

TAUNTON'S **Fine
Woodworking**

June 1992, No. 94

U.S. \$5.50

Canada \$5.95

U.K. £3.40

Drill-press primer

Raised panels

Russian marquetry

Douglas-fir



Butterfly-Leaf Table



**Buy 3
SANDING ITEMS
GET 1 FREE!**
(MIX and MATCH ITEMS O.K.)

(FREE ITEM = LESSER VALUE OF ALL 3)

EXAMPLE MR. JONES BUYS:

- (1) Box 100 Bosch "F" Wt. Discs 80X \$39.99
- (1) Box 100 Bosch "F" Wt. Discs 120X 39.99
- (1) Box 100 Bosch "F" Wt. Discs 150X 39.99
- (1) Box 100 Bosch "F" Wt. Discs 200X FREE!!!

EXAMPLE MR. SMITH BUYS:

- (1) Box 100 Bosch "F" Wt. Discs 80X \$39.99
- (1) 4 1/2" x 10 yd. Stiky Roll 120X 12.99
- (1) Pk. 50 9 x 11 s/c n/l Sheets 320X 12.99
- (1) ITEM WORTH \$12.99 FREE!!!

BULLDOG GOLD STICKY DISCS for your PORTER-CABLE RANDOM ORBIT SANDERS.

Heavier and with more Adhesive! Buy 3 Boxes of Sticky Discs (100/box). Get 1 Box FREE! (Mix and Match grits O.K.) Extra Heavy Duty "D" weight Sticky Discs.



- Buy 50 . . . GET 50 FREE!
 - #1170 - 5" BULLDOG Discs . . . \$20.99
 - #1180 - 6" BULLDOG Discs . . . 25.99
- (Order in multiples of 50 per grit size. Available in 80, 100, 120, 150, 220 & 320 grits.)

BUY 3...GET 1 FREE!

BOSCH RANDOM ORBIT DISCS "F" and "B" Weight

New! SUPER STRONG BOSCH "F" Weight, Velcro, 8-hole Sanding Discs that last longer.



- Buy 50 . . . GET 50 FREE!
- (Avail. in 80, 100, 120, 150 & 200 grits.)
- 5" BOSCH "F" Wt. . . . \$39.99/100 Discs
- 6" BOSCH "F" Wt. . . . \$49.99/100 Discs

BOSCH Aluminum Oxide non-loading "B" Weight, Velcro backing with 8-hole pattern. Buy 3 boxes of Velcro Discs (100/box), get 1 Box FREE! Buy 50 . . . GET 50 FREE!

- (Order in multiples of 50 per grit size. Available in 80, 100, 120, 150, 220 & 320 grits.)
- 5" BOSCH "B" Wt. Discs \$24.99
- 6" BOSCH "B" Wt. Discs 29.99

BUY 3...GET 1 FREE!

RYOBI 4 1/2" SANDING DISCS

Aluminum oxide non-loading "B" weight Velcro backing with 8 hole pattern. Buy 50 . . . GET 50 FREE! Order in quantities of 50 per grit size. (Avail. in 80, 100, 120, 150, 220 & 320 grits.) O.K. to Mix and Match.



- #1282 - 4 1/2" RYOBI "B" Wt. . . . \$26.99

ALL OUR PRODUCTS ARE GUARANTEED!

SINGLE SLEEVELESS Drum Sanders. Build this BENCHTOP SPINDLE SANDER with our plans and instructions for only **\$11.99**



Plans describe the sliding motor mount that adjusts drum height for full range sanding application.

Sleeveless DRUM SANDERS



- 3/4" x 3" Long \$15.95
- 1" x 3" Long 14.95
- 2" x 3" Long 18.99
- 3" x 3" Long 19.99
- Kit of all 4 64.99
- Drum Sander Plans . . 11.99
- 3" x 10' Pre-cut Sandpaper Roll 12.99

BONUS Kit of all 4 Drums, receive FREE Plans & 1 FREE 3" x 10' Sanding Roll...80, 120 or 220 grit.

BOSCH 5" RANDOM ORBIT SANDER

- VARIABLE SPEED
- DUSTLESS

#3480 - 5" Bosch Sander . . . \$109.99

NOW ON SALE...\$99.99



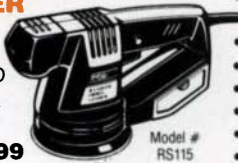
Sanders Shipped FREIGHT FREE!

RYOBI 4 1/2" RANDOM ORBIT SANDER

- DUSTLESS
- LIGHTWEIGHT
- VARIABLE SPEED

#3200 - 4 1/2" Ryobi Sander . . \$79.99

NOW ON SALE...\$69.99



Sanders Shipped FREIGHT FREE!

QUAKER STATE has all your SANDING NEEDS ...all under one roof!

SUNGOLD Sanding Belts

You've Tried the Rest... Now Buy the Best!

BUY 12 BELTS...

GET A BAKER'S DOZEN FREE!
(A Total of 25 Belts)



BELT SIZE	PRICE 25 BELTS	BELT SIZE	PRICE 25 BELTS
1 x 30	\$17.99	3 x 24	\$20.99
1 x 42	18.99	4 x 21	25.99
2 1/2 x 16	18.99	4 x 21 3/4	25.99
3 x 18	19.49	4 x 24	26.99
3 x 21	19.99		

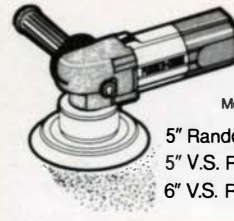
(Avail. in 40, 60, 80, 100, 120, 150 & 220 grits.)

BELT SIZE PRICE FOR 13 BELTS

4 x 36	\$25.99
6 x 48	36.99

Buy 6 Get 7 FREE

PORTER-CABLE Random Orbit Riot!



Sanders shipped freight FREE!

Models #7334, 7335, 7336

5" Random Orbit \$119.99

5" V.S. Random Orbit . . . \$129.99

6" V.S. Random Orbit . . . \$134.99

New! **DUST COLLECTION**

For P-C Random Orbit Sanders. The RIGHT WAY to DUST COLLECT...hood connects your sander to your Shop Vac. 6' Flex Hose included \$26.99



5" Replacement Pad \$14.99

6" Replacement Pad 17.99

5" Contour Pad 14.99

6" Contour Pad 17.99

New! **RANDOM ORBIT SANDER KIT**



#3017K - 5"SS KIT . . . \$205.99

#3018K - 5"VS KIT . . . 215.99

#3021K - 6"VS KIT . . . 229.99

Kit Includes: Sander, Dust Collector, Velcro Conversion Pad, Buffing Kit Contour Pad & 100 Assorted Discs, and Case.

New! **CONVERT YOUR PORTER-CABLE SANDER TO TAKE VELCRO DISCS!**



Tired of using Sticky Discs! Kit includes: (1) 5" or 6" Velcro Conversion Pad and an Assortment of (10) each Super Strong "F" Weight Sanding Discs. 80, 120, 220 grit.

5" Kit . . . \$29.99

6" Kit . . . 39.99

BELT CLEANING STICK 1 1/2" x 1 1/2" x 8"

Makes belts, discs, sleeves, etc...last at least 3x as long but most importantly allows abrasive to cut without burning or excessive scratching. If you don't put that mark in now, you will not have to remove it later!

Cat # 6336 1 stick for . . . \$ 5.99

3 sticks for 10.99

6 sticks for 16.99

QUAKER STATE WOODWORKING SUPPLY

4434 KUTZTOWN ROAD
READING, PA 19560

1-800-776-5467

FOR FAST DELIVERY!

- Check Money Order Discover
- MasterCard Visa C.O.D. (Add \$4.75)

S & H: Under \$30 - add \$3.75. PA residents add 6% sales tax.



FREE SHIPPING

on orders over

\$30.00

CONTINENTAL U.S. ONLY!

DEPARTMENTS

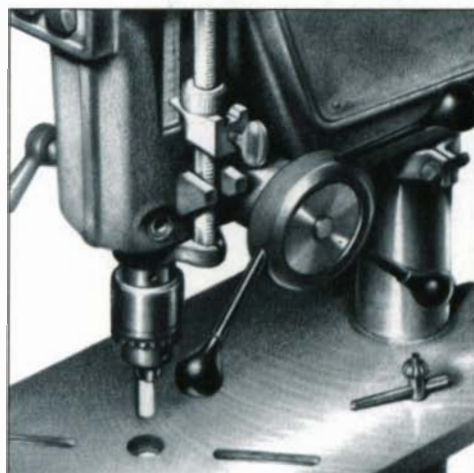
Letters	4	Classified	92
Methods of Work	12	Events	98
Questions & Answers	22	Notes and Comment	104

ARTICLES

A Chest for All Seasons by Christian Becksvort <i>Wood movement is part of the plan for solid construction</i>	38
Belt/Disc Sander Upgrade by William Tandy Young <i>Minor modifications improve belt tracking and dust collection</i>	42
French Polishing for Restoration Work by Scott Lawrence <i>Modern padding finishes update an age-old technique</i>	46
Flip-Stop Fence for a Radial-Arm Saw by Art Duser <i>The track-mounted stop is always handy</i>	49
A Butterfly Expansion Table by Paul Schürch <i>Self-storing leaf hides under the top</i>	50
Drill Press Primer by Bernie Maas <i>And tips on sharpening woodworking drill bits</i>	55
Tuning Your Drill Press by Robert M. Vaughan <i>How to find and eliminate vibration, play and wobble</i>	60
The Marquetry of Vadim Aksyeonov by John Humboldt Gates <i>An artist creates wooden renderings of Russian landmarks</i>	62
Machining Raised Panels by Joe Beals <i>And beveling panels by hand</i> by Tom Wisshack	65
Bowl Turning with a Glue Block by Jack Warner <i>And quick repairs with cyanoacrylate glue</i> by Giles Gilson	70
A Kerf-Bent Mirror Frame by Ken Picou <i>Sawcuts turn the corners and epoxy fills the voids</i>	73
Confessions of a Junkyard-Motor Junkie by Ted Myers <i>Finding, cleaning and wiring cheap machine power</i>	76
Douglas-Fir: It's Not Just for Studs Anymore by Jon Arno <i>A tough softwood makes a great furniture wood</i>	80



Making raised panels, p. 65



A close look at a drill press, p. 55



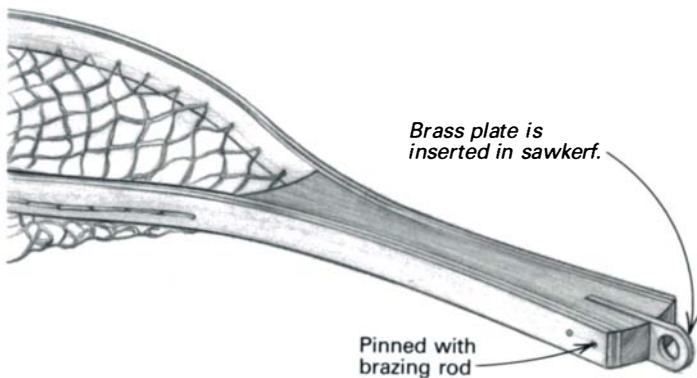
Building a solid-wood chest, p. 38

On the Cover: A tight shot of the mechanism for a butterfly-leaf table. How to design and install one of these self-storing table leaves on p.50. Photo: Sandor Nagyszalanczy.

A tip on random orbit sanders from the auto shop—As an auto-body-repair instructor and an old car restorer, I enjoyed the article on random-orbit sanders in *FWW* #92. Random orbit sanders, powered with compressed air, have been used for years in body repair. The article failed to mention that 5-in. or 6-in.-dia. sandpaper can be purchased without adhesive. Disc adhesive comes in either tubes or spray, although I prefer the spray. The back of the sandpaper can be sprayed and set aside for use later that day. It's good to also apply a little adhesive to the sander's pad occasionally. This system is more economical than using pre-glued discs, and the discs come off the pad much easier. Auto-parts stores that carry body supplies will have both the discs and the adhesive.

—Will Boksa, Adams, Wisc.

An improved landing net



I read the article by Geoffrey Carson on laminating a landing net in the February 1992 issue of *FWW*. I made a similar net several

years ago, and since then I have made several more for fishing friends. It concerns me, however, that the author chose to "install a brass screw eye" to complete his net. I suggest that this is tantamount to going to the store to buy a trout for the lead photo.

I think the method I use, as shown in the drawing above produces a sturdier attachment and a more aesthetic look appropriate to a fine woodworking project. I made a plate from 20-gauge brass, drilled a 1/4-in.-dia. hole near one end and inserted the plate in a kerf in the end of the handle. The plate is pinned in place with brass brazing rod. —Renzo Gervasoni, Ridgewood, N.J.

Justice is done—Jon Arno's and Rudi Wolf's articles about chestnut in the February 1992 issue of *Fine Woodworking*, reminded me of a true story related to me during my apprenticeship, regarding the similarities of our native Sweet Chestnut with English Oak (*Quercus robur*).

When the proprietor of the local timber yard died, his elder son called upon an undertaker who had purchased wood for coffins from his father for many years and asked him to carry out the funeral arrangements.

The arrangements were made, the coffin was built and the son went to the undertaker to pay him for his services. The son stated that the only fault he could find with the oak coffin he had ordered was that it was made of chestnut. To this the chagrined undertaker replied that the father had sold him the chestnut as oak.

—C. B. Reedman, Market Harborough, Leics., England

Surface-jointing convex side down—The article, "Stock Preparation" by Mark Duginske (*FWW* #92), thoroughly covered an often-neglected subject. But, in my experience, face jointing a bowed board with its concave side down is self-defeating.

Fine Woodworking Magazine

Executive Editor Jim Boesel

Managing Editor Sandor Nagyszalanczy

Art Director Kathleen Rushton

Assistant Editors Charley Robinson,

Vincent Laurence, Alec Waters

Copy/Production Editor Deborah Surprenant

Editorial Secretary Claire Warner

Contributing Editors Tage Frid,

R. Bruce Hoadley, Christian Becksvoot,

Robert M. Vaughan, Mark Duginske

Consulting Editors George Frank,

Norman Vandal

Methods of Work Jim Richey

Indexer Harriet Hodges

Publisher John Lively

Assistant Publisher James P. Chiavelli

Circulation Manager Brenda Hamilton

Marketing Coordinator Susan Roman

Administrative Secretary Susan M. Clark

Advertising Sales Manager Dick West

National Accounts Managers Barney Barrett,

Larry White

Advertising Coordinator Kathryn Simonds

Advertising Secretary Betsy Quintiliano

Tel. (800) 283-7252 Fax. (203) 426-3434

Fine Woodworking Books & Video

Publisher John Kelsey

Associate Editor Andy Schultz

Secretary Barbara Hudson



The Taunton Press: Paul Roman, president; Janice A. Roman, vice president; Carolyn Kovalski, administrative secretary. **Corporate Staff Directors:** Susan Edelman, design; John Kelsey, editorial; John Lively, chief of staff; Jan Wahlin, marketing. **Accounting:** Wayne Reynolds, controller; Patrick Lamontagne, manager; Jeffrey Sherman, financial analyst; Mary Sullivan, general ledger supervisor; Carolyn Stiles, Jr. cost accountant; Carol Diehm, accounts payable supervisor; Susan Burke, accounts payable clerk; Lawrence Rice, credit supervisor; Lydia Krikorian, senior collection clerk; Judith Rivera, Victoria Theobald, collections clerks; Diana D'Onofrio, payroll coordinator; Andrea DuBois, Elaine Yamin, junior accountants; Dorothy Blasko, secretary. **Corporate Design:** Philip Allard, corp. promotion manager; Steven Hunter, art director; Wendy Bowes, Judy Lind, associate art directors; Mary Beth Cleary, promotion production coordinator; Francesca Arminio, promotion asst. **Art Production:** Robert Olah, manager; Catherine Cassidy, Jodie Delohery, Henry Roth, associate art directors; Iliana Koehler, production assistant. **Copy/Production:** Ruth Dobseva, managing editor; Peter Chapman, Pamela Purrone, copy/production editors. **Corporate Sales:** Dale Brown, director; Donna Picpont, public relations manager; Diane Patterson, executive secretary; Andrea Ondak, trade and special sales manager; Barbara Buckalew, retail marketing coordinator; Marcie Siegel, publicity/trade sales asst.; Lori Moir, telemarketer. **Data Processing:** Drew Salisbury, manager; Brendan Bowe, fulfillment systems manager; Roger Seliga, financial systems manager; Gabriel Dunn, programmer/analyst; Arthur Caron, Robert Nielsen, programmers; J. Larry Kinnear, tech. services admin. Sherill Kolakowski, computer support technician. **Folkwear:** Cheryl Clark, manager; Garol Gee, admin. asst.;

Gregory McMahan, pattern designer. Fulfillment & Operations: Tom Luxeder, director; Jane Torrence, secretary. **Client Services:** Patricia Wilianson, coordinator; Roxanne Frimmet, Megan Sangster, client services representatives; **Customer Service (Subscriber):** Patricia Malouff, manager; Nancy Schoch, senior customer service rep; Donna Weinstein, Diane Hurlv, Marylou Thompson. **Mail Processing:** Joyce McWilliam, supervisor; Gayle Hammond, Barbara Lowe. **Customer Service (Trade):** Christine Cosacchi, supervisor; Kristen Boeckmann, cust. service rep.; Peggy LeBlanc, Denise Pascal, data entry. **Distribution:** Paul Seipold, manager; Grace Aumuller, David Blasko, Michael Capalbo, James Chappuis, Mary Ann Costagliola, Maureen Flynn, Fred Monnes, Alice Saxton, Astor Taylor, Robert Weinstein; Linnea Ingram, secretary. **Purchasing & Facilities:** William Schappert, manager; Lois Beck, office services supervisor; Chuck Hollis, maintenance foreman; Mark Cole, maintenance assistant; Christopher Myers, buyer; Donna Freeman, chef/manager; Kathleen Costello, Norma-Jean Taylor, assistants. **Subscription:** Carole Ando, manager; Connie Barczak, Bonnie Beardsley, Brigitte Blais, Madelaine Frengs, Marie Pato, Andrea Shorrock. **Manufacturing:** Kathleen Davis, director. **Prepress:** Austin E. Starbird, manager; Robert Marsala, graphic arts supervisor; Susan Kahn, staff photographer; Nancy Atkinson, Chansam Thammavongsa, production assistants; Deborah Cooper, color center supervisor; Richard Booth, night-shift supervisor; Mark Coleman, William Godfrey, Laurene Jakob, color system operators; Nancy Knapp, composition production coordinator; Margot Knorr, publications applications manager; Monica Murphy, desktop publications associate; Lisa DeFeo, system operator. **Print Production:** Diane Flanagan, manager (promo); Thomas Greco, manager (books); Rosemary Pagel, associate (books); Philip VanKirk, manager (magazines); Deborah Baldwin, associate (magazines); Tracie Pavlik, secretary. **Personnel:** Carol Marotti, manager; Linda Ballerini, Chris Lincoln, personnel assistants. **Video:** Craif Umanoff, video coordinator; Thomas Menard, asst. video producer.

Copyright 1992 by The Taunton Press, Inc. No reproduction without permission of The Taunton Press, Inc. *Fine Woodworking®* is a registered trademark of The Taunton Press, Inc. **Subscription rates:** United States and possessions, \$25 for one year, \$45 for two years, \$66 for three years; Canada and other countries, \$30 for one year, \$55 for two years, \$80 for three years (in U.S. dollars, please). Single copy, \$5.50. Single copies outside U.S. and possessions: U.K., £3.40; other countries and possessions, \$5.95. Send to Subscription Dept., The Taunton Press, PO Box 5506, Newtown, CT 06470-5506. For orders only, call (800) 888-8286. Address all correspondence to the appropriate department (Subscription, Editorial, or Advertising), The Taunton Press, 63 South Main Street, PO Box 5506, Newtown, CT 06470-5506. List management: The Kleid Co., 530 5th Ave., New York, NY 10036-5101.

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*, PO Box 5506, Newtown, Conn. 06470-5506.

Title to the copyrights in the contributions appearing in *Fine Woodworking* magazine remains with the authors, photographers and artists, unless otherwise indicated. They have granted publication rights to *Fine Woodworking*.

D.C. Mitchell
Quality Reproductions of
Period Hardware



Send For Free Brochure
1132 F Powderhorn Drive
Newark, DE 19713 (302) 998-1181

READER SERVICE NO. 78

Victorian Settee Order Today!

\$12.⁰⁰ ppd



FULL-SIZE PATTERNS
and easy assembly instructions.
Featuring contoured seat and back.

HERITAGE MFG. CO. (713) 861-6801
P.O. Box 2781, Houston, TX 77252
Patterns Mailed Next Day

Also available: Chair - \$11.00; Chaise - \$12.00;
Swing/Glider - \$13.00; or, all four models - \$19.95



Polycrystalline
**DIAMOND
TIPPED
LATHE TOOLS**

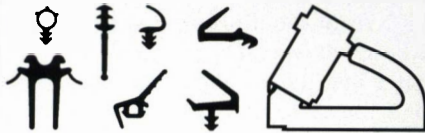
- Razor Edge Sharpness
- No Resharpening
- Fine Finishes
- Precision, Clean, Fast Cutting
- Recommended for All Woods

For Brochure, Send \$1.00 Refunded with first purchase.
CTT P.O. Box 1596, Orem, Utah 84057-1596
or call 801-221-9465

CUTTING TOOL TECHNOLOGIES, INC.

READER SERVICE NO. 153

WEATHERSEALS



We stock the worlds largest selection of silicone rubber window and door weatherstripping. Most can be milled inconspicuously into jambs, edges, or door bottoms, giving any millwork shop or builder the means to make permanently airtight windows and doors. Our affordable corner-grooving machine even makes field retrofitting incredibly easy. We also offer an assortment of other quality seals, glazing gaskets, shimming screws, and multi-point door hardware.

RESOURCE CONSERVATION TECHNOLOGY, INC.
2633 North Calvert Street Baltimore, MD 21218
(410) 366-1146

READER SERVICE NO. 32

FORREST

The World's Finest
Dado Head
Clean Cuts All
Your Grooves!

*"No tearout on all
five woods tested"*

**See Fine Woodworking, July/
August, 1991, p. 59*

• **NO SPLINTERING** —
cross-cutting oak, ply
veneers and melamine.

• **PERFECT FLAT-
BOTTOM GROOVES** —
not staggered steps or round bottoms like a wobble-dado leaves!

• **CUTS IN ALL DIRECTIONS** —
rip, cross-cut, miter, any depth.

• **CUTS ALL SIZED GROOVES** —
1/4" thru 1 1/4" in 1/16" increments. (Set of .005" plastic adjusting shims included).

• **SUPER-HARD CARBIDE** —
gives up to 300% longer life, especially good on ply woods and abrasive particle-boards.



**Here is why this
great Dado Head
has no equal!**

C-4 Carbide Tips — 24
on each saw blade —
twice as many as most
competitors.

C-4 Carbide Tips —
4 on each chipper, with
special face hooks.



SPECIAL SALE!
10% OFF!

FORREST

FORREST MANUFACTURING COMPANY, INC.
461 River Road, Clifton, N.J. 07014
PHONE TOLL FREE!

(800) 733-7111

In NJ: (201) 473-5236 FAX: (201) 471-3333

8"-5/8" Bore
List \$299
SALE \$269

10"-1" Bore
List \$362
SALE \$325

Plus \$5.50 Shipping



We honor Amex, Visa & Master
Card, Money Orders, Personal
Checks and COD's. TO ORDER
BY MAIL clip ad, circle choices
and enclose payment. Specify
Dept. PW when ordering.

READER SERVICE NO. 160

E-Z Products,
the newest
David R. Webb Company
Division, is now
able to deliver these
quality products.

- Veneer Edgebanding
- Metallic Edgebanding
- Flexible Sheet Veneer
- Hotmelt Glue
- Tambour

Quality, Volume,
Service...

That's

**VALUE
PLUS**



e-z products

1137 Foust Avenue
High Point, North Carolina 27260
Telephone 919/884-5357
Fax 919/884-1329

READER SERVICE NO. 144

When jointing or planing a board, the ends will usually bow toward the side being machined. Therefore, by jointing the convex side, the bow will lessen considerably after a couple of passes. This is most evident in longer boards and enables you to get the maximum usable length from a bowed board.

To joint a face convex side down, start with one end on the outfeed table, and feed as normal. The difference in height between the two tables will help keep the board from rocking. If necessary, support the near end with your fingers to hold the gap between board and table about equal at both ends. Make a pass or two, removing wood from the middle of the board. (Since only the midsection is being jointed, the pass will be completed before your hands get too near the cutterhead.) When there's enough flat area to make a complete pass, use a push block to feed the last foot or two over the cutterhead. Remember, while jointing, to note the feed direction that gives the least amount of tear out.

When you move to the planer, feed the opposite end through first, and check for a bow after each pass. If it reoccurs, planing a little more off the convex side should straighten it without having to rejoin.

I have had good results with this method and have saved myself from digging through the woodpile for straight boards.

—Thomas J. Loizeaux, Youngsville, Pa.

An alternative to steam-bending a dowel—In the “Q&A” section of *FWW* #93, Mr. Jim Ward inquired about bending a 1-in.-dia. dowel into a U-shape. I would like to offer a change in tactics that might make the project a little easier.

Although people have been bending walking-cane handles for a long time, it is easy to underestimate the forces at work when steam-bending a piece like this. Mr. Ward's project uses a 6-in. inside radius with a 180° arc. Once bent, the outer surface of the 1-in. thick piece will measure over 3 in. longer than its inner surface. To visualize this, take a 1-in.-thick bundle of thin strips that are 1 in. wide and all the same length. Hold one end of the strips even, and bend the bundle around a 6-in. radius until it forms a U-shape. To make the bend, the inner layer will slide past the outer layer by more than 3 in.

This graphically illustrates how much the fibers on the outer surface of a steam-bent piece of wood must stretch, and how much those on the inner surface must compress.

An easier way to make the bent piece would be to laminate together a bundle of thin strips like the ones I used to illustrate the principle of stretching and compressing. Depending on the thickness of the strips, they may have to be softened by steaming for about 15 minutes before bending, so they won't break. When the strips are pliable, clamp the bundle over a form with a 6-in. radius. After the bundle has cooled, remove it from the form, spread glue on both surfaces of each strip (except the inner and outer surfaces) and once again clamp the bundle to the form. Wait overnight for the glue to set, and then sand the edges smooth and make a router pass on each corner with a 1/2-in.-radius roundover bit to make the square stock into round stock. With this method, there should be little if any spring back.

—Lon Schleining, Belmont Shore, Cal.

Beware of methylene chloride—As a professional furniture restorer/refinisher, I look forward to receiving *Fine Woodworking* each month as both a source of knowledge and inspiration. Michael Dresdner's article “Removing an Old Finish” in the April, 1992 issue of *FWW* was very informative, but there are a couple of points I'd like to add.

First, when stripping furniture indoors, which is at best a risky activity, it is important to understand that the methylene chloride fumes are heavier than air. These fumes will sink to the floor and accumulate there. Ventilation should be provided by an ex-

plosion-proof fan mounted or vented low to the floor. Second, readers should know that wearing a standard organic mist/lacquer type respirator will not provide protection against methylene chloride fumes.

Some time ago I read that methylene chloride is a suspected carcinogen. Soon thereafter I started bringing my projects to a professional stripper who is equipped to hand strip each piece in a relatively safe environment.

We need to use common sense in handling some aspects of working wood. Some precautions are obvious, like using the safety guards on tools, but others, like those needed when working with solvents, finishes and adhesives, require more education and knowledge.

—Robert S. Judd, Canton, Mass.

Chlorine bleaching compounds can cause rust—I'm writing in response to Michael Dresdner's article, “Removing an Old Finish” in *FWW* #93. Near the end of the article, Dresdner recommends using either chlorine laundry detergent or swimming-pool chlorine to wash pieces after stripping. I wish to warn your readers that this activity should *not* be performed in the workshop because chlorine is very corrosive to iron and steel. Chlorine that evaporates into the air will attack any unprotected iron or steel surface if the concentration of chlorine ions is high enough.

Last summer I thoughtlessly stored an open container of swimming-pool chlorine in my semi-damp basement workshop. My bar clamps, hand screws and the guide rails on my record vise all rusted overnight. Fortunately, all of my hand tools were put away in cabinets, and my table saw and jointer were covered.

—Carl Dorsch, Pittsburgh, Pa.

Troubled by “Troubled by current trends”—After reading Jeremy Singley's letter, “Troubled by current trends” in the April 1992 issue of *Fine Woodworking*, I became disturbed by Mr. Singley's observation that “woodworking isn't art and never will be.” Perhaps *his* woodworking isn't art and never will be, but to say all woodworking isn't art is unjust and indicative of a very narrow vision of working wood.

The medium does not determine whether or not a piece is art. Wood is a very viable medium for art. An art piece in wood can exhibit all the finer points of furnituremaking that Mr. Singley holds dear—elegance, warmth, finesse—and it *can* be enjoyed long term just like his rocker. I have several “art pieces” I made years ago and I never tire of admiring their lines or touching the warmth of the various woods I used. The mark of any good work, whether “art” or furniture, is to hold one's interest without wane for a lifetime.

While I, like Mr. Singley, don't particularly care for “purple boxes with spikes and orange beads,” I do respect someone's desire to make such expressions and will defend his right to do so. Certainly carbon-copy art is very tiring but so is carbon-copy furniture and craft projects.

The public and woodworkers/artists alike should realize that there is a need for both wood furniture and wood art. Wood is too wonderful a material to be limited to only one use. To say we should all be making the same things is a travesty. Mr. Singley would not be happy producing art—I would not be happy just making furniture.

—Steven M. Krause, Gosben, Ind.

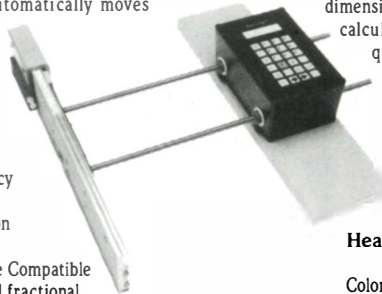
A key to safety with power tools—I just finished reading the fine article “Wiring a Home Shop” by Grant Beck in the March/April 1992 issue and have a suggestion that may appeal to readers planning a home shop.

For the safety of my grandchildren, I have all my shop's power-tool and workbench outlets wired through a key switch in the shop. This type of switch (available from large electrical suppliers) is turned on and off by inserting a special double-

INTRODUCING THE ULTIMATE IN POSITIONING JIGS

Bringing computer technology to woodworking, the AutoJig™ positioning jig automatically moves the fence on your router table or table saw.

- Motor positioned fence
- 1/256" accuracy
- Fast setup
- Four-function calculator
- Incra® Fence Compatible
- Decimal and fractional entry



MADE IN USA

READER SERVICE NO. 142

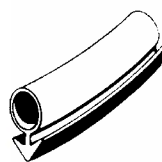
END TEMPLATE RESTRICTIONS

Enter your board width and router bit dimensions, and the AutoJig will calculate the fence positions required to cut dovetails and finger joints. The AutoJig provides a new level of accuracy and flexibility to wood creations.

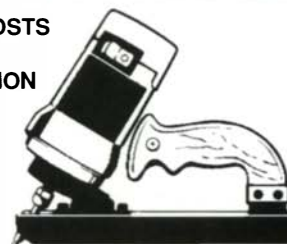
Call or write for a brochure and ordering information.

Heartwood Technology
P.O. Box 50324
Colorado Springs, CO 80949
(719) 599-9321

THE BEST WEATHERSTRIPPING SYSTEM AND MATERIAL AVAILABLE SILICON BEAD WORKS IN CURVES AND CORNERS



- CUTS ENERGY COSTS
- LOOKS BEST
- EASY INSTALLATION
- OUTLASTS MOST HOMES



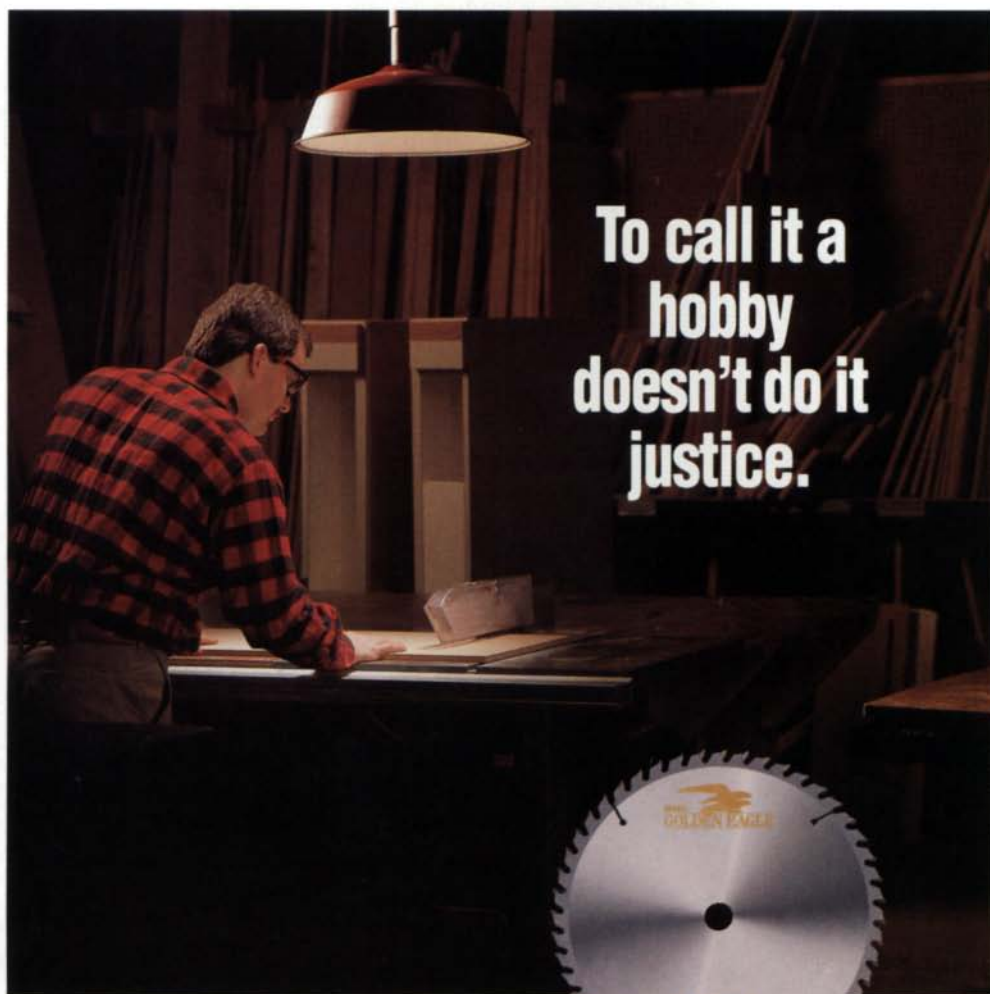
Complete kits: \$399.00

FOR INFORMATION AND DEALER PRICING CONTACT:

WEATHERBEAD SYSTEMS

81-824 TRADER PLACE, C-5, INDIO, CA 92201 1-800-966-0159

READER SERVICE NO. 16



To call it a
hobby
doesn't do it
justice.

And to say Golden Eagle™ saw blades cut better doesn't tell the half of it. Dyanite® carbide tips help Golden Eagle blades cut 2 to 5 times longer than any industrial carbide saw blade.

They hold a sharper edge for a visibly smoother cut. Dyanite carbide holds that edge longer for more cutting. And Golden Eagle

blades can be resharpened as easily as any carbide saw blade.

Call DML for the distributor nearest you. And see for yourself how a better saw blade can help you with your "hobby."

DML
Cutting everything but corners.

DML, Inc.
1350 S. 15th Street
Louisville, KY 40210-1861
TEL: 502-635-8100
FAX: 800-833-5460

PRIMARK
MAGNA PROFESSIONAL TOOLS • DML • MAGNA

READER SERVICE NO. 145

Ogee Foot Mouldings



End your
frustrations!

- Various styles, heights, woods
 - No minimum • Affordable
- Fax/phone 1-800-628-0428

Blue Ridge Moulding
Hinton Virginia

READER SERVICE NO. 113

ENGLISH & AMERICAN MADE HARDWARE

WHITECHAPEL LTD
A COMPLETE RANGE OF
THE FINEST FURNITURE MAKERS
HARDWARE



BOX 136, 3650 W. HWY 22, WILSON, WY 83014. TEL 307 739 9478
CALL OR WRITE FOR OUR 48 PAGE CAT \$3.00.

READER SERVICE NO. 304



WAGNER
SAFE-T-PLANER™
For Drill Presses and Radial Arm Saw

For Professional or Hobby Use!
MAKES: Moulding, Rosettes, Raised Panels,
Concave Cuts and Tapered Legs.

ABSOLUTELY SAFE
Impossible to grab or kick back!

Drill Press Kit — \$35.00 Radial Saw Kit — \$40.00
\$3.00 S & H — Add State Tax where applicable
For Radial Saw state the make, model and shaft size.

KIT INCLUDES: illustration guide,
Safe-T-Planer, grinding wheel, arbor and wrench.

Money back guarantee. Free literature available.

G & W TOOL CO., INC.
P.O. Box 691464 • Tulsa, OK 74169 • (918) 486-2761
MADE IN USA

READER SERVICE NO. 127

wishbone shaped key, which I keep hidden from the children. When the switch is turned off, no tools can be turned on by curious young fingers—or stupid old fingers for that matter. The lights are on a separate circuit and, therefore, are unaffected by the key-switch position. As a matter of habit, I also turn the key switch off whenever I leave the house for extended periods so that a crafty housebreaker who might want to construct something from the pieces of low-grade lumber lying around in my shop will not dull my blades or bits.

—G.E. Adams, Green Valley, Ariz.

Refer to Material Safety Data Sheets—The article “Workshop Solvents” (*Fine Woodworking* #92, pp. 80-83) was a fine treatment of the subject; however, I was surprised that the author did not direct readers to the manufacturer’s Material Safety Data Sheets (MSDS).

Every manufacturer must prepare a MSDS For each product. It lists the contents of the product, the potential hazards and the precautions to be taken in its use. Contractor’s are required by law to maintain a file of these sheets for every product used, so their employees can refer to them. These sheets are readily available from all manufacturers, if not from your local supplier.

—William B. Fink, Jr., Mechanicville, N.Y.

Not a hydrocarbon—In George Mustoe’s article “Workshop Solvents” in the January/February 1992 issue of *Fine Woodworking*, carbon tetrachloride is incorrectly identified as a halogenated hydrocarbon. Carbon tetrachloride is not a hydrocarbon because no hydrogen is present.

A glaring error such as this tends to cast doubt on the technical accuracy of an otherwise informative article. Certainly, more

information on this important topic is needed by those of us who expose ourselves to these chemicals. Keep trying.

—Charles G. Berendsen, New York, N.Y.

George Mustoe replies: While other common halogenated shop solvents are all hydrocarbons, carbon tetrachloride technically is not a member of this group. Although its molecular structure lacks hydrogen, as Mr. Berendsen points out, the chemical and physical properties closely resemble the halogenated hydrocarbons (perchloroethylene, methylene chloride, etc.). For this reason, in non-scientific articles, carbon tetrachloride is often lumped into the same group, a classification scheme that makes sense to woodworkers but offends the sensibilities of organic chemists. Perhaps it would be better to call all of these substances halogenated organic solvents, using a more general level of chemical taxonomy.

—George Mustoe, Bellingham, Wash.

Follow up

Problems with Kuster Manufacturing—We have received several complaints from readers about a former advertiser, Kuster Manufacturing, of Belle Mead, N.J., makers of large wide-belt and drum sanders. Readers report that machines are ordered and paid for but often not delivered. If the machine is delivered, it usually does not run as it should. When buyers attempt to contact the manufacturer, their calls are not returned.

Our advertising sales manager, Dick West, phoned the Somerset County, N.J. consumer complaint division and learned that there is a case pending against the company. He was encouraged to direct all complaints against Kuster Manufacturing to their consumer complaint division (908-231-7000, Ext. 7400).

WIDEBELT SANDERS
...for the **Small Shop**



24" capacity
Automatic Belt Tracking
Quick Change 25x60 Belt
Heavy Conveyor Feed
Single Phase Standard
Simple, Reliable, Fast
Beautiful Finish
A REAL AMERICAN MADE WIDE BELT FOR A DRUM SANDER'S PRICE NOW \$3995.00
(FOB QUILCENE)

MILLER WOODWORKING MACHINERY, INC.
1110 EAST QUILCENE ROAD
QUILCENE, WA 98376 (206) 765-3806

READER SERVICE NO. 24

WOODWORKER'S CATALOG

Over 4000 products to **BUILD, REPAIR, RESTORE, REFINISH** anything made of wood!

It's the catalog woodworkers rely on—116 pages jam-packed with fine woods, veneers, tools, finishing supplies, and much more—all top quality, all reasonably priced, all with our 60-day no-questions-asked guarantee. For your 2-year subscription send \$1.00 to:



CONSTANTINE
Serving Woodworkers for 180 years

Dpt. 37205, 2050 Eastchester Rd., Bronx, NY 10461

READER SERVICE NO. 158

HEAVY GLASS MIRROR CRAFT
GLASS TABLE TOPS
1/4" - 3/8" - 1/2" - 3/4" - 1" THICK GLASS
"USING GLASS MAKES SENSE!"

Using Us Makes BETTER SENSE!



MANY EXCLUSIVE EDGEWORKS!

- DOUBLE PENCIL
- CONCAVE BEVEL
- CHAMFFER AT 45°
- FLAT POLISHED
- O.G. EDGE
- 1" BEVEL
- QUARTER BULL NOSE
- PENCIL POLISHED
- O.G. BEVEL
- TRIPLE BEVEL
- DOUBLE BEVEL

- Low Factory To You Pricing
- Low Transportation Costs
- Prompt, Courteous Service
- Toll Free Order Department
- Two Factories To Serve You Better In Michigan & Georgia
- We Guarantee Quality & Satisfaction

NATIONAL TOLL FREE NUMBERS

NORTHERN PLANT 1-800-528-5544 MICHIGAN 1-800-627-7238	SOUTHERN PLANT 1-800-999-1192 ATLANTA 1-404-881-0892
---	--

For **FREE IDEA BROCHURE** Write:
Glass & Mirror Craft Industries, Inc.
2111 HAGGERTY ROAD • P.O. BOX 516
WALLED LAKE, MICHIGAN 48088

READER SERVICE NO. 130

Full-Size Professional Plan ADIRONDACK CHAIR



Make this classic American design. Our special version may be folded for storage by using ordinary hardware available at your local store. Be ready for Summer and get your plan now!

Plan #700 \$14.00
(catalog free with order)

CATALOG 200 full-size professional furniture plans — \$3.00

FURNITURE DESIGNS, INC., Dept KA-52
1827 Elm Dale Ave., Glenview, IL 60025
(708) 657-7526

READER SERVICE NO. 303

SKIL



A great new dustless random-orbit sander

This powerful (6 amps) sander will sand almost as fast as a belt sander with coarse paper or smoother than an orbital sander with fine paper...the ideal sander for home or shop, at a great price! #7584

Introductory Sale 109.

WHOLE EARTH ACCESS

1-800-829-6300 • 822 ANTHONY ST. • BERKELEY, CA 94710
FREE FRIEGHT VISA/MC

READER SERVICE NO. 72

BUILDING OUR NAME...

BUILDING YOUR DREAMS...

ONE YEAR WARRANTY

SALE

WIDE BELT SANDER

CT-2575 24"	\$4290
CT-3775 36"	\$5390

SHAPER

SP-3400 15 HP	\$469
SK-30SPA 3 HP	\$849
SP-34T TILTING	\$1695

BAND SAW

BS-1316 16"	\$299
BS-0163 16"	\$499
BS-0183 18"	\$649
BS-0202 20"	\$1290

TABLE SAW

HTS0012 12"	\$789
TS-1010 10"	\$1295
TS-1414 14"	\$2690

JOINTER

JT-1007 7"	\$309
JT-1008 8"	\$639
JT-0012 12"	\$1895

WE SPECIALIZE IN CUSTOMER SATISFACTION

LOBO POWER TOOLS

9034 Bermudez Street,
Pico Rivera CA 90660
MAIN OFFICE: (213) 949-3747
ATLANTA: (404) 416-6006
(800) 786-5626 (order only)

READER SERVICE NO. 66

WOOD-PRO Low Odor Non Foaming Long Shelf Life

Instant Wood Adhesive

Instantly Bonds
WOOD • WOOD PRODUCTS
EXOTIC WOODS • TILE
OILY & WET WOODS
SOLID SURFACING MATERIAL
LAMINATES AND MANY
OTHER SURFACES

Four Viscosities
Ultra Thin - Instant Bond
Medium Gap Filling Formula
Maximum Gap Filling Formula
Pro-Gel Formula

"The next generation of instant adhesives." Made in the U.S.A.

Woodcare Products
3548 Riverdale Road
Ogden, UT 84405 801-393-3900
For Orders or Dealer Inquiries 1-800-676-GLUE

Packard Woodworks
P.O. Box 718
Tryon, NC 28782
704-859-6762

Ellis Woodfinishing Products
1538 East Chestnut Ave.
Santa Ana, CA 92705
714-835-0426

READER SERVICE NO. 116

A BETTER FENCE? PRECISELY!

The VEGA SAW FENCE attaches to most saws in minutes and features:

- SPECIAL ALLOY HEAD which glides on chromed steel rails for rigidity and smoothness
- MICRO-ADJUSTER
- FINGER SAVER ATTACHMENT with stock pusher and gauging block (option)
- REAR HOLD DOWN for use with rollers or feeders

VEGA

Route 3, Box 193 Dept. 16
Decatur, Illinois 62526
1-800-222-VEGA

Thoughtfully designed machines made in the USA.

READER SERVICE NO. 106

Fri. & Sat.. 10 a.m.-8 p.m.
Sunday 10 a.m. - 6 p.m.

Box 920, Durham, Ontario
N0G 1R0 (519) 369-6902

August 7, 8, 9, 1992

Widest Variety of Woodworking Tools and Wooden Crafts.
Free Seminars. Wood Art Competition. Children's Workshop.
Send for Complimentary Brochure

THE WOOD SHOW

EXCELLENCE • IN • WOODWORKING

READER SERVICE NO. 65

Penofin® penetrating oil finish for all wood projects... large or small.

Penofin, with its Brazilian rosewood oil base, is perfect for wood paneling, fine furniture or even sculpture like this mahogany frog by Jesse Jones. In transparent colors or natural. For information call Customer Service: outside California 1.800.468.8820; in California 1.800.468.8817.

PERFORMANCE COATINGS INC.
PO BOX 1569, UKIAH, CA 95482

READER SERVICE NO. 52

VACUUM CLAMPING & VENEERING

NEW! LOW COST!

A MUST TOOL FOR THE PRO AND SERIOUS WOODWORKER!

- o Kits start at \$99.
- o Multiple Workshop Uses
- o Preassembled & Tested
- o Increase Production
- o New Capabilities

Air-powered VAKuum Pump (min. .5HP compressor req'd). Rugged construction, no moving parts. Multiple uses in the workshop. Use the VAK PUMP for VAKuum Klamping and VAKuum Bag Veneering. Develops over 1800 #/sq.ft. of Klamping or Pressing force. You can use dozens of jigs and fixtures to hold small, large or odd shapes for clamp-free routing, sanding, sawing, etc. You can veneer large, small, straight, round, curved or odd-shaped pieces.

CALL 1-800-547-5484 NOW

MADE IN THE U.S.A.

for information on how it can work for you.
Quality Vacuum Products 32 Longmeadow Rd. Lincoln, MA

READER SERVICE NO. 101

Flopped photo leads to confusion—Several readers have written in to point out that the lead photo of “Wiring a Home Shop” in *FWW* #93, p. 58 contains incorrect and dangerous information. Because the transparency was flopped, the receptacle appears to be incorrectly wired. The black wires are attached to the gold screws as they should be, but because the photo presents a mirror image of a correctly wired receptacle, the gold screws are on the wrong side. In addition, the wires appear to be wrapped around the screws in the wrong direction. The wire should be wrapped in a clockwise direction so that when the screw is tightened, the wire will be forced more securely beneath the screw’s head.

Miter gauges are incorrectly identified



The caption for the photo above, which ran on p.74 of *FWW* #93 in Daniel Westberg’s article “After-Market Miter Accessories,” was incorrect. The names of the miter gauges on the left and right were

swapped. The caption should have read: From left to right, Accu-Miter, Multi-purpose Mitre Gauge and Performance Mitre Gauge. Sincere apologies to the manufacturers and the readers.

In the chart included in the miter-gauge article, Rib Mountain Tool Works is correctly listed as the manufacturer of the Fast-Trak miter gauge. However, the FastTrak is available only from Garret Wade, (161 Avenue of the Americas, New York, N.Y. 10013; 800-221-2942), not from the manufacturer.

The Incra Miter Slider, an 18-in.-long aluminum bar with two adjustment screws that expand the bar for a tight fit in the miter-gauge slot, is discussed in Westberg’s article on p.77. The author states that when crosscutting a board more than 10 in. wide, one of the adjustment points will be withdrawn from the slot, thereby compromising the squareness of the cut. The manufacturer contacted us to clarify this point. The Miter Slider is designed to be used as a runner on a sliding tablesaw crosscut jig (as shown in the plans included with the bar). When used this way, the bar is mounted at the back of the jig so that on a standard 27-in.-wide saw table, the jig can be made to handle a crosscut of up to 18 in.

About your safety:

Working wood is inherently dangerous. Using hand or power tools improperly or neglecting standard safety practices can lead to permanent injury or death. So don’t try to perform operations you learn about here (or elsewhere) *until you’re certain that they are safe for you and your shop situation.* We want you to enjoy your craft and to find satisfaction in the doing, as well as in the finished work. So please keep safety foremost in your mind whenever you’re in the shop.

—John Lively, publisher

TRANSPOWER

When it comes to the finest quality at the most reasonable price
TRANSPOWER is proud to say “WE STAND FOR IT!”

For orders & catalogue call
1-800-654-7702

<p>SHAPER / ROUTER MACHINE Extra Large Table Only \$698</p>  <p>1", 3/4" & 1/2" spindles, 1/4" & 1/2" router bit chucks, 3 HP motor, 25" x 22" milled table, T-slot miter gauge, 8000 / 11000 reversible 2 speeds, 3" spindle travel, independent precision fence, 6" insert opening, side & top spring hold-downs.</p> <p>SP860 Tilting spindle shaper \$1250 HP600 3HP shaper, 28" table \$825 DH150 1 1/2 HP shaper \$450</p>	<p>12" AUTO PLANER</p>  <p>12" x 6" max capacity 2HP 16 amps motor AP125 10" planer \$298 AP150 12" planer \$328</p>	<p>AUTO PLANER</p>  <p>AP650 15", 2 HP \$685 AP800 16", 3 HP \$725 AP200A 20", 3 HP \$1195 AP400 24", 7 1/2 HP \$2690</p>	<p>BAND SAW</p>  <p>SB500 14", 3/4 HP \$285 SB600 16", 1 1/2 HP \$495 SB800 18", 2 HP \$625 SB800 20", 3 HP \$1340</p>	<p>TABLE SAW</p>  <p>MS250 10", 1 1/2 HP \$350 TS200A 10", 3 HP \$745 TS200HD 10", 3 HP \$985 TS300HD 12", 3 HP \$1495</p>	<p>AUTO FEEDER</p>  <p>RF150 1/4 HP \$365 RF180 1/2 HP \$395 RF350 1 HP \$625</p>
<p>EDGE SANDER</p>  <p>SD800 6" x 90" belt, 2 HP \$435 SD1200 6" x 130" belt, 2 HP \$980</p>	<p>JOINTER</p>  <p>JT650A 6", 1HP \$295 JT860 8", 2 HP \$595 JT980 8", 2 HP \$695 JT1200 12", 3HP \$1695</p>	<p>DUST COLLECTOR</p>  <p>747 1 HP, 2 bags \$168 2000 2 HP, 2 bags \$285 3000 3 HP, 2 bags \$385 4000 3 HP, 4 bags \$485</p>	<p>AIR DRUM SANDER</p>  <p>1 HP motor, 1725 RPM 6" x 9" sanding brush, 4" x 9" air drum, 1" shaft, 3 Speeds \$285</p>	<p>WOOD LATHE</p>  <p>CP1000 40" copy lathe \$365 HD1500 40" Heavy duty lathe cast iron bed \$595</p>	

TRANSPOWER

TCM Industries, Inc.

For inquiries & information call (714) 594-7099
322 Paseo Sonrisa, Walnut, CA 91789




READER SERVICE NO. 156

New! Glide-Easy Saw™
The Ultimate 4x8 Cutting Panel Saw

The Glide-Easy Saw acts like a 10ft long radial arm saw. Align a 4x8 sheet to the cutting line. Then simply glide the saw.

The Glide-Easy Saw is safe & precise. Build yours from easy assemble kit. **Only \$185 + tax & S/H**

- Use your 7 1/4" circular saw
- 4 precise roller bearings
- Use your 2" electrical conduits

To order write to:
IPD 1556 Halford Avenue #363
Santa Clara, CA 95051
Phone (408) 296-4066

READER SERVICE NO. 5

ROUSSEAU MiniSaw PortaMax

For contractors, cabinet shops, glass shops, home hobbyists, etc.

Pat. Pend.
P.M. 2720 P.M. 2700 P.M. 2710
Folded P.M. 2700

SHOWN WITH ATTACHMENTS

FEATURES

- Converts benchtop saws into full size table saws.
- Can rip 27"/49" with optional extension.
- Fence is secure out to end when locked in position. Set screws for square adjustment.
- Hairline indicator and tape measure for safe, accurate and quick set ups.

For the dealer nearest you please call or write:

ROUSSEAU CO.
1712 13th St.
Clarkston, WA 99403
1-509-758-3954
1-800-635-3416

READER SERVICE NO. 99

ANTIQUE reproduction furniture HARDWARE

HORTON BRASSES
Nooks Hill Rd., PO Box 120F
Cromwell, CT 06416
203-635-4400
send \$3.00 for a catalog

READER SERVICE NO. 302

NEW VIDEO TAPE AMERICAN MADE, HEAVY DUTY! DRUM SANDER

Sand boards, frames, doors, veneer, knots, wild grain perfectly flat and smooth every time!

Reduce sanding time from hours to minutes!

Delivers sanding precision equal to large wide belt sanders at an affordable price!

This is the best drum sander in the world. It has quality features not found on other brands.

NEW video tape \$9.95 (+\$2 s/h). Refund for 30 day return credited against machine purchase.

EXCALIBUR MACHINE CORP.
P.O. Box 82
Anderson, MO 64831
 PLEASE SEND ME A FREE BROCHURE **1-800-368-ROSS**

ROSS

READER SERVICE NO. 25

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.

No test cuts. No wasted wood. Fast setup. Unlimited widths. Classic and variable spacing. Compound angles. Box joints. Curved dovetails. 20 year warranty. Made in USA since 1976.

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

To find out more, contact your Dealer or **KELLER & CO.** Dept. F52
1327 'I' Street, Petaluma, CA 94952
(707) 763-9336

The Keller Dovetail System
Simply the best.

READER SERVICE NO. 134

MLCS, Ltd.

1/4" or 1/2" Shank Carbide-Tipped Router Bit Molding Plane Profiles

\$24.95/\$29.95
\$27.95
\$29.95
\$27.95

SPECIAL OFFER: Set of all four bits only \$99.95

Set of four quickly produces classic traditional mouldings. 2 flute carbide tipped.

Order by **VISA • MasterCard • Discover**
7 Day/24 Hour Service,
Call 1-800-533-9298
or send check to: **MLCS, Ltd.,**
P.O. Box 4053 FT Rydal, PA 19046

READER SERVICE NO. 73

A BETTER METER A BETTER PRICE!

THE PROTIMETER WOOD MOISTURE METER

- Wider range - 6 to 60%!
- Precision accuracy!
- Accessories for surface and deep readings!

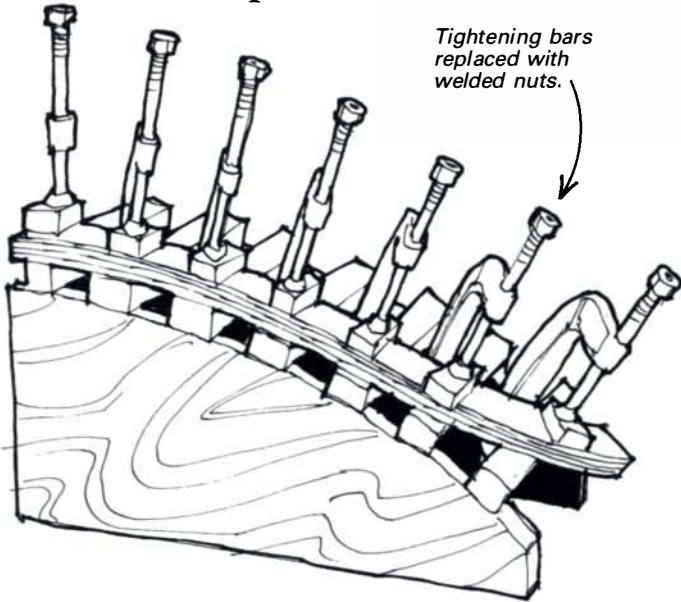
The Mini C is ideal for furniture making and repair, floor installation, drying wood or lumber and building construction. It can be used with 150 species of wood and the LED Display measures from 6 to 60% with accuracy of $\pm 1\%$. Cap, calibration chart, extra 1/2" probes, extension cable with probes and case included. For deeper readings, there's an optional Hammer Probe with 1.37" probes. For surface readings - without pinholes - add the optional Touch Sensor.

For a dealer close to you contact:

PECO
PECO SALES, INC.
P.O. Box 8122
Jackson, MS 39284-8122
DIAL-FREE 1-800-346-6939
FAX 1-601-355-5126

READER SERVICE NO. 33

Modified C-clamps

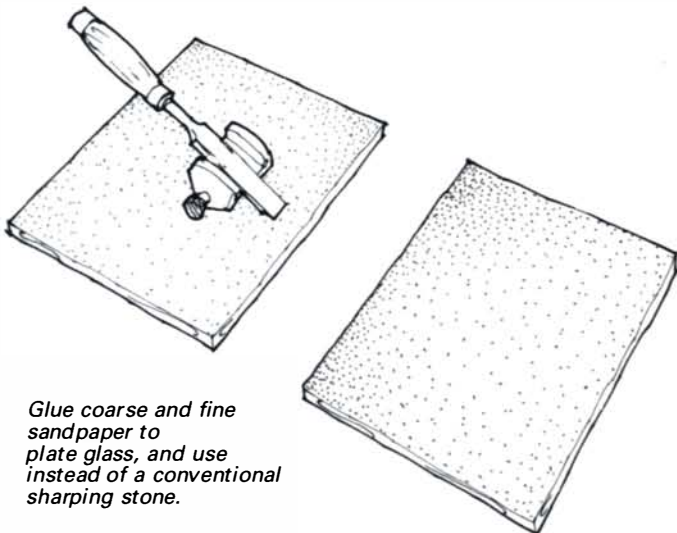


Almost all C-clamps have sliding bars through the end of the screw for tightening. But when you have to use several clamps close together, as you do when gluing laminations to a curved form, for example, these bars get in the way. On a recent project, I finally got annoyed with the interfering handles, so I removed the tightening bars and welded nuts to the ends of the clamp's screws. Now I can easily take up the slack by twisting the screws with my thumb and forefinger and then give each a final tightening with a short-handled socket wrench. As an added bonus, the clamps stack up neatly on a storage post.

—Jack Jerome, Nokomis, Fla.

Quick tip: Apply a thin coat of nail polish to the cutting edge of chisels and plane irons before sharpening. The wear pattern in the color will give you direct feedback about the sharpening angle and honing progress. —Howard E. Moody, Upper Jay, N.Y.

Chisel sharpening

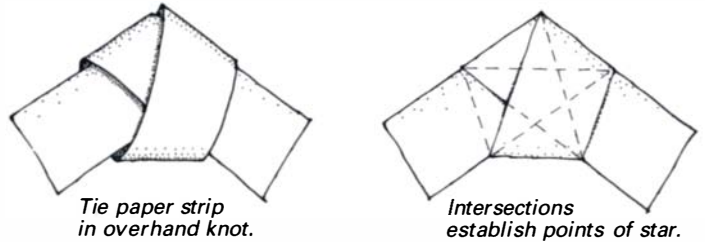


Here's how to produce a really sharp edge on a chisel or plane iron quickly and without the typical problems of holding the tool by hand on a grinder, such as overheating an edge or dealing with unevenly worn sharpening stones. Attach full sheets of 150-grit and 600-grit sandpaper to 1/4-in.-thick plate glass with spray adhesive. Place your chisel in a wheeled sharpening guide, and begin with the 150-grit. Spray a little water as a lubricant, and go to work. You will quickly produce a flat bevel, even on

the widest chisel. Now go to the 600-grit, again with water. The sharpening guide ensures that you will get exactly the same angle on the subsequent, finer honing, and in no time, you'll have a sharpened edge that almost looks polished. Finer paper up to 2000-grit is available if you want to polish further.

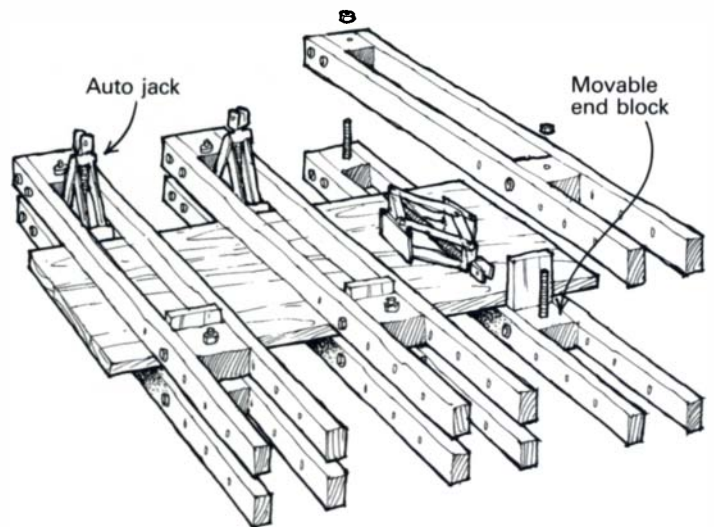
This method also works for truing the bottom of a plane or the flat side of a chisel. —Thomas R. Schrunck, Minneapolis, Minn.

Another way to make a five-pointed star



I've read about several methods for laying out pentagons or five-pointed stars based on algebra or trigonometry, like the one put forth by Daniel Bass in *FWW* #89. My method for laying out a five-pointed star requires neither calculator, compass, protractor, formulas nor hard-to-remember constructions. Take a strip of paper as wide as the distance between star points, and carefully tie a simple overhand knot. Thin but strong paper works best. Resist the temptation to flatten and crease the paper until you have removed all the slack. When the strip knot is tight and flattened, you have created a perfect pentagon pattern, as shown in the sketch above. You can scale the pattern up or down to whatever size pentagon you need or connect the intersections of your paper knot to draw a star. —Ralph Koebke, Fremont, Ind.

Auto-jack bar clamps



Here's a way to make low-tech wooden bar clamps for gluing up panels, tabletops and the like. The inexpensive clamps, which utilize salvaged scissor-style auto jacks for the main component, adjust to any thickness of stock and automatically align the stock being glued. Also, the parts are bolted instead of glued together, so you can easily replace any damaged component.

To build the clamps, select 1-in. or thicker dense hardwood, and make the various parts as shown in the sketch. To use the clamps, first bolt the movable end blocks into the appropriate hole that correlates to the size panel you're gluing up. Then place the work on the lower tier of clamps and apply glue to the edges. Next slide on the upper parts of the clamps and hand-tighten the nuts to align the boards being glued up. Last of all, insert and tighten the car jacks to put edge pressure on the glued lumber. —Koji Katsuragi, Kumamoto, Japan

SUNHILL MACHINERY

Take Advantage of Our Highly Discounted Freight Specials



\$875

CT-1913 Chisel Morticer

- 1HP, Magnetic Controls
- Chisel Stroke: 5"
- Table Movement 16" x 3-1/2"



\$1279

CT-20B 20" Bandsaw

- 14" Capacity, 20" Throat
- Accepts Blades from 1/8" to 1-1/2"



CT-60L 6" Long Bed Jointer

- 7" x 52" Extended Bed
- Enclosed Base & Motor

\$389

CT-200L 8" Long Bed Jointer

- 9" x 72" Extended Bed
- 2HP 1PH Motor w/ Magnetic Starter

\$809



\$1145

MBS-250 10" Table Saw

- 3HP 1PH
- Standard w/precision extruded aluminum fence system



\$498

FD-308 3 Roller, 4 Speed Feeder

- 1/2HP
- 10-38 FPM



\$859

CT-38B 15" Two Speed Planer

The Original 15" Planer

- 3HP 1PH Motor w/Magnetic Starter



**SP-102
3HP 1PH
\$1295**

SP-102 Two Speed Spindle Shaper

- Extra Heavy Duty Components
- Reversible & Interchangeable Spindles

5HP 3PH \$1395



\$995

CT-108 Edge Sander

- Inclined work table is adjustable for even belt wear, decreased sanding marks
- 6" x 108" Belt

Call Toll Free to Place Your Order: 800/544-1361



SUNHILL MACHINERY
500 Andover Park East
Seattle, WA 98188
206/575-4131 • 206/575-3617 FAX
800/544-1361

READER SERVICE NO. 80

Makita FREE FREIGHT • Same Day Service
Low Prices On Largest Assortment

 \$478⁰⁰ Includes Blades List \$895	 \$178⁰⁰ List \$350
 \$148⁰⁰ Kit Incl.: Keyless Chuck, Charger, Case, & 2 Batteries List \$290	 \$484⁰⁰ List \$819
 \$469⁰⁰ List \$818 With FREE Makita Carbide Blade!	 \$116⁰⁰ List \$208
 \$69⁰⁰ List \$118 Virtually eliminates swirl marks. Uses std. hook & loop paper. INTRO SPECIAL	 \$79⁰⁰ List \$130 SALE Var. Sp., Rev.

NEW! RYOBI

\$599
List \$1112
SALE
INCLUDES FREE STAND

CALL 1-800-262-5482
That's 1-800-2MAKITA!

HOME LUMBER CO.
449 WHITEWATER ST., WHITEWATER, WI 53190
C.O.D.

READER SERVICE NO. 106

RIP SAW

The Portable Sawmill.

The "affordable portable" one man band sawmill. Weighs only 45 lbs. Cuts 20" diameter logs into lumber. Minimum 1/8" to maximum 9" thickness. Maximum width, 14".

Write or call for free brochure.

Better Built CORPORATION
(508) 657-5636
845 Woburn Street. Dept. FW, Wilmington, MA 01887

READER SERVICE NO. 135

COMING THIS FALL!

★The Woodworking Shows★
machinery
tools • supplies

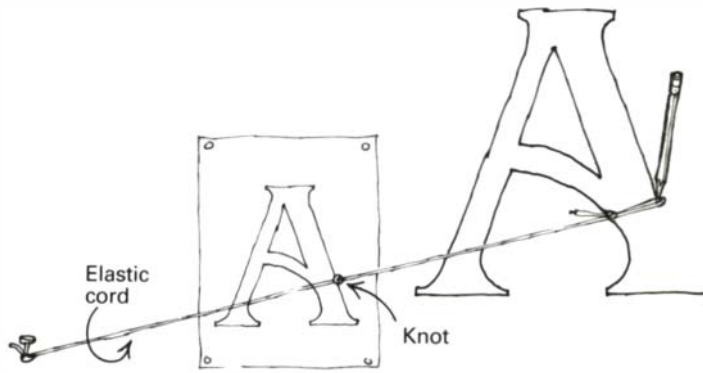
- Baltimore/Wash.
- Chicago
- Columbus
- Denver
- Detroit
- No. California
- Portland
- Seattle
- So. California
- Twin Cities

• And More!

Call for free brochure
Monday - Friday 8 am - 5 pm Pacific Time
1-800/826-8257 or 310/477-8521

READER SERVICE NO. 11

Elastic pantograph



I use this elastic-cord pantograph to transfer designs from paper to wood for carving. You can buy small diameter elastic cord at mountaineering shops, or rob the shock cord from the inside of hollow tent poles. Set up the cord, nail, wood, paper and pencil as shown in the diagram. Keep tension on the cord at all times, and move the pencil so the knot in the cord follows the design on the paper to trace an enlarged version of the design.

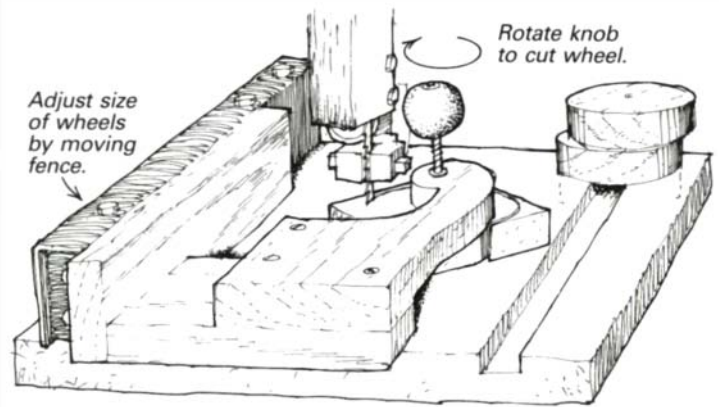
The degree of enlargement can be varied by changing the position of the knot. The closer the knot is to the nail, the bigger the proportion of enlargement.

—Bob Cromwell, Royalston, Mass.

Quick tip: To ensure your suddenly acquired stock of free green wood doesn't crack or check before you get it on the lathe, keep it submerged in a tub of water. Wood can be preserved in this manner almost indefinitely.

—Earl R. Rice, Augusta, Ga.

Cutting toy wheels on the bandsaw



The toy wheel cutting fixture I made for my Craftsman 12-in. bandsaw, attaches to the saw's fence with two screws. The fixture will cut out wheels ranging in diameter from 2 in. to 6 in. from 3/4-in. stock. You can cut wheels from thicker stock by adding a spacer. Bandsawn wheels have advantages over those produced by a hole-saw: The diameter selection is infinite, and because there is no hole through the wheel, there's more flexibility in mounting.

To use the fixture, I first precut the wheel blanks about 1/2-in. larger than the finished wheel. Then I slide the blank into the fixture with the center of one edge pressed lightly against the blade. I insert the pivot-knob screw into the spacer hole and screw the knob into the blank about one or two turns. The spacer hole is lined with a piece of tubing, so it won't become enlarged. Then I turn on the saw and rotate the block into the blade by turning the knob.

—E. T. McCord, Tucson, Ariz.



BEST IN IT'S CLASS!
SPECIAL OFFER! FOR A LIMITED TIME ONLY!

IMPORTS, INC. "IMPORTERS OF FINE MACHINERY"

12" PLANER

We took the best features of all the 12" Planers on the market and developed the ultimate machine in the true Grizzly tradition. Exclusively from us, this 12" Planer beats the "Beep" out of all other 12" Planers available in the U.S.A.! Fully tested and refined, the results achieved by this machine are simply amazing. Boards come out smoother and require less sanding and the light weight of the machine allows you to carry it to the job if necessary! Now, for a limited time you can get an extra set of blades **FREE** when you purchase our 12" Planer!



12" PLANER MODEL G1017 ONLY \$385⁰⁰
EXTRA BLADES WITH PURCHASE!!!
FREE! MODEL G1195 (Set of 2) a \$39⁵⁰ value!

TO ORDER:
WEST OF THE MISSISSIPPI EAST OF THE MISSISSIPPI
1-800-541-5537 1-800-523-4777
F.O.B. Bellingham, WA or Williamsport, PA 92-111

READER SERVICE NO. 91

PANEL HANDLER

The Solution To Material Handling Backaches

- ◆ rotates 10 3/4" panels
- ◆ raises and lowers full loads
- ◆ foot actuated hydraulic jack
- ◆ money back guarantee

UNCOMPROMISING QUALITY

SHOPCARTS

PATENT PEND. MADE IN U.S.A.

445 HARRIET STREET • SAN FRANCISCO, CA 94103
PHONE: 415/552-9522



As seen in FWW, Nov./Dec., 1991, p. 130

Allows One Man To Lift, Carry, & Rotate 10 panels

READER SERVICE NO. 37

WOODPECKERS

1-800-752-0725

Call about...FREE SHIPPING and the best selection of quality Router Bits, Saw Blades, and much more!



18" INCRA FENCE SYSTEM \$44.95 (LIST \$54.95)	16" Incra Pro, 28" Pro Fence System, Right Angle Fixture, Incra Gauge, Handbook & Templates. \$225.00 Value
Includes: Incra Fence, Incra Stop & Stop Extender Bar	
INCRA JIG \$29.95 (LIST \$39.95)	
RIGHT ANGLE FIXTURE \$24.95 (LIST \$29.95)	
PRO PACKAGE — \$169.00	
INCRA JIG PRO 12 \$59.95	INCRA VIDEO \$16.95
INCRA JIG PRO 16 \$69.95	BOOK/TEMP \$16.95
28" INCRA PRO FENCE \$54.95	INCRA GAUGE \$12.95
INCRA HINGE PLANS \$11.95	INCRA MITER SLIDER \$10.95ea 2/\$19.50
	8 Piece Router Bit Set \$59.95

MASTERCARD • VISA • DISCOVER

WOODPECKERS
8318 Manorford Drive • Parma, Ohio 44129

1-800-752-0725
216-888-6332/FAX 216-888-9463

READER SERVICE NO. 83

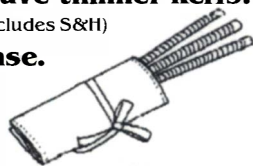


GYOKUCHO

Traditional Japanese
Pull Saws.
Razor Sharp,
Fine and Rip cuts
leave thinner kerfs.

SET OF THREE \$85.⁰⁰ (includes S&H)
with Japanese canvas saw case.

Available Individually
370H \$35 405 \$20
610 \$24 Case \$10
(S&H \$4)



Send for a free brochure of all lines of RAZOR SAWS.
Tool Catalog \$3. Wholesale available.



HIDA TOOL, INC./GYOKUCHO JAPAN

1333 San Pablo Ave., Berkeley, CA 94702 1-800-443-5512



READER SERVICE NO. 301

GUARANTEED OR YOUR MONEY BACK

BAND SAW BLADES

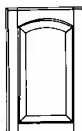
Electro Heat Induction Hardened
New Revolutionary Guide Systems for 1/16 & 1/8 Band Saw Blade Users Fits 12"-14"-16"-18" Band Saws.
Milled Sharp Teeth
Any Length
Any Size

FREE INFORMATION
Bi-Metal - M-2/M-42
Flex & Hard Back • Pallet & Band Mill Blades • Re Saw • Friction
24 Hour Service
.032 Silicon Steel Furniture Band

SUFFOLK MACHINERY CORP. CALL TOLL FREE
12 Waverly Ave. Ste 49, Patchogue, NY 11772 1-800-234 SAWS Ext 49

15 YEARS OF GROWTH NATIONWIDE

READER SERVICE NO. 23



RAISED PANEL DOORS

Also Available:
Ready To Assemble
Cabinets For The
Kitchen, Bath and
Other Rooms.

Check Out Our Features

- ✓ Superior Quality
 - ✓ Fast Delivery
 - ✓ 25 Door Designs
 - ✓ No Order Too Small
 - ✓ Great Prices
 - ✓ Made To Your Size
 - ✓ 8 Wood Species
 - ✓ Drawer Fronts
- Order our brochure, please enclose \$1.00 for shipping.



SCHERR'S CABINETS

Hwy. 2 East, Rt. #5, Box #12
Minot, ND 58701
(701) 839-3384 Fax (701) 852-6090

READER SERVICE NO. 155

DOMESTIC & FOREIGN HARDWOODS

Quality stock for
Cabinet Work

Most all sizes from
1" up to 4" in thickness

HARDWOODS

ASH-BASSWOOD
BIRCH-BUTTERNUT
CHERRY-CHESTNUT
EBONY-MAPLE-OAK
POPLAR-ROSEWOOD
TEAK-WALNUT
Also hardwood plywoods

SOFTWOODS

SUGAR PINE-CYPRESS
CEDAR-SPRUCE
DOUGLAS FIR etc.

MAURICE L. CONDON CO., INC.

248 Ferris Avenue
White Plains, NY 10603
914-946-4111

Monday through Friday
8 AM to 4:30 PM

WHY BUY JET

BECAUSE... IT'S BETTER THAN DELTA

WOODWORKING LATHE	JET JW-1236	DELTA 46-700™
HEADSTOCK	Cast Iron	Plastic
SPINDLE SPEEDS	550-3000 RPM	500-2000 RPM
PRICE—Comparably Equipped	\$689.00*	\$731.55**
NET WEIGHT	183	125
BED WAY WIDTH	5"	4"
WARRANTY	2 YEAR	2 YEAR
HEAD ROTATION FOR OUTBOARD TURNING	One step Quick release No tools required	Multiple steps Tools required

*JET Suggested Retail Price, 2-92
**DELTA Suggested Retail Price, 12-16-91

Find Out How Good The NEW JET Really Is!

FREE
\$40 8-PC. CHISEL SET
WHEN YOU BUY THE
JET JW-1236
OFFER GOOD UNTIL
JUNE 30, 1992

JET

JET EQUIPMENT & TOOLS
P.O. Box 1477
Tacoma, WA 98401
1-800-274-6848

READER SERVICE NO. 114

Tablesawn coves

I've seen several articles lately describing how to cut coves by pushing the workpiece across the tablesaw at an angle using temporary guide fences. The trouble is they're all doing it the same way it was done 50 years ago—scratching rough coves 1/16-in. at a time with sawblades that were designed to cut kerfs.

To cut smooth coves to full depth in one pass, simply replace the sawblade with a molding head fitted with radiused cutters. The molding head removes fluffy shavings—evidence that it is cutting, as opposed to whatever a sawblade does when the work is fed into it from the side. A second cut of 1/32-in. will produce a finish comparable to that of a commercially milled molding. Of course, for a very deep cove, you can remove the waste in more than one pass.

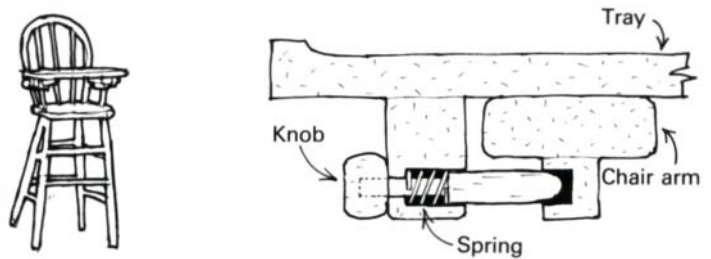
Cove-cutting is not for unsupervised beginners. Beyond the generally accepted safe work habits, I recommend a few special measures. First, use a snug-fitting insert, making sure it is flush to the saw's surface. Make sure the angled fence is held securely in place, and the cutters are sharp and clean. Apply wax to both table and guides so that the work will slide easily. Do not use push sticks—push blocks of the type available from Sears are much better for this operation. You can make your own push blocks from the rubber-padded floats used for finishing concrete. Last, feed the stock at a slow, steady rate. You will be delighted with the results.

—Tom Rose, Los Angeles, Cal.

Quick tip: Storage boxes used to hold 5 1/4-in. computer diskettes (also available in 3 1/2- and 8-in. sizes) make great organizers for 5-in. sanding discs. Just label the boxes' dividers for different grits, backings and coatings.

—Andrew J. Lenhart, Royal Oak, Mich.

High-chair-latching mechanism



After my son, Corey, was born, I wanted to build a high chair for him, but I didn't like the hardware that was available for attaching the removable tray to the chair.

The replacement I designed is basically a modified bullet catch. But instead of installing the bullet pin in a blind hole, I turned the shank of the bullet longer and thinner, extended it out the back through a smaller hole and glued on a small knob. The spring-loaded bullet pin engages a small block, which is permanently attached to the chair under the arm. The block is all that's visible when the tray is removed. This design has lasted through three children without any problems.

—Ben Troxell, San Jose, Cal.

Quick tip: When sanding small parts that can't be gripped with the fingers take a technique from the lapidary. Put a dollop of hot-melt glue on the back of the part and stick it on the end of a dowel. To remove the dowel, place the assembly in the freezer for a few minutes—the part will pop right off. This technique also works well for polishing small metal parts on a buffing wheel.

—Paul Marshall, Apache Junction, Ariz.

We've Added Something To The Cutter That Has Everything . . . A Sale Price.



The colors yellow and orange are trademarks of Freeborn Tool Company, Inc.

Save 25% on Freeborn Cope & Pattern Sets or Raised Panel Cutters.

Cope & Pattern Sets Sale	Price
MC-50-010 thru MC-50-045	\$274.50
MT-50-010 thru MT-50-045	\$290.25*
PC-10-010 thru PC-10-045	\$351.75
PT-10-010 thru PT-10-045	\$371.25*
Raised Panel Sale	Price
MC-54-001 thru MC-55-009	\$123.75
MT-54-001 thru MT-55-009	\$130.50*
PC-14-001 thru PC-15-009	\$156.00
PT-14-001 thru PT-15-009	\$165.00*

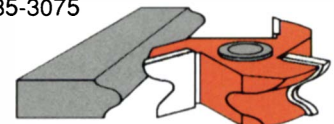
*Plus Current Raw Materials Surcharge

Prices Effective May 1 Thru June 30, 1992.

To Order, Call Toll Free: 1-800-523-8988

In Canada, Call: (509) 535-3075

FAX: (509) 535-7975



Freeborn Tool Company, Inc.

P.O. Box 3403, Spokane, WA. 99220-3403

Delmhorst Model G-30 Wood Moisture Detector

- "One-step" operation • Single four function switch • Temperature stable circuit
- 6-30% range moisture content in wood
- Use with any Delmhorst electrode.

Delmhorst - the name for reliable experience and outstanding service!



Call today toll free
800-222-0638
201-334-2557 (NJ)



DELMHORST
Instrument Company
P.O. Box 68, Dept. 908
Towaco, NJ 07082

READER SERVICE NO. 17

DOUBLE PEDESTAL TABLE BASE

STOCKED
IN OAK
NO MINIMUM
FREE CATALOGUE



See Us
In Booth 1471
NW Atlanta
Aug. 21-24

READY TO ASSEMBLE



Adams Wood Products, Inc.
Dept. Q12, 974 Forest Dr., Morristown, TN 37814

TELEPHONE: (615) 587-2942
FAX: (615) 586-2188

READER SERVICE NO. 18

Imported
European
Hardware



4320 W. Bell Drive
Las Vegas, Nevada 89118

(702) 871-0722

SEND \$2.00 FOR CATALOG



READER SERVICE NO. 207

YESTERMORROW

DESIGN / BUILD SCHOOL
BOX 344 WARREN VT 05674
802-496-5545



Courses for the Layperson and Professional in Design Build, Renovation, Cabinetry, Landscape, Architectural Crafts and more.

Affiliated with Association of Collegiate Schools of Architecture. Certified by Vermont Department of Education.

PLEASE CALL OR WRITE FOR BROCHURE

Yestermorrow Inc. is a non-profit organization which does not discriminate on the basis of race, sex or creed.

READER SERVICE NO. 9

WHY BUY JET

BECAUSE...
IT'S BETTER
THAN POWERMATIC!

10" TABLESAW	JET JTS-10JF	POWERMATIC 63™
FENCE TYPE	Precision Quick Release	Vega™
RIP TO RIGHT OF BLADE	30"	26"
LIST PRICE	\$639.00*	\$951.00**
WARRANTY	2 YEAR	1 YEAR
EXTENSION WING CONSTRUCTION	Solid Ribbed Steel	Open Cast Iron
MOTOR & CONTROL	1 1/2 HP thermal overload Industrial Safety Control	1 1/2 HP Removable Key

*JET Suggested Retail Price, 2-92

**POWERMATIC Suggested Retail Price AL-921

Find Out How Good The
NEW JET
Really Is!

JET'S
GOT
IT!

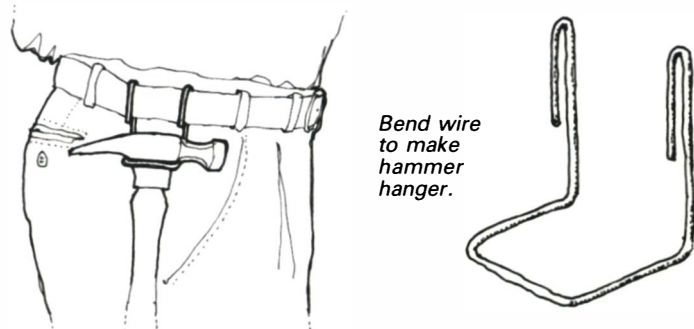
JET

JET EQUIPMENT & TOOLS
P.O. Box 1477
Tacoma, WA 98401
1-800-274-6848

FREE
\$45 40-TOOTH
CARBIDE BLADE
WHEN YOU BUY THE
JET JTS-10JF
OFFER GOOD UNTIL
JUNE 30, 1992

READER SERVICE NO. 115

Hammer hanger



Forty-plus years ago, when I was an apprentice, all tradesmen wore overalls. An old-timer showed me the trick of inserting the hammer's handle into the side opening at the hip below the buttons. Always handy, the hammer's handle hangs along your leg without interfering with movement. Years later, after the overalls era had passed and leather aprons appeared, I found the hammer loops on the aprons were often in the wrong place for me. So I bent up a piece of $\frac{3}{16}$ -in. wire into a hammer hanger like the one shown above. The hanger slides over your belt to any position you prefer—in my case to the spot where I carried my hammer years ago. Most importantly, you can drop the hammer in the hanger without looking and retrieve it just as easily.

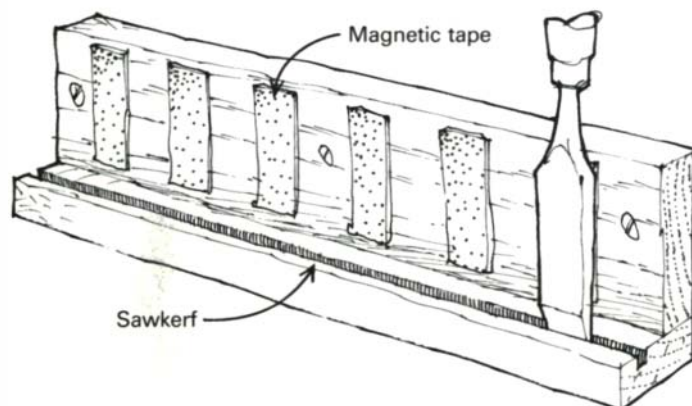
—Jerome Jabnke, Milwaukee, Wisc.

Quick tip: This simple idea has saved me hours of work when trying to trim dowel plugs flush with the surface. Simply tape a double layer of masking tape along the length of each side of the sole of a low-angled block plane. Now take a fine cut with a

sharp blade. The plane rides just off the surface of the wood and neatly cuts the plug flush. A quick sanding finishes the job.

—Bob Gleason, Hilo, Hawaii.

Magnetic chisel-storage rack



I have found this simple-to-make storage rack extremely useful for chisels and turning tools. The sawkerf in the ledge both secures the blade of the tool and protects the finely honed cutting edge. Make the back board thick enough so that the handles won't hit the wall and prevent the blades from resting against the magnetic tape.

The self-adhesive magnetic tape is generally available at hardware and novelty stores. The tools can be removed and replaced easily but won't fall off by themselves; mine even stayed in place through a small earthquake.

—Roger Walker, Orleans, Ont. Canada

New from the publishers of *Fine Woodworking*

You've invested in woodworking machines, now learn how to get the most out of them!

Here's your complete guide to getting the most out of your woodworking machines. In his new book and video set, Mark Duginske shows you how to choose, set up and tune your machines for safety, precision and efficiency. Whatever you make you'll work better with Duginske at your elbow.

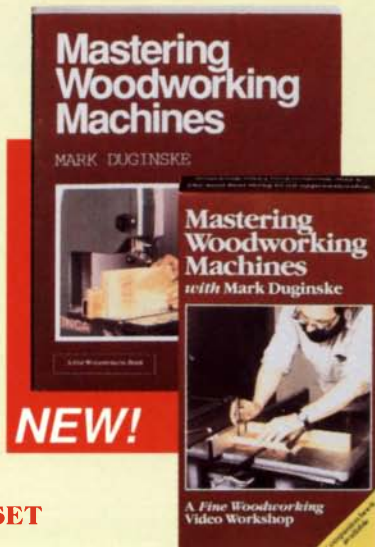
You'll learn to diagnose problems on all common brands of machinery: table saws, shapers, bandsaws, radial-arm saws, drill presses, jointers, routers and planers.

And with the video you'll learn how to see, hear and feel problems, as the sounds and vibrations your machines make may mean that they need tuning or adjusting. Together, the book and video will help you to produce the joints and cabinet parts you need with whatever machines you have.

THE BOOK: MASTERING WOODWORKING MACHINES
SOFTCOVER, 256 PAGES, 175 PHOTOS, 150 DRAWINGS,
ITEM 070136, PRICE \$24.95

THE VIDEO: MASTERING WOODWORKING MACHINES
60 MINUTES, ITEM 060071, PRICE \$34.95

SAVE \$9.95 ON THE BOOK AND VIDEO SET
PRICE \$49.95, ITEM 07A211

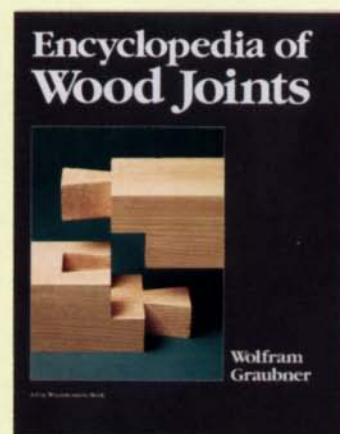


All the joints in the world!

Whatever structural woodworking problems you face, you'll find answers here. Master craftsman Wolfram Graubner presents you with a complete survey of furniture and timber joints from all of the world's major woodworking traditions.

With the help of hundreds of sharp photos and drawings, you'll be able to design and use more than 450 variations on 66 basic joints, including splicing, oblique, right-angle and edge joints.

SOFTCOVER, 160 PAGES, 171 PHOTOS,
310 DRAWINGS, ITEM 070153, PRICE \$21.95

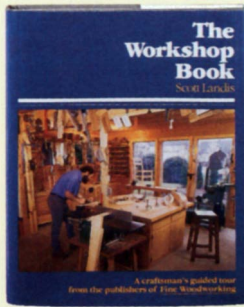


Choose from these *Fine Woodworking* favorites.

The Workshop Book

by Scott Landis

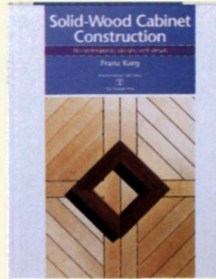
Discover new ways to build, improve and modify your workshop. In *The Workshop Book*, you'll learn how other woodworkers solve the problems you're up against, and you'll be able to create your own woodworking sanctuary in whatever space you can afford. Includes dozens of shop fixtures and accessories and 20 full floor plans for a wide range of shops. HARDCOVER, COLOR, 224 PAGES, 301 PHOTOS, 76 DRAWINGS, ITEM 070094, PRICE \$34.95



Solid-Wood Cabinet Construction

by Franz Karg

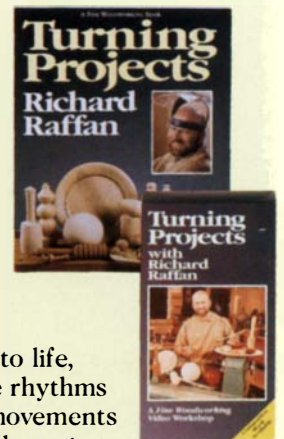
Learn how you can combine traditional construction methods with modern design. Here are cabinets, hutches, credenzas, wall units, desks and bookcases. Clear photographs and superbly detailed line drawings provide the construction details. HARDCOVER, 144 PAGES, 154 PHOTOS, 160 DRAWINGS, ITEM 070154, PRICE \$24.95



Turning Projects

by Richard Raffan

Complete a satisfying course in woodturning. Richard Raffan's book presents 23 intriguing projects — from rolling pins to hollow vessels. The video brings 12 of the projects to life, demonstrating the rhythms and skilled hand movements that make for good turning.



THE BOOK:

SOFTCOVER, 176 PAGES, 400 PHOTOS, 36 DRAWINGS, ITEM 070095, PRICE \$19.95

THE VIDEO:

90 MINUTES, ITEM 060065, PRICE \$39.95

SAVE \$9.90 ON THE BOOK/VIDEO SET

ITEM 07A183, PRICE \$50.00

Small Shop Projects: Boxes

with Jim Cummins

AWARD WINNER

This video helps you transform small wood scraps into a variety of interesting, useful and beautiful little boxes. You'll discover a level of precision and technical wizardry that will enhance your work. 60 MINUTES, ITEM 060057, PRICE \$29.95



Swedish Carving Techniques

by Wille Sundqvist

Discover how to carve with knife and ax. Wille Sundqvist draws on the traditions of his forefathers to demonstrate how to carve spoons and bowls that are a pleasure to use. In the video, his son Jögge shows how to carve a dough bowl and spoon from start to finish.



THE BOOK:

SOFTCOVER, 144 PAGES, 223 PHOTOS, 34 DRAWINGS, ITEM 070107, PRICE \$15.95

THE VIDEO:

60 MINUTES, ITEM 060035, PRICE \$29.95

SAVE \$5.90 ON THE BOOK/VIDEO SET

ITEM 07A135, PRICE \$40.00

Woodworking with Your Kids

by Richard Starr

NEWLY REVISED

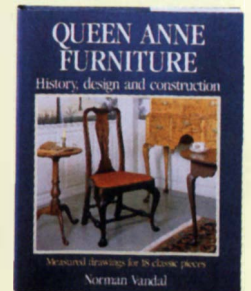
Over 30 favorite kids' projects and how to build them. Includes a new chapter on games. SOFTCOVER, 224 PAGES, 359 PHOTOS, 169 DRAWINGS, ITEM 070125, PRICE \$14.95



Queen Anne Furniture

by Norman Vandal

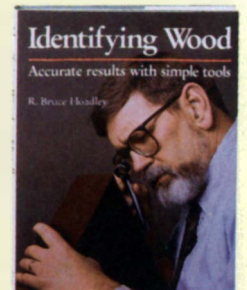
Here's the most comprehensive book ever on this sophisticated American furniture style. You'll get measured drawings for 18 classic pieces of furniture, plus detailed information on making carved and turned cabriole legs. HARDCOVER, COLOR, 256 PAGES, 153 PHOTOS, 18 PLANS, ITEM 070089, PRICE \$34.95



Identifying Wood

by R. Bruce Hoadley

Be a wood detective! R. Bruce Hoadley helps you learn what to look for in any piece of wood and how to find it. Hundreds of charts, photos and microphotographs help you identify 180 different species of hardwoods, softwoods and tropical woods. HARDCOVER, COLOR, 240 PAGES, 393 PHOTOS, 34 DRAWINGS, ITEM 070088, PRICE \$39.95



Design Book Five

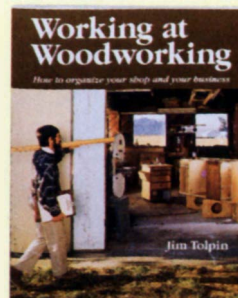
Hundreds of breathtaking examples of what your fellow woodworkers are capable of. Includes contemporary and traditional furniture, imaginative accessories and more. SOFTCOVER, COLOR, 192 PAGES, 304 PHOTOS, ITEM 070086, PRICE \$19.95



Working at Woodworking

by Jim Tolpin

An experienced woodworker and businessman, Tolpin covers the three factors that lead to running a successful one- to two-person shop: organizing and equipping the shop, preparing and manufacturing the work, and running the business. SOFTCOVER, 160 PAGES, 59 PHOTOS, 66 DRAWINGS, ITEM 070108, PRICE \$21.95

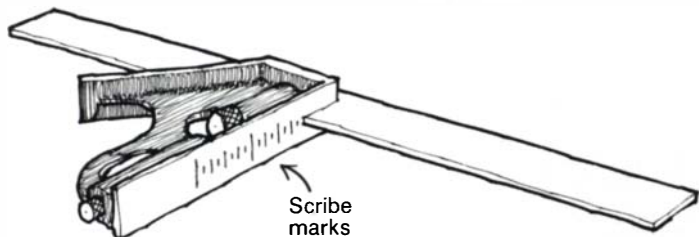


TAUNTON
BOOKS & VIDEOS

...by fellow enthusiasts

To order, use the envelope insert or call toll-free 1-800-888-8286.

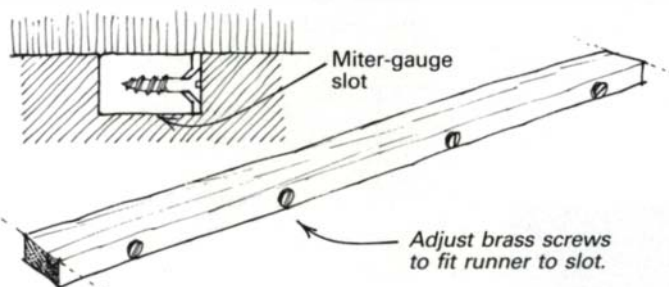
Combination square improvement



I scribed marks at 1/8-in. increments on the body of my combination square to help in transferring measurements. The marks are especially useful when laying out story sticks for cabinets. I didn't scribe the numbers, and 1/16-in. increments are easy enough to eyeball when needed.

—Tom Rodriguez, Westfield, Mass.

Improved miter gauge runner

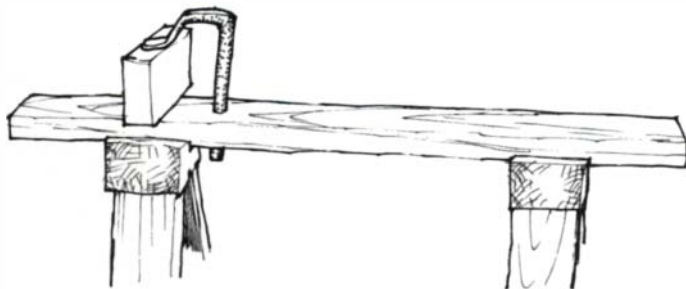


Over the years, I've seen many plans for homemade jigs that utilize a hardwood runner that fits in the miter-gauge slot. But, because wood shrinks and expands depending on the humidity, the run-

ner's fit and, hence, the jig's accuracy will vary. To correct the problem, cut the runner a bit undersize so that it is loose in the slot. Then install four 1/2-in.-long brass screws in countersunk holes along one edge of the runner. You can adjust the screws to get a perfect fit, regardless of the humidity. The brass screws won't wear the sides of the slot and are easily replaced if they wear out.

—Larry Loo, M.D., Clovis, Cal.

Sawhorse holdfast



Holdfast clamps are simple, inexpensive, quick to apply and just as quick to release. I keep one in my toolbox for use with my sawhorse in which I've drilled a few strategically placed holes. The clamp is especially valuable when I have to use both hands in a cutting operation and can't let the workpiece slip around.

—Don Rosati, Easton, Conn.

Methods of Work buys readers' tips, jigs and tricks. Send details, sketches (we'll redraw them) and photos to Methods, Fine Woodworking, PO Box 5506, Newtown, Conn. 06470-5506. We'll return only those contributions that include an SASE.

One Stop Wood Shop

Domestic and exotic hardwood plywood and lumber, marine plywood, over 30 species in stock—all under one roof. Custom cutting services to your exact specifications with little or no waste at competitive prices! We specialize in bundling and shipping.

Call (617) 666-1340 today for catalog and quote.

Boulter Plywood Corp.
24-FW Broadway, Somerville, MA 02145

READER SERVICE NO. 12

TS-ALIGNER

For years, woodworkers have relied on a host of tools and methods for table saw alignment. Some require lots of patience, skill and time. Others rely on trial and error with a bit of luck. Still others are merely over-priced molded plastic toys. TS-ALIGNER is the first tool to seriously address this problem with

scientific reliability. No more burned edges, wandering cuts, or dangerous kickback due to a mis-aligned saw. No more test cuts. No more guesswork. All adjustments can be made quickly and easily with astounding precision and accuracy. You will be amazed at the difference it makes for you.

\$190.00

Includes unit as shown with dial indicator. Optional accessories available at additional cost.

Edward J. Bennett Co.
1016 Morse Avenue Suite 21
Sunnyvale, CA 94089
1-800-333-4994
fax: 408-744-0179

READER SERVICE NO. 112

BLUME SUPPLY, INC.
3316 South Blvd. • Charlotte, NC 28209
704-523-7811 or 1-800-288-9200

STEP UP TO...
POWERMATIC
YOU DESERVE THE BEST!

\$1199

#26 SHAPER 2 HP

\$1550

#66 10" SAW 2 HP
W/50" VEGA FENCE

\$4695

#180 18" PLANER 5 HP
W/ KNIFE GRINDER

\$1975

#100 12" PLANER 2 HP

\$1450

#60 8" JOINTER

NEW!

RB-25 SINGLE PHASE 10 H.P. WIDE BELT SANDER \$7899

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CALL FOR OUR LOW PRICES ON OTHER POWERMATIC MACHINES NOT LISTED, AS WELL AS PRICES ON THE NEW ARTISANS LINE OF MACHINERY.

READER SERVICE NO. 132

AmMax

FREE

* Complete catalog sent upon order.
* Plastic caliper (\$4.00 value) for any order.

TUNGSTEN CARBIDE TIPPED TOOLS

TOOL CO.

Precision tools for skillful woodworkers

CUTTER	TOOL #	CUT DIA.	CUT L.	SNK D.	PRICE	
Straight	ST206	1/4	3/4	1/4	5.50	
	ST208	5/16	3/4	1/4	5.50	
	ST210	3/8	1	1/4	14.50	
	ST213	1/2	1	1/4	5.50	
	ST216	5/8	1	1/4	6.25	
	ST219	3/4	3/4	1/4	8.95	
	ST406	1/4	1/4	1/2	5.50	
	ST408	5/16	1	1/2	5.50	
	ST410	3/8	1	1/2	5.50	
	ST413	1/2	1	1/2	5.50	
Flush Trim	FT210P	3/8	1/2	1/4	6.00	
	FT210	3/8	1	1/4	6.50	
	FT213	1/2	1	1/4	6.95	
	FT213L	1/2	1-1/2	1/4	10.50	
	FT410	3/8	1-3/16	1/2	6.50	
	FT413	1/2	1-3/16	1/2	6.95	
	FT413L	1/2	1-1/2	1/2	10.50	
	Dovetail	DV210	3/8	3/8	1/4	4.95
		DV213	1/2	1/2	1/4	4.95
		DV410	3/8	3/8	1/2	4.95
DV413		1/2	1/2	1/2	4.95	
DV416		5/8	3/4	1/2	6.50	
DV419		3/4	1	1/2	6.95	
Core Box	CB206	1/4	1/4	1/4	8.00	
	CB210	3/8	1/4	1/4	9.00	
	CB213	1/2	5/16	1/4	11.00	
	CB216	5/8	3/8	1/4	12.50	
	CB219	1/4	1/4	1/2	14.00	
	CB413	1/2	5/16	1/2	11.00	
45° Chamfer	CH210	1	3/8	1/4	12.00	
	CH213	1-3/16	1/2	1/4	12.00	
	CH216	1-1/4	5/8	1/4	13.50	
	CH416	1-3/8	5/8	1/2	14.00	
	CH419	1-5/8	3/4	1/2	16.00	
	CH422	1-7/8	7/8	1/2	19.00	
	CH425	2-1/8	1	1/2	24.00	
	Rabbit	RB232	1-1/4	1/2	1/4	12.00
		RB322	1-1/4	1/2	1/2	14.00
		SL203-2	1-1/4	1/8	1/4	10.00
SL205-2		1-1/4	3/16	1/4	11.00	
SL206-2		1-1/4	1/4	1/4	11.00	
SL210-2		1-1/4	3/8	1/4	12.00	

Top of the line **Made In U.S.A.**
Nicholson
 10" 60T \$39.99
 10" 36T \$18.10
 10" 40T \$26.89
 Retail values up to \$60
Carbide Tipped

NEW PRODUCTS
 2-piece Stile & Rail -- \$69 a set

CR01 **OG02**
BE03 **PL04**
OGEE FILLET PANEL RAISING
 1/2" SHANK ONLY
OF466 2-5/8" \$24.00
OF476 3-1/4" \$39.00
STILE & RAIL Reversible
RS248 1/4" shank \$37
RS448 1/2" shank \$37
3 WINGS, 8 CUTTING EDGES
FINGER JOINTER
FJ463 1/2" shank \$53

It's Your Turn!

Record
 Coronet CL-3... The latest Woodturning Lathe for the professional or craftsman.



Heavy Duty cast iron head and tail stocks combined with the 1 1/2" diameter solid twin bed bars reduce vibration to a minimum.
 The adjustable main bearing is silent running, unlike roller bearings. The rotating head stock allows face plate turning up to 30" diameter (with optional bowl attachment).



Features 5 speed Poly "V" Drive, and continuously rated 3/4 H.P. TEFC motor. Between centres capacity available in 36" or 48".

See these and other great Record Tools at your Dealer today!



RECORD TOOLS INC.
 1915 Clements Road, #1, Pickering, Ontario, Canada L1W 3V1
 Telephone: (416) 428-1077 Fax: (416) 428-7555
 USA Toll Free: 1-800-267-8367
 Canada Toll Free: 1-800-263-7512

READER SERVICE NO. 128

	TOOL #	RADIUS	CUT L.	SNK D.	PRICE	
Rounding Over	CR201	1/16	3/8	1/4	10.00	
	CR203	1/8	3/8	1/4	10.00	
	CR205	3/16	7/16	1/4	10.00	
	CR206	2/1	1/4	1/4	11.00	
	CR208	5/16	9/16	1/4	12.95	
	CR210	3/8	5/8	1/4	14.00	
	CR213	1/2	3/4	1/4	16.00	
	CR406	1/4	1/2	1/2	11.95	
	CR410	3/8	5/8	1/2	14.00	
	CR413	1/2	3/4	1/2	16.00	
Roman Ogee	RO204	5/32	1/2	1/4	15.00	
	RO206	1/4	3/4	1/4	16.00	
	RO404	5/32	1/2	1/2	15.00	
	RO406	1/4	3/4	1/2	16.00	
	Cove	CV203	1/8	3/8	1/4	11.00
		CV205	3/16	7/16	1/4	11.00
CV206		1/4	1/2	1/4	11.00	
CV208		5/16	1/2	1/4	12.00	
CV210		3/8	1/2	1/4	12.00	
CV213		1/2	5/8	1/4	13.00	
Classical	CS203	1/8	5/8	1/4	18.00	
	CS206	1/4	7/8	1/4	19.00	
	CS403	1/8	5/8	1/2	18.00	
	CS406	1/4	7/8	1/2	19.00	
	HALF ROUND	HR203	1/4 D	5/8	1/4	12.50
		HR205	3/8 D	11/16	1/4	13.50
HR206		1/2 D	3/4	1/4	14.50	
HR208		5/8 D	1	1/4	16.00	
HR210		3/4 D	1-1/8	1/4	16.00	
HR410		3/4 D	1-1/8	1/2	17.00	
HR413	1 D	1-3/8	1/2	18.00		
HR416	1-1/4 D	1-5/8	1/2	35.00		
HR419	1-1/2 D	1-7/8	1/2	40.00		

LOCK MITRE
ML470 \$34
 1/2" shank

FOR 5/8" TO 1-1/8" STOCK

KEY HOLE
KH210 1/4" shank \$6.50

TONGUE & GROOVE
 1/4" SHANK \$28
 FOR 5/8" TO 3/4" STOCK
 1/2" SHANK \$29
 FOR 5/8" TO 1" STOCK

3 WINGS SHAPER CUTTERS
 3/4" BORE

C940 CONCAVE STILE & RAIL SET \$140
C994 OGEE STILE & RAIL SET \$140
C945 CONVEX STILE & RAIL SET \$140

REVERSIBLE STILE & RAIL **LOCK MITRE**

C965 \$45 **C998 \$42**

FINGER JOINT **GLUE JOINT**

C961 \$69 **C911 \$32**



GET TO THE FINISH LINE FASTER

WITH THE HORSEPOWER, SPEED AND PRECISION OF A PERFORMAX DRUM SANDER

Stride forward to your next project faster. A Performax Drum Sander will reduce your project time from start to finish. Exclusive features allow you to surface rough-sawn lumber, to dimension "unusable" stock, to clean-up glued panels, to finish sand the thinnest veneers, to sand stock as wide as 44", as short as 2 1/2", and as thick as 4".



Don't be left in the sawdust. Select the model to fit your budget and your needs. Prices start at \$300. Call Toll-Free today for brochures and the dealer nearest you, or write to:

Made in the U.S.A.

12211 Woodlake Drive, FW2, Burnsville, MN 55337
PERFORMAX PRODUCTS, INC.
1-800-334-4910
or (612) 895-9922

READER SERVICE NO. 159

CARBIDE TIPPED
HORIZONTAL PANEL RAISING \$49 EACH

* Industrial Quality Grade C3 Tungsten Carbide Tipped
 * 3 mm Thickness Carbide Offer Longer Life.

3/4" BORE **C931** **C984** **C985** **C986** **C987**
1-1/4" BORE **C1084** **C1085** **C1086** **C1087**

REDUCING BUSHING: \$2 / PAIR

NET 30 DAYS TO GOVERNMENT AGENCIES, SCHOOLS.
SAME DAY SHIPPING Count on us!
 Shipping is FREE for orders over \$60 and is only \$2 for smaller orders.
HOURS: MON thru FRI 7 AM to 6 PM
NEW: SAT 8 AM — 2 PM

SEND YOUR CHECK TO:
AMMAX TOOLS CO.
 P.O. BOX 520
 POWAY, CA 92074

READER SERVICE NO. 77

Stanley #29 handplane

I would appreciate any information you can give me about the Stanley #29 plane I own. When was it manufactured? Is it a collector's item, and what does the 29 stand for?

—George Erickson, Two Harbors, Minn.

Richard Starr replies: Your Stanley #29 is a metal-and-wood bench plane that's 20 in. long with a 2 $\frac{3}{8}$ -in.-wide cutter. It is called a *transitional plane* by collectors because it has the mechanism of an all-metal bench plane grafted to a hardwood sole, typically made of beech. Stanley offered these planes in a variety of sizes and shapes, apparently to satisfy workers who were not willing to give up the advantages of a wooden sole (i.e. lighter weight and less friction sliding over the stock). They were slightly cheaper than all-metal planes.

Handplane designs changed in the second half of the 19th century because lots of clever people sought efficient ways to replace the cutter and wedge of the traditional wooden plane. Eventually, one design rose to the top of the heap and has survived as the familiar metal bench plane. This plane, developed by Leonard Bailey and others at the Stanley Company, was copied by many other manufacturers even back then. These are the features that made the new concept so successful: a thin blade that's cheap to replace and easy to sharpen; a cap iron for stiffening the blade and to act as a chip breaker; a cam-actuated lever cap to apply rigid pressure to the cap iron yet release quickly for disassembly; a screw adjustment for setting the thickness of cut and a lateral-adjustment lever for squaring the blade to the sole.

Although your #29 was probably manufactured between 1870 and 1918, Alvin Sellens in his book *The Stanley Plane* (available from Early American Industries Association Book Sales, John A. Watson, PO Box 2128, Empire State Plaza Station, Albany, N.Y. 12220-0128.) suggests several ways to date your plane more accurately. If the name *Bailey* appears forward of the front knob, the tool was probably made after 1909. The frogs on planes made earlier were secured to the stock by wood screws, but after 1912, these were replaced by machine screws, which threaded into metal bushings inserted in the wood (In my experience, I've had the earlier-style frogs loosen repeatedly, so I consider the metal bushings a big improvement).

What does the number 29 stand for? More than a century ago, the Stanley Company evolved a numbering system arcane enough to mystify a cryptographer. The top-of-the-line series of transitional planes, like yours, were numbered from 21 to 37. As far as I can tell, #29 means that your plane is slightly larger than #28 and a bit smaller than #30. However, a Stanley #34 is 30 in. long, but a #35 is only 9 in. long. Go figure. Perusing Sellens' book on Stanley planes will yield lots of additional, interesting history, but will produce no more information about Stanley's numbering system.

[Richard Starr is a teacher and the author of *Woodworking with Your Kids*, published by The Taunton Press]

Getting the make on mahoe

When I was in Jamaica some years ago, I saw a striking local wood called mahoe. I managed to get some shipped to this country and made a stack-laminated table from it. The mahoe turned out to have good working qualities, except it seemed a little too unstable for stack construction. I have never seen this wood in commerce in this country. What can you tell me about it? —William V. Dorwart, Jr., Bala Cynwyd, Pa.

Jon Arno replies: Mahoe is a member of the mallow family, Malvaceae, as are cotton and okra. In fact, mahoe belongs to the same genus as okra, *Hibiscus esculentus*. The two species logged for mahoe lumber are *H. tiliaceus* and *H. elatus*, found on some of the larger islands of the Caribbean and in extreme southern Florida. This diffuse-porous wood has a very fine texture and is similar in appearance to yellow poplar (*Liriodendron tulipifera*). Mahoe's sapwood is stark white while the heartwood is often

tinted with dark, olive-green or black highlights. The wood tends to have a higher surface luster than yellow poplar and the highlights in the heartwood occasionally vary from their normal green to a strikingly vivid, grayish blue. Unlike yellow poplar, mahoe has considerable resistance to attack by fungi and is suitable for exterior use. Also, with an average specific gravity of 0.62 (ovendry weight/green volume), mahoe tends to be a heavier and harder wood than yellow poplar.

Mahoe, especially the mountain variety *H. elatus*, which may attain a height of 70 feet and produce logs of up to 18 in. dia., is a much prized cabinetwood in Cuba. But owing to our government's poor relationship with the current Cuban government, very little of this wood finds its way to the American market. As you've been fortunate to discover, the mountain species also grows in Jamaica, however supplies there are limited. And what little mahoe is to be found growing in Florida is stunted and too shrubby to produce much more than an occasional bowl blank (Florida represents the northern extreme of mahoe's range).

Despite the negative experience you seem to have had with the wood's shrinkage, mahoe is not known for its lack of stability. I suspect the wood you had shipped from Jamaica, being air dried in the humid climate, simply arrived with too much remaining moisture to allow it to be safely put to immediate use. When importing tropical lumber of any kind, it's wise to sticker the boards for a few months and let the wood acclimate to our generally drier climate.

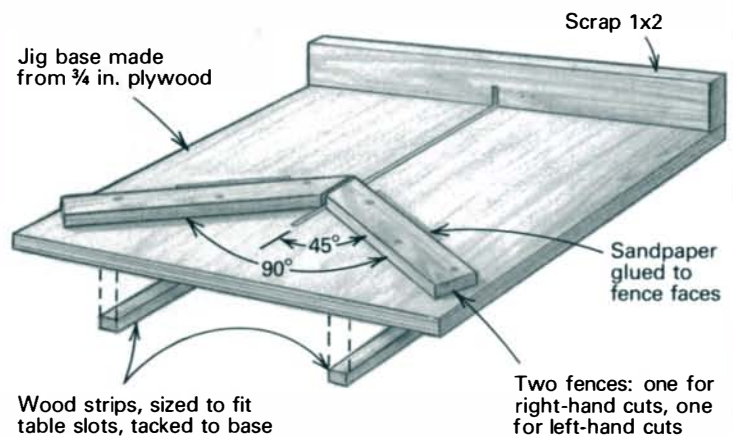
[Jon Arno is a wood technologist and consultant in Schaumburg, Ill.]

Perfect tablesaw miters

I am gearing up for a project that requires numerous precise 45° miter joints. I can use all the help I can get in creating a jig for these cuts, to get my project off to a good start.

—Fletcher K. Wood, Kanab, Utah

Sandor Nagyszalanczy replies: The best method I've seen for cutting dead-on 45° miters uses a simple plywood jig on the tablesaw. The device, as shown in the drawing below, has two fences, one for left-hand miters, and one for right-hand miters. These fences are precisely oriented and fixed to a plywood base with runners that fit a tablesaw's miter slots. The workpiece is held against one of the fences and the jig pushed forward to make the cut.



To make the jig, start with a piece of $\frac{5}{8}$ -in.- or $\frac{3}{4}$ -in.-thick plywood (particleboard is okay, but it's much heavier and not as strong) about the same size and shape as your saw table. If you are planning to cut some really wide or long pieces, you might want to make the base even larger. Now make two strips, sized to fit your miter slots exactly, and glue and tack them to the bottom of the base. Glue and screw a scrap 1x2 to the top back edge of the base. With the blade set to cut all the way through the plywood, slide the jig into the blade so that it cuts about halfway into the base.

WOODWORKING, CARVING, TOYMAKING, CARPENTRY

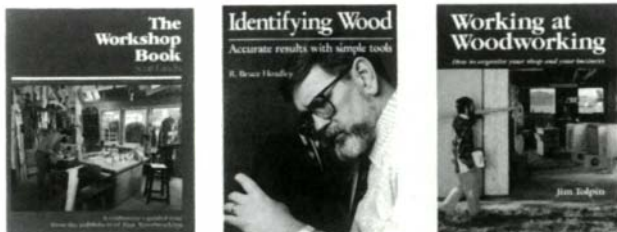
BOOKS & VIDEOS

MANNY'S WOODWORKER'S PLACE

602 S. Broadway, Lexington, KY 40508
VISA, MC, AM.EX., CHECKS ACCEPTED, ADD \$3 FOR C.O.D.

TO ORDER CALL TOLL FREE **1-800-243-0713** INQUIRIES CALL **606-255-5444**

SEND \$2 FOR THE MOST COMPLETE 64 PAGE CATALOG ON WOODWORKING BOOKS & VIDEOS



NEW BOOKS

Mastering Woodworking Machines (Duginske)	\$23	Making Stringed Instruments (Buchanan)	\$19
Woodworking Tools You Can Make	\$12	World Woods In Color (Lincoln)	\$46
The Workshop Book (Landis)	\$32	Table Saw Techniques (Cliffe)	\$16
Graphic Guide To Frame Construction (Thallon)	\$29	Queen Ann Furniture (Vandal)	\$32
Craftsman Style Houses (Fine Home Building)	\$24	Making Kitchen Cabinets (Levine)	\$18
Antique & Collectible Stanley Tools (Walter)	\$24	A Treatise On Stairbuilding And Handrailing (Mowat)	\$22
Carving Totem Poles And Masks (Bridgewater)	\$14	Trim Carpentry (Savage)	\$18
Working at Woodworking (Tolpin)	\$21	Antique Tool Collectors Guide To Value (Barlowe)	\$14
Identifying Wood (Hoadley)	\$38	Sam Maloof, Woodworker (Maloof)	\$38
Scroll Saw Holiday Patterns (Spielman)	\$12	VIDEOS	
		Build A Kentucky Rifle (2 1/2 hr.)	\$50
		Knifemaking (70 min.)	\$40

READER SERVICE NO. 202

Some of your best tools are lost on your bookshelf...

...but now you can find them.

THE PC INDEX to Fine Woodworking®



FWW is a reference work filled with information tools for your craft. Now use your PC to review the contents of all issues for titles, descriptions and authors of feature articles as well as for topics covered in the regular departments including Letters, Methods of Work, Questions and Answers and even Back Covers.

Enter any keyword and in seconds search the entire index for a list of matching entries. For example, there are currently **65 entries found matching the keyword VENEER** and each entry describes the context and directs you to its corresponding issue and page. THE PC INDEX is arranged by issue and contains over 2400 entries covering more than 3500 topics. You can also key in your new magazines to THE PC INDEX so that it is always up to date. No need to purchase updates. But if you don't type, you may purchase a complete update from us at any time for only \$12.95.

Special Bonus! The Taunton Press books containing articles reprinted from FWW are cross referenced in THE PC INDEX. From the magazine index, one keystroke directs you to the book and page of the reprint.

Only \$29.95 plus \$3.50 P/H. Or mail check or money order (U.S. funds) to:
(MA orders add \$1.50 tax) THE PC INDEX, Meredith Associates
Orders only call toll free 24 hrs., 7 days P.O. Box 792
Westford, MA 01886-0792
1-800-831-3200 FAX ORDERS (508) 392-0255

Minimum system required: Any PC compatible computer with min. 512K memory. DOS 2.2 or later. Program enhanced with hard disk drive and/or color monitor. When ordering, please specify 5.25" or 3.5" diskettes.

READER SERVICE NO. 97

Anytime Anywhere Anywood

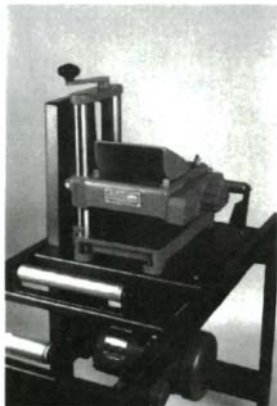
CURVED or STRAIGHT MOLDINGS

Both are yours with W&H Molder/Planer

Thousands of professionals and serious woodworkers use our American-made cast iron molder/planers to produce smooth moldings, raised panels, crowns and curved molding.

In the shop or at the job site, W&H meets your needs every day with quick knife changeover and ultimate versatility with all kinds of wood.

Over 40 years of experience supports our products with a 5 year warranty! Call or write today for our FREE information kit!



**Williams & Hussey
Machine Co., Inc.**
Dept. 132 EB

P.O. Box 1149, Wilton, NH 03086
800-258-1380 (USA) or 603-654-6828 FAX 603-654-5446



READER SERVICE NO. 68

<p>QUICK-GRIP The One Handed Bar CLAMP To apply pressure just squeeze the handle</p> <table border="0"> <tr> <td>#</td> <td>Jaw Opening</td> <td>Spec!</td> </tr> <tr> <td>Q506</td> <td>6"</td> <td>\$12.95</td> </tr> <tr> <td>Q512</td> <td>12"</td> <td>14.95</td> </tr> <tr> <td>Q518</td> <td>18"</td> <td>15.95</td> </tr> <tr> <td>Q524</td> <td>24"</td> <td>17.95</td> </tr> <tr> <td>Q536</td> <td>36"</td> <td>19.95</td> </tr> </table> <p>7pc. Bar Clamp Kit For corner clamping & edge gluing! REG. \$29.95 SPEC! \$17.95 Includes: 6" clamp, 2 reg. pads, 2 full face pads, 1 corner brkt. 1 corner pad #Q577</p>	#	Jaw Opening	Spec!	Q506	6"	\$12.95	Q512	12"	14.95	Q518	18"	15.95	Q524	24"	17.95	Q536	36"	19.95	<p>TRU-GRIP CLAMP 'N TOOL GUIDE MADE IN THE U.S.A.</p> <p>CLAMP 'N TOOL GUIDE The First Bar Clamp That's Also An "Obstruction Free" Straight Edgel</p> <table border="0"> <tr> <td>24" Grip (CT24C)</td> <td>\$21.95</td> </tr> <tr> <td>36" Grip (CT36C)</td> <td>25.95</td> </tr> <tr> <td>50" Grip (CT50C)</td> <td>28.95</td> </tr> </table> <p>BACK-TO-BACK BENCH CLAMP The "Instant SetUp" Portable Bench Clamping System</p> <table border="0"> <tr> <td>18" Grip (BB18C)</td> <td>\$30.95</td> </tr> <tr> <td>36" Grip (BB36C)</td> <td>37.95</td> </tr> <tr> <td>50" Grip (BB50C)</td> <td>44.95</td> </tr> </table>	24" Grip (CT24C)	\$21.95	36" Grip (CT36C)	25.95	50" Grip (CT50C)	28.95	18" Grip (BB18C)	\$30.95	36" Grip (BB36C)	37.95	50" Grip (BB50C)	44.95
#	Jaw Opening	Spec!																													
Q506	6"	\$12.95																													
Q512	12"	14.95																													
Q518	18"	15.95																													
Q524	24"	17.95																													
Q536	36"	19.95																													
24" Grip (CT24C)	\$21.95																														
36" Grip (CT36C)	25.95																														
50" Grip (CT50C)	28.95																														
18" Grip (BB18C)	\$30.95																														
36" Grip (BB36C)	37.95																														
50" Grip (BB50C)	44.95																														

Moon's Saw & Tool Inc. 2531-39 N. ASHLAND AVE. CHICAGO, IL 60614
(312) 549-7924 Call Toll Free: **1 (800)447-7371** Visa, M/C & DiscoverCard Accepted

READER SERVICE NO. 105

NEW **CASCADE TOOLS, INC.**

ROSETTE CUTTERHEAD

This is definitely the best rosette cutter on the market. Not only will it shape rosettes, but it will make rabbets, raised panels and more! — all on your drill press.

This is one tool that does it all!
Rosette, Panel, Rabbeting and Planing Knives Available.

CUTTERHEAD Part No. C1590 ONLY \$29⁹⁵

24 HRS. A DAY! 1-800-235-0272
ASK FOR A FREE CATALOG!

READER SERVICE NO. 93

To make the fences, cut two strips, each about 2½ in. wide, with 45° miters on the ends. Glue narrow strips of 120-grit sandpaper to the edges of the strips that end in the miter points. (The sandpaper will help keep the workpiece from slipping along the fence later). Now butt the ends of the miter together, and use an accurate framing square to keep the strips square to one another. Place the miter over the sawkerf in the jig base and carefully orient the fence assembly to a 45° angle to the line of cut (see the drawing). Glue and screw the fences down; then slide the jig into the running sawblade just far enough to cut through the end of the fence miter.

To use the jig, first cut your frame parts to approximate length, and hold the parts firmly against one fence or the other while pushing the jig through the miter cut. By making sure all pairs of frame members are exactly the same length and by making right and left hand cuts using the two fences, you can be assured of always getting a perfectly square frame.

[Sandor Nagyszalanczy is managing editor of *Fine Woodworking*]

Moving your power tools to Europe

I am planning to return to Norway and wish to take my power tools with me. Will I be able to run my tools that are designed to run on regular U.S. household current? If not, can I buy a converter that'll allow me to use them in Europe?

—Bard Schive, Houston, Tex.

Ed Cowern replies: If you want to use tools made to run on standard 110 volt (v), 60-cycle U.S. household power in a country that uses 220v, 50-cycle current (the standard power in Europe), you must first consider the type of motor in the tool or machine. Most portable power tools, such as drills, routers and belt sanders, are driven by universal motors. As their name implies, universal

motors will run at their designated voltage regardless of the number of cycles in the AC current (most will also run on DC current). The only catch to using your portable power tools in Europe is that you'll still have to buy a transformer that steps down the 220v power to 110v. Such transformers are generally available in ready-made power converters, but these are usually designed to handle only very low power requirements, such as a traveler's hairdryer or electric shaver. To handle your power tools, you'll probably have to buy a transformer from an electrical supply house. You'll need to buy one that is nameplated for 50/60 cycles and will handle the power requirements of the tool. Different sized transformers are distinguished by their volt-ampere rating or kilovolt-ampere rating. To determine the size of transformer you'll need, multiply the number of amps your most powerful tool uses (check its nameplate) by the tool's voltage. The result is the volt-ampere requirement of the tool (to get the kilovolt-ampere rating, divide this number by 1000). Buying a transformer slightly larger than this will allow you to run any of your portable power tools.

Usually transformers do not come with power cords or outlets, so it will be necessary for you to have a competent electrical technician wire the input and output of the transformer for your use. An on/off switch or circuit breaker and a pilot light on the input side of the transformer would be desirable so that it could be turned off when not in use. The pilot light reminds you that the transformer is turned on.

Stationary machines such as tablesaws, jointers and drill presses are typically run by induction motors, though some smaller "homeshop" models employ universal motors. If your motors are nameplated for 50/60 cycles (many are) and will run on either 110v or 220v, all you have to do is rewire the motor for the higher voltage. Then the motor will run directly on 220v, 50-cycle power.

SECO

SECO Best built dust collector with six sizes to choose from. We bag pollution and do it quietly. The right choice at the most affordable price. Call or write today. Prices F.O.B./L.A.

UFO-90
1HP/1Phase
610CFM, 4" inlet
Very quiet machine

UFO-101
2HP/1Phase
1182CFM
two 4" collection inlets

UFO-102B
3HP/1Phase
1883CFM, 4 bags
10.48 CU.FT. of volume
Three 4" inlets

UFO-80
1HP/1Phase
655CFM, with 4" inlet & floor sweeper

SECO INVESTMENTS COMPANY
(Woodworking Machinery Division)
315 Cloverleaf Drive #C
Baldwin Park, CA91706
Tel: (818) 333-1799 Fax: (818) 333-1899

Cover and knob for alternating use of air intakes

Floor sweeper clears away all dust and chips on the floor.

READER SERVICE NO. 119

SUPER TOOL SALE

WE WILL MEET ALL ADVERTISED PRICES

MAKITA

ALL MAKITA ACCESSORIES 30% OFF

SUPER SPECIAL	9.6Volt BATTERY	\$ 25.95
	7.2Volt BATTERY	24.95
	9.6Volt CHARGER	35.95
	7.2Volt CHARGER	33.95
6040DW	3/8" Cordless Drill Kit 7.2Volt	94.00
6040DW	3/8" Cordless Drill Rev.	46.00
5090DW	3-3/8" Saw Kit 9.6Volt	136.00
DA3000DW	3/8" Angle Drill 7.2Volt	134.00
4200N	4-3/8" Circular Saw 7.5amps	127.00
5007NB	7-1/4" Circular Saw 13amps	112.00
804510	1/4 Sheet Pad Sander	51.00
9924B	3"x24" Belt Sander	144.00
3620	1-1/4"H.P. Plunge Router	108.00
9501BZ	4" Grinder 3.5amps	68.00
JR3000V	Variable Speed Recd. Saw w/Case	128.00
HP1030W	3/8" Hammer Drill Variable Speed Rev.	119.00
2700W	8-1/4" Table Saw	265.00
6404	3/8" Drill Rev. 0-2100rpm.	57.00
3606	1 H.P. Router 7.5amps	91.00
1900BW	3-3/4" Planer w/Case	112.00
LS1440	14" Mitre Saw	419.00
2711	10" Table Saw with Electric Brake	475.00

BLACK & DECKER

1703-1	10" Mitre Saw w/50T Carbide Blade	\$179.00
3303	Elu 1 H.P. Plunge Router w/Parallel Fence	99.00
3310	1-1/2"H.P. Cyclone Router	116.00
3328	Elu 3-1/2"H.P. Router	282.00

HITACHI

DT1C-10	3/8" Cordless 2-Speed Rev. Drill 7.2Volt	\$ 63.00
DP44V	3/8" Harm. Drill Var. Speed Rev.	99.00
DP100	3/8" Cordless Hammer Drill 9.6Volt	122.00

SKIL

77	7-1/4" Worm Drive Saw	\$144.00
2735-04	12 Volt Var. Speed Cordless Drill w/Case	134.00
7484	2 Batt. & extra Special spc. Bit Set	99.00
1505-02	5" Random Orbit Sander	119.00
	4" Plate Joiner Kit w/Case	119.00

BE9RL	3/8" Variable Speed Rev.	\$ 67.00
SBE401RL	3/8" Variable Speed Rev.	79.00
SBZE16RL	1/2" Two Range Var. Rev.	118.00
EZ1381	1/2" Cordless Drill	134.00

PORTER CABLE

7310	Laminate Trimmer 5.8amps	\$ 86.00
330	Laminate Trimmer 3.8amps	97.00
100	Speed Block Finishing Sander 1/4 sheet	57.00
690	7/8"H.P. Router	94.00
355	1-1/2"H.P. Router	136.00
821	Platin Biscuit Joiner w/Case	169.00
9629	3/8" Variable Speed Drill	99.00
7750	6 Spd. Electronic Tiger™ Saw Kit	138.00
7335	1/2" Variable Speed Hammer Drill Rev.	142.00
7336	Var. Speed Random Orbit Sander w/5" pad	133.00
7336	Var. Speed Random Orbit Sander w/6" pad	135.00

BOSCH

30% OFF BOSCH JIG SAWBLADES

3050VSRK-1	3/8" Dual Torque VSR Cordless Driver Drill Kit	\$104.00
3230DVS	5" Random Orbit Dustless Sander	109.00
1158VSR	3/8" Pistol Grip Drill - Heavy Duty	59.00
1684	1-3/4 H.P. Router	128.00
1581VS	Orbital Action Jig Saw	139.00
1273DVS	4"x24" Variable Speed Belt Sander	199.00

BOSTITCH

T28-5	Stapler Nailer	\$268.00
M60FN	Finish Nailer	334.00
N80C	Coll Nailer	398.00
N80S	Stick Nailer	398.00

MILWAUKEE

8096	1/4 Sheet Orbital Finishing Sander	\$ 49.00
8256	Top Handle Jig Saw	138.00
6511	2-Speed Sawzall w/Case and Blades	128.00
6527	Super Sawzall Var. w/Case and Blades	186.00

FREUD

LU72M010	10"x40T ATB Wood Combo Blade	\$ 36.00
LU82M010	10"x60T TCG Cut Off Blade	48.00
LU94M010	10"x50T ATB Wood Combo Blade	41.00
LU85M010	10"x80T ATB Wood Combo Blade	59.00
LM72M010	10"x24T Flat Top Rip Blade	36.00
LU87M010	10"x24T Rip Blade Thin Kerf	37.00
LU98M010	10"x72T TCH Non Ferrous Metals	64.00
SD308	8" Bado Set with Carrying Case	118.00
F12000	3-1/4"H.P. Router	185.00
JS100	Joiner System	176.00
EB100	Edge Banding System	217.00

CALL TOLL FREE 1-800-228-6652

FROM U.S.A., CANADA, PUERTO RICO AND VIRGIN ISLANDS • FAX: (305) 999-5738

FREE FREIGHT TO THE CONTINENTAL U.S. ON MOST ORDERS

CHECK • MONEY ORDERS • VISA • MASTER CARD • DISCOVER CARD • C.O.D. CHARGE \$5.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE • PLEASE CALL FOR OTHER QUOTES

AAA TOOL WHOLESALE

6011 MAYO STREET • HOLLYWOOD, FLORIDA 33023
SERVING THE TOOL TRADE SINCE 1958

READER SERVICE NO. 81

ATTENTION ALL WOODCARVERS!!

NEW At last...
...your own magazine

WOODCARVING



A unique **NEW** magazine that covers all aspects of woodcarving. It is written with the interests of both the experienced and aspiring woodcarver in mind. Regular features include Product and Equipment reviews; exploration of woodcarving techniques; well illustrated projects, ideas, hints and tips. **WOODCARVING** magazine will become the most useful tool in your workshop!

WOODCARVING is a quarterly magazine and the first issue will be published in the summer.

Magazine Subscription:
1 Year US \$27.50, 2 Years US \$49.50.

For further information on **WOODCARVING** call toll-free (24hrs) on 1-800 225 9262 or return the coupon below to: GMC Publications Ltd., 166 High Street, Lewes, East Sussex BN7 1XU, United Kingdom.

Yes! Please send me details on **WOODCARVING**.

NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
TELEPHONE _____ 3 FW

Our Famous Dovetail Jigs Really have the Experts Talking

"Certainly no production workshop should be without one of these, and the serious home craftsman will find great joy in using it."

JOHN SAINSBURY'S ROUTER WORKSHOP

"A production-quality machine...we found it easy to use."

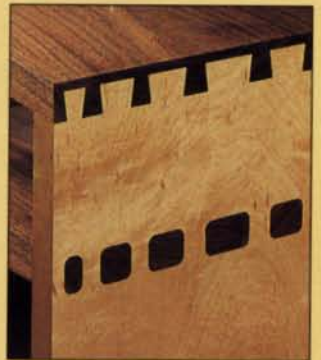
BETTER HOMES AND GARDENS WOOD MAGAZINE

"I was amazed that this jig...could make so many joints...in any pattern you like..."

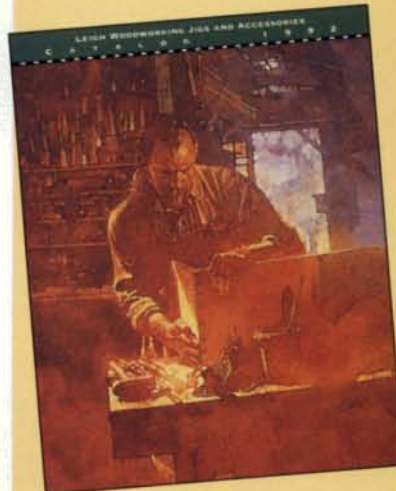
FINE WOODWORKING MAGAZINE

"The Leigh jig cut through dovetails that looked identical to those cut by hand, and fit together as if they had been cut by a master."

WOODSMITH MAGAZINE



And our New FREE Full Colour Catalog will show you Why.



NEW! Through Dovetail Joint Cutter Profiles.

NEW! Half-Blind Dovetail Joint Cutter Profiles.

NEW! Universal Guidebushes to fit even more routers.

NEW! See Leigh jigs in use in "The New Yankee Workshop" videos.

PLUS! The only Multiple Mortise and Tenon Attachment ever made.

AND! Top woodworkers worldwide share their projects and comments.

In U.S.A. ☎ or Canada

Call Toll Free
1 800 663-8932
Or Fax Us At
604 464-7404

Or Mail Us The
Coupon Below:

Leigh Industries Ltd.
P.O. Box 357
1585 Broadway Street
Port Coquitlam, B.C.
Canada V3C 4K6

YES, send me my FREE Dovetail Jig and Accessories Catalog.

LEIGH

Name _____
Address _____
State/Prov. _____
Country _____ Zip/Postal Code _____ FWW

If your motors are nameplated for 60 cycles only, the complications of converting them to run on 50 cycles are difficult enough to warrant buying new 50 cycle motors when you get to Europe. Converters that change 50 cycles to 60 cycles are expensive and not readily available for handling single-phase power. [Ed Cowern is an electrical engineer and president of EMS, a company that distributes Baldor electric motors.]

Problems with slow-drying tung oil

I recently rented Frank Klausz's video on wood finishing, and was particularly interested in his use of tung oil. But when I purchased a can of Pure Tung Oil from Liberon and tried to follow his method, the finish was extremely slow to dry. What am I doing wrong? —Antony Porter, Lorpont, Cornwall, England

Chris Minick replies: Oil finishes are popular with woodworkers because they are easy to apply, give consistent, predictable results and are easy to repair. They do have two major drawbacks though: long drying times and marginal protection qualities.

As you have already found, thick coats of oil are very slow to dry. There are two reasons for the slow drying. First, all vegetable oils, such as tung oil, contain naturally occurring antioxidants which prevent the oil from hardening while still in the plant. These antioxidants must evaporate from the oil before any drying can take place. Hence, applying a too-thick coat of oil will retard the release of the antioxidants, resulting in a long drying time.

Second, oils dry by a process called oxidative polymerization. Oxygen is absorbed from the air and causes the oil molecules to crosslink, forming the finish film. As you would expect, the surface of a heavy coat of oil dries first, skins over and forms an effective oxygen barrier. Oxygen must now diffuse through the cured surface film to polymerize the oil that's uncured below,

which is a very slow process. Metallic driers can be added to most drying oils to speed up the drying process. This fix doesn't work with all oils though, tung oil being the most famous exception. Tung oil polymerizes by a unique mechanism different from other common oils and will not respond to metallic drier treatment.

Two things can be done to overcome the drying problems. If you prefer to use conventional oil finishes, such as raw tung or linseed, apply *very* thin coats and wait at least 24 hours between coats. The better solution though, is to use a modified drying oil, like polymerized tung oil or one of the Danish-oil products. Regardless of brand, traditional Danish-oil finishes are mixtures of alkyd resins, drying oils, and solvents. These products look, act and apply like conventional oils but eliminate the lengthy drying time. This added benefit provided by the alkyd modification provides a harder, more durable finish that still retains the easy repairability feature of conventional oils.

As with conventional oils, the key to success when using any any drying oil as a finish is to apply multiple *thin* coats. Eight-to-ten coats may be necessary to provide sufficient protection for heavily used furniture, such as dining room tables. A sufficiently thin coat can be applied by using a wipe-on/wipe-off technique. Saturate a cloth with oil and wipe a liberal coat on your project. Apply enough oil to visually wet the surface. Then allow the oil to soak into the wood for 20 to 30 minutes and wipe off the excess. Let the remaining thin oil film dry for at least 24 hours, and repeat the process until you are satisfied with the appearance.

[Chris Minick is a product development chemist and amateur woodworker in Stillwater, Minn.]

Send queries, comments and sources of supply to Q & A, Fine Woodworking, PO Box 5506, Newtown, Conn. 06470-5506.

Patented self-stabilizing design
secure on most uneven surfaces



Supports 2½ tons

**MORE THAN
A ONE TRICK
PONY**

**PACK
HORSE™**
SAW HORSES

\$99.95 a pair

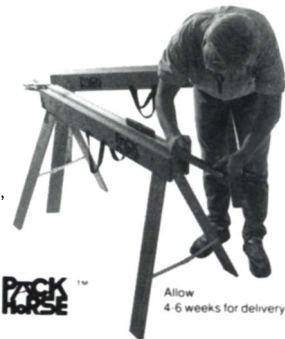
plus shipping & handling

The PACK HORSE is a saw horse made of Southern Yellow Pine & Birch plywood and weighs 32 lbs. When latched together it stores easily in truck or trunk.

Master Card and Visa accepted, call toll free 1-800-945-9545

DAVALCO PRODUCTS
301 West 53rd St. suite 3D
N.Y.C. N.Y. 10019

Money back guarantee for 1 year
Materials & workmanship guaranteed for 5 years



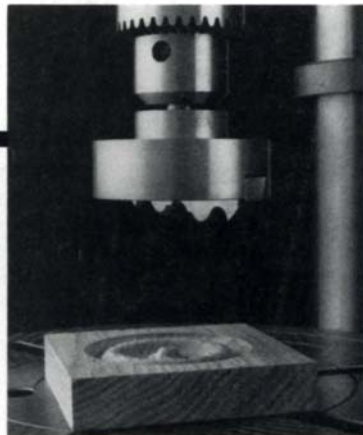
**PACK
HORSE™**

Allow
4-6 weeks for delivery

ROSETTE CUTTERHEAD

WOODSTOCK
INTERNATIONAL
WOODWORKING TOOLS AND ACCESSORIES

92W-104



DEALERS!

Here is an inexpensive way to produce perfect rosettes on a drill press or wood lathe. Our rosette cutter can be chucked into any 1/2" drill

chuck or mounted directly into a drill press or tail stock spindle using optional Morse tapers.

- Solid steel construction
- Cuts up to 3" rosettes
- Optional Morse tapers available
- Wide variety of profiles to choose from
- Rabbeting & paneling knives available

NEW!

P.O. BOX 2027
BELLINGHAM, WA 98227 U.S.A.

PHONE: (206) 734-3482
FAX: (206) 671-3053

WHOLESALE ONLY!

**SAFE • EASY • PRECISE
PROFESSIONAL
WOOD SCULPTURING**

AUTO MACH
Compact. 10,000 vpm oscillating speed. Pressure activated. Operates on ordinary household current.
Send for free brochure. **\$31400**
Dealers inquiries invited Visa and Mastercard accepted
1700 N. Penny Lane Schaumburg, IL 60173 (708) 397-9401

Sugino Corp.

READER SERVICE NO. 118

STEVE WALL LUMBER CO.
Quality Hardwoods and Woodworking Machinery For The Craftsmen and Educational Institutions

LUMBER SPECIALS
CHERRY.....\$99*
100 bd. ft. Bdl. Log Run 13/16
WALNUT.....\$110*
100 bd. ft. Bdl. #1 Com. 4/4
*FOB Mayodan-Motor Frt. Only

UPS Special

Ash	4/4	Select	1.90	\$ 60.00
Basswood	4/4	Select	1.30	\$ 48.00
Cypress	4/4	Select	1.60	\$ 50.00
Butternut	4/4	Log Run	1.40	\$ 56.00
Cherry	4/4	Select	2.45	\$ 68.00
Hickory	4/4	Select	1.50	\$ 48.00
Mahogany (Genuine)	4/4	Select	2.75	\$ 74.00
Maple (Hard)	4/4	Select	1.60	\$ 53.00
Maple (Soft)	4/4	Select	1.35	\$ 47.00
Pecan	4/4	Select	1.50	\$ 48.00
Poplar	4/4	Select	1.20	\$ 46.00
White or Red Oak	4/4	Select	1.80	\$ 58.00
Walnut	4/4	Select	2.75	\$ 72.00
Cedar (Aromatic Red)	4/4	1C+Btr.	1.40	\$ 47.00
White Pine	4/4	F.G.	.85	\$ 38.00

Above prices are for 100' quantities of kind/ried rough lumber sold by the Bd. Ft. FOB Mayodan, NC Call for quantity discounts. Other sizes and grades available.

Above prices are for 25 bd. ft. bundles of clear kindred lumber 3"-10" wide x 3"-7" long (Random widths & lengths) Surfaced 2 sides or rough. Delivered UPS prepaid in the Continental U.S.

**STEVE H. WALL
LUMBER CO.**
BOX 287 • MAYODAN, N.C.
27027
919-427-0637
1-800-633-4062
FAX 919-427-7588

Send \$1.00 For Lumber and Machinery Catalog

READER SERVICE NO. 36

**Woodworker's
HARDWARE**
Manufacturers Hardware For The Home Craftsman

FREE CATALOG
Huge line of SPECIALIZED Cabinet and Furniture Hardware.

- Knobs
- Pulls
- Hinges
- Drawer Slides
- Lighting
- Cabinet Accessories
- Connectors
- Locks
- Abrasives

Much, Much More!

Send or call for FREE CATALOG
P.O. Box 784 St. Cloud, MN 56302

1-800-383-0130

READER SERVICE NO. 67

CMT Tools
"Only Premium Quality Tools For Professionals"

Solid Brass Inlay Set
Simplify your inlay work and increase your accuracy with CMT's new inlay set. The solid brass template guide will follow any 1/4" thick pattern, allowing you to produce perfectly-fit inlays in any shape you desire. Fits Porter-Cable, Black & Decker and similar bases and any other router with a manufacturer-supplied adapter for Porter-Cable template guide. Includes solid carbide spiral bit, quick-change bushing, template guide and complete instructions.

NEW
880-002K Sale: \$34.90

Your CMT Bits Feature:
• **TEFLON®:** A tough layer of Teflon® baked (not painted) on every bit body to enhance visibility and performance.
• **PREMIUM FATIGUE-PROOF® STEEL:** All shanks and bit bodies are constructed of the same steel specified by automakers like Ferrari and Porsche for critical transmission and drive train parts. This steel stands up to the heat and stress of high performance driving or high production woodworking.
• **ANTI-KICKBACK DESIGN:** This vital safety feature is used whenever size of the bit allows, generally 3/4" diameter or larger.
• **MICROGRAIN CARBIDE:** We use only CMX-4, the premium carbide of Cerametal, the world's largest manufacturer of tungsten-carbide. The hardness is between C2 (92 Hrc) and C4 (94 Hrc) depending on the application.

All Sets Include Hardwood Case

13-Piece Set
CMT's finest 1/2" shank carbide-tipped bits, including dovetail, mortising, round nose, V-groove and 3 straight bits. Also includes cove, rabbeting, roundover, ogee, chamfer and flush trim bits with shielded bearings. All feature Teflon® coatings and micrograin carbide.
800-505 List: \$275.00 Sale: \$199.00

Complete Sets For Inca And Leigh Jigs
The bit for every joint your jig will cut. Our 10-piece 1/4" & 1/2" shank set for Leigh (800-502) includes 3 straight and 7 dovetail bits. The 8-piece set for Inca (800-500=1/4" shank, 800-501= 1/2" shank) have 2 straight and 6 dovetail bits.
800-500 List: \$137.60 Sale: \$99.00
800-501 List: \$145.80 Sale: \$109.00
800-502 List: \$180.40 Sale: \$129.00

6-Piece Set
This great starter set includes 1/2" shank chamfer, roman ogee, roundover, rabbeting & cove bits with shielded bearings, plus a 1/2" round nose bit. All with micrograin carbide edges.
800-504 List: \$157.90 Sale: \$119.00

12-Piece Set
Packed with possibilities, this 1/4" shank set includes chamfer, rabbit, radius, flush trim, cove and ogee bits with shielded bearings. Also included are dovetail, V-groove, mortising, round nose and 2 straight bits. All bits have micrograin carbide edges, bearing bits feature anti-kickback design.
800-503 List: \$224.40 Sale: \$159.00

Lifetime Warranty: We stand behind every CMT bit with a simple guarantee. If you have a problem with one of our bits before resharpening, simply return it for immediate exchange or credit. Excludes dullness due to usage
Please Send \$2.00 For Our Complete Catalog
CMT Tools, 5425 Beaumont Center Blvd, Suite 900 Tampa, Florida, 33634
1-813-886-1819, 1-800-531-5559
FAX: 1-813-888-6614
In Canada call: 1-416-663-8665

Call For The Dealer In Your Area. Dealer Inquiries Welcome!

READER SERVICE NO. 133

\$\$\$

**SAVINGS
ADD UP
FAST
WITH AN
EBAC
DRY
KILN**

LOW INITIAL COST

LOW OPERATING COSTS

QUALITY KILN DRIED LUMBER

RAPID PAYBACK

EASY TO OPERATE
CALL TODAY 1-800-433-9011

EBAC LUMBER DRYERS
106 John Jefferson Road, Suite 102
Williamsburg, VA 23185
(804) 229-3038 Fax (804) 229-3321
In Canada: (416) 985-2123 Fax (416) 985-3708

\$\$\$\$\$

READER SERVICE NO. 61

NEW! DRUM SANDER
with Infinitely Variable Power Feed!



At last! A complete power-feed Drum Sander at an affordable price! Choose from 26" and 38" models.

Now you can save hours of tedious hand scraping and sanding. In a matter of seconds, you can turn out satin-smooth panels, doors, shelves and other glued-up pieces. No more dips and waves. No more gouging. Infinitely variable power feed gives you total control. Turns out perfectly flat, glass-smooth panels that look better and take stain more evenly than any you could do by hand.

Send for complete facts. See how the Woodmaster can finish cabinet pieces, resawn stock, paneling, tabletops, knees, burls and much more! Made in U.S.A. Easy terms.

Call Toll Free 1(800) 821-6651, Ext. DS35



YES! Please rush my **FREE INFORMATION KIT** and details on your 30-Day Free Trial Guarantee.

Woodmaster Tools Dept. DS35
2908 Oak, Kansas City, MO 64108

NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
PHONE (____) _____

READER SERVICE NO. 55

SawWALKER™
Portable Tool System



MODEL SW1
Ruled extension stop extends to a full 8 feet.



COMPARE FEATURES

- Fits all power miter boxes, not just some, even 15" and compounds.
- Large wheels negotiate stairs, rough terrain.
- H.D. Wheel lock
- Outrigger support for heavy loads, rough terrain.
- Durable steel extension wings, not particle board like other systems.
- Tape and stop extends to full 8 feet.
- H.D. extension support braces won't break and are fully adjustable.

SawWALKER™ folds compactly, steering handles and large wheels handle any terrain. Lower compartment holds tool box or misc.

AMERICAN DESIGN & ENGINEERING INC.
St. Paul Park, MN
1-812-459-7400 1-800-441-1388

ANTIQUE & USED TOOLS

Quality selection of scarce, older and complete, working handtools for collectors and woodworkers- planes, scrapers, spokeshaves, chisels, saws, levels, rules, unusual items, etc.

Prompt, postpaid service. VISA/MC.

SATISFACTION GUARANTEED

SUBSCRIPTION > \$10.00

CURRENT LIST > \$ 2.50

BOB KAUNE

specializing in



buy and sell

511 W. 11th, Dept. D92 • Pt. Angeles, WA 98362
(206) 452-2292

Wood Moisture Meter

pocket-size
MINI-LIGNO
Range: 6-20%
in 1% steps
Size: 1"x2¼"x5½"



\$110
only

Including Case, Battery, Pins for 3/16" or 7/16" measuring depth.

Also available as Mini E, 6-36%

Lignomat USA Ltd.
503-257-8957 800-227-2105

P.O. Box 30145 fw
Portland, OR 97230

READER SERVICE NO. 40

FREE WOODWORKING TOOL CATALOG!

Our new 140 page, full-color catalog is packed with over 4,000 new and best-selling quality woodworking tools, books, cabinetry hardware, and supplies.

Order Yours Today!

Call free **1-800-542-9115** Or write:



WOODCRAFT®

210 Wood County Industrial Park
Dept. 92WW05T, P.O. Box 1686
Parkersburg, WV 26102-1686

READER SERVICE NO. 103

Buy right, ^{The FIRST Time} Buy BRIDGEWOOD®!

FINE QUALITY WOODWORKING MACHINERY
YOU BUY DIRECT: NO MIDDLEMAN



BW-2S SHAPER \$895.
Large 20" x 24¾" table. Dovetail miter gauge slot. ½" and ¾" interchangeable spindles. 2 HP motor, forward/reverse switch. Seven other model sizes available.



PLANER \$2,495.
Planes 16" wide by 7" thick. Exclusive stock feed disconnect. 3 HP US Motor, variable feed rate. Other models from 12" to 24" wide.



BWJ-872 JOINTER \$1,795.
Planes 8" wide and up to ½" deep. Four knife cutter head. 2 HP US motor. Other models from 6" to 16" wide.



PBS-740 BANDSAW \$2,695.
Designed and made in Europe. 28" throat opening. 19½" depth. Table tilts 45°. Miter gauge slot. Rip fence. Other models from 14" to 20" available.



Wilke Machinery Company: Phone 717-764-5000
OFFICES AND SHOWROOM 3230 SUSQUEHANNA TRAIL YORK PA 17402

New, 52-page BRIDGEWOOD CATALOG
SEND \$1.00 FOR YOUR COPY.



90P1

READER SERVICE NO. 157

TABLE SAW FENCES

T50	50" BIESEMEYER	294
X50	50" EXCALIBUR	329
34-897	50" UNIFENCE	289

BOSCH

1370DEV5	5" R.O. Sander	289
1604K	1 3/4 hp Router kit	164
1609K	3-base Trimmer kit	167
1608U	Underscribe Trimmer	119
1631K	Recipsaw	119
1942	Heat gun	68

1581VS

3051VSRK-1	Cordless drill Kit	129
3051VSRK	With 2 batteries	145
9164VSR	3/8" Midget Drill	105

Emqlo

AM39HC4V	3/4 HP - 2 tank	288
AM78HC4V	1 1/2 HP-2 tank	298

BLACK & DECKER

1166	3/8" Professional Drill	59
1350-09	Timberwolf Drill	254
2664K	Cyclone 9.6v Cordless	129
2665K	Cyclone 12v Cordless	148
2720	1.5hp Router 1/4" collet	113
2721	1.5hp Router 1/2" collet	122
2750	Mini Grinder	77
3102-09	2 spd Cutsaw	99
3328	3.5 hp Elu Router	266
4076	7" Wildcat Grinder	143
14765	25pc Bullet Drill bit set	55

2670 Impact Wrench \$139

FANTASTIC TOOL DISCOUNTS

Makita

6093DW \$124
Cordless Driver Drill



6093D	tool only Drill	83
1900BW	Plane Kit	112
3612B	3hp PlungeRouter	164
3612BR	3hp PlungeRouter	164
4209N	Trim Saw	126
5005BA	5 1/2" Circ. Saw	134
6404	3/8" Drill	57
6510LVR	3/8" DRILL	83
6801DBV	Drywall Screwgun	89
9514	Mini Grinder	66
9924B	3x24 Beltsander	144
9924DB	Same w/dustbag	158
BO4530	Round Pad Sander	59
BO4510	Pad Sander	49
DA3000DW	7v RA Cordr drill	134
DA390DW	9v RA Cordr drill	148
DA390D	RA tool only 9v	84
JR3000V	Recipro Saw	127

LS1030 \$215

10" Miter Saw



SKIL

1605-2	Biscuit Joiner	118
5510	5 1/2" Trim Saw	108
5860	60" 8 1/4" Wormdrive	168
9645	7" Disc Grinder	119
9665	9" Disc Grinder	129

77 \$142
7 1/4" Wormdrive Saw



Milwaukee

0222-1	3/8" Drill	104
0234-1	1/2" Magnum	112
0375-1	3/8" RA Drill	123
0379-1	1/2" RA Drill	146
1660-1	1/2" HD Drill	168
1670-1	Hole Hawg	219
3202-1	1/2" HD RA Drill	199
3300-1	RA Magnum	178
5347	RotoHammer	429
5371-1	1/2" Hammer Kit	184
5375-1	1/2" Hammer Kit	169
5392-1	3/8" Hammer Drill	114
5397-1	3/8" Hammer Kit	138
5455	7" Polisher	133
5660	1 1/2 hp Rox er	184
5680	2 hp Router	204
6014	1/2 sheet Sander	115
6016	Pad Sander	49
6125	5" R.O. Sander	125
6126	6" R.O. Sander	128
6142	Mini Grinder Kit	119
6234	VS Band Saw	259
6365	7 1/4" Circular Saw	116
6507	VS Sawzall	131
6508	VS Sawzall	129
6527	Super Sawzall	164
6528	Super Sawzall	163
6539-1	Cordless screwdriver	72
6583-1	VS Screwshooter	142
6747-1	Drywall gun 0-2500	99
6750-1	Drywall gun 0-4000	88
6753-1	Drywall gun 3.5 amp	85
8975	Heat Gun	58
8977	Variable Heat Gun	74

6511 \$125
2 spd Sawzall



STABILA

LEVELS - Hand holes. Two vertical vials. Two milled faces. Yellow coat.

2464	24"	36
2469	36"	39
2467	48"	45

PORTER-CABLE

330 Palm Sander \$53



100	7/8 hp Router	94
5116	Dovetail Jig	249
555	Biscuit Joiner	163
690	1-1/2 hp Router	123
693	Plunge Router	162
6931	Plunge Base	74
696	Router Table	116
7310	Trim Router	83
9118	Door Plane Kit	108
9345	SawBoss Kit	122
9629	Recipro Saw	137
97310	Trimmer kit	184
9851	12v Cordless Drill	135

7336 \$129
VS Orbital Sander



STIKIT SANDPAPER

Grit	4 1/2" rolls 10 yards	3M
80	10.95	9.95
100	9.95	9.95
120	9.95	9.95
150	9.95	9.95
180	9.95	9.95
220	9.95	9.95

RYOBI

BT3000 \$539
Professional 10" Table Saw



BE321	3x21 Sander	127
BT3000	10" Pro Table Saw	539
JM100K	Biscuit Joiner	202
JS045	Jig Saw	85
L1323ALSK	Plane	119
RS01	2hp Plunge Router	148
RE600	3hp Plunge Router	199
RJ100VK	Reciprocating Saw	89
S55A	Palm Sander	43
SC160	Scroll Saw	133
TFD170	9v Cordless Drill Kit	144
TFD220	12v Cordless Drill Kit	164
TS200	8" Compound Miter	143
TS260	NEW! 10" Comp. Miter	219
TSS200	NEW! 8.5" Skidew	447

HITACHI

CR10V	Recipro Saw	119
F20A	Plains	89
M12V	3 1/4hp Plunge Rtr	223
TR6	Trim Router	93
TR12	Plunge Router	165

C8FB \$438
Compound Miter



Panasonic

CORDESS POWER TOOLS

EY571B	9v Cordr Drill	127
EY571BC	with case	139
EY970B	battery	39

freud

94-100 5pc \$153
Router Bit Cabinet Set

WC104	4pc Chisel Set	38
WC106	6pc Chisel Set	49
Professional	Carbide-Tipped Blades	
LU85M010	10" 80T Finish	56
LU84M011	10" 50T Combo	38
LU73M010	10" 60T Finish	43
TK906	10" 50T Combo	26

SENCO

not available in all areas

LS2	Pinner 5/8" - 1"	248
LS5	Pinner 1" - 1 1/2"	258
SFN2	Big Finish Nailer	385
SKS	1/4" Crown Stapler	254

SFN1 1-2" Finish Nailer \$263



DML
Cutting everything but corners

D1024R	10" 24T Rip	44
D1040GA	10" 40T Gen. P.	46
D1050PL	10" 60T Planer	45
D1060CA	10" 60T Cutoff	48
D1080TA	10" 80T Trim	59
D2458	SawMan 3 blade set	159
D1024R, D1050PL, D1080TA	Adjustable Dado	
AD8000	8" Adjustable Dado with Twin V-Blades	89

USE VISA, MC, DISCOVER

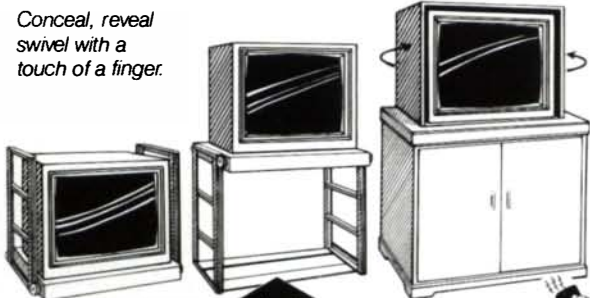
FREE SHIPPING on orders over \$50.
Within continental 48 states, HI and AK extra.
Sales limited to stock on hand.

ABBEY TOOLS
1-800-225-6321

1132 N. MAGNOLIA, ANAHEIM CA. 92801
OPEN 8-5:30 WEEKDAYS 9-2 SATURDAY
Calif. residents add 7.75% state sales tax
SERVING YOU FOR OVER 15 YEARS
Prices subject to change without notice

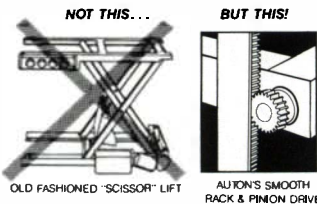
READER SERVICE NO. 110

Conceal, reveal
swivel with a
touch of a finger.



AUTON POP UP TV LIFTS

YOU BUILD THE FURNITURE—WE'LL PROVIDE THE AUTOMATION



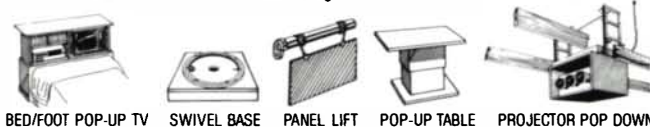
Since 1955, the Auton Company has served the design community with quality motorized systems that utilize remote controls and small, powerful motors. Motorized platforms glide smoothly and quietly on four racks and pinions and even swivel at a touch of a button.

AUTON POP UP COMPUTER LIFTS

Lower your computer and keyboard into a cabinet at a touch of a button. Provides vital security while enhancing the appearance of any office. Helps keep computers dust free when not in use. Call or write today for free literature.



AUTON COMPANY Box 1129 · Sun Valley, CA 91353-1129 · (818) 367-4340
Beverly Hills (310) 659-1718 · Honolulu (808) 734-1260 · FAX (818) 362-9215
Auton does not make furniture. US & Foreign Pat. Pend. MADE IN THE USA.



READER SERVICE NO. 58

CO-MATIC

CO-MATIC MACHINERY CO., LTD.

P.O. BOX: 128 FENG YUAN TAIWAN 42099
PHONE: 04-5667105 FAX: 886-4-5667109

The only name you need to know in POWER FEEDER.

5 Years
Limited
Warranty



Distributor:

SUNHILL NIC CO., INC.
500 Andover Park East, Seattle, WA 98188
CALL TOLL FREE (800) 544-1361

READER SERVICE NO. 43

DELTA BENCH TOP TOOLS			
Model		List	Sale
23-700	Wet/Dry Grinder	234	155
23-880	6" Bench Grinder 1/4 HP	86	75
23-880	8" Bench Grinder 1/2 HP	151	115
11-950	8" Drill Press	199	145
28-160	10" Hobby Band Saw	210	145
31-050	1" Belt Sander 2.0 amp	104	78
31-460	4" Belt/Disc Sander	198	145
31-340	NEW 1" Belt/8" Disc Sander	268	186
31-080	NEW 1" Belt/5" Disc Sander	134	94

NEW TOOLS BY DELTA			
Model		List	Sale
40-560	16" 2 speed Scroll Saw	266	184
11-990	12" Bench Drill Press	276	209
11-090	32" Radial Bench Drill Press	399	309
43-355	3/4" Shaper 1 1/2 HP	964	695
43-505	1/2" Bench Router/Shaper	399	275
22-540	12" Bench Top Planer	595	398
36-220	10" Compound Miter Saw	350	235
28-180	Bench Band Saw	232	167
40-640	NEW 20" Bench Scroll Saw	466	325
23-675	NEW 6" Grndr/3x24Belt Sndr	141	105
14-600	Hollow Chisel Mortiser	668	465
46-700	12" Wood Lathe	548	419

DELTA STATIONARY			
Model		List	Sale
34-761	10" Unisaw 1-1/2 HP	1715	1295
33-990	10" Radial Arm Saw	818	585
37-280	6" Motorized Jointer	488	389
50-179	3/4" HP 2 stage Dust Collector	483	335
50-181	2 HP Dust Collector	885	610
70-200	NEW 20" Floor Drill Press	1049	775
37-154	DJ15 6" Jointer w/3/4 HP motor	1420	1079
33-055	8-1/4" Sawbuck comp w/legs	865	579
34-330	NEW 8-1/4" Table Saw 13A	343	229
34-670	10" Motorized Table Saw	511	395
32-100	Station Plate Jointer	645	285
36-040	8-1/4" Compound Miter Saw	224	165
34-915	30" Unifence	385	239
34-897	50" Delta Unifence	525	279
36-755	NEW 10" Tilt Arbor Saw	1264	929
34-445	34-444 Saw with 30" unifence	1200	815
HTC Mobile Bases for above Machines			
HRD-10	fits Delta 34-444 table saw	88.50	
HRD-10X	fits Delta 34-445 table saw w/nce	132.00	
HRD-14	fits Delta 28-283 bandsaw	88.50	

MILWAUKEE TOOLS			
Model		List	Sale
6527	NEW Sawzall with case	299	164
6528	above Sawzall w/wired cord	295	164
6125	NEW 5" Random Orbit Sander	200	119
6126	NEW 6" Random Orbit Sander	205	125
0399-1	12V c/ds Drill Kit complete	304	165
0402-1	above Drill w/keyless chuck	309	169
0395-1	9.6V cordless Drill w/case	284	158
0224-1	3/8" Drill 4.5 amp magnum	203	115
0234-1	1/2" Drill 4.5 amp 0-850 rpm	223	119
0244-1	1/2" Drill 4.5 amp 0-600 rpm	223	122
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	189	105
0228-1	3/8" Drill 3.5 amp 0-1000 rpm	183	102
0375-1	3/8" close quarter Drill	223	129
0379-1	1/2" close quarter Drill	254	145
6539-1	c/ds Screwdriver 190 rpm	127	75
6546-1	c/ds Screwdr 200 & 400 rpm	138	79
3102-1	Plumbers right angle Drill Kit	360	195
5399	1/2" D-handle Hammer Drill Kit	319	184
1676-1	HD Hole Hawg with case	459	247
6511	2 speed Sawzall with case	234	134
6750-1	Drywall Gun 0-4000 5.4 amp	162	93
6507	Original Sawzall with case	249	135
6170	1/4" Chop Saw 15 amp	489	279
6014	Orbital Sander 1/2 sheet	214	116
8977	variable temp. Heat Gun	122	75
5397-1	3.8" var. spd Hammer Drill Kit	244	139
5371-1	1/2" var. spd Hammer Drill Kit	335	188
3107-1	1/2" var. spd rt angle Drill Kit	370	199
6754-1	Drywall Gun 0-4000 5.4 amp	192	114
3300-1	1/2" var. speed rt angle Drill	329	179
5680	Router 2 HP - 12 amp	355	205
6215	16" Chain Saw	309	174
0235-1	1/2" Drill w/keys chuck mag	223	125
6145	4-1/2" Grinder 10,000 rpm	162	98
6142	6145 with case & accs	199	129
6749-1	Drywall Gun 0-2500 5.4 amp	224	119
5353	Exide 1-1/2" Rot. Hammer w/case	910	499
6365	7-1/4" Circular Saw 13 amp	214	120
8367	above Saw - double insulated	209	122
6368	6365 w/nce & carbide blade	224	125
6368	6365 w/nce, carb. blade, & cse	244	134
6377	7-1/4" Worm Drive Saw	324	175

FREUD CARBIDE TIPPED SAW BLADES			
Item	Description	Teeth	List Sale
LU72M10	Gen Pur. A.T.B. 10" 40	67	39
LU82M10	Cut-off 10"	60	49
LU84M11	Comb 10"	50	76
LU85M10	Super Cut-off 10"	80	112
LM72M10	Ripping 10"	24	68
LU73M10	Cut off 10"	60	82
LU87M10	Thin Kerf 10"	24	70
LU88M10	Thin Kerf 10"	60	86
LU98M10	Ultimate 10"	80	125
TK206	10" Framing	24	38
TK303	7-1/4" Finishing	40	37
TK306	10" Finishing	40	46
TK906	10" Combo	50	52
SD306	6" Dado - Carbide	215	109
SD308	8" Dado - Carbide	229	119
F0	1-3/4" x 5/8" Biscuit 1000 Qty.	32	29
F10	2-1/8" x 3/4" Biscuit 1000 Qty.	32	29
F20	2-3/4" x 1" Biscuit 1000 Qty.	34	29
FA	Assorted Biscuits 1000 Qty.	34	29
FB100	16 piece Forsner Bit Set	331	165
94-100	5 pc Router Bit Door System	319	159
JS100	Biscuit Jointer with case	334	159
FT2000	3-1/4 HP Plunge Router	350	179
FT2000E3	1/4 HP v/spd Plunge Router	410	209

MAKITA TOOLS			
Model		List	Sale
6070DW	3/8" v/spd Reverse Drill 7.2V	124	74
6071DWK	above Drill w/removable batt.	194	109
5090DW	3-3/8" Saw Kit 9.6 volt	250	139
6010DWK3/8"	cordless Drill Kit 7.2V	173	97
6010SDW3/8"	cordless Drill Kit 7.2V	96	59
DA3000DW	3/8" Angle Drill 7.2 volt	241	136
4390DW	9.6 cordless Recip Saw Kit	234	129

6012HDW	2 spd Drill w/clutch-comp	236	125
6092DW	var. spd Drill Kit complete	257	127
6093DW	v/spd Drill w/clutch-complete	261	135
6093DWW	6093DW Drill Kit w/Flash Lt.	299	169
6095DWE	6095DW Drill Kit w/2 batteries	270	139
632007-4	9.6 volt Battery	47	30
632002-4	7.2 volt Battery	39	28

5007NBA	7-1/4" Saw w/electric brake	243	129
5008NBA	8-1/4" Saw w/electric brake	301	163
B04510	1/4 sheet Pad Sander	93	55
9900B	3" x 21" Belt Sander w/bag	283	149
9924DB	3" x 24" Belt Sander w/bag	299	159
9045N	1/2 sheet Fin. Sander w/bag	246	129
4301BV	Orb. var. spd Jig Saw 3.5A	262	142
JR3000V	var. speed Recip Saw w/cse.	239	129
LS1020	10" Miter Saw 3.5 amp	571	299
9820-2	Blade Sharpener	394	195
1900BW	3-3/4" Planer with case	221	116
1911B	4-3/8" Planer 7.5 amp	255	139
1100	3-1/4" Planer with case	434	227
9207SPC	7" Sander/Polisher	294	154
3601B	1-3/8 HP Router	261	139
B04550	1/4 sheet Pad Sander w/bag	91	57
DA3000R	3/8" Angle Drill	285	152
HP210N	3/4" var. spd Hmr Drill w/cse.	304	167
2708W	8-1/4" Table Saw	519	269
2711	10" Table Saw with brake	868	489
1805B	5-1/8" Planer Kit with case	731	365
5005BA	1-1/2" Circular Saw	238	139
6404	3/8" Drill Rev. 0-2100 rpm 2 A105	58	
6510LVR	3/8" Drill Rev. 0-1050 rpm	152	83
6820V	0-4000 rpm Drywall Gun 5.2 A160	90	
6013BR	1/2" Drill Rev. 6 amp	263	139
5402A	16" Circular Saw 12 amp	675	345
3612BR	3 HP Plunge Router	347	165
9401	4" x 24" Belt Sander w/bag	343	175
4302C	var. speed Orbital Jig Saw	283	159
5077B	7-1/4" Hypoid Saw	260	142
LS1440	14" Miter Saw	759	435
LS1030	NEW 10" Miter Saw	428	225
5007NB	7-1/4" Circular Saw 13 amp	214	114
3612B	3 HP Plunge Router sq/base	347	165
2012	12" Portable Planer	913	475
LS1011	10" Slide Compound Saw	859	445

SENCO AIR NAILERS			
Model		List	Sale
SFN1	Finishing Nailer 1" - 2"	377	275
SFN2	Finish. Nailer 1-1/2" - 2-1/2"	571	395
SN325	Nailer 1-7/8" - 3-1/4"	665	455
SN4	General purpose 2" - 3-1/2"	685	468
LS2	Pinner 5/8" - 1"	351	255
SKS	Stapler 5/8" - 1-1/2"	351	255
LS5	Pinner 1" - 1-1/2"	399	285

BOSTITCH AIR NAILERS			
Model		List	Sale
N805-1	Stick Nailer Super Sale	389	
N80C-1	Utility Coil Nailer	845	409
N12B-1	Coil Roofing Nailer	845	418
N60FN-2	Finishing Nailer	625	345
T31	Brad Nailer	270	152
CWC100	1 HP Pancake Compressor	445	295

SKIL SIZZLERS			
Model		List	Sale
3810	10" Miter Saw	263	205
3810K	3810 w/60 tooth Carbide Blade	229	144
77	7-1/4" Worm Drive Saw	230	144
5825	6-1/2" Worm Drive Saw	255	159
2735-04	12 volt cordless Drill Kit	210	135
2735-04X	2735-04 w/keyless chuck	235	137
1605-02	NEW Biscuit Jointer w/cse	200	119
7584	NEW 5" Rndm Orbit Sander	160	104

PANASONIC CORDLESS			
Model		List	Sale
EY6205BC	NEW variable speed 12 volt Drill w/15 minute charger & case	390	179
EY6200B	NEW 2 speed 12 volt Drill D-handle with 15 minute charger	350	178
EY6281BC	NEW variable speed 9.6 volt Drill w/15 minute charger w/case	350	165
EY571B	var. speed 9.6 volt Drill Kit	239	128
EY571BC	EY571B with case	275	145
EY6207BCNEW	12 volt 1/2" Drill w/keyless chuck var. spd w/15 min. charger & case	421	218

LEIGH DOVETAIL JIGS			
Model		List	Sale
D1258R-12	List 325.00 Sale 269.00		
D1258R-24	List 399.00 Sale 325.00		
LEIGH INSTRUCTIONAL VIDEO SALE 29.00			
MMTA	24" Mort. & Tenon attachment	299	175

HITACHI TOOLS			
Model		List	Sale
C7SB	7-1/4" Circular Saw	214	109
DTC10	3/8" 7.2 volt cordless Drill	138	78
C7BD	7-1/4" Circular Saw with brake	230	127
M12V	NEW 3 HP var. speed Router	447	225
TR12	Plunge Router 3 HP	354	169
F1000A12	Planer/6" Jointer	2835	1519
C10FA	10" Deluxe Miter Saw	536	269
C12FA	NEW 12" Miter Saw	632	295
C8FB	8-1/2" Slide Compound Saw	899	445
FREUD LU91M0088-1/2"	Carb bld 48 l	68	43
LC15FB	15" Miter Saw	745	375
FREUD LU85M015	15" c/bld 108 tooth	180	105

1992 TOOL CATALOG AVAILABLE
Call Toll-Free 1-800-328-0457 in Minnesota Call (612)224-4859
CHECK • MONEY ORDER • VISA • MASTERCARD • DISCOVER
SEVEN CORNERS ACE HDW. INC.
216 West 7th St. • St. Paul, MN 55102 • Est. 1933

DELTA TOOLS			
Model		List	Sale
34-444	Table Saw Complete w/1-1/2 HP. motor & stand	615.00	
34-445-34-444	Table Saw complete w/30" Unifence and 32-010 EMS system	835.00	
28-283	14" Band Saw w/encloded stand and 50-274 mobile base	729.00	
22-662	13" Planer with 2 HP motor, stand, and 32-011 EMS system	1169.00	
17-900	16-1/2" Floor Drill Press	385.00	
40-601	18" Scroll Saw w/stand and blades	749.00	

ACCURACY FOR SALE!

Carter Micro-Precision
and Guidall Band
Saw Guides.
Precision.
Durability. Value.



Three sizes of each model.
Mounting brackets and studs to
fit most band saws. Write or call
now for FREE BROCHURE.

Carter PRODUCTS COMPANY, INC.
437 Spring St., NE,
Grand Rapids, MI 49503
(616) 451-2928 / FAX: (616) 451-4330

READER SERVICE NO. 42

Wood-Mizer®

World's Largest Manufacturer of Portable Sawmills

Own a Sawmill!

Start a Profitable
Business!

Save money cutting
your own lumber,
make money
cutting for
others.



1-800-553-0219

32 Page Full Color Catalog - \$2.00
66-minute demonstration video - \$10.00
MasterCard or Visa accepted
8180 West 10th Street • Dept Z51
Indianapolis, Indiana 46214-2400

READER SERVICE NO. 205

THE SCHOOL OF CLASSICAL WOODCARVING



Courses in WOOD carving, STONE carving
and GILDING; for furniture and architecture.

Acanthus Leaf Training Video

72 minute demonstration on the flow and
movement of this classical motif.

12 week course \$2,970.
1 & 2 week courses in Sept. \$475. per week
Video \$49. plus \$3.50 s/H

10 Liberty Ship Way #4116, Sausalito, CA 94965

READER SERVICE NO. 64

SUNHILL MACHINERY

Time Proven and Affordable SDM Series Wide Belt Sanders



*We Have Thousands of
Satisfied Customers -
We Would Be Happy to
Provide a Reference in
Your Area!*

*Portable Dust Collection
Systems and
Dust Collection
Accessories Available.*

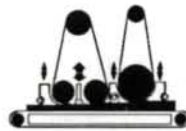
Single Head Models (Platen):
SDM-25 25" Model \$5995
SDM-37 37" Model \$8998
SDM-44 44" Model \$13,250
SDM-52 52" Model \$15,650

Two Head Models (Combination):
SDM-225 25" Model \$11,360
SDM-237 37" Model \$15,950
SDM-244 44" Model \$19,895
SDM-252 52" Model \$24,790



Platen Head

- Pneumatic Oscillation & Belt Tensioning
- Fully Adjustable Platen
- Safety Interlocks/Auto Braking
- Powerful TECO Motors
- All Steel Plate & Cast Iron Construction



Combination Head

Take Advantage of Our Highly Discounted Freight Rates!

For More Information or References Please Contact Us:

SUNHILL MACHINERY
500 Andover Park East
Seattle, WA 98188

206/575-4131 • 206/575-3617 FAX
800/544-1361

SUNHILL MACHINERY

READER SERVICE NO. 79

Supergrit®
Random Orbital Sander Discs
5" White PSA 180 Grit \$15.00/100

PREMIUM QUALITY BELTS: BEST RESIN OVER RESIN, "X" WEIGHT 10/Box

1 x 42	\$.70ea.	4 x 24	\$1.05ea.
3 x 18	.75	4 x 36	1.30
3 x 21	.80	6 x 48	2.95
3 x 24	.85	6 x 89	5.60

ADHESIVE CLOTH DISCS: BEST RESIN OVER RESIN, "X" WEIGHT

5" Diameter	\$.80 ea.	9"	\$1.80 ea.
6"	.90	10"	2.00
8"	1.40	12"	2.50

Prices quoted @ 80 grit, other grits available.

GARNET PAPER — ORANGE **WATERPROOF PAPER — BLACK**
A/O CABINET PAPER — BROWN 220 thru 1200 100 PPK \$23.00

40 Grit	50 PPK	\$16.00
60 Grit	50 PPK	14.00
80 Grit	50 PPK	13.00
100, 120, 150	100 PPK	22.00
180, 220	100 PPK	19.00

NO LOAD PAPER — WHITE
180 through 400 100 PPK \$20.00
Also Shop Rolls • Cloth Sheets • Drums

CLEANING STICKS \$3.50 Small \$6.50 Large

RED HILL CORP., P.O. BOX 4234, GETTYSBURG, PA 17325
(800) 822-4003
Free Freight to most areas
Free catalogue

READER SERVICE NO. 104

Reliant™

POWER TOOLS

Value Plus Performance
At Discount Prices

**4-Speed 1 HP
14" Band Saw**



- Special motor mount eliminates vibration.
- 1 HP motor (4 speeds: 160, 220, 335 & 3000 SFM).
- Independently adjustable blade guides.
- 13 3/4" x 13 3/4" table tilts 45° right & 10° left.
- Capacities 6 1/4" under blade guides; 13 3/4" frame to blade.
- Stand & miter gauge included.

DD90 Only \$299.95
Includes Shipping

Full One-Year Warranty

1-800-767-9999

Fast FREE Shipping to 48 States
To order at this special price, mention Dept FW52 to our operator.
MA, ME, RI Res. Add Sales Tax

Offer Expires 6/30/92

Trend-lines®

Dept. FW52 • 375 Beacham St • Chelsea MA 02150
For Free Catalog Call-1-800-366-6966

READER SERVICE NO. 85

**A New Dimension
in Woodworking
Versatility**

**MAFELL
erika**

"Pull-Push-Saw"

**Combination
Table and
Radial Arm Saw**



US-\$ 1395
220 V Machine only
Also available in 110 V

Maximum Versatility

- Fixed blade operation for precision table saw performance.
- Free blade operation for versatile radial arm saw features.
- Lightweight design for easy transportation to the work-site.
- Compact construction for convenient workshop storage.
- Wide range of accessories for equipment customizing.
- Best features of both a table and a radial arm saw.

Professional Features

- Accurate blade tilt to 45°
- Blade height adjustment up to 2 1/2"
- Front and rear locking rip fence
- Quick set miter gauge
- Double rail saw guides and four point mounting
- Ball bearing construction
- Carbide-tipped blade

FREE ERIKA BROCHURE

MAFELL North America Inc., 80 Earhart Drive, Unit 9, Williamsville, N. Y.
Phone: (716) 626-9303 · Fax: (716) 626-9304
Complete Catalogue \$ 1 Each for Stationary or Timber Framing Tools

READER SERVICE NO. 129

ANDERSON RANCH ARTS CENTER

1992 SUMMER WORKSHOPS

Jim Barefoot
*Upholstery Design
& Technique*

Michael Emmons
Willow Furniture

Bob Flexner
Understanding Finishing

Michael Fortune
*Intermediate Furniture
Making*

Gail Fredell
*Furniture Design:
Developing A
Personal Aesthetic*

Nora Hall
Classic European Carving

Bill Hochhausen
Sculptural Woodcarving

Silas Kopf
*Marquetry, Veneering,
and Inlay*

**Peter Korn
& Harv Mastalir**
Basic Woodworking

James Krenov
A Personal Approach

Kathleen Loe
Faux & Painted Finishes

Sam Maloof
Furniture

Stephen Proctor
Advanced Furniture Making

Monroe Robinson
Working with Veneers

*For our free
1992 catalog contact:*

Anderson Ranch Arts Center
P.O. Box 5598,
Snowmass Village, CO 81615
303.923.3181
fax: 303.923.3871

READER SERVICE NO. 102

THE SECRET IS IN OUR GUNS

CHOICE OF 9 TIPS AND 16 AIR CAPS
CUSTOMIZED TO MEET YOUR SPRAY NEEDS



OVER THE PAST 10 YEARS
THOUSANDS OF FINE WOODWORKERS HAVE DISCOVERED
THE FLEXIBILITY AND VERSATILITY OF

CROIX

711V HVLP
CONVERSION GUN
REG \$365
NOW \$330



PIONEERS IN TURBINE & CONVERSION HVLP

SYSTEM CX-5	SYSTEM CX-7	SYSTEM CX-8	SYSTEM CX-9	SYSTEM CX-10	SYSTEM CX-12	SYSTEM CX-20
\$462	\$649	\$835	\$740	\$879	\$1099	\$1299

AUTHORIZED FACTORY SERVICE WITH ALL PARTS IN STOCK

J.A. HARCHUCK SALES



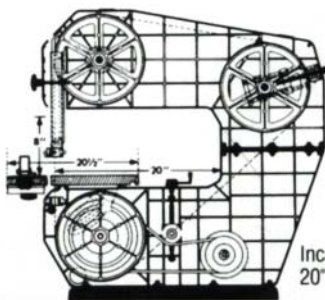
APOLLO, PA 15613

TO ORDER CALL 412-733-7555



FREE DELIVERY IN CONTINENTAL USA

READER SERVICE NO. 62



17 Years
in USA

Inca 710
20" Bandsaw

**SWISS DESIGN
Woodworking Machines**

*Renowned Precision Machines
at Sale Prices*

EXAMPLE:
New Model 2100 12" Table Saw
Save up to \$500.

Shipped Direct from Inventory
5 Year Limited Warranty

Call or Send for More
Information

(800) 221-2942

Garrett Wade Co., Inc.
161 Avenue of the Americas
New York, NY 10013

INCA

READER SERVICE NO. 13



**Scoring Saw
Attachment**

Modulus SS-100

The SS-100 Scoring Saw attachment will cut double sided material chip-free, top and bottom, on YOUR 10" table saw.

- One piece cast iron body
- Carbide tipped blades
- No modification to saw
- Uses standard arbor nut
- Uses standard table insert
- 45° angle range

U.S. Distributor:

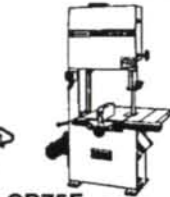


**SISCO
SUPPLY** INC.

102 Kimball Avenue
So. Burlington, VT
Phone (802) 863-9036
FAX (802) 863-9660
Dealer Inquiries Welcome

READER SERVICE NO. 63

C15FB



CB75F

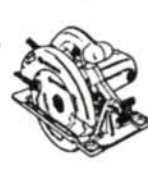
HITACHI Super Specials



C8FB



P12RA



C7SB



TR12

Check Listings Below

PORTER-CABLE

ROUTERS		
100	7/8 Hp Router	175 104
690	1-1/2 Hp Router 10A	240 134
691	1-1/2 Hp D-Handle Router	260 141
695	1-1/2 Hp Router-Shaper Table	335 203
696	Router-Shaper Table	185 122
693	1-1/2 Hp Plunge Router	295 165
6931	Plunge Router Base	120 75
7518	3-1/4 Hp 5 Speed Router	475 265
7519	3-1/4 Hp Router	410 224
7536	2-1/2 Hp Router	355 199
7537	2-1/2 Hp D-Handle Router	375 209
7539	3-1/4 Hp Plunge Router	410 224
7539	3-1/4 Hp V/S Plunge Router	475 264
5060	Stair Ease Template	200 139
5061	Stair Ease Template Hardwood	210 145
59381	Door Hinge Butt Template Kit	240 159
5116	Omni-Jig 16" Dovetail Jig	400 259
7310	5.6A Laminate Trimmer	150 86
7312	5.6A Offset Base Lam. Trimmer	215 122
7319	5.6A Tilt Base Lam. Trimmer	170 105
7399	5.6A Drywall Cutout Unit	145 85
97310	Laminate Trimmer Kit	345 188

SANDERS		
303	Paint Remover	270 170
304	7" Disc Sander	235 139
305	7" Polisher	225 137
351	3"x21" Belt Sander w/o Bag	245 137
352	3"x21" Belt Sander w/ Bag	255 142
360	3"x24" Belt Sander w/ Bag	330 182
361	3"x24" Belt Sander w/o Bag	310 174
362	4"x24" Belt Sander w/ Bag	345 189
363	4"x24" Belt Sander w/o Bag	330 184
504	3"x24" HD Belt Sander w/ Bag	550 345
503	3"x24" HD Belt Sander w/o Bag	535 345
300	Speed Bloc Sander 14" Pad	102 57
505	1/2 Sheet Pad Sander	210 117
9505	1/2 Sheet Commem. Sander	240 129
7334	5" Random Orbit Sander	210 119
7335	5" V/S Random Orbit Sander	230 129
7336	6" V/S Random Orbit Sander	235 134

CORDLESS DRILLS		
9850	12V Drill w/Case 0-400 RPM	240 135
9851	9850 w/Keyless Chuck	240 135
9852	12V Drill w/Case 0-1000 RPM	275 159
9853	9852 w/Keyless Chuck	275 159
9854	12V 1/2" Drill w/Case 0-360 RPM	280 165
8500	12V Battery For The Above Drills	62 39

DRILLS		
621	3/8" HD V/S Drill 0-1000 RPM	170 99
666	3/8" HD V/S Drill 0-1200 RPM	200 125
7514	1/2" HD V/S Drill 0-750 RPM	210 119
7515	1/2" HD V/S Drill 750 RPM	215 124
7540	0-4000 Drywall Screwdriver 5.2A	185 112
7545	0-2500 Drywall Screwdriver	185 112

SAWS		
315-1	7-1/4" Top Handle Circular Saw	210 118
9315-1	315-1 w/Case & Carb. Blade	240 135
617	7-1/4" Push Handle Circular Saw	210 118
9617	7-1/4" Push Handle w/Case & Carb. Blade	210 135
314	4-1/2" Trim Saw	240 138
9314	4-1/2" Trim Saw w/Case	265 149
345	6" Saw Boss 9A	180 104
9345	6" Saw Boss w/Case	220 124
9647	Tiger Cub Recip Saw w/Case	195 119
9637	Recip. Saw V/S w/Case 8A	250 138
7549	Top Handle Jig Saw	250 149
7649	Barrel Grip Jig Saw 4.8A	250 159

PLANERS		
320	Abrasive Plane 3A	190 116
367	3-1/4 6.5A Planer	250 149
9118	Porta Plane Kit	360 205
9652	Versa Plane Kit	460 299
102	Door Hanging Kit	490 289

PLATE JOINERS		
555	Plate Biscuit Joiner w/Asst.	315 164
9555	Plate Joiner w/Case & Asst. Biscuits	345 186

DELTA

BENCH TOP TOOLS		
11-080	32" Radial Drill Press	399 289
11-950	8" Drill Press	199 145
14-600	Hollow Chisel Mortiser	668 449
22-540	12" Bench Top Planer	595 399
23-680	6" Bench Grinder 1/4" Hp	86 75
23-700	Wet/Dry Grinder	234 159
23-880	8" Bench Grinder 1/2"	151 115
28-180	NEW Bench Band Saw	232 169
31-050	1" Belt Sander	104 78
31-080	1" Belt/5" Disc Sander	134 94
31-340	1" Belt/8" Disc Sander	268 184
31-460	4" Belt/Disc Sander	198 145
32-100	Plate Joiner	422 285
32-200	Boring Machine w/13" Spindle	1595 1179
34-080	10" Miter Saw	308 195
34-330	Deluxe 8-1/4" Bench Saw	343 235
36-220	10" Compound Miter Saw	350 235
40-150	15" Scroll Saw	179 119
40-560	16" 2 Speed Scroll Saw	266 184
43-505	1/2" Bench Router/Shaper	399 279
34-897	50" Delta Unifence	525 295
34-915	30" Delta Unifence	385 239
50-179	3/4 Hp Dust Collector	483 329

STATIONARY

Prices Do Not Include Shipping
FOB Raleigh, NC

17-900	16-1/2" Drill Press	478 315
20-300	4" x 6" Horizontal Band Saw	410 265
22-661	13" Planer 2Hp, Stand, EMS	1633 1050
28-245	14" Band Saw Open Stand w/amp/779	499 489
28-283	14" Band Saw w/Enclosed Stand w/mobile base, White Qty Last	965 659
31-730	6" Belt/12" Disc Sander	1393 1049
33-055	Deluxe Sawbuck w/Logs	854 529
33-900	Deluxe 12" Radial Arm Saw	1908 1239
33-990	Deluxe 10" Radial Arm Saw	818 539
34-444	10" Contractor's Saw	923 575
34-445	10" Contractor's Saw w/30" Unifence	1203 759
34-782	10" Unisaw w/52" Unifence and motor cover	2206 1625
36-751	10" Cab. Saw w/30" Unifence	1487 999
36-752	10" Cab. w/52" Unifence	1702 1099
37-154	6" Precision Jointer w/stand	1420 999
37-280	6" Motorized Jointer w/stand	498 339
37-350	8" Precision Jointer w/stand	1870 1399
40-601	12" Variable Speed Scroll Saw	1025 689
43-275	Onsrude #2003 Inv. Rt.	3335 2500
43-355	1-1/2 Hp Wood Shaper	964 629
43-375	3 Hp HD Two Speed Shaper	2086 1575
46-700	12" Variable Speed Wood Lathe	548 359
50-180	1 Hp Dust Collector	611 399
50-181	2 Hp Dust Collector	885 579

freud®

	Teeth	List	OUR PRICE
LU72MO10	10" Gen. Purpose	40	67 39
LU73MO10	10" Crosscut	60	82 45
LU84MO11	10" Combination	50	76 42
LU85MO10	10" Ultimate Crosscut	80	112 59
LU87MO10	10" Thin Kerf	24	70 39
LU88MO10	10" Thin Kerf	60	86 45
LU98MO10	10" Ultimate 10"	80	125 60
SD306	6" Dado-Carbide	215	109
SD308	8" Dado-Carbide	229	117
F0	1-2/4" x 5/8" Biscuit 1000 qty	32	27
F10	2-1/8"x3/4" Biscuit 1000 qty	32	27
F20	2-3/4"x1" Biscuit 1000 qty	34	28
FA	Assorted Biscuits	34	28
FB107	7 Pc. Forstner Bit Set	86	54
FB100	16 Pc. Forstner Bit Set	331	179
WC106	6 Pc. Chisel Set	86	52
WC110	10 Pc. Chisel Set	140	84
90-100	15 Pc. 1/4" Router Bit Set	324	169
91-100	13 Pc. 1/2" Router Bit Set	324	169
94-100	5 Pc. Cabinet Door Set	319	165
JS-100	Biscuit Joiner	333	164
JS-100	Biscuit Joiner w/1000 asst. Bisc.	369	186
FT2000E	3-1/4 Hp Plunge Router	410	229

BOSCH

1194VSR	1/2" V/SR Hammer Drill	264 149
11202	1-1/2" Rotary Hammer	720 369
11212VSR	3/4" SDS Bulbong Rotary Hammer	370 189
1272	3"x24" Belt Sander	308 177
1272D	3"x24" Dustless Belt Sander	329 184
1273DVS	4"x24" V/S Belt Sander	370 189
1347	4-1/2" Mini Grinder	160 95
1581VS	Top Handle Jig Saw	265 136
1582VSC	New Clic Barrel Jig Saw	265 136
Bosch Metal Case	for above Jig Saws	34 30
Bosch 30 Blade Asst. For Jig Saws		27 27
1604	1-3/4 Hp Router	236 122
1604K	1-3/4 Hp Router Kit	287 157
1606	1-3/4 Hp D-Handle Router	273 148
1608	Lam. Trim Router	149 88
1609K	Lam. Installers Kit	309 173
1609KX	Lam. Installers Kit w/Underscribe	361 202
1611	1 Hp Plunge Router	385 199
1611EVS	3-1/4 Hp V/S Plunge Router	448 231
1632VSK	V/S Orbital Recip. Saw Kit	247 145
1654	7-1/4" 13 amp Circular Saw	205 99
1842	Heat Gun	111 69
3050VSRK	3/8" V/SR Cordless Drill Kit w/2 battery packs	256 133
3258K	3-1/4" Hp Router Kit	265 148
3270D	3"x21" Dustless Belt Sander	260 145
3272	3-1/4" Planer	147 95
3283DVS	5" Random Orbit Sander	169 105
90300	3-1/4 Hp Router	556 349



0222-1	3/8" Drill 3.5 amp, 0-1000 RPM	185 105
0228-1	3/8" Drill 3.5 amp, 0-1000 RPM	179 102
0234-1	1/2" Drill 5.4 amp, 0-850 RPM	219 118
0375-1	3/8" Close Quarter Drill	219 129
0379-1	1/2" Close Quarter Drill	249 147
0395-1	3/8" 9.6V Cordless Drill Kit	279 166
1676-1	HD Hole Hawg w/Case	449 244
3107-1	1/2" V/S Right Angle Drill w/Case	360 195
5192	2" HD Die Grinder	289 171
5371-1	1/2" V/S Hammer Drill Kit	335 188
5397-1	3/8" V/S Hammer Drill Kit	239 139
5660	1 1/2 Hp Router 10 amp	325 185
5680	2 Hp Router 12 amp	355 205
5925	3 x 24 Belt Sander w/Bag	419 228
5936	4 x 24 Belt Sander w/Bag	419 228
6014	1/2 Sheet Orbital Finish Sander	209 116
6368	7-1/4" Saw, fence carb. blade and case	239 139
6508	2 Speed V/S Sawzall w/Case	249 135
6528	V/S Super Sawzall 8A w/Case	295 164
8975	Heat Gun 570° & 1000°	89 65
8977	Var. Temp. Heat Gun 212-1000°	114 75
6754-1	0-4000 Drywall Screwdriver 4.5A	189 114
6749-1	0-2500 Drywall Screwdriver	209 117

SENCO®

FASTENING SYSTEMS

LS-2	Pinner 5/8"-1"	363 248
LS-5	Pinner 1"-1-1/2"	381 258
SN-1	Finish Nailer 1"-2"	419 259
SN-2	Finish Nailer 1-1/2"-2-1/2"	599 379
SKS	Narrow Crown Stapler	365 249
SN325+	Framer 1-7/8" - 3-1/4"	639 369
SN4	Framer 2"-3-1/2"	713 469

Emglo

AM39HC4V-3/4"	Hp Compressor	499 279
AM78HC4V-1-1/2"	Hp Compressor	514 289

RYOBI

AP10	10" Portable Planer	794 365
BE321	3"x21" Belt Sander	272 135
JM100K	Plate Joiner Kit	431 209
JP155	Jointer/Planer	611 299
RA200	8-1/4" Portable Radial Arm Saw	520 245
RE600	3Hp V/S Plunge Router	444 199
S550	1/6 Sheet Finishing Sander	79 45
TS251U	10" Miter Saw	397 166
TS380	14 1/2" Miter Saw	840 369

HITACHI

C78D	7-1/4" Circular Saw w/ Brake	230 119
C75B	7-1/4" Circular Saw	214 99
C8FB	8-1/2" Slide Compound Saw	899 434
C10FA	10" Miter Saw	538 275
C12FA	12" Miter Saw	632 309
C15FB	15" Miter Saw	745 369
M8	7.3 amp, 1/4" Router	215 114
TR-12	3 Hp 1/2" Router	347 169
M-12V	3-1/4" Hp V/S Router	447 229
SV-12SA	4-3/8" Orbital Sander	80 48
D10-DFK	3/8" Cordless Driver Drill 9.6 V	280 135
D10-V1	3/8" V/S Reversible Drill	148 99
D13V	1/2" V/S Reversible Drill	198 109
W6VA2	0-2600 Drywall Screwdriver 5.5A	161 95
W6V2	0-4000 Drywall Screwdriver 5.5A	149 79
DV20V2	3/4" V/S Hammer Drill w/Case	257 135
DH38YE	1-1/2" Rotary Hammer w/Case	753 379
G12SA	4-1/2" Disc Grinder	145 79
PDL180A	7" Disc Grinder	212 100
SP18V	7" Disc Sander/Polisher EVS	274 145
F-20A	3-1/4" Planer	172 99
F30	3-5/8" Planer 8.3 amp	319 179
P-50	6-5/8" Planer 11 amp	563 299
CR-10V	V/S Orbital Recip. Saw	241 125
CC14	14" HD Cutoff Saw	358 189

STATIONARY

Prices Do Not Include Shipping
FOB Raleigh, NC

CB75F	14-1/2" Band Saw	3070 1499
F1000A	12" Planer/JS	2835 1425
P12R	12" Portable Planer	1185 599
P12RA	12" Planer/Joiner	1555 799

SKIL®

5825	6-1/2" Worm Drive Saw	246 149
77	7-1/4" Worm Drive Saw	247 149
77-04	7-1/4" Worm Drive Saw Kit	292 179
5860	8-1/4" Worm Drive Saw	275 169
5660	8-1/4" 60° Bevel Circular Saw	223 139
5510	5-1/2" Trim Saw	166 109
2735-04	12 Volt 2 Speed Variable Cordless Drill	231 135
1605-02	Plate Joiner w/Case	319 118
9611-02	12 Volt 2 Speed Heavy Duty Sander/Grinder	135 79
9845	7/8" Sander	

JoinTECH Ultra - Precision Woodworking System

A major engineering advancement for precision positioning has now come to Woodworking in the IPM-1

IPM-1 (patent pend.) INCREMENTAL POSITIONING MACHINE

The Heart of the System, IPM-1 has unparalleled accuracy and superiority in design and quality. Makes your router table an Ultra-Precise System to accomplish perfect and beautiful joinery.



LEAD SCREW ACCURACY

Precision lead screw design provides the ultimate in accuracy and repeatability with Zero backlash; Reliable accuracy unobtainable from sawtooth racks or gears.



SPECIAL FEATURES

- **Rapid Positioning** - less than two seconds to change any setting with the push of a button
- **Incremental Positioning** in multiples of 1/32" over a 10-1/2" range (16-1/2" range for the IPM-2)
- **Calibrated Thumbwheel** allows micro adjustments in detented .002" increments.
- **Optical Cursor** for easy and continuous position readout of scale or template.

Rugged, Rigid, and Durable. All metal design of machined high-grade aluminum, brass and stainless steel. Precision roller bearing movement.

Fully Assembled and Ready to Use.

IPM-1 FENCE SYSTEM Complete accessory system for making all Dovetail and Box Joints. U.S. Patent No. 5,018,562



27" fence shown.
18", 36" and 48" also available

IPM FENCE SYSTEMS INCLUDE:

- **Rugged and Solid Aluminum Fence** has a dovetail slot for interlocking Stop Block and optional Vertical Push Fixture. No holes in fence surface.
 - **X-Y Positionable Stop Block** locks into fence dovetail. Patented design also adjusts for vertical height - especially useful when making half-blind joints.
 - **Retractable Stop Extender** stored inside fence can be extended and locked into any position. Swivel stop on end eliminates need for clamps.
- Optional Vertical Push Fixture** for end-grain cutting interlocks into fence dovetail and is impossible to tip over or kick out from fence during use. Safety of this patented fixture far exceeds any other design or method.

IPM-1 FOR YOUR TABLE SAW

IPM-1 combined with an IPM fence is an extremely rigid and accurate replacement set-up for your present table saw fence and at less than the cost of any other quality fence alone!



JoinTECH TEMPLATES

Jointech, the inventor of pre-printed templates, offers 38 different patterns for making every size dovetail and box joint including the intricate Double and Double-Double variations.

U.S. Patent No. 4,965,943



JoinTECH

Made in U.S.A.

For a Free Brochure

and name of nearest dealer write to:
JoinTECH Corporation
P.O. Box 790727
San Antonio, TX 78279

READER SERVICE NO. 111

DAVIS WELLS

WOODWORKING
MACHINERY

CAST IRON QUALITY

11090 S. Alameda • Lynwood, CA 90262

213 636-0621 FAX 213-635-2901

*Quality, Durability and Accuracy
Since 1930*

- 12" & 16" Tablesaw
- Shaper
- 20" Bandsaw (all cast!)
- 6" x 62" Jointer
- Single and Double Borers

READER SERVICE NO. 108

- Pink Ivory
- Dagame
- Brazilian Rosewood
- Pear
- Plum
- Burls
- Snakewood
- Bubinga
- Koa
- Satinwood
- Cocobolo
- Padouk
- Rosewood
- Bloodwood
- Ziricote
- Purpleheart
- C. Ebony
- Pau Rosa
- Camphor

Quality Exotic Wood

» TURNERS «

» CABINET MAKERS «

Individually Selected Lumber
for
Furniture/Boxes/Inlays

Over 70 Species

All Inquiries Welcome... Call or Write

Berea Hardwoods Co.
125 Jacqueline Drive
Berea Ohio 44017

216-243-4452

- Pernambuco
- Mac. Ebony
- E.I. Rosewood
- Bocote
- Curly Maple
- Quilted Maple
- Al. Ebony
- Zabrano
- Lacewood
- Lignum Vitae
- Osage
- Tulipwood
- Blackwood
- Mahogany
- Jelutong
- Holly
- Wenge
- Goncalo Alves
- Many More...

READER SERVICE NO. 151

Swiss Design Woodworking Machines

*Renowned Inca Precision
Woodworking Machinery*

EXAMPLE:
Model 570 Equipped with the
Famous Tersa Instant Cutter
Change System

Shipped Direct from Inventory
5 Year Limited Warranty

Call or Send for More Information
on the Entire Inca Line

(818) 797-8282
INJECTA MACHINERY
2217 El Sol Ave
Altadena, CA 91001

INCA

READER SERVICE NO. 2

Transform your angle grinder into a Random Orbit Sander.

The Marshco Random Orbit Sanding Head fits onto any 4"-5" angle grinder allowing you the speed of a disc or belt sander and the control of an orbital sander. This powerful sanding head combines orbital and spinning action at 10,000 orbits per minute leaving you with no cross grain scratch, swirl or hook marks and no corner edge round-off. The exclusively patented Marshco Random Orbit Sanding Head has rugged ball-bearing construction and adapts to any surface. Suggested retail:

\$59.95

- \$3 shipping and handling
- Visa and MasterCard accepted
- When placing order indicate
make, model or thread size

PRODUCTS, INC.

READER SERVICE NO. 10

AVIATION
Industrial Supply Co.
BOSCH

30% off Bosch Router Bits
BOSCH SAWS

Orbital Action Jig Saw,
Model 1581VS
4.8 amp **\$139**

	List	SALE
1582VSC "Chic", Orb. Nob. Hdl. Jig Saw	\$265	\$139
1632VSK Panther Recp. Saw	\$247	\$145

BOSCH DRILLS

Dual Torque Variable Speed
Reversing 3/8" Cordless Driver
Drill Kit, Model 3050VSRK
w/2 batteries **\$139**

3000VSRK 9.6 Cordless Drill w/2 Batt.	\$236	\$129
1001VSR 3/8" Var. Spd. Rev. Drill	\$131	\$79
1021VSR (as above) Hvy. Duty	\$180	\$109
1023VSR 1/2" H.D., V.S. Rev. Drill	\$199	\$114
1000VSR 3/8" Var. Spd. Rev. Drill	\$131	\$79
1194VSR 1/2" Hammer Drill	\$264	\$147

BOSCH SANDERS

4" x 24" Variable
Speed Belt Sander, **\$197**
Model 1273DVS

	Sanding Frame for 1273DVS	\$116	\$98
3270D	3" x 21" Dustls. Belt Sander	\$260	\$145
1272	3" x 24" Belt Sander	\$308	\$175
1272D	3" x 24" Belt Sander w/D. Coll.	\$329	\$185
1273	4" x 24" Belt Sander	\$324	\$185
1273D	4" x 24" Belt Sander w/D. Coll.	\$345	\$190
1290D	Fin. Sander, 1/2 Sheet Dustless	\$232	\$135
3258	3-1/4" Power Planer	\$239	\$145
1370DEVS	Kit, H.D. Rand. Orb. Sand/Pol.	\$391	\$299
1290	1/2 Sheet Finishing Sander	\$217	\$95
3283DVS	5" Rand. Orb. Sand/Polish	\$169	\$109
3283DVSK	Kit, (same as above)	\$199	\$139

BOSCH ROUTERS

1601	1 hp. Router	\$184	\$105
1604	1-3/4 hp. Router	\$236	\$145
1604K	(same as above) w/Case & Acces.	\$287	\$175
1606	D-Handle, 1-3/4 hp. Router	\$273	\$147
90300	Fixed Base Router, 3-3/4 hp.	\$556	\$349
1608LX	Laminate Trimmer	\$170	\$99
1609K	Installers Kit	\$309	\$168
1609KX	Laminate Trim Kit	\$361	\$199
1611	Plunge Router, 3 hp.	\$386	\$190
1615EVS	3-1/4 hp. Var. Spd. Plng. Router	\$460	\$265
1611	Plunge Router, 3-1/2 hp., 220 v.	\$435	\$269
1611EVS	3-1/4 hp. V.S. 220 v. Plng. Router	\$509	\$310

HITACHI

CB75F	Resaw Bandsaw	\$1598
C15FB	15" Mitre Saw	\$375
C12FA	12" Mitre Saw	\$289
C10FA	10" Mitre Saw	\$269
F1000A	12" Planer/6" Jointer	\$1498
C8FB	8-12" Compound Mitre Saw	\$438
P12RA	12" Planer/8" Jointer	\$829
M12V	3-1/4 hp. VS-PL Router	\$224

FREE FREIGHT
Denver - (303) 355-2391
3900 Ulster St., Denver 80207

CALL TOLL FREE
1-800-748-1945

VISA and MASTERCARD ACCEPTED

READER SERVICE NO. 137

200,000 REASONS WHY YOU SHOULD OWN A T-SQUARE® SAW FENCE.

Over 200,000 in fact. Doran in Calgary.
Robert in Brisbane. José in Puerto
Rico. Alvise in Milan. The list
of Biesemeyer T-Square saw
fence owners spans the globe,
and continues to grow.

Why so many? Because
Biesemeyer sets the industry stan-
dard. The T-Square saw fence
system cuts precision parts for all
your home shop projects. Safely.
Affordably.



Biesemeyer's famous T-Square saw
fence system fits any table saw.
Shown here with our new
BladeGuard™ system.



Biesemeyer's new sliding
table system makes
cross-cutting a
breeze.

And now Biesemeyer introduces the new sliding
table. Perfect for cross-cutting. By using the
T-Square sliding table on your table
saw, you get the benefits of a radial
arm saw—for a fraction of the cost.
Cap off your saw fence and
sliding table with the added safety
of Biesemeyer's new BladeGuard
system. Safety was never this con-
venient before. BladeGuard easily
lifts out of the way for cuts using jigs
and for sliding table use.

For more information, call
1-800-782-1831. In Arizona, 835-9300.

And for useful hints on the many uses of our products, just ask for
Bill Biesemeyer, fellow woodworker.

1-800-782-1831

Try them for two weeks. If you're not completely satisfied, you'll
receive a full refund plus shipping costs.

BIESEMEYER®
It still costs less to own the best.

READER SERVICE NO. 89

LOOK UNDER THE HOOD.

It's a classic machine. The Delta Unisaw® 10" Tilting Arbor Saw. Standard of the industry.

Start it up and you know this is a serious saw.

But like any classic, it's what's under the hood that makes this baby hum.

We introduced the Unisaw back in 1937, and we've been trying to improve on it ever since. No easy task.

So when we hear someone say "They don't make 'em like they used to", we let them testdrive a new Unisaw.

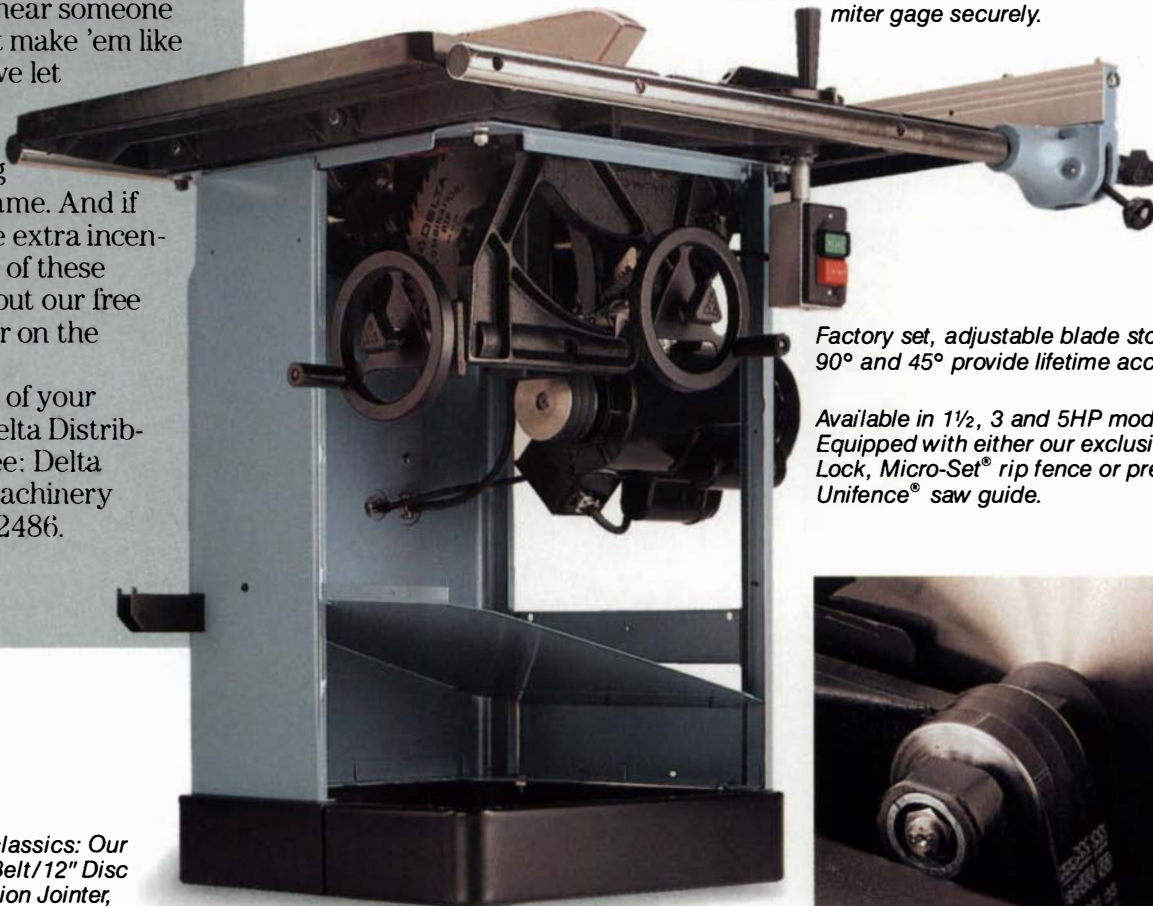
We're inviting you to do the same. And if you need a little extra incentive to own one of these classics, check out our free accessories offer on the facing page.

For the name of your participating Delta Distributor, call toll free: Delta International Machinery Corp. 800-438-2486. In Canada, call: 519-836-2840.

Massive, widely spaced, saw carriage trunnions disperse vibration. Modified Acme thread on worm gear prevents sawdust from jamming trunnion rack. Machined steel motor and arbor pulleys won't overheat or expand.



Big 27"x36" cast-iron table (with wings) is ribbed to prevent warping and springing. T-slots on either side of blade hold Auto Set® miter gage securely.



Factory set, adjustable blade stops at 90° and 45° provide lifetime accuracy.

Available in 1½, 3 and 5HP models. Equipped with either our exclusive Jet Lock, Micro-Set® rip fence or premier Unifence® saw guide.



Three-belt drive supported between ball bearings to minimize deflection. Precision ground arbor is flange-faced after assembly to reduce run-out. Arbor carried in two sealed ball bearings, mounted in precision bored seats for less vibration, longer bearing life.

A whole fleet of classics: Our Combination 6" Belt/12" Disc Sander, 8" Precision Jointer, Unisaw 10" Tilting Arbor Saw and Heavy Duty Wood Shaper.



**Building
On Tradition**
DELTA
A Pentair Company

LIMITED TIME OFFER*

After you've looked under the hood, drive home an even better deal.

Get to your participating Delta Distributor between now and July 31, and cut the best deal you can on any Delta Unisaw® 10" Tilting Arbor Saw. When you do, he'll present you with a certificate good for any one of the three Unisaw Accessory Packages listed below. Retail values up to \$270.

Select the package that best suits your needs. Fill in the certificate, mail it to Delta and we'll ship you the package of your choice. Absolutely free.

See your Delta Distributor for complete details.

PACKAGE I

- 10" x 18 FT C-T Rip Blade
- 10" x 50 ATB C-T Combination Blade
- 10" x 80 ATB C-T Thin-Kerf Combination Blade
- Work Support Roller Stand

PACKAGE II

- Mobility Kit for Unisaw with 52" Unifence® Saw Guide
- Unifence Auxiliary Cut-Off Fence

PACKAGE III

- C-T 6" Dado Head Set
- Dado Head Table Insert
- Mobility Kit for Unisaw

*Offer good only from participating distributors in the continental U.S., Alaska, Hawaii and Canada, from April 1 thru July 31, 1992. To qualify, machines must be purchased with motors.



READER SERVICE NO. 47

Lie-Nielsen TOOLWORKS INC.

Makers of Heirloom Quality Tools
Route 1, Warren, Maine 04864
1-800-327-2520
Bronze Scraper Plane \$115.



Free Brochure of Heirloom Quality Tools

READER SERVICE NO. 6

Study the Classics.

In a comprehensive two-year program designed to teach the techniques of quality custom furniture construction. For further information contact Lonnie Bird at **1-614-245-5353** or in Ohio **1-800-282-7201** toll free.



WOODWORKING TECHNOLOGY UNIVERSITY OF RIO GRANDE
Rio Grande, OH 45674

Econ-Abrasives

WE MANUFACTURE ABRASIVE BELTS ANY SIZE, ANY GRIT!

BELTS

GRITS ASSORTED UNLESS OTHERWISE SPECIFIED

1x30	\$.73ea	3x24	\$.84ea
1x42	.73ea	3x27	.87ea
1x44	.73ea	4x21 3/4	.96ea
2 1/2x16	.77ea	4x24	.99ea
3x18	.78ea	4x36	1.20ea
3x21	.81ea	6x48	3.14ea
3x23 3/4	.84ea	2 1/4x80	2.94ea

WE MAKE ABRASIVE BELTS ANY SIZE, ANY GRIT.

SHEETS: (9x11)

FINISHING PAPER

50/pkg	100/pkg	50/pkg	100/pkg
80-A	\$10.00 \$17.00	40-D	\$17.00 \$32.00
100 thru 280A	9.00 15.00	50-D	16.00 29.00
		60-D	15.00 27.00
		80-D	14.00 25.00

CABINET PAPER

NO LOAD PAPER

100 thru 150C	13.00	23.00
180-A thru 400-A	50/pkg \$11.00	100/pkg \$19.00

WET/DRY PAPER

JUMBO CLEANING STICK	\$8.80	220 thru 600A	50/pkg \$14.00	100/pkg \$24.00
----------------------	--------	---------------	----------------	-----------------

OTHER ITEMS

- *WIDE BELTS
- *ROLLS
- *FLAP WHEELS
- *PUMP SLEEVES
- *PSA DISCS
- *ROUTER BITS
- *WOOD GLUE

Econ-Abrasives

P. O. Box F865021
Plano, TX 75086
(214)377-9779



*MINIMUM ORDER \$25.00

*MasterCard, VISA, or Check

*SATISFACTION GUARANTEED!

*CALL FOR FREE 1991 CATALOG

TX & NV Add Sales Taxes
Continental U. S. Shipping
Charges add \$5.50

NATIONAL (800)367-4101

READER SERVICE NO. 1

Save Money on Solid Hardwood Furniture DO-IT-YOURSELF KITS



Now, you can furnish your home with the very finest solid cherry and oak furniture, and clocks, at a fraction of retail cost.

Imagine a bedroom in solid cherry at a cost of hundreds, instead of thousands.

Picture your living room in Queen Anne Styling. Tables, lowboy, secretary desk. All this from

easy-to-assemble kits and easy-to-apply finish.

All parts pre-cut. All frames, doors pre-assembled for you.

Thousands of satisfied customers.

Send \$1.00 for Color Catalog



WORLD'S LARGEST MANUFACTURER OF GRANDFATHER CLOCK AND FURNITURE KITS

Dept. 4302 Emperor Industrial Park
Fairhope, AL 36532 • Tel: 205-928-2316

Name: _____

Street: _____

City: _____

State: _____ Zip: _____

READER SERVICE NO. 60

A Chest for All Seasons

Wood movement is part of the plan for solid construction

by Christian Becksvoort

Wood movement is too powerful a force to ignore in furniture construction. It can break apart joints, wedge drawers closed and split carcass sides. Wood movement cannot be avoided; as humidity levels rise, wood expands, and, as humidity drops, wood shrinks. Although movement occurs in all three dimensions, it is relatively insignificant along the length of a board, about one-tenth of a percent or $\frac{3}{32}$ in. for an 8-ft.-long board. And because the thickness is usually such a nominal amount, movement in this direction can generally be ignored. A flatsawn board, however, can move significantly across its width. One of my favorite woods, black cherry, is slightly more stable than most woods, but even it will cause a carcass to self-destruct if natural wood movement is ignored. For example, a 50-percent change in relative humidity, not uncommon with seasonal changes in many parts of the country, will cause the 19-in.-deep chest, shown in the photo at right, to change by $\frac{1}{2}$ in.—expanding front to back during periods of dampness and shrinking back during dry weather. Any cross-grain constraints that interfere with this movement will cause cracked sides or popped joints.

Because I wanted to build pieces of lasting quality, I re-evaluated the entire process of case assembly, with special emphasis on avoiding cross-grain restrictions to the seasonal movement of the case parts. I examined antiques, reread books and talked to craftsmen who were restoring old pieces and creating new ones. My research showed the most frequent problem areas in chests of drawers are applied moldings, web frames for drawers, solid-wood backs, drawer construction and fitting drawers to their openings.

I try to design my cases and drawers for the most extreme conditions they are likely to encounter because I never know where one of my pieces might end up. I've shipped furniture throughout the Eastern seaboard and as far west as California. In fact, the chest of drawers in the photo at right was built in the middle of a Maine winter and shipped to Germany

in the hold of a ship in August's heat and humidity. Since I began applying the construction techniques shown in the drawing at right, many of which have been around for centuries, I haven't had any problems with inadequate allowance for wood movement.

Building the web-frame drawer supports

A major difficulty when making a chest of drawers with solid sides is installing the drawer runners so they'll provide adequate support for the weight of a fully loaded drawer and yet still allow the carcass sides to expand and contract front to back. My web-frame system, as shown in the drawing detail, consists of a front and back drawer divider glued into the carcass sides and drawer runners that also act as kickers to keep the drawer below from tipping when it's pulled out. The key to this system is that the tenons on

the ends of the runners are glued only to the front dividers and not to the back dividers. Also, the runners are not glued into the dados in the case sides that locate and support them. And because I allow space between the runners' tenon shoulders and the back dividers, the case sides are free to expand and contract.

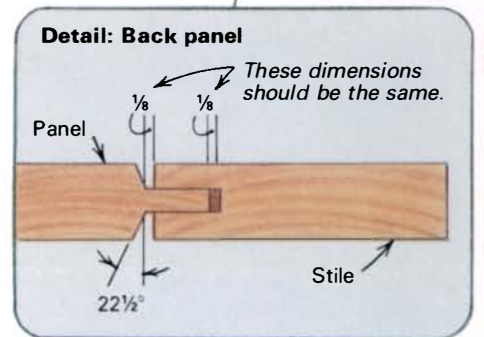
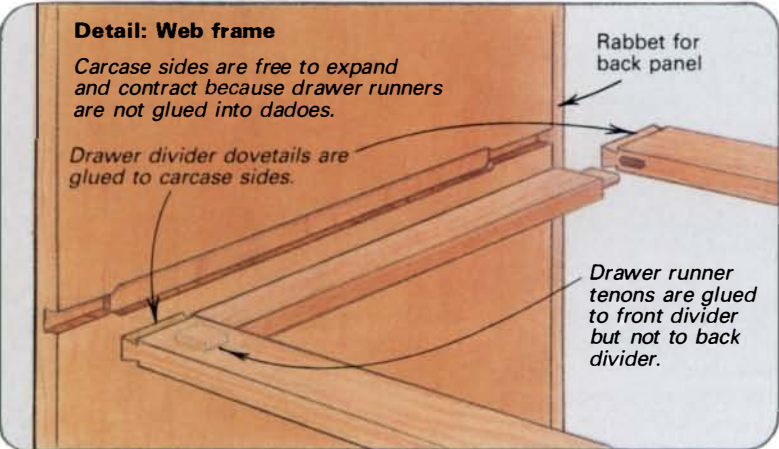
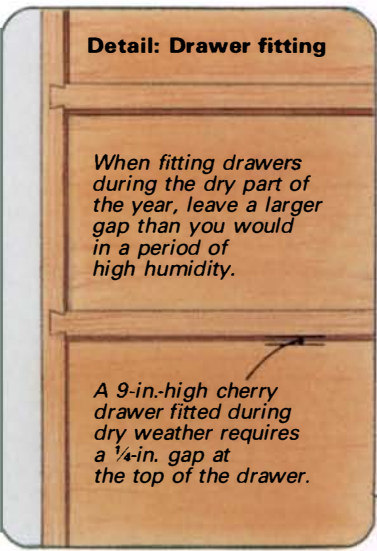
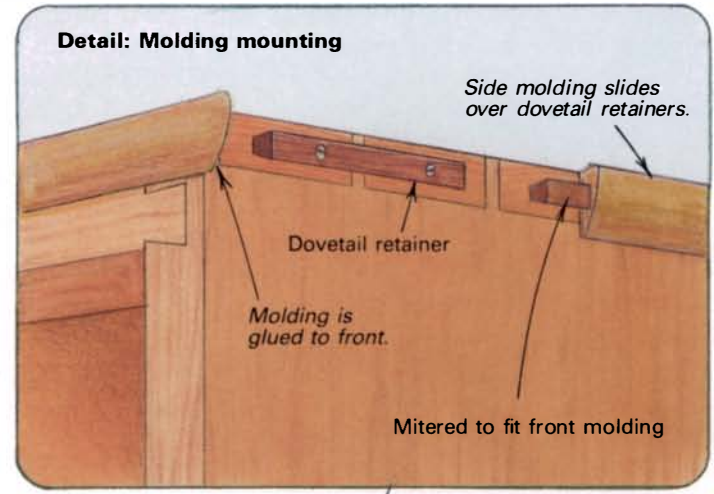
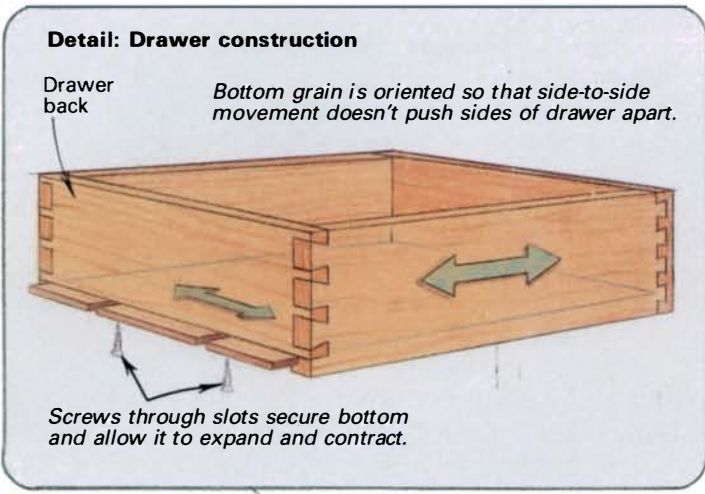
To lay out the dados in the case sides that house the drawer runners, I butt the front edges of the sides together and clamp them. This method ensures perfect alignment of the web frames. Then I unclamp the sides and use the jig shown in the photo on p. 40 and a pair of routers with identical-size bases to cut the stopped dovetail slots at the front and back edges of the sides for the drawer dividers and the dado for the runner all with one setup. I first rout the $2\frac{1}{4}$ -in.-long dovetail slots for the drawer dividers with a $\frac{3}{4}$ -in.-dia. dovetail bit. Then I remove the stop from the center of the jig and switch to the second router, which is fitted with a $\frac{3}{4}$ -in.-dia. straight mortising bit, to cut the $\frac{3}{16}$ -in.-deep dado that connects the slots.

This technique can be used with only one router, but it's more difficult and time-consuming because either the router or the jig

Photo: Christian Becksvoort



The unadorned appearance of this seven-drawer chest hides many techniques that accommodate the natural movement of wood and ensure the piece's longevity.



must be reset for each cut. Before I had two routers, I'd dado the grooves with the jig and router and then handcut the dovetails.

A word of warning here: I found that the baseplates on both of my Bosch routers were $\frac{1}{32}$ in. off center. Thus, if I had the routers turned the wrong way in the jig, the cuts were $\frac{1}{16}$ in. off. I corrected the problem by enlarging the countersunk screw holes in the routers' baseplates and shifting them slightly to center them.

When routing the dovetails for the top web frame, you'll have to provide support for the side of the jig that hangs off of the case side, and take care to preserve the fragile piece left when the routed dovetail undercuts the handcut carcass dovetails. Because the top frame serves only as a kicker, I eliminate the dadoes for the runners.

Making and installing the web frames

After routing the sides for the dividers and runners, I assemble the carcass and begin making and installing the components of the web frames. First, I cut all the drawer dividers to length and then dovetail their ends on the router table using a tall auxiliary fence and fingerboard for support. Next, I dry fit a front and a back divider to determine the exact length of the runners. I measure the distance between the dividers, add the length of the tenons and then subtract the desired clearance between the runner's tenon shoulder and the back dividers. This clearance depends on the moisture content of the case. During the dry period of the year, I leave about $\frac{1}{8}$ in., but when the humidity is high, I allow as much as $\frac{1}{2}$ in. to avoid problems when the case sides contract. All the clearance in the world won't help a bit though, if you forget to allow the same clearance between the end of the tenon and the bottom of the mortise in the divider.

After cutting stock to length, I mark and cut the tenons on the runners and the mortises in the dividers. If you use two small top drawers, as I did on the chest shown on p. 38, you'll need to add a wide runner at the center of the two top frames and fit a vertical drawer divider between them.

I assemble the web frames by first gluing all the front drawer dividers into place flush with the face of the carcass. (The top di-

viders are glued and clamped to the top of the case.) Then I turn the case over and glue a wide runner (kicker) into the center mortise and two regular-width runners into the mortises at the ends of the top divider. When installing all the other web frames, the runners must be inserted into the dadoes in the carcass sides as well. Next, I glue the back dividers into position flush with the rabbet for the back, as shown in the photo on the facing page. Remember that in the back, only the dovetailed dividers are glued to the case sides; the runners' tenons are *not* glued into the mortises. And make sure you have the appropriate gap between the shoulder of the runners and the back dividers.

Making and installing a frame-and-panel back

The back of my chest is almost 31 in. wide. A glued-up, flatsawn panel of that width might expand and contract as much as $\frac{3}{4}$ in. with normal swings in humidity. But by using frame-and-panel construction, as shown in the drawing on p. 39, the only parts of the back that will move and affect its width are the 3-in.-wide vertical side stiles. And, by selecting quartersawn wood for the stiles and rails, I reduce the normal movement of that 6 in. of wood by almost 50 percent so that the 31-in.-wide back will move only a total of about $\frac{1}{16}$ in. Because the movement of the back is insignificant, the frame-and-panel assembly can be glued and nailed solidly into its rabbets in the case sides and top and along the back edge of the solid bottom piece. The glued-in back not only squares up the carcass, but also greatly increases its strength.

When building a frame-and-panel assembly, you must allow for wood movement of the solid panels within the grooves in the frame. Because the grain of the panels runs vertically, I rip them undersized to allow at least $\frac{1}{4}$ in. overall side-to-side movement. Because of the minimal longitudinal movement of wood, I allow only $\frac{1}{16}$ in. for top-to-bottom clearance to keep the panels from being loose in the groove. While the clearance between the tongue and the bottom of the groove is important, it is equally important to leave the same gap between the edge of the frame and the shoulder of the tongue, as shown in the drawing detail on p. 39.

When making the tongues on my panels, I use a bearing-guided rabbeting bit that I had custom ground to a $22\frac{1}{2}^\circ$ bevel to create the slightly sloping shoulder. The appearance of this panel is in keeping with the traditional Shaker-style furniture that is my speciality, yet it increases the visual gap between the rail and the panel. It would be very easy to see any variation from one side to the other if the gap were only $\frac{1}{8}$ in. wide. But with the wider gap afforded by the beveled panel shoulder, slight variances are not noticed.

Attaching moldings

Although moldings on Shaker-style furniture are minimal, they have the same potential for disaster as any other cross-grain construction. The sliding dovetail mounts that I use for the top end moldings, as shown in the drawing, allow free cross-grain movement and will also work for the wider cornice-type moldings found on more traditional furniture. This technique is applicable for moldings applied at the top, waist or base of cabinets as well. The dovetail retainers are made and installed in



Becksvoort routs the dovetail slots for the drawer dividers with a jig that traps the router base. After routing both dovetail slots, he removes the jig's center stop, changes to a router with a straight bit and cuts the dado between the slots for the drawer runners.

a long strip and then sections are cut from the strip to leave a row of perfectly aligned individual retainers that won't restrict movement. A dovetail slot in the back of the molding slides over the retainers to hold the moldings in position. This method allows unlimited wood movement, keeps the molding tight against the case year round, looks good from the back and does not require nails.

Because the grain of the front molding is parallel to the grain of the carcass, it can be glued directly to the top front of the case. But to attach the side moldings, I begin by routing the dovetail slot in the molding, and then I make the dovetail retainer to fit the slot. A fingerboard holds the molding securely against the fence of my router table while I rout the slot. I use a $\frac{3}{8}$ -in.-dia. dovetail router bit exposed $\frac{1}{4}$ in. above the table and adjust the fence to cut near the center or the heaviest part of the molding. When completed, I cut the molding in half and miter the front ends to fit the mitered molding glued to the face of the chest.

I make the retainer from a piece of scrapwood 3 in. wide to 5 in. wide and a little longer than the depth of the case. I plane the piece to just over $\frac{3}{8}$ in. thick, readjust the router table fence so that the stock is not trapped between the fence and bit, and then run the edge of the retainer stock past the dovetail cutter. I cut both sides of the long edges, adjusting the fence as necessary, until the retainer is a snug fit in the molding slot. Then I rip the dovetail retainers off the scrap stock on the bandsaw and plane them until they are 0.002 in. to 0.005 in. thinner than the depth of the groove in the molding. A dial caliper or micrometer is very helpful for measurements this fine. I use a smooth piece of plywood secured to the planer bed when planing pieces this thin to prevent them from being broken as they pass over the bed rollers.

To align the retainer on the chest, I hold the slotted molding in position on each side and make knife marks at the front and rear of the case to locate the dovetail slot. Guided by a steel rule, I connect these marks, making two parallel scribe lines across the case. Next, I crosscut the dovetail retainers as long as the case is wide and mark off five or six sections, allowing about $\frac{1}{2}$ in. waste between each section to be removed after the retainers are installed. I predrill two holes in each marked-off section for wood screws, apply a dab of glue between each pair of screw holes and temporarily tack the retainer in place between the two scribe lines. After drilling pilot holes into the carcass, I screw the retainer in place and remove the temporary brads. Then I chisel out the $\frac{1}{2}$ -in.-long waste chunks to leave perfectly aligned, individual retainers.

I install the moldings, by tapping them on with a mallet from the back of the case until they are within 2 in. of the front molding. Then I apply glue to both miters and to the first retainer on each side before tapping the moldings home. To get a tight miter, I clamp the glued end of the moldings across the carcass. After the glue dries, I trim the back ends of the moldings flush with the back of the cabinet.

Making and fitting drawers

I make my drawers with half-blind dovetails at the front and through-dovetails at the back. The drawer bottoms slide into



After installing the front drawer dividers and runners, the back dividers are slipped onto the runners' back tenons and glued into dovetail slots in the carcass. The runners' front tenons are glued, but not the back, to allow for movement of the carcass sides.

grooves in the drawer sides and front from the rear, and the bottoms are secured with two screws through slots into the drawer back, as shown in drawing detail on p. 39. I don't glue the bottom into the groove in the drawer front because this can make repairs difficult, but a $\frac{1}{2}$ -in.-deep, tight-fitting groove in the drawer front is usually enough to hold the bottom in place. The bottom is solid cherry, with the grain running side to side. If the grain were oriented the other direction, the bottom could expand in humid weather, pushing the drawer sides out and jamming the drawer between the carcass sides. The bottom extends beyond the back of the drawer and, with leather bumpers attached to its back edge, acts as a stop. Since the drawer bottoms and the case sides will all expand front to back and at approximately the same rate, the drawers will stay flush with the front of the carcass.

Fitting drawers is always iffy: A good fit depends on the height of the drawer, current moisture content of the wood, time of year and other unknown conditions. The species of wood also will have an effect. Some woods, such as redwood, cedar and teak, are very stable while others, such as beech, madrone and certain oaks, will require larger gaps.

Because a tight-fitting drawer can be a source of considerable irritation, I always err on the safe side: I'd rather have a larger gap than a stuck drawer. For example, the 9-in.-high bottom drawer of this chest (the tallest drawer I'll use) can expand $\frac{1}{4}$ in., enough to seal it closed for the duration of a humid summer until cold, dry winter weather shrinks it back down. With a drawer of that size and a moisture content of 7 percent, I leave $\frac{1}{4}$ in. above the drawer. This gap can be decreased if the moisture content is closer to 10 percent or 11 percent and should be increased when working with woods such as maple. If I know the piece will be shipped to a dry location, such as Tucson, Ariz., I leave only a $\frac{1}{16}$ -in. gap for my largest drawer. Smaller drawers will require correspondingly smaller gaps, as shown in the photo on p. 38, where the top drawer has a gap about one-half that of the bottom drawer. □

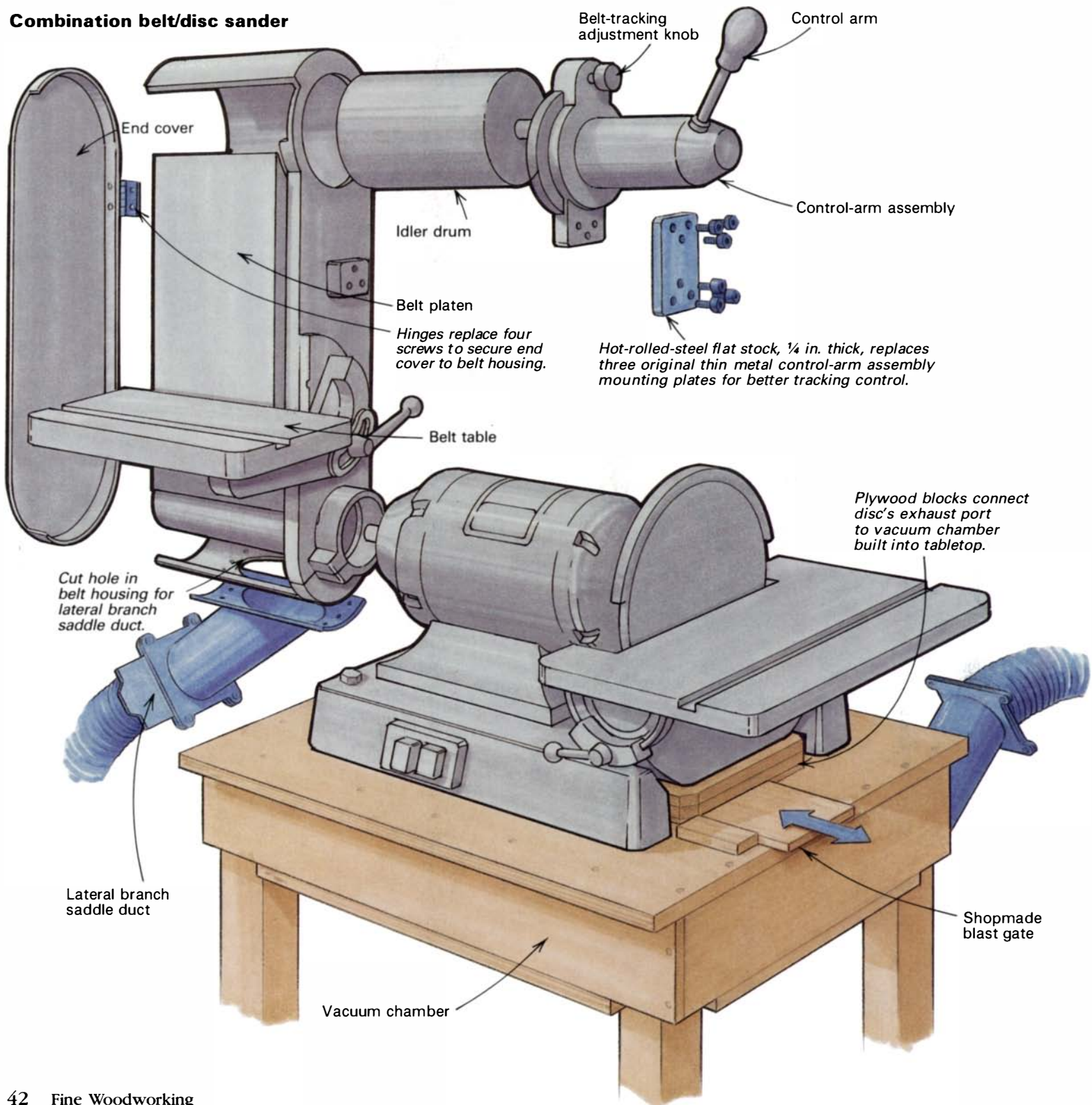
Christian Becksvoort is a contributing editor to FWW and a custom furniture maker in New Gloucester, Maine.

Belt/Disc Sander Upgrade

Minor modifications improve belt tracking and dust collection

by William Tandy Young

Combination belt/disc sander



The combination belt/disc sander is a tool that is probably not on many peoples' list of basic essentials. But the combination sander in our shop has grown to be a necessity that can help move work along in unrivaled fashion. The possibility of owning one of these versatile machines has in recent years been enhanced by the appearance of several modestly priced Taiwanese brands that have the potential for top performance.

The word *potential* is key because, like many inexpensive light-industrial tools, the Taiwanese sander shown in the photo at right, did not arrive at my doorstep perfectly designed and manufactured. However, because the machine had sound, basic components, such as castings, bearings and controls, I was able to get it to perform quite well with a certain amount of remedial upgrading. But be aware that any of these changes may void your warranty. I've taken a generic approach in my discussion of these upgrades because they apply to similar sanders offered by other importers.

Compensating for high speed

The first thing I noticed about the sander after setting it up was that the belt ran too fast for optimal woodworking. Indeed, both belt and disc functions can professionally burn endgrain on short notice. Because the unit is driven directly by an AC-induction motor, the only remedy for the excessive speed is to use sharp (fresh), high-quality abrasives and a light touch with the workpiece (both are good habits to develop anyway). There are advantages to mounting a direct-drive motor between the disc and belt sanders, however. This arrangement allows room for using the belt sander without interference from the disc cowling, as on some belt-driven machines, and the direct drive provides a disc sander that runs remarkably true and needs no further modification.

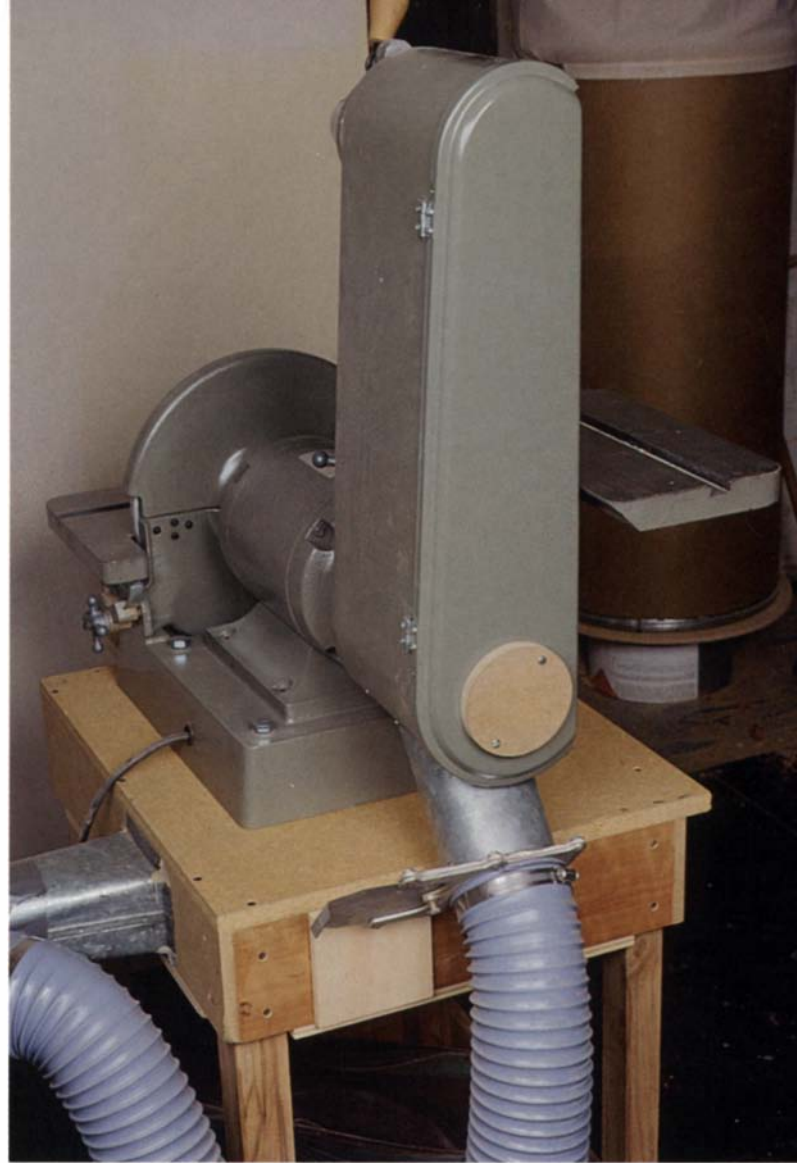
Belt-tracking modifications

Belt-sander tracking was the next issue I had to deal with. Lateral belt tracking on this machine is controlled with the spring-loaded control-arm assembly at the top of the belt housing, which is fitted with an adjustment knob for fine tuning. But the sandwich of thin metal plates that link the control-arm assembly (including the idler drum) to the belt housing are not stiff enough to ensure continuously true belt tracking. At the suggestion of a smart, neighborly machinist, I replaced these plates with a solid piece of 1/4-in.-thick hot-rolled-steel flat stock that's 2 in. wide by 3 1/4 in. long (see the drawing at left). The plates and the control-arm assembly are easily removed from the belt-housing body by backing out six Allen bolts. Using one of the original thin plates as a template, I drilled slightly oversized bolt holes in the new 1/4-in.-thick plate. The oversized holes allowed some front-to-back adjustment so that the idler drum could be aligned with the platen and the drive drum.

Although tracking improved dramatically with these upgrades, I still found the belt-tracking adjustment knob to be extremely sensitive as a consequence of the basic system design. However, there are advantages to this design that more than outweigh the inconvenience of having to monitor the position of the belt during use. The main advantage is the ease with which the belts can be changed. You simply pull down the control arm (which relaxes the idler-drum tension) and slip the belt off the drums.

Hinging the end cover for easier belt changes

The only real hitch in the belt-changing process is the end cover of the belt housing. As shipped from the factory, the end cover was screwed to the belt-housing casting in four places and was rather laborious to remove for belt changes. So I simply hinged the cover to the housing, as shown in the photo above. I placed shims between the hinge leaves and the belt housing to compensate for the



To adapt his belt sander for dust collection, the author cut a hole in the bottom of the belt housing. He also connected the disc sander's exhaust port to the table, which acts as a vacuum chamber.

thickness of the cover lip, and I ground off the excess length of the sheet-metal screws (used to mount the hinges) inside the cover in deference to the well-being of the belt. I found that bending the lip of the cover a bit here and there created a friction fit to the housing that would hold the cover closed without a latch.

Because belt changes are speedy with the hinged cover, I don't hesitate to change grits or use dedicated belts for different materials. The belt drums on this sander are manufactured with ample crowns to aid in positive, steady belt tracking, but the crowns can distort the belt's flatness across its width after a period of time. Additionally, since belt tension is not adjustable with this system, the belt continually takes the maximum amount of spring tension manufactured into the control-arm assembly. I think of this as a graphic depiction of job stress and give the belt a rest every evening by removing it from the sander.

Belt-platen tricks for longer belt life

Removing the belt overnight will help increase its life, but no belt would last very long while cascading over the sharp leading edge on the belt platen of this machine. I carefully relieved the leading and trailing edges with a mill file. And, while I was at it, I eased all the unnecessary sharp edges throughout the machine.

Another trick to increase belt life and performance is to reduce friction between belt and platen by using graphite (commonly sold in pad and stick form.) Rather than attaching pads to the platen, I



The author built two sliding tables: one with a 90° fence and one with a pair of 45° fences for accurate end sanding. The tables ride in the miter-gauge slots.

sparingly rub a graphite stick (Process Engineering Corp., Crystal Lake, Ill. 60039-0279; 815-459-1734) on the platen as needed. Graphite should not be applied to the belt or to the drums because any buildup will reduce drive friction, affect tracking and over-stress the belt. After removing the belt and unplugging the sander, I periodically remove any excess graphite from the drums with paint thinner.

Adding dust collection

Once I had fine-tuned the sander, I used it more often, and, consequently, I discovered what a dust generator it is. Although my sander had an exhaust port under the disc, it had no port for the belt. Since I needed a stand for the machine, I built one with an enclosed box beneath its top that acts as a collection chamber for the disc sander. The main dust collection line enters the box from

the rear, as shown in the photo on p. 43. A hole in the stand's top lines up with the exhaust port for the disc sander, and a stack of plywood blocks, with holes in their centers, slip over the exhaust port and connect to the stand. Included in the plywood blocks is a shopmade, plywood blast gate to control the vacuum.

To provide dust collection for the belt sander, I ran a branch off the main line into a lateral branch saddle duct fit to a hole that I cut in the bottom of the belt housing. The branch saddle is a dust-collection-system fitting available in various sizes. This one is designed to fit a 7-in.-dia. duct pipe and reduces to a 4-in.-dia. opening for a blast gate and hose. To cut the hole in the belt housing, I first removed the control-arm assembly, the belt table and the belt platen, as shown in the drawing on p. 42. Then by loosening two bolts, I removed the entire belt housing. I traced the branch-saddle opening and cut the hole in the belt housing with a metal cutting blade in a variable-speed sabersaw. I screwed the saddle on with self-tapping sheet-metal screws, and I used just enough flex hose to allow the belt housing to be rotated to its horizontal position. This fitting does a superb job of collecting dust and replaces my earlier inadequate attempt of connecting the vacuum to the end cover. The wooden plug on the end cover in the photo on p. 43 shows you where *not* to attach a vacuum hose.

Auxiliary tables for accurate sanding

The modifications described here have greatly increased the performance of my machine, but various jigs have contributed to really accurate sanding. For example, I made plywood tables like the one shown in the top photo at left that have strips screwed to their bottoms that ride in the tables' miter-gauge slots. One table has a fence that's 90° to the belt, and the other has a pair of 45° angled fences. Unfortunately, because of variations in the two miter-gauge slot locations, I need a different set of tables for the belt and disc functions, but when end sanding pieces for a precise fit, these tables are indispensable. □

William Tandy Young is a professional cabinetmaker and conservator in Stow, Mass.

Shopmade sanding belts

Epoxied butt joint _____ by Bill Skinner

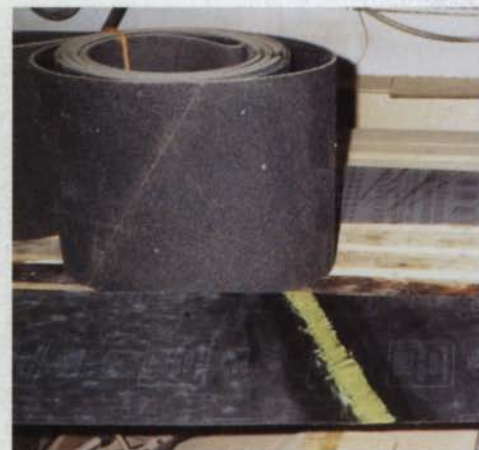
I've been making sanding belts for my stroke sander and smaller machines for more than 40 years. I use an angled butt joint reinforced with a strip of Kevlar cloth (similar to fiberglass but much stronger) glued to the back of the belt with Hexcel Epolite 2461 epoxy resin (see the photo at right). The belts joined with this system are plenty strong (I haven't broken one yet), and the butt joint allows me to run the belt in either direction. Kevlar cloth and Hexcel Epolite resin, which are commonly used by boatbuilders, are available from the Fiberglass Mart (12619 Highway 99 S., Everett, Wash. 98204; 206-743-0332). One quart of resin and hardener and 1/3 yd. of Kevlar cost about \$40, which should do all the belts you'll ever use.

I cut the belt stock (cloth-backed only) about 4 in. longer than required for the finished belt and clamp it along a straight edge with the ends overlapped to yield a belt of the exact length needed. With a sharp knife guided by a straightedge, I cut through both layers of abrasive to create a perfect butt joint. An angled joint reduces bumping as the joint passes over the platen.

I reinforce the joint with a 1-in.-wide strip of Kevlar glued with a spoonful of resin/hardener. I put a piece of waxed paper under the belt and over the Kevlar strip and then clamp a short piece of 2x2 over the joint and let it set overnight. □

Bill Skinner is a retired cabinetmaker in Everett, Wash.

Photo: Bill Skinner



Butt-joined sanding belts are easy to make, and they can be run in either direction. The author glues a strip of Kevlar cloth across the back side of the joint with Hexcel Epolite epoxy resin.

I first started making my own sanding belts about 10 years ago when I came across several boxes of industrial abrasive cutoffs from a furniture factory. I made a variety of sizes (from 1-in. to 6-in. wide and from 24-in. to 48-in. long) because I could save a fair amount of money by buying bulk abrasive at salvage prices. Now I can get the 3-in.- and 4-in.-wide by 24-in.-long belts for my portable machines for about \$1, so I no longer make these, but I still glue up my own 1-in.- and 6-in.-wide belts.

In the years that I've been making these belts, I've made a lot of mistakes, so the techniques I offer have been gleaned from the school of hard knocks. My method involves grinding the abrasive from the overlapping ends of the belt and gluing the ends together with polyvinyl acetate (PVA) glue (I prefer Titebond, manufactured by Franklin International, 2020 Bruck St., Columbus, Ohio 43207). A special fixture aligns the belts and clamps them securely. These methods have worked for belts up to 6 in. wide and will probably work for wider belts, although I've never needed anything bigger. There is a special tape adhesive available, but it is very sensitive and requires precise preparation of the belt and strict control of temperature and clamping pressure, so it's better suited to commercial operations.

Selecting and cutting the abrasive: I recommend high-quality, cloth-backed abrasives over paper-backed abrasives when making belts. I find that cloth holds up better to the grinding process, and the more durable backing provides a longer lasting, better performing belt.

To cut the abrasive to size, I first make a wood pattern stick, with its ends cut at a 30° angle to reduce the bump when the lapped belt joint passes over the material being sanded. The length should be ½ in. longer than the nominal belt size to allow for the lap joint. I write the word *up* on one side of the pattern stick so that I can keep the angle going the same way when I move from cutting to clamping. It doesn't matter which way the angle goes, but it's important to be consistent throughout the belt-making process.

Cloth-backed abrasive is easily ripped to the appropriate width, and a test tear or two will quickly reveal which direction tears more predictably.

To cut the strips to length, I first secure them to the edge of a bench or table with spring clamps to hold them straight. Then I lay the pattern stick over the abrasive and mark where the end cuts are to be made, as shown in the top photo on this page. I use old scissors to cut the lengths while the paper is still clamped to the bench, and I also trim any strings that are hanging off

the sides of the strips at this time, otherwise they become a real nuisance later.

Grinding the lap joints: After trying all sorts of grinding fixtures, I have gravitated to a ½-in.-dia. metal rod located about the thickness of a business card away from the face of the grinding wheel. It takes a bit of adjusting to get the rod the proper distance from the wheel, but with all the end cutoffs lying around, experimental stock is rarely lacking. I slip the end of a 6-in.-wide belt between the rod and the grinding wheel at an angle, as shown in the center photo. If the grinder has side guards, these must be removed so that the full width of the belt can pass smoothly past the grinding wheel's face. For 1-in.-wide belts, I drop the end of the abrasive strip straight down between the rod and the grinding wheel and then quickly withdraw it. I try to grind about ¾ in. of abrasive off to allow for a comfortable lap. Grinding the abrasive takes about a full second; if you keep the abrasive on the grindstone too long, the cloth will be ground away. Grinding abrasive is a dusty, dirty task, and a respirator is a necessity.

Gluing the lap joint: The fixture I made for gluing the abrasive holds the belt ends parallel and secures the joint between steel clamping pads with a C-clamp, as shown in the bottom photo.

The pads I use are made from ⅜-in.-thick by ¼-in.-wide bar stock. I mounted two steel dowel pins in the ends of one pad and drilled matching holes in the other to keep the pads aligned when the rotary screw pressure of the C-clamp is applied.

I used to be concerned about the durability of the glue joint, but I have 10-year-old belts held together with PVA glue that are still quite usable. Try a plastic resin glue if moisture or heat is a particular problem.

To glue up a belt, I put the clamp pad with the pins in the fixture and secure the belt in position with spring clamps. After gluing the lapped ends of the belt, I drop the other clamp pad in position and fasten it with a C-clamp. I've made five sets of clamp pads for each belt size, so I can remove the clamped-up belt from the fixture to let it dry and proceed to glue up another belt.

Once the glue is dry, I scrape off any squeeze-out to avoid bumps in the belt or the possibility of the belt separating if the glue catches on the work.

When using these shopmade belts, I always run them so that the open edge of the lap won't catch on the edge of the work and rip the belt apart. □

Robert Vaughan is a contributing editor to FWW and a professional woodworker in Roanoke, Va.



A pattern stick makes it easy to consistently cut abrasive strips to the correct length with uniformly angled ends. Angling the ends reduces bumping when the glued joint contacts the workpiece.



Grinding away the abrasive cleans up the belt for gluing the lap joint and makes for a thinner glueline and smoother running belt.



The gluing fixture aligns the belt while the lap joint is being clamped. Multiple steel pads permit the removal of one belt from the fixture to glue up others.



Its finish all but destroyed, this barrister's bookcase top is about to be reborn. The author fills large holes and gouges with auto-body filler and then presses shellac into the smaller cracks with an electric burn-in knife.

To darken a high spot (below), the author dabs a bit of powdered stain onto the surface of the finish and then quickly polishes over it.

Though not the most practical finish for a surface subject to wear or possible contact with liquids, a French polish is a beautiful, authentic antique finish (right).



French Polishing for Restoration Work

Modern padding finishes update an age-old technique

by Scott Lawrence

The subject of French polishing almost always provokes strong opinions among finishers—some swear by it and some swear at it. This disparity of opinion is due to the finish's great beauty coupled with its fragility. Possessing little durability and having almost no resistance to common household spills, heat or solvents, it is not a practical finish for most new furniture or cabinetry. It is unsurpassed, however, for repairing and restoring antiques because it captures and preserves the age marks and patina, rather than obliterating them as is typically the case when an antique is stripped and refinished.

Even a severely degraded finish can be brought back with a French polish through the use of powdered aniline stains and a shellac stick of the appropriate color. I keep a full range of both on hand whenever I'm working on a restoration. The shellac stick allows me to fill any nicks, gouges or checks, and the powdered stains allow me to restore color to a worn or faded finish and even to match a replaced part to the rest of the piece. A word of caution: The technique I describe is legitimate for most antique restoration work, but if you are asked to restore a museum-quality antique, you should consult a conservator before taking any action.

French polishing is the building up of a shellac film that's applied with a cloth pad soaked in either a shellac/alcohol mixture or a modern, premixed formula consisting of shellac and some other solvent (such as ethyl acetate or methyl isobutyl ketone). Lubricated with a few drops of oil, the dissolved shellac builds quickly and dries as it's applied, allowing a finish to be built in one session. Although simple in theory, mastering the technique requires a fair amount of practice. If the pad is too wet, it will tend to dissolve the finish you've already put down; if too dry, the pad will stick to the finish and leave cloth prints. Even when modern, premixed formulas are used, the beginner is advised to develop the technique on an expendable piece or two. For more on the basics of French polishing, see the sidebar on the following page.

Materials

Traditionally, French polish consisted of various formulations of shellac, alcohol and a tiny amount of oil to lubricate the pad. Although traditional finishers always have delighted in discovering ever more obscure and exotic variations on this basic formula, the modern, premixed padding finishes will give virtually the same results with much less hassle (see the sidebar at right). The techniques discussed in this article were developed for use with the modern finishes, but they can be adapted for use with traditional French-polishing materials.

Modern padding finishes can be roughly categorized as high-build, general-purpose or topcoat formulas. High-build padding finishes, such as Mohawk's Lacover or Star's Lac-French, are the best choice for filling and smoothing a cracked, worn or scratched surface (see the Sources of supply box on p. 48 for addresses). This high-build formula will fill and level all but the most severely degraded finish. I use this type of padding finish for all steps of a restoration except the final one and sometimes even then.

General-purpose padding finishes can be used where less build-up is required. I carry a small bottle of this formula in my touch-up kit for on-site finish repairs that don't require a high degree of stain resistance (such as table legs and the sides of case goods). Behlen's Qualasole, Star's Wil-Pro and Mohawk's Rapid-Pad are all good general-purpose padding finishes, although each possesses slightly different characteristics.

Topcoat finishes such as Mohawk's Golden Rapid-Pad or Star's Starlite are formulated to flow out smoothly with a minimum of streaking, which makes them the best choice for final topcoating of large surfaces such as tabletops or desktops.

Cleaning and preparing the old finish

I've never followed the common practice of cleaning an antique with water and detergents. Naphtha does a fine job of cleaning the finish's surface of old wax, dirt and polish, without harming either the wood or the finish as water and harsh alkaline detergents often do. I simply sponge on naphtha and blot up the crud with paper towels. When the paper towels come off the surface clean, I'm done. In severe cases, I'll gently scrub the piece first using 3M's Scotch-Brite pads and naphtha. Another advantage of using naphtha to clean antiques is that it evaporates within minutes, so restoration work can begin almost immediately. But if you clean with detergents and water, you have to let the piece dry overnight.

Right after cleaning is generally the best time to repair any gouges, chips or dents. I do this with an electric hot knife and the appropriate color of shellac stick (available from Mohawk, Behlen or Star). I prefer the electric hot knife over other types because it's more convenient when I have to make on-site repairs, and the heat it generates is most consistent. I slice a bit of shellac off of the stick, smear it into the damaged area and smooth it as best I can (see the top left photo on the facing page). Then I sand the repair smooth with #320 or #400 wet/dry sandpaper moistened with naphtha. Any graining or blending of the repair will be done later.

Next, I usually stain and seal any bare or badly worn areas with a glazing stain made up of either powdered aniline stains or artists' oil colors mixed into clear Watco oil finish. This oil-base stain penetrates and stains worn and bare areas and wipes off the darker, already-finished sections, without obscuring the grain. If the area to be stained is large, I wipe the stain on with a rag, but for smaller areas and when blending in details, I use an artist's brush. If you have rebuilt any missing parts, you can also use this same oil-stain mix to begin matching the new wood to the existing finish. Try to match the color to the lightest color in the old finish. You will darken and "age" the new part in subsequent steps.

Once the oil stain has dried thoroughly (48 hours or so), you can distress the new section to match the general condition of the piece. Observation is the key to realistic distressing. Rounding

Padding finishes vs. shellac and alcohol

Modern padding finishes are virtually identical in appearance to the traditional shellac-and-alcohol finish, but they're more versatile, faster and easier to use than the traditional mixtures. Because the modern padding formulas are premixed, there's no need to experiment to find the proper consistency and build. And since there are a number of formulas with varying degrees of build available, you don't have to alter the ratio of solids to solvents toward the end of the finish, as you do with the traditional method. Finally, in my subjective experience (although I haven't done any quantitative research), the premixed finishes are somewhat more durable and stain resistant than a traditional polish.

So what's the controversy? Beats me. I get just as much personal satisfaction from using a premixed padding finish as I would (and have) from using shellac and alcohol, without any of the hassle. I'm quite satisfied with the quality of the results (as are my customers), and that's the bottom line as far as I'm concerned.

—S.L.

over of exposed edges, bump marks on legs and little dings where silverware and plate rims might have left slight impressions on a tabletop create a truer feel than wholesale abuse. Don't overdo it—excessive flyspecking, chain marks and rasping look phony. Think about how the piece was used, and distress accordingly. Reapply the oil stain to distressed areas, if necessary; then let the piece dry.

Building a new finish

Except in the rare instance an antique needs only a new topcoat, you must first rebuild the finish, filling in the countless scratches and scuff marks that have accumulated over the years. I rebuild the finish with high-build padding formula, adding a touch of powdered stain if I need to further doctor the color. I like to use a clear glass ashtray (available at the finest hotels and bars) to mix padding formula and powdered stain; I look for both a proper color match and the right degree of transparency given the piece I'm working on.

I apply the padding finish in circular or figure-eight strokes to the damaged area until I've built up a new layer of finish about as thick as the old one. With a very thick finish that has been severely degraded (cracked, peeled or crazed, for example), it will be necessary sometimes to build up a new film on the repaired area, sand down the adjacent old finish until the two surfaces are roughly level, and then apply a coat of the padding finish to both sides. This coat can be lightly sanded to remove any padding marks, and a final coat can be applied with the grain to blend the two areas.

With open-pored woods, such as oak, walnut or mahogany, I like to "grain" any repairs that I've burned in using a shellac

stick and a hot knife. I score the repair slightly with the edge of a chisel or a glass cutter and try to connect these lines with grain lines on either side of the repaired area to create the effect of grain running uninterrupted through the repair. Then I rub a little dark oil stain into these grain marks until they match the color of the surrounding wood grain. Done carefully, this faux graining will make your repairs disappear. Let the piece dry overnight before proceeding.

Next, I do any final color glazing or streaking to blend in areas that have been patched extensively. I lightly brush the freshly padded surface of the repair with a dab of powdered stain on a fingertip of my left hand; then I quickly pad over it to dissolve the touch-up powder into the finish and to seal it (see the bottom photo on p. 46). This process will leave a subtle streak of color in the surface, simulating a contrasting streak in the wood or completely disguising a repair under the predominant wood color.

If the restored area still looks too light or new, now is the time to darken it, using layers of glazing made up of powdered stain and padding formula mixed in your "souvenir" ashtray. Pad on the mix using long, straight strokes running with the grain. The ability to match for color and for a realistic degree of opacity is a skill that will come only with experience. But I can tell you that a finish that is too clear will make an area stand out as new and that a finish that is too opaque will render your efforts muddy and lifeless. Remember that you are trying to recreate many years of aging—don't try to reproduce this in one quick application of glazing.

When you have blended in the restored area to your satisfaction, the entire surface (preferably the entire piece) should be topcoated with one of the light-bodied padding finishes (see the large photo on p. 46). Use a fairly dry pad at first so you don't smear your previous work. Once you've sealed the surface, you can work with a slightly wetter pad, using long, straight strokes. When you're first experimenting with the finish, play with variables such as the moistness of the pad and the pressure and/or speed of your strokes. The only hard-and-fast rule is *not* to let your pad come to a stop while on the finish surface; always keep the pad moving until it's completely removed from the surface.

Should your restored finish be too glossy for your (or your client's) liking, it can be rubbed down with #0000 steel wool after a few days. You can also put a coat of high-quality wax over a French-polish finish to give it a bit more protection. Don't use a liquid wax, however, since they often contain solvents or water, which could damage the French-polish finish. Should your newly restored piece become scuffed or scratched, don't worry. It can be easily repaired using the same materials and techniques as described above but in much less time than a full restoration. □

Scott Lawrence is a professional furniture finisher and restorer in Colorado Springs, Colo.

Sources of supply

Modern padding finishes, shellac (in many forms), alcohol and other solvents, and powdered stains are all available from the following manufacturers and distributors.

Mohawk Finishing Products Inc. (also manufactures the Behlen line*), Route 30 N., Amsterdam, NY 12010; (518) 843-1380

Star Finishing Products Inc., 360 Shore Drive, Hinsdale, IL 60521; (708) 654-8650

Wood Finishing Supply Co., Inc., 100 Throop St., Palmyra, NY 14522; (315) 597-3743

* H. Behlen and Bros. finishing supplies are available through retailers only.

French polishing: the short course

Here are the basics of French polishing in a nutshell: Make an egg-sized ball of clean cotton cloth. Saturate with finish compound—either the traditional shellac-and-alcohol mixture or one of the modern, premixed formulas. The pad should be damp but not wet. Squeeze out the excess. Then wrap the pad tightly with another clean, lint-free cotton cloth. Make sure this cover cloth is free of wrinkles on its bottom surface, or it'll streak the finished surface.

If you're using the traditional shellac-and-alcohol mixture, sprinkle a few drops of linseed or mineral oil onto the surface to be polished. This will lubricate the pad, allowing it to move freely without sticking. (This step is not necessary with the premixed padding finishes.)

Apply pad to wood with circular strokes. Start this circular motion in the air before the pad comes into contact with the surface. Gradually pad out the entire surface, using slightly overlapping strokes. Repeat this process until the desired film thickness is achieved; then finish with overlapping straight strokes running with the grain.

When using the shellac-and-alcohol mixture, you must wipe the entire finished surface with a fresh pad that's been slightly dampened with alcohol. This will remove any remaining oil from the surface and burnish the shellac film to a smooth, glossy sheen.

For more on French polishing, see *Fine Woodworking on Finishing and Refinishing* and George Frank's article from *Fine Woodworking* #58 in *The Best of Fine Woodworking—Finishes and Finishing Techniques*. —S.L.

Flip-Stop Fence for a Radial-Arm Saw

The track-mounted stop is always handy

by Art Duser

“You can’t buy any more tools,” my wife told me in no uncertain terms, and she added, “the accessories cost too much!” Though she wasn’t entirely serious, her wake-up call helped me to rank my woodworking tool needs; I began to think seriously about what I could do without and what I could build myself. Since then I’ve built a number of power-tool accessories, including the radial-arm saw fence with flip stop that’s discussed in this article. Building my own accessories not only saves me money (allowing me to buy more lumber and essential tools) but also provides real satisfaction, borne of self-reliance and successful problem solving.

My fence consists of two 5 ft. lengths of mahogany—a main fence and an extension fence—that I spliced together, as shown in the drawing. A dado in the top of both pieces of mahogany houses a piece of extruded aluminum shelf standard (manufactured by Dorfile, a division of Newell Home Hardware Co., 4533 Old Lamar, Memphis, Tenn. 38118; 901-365-0479). The lips of the shelf standard capture a toilet-flange bolt that extends through a piece of polyethylene (generally available as scrap from a plastics supply house). A knurled thumbnut atop the block permits me to lock it in place. The flip stop is screwed into a hole that I drilled and tapped on the side of the polyethylene block.

The main fence is pinched between the front and rear portions of the saw’s table (in the same manner as the stock fence) and is made more rigid near the blade with a piece of aluminum angle that I screwed to the main fence’s downward-extending lip (see the drawing). The extension fence can be connected to the main fence either with a pan-head machine screw and a T-nut set into the extension fence (as I did) or with a wood screw through both members into the table below. Both extension and main fences are carefully aligned and then screwed to the extension table.

Stop block and flip stop

The first stop block I made was of hardwood and required a mortise on its back side to cap-

ture the locking nut for the flip stop’s pivot screw. Since then I’ve made a few of these fences for friends, and I’ve used polyethylene for all my stop blocks. The polyethylene permits drilling and tapping of the hole for the pivot screw and will hold the screw snug with just enough play.

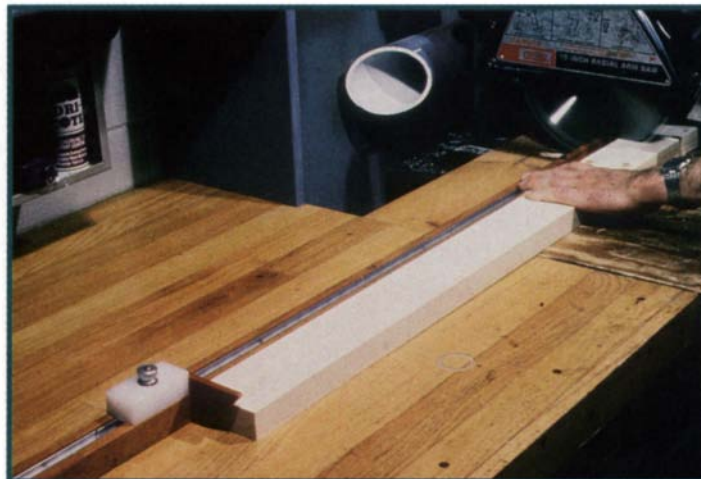
I’ve used knurled thumb nuts on the toilet-flange bolt for all my stop blocks (though I’m sure a wing nut would do the job as well), and I embed a flat washer in the top of the block to prevent the thumb nut from wearing into the polyethylene. To minimize friction in the track when the stop block is moved, I file the flat sides of the flange bolt’s head slightly. I also set a rubber tack bumper into the main fence near the blade to discourage the stop-block assembly from getting too close to the blade.

I’ve used both aluminum and phenolic-resin board for flip stops, but plywood would probably work as well. The front edge of the stop curves upward so that it will flip back when a long piece of stock is pushed into it. This makes it easy to trim one end of a board before flipping it end for end to cut it to length.

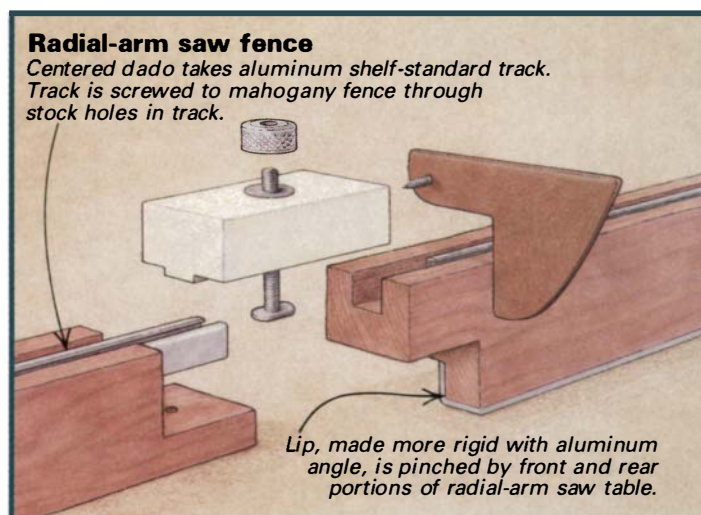
I use my radial-arm saw almost exclusively for 90° cross-cutting, so I’ve tuned it up to cut dead on. When I need to cut a 45° miter or any other angle, I position the piece I’m cutting with one of a number of pre-cut plywood angles I’ve made for this purpose. I find this method to be more accurate and a lot quicker than having to reset my saw every time I want a different angle. If you cut angles other than 90° on your saw, you’ll want to keep the aluminum back farther from the blade, and you may have to use a block against the flip stop if you are cutting fairly short pieces.

I’ve only made these fences for radial-arm saws, but I’m sure some ingenious woodworker could modify the design to accommodate a miter saw or even a sliding compound-miter saw. □

Art Duser is a woodworker and a member of The Triangle Area Woodworkers’ Club, which meets in Raleigh, N.C. He’s also a data communications specialist.



Quick, accurate multiple cuts are all but assured with a good fence setup. The flip stop is angled up in the front to allow the user to push a piece of stock into the fence for a square cut and then flip the stop back down for the cut to length.



Radial-arm saw fence

Centered dado takes aluminum shelf-standard track. Track is screwed to mahogany fence through stock holes in track.

Lip, made more rigid with aluminum angle, is pinched by front and rear portions of radial-arm saw table.

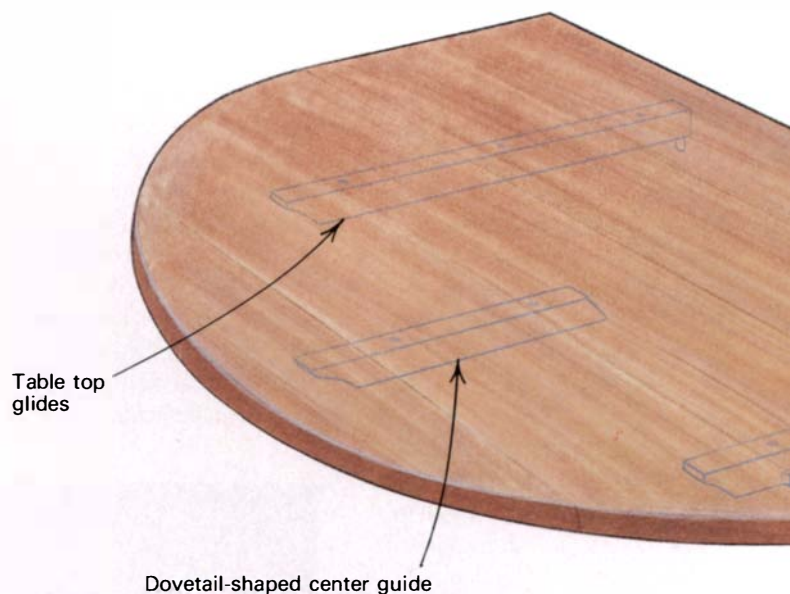
A Butterfly Expansion Table

Self-storing leaf hides under the top

by Paul Schürch

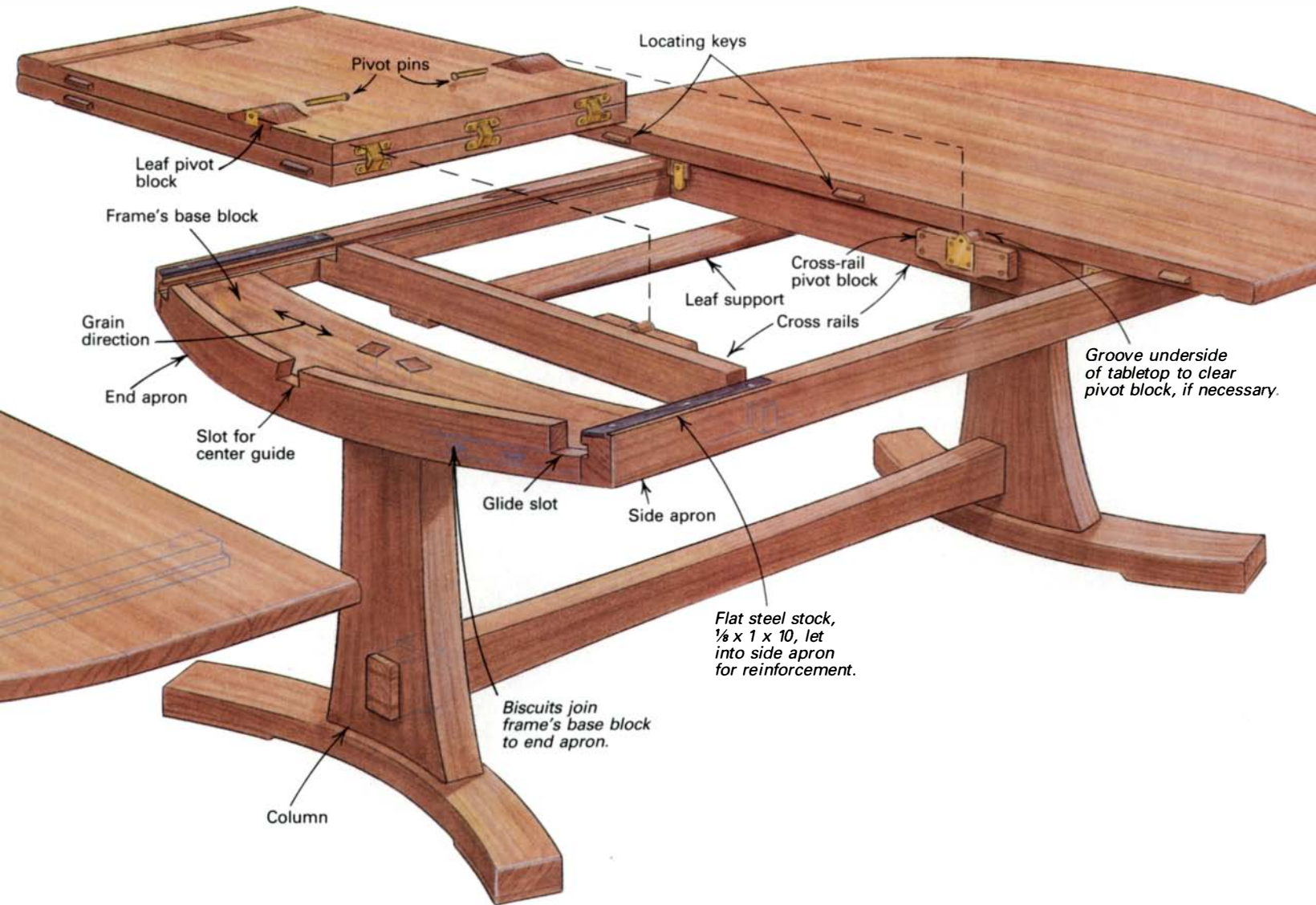
In a butterfly-leaf table, a hinged leaf stored under the top pivots up and unfolds to extend the table. This leaf-storage system eliminates the need to handle the heavy, bulky leaves normally used in an extension table and also avoids the possibility that forgotten leaves will be left behind in the excitement of loading up the moving van. Just this past year, I've had two jobs making and matching table leaves to replace ones that had been lost. So when commissioned to design and build an extension table, I decided on the butterfly-leaf table for its practicality, aesthetics and absolute ease of operation.

The butterfly mechanism is not as complicated as it may appear, and once the basic geometry is understood, the mechanism can be built easily. The hinged-leaf sections counterbalance each other, as shown in the photo below, and move almost effortlessly. The key



The butterfly-leaf table derives its name from the motion of its folding leaf as it is moved from the stored position between the rails to the open position in the extended table.

Fig. 1: Butterfly-leaf table construction



to laying out the mechanics of the leaf is to build a full-scale mock-up based on the cross-sectional view of the butterfly leaf and aprons shown in figure 2 on p. 52. You must take into consideration that the leaves need space to swing freely under the table and that the aprons are an important structural part of the table. With the exception of these restrictions, there is considerable flexibility in designing a butterfly-leaf table. The top can be just about any shape or size and can be supported by a trestle base like the one shown in the photo at left or with a more traditional four-legged base. The table's base-and-apron assembly are stationary, and the ends of the tabletop are screwed to glides that ride in grooves cut into the side aprons. For greater extension capabilities, the table could include multiple butterfly leaves.

In addition to the mechanics of the folding leaf, there are some other key areas that this article will touch on. The material from which the table is made will not only affect the appearance but also can have an impact on the function of the mechanism. For example, woods with excessive seasonal movement may interfere with the operation of the leaf. The hardware for the folding leaf is surprisingly simple, and much of it is easily shopmade, as are the guides and glides that the table ends slide on. And, finally, I'll discuss the pivot blocks, which ensure smooth operation and the locating keys, which position the leaf in relation to the tabletop. In

the sidebar on p. 54, I'll describe the simple templates I use to rout the mortises and tenons that connect the top to the base.

Making a mock-up of the butterfly mechanism

A full-scale drawing of the leaf in both the open and closed position and a working mock-up of the table-leaf mechanism are essential for planning and laying out a butterfly leaf that opens easily, aligns properly with the tabletop and stores without interference below the top. To make the mock-up, draw a cross-sectional view, as shown in figure 2 on p. 52, on a smooth piece of plywood. Two thin strips of plywood, fastened together with a fabric hinge at one end, represent the hinged table leaf. Drive a nail through the mock leaf at the approximate pivot point, as shown in figure 2. Put another nail into the plywood drawing to represent the edge of the leaf support. Now you can move the mock leaf through its entire range of motion and experiment with the location of the pivot point and the leaf support. As the top half of the leaf is lifted, the bottom half should ride on the leaf support and just barely clear the apron. To gain more clearance, you could move the aprons farther apart, but having the aprons as close to the folded leaf as possible provides the best balance and support for the open leaf.

To make the mock leaf, rip two strips of 1/2-in.-thick plywood as wide as the tabletop is thick (1 1/4 in. for the tabletop shown in this

article). A piece of fabric glued onto the ends of the plywood strips simulates the action of the Soss hinges used in the actual leaf. The location of the folded leaf between the side aprons of the table is not critical, although I positioned my folded leaf so that it is centrally located between the aprons and parallel to the top. The space between the folded leaf and the underside of the tabletop must accommodate the pivot block without interfering with the top as it slides open and closed. As this space becomes larger, however, the side aprons must become wider to conceal the leaf below the table. About $\frac{3}{8}$ in. clearance is ideal, but because I wanted narrow aprons, I left only $\frac{1}{8}$ in., and, consequently, had to groove the underside of the top to pass over the protruding cross-rail pivot blocks, as shown in the bottom photo on the facing page.

Pivot-point placement is very critical and needs to be carefully laid out. After positioning the folded mock leaf on the drawing in the closed position, outline the leaf's exact location on the plywood and remove the leaf mock-up. Then draw a line from the closed leaf-joint center (point A in figure 2 below) to the open leaf-joint center (point B, which must fall at the table's center). The pivot point lies at the middle of this line.

Now, reposition the mock leaf on the drawing and glue a semi-circular block with a small hole drilled through it onto the leaf, so the hole aligns with the pivot point. A finishing nail, driven through the hole serves as the pivot point while a second nail driven into the plywood drawing simulates the contact point between the leaf and the edge of the leaf support. Clamp the plywood drawing in a vertical position so that the leaf hangs on the pivot nail and gravity holds the bottom half of the leaf against the leaf-support nail. Pull the top half of the leaf up, over and into the open position, while checking that the lower half of the leaf slides properly on the leaf support and clears the side apron by at least $\frac{1}{4}$ in. Also, be sure the trestle or other substructure does not interfere with leaf movement. Although the leaf is balanced and moves with very little effort, it should not open on its own. If the leaf does not stay in the closed position, the pivot point needs to be moved toward the hinged edge of the leaf, which in turn necessitates repositioning the leaf and possibly the leaf support. It takes some experimenting, but once this mock-up functions properly, you are assured that the actual tabletop will operate flawlessly.

Choosing the right wood for the top and leaf

Most of the references I found on making butterfly-leaf tables recommended against using solid wood because seasonal movement or warping can cause the mechanism to bind or cause a mismatch between the leaf and the tabletop ends. My solid-wood table, now six years old, was built with wood movement in mind. Even though the table is subjected to humidity swings of 25 percent to 55 percent, it still works very well.

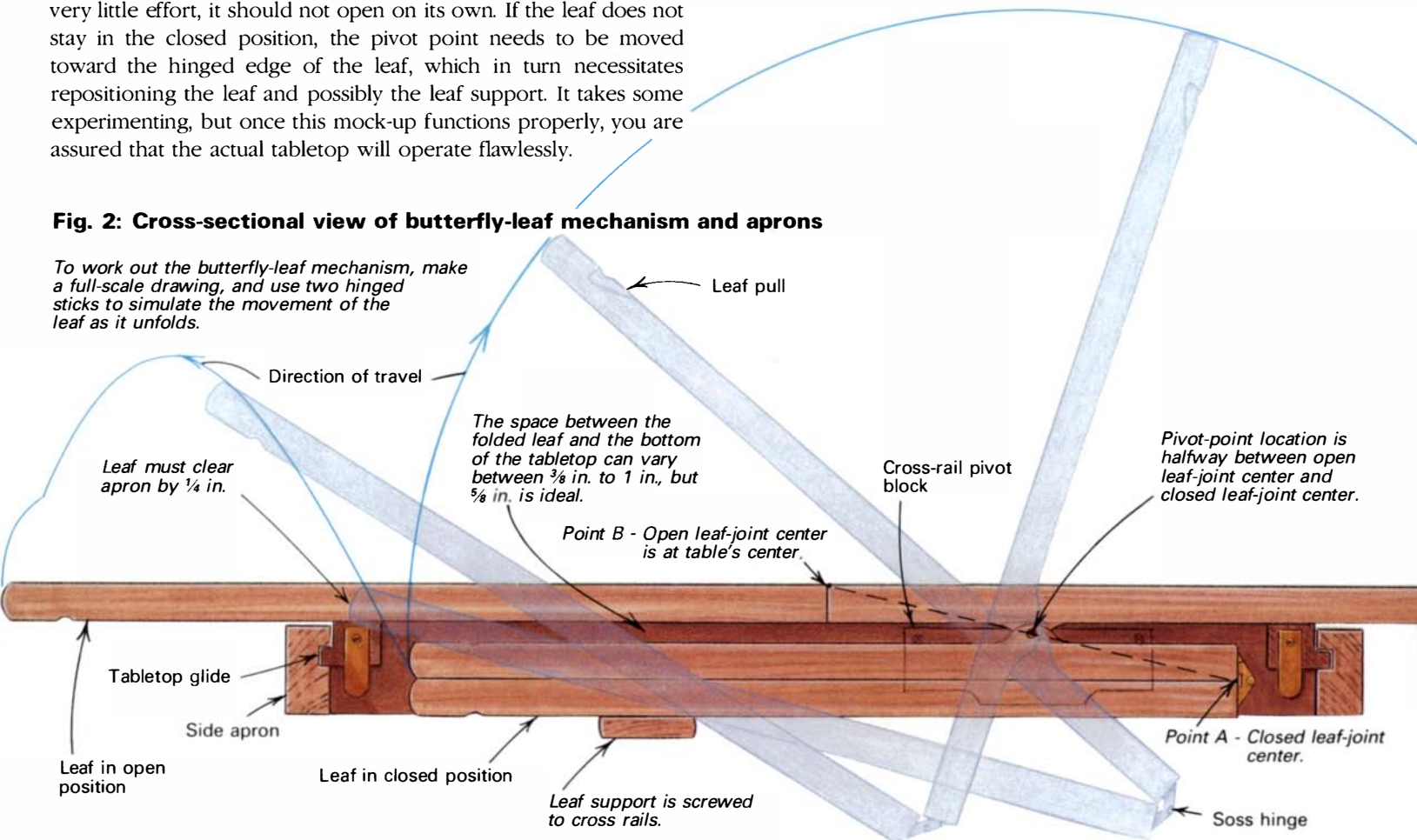
Wood selection is very important. I used teak for this table, but mahogany, oak or even pine will do, if it is high-quality, stabilized wood. The wood must be properly air- or kiln-dried (with no internal tension) and stabilized to the shop's environment. Boards with a wild and undulating grain pattern or those that bind or warp when ripped are sure to have internal tension and should be avoided. The grain of the tabletop should run across its width, and to equalize or minimize warping, I recommend using the opposed-heart method when gluing up the top, as shown on the table's edge in figure 1 on p. 51. To allow for seasonal movement of the leaf, I left $\frac{1}{4}$ in. between the leaf and each pivot block. And because the aprons are the main structural support and form the glide system for the tabletop, quarter-sawn defect-free wood, with its grain oriented as shown in figure 2 below, is preferred.

Selecting and making the hardware

I joined the leaf halves with three heavy-duty Soss hinges (see the Sources of supply box on p. 54) that permit the halves to fold back on themselves yet are completely invisible when the leaf is open. The pivot pins that hold the leaf in the table are two $\frac{1}{4}$ -in.-dia. by $3\frac{1}{2}$ -in.-long solid-brass hinge pins. I had to scavenge them from a set of brass butts after I found out that I couldn't just buy the pins. I might have been able to use the butt hinge leaves to make the

Fig. 2: Cross-sectional view of butterfly-leaf mechanism and aprons

To work out the butterfly-leaf mechanism, make a full-scale drawing, and use two hinged sticks to simulate the movement of the leaf as it unfolds.



pivot plates or table stops if I hadn't already cut them from some 1/8-in.-thick by 1 1/2-in.-wide flat, brass bar stock. I also made a table lock from the brass stock. I cut the brass with a coarse metal-cutting blade mounted in a sabersaw and used drops of water as a cooling lubricant. I recommend wearing safety glasses to protect your eyes from flying brass chips. After roughing out, the brass is easily filed to shape, buffed to a bright shine with a felt buffing wheel and soft-metal rouge compound, and, finally, sprayed with Agateen 2-B cellulose-nitrate lacquer. Because these brass pieces are rarely handled, the lacquer provides a durable shine and prevents tarnishing.

To facilitate the removal and reinstallation of the tabletop, I screwed a threaded insert into the end of the tabletop glide, so the brass end stop could be fastened with an easily removed machine screw, as shown in figure 3 below. A hook-and-screw table lock, which holds the table ends together when the leaf is not in use, is mounted about 3 in. from the perimeter and across the joint on the underside of the table ends. When the table is fully extended, the weight of the leaf on the locating keys prevents the table ends from being accidentally pulled apart. But if you prefer, locks also could be installed on the leaf.

To strengthen the aprons against the leverage exerted by the extended tabletop, I reinforced the top ends of the side aprons with 1-in.-wide strips of 1/8-in.-thick by 10-in.-long flat, steel bar stock, as shown in figure 1 on p. 51. I screwed the steel to the side aprons with three #12 by 2 1/2-in.-long flat-head screws, positioned to avoid the slide groove on the aprons' inside edges. The steel, located under the table ends, is not visible even when the table is fully extended on its glides.

Guides and glides

For each table end, there are two tabletop glides and one center guide, as shown in figure 1 on p. 51. The guides and glides should be made from a dense wood with the grain angling across the stock at 45° when viewed from the end (as shown in figure 2 on the facing page), which offers more lateral and shear strength. The end aprons and the cross rails are notched to allow passage of the tabletop glides, as shown in the top photo at right, and the end aprons are also notched for the center guides. The dovetail-shaped

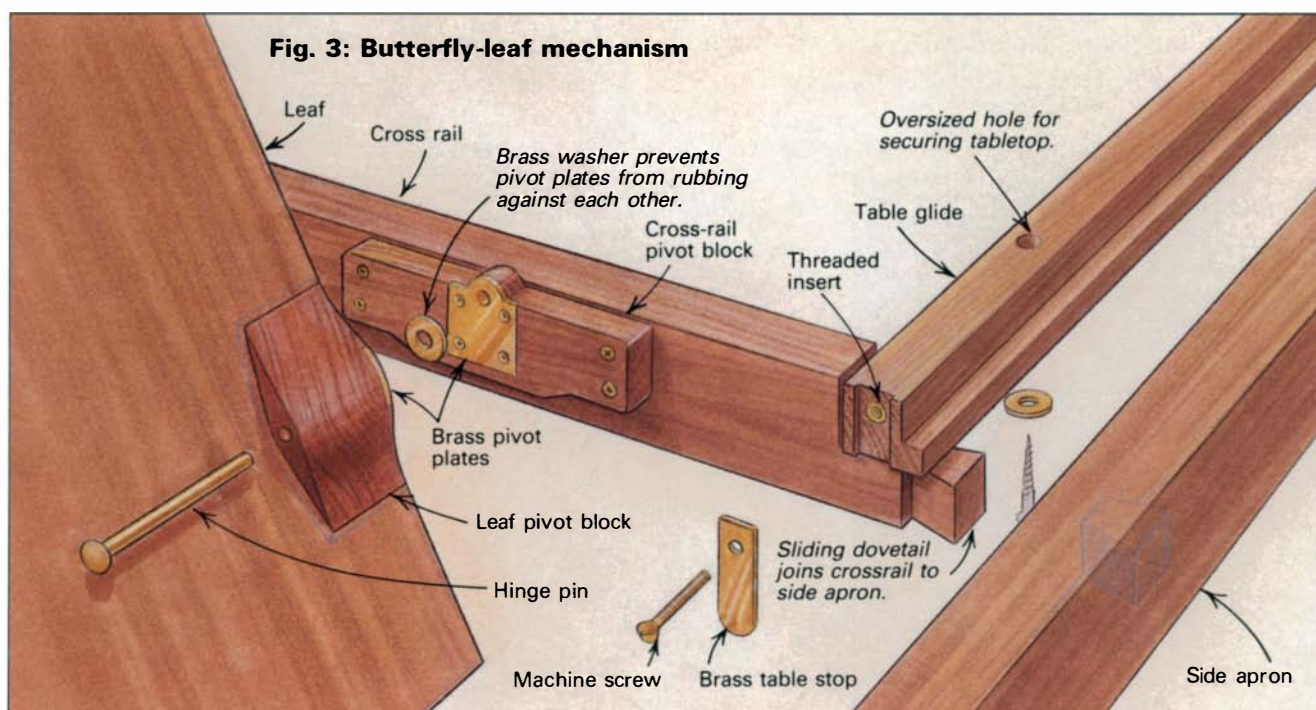


The table glide extends through the end apron, which is dovetailed to the side apron. Also shown are the dovetail joints that connect the frame's base block and the cross rail to the side apron.

The butterfly-leaf mechanism includes the cross-rail pivot block, the leaf pivot block and pin, and the Soss hinges that join the two halves of the leaf. The author grooved the underside of the tabletop to accommodate the pivot blocks' knuckles, but this could be avoided by lowering the pivot point slightly.



Photo: Paul Schürch



center guides provide additional support and prevent undue stress on the glides if the table is picked up by the top. The guides also prevent racking when the top sections are slid in and out and even can serve as stops if positioned to hit the cross rails when the top is fully closed.

The guides and glides are screwed to the underside of the tabletop with round-head screws and flat washers through oversized holes. The oversized holes permit adjusting the glides and guides to their respective slots and allow for normal wood movement with seasonal changes in humidity.

Locating keys

Although locating keys and their corresponding mortises along the mating edges of the leaf and table ends, shown in figure 1 on p. 51, may be optional on other types of extension tables, they are necessary on a butterfly-leaf to secure the folding leaf in the open position. The locating keys also align the leaf with the table ends and when the leaf is folded, align the table ends to each other. I have found that three keys across the width of the table are sufficient. The key located near the leaf joint is positioned on the lower half of the leaf (when the leaf is closed), so it will clear the pivot block on the cross rails when opening or closing the leaf. The 1-in.-thick cross-rail pivot block automatically provides ample clearance between the locating keys (which should protrude about $\frac{5}{8}$ in.) and the table's ends. I've found that it's best to wait until the leaf is ready to be installed in the table before cutting the mortises and setting the locating keys into the edges of the table ends and leaf. Then I can make last minute adjustments to be sure everything is perfectly aligned.

Mounting the pivot blocks

Because the leaf pivot blocks bear considerable weight and are subjected to some abuse as the leaf swings in and out of the table, I dovetail them into the leaf. Each of these joints is further reinforced with a brass pivot plate mortised into the side of the leaf, as shown in figure 3 on the previous page, and screwed to both the leaf and the block.

Before installing the cross-rail pivot block, make sure that the table ends slide freely together and apart in a smooth, predictable fashion, and then mortise for and install the locating keys. To locate the cross-rail pivot blocks, clamp the tabletop ends and leaf together in the full extension position, and from under the table, screw the pivot blocks to the cross rails with a single screw. Gently swinging the leaf open and closed will reveal if any final adjustments are needed before securing the pivot blocks with three more screws. □

Paul Schürch is a custom furnituremaker in Santa Barbara, Cal.

Sources of supply

Soss hinges and threaded brass inserts are available from Woodcraft Supply, 210 Wood County Industrial Park, PO Box 1686, Parkersburg, WV 26102; (800) 225-1153.

Brass bar stock for making pivot plates, stops and table locks is available from Industrial Metal Supply Co., 3303 N. San Fernando Blvd., Burbank, CA 91504; (213) 849-3184.

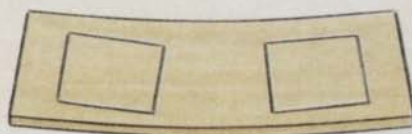
Agateen 2-B lacquer for coating brass is available from Agate Lacquer Manufacturing Co., Inc., 11-13 43rd. Road, Long Island City, NY 11101; (718) 784-0660.

Templates for through-mortises and tenons

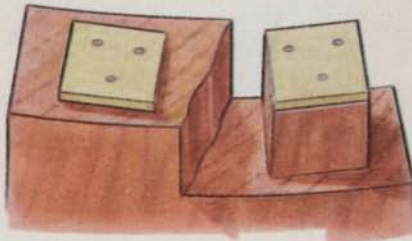
I connect the trestle base of my butterfly-leaf table to the upper assembly with a through wedged mortise-and-tenon joint, as shown in the photo below. It's a challenge to lay out and cut this joint exactly where I want it, with tenons that fit tightly into their mortises. However, the simple templates shown in the drawings at right make lay out easy and ensure perfect-fitting joints every time. —P.S.



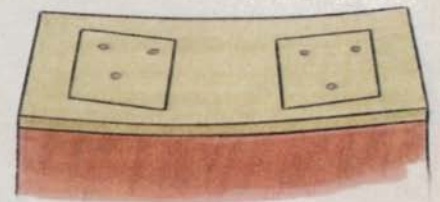
Trestle mortise-and-tenon templates



Step 1: Cut a piece of $\frac{1}{4}$ -in.-thick Masonite to match the top of the trestle column. Cut the mortise openings; then scribe, cut and fit the tenon templates to the opening.



Step 3: Rout away the waste, taking about $\frac{1}{8}$ in. per pass with a flush-trimming bit with the bearing mounted above the cutter. Be careful not to contact the template until you've cut deep enough for the bearing to ride along the template.



Step 2: Position the mortise template on the column end, drop the tenon templates into place and, after predrilling the Masonite, nail the tenon templates onto the column with brads. Remove the mortise template.



Step 4: Position the mortise template on the frame's base block and rout away waste in the center of the mortises. Again, keep the router bit away from the template until the bearing will ride on it. Square up the mortise corners with a chisel.

Drill Press Primer

Anatomy and use of a woodworker's standby

by Bernie Maas



Using a metal rule, Maas double checks each hole's edge distance for the series he bored with a machine-spur bit chucked in his drill press. A fence, clamped to the table with a hold-down, keeps the workpiece aligned while the machine's depth gauge (next to the feed lever) ensures that the holes are uniformly deep.

If your solutions to boring holes have been a wrist-cracking brace and bit and an ear-straining electric drill, then you'll break into a smile when you crank up a drill press. Originally devised for metalworking, the drill press offers the same professional results for woodworking: consistently accurate holes. While the press is a premier hole maker, its name belies its ability to do other work, such as mortising. In contrast to most stationary machines, the press is a quick study, and it's quiet and fairly safe to use.

Basically, there are two types of drill presses: benchtop and floor standing. Bench models range in height from 22 in. to 46 in., while floor models can be anywhere from 52-in. to 76-in. tall. Drill-press capacity or throat size—the largest circular workpiece you can bore a central hole through and not hit the column with—is often expressed as *swing* or *diameter*. Bench models usually have a swing from 8 in. to 12 in. Floor models range from 10-in.-dia. machines up to 21-in.-dia. monster presses. I prefer the floor-standing

models in the 11-in. to 16-in. range because they can be positioned in tight spots without occupying valuable bench space, and this size is ideal for most woodworking jobs.

Drill-press parts and their purposes

The drill press is made up of four basic parts (see the drawing on p. 57), which are clamped to a polished steel column. From the bottom up, there's a base (foot), a movable table, a safety collar, and a head. Both the table and base are usually cast iron and ribbed for strength and rigidity. The base is big enough to stabilize the machine, and usually features bolt-down holes. The table, adjustable up and down, has a smoothly machined flat top that's either square or circular. Commonly, there's a split ring and a screw handle to lock the table to the column. Some tables have slots to clamp fixtures; some tilt for angle work, but all have a central hole so that you won't easily run a bit into the metal top. The safety collar is locked to the column just beneath the head to sup-

port the head in case it accidentally slips. Finally, there's the head itself, a cast unit that houses the most important parts: the motor, pulleys, pinion shaft, quill and electricals. Most drill presses have sealed-bearing motors ranging from $\frac{1}{4}$ HP to $\frac{3}{4}$ HP. The drive belt is tensioned by shifting the motor on its bracket. When properly tensioned, the belt should flex about an inch midway between the motor and spindle pulleys.

The quill assembly—The heart of the head is the quill, which is the sleeve that contains the spindle. The quill allows the spindle shaft both to revolve (drill) and to reciprocate (press) simultaneously (see the drawing detail on p. 57). Ball bearings at each end retain the spindle within the quill and keep it centered and free to rotate. Rack-and-pinion gearing, controlled by the quill handle (feed lever), moves the quill up and down. Quills usually have a vertical stroke of 3 in. to 4 in., although some travel 6 in. An adjustable clock spring returns the quill

Selecting spindle speed

Heat is the enemy of bits; you need to get your bit in and out of a workpiece before friction heats it up. To do this, your drill press has to generate the correct number of RPMs. Most presses will run between 400 RPM and 5500 RPM. Speeds are adjusted by altering the position of the drive belt. The press will run fastest when the belt couples the smallest spindle pulley with the largest motor pulley. To help determine the best speed to use for the bit you've chosen, refer to the chart below. -B.M.

Bit type/size☆	Recommended speed (RPM)*
Machine spur 1/8 - 3/8 over 3/8	3,600 1,800
Multi-Spur 1/2 - 2 2 - 3 over 3	1,200 900 600
Forstner 3/8 - 3/8 1 1/16 - 1 1 1/16 - 1 7/16 1 1/2 - 3	1,800 - 2,400 1,400 - 1,800 900 - 1,200 250 - 600
Spade† 1/4 - 1 1/2	1,000 - 2,000
Powerbore† 3/8 - 5/8 3/4 - 1	1,800 - 2,500 1,200 - 2,000
Twist 1/16 - 3/16 1/4 - 7/16 1/2 - 3/4	2,400 - 4,700 1,250 - 2,400 700 - 1,250
Plug cutter Under 1/2 1/2 - 1	2,400 1,800

☆ Don't use long (over 6 in.) thin-shank bits over 1,000 RPM

* Slower RPMs (when range is given) are for hardwoods. Actual spindle speed will be influenced by step-pulley sizes and density variations within the wood. Generally, the larger the bit and the harder the material, the slower the speed.

† Speeds over 2,500 RPM will likely burn workpiece.

to its up position. From time to time, the spring and quill should be lubricated through their oil holes, but unless you're desperate for entertainment, don't try to take apart the spring assembly.

You can lock the quill or preset the depth to which it can advance. On the left of the head is the quill-lock handle. On the right is the depth gauge, usually a simple rod-and-nut arrangement. To set the depth gauge, lower and lock the quill at the desired depth, and snug the gauge's bottom stop nut against the lug on the head. Then unlock the quill, return it to the starting position, and lock the gauge's top nut against the bottom one.

The chuck—Fixed to the lower end of the quill is a three-jaw chuck, sometimes called a Jacob's chuck (after its inventor). While 3/4-in. and 3/8-in. chucks are not uncommon, most presses have 1/2-in. or 3/8-in. chucks. A chuck's size designates the maximum diameter shank that it will take; minimum capacity is usually 1/16 in. Some chucks have springs that automatically eject the key, so it can't be left in the chuck accidentally. For the best grip possible, tighten all three of your chuck's key holes, especially when boring large holes (over 1 1/2 in.). Large bits exert considerable torque, sometimes stalling while the chuck continues to spin. This chews up the chuck and galls the bit shank so that it won't run true.

Drill-press safety

The drill press is not inherently dangerous, but it deserves respect and warrants some precautions. The greatest hazard is spinning work. Large bits muster enough torque to rip work from your grip, smacking it into your knuckles or worse—launching it at bystanders. Besides causing injury, a whirling piece of wood can bend a bit or the spindle. Boring a hole off center can also whip work around. Misalignment occurs when the bit grabs a hole's edge or when small or unwieldy stock dances out of line or becomes cocked due to vibration or table tilt. Chips and debris left on the table also can allow a piece to drift dangerously off center.

In order to avoid these hazards, always keep the floor around the press clear and the table clean and well lit. To prevent work from spinning when boring small holes, brace it against a clamped block or fence, and when using bits over 1/2 in., clamp the work down. In addition, you can use a hold-down (available from Enco Manufacturing Co., 5000 W. Bloomingdale, Chicago, Ill. 60639) to prevent work from lifting when you withdraw bits (see the photo on p. 55). Through the following good shop practices, you'll avoid other hazards, such as flying

pieces, entanglement and cutter contact: Never leave the key in the chuck; wear eye protection; tie back long hair and don't wear jewelry or loosely hanging clothing. Remember that the chuck and bits revolve clockwise—keep your hands and body clear of them and anything else that might spin.

Feed rate, pressure and speed

When boring wood with a drill press, the spindle speed, feed rate and the pressure you apply determine the quality of the hole. Too much pressure on the feed lever causes rough cuts or jammed and broken bits. Too slow a feed rate can burn the work and overheat the bit. Feed steadily and evenly. A fast or choppy stroke can cause drift, thus elongating a hole. Boring at the correct rate and pressure produces uniform shavings, about .040-in.-thick. If you're coming up with dust, either the feed is too slow or the bit is dull. If your bit is advancing slowly but is requiring a lot of pressure, then your speed is too fast or your bit is dull. Refer to the chart at left for recommended speeds for bits. With a little practice, you'll know when you've found the best combination of feed rate, pressure and speed.

Boring with a drill press

Before you do any boring, cover the drill-press table with an auxiliary table of 3/4-in. plywood. The auxiliary table supports the fibers on the underside of your work and may save you from running an expensive bit into the cast-iron table. Additionally, if a bit slips as you're chucking it, it'll only drop a few inches onto plywood instead of diving 4 ft., point first, into the cast-iron base. A fence is another drill-press helper. I clamp a fence to the table to help keep the work from spinning and to align a series of holes, such as bracket holes for shelving. My fences are made from straight lengths of 1x2 hardwood with a 1/16-in. chamfer on the bottom edge. The chamfer acts as an escape hatch for chips, which otherwise will pack against the fence, throwing off its registration.

To bore a hole, put your auxiliary table down first, and then adjust the table to a comfortable height. After selecting the right bit for the job (see the sidebar on p. 59), mount it in the chuck and set the spindle speed for the size and type of bit you are using (see the sidebar at left). If the bit has a center lead point, ding a center hole in your work with an awl or punch. For plug cutters and Forstner bits, which don't have lead points, lay out the circumference of the hole with a circle template (found in most art-supply stores). If you're boring an angled hole, lay out the hole's upper limit (where the boring will begin). And remember, the perimeter of an angled hole is an ellipse.

Most holes will be shallower than your press's stroke, but if the hole depth exceeds the stroke of the machine, you can use a bit extension shaft or drill as deep as you can, and then raise the table or block up the work until you get to the depth you need. If the hole depth is less than the stroke and shallower than the thickness of the workpiece, adjust and lock your quill travel. Keep in mind that the chip ejectors for both Forstner and Multi-Spur bits work best in shallow holes. In deep holes, the chips wad up, making it tough to back out the bit. Avoid wadding by raising these bits periodically to evacuate the waste. But don't retract a Multi-Spur bit completely from the hole, and then feed the spinning bit back in again because the teeth will likely grab the hole's edge and ruin the face of your work. Instead, stop the machine and feed the bit back into the hole. Restart the motor and continue boring.

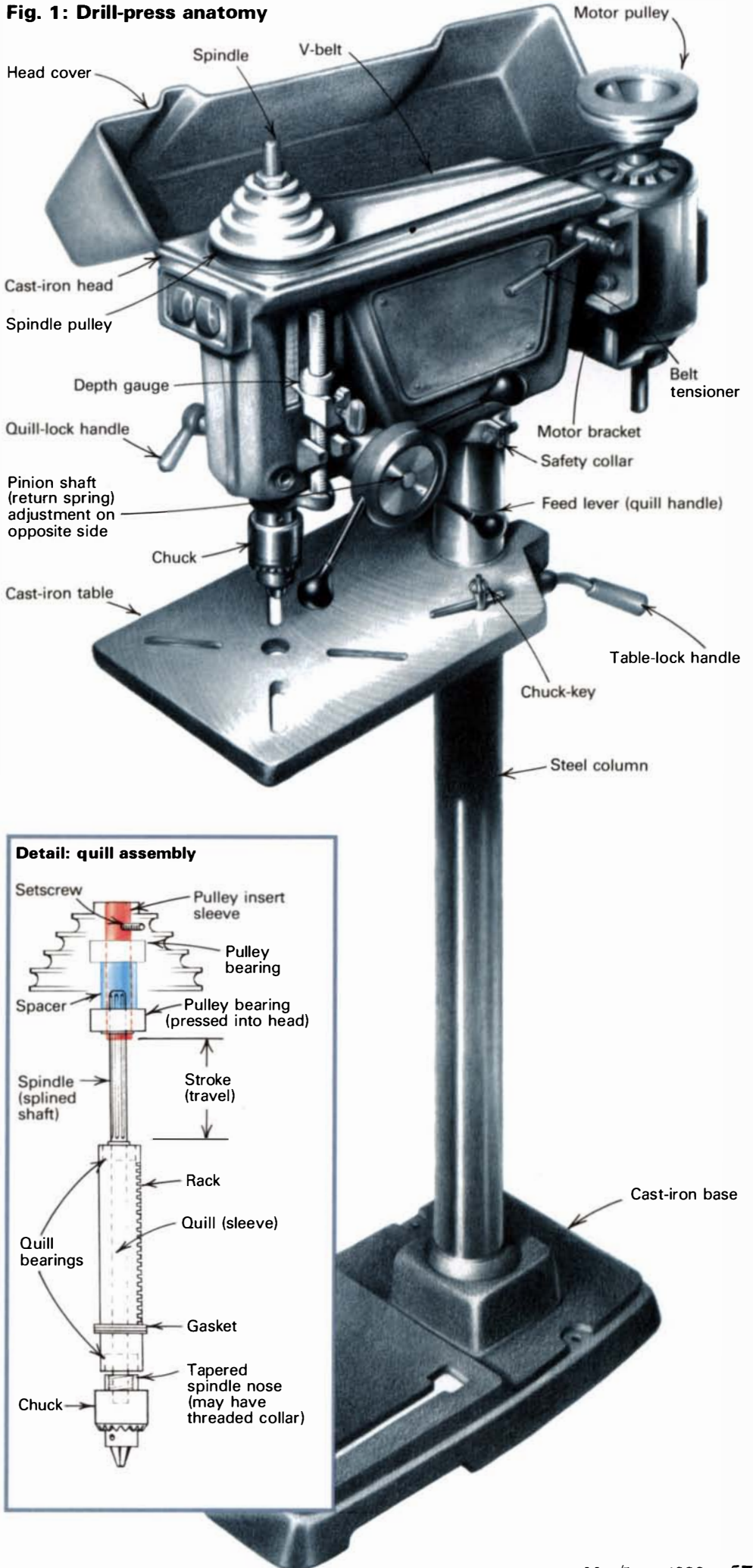
If you have to bore completely through the workpiece, there's a good chance you'll split the underside. You can avoid this by drilling only deep enough for the lead point to come through and then back drilling from the other side. To do this, first, lower the bit (with the motor off) and sink just the point into the auxiliary table. Lock the quill at this position and set the depth gauge to bore only this deep. Release the quill lock and fire up the machine. Get a good grip on your work or clamp it down, and bore until the depth stop bottoms out. Then turn the work over and look for the tiny pilot hole made by the point. If you back drill carefully, you'll wind up with a splinter-free hole. This method won't work with a Forstner bit because it doesn't have a lead point. So instead, set the depth stop to where the bit's rim barely brushes the underlayment. Then carefully bore down from the topside. Lower the bit gently until you feel the bit just break through.

To use a fence when boring a series of holes, first set the workpiece on the table. With the motor off, lightly tack your bit's point into a hole's center and lock the quill. You don't have to align the fence parallel to the table's edge because only one point—the bit's center—must be the correct distance from the fence. Snug the fence against the work (chamfered edge down and toward the bit), and clamp the fence to the table. Make sure the clamp pads are on a flat spot under the table, not against a rib where they might vibrate loose. Release the quill lock, start the motor and bore the first hole. Slide the work along the fence to bore the rest of the holes in a row, as shown in the photo on p. 55.

Fixtures and table vises

There are dozens of drill-press fixtures that you can make. A few that I like are a V-block

Fig. 1: Drill-press anatomy





When boring angled holes for splayed legs, Maas uses ramps like the pair in the foreground (above). A pocket-hole fixture (left, background) makes sloped (75°) holes for recessed screws. The steel vise (right, background) serves as a tilting table, which can precisely hold small pieces.

A V-block cradles a dowel being bored with a Forstner bit (left). To make the cradle, the author cut 45° chamfers on two edges of a foot-long 2x4, ripped the 2x4 in half and glued the halves together.

(cradle), a pocket-hole fixture and a riser block (ramp). A V-block (see the photo above left) allows you to bore almost any cylindrical workpiece. If you try to bore a hole in a dowel freehand, the dowel will roll, and you will have a devil of a time getting the hole where you want it. But you can stabilize the dowel by cradling it in a V-block. To make a V-block, simply cut a 45° chamfer along two edges of a 1-ft. length of 2x4; then rip the piece in half, and glue the halves together to form a 90° cradle.

A pocket-hole fixture comes in handy when you need to make angled holes for screws that fasten an apron to a tabletop's underside or screws that join stiles to rails in a cabinet face frame. The fixture is L-shaped and like the V-block, forms a 90° cradle (see the photo above right). But a pocket holer tilts the workpiece at about a 75° angle. When using a pocket holer, always bore the large hole (land) that recesses the screw head first. Then bore the hole for the screw shank most of the way through before turning the work over to back drill. If you want your pocket holes in a neat line, add a fence to the setup.

You'll also need holes that are angled to the work surface when socketing splayed legs for a stool. If your press has a tilting table, you can bore the angled holes directly. Whenever I do this, however, my lumber, clamps and ruler end up on the floor. A good solution is to build a riser block or ramp, which is simply an inclined auxiliary table. To make a project-specific ramp, just cobble together some plywood scraps to

form the table angle you need as well as a base with a clamping ear. A variation of this has a hinged table, so you can bore at almost any angle, much like a tilting table. The photo above right shows a couple of ramps that my students have made over the years.

A steel drill-press vise (see the photo above right), sometimes called a milling vise or an angle vise (also available from Enco), mimics a tilting table. But, because they have machined jaws with intersecting grooves to improve their grip, these vises let you precisely hold small objects, such as tubing and rods. They're also great finger savers. The more sophisticated vises have swiveling bases and cross slides, which allow you to hold odd-shaped pieces at very precise alignments to your drill-press spindle. Although some vises can be expensive, their accuracy and durability justifies the cost.

Other functions and accessories

The press can perform many secondary functions that are variations on boring, such as countersinking screw holes. You also can counterbore (superimpose a large hole over a smaller one) by clamping the work and using a Forstner or Multi-Spur bit. With a set of plug cutters (see the sidebar on the facing page) you can make cross-grain plugs for hiding counterbored screws, instead of using end-grain dowels. With a fence and a Forstner or Multi-Spur bit, you've got a basic mortiser; just bore interlocking holes and chisel the resulting slot square. A hollow-chisel mortising bit and a drill-press yoke will let you do both operations at once (see *FWW* #83, pp. 52-56).

For some drill-press users, a set of drum sanders for smoothing curved edges is also a must. But because drum sanding exerts substantial side pressure, you're likely to cause premature wear on the chuck, spindle or bearings. This is true for drill-press grinding and routing, too. Furthermore, drill-press routing isn't very effective because the press can generate only about one-fifth of the necessary speed. And without a guard and anti-kick-back pawls, the procedure is dangerous. For these reasons, I leave sanding, grinding and routing to the tools designed specifically for those functions and save the drill press for the boring operations that it does so well. □

Bernie Maas is an associate professor of wood-working at Edinboro University of Pennsylvania.

Sources of supply

Information on sharpening methods and recommended speeds for bits is furnished by the following bit manufacturers.

Machine spur and Multi-Spur:
Forrest City Tool Co. (a division of Textron Corp), 620 23rd St. N. W., Hickory, NC 28601.

Forstner:
CONVALCO, 102 Washington St., PO Box 1957, New Britain, CT 06050

Spade:
Irwin Co., 92 Grant St., Wilmington, OH 45177

Powerbore:
Stanley Tools (a division of Stanley Works), 600 Myrtle St., New Britain, CT 06050

Twist drills and plug cutters:
Vermont American Tool Co., PO Box 340, Lincolnton, NC 28093.

Common woodworking bits

Multi-Spur

File relief of tooth at factory angles; avoid shifting its tip.

File lifter's upper face rather than the lower clearance angle.

Brad point

If properly sharpened, lifter shears after tip cuts hole's edge.

Multi-spur bits come in $\frac{3}{8}$ in. to 4 in. dia. and are your best choice for holes larger than 1 in. They have brad points to seat and lead them into wood. They use saw-like teeth arranged in a circle to cut the outside of the hole and recessed lifter tips, which shear off and eject the wood chips. Bits can start holes at almost any angle, bore overlapping holes (good for mortises and rabbets) and start holes on curved surfaces or cylindrical workpieces.

Plug cutter

File upper angle of lifter.

File outside of rim toward cutting edge.

Plug cutters come in sizes from $\frac{1}{4}$ in. dia. to 2 in. dia., and come in lengths from under an inch to over 3 in. They use a cutting rim to scribe a hole's edge and a lifter to remove chips. Plug cutters can make a custom plug for almost any counterbored hole, whether to cover a screw head or to inlay some decoration.

Forstner

File inside of cutting rim out toward edge.

File angle (upper face) of lifter.

Forstner bits come in $\frac{1}{4}$ in. to 3 in. dia. They make flat-bottom holes with glass-smooth walls. Large Forstner bits usually have tiny cone-shaped lead points. Ersatz-Forstner bits have long lead points but won't make flat-bottom holes. The bits combine an outside razor-edged circular band, which cuts wood fibers with an interior pair of lifters that hog out material. Because lifters and cutters act on the same plane, these bits are increasingly grabby with size. Bits can bore angled holes, overlapping holes and holes on curved surfaces.

Spade

Grind both edges of lead point.

Set tool rest to grind scraper edge(s) at a 5° to 10° rake angle.

Spade bits come in $\frac{1}{4}$ in. to $1\frac{1}{2}$ in. dia. They're made for quick, rough holes. They have long, sharp-edged lead points, and either one or two scrapers. Bits work well in endgrain, and if you need a hole with a different-shaped bottom, just grind the spade to the profile you need. If you need an in-between sized bit, you can grind its outside diameter down to size.

Powerbore

Sharpen spur similar to machine spur tip (below).

File brad point at angle towards tip.

File scraper edge outward, following factory angles.

Powerbore bits come in $\frac{3}{8}$ in. to 1 in. dia. and, like spade bits, they cut holes fast. They use a spur and scraper arrangement to cut holes. They're less expensive than other brad-point bits and they make cleaner holes than spade bits.

Machine spur

Brad point

File relief and flute lifter (avoid "belly").

File spur toward tip from inside.

Machine-spur (brad-point) bits come in $\frac{1}{16}$ in. to $\frac{1}{4}$ in. dia. These are the best all-around hole makers for wood. They have two perimeter spurs that sever wood fibers, and lifters scrape out the interior of the hole. Brad (diamond) point starts and leads the bit into the wood.

Choose the right bit and keep it sharp

Many of us have chucked twist bits in a drill press because they're cheap and handy. While twist drills can make holes in wood, they're really designed to cut metal. In contrast, screw-tipped bits, although made for wood (like augers designed for slow hand-boring), should never be used in a drill press. An auger in a press feeds itself too aggressively. The result is a torn-up hole or an unclamped workpiece whipping out of control. Luckily, there are better bit alternatives for boring crisp, precise holes in wood.

When I'm boring holes with a drill press, I usually use one of three bit types: ma-

chine spur (or brad point), Multi-Spur or Forstner. And although I don't use them as often—spade, Powerbore and plug-cutting—are three other bits that come in handy. All six types (shown in the drawing above) are designed to cut wood, so they are available from most woodworking-supply stores.

Basic bit care: Only run bits at their recommended speed, and don't toss them in a drawer. Instead, store them in an index, a cloth pouch, a rack or a compartmented wooden case. Also, douse bits with WD-40 every so often to discourage rust, and pol-

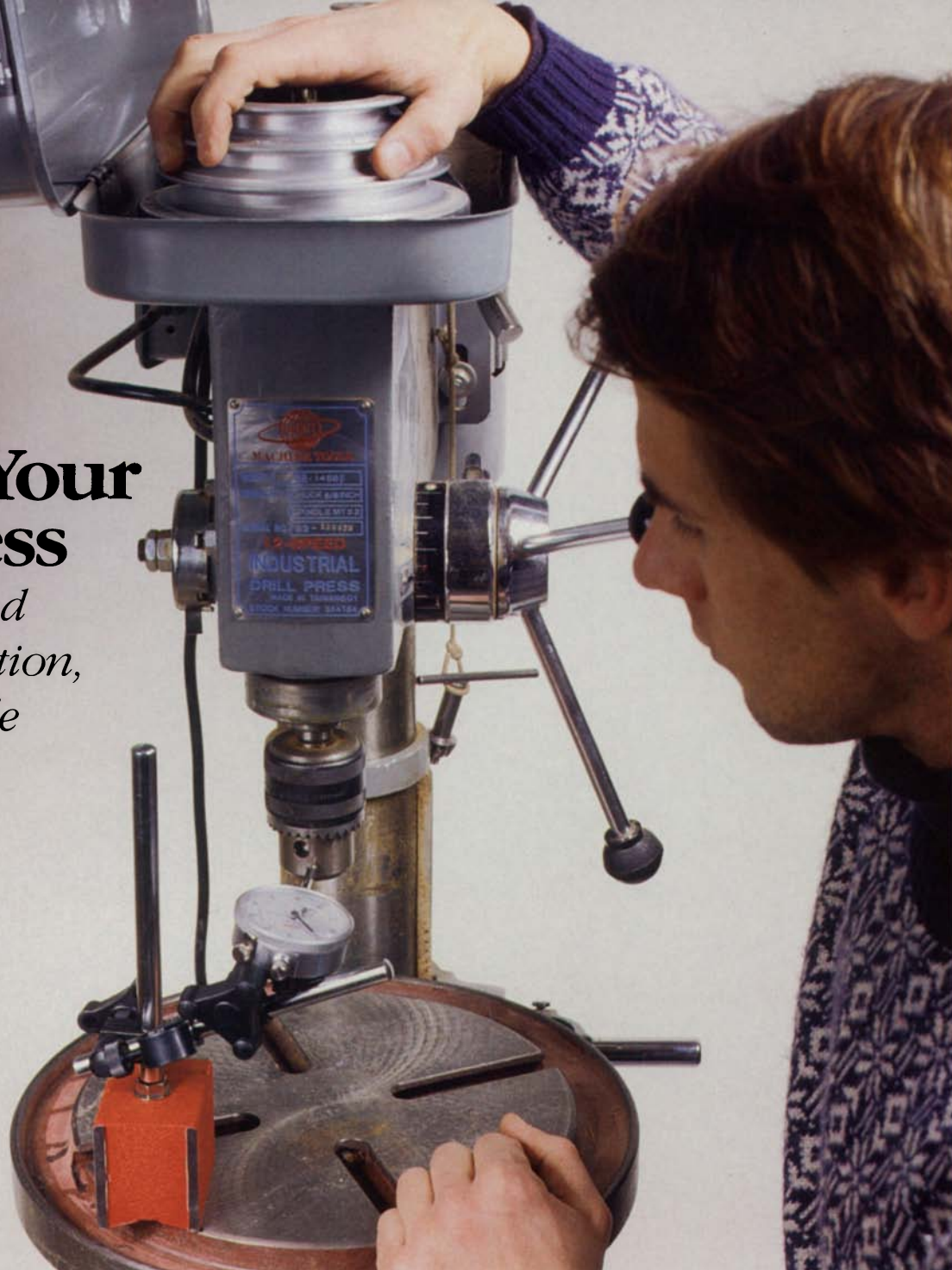
ish the bit's flutes and spirals with steel wool to keep them running cool. To keep carbon steel bits surgically sharp, touch up their edges with auger-bit files. Don't worry about wire burrs left from filing; they'll be stropped away as you bore holes. For hardened-steel edges, like those on most spade bits, use a grindstone. If you want to sharpen your twist drills, see Ken Donnell's article in *Fine Woodworking* #82, pp. 72-74. Finally, if you think a bit has been used or honed beyond reason, don't despair, and don't toss it out. For a nominal fee, most bit makers will restore bits to their factory specs. —B.M.

Tuning Your Drill Press

How to find and eliminate vibration, play and wobble

by Robert M. Vaughan

To check for wobble in a chuck, place a dial indicator on the table with its plunger perpendicular to the chuck. Unplug the machine and turn the spindle pulley; the gauge will read any eccentricity.



Whether you buy a new drill press, a used one or you inherit one from granddad, you should periodically check its precision. Provided you've chucked in a straight, sharp bit, your press should run steadily, and it should bore clean holes. But there are basically three things that can prevent top performance in your press: vibration, play and wobble (runout).

Taking out vibration

Vibration usually originates at a press's drive system. If you feel vibration, open the head cover, turn the machine on and see if the pulleys idle smoothly and without noise, beyond the humming of the belt. If they don't, kill the power, remove the belt and check its condition. If the belt is brittle or has bumps or cuts, replace it. Next, hand spin the pulleys to see if they have any cracks or are out of round. Before replacing a pulley that wobbles, try retightening its setscrew. If there's a rumble or growl when the pulleys are spinning, dirty or worn bearings are likely the problem and should be replaced (for more on this, see *FWW* #90, pp. 49-51).

Removing quill side play and spindle end play

A press can develop side play between the head casting and the quill. To check for this, lower the quill and then shake it (not the chuck) from side to side to see how much slack there is. If the head casting is split at the front, there should be a bolt and locknut that will allow you to snug the halves together to take some of the play out. If your press has a solid head, then a remedy for side play is unlikely.

To check spindle end play, lock the quill, and try to move the chuck up and down. If there's end play, then the slack is probably between the quill and the collar above the upper quill bearing. To fix this, loosen the collar's setscrew, and slide the collar back to its original position. If you're lucky, a plate will be on the front of the head to access the collar. If not, the feed lever and the pinion will have to be removed along with releasing tension off the quill's return spring. This procedure is tricky and somewhat dangerous, so if your machine's instruction manual doesn't cover how to disassemble the spring assembly, have a professional do the work.

Wobble and how to find it

A wobbly chuck usually results from poor techniques. For example, you get a bit hung up in a workpiece and it swings around and bangs the column; or you let a workpiece dance around on the table while you're drum sanding the inside of a tight curve.

To detect and measure wobble, you'll need a dial indicator mounted on a magnetic base. First, chuck in a precision rod of known straightness. I use a 1/2-in.-dia. by 2-in.-long hardened, ground-steel dowel. Next, put the indicator's base on the table or column, so the plunger is touching the end of the rod. With the press unplugged and the head cover open, hand turn the spindle pulley and watch the indicator to pinpoint maximum fluctuation. Stop turning when the rod is at its farthest from the plunger. Wrap a piece of masking tape around the chuck, and mark a reference point above the plunger with a felt-tip marker. You can also check the outside of the chuck in this way (see the photo on the facing page). If I get more than .003-in. at the tip of the rod or more than .002-in. on the chuck, I feel it's time for some corrective action.

Correcting wobble with a smack

Rather than replacing your machine's most expensive parts (quill, spindle and chuck), you may be able to smack wobble out (see the bottom photo). Since a shock force knocked things out of alignment, an equal-and-opposite blow (within reason) can line things up again. Move the arm of the indicator out of the way, and then mount a hefty steel rod in the chuck and put on your safety glasses. Position the chuck so you can smack the rod directly opposite your mark. Your first tap should be a light one—similar to driving a 5/8-in. brad into soft pine. Chuck your precision rod, reposition the plunger and rotate the spindle to observe any change. Repeat until you've got less than .002-in. wobble.

Chuck removal

Occasionally, you'll have to remove a chuck to install a mortising yoke or to clean and repair the chuck. The backs of most chucks (including the key-and-scroll Jacob's type and the hand-tightening Albreicht type) have a tapered hole, which mounts either onto a matching tapered stud on the spindle nose or onto an adaptor that connects to the spindle. Chucks that mount directly to the spindle nose are usually held on either by a plain friction-fit or by a combination of friction and a threaded collar with snap ring.

If there's a ring with holes around the top of the chuck, you can unscrew this collar to force the chuck down off the spindle. To turn the collar, most press manufacturers provide a spanner (similar to an open-end wrench). Stick the spanner's pin into a hole in the lock ring, and insert the handle of the chuck-key into a chuck hole. Grip the key for leverage and loosen the collar by turning the spanner clockwise (see the center photo). Keep turning, even though it'll feel like the collar is tightening again as it bears against the top of the chuck. If it doesn't break free, wrap a cloth around the chuck, and clamp it in a drill-press table vise. Then try to unscrew the collar.

Chucks without collars can often be popped off with an ordinary open-end wrench. First, lower the quill to expose the top of the chuck, and lock the quill. Then take a wrench that fits over the shaft between the chuck and the quill, and dislodge the chuck by snapping the wrench upward, as shown in the top photo. If the chuck doesn't come off, rotate the spindle a half turn, add some Liquid Wrench and try again. Your next options are to try either prying the chuck off with a set of Jacob's-brand removal wedges or taking the quill assembly out of the head and bringing it to a machinist or service center to have the chuck removed.

To remove a chuck from an adaptor, first use a drift wedge to dislodge the adaptor (with chuck). Then drill a hole in a block of



There are two ways to remove most chucks. For chucks without a collar (above), lower and lock the quill and insert an open-end wrench above the chuck. Snap the wrench upward to pop the chuck off. To remove chucks with threaded collars (right), grip a chuck hole by inserting the handle of the chuck-key, and turn the collar clockwise with a spanner.



The author uses a hammer to remove wobble (below). He taps a chucked steel rod and then rechecks for runout with a dial indicator and a precision rod.



wood to accept the Morse-taper end of the adaptor. Split the block in two, and clamp it around the adaptor in a vise. Twist the chuck off with the key or a pipe wrench.

Chuck remounting

To remount taper-fit chucks, first clean the mating surfaces with a dry rag and press the chuck onto the spindle by hand. Next, retract the chuck's jaws and strike the bottom of the chuck squarely with a wooden mallet. Or reseal the chuck by lowering it evenly against a piece of plywood laid on the press's table. If the spindle's nose is worn, a couple of drops of cyanoacrylate (super glue) can often hold it in place, and the resulting bond still can be broken easily when needed. Finally, check concentricity with the indicator and the straight rod again, and, if needed, fine-tune things with a few hammer taps on the heavier rod. You'll be amazed how light a blow it takes to align things. □

Robert Vaughan is a contributing editor to FWW.



The Marquetry of Vadim Aksyeonov

An artist creates wooden renderings of Russian landmarks

by Jon Humboldt Gates

Despite the recent breakup of the Soviet Union and a declining economy in the region, the wealth of Russian art never diminishes. The marquetry of Vadim Aksyeonov is an impressive example of this wealth. Aksyeonov's wooden mosaics may be the most accomplished work of their kind to come from Russia. His proficiency as a painter is apparent; all his panels exhibit a remarkable three-dimensional quality (see the top photo on the facing page). In addition, Aksyeonov's work is of historical significance because some of the panels offer accurate representation of destroyed Russian landmarks.

Aksyeonov's formative years

Vadim Aksyeonov was born in the town of Menzelinsk, near the Ural mountains; from an early age, he dreamed of becoming a landscape oil painter. During World War II, while stationed in Lvov in the Ukraine, he sketched memorials and churchyards—scenes that would later inspire his marquetry. In 1955, Aksyeonov entered Moscow's Pedagogical Institute to study art and painting, and upon graduating, he became an art instructor. During this time, he often traveled to small villages to paint his favorite subjects: old churches and abandoned monasteries. In his free time, Aksyeonov taught himself the techniques of marquetry, and because his early works were translated directly from paintings, they displayed his characteristic treatments of perspective, light and shadow (see the bottom right photo on p. 64). In the 1980s, Aksyeonov began creating detailed architectural marquetry in tribute to Russian Orthodox and Islamic churches that were destroyed under Soviet authority. He also inlaid panels of old cityscapes, like the 18th-century Moscow Kremlin, shown in the bottom photo on the facing page. Working from photos and sketches, Aksyeonov recreated images of lost buildings by inlaying scores of native woods, like *beriozka* (birch), *kashtan* (walnut), and *klyoan* (maple).

Images preserved in wood

Aksyeonov begins his panels by drawing a subject (scaled by eye) with a pencil and a plastic straightedge. Then he transfers the drawing onto tracing paper so that he can reverse the tracing and copy it with carbon paper onto the back side of the veneers. Veneer samples are chosen for hue and grain pattern because Aksyeonov does not paint or dye any of them. He orients the veneer's grain and scribes the major elements of the scene onto them, such as the sky, foreground and buildings. After cutting out these large pieces

with a knife that he crafted from a circular-sawblade tooth, he marks and cuts out the medium-sized elements from the larger pieces (see the photo above). Then he slides another wood variety under the hole and scribes the piece that will fit into the opening. He works from larger to smaller shapes, until all the pieces are cut.

Before mounting the veneers on a backboard of $\frac{3}{4}$ -in.-thick particleboard or plywood, Aksyeonov uses sticky brown-paper tape to hold all the pieces together. He assembles the whole scene face up, and then cuts strips of tape, wets the glue side and presses the tape firmly over the whole surface of the scene. He smooths the taped joints with the butt of his knife's wooden handle. Next, he turns the taped-together sketch face down, spreads a thin, even coat of yellow glue onto the veneer back and the plywood backboard and places the glued surfaces together. To keep the assembly flat and the pressure uniform, Aksyeonov uses a 4-ft. by 6-ft. veneer press that's heated to about 150° by two $\frac{1}{8}$ -in.-thick zinc electric plates. The panel is sandwiched between two layers of newspaper, the zinc plates and two heavy wooden platens. The platens, which are larger than the panel and the plates, are pressed together, and the assembly is left to dry from 4 to 12 hours. After removing the panel from the press, Aksyeonov peels the brown tape from the surface, and scrapes off any dried glue. Next, he levels the veneers with a portable electric sander and hand-sands the surface to remove any scratches. Then he frames the panel and seals it with two coats of lacquer.

Current work

Vadim Aksyeonov, now 65 years old, continues to teach art and do marquetry during the evenings and weekends in the living room of his Moscow home. The panel he's working on in the photo above is his second attempt. When he was completing the scene the first time, his dog *Taiga* (Tundra) "ate it while his master wasn't looking." Every summer, Aksyeonov returns to Menzelinsk where he visits old friends, hunts in the forest, paints in the countryside and renews his creative energy for marquetry. □

Jon Humboldt Gates is a hobbyist woodworker, musician, and author of a collection of travel stories and photos titled Soviet Passage (Moonstone Publishing, PO Box 911, Trinidad, Cal. 95570). Anyone wishing to arrange a gallery of Aksyeonov's marquetry, should contact Moonstone Publishing. Special thanks to journalist Oxana Khomenko for her research and translation help.



Russian landscape painter and marquetarian, Vadim Aksyeonov, chooses highly figured woods for large elements, like the sky and foreground shown in this scene of the Church of Assumption at Pokrovka in Moscow. But he does most of the inlaying within the panel's building mass. This church was built from 1696 to 1699 and later demolished by the Soviets.

To create this image of Moscow's 18th-century Kremlin, Aksyeonov based every inlaid detail, including shadows, trees and reflections, on old sketches and photographs. The scene is an excellent example of the way Aksyeonov combines bold and subtle colors and grain.





This panel of Temple of Christ the Saviour (at left) contains hundreds of pieces cut from over a dozen varieties of wood from around the world. Built in Moscow in 1839 to 1880, the temple was razed in 1931. Church groups are now collecting funds to reconstruct the building at its former location across from the Kremlin.

Aksyeonov began his Myechet Church panel (below left) during an annual return trip to Menzelinsk. After its tower was destroyed in the 1930s, the building became a library until 1991 when it was returned to the Islamic faith, which is still popular in that region. The church, constructed in 1910, is currently having its tower rebuilt.

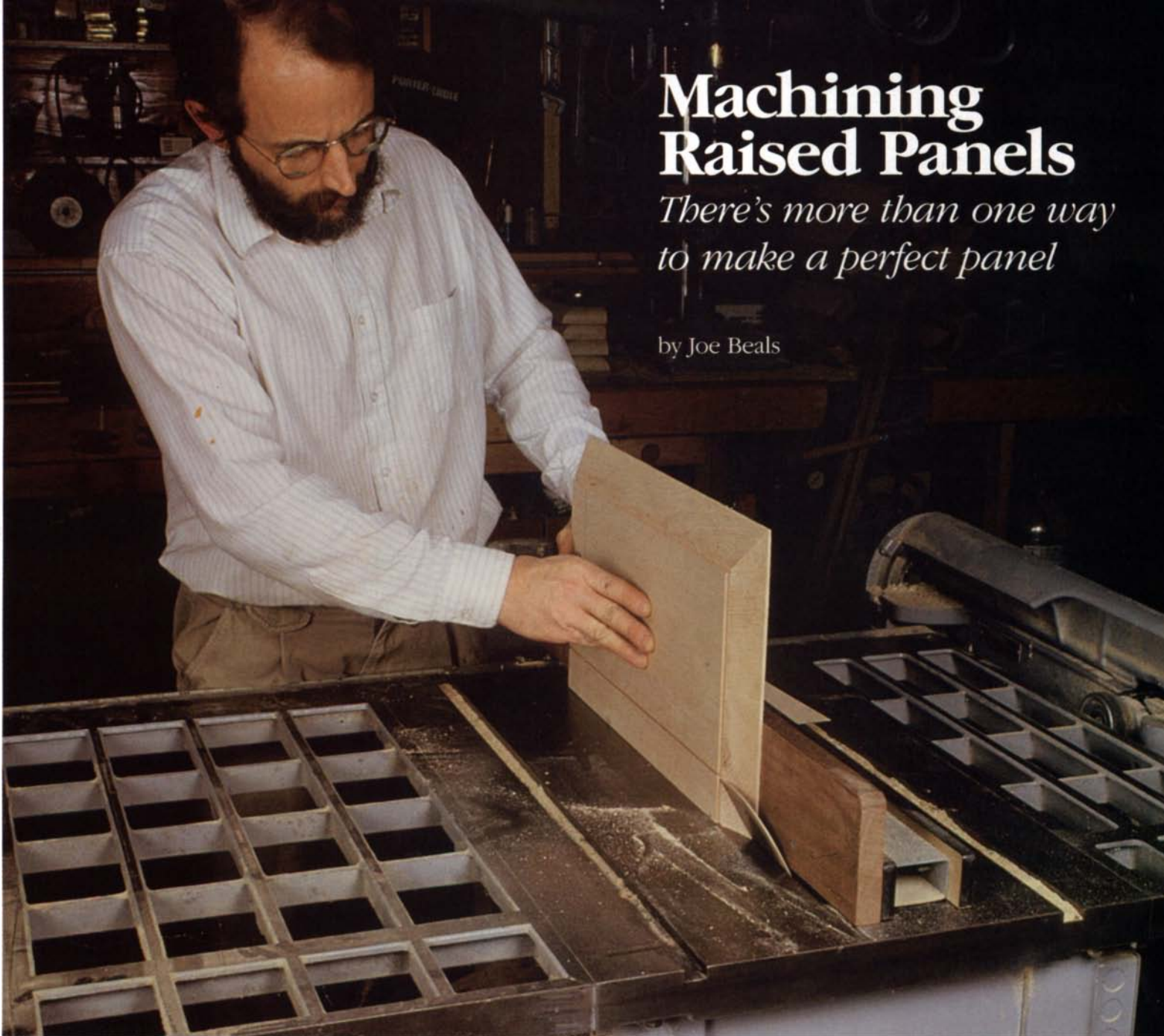
Exotic veneers are becoming increasingly difficult to locate in Russia. When he can, Aksyeonov uses native maple, walnut and birch, as in the panel (below right), completed in 1976, of Karilia's Peter and Paul Chapel near St. Petersburg.



Machining Raised Panels

There's more than one way to make a perfect panel

by Joe Beals



A traditional raised panel is easily cut on the tablesaw with the aid of a tall auxiliary fence to help stabilize the panel. A zero-clearance throat plate supports the edge of the panel on the table. The square shoulders of the panel's field are cut first.

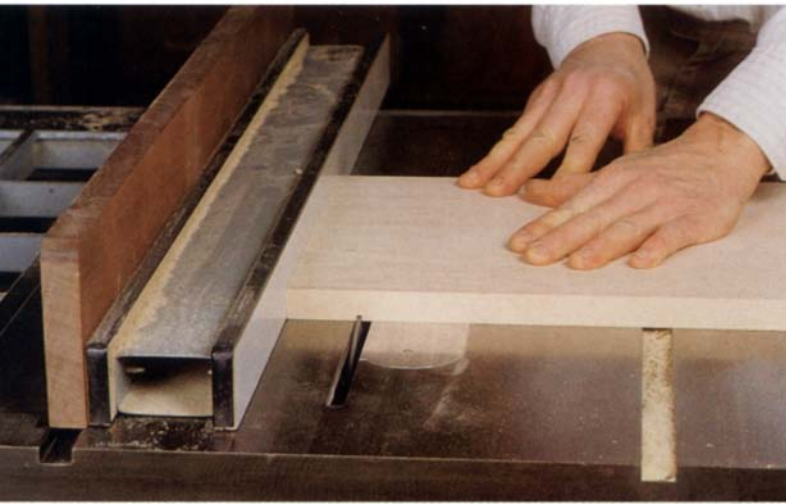
Despite their apparent simplicity, the panels used in framed cabinet doors demand a thoughtful approach to ensure good results with machine techniques. The door frame bears the load, but a poorly made panel can distort or break the frame that surrounds it. In addition, because panels are most of what we see, their construction requires as much attention to design detail as does the frame. (See my article, "Cabinet Door Frames," in *FWW* #86, pp. 76-79.)

The origin of the raised panel is a classic case of form following function. The problem is how to build a dimensionally stable, solid-wood door. The solution is a frame built from narrow stock that moves very little with seasonal changes of humidity. The wide beveled-edge panels are free to expand and contract within the frame grooves that capture them.

Early colonial panels reveal this method of construction in its most basic form. Panel edges are beveled without much finesse, and the panel is often left rough on the back side. Dedicated panel-raising planes evolved that could produce a smooth, accurate

bevel worked to a shoulder, giving a crisp, pleasing outline to the panel field. Panel-raising planes also allowed the bevel to be varied from narrow and steep for small doors to broad and shallow for large doors. In addition, the shoulder depth could be varied to accommodate a range of stock thicknesses, and the face of the panel could be made recessed, flush or proud of the frame.

In straightgrain, easily worked woods, such as walnut, mahogany or clear pine, raising an occasional panel by hand is very satisfying. (See the sidebar on p. 69). But for production runs or for panels made of dense woods, such as oak, maple or cherry, a machine method is more practical. Although I prefer a heavy-duty shaper, excellent panels can be raised on the tablesaw, as shown in the photo above. Panels can also be raised with a table-mounted router, but it's potentially dangerous. When beveling a panel, a good deal of stock must be removed, which puts a heavy load on the router bit. Also, typical panel-raising bits are massive chunks of steel, which can test the bearings and durability of a router. To reduce these stresses, I recommend removing most of the waste



The shoulders that define the field of the panel are cut by adjusting the rip fence the appropriate distance from the blade and setting the blade about $\frac{1}{8}$ in. above the table.

with the tablesaw and then making a finishing cut on the shaper or router table. Vertical panel bits for routers are a fairly recent advancement in router-panel-raising technology (see the sidebar on p. 68). Because these bits cut in the vertical plane, they're smaller and safer. Before I get into panel-raising techniques, however, I'll first talk about preparing the panel stock.

Gluing up and sizing panels

Careful selection of stock for panels is very important. All panel stock for a single piece of furniture or for a set of cabinets to be installed in the same room should be similar in grain pattern and color. Since it's likely you will have to glue up stock for wide panels, matching these panels is equally important. Many authors advise alternating heart and sap faces to produce a more stable panel. They reason that because plainsawn stock tends to cup toward the sap or bark side, stock that's glued up with heart or sap sides all on the same surface will develop a large cumulative bow. In contrast, stock glued with alternating heart and sap faces up will produce a less-troublesome, wave-like distortion. I like the theory, but in actual practice, too slavish a devotion to principle can produce results that are technically correct and aesthetically lousy. Remember that the goal is a glued-up panel that looks like a single piece of wood: if two heart faces match perfectly, put them together.

I set glued-up panel stock aside for a day or two to let the glue dry and to allow the wood to relax from clamping pressure, before cleaning the glue joints and dressing the surfaces with a sharp bench or jack plane. Raking off glue squeeze-out with a scraper can cause tearout, which telegraphs the glueline. Although I prefer a handplane, a surface planer or wide-belt sander can also be used to dress the panels. Whichever method is used, make sure all panels are the same thickness so that when the bevels are machined, the panels will have uniform edges to fit to the frames' grooves. The fielded surface should require only a light finish sanding after beveling to minimize the risk that the shoulders will be rounded over.

Tablesawn panels

I will discuss my method for raising panels on the tablesaw first because I use the saw to remove most of the waste even when raising panels on a shaper or router table. Sawn panels require two cuts: one for the shoulder and one for the bevel. To avoid trapping the cutoff scrap between the blade and the fence, I cut the shoulder first and then saw the bevel with the blade tilted away from the fence. I always use scrap stock to test my setups. To cut

the shoulders, I set the fence and blade height to my layout lines on the test piece and then cut all four shoulders, as shown in the photo at left. A sharp carbide blade leaves a crisp, clean edge, especially across the endgrain.

To saw the bevels, hold the panels vertically on the saw table, and tilt the blade to the bevel's angle. Start sawing one end, and rotate around the panel from end to side. A high auxiliary fence stabilizes the panel, as shown in the photo on p. 65. A carbide blade will tend to burn the endgrain bevel, but a razor-sharp steel combination blade won't. A hollow-ground steel planer blade might be even better, but the setup must be perfect to avoid scorch marks. In addition to cutting cleaner and faster, a steel blade also can be filed sharp halfway through a run of panels.

No matter how carefully you saw, the panels will still need to be cleaned up. I dress the bevels with a skew-iron rabbet plane that will cut to the shoulders. If the sawing went well, the planing is quick. Sanding is a less satisfactory alternative: It does not produce the wonderful sheen of sliced fibers that a plane does and can be terribly time-consuming on a production run of panels.

Router- or shaper-cut panels

Panel raising on the spindle shaper or router table is accurate and convenient, though not to the degree you might expect. Because the bevel profile is fixed by the cutter pattern, you can obtain a range of profiles only by stocking an assortment of cutters—at \$100 or more per cutter. For that reason, I suggest starting with a traditional flat bevel and square shoulder profile, a time-tested, classic pattern that always looks good. Discount carbide cutters are available, but they often sacrifice quality of material and accurate grinding. You'll be happier with good cutters, such as those manufactured by Freud (PO Box 7187, 218 Feld Avenue, High Point, N.C. 27264; 919-434-3171) or Freeborn Tool Co., Inc. (PO Box 3403, Spokane, Wash. 99220-3403; 800-523-8988 or 509-535-3075).

A panel-raising cutter produces a specific profile that only can be varied by a small range of adjustment in the shoulder depth. Most cutters are for $\frac{3}{4}$ -in. stock, which leaves a $\frac{1}{4}$ -in.-thick tongue at the panel perimeter. Thicker stock can be accommodated by rabbeting the back side of the panel to produce an appropriate tongue.

Cutting the waste from around the panel field requires removing a surprisingly large volume of wood. While it is possible to shape an edge in a single, full-depth pass, it's hard on the cutter and demands tremendous power. Furthermore, producing an acceptable finish in one cut is almost impossible. Of course, you could make multiple passes, but it's better to waste the bulk of material by beveling the panel's edges on the tablesaw. This may seem like a step backward, but the work will go faster, there will be less dust and the bulk of stock removal is done with an easily sharpened sawblade rather than by a very expensive cutter.

Before beveling the panel on the tablesaw, I set up the shaper first, adjusting the fence for a full profile cut and setting the cutter height to the appropriate shoulder depth or tongue thickness. A full-depth pass in a piece of pine lets me preview the profile and creates a pattern for setting the tablesaw fence and blade angle. Because the sawcut will waste only the excess material, I don't bother with the shoulder cut. With the sawing done, I can cut the finished profile on the shaper with a single, full-depth pass, as shown in the top photo on p. 68. If I were using a table-mounted router instead of a shaper, I would cut the final profile in two light passes.

Although I prefer a shaper for panel raising, the table-mounted router offers one distinct advantage. The router runs with the cutter below the work, while standard shaper practice has the cutter mounted above the work, rotating counter-clockwise. I have two objections to this shaper setup: first, the cutter is entirely exposed and

Fig. 1: Fitting the panel to the frame

Take panel dimensions from a door frame assembled dry, and always allow clearance so an expanding panel will not push the frame apart. Allow $\frac{1}{16}$ in. per foot of panel width when building during high humidity and $\frac{1}{8}$ in. in low humidity. Panels with flat shoulders or

concave bevels provide the best fit with no interference between the face of the bevel and the groove. Wedge-shaped bevels must have clearance between the face of the bevel and the frame, or the bevel will bind with the frame before the panel's edge bottoms in the frame's

groove. If the bevel binds, either the frame joints will break apart (especially if the frame is built with stub tenons common to cope-and-stick shaper cutters) or the stiles will split above the groove. Long bevels fit the groove better and

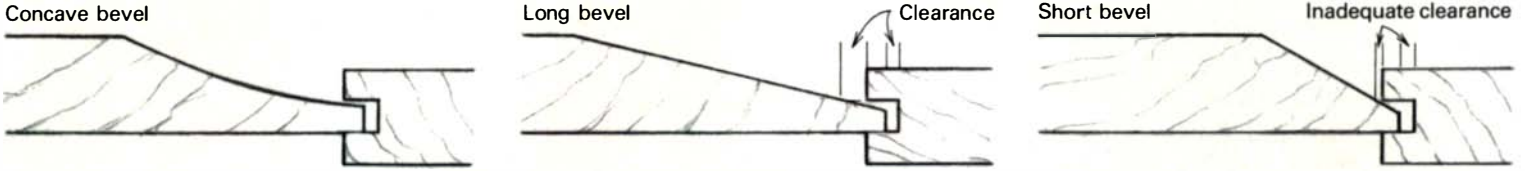
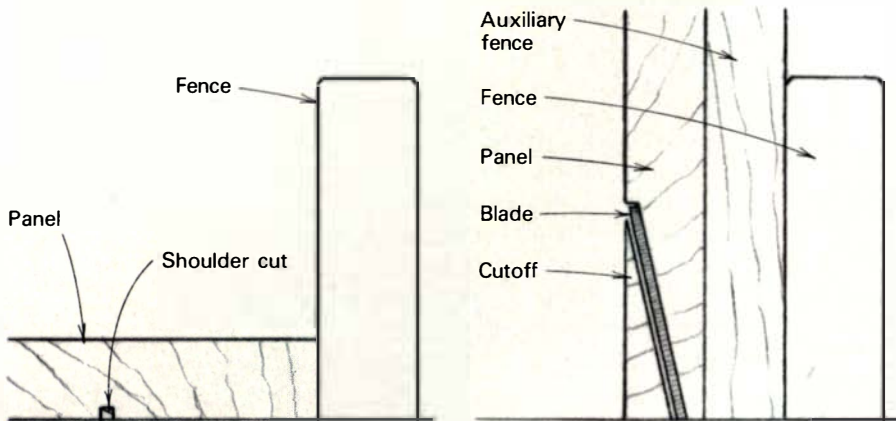


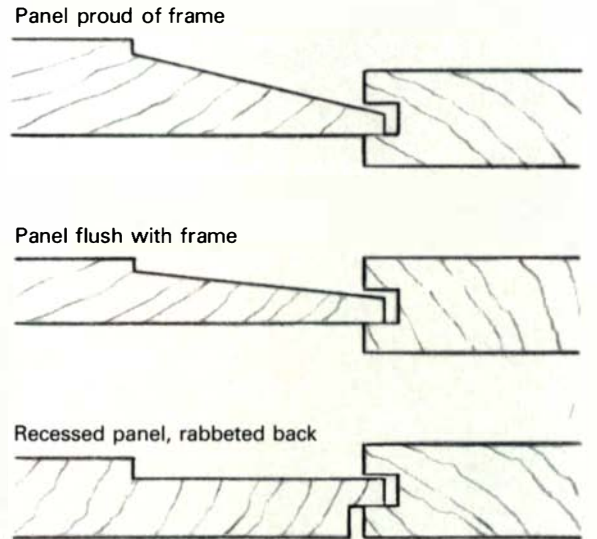
Fig. 2: Raising wood panels

Tablesawn panels

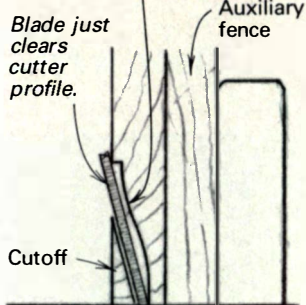
Raising a panel on the tablesaw requires a shoulder cut and a bevel cut as shown below. Position the fence so cutoff is not trapped between blade and fence. Tablesawn panels can have a variety of bevel widths and angles, but remember to size the bevel's edge so that it doesn't bind with the frame.



Design variations

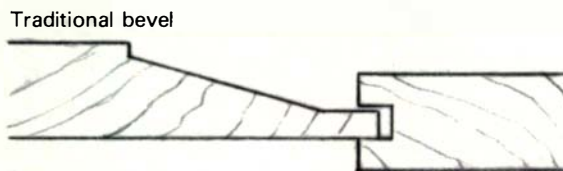


Actual profile of router or shaper cutter.

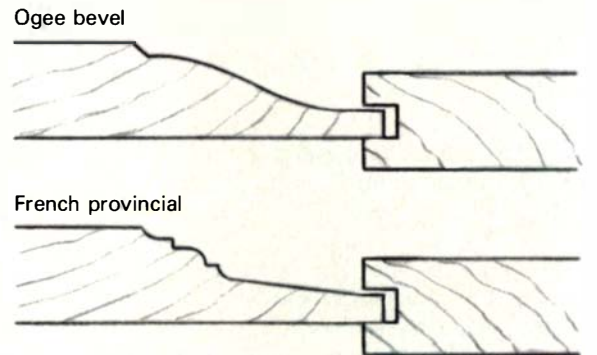


Router- or shaper-made panels

Beveling panel stock on the tablesaw before shaping or routing reduces wear on cutters and allows a smooth finish cut in just one or two passes. Shown here are a few of the profiles available for shaper and router cutters. Note the flat shoulder that fits snugly in the frame's groove and eliminates the wedging action of a tablesawn or hand-raised bevel.



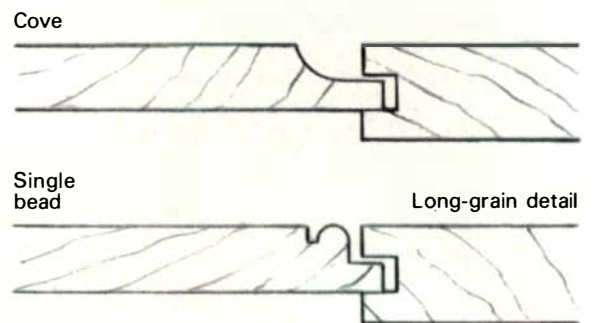
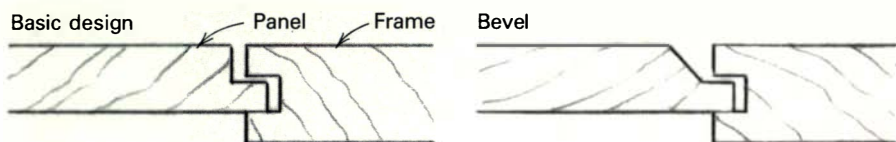
Design variations

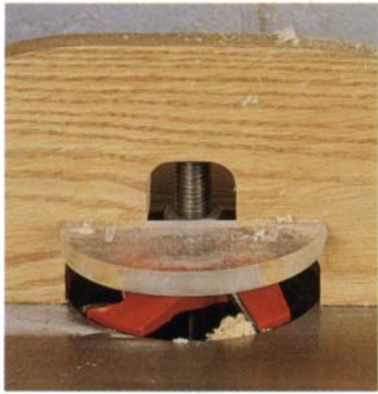


Rabbeted panels

Panels can also be raised by cutting a rabbet around the perimeter. Leave the same clearance between the edge of the field and the frame as between the panel's edge and the groove's bottom.

Details worked on the edge of the panel's field can soften the edge and reduce the visual effect of panel movement. Beading and its variants, such as V-grooves, are typically worked only on the two long-grain edges to avoid a fragile condition across the endgrain.





By reversing his shaper to run with a clockwise rotation, the author was able to mount the cutter below the table, thus reducing the hazards of an exposed overhead cutter and minimizing the chances of damaging the panel. A second spindle nut, tightened to the first nut, ensures the cutter won't come loose. Because this mounting can restrict chip ejection (left), the machine should be turned off and the chips cleared often.

however well-guarded, a hazard to your hands, and second, if you jog or bump the panel, it will be damaged instantly and possibly kicked back. Large or heavy panels are particularly hard to control, even on a big shaper table. Table extensions and hold-downs can reduce the chance of damaged panels, but your fingers are still at risk.

The solution to both problems is to run the shaper cutter submerged, in clockwise rotation. Because the stock is above the cutter, any inadvertent movement off the table simply leaves a crown that can be removed with another pass. With the stock shielding the cutter, there is far less danger of trimming your hands to the bevel profile. However, there is one potential hazard when using this method. Panel-raising cutters are typically very large and virtually will fill the table opening through which they protrude. Depending on your shaper's design, there may not be enough room to eject the chips, as shown in the bottom left photo. Trapped chips can bog down the motor, so I stop the machine after every few panels to blow out the waste with compressed air.

Not all shapers have a reversing option, which means running a submerged cutter may not be possible. If you retrofit a reversing switch to your shaper, as I did to mine, remember that the clockwise rotation will tend to loosen the spindle nut. To prevent this, I screw on a jam nut and tighten it hard against the spindle nut.

Finishing

A discussion about raised panels would be incomplete without the finishing argument. Many woodworkers finish the panels before assembling the frame, so shrinkage won't expose an unfinished edge. This approach may work for a panel or two, but for production runs, it doubles or triples my completion time. I've found that when the panel and frame are finished together after assembly, enough stain will seep into the groove along the bevel to accommodate any panel shrinkage. If the panel's fit precludes this, then the panel is too tight in its grooves. □

Joe Beals is a designer, builder and custom woodworker who lives in Marshfield, Mass.

Vertical router bits raise panels safely

by Charley Robinson

Because I don't have a shaper, I rely on my table-mounted router for my shaping operations. But I've never felt comfortable running the 3½-in.-dia. bits that are designed for raising panels. The noise and breeze created by this whirring mass, whose rim speed exceeds 225 MPH at a typical router speed of 22,000 RPM, is a warning of the potential dangers. The large cutter exerts considerable leverage, requires more feed pressure than usual and makes the workpiece hard to control. At best, this size bit should be run in the 11,000 RPM to 13,000 RPM range, which means you would need a large, variable-speed router or a separate speed controller.

Because of these problems, I avoided raising panels on my router table until I came across panel-raising bits designed to work in the vertical plane, as shown in the photo at right. The rim speed of these 1-in.-dia. bits is only a fraction of the larger

bits, and, therefore, they don't require reduced speeds. The smaller diameter also reduces the leverage and makes it safer and easier to feed stock.

I use a 10-in.-tall auxiliary fence to support the panel, as shown in the photo. The bit is recessed into the fence, so the panel is not trapped between the bit and the fence. To save wear and tear on the bit and router, and to reduce the dust, I bevel the panel on the tablesaw first to remove most of the waste. Then I make two passes on the router table, adjusting the fence so the last pass cuts away only about ⅛ in., which produces a clean, smooth bevel. Vertical panel-raising bits are available from the inventor, Brad Witt of Woodhaven (5323 W. Kimberly Road, Davenport, Ia. 52806; 800-344-6657) and most mail-order tool catalogs. □

Charley Robinson is an assistant editor at FWW.



Photo: Vincent Laurence

Beveling panels by hand

by Tom Wisshack

The beveled panel is the humble antecedent of the raised panel. It was most likely introduced as a practical necessity at a time when thin boards were either impractical or unobtainable. By beveling the edges of a relatively thick board, the craftsman could fit it into a frame and avoid the tedious resawing of boards. As a general rule, the flat side of the panel was placed outward, and the bevel was inside or on the back where it wouldn't show. A distinct advantage of this construction was that boards of uneven thickness could be used for the panels by simply adjusting the amount of bevel.

The decorative merit of beveled panels was recognized by the 17th century when beveled panels with molding applied around the field were used on drawer fronts and cabinet ends. The beveled panel remained an important structural element in furniture during the 18th and 19th centuries. In America, the bottoms of drawers almost invariably were beveled to fit unglued into grooves in the fronts and sides of drawers so that movement could occur. This basic technique is as sound today as it was in the 18th century.

When beveling the back of a panel, the width of the groove in the frame and the thickness of the panel are the main considerations. In general, a long bevel will allow the panel to more properly fill its corresponding groove (see figure 1 on p. 67). Beveled panels that were not meant to be seen were often worked without specific dimensions. For an exposed beveled panel, the aesthetic appeal of the panel plays a large role, and the surface of the panel should be divided into attractive, well-proportioned parts. But the panels still must fit the frame properly.

I join my frames with pegged mortise-and-tenon joints, cutting haunched tenons

on the tablesaw to fit mortises roughed out on a drill press and cleaned up with a chisel. To make the panel, I glue up stock $\frac{1}{2}$ in. oversized and, after the glue dries, trim the panel to fit exactly within the frame's grooves. Later, I plane a little off the panel's edge to allow for normal wood movement.

I rough plane both sides of the panel but leave the face to be polished with a block plane, after the panel has been beveled. After determining the appropriate proportions for the bevels and field, I use a marking gauge to draw a shoulder line around the perimeter of the panel, as shown in the drawing below.

I bevel the endgrain first, after chiseling away one corner of the panel, as shown in the drawing, so that when I plane toward that corner, I won't splinter the edge of the panel. For a panel in the 10-in. to 15-in.-wide range, a 14-in. jack plane is ideal for making the initial cuts to establish the angle. Then I switch to a sharp block plane for the final trimming. I get the cleanest cuts on the endgrain by holding the plane slightly diagonal to the bevel. Cuts should be made with long, smooth strokes, parallel to the panel's edge. I test the fit of the panel to the frame with a mullet, as shown in the drawing. I stop planing when the mullet fits snugly onto the bevel without allowing the panel to quite reach the full depth of the groove.

Once the first bevel is planed, I use a marking gauge to transfer the edge thickness around the panel as a guide for planing the other bevels. However, I always use the mullet to gauge the bevels as I make my finishing cuts. With a freshly sharpened plane blade, I make the final cuts to allow the panel to bottom out in the groove. After all four bevels have been planed, I trial-fit the frame and panel together.

At this time, I also trim a small amount off each long-grain edge to allow for sea-

sonal movement. For most of my panels, which tend to be 10-in. to 15-in. wide, I allow a $\frac{1}{8}$ -in.-wide gap on each side and about $\frac{1}{16}$ -in. on top and bottom. To keep the panel from rattling in the frame, I put a small wooden pin through the center of the top and bottom rails to hold the panel centered in its opening yet allow it to shrink and expand as needed. I prefer to paint, stain or apply a coat of sealer to panels before assembly to avoid a white line along the panel's edge. I allow extra clearance for the thickness of the finish.

When gluing up a frame and panel, I've learned to have absolutely everything ready and handy, including a work list. When gluing the mortise and tenon, I'm careful to avoid getting even the smallest amount of glue near either the panel or its groove. I assemble the frame and panel, checking my work list at each step, and then attach the bar clamps, positioning them so that I have room to install the pegs. After removing any surplus glue, I drill holes for and install two square pegs through each joint.

A work list for such a simple job might seem ridiculous, yet I once glued a frame together and drove the pegs home before realizing I had forgotten to install the panel. With great care, I was able to get the frame apart and prepare it for reassembly. Proud of this effort, I applied glue to the various parts and reassembled them. Only when I reached for the clamps did I realize I had again left out the panel. Fortunately, I was able to wiggle the frame apart enough to slide the panel in place. That's why I always make a work list that includes the reminder, in large, red letters, "INSTALL PANEL." □

Tom Wisshack makes and restores fine furniture and is a wood-finishing consultant in Galesburg, Ill.

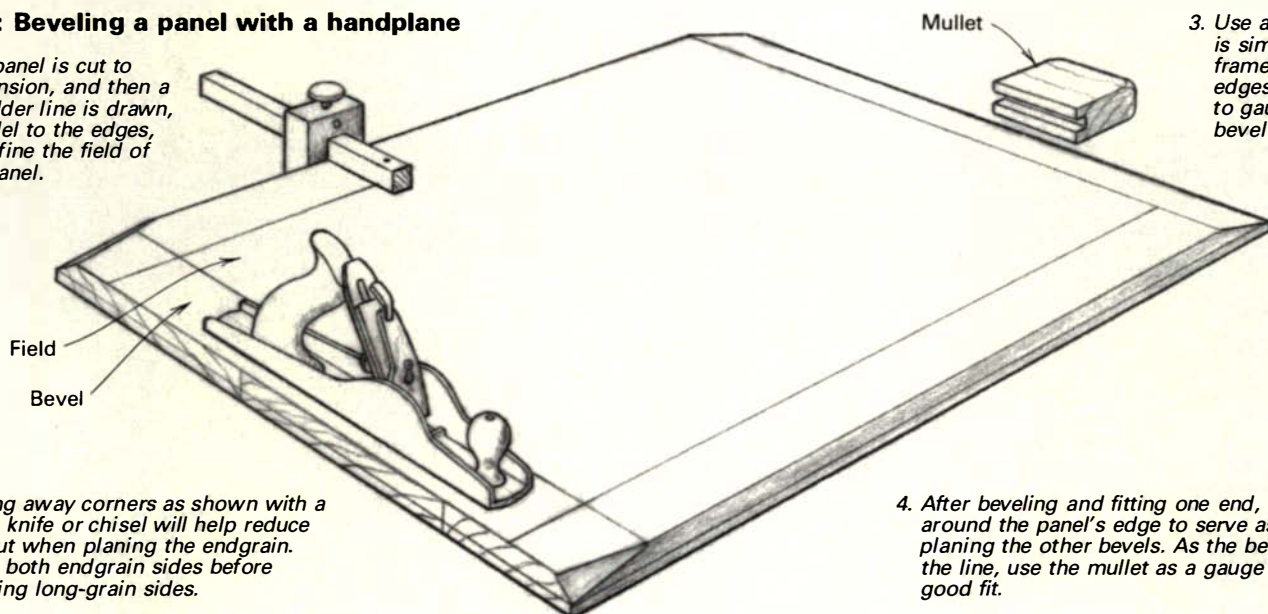
Fig. 3: Beveling a panel with a handplane

1. The panel is cut to dimension, and then a shoulder line is drawn, parallel to the edges, to define the field of the panel.

2. Cutting away corners as shown with a sharp knife or chisel will help reduce tearout when planing the endgrain. Bevel both endgrain sides before beveling long-grain sides.

3. Use a mullet, which is simply a scrap of frame stock with the edges rounded over, to gauge the panel bevel while planing.

4. After beveling and fitting one end, scribe a line around the panel's edge to serve as a guide for planing the other bevels. As the bevel approaches the line, use the mullet as a gauge to ensure a good fit.





Warner's glue-block method for mounting a blank on the lathe starts with turning the bottom flat using a scraping tool (top inset), which leaves a small stub tenon. A shallow mortise for the tenon is then cut with a $\frac{3}{8}$ -in.-wide scraper into the glue block, which is screwed to a faceplate (center inset). After the blank has been glued to the block with gap-filling cyanoacrylate adhesive and turned, it is parted off (above) with a narrow parting tool. Finally, the bowl is remounted between the tailstock and a foam-covered plywood disc secured to the headstock, and the foot is cleaned up (bottom inset).

Bowl Turning with a Glue Block

Fast-setting glue and a stub tenon secure and center the blank

by Jack Warner

Securing a workpiece on the lathe for faceplate turning is a problem with which every beginner must wrestle. The old standbys—faceplates, screw chucks, expansive chucks and spigot chucks—all have distinct disadvantages. Faceplates and screw chucks require that the piece have a heavy base to take screws big enough to keep the piece on the lathe, and then you're left with holes to fill. As an alternative, the section of the base that contains the screw (or screws) can be turned away when finishing the foot, but that's a waste of material. When using expansive chucks or spigot chucks, you must make the size and shape of the workpiece's foot fit the chuck, which can put a crimp in your design.

About four years ago, North Carolina turner Knud Oland (now deceased) showed me a method of mounting a turning blank on the lathe via a glue block. This method has served me flawlessly and also is now in very common use among turners. The blank is mated to the glue block with a small mortise-and-tenon joint and glued in place with a quick-setting cyanoacrylate (CA) adhesive. After turning, the work is parted off by cutting into the glue block—not the workpiece. There is virtually no waste and the method never intrudes upon the design.

The method depends on using cyanoacrylate glue, which is super strong and seems to work equally well with either wet or dry wood. Further, the glue sets in a matter of seconds. This means that the glue block and turning blank can be held together instead of clamped. There are at least half a dozen brands of CA that are suitable for turning purposes and that can be purchased through most woodworking supply houses and practically all hobby shops (see the sidebar at right).

Fitting the glue block to the workpiece

I've stumbled upon a simple way of making a small mortise-and-tenon joint that creates a mechanical connection between the workpiece and the glue block. The joint provides little mechanical strength because the tenon is usually cross-grain, but it provides an exact reference for recentering the piece. This is especially helpful when it comes time to finish the bottom of the bowl.

To make the tenon on the bottom of the workpiece, I mount the blank between lathe centers, with the top of the blank at the headstock and a cup center in the tailstock. After turning the wood round, I flatten the bottom with a gouge to get it close and then use a heavy-skewed scraper to get it as flat as possible (see the top inset photo on the facing page). I use the straight edge of the scraper's shank to check for flatness so that I don't have to take the work off the lathe. Using the scraper to work right up to the lathe's 1/2-in. cup center, I leave a 1/2-in.-dia. nipple of wood, which creates a tenon exactly in the center of the foot. Usually this tenon is no more than 1/8 in. long, but if I had to waste a lot of wood getting the foot flat, it could be a good deal longer.

After the workpiece is removed from the lathe, I make the glue block and secure it to a small faceplate. The wood used for the glue block is important and deserves careful consideration. Obviously, you don't want to pay a bundle for wood to be used this way. Poplar and oak seem to crack too easily. In the Southeast, hard maple is relatively cheap, and it works well. I generally use 8/4 stock, so the same block can be used several times. But if I'm going to turn something especially hairy—unusually large or unbalanced—I'll use 4/4 stock and hold it to the faceplate with screws that leave just enough room to part the work off right below the glueline after turning. I roughcut each glue block to size on the bandsaw first, and secure it to the faceplate with 2-in.-long square-drive screws. Then I turn the face of the block flat (just as I did with the workpiece) and turn the block to the same diameter as the faceplate. With a narrow scraper, I cut a 1/2-in.-dia.

Cyanoacrylates are super glues

Although it has become virtually a generic name among woodturners, Hot Stuff no longer has the market to itself. I've found at least three other lines of cyanoacrylate (CA) intended for similar purposes. Perhaps the most commonly available is the Pronto line of adhesives made by 3M, chiefly CA-100, a fairly high-viscosity, gap-filling liquid, and CA-50, a gel that comes in a tube. There's also a product called Zap, which is a low-viscosity liquid that's available from Oland Craft (Route 1, PO Box 75, Brasstown, N.C. 28902; 704-837-2273). And just coming on the market is Wood-Pro glue, available in ultra-thin, medium and maximum viscosities and a gel. This glue was originally formulated for wood and has a particularly interesting property: If the accelerator isn't used, it has a 90-minute work time before setting. Colorants also will be available for the Wood-Pro glue. For information on this product, call Woodcare Products at (800) 676-4583.

Because all my experience is with Hot Stuff, that's what I'll talk about from here on. Hot Stuff comes in three mixtures—regular, gap filling and super gap filling. The regular formula is too thin to be of any use for holding work onto the lathe, but the gap-filling formula—the bottle with the yellow label—is generally just right. Although CAs are not cheap, a 2 oz. bottle, which costs about \$10, goes a long way: Generally I can mount several dozen bowls (to glue blocks) out of a single bottle. For best results, an accelerator should be used with the glue. Satellite City makes an accelerator called Hot Shot, which can be found in most hobby shops or ordered from Satellite City (PO Box 836, Simi Valley, Cal. 93062; 805-522-0062).

Bob Hunter, a representative of Satellite City, told me the trick to storing an opened bottle of Hot Stuff for up to one year: squeeze it until a little bead of glue appears at the end of the nozzle; then cap it and store it upside down.

Cyanoacrylate safety: There are a few caveats when using CA adhesives. First, there is a pungent odor and fumes that can irritate your eyes when your tools cut through a layer of glue during turning. Satellite City makes a special odorless version, called UFO (short for User-Friendly Odorless) in the very thin and very thick versions.

Second, and most importantly, you must be careful when applying CA because it will glue your skin just as quickly and firmly as anything else. I know this from experience. Once, while using Hot Stuff to seal a crack, I absent-mindedly kept rubbing sawdust into the fissure and didn't get my finger out quickly enough. I stood there by the lathe, with a large bowl hanging off my index finger, feeling equal parts of fear and embarrassment. I tried using the solvent that's marketed with Hot Stuff, but it didn't help me get that bowl off my finger; in the end, I left some skin on the bowl, which is a rather unpleasant experience. Hunter insists I wasn't patient enough—that the solvent, given a few minutes, will dissolve the bond. (He said it will also get Hot Stuff out of your clothes.) If only a little glue gets between your fingers, carefully peel them apart under a stream of warm water.

One final caution: Don't squeeze a CA bottle hard to get glue to come out when the tip is clogged. I have heard of several cases where the glue squirted sideways and into an eye. None of these accidents resulted in permanent damage, but the experience can be painful and frightening. Hence, I examine the tip of the bottle, and if the fluid won't come out normally, I clear it by rapping the bottom of the bottle sharply on the table. Of course, the best insurance when using CAs is care. If you'll take a few simple precautions, I think you'll find that CAs are good stuff.

J.W.

Quick fixes on the lathe

by Giles Gilson

I first encountered cyanoacrylate (CA) adhesive during the 1960s when I worked as a prototype assembler at an engineering firm. By the early '70s, model-airplane builders caught on to CA, and it began to appear in hobby shops. But, these early varieties had very thin viscosity and didn't fill gaps well, so joints had to fit together perfectly (modelers soon discovered that baking soda worked very well as a glue thickener).

CA manufacturers today offer a whole range of different glues that are designed for wood (see the sidebar on p. 71), and woodturners especially have found CAs useful. I've found many applications for CAs in my turning work. For example, I glue wood to other materials, such as fiberglass and aluminum, which I often incorporate in my pieces. CA is also great for strengthening areas of soft or punky wood in damaged or spalted turning blanks (use the low-viscosity type of glue and let it soak in).

But one area where CAs are indispensable is repair work. The glue's transparency coupled with its strength and nearly instantaneous drying time make it possible for a woodturner to fix a mistake, in most cases, without having to remove the turning from the lathe. Two common turning situations in which CAs excel are fixing breakage and small surface repairs. The processes for handling these problems are shown and described in the photos and captions below. With a little experimentation, I'm sure you'll find your own uses for these versatile adhesives. □

Giles Gilson is a woodturner, sculptor and product-design specialist living in Schenectady, N.Y.



Cyanoacrylate glue is great for quick repairs, such as mending the broken rim of a bowl (top left). After the piece is refitted, thin cyanoacrylate (CA) is wicked into the joint (top right). Minor defects in a bowl's surface are restored by packing the area with sawdust and applying thin CA (bottom left). After the CA cures for a few minutes, the spinning workpiece is sanded with a small sanding disc chucked in an electric drill (bottom right).

recess in the center of the glue block to provide a snug fit for the workpiece's tenon, as shown in the center photo on p. 70.

Gluing up

Now, the faceplate comes off the lathe, and the glue block and workpiece are checked for a good fit. To glue them together, I apply accelerator to the foot of the workpiece, and a gap-filling CA on the glue block. According to Satellite City, the makers of Hot Stuff (which is the brand of CA I use), applying too much glue can weaken the bond. A product pamphlet that comes with the glue suggests that one drop of glue is sufficient for 1 sq. in. But remember that you may be cutting past some of the outer edge of the original foot when you finish it, so apply the glue in a spiral—liberally near the center and sparingly toward the outer edge. But don't get any glue in the mortise because you don't want the tenon glued down. Then the turning blank and glue block are mated and held under pressure for about 15 to 20 seconds, until the glue sets. If glue oozes out from under the block, I also spray that with a little accelerator to make sure the glue isn't so liquid that it will fly around when I start the lathe.

Now the workpiece is ready to go on the lathe and become a bowl. The mortise-and-tenon method automatically centers the rough workpiece on the lathe. Also, the whole assembly can be removed and later remounted on the lathe with no re-turning necessary to get the workpiece back into round (the bigger benefits, however, come when I reverse the bowl on the lathe to clean up the foot, as described below). I'm confident with my glue-block method, but I've never been an optimist. So when I turn a particularly large piece, I keep the tailstock in place while rough shaping the outside of the piece.

Parting off and finishing the foot

When the piece is sanded and ready for removal, I use a parting tool to cut through the glue block, as shown in the large photo on p. 70. After my nerve runs out, I use a thin-blade Japanese ryoba saw to finish the cut. For cleaning up the foot, my procedure varies depending on whether the piece has a formal or a natural lip. Formal-lipped pieces are mounted on a plywood disc with a groove to accept the lip. Natural-lipped pieces are mounted over a disc of plywood that's held onto a 1/2-in.-dia. threaded rod and covered with foam carpet padding (see the bottom inset photo on p. 70). The tailstock, still fitted with the cup center, is brought up to hold the piece in place. This is when I realize the final benefit of the little tenon cut on the back of the piece. When I saw through the glue block, I'm careful to leave the tenon on the foot of the piece, and it still bears the dimple left by the pin in the cup center. This dimple marks the exact center of the foot. I orient the piece so that the cup center falls right back into place, and the bowl is exactly centered. I shape up the foot if necessary, cut away the remains of the glue block and all but a nubbin that holds the live center. Then when the piece is off the lathe, I remove the nub with a sharp carver's gouge, sand the spot clean and it's done.

If you rough turn your pieces wet and set them aside to dry, be sure you orient the grain of the glue block to run parallel to the workpiece. Even then, the movement of the wet piece is likely to pop off the block. If this does happen, all you need to do is mount the bowl between centers, using the tenon once again to find the exact center of the bottom; flatten the foot of the piece; clean up the glue block and reglue. □

Jack Warner is a journalist who writes a nationally distributed newspaper column on woodworking and furnituremaking. He's also a woodturner who lives in Atlanta, Ga.



A Kerf-Bent Mirror Frame

*Sawcuts turn the corners
and epoxy fills the voids*

by Ken Picou

Woodworkers have traditionally used multiple sawkerfs to bend wood smoothly and gracefully. A series of closely spaced cuts are made almost through the strip or panel, leaving a thin layer of undisturbed material beneath. When the panel is bent, the kerfs close, and the thin, uncut surface is shaped into a smooth radius with a pattern of triangular voids on the edge of the material. Although these voids are usually concealed, I discovered that with a bit of strategy and a little epoxy, these kerfs can become an integral component of design. I make continuous mirror frames from a single strip of wood by planning the arrangement of the cuts, making my cuts carefully and then filling the kerfs with colored epoxy. The result is a frame that is both decorative and structurally sound. I have incorporated this joinery in the design of a series of uniquely shaped wall mirrors, such as the one that's shown in the photo on this page, and my method works equally well with picture frames, table aprons, top frames and decorative railings.

The process

Making a segmented-joint frame is quite simple: A single strip of frame stock is partially sawn through along the edge and is bent to form a series of radiused corners. The wedge-shaped voids are covered on the face side with duct tape to form a mold and then are filled with colored epoxy. Once the epoxy has cured, the remaining thin ribbon of wood along the frame's outer edge is sand-

By filling kerfs in a bent strip with epoxy resin, you can make decorative wooden frames of all shapes and sizes. Picou carefully planned the spacing of the cuts to create these geometric patterns of colored-epoxy wedges.

ed away, completely separating the components of the joint. The result is shiny, colored wedges separated by thin, rectangular strips of wood, which align radially around the curve. This creates a geometric pattern with sharp contrasts in shape, texture and color, as shown in the photo on the previous page.

One of the most interesting aspects of this technique is that once you figure out how many kerfs are required to create a rectangular frame, you can use the same number of cuts to form any closed-shape frame, provided you use the same width stock. Various shapes can be developed by changing the number of kerfs per joint and the distance between the joints.

Counting the kerfs

The first step in creating a segmented-joint frame is determining the number of kerfs it will take to allow the frame stock to be bent to form a complete frame (360°). Although this could be calculated, I find it simpler to rip a strip of scrapwood that's the same width as the frame I wish to make. With the blade of my radial-arm saw raised to cut within 1/16 in. of the saw table, I start making kerfs along the length of the test piece. I continue to cut until the strip can be bent to form a right angle with all the kerfs completely closed along the inside edge. I confirm this by checking it with a framing square, as shown in the top photo on this page. If you find, for example, that 15 kerfs result in a bend that's more than 90° yet 16 kerfs let the strip bend past 90°, you can fine-tune the angle by varying the width of the kerf or the wood strip or by simply adjusting the depth of cut just a bit. A wider kerf, narrower strip or slightly lowered blade means fewer kerfs are needed for 90°. A thinner kerf, wider strip or raised blade means that more kerfs are needed. Once you have determined the number of kerfs required for a perfect 90° angle, multiply by four to get the total number required to complete a closed frame. When designing the frame, any corner angle can be figured based on the total number of kerfs: if 64 cuts equal 360°, then 8 would equal 45° and 4 would equal 22.5°. Once you have developed a feel for this system, the combinations are limitless.

Kerfing the frame

After you've worked out a full-scale frame design on paper, select and thickness your frame stock and rip it to the same width as your test piece. Check your design to determine the length of stock you need. For the wall mirror shown in the photo on the previous page. I used 3/4-in. thick by 1 7/8-in. wide stock that was 96-in. long. Make sure your radial-arm saw adjustments are set the same as during the test cut, and begin kerfing the strip according to your plan. Position the back side of the frame stock against the fence, so any splintering that results will end up on the back

of the frame. I have found that spacing the kerfs 1/4 in. apart at the corners yields a pleasing radius and creates an interesting visual interplay between the colored epoxy wedges and the small rectangles of wood. To keep the spacing between the kerfs uniform, make a pencil mark on the fence as a guide to show you how far to advance the stock after each cut. After completing the kerfing, trim the ends of the strip as necessary and carefully roll the frame into shape (see the bottom photo). The frame should lock rigidly into shape as the kerfs close up. If the ends don't meet, widen a kerf or two very slightly. If the ends are too long, trim them. And if the strip accidentally breaks, repair it by gluing the outer ribbon with cyanoacrylate (super glue).

Gluing up

A flat piece of particleboard or plywood serves as a platform for pouring the resin. To help you align the frame, draw a line lengthwise down the center of the board and several evenly spaced perpendicular lines across the width. Clamp the frame to the platform, face side up, and cover the face and inside edges of all kerfed areas with duct tape to retain the resin during the pour. Now unclamp the frame and flip it over. Clamp it to the platform face down with a piece of waxed paper between the frame and the platform (see the top photo at right).

I use West System epoxy (available from Gougeon Brothers Inc., 100 Patterson Ave., Bay City, Mich. 48706; 517-684-7286) and tempera powders or artist's acrylic paint for a colorant. When using epoxy, always work in a well-ventilated area, and make sure the room temperature and the humidity during the pouring and curing period are in the range prescribed by the manufacturer. As you mix the epoxy and colorant, stir slowly to avoid bubbles, and pour the mixture into the kerf voids slowly and carefully. Segments can be re-filled as the epoxy soaks into the wood. Let the resin cure overnight.

After unclamping the frame the next morning, carefully peel off the duct tape. If there are any voids in the face of the frame, fill them now. The epoxy on the back of the frame will have sunk a bit as the epoxy penetrated the pores of the wood. You will have a chance to refill this area in the next step.

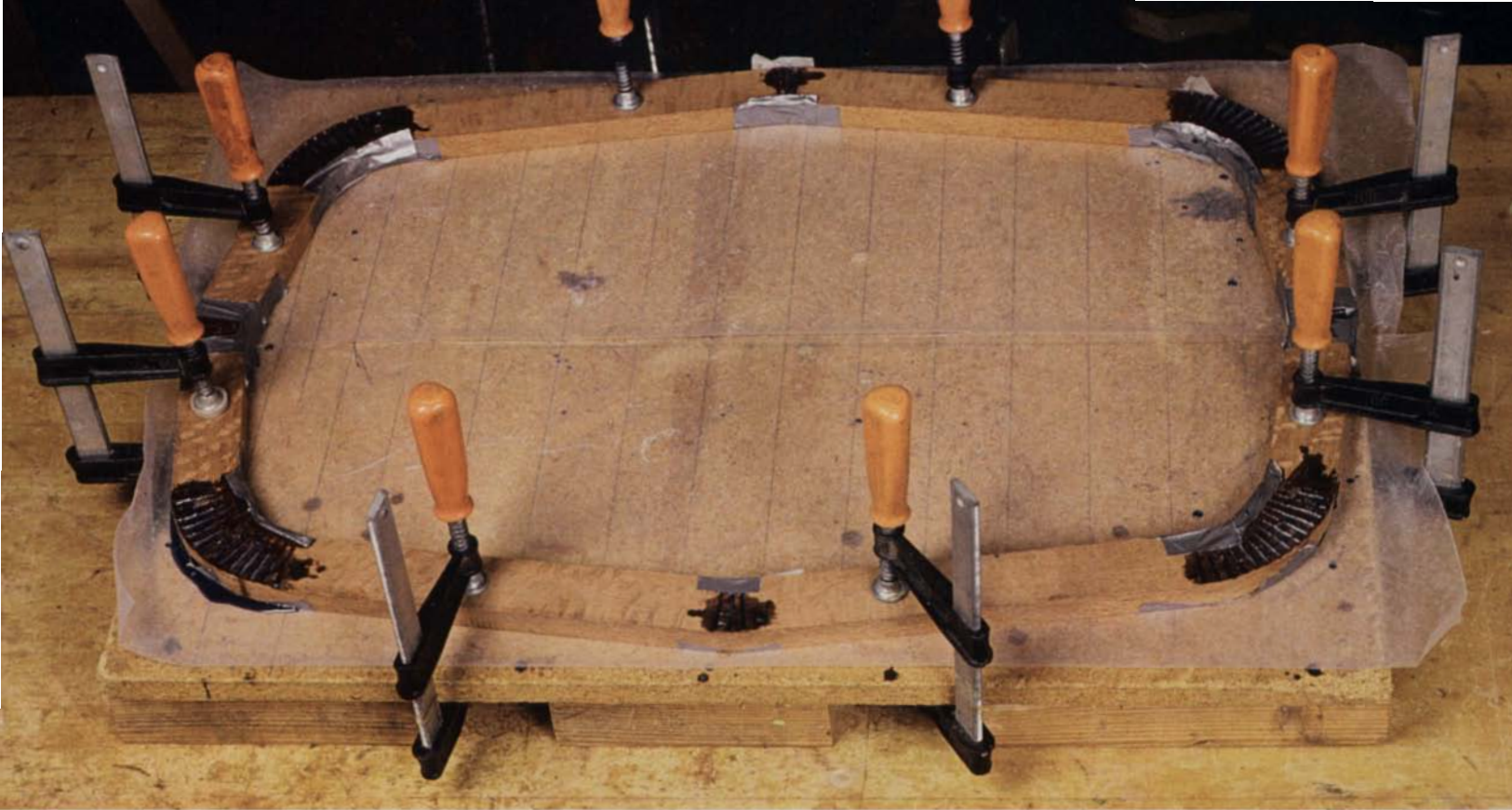
Reinforcing the frame

Even after the outer ribbon of wood is removed later, segmented joints are surprisingly strong. You can, however, greatly increase the strength of the frame and its ability to withstand impact by routing a narrow 3/8-in.-deep channel around each corner on the back of the frame and pouring a liquid spline (see the center photo on the facing page). Mount a 1/4-in. straight bit in a table-mounted router, and set the fence so the bit will rout at the center of the frame.



Kerfing a mirror frame: a test strip (above) is cut to determine the number of kerfs needed for the piece to bend into a right angle. This number, multiplied by four, yields the kerfs needed for a closed frame. After kerfing on the radial-arm saw (below), the frame is rolled up to check its shape.





The kerfs are filled with colored epoxy using artist's acrylic paint to tint the resin. After the face and edges of each joint are covered with duct tape to create a mold, the frame is clamped to a flat panel and epoxy is poured into the kerfs (top photo). After the epoxy has hardened, a narrow channel is routed across the back

of each joint on the router table (left photo), and then epoxy is poured in to form a liquid spline to reinforce the frame (center photo). Finally, the ribbon of wood that's left on the outside edge of the frame is sanded away (right photo), creating the illusion that the frame was assembled out of many separate segments.

Carefully lower the frame, back side down, onto the spinning bit and maneuver around the radius of each corner to rout a channel (see the photo at left above). You can further reinforce each joint by placing a length of heavy-gauge wire in the channel before pouring.

Sanding and finishing

Once the epoxy cures, you can sand away the outer ribbon of wood that initially held the frame together. I do this on a stationary belt sander (see the photo at right above), but you could also secure the frame in a bench vise and use a portable sander. The edges of the frame can then be routed to suit your taste. I generally use a roundover or chamfering (45°) bit. To prepare your frame to accept a mirror or artwork with glass, rout a rabbet on the inside back edge with a piloted rabbeting bit. You are now ready for the final sanding (I sand to 600-grit) and finishing. I usually hand-

rub a tung-oil finish on my frames but lacquer also will work well. I generally use a 1/4-in. plate-glass mirror to avoid the distortion common in thinner glass and back it up with 1/8-in. plywood to secure and protect the mirror. I finish the job with a sawtooth-style wall hanger screwed securely to the frame.

Once you're comfortable thinking and working with kerf-bent joints, you might want to develop your own style. New shapes can be designed with simple math or by trial and error using scrap stock. You can also vary the width of the sawkerfs within a frame to add a different design element to your work. You can even make sculptural pieces by kerfing different faces of thicker stock and working in three dimensions. Regardless of application, the basic techniques remain the same. □

Ken Picou is a designer/woodworker living in Austin, Tex.



Scavenging through junkyards for used electrical motors can provide cheap power for shop tools. You'll need protective clothing (a beekeeper's hat thwarts angry insects), a three-pronged cultivator for probing through tall grass and a cart to carry the heavy booty.

Confessions of a Junkyard-Motor Junkie

Finding, cleaning and wiring cheap machine power

by Ted Myers

I was once a decent person just like you. When I bought a new machine, I bought a motor, too. Though I might be able to afford a cheap machine or kit, the cost of the motor would often put it out of reach. If only a cheap source of motors could be found, I would be able to equip my woodshop at poverty prices. But where?

And then it happened. I was on a junkyard safari in search of the elusive full-chromed car bumper. Pushing my way through the dense weeds and grass, I suddenly found myself at the bottom of a crushed-car canyon. But neither the flattened Fords nor Chevies caught my attention. There, at the far end of the canyon, shining in the sunlight, stood a veritable mountain of electric motors. There were quarter-, third-, half- and three-quarter horse motors. Some were blue, some gray, some black, some red with rust, some burnished satin and some blistered. But were any still good? Are not all junkyard motors bad? For a few dollars each, I bought three that looked good. Two worked, and the other was sold back for scrap at only a small loss.

For the past 20 years, when the need arose, I have resolutely beaten the brush in junkyards and landfills to find good electric motors. There are many to be found, and with your indulgence, I would like to share a few hard-earned tips on both how to tell a good motor from a junker and how to decipher the wiring to get your cheap motor up and running.

The equipment

The successful junkyard motor safari demands preparation but little specialized equipment. As you can see in the photo at left, the proper outfit includes: high boots (to protect the feet and ankles), sturdy coveralls, leather gloves and topping it all off, a beekeeper's hat or mosquito netting (in case you stumble upon a nest of yellow jackets). The three-pronged cultivator is essential for poking through high grass and brush and also hooking motors off piles. It also encourages more respect from junkyard dogs and smart alecks who might laugh at your beekeeper's hat. A sturdy garden cart is crucial because electric motors are heavy, and carrying even one can slow you down. Be sure to show the junkyard operator what you bring into the yard. One fellow tried to charge me for the cart even though my name was stenciled on it!

All the other equipment can be held in a small toolbox. Grip-lock pliers and side cutters are for handling wires and cords. If the motor is still in the appliance, a socket set, wrenches and screwdrivers are needed for removal. A utility knife cuts off old V-belts. You'll need two meters to test a motor's wiring: a small, inexpensive multimeter and a large precision meter that's capable of taking accurate,

low-range ohm readings. I carry the small one in my pocket and leave the larger more sensitive meter in the car. Be sure to use old-style meters with needles because the types with an LED readout don't show up well in bright sunlight. Also, bring along a host of rags to clean dirt and grease from prospective treasures.

Stalking electric motors

Before you start out, be sure to call the junkyard to see if motors are available. The demand for copper has been way down, and many yards have gotten rid of their motors at a loss. Others will love to see you and currently will charge about \$5 a motor. You may have to talk your way into the landfill, but it helps if you bring in a load of trash. And, as you hand over your dumping fee, ask if you might look for a motor in the appliance section of the yard. Motors are usually loose and piled in one area, but don't be surprised to find some scattered here and there. Landfills usually have appliance sections where motors are still in the appliances.

Once you've located a motor, approach it from the connector end. It's now time to put that cheap multimeter to work. Motors always have at least two and sometimes as many as nine connectors. For simplicity, let's start with a two-connector motor. With the meter set to read ohms, touch the two leads to the connectors. If the needle does not move, the wind-

The three-pronged cultivator is essential for hooking motors off piles. It also encourages more respect from junkyard dogs and smart alecks who might laugh at your beekeeper's hat.

ings are burnt-out. If the needle jumps to zero (indicating continuity), then probably both windings are good, and you have a possible candidate. (On motors with more leads, check each pair.) Next, read between each connector and the motor case. If any continuity is read, leave that motor because one of the windings is shorted to the case. If the motor has passed the meter test, spin the shaft. Do not be put off by a hard-to-spin shaft. Quite often, the motor's grease simply has hardened or the oil reserves are dry. Sometimes, the bearings will be bad but, in my experience, not as often as you might expect.

If the motor is still in an appliance, it will have to be removed. I cut all the lead wires

and the power cord, leaving them as long as possible. Each manufacturer mounts its motors in a different manner, and some are really difficult to unbolt. Do not be shocked if you must walk away from a good motor simply because it cannot be removed. Do not, however, be put off by a motor you find in the dirt. Also, there are more bad motors piled loosely than in machines or appliances. Usually an appliance is discarded when its transmission goes bad, though the motor is probably still good.

Different kinds of motors

Knowing the various types of motors and what they can do will help to provide a focus to your junkyard-motor quest. The top photo on p. 78 shows some of the types of motors you're apt to find in a junkyard or landfill. Though hard to find, repulsion motors are worth scrounging for because these offer the highest starting torque for the smallest starting current, and there's nothing better for running a pump or an air compressor. Split-phase motors are the standard junkyard fare. These need time to come up to speed and are most usable in tools that require low starting torque, such as jointers and bench grinders. Capacitor-start motors use a capacitor on the starting windings to provide high starting torque, which is good for tablesaws and bandsaws. Once up to speed, a centrifugal switch cuts the capacitor out, and the motor runs like a split-phase. A capacitor-start/capacitor-run motor keeps the capacitor on-line for high torque and instant reversing. Usually found in garage-door openers, these motors overheat badly if operated continuously.

To find out valuable information about a motor, look for either a nameplate or stampings on the case. The horsepower (HP) rating is the main concern: Is the motor powerful enough to do the required job? Motor phase also is important, because only single-phase motors run on regular household power. Three-phase motors must be run either on special three-phase power or require a phase converter. Some motors will only run on either 110v or 220v while some can be wired to run on either voltage. The amps rating shows how much current the motor draws. Also, check the number of cycles on the plate: You want 60 Hertz (Hz), the standard in the United States. Many motors have one or more speeds. Standard motor speeds, which are stated in revolutions per minute (RPM), are 3450, 1725 and 1140 for two-, four- and six-pole motors. The plate will also tell you whether the motor is continuous duty, which means it can be run for long periods of time.

The final check

After selecting a motor (or motors) that meets your needs and before putting your money



The different types of motors you're apt to find include (from left to right): the repulsion motor, a high-starting-torque AC motor with brushes; the slow-starting split-phase motor, commonly used

to run fans; the versatile capacitor-start motor, identified by its protruding capacitor housing; and the small-capacitor start/capacitor-run motor, rescued from a garage-door opener.

down, you can perform one more test by using the sensitive ohmmeter. Because every wire that carries current has a little electrical resistance, the resistance of both a motor's start and run windings can be checked with an ohmmeter. Normal resistance in run windings ranges from 3 to 6 ohms; start windings range from 4 to 8 ohms. You can read these directly on a four-connector motor by testing the two pairs of winding leads (see the hookup section on the facing page to help indentify the pairs). If the motor has only two leads, it means the start and run windings are wired in parallel. In this case, since parallel wiring reduces the overall resistance, a reading of about 1 to 2 ohms is correct. If the meter reads zero or between 4 and 5 ohms, then one winding or the other is bad. When testing a capacitor-start motor, it's normal for the meter to read zero at first and then come up to an ohm reading. This is because the capacitor

draws all the voltage from the meter while it is testing. The capacitor is probably bad if the windings still read zero after a few seconds.

If all the tests outlined above are positive, you must still make an intuitive leap. Will the motor's bearings last? Will the starting switch work? You must trust your intuition just as you do when you play the stock market or get married. Here are a few rules of thumb to help you make your decision: Surface rust on a motor is okay, but blistered paint is not, since it probably indicates that the motor overheated at one time or another. Also, beware of that otherwise nice motor with sawdust packed inside its housing; it may have been well-cooked by a lazy woodworker who used a dull sawblade to cut oak.

Motor cleaning

Cleaning is the first order of business when you get your motor (or motors) home. Many

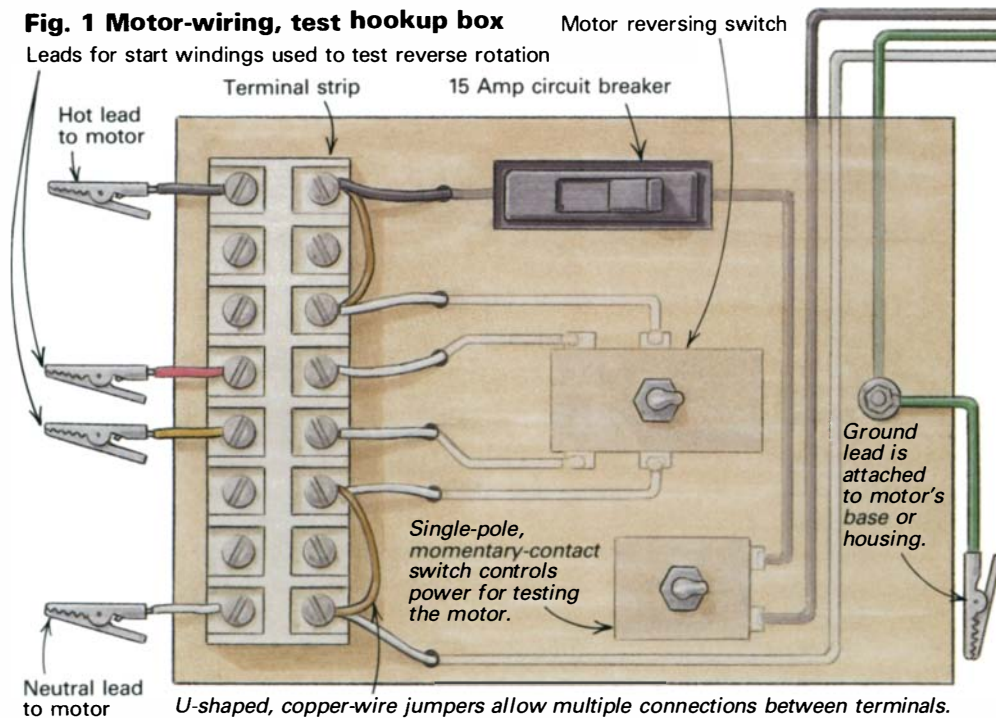
are sufficiently cleaned with just a shop vacuum and a small artist's brush to get the lint and crud out of the end bells. A wire brush and wax will remove rust, and heavy grease and grime will yield to a small amount of mineral spirits. Some people recommend cleaning with carbon tetrachloride, but I avoid it because it's too dangerous. In extreme cases, the universal solvents of soap and water are quite safe and effective so long as everything is dried well afterward.

I found the repulsion motor shown in the photo above buried to its rear end bell in sand and dirt. I cleaned it by removing the end bells, pulling the rotor out and blasting away with a garden hose. When the water ran clear, I used the exhaust on a shop vacuum to dry everything thoroughly. Once the oil wicking was fully saturated at each bearing, this repulsion motor ran just fine. And at \$5, it turned out to be a real bargain.

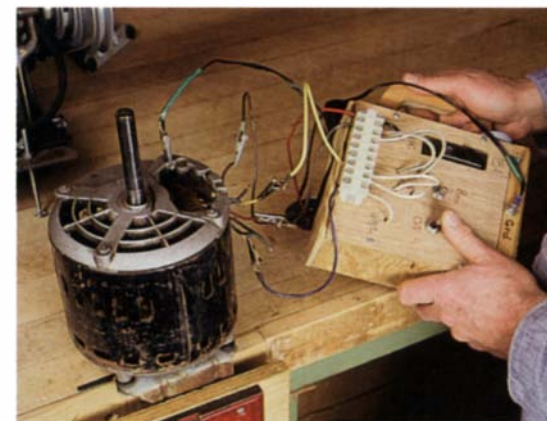
Fig. 1 Motor-wiring, test hookup box

Leads for start windings used to test reverse rotation

Motor reversing switch



Source (hot) black
Ground (earth) green
Return (neutral) white



The author's shopmade electrical hookup box helps him to determine the correct wiring of an old motor safely and without barming the motor. Once the motor's leads are hooked up for a test, a spring-loaded switch protected by a circuit breaker supplies power.



A motor recovered from an old washing machine powers the author's shopmade bandsaw. Because the 1/2-HP split-phase motor had no base, angle-iron brackets were built to mount the motor to the saw.

Hooking up your junkyard motor

Sometimes a motor's nameplate includes a diagram of how the motor should be wired. But in most cases, you are left to figure this out on your own. To facilitate this experimentation, I built a simple hookup box, as shown in the bottom photo on the facing page and in figure 1. The hookup box allows you to try out different wiring arrangements on motors with more than two leads (to determine which wires change RPM or direction) without burning out the motor or, more importantly, risking electrocution. Power is supplied through a spring-loaded on/off switch, backed up by a 15-amp circuit breaker. At the first sign of trouble, you only need to release the switch to cut off power. A 10-amp motor-reversing switch provides a way to test for rotation reversal on motors with four or more leads. All motor leads connect to the hookup box by way of a terminal strip with hookup leads that end with alligator clips. Small U-shaped jumpers, bent from solid copper wire, are used to connect terminals together for routing one connection to several terminals when necessary.

Before testing, the motor must be bolted down to the workbench. Motors without bases should be held securely in a vise. The ground-wire clamp from the hookup box is attached to the motor's base or case. I leave the hookup box unplugged, until after I've made all connections; then I plug the box into a 110v outlet. (My box only tests 110v motors). If you suspect your motor is 220v or 110/220v, check the nameplate for a wiring diagram. If there isn't one, play it safe and take the unit to a motor-repair shop for wiring.) Remember that all exposed connections on the box are hot. How you hook up each motor will depend on the number of leads it has: Each situation must be dealt with separately.

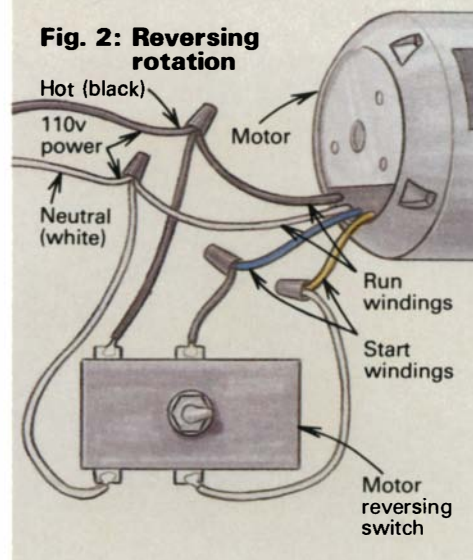
Two leads—Two connections are the minimum needed to run a motor, as a motor's wiring must form a closed loop with the power

company's transformer. Connect the two leads to the hot and neutral connections on the hookup box, and then try it out. If the motor has a white wire, this is almost always the neutral wire, while the hot wire might be black, red, blue or orange (green is always ground).

Three leads—Motors capable of running at two speeds (1725/1140 RPM) have three connectors. One wire will probably be white, for the neutral. By hooking up one of the other two (hot) leads, the motor will run at one speed or another. *Do not* connect both wires to hot at once. Also, remember that if one of the hot leads is connected, the free one will also be hot, so take care.

Four Leads—A four-connector motor, unless it is a three-speed with one neutral wire, will have separate pairs of connectors (each with a hot and a neutral wire) for both start and run windings. You can identify the start pair because it has the highest resistance (yields the higher ohm reading when you test the pair). The rotation of these motors is easily reversed by intercepting the hot and neutral wires with a motor reversing switch and then passing them on to the start connectors, as shown in figure 2 above.

Five or more leads—We are now entering the *Twilight Zone* of junkyard motors and things can get rather confusing when you're trying to decipher their wiring. First, try to find the motor's start and run windings by checking the ohm readings, as described above. Next, label each of the motor's leads with a different letter. Then proceed to test each lead to another with the sensitive ohmmeter. Pairs that test 0 ohms would short out if connected to hot and neutral as a pair; lead pairs that yield low ohm readings (3 ohms to 4 ohms) are much more promising. Using the hookup box, you can experiment by connecting these leads to power in various combinations. They



are likely to change the motor's speed or reverse the direction of rotation.

Once the motor-wiring riddle is solved, you're ready to wire up your motor. To switch small motors on and off and change speed and reverse rotation, I have found that common 15-amp household light switches work very well. In cases where I need a motor reversing switch for a fractional-horsepower motor, I buy mine from Burden Surplus Center (1015 West O St., PO Box 82209, Lincoln, Neb. 68501-2209; 800-488-3407). They cost about \$2.

Once your motor is all wired up, you're ready to put it to work. If the motor has a base, all that's required is to bolt the base to the machine, tighten the appropriate sheave or pulley on the shaft, install a V-belt and let her rip. If the motor doesn't have a base, you can buy a universal base (shown on the far right motor in the top photo on the facing page) for \$6.75 from AMT (Fourth Ave. and Spring St., Royersford, Pa. 19468; 215-948-0400). Or you can engineer your own secure mounting brackets. The 1/2-HP split-phase motor shown on my homemade bandsaw in the photo above is attached to angle-iron brackets secured to the tool's base through the bolt holes in the motor.

As you might now suspect, junkyard motors are quite a test of knowledge, logic and intuition. The more knowledge we have, the more our logic works for us, so you might want to read more about electric motors at your local library. But experience creates one major concern. It's been my misfortune to witness one too many electrical accidents. When I catch myself operating in the dumb to stupid range, I shut off switches, pull plugs and walk away until another day. Please do the same. Happy hunting and may the Electromotive Force be with you! □

Ted Myers is an English teacher, amateur woodworker and machinist in Cambridge, Minn. This material was adapted from Myers' article in the January/February 1991 issue of Home Shop Machinist.



Perhaps the largest tree ever felled by a human being, this Douglas-fir was brought down by George Carey (on the ladder) and his crew in 1895. The tree, reputed to be 417 ft. tall., grew on Vancouver Island, British Columbia.

Douglas-Fir: It's Not Just for Studs Anymore

A tough softwood makes a great furniture wood

by Jon Arno

If you're like me, the first images conjured up by the words *Douglas-fir* are of 2x4 studs, 2x12 joists and racy-grained plywood. There's plenty of validity to that stereotype, but there's more to the story. While its strength-to-weight ratio makes it the ideal construction timber, Douglas-fir is a remarkably diverse species, which will also yield plenty of furniture-grade wood.

What is Douglas-fir?

Douglas-fir has been (and sometimes still is) called Oregon pine, Columbian or British Columbian pine, Douglas spruce and red fir. Regardless of what it's called colloquially, there's little question that Douglas-fir is a member of the pine family (Pinaceae) along with spruce, larch, (true) fir and hemlock (see the photos at right).

On the genus level, though, it's something of an anomaly. Despite its vernacular name, Douglas-fir is not a true fir (genus *Abies*). First classified in 1803 as a pine, *Pinus taxifolia*, it was switched to the fir genus as *Abies taxifolia* in 1805. Later in the 19th century, the great naturalist John Muir referred to it as Douglas spruce, but it was never formally placed in the spruce genus, *Picea*. In 1889 it was given its own genus, *Pseudotsuga*, which translates as "false hemlock," and named *Pseudotsuga taxifolia*. Most recently, in 1950, its name was changed to the present designation, *P. menziesii*, honoring its discoverer, Archibald Menzie, a surgeon and naturalist who collected the first samples for scientific study in 1793.

There are only five species worldwide recognized as *Pseudotsuga*, and only two of these are native to North America. One of

our domestic species, big-cone Douglas-fir (*P. macrocarpa*), is a small tree occupying a rather limited range in Southern California. It's not a significant timber species. The other, *P. menziesii*, is North America's most plentiful species of softwood and accounts for about one-fifth of our total reserve of softwood timber: Over 120 billion cubic feet of Douglas-fir is growing in the United States and Canada today.

The wood of Douglas-fir varies considerably throughout its vast growing range. Extending from Canada to Mexico and from the Rockies to the Pacific coast, Douglas-fir has successfully adapted to diverse growing conditions. In the mild, perpetually moist climate of the coastal Pacific northwest, second-growth plantings of Douglas-fir attain sawlog size very rapidly, producing a rather stringy and harshly figured wood. One tree recently cut on Washington state's Olympic Peninsula was 170 ft. tall and 3 ft. dia., but only 72 years old! While examples of this kind of growth certainly support the argument that Douglas-fir is a renewable natural resource, the wood produced by these rapidly grown trees just isn't the same. Bright orange in color, with wide annual rings and a rather coarse texture, it's an inferior construction or furniture wood.

The wood from old-growth trees, however, has a mellow brownish color with yellow to pale-orange highlights and a pleasant, pinstripe grain pattern on radially cut surfaces. Trees a thousand years and older, 8 ft. to 10 ft. across and well over 300 ft. tall, can still be found on good growing sites in Oregon and Washington. The unofficial record—substantiated only by the photograph on the facing page—is of a colossal specimen felled by lumberjack George Carey on Vancouver Island in 1895. This tree is reported to have measured 417 ft. tall and 25 ft. dia. If true, this would have been the tallest tree known to man, surpassing the loftiest living redwood by more than 50 ft.

There is yet another variety (botanically speaking, the same species, but with morphological differences) of *P. menziesii* indigenous to North America. A somewhat stunted variety that's native to the interior of the continent, its range extends from Alberta southward through the Rocky Mountains into Mexico. Because of the extent to which it has adapted to the more arid conditions of this region, some botanists suggest that this Rocky-Mountain variety should be considered a separate species, *P. glauca*. The two varieties cross-pollinate (or intergrade), however, and this has prevented the interior variety from attaining separate-species status. It is, nonetheless, a noticeably different tree. Seldom exceeding 100 ft. tall, its foliage is a lighter, bluish-green color.

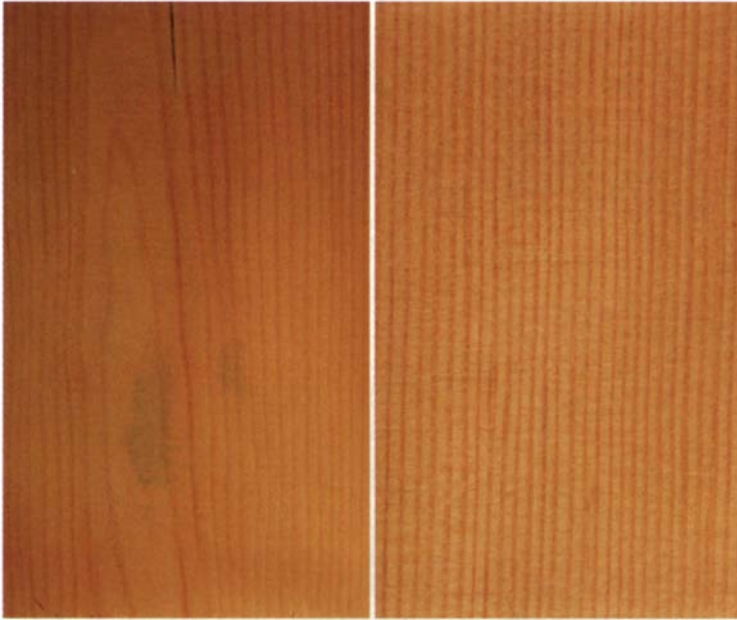
The wood of this variety—often peppered with small knots—exhibits considerable variation in both texture and density. In the



Inset photo at right: Courtesy of Western Wood Products Association



Douglas-fir can be a renewable resource, as this 65-year-old stand (far right) shows, but the quality of second-growth timber pales beside old-growth. The bark of young Doug-fir is smooth, gray and thin, but turns brownish red, thick and deeply fissured as the tree ages (above right). The three-pronged bracts that protrude between cone scales (above left) are unique to Douglas-fir.



Flatsawn (left) and quartersawn (right) Douglas-fir exhibit very different characters. The proximity of the growth rings on quartersawn stock makes the extreme density between earlywood and latewood much less troublesome to work.

north, where the trees grow slowly but receive periodic moisture throughout the year, the wood tends to be dark red, fine textured, hard and exceptionally stable. Toward the southern end of its range, however, in Arizona and New Mexico, where less-frequent rains cause spurts of rapid growth punctuated by periods of relative dormancy, the wood tends to have proportionately wider bands of earlywood, which make it, overall, much softer, weaker and somewhat pinkish-yellow in color.

Beyond the stereotype: fir for furniture

But what about the wood of typical first-rate Douglas-fir? By this I'm referring to the old-growth wood from the Pacific Northwest. As softwoods go, Douglas-fir is downright tough. It's heavier and stronger than either yellow poplar or butternut, two hardwoods commonly used in the furniture industry, and it is nearly as dense as cherry. Also, like cherry, it is a very stable wood with a naturally warm, pinkish-brown color when freshly cut, shifting to a rich, subtle orange as it ages. Its resistance to abrasion, while not on par with maple or oak, is among the best of the softwoods, and this trait, along with its color, strength, stability and affordability, make it our most popular softwood for interior flooring.

The character of any wood greatly depends on how the tree has been cut. This is especially true for Douglas-fir because of the dra-

Working Doug-fir

by Curtis Erpelding

My first crude attempts at furniture were made with construction-grade Douglas-fir. I liked to think that those pieces resembled the modern pine Scandinavian furniture I admired in books and magazines. Still, I remember looking at my rough pieces and imagining my peers' skepticism, "When are you going to start working with real wood?" Fir was for building houses, supporting weight, easy to cut and nail. At best it found its way into floors, door jambs, window casings and trim moldings. It performs these jobs admirably, but, as I've gradually come to appreciate, it's capable of so much more (see the photo on the facing page). As with any hardwood, though, getting to know Doug-fir's particular idiosyncrasies will make working it less frustrating and more rewarding.

Machining properties: Douglas-fir generally machine-joints and planes well, although the face of flatsawn lumber is susceptible to tearout. Dampening suspected problem areas with a sponge prior to machining can help, as will using sharp blades, a light cut and a slow but steady feed rate.

When cutting profiles with a shaper or router, it's always better to climb cut (or back cut) if possible. *Climb cutting* means feeding the work in the direction of the cutter's rotation. This is a potentially dangerous operation, though, because the workpiece will want to fly forward—out of your hands—if you're using a shaper or router table. On a shaper, it would be foolhardy even to attempt this operation without a power feed; on a router table, you still need to use great care (a power feed would be preferable here also). If you are using a hand-held router, the router will try to self feed; you have to restrain it. When you're climb cutting with a hand-held router, you should take a number of light passes rather than one pass to finished profile to avoid having the bit catch and pull your router across your work.

Handplaning vs. sanding: When preparing a surface for finishing, I prefer to handplane vertical grain and to sand flatsawn boards. Vertical grain can certainly be sanded too, but the plane is faster and gives a superior surface. The disadvantage of sanding Douglas-fir (whether flatsawn or quartersawn) is that you're likely to get a bumpy effect because of the difference in hardness between earlywood and latewood. It's extremely difficult, however, to plane flat grain cleanly and without tearout because of the constantly changing grain direction. Wetting the surface of the wood, as when using a power planer, will help some. A well-tuned plane with a finely honed blade is a must, but it's still not an easy go.

A handplane with a blade angle of 45° to the work is normally recommended for softwoods, including Douglas-fir. In contrast to its positive effect on planing hardwoods, increasing the blade angle to 50° or 55° (as you might if you make your own planes) actually has a slightly negative effect on controlling tearout in Doug-fir. Doug-fir also responds poorly to a scraper, although areas can be leveled out somewhat in preparation for sanding.

Douglas-fir has a propensity to lift and splinter when the grain runs out to an edge. Handplaning rather than sanding an edge can help to control splintering. When sanding an edge, wrap the sandpaper around a block so that the edge of the paper can't catch on a point of dark latewood and pull up a splinter. For the same reason, if you're using a palm sander, orient it so the turned-up edges of the sandpaper held by the sander are in line with the edge you're sanding.

Despite all precautions, though, edges still seem to splinter and usually when least expected. Perversely, they always seem to surprise me on my last pass with sandpaper prior to finishing. Luckily, splinters are easy to repair. If a splinter is still intact (and hasn't lodged under your fingernail or in your palm) it can easily be glued back into place and clamped with masking tape. When the splinter is missing or so damaged that it can't be replaced, the edge can still be built back up with five-minute epoxy. Run masking tape along one face to form a dam, and work the epoxy into the damaged area. When the epoxy has cured, file and sand it to match the contour. The clear repair will become practically invisible.

matic contrast in density (and color) between its earlywood and latewood. The garish appearance of Doug-fir plywood is a result of the exaggeration of this contrast, which occurs when the log is rotary cut. When flatsawn, this fluid, meandering pattern is far subtler and more attractive—though still bold—resembling figured oak.

At the opposite end of the spectrum from rotary cut is quarter-sawn Douglas-fir, or VG (vertical-grain) fir as it's called in the Pacific Northwest (see the photos on the facing page). When it's quartersawn, the radial surface of the wood shows, displaying neatly parallel lines of light and dark grain (earlywood and latewood). The effect is so dramatically different from either flatsawn or rotary cut that the wood seems to have undergone a complete metamorphosis, having changed quickly from a splashy madras sportcoat into a formal, pinstripe suit.

The contrast between earlywood and latewood gives the woodworker a number of design possibilities, but it also poses some pragmatic problems both in machining and finishing the wood. In machining, the varying degrees of drag on bit or blade (due to the differing density of the wood) sometimes causes chatter or tearout. Also, blades must be kept especially sharp or crosscut edges may fray, creating a ridge of needle-sharp splinters. And being stabbed by a Douglas-fir splinter can be a prolonged, unpleasant experience, because even a minute sliver will cause a wound that will

fester and heal exceptionally slowly. Although the exact cause of this reaction is unknown, it's suspected that a terpene in the wood is a histamine sensitizer. (See the sidebar below for an in-depth look at working and finishing Douglas-fir.)

From practical and economic perspectives, Douglas-fir has a lot to offer the furnituremaker, which is something those in the Northwest have known for awhile. It's time woodworkers in other parts of the country added it to their palette of furniture woods. Until recently, it's been readily available in virtually any width, length and thickness, and at a relatively moderate cost. Old-growth Douglas-fir has become a bit scarcer and pricier in the last few years, due to both log exports and logging bans, but there are still vast forests of the timber. Woodworkers should embrace rather than deny the fact that the old-growth forests are a finite resource and should treat this great wood with the same veneration furnituremakers of old had for Cuban mahogany and Brazilian rosewood. As long as it's thought of as merely a construction timber, high-volume appetites will continue to devour the remaining stands of these centuries-old giants. Conversely, if woodworkers give Douglas-fir its due, elevating its status in the hierarchy of woods, it should be around for many years to come. □

Jon Arno is a wood technologist and consultant in Troy, Mich.

Finishing: Most softwoods have either a pale-yellow to white color, like pine, hemlock and spruce, or a reddish-brown color like red cedar and redwood. Douglas-fir is unique among the softwoods for its orangish color, and in my finishing, this is the color I try to preserve and enhance. Staining Doug-fir is completely out of the question as far as I'm concerned. I can't imagine what I'd possibly try to make it look like, and it seems an insult to try to make something that's fine in its own right look like something it's not.

To my eye, oil is the definitive finish for fir. Yet a straight oil finish on fir tends to take too long to build and looks too dark and dry. To avoid these shortcomings, I use several coats of dilute shellac or lacquer first, which seals the wood and allows the subsequent oil coats to build faster without overly darkening the wood. The object is for the sealer to penetrate the wood rather than build on the surface. A sealer and three coats of oil will give the same surface luster as six or more coats of oil alone. I prefer lacquer to shellac as a sealer because of shellac's tendency to remain sticky if contaminated with water. I dilute one part regular lacquer with three parts thinner and brush on two coats, sanding with 320-grit or 400-grit sandpaper between coats. Allowing the sealer to dry for one day before oiling is sufficient.

I prefer a light-bodied oil like Watco tung oil, which dries and builds too quickly for my taste. The first coat is brushed on and allowed to sit about half an hour—long enough to penetrate but not to become tacky—before wiping off. A day later, a second coat is rubbed on with steel wool and wiped off immediately. Subsequent

coats are applied in the same way at one day intervals. Try not to wipe off the oil too thoroughly because you want to leave a very thin film that will polymerize. Polymerization is responsible for the low luster and depth that are the hallmarks of a good oil finish. Using a clean, dry rag may defeat your purpose by removing all the oil. A moderately (not saturated) oily rag is better. Make sure you dispose of the rags properly to prevent spontaneous combustion.

After three coats of oil, the wood starts to acquire a glow; the color deepens rather than darkens, and its signature orange color and graphic grain pattern start to give this most utilitarian of softwoods an exotic panache. For a soft, pale, ethereal effect, skip the oil and apply several coats of wax over the sealer instead.

In the real world of budgets and deadlines, it's not always possible to use our favorite, perfect finish, and humbler alternatives must be substituted. Several coats of sealer alone can provide an adequate finish that's resistant to dirt and fingerprints and kind to the natural color of the wood. Lacquers, varnishes and polyurethanes can all be used on fir, though I don't like the coated, superficial look they impart. There are other finishes for floor and marine applications, but I've chosen to ignore these, both out of prejudice and ignorance. After all, we're talking about fir and furniture, and it's about time we invite this neglected orphan into the family of fine furniture woods. □

Curtis Erpelding is a professional woodworker and designer in Port Orchard, Wash.

Photo: Steven Young



Clean design and crisp joinery distinguish Curtis Erpelding's work in Doug-fir. To enhance its orange color, he sealed this piece with dilute varnish sealer, and then finished it with four coats of Danish oil.



A veritable tableau of Northwestern woods, Tom Conroy's blanket chest is an elegant and articulate (though silent) case for the use of softwoods in furniture. The legs and frame for the lid are black-lacquered alder; the rails and the top panels are Doug-fir rescued from a stack headed for a door factory. The side panels, (the front one featuring Tracy Powell's fish carving) are planks of western red cedar that Conroy found at a shingle mill. The handle is made of Pacific yew.

Douglas-fir...niture

by Vincent Laurence

It's always seemed a travesty to me that trees of great beauty and stature, such as old-growth Douglas-fir, should be reduced to such prosaic and merely utilitarian objects as sheets of plywood or 2x4 studs. These centuries-old (and in some cases, millenia-old) giants deserve a better fate.

The late George Nakashima spoke of giving trees a "second life" as dignified as their first, of honoring the *kodama*, or the spirit of the tree. Creating fine furniture was his way of doing that, and although much of his work was in temperate hardwoods from the Pennsylvania woods near where he worked, he grew up in the Pacific Northwest and revered the Douglas-firs that, in his words, "punctured the heavens."

The furniture makers whose work is featured on these two pages have honored the Douglas-fir. A common thread ran through the conversations I had with each of them, a conviction that Douglas-fir is a fine furniture wood, a material precious both for its innate beauty and for its increasing scarcity. □

Vincent Laurence is an assistant editor at FWW.



The calm character and muted color of Douglas-fir gave Marie Hoepfl's bookcase/hutch the quiet grace and warmth she was looking for. Hoepfl used solid wood throughout, except for the door panels and top, which were laminated like plywood; the curved top consists of 11 plys. Woods used in the marquetry include satinwood, poplar, holly and orangewood.



His great-grandfather's violin needed a home, and Mark Minor wanted the cabinet to harmonize with its contents. Minor chose Douglas-fir for its similarity to the violin's spruce top and rosewood for the drawer front as a counterpoint to the instrument's chin rest, fingerboard and tuning pegs. The redwood door panels were chosen for their color and for the textural similarity to the Doug-fir.

Photo: Sean Sprauge



Inspired by the rich texture and patina of a 40-yr.-old Douglas-fir cabinet made by James Krenov, Austin Meinert resolved to build something very fine from what's normally considered a cheap, construction-grade wood. The sides and top are constructed of laminated plys, with bookmatched Doug-fir on the outside and Alaskan yellow cedar on the inside. The writing surface, drawer sides and web frame are maple. Carving the stylized flowers and foliage (detail, right) required patience and very sharp tools.





PORTER-CABLE
FREE* OAK STORAGE CASE



WHEN YOU BUY
ANY EIGHT
PORTER-CABLE
ROUTER BITS!

*SENT TO THE END USER BY PORTER-CABLE. A \$39.95 VALUE, CALL FOR DETAILS.

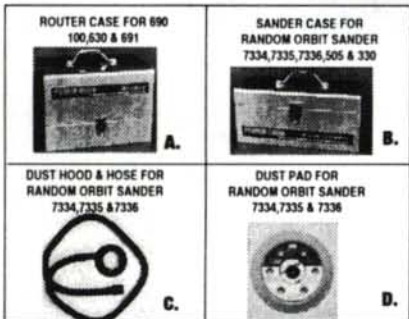
Straight Bits				Roundover Bit			
PC#	Dia.	Flute	Price	PC#	Radius	Price	
43718	1/4"	7/8"	\$8.15	43085	3/16"	\$18.95	
43312	3/8"	1"	8.50	43402	1/4"	19.30	
43318	1/2"	1"	9.30	43086	5/16"	19.65	
43327	9/16"	1"	10.60	43405	3/8"	19.65	
43333	5/8"	1"	10.35	43408	1/2"	19.95	
43052	3/4"	1"	10.65				
Laminate Trim Bits				Beading Bit			
PC#	Dia.	Flute	Price	PC#	Radius	Price	
43252	1/2"	1/2"	\$9.85	43410	1/4"	\$18.35	
43731	1/2"	1"	10.75	43413	3/8"	19.65	
				43416	1/2"	21.65	
Rabbeting bit				Dovetail Bits			
PC#	Cut	Flute	Price	PC#	Dia.	Flute	Price
43082	3/8"	1/2"	\$16.50	43705	1/2"	7/16"	\$10.70
				43775	3/4"	29/32"	20.97

ALL BITS 1/4" SHANKS
CALL FOR PRICES ON OTHER BITS NOT LISTED

PORTER-CABLE
ROUTER & SANDER KITS

- 690K- 690 ROUTER, EDGE GUIDE & CASE \$179.95
- 7335K- 7335 5" RANDOM ORBIT SANDER, STEEL CASE & DUST COLLECTION HOOD. \$189.95
- 7336K- 7336 6" RANDOM ORBIT SANDER, STEEL CASE & DUST COLLECTION HOOD. \$194.95

PORTER-CABLE



- A.PC# 26794 ROUTER CASE \$29.95
- B.PC# 47334 SANDER CASE 23.95
- C.PC# 73333. DUST PICKUP HOOD & HOSE 23.95
- D.PC# 14700 DUST COLLECTOR PAD 5" 13.95
- D PC# 17000 DUST COLLECTOR PAD 6" 16.95

FREE FREIGHT ON ORDERS OVER \$50.00

SANTA ROSA TOOL & SUPPLY

1651 PINER RD. • SANTA ROSA, CA 95403
IN CALIF. OUTSIDE CALIF.

800-464-8665 800-346-0387

OR FAX US YOUR ORDER
800-545-3705

ALL OFFERS & PRICES SUBJECT TO CHANGE WITHOUT NOTICE.
VISA • MASTERCARD • DISCOVER • AMERICAN EXPRESS
OFFER EXPIRES JUNE 30, 1992

READER SERVICE NO. 121

THE REAL BUILDERS' SUPPLY FOR OVER 200 YEARS.

COMPLETE LINE OF
Trakita
TOOLS
NOW AVAILABLE AT
DISCOUNT PRICES
OVER 140 MODELS IN STOCK!

Since 1781

Bethel Mills

Rock Solid Yankee Tradition.
Rock Bottom Yankee Prices.

- BO5000
New! 5" Random Orbit Sander \$ 59
- 2708W
8 1/4" Table Saw \$255
- 2012
12" Planer \$469
- 5007NB
7 1/4" Circular Saw \$105
- 9036
New! Finishing Sander \$ 62

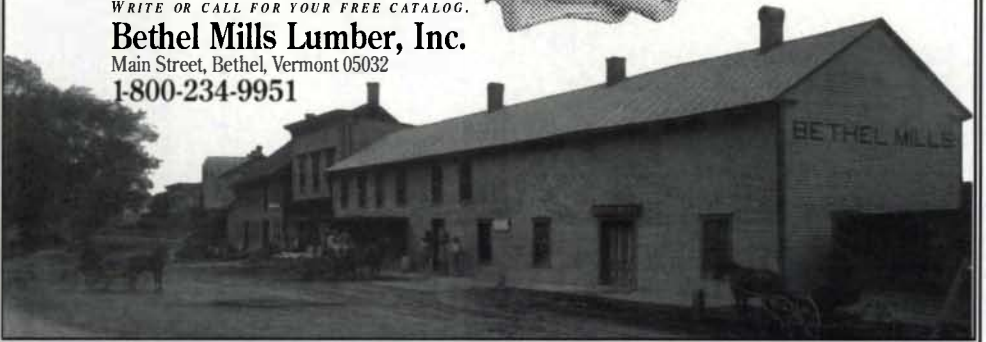
- Special!
LS1011
10" Compound Miter
With 50 Tooth Carbide Blade
\$429
While Supplies Last

- 6095DW
Cordless Drill Kit
With Keyless Chuck \$135
 - 5103NA
13 1/8" Circular Saw \$359
 - 7104L
Chain Mortiser \$899
- LARGE INVENTORY OF PARTS
AND ACCESSORIES



WRITE OR CALL FOR YOUR FREE CATALOG.

Bethel Mills Lumber, Inc.
Main Street, Bethel, Vermont 05032
1-800-234-9951



READER SERVICE NO. 88

ROUTER TABLES • INCRA •

FREE CATALOG

OVER 2000
ROUTER BITS,
SHAPER CUTTERS
& ACCESSORIES

Send today for your FREE copy of our 64 page catalog. The industry's largest selections of American made bits. The finest quality backed by the best guarantee in the business! Over 600 photos and technical illustrations. Over 600 new items. Many exclusives and hard to find items!



To Order Call TOLL FREE
1-800-872-2511 or write:



124 PARKER COURT, P.O. BOX 1099
CHARDON, OHIO 44024

COUNTER SINKS & DRILLS

READER SERVICE NO. 84

DROP-IN-THE-BUCKET™
"THE INNOVATIVE STORAGE SYSTEM"

PERFECT FOR:

- Craftspersons,
 - Home Owners,
 - Boat Owners,
 - Handymen,
 - Tradesmen,
 - Carpenters,
 - Fishermen,
 - Mechanics,
 - Plumbers.
- ANYONE WITH SOMETHING TO STORE!



ORGANIZES:

- Nuts, Bolts,
 - Screws, Nails,
 - Staples, Tacks,
 - Pipe Fittings,
 - Fasteners,
 - Washers,
 - Tools,
 - Crafts,
 - Toys.
- SMALL PARTS OF ANY KIND!

DROP-IN-THE-BUCKET™ Consists of a "Standard" 5 gal. Bucket with Lid and Handle, Plus 5 Custom-Designed Interlocking Stackable Inserts. OUR INSERTS WILL FIT MOST 5 GALLON BUCKETS. COMPLETE SYSTEM - \$19.95 + \$3.50 Shipping
Five Inserts Only - \$16.95 + \$3.00 Shipping
Order 24-Hours a Day - 7 Days a Week • MC and VISA Accepted

ORDER FROM: JOURNEYMAN PRODUCTS, LTD.
Call: 1-800-248-8707
P. O. BOX 4472 Dept. W, Annapolis, MD 21403

READER SERVICE NO. 41

— FOR WOODWORKERS —

Achieve

THE ULTIMATE FINISH

1500 — 12,000 GRIT CLOTH BACKED SPECIAL ABRASIVE.
Produces the clearest, smoothest surfaces with any finish.

9 grits - 9 3"x5" sheets NOT SANDPAPER
Lasts a very long time and is washable.

FAST — EASY TO USE
KIT: \$15.00 PPD

To Order, Call or Write
The Berea Hardwoods Co.
125 Jacqueline Drive
Berea, OH 44017
Master Card
Visa
1-800-937-2373

READER SERVICE NO. 152

SAVE MONEY!

KILN DRY LUMBER



MAKE MONEY!

Kiln Dry for others. As the nation's largest manufacturer of dehumidification Dry Kilns, we can supply you with the same type equipment used by many of the major firms.

Call or write today for free facts that will help you make and save money.



207-989-4335

P. O. Box 1107, Bangor, Maine 04401

READER SERVICE NO. 3

NOVA 4 JAW SELF CENTERING CHUCK



The NOVA Chuck combines all the advantages of 3 and 4 jaw chucks as well as combination chucks while solving the disadvantages of them all.



Advantages:

- Wide Jaw Movement
- Same Jaw used for Expansion or Contraction
- Quick 2-way Lever Action
- Holds Square Stock
- All Machined Steel
- Safe-Easy to Use
- Optional Jaws Available



Sizes Available:

- Sears 3/4-16
- General 260 1 1/4-8
- Delta/Rockwell 1"-8
- Shopsmith 5/8" plain
- Powermatic 90 1 1/2-8

PRICE \$159.95
plus \$3.75 shipping

THE WOODTURNERS CATALOG

Send \$2.00 for our 48 page color catalog \$2.00 refunded with order/free with purchase

CRAFT SUPPLIES U.S.A.

1287 E. 1120 S.
PROVO, UT 84606
(801)373-0917 Fax (801)374-2879



READER SERVICE NO. 201



NEW FROM JET

JCS-10 TABLE SAW



W/ BIESEMEYER FENCE \$1099

- 10" PLADE
- 2 HP MOTOR
- BIESEMEYER #50



JCS10A — W/BIESEMEYER #40	\$998
JCS10 — W/ JET FENCE	849
JCS10A — W/ JET FENCE & MTR. CVR.	898
JBS14CS — 14" BANDSAW	438

FREIGHT PRE-PAID TO MOST AREAS. CALL US FOR DETAILS.

NEW FROM JET



JWL-1236 WOOD LATHE

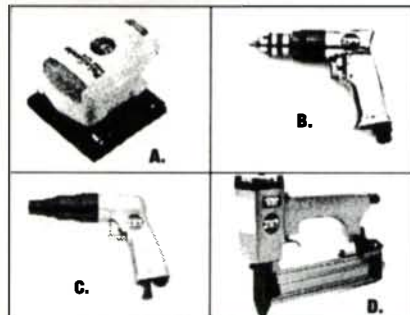
- HEAVY-DUTY CAST IRON LATHE
- VARIABLE SPEED
- 3/4 HP, 1PH
- 550-3,000 RPM

\$525



JJ6CS — 6" JOINTER	\$438
DC650 — 1 HP DUST COLLECTOR, 650CFM	219
DC1200 — 2 HP DUST COLLECTOR, 1200CFM	399

NEW FROM JET



A. JSG9613 — 20,000 RPM AIR SANDER	\$79.95
B. JSM705 — 3/8" REV. AIR DRILL, 1800 RPM	44.95
C. JSM804 — POSITIVE CLUTCH SCREWDRIVER	64.95
D. JDPN6072 — 3/8"-1-1/4" BRAD NAILER	129.95

OVER 100 NEW AIR TOOLS INCLUDING A COMPLETE LINE OF NAILERS & STAPLERS! COMPLETE LINE OF JET PRODUCTS AVAILABLE. CALL US FOR BEST SELECTION, BEST PRICE!

SANTA ROSA TOOL & SUPPLY

1651 PINER RD. • SANTA ROSA, CA 95403
IN CALIF. OUTSIDE CALIF.

800-464-8665 800-346-0387

OR FAX US YOUR ORDER
800-545-3705

ALL OFFERS & PRICES SUBJECT TO CHANGE WITHOUT NOTICE.
VISA • MASTERCARD • DISCOVER • AMERICAN EXPRESS
OFFER EXPIRES JUNE 30, 1992

READER SERVICE NO. 122



How Smooth Does Our Teflon®-Coated Saw Blade Cut?

The WIZARD ELITE™ cuts so smooth the wood has a baby-smooth finish.

Coated with non-stick DuPont Teflon to keep the blade clean and free of build-up.

WIZARD ELITE features specially sharpened carbide tips to provide smoother and easier cuts in hard or soft wood.

Try WIZARD ELITE and "feel" what we mean.



FREE SHARPENING

Return to factory within 1-year of date of purchase. Coupon enclosed with blade.

If you're not 100 percent satisfied, we'll refund your money with no questions asked. For more information and a dealer near you call: 800/828-9000 or 716/778-8588.



UNITED STATES SAW

The Professional's Choice
Burt, New York 14028

Teflon is a registered trademark of the DuPont Corp.

READER SERVICE NO. 71

Fine Building

SAME DAY SHIPPING
FREE FREIGHT!

WE'LL BEAT ANY AD PRICE GUARANTEE

ESD
C4 NEW Panel Saw \$849
H5 64' capacity panel saw 1249

ITW Paslode
IM-325 Impulse Framing Nailer \$649
IM-250F trimpulse finish nailer 649

WEDGE
SL224 NEW! 24" Rail w/Module \$54
SMARTLEVEL
SMPR2 2' pro rail w/mod w/cs 94
TR-2 2' level w/mod w/cs 104
TR-4 4' level w/mod w/cs 124
PR4 4' Pro Rail w/mod w/cs 114
PR78 78" Pro Rail w/mod w/cs 148

JET
JBS-14CS 14" Wood Bandsaw \$449
JBS-18 18" bndsw 2hp w/stand 899
WBS-20 20" w/dctng bandsaw 1999
OVS-10 oscillating spindle sdr 1749
DC-650 1 HP Dust Collector \$229
DC-1200 d. col. 2 hp/1200 cfm 429
DC-1900 d. col. 3 hp/1900 cfm 599
EHV-6 6x89 edge sander 629
JJ-6CS 6" Long Bed Jointer \$449
JJ-4 4' deluxe jointer 349
JJ-8CS NEW 8" long bed jointer 999
JJ-12 12" long bed jointer 2599
JTS-10JF 10" Saw With Jet Fence \$519
JCS-10 10" cab saw w/Jet Inc 929
JTS-12 12" table saw 1.5 hp 599
JDP-14M 14" bench 16 s. press 319
JDP-17M 17" floor 16 s. press 399
JDP-20MF 20" floor 12 s. press 689
JWB-37P 37" x 60" Wide Belt Sander \$10,649
JWB-25P 25x60 w. belt sdr 7769
JWB-13P 13x60 w. belt sdr 4495
JWB-25PH 25x75 w. belt s. 11769
JWB-37PH 37x75 w. belt s. 12499
JWL-1236 12" VS Wood Lathe w/Stand \$549

Kaddies, Inc.
TK Portable Tool Storage System On Wheels \$184

PORTER-CABLE
7334 Random Orbital Sander w/Case & 2 Rolls Paper \$154
7334 random orbital sander 122
7335 5" VS random sander 132
7336 6" VS random sander 138
73333 NEW sander dust kit 25
505 1/2 sheet finish sander 118
330 speed bloc finish sander 59

RYOBI
97310 Laminate Trimmer Kit \$188
352 3x21 sander with bag 138
360 3x24 sander with bag 184
362 4x24 sander w/bag 189
503 3x24 wormdrive w/bag 345
504 3x24 wormdrive sander 335

RYOBI
RE600 3HP VS Plunge Router \$209
TSS220 NEW 8-1/2" comp saw 449
JP-155 6-1/8" jointer/planer 299
RA-200 8-1/4" radial arm saw 248
TS380 14" miter saw 399
TS25410" mitre saw w/c.t. blade 209
BT2500 10" bench table saw 299
RS115 4-1/2" random orb sander 75
WC101 wood carver blade 40

RYOBI
555 Plate Jointer With Case & 500 Assorted Biscuits \$184
555 plate jointer w/case 169
5556 adjustable tilt fence 49
5116 16" Omni jig 260
7536 2-1/2 hp router 199
7537 2-1/2 D hndl router 209
7399 drywall cutout 79
7310 laminate trimmer 89
9118 porta plane kit w/cut 199

RYOBI
9345 6" Saw Boss Kit \$124
345 6" Saw Boss w/c.t. blade 104
314 4-1/2" trim saw 128
9314 4-1/2" trim saw kit 148
9315-1 7-1/4" saw w/case, ct bl 138
7549 top handle VS jig saw 144

RYOBI
7539 NEW 3-1/4 HP 5 Speed Plunge Router \$265
690 1-1/2 HP router 132
691 1-1/2 hp D hdl router 144
696 router-shaper table 124
695 router table w/router 204
7518 3-1/4 hp 5speed router 265
7519 3 hp production router 224
7538 3-1/4 hp plunge router 224

RYOBI
9637 Electronic V.S. Tiger Saw Kit \$139
9647 tiger cub with case 118
693 1-1/2 hp plunge router 164
6931 plunge router base 78
97750 1/2" hammer drill kit 159

RYOBI
22-540 12" Portable Planer w/Dust Collector Chute \$409
28-180 NEW bench bandsaw 169
43-505 NEW router/shaper 285
11-090 NEW radial drill press 285
28-245 14" bandsaw w/lamp 599
40-640 NEW! 20" VS Scroll Saw \$329
46-700 NEW 12" vs wood lathe 429
23-700 wet/dry grinder 159
11-950 8" bench drill press 145
40-560 16" 2 speed scroll saw 184

RYOBI
7334 Random Orbital Sander w/Case & 2 Rolls Paper \$154
7334 random orbital sander 122
7335 5" VS random sander 132
7336 6" VS random sander 138
73333 NEW sander dust kit 25
505 1/2 sheet finish sander 118
330 speed bloc finish sander 59

BAUER
79

PONY AIR
LPN672 Air Palm Nailer With Glove \$94
Drives 6d-50d nails!

fREUD
JS100 Jointing System W/Case & 500 Assorted Biscuits \$179
JS100 plate jointer w/case 164
FT-2000E 3.25 hp vs plng rout 219
FT-2000 3.25 plunge router 184
EB-100 edge banding system 229
FRT-2000 wooden router table 169
UC-900 5 pc shaper cabinet set 349
94-100 5 pc router cabinet set 359
95-100 5 pc rtr set w/99PK 1 199
91-100 13pc 1/2" router bit set 189
90-100 15pc 1/4" router bit set 159

RYOBI
RE600 3HP VS Plunge Router \$209
TSS220 NEW 8-1/2" comp saw 449
JP-155 6-1/8" jointer/planer 299
RA-200 8-1/4" radial arm saw 248
TS380 14" miter saw 399
TS25410" mitre saw w/c.t. blade 209
BT2500 10" bench table saw 299
RS115 4-1/2" random orb sander 75
WC101 wood carver blade 40

RYOBI
555 Plate Jointer With Case & 500 Assorted Biscuits \$184
555 plate jointer w/case 169
5556 adjustable tilt fence 49
5116 16" Omni jig 260
7536 2-1/2 hp router 199
7537 2-1/2 D hndl router 209
7399 drywall cutout 79
7310 laminate trimmer 89
9118 porta plane kit w/cut 199

RYOBI
9345 6" Saw Boss Kit \$124
345 6" Saw Boss w/c.t. blade 104
314 4-1/2" trim saw 128
9314 4-1/2" trim saw kit 148
9315-1 7-1/4" saw w/case, ct bl 138
7549 top handle VS jig saw 144

RYOBI
7539 NEW 3-1/4 HP 5 Speed Plunge Router \$265
690 1-1/2 HP router 132
691 1-1/2 hp D hdl router 144
696 router-shaper table 124
695 router table w/router 204
7518 3-1/4 hp 5speed router 265
7519 3 hp production router 224
7538 3-1/4 hp plunge router 224

RYOBI
9637 Electronic V.S. Tiger Saw Kit \$139
9647 tiger cub with case 118
693 1-1/2 hp plunge router 164
6931 plunge router base 78
97750 1/2" hammer drill kit 159

RYOBI
22-540 12" Portable Planer w/Dust Collector Chute \$409
28-180 NEW bench bandsaw 169
43-505 NEW router/shaper 285
11-090 NEW radial drill press 285
28-245 14" bandsaw w/lamp 599
40-640 NEW! 20" VS Scroll Saw \$329
46-700 NEW 12" vs wood lathe 429
23-700 wet/dry grinder 159
11-950 8" bench drill press 145
40-560 16" 2 speed scroll saw 184

RYOBI
7334 Random Orbital Sander w/Case & 2 Rolls Paper \$154
7334 random orbital sander 122
7335 5" VS random sander 132
7336 6" VS random sander 138
73333 NEW sander dust kit 25
505 1/2 sheet finish sander 118
330 speed bloc finish sander 59

BLACK & DECKER
138

DEWALT
1707 8-1/2" Compound Mitre Saw \$369
1765 belt/disc sander 429
7770-10 3.5 hp 10" radial saw 899
7790 3.5 hp 12" radial saw 1199

Emqlo
AM78-HC4V 1-1/2 HP Vertical Twin Tank \$319
AM99-HC4V New 2hp ver. twin tank 389
AM-GAS gas vertical twin tank 529
AM99-HC4 2hp twin tank 379
AM78-HC4 1-1/2hp twin tank 309
AM39-HC4V 3/4hp w twin tank 299
K15A8P 1.5hp wheelbarrow 629
K2A8P 2hp wheelbarrow 679
K5GA-8P 5hp Honda whlbrrw 749
K4WA-8P 4hp Wisc whlbrrw 599
O45 3/8" x 50' Goodyear hose 20

POWERMATIC
1660760 66 Saw 3 HP W/50" Biesemeyer \$1799
1270100 NEW #27 shp/3hp 1pr 1929
1000099 #100 planer/12"/2hp 2149
1800205 5hp, 18" pl. w/knife gr 4999
1500040 6" jointer 3/4hp 1 ph 1199
1610050 8" jointer 1.5 hp 1ph 1549
1300134 6x48 belt/12" disc sdr 1199
1152825 15VS dr. press 3/4hp 1429
1410040 14" bndsw 3/4hp 1ph 1329
1790808 25" wide belt sdr 8399

POWERMATIC
1791000 63 Artisan Saw W/Vega Fence \$699
1791001 63 Artisan w/50" Vega 799
1791020 3/4" wood shaper 1hp 479
1791010 15" scroll s. w/blower 159
1791030 14" bench drill press 329
1791040 14" floor drill press 369
1791050 6" jointer with stand 499
1791060 14" bandsaw w/stand 599
1791070 NEW 1-1/2hp dust coll 399

HITACHI
C8FB 8-1/2" Compound Mitre Saw \$439
P12RANEW 12" planer/6" jointer 829
P12R NEW 12" portable planer 699
D100DFK 9.6v VSR dr kit 139
C15FB 15" mitre saw 379
C12FA 12" mitre saw 299
C10FA 10" mitre saw 269
C7BD 7-1/4" saw w/case 129
M12V 3-1/4 hp VS pl. router 224
TR12 3 hp plunge router 179
CB75F resaw bandsaw 1629
F1000A 12" planer/6" jointer 1529

HITACHI
C8FB 8-1/2" Compound Mitre Saw \$439
P12RANEW 12" planer/6" jointer 829
P12R NEW 12" portable planer 699
D100DFK 9.6v VSR dr kit 139
C15FB 15" mitre saw 379
C12FA 12" mitre saw 299
C10FA 10" mitre saw 269
C7BD 7-1/4" saw w/case 129
M12V 3-1/4 hp VS pl. router 224
TR12 3 hp plunge router 179
CB75F resaw bandsaw 1629
F1000A 12" planer/6" jointer 1529

HITACHI
C8FB 8-1/2" Compound Mitre Saw \$439
P12RANEW 12" planer/6" jointer 829
P12R NEW 12" portable planer 699
D100DFK 9.6v VSR dr kit 139
C15FB 15" mitre saw 379
C12FA 12" mitre saw 299
C10FA 10" mitre saw 269
C7BD 7-1/4" saw w/case 129
M12V 3-1/4 hp VS pl. router 224
TR12 3 hp plunge router 179
CB75F resaw bandsaw 1629
F1000A 12" planer/6" jointer 1529

HITACHI
C8FB 8-1/2" Compound Mitre Saw \$439
P12RANEW 12" planer/6" jointer 829
P12R NEW 12" portable planer 699
D100DFK 9.6v VSR dr kit 139
C15FB 15" mitre saw 379
C12FA 12" mitre saw 299
C10FA 10" mitre saw 269
C7BD 7-1/4" saw w/case 129
M12V 3-1/4 hp VS pl. router 224
TR12 3 hp plunge router 179
CB75F resaw bandsaw 1629
F1000A 12" planer/6" jointer 1529

Panasonic
EY5718C 9.6 V, VSR Drill w/Case & 2/Batteries \$149
EY62058C 12v, VSR dr w/case 179
EY62008C 12v 1/2" cds w/case 179
EY503B 12v 2.4v 2 sp. screwdriver 69
E9590H carrying case 20
EY62078C 12v, 1/2" VSR dr w/cs 219
EY69008C 12v, 3/8" hamr dr. kit 205

Milwaukee
6527 NEW! Variable Speed Super Sawzall \$165
6125 5' random orbital sander 124
5371-1 1/2" hammer drill kit 189
5365-1 Hawk 1" SDS rtry. h. kit 325
5353 Eagle 1-1/2" rtry hmr kit 525
5660 1-1/2 hp 10 amp router 185
5680 2 hp 12 amp router 215

Milwaukee
6507 V.S. Sawzall With Case \$139
6508 VS sawzall w/case 139
6528 VS super sawzall 154
5397-1 3/8" hammer drill kit 169
5375-1 1/2" hammer drill kit 169

Milwaukee
0402-1 12 Volt VSR Cordless Kit W/Keyless Chuck \$168
0399-1 12 Volt VSR cds drill kit 159
0395-1 3/8" VSR cordless dr kit 154
0222-1 3/8" VSR 3.5 amp drill 100
0234-1 1/2" VSR 0-850 magnum 122
0244-1 1/2" VSR 0-600 magnum 122
1676-1 2 sp. hole hawg kit 249

Milwaukee
6368 7-1/4" Saw W/C.T. Blade, Saw and Fence \$135
6305 6-1/4" cds circular saw 174
6546-1 2 sp cds screwdriver 84
6753-1 0-4000 VSR screwdriver 88
6750-1 5 amp VSR screwdriver 94
0375-1 3/8" close quarter drill 128

Milwaukee
3107-1 VS Right Angle Drill Kit \$204
6145 4-1/2" angle grinder 99
5455 7" 1750 rpm polisher 134
6256 VS top handle jig saw 139
6014 1/2 sheet finishing sander 119
8975 dual temp. heat gun 59

Milwaukee
6145 4-1/2" angle grinder 99
5455 7" 1750 rpm polisher 134
6256 VS top handle jig saw 139
6014 1/2 sheet finishing sander 119
8975 dual temp. heat gun 59

BIESEMEYER
50L12 50" Commercial w/12" Left \$295
52L12 52" homeshop fence 235
40L12 40" homeshop fence 209
28L12 28" homeshop fence 199

Jorgensen
8" Handscrew \$12
1 10" handscrew 13
2 12" handscrew 15
3 14" handscrew 19
4 16" handscrew 25
7224 24" l-bar clamp 17
7236 36" l-bar clamp 18
7248 48" l-bar clamp 20
7260 60" l-bar clamp 23

HITACHI
NR83A Full Head Stick Nailer \$409
NR83AA clipped head stick nlr 419
NV83A full head coil nailer 419
NV45AB coil roofing nailer 429
N5008AA 5/8" to 2" HD stapler 319
NT65A 1" to 2-1/2" brad nailer 349
NT45A 5/8" to 1-3/4" brad nailer 279

HITACHI
NR83A Full Head Stick Nailer \$409
NR83AA clipped head stick nlr 419
NV83A full head coil nailer 419
NV45AB coil roofing nailer 429
N5008AA 5/8" to 2" HD stapler 319
NT65A 1" to 2-1/2" brad nailer 349
NT45A 5/8" to 1-3/4" brad nailer 279

Paslode
649

SIoux
690 Air Palm Finish Sander \$139
658 lever type finish sander 159
8000 3/8" VSR 0-1300 drill 129
8020 electric screwdriver 189

DELTA
34-782 3 HP Unisaw w/Unifence & Motor Cover \$1799
34-782B 3hp unisaw w/Bies. 1829
34-781F 1.5hp unisaw w/Unif 1599
34-781B 1.5hp unisaw w/Bies. 1629
34-763 3hp Jet-Lock unisaw 1599
34-761 1.5hp Jet-Lock unisaw 1399
34-445 10" Contractor's Saw w/30" Unifence & EMS \$849
34-445B10" cont. saw/28" Bies. 849
34-444 10" contractor's saw 619
34-670 10" motorized table saw 229
34-330 8-1/4" bench table saw 299
33-990 12" radial arm saw 1369
33-890 10" radial arm saw 599

DELTA
28-283 14" 3/4 HP Bandsaw \$735
33-055 8-1/4" sawbuck w/legs 589
37-280 6" motorized jointer 399
37-154 6" jointer, DJ-15 w/std 1089
17-900 16-1/2" floor drill press 399
34-080 10" mitre saw 199

DELTA
43-375 3 HP HD Two Speed Shaper \$1679
22-66213" planer w/stand&ems 1179
31-730 6" belt/12" disc sander 1149
37-350 8" jointer, DJ-20 w/std 1499
46-5415 12" V.S. wood lathe 1499
40-601 18" V.S. scroll saw 719

DELTA
36-220 10" Compound Mitre Saw \$238
14-600 NEW hollow chisel mort 449
50-181 2 hp dust collector 418
50-180 1 hp dust collector 418
50-179 3/4 hp dust collector 338
34-897 50" Delta unifence 289
34-915 30" Delta unifence 229
32-100 plate jointer 269

DELTA
31-380 4" X 132" Edge Sander \$1449
34-995 3 phase stock feeder 829
34-994 1 phase stock feeder 869
34-985 1 phase stock feeder 489
20-150 14" cut-off saw 249

DELTA
36-755 10" Cabinet Saw \$949
43-355 1-1/2HP 3/4" wood shpr 729
36-751 10" cab. w/30" Unifence 1129
36-752 10" cab. w/50" Unifence 1229
70-200 20" floor drill press 829
43-275 Onsruder#2003 Inv. rtr 2899

DELTA
36-755 10" Cabinet Saw \$949
43-355 1-1/2HP 3/4" wood shpr 729
36-751 10" cab. w/30" Unifence 1129
36-752 10" cab. w/50" Unifence 1229
70-200 20" floor drill press 829
43-275 Onsruder#2003 Inv. rtr 2899

DELTA
36-755 10" Cabinet Saw \$949
43-355 1-1/2HP 3/4" wood shpr 729
36-751 10" cab. w/30" Unifence 1129
36-752 10" cab. w/50" Unifence 1229
70-200 20" floor drill press 829
43-275 Onsruder#2003 Inv. rtr 2899

DELTA
36-755 10" Cabinet Saw \$949
43-355 1-1/2HP 3/4" wood shpr 729
36-751 10" cab. w/30" Unifence 1129
36-752 10" cab. w/50" Unifence 1229
70-200 20" floor drill press 829
43-275 Onsruder#2003 Inv. rtr 2899

At Fine Prices!

Emglo

BOSCH
1370DEVSK
6" H.D. Random Sander Kit
\$259

BOSCH
3272 3-1/4" planer 4.2 amps **89**
1608U underscribe lam. trmr **139**
1609KX laminate trimmer kit **209**
1195VSR 3/8" 6amp hmr drill **139**
1194VSR 1/2VSR 6amp hmr dr. **139**

Lamello
TOP 10 Plate Joiner w/Case
\$549
COBRA NEW Joiner **299**

LEIJI
D1258R-24
24" Dovetail Jig
\$319
D1258R-12 12" dovetail jig **275**
MMTA-24 24" mortise attach **175**
MMTA-12 12" mortise attach **165**
LJV instructional video **29**

HONDA
EB2200XA
2200 Watt Construction Generator
\$879
EB3500XA 3500 watt generator **1279**
EB5000XA 5000 watt generator **1669**
EB6500XA 6500 watt generator **2159**
EW171AB1 4000 watt gen./weld **1879**
EB12D 12,000 w. diesel gen **6999**

EX1000A
1000 Watt Generator
\$599
EM2200XA 2200 watt generator **919**
EM3500SXA 3500 electric start **1399**
EM5000SXA 5000 electric start **1749**
ES6500KIA 6500 electric start **2399**

KRAUSE
121482
12" Multimatic 300 lb. Multi Purpose Alum. Ladder
\$129
121499 16 foot ladder **149**
121321 12" Tri-matic ladder **95**

David White
LP6-20
20X Sight Level Package
\$199
AEL-300 auto laser system **549**
ALTP6-90018 auto lvl trmst pkg **439**
ALB-22 22 x auto level **425**
LT6-900 20 x level transit **249**
LT8-300 26 x transit **449**
LT8300P 26 x opt. transit **529**
ALTP6-900 18x auto level transit **389**
ALP6-18HD 18x auto package **375**

Makita
6095DW
3/8", VSR, W/Keyless Chuck
\$139
6093DW 3/8", VSR kit **139**
5007NBA 7-1/4" saw w/elec. brk **129**
2711 10" table saw w/brake **479**
2708W 8-1/4" table saw w/ct bl. **264**
122700A porta table for 2708W **219**
LS1030 10" mitre saw **229**
2012 12" port. planer w/dust chl **469**
LS1011
10" Compound Mitre Saw
\$439
3612BR 3 hp plunge router **165**
9820-2 blade sharpener **199**
HP2010N 3/4", VSR hammer kit **165**
JR3000V VS recip. saw kit **128**
1900BW 3-1/4" planer w/case **118**
2040 15-5/8" stationary planer **1369**

Qual-Craft
2200 Pump Jack
\$59
2201 top brace **21**
2203 guard rail holder **23**
2204 work bench **41**
25100 adj. wood roof bracket **16**
2601Q NEW wall jack **119**

Elu
3338
2-1/4 HP Electronic VS Plunge Router
\$259
3304 1hp VS plunge router **159**
2721 1.5hp fixed base router **139**
1186 3/8" VS 5 amp Holgun drill **99**
1316 1/2" VS 5 amp Holgun drill **109**
3380
Jointer/Spliner With Case
\$259
3375 3-1/8" universal planer **169**
4024 3x21 VS sander **169**
4029 4x24 sander **299**
4015 1/2 sheet finish sander **129**

Telpro Inc.
PANELIFT™ Drywall Lift
\$449

SKIL
134

AEG
VSRE-500K
5" VS Random Sander w/Case
\$154
VSRE-600K 6" random sander kit **159**
AVSR-500S crdlss rand. sander **229**
HBSE-75S 3x21 vs belt sander **174**
FSPE-100 barrel grip jigsaw **154**
BSPE-100K top-handle jigsaw **164**

BLACK & DECKER
2694
7-1/4" Super Sawcat W/Brake
\$138
2684 7-1/4" sawcat w/brake **128**
2685 8-1/4" sawcat w/brake **138**
2695 8-1/4" super sawcat w/br. **148**
2700 7-1/4" worm drive saw **144**
2710 8-1/4" worm drive saw **158**
79-034
#400 Workmate
\$109
2664K9 6v, 3/8 cyclone drill kit **149**
2661K 3/8 VSR 13.2 v Kodiak **249**
5991K 3/8VSR 13.2v hmrgrin **279**
2681K VSR 13.2v d. scrugun **259**

1/2" Timberwolf R. A. Drill Kit
\$289
1405 3/4" hd reversing drill **379**
1321 1/2" HD spade hndl drill **159**
1311 1/2" HD VSR Holgun drill **119**
1180 3/8" HD VSR Holgun drill **105**
2600 3/8 HD VSR drill **85**
2660 VSR drywall scrugun **85**

3034
7-1/4" Circular Saw
\$99
2037 0-4000, VSR, 5A scrugun **98**
2054 0-2500, VSR, 5A scrugun **148**
2059 0-2500, VSR, 5A tek gun **118**
2670 1/2" HD impact wrench **139**
5014
3/4" Rotary Hammer w/Case
\$169
5071 3/8" VSR hammer drill kit **139**
5073 1/2" VSR hammer drill kit **159**
5048K 1-1/2" rotary hammer kit **399**
5054K 3/4" D-Hdl. SDS hamm. kt **189**
5059K 2" rotary hammer kit **769**
5018K chipping hammer kit **429**
5021K demolition hammer kit **649**
5027 breaker hammer **1199**

1703
10" Mitre Saw With Bag & C.T. Blade
\$188
2711 industrial 1/4" sheet sand. **58**
3158K VS orbital jig saw kit **134**
3105 VS orbital cutout kit **134**
4076 Wildcat grinder 6000rpm **139**
2750 4-1/2" angle grinder **79**

DELTA
409

FUJI
#HVLP High Volume Low Pressure Sprayer
\$599
HVLP SUPER 3 turbine **649**

BOSCH
1581VS
Top Handle Jig Saw w/Case & 30 Blades
\$184
1581VS top handle jig saw **132**
1582VS barrel grip Clic jig saw **132**
1632VSK VS recip saw kit **145**
3050VSRK 3/8 VSR kit w/2 batt **129**
3258 3-1/4" power plane **128**
1654 7-1/4" saw w/ct blade **118**

3283DVS
Dustless Random Orbital Sander
\$104
3283DVSK New 5" random kit **124**
1348AE 5" elec. mini grinder **118**
1608 laminate trimmer **89**
1609 offset base laminate trmr **119**
1942 heavy duty heat gun **75**

1273DVS
4x24 V.S. Belt Sander
\$198
1273D 4x24 sander with bag **188**
1272D 3x24 sander with bag **179**
3270D 3x21 sander with bag **144**
1290D 1/2 sheet finish sander **144**

1615EVS NEW!
3-1/4 HP VS Router
\$269
1611 3 hp plunge router **198**
1604 1-3/4 hp router **129**
1606 1-3/4 hp D-handle router **159**
1609K 3 in one trimmer kit **175**

1021VSR
3/8" VSR, 0-1100 Drill
\$95
1022VSR 3/8" 0-1100 XHD VSR **109**
1023VSR 1/2" 0-550 hd VSR dr. **109**
9164VSR 3/8" 0-1000 m. midget **119**
9166VSR 1/2" 0-650m. m drill **129**

1404VSR
0-4000 Drywall Driver
\$84
1405VSR 0-2500 drywall driver **94**
1420VSR 0-4000 hd drywall dr **84**
1421VSR 0-2500 hd drywall dr **94**
1422VSRQ 0-2500 hd tek dr **114**

11212VSR
3/4" Bulldog SDS Rotary Hammer
\$199
11202 1.5 rotary hammer **429**
11214VS 1.75 VS rotary hmr **679**
11304 Brute breaker hammer **1229**
11305 demolition hmr **10** amp **699**
11216EVS SDS-max vs rot hmr **699**
11309EVS SDS-max dmol hmr **649**
11310EVS vs demolition hmr **499**

BOSCH
299

BAUER
30406
6', 300 lb Fiberglass Stepladder
\$79
30405 5' fiberglass ladder **69**
30404 4' fiberglass ladder **59**

SKIL POWER TOOLS
2736-04
12 V, 3/8" VSR Keyless Drill Kit w/2 Batteries
\$134
7484 5" random orbital sander **109**
1605 NEW plate joiner **124**
77 7-1/4" worm drive saw **145**
5550 NEW 7-1/4" circular saw **99**
5657 7-1/4" 13 amp circ. saw **119**
5660 8-1/4" 60" pro bevel saw **139**
5860 8-1/4" 60" rafter master **169**

PERFORMAX S/T
Per-ST100
Radial Saw Surface Sander
\$289
Powerfeed attachment **319**
ProMax II stationary sander **1489**
SuperMax 25" stationary sander **2269**
SuperMax 37" 37" drum sander **2995**
SuperMax 37x2" 37" drum dsndr **3495**

Dugco
Zambesi
2' x 6.5' Solid Workbench
\$799
Deluxe 1.9' x 4.7' workbench **479**
Major 2.2' x 5.5' workbench **549**
Carver 4.2' x 1.4' workbench **299**

TROJAN
TWC-24
Work Center
\$99

Porta-Nails
401P
Hardwood Floor Nailer
\$189
501 floor face nailer **189**

shop-vac
890-11
10 Gallon, 2 Stage, 2 HP By-Pass S. Steel Vac
\$289
610-50 10 gal. S.S. cont. vac **179**
750-01 300 CFM Tool Mate **249**
464-38 12 gal. poly. cont. vac **189**

HEGNER
Multi-Max 14
With Stand
\$599
Complete Line In Stock!

Radius
P10
1 Watt Communication Radios
\$169
Complete with charger & batteries. Now with 2 year warranty.

The Accu-Miter
Precision Mitre Gauge
\$149
Complete Line In Stock!

SENCO
SFN-1
1" - 2" Finish Nailer
\$278
SN-4 6d-16d frame nailer **468**
SFN-II 1-1/2 to 2-1/2 fin. nlr. **398**
SN325+ NEW 6d to 12d nailer **399**
SKS 1/4" crown finish stapler **258**
M-II 1-3/8" to 2" HD stapler **348**
LS-2 5/8" to 1" brad tacker **258**
LS-5 1" to 1-1/2" brad tacker **288**
PW roofing stapler **338**
SPS-RFR roofing stapler **338**
Not Available In All States

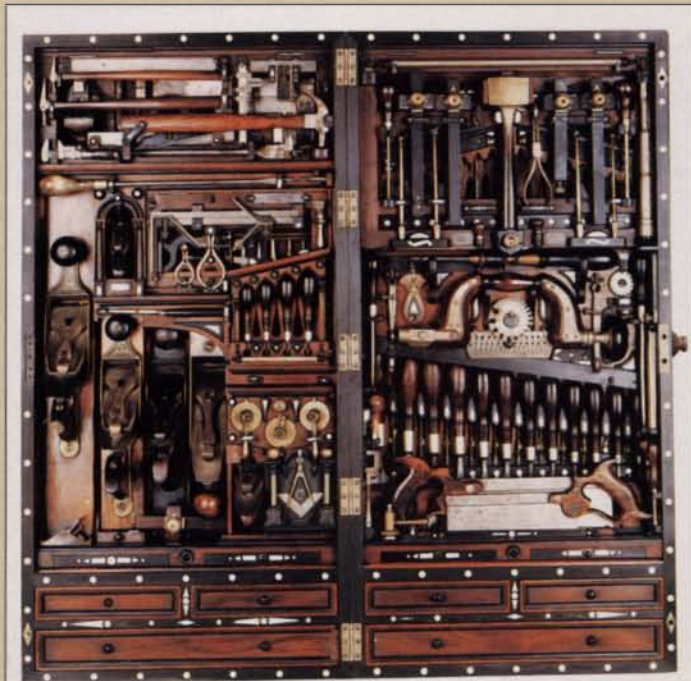
Lignomat
Mini-Ligno
Wood Moisture Meter 6-20%
\$99
Mini-ligno E 6-36% **109**

BALDOR
L3504M
1/2 HP, 1 Phase 1725 TEFC
\$105
L3507M 3/4hp 1 ph. 1725 TEFC **125**
L3506 3/4hp 1 ph. 3450 TEFC **130**
L3510M 1hp 1 ph. 1725 TEFC **140**
L3509M 1hp 1 ph. 3540 TEFC **160**
L3514M 1.5hp 1 ph. 1725 TEFC **175**
L3513M 1.5hp 1 ph. 3540 TEFC **195**
L3516TM 2hp 1 ph. 1725 TEFC **195**
L3515M 2hp 1 ph. 3450 TEFC **240**

STANLEY BOSTITCH
N80S-1
16d Stick Nailer
\$369
N128-1 coil roofing nailer **409**
N80C-1 coil nailer **379**
N100S-1 6d-20d nailer **569**
N60FN 1-1/4" to 2-1/2" fin. nlr. **339**
T28-5 1-3/16" finish stapler **269**
T31-1 5/8" to 1" brad tacker **159**
T50S4-1 sheathing/deck stapler **369**
T40S2-CT roofing stapler **299**
M11FS floor stapler **549**
Nails and Staples Priced to Sell!

CALL U.S. OR CANADA FOR MIKE, TOM, ERIC, LORI, OR BRENDA!
1-800-358-3096
 Box 1716 • Grand Forks, ND • 58206
 FWW #93 May-June
 Send \$3.00 For 208 Page Catalog
 *Any comparable National ad in this issue.
 (Not applicable to liquidation sales.)
 Limited to stock on hand.
 MOST PORTABLE TOOLS SHIPPED FED-EX \$10.00 MORE
FEDERAL EXPRESS
FAX US YOUR ORDER!
1-701-746-2857
TOOL CRIB
 OF THE NORTH
 DIVISION OF **a c m e Electric**
 ** FULL LINE DISTRIBUTOR ** FREE FREIGHT IN 48 CONTIGUOUS USA ** FACTORY AUTHORIZED SERVICE ** ERRORS AND PRICES SUBJECT TO CHANGE **

From Back Cover to Poster



TOOL CHEST LEGACY

If the workmanship in a tool chest is any indication of the maker's talent, then the craftsmanship of master carpenter and stonecrafter H.O. Studley must have been awe-inspiring. In an oak chestnut box adorned with rosewood, ebony, pearl and ivory, Studley kept both tools for trade and a collection of the finest hand tools made prior to 1900, including a complete set of woodworking tools as well as machines and non-workshop tools. To pack the 300-plus tools into a case only 19 1/2 in. wide, 39 in. long and 9 1/2 in. deep, Studley devised a jigsaw-puzzle arrangement of flip-up trays, fold-out layers and hidden compartments. Master miter. Fine Handwork now owns the chest, which has been in his family since it was bequeathed to his grandfather by Studley. Handwork acquired the chest from his brother by trading a 1934 Ford sedan for it. A great trade! It would seem so fast one tool—the Stanley #1 plane housed in the ebony armoire in the upper-left part of the chest—was appraised at \$700. Handwork, a rosewoodworker, plans to sell the chest.

Now available from *Fine Woodworking* magazine

The response to *Fine Woodworking's* July/August back cover was overwhelming. So many of you called or wrote asking for a poster reproduction of the exquisite tool chest by H.O. Studley, that we decided to go ahead and print one up.

We rephotographed the chest and enlarged the photo to fill the 18" x 26" poster shown above. Seen at this size, Studley's ingenuity and workmanship is even more apparent.

The poster is printed in full color on the same book-quality stock as the *Fine Woodworking* covers. And we'll mail it to you carefully rolled to keep it suitable for framing.

It makes a great gift for you or a friend.

To order, use the coupon below or call 1-800-888-8286.

Please send me _____ copies of The Tool Chest poster at \$9.95 each, plus \$2.50 postage and handling (#180).

Name _____

Address _____

City _____ State _____ Zip _____

Payment enclosed MasterCard VISA Am. Ex.

Charge card # _____

Exp. Date _____ Signature _____

TAUNTON
MAGAZINES

...by fellow enthusiasts

The Taunton Press
63 South Main Street
Box 355PWAM
Newtown, CT 06470

PROFESSIONAL GRADE CARBIDE TIPPED SAW BLADES

Luxite blades are designed and manufactured to produce the quality cut demanded by professional and amateur woodworkers.

A CUT ABOVE THE REST—GUARANTEED

Our blades are manufactured to exact tolerances for the most demanding of applications. We back each blade with a 100% satisfaction guarantee.

ORDER TODAY

There's no need to wait for the superior Luxite cut. Your blades are in stock and ready for immediate shipment. Call us today at 1-800-OK4-SAWS.

YORK SAW & KNIFE
COMPANY, INCORPORATED
P.O. Box 733
York, Pennsylvania 17405

READER SERVICE NO. 49

MLCS, Ltd.

MAKE BEAUTIFUL RAISED PANEL DOORS WITH YOUR 1/4" or 1/2" ROUTER or WITH YOUR 1/2" or 3/4" SHAPER.

Professional production quality bit makes it quick and easy to produce matching rails and stiles — the panel raising bit with ball bearing guide makes the raised panel perfect every time.

Size & Form	Item #	Price per Set
1/4" Shank Router	#554	\$69.95
1/2" Shank Router	#882	\$79.95
1/2" & 3/4" Shaper	#1059	\$99.95

Regular value Over \$150.00

save 55%

PERSPECTIVE VIEW OF PANEL DOOR (WITH ONE RAIL REMOVED)

RAISED PANEL BIT

SUPPLIED WITH BALL BEARING

Carbide Tipped

- 2" Large Dia. (1/4" Shank)
- 3-1/2" Large Dia. (1/2" Shank)
- 4-5/8" Large Dia. (Shaper)

REVERSIBLE COMBINATION RAIL and STILE BIT

(For making matching rails and stiles in raised panel doors, etc.) Works with stock from 1 1/16" to 7/8"

CARBIDE TIPPED — TWO FLUTE

supplied with Ball Bearing

NEW 32 page CATALOG Featuring 100's of Bits & Shaper-Cutters

To order by MasterCard or Visa Toll Free
7 Day - 24 Hour Order Service, Call 1-800-533-9298 or
send check to: **MLCS, Ltd., P.O. Box 4053 F L, Rydal, PA 19046**

READER SERVICE NO. 74

The Woodworkers Source Inc.

of Kalamazoo, Michigan

GUARANTEED

LOWEST PRICES ★

FASTEST SERVICE ★

FINEST QUALITY

PRINCECRAFT

Edge Banding System

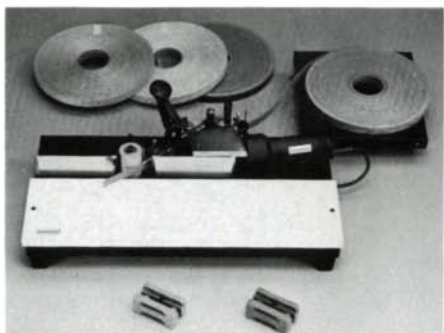
Edge Bander \$189.50

Edge Trimmer \$10.00

End Cutter \$70.00

Special price for entire system

\$239



Shown with Edge Trimmer



Shown with optional Glue Bottle

PRINCECRAFT

Biscuit Joiner

\$129.95

To Order Call Toll-Free

1-800-968-4004

Add \$6 for shipping/handling

FREE CATALOG AVAILABLE

PRINCECRAFT

Wetstone Grinder

for precision resharpening
of knives and handtools

\$175.95



Woodworkers Source • 633 Jackson Ct. • Kalamazoo, Michigan 49001

READER SERVICE NO. 34

NORTHSTATE 15" PLANERS



- Model 310: \$810
- Powerful 3 hp motor
- Cast iron construction
- Magnetic switch
- 1 year warranty
- Dust hood
- Anti-kickback
- Stand included

NORTHSTATE 10", 12", 14" CABINET SHOP SAWS

- BIESEMEYER, VEGA, EXCALIBUR fences available



- 3.5, 7-1/2 hp motors
- Magnetic controls
- Cast iron top
- Uni-lock fence
- VERY HIGH QUALITY
- \$1,150 w/std fence
- \$1,250 with 50" rip fence

- HTC MOBILE BASES

LENEAVE QUALITY—SINCE 1957



- Model 315: \$859
- Same features as the Model 310 plus:
- Table extension
- 2 speeds

NORTHSTATE CABINET SHOP SHAPER



- 3 hp/1 ph, 5 hp/3 ph
- 2 speed-reversible
- 2 spindles: 3/4", 1-1/4"
- 1/2", 1" available
- Router collets avail.
- Cast iron table
- Spring hold down & miter gauge
- Extra heavy duty
- 1 year warranty
- \$1,095
- Tilt spindle model avail.

*** FREEBORN***

Shaper cutters available
Prices Subject to Change

NORTHSTATE PLANERS



- 20", 5 hp: \$1,360
- 24", \$2,795
- 5 hp & 7-1/2 hp

NORTHSTATE BANDSAWS

- 14", 1 hp: \$425
- 18", 2 hp: \$795
- 20": \$1,495
- 24": \$2,465

PORTER CABLE

- 555: Plate Jointer: \$163
- 330: Sander: \$57
- 360: Sander: \$176
- 505: Sander: \$114
- 351: Sander: \$137
- 352: Sander: \$138
- 363: Sander: \$178
- 362: Sander: \$184
- 361: Sander: \$169
- 7549: VS jigsaw: \$143
- 9627: Rec. Saw: \$132
- 7519: Router: \$224
- 7538: Router: \$224
- 7539: Router: \$264
- 690: Router: \$131
- 630: Router: \$121
- 314: Saw: \$122.50
- 315-1: Saw: \$114
- 9118: Plane Kit: \$191
- 97310: Lam. Trim Kit: \$184
- 7334: Orbital Sander: \$118
- 7335: Orb. Sander: \$128
- 5116: Omnijig: \$262

NORTHSTATE 8" CABINET SHOP JOINTER



- Heavy cast iron const.
- 2 hp, single phase
- 9" x 67" bed
- 3 knife cutter head
- Dual tilt fence
- Magnetic controls
- SALE: \$795
- 6" jointer: \$375
- 12" jointer: \$1,895
- Delta 8" jointer: CALL!

HITACHI

- C15FB: Mitre Saw: \$376
- C8FB: Comp. Mitre: \$438
- TR-12: Pl. Router: \$169
- F20A: Plane: \$97
- CC14: Chop saw: \$196
- D10D: Cordless Drill: \$114
- CB75F: Re/band-saw: CALL
- M12V: 3 1/4 hp, vs router: \$223

DEWALT

- 7749: Radial Arm Saw: \$685
 - 7770-10: Radial Arm Saw: \$865
 - 7790: Radial Arm Saw: \$1195
 - 1765: Belt/Disc Sander: \$485
- All Dewalt Ind. radial arm saws available
* Freeborn Shaper Cutters
* Mini-Max Machinery
* Ad justable Clamps
PORTER CABLE
complete line available

LENEAVE MACHINERY & SUPPLY COMPANY

305 West Morehead St., Charlotte, NC 28202 (704) 376-7421; Toll free outside NC 800-442-2302

MOULDERS



- Four and Five Head Models
- Variable speed
- All cast-iron construction
- 2-1/4" x 6" capacity
- Designed to make high quality moulding at the lowest possible cost

RAISED PANEL DOOR MACHINE



UNIQUE: Machine all five components with only one operator

NORTHSTATE WIDE BELT SANDER



- Best buy in the industry!
- Variable speed
- Platen head
- Dual motors
- Heavy cast iron & steel
- Plate construction
- 10, 15, & 20 hp
- 25" List: \$8,650
- SALE: \$5,895, 15 hp
- 37" List: \$12,900
- SALE: \$8,888, 20 hp
- Phase converter avail.

MINI MAX MACHINERY

▲ DELTA

- 34-782: Unisaw & All models - Call for promo prices
- 46-541: Lathe: Call for promo price
- 43-375: Shaper: Call for special
- 40-560: 16" Scroll Saw NEW! \$184
- 40-601: Scroll Saw - CALL!
- 31-730: Belt/Disc Sander: - CALL!
- 37-350: 8" Jointer w/std: - CALL!
- 34-444: 10" Contr. Saw: \$614
- 34-445: 10" w/Unifence - CALL!
- 28-283: 14" Bandsaw - CALL!
- 28-245: 14" Bandsaw w/access:
- 17-900: 16-1/2" Drill Press: - CALL!
- 43-355: Shaper NEW!
- 33-990: 10" Radial Arm Saw: \$549
- 36-755: Tilt arbor saw NEW!
- 32-100: Plate Jointer - NEW! CALL!
- 22-540: 12" planer NEW! - Call for promo price
- Stock feeders: 34-985, 34-994, 34-995 - Call for promo price
- **Complete Delta line available.**

SALE PRICES
• 2 hp, 2 bag: \$295
• 3 hp, 4 bag: \$485

SENCO

- SN4 \$466
- SN325 \$399
- SFN2 \$378
- SFN1 \$274
- SKS \$249
- LS2 \$247
- LS5 \$254
- PW \$345
- EMGLO 1-1/2 HP compressor \$318



- BIESEMEYER
- VEGA
- EXCALIBUR
- PARALOK
- UNIFENCE

fences available

* We try not to be undersold,
tell us our competitors' prices.

CLASSIFIED

The CLASSIFIED rate is \$5.75 per word, min. ad 15 words. All payments must accompany orders; all are noncommissionable. DISPLAY CLASSIFIED rates on request. The WOOD & TOOL EXCHANGE and SITUATIONS WANTED are for private use by individuals only; the rate is \$8/line. Minimum 3 lines, max. 6 lines, limit 2 insertions per year. Send to: *Fine Woodworking*, Advertising Dept., Box 5506, Newtown, CT 06470-5506. Deadline for the July/Aug. issue is April 24, 1992. (800) 283-7252, ext. 562; or FAX (203) 426-3434.

Business Opportunities

BROOKLYN WOODWORKERS CO-OP seeks new members. Sharing fully-equipped shop; private space; thriving atmosphere. 61 Greenpoint Ave., Brooklyn, NY 11222. Bill (718) 349-3614.

LIVE/WORK IN ARKANSAS' OZARKS. Owner retiring; well-established antique furniture restoration/refinishing business. 4169 sq. ft. home/workshop/garage on over 1 acre of prime highway frontage. \$95,000 buildings. \$50,000 for business. Call Dawn, Beaman Realty, 1-800-467-5253.

PRODUCTION WOOD BUSINESS for sale. \$100,000 yearly gross, relocate anywhere. Marquetry based, will train. 100's of wholesale accounts. WOODWORKS, 1480 Spiritwood, Victor, MT 59875.

CHICAGO AREA WOODSHOP FOR SALE: 4500-sq. ft. building; studio space, retail store front, spray booth, 3 phase. Located 15 min. from Chicago in Oak Park, IL., home of Frank Lloyd Wright. Call David: (708) 386-5580.

INVENTIONS/NEW PRODUCTS/ideas wanted. Call TICI for free information/Inventors Newsletter. 1-800-468-7200, 24 hours per day. USA and Canada.

POST & BEAM SHOP, 5250 SQ. FT. Fully equipped w/living accommodations. 5 acres on a lake near the ocean. For sale/lease/partnership. Anacortes, WA. (206) 293-8636.

BENCH SPACE AVAILABLE. Share Studio-Furniture Shop with 3 established makers. Fully equipped. Industrial machinery. Spray booth. Creative environment. Concord, MA. (508) 371-0353.

TAGUA is LEGAL IVORY

3 lb. (approx. 45 pcs) \$25 PPD
 66 lb. (approx. 1000 pcs) \$220 PPD
GIANT TAGUA, 3 lbs.
 (approx. 16 pcs) \$45 PPD
 110 lbs. (700 pcs) \$600 PPD
 (Tagua animals, netsuke beads also available.)

MANUFACTURERS OF DIAMOND TOOLS AND NATURAL RECONSTRUCTED GEMSTONES; S.A.S.E. Mother-of-pearl:
 1 1/2" x 1 1/2" x 4" \$70 PPD.
SOLID ASIAN WATER BUFFALO HORN:
 3 lbs. (approx. 6 pcs) \$25 PPD,
 66 lbs. \$450 PPD
 1-800-872-5263
 or 602-994-1620 AM, MC, VISA accepted

HILARY 7117 3rd Ave. Scottsdale, AZ 85251
 Agricultural Intl.

Situations Wanted

GRADUATE OF GENOA SCHOOL of Furniture Designer Makers, 1991. Looking for position in high-end custom furniture shop. Will relocate anywhere nec. Portfolio available. Joel Liebman, Box 188, Genoa, NY 13071. (315) 497-3270.

EXPERIENCED WOOD WORKER looking to make production furniture parts to support my family. Large one-man shop. Any quantity. Chris Oldham; (203) 382-0230. Collect calls accepted. Sincere inquiries only please.

Help Wanted

EXPERIENCED CABINETMAKER. Established shop producing high-quality, custom contract furniture and architectural woodwork, seeks skilled individual to join our staff. Competitive wages and comprehensive benefits. Wall/Goldfinger, Inc., 7 Belknap St., Northfield, VT 05663. (802) 485-6261.

Instruction

CHICAGO AREA APPRENTICESHIP: prestigious, high-end studio. Work and study for 1 year. Design and build own projects under master craftsman. No tuition, and no salary. Some experience in power tools required. For brochure write: David Orth, 1107 Chicago Ave., Oak Park, IL 60302.

WOODWORKING, DESIGN, BUSINESS, MARKETING, Associates degree. Haywood Community College, Freedlander Dr., Clyde, NC 28721. (704) 627-2821.

LEARN TO TURN WOOD. Precision lathe work for fun and fine products taught by JAMES L. COX WOODWORKING SCHOOL. Free brochure. RD 2, Box 126 Beaver Dam Rd., Honey Brook, PA 19344. (215) 273-3840.

APPRENTICE WITH MASTER CRAFTSMEN. Unique in-shop experience. Woodworking and other crafts. Year round program. Baulines Craftsman's Guild-FW, Schoonmaker Point, Sausalito, CA 94965. (415) 331-8520.

ONE-YEAR apprenticeship program in woodworking. Intensive training encompassing design, production, and marketing of fine furniture and cabinetry. Tuition. Maxwell & Kelly Furniture Co., Philadelphia, PA. (215) 988-9065.

DAKOTA COUNTY TECHNICAL COLLEGE OFFERS a furniture restoration major. Call (612) 423-8301, or write 1300 145th St. E., Rosemount, MN 55068.

RED WING TECHNICAL COLLEGE offers Guitar Building and Repair, & Violin-Family Repair majors. For information on these majors or short courses call 1-800-657-4849. EOE.

CHICAGO SCHOOL OF VIOLIN MAKING. Full-time, 3 1/2-year program under direction of master violin maker. Traditional methods of violin construction and repair taught; for information, write C.S.V.M., 3446 North Albany, Chicago, IL 60618. (312) 478-0505.

FINE AND CREATIVE WOODWORKING two-year degree program emphasizing designing, building fine quality, custom furniture. Affordable tuition, outstanding facilities, experienced instructors. Rockingham Community College, PO Box 38, Wentworth, NC 27375. (919) 342-4261.

GETTING STARTED IN STAINED GLASS. Instructions, bonus coupons. \$2. Whittemore, Box 2065MS, Hanover, MA 02339.

WOODTURNERS

Since 1976, I've been teaching beginners to turn, and experienced turners to hone their skills. I also stock Myford Mynstro lathes, Sorby tools, & other turning essentials. Call or write for free brochure:

RUSS ZIMMERMAN
 RFD 3, Box 242 Putney, Vermont 05346
 802-387-4337

CARPENTRY - 9 month course. All facets of basic carpentry - rough and finish work includes hand tool use and hand woodworking. **PRESERVATION CARPENTRY - 2 years.** Preserve and restore pre-20th century buildings. **CABINET & FURNITURE MAKING - 2 years,** custom furniture construction. Traditional styles; hand joinery and embellishment. **PIANO TECHNOLOGY - 2 years.** Tuning, action repairs, and rebuilding. **VIOLIN MAKING & RESTORATION - 3 years** for making; optional 4th year for repair/restoration. Financial aid for qualified students. Accredited member NATTS.

NORTH-BENNET-STREET-SCHOOL
 39 N. Bennet St., Box A, Boston, MA 02113
 (617) 227-0155

FINE CABINETMAKING

Courses with master craftsman in long established professional and teaching workshop in beautiful historic area. For Prospectus call U.K. 0803 862861

Christopher Faulkner
 Ashridge Workshops, Dartington,
 Totnes, Devon TQ9 6EW, England.

The Landing School

LEARN WOODEN BOAT BUILDING & DESIGN. Two full-time residential programs that offer intensive training in a creative but disciplined environment. V.A. approved. Accredited member, CCA. Financial aid available for qualified students. The Landing School, Box 1490F, Kennebunkport, ME 04046. (207) 985-7976.

peters valley craft center

19 Kuhn Road Layton, NJ 07851
 201-948-5200
 Write or call for brochure

Woodworking Workshops
 June, July and August
 Two to Eight Days

THE HYMILLER SCHOOL OF FINE FINISHING & ILAND JOINERY

One and two-week intensive in-shop training will give you all the necessary knowledge to start your own business. 3rd generation craftsman John Hymler.

Send \$5 for complete info package.
 P.O. Box 3260, Crossville, TN 38557
 (615) 484-9309

Miscellaneous

BRANDING IRONS. Names, signatures, logos, any size, design. Norcraft Custom Brands, Box 277F, So. Easton, MA 02375. Telephone (508) 238-2163 anytime.

SUPER SCRUB 2000

\$4.95 PLUS \$1.50 for SHIPPING AND HANDLING

THE ORIGINAL SURGEON'S SCRUB BRUSH

Professional Quality

Gets ALL the dirt out from under your fingernails. Completely

Allow 2 to 4 weeks for delivery

SCRUB • P.O. BOX 1776 • BREA, CA 92622

Moisture Meter

END WOOD WARPING

METER MT90 4% - 16% ONLY \$69 U.S.

ONE YEAR UNCONDITIONAL GUARANTEE

MODELS 3%-100% AVAILABLE

ASK FOR FREE CATALOG (519) 439-0731

ELECTROPHYSICS, BOX 1143 STATION B LONDON, ONTARIO N6A 5K2, CANADA

CUSTOM BRANDING IRONS

DRILL PRESS or HANDHELD
 250 to 800 watts

SEND \$1.00 FOR BROCHURE

ENGRAVING ARTS (077) 984-8203
 P.O. Box 787 FAX (077) 984-8048
 Laytonville, CA 95454

THE FINE GOLD LEAF PEOPLE™

Genuine, Imitation & Variegated Sheets & Rolls • Brushes & Supplies Technical Books & Videos

in USA: Three Cross Street • Suffern, N.Y. 10901-4601
 1-800-283-5323 / Fax: 914-368-1535
 In Canada: 508 Douglas Ave.
 Toronto (Ont.) M5M 1H5 • Voice/Fax: 416-787-7331
 "Work With The Best In The Business"

DOWELS - PLUGS - PEGS

Manufacturer Direct
 Largest & finest selection Oak, Walnut, Hickory, Maple, Cherry, Mahogany, Teak, even Treated Dowels. Quantity discounts.

MIDWEST DOWEL WORKS, INC.
 4631 Hutchinson Road Cincinnati, Ohio 45248
 (513) 574-8488

Catalogue request.

WILLIAMSBURG BLACKSMITHS

Wrought-Iron Hardware

To Order Catalog, Send \$5 To:
 P.O. Box 1776, Dept. FW
 Williamsburg, MA 01096
 Phone: (800) 248-1776

THE BEALL TOOL CO.

The Beall Wood Threader

The ultimate wood threading device. Attaches to router & makes perfect threads in 5 right handsize and 3 left. Write or call: Dept. FW, 541 Swans Rd., NE, Newark, OH 43055, 614-345-5045, 1-800-331-4718.

VACUUM BAG PRESSES

Use the atmosphere as a press. Evenly distributed pressure creates perfectly veneered panels and bent laminations. Compact & affordable. Call or write:

MERCURY VACUUM PRESSES
 (707) 964-7557
 BOX 2232-FORT BRAGG, CA 95437

Finishes

SPRAY-ON-SUEDE. Free brochure (sample enclosed). Donjer Products, Ilene Ct. Bldg. 8F, Belle Mead, NJ 08502. (800) 336-6537.

MDF SANDING SURFACER. Prestec™ fills, seals and primes raw MDF in one operation. Accepts all types of top coatings. Donald M. Steinert Co., Dept. FWP, 800 Messenger Rd., Grants Pass, OR 97527. (503) 846-6835.

VELVIT PRODUCTS

Chemgard Wood Treatments: anti-mold & mildew treatment ideal for logs that won't be sealed for months after they're milled. **Velvit Oil:** an interior wood finish that seals, fills, stains & protects wood in one application. Maintenance free. No need to varnish. **Cabin & Deck Finish:** exterior wood finish that is deep penetrating formula of oils, resins, fungicides & water proofing compounds.

VELVIT PRODUCTS COMPANY, P.O. Box 1741, Dept FW, Appleton, WI 54913, (414) 722-8355

Glues/Adhesives

HIDE GLUE-ALL GRADES, including glass chipping, 5# and up. Bjorn Industries, Inc., 551 King Edward, Charlotte, NC 28211. (704) 364-1186.

Building? Restoring? Repairing? use **CHEM-TECH T-88** the epoxy professionals use! Strength and reliability proven in boats and aircraft over 15 years. Introductory offer 1/2 pt. of T-88 \$9.95. Technical staff on call to answer your questions. Call or write:

CHEM TECH P.O. Box 70148
 Seattle, WA 98107
 (206) 783-2243

Musical Supplies

GUITARMAKING SUPPLIES: Send \$2 for our catalog of quality tonewoods, kits, accessories, books, tools, and finishing supplies. Guitarmaker's Connection, Martin Guitar Company, Box 329, Nazareth, PA 18064. (800) 247-6931.

GUITAR, BANJO MANDOLIN and violin building materials. Repair tools, replacement parts, tone woods and finishing supplies. Free 104-page catalog. Guitar Shop Supply, Box 900F, Athens, OH 45701. 800-848-2273.

VIOLIN, GUITAR, banjo, mandolin-making materials, accessories, books. Catalog, \$1. International Luthiers Supply, Box 580397, Tulsa, OK 74158.

PLANS, KITS & SUPPLIES for musical instruments: harps, dulcimers, psalteries, lyres, more! Musicmaker's Kits, Dept. FW, 423 So. Main St., Stillwater, MN 55082. (612) 439-9120.

HAMMERED DULCIMER PLANS! By noted builder Charlie Alm. Best book on subject. \$19.95. Woodworks, Box 428, Dept. FW, Brookston, IN 47923. (317) 563-3504, 800-526-4791.

LUTHIERS' SUPPLIES: Imported tonewood, tools, varnishes, books, plans, parts, accessories, strings, cases, for violins, violas, cellos, basses and guitars. Assemble-yourself violin and guitar kits. Catalog, \$50, includes 10% discount certificate. International Violin Company, Ltd., 4026 W. Belvedere Ave., Baltimore, MD 21215.

Plans & Kits

SOLID MAHOGANY AND CHERRY KITS. Traditional designs. All hand-crafted and ready to assemble. Habersham House, PO Box 720442, Atlanta, GA 30358.

FULL-SIZE PROFESSIONAL PLANS - Catalog \$3. Over 200 professionally-designed plans for building fine furniture. Furniture Designs, Inc., CK-52, 1827 Elmdale Ave., Glenview, IL 60025.

Reconstruct America's Past
New, Never Before Published, Full-Size, Authenticated Plans For Early American Country Furniture.
Checker Money Order or American Workshop Series
 Catalog \$2.00 (Refundable with order)
 All plans are exactly measured and professionally executed, having been painstakingly derived from the antique originals.
 4642 Wilkens Ave., Suite 420 B, Baltimore, Md. 21229

Hand Tools

BEST JAPANESE HANDTOOLS at discount prices. Only at Nippon—4—Less. Call or write for free catalog. (408) 356-4184. PO Box 1301, Alviso, CA 95002.

JAPANESE TOOLS SINCE 1888. Free catalog. Tashiro's, 2939 4th Ave. So., Suite 101, Seattle, WA 98134. (206) 621-0199, FAX (206) 621-0157.

FINEST QUALITY HAND FORGED CARVING TOOLS. Small scorpis, drawknives, bentknives. Free catalog. North Bay Forge, Box F2, Waldron, Wa 98297.

Japanese Pull Saws
 We have the largest selection of Japanese Pull Saws in the United States. Send \$1.00 for a 2 year subscription to our 80 page catalog of fine woodworking tools.
THE JAPAN WOODWORKER
 1731 Clement Ave., Suite 100 • Alameda, CA 94501
 Phone (415) 521-1810

TOOLS - ANTIQUE & USED - STANLEY
 Quality selection of scarce hand tools for collectors and woodworkers—planes, scrapers, spokeshaves, saws, chisels, levels, rules, unusual items, etc. Complete, working tools. Satisfaction Guaranteed. Prompt, postpaid service.
 VISA, MC. Current illustrated list \$2.50. Sub. - \$10/yr., 5 lists.
BOB KAUNE, Dept. C92, 511 W. 11th, Pt. Angeles, WA 98362 (206) 452-2292


 Stop tearing your pockets and fumbling for your tape and pencil!
The Cabinetmakers Sidekick™
 keeps them both right on your belt.
 Designed by a cabinet maker, made in the U.S. of top grain leather.
\$9.50 ppd.
 (Does not include tape or pencil. Allow 2-4 weeks for delivery.)
To: Wood Studio
 Rt. 3 Box 427
 Decatur, AL 35603

Power Tools

THE INVISIBLE CLAMP, (venturi-vacuum pump system.) Holds fast for un-obstructed routing, sanding and veneering, no marring. Write Vac-U-Clamp Systems: PO Box 114, American Fork, UT 84003.

BANDSAW—SAWMILL KIT. Affordable and portable. Write for free literature. Linn Lumber Co., PO Box 326, Lebanon, OR 97355.

RESTORED MACHINERY - Finest wood-working machines ever made. Oliver, Yates, Northfield. Bandsaws, table saws, wood lathes, etc. Puget Sound Machinery. (206) 857-5088

WOODTURNING LATHES: bowl, spindle, large swing, long bed, slow speed, custom build. DeRose & Co., PO Box 150, Mechanicsville, VA 23111. (804) 746-1705.

OLIVER JIGSAW, #173, 36-in. throat, 34-in. by 34-in. table, 1 1/2 HP, 3PH, \$600. Pittsburgh, PA. (412) 379-8637.

WOOD-MET SERVICES
 Tool catalog of over 600 plans to build your own hand and power tools. Equip your shop at great savings. A wide variety from complete machines and attachments to hand tools and accessories for home, school and commercial shops.
 Catalog \$1 refundable
 3314 West Shoff Circle, Dept. FW
 Peoria, IL 61604

LAMELLO MACHINES
NEW COBRA MODEL
LAMELLO QUALITY FOR UNDER \$300.
Special Introductory Price
Select Machinery Inc./Hank Koelmel
 64-30 Ellwell Crescent,
 Rego Park, NY 11374
 (718) 897-3937
CALL OR WRITE FOR FREE BROCHURE

NEW DELTA SPECIALS
 Edge Sander #31-380 \$1,100; belt finisher #23-905 \$1,000; scroll saw #40-419 \$825; Unisaw #34-782 \$1,499 after rebate. Drill press #17-425 \$2,250, also 3HP single phase special saw motor replaces #83-651 \$288 post paid. Used machinery list also available.
PLAZA MACHINERY • 802 234-9673

Publications/Catalogs

BUILD, RESTORE, REPAIR, refinish! Carvings, moldings, brass, hardwoods, veneers, upholstery, caning, lamps. \$1 for unique wholesale catalog. Van Dyke's, Dept. 71, Woonsocket, SD 57385.

KNOW YOUR MOISTURE CONTENT. Quick, simple method uses pocket calculator. No weighing. Illustrated booklet \$2. Satisfaction Guaranteed. ARCH DAVIS DESIGN, PO Box 119-F, Poores Mill Rd., Morrill, ME 04952.

SEND \$3 (refundable w/order) 92-page handtool catalog. New Wood, 204 Circle, Fox River Grove, IL 60021.

THE TOOL CHEST CRAFTSMAN LIBRARY CATALOG
 for both the professional and amateur
 1000's OF BOOKS COVERING
 • Woodworking - All Aspects
 • Home Remodeling & Maintenance
 • Tools & Their Uses • Contracting
 • Projects For Home & Recreation
 To order your catalog Send \$2.00 (refundable with first order) To: THE TOOL CHEST Dept. T 45 Emerson Plaza East Emerson, NJ 07630

Services

PROTECT YOUR COLLECTION of favorite magazines, have them hardcover bound. \$22.50 (plus \$4 S/H). 1-800-532-9966. ISSUES A-BOUND.

Soft Ware

COMPUTER INDEX locates information in 9 leading woodworking magazines. Yearly updates. IBM compatible, hard disk; 512K, DOS2.0. \$49.95, plus \$4.50 S/H. Free brochure. WOODFIND, PO Box 2703F, Lynnwood, WA 98036.

Shows

CALL FOR ENTRY: JURIED COMPETITION. August 7-9. Five categories: Furniture—tables, Carving—Freeform; Relief, carving—theme 'Our Canadian Heritage'; Turning—Hollow Vessels; Toys—Original, no prefab. \$5000 in cash prizes. Deadline for entry June 30. For application write: The Wood Show, Box 920, Durham, Ont., Canada NOG-1R0. (519) 369-6902.

Wood

TURNING BLOCKS, BURLS, AND CROTCHES—exotic and domestic hardwoods—write or call for price list. Wood-ply Lumber, 100 Bennington Ave., Dept. F, Freeport, NY 11520. (516) 378-2612.

HOMESTEAD HARDWOODS, (216) 889-3770. Kiln-dried ash, basswood, butternut, cherry, chestnut, curly maple, oak, poplar, sassafras, walnut. 6 great widths and thicknesses.

TULIPWOOD, BRAZILIAN ROSEWOOD, kingwood, wormy chestnut, and many others. Also fancy veneer faces. H&B Hardwoods (502) 339-8789.

VEENER: FOR MARQUETRY AND RESTORATION. Write for cat. Mail Order Marquetry, RR #6, Shelburne, Ont., Canada L0N 1S9.

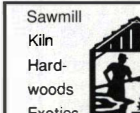
RAREST CALIFORNIA BURLS direct from logger. Huge selection beautifully figured redwood, maple, manzanita, & madrone. Also guitar-quality squares or slabs. (707) 442-1319

GENUINE CUBAN MAHOGANY, ebony, cocobolo, bocote, Mexican kingwood, pink ivory, snakewood, tulipwood, zebra wood, padouk, bubinga, zircote and more. Lumber, turning stock, logs, slabs. Direct importers of the finest quality exotic hardwoods at reasonable prices. Send stamped envelope to: Tropical Exotic Hardwoods of Latin America, Box 1806, Carlsbad, CA 92018. (619) 434-3030.

HARDWOOD FLOORING & WAINSCOTTING
 PACIFIC MADRONE Salmon colored beauty
 GOLDEN TAN OAK Bright, colorful hardwood
 CALIFORNIA RED OAK Traditional elegance
 Prices Start at \$.99/sq. ft.
 1/2" & 3/4" Square Edge
Cal Oak Lumber Co.
 1000 Cal Oak Rd., Oroville, CA 95965
 (916) 534-1426

WESTERN PENNSYLVANIA WOODWORKERS
 50 Domestic & Imported Woods • Veneers
 Finishes • Mouldings • Hardware • Plans • Books
 Carving Stock • Magazines • Quality Tools
 Call or Visit Our Store
WOODCRAFTERS SUPPLY
 7703 Perry Hwy (Rt. 19) 2921 Buffalo Rd.
 Pittsburgh, PA 15237 Erie, PA 16510
 (412) 367-4330 (814) 899-5466

WINTER WOODS
TIGER & BIRDSEYE MAPLE
TOP QUALITY GUARANTEED LUMBER
TURNING SQUARES BOWL BLANKS
ROUGH OR SURFACED
 RT 1 BOX 765G, MUNISING, MI 49862 906-387-4082


 Sawmill
 Kiln
 Hard-woods
 Exotics
Willard Brothers Woodcutters
 300 Basin Rd., Trenton, NJ 08619
 Call (609) 890-1990

QUARTERSAWN WHITE OAK AND FIGURED LUMBER
 Curly, Bird's-eye, Quilted, Crotch
 800-373-6097 or 215-775-0400
 RD #3, Box 3268, Mohnton, PA 19540-9339

TALARICO HARDWOODS

GROFF & HEARNE LUMBER
PREMIUM WALNUT-CHERRY & OTHER FINE CABINET WOODS.
 Boards to 40" wide, curly cherry, figured maple, matching flitches, slab cuts, KD.
Groff & Hearne Lumber
 858 Scotland Road
 Quarryville, PA 17566
 717-284-0001 800-342-0001

HIGHLY FIGURED WALNUT SLABS and book-match panels. California Walnut Designs, 12681 Wolf Rd., Grass Valley, CA 95949. (916) 268-0203

ARCHITECTURAL HARDWOODS & VENEERS, INC. The finest in materials. Custom blue print panels. Wholesale/retail. Call for samples. CA (415) 822-1423, FAX (415) 822-1453.

ATTENTION WOODWORKERS maple and redwood burl. Figured, quilted, bird's-eye, lace Any size or thickness available. Quality. Albany, OR. (503) 926-1123.

CURLY MAPLE FOR MUSICAL INSTRUMENTS and fine wood working. Bob Wenzel, (218) 386-1742, Minn.

PRIVATE COLLECTION 10/4 — 16/4 western black walnut. Dried 25 to 30 years. 1500 bd. ft. \$7500, or best offer. 8/4 English walnut clears. Kiln-dried. 750 bd. ft. \$2250. Stump wood, curly maple, burls, some trade for tools. (503) 935-1167, (OR).

EXOTIC, DOMESTIC WOODS. Mesquite, pecan, aromatic cedar, tidewater cypress, figured oaks, fiddleback sycamore. Texas Kiln Products. (512) 321-5907 catalog. 1-800-825-9158 orders only.

GILMER WOOD CO.
 503-274-1271
Rare & Exotic Woods
 • in logs, planks & squares
 • over 50 species in stock
 • also cutlery, turning & musical instrument woods
 2211 NW St. Helens Rd., Portland, OR 97210

FINE VENEER
 Highest Quality Low Prices Full Length Veneers Large Selection Exotic Lumbers Custom Plywoods
 Retail or Wholesale Area Code 716 655-0206 Call or Write for FREE Catalog
certainly wood
 11753 Big Tree Rd., E. Aurora, N.Y. 14052
 Fax No. (716) 655-3446
 Our wood certainly makes a difference.

HARDWOODS
EXOTIC & DOMESTIC OVER 75 SPECIES
 LUMBER • PLYWOOD • VENEERS
 TURNING SQUARES & BLANKS

COLLECTORS SAMPLE KIT
 30 EXOTIC & DOMESTIC WOODS
 " x 3" x 6" SANDED FINISH
\$29.00 PLUS \$5.00 S&H
 Ideal for: Collectors • Schools • Craftsmen • Cabinet & Furniture Makers • Architects • Designers
1-800-423-2450
WOODWORKERS
 5402 S. 40th St. • Phoenix, AZ 85040
 (602) 437-4415

APPALACHIAN AND EXOTIC HARDWOODS VENEERS PLYWOOD TURNING AND CARVING BLOCKS

tree-complete line of tools and accessories
 Call or write for free price list

HARTWOOD, LTD.

 EAST GOLDEN LANE, P.O. BOX 397, DEPT. 1B
 NEW OXFORD, PA 17350
 PHONE (717) 624-4323
 FAX (717) 624-4365

CURLY MAPLE. Large, fancy 10/4 curly maple off-cuts, by piece, pile or \$200/skid. Also walnut, cherry, and curly maple 4/4 lumber, 10/4—12/4 flitches. 1 1/2-in. diameter dowels and turning stock. Dunlap Woodcrafts, Vienna, VA. (703) 631-5147.

FIGURED LUMBER: sequentially-sawn and numbered, KD. Burl, curly, quilt, mottled, spalting, bowl blanks. Seasoned Hardwoods. (503) 247-7875.

OREGON BLACK WALNUT—Lumber, turning squares, carving blocks, highly figured wide boards. **GOBY WALNUT PRODUCTS**, Dept. FW, 5016 Palestine Rd., Albany, OR 97321. (503) 926-7516.

TRUE QUARTERSAWN LUMBER. Oak, cherry, pine, cut from prime logs. Air-dried. Newman, Box 46, New Braintree, MA 01531. (508) 867-3318.

FANTASTIC SALE: Exotics R/F safe. Carvers, cabinet/furniture inlays. 40 species, burls, lumber, squares. Write **STARS** Box 9314, Baltimore, MD, 21228. (301) 788-2696.

GABON EBONY, SNAKEWOOD AND PINK IVORY lumber, logs and billets. Quality guaranteed. Wholesale prices. Over 60 other species in stock. Free catalog. (213) 542-3576. Exotic Hardwoods, 4100-B Spencer St., Torrance, CA 90503.

CHERRY TURNING STOCK. 8/4 to 16/4, to 48-in. lengths. Poplar pre-cut, sanded drawer parts. SASE for prices and details. Randall Grace, 3110 Summers Rd., Franklin, TN 37064. (615) 791-1832.

GOOD HOPE HARDWOODS—Curly cherry, walnut, figured mahogany, and tiger maple. Highly figured Claro walnut in matched sets for fine furniture and in flitches up to 54-in wide by 13 ft. long. Norman Hughes, 1627 New London Rd., Landenberg, PA 19350. (215) 274-8842.

veneers, burl, figured, and bowl blanks. MESQUITTES UNLIMITED, Rte. 4, Box 322, Wichita Falls, TX 76301. (817) 544-2262

REDWOOD LACE BURL, OTHER WESTERN SPECIES, squares, slabs, whole. Western lumber, figured lumber, rare woods, sample kits. SASE list. Eureka Hardwood Supply, 3346 D St., Eureka, CA 95501. (707) 445-3371.

DESERT IRONWOOD! Orange/gold chocolate lines. Rough-hewn blocks. \$5/pound, \$25 minimum, includes shipping. Sample \$3. Woods of the Desert, Dept. F, PO Box 7066, Alhambra, CA 91802.

FINE HARDWOODS: select kiln-dried. 36 species in stock. Call for price list. Custom cutting available. FAX us your material list. Heritage Building Specialties. (800) 524-4184. FAX (218) 739-5798.

PINK IVORY: Logs, log sections and dimensioned stock. Direct from logger, importer, specializing in precious African hardwoods. Quality always guaranteed. M. S. Tisdale, 25000 S.W. 207th Ave., Homestead, FL 33031. (305) 248-0593.

MICRO—THIN HARDWOODS. 1/4-in., 3/8-in., 1/2-in., 5/8-in., 3/4-in. thicknesses. Clear, kiln-dried, S4S-sanded. Mahogany, cherry, walnut, oak, poplar. Write for exceptional prices. West Friendship Hardwoods, PO Box 103, West Friendship, MD 21794.

Sandy Pond Hardwoods

TIGER and BIRD'S-EYE
Curly Ash, Curly Oak
Curly Cherry, Curly Birch
LUMBER AND FLOORING

921-A Lancaster Pike, Quarryville, PA 17566
(717) 284-5030

MESQUITE LUMBER. Kiln-dried & bowl blanks. MESQUITTES UNLIMITED, Rte. 4, Box 322, Wichita Falls, TX 76301. (817) 544-2262

SELECT & BETTER 20/BD. FT. BULK PACKS: red oak \$2.10/bd. ft.; ash \$1.82/bd. ft.; hickory \$1.54/bd. ft. Additional species. Visa—MasterCard. Free catalog. **BADGER HARDWOODS**, Rt. 1 Box 262, Suite FW3, Walworth, WI, 53184. (800) 252-2373.

GUARANTEED CLEAR COCOBOLO, squares, lumber, bocote, ebony, lignum, cirocote. Vacuum kiln-drying. Tropical Timber. (503) 621-3633.

HARDWOOD CUT TO ORDER
... 100 Species in Stock ...
• Custom Mouldings •
MC/Visa accepted. Call or write:
COLONIAL HARDWOODS, INC.
7648 Dynatech Ct.
Springfield, VA. 22153
(800) 466-5451 (703) 451-9217
Shipped UPS or Common Carrier

Pickens Hardwoods
P.O. Drawer 1127
Clinton, MS 39060-1127
601-924-4301
Domestic & Imported Hardwoods
Call for information or send \$2.00 for Catalogue; \$2.00 Coupon included.

Master Card Discover Visa
Fine Woods
RIVERSIDE LUMBER
Purple Heart — \$2.38
Honduras Rosewood — \$18.00
18 ft. min. Please
1-800-669-6624
New Orleans, La.

FINE WOODWORKING 34 back-issues #53—88. Missing 74, 75. \$2. each, plus shipping. Central Florida. (813) 676-2357.

SHUTTER COMPONENTS, 3 1/2-in. louvers, stiles, rails, tiltrods, & frame milled from poplar. Tom, 27301 Nicole Dr., Laguna Niguel, CA 92656. (714) 633-1262.

FOR SALE: WOODSMITH issues 2, 5, and 7 thru 78. Take all. Price negotiable. Please call Bob at (407) 969-1979.

STROKE SANDER: Wysong and Miles, 5HP, 3PH heavy duty 6-in. by 300-in. cap. Sliding table, good condition. \$1900. (206) 385-7505. PO Box 1195, Pt. Townsend, WA 98368.

SITKA SPRUCE, ALASKA CEDAR: air-dried inside for 12 yrs. Choice thick stock. Lengths to 20 feet. Approx. 2000 bd. ft. each. Sold as species lot only at \$3/bd. ft. Hornick, PO Box 84, Oak Hall, VA 23416. (804) 824-5445.

CARVING MACHINE DUPLICATOR, Kurt Star, 2-spindle w/60-in. extension plus plenty of spare bits. \$1000. (401) 783-5938 (eves).

LARGE PRIVATE STOCK, black walnut, red oak, white oak. Stickered inside ten years. Good dimensions, fair prices. Min. order 200 bd. ft. Dr. James Shrewsbury, 505 S. Jefferson, Princeton, KY 42445. Call (502) 365-6119.

MYFORD ML8-A woodturning lathe: 4 speed, rear turning attachment, reverse-rotation switch. Complete set of tools; face plates and centers. \$795. J. Anderson; (603) 428-3029.

FINE WOODWORKING 1—92 complete set, excellent condition. Price negotiable. Evenings; (507) 289-6649.

STANLEY #55 PLANE with cutters, best offer. #196 curved rabbit plane, mint condition. \$1250. James (216) 237-5327.

CHESTNUT LUMBER: hand hewn beams and dimensional lumber for flooring, cabinets and furniture. (203) 567-3491.

WOOD & TOOL EXCHANGE

Limited to use by individuals only

For Sale

CHESTNUT LUMBER up to 1-in. by 14-in. by 16ft., \$5—10/bd. ft., OBO. 35-in. ft. of wainscote, 9ft. doors also for sale. (904) 775-1054.

EMMERT PATTERNMAKER'S VISE. All parts, incl. aux. tilt plate. Completely re-conditioned. \$480. Packed & shipped in the cont. USA. (812) 423-9209

DELTA 3HP, 2 speed shaper #43-375 w/sliding jig #43-186. Excell. condition. \$1300 plus fght. from San Diego. Bill; (619) 453-4480.

KILN DRYER, EBAC 3500 bd. ft. unit plus moisture meter with remote probes. \$1200. (401) 783-5938 (eves).

MAHOGANY CROTCH VENEER 24-in. by 56-in, five 216 sq. ft. bundles. \$3.50/sq. ft. Full bundles only. (312) 733-0158 or 772-5608.

OLD PORTER CABLE SAWS; A-8, 508, 528 etc. Very good condition. Send for list D. Churbrick, 133 Chestnut St., Middlesex, NJ 08846.

WOODLATHE, POWERMATIC mod. 90, 1HP, PH variable speed, new bearings, good condition. \$1200. Band saw, 20-in. Galmeyer/Livingston restored, 1 or 3PH. \$1900. John Donkus; (717) 258-3102.

BALTIC BIRCH PLYWOOD 1/4-in., 5 birch-ply, no voids, 100's of 12-in. by 60-in. pieces. 5 pcs. \$20, 10 pcs. \$30, 15 pcs. \$40. PPD in cont. USA. Discount for large qty. Cindy Drozda, or Tom Lewis, 2756 47th St., Boulder, CO 80301. (303) 440-3579.

Wanted To Buy

FINE WOODWORKING back issues 1—80, will consider any set. Mike, 504 Ranger, Beeville, TX 78102. (512) 358-7105.

WANTED: COMPLETE SET OF FINE WOODWORKING, 1—82 minimum. Price negotiable. Please call Tom: (307) 733-8535.

PORTER-CABLE

MODEL 555 BISCUIT JOINER
INCLUDES CARBIDE BLADE, FENCE & STEEL CASE
BISCUITS—\$26 PER 1000!
OUR PRICE \$164.00

MODEL 690 1 1/2 HP ROUTER
INCLUDES 1/4" & 1/2" COLLETS, 10 AMP, 23000 RPM
EDGE GUIDE \$14.95
OUR PRICE \$128.00

MODEL 9853 CORDLESS DRILL KIT
12 VOLT, 2 STAGE VARIABLE SPEED, REV. 5 POSITION CLUTCH, KEYLESS CHUCK. INCLUDES BATTERY, CHARGER, & STEEL CASE!
*****SPECIAL*** EXTRA BATTERY \$26.00!**
OUR PRICE \$148.00

MODEL 7336 6" RANDOM ORBIT SANDER VS
USES ADHESIVE BACKED DISCS FOR A SWIRL FREE FINISH—3.7 AMP, 2500-6000 OPM, BALL BEARING CONST.
NEW DUST EXTRACTION SYSTEM \$24.00!
OUR PRICE \$129.00

MODEL 7539 3 1/4 HP VS PLUNGE ROUTER
OUR PRICE \$264.00

MODEL 7549 BAYONET SAW
TOP HANDLE, ORBITAL VAR. SPEED—USES ANY SHANK BLADES!
OUR PRICE \$139.00

INTERNATIONAL TOOL CORPORATION
1939 TYLER STREET, HOLLYWOOD, FL 33020
1-800-338-3384
IN USA, CANADA, PUERTO RICO & US VIRGIN ISLANDS!
FREE FREIGHT & SAME DAY SHIPPING ON MOST ORDERS OVER \$25.00 MINIMUM PURCHASE

COD ADD \$5.00
CASH, CASHIERS CHECK OR MONEY ORDER PLEASE

READER SERVICE NO. 75

FINE WOODWORKING CUSTOMER SERVICE
WE'RE HERE TO SERVE YOU!

We want you to be a satisfied customer. If you ever have a problem, question or a complaint about your magazine subscription or a book or video purchase, please call us — toll-free. We will be happy to help you in any way we can. We gladly:

- Confirm Shipments
- Answer Your Questions
- Resolve Complaints
- Handle Refunds & Returns

FOR CUSTOMER SERVICE, CALL: 800-477-8727
(8AM — 5PM EST, MON.-FRI.)
FAX: 203-270-9373

TO PLACE AN ORDER, CALL: 800-888-8286 (24 HOURS A DAY)
We accept MasterCard, Visa and American Express
(Please have your credit card handy when placing your order.)

THE TAUNTON PRESS
63 S. Main St., P.O. Box 5506, Newtown, CT 06470-5506

Also from the publishers of *Fine Woodworking*...

Fine Homebuilding®

**Straight talk about building
and remodeling houses...**



from people who know.

To build or remodel a house, you don't need a lot of pretty pictures or fancy prose. Just good, solid *detailed* information that helps you do the job right — the *first* time.

That's what you get in every issue of *Fine Homebuilding*... Straight talk from pros who've spent years in their trade... Honest reports on building tools and materials... Site-tested techniques that really work... New ways to solve old problems... Plus inspiring examples of fine craftsmanship and home design.

You won't find this much in-depth, technical information on home building anywhere else.

- Fundamental frame carpentry
- Trim & finish carpentry
- Floors & walls
- Concrete & masonry
- Tools & materials
- Houses on a budget
- Energy-efficient designs
- New construction & remodeling



A full year of *Fine Homebuilding* (a total of seven issues) is only \$29. That's less than the cost of six sheets of 1/2-in. drywall!

Just mail the coupon below or call us toll-free at 1-800-888-8286 and use your credit card. Of course, if you're not completely satisfied, you can cancel your subscription at any time. No questions asked.

Subscribe to *Fine Homebuilding* today! It's sure to become your most useful tool.

Act Now and Save 24% Off the Newsstand Price!

In the U.S.: \$29/year (7 issues) Outside the U.S.: \$33/year

PHAW

Name _____

Charge card # _____

Address _____

Expiration Date _____ Initials _____

City _____

Make checks payable to The Taunton Press.

U.S. funds only, please.

Canadian residents add 7% GST.

Send to: The Taunton Press, 63 S. Main St.,

P.O. Box 5506, Newtown, CT 06470-5506

Offer valid through 12/31/93

State _____ Zip _____

Please bill me Check enclosed

MasterCard Visa Am. Express

CASCADE TOOLS, INC.

CLASSICS!

We offer a wide variety of classical bits. Set the standard for table, furniture and edge work. Give your work a custom look.

1/4" SHANK

PART	CUTTER DIA. A	CUTTING LENGTH B	OVERALL LENGTH C	CUTTING WIDTH W	PRICE
C1289	1-1/4"	5/8"	2-1/8"	3/8"	\$25 ⁰⁰
C1290	1-1/2"	5/8"	2-1/4"	1/2"	\$25 ⁰⁰

1/2" SHANK

PART	CUTTER DIA. A	CUTTING LENGTH B	OVERALL LENGTH C	CUTTING WIDTH W	PRICE
C1291	1-1/4"	5/8"	2-1/8"	3/8"	\$25 ⁰⁰
C1292	1-1/2"	5/8"	2-1/4"	1/2"	\$25 ⁰⁰

1/4" SHANK

PART	CUTTER DIA. A	CUTTING LENGTH B	OVERALL LENGTH C	CUTTING WIDTH W	PRICE
C1293	1-1/8"	1/2"	2-1/8"	5/16"	\$25 ⁰⁰
C1294	1-3/8"	11/16"	2-1/4"	7/16"	\$25 ⁰⁰

1/2" SHANK

PART	CUTTER DIA. A	CUTTING LENGTH B	OVERALL LENGTH C	CUTTING WIDTH W	PRICE
C1295	1-1/8"	1/2"	2-1/4"	5/16"	\$25 ⁰⁰
C1296	1-3/8"	5/8"	2-1/2"	7/16"	\$25 ⁰⁰

1/4" SHANK

PART	CUTTER DIA. A	CUTTING LENGTH B	OVERALL LENGTH C	CUTTING WIDTH W	PRICE
C1297	1-1/4"	5/8"	2-1/8"	3/8"	\$25 ⁰⁰
C1298	1-3/8"	5/8"	2-1/8"	7/16"	\$25 ⁰⁰

1/2" SHANK

PART	CUTTER DIA. A	CUTTING LENGTH B	OVERALL LENGTH C	CUTTING WIDTH W	PRICE
C1299	1-3/8"	1/2"	1-3/8"	7/16"	\$25 ⁰⁰
C1300	1-5/8"	3/4"	2-1/2"	9/16"	\$25 ⁰⁰

1/4" SHANK

PART	CUTTER DIA. A	CUTTING LENGTH B	OVERALL LENGTH C	CUTTING WIDTH W	PRICE
C1301	1-1/2"	3/4"	2-1/4"	1/2"	\$25 ⁰⁰

1/2" SHANK

PART	CUTTER DIA. A	CUTTING LENGTH B	OVERALL LENGTH C	CUTTING WIDTH W	PRICE
C1302	1-5/8"	7/8"	2-3/4"	9/16"	\$25 ⁰⁰

1/2" SHANK

PART	CUTTER DIA. A	CUTTING LENGTH B	OVERALL LENGTH C	BEAD DIA. b	PRICE
C1262	1-1/8"	7/8"	2-3/8"	1/4"	\$20 ⁰⁰
C1263	1-3/8"	1"	2-1/2"	5/16"	\$22 ⁰⁰
C1264	1-5/8"	1-1/4"	2-3/4"	3/8"	\$24 ⁰⁰

EXCLUSIVE DISTRIBUTOR OF  INDUSTRIAL CARBIDE TOOLING!

ASK FOR A FREE CATALOG!

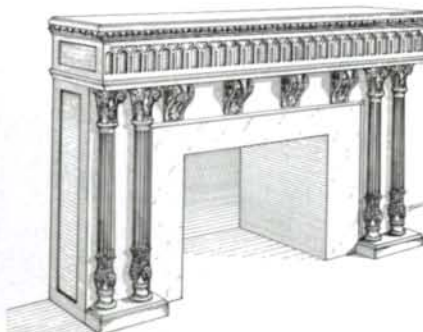
FREE SHIPPING ON ORDERS TOTALING \$100 OR MORE!



1-800-235-0272
ORDER 24 hrs. A DAY!



Raymond Enkeboll Designs



One of many renderings from our new Design Portfolio illustrating traditional and innovative ideas on how to use our unique line of architectural wood carvings.

Catalog & Design Portfolio - \$15.
Free Brochure Available
Please Indicate PWO692

16506 Avalon Blvd. Carson, CA 90746 Tel: (310) 532-1400 Fax: (310) 532-2042
READER SERVICE NO. 86

MIRRORA - THE HAND MIRROR COMPLEMENT

PERFECTLY BEVELED MIRROR

- The finishing touch for all woodcrafters • Ovals, and Circles, in 11 sizes, 3 colors • 1,000,000 pieces in stock-UPS Delivery-Ready-to-ship • Any shape or size can be beveled or fabricated • Glass mirror for all woodcrafting needs-shelves, doors
- Any size-thickness up to 1" • Call 1-800-MIRRORA NOW to place orders and get our full-line color catalog.

FLORAL
Glass & Mirror, Inc.

895 Motor Parkway
Hauppauge, New York 11788
516/234-2200 800-647-7672

READER SERVICE NO. 87

Buy Direct From The Manufacturer And **SAVE!**

**Buy 12 "EVER-LAST" Belts...
Get 12 Belts
FREE!**

Need ROLLS, WIDE BELTS, DISCS, SLEEVES, STROKE BELTS, etc.
Write for catalog.



Belts available in 36, 50, 60, 80, 100, 120, 150, 180, 220, 320 grit sizes.
Please specify grit sizes when ordering, otherwise an assortment will be supplied.

- 1" x 30"\$16.50/Doz. + 12 FREE
- 1" x 42"\$16.95/Doz. + 12 FREE
- 2" x 48"\$25.25/Doz. + 12 FREE
- 2-1/2" x 16"\$17.95/Doz. + 12 FREE
- 3" x 18"\$18.25/Doz. + 12 FREE
- 3" x 21"\$19.25/Doz. + 12 FREE
- 3" x 24"\$19.75/Doz. + 12 FREE
- 4" x 21"\$23.50/Doz. + 12 FREE
- 4" x 21-3/4"\$23.75/Doz. + 12 FREE
- 4" x 24"\$24.00/Doz. + 12 FREE
- 4" x 36"\$28.75/Doz. + 12 FREE
- 6" x 48"\$37.50/2Doz. + 6 FREE

Other size belts on request.

Belt Cleaning Stick\$4.95 each

For Fast Delivery Call Toll Free
1-800-428-2222 (U.S.A.)
1-800-222-2292 (PA only)

9" x 11" PAPER SHEETS
A/O or Garnet Cabinet Paper

	50 PACK	100 PACK
40-D.....	\$17.00	\$32.00
50-D.....	\$16.00	\$29.00
60-D.....	\$15.00	\$27.00
80-D.....	\$14.00	\$25.00
100-C.....	\$13.00	\$23.00
120-C.....	\$13.00	\$23.00
150-C.....	\$13.00	\$23.00

No Load Finishing Paper (White)

120-C.....	\$14.00	\$24.00
150-C.....	\$14.00	\$24.00
180-A.....	\$11.00	\$19.00
220-A.....	\$11.00	\$19.00
280-A.....	\$11.00	\$19.00
320-A.....	\$11.00	\$19.00
400-A.....	\$11.00	\$19.00

SHIPPING CHARGES: \$4.75 Continental U.S.
PA residents add 6% sales tax.
Minimum order \$25.00

MONEY ORDER CHECK
 MASTER CARD VISA

**INDUSTRIAL
BRASIVES CO.**

644 N. 8th ST. • READING, PA 19612

READER SERVICE NO. 20



WHOLE EARTH ACCESS

TOLL FREE 7 DAYS 1-800-829-6300 / VISA • MASTERCARD • DISCOVER

822 ANTHONY STREET, BERKELEY CA, 94710
FREE FREIGHT CONTINENTAL USA • ERRORS SUBJECT TO CORRECTIONS *FOB BERKELEY CA

PORTER CABLE

9852
NEW! 3/8" 12v
Magnequench
Cordless Drill



159.
9853 12v Magnequench w/Keyless Chuck 159.
9854 1/2" Magnequench Cordless Drill 165.

666	3/8" VSR T-Handle Drill	125.
7511	3/8" VSR H.D. Drill	114.
7514	1/2" VSR H.D. Drill	119.
7515	1/2" VSR H.D. Drill w/ Keyless Chuck	124.
320	Abrasive Plane	119.
9367	3-1/4" Plane Kit	159.
9118	Porta-Plane Kit	205.
9652	Versa-Plane Kit	299.
555	Plate Joiner Kit	165.
100	7/8 HP Router	105
690	1-1/2 HP Router	134.
691	1-1/2 HP D-Handle Router	144.
693	1-1/2 HP Plunge Base Router	169.
7310	Laminate Trimmer	89.
7312	Of set Base Laminate Trimmer	122.
7319	Tilt Base Laminate Trimmer	105.
7399	Drywall Cut-Out Tool	79.
7518	3-1/4 HP 5-spd Router	269.
7519	3-1/4 HP Router	225.
7536	2-1/2 HP Router	204.
7537	2-1/2 HP D-Handle Router	215.
7538	3-1/4 HP Plunge Router	229.
7539	3-1/4 HP VS Plunge Router	269.
97310	Laminate Trimmer Kit	189.
330	Speed-Bloc Finishing Sander	58.
352	3"x21" Dustless Belt Sander	142.
360	3"x24" Dustless Belt Sander	182.
362	4"x24" Dustless Belt Sander	189.
504	3"x24" Wormdrive Belt Sander	329.
505	1/2 Sheet Finishing Sander	118.
7334	5" Random Orbit Sander	119.
7335	5" VS Random Orbit Sander	129.
7336	6" VS Random Orbit Sander	135.
314	4-1/2" Trim Saw	138.
315-1	7-1/4" Top Handle Circular Saw	118.
345	6" Saw Boss Circular Saw	104.
7549	VS, Var-Orbit D-Handle Jigsaw	145.
9345	Saw Boss Kit	124.
9637	VS Tigersaw Kit	139.
9647	Tiger Cub Reciprocating Saw	118.

BOSCH

3050VSRK
3/8" Cordless
Driver/Drill, 2 bat.



139.

3051VSRK	Cordless Driver/Drill w/keyless chuck	149.
1000VSR	3/8" VSR Drill, 0-2100 RPM	79.
1021VSR	3/8" H.D. VSR Drill, 0-1100 RPM	99.
1194VSR	1/2" VSR Hammer Drill	159.
9164VSR	3/8" Mighty Midget VSR Drill	109.
9166VSR	1/2" Mighty Midget VSR Drill	118.
1347A	4-1/2" Mini Grinder, 5/8" -#11 spindle	95.
1348AE	5" EFC Mini Grinder, 5/8" -#11 spindle	118.
11202	1-1/2" Rotary Hammer	429.
11212VSR	3/4" VSR SDS Bulldog Rotary Hammer	195.
11214VS	1-3/4" EFC VS Rotary Hammer	629.
11215DVSR	3/4" Dustless Bulldog VSR SDS Hammer	299.
11304	Brute Breaker Hammer	1229.
11305	Demolition Hammer	689.
3258	3-1/4" Planer	137.
1942	Heavy Duty Heat Gun	72.
1604	1-3/4 HP Router	135.
1604K	1-3/4 HP Router Kit	165.
1606	1-3/4 HP D-Handle Router	159.

1608LX	Laminate Trimmer w/Deluxe Guide	109.
1608T	Tilt Base Laminate Trimmer	105.
1609	Offset Base Laminate Trimmer	125.
1609K	Installers Trimmer Kit	179.
1609KX	Deluxe Installers Trimmer Kit	229.
1615EVS	NEW! 3-1/4 HP EFC VS Plunge Router	265.
1272D	3"x24" Dustless Belt Sander	179.
1273D	4"x24" Dustless Belt Sander	188.
1273DVS	4"x24" VS Dustless Belt Sander	219.
1370DEV	6" VS Random Orbit Sander w/Access.	299.
3270D	3"x21" Dustless Belt Sander	145.
3283DVS	5" Dustless Random Orbit Sander	105.
1581DVS	VS, Var. Orbit Jigsaw, Dustless	189.
1581VS	VS, Var.Orbit Jigsaw, D-Handle	145.
1582VS	VS, Var.Orbit Jigsaw w/CLIC	145.
1632VSK	VS Panther Recip. Saw Kit	145.
1654	7-1/4" Circular Saw	118.
1420VSR	VSR Drywall Driver, 0-4000 RPM	85.

MILWAUKEE

0399-1	3/8" VSR 12v Driver/Drill Kit	165.
0402-1	VSR 12v Driver/Drill w/Keyless Chuck	169.
6546-1	Cordless Screwdriver, 2-spd	79.
0222-1	3/8" VSR Drill, 0-1000 RPM	108.
0224-1	3/8" Magnum Holeshooter, 0-1200 RPM	115.
0234-1	1/2" Magnum Holeshooter, 0-850 RPM	119.
0239-1	VSR Keyless Chuck Drill	125.
0244-1	1/2" Magnum Holeshooter, 0-600 RPM	119.
0375-1	3/8" Close Quarter Drill	129.
0379-1	1/2" Close Quarter Drill	149.
0567-1	Drain Cleaner Kit	235.
1676-1	Hole Hawg Kit	245.
3002-1	Electricians Rt. Angle Drill Kit	195.
3102-1	Plumbers Rt. Angle Drill Kit	195.
3107-1	VS Right Angle Drill Kit	199.
5192	Die Grinder, 4.5 Amp	175.
6140	4-1/2" Angle Grinder	99.
6141	5" Angle Grinder	109.
5362-1	1" TSCR Hawk Rotary Hammer	319.
8975	Heat Gun	59.
5680	2 HP Router	219.
5925	3"x24" Dustless Belt Sander	239.
5936	4"x24" Dustless Belt Sander	239.
6012	1/3 Sheet Finishing Sander	116.
6014	1/2 Sheet Finishing Sander	119.
6016	1/4 Sheet Finishing Sander	52.
6126	6" Random Orbit Sander	129.
6215	16" Electric Chainsaw	174.
6232	4-3/4" Bandsaw w/Case	279.
6365	7-1/4" Circular Saw	120.
6377	7-1/4" Wormdrive Saw	175.
6460	10-1/4" Circular Saw	259.
6528	VS Super Sawzall	169.
6750-1	VSR Drywall Driver	94.
6754-1	VSR Magnum Drywall	119.
6798-1	TEK Screwdriver	109.

FREUD

LM72M008	8"x24T Rip	35.
LM72M010	10"x24T Rip	37.
LU73M010	10"x60T ATB	45.
LU81M010	10"x40TTCG	39.
LU84M008	8"x40T Combination	44.
LU84M011	10"x50T Combination	39.
LU85M008	8"x64T ATB Fine Cut Of	49.
LU85M014	10"x80T ATB Fine Cut Of	58.
LU85M015	15"x108T ATB Fine Cut Of	105.
LU87M010	14"x108T ATB Fine Cut Of	105.
LU87M008	8"x22T Thin Kerf	42.
LU87M010	10"x24T Thin Kerf	39.
LU88M008	8"x48T Thin Kerf	47.
LU88M010	10"x60T Thin Kerf	45.
LU91M008	8-1/2"x48T Miter Saw Blade	42.
LU91M010	10"x60T Miter Saw Blade	49.


LU98M010	10"x80TTCG	68.
TK103	7-1/4" x 16T Decking Blade	13.
TK203	7-1/4" x 24T Framing Blade	16.
TK204	8-1/4" x 24T Framing Blade	23.
TK303	7-1/4" x 40T Finish Blade	23.
TK304	8-1/4" x 40T Finish Blade	24.
SD308	8" Dado Set	117.
FT2000	3-1/4 HP Plunge Router	179.
90-100	15 Pc. Router Bit Set	159.

ADJUSTABLE CLAMP

50	3/4" Pipe Clamp Fixture	Ea	Box/12
		7.95	89.
3706	6" Steel Bar Clamp	Ea	Box/6
3712	12" Steel Bar Clamp	6.49	36.55
3718	18" Steel Bar Clamp	6.99	39.75
3724	24" Steel Bar Clamp	7.75	42.99
3730	30" Steel Bar Clamp	8.39	47.75
3736	36" Steel Bar Clamp	9.55	53.45
0	Wooden Handscrew, 4-1/2" Open	10.39	58.75
1	Wooden Handscrew, 6" Open	11.95	62.95
2	Wooden Handscrew, 8" Open	12.95	71.49
		15.95	81.89

DELTA

22-540
12" Portable
Planer




399.

34-763	10", 3 HP Unisaw, 1 PH	1459.*
34-781	10", 1-1/2 HP Unisaw/ Unifence	1429.*
34-782	10", 3 HP Unisaw /Unifence, 1 PH	1599.*
31-730A	6" Belt/12" Disc w/Electricals	1095.*
37-350A	8" Long Bed Jointer w/Electricals	1449.*
43-375	3 HP HD Two-Speed Shaper	1599.*
11-990	12" Bench Drill Press	209.
14-600	Hollow Chisel Mortiser	469.
17-900	16-1/2" Drill Press	339.*
46-700	12" VS Wood Lathe	399.

Call For Quotes On Machines Not Listed

EMGLO


AM39HC4V
3/4 HP Vertical
Twin Tank



295.

MAKITA

BD5000
NEW! 5" Dusrless
Random Orbit Sander



69.

DA391D	VSR Cordless Angle Drill, 9.6v, keyless	90.
5090DW	3-3/8" Saw Kit, 9.6v	139.
6093DW	3/8" VSR Driver/Drill Kit, 9.6v	135.
6095DW	3/8" VSR Cordless Driver/Drill w/Keyless Chuck	145.
6200DW	3/8" VSR Hi-Torque Driver/Drill Kit	155.
DA3000R	3/8" VSR Angle Drill	148.
6404	3/8" VSR Drill, 0-2100 RPM	58.
G3500R	3500w Generator	995.*
9207SPC	7" Electronic Sander Polisher	154.
1805B	6-1/8" Planer w/Case	365.

1900BW	3-1/4" Planer Kit	114.
1911B	4-3/8" Planer Kit	145.
9820-2	Blade Sharpener	195.
3612BR	3 HP Plunge Router	165.
BD4510	1/4 Sheet Finishing Sander	54.
BD4550	1/4 Sheet Dustless Finishing Sander	57.
9401	4"x24" Dustless Belt Sander	175.
9900B	3"x21" Dustless Belt Sander	145.
LS1011	10" Compound Miter Saw	449.
LS1030	10" Miter Box	229.
LS1440	14" Miter Saw	435.
4200N	4-3/8" Trim Saw	129.
5007NBA	7-1/4" Circular Saw, Elec. Brake	127.
5077B	7-1/4" Hypoid Framers Saw	139.
5402A	16" Circular Saw	349.
2012	12" Portable Planer	469.
2708W	8-1/4" Table Saw	269.
2711	10" Table Saw w/Brake	489.

RYOBI

RS115
4 1/2" VS Random
Orbit Sander




75.

TFD220VRK	12v Cordless Drill Kit	165.
L1323ALSK	3-1/4" Planer Kit, Long Base	125.
JM100K	Biscuit Joiner Kit	209.
RE600	3 HP VS Plunge Router	205.
TR30U	Laminate Trimmer	88.
BE321	3"x21" VS Belt Sander	129.
BE424	4"x24" VS Belt Sander	168.
TS254	10" Miter Saw	209.
AP10	10" Portable Planer	359.
BT2500	10" Table Saw	309.
BT3000	10" Sliding Table Saw	569.
JP155	6-1/8" VS Jointer	299.
RA200	8" Radial Arm Saw	245.
SC160	16" Scroll Saw	139.

HITACHI

C8FB
8 1/2" Compound
Mitre Saw



449.

M12V	3 HP VS Plunge Router	235.
C10FA	Deluxe 10" Miter Saw	275.
C12FA	12" Miter Saw	319.
C15FB	15" Miter Saw	379.
C7BD	7-1/4" Circular Saw, Elect. Brake	135.
W6V2	VSR Quiet Drywall Screwdriver	89.
CB75F	Bandsaw/Resaw	1575.*
F1000A	12" Planer/6" Jointer Combo	1475.*
P12RA	Portable 12" Planer/ 6" Jointer Combo	839.

HITACHI NAIL GUNS

NR83A	Clipped Head Stick Nailer	419.
NV83A	Full Head Coil Nailer	429.
N5008AA	1/2" Crown Stapler, 5/8" - 2"	319.
N3824AR	1" Crown Roofing Stapler	329.
NT65A	16 Ga. Finish Nailer	319.

SKIL

2735-04	8" VSR 12v Cordless Drill Kit, w/2 Bat.	135.
77	7-1/4" Wormdrive Saw	145.
5860	8-1/4" 60" Wormdrive Saw	169.
3810	10" Miter Saw	225.
1605-02	Plate Joiner Kit	119.

Listings of gallery shows, major craft fairs, lectures, workshops and exhibitions are free, but restricted to happenings of direct interest to woodworkers. We list events (including entry deadlines for future juried shows) that are current with the time period indicated on the cover of the magazine, with overlap when space permits. We go to press three months before the issue date of the magazine and must be notified well in advance. For example, the deadline for events to be held in March or April is January 1; for July and August, it's May 1, and so on.

NATIONAL & INTERNATIONAL: Seminar—Finishing and Sanding Solutions for the '90s, May 11-13. Amway Plaza, Grand Rapids, Michigan. For info, contact Daniel Cassens, Department of Forestry and Natural Resources, Purdue University, West Lafayette, IN 47907-1200. (317) 494-3644.

Symposium—American Association of Woodturners, June 18-20. Brigham Young University, Provo, Utah. Contact American Association of Woodturners, 667 Harriet Ave., Shoreview, MN 55126. (612) 484-9094.

Convention and exhibition—Guild of American Luthiers, June 24-28. Shrine to Music Museum, Vermillion, South Dakota. Contact Guild of American Luthiers, 8222 S. Park Ave., Tacoma, WA 98408-5226. (206) 472-7853.

Convention and show—Unfinished Furniture Association, June 27-29, Nashville Convention Center, Nashville, Tennessee. Contact Sandi Soellner at (800) 487-8321.

Conference—World Turning Conference, April 21-25, 1993. Wilmington, Delaware. Application deadline: Aug. 1. Contact Albert LeCoff, Wood Turning Center, PO Box 25706, Philadelphia, PA 19144. (215) 844-2188.

Juried exhibition—Re-defining the Lathe-Turned Object. Call for entries. Slide deadline: October 1. For prospectus, send SASE to Arizona State University Art Museum, Nelson Fine Arts Center, Tempe, AZ 85287-2911. (602) 965-2787.

ARKANSAS: Open House—North Scenic 7 Spring Open House, May 1-3. For more info, contact Mert Parsons, President, Highway 7 Artists and Crafters Co-op, PO Box 326, Jasper, 72641. (501) 428-5224 or (501) 428-5501.

CALIFORNIA: Exhibition—International Lathe-Turned Objects: Challenge IV, thru May 31. Craft & Folk Art Museum, fourth floor of the May Co., corner of Wilshire and Fairfax, Los Angeles. Exhibition of 80 objects by more than 60 artists. Contact the museum at (213) 937-5576.

Shows—San Bernardino Woodworking Show, May 1-3. Maruko Convention Center, 295 North E St., San Bernardino; Southern California Woodworking Show, May 15-17. Long Beach Convention Center, Exhibit Hall 3, 300 Ocean Blvd., Long Beach. For more info, contact The Woodworking Shows, 1516 S. Pontius Ave., Los Angeles, 90025. (800) 826-8257.

Festival—9th annual California Strawberry Festival, May 16-17. Fine arts and crafts show. College Park, Oxnard. For more info, call Pacific Arts Festivals at (805) 831-1972.

Workshop—Building the Norwegian Pram with Simon Watts, June 6-12. San Francisco Maritime. For info, contact Crissy Field, National Maritime Museum Association, Bldg. 275, San Francisco, 94129. (415) 929-0202.

Competition and exhibition—Designs in Wood, June 16-July 5. Sponsored by San Diego Fine Woodworkers Association. Deadline: June 1. For entry forms, contact Southern California Expo, Entry Office, Del Mar, 92014-2216.

Workshops—Woodworking for women. Furnituremaking with hand tools using traditional joinery, weekends. Call for schedule: Debey Zito, (415) 648-6861.

Solicitation—New artists wanted for the Los Angeles Craft & Folk Art Museum Research Library. Used by collectors, curators, architects, designers. For info, contact Craft & Folk Art Museum Library, c/o the May Co., 6067 Wilshire Blvd., Los Angeles, 90036. (213) 934-7239.

Workshops—Various workshops incl. Japanese wood-working, joinery and sharpening. Contact Hida Tool Co., 1333 San Pablo, Berkeley, 94702. (415) 524-3700.

COLORADO: Classes—Woodworking and related classes, year-round. Red Rocks Community College, 13300 W. 6th Ave., Lakewood, 80401. (303) 988-6160.

Seminars—Woodworking seminars thru May. Contact Woodcraft Supply, 4403 South Tamarac Parkway, Denver, 80237. (303) 290-0007.

Workshops—Summer woodworking and furniture design workshops, June thru Aug. Instructors include: Silas Kopf, James Krenov and Sam Maloof. For a free catalog, contact Anderson Ranch Arts Center, PO Box 5598, Snowmass Village, 81615. (303) 923-3181.

Seminar—Beginning Woodworking for Youngsters, May 9. Woodcraft Supply, 4403 S. Tamarac Parkway, Denver. For more info, call (303) 290-6764.

Seminars—Woodworking seminars, Sept. thru April. Contact Schlosser Tool and Manufacturing Co., 301 Bryant St., Denver, 80219. (303) 922-8244.

CONNECTICUT: Exhibition—Containers, thru May 10. Lyman Allyn Art Museum, New London. For info, call (203) 443-2545.

Juried exhibition—24th annual Celebration of American Crafts, Nov. 9-Dec. 23. Deadline: July 1. For prospec-

tus, send SASE to Celebration of American Crafts, Creative Arts Workshop, 80 Audubon St., New Haven, 06510.

Juried show—SoNo Arts Celebration, Aug. 1-2. Waterfront district of South Norwalk. For an application, send SASE to SoNo Arts Celebration, Exhibiting Arts Committee, PO Box 2222, South Norwalk, 06852. (203) 849-9366.

Juried expositon—35th annual Guilford Handcrafts Exposition, July 16-18. Town Green, Guilford. For more info, call (203) 453-5947.

Exhibition—Windsor Chairs by James Rendi, June 6-July 19. Brookfield Craft Center, 127 Washington St., South Norwalk. For more information, call (203) 853-6155.

Exhibition—Colorful Carvings and Bird Houses by Rain-tree Carving (Barry Leader), June 14-Aug. 2. Brookfield Craft Center, Route 25, Brookfield. Call (203) 775-4526.

FLORIDA: Meetings—Central Florida Woodworkers Guild, second Thursday of every month, Winter Park. For information, contact Ed Harte (407) 862-3338.

Meetings—Sarasota Woodworking Club. Second Thurs. of every month. For info, contact Tom Clark, 3544 Oak Grove Drive, Sarasota, 34243. (813) 351-9059.

GEORGIA: Fair—Prater's Mill Country Fair 1992, May 9-10. This rural festival takes place on the grounds of an 1855 water-powered mill. Contact Prater's Mill Foundation, 101 Timberland Dr, Dalton, 30721. (404) 259-5765 or (404) 259-3420.

Competition—Design Emphasis '92 furniture design competition, call for entries. Sponsored by and held in conjunction with the International Woodworking Machinery & Furniture Supply Fair '92, Aug. 21-24, Georgia World Congress Center, Atlanta. For info on the competition, contact Shirley Byron, IWF, 8931 Shady Grove Court, Gaithersburg, MD 20877. (301) 948-5730.

Workshops—Japanese woodworking by Toshihiro Sahara. One Saturday each month, year-round. Contact Sahara Japanese Architectural Woodworks, 1716 Defoor Place N.W., Atlanta, 30018. (404) 355-1976.

Courses—Various woodworking courses, Feb. thru May. For info, contact Chris Bagby, Highland Hardware, 1045 N. Highland Ave., N.E., Atlanta, 30306. (404) 872-4466.

IDAHO: Festival—24th annual Art on the Green festival, July 31-Aug. 2. Fort Sherman area of North Idaho College campus, Coeur d'Alene. For more info, contact Citizens Council for the Arts, PO Box 901, Coeur d'Alene, 83814. (208) 667-9346.

INDIANA: Classes—Various woodworking classes and workshops including general woodworking, lathe and router seminars. Woodworking Unlimited, 6038 E. 82nd St., Indianapolis, 46250. (317) 849-0193.

Juried show—Works in Wood. Deadline: July. For more info, contact Marsha Demkovich, Chesterton Art Gallery, PO Box 783, Chesterton, 46304. (219) 926-3041.

IOWA: Juried fair—22nd annual Art in the Park, May 16-17. Four Square Park, Main Ave., Clinton. Fine arts and crafts. For more info, contact Carol Glahn, Clinton Art Association, Box 132, Clinton, 52733. (319) 259-8308.

KANSAS: Juried show—8th Annual Lenexa's National Art Show, June 12-14. Sar-Ko-Par Trails Park, Lenexa. For more information, contact Lenexa's National Art Show, 13420 Oak, Lenexa, 66215-3652. (913) 541-8592.

KENTUCKY: Show—Kentucky Lake Arts and Crafts Show, May 23-24. Land between the Lakes, Aurora. For more information, contact Cindy Lawson, PO Box 1332, Murray, 42071. (502) 753-1460.

Workshops—Woodturning and joinery instruction. One-day to one-week courses. Contact Jim Hall, Adventure in Woods, 415 Center St., Berea, 40403. (606) 986-8083.

Meetings—Kyana Woodcrafters Inc., first Thursday of each month. Bethel United Church of Christ, 4004 Shelbyville Road, Louisville, 40207. (502) 426-2991.

Workshops—Traditional Windsor chairmaking instruction. One-week courses. Contact David Wright, 503 Prospect, Berea, 40403. (606) 986-7962.

MAINE: Show—Woodworking World Show, May 1-3. Portland Exposition Bldg., 239 Park Ave., Portland. For more information, call (800) 521-7623.

Classes—Haystack Mountain School of Crafts, summer program. For info, contact 1992 Haystack Mountain School of Crafts, PO Box 518, Deer Isle, 04627. (207) 348-2306.

Classes—Woodworking for adults and children in daytime, evenings and on weekends. Portland School of Art, 97 Spring St., Portland, 04101. (207) 775-3052.

MARYLAND: Juried show—15th annual Spring Arts and Crafts Fair, May 1-3, Maryland State Fairgrounds, Timonium. For more info, contact Deann Verdier, Director, Sugarloaf Mountain Works, Inc., 200 Orchard Ridge Drive, Suite 215, Gaithersburg, 20878. (301) 990-1400.

Show—20th biennial Crafts Collection, June 3-July 13. Strathmore Hall Arts Center, Rockville. For more info, contact Mac Ehrlich, 6540 Bradley Blvd., Bethesda, 20817. (301) 365-1133.

Exhibition—10th annual Artscape '92, July 17-19. Crafts exhibition and market, Baltimore. For more info, call (410) 396-4575.

Juried show—29th annual Havre de Grace Art Show, Aug. 15-16. Tydings Memorial Park, Havre de Grace.

Deadline: June 15. For an application, send SASE to Art Show, PO Box 174, Havre de Grace, 21078. (410) 879-4404 or (410) 939-3303.

Juried festival—Maryland Country Music & Craft Festival, Aug. 15-16. Fair Hill. For more info, contact Carl Hyden, Governor's Office of Art & Culture, (410) 333-4793.

MASSACHUSETTS: Exhibition—Garden Treasures, May 9-July 11 at 175 Newbury St., Boston; May 18-July 11 at 101 Arch St., Boston. For info, contact The Society of Arts and Crafts at (617) 266-1810.

Exhibitions—Kimberly Kelzer and Jay Stanger, thru May 22. Clark Gallery, Lincoln Station, Lincoln; Stephen Whittlesey and selections from Peter Joseph Gallery, May 1-30. Gallery NAGA, 67 Newbury St. Boston. For more info, call (617) 259-8303.

Seminars—Various woodworking seminars thru May 16. For further info, contact Woodcraft Supply, 313 Montvale Ave., Woburn, MA 01801 (617) 935-6414.

Workshops—Painted Surfaces and Faux Finishes with Demetra Andreadis, May 8-10; Carpentry: Design and Build with Lance Hodes, June 20-22. For more info, contact Horizons, 374 Old Montague Road, Amherst, 01002. (413) 549-4841.

Show—7th annual Crafts at the Castle, Dec. 4-6. Deadline: May 18. For an application, contact Crafts at the Castle, Family Service of Greater Boston, 34 1/2 Beacon St., Boston, 02108. (617) 523-6400.

Fair—American Craft Council Fair, June 26-28. Eastern States Exposition, West Springfield. For more info, contact American Craft Enterprises at (800) 836-3470.

Workshops—Summer workshops at The Heartwood School, Johnson Road, Washington, 01235. (413) 623-6677.

Workshops—Fundamentals in Fine Woodworking, June 1-12, July 13-24 and Aug. 10-21; Shaker Nightstand, July 13-24 and Aug. 10-21; Bow Repair and Restoration, July 20-31; Violin Repair, Aug. 3-14. For info, contact North Bennet Street School, 39 N. Bennet St., Boston, 02113. (617) 227-0155.

Classes—Woodworking classes, throughout most of the year. Boston Center for Adult Education, 5 Commonwealth Ave., Boston, 02116. (617) 267-4430.

MICHIGAN: Seminar—Basic Wood Technology-Advanced Applications, May 21. Holiday Inn, Kalamazoo. For info, contact Dr. Otto Suchsland: (517) 355-7562 or Dr. Huber: (517) 355-6544.

Seminars—Various woodworking seminars thru May 24. For more information, contact Woodcraft Supply, Heritage Plaza, 14695 Telegraph Road, Redford, 48239 (313) 537-9377.

MINNESOTA: Fair—American Craft Council Fair, May 2-3. Minneapolis Convention Center. For more info, contact American Craft Enterprises at (800) 836-3470.

Courses—Log building, graduate session (furniture, railings, finishing), May 11-17. For more information, contact Great Lakes School of Log Building, 3544 1/2 Grand Ave., Minneapolis, 55408. (612) 822-5955.

Juried show—10th annual Upper Midwest Woodcarvers' Exhibition, July 25-31. Blue Earth. For more information, contact Harley Schmitgen, 311 E. 14th St., Blue Earth, 56013. (507) 526-2777.

Seminars—Various woodworking seminars thru May. Contact Woodcraft Supply, Plaza at Oxboro, 9741 Lyndale Ave. S., Bloomington, MN 55420. (612) 884-3634.

Juried festival—Minnesota Crafts Festival, June 27-28. College of St. Catherine, St. Paul. For info, contact MCC-Festival, Suite 308, 528 Hennepin Ave., Minneapolis 55403. (612) 333-7789.

Classes—Woodcarving classes year-round. Also, seminars on woodturning, chair caning and whittling. Special one-week summer session Aug. 10-14. For info, contact the Wood Carving School, 3056 Excelsior Blvd., Minneapolis, 55416. (612) 927-7491.

MISSOURI: Seminars—Various woodworking seminars thru May 9. For info, contact Woodcraft Supply, Dierberg's Heritage Place, 12511 Olive Blvd., Creve Coeur, 63141.

Juried exhibit—Turned Visions, May 8 thru June 27. A portion of the sales' commission will benefit the Woodworkers' Alliance for Rainforest Protection. Contact Craft Alliance, 6640 Delmar Blvd., St. Louis, 63130. (314) 725-1177.

MONTANA: Exhibition—Good Wood III, Oct. 2-4. Ramada Inn, Billings. Contact Montana Woodcarvers Association, 2919 Lynn Ave., Billings, 59102. (406) 656-2051.

NEBRASKA: Classes—Carving a Standing Bear with Desiree Hajny, May 16-17; Carving a Big-Horned Sheep, Sept. 18-20. Midwest Woodworkers Supply, Omaha. For more info, contact Midwest Woodworkers Supply, 13209 I St., Omaha, 68137. (402) 330-5444.

NEW HAMPSHIRE: Classes—19th summer Violin Craftsmanship Institute. University of New Hampshire. For more information, contact Violin Institute, UNH Continuing Education, Brook House, 24 Rosemary Lane, Durham, 03824. (603) 862-1088.

Demonstrations—2nd annual Wood Day, May 9. Canterbury Shaker Village. For info, contact Shaker Village, 288 Shaker Road, Canterbury, 03224. (603) 783-9511.

Demonstration—Techniques on making chairs and benches with Jim Becker, May 16. Guild of New Hamp-

Rated #1



Saw shown with Optional Motor Cover

Rated #1 by WOOD Magazine

* Less electric

GENERAL Tools

Built to last a lifetime

- * 10" Table Saw standard fence 350-1 Call
- * with 50" Beisemeyer fence 350-T50 Call
- * with 50" Paralock or Excalibur 350P50/E5 Call
- * 15" Bandsaw enclosed stand 490-1 Call
- * Variable Speed Lathe 160-2 Call
- Variable Speed Lathe 1hp 260-1 Call
- * 8" Jointer enclosed stand 480-1 Call
- * 15" Drill Press 6 Speed 34-01 Call
- * 3/4" Spindle Shaper 2800-B Call
- * 1 1/4" Spindle Shaper SS032 Call
- * 14" Radial Arm Saw V154 Call
- * Dowel Machine 3/8"-11/4" DM-032 Call

To Order or get Information:

102 Kimball Ave
So. Burlington, Vt.
SISCO SUPPLY Inc. 05403

802-863-9036

READER SERVICE NO. 7

Protect Your Back Issues



SLIPCASES FOR YOUR BACK ISSUES. Bound in blue and embossed in gold, each case holds at least 7 issues of *Fine Woodworking* (a year's worth), and costs \$7.95 (\$21.95 for 3, \$39.95 for 6). Add \$1.00 per case for postage and handling. Outside the United States, add \$2.50 each (U.S. funds only). PA residents add 7% sales tax. Send your order and payment to the address below, or call toll-free, 1-800-825-6690, and use your credit card (minimum \$15). Jesse Jones Ind., Dept. FWW, 499 E. Erie Ave., Philadelphia, PA 19134. (No P.O. boxes, please).

to the address below, or call toll-free, 1-800-825-6690, and use your credit card (minimum \$15). Jesse Jones Ind., Dept. FWW, 499 E. Erie Ave., Philadelphia, PA 19134. (No P.O. boxes, please).

ARROWMONT School of Arts and Crafts

Box 567, Gatlinburg, TN 37738 (615) 436-5860

One and Two Week Workshops
JUNE 8 - AUGUST 14, 1992

WOODTURNING: Roy Ferguson, Michael Hosoluk, Todd Hoyer, Steve Loar - John Jordan, Michael Peterson, Alan Lacer, David Ellsworth/**CLAY/FIBER-FABRIC/METAL/DRAWING/PAINTING/CALLIGRAPHY/PAPERMAKING/BOOKARTS/PHOTOGRAPHY**

Graduate/undergraduate credit
Assistantships/scholarships
Year-round gallery exhibition schedule

EQUAL OPPORTUNITY INSTITUTION

READER SERVICE NO. 107

Breathe Easier!



Powered Air Respirators for Wood Dust

\$329⁰⁰ Model AGHI

Excellent for all woodworking jobs which create "DUST." Also offers eye protection. Can be worn with beard and glasses. Systems also available for paint and lacquer fumes.

AIRSTREAM DUST HELMETS

Highway 54 South, Elbow Lake, MN 56531
Toll Free 1-800-328-1792 or 218-685-4457

READER SERVICE NO. 59

The Wood Slicer™

Extra-Durable, Precision Resawing Blades for Delta, Sears, Shopsmith, Inca & other Bandsaws

Slice through hardwoods up to 12" thick with the cleanest, easiest cuts your bandsaw has ever delivered. Wood Slicer™ blades feature individually filed, precision set teeth which are bombarded with titanium carbide and impulse hardened to stay sharp 3 times longer than ordinary blades. Carbon-manganese spring steel blade stock is thinner and stronger, allowing high tension while wasting less wood and requiring less power from your saw.



\$29.95*
(standard lengths)

State-of-the-art welds are unconditionally guaranteed against breakage. Half-inch 3-tooth design is ideal for resawing and ripping any wood up to your saw's maximum capacity.

Specify standard length: 72" (Shopsmith), 73" (Inca), 80" (Sears), 93-1/2" (Delta 14"), or 104-3/4" (Delta 14" with riser block). Custom lengths available with 4-6 weeks delivery for \$34.95 each.*

MC/VISA/Discover users
ORDER TOLL FREE
(800) 241-6748

* Add \$3.50 per order shipping charge within 50 states.

highland hardware
1045 N. Highland Ave. Dept. F 94
Atlanta, GA 30306 (404) 872-4466

READER SERVICE NO. 15



RBI

THE AMERICAN TOOLMAKER

While the history of RBIndustries goes back 60 years, this is the first time we've brought together all our precision-made tools and accessories in one catalog. The Hawk Precision Scroll Saw, 4-in-1 Woodplaner, PanelMasterDoorMachine, Router Mates, and much more. Quality equipment built here in the heart of America.

RBIndustries, Inc.
1801 Vine, P.O. Box 369
Harrisonville, MO 64701
800-487-2623

B38

READER SERVICE NO. 26

NEW!

Renovating Old Houses

George Nash



Bring that old house back to life.

Few things are more satisfying than bringing an old house back to useful life. Experienced renovator George Nash's new comprehensive book will help you with all your renovation jobs. You'll be able to renovate an old house to modern standards without destroying the warmth and spirit of the original. You'll learn how to:

- Rebuild foundations and porches
- Repair slate, asphalt, wood or metal roofs
- Add, subtract and enlarge windows
- Weatherproof an old house
- Repair plaster walls and wood floors
- Upgrade wiring, heating and plumbing

HARDCOVER, 352 PAGES, 205 PHOTOS, 127 DRAWINGS, 4 CHARTS, ITEM 070105, PRICE \$37.95

From the publishers of
Fine Homebuilding

100790

Yes, please send me *Renovating Old Houses* for a Risk-Free 14-day examination period. If I'm not completely satisfied, I may return it and owe nothing. Otherwise I will be billed \$37.95 plus \$4.00 postage and handling (CT residents add 6% sales tax, Canadian residents add 7% GST). 070105

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

I PREFER TO PAY NOW:
 MY PAYMENT IS ENCLOSED. MC VISA AM EX

CARD # _____

EXP. DATE _____ INITIALS _____

The Taunton Press
63 South Main Street, P.O. Box 5506
Newtown, CT 06470-5506

To order use this coupon or call toll free:

1-800-888-8286

TAUNTON BOOKS/VIDEOS

...by fellow enthusiasts

shire Woodworkers, Kensington. For info, contact John Skewes (603) 778-7360.

Juried exhibition—Guild of New Hampshire Woodworkers, Oct. 19. Killian Gallery at the Sharon Arts Center, Sharon. Deadline June 19. Contact John Skewes, 132 Drinkwater Road, Kensington, 03833. (603) 778-7360.

Classes—Fine arts and studio arts. Manchester Institute of Arts and Sciences, 114 Concord St., Manchester, 03104.

Classes—Various woodworking classes, year-round. Including antique repairs, carving canes & walking sticks, small boxes, kitchen utensils, lathe-turning, hand-carving, more. Contact The Hand & I, PO Box 264, Rte. 25, Moultonboro, 03254. (603) 476-5121.

Auctions—Antique and craftsman's tool auctions, year-round. Contact Richard A. Crane, Your Country Auctioneer, 63 Poor Farm Road, Hillsboro, 03244. (603) 478-5723.

NEW JERSEY: Show—13th annual South Jersey Wood Carvers Show, June 6-7. New Jersey National Guard Armory, Cherry Hill. Contact Pat DeAngelis: (609) 227-1969.

Juried festival—Waterloo Arts and Crafts Festival, Sept. 26-27. Deadline: June 15. Waterloo Concert Field, Stanhope. For more info, call Stella Show Management Co. at (201) 384-0010.

Juried show—22nd annual Peters Valley Craft Fair, July 25-26. For more info, contact Peters Valley Craft Fair, 19 Kuhn Rd., Layton, 07851. (201) 948-5200.

Workshops—Summer woodworking program. June thru Aug. For brochure, write to Peters Valley Craft Center, 19 Kuhn Road, Layton 07851 or call (201) 948-5200.

NEW MEXICO: Seminar and juried exhibition—Seminar with master cabinetmaker James Krenov and an exhibition of fine woodworking, July 10-11. For more info, contact Santa Fe Community College, Community Services, PO Box 4187, Santa Fe, 87502-4187.

Classes—Woodworking classes. Northern New Mexico Community College, El Rito, 87520. (505) 581-4501.

NEW YORK: Exhibitions—Timothy Philbrick, thru May 2. Rosanne Somerson, James Carpenter, thru May 15. Peter Joseph Gallery, 745 Fifth Ave., New York City. (212) 751-5500.

Show—14th annual Great Neck Celebrates Crafts, May 3. Old Village, Great Neck, Long Island. For more information, contact Creative Faïres Ltd., PO Box 1688, Westhampton Beach, 11978. (516) 288-2004.

Exhibition—Japanese Folk Art: The Triumph of Simplicity, May 14-July 2. Japan Society Gallery, 333 E. 47th St.,

New York. Contact Aimee Gautreau at (212) 715-1216.

Fair—International Contemporary Furniture Fair, May 17-20. Jacob K. Javits Convention Center. Contact George Little Management, Inc., 2 Park Ave., Suite 1100, New York, 10016-5748. (212) 686-6070.

Workshops—Japanese Hand Tools, May 23-24 and June 13-14. 2449 W. Saugerties Road, Saugerties, 12477. (914) 246-5207.

Juried show—Woodstock-New Paltz Arts & Crafts Fair, Spring Show, May 23-25, Ulster County Fairgrounds. Contact Scott or Neil Rubinstein, Quail Hollow Events, PO Box 825, Woodstock, 12498. (914) 679-8087.

Exhibition—Constructed Sculpture in Wood, thru June 7. The Brooklyn Museum, 200 Eastern Parkway, Brooklyn. For more info, call (718) 638-5000, ext. 330.

Classes—Boatbuilding classes, June thru Sept. Contact The Antique Boat Museum, 750 Mary St., Clayton, 13624. (315) 686-4104.

Exhibition—Step Lively: The Art of the Folk Cane, June 4-Sept. 7. Museum of American Folk Art, 2 Lincoln Square, New York. Contact Susan Flamm at (212) 977-7170.

Juried show—Spring Crafts at Rhinebeck, June 26-28. For info, contact Crafts at Rhinebeck, PO Box 389, Rhinebeck, 12572. (914) 876-4001.

Festival—Chautauqua Crafts Festival, July 3-5 and Aug 7-9. Bestor Plaza, Chautauqua Institution. For info, contact Gale Svenson, Director, Chautauqua Crafts Festival '92, PO Box 89, Mayville, 14757. (716) 386-6043.

Juried festival—16th annual American Crafts Festival, July 4-5 and July 11-12. Lincoln Center, New York City. For more info, contact Brenda Brigham, American Concern for Artistry and Craftsmanship, PO Box 650, Montclair, NJ 07042. (201) 746-0091.

Classes—Various beginning and advanced woodworking classes. Constantine, 2050 Eastchester Road, Bronx, 10461. (212) 792-1600.

Meetings and classes—New York Woodturners Association, first Tuesday of each month. Woodturning techniques exhibits, more. Also, Woodworking with Maurice Fraser. Sessions begin June 1. The Craft Student League, YWCA, 610 Lexington Ave., New York City.

NORTH CAROLINA: Fair—Blind May Fair, May 23-24. Folk Art Center, Milepost 382 on Glue Ridge Parkway, Asheville. For more info, call (704) 298-7928.

Shows—17th annual Highland Heritage Art and Craft Show, July 11-14. Asheville Mall, Asheville; 2nd annual Heritage Art and Craft Show, July 1-5. Old Threshers' Reunion, Denton; 4th annual Mountain Magic Art and Craft

Show, July 10-12. Carolina Day School, Asheville. For more info, contact High Country Crafters, 46 Haywood St., Asheville, 28801. (704) 254-2787.

Workshops—Summer woodworking workshops, June thru Aug. Penland School, Penland. For a catalog, write to Penland School, Penland, 28765 or call (704) 765-2359.

Show—North Carolina Piedmont Woodcarvers annual show, Oct. 3. For info, contact Bob Williams, Route 7, Box 234, Mooresville, 28115. (704) 663-3736.

Video course—Wood Technology, six-lesson correspondence course on the wood industry. For info, contact Ms. Vann Moore, Dept. of Wood & Paper Science, North Carolina State Univ., PO Box 8005, Raleigh, 27695-8005. (919) 737-3181.

Workshops—Woodworking and woodcarving workshops, year-round. For info, contact John Campbell Folk School, Route 1, Box 14-A, Brasstown, 28902. (800) 562-2440 or (704) 837-2775.

Meetings—North Carolina Woodturners, second Saturday of every month. Also, woodturning workshops for all levels. For info, contact Eric Hughes, Rte. 3, PO Box 300, Conover, 28613. (704) 464-5611.

OHIO: Workshop—Spray Finishing Technology, May 11-14. Classes to be held at Technical Training Centers at DeVilbiss Ransburg in the Toledo area. Contact Dr. Richard Krupp at Bowling Green State University: (419) 372-7560.

OREGON: Show—About Beds, May 9-June 14. Made in Jefferson Gallery, 3259 Jefferson Scio Drive, Jefferson. For info, contact Toni Gilbert at (503) 327-2543.

Show—Summer Show of Fine Woodworking, June 25-28. Presented by the Siskiyou Woodcraft Guild. Pioneer Hall, Winburn Way, Ashland. (503) 482-4829

Design Competition—5th annual Table, Lamp and Chair. Deadline: June 30. For more information, contact Table, Lamp and Chair '92, PO Box 69352, Portland, 97201. (503) 246-7314.

Workshops—Special English Finishing Techniques, July 13-17; Conservation and Restoration, July 20-24. Instructor: Bruce Luckhurst. Oregon School of Arts and Crafts, 8245 S.W. Barnes Road, Portland, 97225. (503) 297-5544.

Juried show—Nehalem Fine Woodworking Show, Aug. 1-31. Artisans's Gallery, 12870 H St. (Highway 101). Slide deadline: June 1. Contact Deborah Kerner, Artisan's Gallery, PO Box 367, Nehalem, 97131. (503) 368-7301.

Meetings—Guild of Oregon Woodworkers, third Friday of every month. For location, contact the Guild at PO Box 1866, Portland, 97207. (503) 293-5711.

PORTER CABLE

ROUTER BITS 30% OFF OF LIST-BUY 8 BITS DURING 1992 & GET OAK ROUTER BIT CABINET FREE-CALL FOR DETAILS!

100	7.8 HP ROUTER	97
314	4 1/2" TRIM SAW	132
345	SAW BOSS 6" CIRCULAR SAW	102
330	SPEED BLOCK FINISHING SANDER 1/4 SHT	56
351	3" X 21" BELT SANDER	135
352	3" X 21" BELT SANDER WITH DUST BAG	139
360	3" X 24" BELT SANDER WITH DUST BAG	179
361	3" X 24" BELT SANDER	166
362	4" X 24" BELT SANDER WITH DUST BAG	168
363	4" X 24" BELT SANDER	183
504	3" X 24" BELT SANDER XTRA HEAVY DUTY	324
505	1/2 SHEET FINISHING SANDER	115
548	BAYONET SAW WORM DRIVE	189
555	BISCUIT JOINER WITH STEEL CASE	164
617	7 1/4" BUILDERS SAW	117
621	3/8" DRILL VARIABLE SPEED, REVERSIBLE	98
690	1 1/2 HP ROUTER W 1/4" & 1/2" COLLETS	128
691	1 1/2 HP "D" HANDLE ROUTER	139
693	PLUNGE BASE ROUTER, 1 1/2 HP	165
695	SHAPER TABLE W 1 1/2 HP ROUTER	204
5008	DOVETAIL TEMPLATE	78
5115	OMNI JIG	259
5556	BISCUIT JOINER TILT FENCE	42
6931	PLUNGE ROUTER BASE	74
7310	LAMINATE TRIMMER, 5.6 AMP	85
7312	OFFSET TRIMMER	118
7335	5" RANDOM ORBIT SANDER-VARIABLE SPD	125
7336	6" RANDOM ORBIT SANDER-VARIABLE SPD	129
73333	RANDOM ORBIT DUST EXTRACTION SYSTEM	24
7518	3 1/4 HP FIXED BASE ROUTER 5 SPEED	259
7519	3 1/4 HP FIXED BASE ROUTER SINGLE SPD	224
7536	2 1/2 HP FIXED BASE ROUTER	198
7537	2 1/2 HP FIXED BASE "D" HANDLE ROUTER	208
7538	3 1/4 HP PLUNGE ROUTER SINGLE SPEED	224
7539	3 1/4 HP PLUNGE ROUTER 5 SPEED	264
7549	TOP HANDLE BAYONET SAW	144
9118	PORTA PLANE KIT W CASE CARBIDE BLADE	198
9314	4 1/2" TRIM SAW KIT	147
9315	7 1/4" BUILDERS SAW KIT	134
9345	SAW BOSS 6" CIRCULAR SAW KIT	122
9548	WORM GEAR BAYONET SAW KIT	194
9617	7 1/4" BUILDERS SAW KIT	134
9637	TIGER SAW VAR SPEED RECIP SAW KIT	138
9647	TIGER CUB RECIPROCATING SAW KIT	114
9652	VERSA PLANE KIT	289
9654	12 V, 1/2" CDLESS KIT VAR SPD W GEARED CK	159
97310	LAMINATE TRIMMER KIT W 4 BASES & CASE	187

INTERNATIONAL TOOL CORPORATION
 1939 TYLER STREET, HOLLYWOOD, FL 33020
 COD ADD \$5.00 (CASH, CREDITORS CHECK OR MONEY ORDER PLEASE)
1-800-338-3384 IN USA, CANADA, PUERTO RICO & US VIRGIN ISLANDS!
 FAX US YOUR ORDER AT 1-305-927-0291
FREE FREIGHT & SAME DAY SHIPPING
 ON MOST ORDERS WITH \$25.00 MINIMUM PURCHASE

PORTER CABLE
 MODEL 6953
3/8" VAR SPEED, REV. CORDLESS DRIVER DRILL KIT W/KEYLESS CHUCK, BATTERY, CHARGER & CASE
 EXTRA BATTERY \$26.00
OUR PRICE \$148.00

Panasonic
 EY6207BC12V 1/2" KYLS CK 2 SPD VSR BAT 15MIN CS \$208
 EY6258C12V 3/8" CK KYLS 2 SPD VSR W 15 MIN CHRGR 178
 EY6600C12V 3/8" HAMMER DRILL 15 MIN CH BAT CSE 199

DELTA
 22-540 12" PORTABLE PLANER \$410
 31-460 4" BELT 6" DISC SANDER 135
 40-560 16" TWO SPEED SCROLL SAW 184
 31-080 1" BELT 5" DISC SANDER 94

HTC MOBILE BASES ARE 15% OFF LIST! CALL FOR PRICES

freud ALL ROUTER BITS & SHAPER CUTTERS ARE 40% OFF OF LIST PRICES!
 MODEL FT2000E
3 1/4 HORSE POWER PLUNGE ROUTER, VAR SPEED WITH 1/2" COLLET, 1/4" REDUCER
OUR PRICE \$205.00

Panasonic
 MODEL EY571BC
PANASONIC 8.6 VOLT, 3/8" DRIVER DRILL, 2 STAGE VAR, REV. 5 POSITION CLUTCH, INC. 2 BATTERIES, 1 HOUR CHARGER, CASE
OUR PRICE \$149.00

HITACHI
 TR12 3 HP PLUNGE ROUTER \$166
 C8FB 8 1/2" SLIDE COMPOUND MITER W 24T BLD 448

MILWAUKEE
 0228-1 3/8" VSR PISTOL GRIP DRILL \$ 98
 6014 1/2 SHEET FINISHING SANDER 116
 6017 1/4 SHEET FINISHING SANDER DUSTLESS 54
 6365 7 1/4" CIRCULAR SAW 117
 6511 2 SPD SAWZALL W CASE & BLADES 128
 6527 SUPER SAWZALL WITH CASE & BLADES 164

SKIL FREE CARBIDE BLADE WITH SAW PURCHASE
 1575 3 3/4" PLANER W CARBIDE BLADES \$119
 1605-02 BISCUIT JOINING MACHINE WITH CASE 119
 2735-04 TOP GUN 12V W 2 BAT CSE VSR KEYLESS 129
 77 7 1/4" WORM DRIVE SAW INC CARBIDE BLD 145
 5550 7 1/4" CIRCULAR SAW W CARBIDE BLADE 89
 5660 8 1/4" 60 DEGREE PRO BEVEL SAW W CBD 138
 5860 8 1/4" 60 DEGREE PRO BEVEL WORM DRIVE 168
 1575 3 3/4" PLANER W CARBIDE BLADES 119
 7484 RANDOM ORBIT SANDER 5" DUSTLESS 99

SKIL
 MODEL 1605-02
BISCUIT JOINER WITH CASE & 200 FREE BISCUITS!
 1000 BISCUITS \$26.00 ANY SIZE!
OUR PRICE \$119.00

VEH MODEL 636K
OSCILLATING CORNER SANDER WITH CASE & 100 SHEETS OF ASSORTED STICKIT PAPER!
OUR PRICE \$279.00

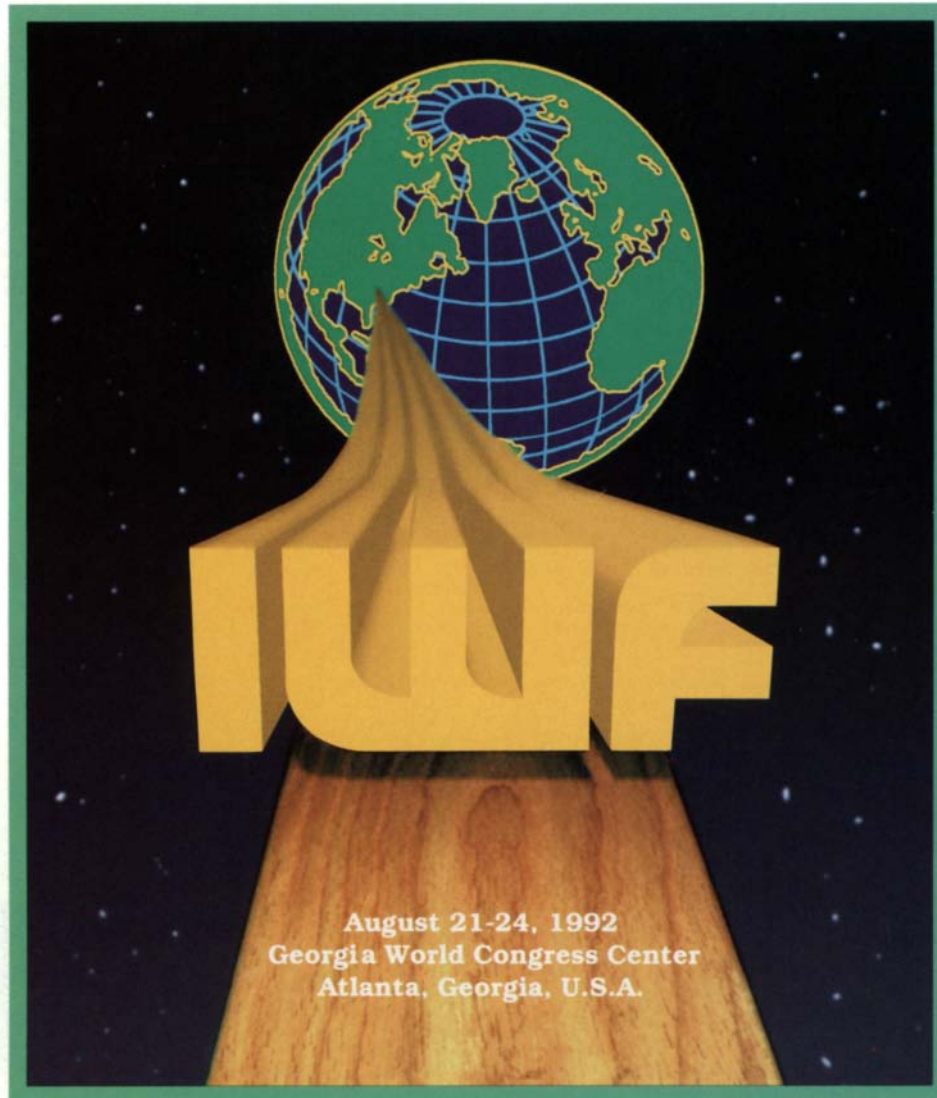
PORTER CABLE
 MODEL 7336
6" VARIABLE SPEED RANDOM ORBIT SANDER WITH STICKIT PAD
OUR PRICE \$129.00

freud ALL ROUTER BITS & SHAPER CUTTERS ARE 40% OFF OF LIST PRICES!
 JS100 BISCUIT JOINER W STEEL CASE 165
 FT2000 3 1/4 HP PLUNGE ROUTER 175
 LU85M008 8" X 64T ATB ULTIMATE WOOD CUT-OFF 52
 LU88M008 8" X 48T ATB CROSSCUT THIN KERF 42
 LU84M008 8" X 40T ATB COMBO WOOD BLADE 38
 LU84M011 10" X 50T ATB COMBO WOOD BLADE 38
 LU85M010 10" X 80T ATB CUT OFF BEST FOR WOOD 55
 LM72M010 10" X 24T FLAT TOP RIP BLADE WOOD 36
 LU87M010 10" X 24T RIP BLADE THIN KERF 37
 LU88M010 8" X 40T CROSSCUT THIN KERF 43
 LU89M010 10" X 72T TCH NON FERROUS METALS 64
 LU92M010 10" X 80T TCH BEST FOR LAMINATES 68
 LU86M010 10" X 80T TCH WOOD OR LAMINATES 68
 TK103 7 1/4" X 16T THIN KERF DECKING 14
 TK203 7 1/4" X 24T THIN KERF 18
 TK206 10" X 24T THIN KERF RIPPING 20
 TK306 10" X 40T THIN KERF COMBINATION 25
 TK906 10" X 50T THIN KERF CROSSCUT COMBO 27
 SD308 8" DADO SET WITH CARRYING CASE 116
 WC106 6 PIECE WOOD CHISEL SET WITH CASE 49
 FB107 7 PIECE FORSTNER BIT SET WITH CASE 49
 88-100 9 PC ROUTER BIT SET 1/4" SHANKS 84
 90-100 15 PC PROFILE SET 1/4" SHANKS 142
 91-100 15 PC PROFILE SET 1/2" SHANKS 149
 EB100 EDGE BANDING SYSTEM 224

BOSCH ALL BOSCH ROUTER BITS ARE 40% OFF OF LIST PRICES!
 1272 3" X 24" BELT SANDER \$164
 1273DVS 4" X 24" BELT SANDER DUSTLESS VS 194
 1370DVS 6" DSTLS VS RANDOM ORBIT SANDER 224
 1581VS TOP HANDLE JIG SAW ORBITAL VAR SP 134
 1582VS BARREL HANDLE CLIC JIG SAW ORB VS 134
 1602 1 1/2 HP ROUTER 124
 1604 1 3/4 HP ROUTER 129
 1608 TRIM ROUTER 85
 1609K INSTALLERS KIT W 3 BASES & CASE 164
 1609KX DELUXE INSTALLERS KIT W 4 BASES CSE 198
 3050VSRK CORDLESS DRILL 9.6V VS 2 BAT & CASE 132
 3283DVS 5" RANDOM ORBIT SANDER VS DSTLS 95

BOSTITCH
 N89S STICK NAILER 6 TO 16 PENNY \$388
 T40S-1CT ROOFING STAPLER 299
 N12B ROOFING NAILER 416
 N60FN FINISH NAILER 1 1/4" TO 2 1/2" CAPACITY 335
 M111-812 T-NAILER 9 16" 2 1/4" CAPACITY 429
 T28-5 FINISHING STAPLER 1 3/16" CAPACITY 268
 T31-3 FINISHING STAPLER 1" CAPACITY 148

Think IWF '92—Atlanta



International Woodworking Machinery & Furniture Supply Fair—U.S.A.®
Sponsored by: American Furniture Manufacturers Association
Wood Machinery Manufacturers of America
Woodworking Machinery Importers Association

The Marketplace With The Answers For Improved Products and Profits

Now is the time to start planning for increased productivity and market share. IWF '92 can help you get there. More than 900 exhibiting companies have the ideas and answers, the materials and the machinery...all showcased in the **LARGEST International Woodworking Machinery and Furniture Supply Fair** in the Western Hemisphere. IWF '92 will cover approximately 585,000 net square feet (54,000 square meters) of exhibit space with 36,000 total participants attending.

You'll also have the opportunity to take part in carefully selected, comprehensive seminars on the hottest industry topics that need your attention now!

So come to where the woodworking world gets their information—in the country with the largest single market for furniture, custom woodworking, architectural woodwork, kitchen cabinetry, woodworking machinery and supplies—IWF '92!

Mail this form to: IWF c/o Cahners Exposition Group
1350 E. Touhy Ave., Des Plaines, IL 60018 U.S.A.
TEL: (708) 390-2472, FAX: (708) 635-1571

- I'm interested in attending.
 I'm interested in exhibiting.

(Please type or print)

Name _____

Title _____

Company _____

Street Address _____

City/Postal Code/State/Country _____

Telephone _____

Fax No. _____

N1

PENNSYLVANIA: Juried exhibitions—Re-Awakening: A Celebration of Spring, May 2–June 7; Stories: The Narrative Art in Contemporary Crafts, Aug. 8–Sept. 20. For more info, contact Luckenbach Mill Gallery, 459 Old York Road, Bethlehem, 18018. (215) 691-0603.

Festival—9th annual Penn's Colony Festival, Sept. 19–20 and Sept. 26–27. Application deadline: May 31. For info, contact Penn's Colony Festival, 603 E. End Ave., Pittsburgh, 15221. (412) 241-8006.

Market—20th Lancaster designer spring art and craft market, June 6–7. For info, call Pegge Shannon (717) 291-1173 or Lancaster Designer Craftsmen (717) 295-1500.

Show—Market Square Traditional Wholesale Show, June 13–15. Valley Forge Convention Center, King of Prussia. For more info, call (717) 776-6989.

Classes—Woodcarving at Sawmill Center for the Arts, June 22 thru Aug. For more info, contact Cook Forest Sawmill Center for the Arts, PO Box 180, Cooksburg, 16217.

Juried festival—Central Pennsylvania Festival of the Arts, July 9–12. For info, contact Katherine Talcott, Assistant Director, Central Pennsylvania Festival of the Arts, PO Box 1023, State College, 16804. (814) 237-3682.

Classes—Windsor chairmaking, all levels, weekly and weekends. Contact Jim Rendi, Philadelphia Windsor Chair Shop, PO Box 67, Earlville, 19519. (215) 689-4717.

Classes and demonstrations—Carve a Cabriole Leg with Gene Landon, May 2–3; Sharpening with Prew Savoy, May 16–17; Mike Dunbar Builds a Sack Windsor Chair, May 30–31; Build a Chippendale Chair with Gene Landon, June 13–17. Olde Mill Cabinet Shoppe, 1660 Camp Betty Washington Road, York, 17402. (717) 755-8884.

SOUTH CAROLINA: Festival—Mayfest Arts and Crafts Showcase, May 2–3. Sidney Park, Columbia. For info, contact Columbia Action Council, 817 Calhoun St., Columbia, 29210. (803) 254-0253.

TENNESSEE: Workshops—Windsor Chairmaking with David Wright, June 8–12; Art of Woodturning with Giles Gilson, June 8–12; Timber Framing with David Hickman and Joe MacDonald, June 8–12; Woodcarving with Jess Betschart, July 20–24; Woodturning with John Jordan, July 20–24. For more information, contact Ilene Quall, Appalachian Center for Crafts, PO Box 430, Route 3, Smithville, 37166. (615) 597-6801.

Workshops—Summer workshop program at Arrowmont School of Arts and Crafts, June thru Aug. For more information, contact Registrar, Arrowmont School, PO Box 567, Gatlinburg, 37738. (615) 436-5860.

VERMONT: Classes—Shop courses, May 31–Aug 1. For more info, contact Yestermorrow, PO Box 344, Warren, 05674. (802) 496-5545.

Classes—Cedar/Canvas Canoe Construction, July 5–10 and Sept. 6–11. For more information, contact Sterling College, Craftsbury Common, 05827. Or call Horace Strong at (802) 586-2575.

VIRGINIA: Exhibition—Spotlight '92, May 8–July 31. Sponsored by Southeast Region of the American Craft Council and Hand Workshop, Virginia Center for the Craft Arts. For more information, contact Spotlight '92, Hand Workshop, 1812 W. Main St., Richmond, 23220. (804) 353-0094.

Show—17th annual Richmond Craft and Design Show, Nov. 20–22. Richmond Centre for Conventions and Exhibition. Slide deadline: June 1. For an application, contact Hand Workshop, 1812 W. Main St., Richmond, 23220. (804) 353-0094.

WASHINGTON: Seminars—Various woodworking seminars thru May. For info, contact Woodcraft Supply, Georgetown Center, 5963 Corson Ave. S. Seattle, 98101. (206) 767-6394.

Juried show—6th annual show and sale, Kitsap County Woodcarvers Club, June 13–14. Kitsap Mall, Silverdale. For more info, contact Chuck Malven, 6015 Osprey Cr., Bremerton, 98312.

Meetings—Northwest Woodworkers Guild, last Wednesday of each month. Contact John Gruenewald 622 9th Ave., Kirkland, 98033. (206) 827-8012.

Workshops—Boatbuilding workshops and seminars year round. For more information, contact Northwest School of Wooden Boatbuilding, 251 Otto St., Port Townsend, 98368. (206) 385-4948.

WEST VIRGINIA: Workshops—Workshops include Windsor chairmaking and Basic Cabinetry, May 17–Aug. 17. For info, contact Crafts Center, Cedar Lakes, Ripley, 25271. (304) 372-7005.

Workshops—Workshops include Banjo Construction, Log House Construction and Chip Carving, July and August. For more info, contact Augusta Heritage Center, PO Box C.N., Davis and Elkins College, Elkins, 26241-3996. (304) 636-1903.

WISCONSIN: Exposition—The Masters Wildlife Art Exposition and Ducks Unlimited Carving Competition, May 16–17. City of Racine Festival Hall, 5 Fifth St. Racine.

AUSTRALIA: Festival and meeting—Battle of the Coral Sea, May 1–12; meeting May 11. The Townsville Area Woodturners Association, PO Box 692, Aitkenvale, 4814, Queensland. Contact Neville Hines (077) 73-556 or Mac Goodwin (077) 79-1932.

CANADA: Juried exhibition—Southern Alberta Woodworkers Society. Call for entries. For entry forms, write Southern Alberta Woodworkers Society, PO Box 6753, Station D, Calgary, Alberta, T2P 2E6. For info contact, Doug Haslam: (403) 270-3195.

Show—Woodturnings by Bob Gonzales, July 4–5 and July 11–12. Arnold Mikelson Mind and Matter Gallery, 13743 16th Ave., White Rock, Surrey, B.C. (604) 536-6460.

Juried exhibition and show—9th annual Wood Show, Aug. 7–9. Durham Community Centre, Grey County. For brochure or info, contact The Wood Show, PO Box 920, Durham, Ont., N0G 1R0. (519) 369-6902.

Workshops—Furniture workshops, June 15 thru Aug. 8. Sheridan College Summer School of the Arts, 1430 Trafalgar Road, Oakville, Ont., L6H 2L1. (416) 845-9430.

Seminar—Woodturning Design and Technique III, Aug. 1–3, Kelsey Campus, Saskatoon. Instructors: Del Stubbs, Richard Raffan, Giles Gilson, Mark Sfirri. For more information, contact Saskatchewan Craft Council, 813 Broadway Ave., Saskatoon, Sask. S7N 1B5 (306) 653-3616.

Classes—Furnituremaking, carving, lathe turning, router and more. Tools 'n Space Woodworking, 338 Catherine St., Victoria, B.C., V9A 3S8. (604) 383-9600.


Meetings—Canadian Woodturners Association meetings, throughout the year. Second Tuesday of each month. Contact Patrick Chen, PO Box 8812, Ottawa, Ont., K1G 3J1. (613) 739-7746.

Meetings—Blue Mountain Woodworking Club meetings, throughout the year. Third Wednesday of each month. Contact Glenn Carruthers, PO Box 795, Stayner, Ont., L0M 1S0. (705) 444-1752.

Meetings—West Island Woodturners Club meetings, second Tuesday of each month. Also, woodturning courses. Contact Eric Webb, 61 Devon Road, Beaconsfield, Que., H9W 4K7. (514) 630-3629.

Meetings—Northern Alberta Woodcrafters Guild meetings, third Thursday, Sept. thru June. Contact Douglas Lobb, 121 Healy Road, Edmonton, Alberta, T6R 1W3. (403) 430-7391.



ENGLAND: Classes—Woodworking classes. Smith's Gallery, 56 Earlam St., WC2. Contact Laetitia Powell, Parnham, Beaminstor, Dorset, DT8 3NA. (0308) 862204.



HITACHI

SUMMER SIZZLERS


TOLL FREE 1-800-247-7178

	C8FB 8 1/2" Slide Compound Saw..... \$ 439.00
	C12FA 12" Miter Saw..... \$ 289.00
	C7SB 7 1/4" Circular Saw..... \$ 109.00
	With Carbide Blade
	CJ65V Jig Saw, Orbital, VSP..... \$ 139.00
	M12V 1/2" Plunge, Variable
	Electronic Router..... \$ 223.00
	SB75 3x21 2 Speed Belt Sander..... \$ 136.00
	SB8T 3x24 2 Speed Belt Sander..... \$ 139.00
	W6V2 Drywall Screwdriver..... \$ 79.00
	CB75F 14 1/2" Band Saw (Resaw)..... \$1519.00*
	P12R Planer..... \$ 669.00*
	P12RA Planer and Jointer..... \$ 879.00*
	*PLUS FREIGHT

DEWALT SPECIAL NEW DW-945K 12 Volt VSP, Cordless Drill Kit
2 Speed, Keyless Chuck, Case..... \$ 159.00

5.5% Sales Tax for Wisconsin Residents.
HOURS: 7:30-5:00 Monday-Friday
VISA • MasterCard • Money Order • Check • C.O.D.

FREE FREIGHT
On All Tools



MARLING
LUMBER COMPANY

P.O. BOX 7668
1801 EAST WASHINGTON AVE.
MADISON, WI 53707

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



Hob-Knobbing...

...with the best furniture hardware there is. The kind demanding craftsmen have been ordering from us for years. Be it knobs or pulls, rely on our new 70-page catalog to help you with the toughest project. To get your copy of this valuable reference, use circle #401 and send \$4.00 to:

PAXTON HARDWARE LTD.

7818 Bradshaw Road, Dept. FW19, Upper Falls, MD 21156

Quick Shipment Free Mini-Catalog

READER SERVICE NO. 22



POWERMATIC

HOT SHEET SPECIAL!

from New York State's largest **POWERMATIC** dealer.
Call for special pricing.

Over 50 different machines in stock.

Northland Woodworking Supply
65 Wurz Ave., Utica, NY 13502

315-724-1299 FAX 315-724-1298

READER SERVICE NO. 143

Portable/Folding SAW HORSE

Plans \$9.95 Kit \$45.95

8" x 42" x 28"H Birch Ply and Yellow Pine.

Easy to Follow Plans
Ready to Assemble, FINISHED Kits!



Portable/Folding MITER SAW TABLE

Adjustable Height

Plans \$12.95 Kit \$259.95

Fast Set-up. 6' x 12", Birch Ply & Oak w/ Formica® covered table.



Prices include shipping. Send check or money order to:

A & M Designs
P.O. Box 460597
Garland, TX 75046-0597
214-272-4433

READER SERVICE NO. 50

Fine WoodWorking

SUBSCRIBER SERVICE

We occasionally make our subscriber list available to companies whose products we think may be of interest to you. If you prefer not to receive this mail, just send your mailing label (or an exact copy) to the address below. We'll take care of the rest.

Customer Service Dept., The Taunton Press
63 S. Main St., P.O. Box 5506
Newtown, CT 06470-5506

We've helped hold it together... Since 1903

"Jorgensen"
"Pony"
Adjustable



Quality in our products... dedication in our service. We've held to these commitments just as you've held up our Clamps and Vises as your standards to each new generation since 1903. We'll continue to hold consistently to our traditions of excellence.

Write for our Catalog SEND \$1.00
Adjustable Clamp Company
431 N. Ashland Avenue, Chicago, IL 60622

READER SERVICE NO. 45

Incra Jig PRO

U.S. PATENT #4,793,604 Other Patents Pending

From the makers of the Original INCRA JIG

When the Original INCRA JIG was introduced in late 1987, many woodworkers began to explore the potential of this unusual new tool. They quickly discovered that not only did it make their everyday woodworking operations easier and more accurate, but it also enabled them to produce work that they would have previously thought impossible.

Within a few short years, INCRA JIG became widely recognized throughout the industry as not just another interesting new gadget, but rather **AN EVOLUTIONARY ADVANCEMENT IN THE ART OF WORKING WITH WOOD.** If you ask an experienced INCRA JIG user he will tell you that he understands exactly what we mean. He will tell you about the absolute perfection he has been able to achieve in making **box joints** and **dovetails.** He will show you impossible looking new joints like the **INCRA Double Dovetail** and the **INCRA Double-Double Box Joint.** Or perhaps he will simply tell you that it has revolutionized the way he works on the router table or table saw.

Now, four years later, the NEXT generation of INCRA has arrived . . . We are proud to introduce INCRA JIG PRO!

The INCRA Double-Double Through Dovetail is but one example of the extraordinary work that you can accomplish with INCRA JIG's precision and ease of use.



INCRA JIG Pro uses the same rack positioning technique that gives the Original INCRA JIG its phenomenal accuracy. And like the Original, INCRA JIG Pro can be used to produce flawless joinery of every kind, as well as other intricate work. When combined with the optional 28" INCRA JIG Pro Fence System shown here, it becomes a truly superb router table or table saw fence. (Wooden base plate not included.)



In addition to all of the capabilities that have made the Original so successful, here are some of the **NEW FEATURES** that we've added to the INCRA JIG Pro:

- Positions your work over a **FULL 16" RANGE.** That's twice as much as before. (12" model is also available)
- **QUICK ACTION** cam clamp lets you instantly lock the jig at any position with a single motion of the hand.
- Spring loaded - **FLOATS EFFORTLESSLY** to any new position.
- **FLIPSIGHT™** hairline cursor and easy to read top mounted sliding scale.
- Rugged, solid aluminum construction
- Less than 0.004" error (about the thickness of this page) over the **FULL 16" RANGE.**
- Return to any former position with **NO MEASURABLE ERROR.**
- **Works with all GENUINE INCRA JIG accessories.**

Also look for these other GENUINE INCRA TOOLS

- The Original INCRA JIG
- The Official INCRA JIG Handbook & 17 TEMPLATES
- The Complete INCRA JIG Video
- 18" INCRA Fence System
- INCRA Right Angle Fixture
- **NEW!** INCRA Miter Slider
- **NEW!** INCRA Wooden Hinge Plans
- INCRA Gauge
- **NEW!** 28" INCRA Pro Fence System (for use with INCRA JIG Pro only.)

For a **FREE INCRA PRODUCT BROCHURE** and the name of your nearest dealer, write:
Taylor Design Group, Inc. P.O. Box 810262 Dallas, TX 75381



The grain of the silver-ash veneer top (above) on David Upfill-Brown's demilune table radiates perfectly from the center of the table and contrasts with the jarrah detailing.

The William-and-Mary style cabinet, (at left) made by Geoff Hannah, is exquisitely inlaid with accurate depictions of Australian flora and fauna. The piece has 64 drawers, including several secret ones.

The subtle curves of Richard Vaughan's cheval mirror (far left) are executed in lightly fiddle-backed silver ash. The 70-in.-high mirror tilts to accommodate the height of any viewer.

Australian woodworkers excited by response to Sydney show

Public reaction to the biennial show of The Woodworkers' Association of New South Wales (WANSW), held for four weeks last fall, was overwhelmingly positive. The Sydney, Australia, exhibition, titled "Hands On," focused on native talent and native timbers. The goal was to increase awareness of the group's work. The title not only reflected the woodworkers' approach to their work, but it was also an invitation to the public to get their "hands" on the exhibits—an invitation that most of the visitors weren't able to resist.

And there were lots of visitors; some 2,000 people a day marveled over the intricate work of more than 30 of the countries finest

woodworkers. The huge success of the exhibition, in terms of both attendance and sales, can be attributed to the sponsorship of The Forestry Commission of New South Wales. With this financial backing, WANSW was able to promote and produce a first-class exhibition that addressed the misconception that in Australia, quality woodworking doesn't exist.

The marquetry masterpiece that's shown in the bottom right photo was created by Geoff Hannah. The high chest took more than 2,000 hours to complete and has 64 drawers with an individual Australian animal or plant motif on each drawer. The chest sold for approximately \$76,000 (U.S.) and is

now in the Government House, which is Australia's equivalent of the White House.

Some observers felt that David Upfill-Brown's demilune table shown in the top right photo exhibited the finest craftsmanship of the show. But all of the 150 entries were excellent, from small, well-crafted wooden toys to Hannah's magnificent cabinet.

It's hard to believe that just 10 years ago the driving force behind such a successful show, Richard Vaughan, wasn't even a woodworker. After attending a WANSW exhibition, Vaughan enrolled in the two-year program in advanced cabinetmaking at Sydney Technical College. Following this training, he es-

WE MAKE THEM BETTER.



Powerful 2.2 AMP Makita motor for reliable performance.

Equipped with a lock-on button for continuous operation.

Extra large clamps allow for quick and easy paper changes.

Connect optional dust collector hose and attach to Makita vacuums for clean, dustless operation.

Sanding pad accepts a 1/3 sheet of standard sandpaper.

At Makita we're constantly striving to make the best power tools money can buy. That's why Makita's Model 9036 is equipped with extra large clamps for quick and easy paper changes. And for convenience, it has been designed to utilize a 1/3 sheet of standard sandpaper.

The 2.2 AMP motor delivers almost 30% more power than other Makita models of comparable



Model 9036 shown with optional dust collector hose (Part No. 192108-5) and Makita Bench Vacuum (Model XBV01A).

size and it operates at 12,000 OPM for fast, efficient stock removal to help get the job done quickly. The 9036 also utilizes an optional dust collector hose that attaches to Makita vacuums for clean, dustless operation and reduced paper clogging. At Makita the best just got better.



IT'S ALL THE POWER YOU NEED.®

Makita U.S.A., Inc., 14930 Northam Street, La Mirada, California 90638; (714) 522-8088

tablished his own studio. Not only has Vaughan become a serious woodworker, as indicated by his cheval mirror shown in the photo at left on p. 104, but he's also the chairman of WANSW.

The next "Hands On" exhibition is scheduled for September 1993 in Sydney, Australia. For more information, contact Woodworkers' Association of New South Wales at 14 Fred Lane, Lilyfield, NSW, Australia 2040.

—Charley Robinson

A touch of crass

Out of earshot, we called him "Jimmy the Hacker." Although he was the senior finisher in the shop, he had a reputation for requiring two or three attempts to get a finish right. Still, when he was sober, he did some beautiful work, and the neophytes like myself enjoyed learning from this profane ex-marine in spite of his rather short temper.

One Friday, Jimmy was putting the finishing touches on a tabletop that had been keeping him busy all week. The finish was a fake-grain lacquer job with at least three separate color glazes used to mimic red oak. It was a bear of a finish, and this was Jimmy's second shot at it already. His first effort was undone by an inconsiderate flying insect. After the final coat of lacquer was applied, a palmetto bug flew into the still-wet finish, and its death throes undid all of his fine efforts. Each coat of a lacquer finish dissolves all of the previously applied coats. The last coat melts all others into a thick layer cake of translucent colors. As it flopped around, that bug ruined the finish right down to the raw wood. There was nothing to do but strip the finish off and start over.

Now in its second incarnation, the table received its final coat. Just as Jimmy wheeled the top out into the drying room, the shop's owner came by with two potential customers in tow. They were the sort of Southern matrons who still wore socially correct white gloves despite the eroding etiquette of the 1970s. The look of the still-wet lacquer under bright lights must have been too much to resist, for as she walked past, one of the women gently ran her fingers across the glistening top. To her surprise, the lacquer moved aside leaving a furrow down to the wood. It looked like the icing on a two-year-old's birthday cake after an unofficial tasting.

Those of us who saw the incident let out a collective gasp, and stood stock still, convinced that we were about to witness a justifiable homicide. Jimmy turned beet red and barely containing his fury, blurted out "That finish is wet!"

"Oh, it's quite all right," replied the offender, holding up a clean, but now gloveless finger, "I had my gloves on."

—Adapted from Michael Dresdner's forthcoming book, *The Woodfinishing Book*, to be published in the fall by The Taunton Press.

Wood collectors announce international fest

"Get this bunch of people together in a wheat field in Kansas, and we'll have a good time." That's what Rex Vaught, an Indiana member of the International Wood Collector's Society (IWCS), thinks of the forthcoming Woodfest International slated for June 7 to 11 in Blacksburg, Va. Vaught says "You'll never find a friendlier, more helpful or more generous group."

This year's meeting features more than 40 programs, including lectures on the nature of wood, demonstrations of turning, carving, cabinetry, and other wood pursuits, a gallery where members can display their best work,

an auction of hundreds of species of wood and an auction of members' work. Other programs, including weaving, pottery, guided walks and other craft workshops, are being offered for the less-fanatical wood collectors and their families.

The IWCS is a non-profit organization dedicated to the exchange of wood and information about wood. Founded in 1947, the IWCS, has 1400 members in 25 countries. For more information, contact Lloyd Sumner, 5900 Chestnut Ridge Road, Riner, Va. 24149; (703) 382-1974 (before 9:00 PM EST).

—Lloyd Sumner, Riner, Va.

Real woodworking

I lived in Nepal for almost a year before I had time to closely examine their woodworking. But when I found the time, I went to the Mecca of Nepalese woodworking, Baktapur, an ancient city located in the Kathmandu valley.

As I jerked and jimmied my four-wheel drive through the narrow, brick streets, I was immediately enveloped in and impressed with the antiquity of Baktapur. I felt as though I was driving back into time, complete with goats, chickens and an occasional water buffalo placed here and there for effect. The brick homes and shops pushed at me from either side stretching from three-to-five stories into the clear, blue sky.

There was much to absorb. The Nepalese are a very spiritual people and all about me were carvings in wood and stone depicting Hindu gods and Buddha. Over many of the doorways I could see the ancient toranas—elaborate carvings on the lintels—in fact woodcarvings were everywhere. I was amazed at the number of carvings on each home. The doors were intricately carved, as were the door frames, and each home was

adorned with a number of windows known as *tiki jhaya*, or eye windows, impressive both as carvings and in their complex joinery.

I found Baktapur's most famous woodcarving, the *Peacock Window*. The window was down a narrow walkway and was completely unprotected. It was a very impressive carving, but not being a woodcarver, I was more interested in the joinery, which, I must confess, was a little disappointing. On all the carvings in the area, the joints looked sloppy, and on most, the wood had pulled back and twisted out of shape. I began to chalk up all the hoopla about Baktapur's woodworking to a pretentious guidebook—just another gimmick to grab the tourists.

I wandered around a few more streets and found myself in front of the Baktapur Wood Carvers Conservation Society. I went in and met Mr. B. K. Adhikary, the manager of the society, who told me that the organization was formed in 1977 to provide a program to preserve the traditional woodcarving skills that were rapidly dying out. Because of the poor joinery I had just seen, I wondered why anyone would want to preserve these skills. However, I kept my thoughts to myself and

Photo: Mike Peterson



The 550-year-old peacock window in Baktapur, Nepal is considered the masterpiece in a city overflowing with intricate architectural carvings.

WOODWORKER II - Best on TABLE SAW

With this ONE ALL PURPOSE blade 40 Teeth you can SMOOTH RIP & CROSSCUT 1" - 2" ROCKHARDS and SOFTWOODS with smooth-as-sanded surface. PLY-VENEERS oak/birch crosscut with NO BOTTOM SPLINTER.

- Mostly 1/8 kerf 15°, ATB and 20° face hook (easyfeed).
- DOUBLE HARDER and 40% STRONGER CARBIDE.
- Ends blade changing (does rip, combo and crosscut).
- Ends scratchy saw cuts (for the rest of your life).
- Ends second step finishing (jointing and sanding).
- Ends cutting 1/16" oversize to allow for RESURFACE.
- Buy and sharpen ONE blade instead of 3, 24T rip, 50T Combination, 80T Crosscut.
- Strongly recommend our .001 flat large stiffener-dampener against outside of blade for smoothest, quietest, cuts by this and any other blade.
- Use 30T if ripping mostly 2" - 3" hardwoods.
- Side wobble held .001 - others .004/.010 is common! RAISE for THICK woods, LOWER for THIN woods and perfect cut everything! All 5/8" holes, unless otherwise noted.

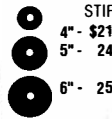
List	SALE	List	SALE
14" x 40T x 1"	\$215	\$139	
14" x 30T x 1"	195	129	
12" x 40T x 1"	183	119	
12" x 30T x 1"	162	109	
10" x 40T 1/8 & 3/32	156	109	
30T 1/8 & 3/32	135	89	
9" x 40T	\$146	\$99	
30T	125	89	
*8-1/4" x 40T 3/32	136	89	
8" x 40T 3/32	136	89	
30T 3/32	115	79	
7-1/4" x 24T 3/32	112	49	

5/8" holes std. Boring up to 1-1/4" \$7.50 extra - Shipping \$4.00

ALSO help your SEARS blade, FREUD, PIRANHA, JAPANESE THIN SAW, DML, LEITZ, etc.

FOR BETTER CUTS!

Use our large 1/8" DAMPENERS STIFFENERS, against one side



5/8" holes std. Boring up to 1-1/4" \$7.50 extra. Others available. Add \$2.50 Shipping.

4" - \$21
5" - 24
6" - 25

Tryable and RETURNABLE
Stops vibration, flutter, cutting noise and blade ring. Parallel and flat to .001. 7" and larger available

* NEW For Sears Tablesaw

WOODWORKER I - Best on RADIAL SAW

(tablesaw too) This ALL PURPOSE blade gives scratch free POLISHED cuts on all materials RIP or CROSSCUT up to 2".

- All 60T and 3/32" THIN kerf 20° ATB and 5° face hook.
- DOUBLE HARDER and 40% STRONGER carbide.
- THIN KERF:
- Saves 1/3 wood loss on each cut, radial or table. Feeds easy when used for moderate rip and crosscut on table saw.
- Reduces "JUMP IN" greatly for better "PULL-CONTROL". Practically eliminates bottom splinter on RADIAL-CROSSCUT.
- Totally stops ALL bottom and top splinter on ply veneers in push-cut mode on RADIAL.
- Our STIFFENER STRONGLY RECOMMENDED AGAINST outside of blade only for best cuts.

Made and serviced in USA for your benefit.

List	SALE
14" x 60T x 1" 1/8"	\$224
12" x 60T x 1" or 5/8"	198
10" x 60T x 5/8"	162
9" x 60T x 5/8"	156
8" x 60T x 5/8"	150
8" x 60T x 5/8"	136

New 8-1/4" x 40T x 5/8" SEARS RYOBI RA200 T2000 HITACHI PSM8 MAKITA 5008 NBA PORTER CABLE 368-1

DADO KING MULTITOOTH LASERCUT DADO SET cuts ALL 1/4" - 13/16" flat bottom grooves WITH or CROSSGRAIN all woods, OAK, BIRCH, VENEER PLYS, and MELAMINE. NO SPLINTERING due to unique 4T Neg. Face fillers and 24T outside saws.

OUT PERFORMS 29 OTHER DADO SETS - Wood Magazine, Oct. 91.

No tearout on all five woods tested. - Fine Woodworking July/Aug. 1991.

Boring up to 1-1/4" \$25 Per Set **SALE! 10% OFF** \$5.50 Per Set Shipping

8" - 5/8" Bore List \$299 / SALE \$269 • 10" - 5/8" & 1" Bore List \$362 / SALE \$325

For HOLZ-HER VERTICAL PANEL SAW 220mm x 30mm Bore

50 Teeth CONCAVE FACE #1 or #2 List \$162 SALE \$139

80 Teeth FLAT FACE #3 or #4 List \$204 SALE \$159

For STREIBIG VERTICAL PANEL SAW 300mm x 30mm Bore

60 Teeth CONCAVE FACE #1 or #2 List \$238 SALE \$179

100 Teeth FLAT FACE #3 or #4 List \$268 SALE \$179

DURALINE Hi-AT For TABLE & RADIAL SAW

(very good on chop saw too!) STOP SPLINTERING those SPLINTERY OAKS, HARDWOOD VENEERS and thin 2 SIDE LAMINATES ON PARTICLE BOARD.

FOR FASTER FEED RATES AND MORE ABSOLUTE SPLINTER CONTROL.

DURALINE Hi-AT

Note: Fine Woodworking Editorial Nov./Dec. 1988 No. 73 pg. 65 S. N. recommends high alternating top bevel (ATB) thin kerfs and large blade stiffeners for smoothest cuts on RADIAL SAW, etc.



Jim Forrest, President and designer microscoping cutting edge.



11 5/8" holes. Boring up to 1-1/4" \$7.50 extra Larger holes - time basis. Shipping \$4.00.

8" x 80T 1/8 & 3/32	\$202	14" x 80T	\$232
9" x 80T 1/8 & 3/32	207	100T	266
10" x 80T 1/8 & 3/32	207	16" x 80T	262
12" x 80T x 1 1/8	212	100T	294
100T x 1"	253	Above 1" bore std.	

CARBIDE is THE HARDEST OF THE C-4 grades and 40% STRONGER, NOT WEAKER!!

For 50% to 300% longer life!

CHOPMASTER SERIES FOR MITER SAWS

for tight, smooth, splinter-free miter-joints.

NEW AVAILABLE SIZES.

List	SALE
Hitachi 8-1/2"	\$99
DeWalt 8-1/2"	\$99
8-1/2" x 60T x 5/8"	\$179
9" x 80T x 5/8"	204
10" x 80T x 5/8"	207
12" x 80T x 1"	229
14" x 100T x 1"	266
15" x 100T x 1"	277

Use small stiffener where possible.

WE RECOMMEND OUR FACTORY SHARPENING. 2-4 DAYS ON THESE AND ALL MAKES OF CARBIDE TIP SAWS. SHIP IN UPS (600 grit microscoped) 10 x 40T \$15.00. 60T \$17.75 Add return UPS \$4.00 and 2nd Day Air \$7.

SATISFACTION GUARANTEED OR FULL CASH REFUND. 45 years of fine American saw making & sharpening

FORREST MANUFACTURING COMPANY, INC. 461 River Road, Clifton, N.J. 07014

FORREST

Dealer Inquiries Welcome.

BUSINESS OPEN ACCOUNTS AVAILABLE



We honor Amex, Visa & Master Card, Money Orders, Personal Checks, and COD's. TO ORDER BY MAIL clip ad, circle choices and enclose payment. Specify Dept. FW when ordering.

PHONE TOLL FREE!

1-800-733-7111 (in NJ: 201-473-5236)

FAX: 201-471-3333

READER SERVICE NO. 154

Incra® An evolutionary advancement in the art of working with wood.

The Original INCRA JIG, and now the new INCRA JIG PRO have revolutionized the way people work with wood. Because of INCRA, most ordinary woodworking operations are now quicker, easier, and more accurate than ever before. But more importantly, these new tools have enabled woodworkers to achieve results that simply were not possible before. A quick look at some of the photos will show you what we mean. These are just a small sampling of the extraordinary work that you can now accomplish with the highly affordable INCRA Line of Precision Tools.



The Complete INCRA JIG VIDEO

This one hour program will help you unleash INCRA JIG's incredible versatility and inspire new ideas for its use. It includes complete step-by-step instructions for making box joints and dovetails, plus much more. Also included are full video instructions plus FREE templates and plans for making the new INCRA Double-Double Box Joint. While this video features the Original INCRA JIG, all information is applicable to the new INCRA JIG PRO.

NEW! INCRA MASTER TEMPLATE SET

From Taylor Design, the inventor of the GENUINE INCRA TEMPLATES. This 50 template set features all new designs in a brand new extended length. Also includes full sized plans and a handy new centering chart. For use with both the Original INCRA JIG and the INCRA JIG PRO.



Beautiful joinery like this can be easily accomplished using the Official INCRA JIG Handbook & Templates with either the Original INCRA JIG or the new INCRA JIG PRO.



NEW! INCRA MITER SLIDER

INCRA Miter Slider replaces the cranky, inaccurate wooden runners that you've had to rely on for your shop built table saw jigs. These 18" long aluminum runners adjust to fit any standard 3/4" x 3/8" miter gauge slot. A simple turn of a screw adjusts for a perfect fit. Another turn locks the jig rigidly in place. Comes with FREE illustrated plans for making a variety of popular table saw jigs and fixtures, like the miter jig shown here.



NEW! INCRA Wooden Hinge Plans

Beautiful wooden hinges like these can bring complete wooden harmony to your next jewelry box, cabinet door, hinged table leaf, and more. These fully illustrated plans include a FREE Drilling guide for making the hinge pivot pin holes.

The beautiful work shown here is just a small sampling of the many new woodworking capabilities that the INCRA Precision Woodworking System can bring to your shop.

The INCRA SYSTEM

- The Original INCRA JIG
- NEW! INCRA JIG PRO
- 18" INCRA Fence System
- NEW! 28" INCRA Pro Fence System
- INCRA Right Angle Fixture
- Official INCRA JIG Handbook & Templates
- The Complete INCRA JIG VIDEO
- INCRA GAUGE
- NEW! INCRA HINGE PLANS & DRILLING GUIDE
- NEW! INCRA MITER SLIDER

For a FREE INCRA BROCHURE & the name of your nearest dealer, write: Taylor Design Group, Inc. P.O. Box 810262 Dallas, TX 75381

asked him how old the peacock window and the surrounding carvings were. He said the peacock window was 550 years old and most of the other pieces around 500 years old. I almost fell over. Suddenly I realized the carvings I had seen were masterpieces, works of art, invaluable pieces of true craftsmanship. It seemed inconceivable that something made of wood and exposed to the elements for more than 500 years could still be here.

He took me on a tour of the society's workshop where craftsmen, some as young as 15 years old, were busy at various tasks. There was Mr. Shilpakar (his name means *master artisan*), an 85-year-old man working side by side with his son and grandson. I asked what kind of wages they were paid, and Mr. Adhikary said that they earned from 30-to-85 rupees per day, (\$.33 - \$.78) depending on their skill level. Right about then I was distracted by the whine of what they call a tablesaw—a loose imitation of the real

thing. Other than this saw and a power hand planer, all the work was being done by hand.

He then showed me an extensive renovation program for preserving some of the carvings that are beginning to decay. Because of the remarkable condition of the carvings (considering the years of exposure and abuse), I asked what craftsmen had originally used for sealing the wood.

"Oh, you know, a little wax and suet and local medicine," Mr. Adhikary replied.

"Local medicine? What's that?"

"Well, you know, local medicine."

I wasn't sure if he didn't think it that important or if he was trying to hide a trade secret, so I pushed on.

"No, I don't know, what do you mean, *local medicine*?"

"Well, clay and sand and dried leaves . . ."

I thanked Mr. Adhikary and wandered over to the society's store. I purchased a large tiki jhaya for \$7.80, stowed it safely in the jeep and bumped my way back to Kathmandu.

I've often heard woodworkers described as *expert* and *master* craftsmen. And I've heard comments like "Now, he's a real woodworker!" dropped by those who are in the know or who are at least pretending to be, and I've wondered what it takes to be labeled in such a way. Perhaps real woodworkers, like the Nepalese woodcarvers, are committed to a standard of craftsmanship described in a frontispiece quote by John Ruskin in a 1943 edition of *Audels Carpenters and Builders Guide*: "When we build, let us think that we build forever. Let it not be for present delight nor for present use alone. Let it be such work as our descendants will thank us for; and let us think, as we lay stone on stone, that a time is to come when those stones will be held sacred because our hands have touched them, and that men will say, as they look upon the labor and wrought substance of them, 'See! This our father did for us.'"

—Mike Peterson, Sacramento, Cal.



Photo above: Dwight F. Brooks, photo below: James F. Liles

The biggest little boat in the bay

When Dwight Brooks saw the *Gulfstreamer* pull into a Los Angeles area marina, he was immediately taken by the magnificent 114-ft. yacht. As luck would have it, the yacht belonged to an old friend whom he hadn't seen for years, so Brooks decided to track the owner down and get permission to go aboard and take photographs of the interior. He also managed to obtain the plans originally used by Bennetti Yachts in Viareggio, Italy to build the boat. Although the plans were entirely in Italian and had no dimen-

sions, Brooks photographed the drawings and used them to build the 1/12 scale, 10-ft.-long model of *Gulfstreamer* that's shown in the photo below.

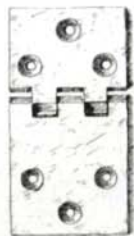
The hull is standard plank-on-frame construction with 1/8-in. by 3/4-in. balsa planks glued and nailed to a 1/2-in. plywood framework. The curved aft section was molded out of foam, and the hull was covered with fiberglass—inside and out—for maximum strength. All three decks were made by gluing 1/8-in. by 3/8-in. teak strips to an aircraft plywood base. To match the real yacht's decks, Brooks left 1/8-in. spaces between each strip of teak decking and filled these gaps

Dwight Brooks thinks big when he scales things down. His 1/12-scale, radio-controlled model of a 114-ft.-long Italian-made yacht (below), causes a lot of doubletakes when he runs it on the lake near his cabin in Minnesota. A large model allows total attention to detail, as revealed by the cabin's completely furnished interior (left).



UNDERSTANDING ORIGINAL HARDWARE

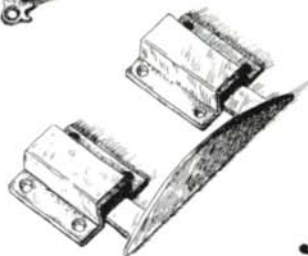
UNDER THE TABLE HARDWARE . . .



Seldom seen, usually never polished, often taken for granted, — catches for tilt top's, hinges for drop leaves and holding clips for sectional dining tables all contribute to the function of the finished piece.

Square, round, lion paw, or cup casters of all sizes, using brass, china, wood, cast iron, leather, or no wheels finished thousands of legs since 1700.

Call or write for free mini-catalog, or send \$5.00 for our full 108 page catalog. We now reproduce more than 100 items like these.



BALL and BALL
Finest Quality Reproductions

463 W. Lincoln Hwy • Exton, PA 19341 • (215) 363-7330

READER SERVICE NO. 14

TOOLS ON SALE™

AMERICA'S LOWEST PRICED TOOLS

FREE FREIGHT TO THE 48 CONTINENTAL STATES ON EVERY ITEM.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

INTRODUCING

★ ★ NEW DEWALT TOOLS ★ ★

CORDLESS				***JIG SAWS***			
Model	Description	List	Sale	Model	Description	List	Sale
DW947K	13.2V, 0-1200 rpm, 3/8" drill kit	377	209	DW318K	4.5 amp saw w/case, 0-3100 spm	232	139
DW945K	12V, 0-400/0-1300 rpm, 3/8" drill kit	284	165				
DW944K	9.6V, 0-350/0-1200 rpm, 3/8" drill kit	264	155				
DW946K	12V, 3/8" hammer drill kit	312	179				
DW9090	Battery Supercharger - "Worlds Most Advanced Charger" will charge all competitors batteries in less than 18 minutes. Lengthens battery life by as much as 3 times!	Special Sale	179.00				
CIRCULAR SAWS				***DRILLS***			
DW357	7-1/4" Circ. Saw, 13 amp	190	122	DW100	3/8" drill, 4 amp, 0-2500 rpm, rev	110	65
DW360	7-1/4" Circ. Saw w/brake, 13 amp	222	135	DW102	3/8" drill, 4.5 amp, 0-1200 rpm, rev	154	92
DW364	7-1/4" Circ. Saw w/brake and rear pivot adjustment, 13 amp	245	148	DW103	3/8" drill, 5.0 amp, 0-1200 rpm, rev	189	115
DW377	7-1/4" Worm Drive Saw, 13 amp	250	159	DW110	1/2" drill, 5.0 amp, 0-600 rpm, rev	216	125
				DW111	1/2" drill, 5.0A, 0-900, rev	216	125
				DW120K	1/2" right angle drill w/case, 7.0 amp, reversing, 400, 600, or 900 rpm	352	219
				DW124K	1/2" joist & stud drill w/case, 8 amp, rev	504	295
				DW130	1/2" spade handle drill, 7 amp, rev	240	155
				DW140	1/2" end handle drill, 7 amp, rev	257	159
				DW500K	3/8" hammer drill w/case, 5 amp, rev	239	145
				DW510K	1/2" hammer drill w/case, 5 amp, rev	282	169
RECIPRO SAWS				***DRY WALL GUNS***			
DW304K	6.0 amp saw w/case, var. speed	224	139	DW250	4.5 amp gun, 0-4000 rpm, reversing, "set & forget" nosepiece	146	89
DW306K	8.0 amp saw w/case, var. speed	254	159	DW254	4.5 amp gun, 0-2500 rpm, reversing, "set & forget" nosepiece	146	89
ROUTERS				***GRINDERS***			
DW610	1-1/2 HP 2 handle Router with 1/4" & 1/2" collets	250	139	DW402	4-1/2", 6 amp, 10,000 rpm w/side hdlc	143	85
				DW474	7", 15 amp, 6000 rpm w/side hdlc	205	135
SANDERS							
DW411	1/4 sheet palm sander, 1.7 amp, 13,500 opm	87	54				

DEWALT MITRE SAWS

Model	Description	List	Sale
DW705	12" Big Capacity Compound Saw, 13 amp, 4000 rpm, elec. brake, includes 32 tooth carbide blade	555	339
DW704	12" Big Capacity Mitre Saw, 13 amp, 4000 rpm, elec. brake, includes 32 tooth carbide blade	480	289

DEWALT and Tools On Sale™ Exclusive Special:

Buy any 5 DeWALT tools by December 31, 1992

and receive one tool absolutely free! Call for Details.

1992 TOOL CATALOG AVAILABLE

Call Toll-Free 1-800-328-0457 In Minnesota Call (612)224-4859

FAX (612)224-8263

CHECK • MONEY ORDER • VISA • MASTERCARD • DISCOVER

SEVEN CORNERS ACE HDW. Inc.

216 West 7th St. • St. Paul, MN 55102 • Est. 1933

READER SERVICE NO. 131

INDEX TO ADVERTISERS

AAA Tool	25	Eagle America	86	LeNeave Supply	91	Sisco Supply	32, 99
A&M Designs	102	Ebac Lumber Dryers	27	Lie-Nielsen Toolworks	37	Suffolk Machinery	15
Abbey Machine	29	Econ-Abrasives	37	Lignomat, USA	28	Sugino	27
Acme Electric Tools	88, 89	Electrophysics	92	Lobo Power Tools	9	Sunhill Enterprises	13, 31
Adams Wood Products	17	Emperor Clock Co.	37	MLCS	11, 90	Super-Scrub 2000	92
Adjustable Clamp	103	Engraving Arts	92	Mafell	32	TS-Aligner	20
Airstream Dust Helmets	99	Raymond Enkeboll Designs	96	Makita	105	Talarico Hardwoods	93
American Design & Eng.	28	<i>Fine Homebuilding</i>	95	Manny's Woodworker's PL	23	Tarheel Filing	33
American Heritage Workshop	93	Floral Glass & Mirror	96	Marling Lumber	102	The Taunton Press	18, 19, 90, 99
Ammax Tools	21	Forrest Manufacturing	5, 107	Marshco Products	34	Tool Chest	93
Anderson Ranch	32	Freeborn Tool	16	Mercury Vacuum Pumps	92	Tool Crib of the North	88, 89
Arrowmont School	99	Furniture Designs	8	Midwest Dowel	92	Tools on Sale	30, 109
Art Essentials	92	G&W Tool Co.	7	Miller Woodworking	8	Transpower Industries	10
Ashridge Workshops	92	Garrett Wade	32	DC Mitchell Hardware	5	Trendlines	31
Auton Co.	29	Gilmer Wood	93	Moon's Saw & Tool	23	United States Saw	87
Aviation Supply	35	Glass & Mirror Craft	8	North Bennet St. School	92	Vega	9
Ball & Ball	109	Grizzly Imports	14, 111	Northland Wwkg	102	Velvit Products	92
Beall Tool	92	J.A. Harchuck	32	Nyle Lumber Dryers	87	Steve Wall Lumber	27
Berea HardWoods	34, 86	Hartwood, Ltd.	93	PC Index	23	Weatherbead	7
Bethel Mills	86	Heartwood Technology	9	PECO Sales	11	Whitechapel Brasses	7
Better Built	13	Heritage Manufacturing	5	Paxton Hardware	102	Whole Earth Access	8, 97
Biesemeyer	35	Hida Tool	15	Performance Coatings	9	Wilke Machinery	28
Blume Supply	20	Highland Hardware	99	Performax Products	21	Willard Brothers Sawmill	93
Blue Ridge Moulding	7	Hiltary	92	Peters Valley Craft Ctr.	92	Williams & Hussey	23
Boulter Plywood	20	Home Lumber	13	Pickens Lumber	94	Williamsburg Blacksmiths	92
CMT Tool	27	Horton Brasses	11	Plaza Machinery	93	Wood Met Services	93
Cutting Tool Technologies	5	Hymiller School	92	Quaker State	2	Wood Show	9
Cal Oak Lumber	93	IPD—Glide Easy	11	Quality Vacuum Products	9	Wood Studio	93
Carter Products	31	IWF '92	101	RBIndustries	99	Woodcare Pro	9
Cascade Tool	23, 96	Imported European Hardware	17	Record Tools	21	<i>Woodcarving Magazine</i>	25
Certainly Wood	93	Industrial Abrasives	96	Red Hill Corp.	31	Woodcraft	28
Chem-Tech	92	Incra Jig	103, 107	Resource Conservation	5	Woodcrafters Supply	93
Classified	92-94	Injecta Machinery	34	Rio Grande University	37	Woodmaster	28
Colonial Hardwoods	94	International Tool Corporation	94, 100	Riverside Lumber	94	Wood-Mizer	31
CoMatic Machinery	29	Japan Woodworker	93	Ross Drum Sanders	11	Woodpeckers	14
Maurice L. Condon	15	Jesse Jones Ind.	99	Rousseau	11	Woodstock Intl.	26
Constantine	8	Jet Equipment	15, 17	Sandy Pond Lumber	94	Woodworkers Source, Inc.	91
Craft Supplies, USA	87	Jointech	34	Santa Rosa	86, 87	Woodworkers Source of Arizona	93
DML Saw Co.	7	Journeyman Products	86	School of Classical Woodcarving	31	Woodworker's Hardware	27
Davalco	26	Bob Kaune	28, 93	Scherr's Cabinets	15	The Woodworking Shows	13
Davis & Wells Machinery	34	Keller Dovetail System	11	SECO Woodworking Mach.	24	Yestermorrow School	17
Delmhorst	17	Landing School	92	Seven Corners	30, 109	York Saw	90
Delta	36, 37	Leigh Industries	25	Shopcarts	14	Russ Zimmerman	92
E-Z Products	5						

with black Bondo caulking. Cabin structures are mahogany aircraft plywood assembled with cyanoacrylate. Brooks reproduced all the furniture in the real *Gulfstreamer*, as shown in the top photo on p. 108, by working from his photographs, and he purchased additional furnishings, such as working lamps, fire extinguishers, dishes and TV sets from doll-house suppliers.

The radio-controlled model is completely operable thanks to two 12v and two 6v batteries that power twin electric flap motors, complete navigation and interior lights and a built-in AM/FM tape-deck system. After spending around 3000 hours in his California shop to complete the boat, Brooks crated it up, had it flown to Minnesota on a commercial DC-10, and then trucked it 150 miles to Brainerd, Minnesota where he has a cabin on a lake. Other than stopping the 300-lb. yacht once it has momentum, the biggest problem Brooks has when running the boat on the lake is avoiding curious boaters who want to get a closer look. —Jim Boesel

Product review

Scraper system: Variable Burnisher, Jointer/Edger and Super-Hard Milled Scrapers, Veritas Tools Inc., 12 E. River St., PO Box 1720, Ogdensburg, N.Y. 13669-1720; (800) 667-2986.

A good part of woodworking's allure for me has always been the skill and handwork of the craft. In an age dominated by automated precision and repetition, it's all the more satisfying to cut dovetails by hand or to finish a surface with a cabinet scraper. And with dovetails and scraping at least, not only do I create less dust and noise, but I can get the job done almost as quickly as I could with power tools.

The lowly scraper has long been one of the most heavily used tools in my shop. After a little initial experimentation, keeping it cutting properly was no problem. I made a quick pass with a file, a couple more passes on a stone, and a quick burnishing with the back of a chisel or an old hydraulic piston rod, and I was off and running. I tried to get the hardest scrapers on the market, but I was still frustrated at how often they needed to be resharpened.

Then I ordered Lee Valley Tools' Super-Hard Milled Scrapers. The four scrapers in the set, varying from 0.4mm thick (very flexible) to 1mm (very stiff), are much harder than any others I have used (Rc 48-52 vs. Rc 38-42). Because they're so hard, they stay sharp much longer than my old scrapers. Unfortunately, their hardness also makes them more difficult to sharpen.

I must not have been the only one with that problem. Veritas, which is Lee Valley Tools' manufacturing arm, recently introduced the Variable Burnisher, a rather complex-looking device that actually performs a simple function and does it well. In a moment of weakness, flush with the proceeds of a recent sale and frustrated with trying to sharpen the extra-hard scrapers, I ordered not only the burnisher but also Lee Valley's Jointer/Edger, a metal jig that holds a file at exactly 90° to the face of the scraper. The investment very quickly paid for itself.

A dull scraper has two features: the edge is highly polished and slightly crowned (from passing over the wood), and the hook is gone. Sharpening starts with re-squaring the edge; using the Jointer/Edger, this takes about 30 seconds per edge. Because the file leaves a slightly striated surface, it's easy to tell when the edge is square again by watching the light reflecting off of it. I haven't found it necessary to stone the scraper after filing. I use a very fine file and light pressure, which give me an edge ready for burnishing. I've not found it necessary to flatten the face of the scraper either. Any bell or mushroom shape at the edge will only beef up the new hook.

Photo: Vincent Laurence



Veritas's scraper system includes a new adjustable-angle burnisher, a file-holding jig that squares the scrapers edge and a set of four ultra-hard scrapers of varying thickness. Big shavings curled right off the lip of the scraper (foreground) leaving a glassy smooth finish on this mahogany crotch.

Once I've squared the edge, three or four passes with the burnisher complete the job. Since the actual burnishing rod within the tool is made of carbide, which is much harder than any scraper, a few passes are all that's needed. What makes Lee Valley's burnisher unique is its adjustability. The burnisher can be set to any angle between 0° to 15°, quickly and accurately. I take a couple of passes at 0° (to "mushroom" the edge slightly); then finish the burnishing at my desired angle. I set the burnisher at 2° to 3° for very fine work and up to the full 15° for rough glue removal.

A complete overhaul of a scraper's edge takes less time than reading this review, and the results are wonderfully predictable. This scraper system belongs in every shop in which hardwoods are worked.

You can order Veritas' Variable Burnisher (\$34.95), Jointer/Edger (\$12.95) and the Lee Valley scrapers (set of four, \$12.95) from Veritas Tool Inc., or from Lee Valley Tools, Ltd., 1080 Morrison Drive, Ottawa, Ont., Canada K2H 8K7; (613) 596-0350.

—Mac Campbell, Harvey Station, N.B., Canada.

Photo below and back cover photo: Gorgey Spiridonov



Back cover key

Vadim Aksyeonov's marquetry tabletop, *Vortex of Dancers* (back cover), depicts the traditional folk dress of women living in the Commonwealth of Independent States (formerly the Soviet Union). The following is a list of the 15 republics (at the time of this printing). Start at the top with the woman in the dark-striped skirt, and proceed clockwise.

- | | |
|-----------------|----------------|
| 1. Lithuania | 9. Uzbekistan |
| 2. Turkmenistan | 10. Azerbaijan |
| 3. Estonia | 11. Kirgizia |
| 4. Georgia | 12. Armenia |
| 5. Russia | 13. Latvia |
| 6. Ukraine | 14. Kazakhstan |
| 7. Moldavia | 15. Tajikistan |
| 8. Byelorussia | |

Notes and Comment

Do you know something we don't about the woodworking scene in your area? Please take a moment to fill us in. Notes and Comment pays for stories, tidbits, commentary and reports on exhibits and events. Send manuscripts and color slides (or, black-and-white photos—preferably with negatives) to Notes and Comment, Fine Woodworking, PO Box 5506, Newtown, Conn. 06470-5506.

ASK ANYONE!

We are still the only company in the U.S. to provide a reference service whereby we will locate a customer near you who has bought a piece of equipment you are interested in and from whom you may get a first-hand, unbiased report on our equipment and service. **NOW THAT'S CONFIDENCE!**



IMPORTS, INC.

"IMPORTERS OF FINE MACHINERY"



NEW!

15" BELT SANDER
MODEL G1052
ONLY \$795⁰⁰

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



NEW!

24" DRUM SANDER
MODEL G1066
ONLY \$1095⁰⁰

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



6" x 48" COMB. SANDER
MODEL G1014
ONLY \$195⁰⁰

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



10" HEAVY DUTY
TABLE SAW
MODEL G1022

Reg. \$365 **SALE \$355⁰⁰**

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



SUPER HEAVY-DUTY
TABLE SAW
MODEL G1023
ONLY \$895⁰⁰

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA

22" SCROLL SAW
MODEL G1060
ONLY \$149⁹⁵

A LARGE CAPACITY
SCROLL SAW AT AN
UNBEATABLE PRICE!



NEW!

15" PLANER
MODEL G1021
ONLY \$735⁰⁰

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA

(STAND IS OPTIONAL)



20" PLANER
MODEL G1033
ONLY \$1,295⁰⁰

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



2 H.P. DUST
COLLECTOR
MODEL G1029
ONLY \$295⁰⁰

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



1-1/2 H.P. SHAPER
MODEL G1035
ONLY \$495⁰⁰

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



3 H.P. SHAPER
MODEL G1026
ONLY \$850⁰⁰

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA

6" x 47" HEAVY DUTY
JOINTER
MODEL G1182

Reg. \$375 **ONLY \$345⁰⁰**

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



8" x 65" SUPER HEAVY
DUTY JOINTER
MODEL G1018

Reg. \$695 **SALE \$650⁰⁰**

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



16" BAND SAW
MODEL G1538
ONLY \$525⁰⁰

F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



READER SERVICE NO. 90

92-114

IF YOU LIVE WEST
OF THE MISSISSIPPI

P.O. BOX 2069
BELLINGHAM, WA 98227
Customer Service: (206) 647-0801

ORDERS: **1-800-541-5537**



IF YOU LIVE EAST
OF THE MISSISSIPPI

2406 REACH ROAD
WILLIAMSPORT, PA 17701
Customer Service: (717) 326-3806

ORDERS: **1-800-523-4777**



DANCING TOGETHER

While visiting Moscow several years ago, author Jon Humboldt Gates happened upon the extraordinary marquetry of Vadim Aksyeonov. Aksyeonov, who was trained as a painter, creates refined marquetry like the 38-in.-dia. tabletop, *Vortex of Dancers*, shown here. Aksyeonov designed the table for a Moscow drawing room in 1982 as a statement of friendship between the various cultures of the republics, which at the time comprised the now dissolved U.S.S.R. Each of the 15 women dancing together on the tabletop is wearing the traditional costume of her republic. For a list of the 15 republics, see page 110 and for more about Aksyeonov's marquetry, see page 62.
