 252-2559 fax: 252-0502
Videotape demo available. Call for details

Andrews Toolworks, Inc
Huge Selection of Stock
and Custom Router Bits
www.routerbitsonline.com
800.821.8378


200 WOODWORKING PROJECT PLANS
ALL UNDER \$10 EACH
PlansNOW.com

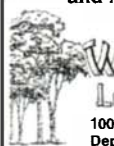

TIMBER WOLFTM
Band Saw Blades
Swedish Silicon Steel ~ 1/8" - 2"
www.suffolkmachinery.com
Free Catalog ~ 800-234-7297


HARDWOODS
Lumber • Veneer • Turning Stock
Over 100 Quality Hardwoods
From Around the World
exoticwoods.net
Wood Descriptions • Prices • Current Specials
Secure On-Line Ordering
WOODWORKERS Source
5402 S. 40th Street • Phoenix, AZ 85040
800.423.2450


www.tooltrolley.com
Precision Saw & Router Guides
Trolleys Improve Safety & Control and Increase Versatility
Simplify Cutting Large Panels, Joining, Shaping or Making Complex Joints
1-800-524-1138


CUSTOM ROUTER BITS, CUTTERS & KNIVES
2 week or less delivery
LIBERTY LINE
WHEN IT COMES TO ROUTER BITS
WE KNOW WHAT WE'RE TALKING ABOUT.
RIDGE CARBIDE TOOL CO.
"Industry Leader In Custom Router Bits"
FAX us your custom drawings toll free at
1-888-RCTOOL (728-8665) or
mail drawings or wood samples
RIDGE CARBIDE TOOL CO.
595 New York Ave., PO Box 497, Lyndhurst, NJ 07071
Send \$3 for complete 100 page Stock Tool Catalog
or see us at www.ridgecarbide.com
800-443-0992 rctool@bellatlantic.net

Furniture That Floats
noahs Cedar Strip, Plywood, Canoe & Kayak Kits,
 Boat Building Supplies
www.noahsmarine.com 416-232-0522 Free Catalog

IMPORTED & DOMESTIC HARDWOODS
LUMBER • PLYWOOD • VENEERS • TURNING BLOCKS • BURLS
FINE WOOD CARVINGS
and **ARCHITECTURAL MOLDINGS**
 Over 80 species of hardwood in stock.
Wood-Ply Lumber Corp.
100 Bennington Ave., Dept. FW
Freeport, NY 11520
CALL FOR PRICE LIST:
866-378-2612
FAX 516-378-0345
www.woodply.com

E.C. Emmerich Primus Planes at
www.TheBestThings.com
The Best Things stock a full line of ECE Tools
for discerning Craftsmen
800-884-1373
Your Source for Traditional Hand Tools


THE ST. JAMES BAY TOOL Co.
Infill Style Planes
Finished or Kits
Parts for
Antique Planes
Free Brochure
800-574-2589
www.stjamesbaytoolco.com
 122 E. Main St.
Mesa, AZ 85201
480-835-1477

THE ORIGINAL ROUTER MOUNTER[®]
PATENT PENDING
No Tools!
No Screws!
No Hassle!
FROM THIS... TO THIS... IN SECONDS!

www.routermounter.com

New Dura-Bull
WOOD VENEER LAMINATE
Very bendable No glue bleed through True Grade "A" Over 90 species 2' x 8' to 5' x 12'
Easy to work with! Lightweight Works great with world friendly adhesives
Available now from your local **CraftWood** authorized dealer
812-288-9201 Tel **SRWOOD** 812-288-5225 Fax
1801 Progress Way, Clarksville, IN 47129-9205
On the web www.craftwood-srwood.com


Craftsman Studio.com LS Starrett..Norton..
1-888-500-9093 - Email FWL73@CraftsmanStudio.com
for Brochures & Gift Certificate
Fine Tools..Fair Prices..Fast Shipping
Cherries..H.N.T. Gordon..Clifton..Lie-Nielsen..


Go online for product information
Find our advertisers' web sites quickly and easily on our online Advertiser Index at
www.finewoodworking.com
Fine WoodWorking[®]

CANVASGOODS
 Superior Shop Apron for
 Woodworkers
 All Day Comfort, Protection
 Sturdy 11 oz. Natural Canvas
 Split Leg, X-Back Straps
 Reinforced Corners
 Brass Grommets
 Bellows Pockets
 for Tape, Tools
 \$34.95 + \$5.00 S&H
 www.canvasgoods.com
 1-866-742-5223

WOOD RIVER VENEER
 Architectural, Cut to Size
 & Specialty Panels,
 Tabletops, Doors & Veneer
 (800) 875-7084
 www.woodriverveneer.com

accurate and tear out free
 system/shelf pin holes in all materials
 with your plunge router professional appearance
 32mm European system or traditional "I" centers
MEG PRODUCTS
 phone/fax 609-587-7187
 9 John Lenhardt Road
 Hamilton Square, NJ 08690
 www.megproducts.com

OLD GROWTH
Tight Grained • Highly Figured
Wide Quartersawn White Oak
 • English Brown Oak • French Oak • Curly
 English Sycamore • American Sycamore
 CUSTOM ORDERS SAWN FROM OUR LOGS
 ORDERS CUSTOM PULLED
 ALL MAJOR CREDIT
 CARDS ACCEPTED
TALARICO HARDWOODS
 World Class Figured &
 Bookmatched Lumber
 610-775-0400
 www.talaricohardwoods.com
 22 Hardwood Lane
 Mohnton, PA 19540

Woodworking in the
Foothills of South Carolina
 Instruction at the Studio of Michael
 McDunn, side-by-side with a thirty-
 year veteran of the craft. Classes
 available for all skill levels.
 ★ Basic Woodworking
 ★ Furniture Construction ★ Wood Turning
 E-mail: MPMcDunn@aol.com
 Website: www.mcdunnstudio.com/classes.htm
 741 Rutherford Road, Greenville, SC 29609
 Telephone (864) 242-0311

Curly Woods
 Specializing in North American Figured Woods,
 Exotic Woods and Turning Woods.
 www.curlywoods.com
 Toll-free: (866) Mr. Woods (866.679.6637)

BAUHAUS APPRENTICESHIP INSTITUTE
 Apprenticeship: Art-Furniture Construction/Design,
 one year-fulltime, hands-on, professional, no tuition / no salary.
 1757 North Kimball Ave., Chicago, IL 60647, (773) 235-7951
 www.LF.org/bhai2000

ARIZONA MESQUITE SPECIALIST
 www.lumberlady.com
 toll free (877) 919 - 9422
 free picture catalog
 ebony snakewood

DOVETAIL RESTORATION LLC
 Featuring gold-tooled
 replacement leather for
 desk and table tops and
 custom cut table pads.
 410-243-8300
 www.dovetailrestoration.com

We make the world plane
 VISA
 We also make it fancy
 For prices of 75 E.C.E. planes and other cabinet-
 maker's tools, write: David Warren Direct,
 7317 Chesterfield Rd., Crystal Lake, IL 60012 or
 call 800-724-7758. Dealers invited. View tools
 online at www.ecemmerich.com

MAKE A WINDSOR CHAIR
 with Michael Dunbar
Learn with the Master.
 Craftsman • Teacher • Author
 — 31 Years —
 Week-long Workshops Held Year-round
 44 Timber Swamp Road
 Hampton, NH 03842
 603-929-9801
 thewindsorinstitute.com

If You're Shopping for a
TORMEK
Call Us First!
 • All Accessories In Stock
 • 6-Year Extended Warranty
 • On-Line User Forum
 • Telephone Support
SHARPTOOLUSA • 1-800-872-5489
 1106 VALLEY RIDGE DRIVE www.SharpToolsUSA.com
 GRAIN VALLEY, MO 64029 info@sharptoolsusa.com

New! Feedmaster Pro New!
 Now you control the feed rate on your
 Williams & Hussey Molder
 Feed speeds from 0 to 19 feet per minute
 • Smoother finishes
 • Simple and safe
 to use and install
 • Allows more power
 to the cutterhead
 • Call for catalog
 Visit us on the web at www.eggsschmidt.com
 Charles G. G. Schmidt & Co., Inc.
 301 W. Grand Ave Montvale, NJ 07645
 1 800-SCHMIDT Fax 1 201-391-3565

NEWEDGE CUTTING TOOLS.COM
 SIMPLY, A TURN FOR THE BETTER
 GO TO OUR WEB PAGE FOR MORE INFORMATION
 ABOUT OUR NEW TURNING TOOLS MADE IN USA
 STYLES: ROUND • DIAMOND
 SQUARE • PARTING
 NEVER SHARPEN YOUR
 TURNING TOOLS AGAIN
 SIMPLY ROTATE THE THROWAWAY CARBIDE TIP
 FOR A NEW SHARP CUTTING EDGE
 PHONE/FAX 880 628-4642 • E-MAIL: NEWEDGE@AOL.COM

DUST BOY, INC.
 1 and 2 HP Dust Collectors
 • Cast Aluminum Blowers
 • High Efficiency
 • Extremely Quiet
 • Portable
 • 5 Year Warranty
 Visit: www.dustboy.com
DUST BOY, INC.
 P.O. Box 278
 Arcanum, OH 45304
 Free Brochure & Layout
 Information Available
 Fax (937) 692-8838
 800-232-3878

DON'T SETTLE FOR SAP!
Penna. CHERRY - Plain & Figured
 Selected for good color and minimal sap • 4/4 to 16/4 •
 widths to 18" • matched sets for panels • clear matched
 wide 5/4 for tops • crotches • 5" figured plank flooring •
 turning stock • custom orders sawn • 200' shipping min.
MAHOGANY dense & dark • widths to 40" • **TIGER MAPLE**
 www.irionlumber.com 570-724-1895 irionlum@epix.net

KREMER
 PIGMENTS
Shellac Flakes
 • with or without wax • light and extra light
 • refined or crude • ruby shellac
 Free catalog of woodfinishing supplies
 Kremer Pigments Inc. • 228 Elizabeth Street
 New York, NY 10012 • (800) 995 5501
 www.kremer-pigments.com

Heartwood
 Domestic and Exotic Hardwoods
 www.heartwoodlumber.net
 (866) 966-4646



WINDSOR CHAIR WORKSHOPS
in historic Oley Valley, Pennsylvania
Free camping/trout fishing on site
Jim Rendi, Tel: 610-689-4717
www.philadelphia-windsor-chair-shop.com
philawindsor@aol.com

Captivating Books



Whether you want to make hand tools, learn to use them, or collect them—turn to Astragal Press for affordable, reliable information. Complete catalog on-line at: www.astragalpress.com.
Or call toll-free 866-543-3045

TWO CHERRIES



Huge selection of hand forged woodcarving and bench chisels
Robert Larson Co.
San Francisco
800-356-2195
www.rlarson.com
Since 1858

The Fine & Creative Woodworking Program at ROCKINGHAM COMMUNITY COLLEGE
is an internationally recognized associate degree & certificate program. Instruction in hand-tools, furniture, construction, shop start-up, operation & much more.
PO Box 38, Wentworth, NC 27375-0038
Phone: (336) 342-4261, ext. 2178.
www.rcc.cc.nc.us/woodwork/homepage.html
AAEEOC

Fine European Hand Tools



www.diefenbacher.com
Diefenbacher Tools • 12132 Old Big Bend • St. Louis, MO 63122
Free Hand Tool Catalog • 800-326-5316



CROWN PLANE COMPANY
TRADITIONAL BENCH MADE PLANES
JACK...SMOOTH...SCRUB...SCRAPERS...BLOCK
CHAIRMAKERS TRAVISHERS...COMPASS PLANES
18 Chase Street South Portland, ME 04106
(207) 799-7535
Order Online www.crownplane.com

TOP-RATED SEA KAYAKS
Rugged, Ultra-Light, Beautiful
Leader in Kayak Kits Since 1986



PYGMY
BOATS, INC.
CALL OR WRITE FOR OUR FREE COLOR CATALOG:
(360) 385-6143, P.O. Box 1529, Dept. 98
Port Townsend, WA 98368
www.pygmyboats.com

Oregon Black Walnut

GOBY WALNUT PRODUCTS
5016 Palestine Rd.
Albany, OR 97321
VIEWING BY APPOINTMENT ONLY
(541) 926-1079
Web Site: www.gobywalnut.com

Wide lumber - 1/4 through 16/4
Turning - Carving Stock
Gunstocks - Veneer
Instrument Grade Lumber
No Minimum Order

CUSTOM BRANDING IRONS
HIGH QUALITY, DEEP ENGRAVED BRONZE DIES
LONG LASTING - INDUSTRIAL DUTY HEATERS
NOT THE CHEAPEST - QUALITY COSTS MORE
FREE BROCHURE AND SAMPLE BRANDS
ENGRAVING ARTS 800-422-4509 fax: 707-984-8045
P.O. Box 787 www.brandingirons.net
Laytonville, CA 95454 e-mail: clem@brandingirons.net

QUARTERSAWN HARDWOODS & HIGHLY FIGURED LUMBER
Ash, Cherry, Hard Maple, Red Oak, White Oak, Walnut, Sycamore, Mahogany, Hickory, and Birch.
Also, many Exotic Species in Stock.
NEW We now have Curly Bubinga, Curly Makore, + other figured exotics.
WEST PENN HARDWOODS, INC.
(888) 636-WOOD (9663)
www.westpennhardwoods.com

Traditional Hand Tools
We search the globe for fine hand tools still made with pride. Call for a free catalog or visit us on the Web.
Traditional Woodworker
Fine Tools for Discerning Craftsmen
www.traditionalwoodworker.com
1-800-509-0081

Let Reader Service work for you.
Receive information direct from your choice of advertisers by using the Reader Service form located next to the inside back cover.

BRAZILIAN CHERRY
LUMBER, FLOORING & PLYWOOD
PRIME QUALITY HARDWOOD LUMBER & FLOORING
THOUSANDS OF BOARD FEET
ALL DIMENSIONS
MANY UNUSUAL SPECIES IN STOCK
RARE EARTH HARDWOODS
IMPORTER / MANUFACTURER
Tel 800-968-0074
Fax 800-968-0094

BARTLEY
Museum quality Reproduction kit Furniture in Shaker, Queen Anne, and Chippendale styles in Tiger Maple, Cherry, Walnut & Mahogany Woods. Build your own masterpiece & Save hundreds \$\$\$\$!
Use Bartley Gel Finishes to finish your masterpiece.
Catalog at 1-800-787-2800
www.bartleycollection.com



The Cutting Edge, Inc.
Fine Hand Tools For Turners Carvers & All Woodworkers
Hollow Turning
Henry Taylor Carving & Turning Tools
AutoMach
Power Carving
www.cuttingedgetools.com
11760 S. Sam Houston Pkwy. Houston, TX 77031
713/ 981-9228

Arbor Day..A Great Idea Grows
In 1872, J. Sterling Morton gave the world a great idea. He created a holiday unlike any other, Arbor Day.
This year, plant Trees for America. For your free brochure, write: Trees for America, The National Arbor Day Foundation, Nebraska City, NE 68410.
The National Arbor Day Foundation
www.arborday.org



CURVED MOULDINGS
B.H. DAVIS COMPANY
 PO BOX 70, GROSVENORDALE, CT 06246
 PHONE: (860) 923-2771 FAX: (860) 923-3495
 www.curvedmouldings.com
 ANY: Shape, Species, Profile - CURVED: Casing, Crown etc.

NORTHWEST SCHOOL OF WOODEN BOAT BUILDING
 Call or e-mail for our course catalogs.
 360-385-4948
LEARN FINE WOODWORKING.
 Accredited. Accomplished. And a lot of fun!
 Programs from one day to twelve months.
 www.nwboatschool.org

GOOD HOPE HARDWOODS, Inc.
 "Where Fine Woodworking Begins"
 4/4-24/4 Custom Cut Wide Matched Sets
 Custom Flooring Available
 Specializing In:
 Figured & Plain Cherry, Walnut & Claro Walnut,
 Tiger Maple & 58" Wide Bubinga
 Plus Many Other Species
 1627 New London Rd., Landenberg PA 19350
 Phone 610-274-8842/Fax 610-255-3677
 www.goodhope.com
 We Provide Personalized Service

BARR SPECIALTY TOOLS
 www.barrtools.com
 1-800-235-4452
 CALL FOR FREE CATALOG

Combine Your Passions For Wood & Water
Make Bamboo Fly & Spin Rods
 68 Page Specialty Tool Catalog--\$5.00 (ref.)
 Video Series, Books, One Week Classes
 GWT, Inc. • P.O. Box 159 • Hopeland, PA 17533
 (717) 738-7330 • www.goldenwitch.com

Go online for product information
 Find our advertisers' web sites quickly and easily on our online Advertiser Index at
www.finewoodworking.com
 Fine WoodWorking®

CATALOG for WOODTURNERS!
 Call Toll Free...
 (800)-683-8876
 Fax...(828) 859-5551
 E-Mail...packard@alltel.net
 Packard Woodworks - PO Box 718 - Tryon - NC 28782

www.librawood.com
 "Forrest" Sawblades
 "Bosch" Power Tools
 "Whiteside" Router Bits
www.librawood.com

SELF-ADHESIVE 70% WOOL FELT
 TAPES • STRIPS • TABS • DOTS
 1-800-796-2333
 APPROX. 1/16" & 1/8" THICK
 BROWN, GREEN, BLACK
 WHITE, AND SILVER GRAY
UBDANN PRODUCTS DIV.
 9611 SOUTH COTTAGE GROVE AVE.
 CHICAGO, IL 60628
 FAX 773-375-2494

When Only The Finest Veneer Will Do...

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

GILMER WOOD CO.
 Quality Domestic & Exotic Lumber
 • Logs, blanks, squares
 • Over 50 species in stock
 • Thin woods, Assortments, Books
 • Musical Instrument woods
 Phone 503-274-1271
 2211 NW St. Helens Rd. Portland OR 97210
 Fax 503-274-9839 www.gilmerwood.com

WOODJOY® TOOLS
 Fine Tools to Enhance Your Skill & Ability
 P.O. Box 204, Swansea, MA 02777
 508-669-5245
 woodjoytools.com

Dovetail - Tenon - Carcass Saws

Adria
 HANDMADE BACKSAWS
www.AdriaTools.com

BEVEL BOSS
 "When the angle isn't 90° I reach for the Bevel Boss. It's a simple tool that lets me set my T-bevel accurately to within 1/4".
 The Bevel Boss is the ultimate angle authority in my shop."
 Chris Becksvort, Contributing Editor to Fine Woodworking

 3" End Scale • 12" Rule, 1/16" Grads On Back • Easy To Read & Use
877-472-7717 • www.sutherlandtool.com

Your FESTOOL Headquarters
 European tools for the discriminating craftsman
 See the entire line online or call for a free catalog
www.Festoolonline.com 1.800.669.5519

AFRICAN EXOTIC HARDWOODS
 • BEST PRICES - DIRECT FROM SOURCE
 • EXOTIC LUMBER, BLANKS AND BURLS
 • LARGE OR SMALL ORDERS WELCOME
 • SHIPPED PROMPTLY NATIONWIDE
 CONTACT FABS AND MIKE TODAY (828) 658-8455 TEL.
CORMARK INTERNATIONAL (828) 645-8364 FAX.
 181 REEMS CREEK ROAD, WEAVERVILLE, NC 28787

BREATHE EASY
 The Amazing Duster 600 Air Filtering Machine.

 Duster 600
 ISLAND CLEAN AIR INC.
 Call 1-800-661-6211 for information

Classic European Woodcarving
 Single and group instruction available
 With Master Woodcarver - Videos - Tools - Patterns - Supplies - Everything
Nora Hall
 www.norahall.com • Toll Free 1-866-392-3416 • nora@norahall.com

MISUGI DESIGNS

 Japanese Tansu & Cabinet Hardware
 Japanese Woodworking Tools
 Japanese Paper
 Visit us at:
www.misugidesigns.com
 Tel: 707-422-0734 / Fax: 707-425-2465

Discover the lasting beauty of genuine teak

- Lumber
- Millwork
- Flooring
- Plywood
- Doors
- Teak & Ipe
- Decking

No one knows more about Teak or takes more care in bringing it to you.



EAST TEAK
TRADING GROUP, INCORPORATED
www.eastteak.com

(800)338-5636 East Coast (800)537-3369 West Coast

Augum's Pen Works

The Largest Selection of Turning Kits and Woodworking Supplies Online!

Penn State Industries, Berea Hardwoods & More!
Pen, Keychain, Bottle Stopper Kits + Many More!
Everything You Need:
Tools, Adhesives, Finishing Supplies,
Gift & Display Boxes,
Inlay Supplies (Inlase, Crushed Stone),
Jewelry Supplies, Wood Blanks, Horn,
Colorply, Diamondwood, Aquapearl + More!
All At The LOWEST PRICES On The Internet!
Number ONE In Customer Relations!
Come Give Us A Look!

www.AUGUMSPENWORKS.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 

THE FURNITURE INSTITUTE of MASSACHUSETTS

Philip C. Lowe, Instructor/Director

A 2-year Hands-on Program with Master Furniture Maker

116 Water Street
Beverly, MA 01915
(978) 922-0615

Summer Workshops available
www.furnituremakingclasses.com

BEST SHOP JIGS

Step-by-Step Plans with Hardware

WoodsmithStore.com

COOK WOODS

cookwoods.com
TOLL FREE 877.672.5275

MADRONE BURL ~ KOA ~ MYRTLE
POMMELLE SAPELE & BUBINGA
PLUS MANY OTHER RARE EXOTIC SPECIES.

COLLEGE of the REDWOODS Fine Furnituremaking

Continuing the Tradition ■

Apply March 1-31

for further information:
College of the Redwoods
440 Alger Street
Fort Bragg, CA 95437
707.964.7056
www.crfinefurniture.com

"Selling the world's finest veneers isn't our job, it's our pleasure."

berkshire veneer
COMPANY, INC.

29 LOCUST HILL ROAD | GT. BARRINGTON, MA 01230
TOLL FREE: 1 (877) 836-3379 | FAX: (413) 644.9414
EMAIL: info@berkshireveneer.com WEB: www.berkshireveneer.com

DOVETAILED DRAWERS

Reasonably priced method to distinguish your cabinets.

- Custom-sized width and depth
- 1/2" solid maple, assembled and sanded
- 2-coat catalyzed finish available
- Quick service, shipped UPS

EAGLE WOODWORKING
1130 East Street, Tewksbury, MA 01876-1459
FAX (978) 640-1501 (800) 628-4849

why cabinetparts.com?

blum — euro hinges — tandembox — solo —
orgaline — grass — accuride — wilsonart —
salice — sugatsune — peter meier — neva-
mar — knape & vogt — drawer slides — flip-
per door slides — rev-a-shelf —
lazy susans — kitchen accessories — lam-
inates — amerock — blum — euro hinges —
ta — accuride — wilsonart — salice — sugatsune —
peter meier — nevamar — knape & vogt —
drawer slides — flipper door slides —
mepla — rev-a-shelf — lazy susans —
kitchen accessories — laminates — ame-
rock — blum —

cabinetparts.com inc • 1717 sw 1st way • suite 41 • deerfield beach, fl • 800 857 8721

Quality German Workbenches

1-800-32Bench

Diefenbach Benches
33498 East US Highway 50
Pueblo, CO 81006
www.workbenches.com

FINE WOOD KAYAK PLANS

Catalog \$3. Guillemot Kayaks
Suite # 924 Thompson St. Glastonbury, CT. 06033
Phs 860-639-8847 — www.KayakPlans.com/f

OSBORNE Wood Products, Inc.

Your Source for Quality Wood Turnings!

Kitchen Island Legs & Much More

Call for a catalog: 1-800-746-3233
or visit our website at
www.osbornewood.com

8116 Highway 123 North
Toccoa, GA 30577

Gondwana Forest Products

Your direct source for Aussie decorative woods for the wood turner and furniture maker.

Specialists in burl (mallee, coolabah, myrtle, Tasmanian eucalypt varieties) and kiln dried figured lumber.

www.aussieburls.com

Pssst! Need wood?

woodfinder

It's FAST, EASY and FREE!

Browse our WOOD LIBRARY!

Over 400 quality suppliers!

www.woodfinder.com

SUPPLIERS: Join us today! Call 1-877-933-4637 for details.

CLASSIFIED

The Classified rate is \$9.50 per word, 15 word min. Orders must be accompanied by payment, ads are non-commissionable. The WOOD & TOOL EXCHANGE is for private use by individuals only; the rate is \$15/line, minimum 3 lines. Send to: *Fine Woodworking* Classified Ad Dept., PO Box 5506, Newtown, CT 06470-5506. FAX 203-270-6310, Ph. (800) 926-8776, ext. 3310. Deadline for the January/February 2005 issue is October 25, 2004.

Business Opportunity

WOODSHOP FOR LEASE in Southern Oregon. Includes machinery & many fantastic features. Option to lease onsite apartment. (541) 846-9251. Email: donsteinert@earthlink.net

Finishes

SPRAY-ON SUEDE. Line boxes in seconds. Free brochure (sample enclosed). DonJer Products, 13142 Murphy Road, Winnebago, IL 61088. 800-336-6537. www.donjer.com

Hand Tools

PETE NIEDERBERGER- Used and Antique tools and parts. List #1 SOLD OUT- thank you. Contact me for current stock. (415) 924-8403 or pniederber@aol.com

ANCIENT & MODERN TOOLS. Woodworking, metal working and other. Users and collectors. www.pennyfarthingtools.co.uk

FREE Woodcarving Tool Catalog 1-888-901-8099. stubairect.com Class info also available!

ANTIQUE & USED TOOLS. Hundreds of quality handtools. Many Stanley + parts. At www.antique-used-tools.com Visa/MC. BOB KAUNE, 511 W. 11th, Port Angeles, WA 98362. (360) 452-2292.

Miscellaneous / Accessories

GLASS SOURCE FOR WOODWORKERS. Glass and mirror custom cut, beveled, edged, etched, or grooved to your specifications. Shipped direct from our shop to yours. Call for free brochure, inquiries, or to place an order. Glass Source 1-800-588-7435.

Help Wanted

APPRENTICE WHEELWRIGHT Colonial Williamsburg Foundation is looking for a friendly, guest-focused individual with an interest in history, basic skills using woodworking hand tools, and a commitment to learning and interpreting the 18th-century wheelwright's trade. For further information, contact Ed Joyner at ejoyner@cwf.org E.O.E.

Instruction

LONNIE BIRD'S SCHOOL OF FINE WOODWORKING Hands-on woodworking, small class size, focus on craftsmanship. Classes range one day to two weeks in length; beginning to advanced levels. (865) 484-1145. www.lonniebird.com

ROCKING CHAIR SCHOOL www.haltaylor.com

NEW ENGLAND SCHOOL of Architectural Woodworking 35-week career training in architectural woodworking or 6-week summer intensive for the serious enthusiast. (413) 527-6103. (MA) www.nesaw.com

BLUE RIDGE MOUNTAINS, VA. One-year apprenticeship available to motivated individual. Saturated learning environment. Accommodations available, tuition. For more information call: Michael Maxwell, (540) 587-9543.

WOODWORKER ACADEMY, comprehensive entry level workshops and precision improvement are our specialty. San Francisco area (510) 521-1623 or www.woodworkeracademy.com

BENJAMIN HOBBS Furniture Making Classes. Queen Anne and Chippendale chairs, chests, beds, tables, more. Hertford, NC. (252) 426-7815. www.hobbsfurniture.com

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

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

APPRENTICESHIP Winner of *Fine Woodworking* Magazine's Apprenticeship Program Award in Professional Artisan Furniture making/designing in rare solid woods. Tuition. Jeffrey Greene. (215) 348-5232. (PA) www.jeffreygreene.com

RENAISSANCE APPRENTICESHIP PROGRAM: Design, carving, inlays. East Texas. (903) 769-1017. www.furniture4design.com; click on "Apprenticeship."

MASTERPIECE SCHOOL OF FURNITURE offers 1-3 year program in traditional furniture making. Mendocino Coast, California. Summer classes available. Ph/Fax (707) 964-8798. www.masterpieceschool.com

Machinery New/Used

USED PORTABLE SAWMILLS! Buy/Sell. Call Sawmill Exchange: 800-459-2148, (205) 969-0007. USA & Canada, www.sawmillexchange.com

Musical Supplies

PLANS KITS & SUPPLIES for musical instruments; harps, dulcimers, psalteries, banjos and more. Music-maker's Kits, Dept. FW, PO Box 2117, Stillwater, MN 55082. (651) 439-9120. www.musikit.com

BUILD YOUR OWN violin, guitar, or dulcimer! Free catalog featuring kits and all the tools, finishing supplies and instructions needed to build your own instrument. Stewart-MacDonald, Box 900-F, Athens, OH 45701. Call 800-848-2273. www.stewmac.com

Plans & Kits

ROCKING CHAIR PLANS www.haltaylor.com

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

CARLYLE LYNCH MEASURED DRAWINGS—Museum and private collection furniture plans by Carlyle Lynch. Catalog \$2. P.O. Box 13007, Arlington, TX 76094. (817) 861-1619.

Power Tools

NAILERS AND STAPLERS at www.nailzone.com Top brands of tools and fasteners. Visit our website. (800) 227-2044.

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

Publications

HANDMADE FURNITURE PROJECTS - A new book featuring 23 wood projects selected from *Australian Wood Review*. Order from woodreview.com

Wood

EXCEPTIONAL BLACK WALNUT. Book matched. 18-in. to 24-in., 21-ft. long. Sustained Yield Forestry. (860) 480-3402, (860) 693-8425.

QUILTED, CURLY, SPALTED, Burled & birdseye maple, figured claro walnut, figured myrtlewood, musical grade lumber and billets. Visit our online store @ www.nwtimber.com or call (541) 327-1000.

COLLECTOR'S SPECIALTY WOODS "Rocky Mountain Dry" lumber, tops, burl slabs, flooring, blocks, bases-showroom/millroom/wood yard; www.cswoods.com (719) 746-2413. (CO)

EISENBRAND EXOTIC HARDWOODS - Wide selection of imports. Reasonable prices. Quality guaranteed. FREE brochure. 800-258-2587. (CA) www.eisenbran.com

TIGER MAPLE, MAHOGANY, CHERRY, WALNUT; plain and figured. Wide boards, matched sets, 4/4 to 24/4. 200-ft. minimum. (570) 724-1895. www.ironlumber.com

QUILTED MAPLE, curly maple, figured claro walnut, black walnut, African ebony, beng (afzelia), Honduras rosewood, Lumber, sequenced wide boards. (541) 467-2288. www.PineCreekWood.com

MESQUITE Cheap. (915) 585-7693.

WALNUT SLABS/CROTCHES Claro, myrtle, elm. Black acacia. 877-925-7522. From our sawmills. Gilroy, CA. www.bakerhardwoods.com

FIGURED CLARO WALNUT slabs, planks, blocks, dimensions suitable for small to very large projects. California Walnut Designs. 800-660-0203. www.woodnut.com

FLORIDA—FROM ASH TO ZEBRAWOOD with milling available, including custom, antique restoration and curved moldings. Hardwood Lumber of Lakeland. (863) 646-8681. FREE 877-710-3900.

WIDE SLABS. Stellar figured lumber. Cherry, maples, ash, black walnut. SALT LAKE CITY. www.gnarlywoods.com 877-332-8473.

QUALITY NORTHERN APPALACHIAN hardwood. Custom milling. Free delivery. Bundled, surfaced. Satisfaction guaranteed. Niagara Lumber, 800-274-0397 (NY) www.niagalumber.com

CALIFORNIA'S FINEST BURLWOODS: Massive inventory, many varieties, all sizes, any use, direct, guaranteed. Established 30-years. Burl Tree, 800-785-BURL.

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.anexotic hardwood.com

ATTENTION VA/MD AREA WOODWORKERS. K/D quartersawn sycamore, red & white oak. Cherry, walnut, elm, apple, and other domestic hardwoods. Herbine Hardwoods, Leesburg, VA. (703) 771-3067.

REDWOOD AND BUCKEYE BURL. Table and clock slabs, turning blocks. Burl Country: (707) 725-3982. Fax 707-725-3306. www.burlcountry.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.

DOMESTIC AND IMPORTED EXOTICS. For musical instruments, pool cues, knife handles and custom furniture. Price list. Exotic Woods, 1-800-443-9264. www.exoticwoods.com

NORTHWEST'S FINEST BURL, maple, myrtle, redwood, buckeye. Table, clock slabs, turning blocks. (503) 394-3077. burlwoodonline.com

WESTERN RED CEDAR vertical grain and clear Douglas fir. For more information call (541)-344-3275, fax 541-344-1654 or www.easycreeklumber.com

GRIFFIN EXOTIC WOOD - Turning wood specialists! Many types/sizes. www.exoticwood.biz Toll Free: 1-866-518-9663.

WOOD AND TOOL EXCHANGE

Limited to use by individuals only.

For Sale

Fine Woodworking; #12 thru 171 (missing 25 and 79). \$350 plus shipping. (409) 737-1348. (TX)

Fine Woodworking; #1-149, mint condition, index, 22 slipcases. \$595. plus shipping. (561) 375-6477 ph/fax evenings till 9 PM. (FL)

Fine Woodworking issues, complete set #1 to this issue, excellent condition. \$750. plus shipping. Call (802) 652-4842.

SHOPSMITH, VINTAGE MODEL 10-ER, mechanically perfect, all accessories & manual, \$625. (914) 698-8354.

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 #
117	Adams Wood Products, Inc., p. 35	78	Eagle Tools, p. 9	190	Laguna Tools, p. 21		The St. James Bay Tool Co., p. 114
	Adria Toolworks, Inc., p. 117	61	Eagle Woodworking, p. 118	11	Launstein Hardwoods, p. 7	144	Saw-Jaw, p. 7
32	Airware America, p. 114	133	East Teak, p. 118	184	Lee Valley & Veritas, p. 11	89	Scherr's Cabinet & Doors, Inc., p. 98
135	Allen Designs, p. 17	19	Edward R. Hamilton, Bookseller, p. 24		Leigh Industries, p. 106		School of Woodworking, p. 114
101	Allred & Associates, Inc., p. 114		Engraving Arts, p. 116	86	Lie-Nielsen Toolworks, p. 109	98	Sears Craftsman, p. 39
69	Andrews Toolworks, p. 114	3	Epoxy Heads, p. 9	63	Lignomat Moisture Meters, p. 106	132	Shaker Workshops, p. 38
15	Astragal Press, p. 116			1	The Lumberlady, p. 115	9	Shan Precision, p. 109
114	Augum's Pen Works, p. 118	138	Felder USA, p. 24	21	Luthiers Mercantile Intl., p. 38	6	Sharp Tools USA, p. 115
	B.H. Davis Company, p. 117	168	Festool, p. 117			159	Shopbot Tools, Inc., p. 38
35	Ball & Ball Reproduction Hardware, p. 98		Fine Woodworking's New Digital Tips Library, p. 107	64	M.L. Condon Company, p. 101	57	The Studio of Michael McDunn, p. 115
193	Barr Specialty Tools, p. 117	43	Forrest Manufacturing, p. 23	177	MLCS, Ltd., p. 20	119	Suffolk Machinery, p. 114
73	Bartley Collection, Ltd., p. 116	136	Freud, p. 15	142	Makita USA, Inc., p. 99	100	Sutherland Tool, p. 117
79	Bauhaus Apprenticeship Institute, p. 115	76	The Furniture Institute of Massachusetts, p. 118	13	Mao Shan Machinery, p. 17		
152	Berea Hardwoods, p. 106			53	McFeely's Square Drive, p. 38	95	Talarico Hardwoods, p. 115
187	Berkshire Veneer Co., p. 118	44	General Manufacturing Co., Ltd., p. 37	97	Meg Products, p. 115	112	Target Enterprises, p. 27
23	Brookside Veneers, Ltd., p. 103	14	Gerstner & Sons, p. 38	45	Microplane, p. 11		Taunton's Tool Guide, p. 113
104	Brusso Precision Hardware, p. 37	77	Gilmer Wood Company, p. 117	155	Miller Dowel Company, p. 19	167	Tech Mark, Inc., p. 25
		175	Gladstone Tools, p. 111	25	Mini Max USA, p. 37	163	Thebestthings.com, p. 114
141	CMT USA, Inc., p. 27	49	Goby's Walnut Wood Products, p. 116	24	Mini Max USA, p. 101	93	Thewindsorinstitute.com, p. 115
80	CT Valley School of Woodworking, p. 98		Golden Witch Technologies, Inc., p. 117	96	Misugi Designs, p. 117	90	Titebond, p. 35
94	Cabinetparts.com, p. 118	70	Gondwana Forest Products, p. 118	164	Moulding Knives.com, p. 3	127	Tool Trolley, LLC., p. 114
179	Cadex Tools, p. 9	147	Good Hope Hardwoods, p. 117	166	New Edge Cutting Tools, LLC., p. 115	81	Tools for Working Wood, p. 98
	Canvas Goods, p. 115	48	Gorilla Glue, p. 38	55	Noah's, p. 114	107	Traditional Woodworker, p. 116
37	Carter Products, p. 11	34	Gougeon Brothers, p. 114		Nora Hall, p. 117	181	Trend Routing Technology, p. 101
33	Certainly Wood, p. 117	102	Groff & Groff Lumber, p. 118	128	Northwest Timber, p. 113		
160	Charles G.G. Schmidt & Co., p. 115	186	Guillemot Kayaks, p. 118	22	Northwest School of Wooden Boatbuilding, p. 117	99	Vac-U-Clamp, p. 101
106	Chesapeake Light Craft, p. 113			162	Oneida AirSystems, p. 17	92	Vacuum Pressing Systems, p. 17
191	Classic Designs by Matthew Burak, p. 9	31	HTC Products, Inc., p. 98	17	Osborne Wood Products, p. 118	189	Varathane, p. 29
30	Clayton Machine Corp., p. 7	161	Hartville Tool Woodworking, p. 9	56	Outwater Plastics Industries, p. 25	51	Veto Pro Pac, LLC., p. 106
131	Cohasset Colonials, p. 37	50	Hearne Hardwoods, Inc., p. 9			171	Viel Tools, Inc., p. 27
153	College of the Redwoods, p. 118	140	Heartwood Lumber, p. 115	172	Packard Woodworks, p. 117	40	Virutex.com, p. 103
	Colonial Williamsburg 2005 Conference, p. 19	47	Hida Tool, p. 35	108	Panasonic Power Tools, p. 31	120	W. Moore Profiles, p. 24
39	Cook Woods, p. 118	42	Highland Hardware, p. 11	178	Penn State Industries, p. 20	176	WGB Glass, p. 7
38	Cormark International, p. 117	62	Hoffman Machine Co. Inc., p. 103	72	Philadelphia Windsor Chair, p. 116	68	Wagner Electronic Products, p. 111
124	Craftsman Studio, p. 114				PlansNow.com, p. 114	59	Waterlox Coatings Corp., p. 37
170	Crown Plane Co., p. 116	110	Inside Passage School of Fine Woodworking, p. 7	139	Porter Cable, p. 12-13	118	West Penn Hardwoods, p. 116
105	Curly Woods, p. 115		Irion Lumber Co., p. 115		Porter Cable, p. 34a		Whitechapel, Ltd., p. 27
111	The Cutting Edge, Inc., p. 116	103	Island Clean Air, Inc., p. 117	87	Pygmy Boats, Inc., p. 116	65	Wilke Machinery Co. /Bridgwood, p. 109
		27	Iturra Design, p. 103			10	Williams & Hussey, p. 101
91	Dakota County Technical College, p. 111	129	J.B. Dawn, p. 117	157	Rare Earth Hardwoods, p. 116	180	Wood Rat, p. 19
	David Warren Direct, p. 115	192	The Japan Woodworker, p. 106	36	Ridge Carbide Tool Co., p. 114	16	Wood River Veneer, p. 115
29	Delmhorst Instrument Co., p. 20	12	JessEm Tool Co., p. 25	183	Rikon Power Tools, p. 98	148	Woodcraft, p. 20
146	Delta Machinery, p. 96-97	58	Jet Equipment, p. 2	41	Robert Larson Company, Inc., p. 116	149	Woodcraft, p. 27
125	Delta Machinery, p. 123	194	Jointech, p. 103	158	Rockingham Community College, p. 116	150	Woodcraft, p. 104-105
113	Diefenbach Benches, p. 118				Rockler Companies, Inc., p. 25		Woodfinder, p. 118
185	Diefenbacher Tools, p. 116	174	Kay Industries, Inc., p. 98	2	Rosewood Studio, p. 11	151	Woodjoy Tools, p. 117
	Dovetail Restoration, p. 115	26	Keller & Company, p. 27	88	Router Bits.com, p. 17	154	Woodland Tool Supply Co., p. 7
165	Dowelmax, p. 17	145	Kreg Tool Company, p. 109	169	Router Mounter, p. 114	82	Woodmaster Tools, p. 35
7	Drill Doctor, p. 3	122	Kremer Pigments, p. 115			83	Woodmaster Tools, p. 111
134	Duluth Trading Co., p. 24	20	Kuffel Creek Press, p. 38	137	SATA, p. 3	75	Wood-Ply Lumber Corp., p. 114
52	Dust Boy, Inc., p. 115			188	SR Wood, p. 114		Woodsmith Store, p. 113
							WoodsmithStore.com, p. 118
						156	Woodworker's Depot, p. 111
						123	Woodworker's Source, p. 114
						116	Woodworker's Supply, p. 37

Keep your finish fresh

Your shop probably has a shelf cluttered with cans, jars, and bottles of finish left over from previous projects. Some of the containers aren't labeled, so the contents are a mystery; others are so old that the lids and tops are either glued on tight or won't seal at all. These leftovers represent a waste of material and space, because the fact is you shouldn't let the vast majority of old finishes anywhere near your next project.

Although there are ways to preserve finishes for a time and to determine whether leftovers are still viable, minimizing waste starts at the time of purchase. You should make a habit of buying the smallest amount of finish you need for the job at hand. That way, you won't have to store a lot of material for a long time. In fact, it may be a false economy to buy a gallon of finish once instead of smaller containers on different occasions.

All finishes have a shelf life

It might be better if woodworkers treated finishes as they do food: You don't expect that slab of cheese in the fridge to be edi-

ble a year from now. Would you risk your health eating a dubious piece of steak rather than buying more? Of course not. Yet woodworkers happily keep cans of varnish for years and think nothing of finishing their latest masterpiece with old shellac rather than mixing a new batch.

Even when stored unopened in ideal conditions, finishes deteriorate. In the case of varnish, the metallic driers gradually lose

their effectiveness. The deterioration is faster with semigloss and satin varnishes as the flattening agents react with the driers. If satin varnish from a fresh can dries in two to three hours, varnish from a two-year-old can probably will take an hour or two longer; varnish that's beyond three years old probably never will cure fully.

In his article about shellac (*Finish Line*, *FWW* #134, pp. 129-130), Chris A. Minick



LIMIT CONTACT WITH OXYGEN

To reduce the amount of oxygen in the can of finish, transfer the contents of a half-empty can into smaller containers (left). Another option is to fill the empty space in the can with Bloxygen, an inert gas that prevents oxygen from coming in contact with the finish (below).



Finish Line (continued)



False economies of scale. *Buying a gallon of finish may be cheaper than buying four quarts, but not if you have to dispose of half the contents in the gallon container because you kept it too long.*

explains how shellac starts to deteriorate as soon as the flakes are dissolved in alcohol. Chemical changes make the shellac increasingly less water resistant and unable to form a hard finish. For this reason, I follow Minick's advice and make all of my shellac from dry flakes. I toss any leftover liquid shellac after six months.

Precatalyzed lacquers last about a year, so buy them from a source with high turnover and write the purchase date on the lid.

Ways to preserve finishes

Although the aging of finishes is inevitable, there are ways to slow it down. Keeping oxygen away from the finish is key. Make sure you have a tight seal on the container, which requires a clean rim and lid. If you are working right from the can, don't drag the brush across the rim; instead, tap it on the inside edge of the can. Ideally, you should not work directly from the can. Rather, pour the amount of finish you need into a smaller container. Doing so helps reduce the chance of introducing contaminants into the clean finish in the can.

Air trapped in a can causes some finishes to skim over and some cans to rust. If you are left with a can of finish that is more air than liquid, you could transfer the finish to

smaller containers to preserve its useful life. But be careful what kind of container you choose. While coffee cans are good for storing dirty solvents, I would not recommend them for holding any type of finish. Coffee cans may react with the finish, or rust, contaminating the liquid. This is especially true for water-based products.

Glass jars are good storage containers, but make sure the lids create a tight seal and aren't prone to rusting. Jars that once contained acidic products such as pickles generally have well-protected lids.

I work extensively with water-based products and have found that the one-quart and one-pint plastic containers available at any grocery-store salad bar or deli are perfect for storing these finishes.

When transferring finishes to different containers, be sure to apply a clearly written label that will not fade or fall off. The label should include what is in the container, the recipe if it is a mix, and the date you filled the container.

If the original can still has a good seal, there are two other ways to reduce or eliminate air from the container. You can raise the level of finish by adding solid objects such as glass marbles. A less messy way is to spray an inert gas such as Bloxy-

gen into the can, creating a barrier that protects the finish from oxygen.

Determining whether the finish is bad

There are telltale signs that a finish is no longer usable. In some cases, the consistency will have changed. The solids may have settled to the bottom of the can, and no amount of stirring will mix them properly. When a water-based finish has been frozen, the material becomes thick or even congeals.

Shellac and varnish present a different problem because there are no readily visible signs that they have outlived their useful life. The best way to test these products is to put a few drops on a hard, impermeable surface, such as metal or glass. If the drops solidify completely over the next several hours, the shellac or varnish is still good. However, if the drops remain soft, gooey, or sticky after 24 hours, the finish is too old to use.

With any finish product, there's one rule to follow: When in doubt, throw it out. It simply doesn't make sense to risk ruining a project in which you have invested time and money, simply to avoid spending \$20 on a new can of finish.

Just remember to dispose of the material in accordance with local environmental regulations (see *FWW* #160, pp. 133-134). □



TESTING SHELLAC

Shellac that has been around for a while should be tested before use. Place a drop of it on a piece of glass. If the shellac is still sticky to the touch after 24 hours, throw it away. This test also works with varnishes.





OVER
\$2000
IN SAVINGS

FIVE YEAR
5
WARRANTY

X⁵

UP TO
\$500
IN ACCESSORIES

1 of
4
FREE TOOLS

OFFER EXTENDED BY POPULAR DEMAND

DELTA X⁵

IF YOU'VE BEEN DREAMING OF A DELTA
THIS DEAL IS YOUR WAKE UP CALL.

Our X⁵ deal has been such a hit we've extended the offer. When you buy one of our X⁵ tools, it's almost like putting money back in your pocket. Because all X⁵ tools come with your choice of one of 4 free tools or a cash rebate. You'll also get over \$2000 in savings with Delta's X-treme Savings Book, up to \$500 in free accessories and a best in class 5-year warranty. And with a deal this good, your dream can become a reality. Call 1-800-438-2486 (US) or 1-800-463-3582 (Canada).

VISIT DELTAMACHINERY.COM FOR A FREE X⁵ CATALOG.

DELTA and DELTA X⁵ are registered trademarks of Pentair Tools Group. © Pentair Tools Group. 2004

DELTA

Your achievement. Our tools.

READER SERVICE NO. 125

Just look for
the Delta tools
specially
marked
with X⁵.

French Empire Reenacted

When W. Patrick Edwards built this French Empire *bonheur du jour*, he not only reproduced the appearance of the original, but he also reenacted the process of its making. For Edwards, this is business as usual. He has been repairing, conserving, and reproducing antique furniture without the use of modern machines for 35 years.

His passion for French Empire furniture takes him to France twice a year in search of veneer and hardware. He brought his hardware supplier in Paris photos and measurements of the original gilt-bronze locks and keys, column capitals, and bases and discovered that the pieces were practically stock items. His supplier, it turned out, had made the original hardware two centuries before.

Meant as a place to read or write letters, the *bonheur du jour* is mounted on wheels so it can be rolled into the best light. Edwards veneered it with plum-pudding Cuban mahogany and gave it a French-polish finish. For more on how Edwards veneered the columns, see Master Class, p. 108.

—Jonathan Binzen

Photo: Glenn Cormier

