

TAUNTON'S **Fine
Woody Working**

February 1992, No.92

U.S. \$5.50

Canada \$5.95

U.K. £3.40

Turned Birdhouses

Workshop Solvents

Preparing Stock

Computer Desk



Random-Orbit Sanders

\$ Bucks for Bits \$

For each of these specially marked sets you buy, we'll give you 20 bucks!

Put a Freud router bit set on your wish list and we will give you back \$20. What a great idea! Every bit is solid carbide or carbide tipped for smooth cuts and a long life. Each set comes complete in a slick wooden box. Just purchase any of these specially marked sets before February 29, 1992, mail in the rebate coupon and we'll send you a check for \$20 per set. It's that easy. So, give our bits a whirl, you'll be glad you did. Now that's something you can take to the bank.

Rebate
\$20

Set Yourself Apart from the Rest

Our 92-100 Artisan set is truly the best set for the professional or serious fine woodworker. This set offers versatility and an unlimited range of creativity. All shanks are 1/4" and all bits are solid carbide or carbide tipped. A wooden box is included to keep the bits safe and clean. **Ask for the 26 Piece Artisan Set. Item # 92-100**

Rebate
\$20

The Set That Does It All

This set covers a wide range of router bits: V-grooving, flush trimming, chamfering and dovetailing. All bits are solid carbide or carbide tipped. Set contains 15 1/4" shank bits plus wooden storage case. **Ask for the 15 Piece Advanced Set. Item # 90-100**

Rebate
\$20

How to Make 13 Equal Infinity

The 91-100 offers 13 bits that can create almost anything you can think of! Our set includes: V-grooving, flush trimming, chamfering and dovetailing. All bits are solid carbide or carbide tipped for great results! Comes in a wooden storage case. **Ask for the 13 Piece 1/2" Shank Set. Item # 91-100**

Rebate
\$20

Easy Grooves, Rabbets and Dadoes

Our 91-102 can handle it! Sizes range from 1/4" diameter to a full 1", in 1/8" increments. All shanks are 1/2" diameter. A wooden storage box is included for protection. **Ask for the 6 Piece Straight Bit Set. Item # 91-102**

Rebate
\$20

Complete Versatility in One Set

The 95-100 set will cut tons of cabinet doors and over 39 molding patterns. Use with a 1/2" shank table mounted router for complete versatility! A wooden storage case is standard. **Ask for the 5 Piece Cabinet & Molding Set. Item # 95-100**

Rebate
\$20

A Great Set for the Beginning Woodworker

Our 88-100 has 9 bits of pure cutting power. The shanks are a standard 1/4" and all bits are solid carbide or carbide tipped for long lasting sharpness. A wooden box is included for protection and storage. **Ask for the 9 Piece Basic Set. Item # 88-100**

freud

Precisely what you need.

*Rebates available only on specially marked Freud 88-100, 90-100, 91-100, 91-102, 92-100, 95-100 router bit sets purchased from participating dealers between November 1, 1991 and February 29, 1992.

For the name of your participating dealer or full details on the rebate, call 800-472-7307

Photo: Charley Robinson



Howard Wing hand carves flutes in a cockleshell after roughing out the shell and flutes with a jig-mounted router (article on p. 87). Cover: Random-orbit sanders promise swirl-free finish sanding (article on p. 46). Cover photo: Susan Kahn.

Executive Editor Jim Boesel
Managing Editor Sandor Nagyszalanczy
Art Director Kathleen Rushton
Assistant Editors Charley Robinson, Vincent Laurence
Copy Editor Deborah Surprenant
Assistant Art Director Aaron Azevedo
Editorial Assistant Alec Waters
Editorial Secretary Claire Warner
Contributing Editors Tage Frid, R. Bruce Hoadley, Christian Becksvoort, Robert M. Vaughan, Mark Duginske
Consulting Editors George Frank, Richard E. Preiss, Norman Vandal
Methods of Work Jim Richey
Indexer Harriet Hodges

Publisher John Lively
Assistant Publisher James P. Chiavelli
Circulation Manager Brenda Hamilton
Administrative Secretary Susan M. Clark

Advertising Sales Manager Dick West
National Accounts Managers Barney Barrett, Larry White

Advertising Coordinator Kathryn Mourmian 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

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*.

Fine Woodworking (ISSN 0361-3453) is published bimonthly, January, March, May, July, September and November, by The Taunton Press, Inc., Newtown, CT 06470. Telephone (203) 426-8171. Second-class postage paid at Newtown, CT 06470, and additional mailing offices. GST #123210981. 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. U.S. newsstand distribution: Eastern News Distributors, Inc., 1130 Cleveland Road, Sandusky, OH 44870. List management: The Kleid Co., 530 5th Ave., New York, NY 10036-5101.

DEPARTMENTS

- 4 **Editor's Notebook**
Product review process unveiled
- 6 **Letters**
Women woodworkers; chuck-removal wedges; fingerboard safety
- 16 **Methods of Work**
Modifying drill bits; storage rack; clamping picture frames
- 28 **Questions & Answers**
Storing glue; restoring an oak relic; boat finish
- 107 **Index to issues 86 through 91**
- 112 **Events**
A look at upcoming programs of interest to woodworkers
- 116 **Books**
Marquetry Manual; Identifying Wood; Lutherie Tools
- 120 **Notes and Comment**
Woodworking family; library ladder; product reviews

ARTICLES

- 46 **Random-Orbit Sanders** by Sven Hanson
Eccentric machines for fast, scratch-free sanding
- 51 **Putting your angle grinder into orbit**
by Richard Danzey
- 52 **Computer-Desk Design** by Jim White
Keeping enclosed components cool
- 55 **A versatile mortising fixture** by Lars Mikkelsen
- 56 **Stock Preparation** by Mark Duginske
Dressing for success
- 60 **Turning a Rustic Birdhouse** by Andrew Barnum
A natural attraction for feathered friends
- 62 **Computers in the Shop** by Sandor Nagyszalanczy
From microchips to wood chips
- 64 **Computer-aided design** by Pete Conway
- 67 **Glass-Top Coffee Table** by Christian Becksvoort
Bent-laminated glass-supports within a mitered base
- 70 **The Demise of American Chestnut** by Jon Arno
Tragic loss of a great American timber
- 72 **Chestnut: A European perspective** by Rudi Wolf
- 74 **A New Hollow-Chisel Mortiser** by Robert M. Vaughan
Bench-top solution to boring square holes
- 76 **Profile: Chad Voorhees** by Dick Burrows
Eavesdropping leads to more delicate furniture
- 79 **Constructing carcass-housed drawers**
- 80 **Workshop Solvents** by George Mustoe
Selecting the right chemicals and using them safely
- 82 **Will new VOC regulations affect you?**
by Michael Dresdner
- 83 **Disposing of solvents responsibly** by Jeff Jackson
- 84 **Making a Landing Net** by Geoffrey G. Carson
Steam-bending and laminating a curved frame
- 87 **Router-Assisted Cockleshell Carving** by Howard Wing
A swinging jig shapes the interior and defines the flutes
- 89 **Gluing up a shell with tapered segments**
by Philip C. Lowe and Justin P. Smith
- 92 **Grand Entrances** by Alec Waters

The product review process—Over the past five years that I've been an editor for *Fine Woodworking* magazine, I've had the opportunity to try lots of different tools and machines, and to both write and edit a whole slew of tool review articles. I've also spoken with dozens of readers, and fielded hundreds of comments, most of which, I'm pleased to say, have been positive. But these contacts also have taught me that many readers have only a vague idea of how we conduct our product reviews. Therefore, I thought it a good idea to clarify our approach to tool reviews and to suspend some misconceptions about the review process.

Defining the field—Even though we try to select tools and machines of greatest interest to our readers, there are always more new products out there than we can try. For any one type of tool, there might be a dozen manufacturers that make three, four or more models. Therefore, we limit the number of tools featured in a review by developing a selection criteria to define the field. This allows us to dedicate more space to each model, and discuss its features and performance in greater depth. While criteria vary, we often use price or the tool's size or capacity as a limit, for example, cordless drills that cost less than \$150 or tablesaws with 10 in. blades. A well-developed criteria also ensures that the review ends up comparing "apples to apples." But while hobbyists' models usually can't compare to professional tools, there are instances where inexpensive tools turn out to perform as well as their expensive counterparts. In such cases we include them and indicate their excellent value.

Readers sometimes ask, "Why didn't the article include Brand X's new model?" We make every effort to research the field and to include all appropriate makes and models. However, because of the time involved in developing an article, sometimes a new product becomes available only after the evaluations are complete.

The evaluation procedure—Unlike magazines that "review" products by printing the manufacturer's press release, our reviews are evaluations of actual tool performance. And since we don't have the personnel and resources of a true product-testing journal, like *Consumer Reports*, we limit our articles to the author's observations of features, performance and safety, experienced under workshop conditions. When a review is done out-of-house, we choose an author for his or her experience with the type of tool being reviewed as well as experience with the task the tool is used for. *Fine Woodworking's* editors back up the author's evaluations by trying out the tools at the company woodworking shop. We also often conduct and write these reviews ourselves; each member of the staff has extensive woodworking experience (I had my own professional shop for 10 years). The actual tools used in the review are either borrowed or purchased from the manufacturer; if borrowed, they're returned after the article is completed. And we *never require* a manufactur-

er to give us a tool to keep; this would exclude smaller companies that couldn't afford to give away their products for review.

A product evaluation typically starts when the tool is removed from the box. There's often a lot to learn from what it takes to get a machine unpacked, assembled and adjusted before it's ready to run. The reviewer then puts the tool through its paces, using it on the job whenever possible. We encourage the reviewer to use the tool in a variety of situations and use it for several months whenever possible. If anything goes wrong with the tool during the review, we report the facts accurately. We do check with the manufacturer in these instances, to determine if the problem is only with our tool or common to that model. There is never pressure from our advertising department to "pull a punch" and leave out negative comments that reflect upon a tool's poor performance—even when that tool's manufacturer is an advertiser in the magazine. The only part of a review that a manufacturer is allowed to see prior to publication is the chart. We do that so data involving a tool's price, motor size, optional features, etc. can be verified and updated.

What's a reader to learn?—I often receive calls from readers who say, "I read your article, but I still don't know which one to buy." We're reluctant to elevate one tool over another, mainly because such declarations are terribly subjective given the diversity of our readership. The combination of features and price that makes one tool best for a professional probably won't make the tool a good choice for a hobbyist. And the same tool isn't always best in different applications. This is why our product reviews try to give you all the insights you'll need to make your own choice about which model will work best in your shop—used the way you want to use it. And, since specific models come and go, developing this sensibility will help you make the right choice when choosing tools in the future.

One of the most positive aspects of carefully and critically examining tools and machines in an article is that it can help readers to spend their money wisely. Few of us have unlimited budgets and can afford to replace a tool that turns out to not perform up to expectation. Just as important, our reviews can help steer you towards an inexpensive tool that's a good value, in lieu of a more expensive model. Working on review articles has taught me that a product isn't always better just because it's more expensive. Sometimes, a product review can help to dispel the advertiser's hype surrounding a new tool or device; pitches are often aimed to make consumers think they can't get along without that new wonder tool. Finally, another good reason to read our product reviews is to learn more about how to use the tools in question. Along with his evaluations of 10 random-orbit sanders on p. 46 of this issue, author Sven Hanson gives a variety of tips and tricks on how to use these new sanders to get the best results. —Sandor Nagyszalanczy, managing editor

TAUNTON PUBLICATIONS

...by fellow enthusiasts

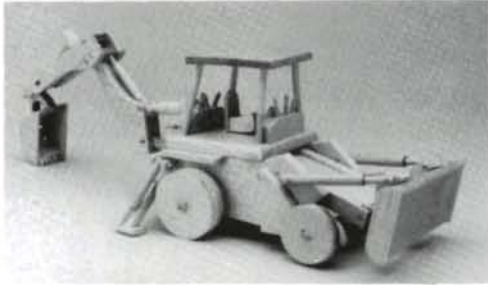
The Taunton Press: Paul Roman, *president*; Janice A. Roman, *vice president*; Carolyn Kovaleski, *administrative secretary*. **Corporate Staff Directors:** Roger Barnes, *design*; John Kelsey, *editorial*; John Lively, *chief of staff*; Jan Wahlen, *marketing*. **Accounting:** Wayne Reynolds, *controller*; Patrick Lamontagne, *manager*; Jeffrey Sherman, *financial analyst*; Mary Sullivan, *general ledger supervisor*; Carolyn Sules, *senior accounting clerk*; 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*; Elaine Yamin, *junior accountant*; Dorothy Blasko, *secretary*. **Corporate Design:** Susan Edelman, *associate design director*; Philip Allard, *promotion services coordinator books/videos*; Steven Hunter, *art director*; Thomas Baker, *promotion services coordinator magazines*; Wendy Bowes, *associate art directors*; Mary Beth Cleary,

promotion production coordinator; Francesca Arminio, *promotion asst.* **Art Production:** Robert Olah, *manager*; Henry Roth, Catherine Cassidy, *associate art directors*; Jodie Delohery, *assistant art director*; Ilana Koehler, *production assistant*. **Copy/Production:** Ruth Dobsavage, *managing editor*; Peter Chapman, Pamela Parrone, *copy/production editors*. **Corporate Sales:** Dale Brown, *director*; Donna Pierpont, *public relations manager*; Diane Patterson, *executive secretary*; Andrea Ondak, *trade and special sales manager*; Barbara Buckalew, *marketing assistant*; Marcie Siegel, *publicity/trade sales asst.*; Lori Moir, *telemarketer*. **Data Processing:** Drew Salisbury, *manager*; Brendan Bowe, *fulfillment systems manager*; Roger Seliga, *senior programmer/analyst*; Gabriel Dunn, *programmer/analyst*; Arthur Caron, Robert Nielsen, *programmers*; James Kinnear, *tech. services admin.* Sherill Kolakowski, *computer support technician*. **Folkwear:** Cheryl Clark, *mgr.*; Garol Gee, *admin. asst.*; Gregory McMahan, *pattern designer*. **Fulfillment & Operations:** Tom Luxeder, *director*; Jane Torrence, *secretary*. **Client Services:** Patricia Williamson, *coordinator*; Roxanne Frimmet, Megan Sangster, *client services representatives*; **Customer Service (subscriber):** Patricia Malouff, *manager*; Nancy Schoch, *senior customer service rep.*; Donna Weinstein, Diane Hurvul, Marylou Thompson, *Mail Processing*; Joyce McWilliam, *supervisor*; Gayle Hammond, Barbara Lowe, *Customer Service (trade)*; Christine Cosacchi, *supervisor*; Kristen Boeckmann, *cust. service rep.*; Gloria Carson, 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*; John Zor, *mail services*; 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, Madeleine 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 Bulson, *desktop publications associate*; Lisa Carlson, *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*.

FULL SIZE PLANS

Backhoe • Scraper • Crane • Grader • Front End Loader
Average Size 18" L / 8" H / 5" W • Not a Toy
Your Choice \$10.00 Plus \$2.00 Shipping & Handling



GORDONS DESIGNS, P.O. Box 33265 • Las Vegas, NV 89133-3265

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

Marshco
PRODUCTS, INC.

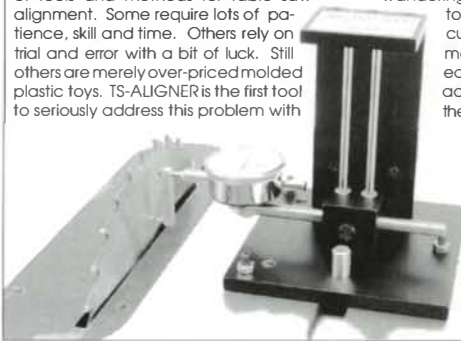
RF2 D Bx 490 • Brooks, Maine 04921 • (207) 722-3523

READER SERVICE NO. 127

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.



Introductory Offer: \$190.00

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

READER SERVICE NO. 67

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.
145 BLUXOME STREET • SAN FRANCISCO, CA 94107
PHONE: 415/957-8743



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

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

READER SERVICE NO. 115

STEVE WALL LUMBER CO.

Quality Hardwoods and Woodworking Machinery For
The Craftsmen and Educational Institutions

Ash	4/4	Select	1.90
Basswood	4/4	Select	1.30
Birch	4/4	Select	1.60
Butternut	4/4	Log Run	1.40
Cherry	4/4	Select	2.45
Cypress	4/4	Select	1.60
Hickory	4/4	Select	1.50
Mahogany (Genuine)	4/4	Select	2.70
Maple (Hard)	4/4	Select	1.55
Maple (Soft)	4/4	Select	1.30
Pecan	4/4	Select	1.50
Poplar	4/4	Select	1.20
White & Red Oak	4/4	Select	1.80
Walnut	4/4	Select	2.50
Cedar (Aromatic Red)	4/4	1C+Btr.	1.35
White Pine	4/4	F.G.	.85
Yellow Pine	4/4	Clear	1.20

Above prices are for 100' quantities of kilndried rough lumber sold by the bd. ft. FOB Mayodan, NC. Call for quantity discounts. Other sizes and grades available.

UPS Specials

.....	\$59.00
.....	\$47.00
.....	\$53.00
.....	\$55.00
.....	\$68.00
.....	\$49.00
.....	\$47.00
.....	\$73.00
.....	\$52.00
.....	\$46.00
.....	\$47.00
.....	\$45.00
.....	\$57.00
.....	\$71.00
.....	\$46.00
.....	\$37.00
.....	\$45.00

Above prices are 20 bd. ft. bundles of clear kilndried lumber 3"-10" wide • 3'-7" long. (Random widths & lengths) Surfaced 2 sides or rough. Delivered UPS prepaid in the Continental U.S.

LUMBER SPECIALS

CHERRY 100 Bd. Ft. Bundle Log Run S2S 13/16 \$ 90*
WALNUT 100 Bd. Ft. Bundle #1 Common 4/4 \$110*

*FOB Mayodan - Motor Freight Only

Call For
Best Prices On

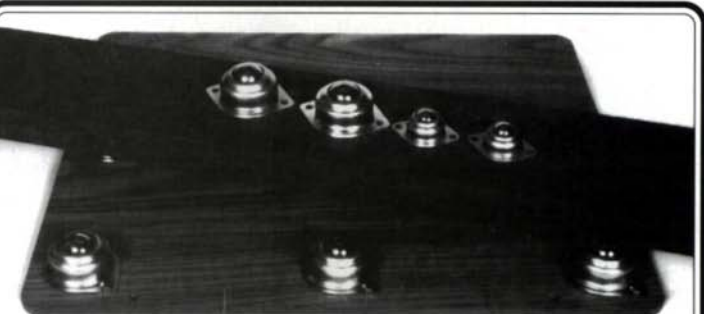
MiniMax

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. 166



The Woodworkers Source Inc.

of Kalamazoo, Michigan

Your heaviest workpieces will handle effortlessly in any of 360° with our Easy Glide Ball Transfer Units. Available in 5/8" and 1" ball sizes, each main ball rotates on a series of smaller ball bearings, each lubricated and sealed for life in heavy metal housing to prevent incursion of dust. The 5/8" units have a 55 lb. load capacity per unit, and the 1" units have a 75 lb. load capacity per unit.

5/8" ball units, box of 6,	\$14.95
5/8" ball units, two or more boxes,	\$12.95
1" ball units, box of 6,	\$18.95
1" ball units, two or more boxes,	\$16.45
Shipping Charges	\$3.50 per box

Call our toll free 800 Number between the hours of 8:30 AM to 4:30 PM EST with Visa or Mastercard or Send certified check or money order (to the address below) and your shipping charges are FREE!

Woodworkers Source Inc.

633 Jackson Court • Kalamazoo, Michigan 49001
Ph (800) 968-4004 • Fax (616) 345-5127
Ph (616) 373-4242 • Fax (616) 375-9019



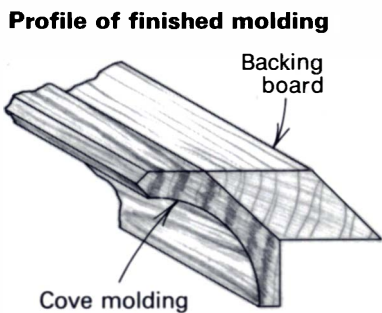
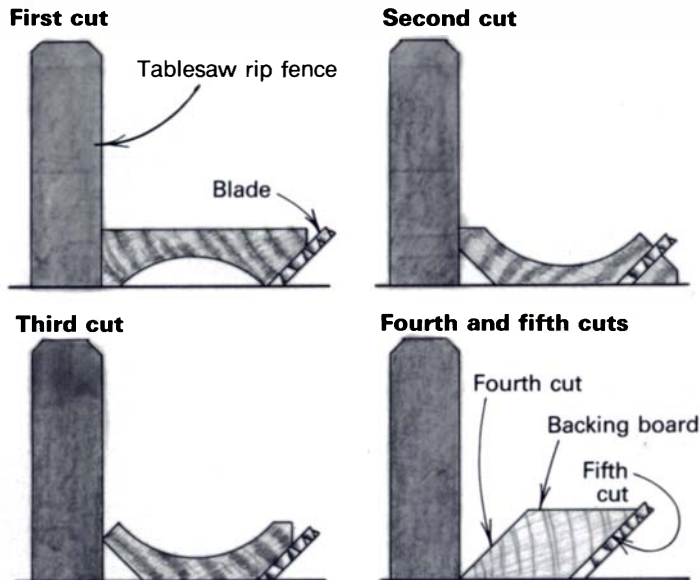
READER SERVICE NO. 44

Tilting with a sawblade—It appears that you can't say enough about using woodworking equipment in a safe manner. After I tapered my thumb a few years ago while attempting to rip a bevel along the edge of a board on a 10-in. tablesaw, I researched the cause of the problem. I found the answer on p. 288 of *Cabinetmaking and Millwork* by John L. Freirer. When making bevel cuts on a tablesaw, the blade is supposed to tilt away from the rip fence. Otherwise, the work can bind and pull your hand into the blade.

Having learned this lesson the hard way, I was very concerned to see the drawing in *FWW* #89, p. 83 that shows four different cuts, all with the blade tilted *toward* the fence. I hope that I'm not too late.

—Jay E Rubel, Atlanta, Ga.

Editors note: It is indeed potentially dangerous to rip a board with the table-saw blade tilted toward the fence. The drawing in question shows how to make the angled cuts on a shopmade crown molding that is glued to a backing board. Although we illustrated the method that the author actually used, we should have rethought the problem in light of the hazards presented by his method. The drawings below show a safer alternate method for accomplishing this fairly common task. Keep in mind that some tablesaws tilt to the left and some to the right, so making bevel cuts safely on your saw may require a mirror image placement of the fence.



(All cuts are made with the tablesaw blade at 45°.) Rip the cove molding first, as shown in the first three cuts, above. Then rip the backing board, as shown in cuts 4 and 5, before gluing the backing board to the molding.

Support for women woodworkers—I am writing in response to several letters in recent *FWW* issues regarding women woodworkers. I have been a self-employed woodworker for 15 years; and even though I have not had the difficulty with tool size and design that other women woodworkers have experienced, I do realize there is a problem and that it should be addressed by tool manufacturers.

As a woman woodworker, I have been frustrated by the skepticism of potential customers (both male and female) concerning the ability of a woman to design and construct professional, high-quality woodworking pieces. For this reason, I keep a portfolio with newspaper articles about my business and top-quality color photos of my work, which includes everything from

turned bowls to dining room tables and chairs. I use this as a marketing tool to provide credibility for my woodworking skills.

I believe articles on women woodworkers offer diversity to *FWW* and simultaneously support and encourage the women who have chosen to make a career of this historically male-dominated field. Perhaps it is a matter of knowing where these women are and exploring the quality of their work.

I would like to establish an informal support network for women woodworkers. If you are interested in participating, write to me at PO Box 182, Allenspark, Colo. 80510. Please provide some general information about yourself and the type of woodworking you do.

—Susan Maxson, Allenspark, Colo.

Chuck-removal wedges—In the "Q&A" column of the July/Aug. 1991 issue of *FWW*, Robert Vaughan responded to a question about how to remove a chuck from a drill press. I was surprised that he didn't mention using chuck-removal wedges for the job because they are much easier to use than a hammer. Rather than banging away on the chuck with a hammer, you just insert the wedge between the chuck back and the spindle housing to force the chuck free. Be sure to put something under the chuck to catch it when it breaks loose and falls.

Chuck-removal wedges sell for less than \$4, and they come in different sizes for different models of chucks. They are available from MSC Industrial Supply Co., 151 Sunnyside Blvd., Plainview, N.Y. 11803.

—J. Grunwaldt, Malvern, Pa.

Undersize laminate—I recently had a rather unpleasant experience with the use of imported plastic laminate, which may be of interest to cabinetmakers.

While attending the Kitchen and Bath show in Dallas, Tex., this year, I came across several very attractive lines of imported laminate. Some of it came from Canada, and some of it came from Italy—all with striking colors not available from U.S. manufacturers. I found an importer of one of the Italian lines, Abet laminati, and ordered some for my latest kitchen renovation. At 99 cents/sq. ft., plus shipping, it was quite competitive with the American brands, which sell for that and more.

When this beautiful laminate arrived, I was happy to receive it, but when I started working with it, the dream turned into a nightmare. I soon discovered that the imported laminate that I ordered was not the same thickness as American laminate, because my design called for using it side by side on a tabletop. The imported laminate is .030 in., while the domestic is .050 in. The difference is astounding. I solved the thickness problem by putting some walnut iron-on veneer below the Italian laminate to bring it up to the domestic material.

But that was the least of my problems. Handling the thin Italian laminate was an invitation to disaster. If you brush up against it, it will crack; handle it with a crack and you've got two pieces of laminate in your hands.

I recommend that anyone interested in trying a new line of laminate inquire about its thickness. With anything thinner than .050 in., be prepared for a challenging laminating job. I had to throw out almost half of the laminate I ordered due to the tears and rips.

—Art Weiss, Natchitoches, La.

Further precautions—It was with interest that I read "Losing your nerve" by Robert Feltman in the "Notes and Comment" section of *FWW* #90. All of Mr. Feltman's suggestions for avoiding accidents and for being prepared in case an accident should happen are commendable, and I agree with them.

I also have a couple of other suggestions which may be of value, particularly if you often work alone in your shop. First, install a push-button phone in the shop in a convenient spot—even with severed fingers, you could probably dial 911. Better yet, install an automatic dialer phone and program the first but-

Simply Unequaled!

BESSEY

K-Body Clamps

Ideal for:

- Serious woodworkers • All woodworking projects
- for use in edge to edge and face to face gluing
- all assembly applications

Features:

Clamp jaws that remain parallel
Glue resistant/non-marring jaws



KP Framing System

End users report
SAVINGS OF UP TO 60%
when used as rail and style jig.



American Clamping Corporation
P.O. Box 399, Batavia, N.Y. 14021
Toll Free 1-800-828-1004

American Clamping (Canada) Inc
P.O. Box 490, Cambridge, ON N1R 5V5
Toll Free 1-800-265-8678

READER SERVICE NO. 132

MAKITA SUPER TOOL SALE PORTER CABLE

Super Special	9.6 volt Battery	\$ 30
	7.2 volt Battery	25
	9.6 volt Charger	40
	7.2 volt Charger	35
6010DWK	3/8" Cordless Drill Kit 7.2v	94
6040DW	3/8" Cordless Drill Rev.	40
5090DW	3-3/8" Saw Kit 9.6v	136
6010SDW	3/8" Cordless Drill Kit 7.2v	58
DA3000DW	3/8" Angle Drill 7.2v	137
6095DWE	3/8" Cordless Drill Kit 9.6v	158
4200N	4-3/8" Circular Saw 7.5 amps	127
5007NB	7-1/4" Circular Saw 13 amps	112
5008NBA	7-1/4" Circular Saw w/Elec. Brake	158
804510	1/4" Sheet Pad Sander	51
99248	3" x 24" Belt Sander	142
3620	1-1/4 H.P. Plunge Router	108
9501BZ	4" Grinder 3.5 amp.	68
JR3000V	Variable Speed Recip. Saw w/case	124
DA3000R	3/8" Angle Drill	148
HP1030W	3/8" Hammer Drill Var. Speed Rev.	119
HP2010N	3/4" Var. Spd. Ham. Drill w/case	164
2708W	8-1/4" Table Saw	265
2711	10" Table Saw with Brake	475
6404	3/8" Drill Rev. 0-2100 rpm	487
LS1011	10" Compound Mitre Saw	487
LS1440	14" Mitre Saw	434

ALL MAKITA ACCESSORIES 30% OFF

BLACK & DECKER

Super Special	3/8" Drill 0-2500 rpm 4 amps	\$ 58
1166	Variable Speed Versa Clutch*	155
2054	7-1/4" Circular Saw 13 amp.	99
2680	7-1/4" Worm Drive Saw	141
2701	7" Right-angle Sander 6000 rpm	139
4076	10" Mitre Saw w/73-770 blade	179

HITACHI

DTC-10	3/8" Cordless 2 speed Rev. Drill 7.2v.	\$ 63
DV14V	9/16" Ham. Drill Var. Spd Rev.	99
DV100	3/8" Cordless Hammer Drill 9.6v	122

SKIL

4560-02	Var. Spd. Adj. Auto Scroll Jig Saw	\$ 89
77	7-1/4" Worm Drive Saw	144
2735-04	12v. Var. Spd. Cordless Drill w/case	134
	2 batt. & extra special 5 pc. bit set	

AEG

BE8RL	3/8" Variable Speed Rev.	\$ 67
SBE401RL	3/8" Vari-Speed Rev.	79
SBZE16RL	1/2" Two range Var. Rev.	112
EZ585	30 oz. Vari-Speed Caulking Gun	155
SCR1E	Screwdriver Vari-Spd. Rev. 0-2500 rpm	79
SCRZE	Screwdriver Vari-Spd. Rev. 0-4000 rpm	79

Call Toll Free
1-800-228-6652
Fax 305-989-5738

FREE FREIGHT
and Same Day Shipping
on Most Orders to the
Continental US

* CHECK * MONEY ORDER
* VISA * MASTER CARD
* DISCOVER
C.O.D. Charge \$5.00

Prices subject to change
without notice

Mon.-Fri. 7:00 am.-5:00 pm. EST
Saturday 8:00 am.-1:00 pm. EST

AAA WHOLESALE SUPPLY
6011 Mayo Street
Hollywood, Florida 33023
Serving the Tool Trade since 1958

WE CARRY A FULL LINE
OF PARTS & ACCESSORIES

READER SERVICE NO. 46

7310	Laminate Trimmer 5.6 amps	\$ 84
309	Laminate Trimmer 3.8 amps	91
315-1	7-1/4" Top Handle Circular Saw	117
330	Speed Block Finishing Sander 1/4 sheet	53
100	7/8 H.P. Router	94
690	1-1/2 H.P. Router	124
691	1-1/2 H.P. Router D-Handle	135
352	3"x21" Dustless Belt Sander	127
555	Plate Biscuit Joiner w/case	164
621	3/8" Variable Spd. Drill	94
695	1-1/2 H.P. Router/Shaper	188
9629	6 Spd. Electronic Tiger Rm Saw Kit	138
7750	1/2" Variable Spd. Hammer Drill Rev.	138
7335	Var. Spd. R'dom Orbit Sander w/5" pd.	126
7336	Var. Spd. R'dom Orbit Sander w/6" pd.	131

BOSCH

3050VSRK	3/8" Dual Torque VSR Cordless Driver Drill Kit	\$104
3283DVS	5" Random Orbit Dustless Sander	109
3272	3-1/4" Planer with Rev. Blades	78
1158VSR	3/8" Pistol Grip Drill - Heavy Duty	59
1273DVS	4" x 24" VS Sander with bag	219

ALL BOSCH JIG SAW BLADES 30% OFF

BOSTITCH

T28-5	Stapler Nailer	\$268
N60FN	Finish Nailer	329
N80C	Coil Nailer	398
N80S	Stick Nailer	398

MILWAUKEE

0228-1	3/8" VSR Pistol Grip Drill	\$ 96
0234-1	1/2" Magnum Hole Shooter Var. Speed	121
6014	1/2" Sheet Orbital Finishing Sander	116
6016	1/4" Sheet Orbital Finishing Sander	49
6256	Top Handle Jig Saw	138
6365	7-1/4" Circular Saw 13 amp.	116
6507	Var. Speed Sawzall w/case and blades	138
6511	2-Speed Sawzall w/case and blades	128
6527	Super Sawzall var. w/case and blades	166

FREUD

LU72M010	10" x 40T ATB Wood Combo Blade	\$ 34
LU82M010	10" x 60T TCG Cut off Blade	43
LU84M011	10" x 50T ATB Wood Combo Blade	38
LU85M010	10" x 80T ATB Wood Combo Blade	55
LM72M010	10" x 24T Flat Top Rip Blade	36
LU87M010	10" x 24T Rip Blade Thin Kerf	37
LU88M010	10" x 60T ATB Crosscut Thin Kerf	43
LU89M010	10" x 72T TCH for Laminate	58
LU92M010	10" x 80T TCH for Wood or Laminate	68
LU98M010	10" x 80T TCH Wood or Laminate	68
TK206	10" x 24T Thin Kerf Ripping Blade	19
TK306	10" x 40T Thin Kerf Combo Blade	24
TK806	10" x 50T Thin Kerf Crosscut Blade	26
SD306	6" Dado Set w/carrying Case	108
SD308	8" Dado Set w/carrying Case	108

READER SERVICE NO. 135

New!!! Professional

INSTY-BIT®

Quick-Change Drilling Products

Add Quick-Change to Any Power Drill!!!

Chucks • Drills
Countersinks • Nut Setters
Extensions & more...

Simply Pull Chuck Sleeve to Change to Screwdriver Bits...

Drill Bits...Countersinks... and Other Hex Power Bits... Instantly Without A Key!

Patented and Made In USA

INSTY-BIT • 3336 Idaho Avenue South
Minneapolis, MN 55426

Toll Free 1-800-426-2732 Phone/Fax

READER SERVICE NO. 100

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.

1-800-777-NYLE
Nyle Corporation
207-989-4335
P. O. Box 1107, Bangor, Maine 04401

READER SERVICE NO. 142

DROP-IN-THE-BUCKET™

"THE INNOVATIVE STORAGE SYSTEM"

PERFECT FOR: Craftspersons, Home Owners, Boat Owners, Handymen, Tradesmen, Carpenters, Fishermen, Mechanics, Plumbers.

ORGANIZES: Nuts, Bolts, Screws, Nails, Staples, Tacks, Pipe Fittings, Fasteners, Washers, Tools, Crafts, Toys.

ANYONE WITH SOMETHING TO STORE!

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. 135

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. 144

ton for an emergency number. If the above measures are not practical, install a switch to sound an alarm outside the house so that if you get hurt when no one is home, the noise will alert the neighbors to call the emergency service.

I've implemented the first two of these precautions in my shop, and—thank God—I have not been obligated to use them. But there is comfort in knowing they are available.

—Robert J. McNeil, M.D., Cambria, Cal.

The trouble with magnetic tool racks—Carl Dorsch's article, "Making a Chisel Cabinet," in *FWW* #89, reminded me of a situation we encountered in our shop about four years ago. My wife, Michele, is a woodturner, and her first "nice" tool rack incorporated magnetic strips to hold her chisels. At first this seemed to be ideal, since she could remove and replace her tools without taking her concentration from the piece she was turning.

After a while, however, she noticed her tools were becoming slightly magnetized, and so they would no longer move easily on the tool rest. This became a nuisance for her, so she demagnetized her chisels and went back to a wooden rack.

To demagnetize, or degauss a tool, wrap a lamp cord tightly around the length of the tool's shaft, and then plug in the cord and turn the lamp on for a few hours, (or longer for large tools).

—Bruce A. Goddard, Pacific Grove, Cal.

Fingerboard safety—A word of caution regarding the so-called improved fingerboard in *FWW* #90, p. 12, and fingerboards in general when used for ripping on a tablesaw.

When setting up a fingerboard, make sure the workpiece will clear the last finger before the cut is complete. If the fingerboard overlaps the sawblade, finger pressure could force the cutoff piece against the side of the blade and result in a kickback.

I am sure that people who use fingerboards regularly know this, but a newcomer to the idea might overlook it.

—Alan Millard, Sebelt, B.C., Canada

Reglue it right—I usually turn to the "Q&A" column first when I receive a new issue of *FWW*. In issue #90, I found a question about regluing a family heirloom chair without taking it apart. Unfortunately, I found the answer—using cyanoacrylate glue and capillary action—totally misleading.

Repairing a piece of furniture with a product that is not easily removed is just going to cause severe headaches for a future restorer. Cyanoacrylate glue is one of those products. Because of its capillary action, cyanoacrylate is nearly impossible to remove from the wood without causing damage.

In addition, the technique for regluing the chair is wrong. First of all, the cyanoacrylate glue squirted into the assembled joint will, for the most part, be sitting on top of another layer of old glue. This may hold for the time being, but after a few seasons of humidity changes, joint failure is sure to occur. Also, for cleanup of the excess glue, you need to use a solvent such as acetone or an acetone-base cleaner, which can be dangerous to the health of the user and harm the chair's finish.

As for the chair in question, the owner should reglue it properly by disassembling the chair, cleaning the joints of old glue and regluing with animal hide glue or aliphatic resin glue (yellow carpenter's glue). Or she should seek the advice and expertise of a competent furniture restorer.

—Richard Cuddy, Middletown, N.Y.

Using the proper respirator—I would like to comment on the article, "Turbine Spray Systems," in the Sept./Oct. 1991 issue of *FWW*. There are two areas that are misleading and that could have negative health consequences for people using high-volume, low-pressure spray systems for finishing wood products. This method has the potential to produce fine mists of shellacs,

lacquers and other finishing materials, as well as vapors from solvents if these products are not water base.

The first problem is with the lead photo which shows a person wearing a single-use dust/mist respirator while using a turbine sprayer. This respirator, while acceptable for low concentrations of some mists, will not protect from lacquer mists or organic vapors in the finishing products. In fact, the organic vapors may wet the respirator, and the person can possibly be exposed to a far greater concentration of vapor than in the air alone. For vapors, an organic-vapor chemical-cartridge respirator is necessary. For lacquer and paint mists, an organic-vapor chemical-cartridge respirator combined with a paint mist pre-filter is required.

The second problem is in the caption accompanying the photo. It states that, when compared to conventional high pressure systems, HVLP sprayers offer, "...more efficient delivery of finish with less overspray and fewer toxic fumes released into the atmosphere." However, fumes are not produced by this method. Fumes are very small solid particles that originate from solids (usually metals) that volatilize and then condense and cool in air. Welding is a process that produces fumes, and this distinction is important for making the proper choice of respiratory protection.

—Lori Todd, Ph.D., Chapel Hill, N.C.

A Corian router-table top—I have what I feel is a unique addition to the wealth of information on router tables provided by Ed Walker in his article in *FWW* #90.

While most woodworkers are using either unfinished plywood or a plastic laminate for their router-table tops, I believe that the new solid-surface materials, such as DuPont's Corian, make a better tabletop. Through discussions with fellow woodworkers I've found that plastic laminate used for this purpose usually ends up de-laminating over time. This may be due to usage, damp conditions in the shop or improper application of the laminate to the substrate.

To avoid these problems when I built my router table, I bought a scrap piece of 1/2-in.-thick Corian for \$10 from a local kitchen-remodeling center. I made the router-table top by laminating the Corian to a piece of 3/4-in.-thick medium density particleboard. There is no chance that the Corian will curl or buckle, and the particleboard provides a stiff backing in case a heavy object is dropped on the table surface.

Because Corian can be machined with carbide tools, it was no problem to cut and rout a rabbeted opening to receive the router, which I mounted on an 8-in. by 12-in. piece of 1/8-in.-thick aluminum plate. I trimmed the perimeter of the tabletop with poplar to eliminate sharp edges and to minimize chipping. I also routed a slot so that I could use my Delta miter gauge with the router table. I used a pivoting fence that bolts to the table at the near end and is clamped at the far end.

You can write on the Corian with a pencil, and it cleans up easily with most surface cleaners (409 or Fantastik). As an added bonus, scratches can be sanded out as well. I suspect that this table will last indefinitely due to the rugged nature of this solid surface material.

—Raymond S. Tadry, Sterling Junction, Mass.

More tricks of the trade, please—It was a pleasure to see R.A. Sharp's "The last word on finding the radius of an arc" in the "Letters" column of issue #91. I too was amused to see the proliferation of mathematical solutions to this problem in previous issues because I'm one of those folks who tends to remember that there is a mathematical solution, but can never remember what the solution is when I need it. From a practical standpoint, once you've determined the radius of an arc, you still have to draw it, and if it happens to be over 10 ft., it could be difficult to draw. I just knew there must be a better way.

Mr. Sharp's hands-on method for drawing an arc with a given

THE SCHOOL OF CLASSICAL WOODCARVING



ACANTHUS LEAF TRAINING VIDEO

Seventy two minute demonstration on the flow and movement required to produce a more professional job. The project is typical of acanthus found on frames and heavily carved furniture.

Twelve week courses on architectural and furniture carving. British Master Carver Ian Agrell teaches a maximum of four students in his San Francisco workshop.

One and two week Summer School

includes hands on instruction on the acanthus leaf, Rococo, Gothic and letter carving.

Video	\$49. plus \$3.50 S/H
12 week course	\$2,970.
1 and 2 week courses	\$475. per week

Send for free brochure:

The School of Classical Woodcarving
10 Liberty Ship Way #4116
Sausalito, California 94965

READER SERVICE NO. 23

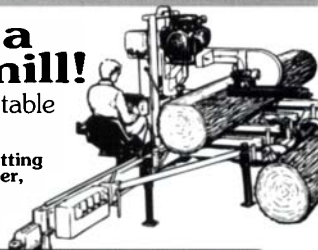
Wood-Mizer®

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 Z49
Indianapolis, Indiana 46214-2400

READER SERVICE NO. 25

ASHMAN TECHNICAL LTD.

Machinery -Tools - Shop Equipment

— GENERAL —		US
350-1	Table Saw 3 HP.	1450
	— with Biesemeyer	1598
	— with Excalibur	1695
490-1	15" Band saw, 3/4 HP.	950
160-2	V/ S Lathe 3/4 HP.	1198
260-1	V/ S Lathe 1 HP.	2254
1180-1	6" Jointer 3/4 HP.	788
480-1	8" Jointer 1-1/2 HP.	1793
	Modulus Scoring Saw	340

Canada's Largest "GENERAL" Dealer

Dept. FW, 351 Nash Rd.
N. Hamilton, Ont., Can L8H 7P4
416-560-2400 FAX 416-560-2404

VISA — FREIGHT COLLECT
prices subject to change

READER SERVICE NO. 70

The Keller Dovetail System:

"Your best choice"

— *Woodworker's Journal*

"The setup is easy, adjustments minimal and the joints perfect. It's the easiest of all the jigs to use and great for production use."

— *Woodworker's Journal*

"In a class by itself."

— *WOOD Magazine*

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

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

To find out more, contact your Dealer or



KELLER & CO.
1327 I St., Dept. FW12
Petaluma, CA 94952
(707) 763-9336

Keller Dovetail System

Simply the best.

READER SERVICE NO. 85

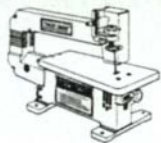
TRADESMAN POWER TOOLS

SPECIAL PURCHASE SALE

13" SCROLL SAW

Great for Hobby Jobs!

Ball Bearing Motor, Aluminum Table, tilts for bevel cutting. Two position blade holder. Uses 5" pinned blades. Cutting capacity 1-1/2"



Model # 8345

\$ 75.00

10" COMPOUND MITER SAW

Contractor Quality

15 Amp Ball Bearing Motor, Automatic Blade Brake and Guard. Cuts 4"X4" or 2"X6" FREE Accessory Kit!



Model # 8330A

\$189.00

"HELPING HAND" STAND

Work Support Stand

Features a unique Ball Bearing Design allowing 360 degree movement

Adjustable 28" to 48"

\$ 39.00



Model # 9975

THE FACTORY STORE

ALL PRICES INCLUDE FREIGHT

ORDER BY MAIL OR PHONE

MA RESIDENTS ADD 5% TAX
P.O. BOX 503
AGAWAM, MA 01004
(800) 845-TOOL

READER SERVICE NO. 72

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. Want to know what FWW has to say on dovetail joinery? Currently there are 53 index entries on dovetails 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. And, you can add 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. (MA orders add \$1.50 tax)

Orders only call toll free 24 hours, 7 days

1-800-831-3200

Or mail check or money order (U.S. funds) to:
THE PC INDEX, Meredith Associates
P.O. Box 792, Westford, MA 01886
(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. 123

chord and rise using three nails and a couple of sticks is not only more practical, but it is an example of one of those tricks of the trade that we are all in danger of losing if older craftsmen don't find a forum for passing them on to the new generation of woodworkers. I for one would like to appeal to other elder craftsmen among the readers of *Fine Woodworking* to share their time-proven methods. Otherwise, we may all find ourselves using mathematical formulas and biscuit joinery because we've forgotten how it used to be done.

—James Bartlett, Palouse, Wash.

Follow-up on electromagnetic fields—Stephen Peterson's letter in the Sept./Oct. issue of *FWW* focuses on the concern about possible health effects from exposure to fields generated by electric power tools operating at 60 cycles per second (C/S) in the workshop. As an electrical engineer (and a happy woodworker) I have researched this topic over the last two to three years and I would like to offer readers of *FWW* a somewhat different view of the risk expressed in Peterson's letter.

First, it is incorrect to refer to this phenomenon as "radiation." The equivalent wavelength of a 60 C/S field is far too long to cause any radiation (ionization) effects. So the electric field (volts/meter) and the magnetic field (gauss or teslas) can be treated separately.

Second, the current status of research and measurements seem to indicate that there is little, if any, significant effect on the biological system from electric and magnetic fields, although work continues to find and isolate a cause-and-effect mechanism which might link field exposure to health risks.

Further, the statement that a magnetic field measuring 3 milligauss (mG) is acceptable and safe is, in my view, totally without

scientific or medical foundation. Perhaps a few comparisons might be helpful here: The Earth's magnetic field (a steady state field) is approximately 500 mG; an electric shaver or hair dryer is over 1,200 mG; house background levels in a typical house are 0.1 to 10 mG; and water pipes can carry "return/leakage" currents which generate up to 30 mG. Squatting down to pick up a piece of wood generates internal body currents several times the induced currents caused by external magnetic fields. Finally, there is some research which suggests that cells are more sensitive to small external fields than they are to large fields. So reducing the external fields in motors may be a bad idea.

It may eventually be shown that external electric and magnetic fields do indeed have an effect on the biological system, but we are far from that state of understanding today. If such a cause-and-effect relationship is established, it would surprise me greatly if it will occupy a position in the top 20 things that place our health at risk today. It seems to me that the sensible approach is to avoid risks which are high on the risk/probability scale, such as driving on Saturday nights when the bars let out; walking in large cities after dark; sunbathing in order to get a tan; smoking; high fat diets and so on. Biological effects of low-frequency fields is so low on an ordered-risk list that I for one am willing to continue to work in my shop with that knowledge in mind.

—Harry L. Hill, Santa Cruz, Cal.

Reinforcing a fold-down futon frame—I liked the design of the futon couch that folds down into a bed described by Gary Rogowski in his article in *FWW* #77, and so I built one for my daughter. I used old-growth Douglas fir instead of cherry, and I replaced the standard bed-rail hardware with stub tenons secured with 5-in.-long bronze carriage bolts and captive nuts.



Model AGH1
\$299.

- ◆ Filters Dust
- ◆ 6 cu. ft. airflow
- ◆ Completely portable, built-in filtration system. (No hoses)
- ◆ Head, face and respiratory protection on one unit.
- ◆ Positive pressure behind face shield.
- ◆ Pleasant flow of purified air.
- ◆ No extra breathing effort.
- ◆ Unrestricted vision.



Airmate 3
\$309.

- ◆ Filters Dust
- ◆ 8 cu. ft. airflow
- ◆ Filtration system located on belt pack, hose brings filtered air to headpiece.



BreatheEasy 10
\$529.

- ◆ Filters Paint & lacquer fumes, furniture stripper, polishes, etc. and/or dust
- ◆ Hard hat available
- ◆ 6 cu. ft. airflow

Excellent for all woodworking jobs which create dust and fumes. All units are light-weight and can be worn with glasses or beard. All units available for same day shipment. We stock all parts and optional accessories for the *Airstream*, *Airmate* and *BreatheEasy* products. Call for free brochures and our special coupon offer.

WE WILL MATCH ALL CURRENT ADVERTISED PRICES.

Airstream Dust Helmets

P.O. Box 975

Elbow Lake, MN 56531

PHONE: 218-685-4457

1-800-328-1792

READER SERVICE NO. 21

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'\$37.50/1/2Doz. + 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

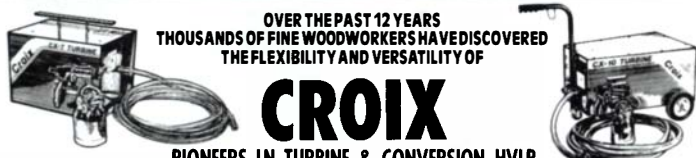
**INDUSTRIAL
BRASIVES CO.**

644 N. 8th ST. • READING, PA 19612

READER SERVICE NO. 63

THE SECRET IS IN OUR GUNS

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



OVER THE PAST 12 YEARS
THOUSANDS OF FINE WOODWORKERS HAVE DISCOVERED
THE FLEXIBILITY AND VERSATILITY OF

CROIX

PIONEERS IN TURBINE & CONVERSION HVLP

MODEL CX-7
4 PSI 1 GUN CAP
REG \$695 NOW \$649

MODEL CX-10
5 PSI 2 GUN CAP
REG \$945 NOW \$879

MODEL CX-20
5 PSI 2 GUN CAP
REG \$1450 NOW \$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

MADE IN USA

READER SERVICE NO. 17

GUARANTEED OR YOUR MONEY BACK

BAND SAW BLADES

WELDS

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

Swedish Silicon Steel European Patented
REALLY TRIED THE BEST?
GSCWIND-GRP.

FREE INFORMATION
Bi-Metal - M-2/M-42

Milled Sharp Teeth
Any Length
Any Size

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

WELDS

READER SERVICE NO. 68

NEW from the makers of INCRA JIG

Incra Miter Slider

What's the most tedious part of building any sliding table saw jig? . . . Custom fitting homemade wooden runners for the miter slot. **MITER SLIDER** makes all of that work unnecessary. These ready-made aluminum runners have a unique expansion mechanism to adjust their width for perfect sliding action in ANY standard miter gauge slot. A simple turn of a screw adjusts **MITER SLIDER** for ZERO sideplay; another turn locks it securely in place. And best of all, **MITER SLIDER** won't warp, shrink or swell, so the jigs you build today will still glide perfectly next week or even next year. **Miter Slider** comes with complete illustrated plans for building a wide variety of highly useful table saw jigs.

Comes with FREE illustrated plans for building these and other popular table saw jigs!



Also NEW from INCRA!

INCRA HINGE PLANS

with FREE Hinge Drilling Guide

The response to the wooden hinges shown in our ads has been overwhelming. Now you can make your own with the new **INCRA HINGE PLANS**. These fully illustrated plans take you step-by-step through the entire hinge making process. The plans include a **FREE** aluminum hinge drilling guide for making 1 7/8" hinges.

For a FREE Brochure and the name of your nearest Dealer, write:
Taylor Design Group, Inc. P.O. Box 810262 Dallas, TX 75381

READER SERVICE NO. 108

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 DH 150 1 1/2HP shaper \$450</p>	<p>12" AUTO PLANER</p> <p>12" x 6" max capacity 2HP 16 amps motor AP 125 10" planer \$298 AP 150 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 HD 1500 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. 160

I was happy with the design, but after less than a year of regular use, the wood dowel pins that slide in grooves in the side rails when the backrest is folded down failed. I had to take the bed apart, replace the wood dowels with 1/8-in.-dia. steel dowel pins, and screw slotted brass plates over the wooden grooves. Since I don't have a machine shop, the job took about 10 hours. I had to make the slots in the 1/8-in.-thick brass plates by drilling a series of holes and then smoothing the sides of the slots with a file.

Because I didn't want to count on the wood to support the steel pins, I also drilled some small brass plates to fit around the pins, mortised the plates into the surface of the wood and screwed them in place. This step possibly could have been omitted, but I wasn't taking any chances. I also let two brass plates into the upper surface of the back rail so when the hinged back of the couch is lowered onto the rail to make a bed, steel pins engage to lock the bed platform against lateral movement.

I still like the design, but my experience has been that wood dowel pins sliding in wood tracks just don't work—or not for very long.
—Simon Watts, San Francisco, Cal.

Oakland fire destroys luthier's workshop—It's every woodworker's nightmare: a spark from a woodstove that ignites a pile of shavings; oily rags ignited by spontaneous combustion; or the arcing current from an overloaded motor that smolders inside a dusty switchbox. But Ervin Somogyi's guitar shop wasn't undone by sawdust or oily rags. It was consumed from without—vaporized last October by the brush fire that ravaged the hills of Oakland, Cal.

Fire is terribly indifferent in choosing its victims, and in Oakland it paid no heed to the quality of Somogyi's instruments—

some of the finest in the business—or the work unfinished on his bench. Ironically, Somogyi thought more carefully than most about a healthy, safe working environment. Air quality, noise reduction and full-spectrum light were important considerations in his 14-ft. by 19-ft. workspace. In the end, he escaped with his life and five guitars. He had insurance, but nowhere near the \$125,000 needed to cover the cost of rebuilding the shop he'd worked in for twenty-one years and to replace the wood, tools and musical instruments that went up in smoke.

Communities are defined by how they respond to hardship. The Amish will raise a new barn to help one of their own. Money won't replace all that Ervin Somogyi lost, but it will go a long way toward helping him build a new shop. If you would like to contribute, checks can be sent to: Friends of Ervin Somogyi (Acct. #0129058871), Elmwood Branch of the Wells Fargo Bank, Berkeley, Cal. 94705. Donations of tools and wood are also welcome. For a list of needed items, contact Ervin Somogyi: 127 Sheridan Road, Oakland, Cal. 94618.

—Scott Landis, Coatesville, Pa.

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

**PERFORMAX PRECISION
NOW COMES BY THE YARD**

NEW! SUPER MAX 37
Single Drum
SUPER MAX 37x2
Dual Drum



Made in U.S.A.

For precise and efficient sanding of wide stock select the Super Max 37. It will exceed your expectations.

For a free brochure and the dealer nearest you call:

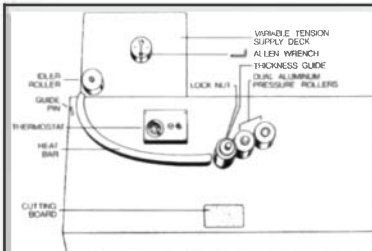
PERFORMAX PRODUCTS, INC. 1-800-334-4910 or (612) 895-9922

READER SERVICE NO. 110

**EDGEMATE
EDGEBANDING
SYSTEM**

SPECIAL \$1199

Ask us to quote you on *all* your Edgematting needs



EDGEMATE PRODUCTS

- Edgemate Variable Tension Supply Deck
- Edgemate Dual Aluminum Pressure Roller System
- Makes Corners Easy
- Most Reliable Bonding in the Industry

HARPER HARDWARE CO.

1712 E. Broad Street (18th & Broad)
Richmond, VA 23223 • In Historic Shockoe Valley
"Serving the Craftsman since 1898 with Specialty Tools and Supplies" Phone: 804-643-9007 FAX: 804-643-9009

READER SERVICE NO. 34

Popular, Pocket-size
MINI-LIGNO
\$110
Only

Incl. Case, Batteries and Pins for 3/16" and 7/16" Measuring Depth.

Also available as: Mini-E Range 5-36% Mini-C with external probe

Wood Moisture Meter
from Lignomat USA

Everybody Knows

that the moisture content of wood is crucial. Moisture related defects such as surface checks, warpage, cracks, loose joints, foggy finishes, etc., can ruin the best piece ever built.

Everybody Knows

moisture defects are irreversible. Therefore don't waste money and time on wet wood. Use a moisture meter to be sure you work only with dry wood.

Ask for *free brochure* on moisture meters (range 4-30%, 4-60%) and accessories to monitor air or kiln drying.

P.O. Box 30145
Portland, OR 97230
Tel: 800-227-2105 503-257-8957

READER SERVICE NO. 134

DELTA BENCH TOP TOOLS			
Model		List	Sale
23-700	Wet/Dry Grinder	234	159
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
28-180	10" Hobby Band Saw	210	145
31-450	1" Belt Sander 2.0 amp	104	78
31-460	4" Belt/Disc Sander	198	145
31-340	1" Belt/8" Disc Sander	286	184
31-080	NEW 1" Belt/5" Disc Sander	134	94

NEW TOOLS BY DELTA			
40-660	16" 2 speed Scroll Saw	266	184
23-650	6" Bench Grinder 1/5 HP	62	54
11-990	12" Bench Drill Press	276	209
11-990	32" Radial Bench Drill Press	399	309
43-355	3/4" Shaper 1 1/2 HP	964	699
43-605	1/2" Bench Router/Shaper	399	279
22-540	12" Bench Top Planer	595	358
36-220	10" Compound Miter Saw	350	239
28-180	Bench Band Saw	232	169

DELTA STATIONARY			
34-761	10" Unisaw 1-1/2 HP	1715	1295
33-990	10" Radial Arm Saw	818	585
37-290	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/34 HP motor	1420	1079
33-850	NEW 6-1/4" Sawbuck	781	549
33-855	above Saw complete w/legs	865	589
34-330	NEW 8-1/4" Table Saw 13A	638	429
34-385	1/6 HP Stack Feeder	638	485
34-670	10" Motorized Table Saw	511	395
32-100	NEW Station Plate Jointer	645	285
36-440	NEW 8-1/4" Cmpd Miter Saw	224	165
34-915	30" Unifencer	385	239
34-897	50" Delta Unifencer	525	295
36-755	NEW 10" Tilt Arbor Saw	1264	865

MILWAUKEE TOOLS			
6527	NEW Sawzall 8 amp variable speed with case	299	164
0398-1	12V cdl's Drill Kit complete	299	165
0402-1	above Drill w/keyless chuck	343	169
0395-1	9.6V cordless Drill w/case	279	158
0224-1	3/8" Drill 4.5 amp magnum	199	115
0234-1	1/2" Drill 4.5 amp 0-850 rpm	219	119
0244-1	1/2" Drill 4.5 amp 0-600 rpm	219	119
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
0375-1	3/8" close quarter Drill	219	129
0378-1	1/2" close quarter Drill	249	147
6538-1	cd's Screwdriver 190 rpm	125	75
6540-1	6539-1 Driver w/bits & case	159	108
6546-1	cd's Screwdriver 200 & 400 rpm	135	79
0312-1	Plumbers night angle Drill Kit	350	195
5399	1/2" D-hole Hammer Drill Kit	319	184
1676-1	HD Hole Hwag with case	449	244
6511	2 speed Sawzall with case	234	134
6750-1	Drywall Gun 0-4000 5 amp	159	93
6507	TSC Sawzall with case	249	132
6170	1/4" Chop Saw 15 amp	479	269
6014	Orbital Sander 12 sheet	209	116
8977	variable temp. Heat Gun	114	75
5397-1	3.8" var. spd Hammer Drill Kit	239	133
5371-1	1/2" var. spd Hammer Drill Kit	335	185
3107-1	1/2" var. spd r/nl angle Drill Kit	360	199
6754-1	Drywall Gun 0-4000 5.4 amp	189	114
3300-1	1/2" var. speed r/nl angle Drill	319	179
6661	1-1/2HP Router - 10 amp	325	185
5680	Router 2 HP - 12 amp	355	205
6215	16" Chain Saw	299	174
0235-1	12" Drill w/kyls chuck mag.	219	125
6145	4-1/2" Grinder 10,000 rpm	159	95
6142	6145 w/case & accs.	197	129
6749-1	Drywall Gun 0-2500 5.4 amp	209	117
5353	Eagle 1-1/2" Rot. Hammer w/case	895	499
6365	7-1/4" Circular Saw 13 amp	209	118
6367	above Saw w/case - double insulated	205	122
6368	6365 w/accs & carbide blade	219	125
6368	6365 w/accs, carb. blade & case	239	134
6377	7-1/4" Worm Drive Saw	319	169

TOOLS ON SALE! X-TRA SPECIAL
Buy any 7-1/4" saw (6365, 6366, 6367, 6368, 6377) & receive an extra Milw. Carbide Tip Saw Blade an \$11.00 value - FREE

FREUD CARBIDE TIPPED SAW BLADES			
5/8" Bore - Industrial Grade			
Item	Description	Teeth	List Sale
LU72M010	Gen Purp. A.T.B. 10" 40	60	37 37
LU82M010	Cut-off 10"	60	90 47
LU84M010	Comb 10"	50	76 40
LU85M010	Super Cut-off 10"	60	112 58
LU72M010	Ripping 10"	24	66 38
LU73M010	Cut off 10"	60	82 45
LU87M010	Thin Kerf 10"	24	70 39
LU88M010	Thin Kerf 10"	60	86 45
LU98M010	Ultimate 10"	60	125 69
TK206	10" Framing	24	38 25
TK303	7-1/4" Finishing	40	37 22
TK306	10" Finishing	40	46 27
TK906	10" Combo	50	52 27
SD306	6" Dado - Carbide	215	109
SD308	8" Dado - Carbide	229	119
F0	13-1/4" x 5/8" Biscuit 1000 Qty.	32	27
F10	2-1/8" x 3/4" Biscuit 1000 Qty.	32	27
F20	2-3/4" x 1" Biscuit 1000 Qty.	34	29
FB100	16 piece Forstner Bit Set	331	165
94-100	5 pc. Router Bit Door System	319	159

JS100	Biscuit Jointer with case-\$30 rebate	159
FT2000	3-1/4 HP Plunge Router-\$30 rebate	179
EB100	Edge Banding Machine-\$30 rebate	229

MAKITA TOOLS			
6070DW	3/8" v/spd Reverse Drill 7.2V	130	74
6071DW	KW Above Drill w/removable batt.	199	105
5090DW	3-3/8" Saw Kit 9.6 volt	256	137
6010DWK3/8"	cordless Drill Kit 7.2V	170	97
6010SDW3/8"	cordless Drill Kit 7.2V	99	59
DA3000DW	3/8" Angle Drill 7.2 volt	251	134
4390DW	9.6 cordless Recip Saw Kit	230	127

6012HDW	2 spd Drill w/clutch-comp.	236	125
6092DW	var. spd Drill Kit complete	252	127
6093DW	v/spd Drill w/clutch-comp.	261	129
6093DWL	6093DW Drill Kit w/Flash Lt.	299	169
6095DW	6093DW Drill Kit w/kyls chuck	268	135
6095DWE	6095DW Drill Kit w/2 batteries	270	139
632007-4	9.6 volt Battery	48	30
632002-4	7.2 volt Battery	40	28

5007NBA	7-1/4" Saw w/electric brake	238	127
5008NBA	8-1/4" Saw w/electric brake	295	158
B04510	1/4 sheet Pad Sander	93	54
9900B	3" x 21" Belt Sander w/bag	278	144
9924DW	3" x 24" Belt Sander w/bag	293	155
9045N	12 sheet Fin. Sander w/bag	241	129
4301BV	Orb. var. spd Jig Saw 3.5A	289	149
JR3000V	var. speed Recip Saw w/cse.	235	129
LS1020	10" Miter Saw 3.5 amp	560	289
9820-2	Blade Sharpener	387	195
1900BW	3-3/4" Planer with case	217	114
1911B	4-3/8" Planer 7.5 amp	255	139
1100	3-1/4" Planer with case	426	225
9207SPC	7" Sander/Polisher	288	154
3601B	1-3/8 HP Router	256	139
B04550	1/4 sheet Pad Sander w/bag	89	57
DA3000R	3/8" Angle Drill	280	148
HP2010M	3/4" var. spd Hmr Drill w/cse	300	165
2708W	8-1/4" Table Saw	509	265
2711	10" Table Saw with brake	851	489
1805B	6-1/8" Planer Kit with case	717	385
5005BA	5-1/2" Circular Saw	234	135
6404	3/8" Drill Rev. 0-2100 rpm	2A	58
6510LVR	3/8" Drill Rev. 0-1050 rpm	149	83
6013BR	1/2" Drill Rev. 6 amp	259	139
5402A	16" Circular Saw 12 amp	662	345
3612BR	3 HP Plunge Router	377	165
9401	4" x 24" Belt Sander w/bag	337	175
4302C	var. speed Orbital Jig Saw	302	159
5077B	7-1/4" Hypoid Saw	255	138
LS1440	14" Miter Saw	744	435
LS1030	NEW 10" Miter Saw	420	225
5007NB	7-1/4" Circular Saw 13 amp	210	114
3612B	3 HP Plunge Router sq/base	377	165
2012	12" Portable Planer	895	455
LS1011	10" Slide Compound Saw	842	445

SENCO AIR NAILERS			
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	475
LS2	Pinner 5/8" - 1"	351	255
SKS	Stapler 5/8" - 1-1/2"	351	255
LS5	Pinner 1" - 1-1/2"	399	285

BOSTICH AIR NAILERS			
N805-1	Stick Nailer Super Sale	389	
N80C-1	Utility Coil Nailer	845	409
T36-50	Sheath & Decking Stapler	595	305
N12B-1	Coil Roofing Nailer	845	445
N60FN-2	Finishing Nailer	625	355
T31	Brad Nailer	270	164
CWC100	1 HP Pancake Compressor	445	295

PANASONIC CORDLESS			
EY6205BC	NEW variable speed 12 volt Drill w/15 minute charger & case	390	179
EY6005B	12V cdl's Drill w/1 hr charger	315	149
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
EY6207BCNEW	12 volt 1/2" Drill w/keyless chuck var. spd w/15 min. charger & case	421	215

LEIGH DOVETAIL JIGS			
D1258R-12	List \$29.00	Sale \$25.00	
D1258R-24	List \$39.00	Sale \$29.00	

LEIGH INSTRUCTIONAL VIDEO SALE \$29.00

HITACHI TDOLS			
C75B	7-1/4" Circular Saw	214	109
C7BD	7-1/4" Circular Saw with brake	230	129
M12V	NEW 3 HP var. speed Router	447	225
TR12	Plunge Router 3 HP	354	169
FT1000A-12	Planer/8" Jointer	2835	1519
C10FA	10" Deluxe Miter Saw	538	269
C12FA	NEW 12" Miter Saw	632	295
C8FB	8-1/2" Slide Compound Saw	899	445
FREUD LU91M0088-1/2"	Carb bit 48 t.	68	43
C15FB	15" Miter Saw	745	375
FREUD LU85M015	15" carb tooth	180	105

1992 TOOL CATALOG AVAILABLE
Call Toll-Free 1-800-328-0457 In Minnesota Call (612)224-8263
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

DELTA TOOLS

34-444 Table Saw Complete w/1-1/2 HP. motor & stand 615.00

34-445 34-444 Table Saw complete w/30" Unifencer and 32-010 EMS system 829.00

28-283 14" Band Saw w/enclosed stand and 50-274 mobile base 739.00

22-662 13" Planer with 2 HP motor, stand, and 32-011 EMS system 1185.00

17-900 16-1/2" Floor Drill Press 385.00

40-601 18" Scroll Saw w/stand and blades 709.00

DELTA #34-080 10" MITER BOX XTRA SPECIAL 198.00

TOOLS ON SALE!™
AMERICA'S LOWEST PRICED TOOLS
FREE FREIGHT TO THE 48 CONTINENTAL STATES ON EVERY ITEM
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

PIRANHA By B & D CARBIDE TOOTH BLADE				
Model #	Dis.	Teeth	List	Sale
73-716	6-1/2	18	13.70	7.35
73-717	7-1/4	18	13.90	7.99
73-737	7-1/4	24	17.20	9.29
73-757	7-1/4	40	31.30	16.79
73-759	8-1/4	40	44.65	24.99
73-719	8-1/4	22	19.65	11.95
73-715	5-1/2	16	13.70	7.99
73-740	10	32	32.98	15.95
73-770	10	60	67.02	29.95
73-711	10	50	65.08	29.95

PORTA NAILER
401 Porta Nailer complete.....265 189
501 Face Nailer complete.....265 189
We stock genuine Porta nails!



You asked for it- here it is!

WOODTURNING

A NEW MAGAZINE FOR ALL WOODTURNERS!



Reading *Woodturning* is the next best thing to turning wood! World famous woodturners share their ideas and techniques so you can improve your skills. *Woodturning* is a magazine which is long overdue! It is written with the interests of both experienced and aspiring woodturners in mind. Prepare yourself for a feast! Regular features include Product and Equipment Reviews: variations in turning techniques; ideas, hints and tips. Many easy-to-follow well illustrated projects are included in each issue. *Woodturning* is a magazine you will be proud to call your own!

Magazine Subscription - 1 Year US \$34.95 2 Years \$54.95 *NOW BI-MONTHLY*

For further information on *Woodturning* 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 *Woodturning*.

NAME _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP _____
 TELEPHONE _____

2FW

Industrial Quality • Same Day Shipping • Free Catalog • Dealer Prices available									
800-966-6543, 214-234-5824 • Fax 214-680-0142					M-F 8AM-7PM / S 10AM-4PM Fax Order : 7 Day - 24 Hour				
C&L Int'l • 1729 Analog, Richardson, TX 75081									
Item No.	Shk.	Diagram	Radius	Price	Item No.	Shk.	Diagram	Cutting Dia. / Len.	Price
100B	1/4	Corner Round	1/8	10.00	401B	1/4	45° Chamfer	1	3/8 12.00
101B	1/4		3/16	11.00	402B	1/4		1-3/16	1/2 12.00
102B	1/4		1/4	12.00	403B	1/4, 1/2		1-3/8	5/8 13.00
103B	1/4		5/16	13.00	404B	1/4		1-5/8	3/4 15.00
104B	1/4		3/8	14.00	405B	1/4		1-3/4	7/8 16.00
105B	1/4		1/2	16.00	406B	1/4		1-7/8	1 18.00
107B	1/2		1/4	13.00	601	1/4	Core Box	1/4	1/4 9.00
108B	1/2		3/8	15.00	602	1/4		3/8	3/8 10.00
110B	1/2		1/2	16.00	603	1/4		1/2	3/8 12.00
112B	1/2		3/4	20.00	604	1/4		5/8	5/8 13.00
113B	1/2		1	32.00	605	1/4, 1/2		3/4	5/8 14.00
115B	1/2		1-1/4	41.00	607	1/2		1	3/4 18.00
116B	1/2		1-1/2	51.00	701	1/4	V Groove	3/8	1/2 9.00
200B	1/4	Beading	1/8	10.00	702	1/4		1/2	1/2 10.00
201B	1/4		3/16	11.00	703	1/4		5/8	5/8 11.00
202B	1/4		1/4	12.00	704	1/2		3/4	5/8 12.00
203B	1/4		5/16	13.00	705	1/2		7/8	3/4 13.00
204B	1/4		3/8	14.00	706	1/2		1	3/4 15.00
205B	1/4		1/2	16.00	1501B	1/4	Slot Cutter	1-1/4	1/8 13.00
207B	1/2		1/4	12.00	1502B	1/4		1-1/4	3/16 13.00
210B	1/2		1/2	16.00	1503B	1/4		1-1/4	1/4 13.00
212B	1/2		3/4	20.00	1506B	1/4	Rabbit	1-1/4	1/2 13.00
301B	1/4	Roman Ogee	5/32	15.00	1511B	1/2		1-1/4	3/8 13.00
302B	1/4		1/4	16.00	1512B	1/2		1-1/4	1/2 13.00
303B	1/2		5/32	15.00	802	1/4	Half Round	3/8"	Dia 14.00
304B	1/2		1/4	16.00	803	1/4		1/2"	Dia 15.00
901B	1/4	Cove	1/4	11.00	805 1/4, 1/2			3/4"	Dia 18.00
902B	1/4		3/8	12.00	807 1/2			1"	Dia 19.00
903B	1/4		1/2	13.00	808 1/2			1-1/4"	Dia 35.00
904B	1/2		1/4	12.00	809 1/2			1-1/2"	Dia 40.00
905B	1/2		3/8	13.00	2001B	1/4	Flush Trim	3/8	1/2 7.00
906B	1/2		1/2	14.00	2004B	1/4		1/2	1 7.50
908B	1/2		3/4	27.00	2008B	1/2		1/2	1 8.50
2501B	1/4	Cove Beading	3/16	16.00	2010B	1/4	3 Flute	1/2	1 9.50
2502B	1/4		1/4	17.00	2020B	1/4	Pattern	1/2	1 14.00
2503B	1/4		5/16	18.00	2021B	1/4		5/8	1 15.00
2508B	1/2		3/8	21.00	2022B	1/4		3/4	1 16.00
2509B	1/2		1/2	23.00	2205D	1/4	Two Flute Straight	1/4	3/4 6.00
TC8B	1/4	Classical	1/8	18.00	2206D	1/4		5/16	1 6.00
TC8B	1/2		1/8	18.00	2207D	1/4		3/8	1 6.00
TC12B	1/4		3/16	19.00	2209D	1/4	(1/2" Shk. Available)	1/2	1 7.00
TC12B	1/2		3/16	19.00	2211D	1/4		5/8	3/4 7.50
TC16B	1/4		1/4	19.00	2212D	1/4		3/4	3/4 8.00
TC16B	1/2		1/4	19.00	2214D	1/4		1	3/4 9.00
7506B	1/4	Ogee	1/8	18.00	GS100	1/4	Straight/Wedge	1-5/8	1 29.00
7508B	1/4		3/16	19.00	GS100	1/2		1-5/8	1 29.00
7508B	1/2		3/16	19.00	GW100	1/4		1-5/8	1 29.00
7512B	1/4		1/4	19.00	GW100	1/2		1-5/8	1 29.00
7512B	1/2		1/4	19.00	2101	1/4	Mortising	1/2	13/32 8.00
2601	1/4	Half Circle	3/8	Dia 7.50	2102	1/4		3/4	3/4 10.00
					2103	1/4			

Foreign orders credit card only • Free shipping on orders over \$20

READER SERVICE NO. 20



"IMPORTERS OF FINE MACHINERY"

ALL NEW! FOR '92!

92-102

OFFSET ROUTER BASES



Make routing easier and safer with an offset base.



ROUTER NOT INCLUDED

MODEL G2512 (Sm.) ONLY \$17⁹⁵
 MODEL G2513 (Lg.) ONLY \$19⁹⁵

25" ACCULOCK TRIANGLE MITER FENCE with 360° range



Adjustable guide for all portable power saws, jig saws and routers. Right or left hand cutting.



MODEL G2515 ONLY \$34⁹⁵



DOVETAIL JIG



Create perfect half blind dovetails with your router & dovetail bit! Completely adjustable with cam action clamping.

MODEL G1660 — ONLY \$84⁹⁵

ROUTER PAD



This pad eliminates holding and/or clamping work while routing.

ROUTER NOT INCLUDED

MODEL G1530 ONLY \$7⁹⁵ EA.
 3 OR MORE ONLY \$6⁹⁵ EA.

SANDING DRUM KITS

Handy, low cost drum kits for use on the drill press, hand drill or wood lathe. Great buy!



SLEEVES AVAILABLE

15-PC. REGULAR MODEL G2500 ONLY \$8⁹⁵
 12-PC. LONG MODEL G2501 ONLY \$8⁹⁵

MAGNETIC EYE SHIELDS



Magnetic base make these easy to use. Ideal for extra face protection.

MODEL G2540 (Sm.) ONLY \$22⁹⁵
 MODEL G2541 (Lg.) ONLY \$24⁹⁵



ORDER OUR 1992 CATALOG... IT'S FREE!

If you live WEST of the Mississippi:
1-800-541-5537 ORDERS
 (206) 647-0801 CUSTOMER SERVICE



If you live EAST of the Mississippi:
1-800-523-4777 ORDERS
 (717) 326-3806 CUSTOMER SERVICE

READER SERVICE NO. 96

Shape a Career in Wood

Looking for a career that rewards creativity and traditional skills? Investigate the School for Professional Crafts! We offer a two-year certificate program in Woodworking taught by nationally recognized professionals. For more information, call or write for our Professional Crafts catalog.

Worcester
Center for Crafts
Dept FW
25 Sagamore Rd.
Worcester, MA
01605
508/753-8183



Chair by Robert March, Dept. Head

READER SERVICE NO. 58

ANTIQUE & USED TOOLS

Quality, older hand tools for collectors and woodworkers. Illustrated lists published 5 times a year.

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

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/ES 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"-1 1/4" DM-032 Call

To Order or get Information:

102 Kimball Ave
SISCO So. Burlington, Vt.
SUPPLY Inc. 05403

802-863-9036

READER SERVICE NO. 13



GIVE A HOOT—DON'T POLLUTE!
UFO—THE ONLY WAY TO GO!

For a limited time only the dust collection systems from SECO Investments will be offered at prices made affordable to everyone.

UFO-101

2HP/1 Phase
1182 CFM, two 4" collection inlets

\$275.00



UFO-90

1HP/1 Phase
610 CFM, very quiet machine 4" inlet

\$160.00



UFO-102B

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

\$410.00



\$220.00



UFO-80

1HP/1 Phase
655 CFM with 4" inlet & floor sweeper

SECO INVESTMENTS COMPANY

(Woodworking Machinery Division)

315 Cloverleaf Drive #C
Baldwin Park, CA 91706
Tel: (818) 333-1799 Fax: (818) 333-1899

READER SERVICE NO. 45

SPRAY FINE FINISHES

for only **\$179⁹⁹** delivered with the New **WAGNER**

FineCoat™

Low Overspray Finishing System

• The Ideal "Fine Finishing Tool"

• Great for applying Varnishes, Stains, Lacquers and water based finishes!



IF NOT SATISFIED AFTER 60 DAYS, RETURN FOR FULL REFUND!

ONLY **\$179⁹⁹** HVLP High Volume, Low Pressure

BONUS: Free Shipping in the continental U.S.A. only. FEATURES: 7.5 amp., 4 PSI, 47 CFM, 15 ft. hose included, 1 quart capacity cup, 15 lb. total weight.

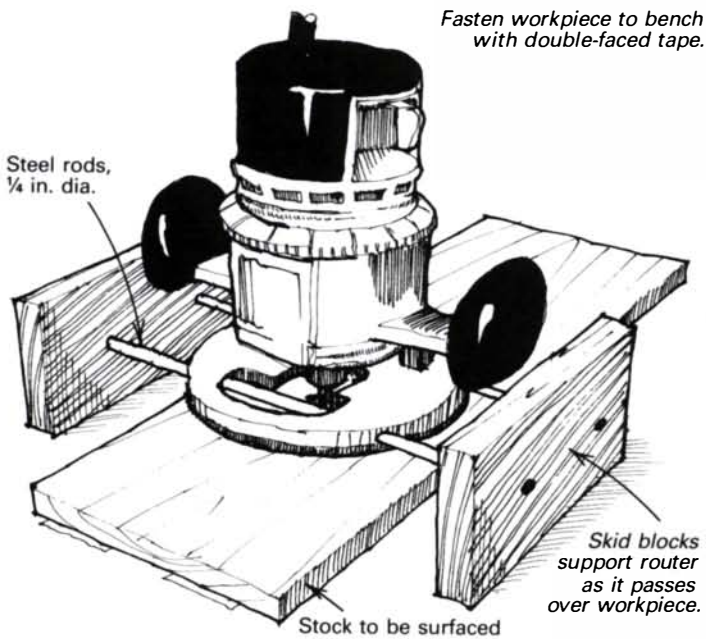
PHONE **1-800-776-5467** ...they are out the next day!

MasterCard Visa (Please include exp. date)
 Check Discover PA Residents add 6% Sales Tax.

Quaker State
WOODWORKING SUPPLY
4434 Kutztown Rd. • Reading, PA 19560

READER SERVICE NO. 130

Surfacing small pieces with a router



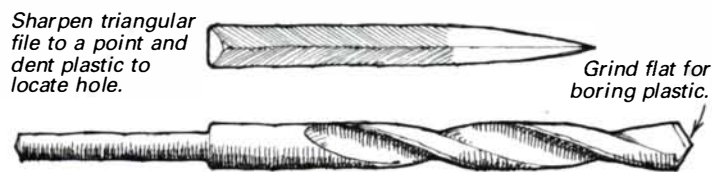
I recently needed to thickness-plane some small pieces of cherry to make a box. I don't have a planer, but I did the job quite satisfactorily using my router and the simple jig shown in the sketch.

To make the jig, run two 1/4-in.-dia. steel rods through the guide holes in the router base. Tap the ends of the rod into 1/4-in.-dia. holes bored into two wooden skid blocks that are large enough to hold the router above the workpiece to be surfaced. Then, chuck a 3/4-in.-dia. carbide-tipped straight bit in the router.

Before using the jig, resaw the workpiece to the approximate thickness that you need, and fasten the wood to the benchtop, rough side up, with double-faced tape. Then move the router jig over the rough surface of the board, taking a light cut with each pass. It only takes a short time to surface and thickness the workpiece.

—Richard Adler, Gulf Breeze, Fla.

Modifying drill bits for plastic



Many woodworkers use plastics for jigs and fixtures that require that holes be drilled in the material. The problem is that most plastics are liable to crack or split if they are drilled incorrectly. You could probably use a regular twist drill up to 1/8 in. dia. without trouble, but larger bits tend to grab as they break through the plastic. You can prevent this problem and obtain clean, smooth holes by honing a flat on the cutting edges of the bit, as shown in the sketch.

To accurately start a hole in plastic, you need to make a small dent in the material for positioning the drill point. Do not use a center punch, as you might do on metal, because the plastic is likely to crack from the force of the punch. Instead, make a dent in the surface with a piece of an old triangular file, which has been ground to a point as shown. Press and rotate the file backwards and forwards to make a dent.

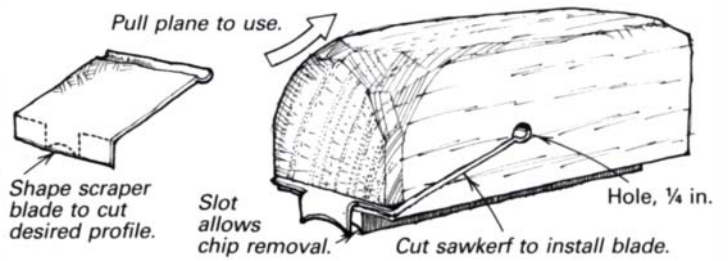
—Percy W. Blandford, Stratford-upon-Avon, England

Quick tip: A great non-slip surface for holding wood for sanding and shaping is Slip-Stop (Canico Manufacturing Inc., 121

Landmark Drive, Greensboro, N.C. 27409). The rubbery, porous material, which comes in rolls, is often available from dealers carrying supplies for recreational vehicles.

—Kenneth C. Palmer, Lakeland, Fla.

A devil of a scraper plane



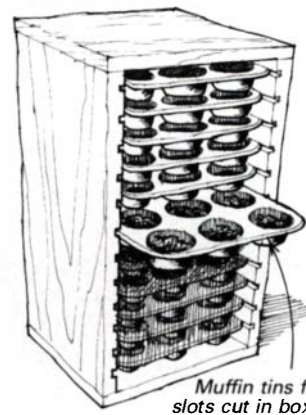
When I need to cut a simple bead or groove in a workpiece and can't use a router, I make a scraper plane using Red Devil brand scraper blades. These steel blades, which are available at most hardware stores, are easily shaped and sharpened with a file. To make the body of the plane, drill a 1/4-in.-dia. hole through a hardwood block and saw a kerf into the hole so that you can fit the blade into the block, as shown in the sketch. Shape the sole of the plane to match the contour of the blade and to adjust the depth of cut. Also, leave a 3/16-in. slot in front of the cutting edge to facilitate chip removal.

—Alden Trull, Union, Maine

Quick tip: A good way to keep laminates separated from the underlying surface when gluing with contact cement is to place strips from old venetian blinds between them. When the laminate is properly positioned, the wide, thin strips can be easily removed.

—J.A. Wilson, Lexington, Mass.

Hardware storage rack



In our antique-auto restoration shop we need a large inventory of standard screws, nuts, bolts and washers in a variety of sizes. When we finally got tired of messing with those flimsy metal cabinets with the little plastic drawers, we built this rack for storing hardware in muffin tins. The rack itself is a simple box with grooves cut into the sides; you could build it any way you want. The main advantages of our setup are compactness, sturdiness, visibility of hardware (when the drawer is pulled out) and number of bins. Our rack uses 12 muffin tins, each with 12 compartments, giving us an ample 144 bins per unit. The muffin tins retail for around \$4, so it is worth watching for a sale or scouting up a wholesale price.

—Durward Brown and Wallace Wiebe, Alva, Okla.

Quick tip: Plane a flat on the handles of narrow chisels and gouges to keep them from rolling around or off the bench. If the flat is aligned with the underside of the blade, it will also position the tool so that you can pick up the tool the right way without looking.

—Percy W. Blandford, Stratford-upon-Avon, England

Quick tip: You can recycle dirty mineral spirits by letting the liquid set in a cool spot for a couple of weeks. Decant the clear stuff into an old mineral-spirit container, and then dispose of the residue.

—Gene Thoma, New Brighton, Minn.

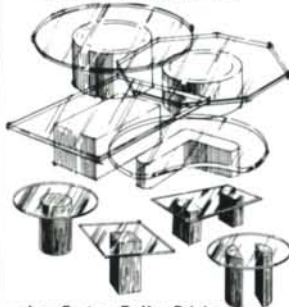
GLASS MIRROR CRAFT

HEAVY

GLASS TABLE TOPS

1/4" - 3/8" - 1/2" - 3/4" - 1" THICK GLASS
"USING GLASS MAKES SENSE!"

Using Us Makes BETTER SENSE!



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

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

MANY EXCLUSIVE EDGEWORKS!

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

READER SERVICE NO. 42

MAGNATE

WB-15 Woodboxed 15pc Carbide Tipped Router Bit Set



\$85.95

1/4" shank, sand blasted body set contains one each of the following tools.

- 201 1/4" Straight bit
- 205 1/2" Straight bit
- 208 3/4" Straight bit
- 303 1/2" Flush trim bit
- 402 1/2" Dovetail bit
- 501 1/4" Panel pilot bit
- 702 1/2" Vee grooving bit
- 902 1/2" 45° chamfer bit
- 1003 1/2" r Cove bit
- 1105 3/8" Slot cutter
- 1204 3/8" r Corner rounding bit
- 1601 5/32" r Roman ogee bit
- 3301 1/2" Mortising bit
- 5101 Solid flush trim bit
- 5201 Solid 7° bevel trim bit

TOLL FREE 1-800-827-2316
MAGNATE BUSINESS INTL.

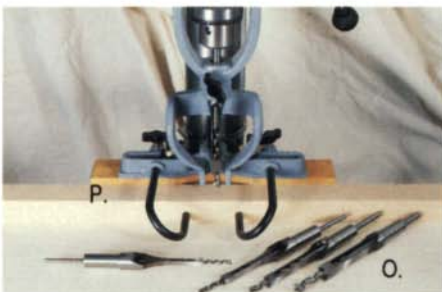
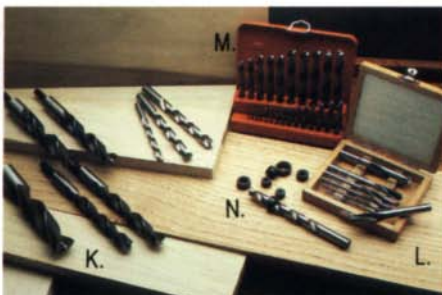
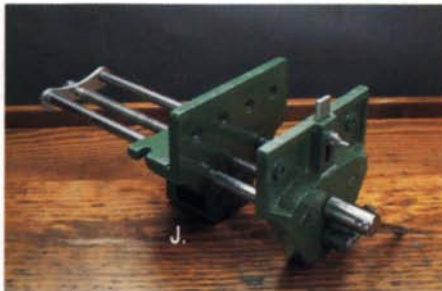
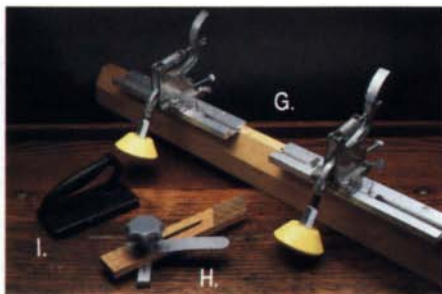
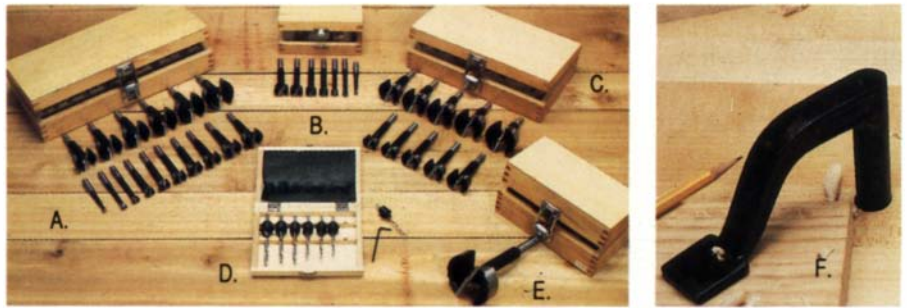
1127 So. Grand Ave., Diamond Bar, CA 91765
714-861-1185 Fax 800-733-9076

Ask for Free 1992 Edition Catalog



READER SERVICE NO. 49

AMAZING PRICE BREAKTHROUGHS!



A. 16 pc. Forstner Bit Set #77581 \$87.95
All bits 3 1/2" overall, precision ground, HRC 50-52. Sizes 1/4" through 2 1/8" in wooden case. All 3/8" shanks. Sizes over 1 1/2" supplied with saw teeth to eliminate overheating.

B. 7 pc. Forstner Bit Set #77571 \$27.95
All bits 3 1/2" overall, precision ground, HRC 50-52. Sizes 1/4" through 1" in wooden case.

C. 10 pc. Forstner Bit Set #53982 \$74.95
All bits 3 1/2" overall, precision ground, HRC 50-52. Sizes 1", 1 1/8", 1 1/4", 1 3/8", 1 1/2", 1 5/8", 1 3/4", 1 7/8", 2", 2 1/8" in handsome wooden case. All bits with saw teeth for faster heat-free drilling!

D. 22 pc. HSS Tapered Drill, Countersink/Bore, Stop Collar Set #12232 \$26.95
For screw sizes #s 5, 6, 7, 8, 9, 10, 12. Wood case included.

E. Jumbo Forstner Bits #18302 \$139.95
8 pc. Set includes 2 1/2" thru 3 1/8", all with saw teeth.
2 1/4" Bit #18232 \$21.95 | 2 3/4" Bit #18272 \$27.95
2 3/8" Bit #18242 \$22.95 | 2 7/8" Bit #18282 \$31.95
2 1/2" Bit #18252 \$24.50 | 3" Bit #77591 \$33.99
2 5/8" Bit #18262 \$25.50 | 3 1/8" Bit #18292 \$35.95

F. Classic Bench Hold-down #54012 \$6.95
Tap on top secures your work, tap at the back releases it. Great for any workbench top.

G. Special Anti-Kickback Device
Table saw Anti-Kickback #50179 \$31.95
Radial Anti-Kickback #74131 \$31.95
Shaper Anti-Kickback #74141 \$31.95
Optional 2 pc. Aluminum Track #74201 \$10.95

H. Anti-Kickback Featherboard & Hold Down
Featherboard fits into miter gauge slot of your table saw and locks into position. Also prevents material from raising off the blade. #29402 \$11.95

I. Safety Push Block
Sure grip 3" x 5" pad. Helps keep hands away from planer, jointer or table saw blades. #54032 \$3.95

J. Quick Release, Large Capacity Bench Vise
Heavy cast iron construction with built-in steel bench dog. Jaws are 7" wide and predrilled for adding wooden faces. Opens to 11" and mounts to a 2 5/8" or thinner section of your bench. #54002 \$37.95

K. 5 pc. Jumbo Bradpoint Drill Set
Comes in sizes 9/16", 5/8", 7/8" & 1". All with 3/8" shanks. #54992 \$18.95

L. 7 pc. Carbide Tipped Bradpoint Drill Set
Creates clean entry holes with no overheating. Sizes 1/8", 3/16", 1/4", 5/16", 7/16", & 1/2". Wooden case included. #53992 \$31.95

M. 25 pc. Bradpoint Drill Set #77611 \$17.95
Fits any 3/8" or larger chuck. Free metal index.

N. 7 pc. Stop Collar Set #93361 \$4.95

O. 4 pc. Mortise & Chisel Set #54022 \$39.95
Comes with sizes 1/4", 5/16", 3/8" & 1/2". Standard 5/8" shank fits most brand's mortise attachment.

P. Mortise Attachment #64202 \$24.95
Fits all major brands and imports including Jet, Grizzly and Delta. For 5/8" shank, chisels and bits.

In Ohio, please add 6% Sales Tax. Minimum order \$18.95.
All orders add \$3.00 shipping/handling charge.

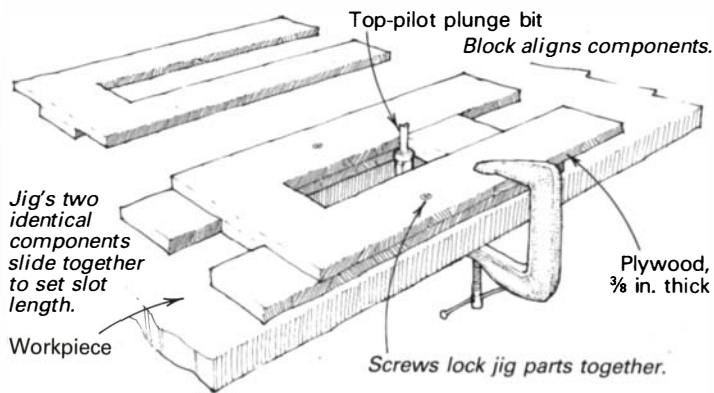
1-800-345-2396

940 W. Maple St., Hartville, Ohio 44632
Offer available in 48 continental states only.



READER SERVICE NO. 133

Plunge router slotting jig



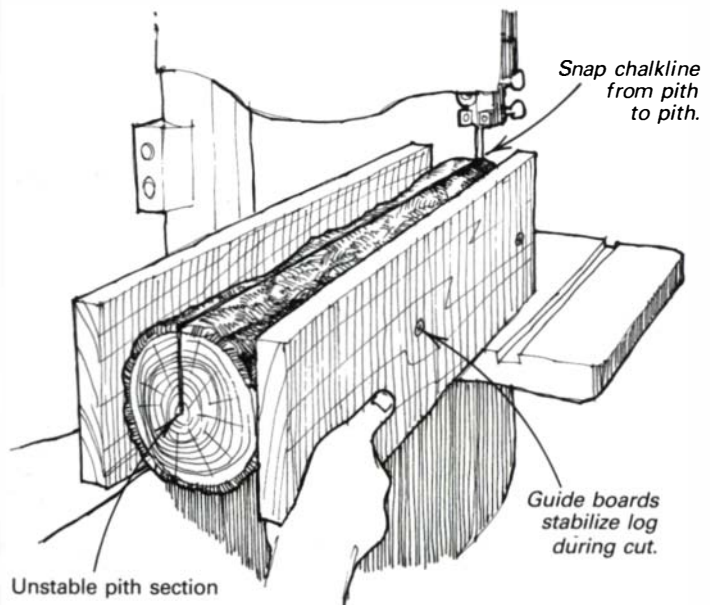
I build cabinets for audio, video and computer equipment. Each cabinet must be equipped with different-size access slots, depending on the equipment to be stored. To cut the various lengths of slots required, I came up with the router jig in the sketch. The jig, which I've found saves time and gives good results, is based on the two interlocking, identical parts cut from $\frac{3}{8}$ -in.-thick plywood. A block glued to each U-shaped component aligns the pieces as they slide together. For best results, the pieces must fit together snugly.

To use the jig, slide the halves to the desired slot length, secure the assembly with two screws and clamp it down in the desired location. I use a plunge router with an Amana top-pilot (on the shaft) flush-trimming plunge bit, which has several advantages over a standard router fitted with guide collars or bushings. First, with a plunge router, you can rout the slot incrementally without having to stop and reset the cutting depth, and second,

with a flush-trimming bit, you don't have to widen the jig slot to compensate for the collars. I have made several jigs for various slot widths, but the $1\frac{1}{4}$ -in. width gets the most use.

—Warren W. Bender Jr., Medford, N.Y.

Ripping logs on the bandsaw



Here's an easy, accurate way to rip short logs on the bandsaw to make bowl blanks. First, determine the best line through the length of the log, and then place the log on the saw table

Trend-lines

If you find a lower price from a national mail order company, we'll match it and give you a \$5.00 catalog gift certificate.

Guaranteed Lowest *freud* Prices!

Now you can save two ways by combining Trend-Line's low prices with Freud's special rebate (good until 1/31/92). Order today on our toll-free number for fast, 24 to 48-hour shipping of these value priced, high quality woodworking tools.

**FREUD
EDGE
BANDING
MACHINE**
TFEB100

\$239.95
Before
Rebate

\$209⁹⁵
After Rebate



**FREUD
BISCUIT
JOINER**
TFJS100A

\$127⁹⁵
After Rebate

\$157.95
Before
Rebate

To Order Call Toll-Free

Mention Dept. FWF12 for these super low prices

1-800-767-9999

ADD \$4.00 SHIPPING AND HANDLING



MA, RI, ME residents add sales tax.

**FREUD 3 1/4 HP
ROUTER**
TF2000

\$139⁹⁵
After Rebate



\$169.95
Before
Rebate

CALL OR WRITE FOR OUR FREE CATALOG

TREND-LINES, INC • DEPT FWF12 • 375 BEACHAM STREET • CHELSEA, MA 02150

READER SERVICE NO. 136

JOIN THE NEW BOOK CLUB EXCLUSIVELY FOR WOODWORKERS...

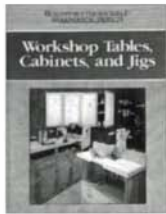
TAKE ANY BOOK FREE!

Choose Another Book at 1/2 Price!

(If you like, take a third book for only \$5.95.) And there's no obligation to buy any more books!

6 GREAT REASONS TO JOIN NOW!

- ◆ Help yourself to huge savings up to \$56.85 by joining now!
- ◆ Discover the best new and classic woodworking books every month in your FREE Club Newsletter.
- ◆ Get discounts from 15% to 50% on every book.
- ◆ Take one Free Bonus Book with every four books you buy.
- ◆ Get Free postage and handling when you include payment with your order after you join.
- ◆ Satisfaction Guaranteed 100%!



#80074-38 \$14.95
1/2 Price: \$7.48



#80070-61 \$17.95
1/2 Price: \$8.98



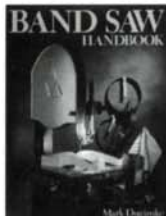
#80093-93 \$16.95
1/2 Price: \$8.48



#80091-93 \$16.95
1/2 Price: \$8.48



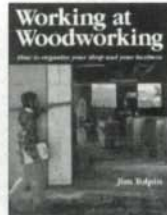
#80053-93 \$16.95
1/2 Price: \$8.48



#80076-93 \$16.95
1/2 Price: \$8.48



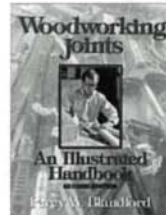
#80063-80 \$25.90
1/2 Price: \$12.95
Count as 1 selection.



#80111-78 \$21.95
1/2 Price: \$10.98



#80092-38 \$14.95
1/2 Price: \$7.48



#80060-61 \$17.95
1/2 Price: \$8.98



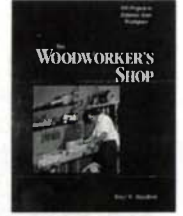
#80078-38 \$14.95
1/2 Price: \$7.48



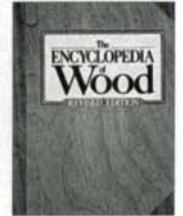
#80052-74 \$27.90
1/2 Price: \$13.95
Count as 1 selection



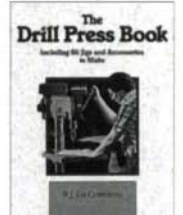
#80102-38 \$14.95
1/2 Price: \$7.48



#80059-41 \$15.95
1/2 Price: \$7.98



#80067-51 \$19.95
1/2 Price: \$9.98



#80094-93 \$16.95
1/2 Price: \$8.48



#80072-93 \$16.95
1/2 Price: \$8.48



#80061-85 \$18.95
1/2 Price: \$9.48



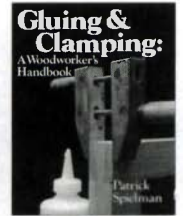
#80054-78 \$21.95
1/2 Price: \$10.98



#80056-78 \$21.95
1/2 Price: \$10.98



#80055-93 \$16.95
1/2 Price: \$8.48



#80090-38 \$14.95
1/2 Price: \$7.48

Here's how the Club works.

Every month you'll get your free issue of the Club newsletter, Woodworker's Book Club News. It describes the month's Main Selection and dozens of other books to choose from. If you want the Main Selection, do nothing and it will be sent automatically. If you want a different book, or want nothing that month, you'll always have at least ten days to decide and return the order form. You have NO OBLIGATION to buy any more books—you're just trying out the club for six months. After that, either you or the Club can cancel your membership any time. Each time you buy a book, your membership will be extended for the following six months. If you should ever receive your WWBC News late so you don't have ten days to decide what you want, we'll take care of it. If that ever happens and you receive a book you don't want, just return it at our expense. If you're ever unhappy with a book for any reason, just return it within 10 days for full refund, no questions asked. When we say Satisfaction Guaranteed, we mean it!

Start your Membership today—with this Special Offer!

FREE BOOK MEMBERSHIP CERTIFICATE

Yes! I'd like to join Woodworker's Book Club! Rush me my special New

I understand how the Club works and that I have NO OBLIGATION to buy any more books.

Member books:

My FREE Book # _____ \$ **FREE**

Signature _____
required on all certificates

My 1/2 Price Book # _____ \$ _____

Name _____

plus postage and handling _____ \$ **3.97**

Address _____

Optional \$5.95 Book # _____ \$ _____

City _____ State _____ ZIP _____

Here's all I pay _____ \$ _____

(Payment must accompany order. Ohioans add 5.5% tax.)

Offer good in U.S. and Canada for new members only. Remit in U.S. funds. All applications subject to approval. Please allow 3-4 weeks for delivery.

Check enclosed (or) Charge my Visa MasterCard

Acct # _____ Exp date _____

Credit Cards call **TOLL-FREE 1-800-876-0963**
9:00 a.m. to 5:00 p.m. Eastern time, Mon.-Fri.

WOODWORKER'S
BOOK CLUB

P.O. Box 12171 • Cincinnati, OH 45212-0171

or other flat surface, so it is lying just as you want it to go through the saw. Cut two 1x10s about as long as the log, and secure one of these pieces to each side of the log with drywall screws. The bottom edges of these guide boards should rest on the saw's flat surface, to stabilize the log.

Now drive a nail into the pith on one end of the log. Stretch a chalkline from this nail down the length of the log, center it on the pith at the opposite end of the log and strike the line. Carefully following this chalkline, rip the log. Sawing through the pith, which is prone to crack as the wood dries, ensures that this unstable section won't end up in the finished bowl. Remove the guide boards and rip the halves again with the first-cut surface held against a fence set so the saw will take 1/2 in. or so off what will be the bottom of the bowl. This gives you a flat surface to set on the saw table when you cut out the round bowl blank and provides enough space for attaching a lathe faceplate.

—Floyd Rogers, Lewisville, N.C.

Quick tip: To prevent tools from rusting in a canvas tool roll, soak the canvas in clear kerosene and let it dry.

—Ken Klosterhaus, Romeo, Mich.

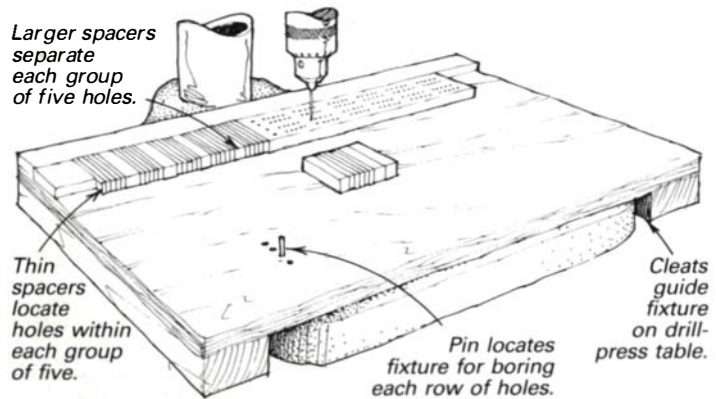
Quick tip: To stop tools from rusting, spray your tool roll with a silicone-base, water-repellent fabric spray. The spray reduces the amount of moisture that the roll picks up from the air.

—Robert Davidson, Traverse City, Mich.

Quick tip: A bench grinder will heat up tool steel very quickly. To avoid overheating a tool when sharpening, work on two tools at a time; when one starts to feel warm, set it down and pick up the other.

—Dario Biagiarelli, Kirkville, N.Y.

Drilling cribbage-board holes



Drilling holes in a cribbage board is time-consuming and very exacting. The fixture shown here produces fast, accurate holes by using small spacers to locate them. Four thin spacers are used for the holes within each group of five, and every fifth spacer is thicker, to set the wider areas between the groups of five. To use the fixture, put all the spacers in place and line up the bit with the first hole. Then drill the first hole, remove one spacer, move the board to the left, drill the next hole and move the board again. Repeat this process until you have completed the row. Realign the jig and replace the stack of spacers to begin the next row. One good method for locating subsequent rows is to slide the jig toward the drill-press post and pin it in place. The whole operation is almost as much fun as playing cribbage.

—Charles W. Whitney, Mount Vernon, Ohio

EXAKT 600 GRIT WET DIAMOND GROUND CARBIDE BITS AND SHAPER CUTTERS

Making Cabinet Doors?

WE HAVE THE LATEST NEW CONCEPT IN RAISED PANEL CABINET DOOR CONSTRUCTION.

- * NO MORE CHANGING BITS OR REVERSING PIECES.
- * DOES SAME JOB 10 TIMES FASTER THAN LEADING BRANDS.
- * TOP QUALITY 600 GRIT WET DIAMOND GROUND MIRROR FINISH.
- * SAVE SET UP TIME! MAKES A PERFECT FIT EVERY TIME.
- * CUTS BOTH CONVENTIONAL AND CATHEDRAL DOORS.

THIS REMARKABLE BIT HAS A 1" CUTTING HEIGHT AND WILL CUT THE RAIL USING ONLY THE TOP 3/4" OF THE BIT, AND BY SIMPLY ELEVATING THE BIT 1/4" THE BIT IS THEN POSITIONED TO CUT THE STILE.



PAT. PENDING

For Router With 1/2" Shank	For Shaper With 3/4" Or 1/2" Bore
#479 Quarter Round \$89.95	#2094 Quarter Round \$139.95
#478 1/4" Bead 89.95	#2096 1/4" Bead 139.95

YOU CAN'T BUY A BETTER BIT EVEN FOR MORE. ALL OUR BITS ARE CARBIDE & 600 GRIT WET DIAMOND GROUND FOR MIRROR FINISH!

TOOLS ETC.

ORDER TOLL FREE 1-800-327-6250 - INQUIRES PLEASE CALL 714-525-3581. ORDERS SHIPPED UPS FREIGHT FREE TO 48 STATES ON ORDERS OF \$35. OR MORE. AK, HI, USVI AND CANADA SHIPPING IS SLIGHTLY HIGHER. 1567 S. HARBOR BLVD. FULLERTON, CA. 92632



Straight Bits

1/4" Shank		
Cutting Dia.	Length	Sale
#150	1/4" 2"	\$7.00
#151	5/16" 2"	7.00
#152	3/8" 2"	7.00
#153	1/2" 2"	7.95
#154	5/8" 2"	8.95
#155	3/4" 2"	12.00
#156	1" 2"	15.95

1/2" Shank		
Cutting Dia.	Length	Sale
#160	1/4" 2 1/4"	\$8.50
#163	3/8" 2 1/4"	9.00
#165	1/2" 2 5/8"	10.50
#167	1/2" 3 1/2"	18.50
#169	5/8" 4"	21.00
#171	3/4" 2 5/8"	12.00
#172	3/4" 3 1/2"	19.50
#173	1" 2 5/8"	13.50

Dovetail Bits

14 Degree		
Cutting Dia.	Shank	Sale
#242	3/8" 1/4"	\$7.50
#243	1/2" 1/4"	8.00
#245	3/4" 1/4"	10.00
#250	1/2" 1/2"	8.50
#253	3/4" 1/2"	10.50
#254	1" 1/2"	14.00

Laminate Trimming

Flush 1/4" Shank		
Carbide Dia.	Length	Sale
#345	3/8" 1 3/16"	\$8.50
#346	1/2" 1 3/16"	8.50

Flush 1/2" Shank

#348	1/2" 1 3/16"	9.50
#349	5/8" 1 1/8"	10.00

Pattern Cutting

With Top Bearing		
Dia.	Shank	Sale
#470	1/2" 1/4"	\$16.00
#471	5/8" 1/4"	17.00
#472	3/4" 1/4"	18.00
#475	1 1/8" 1/2"	24.00

Roundover

RadiusShank Sale		
#	Shank	Sale
#321	1/8" 1/4"	\$15.00
#322	3/16" 1/4"	16.00
#323	1/4" 1/4"	17.00
#324	5/16" 1/4"	18.00
#325	3/8" 1/4"	19.00
#326	1/2" 1/4"	21.00
#327	1/2" 1/2"	21.95
#329	3/4" 1/2"	26.95
#331	1" 1/2"	47.95
#332	1 1/4" 1/2"	49.95

Roman Ogee

RadiusShank Sale		
#	Shank	Sale
#381	5/32" 1/4"	\$22.00
#382	1/4" 1/4"	23.00
#383	5/32" 1/2"	23.00
#364	1/4" 1/2"	25.00

Rabbeting

DepthShank Sale		
#	Shank	Sale
#186	3/8" 1/4"	\$16.95
#194	3/8" 1/2"	17.95

Classical

RadiusShank Sale		
#	Shank	Sale
#433	3/8" 1/4"	\$29.95
#434	1/2" 1/4"	32.95
#435	3/8" 1/2"	29.95
#438	1/2" 1/2"	33.95

45 Degree Chamfer

1/4" Shank		
Cutting Dia.	Length	Sale
#291	1 3/8" 1/2"	\$23.95

Slot Cutter For Biscuit Joining

4 Flutes With Arbor & Bearing		
Shank Size	Sale	
#271	1/4" \$28.95	
#276	1/2" 29.95	

Other Size Slot Cutters

Kerf Depth Sale		
#	Shank	Sale
#270	1/8" 9/16"	28.95
#272	3/16" 9/16"	28.95
#273	1/4" 9/16"	29.95

Cove Bits

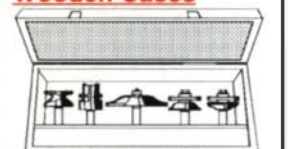
RadiusShank Sale		
#	Shank	Sale
#303	1/4" 1/4"	\$16.95
#305	3/8" 1/4"	19.95
#306	1/2" 1/4"	21.00
#307	1/2" 1/2"	21.95
#308	3/4" 1/2"	32.95

Panel Raisers

1/2" Shank 2 5/8" Diameter		
#	Shank	Sale
#485	15° Bevel	\$49.95
#486	Ogee	49.95
#488	Cove	49.95

3 1/2" Diameter		
#	Shank	Sale
#490	15° Bevel	\$59.95
#491	Ogee	59.95
#493	Cove	59.95

Router Bit Sets In Wooden Cases

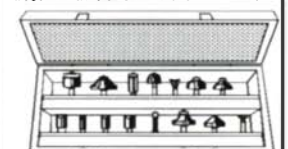


5 Piece Cabinet Makers Door Set comes with 2 pc. Stile & Rail, Glue Joint, Raised Panel bit of your choice and Finger Pull bit.

#100	With ogee R.P. Bit	\$199.95
#101	With bevel R.P. Bit	199.95
#102	With Cove R.P. Bit	199.95

Same As Above But With The NEW Easy To Use Stile & Rail Bit Described At Left.

#105	With ogee R.P. Bit	\$199.95
#106	With bevel R.P. Bit	199.95
#107	With Cove R.P. Bit	199.95



Both sets come with the most popular used bits in wooden case.

#115	15pc set 1/4" Shk.	\$179.95
#113	13pc set 1/2" Shk.	189.95

QUICK-GRIP
Light, Strong, Fast!
The Bar Clamp that's
so handy, you can use it
with one hand!

The One Handed Bar CLAMP
To apply pressure just squeeze the handle

#	Jaw Opening	Spec!
Q506	6"	\$12.95
Q512	12"	14.95
Q518	18"	15.95
Q524	24"	17.95
Q536	36"	19.95

7pc. Bar Clamp Kit
For corner clamping & edge gluing!
Q577 REG. \$29.95 **SPEC! \$17.95**
Includes: 6" clamp, 2 reg. pads, 2 full face pads, 1 corner brkt. 1 corner pad

Moon's Saw & Tool Inc. To order call Toll Free
2531-39 N. ASHLAND AVE. 1 (800) 447-7371
CHICAGO, IL 60614 Visa, MasterCard &
(312) 549-7924 Discover Card Accepted

READER SERVICE NO. 54

Clayton Oscillating Spindle Sanders.
For large or small shops. Ideal for contour sanding. Quick change drums. 1/2" to 4". Satisfaction guaranteed. Covered by 1 yr. warranty. 4 models to choose from. For more information write:



Clayton Machine Corp.
P.O. Box 513, Clawson MI 48017
313-548-2380

Made in U.S.A.

READER SERVICE NO. 4

VACUPRESS VACUUM VENEERING
THE UNCOMMON SOLUTION

Today's sophisticated designs demand uncommon veneering solutions. VacuPress delivers consistent, high quality results by combining atmospheric pressure as a clamp and vacuum's ability to draw glue into the cell structure.

Push veneering—and your creativity—to the limit with VacuPress. Please contact us for more information. Let us put the VacuPress solution to work for you!

FEATURED IN FINE WOODWORKING,
OCTOBER 1990, PAGE 68

VACUUM PRESSING SYSTEMS, INC.
1609 RIVER ROAD BRUNSWICK, MAINE 04011
TELEPHONE 207-725-0935 FAX 207-725-0932


READER SERVICE NO. 101

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. Starting at \$1049.⁰⁰ Write or call for free brochure

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



READER SERVICE NO. 8

THE SANDING CATALOGUE 1 • 800 • 228 • 0000

36 Industrial Grade Klingspor Abrasive Sanding Belts

Stop! Don't throw away money on "cheap imported" sanding belts for your portable sander. Get the Belt Blizzard Box—36 industrial grade Klingspor Abrasives sanding belts in one of three popular sizes and your choice of grits for only \$29.00 plus \$2.50 shipping and handling. Or choose 4" belts packaged 30 per box for the same low price (a \$100 value.)

How can we sell for such a low price? Klingspor generates lots of side and end pieces in their manufacturing process. Instead of trashing the waste The Sanding Catalogue offers woodworkers an opportunity to profit from Klingspor's loss by making portable sanding belts from this first quality abrasive material.

We guarantee these aggressive sanding belts to meet or exceed the performance of your current abrasives. We're so sure these belts will give you **The Most Sanding Power For Your Money** that we'll cheerfully refund your money if you're not 100% satisfied.

1 Choose From Five Popular Sizes:

2-1/2" x 16"* 3" x 21"*
 3" x 24"* 4" x 21"*
 4" x 24"*

*Packaged 6 belts per grit selection for a total of 36 belts.
**Packaged 5 belts per grit selection for a total of 30 belts.

2 Specify grit sizes - Select a total of six grit sizes in any combination. If no selection is made, you will receive one package from each grit category.

GRIT SELECTIONS						
GRIT SIZES	XFine	Fine	Med.Fine	Med.	Coarse	XC
	280-320	180-240	120-150	80-100	50-60	36-40
QTY.						

Order Today - Quantities Limited!

3 # Belt Blizzard Boxes @ \$29.00 =

Total Merchandise Price	
Less Discount: \$50 - \$199 = 10% Off \$200 + = 25% Off	()
Add \$2.50 (to total order) for Shipping and Handling within the Continental U.S.	
CA & NC Customers Only - Add Sales Tax	
TOTAL	

PAYMENT METHOD: Please enclose your personal check, money order or charge card information below. (No cash, please.)

Check MasterCard Visa

Account Number _____

Expiration Date Required _____
Month _____ Year _____

Signature of Cardholder _____

4 SHIP MY BELT BLIZZARD BOX(ES) TO:
(We ship to street addresses only.)

Name _____
Company Name _____
Address _____
City _____
State _____
Zip + 4 _____
Phone _____

#0164

READER SERVICE NO. 131

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

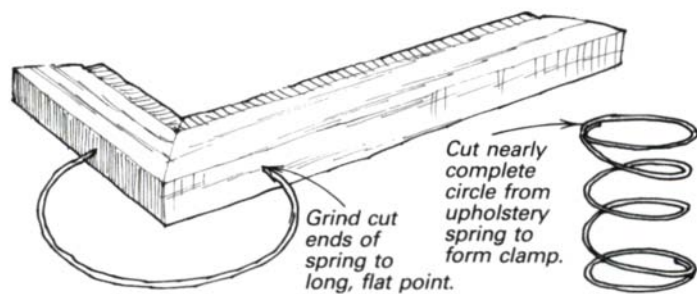
CRAFT SUPPLIES U.S.A.
1287 E. 1120 S.
PROVO, UT 84606
(801) 373-0917 Fax (801) 374-2879





READER SERVICE NO. 204

Clamping picture frames with coil springs

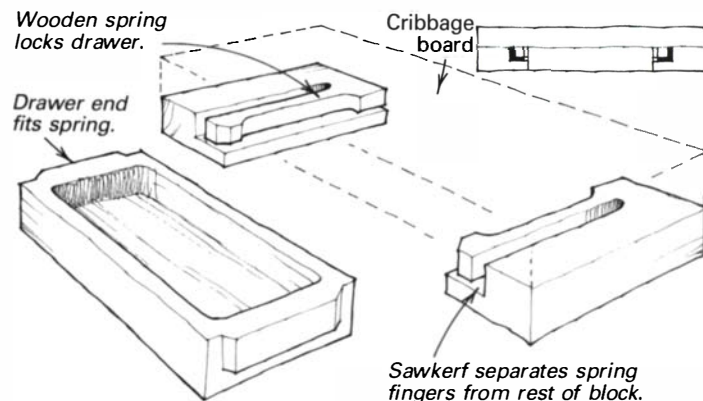


Here's a method for clamping picture frames that I learned years ago at the shop of a New York City framemaker. Use spring clamps made from upholsterer's coil springs to exert pressure. The sharpened ends of the circular springs bite into the sides of the mitered frame pieces putting pressure exactly where it's needed—on the glued miter.

To make the rings, saw nearly complete circles from the coil springs. Then carefully sharpen the cut ends on a belt sander or grinding wheel to form long, flat points. Two upholsterer's coil springs will yield two or three complete sets of four spring clamps of various sizes and tensions. —Steve Mamville, Amagansett, N.Y.

Quick tip: Putting fresh sandpaper on an orbital sander can be frustrating if you start with the paper slightly misplaced. I keep handy a piece of plywood the same size and thickness as the sander pad. Fit the paper to this block, carefully creasing the four 90° bends. After that it easily falls in place on the sander pad and clamps down smooth and tight. —Joseph T. Logan, Easton, Md.

A wooden spring drawer latch



This cribbage-board drawer slides into the board and is held in place with wooden springs. The springs are wooden fingers routed into small blocks attached to the bottom of the board. To make the fingers, rout the indentations on the outside of the fingers that will hold the drawer in place. The cut should be about half the thickness of a 3/16-in.-dia. bit. Then, with the same bit, rout the slot that creates the finger in one pass, starting from the outside and moving to the root of the finger. Separate the finger from the rest of the workpiece, as shown above, by making a pass with a thin-kerf blade on a tablesaw. To tune the fingers to the proper tension, change the thickness of the shaft of the finger. Be careful, even a small change will affect tension. Straight-grain woods with good split resistance, such as maple or ash, are excellent choices for these springy fingers.

—Michael O'Banion, Westminster, Md.

SERVING WOODWORKERS EVERYWHERE!

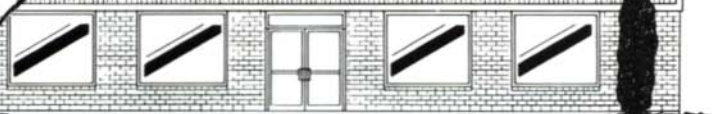
Here's the new 1991-92 catalog!



Over 4,000 products!

- Over 37 years of service
- 11 retail stores
- 48 hour mail order service

The Woodworkers' Store
Hardware • Wood • Tools • Know How



To receive a new 1991-92 catalog send \$2.00 to:

The Woodworkers' Store
21801 Industrial Blvd.
Rogers, MN 55374

Visit a store near you!

- Boston area (Cambridge) • Buffalo • Chicago area (Arlington Heights)
- Cleveland • Columbus • Denver • Detroit area (Royal Oak)
- Milwaukee • Minneapolis • San Diego • Seattle

The Woodworkers' Store
Hardware, Wood, Tools & Know How

CASINGS • BASES • CROWNS • CORNER BLOCKS
VICTORIAN ELEGANCE
 DOORS • GINGERBREAD • WAINSCOT



LARGEST INVENTORY
 OF VICTORIAN MOULDINGS
 & MILLWORK ANYWHERE

- Specializing in Customer Service
- Buy Direct from Mfr.
- Premium & Commercial Grades
- No Minimum Order
- Rush Orders - No Problem!
- Expert Shipping & Packaging
- Lots of Construction Ideas
- Top Quality Precision Millwork
- High Quality Full Color Catalog with over 60 photos

Send \$4 for Catalog or Phone & use your credit card
P.O. Box 2987-FW4
Durango, Colorado 81302
303-259-5915

SILVERTON
 Victorian Millworks

READER SERVICE NO. 402



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. 36



QUALITY THAT'S TOP DRAWER...
 ...for all your drawers. If it's pulls you need, we've got you covered. Whether it's Chippendale or Queen Anne, Hepplewhite or Victorian, we'll help you get a handle on it. It's all there in our new 70-page catalog—a valuable reference tool that fully describes our expanded line of period hardware. To get your copy, use circle #401 and send \$4.00.


PAXTON HARDWARE
 LTD.

7818 Bradshaw Road, Dept. FW30, Upper Falls, MD 21156
 Quick Shipment Free Mini-Catalog

READER SERVICE NO. 65

WOODCHUCK™

Indexing Router System



Call today for **FREE** information package or send \$10.00 for a demo video. (refundable at time of purchase) Several models to choose from including an impressive build it yourself kit.

- tapers
- flutes
- beads
- joinery
- circular molding
- concentric spirals
- and much more

Turn your router into an indexable milling system...
 ...the possibilities are limited only by your imagination.


Phantom Engineering, Inc.

P.O. Box 235 / Provo, UT 84603-0235 / Phone (801) 377-5757

READER SERVICE NO. 118

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



SHAKER FURNITURE

An exciting collection of Shaker dining chairs, tables, beds and other furniture available in Kits or completely finished. All exemplify the simplicity and versatile beauty of Shaker design. Pegs, pegboard, Shaker baskets, oval boxes, dolls and needlework kits. Large selection of replacement chair tape.

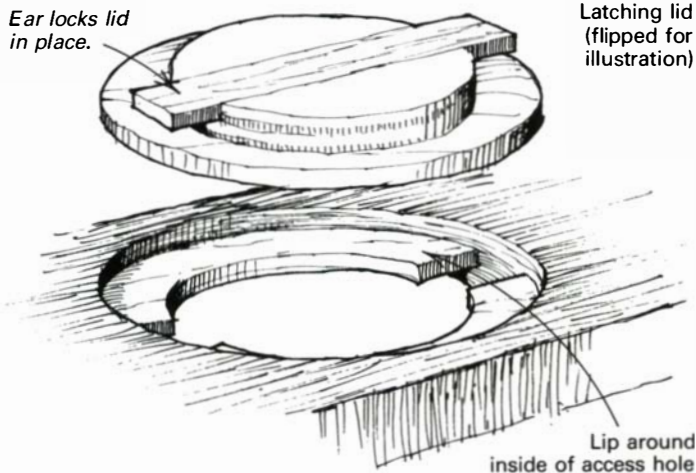
FREE - New 56 page color catalog and 12 tape samples

SHAKER WORKSHOPS
 Box 1028-FW12, Concord, MA 01742
 (617) 616-8985

READER SERVICE NO. 27

Router-made latching lid

Ear locks lid in place.



Latching lid (flipped for illustration)

Lip around inside of access hole

I designed this circular latching lid to conceal the access compartment in the back of a clock, but it could be used in other applications as well. The latch is milled almost entirely with a router pivoting on a trammel point. The dimensions here are based on using $\frac{3}{4}$ -in.-thick material.

Start by drilling a small hole for the trammel point through the panel to be accessed. Pivoting your router around this hole, rout a circular groove $\frac{1}{4}$ in. deep with a $\frac{3}{4}$ -in.-dia. straight bit. The outside diameter of this groove should be about $1\frac{1}{2}$ in. larger than you want the access hole to be. Without changing the depth setting, turn the workpiece over and rout a groove on the other side using the same pilot hole and

trammel setting. Now decrease the trammel radius by $\frac{3}{4}$ in. (the bit diameter) and rout a circular groove at progressively deeper settings until you're all the way through the workpiece. This will leave a $\frac{1}{4}$ -in.-thick by $\frac{3}{4}$ -in.-wide lip around the inside of the access hole.

To make the lid, use the trammel to rout a disc from separate stock that will fit snugly in the recess of the access hole. Next, decrease the trammel's radius by $\frac{3}{4}$ in. and rout a circular rabbet $\frac{1}{2}$ in. deep on what will become the inside of the lid.

Once the pieces fit together satisfactorily, rout a straight groove $\frac{3}{4}$ -in.-wide by $\frac{1}{4}$ in. deep across the inside of the lid. Glue a strip of solid wood in this groove to make the latching ears, as shown in the sketch. Mark where the ears contact the lip around the inside of the access hole and remove these two areas with a coping saw. You should now be able to push the lid flush with the back and lock it by turning. To complete the lid, add a handle, and wax the parts for easier twisting and removal.

— Russell Salter, Pittsburgh, Pa.

Quick tip: Here's a trick that makes it easy to square up a stack laminated block. When preparing the laminates, leave the bottom board slightly wider than the rest, with one long edge machined straight and square. During glue-up, have the squared edge proud of the rest of the stack, and then run this edge against the tablesaw rip fence to square the other side.

—Dario Biagiarelli, Kirkville, N.Y.

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.

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 $\frac{1}{32}$ " over a $10\text{-}1\frac{1}{2}$ " range ($16\text{-}1\frac{1}{2}$ " 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



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

SUNHILL MACHINERY

Take Advantage of Our Limited Time Freight Specials

*Freight charges will not exceed 7% of the purchase price on any of the following items (in the 48 states). Alaska & Hawaii call for special quote. Special Freight Rates Available Until Feb. 29th, 1992



CT-200L 8" Long Bed Jointer

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

\$809



CT-60L 6" Long Bed Jointer

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

\$389



SP-102 Two Speed Spindle Shaper

- Extra Heavy Duty Components
- Reversible & Interchangeable Spindles

3HP 1PH \$1295

5HP 3PH \$1395



MBS-250 10" Table Saw

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

\$1145



CM-20P 20" Industrial Planer

A True 20" Planer for the Professional Shop

- Solid Cast Iron Construction for Exceptional Durability

\$2395



CT-38B 15" Two Speed Planer

The Original 15" Planer

- 3HP 1PH Motor w/Magnetic Starter

\$859



CT-1332S 13" Light Duty Wide Belt Sander

- Variable Speed Conveyor Feed
- 13" x 32" Sanding Belt
- Option: Heavy Duty Stand w/Casters \$69

\$998



CT-108 Edge Sander

- Inclined work table may be adjusted for even belt wear, decreased sanding marks
- 6" x 108" Belt

\$995

Please Contact Us For More Information:

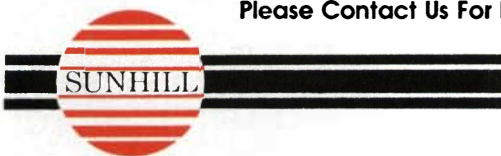
SUNHILL MACHINERY

500 Andover Park East

Seattle, WA 98188

206/575-4131 • 206/575-3617 FAX

800/544-1361



READER SERVICE NO. 125

AVIATION Industrial Supply Co. BOSCH

30% off Bosch Router Bits

BOSCH SAWS

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

1582VSC	"Clic", Orb. Nob Handle Jig Saw	\$144
1582DVS	"Clic", Dustless Orb. Jig Saw	159
1632VSK	Panther Recp. Saw	139
1581DVS	Dustless Jig Saw	159

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 batteries	\$129
1001VSR	3/8" Var. Spd. Rev. Drill	68
1021VSR	(as above) Hvy. Duty	89
1023VSR	1/2" H. Duty, V.S., Rev. Drill	99
1000VSR	3/8" Var. Spd. Rev. Drill	68
1194VSR	1/2" Hammer Drill	147

BOSCH SANDERS

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

	Sanding Frame for 1273DVS above	\$ 98
3270D	3"x21" Dustless Belt Sander	133
1272	3"x24" Belt Sander	165
1272D	3"x24" Belt Sander w/Dust Coll.	168
1273	4"x24" Belt Sander	175
1273D	4"x24" Belt Sander w/Dust Coll.	178
1290D	Fin. Sander, 1/2 sheet dustless	117
3258	3 1/4" Power Planer	125
1370DEVS	Kit — H.D. Random Orb. Sand./Polish.	299
1290	1/2 Sheet Finishing Sander	95
3283DVS	6" Random Orb. Sand./Polish.	109
328DVS	Kit — (same as above)	139

BOSCH ROUTERS

1601	1 hp Router	\$105
1604	1 3/4 hp Router	145
1604K	As above w/Case & Acc.	164
1606	D-Handle, 1 3/4 hp Router	147
9030D	Fixed Base Router, 3 3/4 hp	349
1608LX	Laminete Trimmer	99
1609K	Installers Kit	166
1609KX	Laminete Trim Kit	199
1611	Plunge Router, 3 hp	197
1611EVS	3 1/4 hp Var. Spd. Plunge Router	233
1611	Plunge Router, 3 1/2 hp, 220 Volt	269
11611EVS	3 1/4 hp V.S., 220 V Plunge Router	310

HITACHI

CB75F	Resaw Bandsaw	\$1598
C15FB	15" Miter Saw	378
C12FA	12" Miter Saw	298
C10FA	10" Miter Saw	278
F1000A	12" Planer/6" Jointer	1498
C8FB	8-12" Compound Mitre Saw	438
P12RA	12" Planer/6" Jointer	778

FREE FREIGHT
Denver - [303] 355-2391

CALL TOLL FREE
1-800-748-1945

VISA and MASTERCARD ACCEPTED

READER SERVICE NO. 32

ROBLAND X 31

THE INTELLIGENT ONE MAN SHOP

90-MINUTE
DEMO
VIDEO



- 1100 lbs.
- 3 separate 3HP motors
- 12" jointer
- 12" planer
- 10" table saw
- 50" sliding table
- 3HP shaper
- mortiser
- cast iron

The Robland X 31

is designed to make maximum use of minimum space ideal for the small professional shop and the demanding hobbyist. Change from one tool to another in 20 seconds or less! Solid, sturdy, reliable.

CALL OR WRITE FOR MORE INFORMATION NOW!

2081 LAGUNA CANYON RD., LAGUNA BEACH, CA 92651

LAGUNA TOOLS

1-800-234-1976 or 714-494-7006



Oldham Saw Blades



3 Blade Set - Available in 8", 9" or 10" (Same Price)



Rip



Planer



Cut-Off

Number	Size	Type	
100 7024	10" 24T	Rip	\$84⁹⁵ ppd.
100 7150	10" 50T	Planer	
100 7260	10" 60T	Cut-Off	
900 7024	9" 24T	Rip	\$84⁹⁵ ppd.
900 7150	9" 50T	Planer	
900 7260	9" 60T	Cut-Off	
800 7024	8" 24T	Rip	\$84⁹⁵ ppd.
800 7150	8" 50T	Planer	
800 7260	8" 60T	Cut-Off	

Any 3 blades for \$84.95 ppd. mix or match or any one blade for \$29.95 ppd.

PHILLIPPS BROS. SUPPLY, INC.

Construction and Industrial Supplies

2525 KENSINGTON AVE. AMHERST, NY 14226-4999 716/839-4800
CALL TOLL FREE 1-800-888-7271 *FAX: 716/839-4051

READER SERVICE NO. 50



RAISED PANEL DOORS

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

Check Out Our Features

- ✓ Superior Quality
- ✓ Great Prices
- ✓ Fast Delivery
- ✓ Made To Your Size
- ✓ 25 Door Designs
- ✓ 8 Wood Species
- ✓ No Order Too Small
- ✓ 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. 158

FREE CATALOG

Send today
for your **FREE**
copy of our 72
page full-color catalog.

You'll find the best prices
for over 3,000 brand-name
products. Included are power
tools and accessories, hand tools,
screws, hardware, wood components,
plans, how-to books, and much more.

Trend-lines®

Discount
Woodworking Tools
and Supplies

To order your **FREE**
catalog, just fill out
the coupon below
and mail it to:

Trend-lines
Dept. FW12
375 Beacham St.
Chelsea, MA 02150



Name _____
Address _____
City _____
State _____ Zip _____
DEPT. FW12

READER SERVICE NO. 137

ELECTRIC BRANDING IRON

Your Satisfaction Guaranteed



- Solid Brass—lasts years
- Special wording available
- 2nd line—20 letters/spaces max.
- 1/4" letters
- Distinctive Border
- Torch heated models start at \$26.00
- Add \$3.00 shipping

\$46⁹⁵ OH Res. add 6% sales tax.

Order by mail from:

Brand Mark
462 Carthage Dr., Dept. FW1-2
Beavercreek, OH 45434-5865
(513) 426-6843

TO ORDER CALL TOLL FREE
1-800-323-2570
8:00-5:00 EASTERN TIME

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. 30

ARROWMONT

School of Arts and Crafts
Box 567, Gallinburg, TN 37738 (615) 436-5860

One Week Workshops MARCH 2-27, 1992

WOODTURNING: Leo Doyle, Al Stirt, Ray Key / COOPERING:
Rick Stewart / CEAMRICS / FIBER-FABRIC BASKETRY / METAL-
ENAMEL / GLASS / STONE CARVING / PAINTING / MARBLING /
MONOPRINTING

Graduate/undergraduate credit
Assistantships/scholarships
Year-round gallery exhibition program

EQUAL OPPORTUNITY INSTITUTION

READER SERVICE NO. 86

Quality Exotic Wood

» TURNERS «
Thick Planks for Bowls/Squares

» 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

It's a matter of pride for both of us

It's a matter of pride for both of us

READER SERVICE NO. 151

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. 121

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

TUNGSTEN CARBIDE TIPPED TOOLS

CALL TOLL FREE
 1-800-782-6629 (NATIONWIDE)
 (619)535-8940 (CALIFORNIA)

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	5.50
	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
Flush Trim	FT210P	3/8	1/2	1/4	6.00
	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
	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
	DV425	1	7/8	1/2	8.95
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	3/4	1/2	1/4	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	1-3/8	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
Rabbit	RB232	1-1/4	1/2	1/4	12.00
	RB432	1-1/4	1/2	1/2	12.00
	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, 9 CUTTING EDGES
 FINGER JOINTER
 FJ463 1/2" shank \$53

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

	TODL #	RADIU	CUT L.	SNK D.	PRICE
Rounding Over	CR201	1/16	3/8	1/4	10.00
	CR203	3/8	3/8	1/4	10.00
	CR205	3/16	7/16	1/4	10.00
	CR206	1/4	2/1	1/4	11.00
	CR208	5/16	9/16	1/4	12.95
	CR213	1/2	3/4	1/4	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
	CV203	1/8	3/8	1/4	11.00
	CV205	3/16	7/16	1/4	11.00
Cove	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
	CV406	1/4	1/2	1/2	12.00
	CV410	3/8	1/2	1/2	12.50
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
	HR203	1/4 D	5/8	1/4	12.50
	HR205	3/8 D	11/16	1/4	13.50
HALF ROUND	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	

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.

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

REVERSIBLE STILE & RAIL LOCK MITRE
 C965 \$45 C998 \$42

FINGER JOINT GLUE JOINT
 C961 \$69 C911 \$32

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

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

LOBO POWER TOOLS

WE SPECIALIZE IN CUSTOMER SATISFACTION

READER SERVICE NO. 114

READER SERVICE NO. 102

January/February 1992 27

Storing cyanoacrylate glue

I am having a storage problem with the various brands of cyanoacrylate adhesives. Once I open the bottle, I end up throwing away about half of the container because it dries up—no matter how tightly I fasten the plastic cap. Are there any tips on how to store this glue?

—David M. Levin, Longboat Key, Fla.

George Mustoe replies: Unlike most common adhesives, cyanoacrylate “super glues” set up due to chemical reaction rather than evaporation of a solvent. This solidification can be triggered by traces of various naturally-occurring catalysts, but the substance that’s most likely to be responsible is plain old water. In your case, the glue probably petrifies from humid air that enters the bottle every time you remove the cap. Companies tend to market a small volume of cyanoacrylate in a container that includes a large volume of air, and as you’ve discovered, it’s the half-empty bottles that go bad.

Shelf-life problems are particularly likely in a region such as Florida, where the warm coastal climate means high humidity. In dry parts of the country, cyanoacrylate glues usually have a longer shelf life. As you’ve observed, a tight-fitting cap doesn’t eliminate the problem, though it can help in environments where airborne moisture is only an intermittent phenomenon.

There are several strategies you can try to extend the glue’s storage life. One possibility is to search for the driest possible site to keep your adhesive supply—a high shelf in a heated room may be much less humid than a workshop located in a basement or attached garage. Another approach is to create a desert-like environment by keeping the glue container in a tightly-sealed jar along with a packet of granulated silica gel, a drying agent sold at some camera stores. These packets are also commonly included in cartons used to ship electronic products, so you might be able to get them free at the nearest computer or stereo dealer. Remember, though, the silica gel won’t have any effect unless the glue container is left partly open to allow free air circulation within the sealed jar.

[George Mustoe is a geochemistry research technician at Western Washington University in Bellingham, Wash.]

Restoring an oak relic

I am restoring a Civil War cannon for a town in Iowa with a carriage made of native burr oak. When completed, the cannon will be constantly exposed to weather, and the wood will be painted. Could you recommend a wood-preserved product I could use under the paint to prevent deterioration?

—H. Richard Fishbaugh, Shenandoah, Ia.

Chris Minick replies: Achieving a durable, exterior paint job is a multi-step process. The U.S. Forest Products Laboratory in Madison, Wisc., recommends a three-step procedure: Treatment with a water-repellent preservative, followed by priming and two coats of a high-quality exterior paint. Water-repellent preservatives containing pentachlorophenol (such as Penta) are no longer available, but any preservative that contains copper naphthenate or copper-8-quinolinolate will function equally well. The Cuprinol line of water-repellent preservatives, manufactured by Darworth, Inc. (Box K, Tower Lane, Avon, Conn. 06001), contain the mentioned chemicals. These products are available at most hardware stores and home centers. Soaking the wood in preservative is by far the best method for treatment. Allow the preservative to dry for several days before proceeding with the finishing sequence.

Two coats of exterior-grade primer should be applied next. Tests conducted by the U.S. Forest Products Laboratory indicate that a pigmented-shellac primer provides excellent protection against moisture vapor transmission, the enemy of all exterior-paint jobs. BIN White Pigmented Shellac Primer Sealer (made by William Zinsser & Co., Inc., 39 Belmont Drive, Somerset, N.J.

08873) would be a good choice for your project.

Finally, apply two coats of exterior paint. It matters little if the paint is oil base or water base, equivalent results can be expected with either coating. My personal preference would be a 100% acrylic latex paint. The acrylic systems provide excellent protection from the elements and resist yellowing better than most oil-base systems. It’s worth mentioning that a wealth of wood finishing information can be obtained by writing to the U.S. Department of Agriculture Forest Service, Forest Products Laboratory, Madison, Wisc. 53705. Ask for the wood-finishing list of publications. Most pamphlets are free or available for a minimal cost. [Chris Minick is a product development chemist and amateur woodworker in Stillwater, Minn.]

Choosing a long-lasting boat finish

I just purchased a sailboat with a 28-ft.-long mast made of sitka spruce, and I’m in a quandary as to the best way to finish it. The previous owner refinished the mast every one to two years with a clear spar varnish, but is there a longer-lasting clear finish? It’s troublesome to remove the mast and take it home each year or two to refinish it.

—David P. Biddle, Natural Bridge Station, Va.

Michael Dresdner replies: Spar varnish originally gained popularity among boatbuilders because its high degree of flexibility allowed it to last through the drastic changes in humidity a boat encounters. However, spar varnish is hardly the most durable of finishes. Recently, molecular architects have developed new and better polymers that combine durability with flexibility and throw in many favorable exterior properties as well.

Your best bet for longevity is a water-base aliphatic polyurethane, such as Hydrocote Polyshield (available from Highland Hardware, 1045 N. Highland Ave. N.E., Atlanta, Ga. 30306, 404-872-4466). Avoid aromatic urethanes since they are not ultraviolet (UV) light stable. Whichever product you choose should have UV absorbers as well as hindered amine light stabilizers (HALS) for the optimum life expectancy. In use, don’t be surprised to see one of these finishes lasting at least three times as long as spar varnish. Don’t be too hasty to get your mast back on the boat, though. While these water-base polyurethanes dry very quickly initially, they take at least 30 days to fully cure and should not be subjected to the elements sooner than that.

[Michael Dresdner is a finishing consultant, woodworker and author in Perkasie, Pa.]

Fixing a tippy table

I have recently completed a 48-in.-square oak dining table that has a split pedestal with two leaves. Unfortunately, the table is prone to tipping when even a small amount of pressure is applied to an edge or corner. Is there a mathematical formula to use in determining the minimum footprint the base must have to ensure stability of the table?

—Robert H. Wood, Oneonta, N.Y.

Richard Starr replies: I don’t know a mathematical formula that will assure you of creating a stable table, but I can suggest some ways of thinking about the problem and designing your way around it. The most practical way to add stability to a pedestal table is to make the base very heavy; cafe tables have flat cast-iron bases to give them stability with plenty of legroom. Weighting the base is fine for small tables, but the weighty base required for a dining table would make the table very hard to move.

Regardless of whether you are designing a table with a pedestal base, a trestle or legs, think of each point of contact between the base and the floor as the end of a foot. The distance the tabletop extends beyond the perimeter of the feet (or footprint) is the overhang. The larger the overhang, or greater the weight that you set on the overhang, the greater the risk of overturning the table. The height of the table with respect to the footprint



IMPORTS, INC.
 "IMPORTERS OF FINE MACHINERY"

LOOK
PRICES HELD
FOR 1992!



**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



**16" BAND SAW
 MODEL G1538**
ONLY \$525⁰⁰
 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



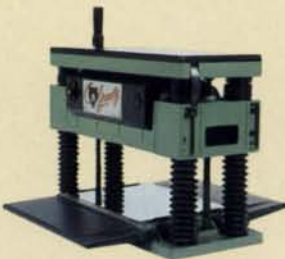
**3 H.P.
 SHAPER
 MODEL G1026**
ONLY \$850⁰⁰
 F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



**6" x 47" HEAVY DUTY
 JOINTER
 MODEL G1182**
 Reg. \$375. **SALE \$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



**12" PLANER
 MODEL G1017**
ONLY \$385⁰⁰
 F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



(Stand
 Optional)

**15" PLANER
 MODEL G1021**
ONLY \$735⁰⁰
 F.O.B. BELLINGHAM, WA or WILLIAMSPORT, PA



**20" PLANER
 MODEL G1033**
ONLY \$1,295⁰⁰
 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



If you live **WEST** of the Mississippi:
1-800-541-5537 ORDERS
 (206) 647-0801 CUSTOMER SERVICE
 P.O. BOX 2069
 BELLINGHAM, WA 98227



**CALL FOR YOUR
 FREE CATALOG!**
 92-103

If you live **EAST** of the Mississippi:
1-800-523-4777 ORDERS
 (717) 326-3806 CUSTOMER SERVICE
 2406 REACH RD.
 WILLIAMSPORT, PA 17701



also affects stability. Even if you fastened legs at the corners of the top, a very tall table with no overhang could tip easily. That's why the footprint of a tall stool is usually larger than its seat. Increasing overhang and height may make a table easier to tip over, but if you make the table longer without increasing the height, you can get away with a lot more overhang on the long ends. That's because most of the table's weight (and its center of gravity) is further from the ends and, therefore, is more difficult to lift, which helps keep the table flat on the floor.

The number of points in contact with the floor in the footprint also affects stability. Euclid taught us that three points define a plane, so all three legs are always in contact with the floor, no matter how uneven it may be. That's why photographers use tripods, and why three-legged tables or stools don't wobble. Unfortunately, all other things being equal, a three-legged table or stool is more likely to tip over than one with four legs. Why? Because when an object tips over, it rotates on the ends of two of its legs. Think of the line between the leg ends as a hinge between the table and the floor. The hinge between the legs of a three-legged table is closer to the center of the footprint than that of a four-legged table with roughly the same size footprint. The further from the center, the more leverage it takes to tip the item over.

Add a fifth leg and the hinge gets even further from the center. Keep adding legs, and the legs will form a circle, which is the most stable shape for a footprint, since the hinge is a single point on the circumference as far from the center as it can be. But the disadvantage of multiple legs, or a full circular pedestal, is that the object will be more wobbly on an uneven surface. Further, you'll probably limit legroom.

To solve the problem with the table you've already built, you'll need to redesign the structure of your table and attach longer legs on your pedestal. To help locate where the points of contact of the table's new footprint should be, temporarily prop four scrap 2x4s (one for each foot) under the tabletop, and then try leaning on the top. Start by placing the 2x4s near the top's outer edge, keeping them perfectly vertical. Gradually move them inward until you find the point where the table is not too tippy. Then attach feet to the pedestal that protrudes to reach the points where the 2x4s contacted the floor.

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

The best tool steel for woodturning

While recently perusing a tool catalog, I read about a tool steel grading system for high-speed steels (HSS), listing the various types: T-1, M-2, M-4, A-11. While each steel seemed to be better than the one listed before it, which one do you think would be the best for woodturning tools?

—Wm. Stephen Fichter, New York, N.Y.

Jerry Glaser replies: All tool-steel manufacturers use standard tests to grade the steels for a number of important characteristics. Some of these tests compare the wear resistance and toughness of one steel against another—one important criteria for selecting a high-quality tool steel. It is the results of these tests that tool companies often use in making claims for the superior wear resistance of A-11 steel. In industry, A-11 is used in various cold-work applications where wear resistance, therefore tool life, is critical. These uses include powder compacting tooling, fire blanking and punches and dies.

The natural question is, why not use A-11 for everything and dispense with all the other tool steels entirely? The reason is that wear resistance is only one factor for selection, albeit an important one. A-11's usefulness as a steel for woodturning tools is supported by several tests conducted by production turners which demonstrated A-11's edge-holding properties. But since the casual turner might find it difficult to assess the value of a particular tool steel by reading technical test data, I decided to

ask a production turner to make 88 balusters out of redwood. All were the same design and turned at the same speed, but using three gouges: one made out of M-2 steel, one out of CPM M-4 and the third out of A-11. The M-2 cut 12 balusters before it required sharpening, the M-4 went to 24 pieces and the A-11 finished the lot without resharpening. Comparing the A-11 performance to the M-2, it performed more than four times better. Though these were not scientific tests, they do confirm that steels such as A-11 are demonstrably better than the conventional T-1 and M-2 tool steels. The downside to using A-11 tool steel is its cost, which is two to three times more than M-2 steel. This limits its use to all but professional or production woodworking applications.

Incidentally, good wear resistance is not necessarily the product of high hardness. A-11 tools used for wood turning are normally hardened between 59-to 62-Rockwell hardness. This allows good wear resistance with enough toughness to prevent chipping from intermittent cuts and/or extremely hard woods. One has to reach a compromise between wear resistance and toughness to make a tool that can be used for turning all kinds of wood.

[Jerry Glaser is a retired aerospace engineer living in Torrance, Cal. He also manufactures a line of woodturning tools and accessories.]

Electric drill gear problems

I have just replaced the main-drive gear in my portable electric drill for the second time in as many weeks, and it still sounds gritty. What can I do to remedy the problem?

—Barry Karloff, Wassila, Alaska

Robert Vaughan replies: My guess is that when the first gear in your electric drill stopped working, chips from the hardened gear teeth got into the grease packed into the surrounding casing. Then, each time you installed a new gear, those little chips worked their way between the moving gear teeth again and—"crunch!—" there went your new gears and more crunchy pieces of steel went floating around in the housing. To remedy this situation, I recommend that you disassemble the drive train and clean the parts and housing of all grease. Make it squeaky clean. Closely inspect all gears for broken or damaged teeth and replace as needed. Put in some new, clean grease, reassemble and you shouldn't have any problems. If the end of the armature has helical gears that are chewed up badly, then you may have to decide whether or not the drill is worth such an expensive repair.

[Bob Vaughan is a woodworking machinery rehabilitation specialist in Roanoke, Va.]

Curing a slow-starting electric motor

Lately, the single-phase motor on my jointer seems to be starting slowly. Could the motor be getting old, or is there some other problem?

—Archibald Leech, Manchester, England

Ed Cowern replies: There are two common failure points in single-phase motors. One is the starting switch, and the second is the starting capacitor. Treating these one at a time, the starting switch is usually a centrifugal device built to snap open when the motor reaches approximately 3/4 of its full-rotational speed. The switch usually has weights and springs like an old-fashioned fly-ball governor used on a steam engine. Frequently in woodworking shops, the contacts or the moving components can get fouled with sawdust or pitch, and the action of the switch will become sluggish or get stuck. If it sticks in the open position, the motor will hum but will not start. If the switch gets stuck in the closed position, the motor will be quite noisy and, if left running, will get very hot and possibly fail. These problems can sometimes be prevented by either keeping the motor clean and blowing away accumulated sawdust before it gets into the motor and fouls the switch, or changing to a totally enclosed, fan-cooled (TEFC) motor.

The second failure point on single-phase motors is the starting capacitor. This is a black or silver cylinder, usually mounted under a sheet metal shroud on the outside of the motor (on some mo-

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 standard. The T-Square saw fence system cuts precision parts for all your home shop projects. Safely. Affordably.



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 convenient 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. 77

The Wood Slicer™

Extra-Durable, Precision Resawing Blades for Delta, Sears, Shopsmith & Inca 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. 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.



\$29.95*

Specify length: 72" (Shopsmith), 73" (Inca), 80" (Sears), 93-1/2" (Delta 14"), or 104-3/4" (Delta 14" with riser block).

RYOBI Woodcarver™

FAST Stock Removal for Freehand Shaping, Carving and Chairmaking



Fit this 4" blade on your 4" or 4-1/2" angle grinder and enjoy the fastest roughing out you've ever done. Anti-kickback chainsaw-shaped teeth cut forward, up, down or sideways without binding to blow away even the hardest woods over broad areas or in tight spaces. 22mm arbor hole is supplied with 5/8" bushing to fit almost any angle grinder. 4" blade diameter lets you leave the guard in place for safety.

\$39.95*

with 5/8" bushing to fit almost any angle grinder. 4" blade diameter lets you leave the guard in place for safety.

MC/Visa/Discover users
ORDER TOLL FREE
(800) 241-6748



*Add \$3 per order shipping charge within 50 states.

1045 N. Highland Ave., Dept. F92
Atlanta, GA 30306 (404) 872-4466

READER SERVICE NO. 12

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. DS33



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

Woodmaster Tools Dept. DS33
2908 Oak, Kansas City, MO 64108

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

READER SERVICE NO. 48

tors, it's mounted inside). Occasionally the capacitor will weaken (change its capacitive value) or short out. When the capacitor weakens, the motor becomes slow starting; when it fails completely, the motor will hum but not start, as in the case when the starting-switch sticks open. If the capacitor shorts, then the motor will be very noisy, may start slowly or run slowly and exhibit the same symptoms as if the switch were stuck in the closed position.

If your motor is exhibiting these symptoms, the capacitor is relatively easy to replace, especially if it is externally mounted. The starting switch is more difficult to replace, but this job should be within the capabilities of most mechanically-inclined individuals. Capacitors and switch parts are usually available through your local electric-motor shop (see your yellow pages under electric-motor repair). You must purchase a capacitor of the correct value and voltage; value is usually stated in microfarads (mfd). As with any electrical job, always make sure the motor is fully disconnected from power before beginning the repair.

[Ed Cowern is an electrical engineer and president of EMS, a company that distributes Baldor electric motors.]

Itching to use silky oak

We've had a problem in our shop: Whenever we work with silky oak, we break out with an itchy rash. This is a beautiful oak, and we'd like to continue using it without these unpleasant side effects. Is there any way the green wood can be treated or soaked so that its toxicity is reduced once it has been dried?

—Greg Davidge, Kula, Hawaii

Jon Arno replies: Silky oak (*Grevillea robusta*) is a very attractive timber, and I certainly understand your desire to keep using it, but it can cause health problems. Belonging to the botanical family, *Proteaceae*, it is not at all closely related to the true oaks,

Quercus spp. Silky oak's light-tan color and large, conspicuous rays tend to give it an appearance, somewhat reminiscent of oak, but it is substantially softer and easier to work than any of the true oaks. Unfortunately, over the years this species has also earned a bad reputation for causing skin rashes and not just among woodworkers. The foliage is also known to affect some people in much the same way as poison ivy because the tree produces some irritating phenolic compounds. As with poison ivy, not all individuals are seriously affected by silky oak, but its toxicity bothers enough people to tarnish its reputation as a cabinetwood.

As for preventive measures, it is doubtful there is any way to make using silky oak totally safe. Chemical compounds tend to become more stable in their oxidized forms, so the chances are the compounds involved here would not be easy to remove by any practical, chemical treatment. The best preventive is to avoid extensive, physical contact with the wood or its sawdust. Good ventilation, a respirator mask, rubber gloves, clothing that minimizes exposed skin, and taking a shower as soon as possible after working with the wood might help prevent the woodworker from developing a sensitivity to the wood, or at least reduce the severity of the rash if it does occur. However, for those who show signs of serious allergic reaction, the safest answer is to stay away from this species altogether.

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

Send queries, comments and sources of supply to Q&A, Fine Woodworking, PO Box 5506, Newtown, Conn. 06470-5506. We attempt to answer all questions, but due to the great number of requests received, the process can take several months.

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. 97



47" L Panel Fence Stake 45" L Table/Chest 51" L Entertainment Center

Build ULTIMATE Wooden Wagons
FUNCTIONAL MULTI-PURPOSE

340 Illustrations/Pattern, 200 pages
Ball Bearing wood or Mfg. Wheels
Furniture Joinery/Std. Hardware
Large Scale Drawings
Rugged Mechanicals
Easy to Follow Shop Steps
Many Builder Options
Under \$7 per plan!

ENDesigns

• 52" Long
• Push Handle
• Removable Seat
• Holds 2-3 Small Children

P.O. Box 33
Vernon Hills, IL 60061
Check/Money order \$2.00 S&H
4-Plan Book \$26.95/Video \$19.95

READER SERVICE NO. 29

Imported European Hardware



4320 W. Bell Drive
Las Vegas, Nevada 89118
(702) 871-0722
SEND \$2.00 FOR CATALOG

MasterCard VISA

READER SERVICE NO. 207

CRAFTSMEN, EQUIP YOUR SHOP AT GREAT SAVINGS

Catalog of over 500 plans to build your own tools, \$1.00, refundable



A wide variety of plans from complete machines and attachments to handtools for home, school and commercial shops. Featured also are accessories for wood and metal cutting lathes, drills, saws, sanders, etc., plus things to make of wood and metal.

WOOD-MET SERVICES, INC
3314 WEST SHOFF CIR. DEPT. FWW
PEORIA, ILLINOIS 61604

READER SERVICE NO. 162

A good miter is hard to find.

Made in New England

Now you know where to look!



POOTATUCK CORPORATION
P.O. Box 24, Dept. FW921
Windsor, VT 05089 (802) 674-5984

Name _____
Address _____
City/State/Zip _____

READER SERVICE NO. 87

PRAZI

New! Beam Cutter Attachment Installs in Less Than 60 Seconds



This conversion kit will enable you to turn your worm drive saw into a cutting tool with a 12" capacity at 90°. Now you can easily perform after pitch cuts, cut stair jacks, or trim arches in thick material in one pass. #PR-7000 **149.**

WHOLE EARTH ACCESS
1-800-829-6300 • Anthony St. • Berkeley, CA 94710
FREE FREIGHT VISA/MC

READER SERVICE NO. 15

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.



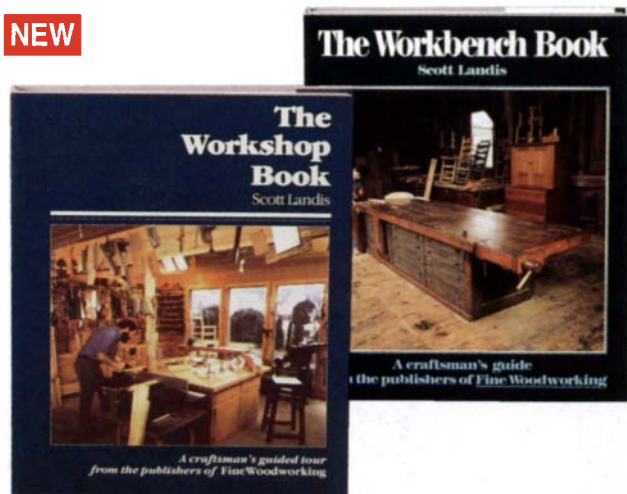
IT'S ALL THE POWER YOU NEED.®

Makita U.S.A., Inc., 14930 Northam Street, La Mirada, California 90638; (714) 522-8088

Fine Woodworking Books

Your two essential workshop tools

NEW



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.

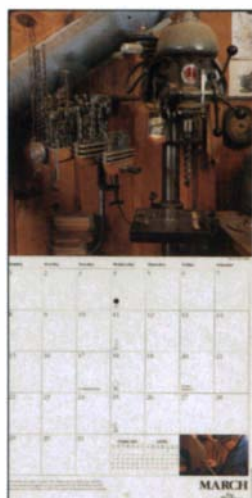
The Workshop Book takes a systematic approach to these common problems:

- storage for tools, lumber and supplies
- heat, light and electricity
- where to put benches and machines
- dust collection
- making the most of the workspace you have

HARDCOVER, COLOR, 224 PAGES, 301 PHOTOS, 76 DRAWINGS, #070094, \$34.95

The Workbench Book by Scott Landis
Explore the strengths and traditions of the workbench, the heart of the woodworker's shop. Detailed photos and illustrations show how the bench works and lead you through the tough spots in its construction.
HARDCOVER, COLOR, 256 PAGES, 278 PHOTOS, 185 DRAWINGS, 4 BENCH PLANS, #070061, \$34.95

SAVE \$4.90 WHEN YOU BUY BOTH BOOKS: \$65.00, #07A194



Don't miss our NEW 1992 calendar containing photos from the most fascinating and intriguing workshops in *The Workshop Book*. (12 IN. BY 24 IN.) 13 PHOTOS, #071007, \$14.95

NEW

Save on our popular *Fine Woodworking on...* books

The Workshop Set

Fine Woodworking on The Small Workshop
Everything from efficient floor plans to home/shop dust control. SOFTCOVER, 96 PAGES, 104 PHOTOS, 120 DRAWINGS, #070033, \$9.95

Fine Woodworking on Hand Tools
All you need to know about choosing, using and making hand tools. SOFTCOVER, 112 PAGES, 174 PHOTOS, 105 DRAWINGS, #070051, \$9.95

Fine Woodworking on Planes and Chisels
Invaluable information on the most important tools in your workshop: the edge tools that cut, shape and finish the wood. SOFTCOVER, 96 PAGES, 149 PHOTOS, 118 DRAWINGS, #070034, \$9.95

Fine Woodworking on Woodworking Machines
Which machines do you really need? How can you get the most out of your router? These and a host of other questions are addressed. SOFTCOVER, 112 PAGES, 149 PHOTOS, 126 DRAWINGS, #070037, \$9.95

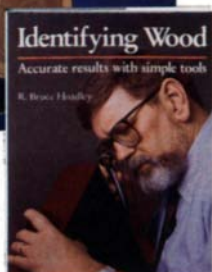
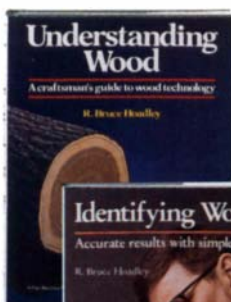
Fine Woodworking on Making and Modifying Machines
Find out how to make your own woodworking machines and improve your old favorites. SOFTCOVER, 112 PAGES, 121 PHOTOS, 151 DRAWINGS, #070047, \$9.95

Purchased separately, these books would cost you \$49.75.

SAVE \$4.75 WHEN YOU BUY THE SET: \$45.00, #07A196



To order, use the insert in this issue or call 1-800-888-8286.



Identifying Wood

by **R. Bruce Hoadley**
Learn the secrets of wood identification. Find out what to look for in any piece of wood and how to look for it. Includes hundreds of easy-to-use charts and crystal-clear photographs and microphotographs. You'll use this reliable information for years. **HARDCOVER, COLOR, 240 PAGES, 393 PHOTOS, 34 DRAWINGS, 15 TABLES, #070088, \$39.95**

"[Identifying Wood] helps take the mystery out of wood identification."
—Woodshop News

Understanding Wood

by **R. Bruce Hoadley**
Discover why wood behaves as it does and how you can work with it instead of against it. Hoadley helps you understand how best to cut, season, machine, join, bend, fasten and finish wood, and explores the crucial interaction of wood and moisture. **HARDCOVER, 256 PAGES, 294 PHOTOS, 132 DRAWINGS, #070011, \$29.95**

SAVE \$9.90 WHEN YOU BUY THE HOADLEY TWO-BOOK SET: \$60.00, #07A145

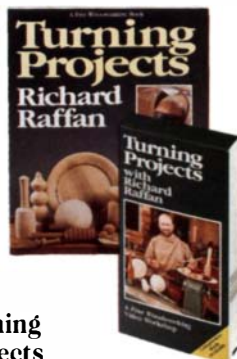
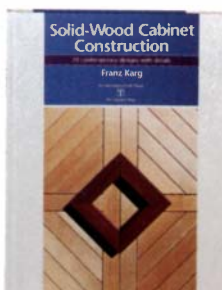


Queen Anne Furniture

by **Norman Vandal**
Here's the most comprehensive book ever published on this sophisticated American furniture style. Norman Vandal takes you in close for a craftsman's view of 18 pieces of furniture, including chairs, tables and case pieces. Includes extensive construction photos and 81 pages of measured drawings. **HARDCOVER, COLOR, 256 PAGES, 153 PHOTOS, 18 PLANS, #070089, \$34.95**

Solid-Wood Cabinet Construction

by **Franz Karg**
Learn how traditional construction methods can be combined with modern design. You'll find sharp photographs and superbly detailed line drawings of cabinets, hutches, credenzas, wall units, desks and bookcases. **HARDCOVER, 144 PAGES, 154 PHOTOS, 160 DRAWINGS, #070154, \$24.95**



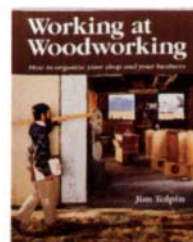
Turning Projects

by **Richard Raffan**
Richard Raffan presents 23 intriguing woodturning projects from rolling pins and mallets to hollow vessels, scoops and ladles, all with complete step-by-step instructions and detailed photo-essays and drawings. Twelve of the most instructive are clearly demonstrated on the video screen. By the end of the book and video you will have completed a satisfying course in woodturning.

BOOK: SOFTCOVER, 176 PAGES, 400 PHOTOS, 36 DRAWINGS, #070095, \$19.95

VIDEO: 90 MINUTES, #060065, \$39.95

SAVE \$9.90 ON THE SET: \$50.00, #07A183

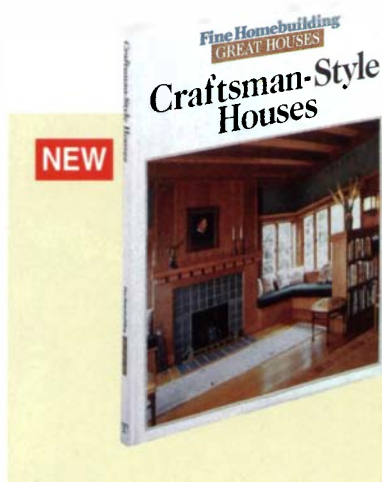


Working at Woodworking

by **Jim Tolpin**
If you dream of opening your own woodworking shop, this book explains how to do it. 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, #070108, \$21.95**

Dictionary of Woodworking Tools

by **R. A. Salaman**
A tool lover's dream come true! Salaman gives you a detailed account of virtually every woodworking hand tool used from the beginning of the Industrial Revolution to today. He explains each tool's origin, purpose, use, and where possible, who designed and made it. **SOFTCOVER, 546 PAGES, 1,022 DRAWINGS, #070121, \$29.95**



Craftsman-Style Houses

Direct from *Fine Homebuilding* magazine! Twenty-eight articles devoted to the Craftsman-style house cover seaside resorts, cozy bungalows, large houses, small spa rooms and more. These articles have never before been collected in book form. **HARDCOVER, 160 PAGES, 116 PHOTOS, 74 DRAWINGS, #070164, \$24.95**

To order, use the insert in this issue or call 1-800-888-8286.

TAUNTON BOOKS&VIDEOS

...by fellow enthusiasts

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. 71



WOODCRAFT®

The Leading Edge

In Woodworking Tools

FREE Catalog Subscription

Our complete woodworking tool catalog features over 4,000 of the finest quality woodworking tools, books, and supplies available today. See the difference yourself **FREE!**



Order yours today!

Call 1-800-542-9115

Or write: Woodcraft, Dept. 92WW019
210 Wood County Ind. Park, P.O. Box 1686
Parkersburg, WV 26101-1686

Visit our retail stores in: • Boston • Denver • Minneapolis • Seattle • Detroit • St. Louis •

READER SERVICE NO. 83



Buying a saw with a sliding table costs big bucks... but a Mule Sliding Table to fit the saw you have now costs just **\$369.**

- Comes complete with extension kit for extra long panels - a moveable stop for quick repeat cuts.
- Lets you cut panels 28" wide - cleanly, squarely, accurately.
- Smooth sliding. Rugged maintenance free design.
- Your Mule adds only 15" to the width of your saw - because you remove the left hand wing.



The New Mule Router Table Replaces This Extension Wing.

Put a Router Table on the Best Stand in Your Workshop. Uses Zero Floorspace!

Use Reader Service or write to:
519 Mill St., P.O. Box 731
Lockport, NY 14095

U.S. PATENT # 4934423

READER SERVICE NO. 113



BLUME SUPPLY, INC.

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

STEP UP TO...

POWERMATIC III

YOU DESERVE THE BEST!



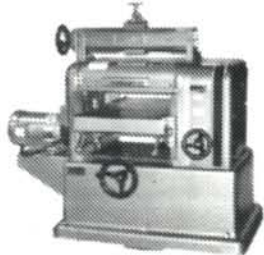
\$1199

#26 SHAPER 2 HP



\$1450

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



#180 18" PLANER 5 HP
W/ KNIFE GRINDER **\$4395**
#100 12" PLANER 2 HP **\$1825**



\$1350

#60 8" JOINTER

NEW! RB-25 SINGLE PHASE 10 H.P. WIDE BELT SANDER **\$7499**

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. 60



CO-MATIC MACHINERY CO., LTD.

P.O. BOX: 428 FENG YUAN TAIWAN 42099
PHONE: 04-5567105 FAX: 886-4-5567109

The only name you need to know in POWER FEEDER.

5 years
Limited
Warranty



Distributor:

SUNHILL NIC CO., INC.
1000 Andover Park East, Seattle, WA 98188
CALL TOLL FREE (800) 544-1361

**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. \$28800
Dealers inquiries invited

1700 N. Penny Lane
Schaumburg, IL 60173
(708)-397-9401

Sugino Corp.

READER SERVICE NO. 104

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!

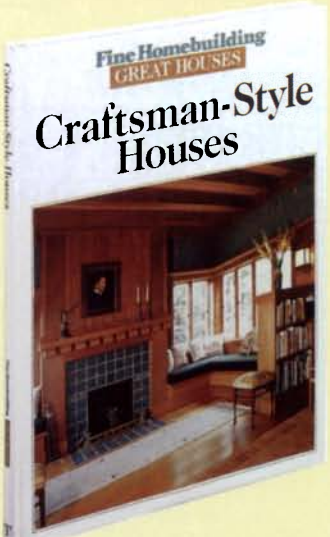
Plan #700 \$14.00
(catalog free with order)

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

FURNITURE DESIGNS, INC., Dept. KA-12
1827 Elmdale Ave., Glenview, IL 60025
(708) 657-7526

READER SERVICE NO. 301

A FINE HOMEBUILDING BOOK



Craftsman-Style Houses

**Inspiring
...and then some.**

Direct from the pages of *Fine Homebuilding* magazine comes *Craftsman-Style Houses*, a new book filled with exciting, workable ideas. You'll find floor plans, detailed technical drawings and full-color photographs illuminating the design and construction of 27 different projects.

The *Fine Homebuilding* articles collected here have never before appeared in book form. This is your chance to see for yourself what this incredibly popular style of architecture has to offer you.

HARDCOVER, COLOR, 160 PAGES, 116 PHOTOS, 74 DRAWINGS, #070164, \$24.95

100826

Yes, please send me *Craftsman-Style 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 \$24.95 plus \$3.00 postage and handling (CT residents add 6% sales tax; Canadian residents add 7% GST). #070164

Name _____

Address _____

City _____

State _____ Zip _____

I prefer to pay now:
 My payment is enclosed. MC VISA AmEx

Card # _____

Exp. date _____

Signature _____

To order, use this coupon or call toll free.

1-800-888-8286



DeWalt Radial Arm Saws

Need Parts?

- Preventative Maintenance Service • On-Site Breakdown Repair • In-Shop Complete Reconditioning
- Obsolete Part Fabrication • Radial Arm Remachining
- Motor Rewinding • Motor Rotor Repair
- Motor Starters & Controls • Blade Sharpening
- Service on Paint Shaking and Tinting Equipment

- Ambitech Motor Brakes • Delta • DML Blades
- DeWalt Radial Arm Saws
- Murphy Rodgers Dust Collectors
- Powermatic • Safety Speed Cut Panel Saws



Wolfe machinery
6107 Merle Hay Road
P.O. Box 497
Johnston, IA 50131

Phone: 515-270-2766
Fax: 515-270-0628

800-345-6659

READER SERVICE NO. 56

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. 145

Do-It-Yourself Kits



**Factory Direct Clocks and Furniture
Also Assembled and Finished**

- Grandfather Clocks, Mantel and Wall Clocks
- Curios, Tables, Chairs, Desks, Cradle...and more!
- Solid 3/4" Black Walnut, Cherry, or Oak
- Heirloom Quality
- Solid Brass West German Movements and Dials
- Money Back Guarantee



- I am interested in
- Do-It-Yourself Kits
 - Finished Clocks
 - Finished Furniture

SEND \$1 FOR COLOR CATALOG

Name _____

Street _____

City _____ State _____ Zip _____
(Please Print)



World's Largest Manufacturer of Grandfather Clock Kits
Dept. 4206, Emperor Industrial Park ■ Fairhope, Alabama 36532

READER SERVICE NO. 33



Thanks For Making Tarheel Filing #1 For The Last 2 Years!

\$1589
Model 66 3Hp, 1Ph Mag. Start w/50" Biesemeyer

\$1339
Model 60 8" Jointer 1-1/2 Hp
MADE IN THE USA

\$4365
Model 180 Planer w/Knife Grinder

\$1160
Model 141 Deluxe 14" Band Saw

Better By Design®
POWERMATIC III

All Stationary Tools FOB Raleigh, NC • Call For Discount Freight Prices

PORTER-CABLE

ROUTERS

100	7/8 Hp Router	175	99
690	1-1/2 Hp Router 10A	240	129
691	1-1/2 Hp D-Handle Router	260	141
695	1-1/2 Hp Router-Shaper Table	335	195
696	Router-Shaper Table	185	118
693	1-1/2 Hp Plunge Router	295	165
6931	Plunge Router Base	120	75
7518	3-1/4 Hp 5 Speed Router	475	259
7519	3-1/4 Hp Router	410	229
7536	2-1/2 Hp Router	355	199
7537	2-1/2 Hp D. Handle Router	375	209
7538	3-1/4 Hp Plunge Router	410	229
7539	3-1/4 Hp V/S Plunge Router	475	259
5060	Stair Ease Template	200	139
5061	Stair Ease Template Hardwood	210	145
59381	Door Hinge Butt Template Hit	240	159
5116	Omni-Jig 16" Dovetail Jig	400	259
7310	5.6A Laminate Trimmer	150	88
7312	5.6A Offset Base Lam. Trimmer	215	119
7319	5.6A Tilt Base Lam. Trimmer	170	105
7399	5.6A Drywall Cutout Unit	145	79
97310	Laminate Trimmer Kit	345	185

SANDERS

303	Paint Remover	270	170
304	7" Disc Sander	235	139
305	7" Polisher	235	139
351	3"x21" Belt Sander w/o Bag	245	127
352	3"x21" Belt Sander w/ Bag	255	137
360	3"x24" Belt Sander w/ Bag	330	174
361	3"x24" Belt Sander w/o Bag	310	166
362	4"x24" Belt Sander w/ Bag	345	184
363	4"x24" Belt Sander w/o Bag	330	179
503	3"x24" HD Belt Sander w/ Bag	550	339
504	3"x24" HD Belt Sander w/o Bag	535	329
330	Speed Bloc Sander 1/4" Pad	102	57
505	1/2 Sheet Pad Sander	210	112
9505	1/2 Sheet Commem. Sander	240	129
7334	5" Random Orbit Sander	210	119
7335	5 1/2" V/S Random Orbit Sander	230	129
7336	6 1/2" 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	12 V Battery For Above Drills	62	39

DRILLS

621	3/8" HD V/S Drill 0-1000 RPM	170	95
666	3/8" HD V/S Drill 0-1200 RPM	200	119
7514	1/2" HD V/S Drill 0-750 RPM	210	117
7515	1/2" HD V/S Drill 750 RPM	215	122
7540	0-4000 Drywall Screwdriver 5.2A185	104	54
7545	0-2500 Drywall Screwdriver	185	104

SAWS

315-1	7-1/4" Top Handle Circular Saw	210	117
9315-1	315-1 w/Case & Carb Blade	240	135
617	7-1/4" Push Handle Circular Saw	210	117
9617	7-1/4" Push Handle w/Case & Carb. Blade	210	135
314	4-1/2" Trim Saw	240	125
9314	4-1/2" Trim Saw w/ Case	265	148
345	6" Saw Boss 9A	180	99
9345	6" Saw Boss w. Case	220	124
9637	Tiger Cub Recip Saw w/Case	195	119
9637	Recip. Saw V/S w/Case 8A	250	135
7549	Top Handle Jig Saw	250	139
7649	Barrel Grip Jig Saw 4.8A	250	149

PLANERS

320	Abrasive Plane 3A	190	109
367	3-1/4 6.5A Planer	250	149
9118	Porta Plane Kit	360	195
9652	Versa Plane Kit	460	279
102	Door Hanging Kit	490	295

PLATE JOINERS

555	Plate Biscuit Joiner w/Case	315	164
9555	Plate Joiner w/Case & Ast. Biscuits	345	186

DELTA

BENCH TOP TOOLS

11-09032	Radial Drill Press	399	279
11-9508	Drill Press	199	145
14-6000	Hollow Chisel Mortiser	668	449
22-540	12" Bench Top Planer	595	389
23-680	6" Bench Grinder 1/4" Hp	86	75
23-700	Web/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	139
32-100	Plate Joiner	422	285
32-200	Boring Machine w/ 13" Spindle	1595	1149
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
34-89750	Delta Unifence	525	289
34-915	30" Delta Unifence	385	219
50-179	3/4 Hp Dust Collector	483	329

STATIONARY
Prices Do Not Include Shipping
FOB Raleigh, NC
\$100 Rebate Available On Tools With R

17-900	16-1/2" Drill Press	478	315
20-330	4" x 6" Horizontal Band Saw	410	265
22-661	13" Planer 2Hp, Stand, EMS	1633	1050
28-245	14" Band Saw Opn. Stand w/Lamp	779	499
28-283	14" Band Saw w/Enclosed Stand w/mobile base	965	659
31-730	6" Belt / 12" Disc Sander	1393	999R
33-055	Deluxe Sawbuck w/Legs	854	519
33-890	Deluxe 12" Radial Arm Saw	1908	1199
33-990	Deluxe 10" Radial Arm Saw	818	525
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	1589R
36-751	10" Cab. Saw w/30" Unifence	1487	969
36-752	10" Cab. w/52" Unifence	1702	1046
37-154	6" Precision Jointer w/stand	1420	959
37-280	6" Motorized Jointer w/stand	498	339
37-350	8" Precision Jointer w/stand	1870	1339R
40-601	18" Variable Speed Scroll Saw	1025	659
43-275	Onsrude #2003 Inv. Tr.	3335	2500
43-355	1-1/2 Hp Wood Shaper	964	629
43-3753	Hp HD Two Speed Shaper	2086	1489R
46-700	12" Variable Speed Wood Lathe	548	359
50-180	1 Hp Dust Collector	611	387
50-181	2 Hp Dust Collector	885	549

f Freud

Teeth	List Price	OUR PRICE
LU72M010	10" Gen. Purpose	40 67 39
LU73M010	10" Crosscut	60 82 45
LU84M010	10" Combination	50 76 42
LU85M010	10" Ultimate Crosscut	80 112 59
LU87M010	10" Thin Kerf	24 70 39
LU88M010	10" Thin Kerf	60 86 45
LU89M010	10" Ultimate 10"	80 125 69
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

FREUD TOOLS BELOW- \$30 MAIL-IN REBATE

JS-100	Biscuit Joiner	333	164
JS-100	Biscuit Joiner w/ 1000 asst. Bisc.	369	186
EB-100	Edge Bander	409	239
FT2000	3-1/4 Hp Plunge Router	350	180

BOSCH

1194VSR1/2	V/S/R Hammer Drill	264	141
11202	1-1/2" Rotary Hammer	720	399
11212VSR	3/4" SDS Bulldog Rotary Hammer	370	189
1272	3"x24" Belt Sander	308	172
1272D	3"x24" Dustless Belt Sander	329	184
1273DVS4	x24" V/S Belt Sander	370	199
1347	4-1/2" Mini Grinder	160	89
1581VS	Top Handle Jig Saw	265	133
1582VSC	New Clic Barrel Jig Saw	265	133
Bosch Metal Case	for above Jig Saws	34	25
Bosch 30	Blade Asst. For Jig Saws	26	26
1604	1-3/4 Hp Router	236	122
1604K	1-3/4 Hp Router Kit	287	167
1606	1-3/4 Hp D-Hole Router	273	148
1608	Lam. Trim Router	149	88
1609K	Lam. Installers Kit	309	173
1609KX	Lam. installers Kit w/Underscribe	361	202
1611	3 Hp Plunge Router	386	199
1611EV3S	1-1/4 Hp V/S Plunge Router	448	231
1632VSKV/S	Orbital Recip. Saw Kit	247	135
1654	7-1/4" 13 amp Circular Saw	205	99
1942	Heat Gun	111	69
3050VSRK	3/8" V/S/R Cordless Drill Kit	256	133
3258K	3-1/4" HD Planer Kit	265	145
3270D	3"x21" Dustless Belt Sander	260	133
3272	3-1/4" Planer	147	89
3283DVS5	Random Orbit Sander	169	95
90300	3-1/4 Hp Router	556	336

Milwaukee

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" 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	360	195
5192	2" HD Die Grinder	289	171
5371-1	1/2" V/S Hammer Drill Kit	335	184
5397-1	3/8" V/S Hammer Drill Kit	239	139
5660	1 1/2 Hp Router 10 amp	355	205
5680	2 Hp Router 12 amp	419	228
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	124
6368	7-1/4" Saw, fence carb. blade and case	239	134
6508	2 Speed V/S Sawzall w/case	249	129
6528	V/S Super Sawzall 8A w/case	295	164
8975	Heat Gun 570° & 1000°	89	65
8977	V. 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
SFN-1	Finish Nailer 1"-2"	419	259
SFN-2	Finish Nailer 1-1/2"-2-1/2"	599	379
SKS	Narrow Crown Stapler	365	249
SN325+	Fraser 1-7/8"-3-1/4"	639	399
SN4	Fraser 2"-3-1/2"	713	469

Emqlo

AM39 HCAV-	3/4 Hp Compressor	499	279
AM78 HCAV-	1-1/2 Hp Compressor	514	299

RYOBI

AP10	10" Portable Planer	794	355
BE321	3"x21" Belt Sander	272	135
BT3000	10" Precision Table Saw	1112	539
JM100K	Plate Joiner Kit	431	209
JP155	Jointer/Planer	619	299
RA200	8-1/4" Portable Radial Arm Saw	520	245
RE600	3Hp V/S Plunge Router	444	199
S550	16 Sheet Finishing Sander	79	45
T3251U	10" Miter Saw	397	166
T3380	14 1/2" Miter Saw	840	369

HITACHI

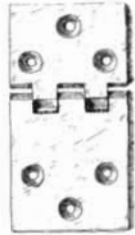
C78D	7-1/4" Circular Saw w/ Brake	230	119
C78B	7-1/4" Circular Saw	214	99
C8FB	8-1/2" Slide Compound Saw	899	439
C10FA	10" Miter Saw	538	275
C12FA	12" Miter Saw	632	309
C15FB	15" Miter Saw	745	375
M8	7.4 amp, 1/4" Router	215	114
TR-12	3 Hp 1/2" Router	347	175
M-12V	3-1/4" Hp V/S Router	447	229
SV-12SA	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	89
D13V	1/2" V/S Reversible Drill	198	99
W6VA2	0-2600 Drywall Screwdriver 5.5A	161	85
W6V2	0-4000 Drywall Screwdriver 5.5A	149	79
QV20V2	3/4" V/S Hammer Drill w/case	257	135
QH38YE	1-1/2" Rot. Hammer w/case	753	379
G12SA	4-1/2" Disc Grinder	145	79
POL180A7	Disc Grinder	212	109
SP18V	7" Disc Sander/Polisher EVS	274	145
F-20A	3-1/4" Planer	172	89
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

C875F	12" Band Saw	3070	1499
F1000A	12" Planer/6" Jointer	2835	1425

UNDERSTANDING ORIGINAL HARDWARE

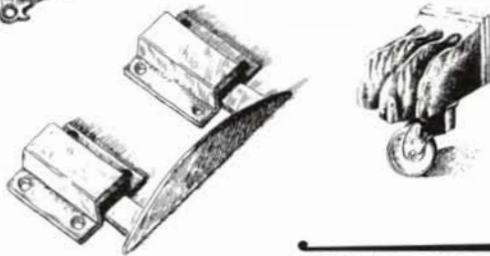
UNDER THE TABLE HARDWARE . . .



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. 9



Fine Craftsmanship Deserves the Very Best.

Craftsmanship begins with the idea. The final result depends on the tool and the craftsman. Atrax tools are made from premium fine-grade carbide, the best on the market today. Atrax offers over 600 styles and sizes to bring the craftsman's ideas to quality results.

ATRAX Tooling Provides Results.

For a catalog or information call:
1-800-237-3521



Distributor inquiries invited.

READER SERVICE NO. 80

WOODPECKERS 1-800-752-0725

25' PANEL RAISER
LIST \$94.50

DIA. SHANK
2.....1/4...\$39.95
2 1/2...1/2...\$49.95
3 1/2...1/2...\$56.70



VERTICAL PANEL RAISER
1 1/2" REVEAL • 1/2" SHANK

\$54.95 LIST \$84.95

5801 5802 5803 5804 5805



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

NEW Complete 8-Bit Set!
SOLID CARBIDE TIPPED ROUTER BITS FOR INCRA JIG™ **\$59.95**

- 1/4" STRAIGHT BIT
 - 3/8" STRAIGHT BIT
 - 1/4" 7.5° DOVETAIL
 - 5/16" 9° DOVETAIL
 - 3/8" 9° DOVETAIL
 - 1/2" 14° DOVETAIL
 - 5/8" 7° DOVETAIL
 - 3/4" 7° DOVETAIL
- ALL BITS TWO FLUTE CARBIDE TIPPED 1/4" SHANK

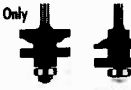
40% OFF FREUD BLADES

TABLE SAW INSERT.....\$11.95

TWO PIECE RAIL & STILE
1/2" Shank Only

ROUND OGEE BEAD

FREUD LIST: \$145.90 SALE \$99.95
BYROM LIST: \$147.50 SALE \$89.95



COVE PANEL RAISER

LIST \$94.50

DIA. SHK.

2.....1/4...\$38.95
2 1/2...1/2...\$43.80
3 1/2...1/2...\$56.70



OGEE PANEL RAISER

LIST \$94.50

DIA. SHK.
2.....1/4...\$39.95
2 1/2...1/2...\$49.95
3 1/2...1/2...\$56.70



REVERSIBLE RAIL & STILE

1/2" SHANK

CLASSICAL.....\$47.95
STRAIGHT.....\$47.95
OGEE.....\$59.95
TRADITIONAL.....\$37.95



Incra Fence System

\$44.95 (LIST \$54.95)

Includes: Incra Fence, Incra Stop, & Stop Extender Bar

Incra Jig

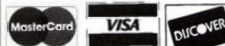
\$29.95 (LIST \$39.95)

\$150.00 SPECIAL

ALL COMPONENTS:

Incra Fence System, Incra Jig, Right Angle Fixture, Video, Handbook & Templates, Gauge, & Push Block.

- INCRA JIG PRO - 16".....\$84.95
- INCRA JIG PRO - 12".....\$74.95
- 26" INCRA PRO FENCE SYSTEM.....\$64.95
- INCRA MITER SLIDER...\$12.95 ea...2/\$23.95
- INCRA VIDEO.....\$18.95
- INCRA JIG HDBOOK & TEMPLATE.....\$17.95
- INCRA GAUGE.....\$14.95
- INCRA HINGE PLANS.....\$12.95



WOODPECKERS
8318 MANORFORD OR.
PARMA, OHIO 44129

Call 1-800-752-0725
(216) 888-6332, or FAX 216-888-9463

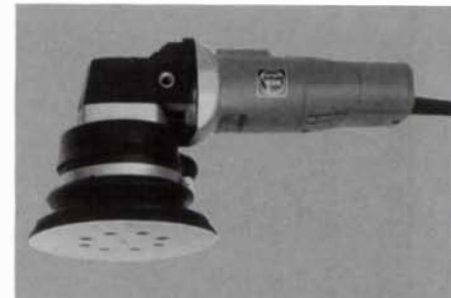
READER SERVICE NO. 81

Dust-Free Random Orbit Sanding

Sand without dust with the new Electric Random Orbit Sander from FEIN.

How it works

Dust created by the sander is sucked up through holes located in the bottom of the sanding pad AND around the outside edge of the pad. This system removes 98% of the dust created during sanding.



Holes in bottom of pad AND around outside edge of pad remove dust before it becomes airborne.

Quick Paper Changing

Velcro® backed sand paper is quickly & easily changed. It has no sticky back to load up with dust, just shake it off and you're back in business.

Built for Production

This is not a "hobby" machine. It is built for the serious professional:

Call 1-800-441-9878 now to receive more information



Fein Power Tools Inc.
3019 W. Carson St., Pittsburgh, PA 15204
(412)331-2325

READER SERVICE NO. 88

The Most Advanced Dovetail Jig
Ever Made

The Leigh Dovetail Jig

Model D1258R

Lets you create
through, half blind or sliding
dovetails, in any layout you want...

- Design your dovetail pattern right on the jig.
- Calibrated settings for fit adjustment.
- Cuts any size of joint, in wood up to 1 1/4" thick.
- "Hand cut" flexibility, with machine speed, precision and ease.



▲ Coffee table made with Leigh MMTA, using 1 1/4" finish walnut and maple.

Plus The Leigh Multiple Mortise & Tenon Attachment

Model MMTA

This attachment for your Leigh Dove-
tail Jig lets you produce precise,
snug fitting multiple mortise & tenon
joints and finger joints—using nothing
more than a plunge router.

For Free Brochure
Call 1-800-663-8932
(Toll-Free, 24 Hours)

In Canada, call collect:
(604)464-2700, 8am-4:30pm PST.
Or mail in the coupon below to:
Leigh Industries Ltd.,
P.O. Box 357, Port Coquitlam,
B.C., Canada, V3C 4K6

LEIGH

- Please send me your FREE brochure.
 I'm also interested in your video on The Leigh Dovetail Jig.

Name _____

Address _____

City _____

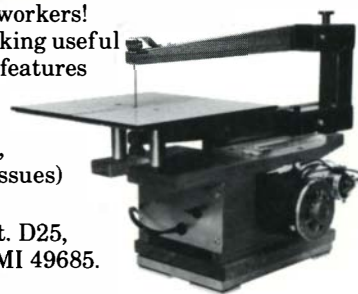
State _____ Zip Code _____ FWW

PROJECTS IN METAL Magazine Teaches You Metalworking Basics with Valuable Projects Like This Scroll Saw

An indispensable tool for woodworkers!
You'll learn metal crafts by making useful
tools for your shop. Each issue features
complete projects – plus notes
on metalworking technique,
and tips to save you headaches,
time, money. \$19.00 a year (6 issues)
check or charge card.

PROJECTS IN METAL, Dept. D25,
P.O. Box 1810, Traverse City, MI 49685.
Or call 800-447-7367.

SPECIAL OFFER: Scroll saw plans are free for the asking when you subscribe.
But be sure to ask!



READER SERVICE NO. 75



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.

Tool Catalog \$3.



Send for a free brochure of all lines of RAZOR SAWS.
Wholesale available.



HIDA TOOL, INC./GYOKUCHO JAPAN
1333 San Pablo Ave., Berkeley, CA 94702 1-800-443-5512

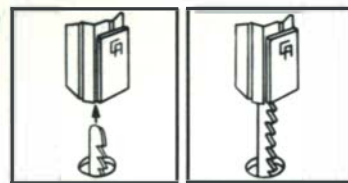


READER SERVICE NO. 302

INTRODUCING...

The WoodE™

FROM LABORSABER®
RETRACTABLE SAW
**BRINGS IT ALL
HOME!**



LABORSABER®
RETRACTABLE
"WoodE-SERIES"
PROFESSIONAL
& AFFORDABLE
FOR THE HOME
WOODWORKING
CRAFTSMAN!

WORKS FROM THE BOTTOM UP...AND INSIDE OUT!
The Saw That Changed An Industry
Now available in an economy priced Professional
model for your WOODWORKING SHOP!

Intricate scrolling, complex shaping, woodworking and
cutting without making an access cut - this is what the
LABORSABER® RETRACTABLE SAW has been doing for
industry for over 20 years! Now, a sealed down version of this
industry leader is available for your home woodworking shop
at a price that makes owning this quality saw even more
valuable.

**MADE
IN THE
U.S.A.**

VIDEO AVAILABLE!

CALL OUR TOLL-FREE NUMBER
FOR MORE INFORMATION

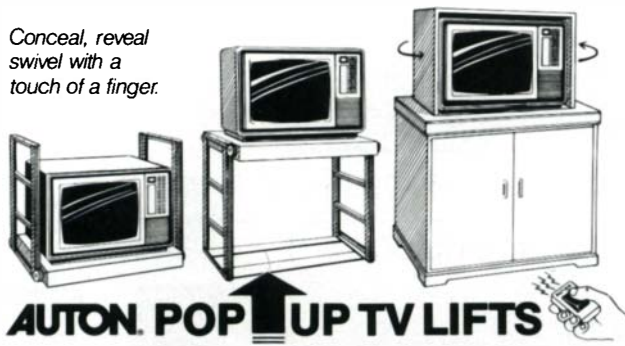
1-800-331-6480

DIANSUPPLY/LABORSABER COMPANY

4505 GREEN PARK RD. • ST. LOUIS, MISSOURI 63123 • 314-892-8597 • FAX: 314-892-6814
LABORSABER, E-SERIES, The WoodE and The Saw That Changed An Industry
are Registered Trademarks/Slogans of Diansupply/Laborsaber Company

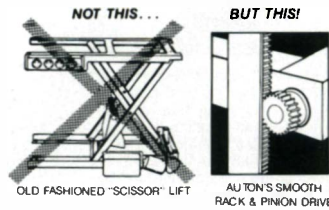
READER SERVICE NO. 109

Conceal, reveal
swivel with a
touch of a finger.



AUTON POP UP TV LIFTS

YOU BUILD THE FURNITURE—WE'LL PROVIDE THE AUTOMATION



OLD FASHIONED "SCISSOR" LIFT AUTON'S SMOOTH RACK & PINION DRIVE

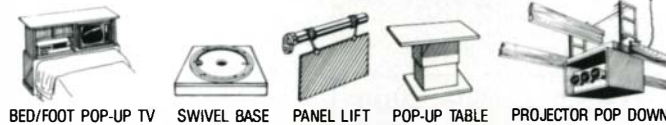
Since 1955, the Auton Company has served the design community with quality motorized systems that utilize remote controls and small, powerful motors. Motorized platforms glide smoothly and quietly on four racks and pinions and even swivel at a touch of a button.

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/(213) 659-1718 • Honolulu/(808) 734-1260 /FAX (818) 362-9215
Auton does not make furniture. US & Foreign Pat Pend./MADE IN USA.



BED/FOOT POP-UP TV SWIVEL BASE PANEL LIFT POP-UP TABLE PROJECTOR POP DOWN
READER SERVICE NO. 78

S[®]
ROUTER BITS
1-800-235-0272
Call today for your FREE Catalog!

- Thicker industrial grade carbide!
- Razor sharp edges ground up to 600 grit fineness!
- Largest selection of profiles available!

READER SERVICE NO. 112

SALE
step up to
Makita
Power Tools
TOLL FREE 1-800-247-7178

Model 6095DWE Cordless Driver-Drill Kit Case with Extra Battery
2-Speed, Variable Speed, Rev., Equipped With Double Voltage (9.6V & 7.2V), Keyless Chuck System, Sale price \$139.95

Model 6170DW 3/8" Cordless Drill
Variable Speed, 3 Hour Charge With Case
Sale Price \$59.95

Model 6200DW 3/8" Cordless Driver-Drill Kit
2 Speed, Var. Speed, Rev., Removable 9.6V Battery, Keyless Chuck, Sale Price \$147.00

Model LS1030 10" Miter Saw
Sale Price \$229.00

Model 6093DL Cordless Driver-Drill with Flashlight
Same as Above With Plastic Case
Sale Price \$159.00

Model LS1011 10" Slide Compound Saw
Sale Price \$439.00

Model 4301BV Jig Saw
Orbital, Variable Speed
Sale Price \$139.00

Model 2012 12" Portable Planer
Sale Price \$449.00

CALL TOLL FREE FOR OUR LOW PRICES ON OTHER MAKITA TOOLS. 1-800-247-7178
5 1/2% Sales Tax for Wisconsin Residents.
HOURS: 8:00-4:30 Monday-Friday
VISA • MasterCard • Money Order • Check • C.O.D.

FREE FREIGHT
On All Tools

MARLING
1904
LUMBER COMPANY
P.O. BOX 7668
1801 EAST WASHINGTON AVE.
MADISON, WI 53707

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

READER SERVICE NO. 41

University of Rio Grande, Ohio

2-year Associate Degree in Fine Wood Working Technology

Program Emphasis:

- Custom furniture construction
- Hand and power tool techniques
- Joints & fasteners
- Wood turning and carving
- Furniture design
- Finishing
- Jig & fixture design
- Wood bending
- Business management

Knowledgeable instructors, small class size and excellent facilities combine to make this program truly unique. For more information call Lonnie Bird at 1-614-245-5353. or in Ohio 1-800-282-7201 toll-free.

FINE WOOD WORKING TECHNOLOGY
UNIVERSITY OF RIO GRANDE
Rio Grande, OH 45674

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	\$.70 ea.	4 x 24	\$1.05 ea.
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 PK \$23.00
40 Grit 50 PK \$16.00	NO LOAD PAPER — WHITE
60 Grit 50 PK 14.00	180 through 400 100 PK \$20.00
80 Grit 50 PK 13.00	Also Shop Rolls • Cloth Sheets • Drums
100, 120, 150 100 PK 22.00	
180, 220 100 PK 18.00	

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. 22

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)

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

READER SERVICE NO. 6

BOOKS & VIDEOS

CATALOG \$2.00

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

MANNY'S WOODWORKER'S PLACE

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

DISCOUNT PRICES

NO SHIPPING CHARGE (U.S.)

OVERSEAS ORDERS ADD 15% SHIPPING

SCHOOL P.O.S
 WELCOME

NEW SPIELMAN'S PATTERN BOOKS



- Classic Fretwork Scroll Saw Patterns \$12
- Victorian Scroll Saw Patterns \$12
- Scroll Saw Fretwork Patterns \$12
- Scroll Saw Fretwork: Tech. & Patterns \$14
- Scroll Saw Holiday Patterns \$12
- Scroll Saw Puzzle Patterns \$12
- Scroll Saw Country Patterns \$12
- Spielman's Original Scroll Saw Patterns \$12
- Scroll Saw Pattern Book \$12

NEW RICHARD RAFFAN

- Book-Woodturning Projects \$19
- Video-Woodturning Projects \$38
- BOTH \$49
- Book-Turning Wood \$19
- Video-Turning Wood \$38
- BOTH \$49
- Book-Turned Bowl Design \$17
- COMPLETE RAFFAN SET (3 Books; 2 Videos) \$112

NEW NORM ABRAMS

- Classics from New Yankee Workshop \$18
 - The New Yankee Workshop \$18
 - BOTH \$35
- NOTE: "New Yankee Heritage" available Jan. '92

WOODTURNING BOOKS by DALE NISH

- Creative Woodturning \$14
- Artistic Woodturning \$17
- Master Woodturners \$19
- ALL 3 ABOVE \$46

BANDSAW BOOKS by DUGINSKE

- Bandsaw Pattern Book \$12
- Bandsaw Handbook \$16
- Bandsaw Basics \$9
- ALL 3 FOR \$35

POWERTOOL BOOKS by de CRISTOFORO

- The Drill Press Book \$18
- The Router Book \$16
- The Table Saw Book \$18
- The Jigsaw/Scroll Saw Book \$18
- The Bandsaw Book \$16

NEW ANTIQUE TOOL BOOKS

- Antique and Collectible Stanley Tools: A Guide To Identify and Value (John Alexander) \$24
- Dictionary of American Hand Tools (Sellens) \$49
- Collecting Antiques Tools (Kean, Pollak) \$25
- Patented Transitional and Metallic Planes in America 1827-1927 (Roger K. Smith) \$55
- The Antique Tool Collector's Guide To Value (Barlow) \$14
- Dictionary of Woodworking Tools (Salamon) \$28
- Restoring, Tuning & Using Classic Woodworking Tools (Dunbar) \$14

NEW BOATBUILDING

- Building The New Instant Boats (Payson) \$19
- More Building Classic Small Craft (Gardner) \$24
- Canoes and Kayaks for the Backyard Builder (Snaith) \$18
- Video Ultralight Boatbuilding With Thomas Hill \$48
- Book Ultralight Boatbuilding (Thomas Hill) \$17
- BOTH VIDEO AND BOOK \$62

CARVING BOOKS by TOM WOLFE

- 8 Titles \$12 EA; All 8 for \$90
- 1. Traditional Santa Carving - 2. Santa and His Friends - 3. Carving The Civil War - 4. Carving Out The Wild West - 5. Dog Carving - 6. The Golfers - 7. Carving Bears and Bunnies - 8. Country Flat Carving
- \$12 EA; All 8 for \$90

CARVING by RICK BUTZ

- Woodcarving with Rick Butz \$18
- Carving Wood \$17
- Video - Woodcarving Tools & Tech. \$32
- BUTZ SET (2 BOOKS 1 VIDEO) \$62

BOOKS by BRUCE HOADLEY

- Identifying Wood \$35
- Understanding Wood \$26
- BOTH FOR \$60

WOOD IDENTIFICATION

- World Woods in Color (Lincoln) \$46
- Encyclopedia of Wood (Makepeace) \$32
- Know Your Woods (Constantine) \$13
- Woods We Live With (Schiffer) \$26

STICKLEY FURNITURE

- The Furniture of Gustav Stickley: History, Techniques, Projects (Bavaro) \$35
- The Early Work of Gustav Stickley (Gray) \$20
- The Mission Furniture of L. & J.G. Stickley (Gray) \$20
- Making Authentic Craftsman Furniture (Stickley) \$9

NEW from TAUNTON PRESS



- The Workshop Book (Landis) \$32
- Solid Wood Cabinet Construction (Karg) \$23
- Graphic Guide to Frame Construction (Thallon) \$29
- Fine Homebuilding Great Houses - Craftsman Style \$24
- Working at Woodworking (Tolpin) \$21
- "Best of Fine Woodworking" Series - 8 Titles \$14 EA; All 8 for \$100
- "Fine Woodworking On" Series - 21 Titles \$9 EA; All 21 for \$175
- "Fine Homebuilding On" Series - 6 Titles \$14 EA; All 6 for \$80
- The Workbench Book (Landis) \$32
- Design Book Five \$19

MARQUETRY

- The Marquetry Manual (Lincoln) \$19
- Marquetry and Inlay (Bridgewater) \$15

CLOCKMAKING

- Clockmaking: 18 Antique Designs (Nelson) \$18
- How To Build 35 Great Clocks (Daniele) \$14
- Build Your Own Grandfather Clock (Nelson) \$12
- Clockmaking for the Woodworker (Kadar) \$14
- 101 Wooden Clock Patterns (Novak) \$12

TIPS, TECHNIQUES

- 200 Original Shop Aids (Capotosto) \$16
- Shop Savvy (Moungovan) \$14
- Workshop Math (Scharff) \$14
- 335 Great Shop Tips (Wood Mag.) \$10

WOODWORKING PROJECTS

- Weekend Projects for Woodworkers \$14
- Projects for Woodworkers Vol. 1 to IV ea. \$12
- 101 Projects for Woodworkers \$14
- 176 Woodworking Projects (Workbench) \$14
- Making Mechanical Marvels in Wood (Levy) \$14
- Making Pet Houses and Carriers (Self) \$9
- Doll's House Do-It Yourself (Dodge) \$14
- Patterns and Projects for the Scroll Saw (Neison) \$18

MUSICAL INSTRUMENTS

- Guitarmaking: Tradition and Technology (Cumpiano) \$58
- Violin Making As It Was and Is (Heron-Allen) \$33
- Making Stringed Instruments (Buchanan) \$19
- Making Wood Folk Instruments (Waring) \$12
- Make Your Own Electric Guitar (Clock) \$16

MALOOF; NAKASHIMA FRID; UNDERHILL

- Sam Maloof, Woodworker (Soft) \$38
- Video - Sam Maloof, Woodworking Profile \$28
- Maloof Book and Video Set \$64
- Soul of A Tree (Nakashima) \$35
- Tage Frid Teaches Woodworking; Book 1, 2, or 3 \$20 EA; All 3 for \$57
- Roy Underhill - 3 Titles EA. \$12
- All 3 for \$35

POWER TOOLS

- Router Basics (Spielman) \$9
- Router Book (Geller) \$25
- Router Jigs, Techniques (Spielman) \$16
- Router Handbook (Spielman) \$12
- The Router (Rosendahl) \$14
- Scroll Saw Handbook (Spielman) \$12
- Shaper Handbook (Cliffe) \$16
- Scroll Saw Basics (Spielman) \$9
- Table Saw Basics (Cliffe) \$9
- Table Saw Techniques (Cliffe) \$16
- Radial Arm Saw Techniques (Cliffe) \$16
- Getting The Most Out of Radial Arm Saw (Rockwell) \$10
- Getting The Most Out of Drill Press (Rockwell) \$10
- The Complete Book of Stationary Power Tool Techniques (de Cristoforo) \$17
- The Complete Books of Portable Power Tool Techniques (de Cristoforo) \$18
- Tool Grinding and Sharpening Handbook (Davidson) \$9

JOINERY

- Woodjoiner's Handbook (Allen) \$14
- Joinery: Methods of Fastening Wood (Self) \$12
- Woodworking Joints (Blandford) \$17
- Woodwork Joints (Hayward) \$9
- Modern Practical Joinery (Ellis) \$18
- Contract Joinery (Austin) \$15

NEW TOYMAKING

- Making Toy Trains in Wood (Lynn) \$10
- Making Classic Cars in Wood (Hicks) \$10
- Making Dinosaur Toys in Wood (Wakefield) \$12
- How To Make Animated Toys (Wakefield) \$12
- Making Vintage Aircraft in Wood (Hicks) \$10
- Toyemaker's Wooden Vehicles (Buckland) \$12
- Blizzard's Dazzling Wooden Toys \$14
- The Ultimate Wood Block Book (Bingham) \$12

FINISHING & REFINISHING

- Wood Finishing with George Frank \$14
- Adventures in Wood Finishing (Frank) \$10
- Video George Frank on Woodfinishing \$38
- Woodfinisher's Handbook (Allen) \$12
- Wood Finishing & Refinishing (Gibbia) \$15
- Complete Manual of Wood Finishing (Aughton) \$13

WOODTURNING

- Woodturning for Cabinetmakers (Dunbar) \$14
- Practical Woodturner (Pain) \$12
- The Craft of Woodturning (Sainsbury) \$12
- The Practice of Woodturning (Darlow) \$24
- Polychromatic Assembly for Woodturning (Brown) \$16
- Hand or Simple Turning (Holtzapffel) \$16
- Ornamental or Complex Turning (Holtzapffel) \$16
- The Woodturners Bible (Blandford) \$16

CHIP CARVING by BARTON

- Chip Carving \$10; Chip Carving Patterns \$10
- Video Chip Carving \$28; All 3 - \$45

MISC. CARVING

- Freshwater Fish Carving (Figer) \$29
- Carving Fish Decoys (Cottle) \$25
- Carving Carousel Animals (Marlow) \$19
- Carousel Horse Carving 1/3 Size (Hughes) \$28
- Sculpting Wood (Lindquist) \$24
- Realistic Decoys (Spielman) \$16
- Decoy Pattern Book (Bridenhagen) \$14
- How To Carve Wild Fowl (Schroeder) \$38

FURNITURE MAKING

- Queen Ann Furniture (Vandal) \$32
- Reproducing Antique Furniture (Gottshall) \$38
- Federal Furniture (Dunbar) \$17
- Make a Windsor Chair (Dunbar) \$13
- Measured Shop Drawings for American Furniture (Moser) \$16
- How To Build Shaker Furniture (Moser) \$14
- Antique Country Furniture of North America (Shea) \$18
- Country Projects for Woodworkers (Woodworker's Journal) \$18
- Construction of American Furniture Treasures (Marlow) \$9
- Fine Furniture for the Amateur Cabinetmaker (Marlow) \$19
- Classic Furniture Projects (Jones) \$12
- Designing Furniture (Stem) \$23

VIDEOS

VHS ONLY



- Brad Witt - Router Secrets \$30
- Wilson - Making Oval Boxes \$30
- Todd - Designing Your Kitchen \$34
- Todd - Stair Framing \$30
- Gross - Roof Framing Basics \$75
- Gross - Roof Framing Advanced \$75
- Schuttner - Basic Stairbuilding \$28
- Bollinger - Laying Hardwood Floors \$28
- Bollinger - Sanding, Finishing Floors \$19
- Law - Installing Cabinets, Countertops \$19
- Law - Installing Doors & Windows \$19
- Rosendahl - Series of 8 Videos on Router Techniques \$24 EA; All 8 for \$145
- Roger Cliffe - Faceplate Cabinetmaking Series of 5 Tapes \$30 EA; All 5 for \$135
- Roger Cliffe - Table Saw or Radial Saw Techniques \$29 EA; both for \$56
- Krenov - Wooden Planes, Cabinet Scrapers \$38
- Cummins - Making Boxes \$28
- Cummins - Small Shop Tips \$28
- Sundquist - Swedish Carving Techniques \$28
- Mehler - Build a Shaker Table \$28
- Parko - Make a Blanket Chest \$37
- Stubbs - Bowl Turning \$38
- Bush - Carving Techniques and Projects \$26
- Rogers - Molding and Picture Frames \$22
- Rogers - Building Cabinets \$22
- Rogers - Building Bookcases \$22
- Rogers - Building Tables \$22
- Maas - Router Jigs, Techniques \$28
- Byrne - 1 Tiling Countertops; 2. Walls 3. Floors \$28 EA; All 3 for \$80
- Roy Underhill - 1. Shop Planes; 2. Chair-making; 3. Log & Timberframe Bldg. EA. \$38
- Klausz - Wood Finishing \$38
- Klausz - Dovetail A Drawer \$28
- Klausz - Mortise & Tennon Joints \$28
- Low - Carve A Ball & Claw Foot \$38
- Flexner - 1. Refinishing; 2. Repairing Furniture EA. \$28

BOOK & VIDEO SETS

- SET CONTAINS 1 BOOK & 1 VIDEO
- Cliffe - Table Saw Tech. \$44
- Cliffe - Radial Saw Tech. \$44
- Savage - Trim Carpentry \$44
- Bollinger - Laying Hardwood Floors \$44
- Schuttner - Basic Stair Building \$44
- Sundquist - Swedish Carving Tech. \$40

CABINETMAKING

- Cabinetmaking and Millwork (Feirer) \$45
- Making Kitchen Cabinets (Levine) \$17
- Video-Kitchen Cabinets (Levine) \$28
- BOTH VIDEO & VIDEO (LEVINE) \$44
- Building Kitchen Cabinets (Cary) \$14
- Cabinetmaking, The Professional Approach (Peters) \$28
- Cabinetmaking (Calhoun) \$39
- Cabinetmaking from Design to Finish (Maguire) \$21
- Shelves, Closets & Cabinets (Jones) \$16
- The Home Cabinetmaker (Burch) \$19
- European Cabinetry (Christ) \$18

STAIR, DOOR MAKING

- Modern Practical Stairbuilding and Handrailing (Ellis) \$22
- Treatise on Stairbuilding (Mowat) \$22
- Basic Stairbuilding (Schuttner) \$14
- Stair Builder's Handbook (Love) \$14
- Doormaking Patterns & Ideas (Birchard) \$18
- Make Your Own Handcrafted Doors & Windows (Birchard) \$16

CARPENTRY; CONSTRUCTION

- Carpentry (Lewis) \$19
- Guide to Residential Carpentry (Feirer) \$18
- Trim Carpentry Techniques (Savage) \$17
- The Genius of Japanese Carpentry (Brown) \$23
- Harwood Floors (Bollinger) \$27
- The Timber Frame House (Benson) \$19
- Timber Frame Construction (Sobon) \$12
- Roof Framing (Gross) \$21
- Wood-Frame House Construction (Anderson) \$13
- Building Small Barns, Sheds, Shelters \$12

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

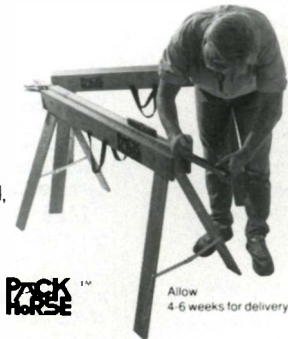
plus shipping & handling

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

READER SERVICE NO. 117

SHAPER CUTTERS
1-800-235-0272
Call today for your FREE Catalog!

- Thicker industrial grade carbide!
- Razor sharp edges ground up to 600 grit fineness!
- Largest selection of profiles available!

READER SERVICE NO. 98

**NORTHSTATE
16" PLANERS**



- Model 310: \$779
- Powerful 3 hp motor
- Cast iron construction
- Magnetic switch
- 1 year warranty
- Dust hood
- Anti-kickback
- Stand included



- Model 315: \$849
- 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
- FREE FREIGHT
- Tiltspindle model avail.
- *** FREEBORN***
Shaper cutters available

Prices Subject to Change

LENEAVE QUALITY—SINCE 1957

NORTHSTATE PLANERS



- 20", 5 hp: \$1,350
- 24", \$2,795
- 5 hp & 7-1/2 hp

**NORTHSTATE
BANDSAWS**

- 14", 1 hp: \$295
- 18", 2 hp: \$795
- 20": \$1,495
- 24": \$2,465

PORTER CABLE

- 555: Plate Jointer: \$163
- 330: Sander: \$53
- 360: Sander: \$174
- 505: Sander: \$108
- 9505: Commemorative 505: \$129
- 351: Sander: \$124
- 352: Sander: \$128
- 363: Sander: \$174
- 362: Sander: \$179
- 361: Sander: \$166
- 7549: VS jigsaw: \$134
- 9627: Rec. Saw: \$127
- 7519: Router: \$224
- 7538: Router: \$224
- 690: Router: \$124
- 630: Router: \$118
- 314: Saw: \$124
- 315: Saw: \$114
- 9118: Plane Kit: \$185
- 97310: Lam. Trim Kit: \$184
- 7334: Orbital Sander: \$117
- 5116: Ormijig: \$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: \$368
- C8FB: Comp. Mitre: \$439
- 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: \$228

DEWALT

- 7749: Radial Arm Saw: \$625
- 7770-10: Radial Arm Saw: \$865
- 7790: Radial Arm Saw: \$1147
- 1765: Belt/Disc Sander: \$427
- All Dewalt Ind. radial arm saws available
- * Freeborn Shaper Cutters
- * Mini-Max Machinery
- * Adjustable 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! \$185
- 40-601: Scroll Saw - CALL!
- 31-730: Belt/Disc Sander: - CALL!
- 37-350: 8" Jointer w/stand: - CALL!
- 34-444: 10" Contr. Saw: \$595
- 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!
- 12-540: 12" planer NEW! - Call for promo price
- Stock feeders: 34-985, 34-994, 34-995 - Call for promo price
- **Complete Delta line available.**

**NORTHSTATE
DUST COLLECTORS**



- 2 hp, 2 bag: \$295
- 3 hp, 4 bag: \$485

SENCO

- SN4 \$475
- SN325 \$399
- SFN2 \$386
- SFN1 \$264
- SKS \$254
- LS2 \$249
- LS5 \$259
- PW \$345
- EMGLO 1-1/2 HP compressor \$298



- BIESEMEYER
- VEGA
- EXCALIBUR
- PARALOK
- UNIFENCE
- fences available

* We try not to be undersold,
tell us our competitors' prices.

**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
- \$1,125 w/std fence
- \$1,225 with 50" rip fence

HTC MOBILE BASES

DELTA
\$969
31-730

**WE'LL BEAT
 PRICE GUARANTEE
 ANY AD**

Nailers.
 2655 Original Cordura Tool Belt System \$99
 Tools Not Included

SAME DAY SHIPPING

CA NEW Panel Saw \$789
 H5 64" capacity panel saw 1249

Makita
\$165
3612BR

DELTA
\$1199
34-761

FREE FREIGHT!

Kaddies, Inc.
 TK Portable Tool Storage System On Wheels \$184

JET
JBS-14CS 14" Wood Bandsaw \$429
 JBS-18 18" bndsw 2hp w/stand 899
 WBS-20 20" wdctng bandsaw 1949
 JSS-6188 6x168 stroke sander 1549
 OVS-10 oscillating spindle sdr 1599
DC-610 1 HP Dust Collector \$229
 DC-1182 d. col. 2 hp/1180 cfm 439
 DC-1883 d. col. 3 hp/1880 cfm 649
 EHVS-80 6x89 edge sander 599
JJ-6CS 6" Long Bed Jointer \$429
 JJ-4 4" deluxe jointer 299
 JJ-8CS NEW 8" long bed jointer 999
 JJ-12 12" long bed jointer 2499
JCS-10A 10" Cabinet Saw With Jet Fence \$899
 JTS-12 12" table saw 1.5 hp 569
 JTS-10SL 10" table saw 1.5 hp 499
 JDP-14M 14" bench 16 s. press 299
 JDP-17MF 17" floor 16 s. press 389
 JDP-20MF 20" floor 12 s. press 689
JWB-37P 37" x 60" Wide Belt Sander \$10,249
 JWB-25P 25x60 w. belt sdr 7199
 JWB-13P 13x60 w. belt sdr 4899
 JWB-25PH 25x75 w. belt s. 10899
 JWB-37PH 37x75 w. belt s. 12499
JWP-12 12" Portable Planer \$379
 JWP-15H 15" planer 3 hp 1099
 JWP-20H-1 20" plnr 2sp/3hp 1789
 JWP-20H-1 20x7 planer 3hp 2749

PORTER-CABLE
7334 Random Orbital Sander w/Case & 2 Rolls Paper \$149
 7334 random orbital sander 118
 7335 5" VS random sander 129
 7336 6" VS random sander 134
 73333 NEW sander dust kit 25
 505 1/2 sheet finish sander 118
 330 speed bloc finish sander 59
360 3" X 24" Sander W/Bag & Metal Case \$184
 352 3x21 sander with bag 138
 362 4x24 sander w/bag & case 194
 503 3x24 wormdriver w/bag 345
 504 3x24 wormdrive sander 325
9853 NEW! 12 V, 3/8" VSR, 2 Speed Drill Kit W/Keyless Chuck \$149
 9852NEW12v. 3/8"VSR, 2sp. kit 149
 9854NEW12v. 1/2"VSR, drill kit 159
 7511 3/8" VSR 5 amp drill 114
 7514 1/2" VSR 5 amp drill 119
 7515 1/2" VSR 5 amp, keyless 124
 7545 drywall 0-2500 VSR drv 105
555 Plate Jointer With Case & 500 Assorted Biscuits \$179
 555 plate jointer w/case 165
 5556 adjustable tilt fence 49
 5116 16" Omni jig 260
 7536 2-1/2 hp router 204
 7537 2-1/2 D hndt router 215
 7399 drywall cutout 79
 7310 laminate trimmer 89
 97310 laminate trimmer kit 189
 9118 porta plane kit w/cut cutter 199
9345 6" Saw Boss Kit w/5 Extra Blades \$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 134
 7549 top handle VS jig saw 144
7539 NEW 3-1/4 HP 5 Speed Plunge Router \$265
 690 1-1/2 HP router 132
 691 1-1/2 hp D hnd router 144
 696 router-shaper table 118
 695 router table w/router 204
 97310 laminate trimmer kit 185
 7518 3-1/4 hp Speed router 259
 7519 3 hp production router 224
 7538 3-1/4 hp plunge router 224
9637 Electronic V.S. Tiger Saw Kit \$135
 9647 tiger cut with case 115
 693 1-1/2 hp plunge router 164
 6931 plunge router base 78
 97750 1/2" hammer drill kit 155

HITACHI
NR83A Full Head Stick Nailer \$429
 NR83AA clipped head stick nr 429
 NV83A full head coil nailer 429
 NV45AB coil roofing nailer 429
 N5008AA 5/8" to 2" HD stapler 329

PONY AIR
LPN672 Air Palm Nailer With Glove \$94
 Drives 6d-50d nails!

"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

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

RYOBI
RE600 3HP VS Plunge Router \$199
 TSS220 NEW 8-1/2" comp saw 439
 JP-155 6-1/8" jointer/planer 299
 RA-200 8-1/4" radial arm saw 248
 TS380 14" miter saw 369
 TS25410" mitre saw w/c.t. blade 209
 BT2500 10" bench table saw 269
 RS115 4-1/2" random orb sander 75
 WC101 wood carver blade 40
BT3000 NEW! 10" Sliding Table Saw \$549
 AP10 10" portable planer 358
 R500 2-1/4 hp plunge router 159
 R501 2-1/4 hp plunge router 149
 R331 2 hp D-Handle router 139
 TR30U laminate trimmer 88
 BE321 3x21 VS belt sander 128
 BE424 4x24 VS belt sander 165
 JM100K NEW plate jointer 205
 TFD1702VRK 9.6v cds kit/2 bat. 145
 TFD2202VRK 12v cds kit/2 bat. 165
 SC1260 16" scroll saw 145

DELTA
34-782 3 HP Unisaw w/Unifence & Motor Cover \$1549*
 34-782B 3hp unisaw w/Bies. 1569*
 34-781F 1.5hp unisaw w/Unif 1349*
 34-781B 1.5hp unisaw w/Bies. 1369*
 34-763 3hp Jet-Lock unisaw 1379*
 34-761 1.5hp Jet-Lock unisaw 1199*
34-445 10" Contractor's Saw w/30" Unifence & EMS \$849
 34-445B10" cont. saw/28" Bies. 849
 34-444 10" contractors' saw 639
 34-670 10" motorized table saw 389
 34-330 8-1/4" bench table saw 229
 33-890 12" radial arm saw 1349
 33-990 10" radial arm saw 589

DELTA
22-540 12" Portable Planer w/Dust Collector Chute \$409
 28-180 NEW bench bandsaw 169
 43-505 NEW router/shaper 279
 11-090 NEW radial drill press 279
 28-245 14" bandsaw w/lamp 579
46-700 NEW 12" V.S. Wood Lathe \$429
 40-640 NEW 20" vs scroll saw 339
 23-700 wet/dry grinder 159
 11-950 8" bench drill press 145
 40-560 16" 2 speed scroll saw 184

Emgle
AM78-HC4V 1-1/2 HP Vertical Twin Tank \$319
 AM-GAS gas vertical twin tank 529
 AM99-HC4 NEW 2hp twin tank 379
 AM78-HC4 1-1/2hp twin tank 309
 AM39-HC4V 3/4hp v twin tank 299
 K15A8P 1.5hp wheelbarrow 629
 K2A8P 2hp wheelbarrow 679
 KSHGA-8P 5hp Honda whlbrw 739
 045 3/8" x 50' Goodyear hose 20

POWERMATIC
1660760 66 Saw 3 HP W/50" Biesemeyer \$1699
 1260100 #26 shaper 3hp 1 ph 1599
 1270100NEW #27 shpr3hp 1ph 1849
 1000099 #100 planer/12"/2hp 1999
 1800205 5hp, 18" pl. w/knife gr 4699
 1500040 6" jointer 3/4hp 1 ph 1169
 1610050 8" jointer 1.5 hp 1ph 1449
 1300134 6x48 belt/12" disc sdr 1149
 1152825 15VS dr. press 3/4hp 1329
 1410040 14" bndsw 3/4hp 1ph 1229
 1790808 25" wide belt sdr 7999
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 1599
 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

DELTA
28-283 14" Bandsaw W/Mobile Base \$735
 33-055 8-1/4" sawbuck w/legs 509
 37-280 6" motorized jointer 389
 37-154 6" jointer, DJ-15 w/std1299*
 17-900 16-1/2" floor drill press 399
 34-080 10" mitre saw 198
43-375 3 HP HD Two Speed Shaper \$1469*
 22-66213" planer w/stand&ems 1179
 31-730 6" belt/12" disc sander 969*
 37-350 8" jointer, DJ-15 w/std1299*
 46-5415 12" V.S. wood lathe 1499
 43-502 overarm router shaper 1499
 40-601 18" V.S. scroll saw 719
36-220 10" Compound Mitre Saw \$238
 14-600NEW hollow chisel mort 469
 50-181 2 hp dust collector 618
 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 288
31-380 4" X 132" Edge Sander \$1299
 34-995 3 phase stock feeder 799
 34-994 1 phase stock feeder 849
 34-985 1 phase stock feeder 489
 20-150 14" cut-off saw 249
36-755 10" Cabinet Saw \$899
 43-355 1-1/2HP 3/4"wood shpr 699
 36-751 10" cab w/30" Unifence 1099
 36-752 10" cab w/50" Unifence 1199
 70-200 20" floor drill press 779
 43-275 Onsruder#2003 Inv. rtr 2799
 * Price Includes Rebate!

DELTA
46-700 NEW 12" V.S. Wood Lathe \$429
 40-640 NEW 20" vs scroll saw 339
 23-700 wet/dry grinder 159
 11-950 8" bench drill press 145
 40-560 16" 2 speed scroll saw 184

Milwaukee
6527 NEW! Variable Speed Super Sawzall \$165
 6125 5" random orbital sander 129
 5371-1 1/2" hammer drill kit 185
 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
6507 V.S. Sawzall With Case \$134
 6508 VS sawzall w/case 134
 6528 VS super sawzall 165
 5397-1 3/8" hammer drill kit 139
 5375-1 1/2" hammer drill kit 169
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 108
 0234-1 1/2"VSR 0-850 magnum 119
 0244-1 1/2"VSR 0-600 magnum 119
 1676-1 2 sp. hole hawg kit 244
6368 7-1/4" Saw W/C.T. Blade, Case and Fence \$135
 6305 6-1/4" cds circular saw 174
 6546-1 2 sp cds screwdriver 84
 6543-1 0-4000 VSR screwdriver 88
 6750-1 5 amp VSR screwdriver 94
 0375-1 3/8" close quarter drill 124
3107-1 VS Right Angle Drill Kit \$199
 6145 4-1/2" angle grinder 98
 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

DEWALT
1707 8-1/2" Compound Mitre Saw \$399
 1765 belt/disc sander 429
 7770-10 3.5 hp 10" radial saw 869
 7790 3.5 hp 12" radial saw 1149

DEWALT
1707 8-1/2" Compound Mitre Saw \$399
 1765 belt/disc sander 429
 7770-10 3.5 hp 10" radial saw 869
 7790 3.5 hp 12" radial saw 1149

DEWALT
1707 8-1/2" Compound Mitre Saw \$399
 1765 belt/disc sander 429
 7770-10 3.5 hp 10" radial saw 869
 7790 3.5 hp 12" radial saw 1149

DELTA
46-700 NEW 12" V.S. Wood Lathe \$429
 40-640 NEW 20" vs scroll saw 339
 23-700 wet/dry grinder 159
 11-950 8" bench drill press 145
 40-560 16" 2 speed scroll saw 184

Panasonic
EY6005BC 12 V, 1 Hour, Keyless Drill Kit w/2 Batteries \$179
 EY6205BC 12v.VSR dr w/case 179
 EY571BC 9.6v.VSR w/c.s. 2 bat. 149
 EY6200BC 12v 1/2" cds w/case 179
 EY5038 2.4v 2 sp. screwdriver 69
 E9590H carrying case 20
 EY6207BC12 v.1/2"VSR dr w/c.s 219
 EY6900BC12 v.3/8" hamr dr. kit 205
36-220 10" Compound Mitre Saw \$238
 14-600NEW hollow chisel mort 469
 50-181 2 hp dust collector 618
 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 288
31-380 4" X 132" Edge Sander \$1299
 34-995 3 phase stock feeder 799
 34-994 1 phase stock feeder 849
 34-985 1 phase stock feeder 489
 20-150 14" cut-off saw 249
36-755 10" Cabinet Saw \$899
 43-355 1-1/2HP 3/4"wood shpr 699
 36-751 10" cab w/30" Unifence 1099
 36-752 10" cab w/50" Unifence 1199
 70-200 20" floor drill press 779
 43-275 Onsruder#2003 Inv. rtr 2799
 * Price Includes Rebate!

Milwaukee
6527 NEW! Variable Speed Super Sawzall \$165
 6125 5" random orbital sander 129
 5371-1 1/2" hammer drill kit 185
 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
6507 V.S. Sawzall With Case \$134
 6508 VS sawzall w/case 134
 6528 VS super sawzall 165
 5397-1 3/8" hammer drill kit 139
 5375-1 1/2" hammer drill kit 169
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 108
 0234-1 1/2"VSR 0-850 magnum 119
 0244-1 1/2"VSR 0-600 magnum 119
 1676-1 2 sp. hole hawg kit 244
6368 7-1/4" Saw W/C.T. Blade, Case and Fence \$135
 6305 6-1/4" cds circular saw 174
 6546-1 2 sp cds screwdriver 84
 6543-1 0-4000 VSR screwdriver 88
 6750-1 5 amp VSR screwdriver 94
 0375-1 3/8" close quarter drill 124
3107-1 VS Right Angle Drill Kit \$199
 6145 4-1/2" angle grinder 98
 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

freud
JS100 Jointing System W/Case & 500 Assorted Biscuits \$144*
 JS100 plate jointer w/case 129*
 FT-2000 325 plunge router 145*
 EB-100 edge banding system 199*
 FRT-2000 wooden router table 169
 UC-900 5 pc shaper cabinet set 349
 94-100 5 pc router cabinet set 159
 95-100 5 pc rtr set w/99PK1 199
 91-100 13pc 1/2" router bit set 189
 90-100 15pc 1/4" router bit set 159
 *Price Includes Rebate Thru 1-31-92!

DEWALT
1707 8-1/2" Compound Mitre Saw \$399
 1765 belt/disc sander 429
 7770-10 3.5 hp 10" radial saw 869
 7790 3.5 hp 12" radial saw 1149

BIESEMEYER
50L12 50" Commercial w/12" Left \$295
 52L12 52" homeshop fence 235
 40L12 40" homeshop fence 209
 28L12 28" homeshop fence 199

DELTA
46-700 NEW 12" V.S. Wood Lathe \$429
 40-640 NEW 20" vs scroll saw 339
 23-700 wet/dry grinder 159
 11-950 8" bench drill press 145
 40-560 16" 2 speed scroll saw 184

HITACHI
C8FB 8-1/2" Compound Mitre Saw \$439
 P12RANew 12" planer/6" jointer 799
 P12R NEW 12" portable planer 599
 D10DFK 9.6v VSR dr kit w/2 bat 159
 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 169
 CB75F resaw bandsaw 1599
 F1000A 12" planer/6" jointer 1499

Milwaukee
6527 NEW! Variable Speed Super Sawzall \$165
 6125 5" random orbital sander 129
 5371-1 1/2" hammer drill kit 185
 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
6507 V.S. Sawzall With Case \$134
 6508 VS sawzall w/case 134
 6528 VS super sawzall 165
 5397-1 3/8" hammer drill kit 139
 5375-1 1/2" hammer drill kit 169
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 108
 0234-1 1/2"VSR 0-850 magnum 119
 0244-1 1/2"VSR 0-600 magnum 119
 1676-1 2 sp. hole hawg kit 244
6368 7-1/4" Saw W/C.T. Blade, Case and Fence \$135
 6305 6-1/4" cds circular saw 174
 6546-1 2 sp cds screwdriver 84
 6543-1 0-4000 VSR screwdriver 88
 6750-1 5 amp VSR screwdriver 94
 0375-1 3/8" close quarter drill 124
3107-1 VS Right Angle Drill Kit \$199
 6145 4-1/2" angle grinder 98
 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

Any Better Than This!

DEWALT

7770-10 **\$869**

Porta-Nails

401P Hardwood Floor Nailer **\$189**

501 floor face nailer 189

BOSCH

1370DEVSK **\$299***

6" H.D. Random Sander Kit

*above item Free Fed-Ex to 48 states

3272 3-1/4" planer 4.2 amps 89
1608U underscribe lam. trimr 139
1609KX laminate trimmer kit 209
1195VSR 3/8" 6amp hmr drill 139
1194VSR 1/2VSR 6amp hmr dr. 159

Lamello

TOP 10 Plate Joiner w/Case **\$549**

COBRA NEW Jointer 299

KRAUSE

121482 12' Multimatic 300 lb. Multi Purpose Alum. Ladder **\$129**

121499 16 foot ladder 149
121321 12' Tri-matic ladder 95

FUJI

#HVLV High Volume Low Pressure Sprayer **\$599**

No Compressor Needed!

HONDA Power Equipment

EB2200XA 2200 Watt Construction Generator **\$879**

EB3500XA 3500 watt generator 1279
EB5000XA 5000 watt generator 1669
EB6500SX 6500 watt generator 2159
EW171ABI 4000 watt gen./weld. 1879
EB12D 12,000 w. diesel gen. 6999

EX1000A 1000 Watt Generator **\$599**

EM2200XA 2200 watt generator 919
EM3500XA 3500 electric start 1399
EM5000XA 5000 electric start 1749
ES6500KIA 6500 electric start 2399

For optimum performance & safety we recommend you read the owner's manual before operating your Honda Power Equipment. Connection of generators to house power requires transfer device to avoid possible injury to power company personnel. Consult a qualified electrician.

BOSCH

1582VS **\$132**

TROJAN

TWC-24 Work Center **\$99**

Mill-Route

MR1/MR-R1 Mill Route **\$269**

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**

2664K 9.6v, 3/8 cyclone drill kit 149
2661K 3/8 VSR 13.2 v Kodiak 249
5991K 3/8VSR 13.2v hmrgrn 279
2681K VSR 13.2v d. scrugun 259

1349-09 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 78

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
5045K 1-1/2" rotary hammer kit 399
5054K 3/4" D-Hdl. SDS hamm kit 189
5059K 2" rotary hammer kit 769
5018K chipping hammer kit 429

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 cutsaaw kit 134
2750 4-1/2" angle grinder 79

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
464-38 12 gal. poly. cont. vac 189

PERFORMAX S/T

Per-ST100 Radial Saw Surface Sander **\$289**

Powerfeed attachment 299
ProMax II stationary sander 1489
SuperMax 25" stationary sander 2199
SuperMax-25 25" dual drm snldr 2695
SuperMax 37 37" drum sander 2995
SuperMax 37x2 37" dual drmsnldr 3495

Lignomat

Mini-Ligno Wood Moisture Meter 6-20% **\$99**

Mini-ligno E 6-36% 109

LEI

D1258R-24 24" Dovetail Jig **\$319**

D1258R-12 12" dovetail jig 175
MMTA-24 24" mortise attach 270
MMTA-12 12" mortise attach 165
LJV instructional video 29

Dugco

Zambesi 2' x 6.5' Solid Workbench **\$799**

Deluxe 1.9' x 4.7' workbench 449
Major 2.2' x 5.5' workbench 549
Carver 4.2' x 1.4' workbench 269

David White

ALTP6-900 18 Auto Level-Transit Package **\$439**

LP6-20 20x sight level pkg 199
AL8-22 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
ALTP6-18HD 18x auto package 375

Qual-Craft

2200 Pump Jack **\$59**

2201 top brace 21
2203 guard rail holder 23
2204 work bench 41
2510Q adj. wood roof bracket 16
2601Q NEW wall jack 119

SKIL

NEW **\$119**

1605

Radius

P10 1 Watt Communication Radios **\$169**

Complete with charger & batteries. Now with 2 year warranty.

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 139
3050VSRK 3/8 VSR kit w/2 batt 128
3258 3-1/4" power plane 124
1654 7-1/4" saw w/ct blade 118

3283DVS Dustless Random Orbital Sander **\$98**

1348AE 5" elec. mini grinder 114
1608 laminate trimmer 89
1609 offset base laminate trimr 119
1942 heavy duty heat gun 72

1273DVS 4x24 V.S. Belt Sander **\$188**

1273D 4x24 sander with bag 175
1272D 3x24 sander with bag 175
3270D 3x21 sander with bag 144
12900 1/2 sheet finish sander 119

1611EVS 3-1/4 HP VS Plunge Router **\$229**

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 109
9166VSR 1/2" 0-650m. m drill 118

1404VSR 0-4000 Drywall Driver **\$74**

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 **\$195**

11202 1.5 rotary hammer 429
11214VS 1.75 VS rotary hmr 629
11304 Brute breaker hammer 1229
11305 demolition hmr 10 amp 689

PORTER-CABLE

7334 **\$118**

BAUER

30406 6', 300 lb Fiberglass Stepladder **\$79**

30405 5' fiberglass ladder 69
30404 4' fiberglass ladder 59

ELU

1186 **\$99**

Panasonic

EY571BC **\$149**

ELU

3338 2-1/4 HP Electronic VS Plunge Router **\$249**

3304 1hp VS plunge router 149
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 **\$245**

3375 3-1/8" universal planer 159
4024 3x21 VS sander 159
4029 4x24 sander 309
4015 1/2 sheet finish sander 119

Telpro Inc.

PANELLIFT™ Drywall Lift **\$449**

SKIL

2736-04 12 V, 3/8" VSR Keyless Drill Kit W/2 Batteries **\$129**

7484 5" random orbital sander 104
1605 NEW plate jointer 119
77 7-1/4" worm circle saw 145
5550 NEW 7-1/4" circular saw 99
5656 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

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
L3516M 2hp 1 ph. 1725 TEFC 195
L3515M 2hp 1 ph. 3450 TEFC 240

The Accu-Miter

Precision Mitre Gauge **\$149**

Complete Line in Stock!

STANLEY BOSTITCH

N80S-1 16d Stick Nailer **\$399**

N12B-1 coil roofing nailer 419
N80C-1 coil nailer 419
N100S-1 6d-20d nailer 499
N60FN 1-1/4" to 2-1/2" fin. nlr. 339
T2B-5 1-3/16" finish stapler 269
T31-1 5/8" to 1" brad tackler 154
CWC100 1hp 4 gallon comp. 299
T50S4-1 sheathing/deck stapler 369
T40S2-CT roofing stapler 299
MIIIFS floor stapler 549

Nails and Staples Priced to Sell!

HEGNER

Multi-Max 14 With Stand **\$599**

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 tackler 288
LS-5 1" to 1-1/2" brad tackler 288
PW roofing stapler 348
SPS-RFR roofing stapler 338

Not Available in All States

CALL U.S. OR CANADA FOR MIKE, TOM, ERIC, LORI, DR BRENDA!

MOST PORTABLE TOOLS SHIPPED FED-EX \$10.00 MORE

1-800-358-3096



Box 1716 • Grand Forks, ND • 58206
Send \$3.00 For 208 Page Catalog

*Any comparable National ad in this issue. (Not applicable to liquidation sales.) Limited to stock on hand.

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 **

READER SERVICE NO. 201

Random-Orbit Sanders

Eccentric machines for fast, scratch-free sanding

by Sven Hanson

Random-orbit machines sand aggressively with scratch-free results. From lower left clockwise: Wen 15, Porter-Cable 7336, Bosch 1370DEVS, Skil 7584, Fein MSf 636-1, Metabo SXE125, Bosch 3283DVS, Milwaukee 6125, AEG VSR600 and Ryobi RS-115.



“Who in the world could possibly need another sander, no matter how new or different it is?” a friend of mine asked when I told him I was considering buying a random-orbit sander. But when I asked him if he knew a faster way to handle a tricky sanding situation (like leveling a cabinet’s face frame or sanding across joint lines without leaving deep scratches), he didn’t have a comeback. A random-orbit sander’s combination of rotation and random orbits allows aggressive material removal while leaving the work surface relatively scratch free, ready for final sanding.

While random-orbit sanders are fairly new to woodworking, they have been a standard tool for many years in auto-body shops, where both electric and air-powered versions are used for rough-sanding metal and hard, sticky fillers, as well as for finish-sanding and for polishing finishes. But can they improve upon the performance of the conventional disc, orbital or belt sanders used in the woodworking shop? Random-orbit machines are capable of removing stock as quickly as portable or stationary disc sanders, but their clear advantage is that they don’t leave deep scratches. Compared to standard orbital sanders, the random-orbit machines sand more aggressively, their paper stays cleaner longer and it is easier to change. For sanding large, flat surfaces, the belt sander remains

the power tool of choice, but when you need to quickly sand narrow or curved surfaces, cabinet face frames or door frames, or if you need to sand off an old coat of paint or varnish, the random-orbit sander is the new champion.

Last summer, I tried and compared 10 different random-orbit sanders made by AEG, Bosch, Fein, Metabo, Milwaukee, Porter-Cable, Ryobi, Skil and Wen (shown in the photo on the facing page). I put each sander through its paces, both in my woodworking shop and on the construction site, and I discovered that although all are capable of producing good work, certain features may make some models a better choice for a particular job. Although I didn’t try every random-orbit sander on the market, I included the other models (a total of 17) in the chart shown on p. 49. (You should peruse the information in the chart before purchasing a random-orbit sander.) Also included in the chart is a new cordless model by AEG, which wasn’t available for me to try out at the time I was preparing this article.

Random-orbit drive

The magical mechanism behind these machines is the tool’s drive system: A shaft rotates a counterweighted disc carrying an off-center thrust bearing (the amount of offset is anywhere from $\frac{3}{16}$ in. to

Sanding discs: Adhesive back vs. hook and loop

Random-orbit sanders employ two different systems of attaching sanding discs, and your choice of sander should be based partially on which disc system better suits your needs. The pressure-sensitive-adhesive (PSA) system of AEG, Milwaukee, Porter-Cable, Skil and Wen uses a special glue to bond the disc to a smooth, vinyl-faced pad. The hook-and-loop system (a generic name of which Velcro is a popular brand) used by Bosch, Fein, Metabo and Ryobi uses a backing pad covered with rows of tiny hooks that lock into a woolly surface on the back of the sanding disc (see the photo at right). Either system can work with dust collection, although the only PSA-system machines that offer it are made by Porter-Cable.

Pressure-sensitive adhesive: The PSA system’s biggest advantage is that the discs are about 40% less expensive than hook-and-loop discs. This is important because they can’t be removed and reused, whereas hook-and-loop discs can. When purchased in a roll of 100 discs, they are cost-effective for a production user, like a larger shop that sands lots of cabinet face frames. Because PSA discs bond very firmly to a flat backing pad, they are capable of very precise work when surface flatness is crucial. However, PSA pads need to be stored dust free and at cool temperatures, or the adhesive gets fouled. Another problem of the PSA system is that the discs sometimes refuse to stick when working outdoors in frosty temperatures. In addition, when the discs heat up to very high temperatures due to excessive

sanding friction, especially with fine grits, the adhesive softens. The eccentric motion then causes the sander to toss the disc, sometimes to Olympian distances, whereupon the pad smears a dollop of sticky adhesive on the work while picking up a fouling layer of sawdust. Fortunately, a few swipes of a cloth that is wet with denatured alcohol or naphtha will clean the pad. And a couple of passes with a sharp scraper will clean off the work surface. It is also worth noting that because the backing pads for PSA discs have a vinyl surface, plastic migration can cause the adhesive to bond tenaciously if the disc is heated during use and then left on the machine. Therefore, always remove a PSA disc before storing the sander.

Hook and loop: I’ve always found changing sandpaper to be one of the biggest bugaboos in woodworking. The great beauty of the hook-and-loop system for the small-shop woodworker is that the discs can be removed from the backing pad and remounted many times, until they are used up. To further extend disc life, you can clean a spinning coated-abrasive disc with a regular cleaning stick, like those used on belt sanders. Discs are available in grits from 25 all the way down to 600, and they can be purchased in small quantities.

Sanders of both disc systems come with a hard or a medium-hard backing pad, and softer pads are available for fine sanding and for sanding curvy surfaces. But I found that when used with the PSA system to sand a contoured form, the flexing, soft

pad made the disc come off the pad easily. A wide range of other discs are available for hook-and-loop sanders, including plastic-abrasive discs, foam polishing and rubbing-compound applicators, and synthetic lamb’s wool polishing or buffing bonnets, for waxing or finish-polishing furniture, a boat or a car (and you thought that you were just buying a sanding machine!). In lieu of a ready-made plastic-abrasive disc, a regular plastic scouring pad, such as Scotch-Brite, can be stuck directly to the hooked backing pad. I found this worked quite well and enabled me to do some fine finish-sanding. I’ll bet that you could do the same with a nice, thick piece of wool felt, for rubbing out a finish with polishing compound. —S.H.



The two methods for attaching sanding discs to random-orbit sanders are the hook-and-loop system, left, and the pressure-sensitive-adhesive system, right.



The Ryobi RS-115 easily sands into corners once its detachable front handle has been removed (above). The plastic-screen dust container nestled below the rear handle slides off for emptying.

The convertible drive system on the Bosch 1370DEVS machine, left, allows the sanding aggressiveness to be adjusted. Beneath the backing pad is a reversible drive ring that can be installed one way for direct drive (heavy sanding) and then flipped over, in about one minute, for “slip drive” (sensitive sanding).

$\frac{3}{8}$ in., depending on the model). This bearing holds the shaft of the sandpaper backing disc, which can be spun freely when the machine is off. The sanding disc is stuck to the backing pad with either pressure-sensitive adhesive (PSA) or with the hook-and-loop system (see the sidebar, “Sanding discs: Adhesive back vs. hook and loop,” p. 47). In operation, the offset between the drive shaft and the disc causes a sanding motion akin to swirling ice cubes in a glass: The glass orbits, the cubes revolve and the two different motions create both rotary and orbital action. The rotation of the pad, when pressed down lightly on the work surface, causes a rather aggressive sanding action similar to that of a disc sander. The resistance between paper and workpiece slows the freewheeling disc to unpredictable and varying speeds, hence the scratch-hiding “random” orbits begin. The compound motion keeps sanding dust from building up and clogging the paper and tends to make the sandpaper scratch less than with either rotary or orbital sanding, which leave predictable scratch patterns. Heavier sanding pressure can cause the disc rotations to slow down or even stop altogether, but the orbits—one for each revolution of the drive shaft—continue just like an orbital sander.

The Bosch 1370DEVS has a novel convertible drive system, shown in the photo at left, that allows you to select between two different degrees of sanding aggressiveness. Removing the backing pad with a single, central Allen bolt (the Allen wrench stores conveniently in the motor housing) reveals the reversible drive ring. With the drive ring installed one way, you get direct drive, meaning the pad will rotate even under heavy sanding pressure. In this mode the Bosch model is a real workhorse. No matter how much weight I put into sanding, I could not significantly decrease the rotations. For finer work, the drive ring can be flipped over to what Bosch calls “slip drive,” allowing disc rotation to decrease as sanding pressure increases. It took me about one minute to flip the ring over and get back to sanding.

Motor arrangements and handles

Random-orbit sanders can be divided into two types—right-angle or in-line—the distinction is based on motor style. Sanders like the Skil and the Milwaukee have motor housings like right-angle grinders used for auto-body work. Power is transmitted to the

sanding disc via a set of rather noisy bevel gears. The in-line sanders, like the Metabo and the Wen, have their motors directly above the sanding disc, with a gearless direct drive to the random-orbit head. The right-angle machines generally have larger, more powerful motors than the in-line ones. Due to these design variations, each type of sander has a different balance and handle configuration, which greatly affects how the tool feels in use. All the right-angle sanders require you to wrap one hand around the motor housing while your thumb or fingers control the on/off switch. This “barrel” grip is popular on many European portable power tools. But with motor housings between $2\frac{1}{2}$ in. and $2\frac{3}{4}$ in. in diameter, woodworkers with small hands (or with arthritis) might find gripping them difficult or tiring. All of the right-angle sanders also have removable front handles: Most have a bicycle-grip handle that can be screwed into either side of the sander, for righties or lefties. These handles lend a firm grip, but I also found that they promoted sanding more deeply on the handled side. I liked the center mounting of Skil’s bail-style handle, which made it a breeze to apply even sanding pressure to the work. AEG now offers an optional bail-style handle for all of its models.

Except for the vertical-bodied Wen sander, all the in-line models have a rear handle with a trigger/speed control and some version of a front grip. Fore and aft positioning of the handles gives the user a choice of ways to grip the machine and distributes sanding pressure evenly around the circumference of the pad. For sanding into cramped corners, the Ryobi’s front grip easily unclips and slides off, as shown in the photo at right. I found that the Ryobi was easy to grip and lightweight enough to work single-handedly even overhead, such as for touching up a kitchen cabinet soffit. I liked the Bosch 3283DVS’s D-handle front grip, which adjusts up or down and can be removed for sanding in tight quarters. The Wen required a two-handed grip for controlled operation, which became very tiring when sanding a larger horizontal surface. The Metabo has a minimal knob grip atop the motor housing and an auxiliary side handle that I thought was mounted too far off center for good control. One disadvantage of all the in-line sanders is that their tall motor housings can make sanding inside cramped cabinets or under obstructions impossible. The lower-profile right-angle machines have the advantage here.

Power, RPMs and sanding efficiency

The motors on the random-orbit sanders in the sample have a tremendous range of motor sizes, from the 1.8-amp Metabo to the 6-amp Skil. But while amperage ratings are honest figures for comparing electrical motor input, amps are not a direct indicator of power output or of sanding efficiency. In my experience, the motor size or disc RPM didn't necessarily reflect sanding aggressiveness. For instance, I found that the Porter-Cable machines, with 3.7-amp motors that produce 6,000 maximum disc RPMs, sanded about as aggressively as the AEG models, even though the AEGs sport 5.7-amp motors and run up to 10,000 maximum RPMs. Among the in-line-motor sanders, the 1.8-amp Metabo sanded more aggressively than the 2 amp Ryobi (both are comparable in maximum RPMs), even though both draw about the same current.

With their heavy-duty bevel gearing and powerful motors, the right-angle sanders are designed to handle continuous, heavy use, including production situations. But while the in-line sanders generally have less-powerful motors than their right-angle cousins, these machines are no slouches. I found that the Bosch 3283DVS sanded about as aggressively as some of the more powerful right-angle machines. However, when using the less powerful units, the disc-rotation speed and even the orbits per minute tend to drop proportionately as pressure is applied to the disc, thereby reducing sanding efficiency. Remember, if you apply too much pressure, the machine will sand less effectively.

Unlike routers and most other power tools, these sanders are best started while in contact with the work. This reduces the ten-

dency for the spinning-and-orbiting disc to gouge the work surface where it makes first contact. As with a belt sander, you must not sand too long in one spot or you'll dig in and create a divot. To prevent this, the Bosch 1370DEVS has a "soft-start" feature that gives you a second or two before the motor revs up to full speed. This is a real stress saver in delicate situations, such as when sanding face frame edges adjacent to plywood with thin face veneers.

With coarse discs, random-orbit sanders are capable of some fairly quick stock removal. But they can be tricky to use when you need to do precise, even work, such as when sanding down a sprayed finish with an ultra-fine-grit disc (shown in the photo at left on the following page). I discovered that, unlike a belt sander, which can be tilted to concentrate the sanding effort on one area of the belt, random-orbit sanders don't always sand in the direction you're applying pressure. I tested this on Plexiglas and then observed the scratch patterns. I found it best to keep the disc flat and in full, even contact with the work surface, but this was more difficult with the right-angle machines with the side-mounted handles.

Random-orbit sanders tend to be quite loud, producing up to 98 decibels (dB), as shown in the chart below. Ear protection is a must. If you work in an enclosed environment, the Ryobi, set to a slow speed, is capable of light sanding while producing only about 70 dB—hardly more noise than a loud conversation.

Switches and variable speed

It's funny how something as simple as an on/off switch can affect your entire opinion of a machine, but a switch that's hard to use

Random Orbit Sanders

Make	Model #	List Price +	Pad dia. (in.), pad type†	Motor Style, amps	No load Speed (RPM)	Net Weight	Noise (dB)	Dust Collect*
AEG (800) 243-0870, (203) 447-4600	VSR500	\$220	5, PSA (H&L*)	Rt Ang, 5.7	10,000	5 lb. 1 oz.	93	None
	VSR600	\$230	6, PSA (H&L*)	Rt Ang, 5.7	10,000	5 lb. 1 oz.	94	None
	VSRE500	\$240	5, PSA (H&L*)	Rt Ang, 4.6	1,000-9,000	5 lb. 1 oz.	NA	None
	VSRE600	\$250	6, PSA (H&L*)	Rt Ang, 4.6	1,000-9,000	5 lb. 1 oz.	NA	None
	AVSR5005 cordless	\$379	5, PSA (H&L*)	Rt Ang, 12v battery	4,700	3 lb.	NA	None
Bosch (800) 334-5730, (919) 636-4200	3283DVS	\$169	5, H&L	In-line, 2.3	6,000-11,000	4 lb. 9 oz.	77-89	Bag, Vac*
	1370DEVS	\$391	6, H&L	Rt Ang, 5	4,800-12,000	6 lb. 3 oz.	82-93	Bag, Vac*
Fein (412) 331-2325	MSf 636-1	\$610	6, H&L	Rt Ang, 3.3	7,500	6 lb. 6 oz.	95	Vac
Metabo (215) 436-5900	SXE125	\$213	5, H&L	In-line, 1.8	5,000-12,000	5 lb. 7oz.	80-84	Bag
Milwaukee (414) 781-3600	6125	\$200	5, PSA	Rt Ang, 5.5	10,000	5 lb. 1 oz.	95	None
	6126	\$205	6, PSA	Rt Ang, 5.5	10,000	5 lb. 2 oz.	NA	None
Porter-Cable (901) 668-8600	7334	\$210	5, PSA (H&L*)	Rt Ang, 3.7	6,000	5 lb. 2 oz.	90	Vac*
	7335	\$230	5, PSA (H&L*)	Rt Ang, 3.7	2,500-6,000	5 lb. 4 oz.	78-89	Vac*
	7336	\$235	6, PSA (H&L*)	Rt Ang, 3.7	2,500-6,000	6 lb.	78-89	Vac*
Ryobi (800) 323-4615, (803) 226-6511	RS-115	\$134	4.5, H&L	In-line, 2	6,000-11,000	3 lb. 4 oz.	70-84	Bag
Skil (312) 794-7495	7584	\$160	5, H&L	Rt Ang, 6	10,000	5 lb. 4 oz.	98	Bag
Wen (800) 462-3630, (312) 763-6060	15	\$60	6, PSA	In-line, 2.5	3,000	4 lb.	91	None

+ Dealer selling prices are typically 5% to 40% lower.

† PSA = pressure-sensitive adhesive; H&L = hook and loop

* Optional feature

NA Information not available



While sanding a lacquer finish with the Bosch 3283DVS, the author strives to keep the machine absolutely flat on the cherry panel.



The dust collection system for the Fein MSf 636 includes the optional 920 13 shop vacuum. By plugging the sander into the vacuum, the vac is turned on and off automatically with the sander.



The switch on the Milwaukee 6125 is an easy-to-press flap on the underside of the motor housing. Hanson found this switch to be the safest and most comfortable to use.

can indeed make smooth and safe operation more difficult. The right-angle sanders feature a variety of switch types, and I found some far better than others. Many of the right-angle models, such as the Bosch 1370DEVS, the Skil 7584 and all models by AEG, have sliding on/off switches that are spring loaded, as a sort of safety release in case you need to turn the machine off in a hurry (random-orbit sanders, much like angle grinders, can't be set down while they are running). But sometimes these switches were a little tough to turn on and too easy to turn off. All the Porter-Cable models come with a simple sliding switch, which is easier to operate, although it lacks the safety of the spring-loaded style. I found the Skil's switch to be very stiff-sliding and difficult to turn on. The Fein machine has a top-mounted, easy-sliding switch in a recess, making accidental switching on or off unlikely. Switches on the AEG models and the Bosch 1370DEVS are side mounted and thumb operated. Interestingly, the motor housing on the AEG sander can be removed and rotated relative to the gearhead, allowing you to change the switch position for left-handed operation. My favorite switch is the large flap on the underside of the motor housing on the Milwaukee 6125, shown in the photo at right. Turning the tool on or off is simply a matter of gripping or releasing the housing—a comfortable, positive and safe operation. In addition to the on/off switch, the variable-speed models by AEG, Porter-Cable and Bosch have a speed-change dial on the butt of the motor housing. While not as convenient as trigger speed control, it is still easy to reach and adjust.

Except for the Wen, which has a simple sliding on/off switch and no variable speed, the other in-line sanders have trigger speed-control switches, each with a small variable-speed dial in the center of the trigger itself. Ryobi puts a handy little “+ and -” above its dial, so you can tell which direction to turn it for higher or lower RPMs. Woodworkers with stubby fingers may find the Metabo's recessed dial difficult to grasp and turn. While the slowest speeds, given in the chart on p. 49, reflect the slowest dial settings

with the trigger fully depressed, the triggers themselves are variable-speed controls. In other words, the dial just limits top RPM; you can still start sanding gradually, which is great for sensitive work.

Dust collection

Because random-orbit sanders are capable of kicking up quite a bit of dust, many of the sanders incorporate some form of dust collection. A standard pattern of holes in the sanding discs allows suction, generated either by the sander's fan or a separate shop vacuum, to pull sanding dust literally through the disc. In addition, a rubber or plastic shroud that is fitted around the disc keeps the dust from escaping and connects to either a dust bag or a vacuum hose. The underside of Metabo's snap-on dust shroud is covered with short, stiff brushes that create a seal to improve dust pickup; while this also increased the stability of the sander, I found it to be kind of cumbersome. All of the machines that incorporate dust collection use the hook-and-loop sanding discs, except for the Porter-Cable models, which use pressure-sensitive adhesive (PSA) discs. While dust collection is optional for the Porter-Cable models, it is not offered for the Milwaukee, Wen or AEG models. If these models were to be used indoors, it would probably be a good idea to set up a kind of dust shroud around the sanding area to prevent the dust that's thrown out during sanding from being strewn around the room.

The Bosch 3283DVS, Ryobi and Metabo all come with dust bags, but each is a little different. The Ryobi's bag has a polyethylene frame with a molded-in screen. While its capacity is small, the bag is easy to unclip and empty, and it seems to catch most of the dust produced by the sander. The Metabo and Bosch 3283DVS employ canvas bags; Metabo's bag sticks out beyond the back end of the handle and occasionally got in my way. A bayonet-style mount keeps it securely in place and releases it easily for emptying, but sanding dust can fall back out of the machine if it's tilted head down (also a problem with the Ryobi). The plastic fitting on the

Bosch 3283DVS that attaches the bag tends to slip out; Bosch's 1370DEVS has an O-ring on the same fitting that keeps the bag in place, which is a nice touch. It's worth noting that with a piece of plastic pipe and some duct tape, a vacuum hose could probably be adapted to any of the dust-bag models.

The most complete dust-collection system for random orbit sanders is offered by Fein (see the center photo on the facing page). Its model MSf 636-1 sander features a rubber dust boot between head and disc and a large-diameter dust hose port. The German company even offers an optional shop vacuum that connects to the hose port. Although this shop vacuum (model 920 13) isn't exactly cheap at \$625, it is compact, quiet and features a special electrical outlet for the sander, which activates the vac automatically whenever the sander is switched on. Other features include an internal bag and a filter cartridge, for easier cleaning and collection of very fine dust particles.

Which sander to choose?

In case you've chosen not to read most of this article and have instead skipped to this conclusion, eager to follow my recommendations and buy the perfect sander, here goes. My favorite random-orbit sanders among the right-angle models included all three Porter-Cable models. The variable-speed 7335 and 7336 handled more smoothly than the single-speed 7334, and I feel they are definitely

worth the extra \$20 to \$25. I would also definitely buy the optional dust-collection system—it worked great. I also liked the AEG models, which were very smooth-running machines with great balance (with the optional bail-style front handles) and high-power motors. If I did high-production work in my shop and had the cash, I'd seriously consider either the Fein (with its companion vacuum) or the Bosch 1370DEVS. Both sanders are continuous-duty machines, exemplary of high-quality European engineering and construction; they were a pleasure to use.

While most in-line sanders aren't as powerful as their right-angle brethren, they are generally lighter and have more versatile handles that allow them to be operated overhead or on vertical or curved surfaces. In this group of machines, my clear favorite was the Bosch 3283DVS. Despite its small motor, it sanded aggressively with very little vibration, and it is truly a bargain for its low price tag. On the job site, I found myself reaching for the little Ryobi, which I felt very comfortable using with one hand. I also found that the machine worked just fine with 5-in. discs, which are more widely available than the proprietary-size 4½-in. Ryobi discs. While the Ryobi felt a bit underpowered to handle heavy work, it would probably be a great choice for hobbyists. □

Sven Hanson is a woodworker and professional carpenter in Albuquerque, N.M.

Putting your angle grinder into orbit

by Richard Danzey

Random-orbit sanders generally sell for nearly twice the price I paid for my right-angle mini-grinder. So my ears perked up when I saw an article for a random-orbit attachment (made by Marshco) designed to fit a right-angle grinder. I ordered the \$60 attachment, shown in the photo at right, directly from the manufacturer. When it arrived in the mail, I mounted it to my Black and Decker 4½-in. right-angle grinder, put on a 40-grit sanding disc, and tried it out by removing old paint from some doors. The Marshco was aggressive, controllable and effective.

The body of the Marshco attachment is machined from a solid, cylindrical aluminum billet. A sealed ball bearing pressed into an offset counterbore on the bottom of the cylinder carries a press-fit threaded insert for the threaded spindle on the unit's high-quality backing pad. A counterweight is riveted opposite the threaded insert, to help ensure a vibration-free operation. The backing pad accepts PSA-type sanding discs.

The Marshco mounts on the grinder's spindle via a threaded mounting hole centered on the top. Mine was threaded ⅝ in. dia. by 11 threads per inch (tpi), to fit my grinder, but units are also available to fit many other brands with 1.25 by 10 tpi metric-threaded spindles.

The attachment is speed rated up to 10,000 RPM, which matches the speed of my angle grinder. However, the instruction sheet suggested slower speeds in cer-

tain circumstances, such as for varnish or paint removal and sanding resinous woods, like pine. Since my grinder is only a single-speed model, I used my Variac, a variable transformer, to slow down the RPMs (you could also use a universal-motor-speed control, such as the one offered by MLCS). Speed reduction by this method makes overheating more likely, since the grinder's motor cooling fan also slows down, so more conservative use of the grinder is advisable.

I've been using the Marshco attachment for about a year, and overall I have been pleased with it. The biggest problem I've encountered was that the original ball bearing, which allows the disc to rotate, soon wore out, causing the attachment to run very rough. I replaced it with a higher-quality bearing. (Marshco is now using a better, fully sealed bearing, so this shouldn't be a problem.)

Should woodworkers who already own angle grinders buy a Marshco attachment in lieu of a dedicated random-orbit sander? Yes and no. If you need both tools, it's obviously less convenient to convert from one to another. Also, if your angle grinder has a single speed, then you'll need a speed controller to have the full range of random-orbit-sanding applications. But because the only compromise the Marshco makes is in ease of setup, not in use, it is a cost-effective way to get started.

Marshco's random orbit sander is \$59.95 plus shipping (RFD #2, Box 490, Brooks,

Maine 04921; 207-722-3523.) The attachment is also available from Woodcraft, 210 Wood County Industrial Park, PO Box 1686, Parkersburg, W. Va. 26102-1686. And AEG sells a random-orbit head called the Rascal. Variable-motor-speed controls are available from MLCS (PO Box 4053 FM, Rydal, Pa. 19046, 800-533-9298.) □

Richard Danzey is a woodworker and a gentleman farmer in Sunman, Ind.



The Marshco attachment on a body grinder is a cost-effective way to access random-orbit sanding. The attachment's backing pad uses PSA-type discs.

Computer-Desk Design

Keeping enclosed components cool

by Jim White

Ever since computers became small enough to put on a desk, there has been a need for well-designed computer furniture. But while computer technology has developed at a phenomenal pace, most computer furniture remains utilitarian at best. Although this mass-produced office-style furniture may be fine for a business work station, you certainly wouldn't want it in your living room. As more households acquire personal computers, there will be an increasing demand for furniture that matches a room's existing decor and also conceals all or most of the electronic components and wiring. The desk shown in the photo above meets those requirements.

If it weren't for the monitor, you wouldn't know this was a computer desk. Designed like a common writing desk, it has two side-pedestal cabinets that support the desktop and the bookcase above. But there are no drawers for paper, pens and file folders. Instead, the cabinets contain the computer's central processing unit (CPU), a fax machine, two printers and a keyboard.

I had been thinking about computer furniture design for several years, and so I was pleased when I received a commission that gave me the opportunity to use many of my ideas. After several meetings with my clients to determine the design, I enlisted the help of Lars Mikkelsen (a fellow professional woodworker) to build the desk. I usually work alone, but on large commissions such as this one (it also included a matching entertainment center), a second person in the shop helps to maintain momentum and mo-

rale. I had worked with Mikkelsen before, and I knew I could depend on him for the level of quality I wanted.

Design and construction

Making the desk match the room's traditional style was the first cabinetmaking problem posed by this project. I used hard maple for the cabinets, both for its durability and because its color matched that of an antique pine mantel in the room. Boards with knots, which would normally be discarded, were saved and used for door panels, adding a little character as well as matching the knots in the mantel. I also found a combination of molding cutters that matched the profile on the mantel's front edge and used them to shape the edge of the desktop.

On most desks, the two pedestal cabinets are tied together with a back panel and the desktop. However, as the design for this desk developed, several things came to light that made me question whether this type of construction would be adequate. First, the desk was to fit into a thickly carpeted alcove, but it was to be entirely freestanding—even held away from the back wall for ventilation purposes. In addition, the design called for flush-fit doors without applied face frames, which would normally add to the rigidity of the case work. Because of these requirements, I was concerned the combined weight of the computer components, along with the bookcase and its contents, would cause the cabinets to settle into the thick carpet and rack out of square, thereby causing the tight-fitting doors to bind in their openings.



To strengthen the pedestal cabinets, I set them each on a 4-in.-high base and joined the bases with a rigid 4-in.-high by 5 $\frac{3}{4}$ -in.-wide plywood box beam, as shown in figure 1 on p. 54. Between the pedestals, the box beam is covered with a baseboard; the space above the beam and behind a removable panel became the central wiring compartment, which contains the wires that run between the pedestals as well as the exhaust fan for the ventilation system (see the photo on the facing page). So that I could level the desk on the carpet's soft, uneven surface, I screwed an adjustable leveler to each inside corner of both bases. Access to the levelers is through screwdriver-size holes drilled in the cabinet floors. The levelers can be adjusted to level the desktop and to center the flush doors in their openings.

With these problems solved, I was still left with the biggest challenge in this project: designing the desk so all the computer components and wires would be concealed, even when in use, and yet still be adequately ventilated and accessible for adjustments, maintenance or repairs. The solutions to these problems can be applied to any computer furniture, so I will detail how I made everything fit and function.

Concealing the components

To plan for the pedestal cabinets' interior shelving systems, I began by measuring the computer equipment. Although I designed the interiors for specific equipment, all the pull-out shelves, as well as the fixed-shelf cleats were screwed—not glued—to the cabi-



A home work station doesn't have to be an eyesore of tangled wires and electronic equipment. The desk on the facing page conceals a computer's central processing unit, two printers and a fax machine.

The wires that run between the pedestals are hidden within the wiring compartment at the back of the knee space (left). A small, muffin-type exhaust fan near the center of the compartment ventilates the enclosed electronic components.

net sides to allow for changes if necessary. I placed the CPU on a fixed shelf, since the user only needs to have access to the disk drives located on the unit's front. But the other components are on pull-out shelves, like drawers, which run on Accuride brand full-extension slides (available from many hardware stores and mail-order suppliers). In hindsight, it may be a good idea to put the CPU on a pull-out shelf, too. This would make it easier to add circuit boards or to plug in accessories such as a mouse.

The printers in the right pedestal are each on a separate pull-out shelf in the completed desk, although that was not the original plan. The need for a flexible design was proven even before the desk was installed. A dot-matrix printer was to sit on the top shelf in the right pedestal cabinet with its paper feeding from the shelf below. I had planned to use full-extension slides on both shelves and connect them so they operated as one. However, midway through the project, my clients bought a laser printer with a self-contained paper feeder. This meant that the old printer could be used exclusively for printing checks. To accommodate the change, I disconnected the two shelves and placed the laser printer on the top shelf. The bottom shelf holds the old printer with enough room behind it for the check feeder.

The CPU and a fax machine are stored in the left pedestal. Above the CPU, at the very top of the cabinet, is a pull-out shelf for a portable typewriter. The fixed shelf for the

CPU is below the typewriter shelf, and below that is another pull-out shelf for a fax machine. The bottom of the left cabinet, below the fax, is for storage. On the door-hinge side of each cabinet, the extension slides are mounted on 1-in.-wide spacer blocks to clear the edge of the doors, which only open 90°. All the doors hang on Soss invisible hinges (see the sidebar on p. 55 for more about Soss hinges) and have non-magnetic touch latches. Magnet latches could interfere with magnetic data storage on the diskettes.

The keyboard tray looks like a typical pencil drawer, but its false front pivots up out of the way so the tray can slide out, as shown in figure 2 on p. 54. Each end of the false front is rabbeted to a triangular piece of plywood that pivots on screws in the cabinet's side panels. To reduce wear, a metal sleeve lines each triangle's pivot hole, and a fender washer fits between the triangle and the cabinet. When the front is up, it passes just beyond top dead center and rests against stops. In the down position, it rests against the keyboard tray. The tray itself rides on Accuride keyboard slides, which lock in the open position, and are suspended from spacer cleats screwed to the underside of the desktop.

The monitor is the only part of the computer out in the open. It is mounted on a pivoting steel platform like those used to hold a television in a hospital room (available from Pivotelli, division of Grant Product, Inc., 25 Commercial St., PO Box 560, Medford, Mass. 02155). The unit, which is bolted to the

back of the desk (see the photo above), has a pivoting arm that allows the monitor to tilt, swing and move forward or back, so it can be positioned nearly anywhere on the desk or be pushed into the corner when not in use. The monitor's wires run along the arm, through a 1-in.-wide space between the bulletin board and the plywood back, and then down to the wiring compartment between the pedestals. The wires for lights under the bookcase that illuminate the desktop also run behind the bulletin board.

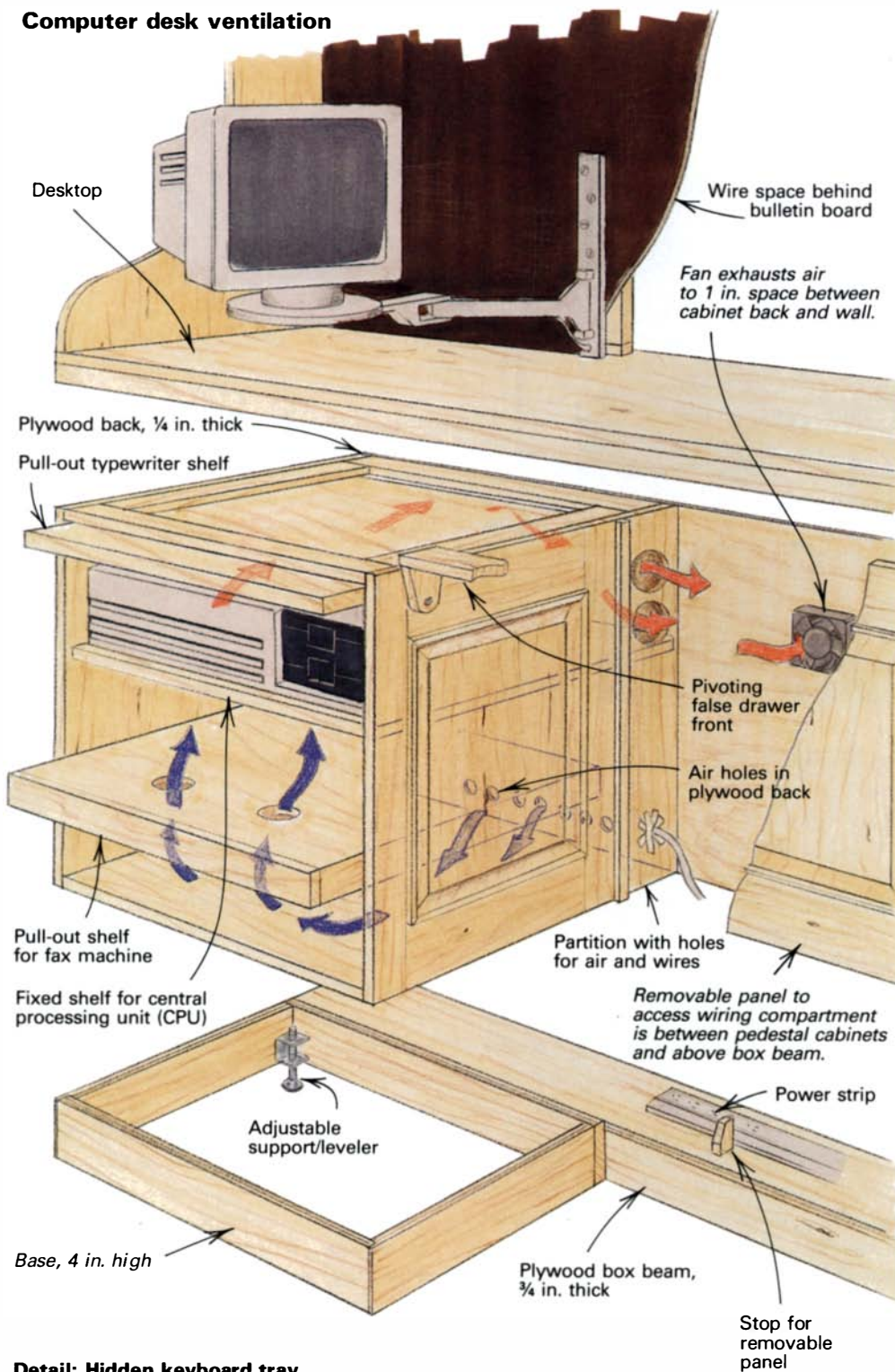
Concealing the tangle of wires

As I mentioned earlier, the wires that connect the various components run through the 5-in.-deep central wiring compartment (shown open in the photo above), which is behind the removable back panel and above the box beam that connects the pedestals. The bottom of the panel fits between the baseboard cap and two angled blocks screwed to the box beam and the top of the panel is held shut with a latch.

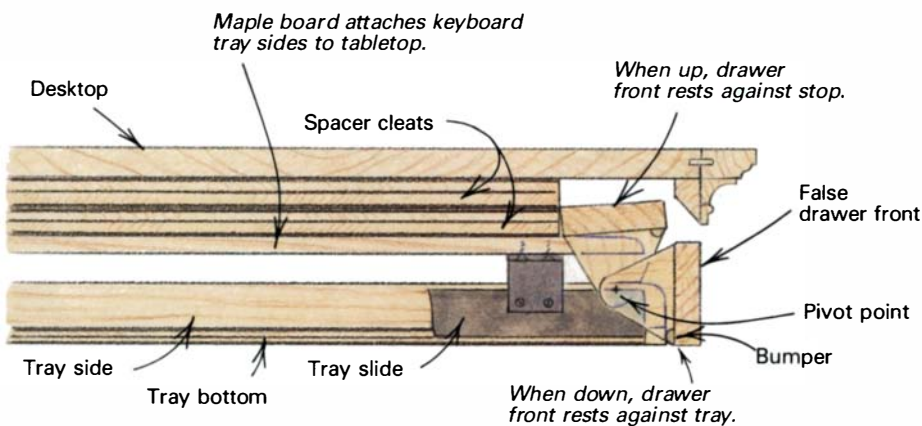
The wires from the components in the pedestal cabinets pass through 3-in.-dia. holes cut high in the plywood dividers on either side of the wiring compartment (see figure 1 on p. 54). All of the components are plugged into a power strip inside the wiring compartment. An illuminated on/off switch, which turns on the power strip (and therefore the entire system), is located just inside the left cabinet door.

Although most of the excess wiring is hidden in the central compartment, it is also necessary to have a loop of wire in the ped-

Computer desk ventilation



Detail: Hidden keyboard tray



estal cabinets for each of the components, to allow for movement of the pull-out shelves. The CPU, which sits on a fixed shelf, needs even more excess wire so the unit can be removed from the cabinet and set on the desktop when wires need to be unplugged from its back. The extra wire for the CPU can just sit behind the unit, but each loop of wires to the equipment on the pull-out shelves is held together with plastic tie wraps and then hung on the inside of the cabinet with small plastic strap hangers (hangers and tie wraps are available at electrical-supply stores). The plastic hangers are screwed near the top of the space between the shelves and halfway between the cabinet's front and back. The wires also run through another hanger that's screwed to the back corner of the shelf; this prevents excess wire from dangling between the back edge of the shelf and the back of the cabinet. This is essential because the shelves extend all the way to the back of the cabinet when they are slid in.

Ventilating the components

The ventilation system I designed for this computer desk is simple but effective (see figure 1 on this page). The air is moved by one quiet, 3-in.-dia. muffin-type exhaust fan (which I bought at Radio Shack) mounted in the center of the wiring compartment. The fan is plugged into the same power strip as the components, so it automatically comes on whenever the computer is turned on.

The key to the system is that the shelves (which fit snugly up against the cabinet back) and the wiring compartment dividers act as baffles that restrict and direct the air flow produced by the exhaust fan when the computer is operated with all the cabinet doors closed. Here's how it works: The exhaust fan creates a vacuum that pulls cool air from the space between the wall and the cabinet back into the pedestal cabinets through holes near the bottom of their plywood back panels. Because the shelves fit snugly in the back, the air then moves forward and passes up through holes near the front of each shelf. Since each component has a different ventilation requirement, I used different size holes to adjust the amount of air flow. After passing over each component, the air passes into the wiring compartment through the 3-in.-dia. wire holes in the top of the partitions that separate the pedestals from the wiring compartment. I covered the wire holes in the bottom of the partitions with tape so as not to disturb the established air-flow pattern. Finally, the air is exhausted by the fan. □

Jim White builds cabinets and furniture in San Francisco and Los Osos, Cal.

A versatile mortising fixture

by Lars Mikkelsen

The design of the computer desk in the photo on p. 52 that Jim White and I built called for a minimum of hardware, which meant no visible hinges. Although typical European-style hinges, like those made by Grass and Blum, are not visible from a cabinet's exterior, they are generally fairly bulky and would have interfered with the electronic equipment on the pull-out shelves. So as an alternative, we used heavy-duty Soss concealed hinges on all the doors.

Soss hinges (available from The Woodworker's Store, 21801 Industrial Blvd., Rogers, Minn. 55374-9514, and other mail-order woodworking suppliers) fit the bill because they are not mounted on the surface of either the door or the cabinet side, where they would take up precious space inside the cabinets. Instead, the two halves of the hinges fit into 1/2-in.-wide by 2 3/8-in.-long mortises in both the door stile and the cabinet side. Since the cabinets have no face frames, we had to mortise into the face of the edgebanded plywood sides as

well as the edge of the door stiles. I devised the router mortising fixture, as shown in the photo and drawing on this page, to accommodate both.

Although the fixture looks a little like a common router table, it works on a different principle. The workpiece is clamped below the fixture's tabletop and the mortise is cut by moving a plunge router's base between tracks on the tabletop. The mortise depth is set with the router's plunge mechanism; the width is limited by the diameter of the bit; and the length is limited by a fixed stop and an adjustable stop that fit between the tabletop tracks. If I want a mortise that's wider than one of my bits, I can move one of the tracks and make two passes. The fixture also has an adjustable fence on the underside of the tabletop for locating the workpiece in relation to the slot for the router bit, and an adjustable toggle clamp for holding the workpiece in place.

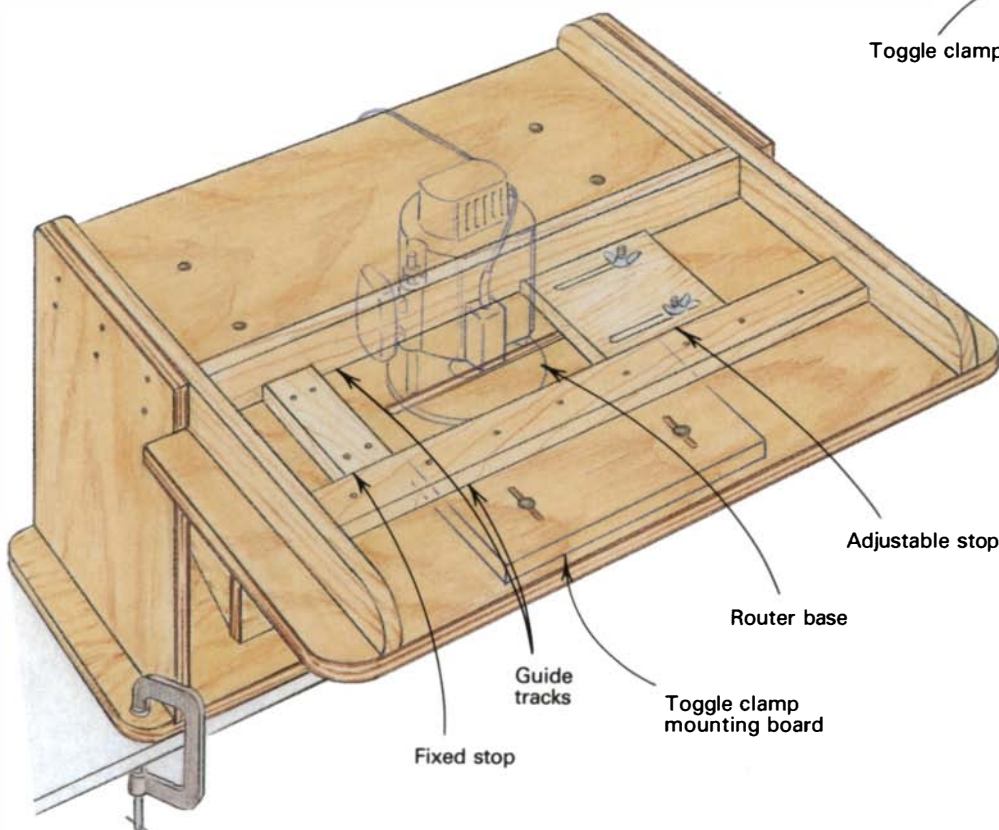
The fixture is quite versatile and accurate, which is essential for routing mating

hinge mortises. To rout a mortise in the edge of a narrow stile, I secure the stile to the adjustable fence with the fixture's toggle clamp, after aligning the mortise centerline with a line marked on the fence. I then slide the router from stop to stop in the tracks and progressively plunge the bit until it reaches the mortise depth.

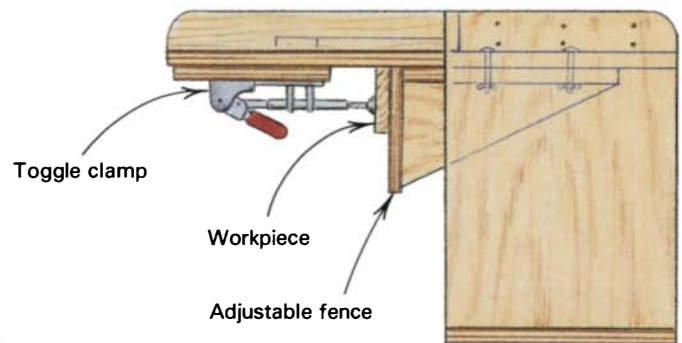
To mortise the edge of a completed door, I let the fixture's fence overhang the edge of the bench and then clamp the door to the fixture as I did the stile. To mortise the face of a wide panel, I remove the toggle clamp from below the fixture's table and C-clamp the panel to the tabletop. Because the front edge of the computer desk's side panels were radiused slightly, I moved the fixture's fence back somewhat when mortising them so that the face of the door would set back behind the curve of the radiused edge. □

Lars Mikkelsen builds cabinets and furniture in Santa Margarita, Cal.

A router mortising fixture



Detail: Side view



Mikkelsen's plunge-router fixture is versatile enough to cut mortises in edges of door stiles or assembled doors as well as in the face of wide cabinet sides.

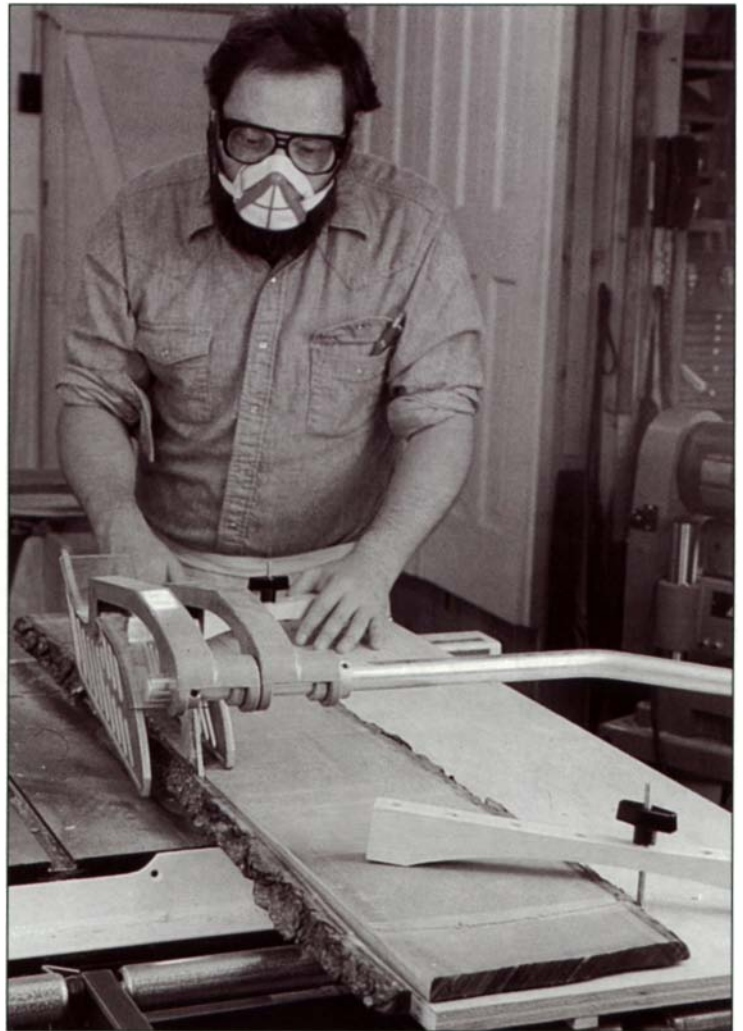
Stock Preparation

Dressing for success

by Mark Duginske

High-quality woodworking is dependent on accurate stock preparation. Marking and sawing tools are designed to work with wood that has flat, straight and parallel surfaces and perfectly square edges. If the stock is not properly dressed, you won't get tight joints no matter how well tuned your tablesaw or radial-arm saw is. Negligence and sloppiness in the early stages of a project will haunt you because each step in woodworking is dependent on the accuracy of the previous step.

Before I actually get into preparing stock, there is a safety issue to contend with: Machining rough wood is one of the most dangerous things you can do in woodworking (see the safety box below). Two components that create potential hazards are the unflat surface of the board and the internal tension within the wood. The tension may come from the growth process or the drying process. Usually, the greater the bow, crook or twist (see figure 1 on the facing page), the greater the internal stress. You can take precautions when flattening a warped board (this will be discussed later), but the more subtle danger is the difficulty of predicting what affect internal tension will have on a machining operation. When a board is ripped on a tablesaw, tension in the wood may cause the



For trimming one edge of a board straight on the tablesaw, Duginske made a simple jig from plywood with a runner on the bottom for the miter-gauge slot. Holes in the plywood and the hold-downs make the jig adjustable for any width board.

Safety tips for machining rough stock

JOINTER

- Always use the guard.
- Keep your fingers away from the cutterhead.
- Do not joint a board shorter than 12 in.
- If the board is shorter than 18 in. long, always use a push stick to keep your hand away from the cutterhead and to hold the wood down on the table while it is pushed past the cutterhead.
- Always run cupped or bowed boards concave-side down.

THICKNESS PLANER

- Don't plane a board shorter than 18 in.
- Rip cupped boards into individual lengths before planing.
- Don't stand behind a board in the planer, particularly when planing more than one board at a time.
- Keep the planer bed waxed or lubricated and free of chips.
- Don't try to remove too much in a single pass.

TABLESAW

- Don't rip warped boards on the tablesaw.
- If you must rip a board with internal tension on the tablesaw, use a short fence that extends just past the blade and a splitter. If possible, substitute a bandsaw for the tablesaw.
- Always use a push stick when ripping narrow pieces.
- Don't stand directly behind the blade when ripping.

two resulting pieces to spread apart or pinch together, both of which can cause a kickback. If you use the tablesaw to rip a board with internal stress, you should use a short, auxiliary fence that extends just beyond the blade and a splitter to keep the kerf from pinching shut. I recommend using the bandsaw for ripping warped boards because then if the wood pinches or spreads, it can't cause a kickback.

Planning your work and selecting your stock

Before you start cutting, it is important to have a clear idea of your project. Think of stock preparation as blending your design with the wood. Plans, working drawings and shopmade sketches will help you visualize the piece, and a cutting list will detail the number and size of the pieces you need. With the cost of good wood ever rising, it is best to make your mistakes on paper. Good plans and a cutting list are your ounces of prevention.

After you've finalized your plan, it is best to select the stock and prepare all of it at the same time. This will prevent confusion and make the whole process more economical in time, material and money. It also ensures uniformity in moisture content and finished dimensions. Selecting lumber is dependent on your immediate needs as well as your budget. The bigger the selection, the easier it is to pick pieces that match and work well together. If you are starting with roughsawn lumber, you should use a handplane or small power plane to remove enough of the sawmarks, so you can preview the grain pattern of each board. Then you can mark each piece from the cutting list onto the boards, so the grain will work with and not against the design of the finished piece. Always machine one or two extra boards in case you miscut a piece.

Preparing rough stock

Rough lumber is usually about $\frac{1}{4}$ in. thicker than its intended final dimension. This means a board that will be surfaced to a finished $\frac{3}{4}$ in. is usually cut to 1 in. or $1\frac{1}{8}$ in. thick at the sawmill and sold as $\frac{1}{4}$ stock. The extra thickness allows for shrinkage and warpage as the wood dries. That extra $\frac{1}{4}$ in. of material may seem like a waste, but the board may lose $\frac{1}{8}$ in. of thickness in the drying process. And if the tree had a lot of internal stress, even $\frac{1}{4}$ in. of excess material might not be enough to salvage a long, warped board.

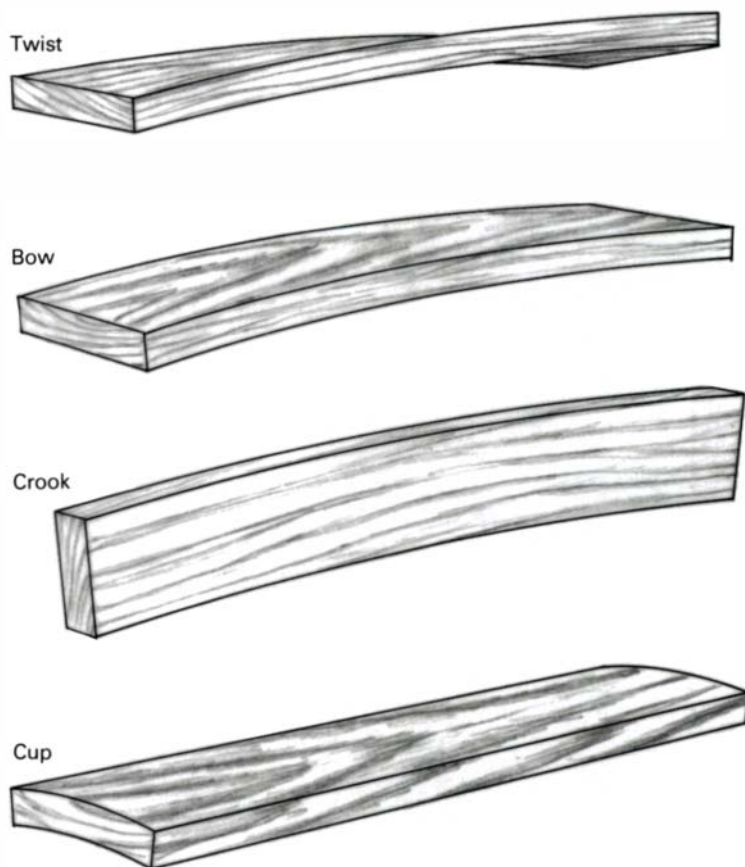
Usually boards are first cut close to length before surfacing (jointing and planing). When rough crosscutting, always allow an extra 3 in. or 4 in. of length for final trimming. However, if the parts list calls for short pieces, keep them in a longer form for planing and ripping, and then crosscut them to length last. A board that is about 48 in. long is the easiest to machine. Recently I had a maple tree bow and cup so much during the drying process that I was not able to salvage a long, wide board, and I was forced to crosscut it into shorter pieces and rip them into thirds before planing (see the center photo on the next page). This is a good strategy for utilizing your worst warped rough stock, and you should keep it in mind when you assess your woodpile.

You have two options when cutting the stock to width: you can surface it first or rip it first. It is quicker to do the jointing and planing first, but your stock may not allow that. For example, if you have a flat, 7-in.-wide board and you want three 2-in.-wide pieces, you can surface the board to create a straight, flat product and then rip the 2-in. boards out of the one. However, if the board is cupped, it is best to rip the board into individual lengths, and then surface and plane them individually to their final thickness.

Determining grain direction before surfacing

When using a surfacing tool, either a jointer, planer or a handplane, it is important to cut *with* the grain rather than against it.

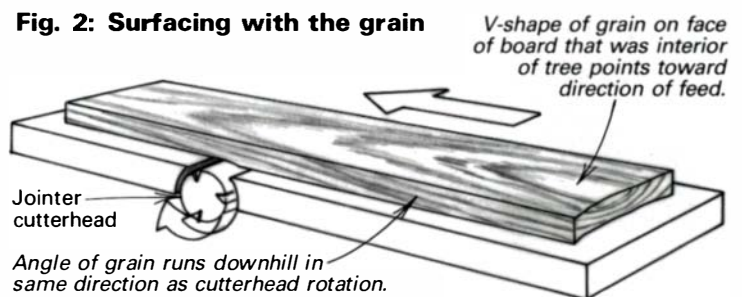
Fig. 1: Glossary of board distortion



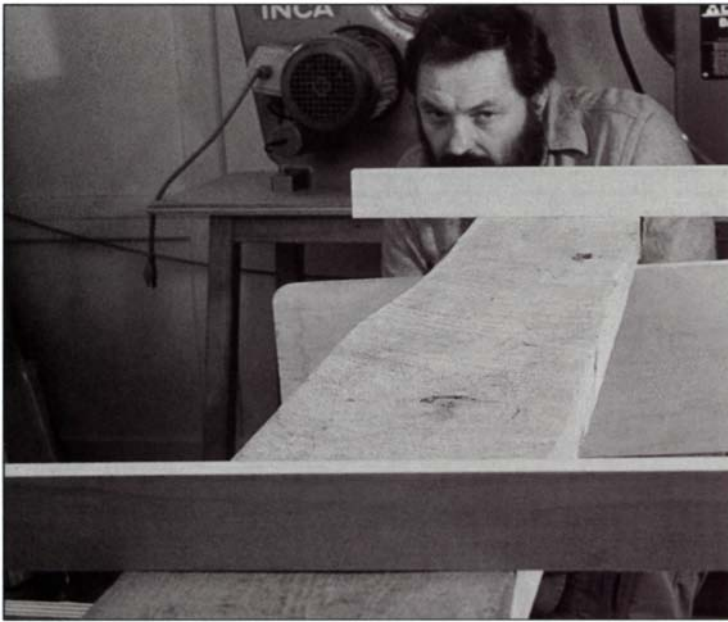
Grain is the inclination of the growth rings. Cutting from the proper direction will leave a smooth surface, but cutting from the wrong direction will lift up or tear out the grain, leaving a rough surface with potentially deep pockmarks. A good analogy of grain direction is patting the hair on a dog. Stroked from head to rear, the hair lies flat, but stroked from rear to head, the hair raises.

The standard approach to determine grain direction is to observe the edge of the board to see which way the grain is running (see figure 2). However, this can be time-consuming when you have a lot to plane. Another option is to use the V-shaped figure on the surface of the board that faced the inside of the tree. (You can determine the inside face by looking at the growth rings on the board's endgrain.) When you look at the inner surface, the V-figure usually points in the direction that the board should be fed through the tool. The V-pattern will point opposite the grain direction when you look at the outside face of the board. The saying to describe this is "inside with, outside against." Of course, woods with distinct grain, like oak, are easier to read than plain-grain woods, like birch or maple. To complicate things further, it is not

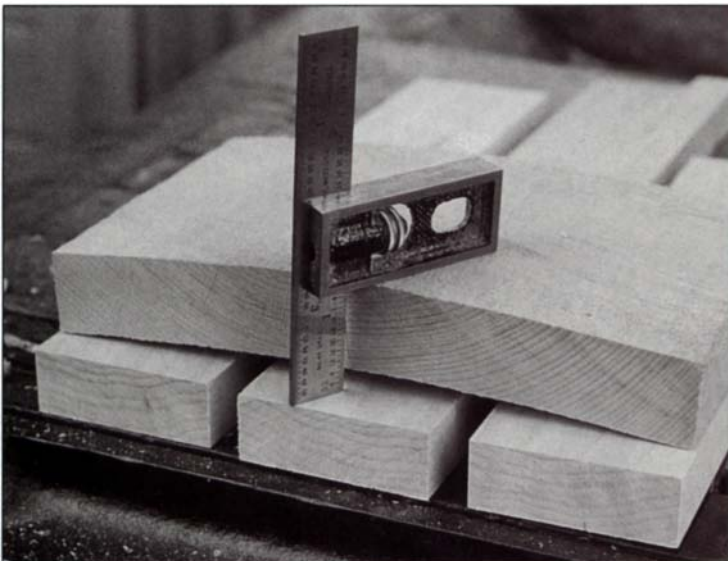
Fig. 2: Surfacing with the grain



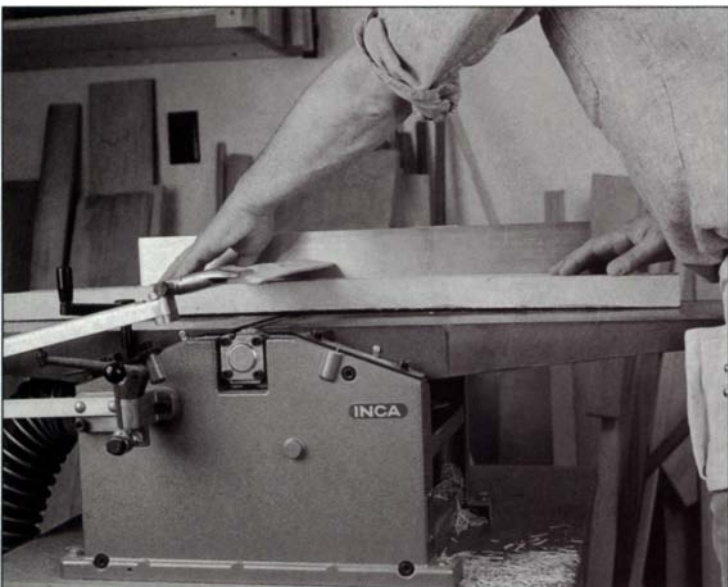
When running this board through planer, cutterhead is above board so opposite face should be down on table.



Winding sticks are used to test for twist (or wind) in a board. Any twist can be detected by sighting across the tops of two sticks with parallel edges placed near the ends of a board.



Badly cupped boards must be ripped before surfacing. This wide, maple board was ripped into thirds before final milling.



Bowed or cupped boards should be run with their concave side down on the jointer to prevent the board from rocking.

unusual for grain to change direction within a board. So, when it is difficult or impossible to determine grain direction, you can take your best guess, make a light first pass and then observe the results: If there is too much tearout, flip the board end for end before the next pass.

Surfacing rough stock

The goal when surfacing rough stock is to remove the waste from around the finished board. The first step is to face-joint one side to make it flat. This side will become the straight-and-flat reference for planing the opposite side parallel and for jointing or ripping the edges square.

Face-jointing—When you are face-jointing a cupped or bowed board, the concave side should rest on the table; this means that each end of the board will touch the jointer table, as shown in the bottom photo on this page. Having the concave side down will minimize any tendency of the board to rock from side to side as it is cut. The ends of the board are jointed first, and each successive pass over the cutterhead removes more material until the surface is flat. You can tell when the surface is flat by listening for the uniform sound of the cutter as it removes material along the length of the board.

A board that is twisted is harder to face-joint because it will have a tendency to rock diagonally back and forth on the table. The traditional way to check for twist is with a pair of winding sticks (as shown in the top photo at left). Winding sticks are two identically dimensioned pieces of wood that are set on opposite ends of the board and sighted across. You can see any deviation out of plane by comparing the top edge of one stick to the other. Identify the high, opposite corners on the board, and make successive light passes over the cutterhead until the board rests flat on the table. Don't be too aggressive and remove too much material from the offending corners. If the warp is severe, I remove excess material with a scrub plane before jointing (see *FWW* #90, p. 65 for more information on scrub planes).

Working with the jointer can be dangerous, but there are steps you can take to make the operation safer (detailed in the safety box on p. 56). Most importantly, when jointing short boards, always use the guard and a push stick/hold-down, as shown in the top photo on the facing page.

Thickness planing—After you have face-jointed one side of the board, you are ready to make the other side parallel using the thickness planer. The jointed side is laid flat on the planer table, and, as the board passes under the cutterhead, it is planed to a uniform thickness. After the rough upper surface is entirely planed, which may take several passes, you should flip the board over and plane the side that was face-jointed because the finish from the planer is usually better than the finish from the jointer. Plane all boards of the same desired thickness at the same time, and run every board through at each setting before raising the table for the next pass.

Check the planed boards to see that they have remained straight. Occasionally, a board may bow because planing releases tension in the lumber. If a board has bowed, rejoin the concave side, being careful not to remove so much material that the finished product will be thinner than desired, and run all boards of that thickness through at the final setting.

Not only can jointing and planing release tension in the board, but this process will expose the interior of the board, which may have a different moisture content than the outside. The fresh surfaces may either release or absorb moisture, thus the board may

resume the distortions that it originally went through during the initial drying. For this reason, many experienced woodworkers allow the wood to “settle” by beginning the stock-preparation process and then allowing the wood to stabilize in the shop environment for a few days to a month. The wood is cut to size, planed about $\frac{1}{8}$ in. oversize, and then stacked with stickers between each board, which allow air to pass around the boards to ensure they reach equilibrium with the environment. After the boards have reached equilibrium, they are surfaced to final dimensions to remove any warp that occurred during the settling process.

Squaring the first edge

After both sides of the board have been surfaced to thickness, the next step is to square one edge on the jointer. If the board is crooked and the edge is out of line by more than $\frac{1}{4}$ in., it is faster to saw the edge off before jointing. And if the edge is rough, you must cut it off. One way to do this is to nail a straightedge to the board and cut the piece on a bandsaw with a rip fence. Alternatively, you can snap a chalkline on the board's surface and bandsaw close to the line without a fence. If you don't have a bandsaw and the piece must be ripped on a tablesaw, use a jig like the one shown in the photo on p. 56. A runner that rides in the miter-gauge slot is screwed onto the bottom of the plywood carrier board, and hold-downs secure the workpiece. After the edge is cut straight, it can be finished on the jointer.

Before edge-jointing the boards, check that the jointer fence is squared with the table by using an accurate square next to the cutterhead. When jointing, it is important to keep pressure down against the table and inward against the fence and to avoid passing your hands directly over the cutterhead. After you have edge-jointed the first two boards, check them for square by laying them on a flat surface and putting the jointed edges against each other.

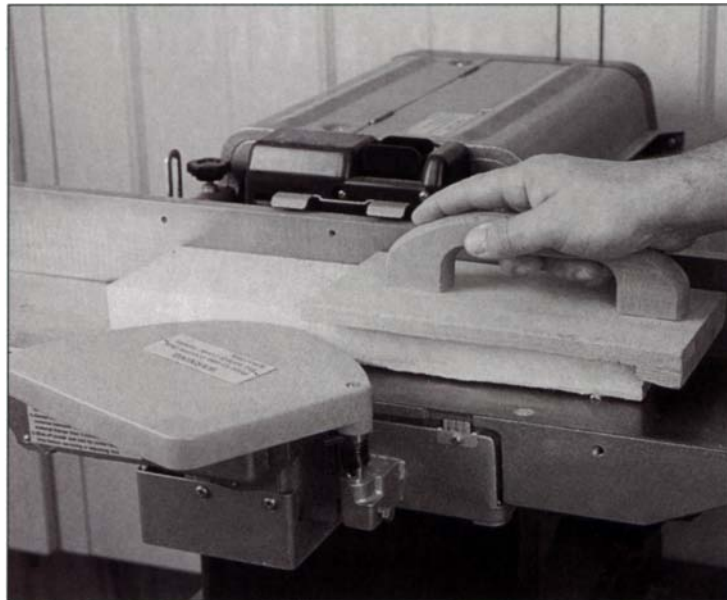
Cutting to width

After surfacing both sides of the board and jointing one edge, you're ready to rip the board to width. The first step is to cut the board on the tablesaw with the board's freshly jointed edge against the fence. However, the blade will leave sawmarks that must be removed before gluing or finishing, so when setting the distance between the rip fence and blade, add about $\frac{1}{16}$ in. for cleaning up the edge on the jointer later. If it takes more than a couple of passes on the jointer, the board's edges may no longer be perfectly parallel to each other. On wide boards this discrepancy is so minor that it usually isn't a problem. However, on boards less than 4 in. wide, such as cabinet face-frame members, it is advisable to make a final cleanup pass on the sawn edges with a thickness planer, especially if you have a planer without bed rollers, which leaves a smoother surface on boards planed on edge.

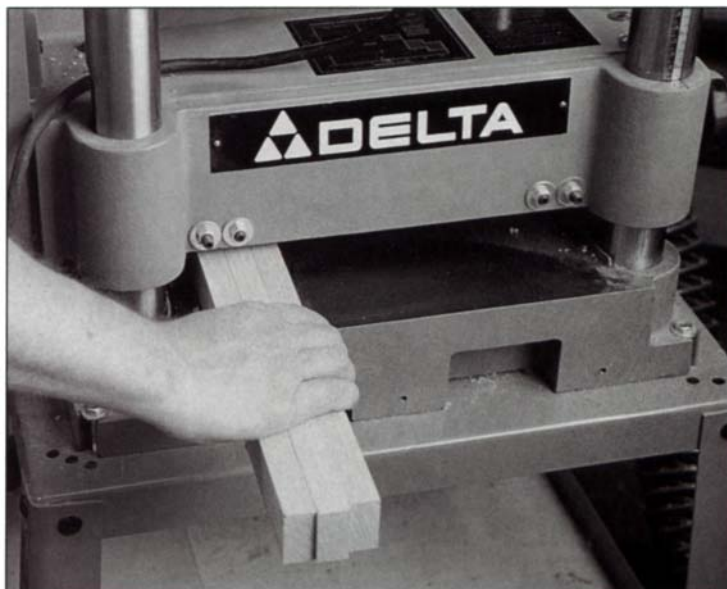
If you are finishing the edge of the board with the planer, run three or four pieces at a time. Hold the group together as they are fed through the planer, as shown in the bottom photo, to prevent individual pieces from tipping. After jointing or planing, double-check to make sure that both edges are square using the test described earlier. Another option for cutting a board to width is to rip the board on the bandsaw and then finish the edge with the planer. This approach is particularly desirable with short, narrow boards because it is much safer to rip this size board on the bandsaw than on the tablesaw.

Cutting to length

When the board is surfaced on all four sides, the last step is to crosscut the two ends. The first cut establishes one square end, and the second cut is to the desired length.



Jointer push sticks also hold the board down on the table and should always be used when jointing short boards.



Narrow boards can be run on edge through the planer to ensure that they are all the same width. Always run several boards at a time, and hold them tightly together.

The tablesaw can be used for crosscutting with either a miter gauge or a sliding crosscut box. (For more information on crosscut boxes, see Kelly Mehler's article in *FWW* #89, pp. 72-75). A radial-arm saw and miter saw are handy alternatives if you are crosscutting pieces longer than 48 in. If more than one board is cut to length, it is best to use a stop, which can be as simple as a piece of wood clamped to the miter gauge or the fence. If you use this kind of stop, it is a good idea to bevel the stop's bottom corner, or clamp the stop slightly above the saw table to keep sawdust from building up against the stop and affecting the length of cut. Some commercial stops are designed to flip out of the way when they are not in use. This design has the advantage of instant repeatability if more pieces of a desired length are needed. □

Mark Duginske is a woodworker in Wausau, Wisc., and contributing editor to FWW. This article was adapted from his forthcoming book, Mastering Woodworking Machines, to be published in April by The Taunton Press, 63 S. Main St., PO Box 5506, Newtown, Conn. 06470-5506.

Turning a Rustic Birdhouse

A natural attraction for feathered friends

by Andrew Barnum



The rustic, natural-bark birdhouses shown here, are simply branches hollowed out on a lathe with turned bottoms. Beeswax seals the exterior surfaces and secures the roof to the body. Also shown are the decorative, complex structures, with coopered bodies and stack-laminated roofs, from which the organic birdhouses evolved.

The first birdhouses I made were highly decorative, non-functional structures. Because birds have often been portrayed as symbols for freedom and vulnerability, I felt that these birdhouses served as a metaphor for man's caring about nature. Symbolically, I was showing my concern for the birds and their importance in our environment.

But I realize birdhouses are normally made to be used. The rustic, functional birdhouses, shown in the photo above with some of my decorative birdhouses, are a nice balance of beauty and utility. Although they are minimally worked, the rustic birdhouses are examples of form following function. By resisting the urge to embellish them, I strove for a simplicity similar to that found in Shaker artifacts. The natural textures blend into wooded settings; eventually, the birdhouses weather and disappear into the landscape.

Selecting the wood

Turning rustic birdhouses on a lathe requires simply hollowing out the body and shaping the bottom and the roof. There is one

problem area, however. Since the pith is left in the roof and bottom, checking and cracking can occur. A handful of woods, including cedar, pepperidge, ash and catalpa, will check very little, even with the pith. When turning green wood, I've been able to control checking fairly well by placing the finished piece inside double paper bags. The bags absorb moisture from the wood and provide a humid atmosphere, allowing the wood to dry gradually, thus reducing the risk of checking. To keep the bark intact, it is best if the tree or branch is cut in the fall or winter after the sap is down.

The dimensions of the tree or branch needed for the birdhouse will depend upon the type of bird that will be residing there. The size of the interior cavity, the diameter and location of the entry hole, and even the distance above ground that the house is hung will affect the suitability of a birdhouse for a particular species of bird. The U.S. Department of the Interior, Fish and Wildlife Service conservation bulletin #14, *Homes for Birds* (publication #024-010-00524-4), provides requirements for a variety of species. (The bulletin is available for \$2.50 from the Superintendent of Docu-

ments, U.S. Government Printing Office, Washington, D.C. 20402.) It is a good idea to consult the bulletin before embarking on any serious birdhouse construction.

After selecting an appropriate-size branch for the body of the birdhouse, I pick another section that is 1 in. to 3 in. larger in diameter for the roof. I allow an extra 2 in. or 3 in. in length on both of these blanks for truing up the ends for faceplate mounting and for the mounting screws.

Hollowing the body on the lathe

These log section blanks tend to be out of balance and may throw off hunks of bark, so I run my lathe at its slowest setting. I consider 600 RPM to be the maximum speed for this type of work. I stand to the side when I first turn on the lathe, ready to turn it off again at the first sign of trouble. If the bark is stable and the lathe isn't bouncing across the floor, I proceed with the turning.

After truing up the ends between centers, I center and mount the bottom of the blank to a 6-in.-dia. faceplate with 1/4-in.-dia. by 1 1/4-in.-long lag screws. I drill a 1/2-in.-dia. hole to the full depth of the interior cavity to serve as a depth guide for hollowing out the blank. Because I'm cutting into endgrain (the grain direction is parallel to the axis of the lathe), I've found that the normal technique of working from the edge toward the bottom is more difficult and produces a lot of tearout. The depth hole makes it easier to work from the inside out, as shown in the photo at left. To reduce tearout, I use a hook tool patterned after some vintage production tools. Pre-World War II piece-rate turners relied on the rapid cutting action of these tools to turn out large volumes of souvenirs for Adirondack and Catskill tourists. Sorby Tools, Ltd. makes a ring tool (available from Constantine, 2050 Eastchester Road, Bronx, N.Y. 10461) that also cuts well and might be easier to use than a hook tool. I leave the interior rough-turned to prevent some poor bird from getting trapped inside. Before repositioning the blank to shape the bottom, I turn a 1/4-in.- to 1/2-in.-long lip around the top edge that will mate with a recess turned into the roof, as shown in the photo at right.

Turning the bottom of the body

After unscrewing the body from the faceplate, I screw on a waste block with a larger diameter than the birdhouse and turn a groove in the block to match the lip turned into the top of the body. The lip should fit tightly into the groove so that the body can be jammed onto the block for shaping the bottom. Supporting the body with the tailstock, as shown in the center photo, provides an

extra measure of safety. I turn away the screw holes and shape the bottom, trying to keep a uniform thickness to reduce the chance of checking. I leave about a 1/8-in.-dia. spindle where the tailstock supports the bottom until I've finished shaping and sanding it. Then I saw through the last bit of waste with the lathe turned off so the turning doesn't fly off.

Turning the roof

I turn the roof of the birdhouse the same as I did the body by mounting it on a faceplate and turning the inside first. Before dismounting it to turn the outside of the top, however, I turn the recess that fits the lip on the top of the body (shown in the photo at right). The fit should be somewhat loose so that the roof doesn't crack if it shrinks on the body. I also turn the exterior of the roof in the same way as the bottom of the body by jamming the roof onto a faceplate-mounted block, with additional support from the tailstock. Too tight of a fit, however, might crack the roof. I have found that a spindle gouge works fine for finishing up the outside surface of the roof, but if you are adventurous, you could use a skew.

Beeswax secures the roof and finishes the birdhouse

Because birds can be highly sensitive to the volatile organic compounds found in many finishes, I use melted beeswax. Although I haven't tried any of the newer water-base finishes, they might also be a viable alternative. I finish only the exterior surfaces of the roof and bottom with the wax by melting the wax in a double boiler and then brushing it on. When the wax on both the roof and the bottom is hard, I secure the roof by inserting the lip of the body into its recess and then inverting the birdhouse. Next, I dribble melted wax into the crack between the body and the roof. This method forms a secure seal that prevents wind and rain from getting into the birdhouse, yet it still allows the roof to be easily removed for annual spring cleaning. To mount the birdhouse in a tree, I first drill a hole through the back of the birdhouse. Then, with a 3-in.-long screw on the end of a long magnetic screwdriver, I fasten the birdhouse to the tree, working through the entry hole. I use a mounting block between the trunk or branch and the body of the birdhouse to provide enough clearance for the roof overhang. □

Andrew Barnum is a woodturner in Carmel, NY. He is also co-founder and president of the Nutmeg Woodturners League, a local chapter of the American Association of Woodturners.



To hollow out a birdhouse, the author first drills a 1/2-in.-dia. hole for a hook tool, so he can work from the center toward the edge to avoid cutting into the endgrain.



Turning the bottom of the birdhouse to a uniform thickness helps prevent checking. The blank is mounted on a jam chuck and supported between centers.



A lip turned on the top edge of the body fits into a recess turned into the underside of the roof. Beeswax is used to seal and protect all exterior surfaces.



As real as it appears, this photo of Po Ku's "Hawksmoor" desk and computer cabinet was created and printed on a powerful computer system called Alias. Ku initially made drawings of the desk using CAD software on a personal computer. Then the data was fed into the Alias system, which animated the three-dimensional image, rendering realistic wood grain, metallic and painted surfaces, and shadows.

Computers in the Shop

From microchips to wood chips

by Sandor Nagyszalanczy

If you bought a personal computer years ago with dreams of using it to educate your children or balance the family budget, chances are that microchip-minded marvel has seen more action propelling heroes through game mazes. But if you're a woodworker, it's probably time to consider reclaiming your computer from the kids and putting it to work in the woodshop. Today woodworkers can use computer devices and programs to perform design and construction tasks undreamed of a very few years ago.

Many full-time woodworkers have been using computers in their businesses for years, doing bookkeeping, preparing job estimates and client correspondence, yet affordable computer technology has also become available to the amateur woodworker.

While advanced computer-aided design (CAD) systems are replacing drafting tables in professional shops, personal computers and inexpensive drawing and drafting programs are helping hobbyists design more complicated projects. And affordable computer-aided manufacturing (CAM) devices, like computer-numerically controlled (CNC) routers, have started to appear in small, one-man businesses—for custom work as well as for production.

Even though this article isn't a comprehensive survey of computer software or hardware, it will give you some idea about how woodworkers are putting modern computer technology to work in their shops and businesses. Perhaps you'll want to take a trip to your local computer store—on your way back from the lumberyard. —S.N.

A computer's image of furniture

Even if you're really good at visualizing a piece of furniture in your mind's eye, you must have had occasions when you wished for a more concrete representation before actually making a model or building the piece. Drawings are helpful, but imagine having a realistic photograph of a piece of furniture that doesn't yet exist. That is exactly what you're being shown in the photo on the facing page. That photograph of Canadian furniture designer Po Ku's "Hawksmoor" desk and computer cabinet was generated by a sophisticated workstation computer system called Alias. Ku, owner of Quess Furniture in Toronto, Ont., and designer of high-end custom furniture, used Alias's computer imagery to refine the design for his elaborate wood-and-metal office furniture in lieu of developing expensive prototypes. He also used the image generated by Alias as a sales tool. With it he was able to sell his client on the furniture series before actually building the first pieces.

The process started not on a computer, but with pencil and paper: Ku drew many sketches before he arrived at his basic design. He then used a computer-aided drawing program (see "Computer-aided design" by Pete Conway on the following page) run on a personal computer to create a three-dimensional line drawing, also known as a "wireframe." Ku then used the CAD program's editing functions to modify the piece's curves and proportions and to refine any and all details.

For the next step, Ku contracted with Design Vision, a communications company in Toronto, to rent time on the Alias system. A complete set of CAD drawings was then used by a programmer to input all the initial coordinates that would define the furniture forms in Alias. It took the programmer approximately three days to input all the information before the machine could turn the wireframes into images with realistic surfaces and shadows. The actual running of the program took only about an hour. Then, refinements were made to the image as Ku and the programmer looked at the screen. Ku had brought along samples of the materials the furniture would be made from: pearwood, Australian lacewood, aluminum and colored metallic lacquer, and they tweaked the program to reproduce these colors and textures to match the originals. Once they were happy with the rendering,

Alias output the data to a special printer that created a photographic-quality image directly on a 4x5 color transparency.

Amazingly, Ku used only a fraction of Alias's potential for simulating reality. All aspects of the "Hawksmoor" furniture—wood grain, lacquer sheen and fine details—could have been rendered even more realistically, but for a much higher price. Some of the most sophisticated work done on the Alias system includes modeling for the animation sequences in last summer's Arnold Schwarzenegger movie, *Terminator 2: Judgement Day*. —S.N.

Panel optimization programs

While expensive workstation computers may be reserved for professionals, there is lots of personal-computer software on the market that's useful and affordable to most woodworkers. If you've ever built a kitchen using expensive hardwood-faced plywood for the carcasses, you've probably spent hours trying different schemes to lay out the parts with the least waste. But put that pencil to rest: there are two low-priced computer programs that will help you develop an efficient cutting scheme. The first, Plywood Planner, which retails for \$29.95, can economically lay out up to 50 pieces on a single sheet; its more powerful brother Casp'er (Computer Aided Sheet Planner) retails for \$149.95 and can handle up to 250 pieces and 50 sheets. The programs, designed to run on an IBM PC, XT or AT (or compatible) were developed by Roger Drummond and are sold through The Woodworkers' Store (21801 Industrial Blvd., Rogers, Minn. 55374-9514).

Both programs come on either a 5¼-in. or 3½-in. floppy diskette and run with either a color or monochrome monitor (a standard graphics card is required). They share many basic features: You can specify the size of your plywood sheet (up to 145 in. sq. in Casp'er; 165 in. by 61 in. in Plywood Planner) and the thickness of the sawblade's kerf in thousandths of an inch, which the program figures into the layout. The dimensions of each piece, which must be rectilinear, are entered into a piece list; Casp'er allows you to note part descriptions and allows identically dimensioned pieces to be entered as a group (see the top photo at right). Fractions must be entered as decimal numbers, which can be

specified down to sixteenths of an inch or in metrics down to millimeters. After the piece list is done, either program computes and then displays a layout diagram showing each piece identified by number and economically arranged on the sheet, as shown in the bottom photo (subsequent sheets in Casp'er are displayed separately). Each layout diagram as well as a list of pieces for that sheet can then be printed out for use during cutout in the shop. Pieces the program can't fit on the plywood are transferred to another list. Casp'er's multisheet capacity is intended for the professional cabinet shop, cutting out parts for kitchens or large casework. Additionally, Casp'er allows storing the layout on diskette and includes more sophisticated optimization programs for adjusting the arrangement of pieces to best suit the job.

In an office full of computers, I did have a hard time finding a machine that had exactly the right internal configuration to run either program correctly. But once running, I found both programs easy to use. Since they are self-prompting (messages appear on the screen suggesting which keys to press to advance to the next step at



Casp'er, a panel-optimization program, produced the colorful parts list and cutting layout above. The user enters a list of plywood pieces and their dimensions (top photo), and then Casp'er economically arranges the pieces on a plywood sheet(s) and produces a layout diagram (bottom photo).

any given time), I could wade through the numerous program menus without having to delve into their skimpy manuals (Drummond has amended Casp'er's manual with a much-needed tutorial). When entering data in the piece list, I found it annoying to not be able to scroll backwards to fix a mistake; the piece must be re-entered correctly and the erroneous one deleted via commands from another menu. I also tried planning a whole kitchen's worth of parts with Casp'er and found it inconvenient that the program rennumbers parts sequentially on each sheet—out of their original order on the original piece list. Therefore, you must print out each sheet's new piece list with its layout diagram—separate operations that I found time consuming. I also had to fiddle around quite a bit to get the best performance from Casp'er's optimizing functions. But the program does allow you to handle special situations such as finding out how big a sheet you'd need to fit all the pieces for a job. —S.N.

Computer-aided design

by Pete Conway

To work out the details of finished pieces before construction begins, I explore ideas through drawings. I use a personal computer set up with a computer-aided design (CAD) program. Besides being invaluable for developing a clearer idea of a piece's lines, proportions and construction details, a computer-generated drawing can help you sell a client on your ideas. And once your design is done, CAD programs that are part of many cabinet shop's software systems, such as Cabinetware or Cabinetvision, have peripheral programs enabling you to print out a precise bill of materials.

Software and hardware: A typical CAD system consists of both a CAD software program and the hardware needed to run it. Software ranges tremendously in price: Full-featured programs, like AutoCad and Cadkey, designed for advanced users like engineers and architects, can cost \$3,000 or more. However, for less demanding users, such as hobbyists, simpler CAD programs and generic drawing and drafting software are available for less than \$100. Each program has its own compatibility requirements, not only regarding the brand, model and memory capacity of the computer, but also the printer, monitor and

other peripherals. (Ask your software dealer about compatibility, as well as future program upgrades.)

While most inexpensive CAD programs will run on a very basic computer, more complicated drawings, like the three generated on AutoCad shown on the facing page, will require more elaborate hardware. Such a system, which will set you back anywhere from \$1,500 to \$3,000, should have a powerful central processing unit (CPU). In the IBM and compatible world, that means an 80286 or 80386 chip, and at least 640K of random-access memory (RAM). For large or complicated drawings, you need a hard disk drive, which allows you to access and store your drawings faster. A numeric coprocessor chip (sometimes called a math coprocessor) installed in the CPU considerably speeds up its ability to do the calculations necessary to render complex drawings.

You'll need a mouse for making the multitude of cursor motions that create and alter your drawings, as well as for selecting program functions. CAD programs can run on a color or monochrome monitor, but in either case, the computer should contain an EGA, VGA or better graphics card, or else curved parts of your screen drawings will be too jagged and crude looking. Color also allows you to assign various hues to different parts of a complicated drawing, for better clarity. If you wish to import designs from paper drawings or plans, you'll want to add a digitizing tablet, which allows a drawing to be laid over a pad with an electronic grid in it and traced with a pen-like stylus (you can also use the pad to draw freehand). For highest-resolution printouts of plans or drawings, plotters are best. These are devices that use ink-filled pens to print on large sheets of paper. But some programs are also capable of producing reasonable looking drawings on less expensive ink jet or dot matrix printers.

Drawing with CAD: I often use my CAD system to prepare accurate plans of cabinets and furniture and dimensioned drawings for parts to be constructed. I've found that the computer allows me to draw my ideas, using the mouse or digitizing tablet to create lines and curved forms on the screen and then to edit them as I see fit. Editing includes tasks such as moving sections of a drawing around the screen, changing the size or proportion of a form, adding or deleting parts, and typing in titles, instructions and dimensions. Certain CAD editing functions can save a tremendous amount of time, such as when drawing a symmetrical cabinet: I draw only half the

cabinet and then instruct the program to create a mirror image for the other half. This not only saves time, but also helps avoid mistakes. When you do make a mistake, the program allows you to delete all or part of your design (thank heavens for that!). Some CAD programs allow you to work in layers, like transparent overlays. You can draw the carcass of a cabinet as one layer, the plinth as a second layer and raised panel doors as a third. I've found this can make deciphering a complicated structure easier, and it allows me to produce a detailed drawing of just that one component if need be. But CAD programs aren't magic. You cannot expect the software to produce a detailed drawing unless you first tell it what you want. And telling it what you want involves familiarity and experience using the program—just like woodworking, you have to practice.

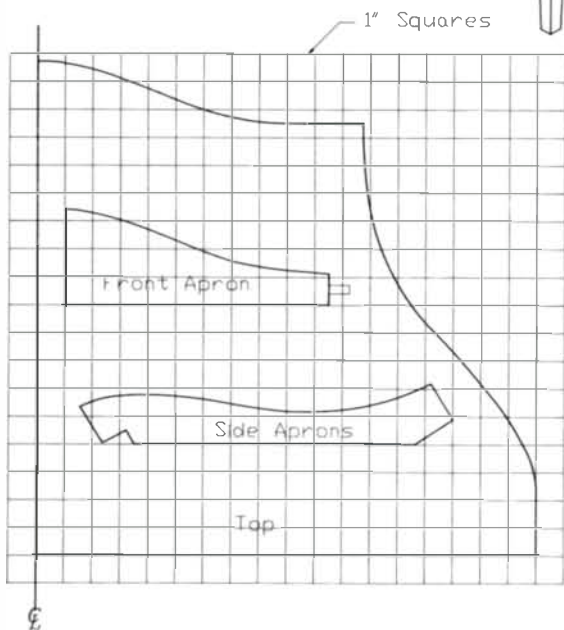
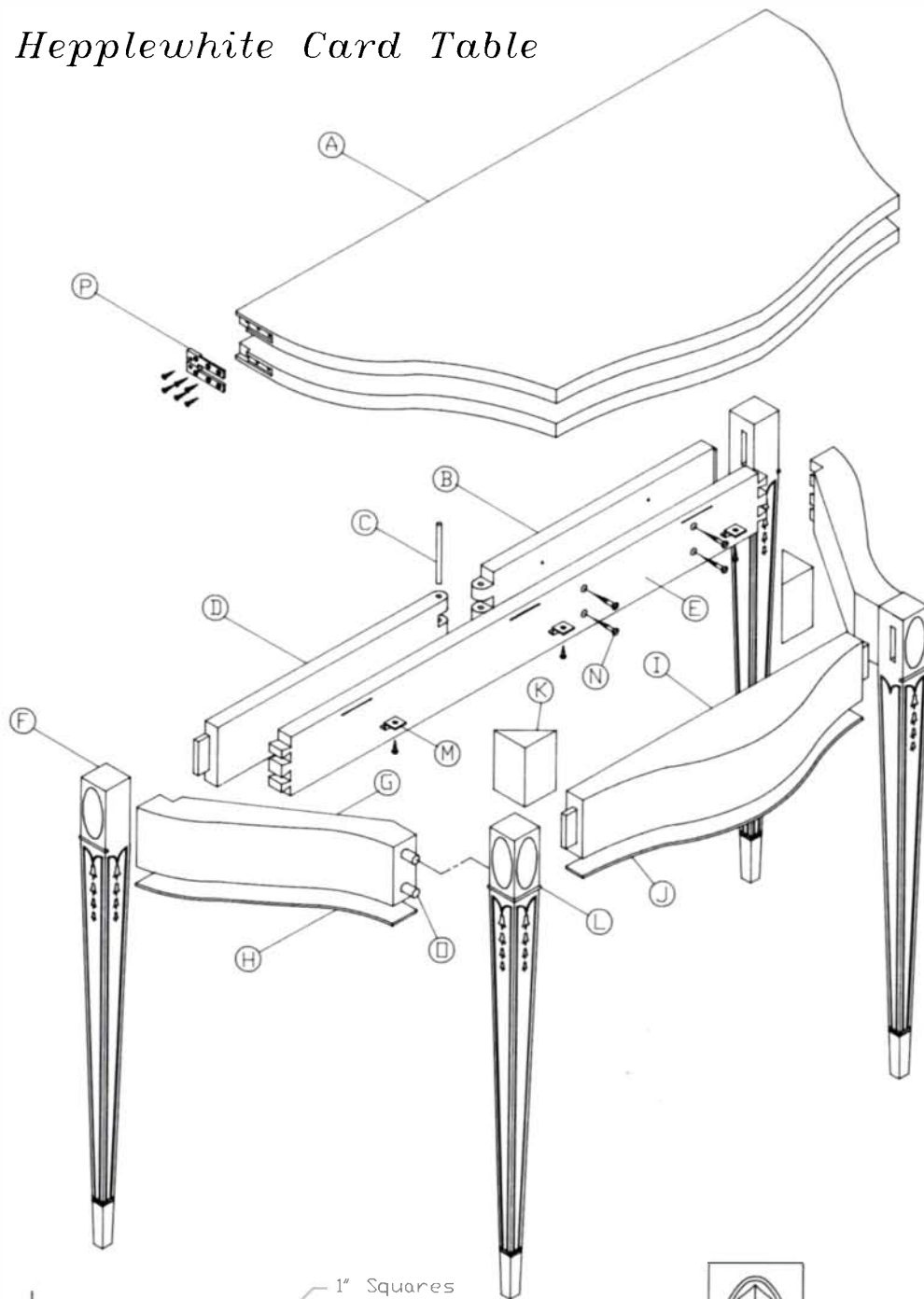
Once an overall drawing is fleshed out, CAD programs give you the ability to zoom in on one area in much the same way that a zoom lens on a camera enlarges part of a scene. This allows you to refine minor details of a larger drawing, say the joinery of a case piece, to work out the fine points of construction. Another powerful feature of CAD programs is their ability to work in exact scale and automatically dimension the lengths of parts. And once you've proportioned a cabinet in the drawing to your liking, you can print it out in feet and inches (decimal or fractional), metric or in other scales. The ability to create a life-size drawing also allows you to use the printout as a template or pattern.

Three-dimensional drawings: While all basic CAD programs produce designs in two dimensions, most advanced CAD programs also allow drawing in three dimensions (3D). I particularly like 3D illustrations because they allow me to examine a complex design from a variety of viewpoints. With the CAD program I use, called AutoCad, I can evaluate a design from as many as four different viewpoints that appear on the screen at one time. Further, if I make changes on an individual view, the changes automatically affect the other views, thus altering the overall design. Since objects in a CAD drawing are only outlined in wireframe, solid areas, such as a tabletop or seat of a chair, are implied; the program has the ability to hide lines wherever parts overlap, to create the effect of solid surfaces. □

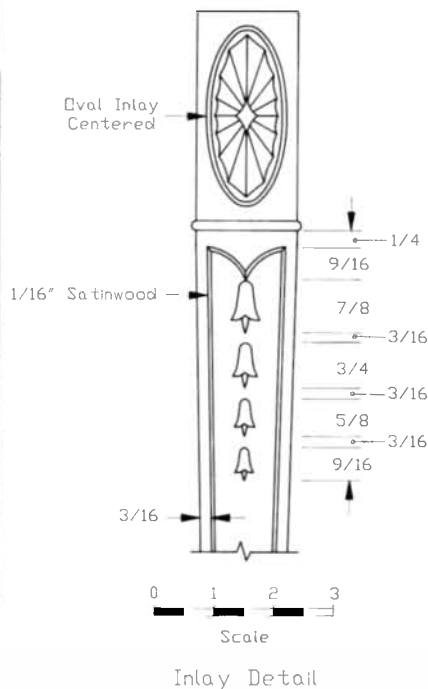
Pete Conway is an assistant professor at the United States Air Force Academy and an avid amateur woodworker.

Hepplewhite Card Table

Card table CAD



Top & Apron Detail



Inlay Detail

A mechanical draftsman for 30 years, Frank Pittman never thought a computer could replace his T-square and pencil. But he finally broke down several years ago and spent six weeks learning how to use a computer and AutoCad, a very powerful CAD program used by architects, engineers and other design professionals. Pittman, who teaches wood technology and furniture construction classes at Western Kentucky University, used AutoCad to create the drawings of the Hepplewhite card table reproduced at left. He and his students also use the program to create drawings of other furniture items and plans for possible production items. Before actually building the card table (see "Building a Gate-Leg Card Table," *FWW* #86), Pittman also created plan and elevation drawings and joinery details (not shown).

Pittman says that while developing a complicated presentation-quality drawing in CAD, like the exploded view above, can take quite a bit of time, it is no slower than drafting it in pencil and then inking it in. The speed of drawing with CAD is at least partially due to the ability to quickly duplicate like parts, such as the table's legs, and copy them to other locations. Pittman also finds the ability to manipulate the proportions of a part, without having to redraw it each time, to be a great design tool. One of the most difficult and time-consuming tasks in CAD is to create a free-form curve, because most CAD programs require you to define the curve via coordinates: You plot points on the screen that the line will pass through, and then command the program to connect the dots. A special function then smooths out the curve.

After the computer work was done, Pittman printed all the drawings shown here on paper using a relatively inexpensive plotter capable of printing on sheets up to 11 in. by 14 in. For the part drawing (below, left), he superimposed a scale grid over a plan view of one quadrant of the top and apron parts. Pittman then created a full-size pattern by redrawing the parts full scale on large grid paper. For the table's inlays, he printed four copies of the detail, shown below right, at full size, and then glued each pattern directly to a leg as a guide for cutting out the flowers. When designing complicated pieces requiring miter joints that meet at odd angles, Pittman will print out a paper drawing of an angled joint and, instead of trying to measure the angles, will use the drawing as a template for setting a saw's miter gauge or building a router jig. —S.N.



The Maxym robot is a mechanized-milling machine run by a personal computer. Shapes can be programmed easily and quickly by drawing them on a digitizing tablet (shown in front of the computer). Then the machine employs a regular router and spiral end mill to perform the desired task. Here, the Maxym robot has been programmed to cut out a curved chair part as an experiment for Thos. Moser Cabinetmakers.

Woodshop Robots

While attending the Woodworking Machinery and Furniture Supply Fair in Anaheim, Cal., last fall, I was astounded at the number of small computer-numerically controlled (CNC) routing machines, that were both sized and priced to be practical for small- and medium-size shops. These machines are comparable to their behemoth brothers that are part of computer-aided manufacturing (CAM) systems used by factories and large production shops to churn out hundreds of identical parts economically. But small CNC machines employ a single—instead of multiple—router head, aren't as heavy in construction and typically can't produce very large parts. And they definitely don't compare in price: The heavyweights start at around \$100,000, while some small CNC systems sell for as little as \$10,000 including software (but not the computer needed to run them).

The milling head on a CNC router is designed to move in two axes for cutting out and shaping on flat surfaces, and three or more axes, for shaping complex three-dimensional forms. They're capable of astounding (and repeatable) accuracy—typically within 0.001 in. The heads' motions are directly controlled by the com-



Although this Thos. Moser continuous-arm chair is traditional in design, part of its manufacturing may soon be done by the Maxym robot, which would carve and sand the chair's seat.

puter, which sends instructions to sets of servomotors. The operator programs the computer with numerical coordinates (this is where the CNC name comes from) that determine the path in which the head travels, such as to rout a rabbet or mill a groove in a cabinet side, to round over an edge on a tabletop or to shape a curved chair part. Many machines accept a standard router as the milling head.

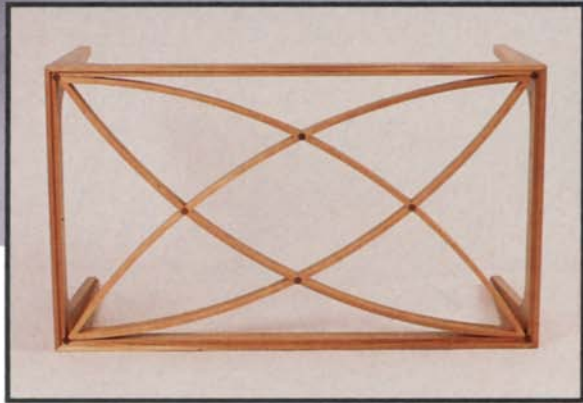
Small CNC routers are even being used on custom jobs. This is partially due to im-

provements in software that circumvent the tedious coordinate plotting, making the new systems more "user friendly" and quicker to program when routing complex or curved shapes. Some systems even allow routing patterns to be imported directly from a CAD program. Some of the jobs that small CNC systems seem especially suited for include: signmaking; carving small objects, special hardware and trim; cutting out, routing, boring and shaping furniture parts; and producing multiple parts for limited-production items.

One of the most impressive CAM machines I've yet seen is the Maxym Robot (pictured in the photo at left), manufactured by USA Robot in Saco, Maine. The company's owner, David Jack Hanson, first became involved with CAM systems when he and a partner decided to produce children's music boxes and clocks. They soon faced a situation where their orders far exceeded what they could make using regular woodworking machinery: they needed 12,000 parts per month from 190 different patterns. After failing to find a CNC machine to fit their needs, Hanson asked a friend with extensive computer and electronics background to help build a robot. But their first model, up and running after only a month, was difficult and time consuming to program, so they wrote a special graphics program that allowed them to draw or trace the desired pattern on a digitizing tablet to control the robot's motions. This fit Hanson's idea of using a robot as a creative tool, not just for repetitive operations.

When interest in their robot system grew, Hanson formed a company to manufacture the robot he named Maxym. Among his clients is Thos. Moser Cabinetmakers, a company that is researching the use of a Maxym for both prototype development and production. Because Moser produces large quantities of custom furnishings for architectural applications, the company often needs to quickly produce prototypes to work out manufacturing details and to present to potential clients. Moser also plans to employ the Maxym for actual production work, carving and sanding the deep-saddle seats on one of its standard-series continuous-arm chairs, like the one shown in the bottom photo above, a process that's now done by hand. Maxym will do the routing and sanding after the chairs are assembled, which will require careful programming so the milling head can work around the chair's spindles.—S.N.

Sandor Nagyszalanczy is managing editor at FWW.



Becksvoort made this glass-top coffee table from 3/4-in.-thick stock rescued from the scrap bin. The legs are mitered together at the corners and also mitered to the aprons, so there is no endgrain showing on the finished table. The inset photo shows the gently curving shapes created by the bent-laminated glass supports.

Glass-Top Coffee Table

Bent-laminated glass-supports within a mitered base

by Christian Becksvoort

When a client asked me to design a glass-top dining table, I decided to build a coffee table as a prototype to work out the joinery and design details. The resulting table (shown above) turned out well and required less than 7 bd. ft. of 1-in.-thick scrap lumber.

The table's construction is relatively simple. The four leg-and-apron units are assembled with miter joints strengthened with floating tenons. These units come together with glued miter joints that run the length of each leg. The glass top sits in rabbets in the top inside edges of the aprons and is further supported by glue-laminated diagonal rails joined with half-laps and screwed into the inside corners of the aprons (see the drawing on p. 69). Using

miter joints throughout the table's design resulted in an unexpected benefit: I didn't have to contend with finishing any endgrain.

Mitering and joining the leg-and-apron units

I cut and assembled the four leg-and-apron units before tapering the legs and shaping the underside of the aprons to ensure a smooth transition. To make the leg-and-apron units, I first cut the eight legs and four aprons to the dimensions in the drawing. I then mitered each leg on one end and each apron on both ends. Whether you cut miters on the tablesaw by setting the miter gauge to 45°, as I do, or on a radial-arm saw or a chopsaw, always test the setup by mitering two scraps and checking the joint with a square.

Because end miters, like those on the legs and aprons, are structurally weak joints, I strengthened them with $\frac{1}{4}$ -in.-thick floating tenons, which also increases the gluing surface. I laid out the mortises for the tenons so that they would be $\frac{1}{2}$ in. from both the top of the aprons and the outside edge of the legs, as shown in the drawing on the facing page, to keep the tenon from interfering with the rabbet for the glass. I used a slot mortiser to cut the mortises, but you could also bore them on a drill press or with a doweling fixture and portable electric drill. The mortises could also be cut with a table-mounted router and fence or a hand-held router and template. Whichever method you use, be sure the mortises are centered so that the surfaces of the legs and aprons will be flush when assembled. Making passes with each side of the leg or apron against the fence or table will automatically center the mortise but may also leave it a bit wider than $\frac{1}{4}$ in. However, this is not a problem because the tenons will be cut to fit into the mortises,

and tenons should be $\frac{1}{32}$ in. shorter than the combined depths of the mortises. A few test cuts will yield a perfect fit.

Dry-assembling each leg-and-apron unit ensures that the miters are tight, that the tenons don't bottom out in the mortises and that the legs are square to the aprons. I did most of my gluing on my saw's outfeed table since its plastic-laminate surface is easy to clean. After applying glue to the miter faces and inside the mortises, I reassembled the first leg-and-apron unit, holding it together with three bar clamps. I laid the first clamp flat and parallel to the apron, to squeeze the top of the legs to the apron miters, and tightened it slightly until the joints began to slip. Then I positioned the two remaining clamps upright from the bottoms of the legs to the top of the apron, as shown in the top photo on this page, and began tightening them. The trick was to tighten all three clamps alternately so the miters pulled together perfectly without slipping.

Tapering and shaping the legs and aprons

Next, I laid out the curves and profiles of the tapered legs and underside of the apron, as shown in the detail of the drawing. I drew the curve between the legs and apron using a coffee can. I bandsawed to the waste side of the line and then finished to the line with a belt sander, a pneumatic sander and by hand-sanding.

After all four leg-and-apron units were bandsawn and sanded, I mitered the outer edge of each of the eight legs. My first inclination for cutting these long miters was to use the tablesaw with the blade tilted to 45° . However, this didn't work well because the rip fence was too far away from the cut, resulting in chatter and vibration at the unsupported bottom end of the legs. I found that I could get nearly perfect miters by tilting my jointer's fence to 45° and making a series of passes until the last pass just met the face of the leg, as shown in the bottom photo at left. After both legs of all four units were mitered this way, I used the tablesaw to rip the rabbet for the glass top in each apron. Because this rabbet will be visible through the glass, it had to be sanded carefully. Before gluing up the leg-and-apron units, I also sanded all inside surfaces, starting with 120-grit paper and working up to 320-grit.

Joining the four leg-and-apron units

Gluing the leg-and-apron units together is an ideal job for an eight-armed Hindu goddess. It's not difficult, but it must be done quickly and efficiently, so laying out the clamps and planning ahead are essential. Almost any clamping arrangement will work. I used a band clamp around the apron and spring clamps and rubber bands along the legs. Before gluing, I dry-assembled the four units, using tape and rubber bands, checked the miters along the legs and touched them up as needed with a handplane. After gluing up the table, I allowed it to dry and then sanded the outside faces to 320-grit.

Making and installing the glass support rails

The curved support rails were made by laminating three strips of cherry over a curved plywood form. To simplify the procedure, I first laminated two wide strips and then ripped them to form the four required rails.

The form for the laminations is simply a stack of five pieces of $\frac{3}{4}$ -in.-thick plywood glued and screwed together into a block. I laid out and bandsawed a 36-in.-radius convex curve along one edge of the block and then disc-sanded the curve fair and smooth.

I made the strips for the laminations by first resawing two $\frac{7}{8}$ -in.-thick pieces of cherry, $3\frac{1}{4}$ in. wide by 44 in. long, into six $\frac{3}{16}$ -in.-thick pieces on the tablesaw. Then I planed each strip to its $\frac{1}{8}$ -in. final thickness. Because my planer has a minimum capacity of only $\frac{1}{4}$ in. thick, I used a piece of $\frac{3}{4}$ -in.-thick plywood as a tem-



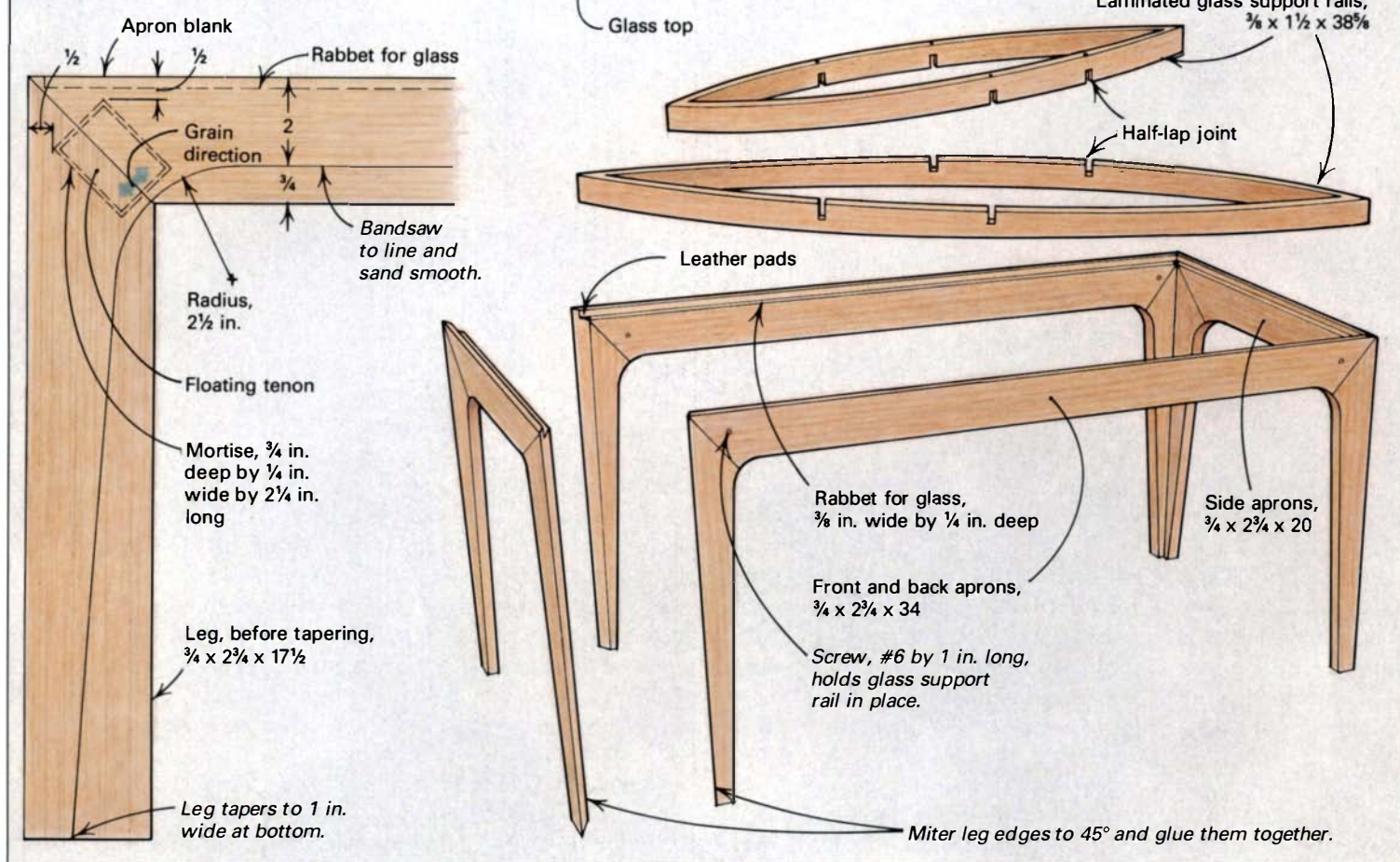
Three clamps pull the miters together and prevent the pieces from slipping when the leg-and-apron units are glued up.



Mitering the edges of the legs on the jointer is easier and provides better results than doing them on the tablesaw.

Glass-top coffee table

Detail: Laying out mortises and inside cuts for leg-and-apron units



porary planer bed and screwed a lip to the underside of the plywood to keep the bed from being drawn through the planer.

To laminate the curved rails, I applied glue to three of the strips with a narrow paint roller, wrapped them in plastic to minimize the mess and held them tightly to the form with a 3-in. heavy-duty band clamp. After the first lamination had dried for 24 hours, I repeated the process for the second set of rails. When the second lamination had dried, I scraped off all the excess glue and jointed one edge. Then I ran the jointed edge against my tablesaw fence and ripped the laminations into the four 1 1/2-in.-wide rails.

The placement of the miter joints between the two pairs of rails is taken from the table, but the table must first be square. Measuring the diagonals will reveal problems, and a clamp can draw the table back to square if necessary. I placed one rail at a time diagonally across the top of the table, so the outside edge of the rail intersected the inside corners. With a square, I transferred these intersecting points along the side of the rail and marked the top edges at each end. Then I aligned a straightedge with both marks across the top of the rail to define the table's diagonal and to bisect the angle between the rails. I scribed lines across the top of the rails with a knife, bandsawed close to the lines and disc-sanded to them. With the first rail marked and cut, I clamped it in place inside the table to help align marks for the second rail. I repeated these steps to mark and cut the other rails. After sanding the rails to 320-grit, I glued pairs of them together, taping across the miters, to form football-shaped glass supports (see the inset photo on p. 67).

When the glue was dry, I dry-assembled the glass supports into the table to mark for the half-lap joints where the supports inter-

sect. First I slid one support into place diagonally between the corners of the table frame until it was about 1/2 in. below the rabet. Then I positioned the second support unit diagonally between the opposite corners, directly on top of the first. Spring clamps on the table legs prevented the supports from slipping farther down. With a knife, I scribed the bottom of the top support and the top of the bottom support where the curves intersected. Then I removed the supports and extended these lines halfway up the sides. After cutting along the lines with a dovetail saw, I chiseled the bottoms flat. Finally, I slid the two units together and trimmed them with a sharp chisel to get a perfect fit.

Once the glass supports fit properly, I glued them together and inserted them into the table. With spring clamps holding the supports in position, I drilled a hole for a wooden plug and then a pilot hole for a screw in each of the long aprons' corners and into the curved supports' mitered corners, as shown above. After inserting the screws and plugging the holes, I gave the entire table a final sanding with 320-grit paper. Four hand-rubbed coats of Watco oil provided a satisfying satin sheen.

Experience has taught me that it's better to take the finished table to a reputable glass shop and have a glass top cut to fit than it is to phone in the dimensions of the glass. For a finished look, I had the edges of the 1/4-in.-thick plate glass ground, and to protect both the glass and the table, I glued round leather pads in each corner of the table and at the intersections of the supports. □

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

The Demise of American Chestnut

Tragic loss of a great American timber

by Jon Arno

At the conclusion of one of my recent wood-identification seminars, a shy and obviously puzzled young man came up to me with a 2-ft.-long 1x6 of grayish buff-brown wood. Before approaching me, he had fumbled through my set of samples on the table by the podium in search of a match that would save him from asking the inevitable question, "Do you know what kind of wood this is?"

Because the sample was so beautifully clean and clear, determining its identity stumped me for a minute. But one peek at the endgrain through the hand lens revealed the familiar flame-shaped pore pattern of American chestnut, *Castanea dentata* (see the two photos of the samples on p. 72). Chestnut was once a major American timber but millions of acres of the trees were destroyed by a blight early in the 20th century. Although my sample set contained American chestnut, there was little mystery as to why this fellow was unable to make the match. My only sample was a remnant of an old barn beam—wormy and streaked with black from the reaction between tannin and steel cut nails—but it was a treasure to me just the same.

As the young man's shyness subsided, I learned that this magnificent piece of chestnut came from his grandfather's shop. And since his grandfather had passed away recently, he wasn't willing to part with this board; its value to him went well beyond the rosewood, walnut and money I was prepared to offer in exchange. Later, it occurred to me just how brief each generation's collective experience is. Only a few decades ago, any schoolboy would have recognized chestnut at a glance. It seemed to be everywhere: the split rail fence he climbed on the way home, the spice rack on his mother's kitchen wall, even the chest of drawers from which he plucked his socks in the morning. And now it is gone; it's almost as if it had never been.

The tragedy of the blight

First reports of the chestnut blight came from the New York Botanical Gardens in 1904. The lethal Asian fungus (*Endothia parasitica*) that caused it probably was introduced on nursery stock brought to North America from the Orient sometime in the late 1800s. Radiating out from New York at a pace of about 20 miles per year, this unstoppable scourge had decimated the entire native range of American chestnut from New England to Georgia and west to eastern Missouri by the late 1940s.

Because the fungus does not destroy the root system, the term *extinction* cannot yet be applied. Chestnut still exists throughout its native range as sporadic thickets of sprouts coming off of ancient stumps. These sprouts may attain diameters of 2 in. to 4 in. and heights of 20 ft. Some may even bear fruit before they too succumb to the blight, but as a North American timber species, the

status of chestnut has now been reduced to that of a shrub. To be sure, there are isolated specimens (see the photo at right on the facing page) that are of great interest to botanists seeking specimens that may have natural resistance. Reports of a healthy tree discovered in Oakland County, Michigan, made it into a suburban Detroit paper not long ago. Also, small woodlots planted by early settlers outside of chestnut's native range can be found that contain healthy specimens spared by their isolation. And there is a small grove in western Wisconsin as well as other occasional plantings all the way to the Pacific.

The demise of any species, fauna or flora, weakens the fabric of life on earth, but the loss of American chestnut represents a tragedy of epic proportions. Prior to the blight, chestnut may have been the single most important species in America's Eastern mixed-hardwood forest. Although not the largest of our native trees, in the forest it had attained heights of more than 100 ft. and diameters in excess of 6 ft. and often yielded clear logs up to 50 ft. or longer. The nuts (see the photo at left on the facing page), technically a seed, were as sweet as the European species (*C. sativa*) and plentiful, coming by the bushels from every tree in multiples of two or more to the burr. The annual food production per acre from mature stands of chestnut rivaled (in some cases surpassed) that of cereal crops such as wheat or even corn. "Chestnuts roasting on an open fire" were traditional holiday treats, and the nuts were also an important ingredient in stuffing. The remainder of the crop served as fodder for livestock or as a mainstay in the diet of native wildlife, thus ultimately coming to our table as meat from the butcher's shop or the hunter's bag.

But what about the timber?

As plentiful as chestnut was, it was never a prized cabinetwood of the caliber of walnut or mahogany. It was too common, too utilitarian and, frankly, it was lacking in some important functional properties. For instance, with an average specific gravity of only 0.40 (oven dry weight/green volume) which is identical to that of yellow poplar (*Liriodendron tulipifera*), chestnut was much too soft to serve as the primary wood in truly rugged and durable furniture. Its ring-porous, open-grain surface (shown on this page in the background) presented some finishing problems, and its propensity to split, while a benefit to the shingle maker, made it risky to use for wide panels or structural members bearing weight across the grain.

Chestnut never was a pretentious choice for glamorous woodworking. It was a plebeian wood, a cheap and plentiful performer of common tasks. Its outstanding weathering properties made it an ideal telephone pole, a somewhat spongy but long lasting railroad tie and an exceptionally durable coffin. It was also used extensively



Chestnut trees once covered nine million acres of America. The nuts (above) were a major cash crop in Appalachia, and the timber was used for everything from telephone poles to furniture. But around 1900, a fungus spread across the country and within 50 years had destroyed this resource. A few groves, like the one at right in Trumpele County, Wisconsin, survived because of their isolation.

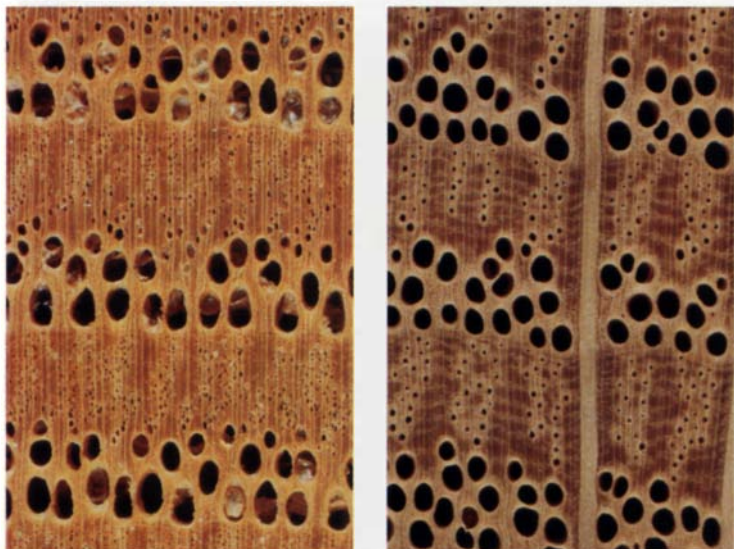


for sash and trim, siding, beams and doors. Chestnut was also a popular choice for the substratum of veneers. With an average volumetric shrinkage of only 11.6% (green to oven dry), it was quite stable relative to other woods used for that purpose such as red gum (*Liquidambar styraciflua*, 15.8%) and even yellow poplar (12.7%). Given its stability, its soft, easy working characteristics and the fact that it was plentiful in the Connecticut river valley and southward through most of the original Colonies, it was commonly used as a secondary wood by some well-known Early American cabinetmakers. For example, chestnut can be found hidden away as the drawer sides and interior parts of some of the finest 18th-century work of the Newport, R.I., masters John Townsend and John Goddard.

As secondary woods go, chestnut has a lot of charm, and its absence leaves a gaping hole in our line-up of domestic species. A secondary wood can be bland, but chestnut isn't. Its ring-porous nature gives it a pleasant figure on the tangential surface, and its mellow light-brown color darkens just enough under a clear coat of varnish to produce a warm, attractive hue without the use of stain. In addition, a great deal of chestnut found its way into small,

functional articles that seem to have a knack for surviving, such as sewing boxes, knife trays, spice chests and clock cases. It is not difficult to find items made in part or completely out of chestnut; however, because the wood has a faint resemblance to oak, examples of it are sometimes mislabeled in antique stores. To identify chestnut in existing pieces, look for an unfinished surface to see if the wood has a natural grayish, buff-brown color. Then, if it also has an oak-like figure, but is surprisingly lightweight for oak and seems to lack oak's dominant ray flecks, there is a good chance it is chestnut.

For today's woodworkers, acquiring chestnut is, of course, a problem. If you watch the classified ads and browse sawmills, a trickle of chestnut can be found. Because of its great weathering properties, standing deadwood remained sound enough to harvest for many years after the blight. Also, lumber resawn from the beams of demolished barns and buildings finds its way into today's market as expensive, wormy-chestnut paneling, but this is an unreliable and finite source. Of the dozen or so species of chestnut worldwide, the European species, *C. sativa*, is most similar to the American variety, both in terms of the flavor of the nut and the



How to tell chestnut from oak: Chestnut, as shown in the background on p. 70, has a buff-brown color with an open-grain figure similar to oak, with which it is often confused. However, chestnut is substantially lighter and softer than oak, and oak's rays are clearly visible on all surfaces while chestnut's rays are difficult to see without magnification. For final verification, examine a smoothly cut section of endgrain with a 10-power hand lens. As shown in the photos of chestnut (left) and oak (right) above, the larger pores in both woods are concentrated along the outside of the annual rings. But chestnut's larger pores tend to form wavy bands with flame-like bursts radiating away from the annual ring (see the photo at left).

stature of the tree. Because of these similarities, I think the insights provided by the European craftsman, Rudi Wolf (see the sidebar at right), are of special interest because they present a hands-on account of a woodworker who still has a plentiful supply of chestnut. Sadly, the blight was introduced into Italy sometime in the 1930s and apparently the European species is not significantly more resistant than ours was.

Some hope for the future

I would like to conclude this eulogy to the American chestnut by saying that it has been so much a part of the American scene that it will be forever fondly remembered. But I can't. As evidenced by the shy young man at my seminar, few generations will pass before it is as forgotten as the flavor of mammoth meat. But there may be hope. Like strains of flu in human populations, plant diseases are known to lose their virulence. Recently, scientists have isolated a less-lethal (hypovirulent) strain of the fungus that can be injected into a tree, like a vaccine, to protect an individual specimen, but it's not a workable solution for large numbers of trees. Also, there are Asiatic species with exceptional resistance such as Chinese chestnut, *C. molissima*, and plant breeders are hard at work searching for hybrids that capture this feature without carrying that species' genes for small stature and poor timber form. Perhaps a hybrid will be found, a chestnut that is almost as good as the one we will, by that time, have forgotten. For woodworkers today, however, it is only through the shared experiences of Old-World craftsmen like Rudi Wolf that we can "savor the flavor of mammoth meat." □

Jon Arno is a wood technologist and consultant in Schaumburg, Ill. For more information on breeding and other research projects aimed at re-establishing the American chestnut, contact The American Chestnut Foundation, 401 Brooks Hall, PO Box 6057, West Virginia University, Morgantown, W. Va. 26506-6057.

Chestnut: A European perspective

by Rudi Wolf

Fifteen years ago, I settled in the south of France, in a mountainous area called the Cevennes, which is part of the Massif Central. Coming from Holland, a flat land beneath sea level, it was quite a change for me. I had prepared for my new life by studying to be a woodworker for six months at a state school for jobless adults. When I arrived in this mountain village, I introduced myself as a carpenter, although I still had much to learn about the trade.

One of the first things I learned was that working for local people meant working with the local wood—chestnut. Chestnut (*Castanea sativa*), shown in the top photo on the facing page, has been one of the most important cultivated trees in the south of France and in the whole Mediterranean area for thousands of years. It seems that a century ago there were more than 300 varieties adapted to all types of geographic and climatic situations. The trees produced nuts that could be used fresh, dried or for cooking; for making a kind of marmelade; to fatten up pigs or to feed to goats to increase their milk production. And then there was the wood.

Chestnut it should be: People in this region grew up with chestnut and would not accept a door or window made of oak. Even when I tell them that I have fine oak planks in stock, which were cut 12 years ago and are well seasoned, their inevitable reply is "Chestnut it should be." Chestnut is used for anything and everything: construction timbers, beams and roof planks, floors, doors, windows, shutters, tables, cupboards, matted chairs, bee-hives and barrels. The wood is also used to dam the river to provide a summertime water reserve in case of fire, and even the young shoots are split into thin strips and used for weaving baskets.

Unfortunately, in recent times many trees have died from the same blight that destroyed the chestnuts in America, and so the chestnut's economic importance has declined. But the blight has not been as bad here, and healthy trees are still plentiful. My 90-year-old neighbor, a farmer, can still distinguish about 20 to 30 varieties of chestnut on the basis of subtle differences in the nuts.

In spite of how commonly used chestnut wood is, I couldn't find it at the commercial lumber firms in town. I had to go inland to the smaller local sawmills where the newcomer, as I once was, tends to get the worst wood. It took me years to learn to recognize the wood's subtle characteristics. Healthy chestnut is whitish yellow and quite solid. Lower grades tend to be brownish in color and somewhat softer. Common defects are, of course, rot and wormholes and a kind of yellow discoloring caused by mildew. But worse yet is the "roulé" or "roulure," which is when the annual rings separate (not to be confused with heart split or dry split). In severe cases, a plank becomes like a bundle of matchsticks, and it is not uncommon to scrap 30% of each board by sawing out the roulé. When the wood is freshly sawn, it is sometimes difficult to see the defects, but I eventually learned to look carefully when buying my wood.

This roulé problem is undoubtedly the reason why modern industrial woodworkers won't touch the stuff—it's just too much trouble. But for the older people in this region, chestnut is an integral part of the traditional way of doing things. They are very proud of the knowledge that's been handed down from father to son about how to use chestnut because, after all, it's their tree, their wood.

Working in the old ways: Some years ago I told my elderly neighbor that I wanted to buy a ladder. He sounded a bit angry when he said, "Don't throw your money away!" He told me that I should wait until winter, go to the north slope of the mountain and cut a pole of chestnut from a 12-to 15-year-old tree. Next, he said to saw the pole lengthwise, make mortises in both pieces and insert dry, split rungs of knot-free chestnut. He assured me that when the green wood dried and shrunk, the rungs would be secure. To prove this, he showed me some ladders that he had made more than 20 years ago. In spite of the fact that they were always left outside in the wind and rain, they were still perfect.

Last year a farmer commissioned me to make a "pasteire," which is a large slope-sided box or trough used to kill and butcher pigs. Upside down, the box makes a table on which the pig is secured and bled. Then the box is turned over and used as a kind of shallow bathtub as hot water is poured on the dead beast so that the hairs can be rubbed off the skin. I couldn't find the high-quality chestnut planks needed for the job, and so I proposed another type of wood. But no, he was willing to wait a year for chestnut.

Restoration work on local houses and furniture has also taught me much about how chestnut was used and how to work with it. When restoring the doors and paneling in the old houses around here, I usually discover beautiful, old chestnut after removing several coats of thick, brown paint. The doors and shutters in the center photo at right are copies of the doors that originally graced this old shop front. When restoring old woodwork or furniture, it is sometimes necessary to darken new chestnut to match the old wood. An untreated plank of chestnut will turn a soft brown after a few years, but I've found that by putting the wood in my goat's stable, the coloring process is speeded up. This is probably caused by the dung's ammonia vapors reacting with the tannin in the chestnut.

One year I made several little stools with fancy carved tops like the one in the bottom photo at right, which I had planned to sell to the tourists. Chestnut is similar to oak, only a little more brittle, and although you can't cut fine details when turning or carving, shallow bas-relief is possible. Unfortunately, tourists didn't buy the stools because there were cheaper, mass-produced stools on the market. However, to my amazement, the usually frugal local farmers came looking. Turning the stools around in their hands, they commented on the quality: "Strong construction, and you used grafted chestnut on the top. Easier to carve, isn't it?" For them, the price was no problem. They know about good construction because they use their own hands to make most of life's necessities.

Slowly, the importance of the chestnut forest is diminishing. The blight plays a role, the people's changing lifestyle another. Now they are planting Japanese varieties that are not affected by the blight, but these new, heartier varieties just aren't the same. As an integral part of the culture, the chestnut is disappearing from the scene here as it did in America. □

Rudi Wolf is a woodworker in southern France.



Large, healthy chestnut trees, like this one on the plateau of the Larzac in France, are still plentiful in Europe. However, the same blight that destroyed the American chestnut is slowly spreading through Europe.

Chestnut has long been the wood of choice for doors, windows and interior paneling in the mountain villages of Cevennes, France. The chestnut doors and shutters on this old shop front are copies of the originals. The old window frame above the doors is made of wild cherry.



Wolf made chestnut stools with bas-relief designs, like the one shown here, to sell to tourists. As it turned out, the tourists preferred the cheaper, mass-produced souvenirs, but the locals appreciated the quality and bought Wolf's stools.



A dedicated mortiser:
The author sinks a 1/2-in. bit nearly 2 in. deep into mahogany with only a moderate amount of effort. The rack-and-pinion gearing on Delta's hollow-chisel mortiser and the author's chisel sharpening and polishing method combine to make deep mortising manageable—even in tough woods.

A New Hollow-Chisel Mortiser

Bench-top solution to boring square holes

by Robert M. Vaughan

For years I chopped out mortises using a heavy, old 15-in. Walker-Turner drill press with a hollow-chisel mortising attachment and a foot feed. After trying Delta's new 14-600 hollow-chisel mortiser (shown above), I sold the old Walker-Turner without a moment's hesitation.

If you cut a fair number of mortises, chances are you're either using a router with a template or you're using a drill-press setup, with or without a hollow-chisel mortising attachment. So why would you spend nearly \$500 on a machine that only cuts mortises? Speed, accuracy and convenience are a few reasons. Whether or not those reasons are compelling to *you*, though, will depend on the size and volume of mortises you're cutting and on your budget.

The mortiser is small (31½ in. high) and portable enough (44 lb.) that you can store it out of the way when not in use. Then, when you need it, you simply screw it to a bench or to a subbase that can be clamped to a bench, and you are ready to go. A couple of dowels can be clamped to the bench on either side of the machine for supporting long stock. Setup time is minimal: You set the depth of stop, adjust the fence to locate the mortise on your stock, and lower and fasten the hold-down bracket; and that's it.

All the convenience in the world doesn't mean a thing, however, if precision suffers or the tool is tiring to use. My first test mortise was ½ in. wide by 1¾ in. deep in red oak. The bit crunched down with

about the same effort my old drill-press mortiser required to drop a 3/8-in. bit 7/8 in. deep into poplar. I had expected the design mechanics would have resulted in easier mortising, but I hadn't expected this lightweight mortiser to perform quite so closely to the half-ton industrial machines I've used. And with only finger pressure holding the stock against the fence, the mortise was absolutely parallel to the sides of the stock. The hold-down bracket held the stock in place, and bit extraction was easy. The test mortises in cherry and mahogany further confirmed the machine's smooth, accurate operation.

With the supplied medium-density fiberboard (MDF) base in place, and using a long bit, clearance beneath the chisel is almost 4 in.—adequate for most face frame and leg stock mortising. The base can also be positioned behind the column, which allows clearance to the benchtop or the floor. Used in conjunction with a bench vise or clamps, the machine's flexibility is expanded greatly.

The bolt-together steel construction of the tool's frame lends itself to many interesting, though warranty-voiding, modifications. A little boring and welding on the steel column or plate steel base could result in a horizontal or other special-purpose mortiser.

Tool anatomy

The guts of this mortiser, and all structural components, are quite beefy for the machine's size, which becomes obvious when you lift

it. The 1/2-HP capacitor-start motor is ample for its task and runs quite smoothly at 3,600 RPM. The entire motor-and-head assembly moves up and down on large dovetail ways, one side of which is an adjustable brass guide that is used to maintain proper fit and smooth operation despite wear. An 18-in. handle engages a rack-and-pinion gear system; the handle can be inserted into the hub of the pinion gear at any of four positions. This allows a mortise to be cut with less than a half-turn of the handle. An hydraulic cylinder, similar to the kind you find on a car's hatchback door, counterbalances the weight of the motor-and-head assembly.

An angle-iron fence is welded to an L-shaped rod that slides in and out of a hole at the base of the column to adjust for stock width. A handle on the side of the column locks this rod in place. The short leg of the L, to which the fence is welded, also serves as the column for the hold-down bracket. The bracket slides up and down on this column and is secured in place using the T-handle hex wrench supplied with the mortiser. The minimum dimension of stock the hold-down bracket will secure is 1 1/16 in., although you could easily block up thinner stock if necessary. Mortise depth is set by adjusting a stop rod on the left side of the machine and fastening it in place with a hex-head setscrew.

Quality materials have been used throughout on this machine, from the German-made Rohm chuck to the neoprene power cord—a minor detail, but a nice touch nonetheless. The power switch, located on the left side of the motor housing, has a removable insert that prevents unauthorized starting. A self-ejecting chuck-key is supplied too, so you won't inadvertently start the machine with the chuck-key installed. An adapter is supplied with the

machine to allow the use of both long and short shank mortising bits. The socket for the hollow chisel is 1 in. dia., but a bushing is included to permit use of the popular 5/8-in. shank chisels.

Taking its overall excellent performance as a given, I have a couple of minor gripes with the machine. The first is that holes weren't provided for the hex wrench and the chuck-key in the plastic cap that covers the top of the mortiser's column. The other is that cup-point socket-head setscrews were used on the adjustments. The cup point digs into the metal and creates a burr that can interfere with the smooth operation of the stops. I ground the setscrew tips flat, and the problem was solved. I called Delta to alert them to this, and I was assured that a different type of setscrew will be used in the future.

Conclusion

This new mortiser is superior to any drill-press rig I have ever used, including presses that sell for more than \$2,000. The size makes it perfect for the space-conscious home-shop woodworker, and its performance makes it an attractive buy for the budget-minded commercial-shop owner. But, as Delta says in its ads, it is a luxury. I would recommend it unequivocally, though, for anyone considering dedicating a drill press to cutting mortises. □

Bob Vaughan is a woodworking-machinery rehabilitation specialist in Roanoke, Va. The Delta 14-600 hollow-chisel mortiser is manufactured in England by Multico Ltd. It is imported into Canada by General Manufacturing Co., Ltd, 835 Cherrier St., Drummondville, Quebec, J2B 5A8.

Honing a hollow chisel

A cutting tool is only as good as its edge, and a hollow mortising chisel is no exception. For years I used a small, tapered half-round file to sharpen the inside bevels of my hollow chisels. Then I read Ben Erickson's article (in *FWW* #83, pp. 52-56) on hollow-chisel mortising with a drill-press setup. Though there's no quick, easy method of obtaining a sharp chisel-and-bit setup, the high-speed steel Clico sharpeners (Sheffield Tooling Ltd., Unit 7, Fell Road Industrial Estate, Sheffield S9 2AL, England) and auger file that Erickson recommends make lighter work of a tedious task.

I've also found that I can improve a new chisel's performance by polishing it inside and out before using it. I hone the outsides of the chisel on my benchstones and follow that with polishing on a hard buffing wheel, using white rouge as a mild abrasive. I take the finish to as glossy a state as I can, without compromising the flatness of the sides.

To sharpen and polish the inside of the chisel, I put a short section of dowel (1/16 in. less in diameter than the width of the chisel I'm sharpening) into the chuck of a hand drill. For example, on a 3/8-in. chisel, which is what I normally mortise with, I use a section of 5/16 in. dowel. I hold the chisel fast in my vise,

rub the dowel with white rouge and then bring the dowel into contact with the inside of the chisel. This polishes the high spots on the inside surfaces to a mirror shine, producing a much slicker passageway through which the wood chips may pass. I polish from both ends of the chisel to eliminate *any* potential hang-up spots. The difference in appearance and performance between an untouched chisel and one that has been sharpened and polished is astounding.

No matter how often I sharpen my hollow chisels, though, and no matter how sharp I've gotten them, they eventually turn blue from heat generated by friction. The only way I know to prevent bluing is to use the bit at an unacceptably slow feed rate or not at all. Keeping the bit sharp and reducing friction as much as possible will go a long way toward alleviating this problem but won't completely eliminate it. A constant stream of air from a compressor, a dust-collecting device or a vacuum cleaner with the air flow reversed, will also help keep the chisel cool and reduce chisel burning. Even burned, blue chisels cut. Although accepted wisdom says that the temper on these tools is ruined, mine have always seemed to sharpen and cut just as well as new chisels. —R.V.



Polishing a chisel's interior: After rubbing the chucked dowel with white rouge, the author inserts it into the hollow chisel. The wooden dowel is soft enough that there is no danger of damaging the chisel while the rouge mildly abrades and polishes its interior passageways.

Profile: Chad Voorhees

Eavesdropping leads to more delicate furniture

by Dick Burrows



Chad Voorhees developed his design sense from early exposure to Shaker furniture and an appreciation of James Krenov's work. But the delicate proportions of his recent furniture are based partly on the reactions of patrons attending his shows.

Chad Voorhees' best work is characterized by refined delicacy, jewel-like accents and impeccable craftsmanship, according to reviews of his one-man and gallery shows. When I visited Voorhees last summer at his small shop in Beaufort, on the North Carolina coast, he told me his visual sense largely developed from a marketing decision he made eight years ago. That decision was a turning point in his career.

Back then, he would sometimes hang out near his display in a particular show to eavesdrop on the audience's candid reaction to his furniture. His work at that time was more massive than his current furniture (see the photos on the facing page) because he was making a conscious attempt to break away from his earlier devotion to James Krenov, which he felt had become inhibiting. Voorhees said he noticed that men usually were drawn to his heavier constructions, but women were pretty lukewarm about the stuff. Ignoring any implications that might be considered a sexist cliché, Voorhees was most affected by the way these divergent reactions hampered sales. When the women resisted buying his work, the men backed off, confidently proclaiming that they could make furniture like that when they got home.

These overheard conversations inspired Voorhees to experiment with proportions. "As soon as I decided to take the opposite approach—to appeal to the feminine aesthetic, as it were—and design with tapered legs, delicate proportions and fine details, I really started to see the kind of furniture that I wanted to make. Seeing how people reacted to my work turned my whole sense of proportion around," he says. As an added bonus, he also no longer overhears men saying, "Honey, I can make one of those."

Voorhees theorizes that "you've got to make something that someone else can't make. You want your work to be like a piece of art. You want people to wonder how or why you did it. However, this stress on wonder doesn't in any way excuse you from doing high-quality work." Voorhees believes that an important part of woodworking is building things for other woodworkers. It's easy to spot other craftsmen at a furniture exhibit because they're on their hands and knees giving everything a white glove inspection. "If people want to get down on their hands and knees, they'll see that my stuff looks good and is well built."

Voorhees' style and his stress on top-notch craftsmanship appear to grow naturally out of his earlier experiences. Although he didn't start building furniture until he was well along in college, he went to high school in a Shaker village in New York state. There he recalls being deeply affected by an environment richly steeped in the Shakers' directness in dealing with things, their reliance on minimal detail and their uncompromising quality.

After high school, he headed to Virginia Commonwealth University in Richmond to study sculpture but soon lost interest. "I was



Photo at left: John Crain; photo at right: Clay Algeo



These cherry-and-padauk pedestals have been steady sellers, marketed nationwide by Voorhees since 1983.

Tambour-like ebony strips on the end panels add a textural design element to this curly maple desk. The 70-in.-wide desk has Voorhees' typically slender legs and a central drawer flanked on each side by a drawer with a Gaboon ebony panel.

taking furniture design at the same time and really got interested in the work being done by the instructors and students."

After college he built high-end display cases with his brother. His goal was to make simple furniture and master the woodworker's trade. That situation changed as he developed his distinctive design sense, especially after he came up with a series of pedestal stands (see the top left photo) that he could produce regularly and sell profitably through wholesale craft markets and galleries across the country. This national exposure led to more commissions, and he began doing more and more one-of-a-kind work.

Despite his art background and his success in the gallery world, Voorhees still exudes a tradesman's pride in his craft. "I'm no better than furnituremakers of 100 years ago. They had integrity, and that's what we've lost—quality and integrity." Voorhees believes that mastering basic skills—understanding wood movement, finishing, fine joinery for hardwood construction—is as crucial today as 100 years ago, especially if you want the freedom to concentrate on producing furniture that looks just the way you want it. "I don't even think about things like mortises and tenons anymore. Everything is second nature. I have the freedom to really concentrate on the visual. I can see beyond the technical parts. If I encounter a problem, I can look it up in books the same way writers use a dictionary while they work."

His emphasis on the visual means much of his design development comes from actual bench work, rather than from drawings or someone else's set of standards. "I design more from common sense than anything else. I'm concerned with what looks right rather than the golden mean or some set of standards. Often I try to pull the piece away from what might be considered standard."

Several years ago, for example, he built a 50-in.-high "Hunt Cabinet." A contemporary dining-room sideboard would normally be 32 to 34 in. high. But traditional huntboards were taller because they were carried outside during a hunt so that riders could serve themselves food and drink while on horseback. Although Voorhees didn't expect his cabinet to be used this way, his goal "was to raise the eye to a different level in the room."

Another tall piece is the 36½-in.-high curly maple and ebony silver chest (shown in the photo at right on p. 78). In addition to creating a light, visual effect with graceful lines that would blend



Photo: Clay Algeo

Voorhees designed his demilune table in 1989 to incorporate the curved, Art-Deco doors with tapered legs and more classical lines. The curved plywood doors on the 44-in.-wide table are veneered with ribbon mahogany and have shell-like ebony handles.

into any setting, the long, tapered legs also improve the functional qualities of the cabinet. "It's just a logical aspect. It works better having the drawers at waist level, rather than forcing users to bend down everytime they want to get something." Like most of Voorhees' cabinets, the silver chest is a freestanding piece with interesting details all around. "I want my pieces to stand by themselves but not necessarily stand out." He added that traditional construction techniques—mortise and tenon, frame and panel—which he favors, also help his work fit into any setting, even a very formal one.

In working out design ideas, Voorhees considers sketches to be tools like saws or chisels, not restrictive blueprints. "The fun is in the building of furniture, not in the drawing. You can't design in three dimensions as well as you can build in three dimensions. As you're building, you need to ask yourself questions—re-evaluate how the piece looks and how all the parts work."

He feels that his sketches are somewhat liberating because they help answer joinery and other technical questions before he gets to the bench. Voorhees believes that the sketches make the bench work more spontaneous and exciting. "I know how the piece will go together, and I'm free to concentrate on the more visual things. I'm constantly thinking about how I can get the look I want. I take an idea and begin playing at the bench—working with combinations of wood types, finding out what will work. I'm convinced you have to stay flexible, take chances and rely a lot on your own instincts. You don't have to be locked in."

Voorhees says that he just assumes everything will work out. If not, he'll just build another piece. "It's wrong to get caught up in what has to be. I decided long ago that I was going to make tons of furniture. I'll be good when I'm 60. Meanwhile, I'm not going to get hung up worrying about everything."

Doing tons of work, as he puts it, is essential for personal and financial growth. He has found that someone will buy whatever he makes, although he sincerely wishes his trade was a little more financially rewarding. And each piece teaches him something new. "The only way you can develop your own sense of design is by building things." Voorhees credits the 2,000 pieces of furniture that he has made in the last 10 years with teaching him the most about proportions, form, balance and the crisp accents that distinguish a craftsman's best work.



Voorhees veneered the top of this 72-in.-wide hall table with bird's-eye maple instead of using solid wood because the frame and legs trap the top with no allowance for wood movement. On the top of each leg is a carved fan-like shell (see detail).

Even though he doesn't follow his drawings exactly during construction, he keeps every one. Each idea in a drawing creates a focal point—often the spark he needs for another idea. "We're always influenced by things around us. When you go back to a drawing or idea years later, you look at it differently. You're not copying the drawing or idea, but reinterpreting it."

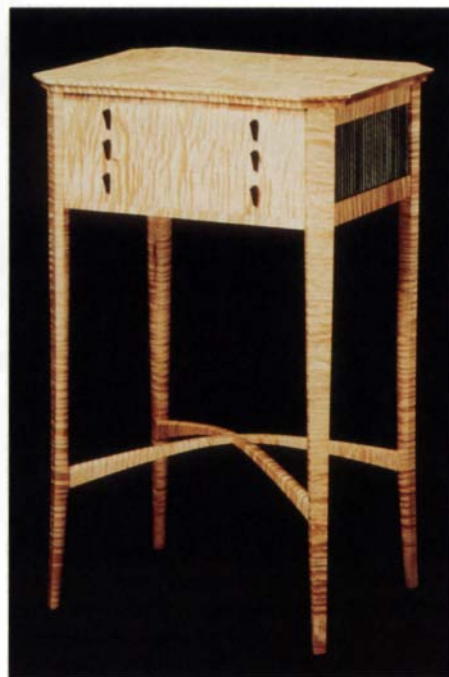
As he matures as a designer, Voorhees finds himself putting more detail into his work. Recently, he's been working with louvers to create texture and visual facets (see the top right photo on the previous page). He has also been working with veneer and various inlays as well as brass and sterling silver, a throwback to his college jewelry studies. These design elements also reflect his fascination with the work of Emile-Jacques Ruhlmann and other great French ebenistes from the early 20th century.

Handles are especially important accents for Voorhees. They are "the jewelry on the piece—the very last thing I do—the crown jewels—the superfine and delicate finishing touch. And it's an extra detail that makes sense; you've got to have handles, and they've got to be just right. On a small box, for example, I might make five different handles and try them before I decide which one to use. I really enjoy the effects I get with the different versions."

The shell-like ebony handles on the demilune table in the bottom photo on p. 77 are good examples of how the right detail can really individualize a piece. These details also give him a chance to express himself while creating something that has broad appeal. "My personality is expressed in every decision I make all through the designing and building process. I enjoy building the pieces, and the people who buy them really enjoy having them. They appreciate the little details and knowing who made them. Life is so full of throw-away stuff that more and more I enjoy knowing I helped people acquire something real and lasting."

What about the concern for integrity and quality he so admired in the master cabinetmakers of the past? "Integrity means you lose money while you spend hours and hours on things that you don't get paid for. But people are putting their trust in you. You sold them on the highest quality that you can make. That's what you have to deliver." □

Dick Burrows is a former editor of FWW and a freelance writer and woodworker in Knoxville, Tenn.



The cross stretchers on this curly maple silver chest add a sense of weight and visual stability to the 36½-in.-tall piece. Voorhees favors long, slender legs on many of his pieces, but in this case, the height also makes the chest more functional. The waist-high compartments provide easy access, a compatible feature with Voorhees' design emphasis on "what works and what's comfortable."

Constructing carcass-housed drawers

by Chad Voorhees

I've never been very happy with conventional drawer-hanging systems. There are just too many variables involved with supporting each drawer on runners screwed into a cabinet and let into grooves plowed into the drawer sides. So, to avoid the contortions needed to align grooves, runners and other parts inside the carcase, I incorporate prebuilt box-drawer assemblies in almost all my work.

A box (or carcass-housed) drawer is simply that—a drawer built to fit snugly inside a box or series of boxes inside a carcass. These boxes can be built very accurately; any necessary tweaking with the parts can

be done before they are installed in the carcass. The drawer operates perfectly because its entire bottom runs on a flat surface and its sides can be precisely planed for a piston fit in the box opening. The flat surface under the drawer can be a solid frame construction or simply a plywood panel.

My method of carcass construction is detailed in the drawing below. The $\frac{3}{8}$ -in.-thick horizontal panels (or frames) under the drawers are rabbeted to fit into grooves in $\frac{1}{2}$ -in.-thick plywood vertical panels. These vertical panels are hidden by the legs (or stiles) in the finished carcass. The horizontal panels are concealed

by the drawer fronts, which are higher than the drawers themselves.

Making the vertical side panels

The key to accurately milling the grooves in the vertical panels is to rip all the grooves in a single piece of plywood that is long enough to complete both sides of the drawer compartment.

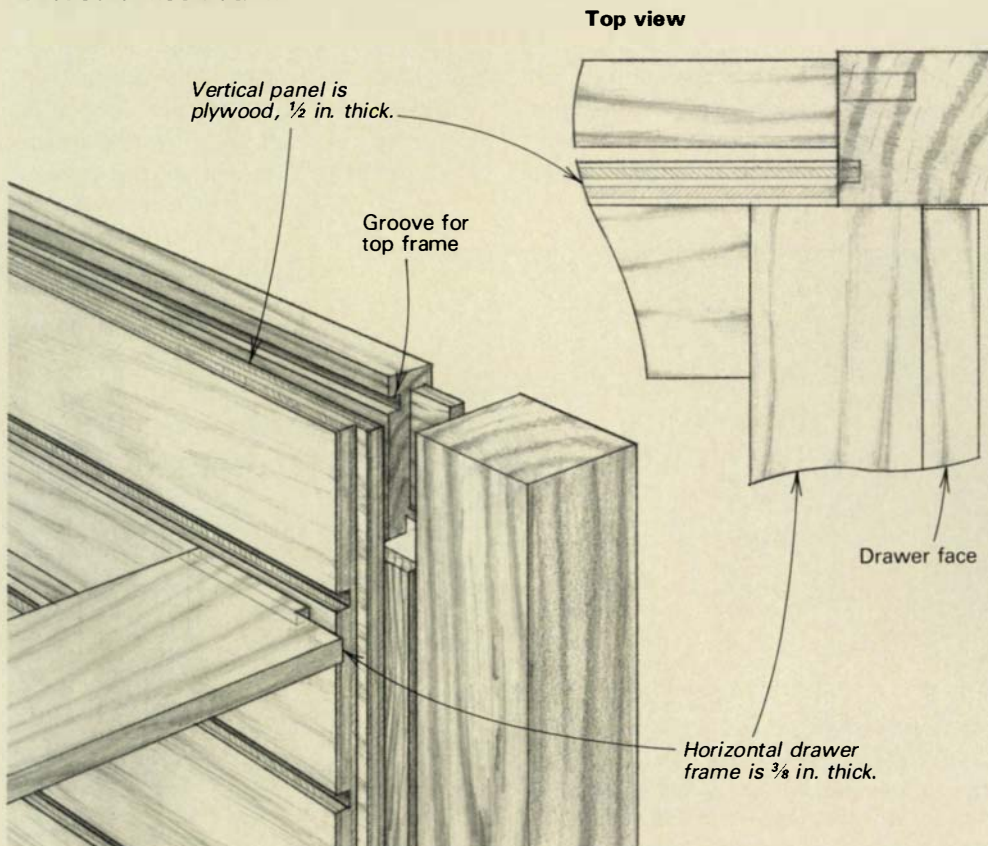
The grooves, which are simply sawkerfs ripped the length of the plywood, are located where I want the bottom of each drawer to be. You can space the grooves as you like. I generally prefer graduated drawers, like those used by the Shaker craftsmen. Having each drawer front $\frac{1}{8}$ in. to $\frac{1}{4}$ in. shallower than the one below it is quite pleasing visually.

After the grooves are cut, I crosscut the panel in half, as shown in the photo at left, and fold it like a book to form each side of the drawer case. This ensures the grooves are square and match exactly. On the front and back end of each panel, I cut a $\frac{1}{4}$ -in. by $\frac{1}{4}$ -in. tongue from top to bottom, so the panel will fit into the carcass's leg or stile. I cut the stopped grooves in the leg or stile to receive the vertical panels with a slot mortiser, but you could do it with a router or by hand. Just make sure that the vertical panel will be flush with the leg's inner edge. As you can see from the drawing, fitting the vertical panels into the uprights not only creates side drawer guides but it also strengthens carcass construction.



Voorhees crosscuts the vertical side panels for his box-drawer construction from a single piece of plywood, after ripping the grooves that will receive the horizontal drawer dividers. Ripping the grooves first and then crosscutting the panel, ensures that the grooves on opposite sides of the case will matchup perfectly.

Carcass construction



Fitting horizontal panels and drawers

Next, I cut panels or frames for the horizontal supports and rabbet them on the tablesaw to create tongues that will fit into the grooves in the vertical panels. Accurately locating the rabbets' shoulders is a pretty exact operation, but since the tongues are on top, I always have a good clean joint where they are most visible. Any gap will be on the bottom where it's less obvious. I sand and wax both the horizontal and vertical panels before assembly.

The drawers themselves are pretty standard. I rip the sides a little oversize, and then plane them to fit the opening after assembling the carcass. Like much Shaker work, my drawers have blind dovetails at the front corners and through dovetails in the rear. As an additional design detail, I make my drawer fronts $\frac{5}{8}$ in. thick and the sides $\frac{7}{16}$ in. thick so that I can make the blind dovetails on the front longer and thinner than the through dovetails on the back. □

Chad Voorhees designs and builds furniture in Beaufort, N.C.

Workshop Solvents

Selecting the right chemicals and using them safely

by George Mustoe

The alchemists of the Middle Ages alternated their attempts to transmute lead into gold with the search for a universal solvent—a liquid capable of dissolving all materials (had they succeeded, I wonder how they'd have packaged their discovery). Six hundred years later, I'm still following in the alchemists' footsteps. As a chemist, I'm frequently asked to dilute a dish of goeey stuff or to dissolve some residue without damaging the underlying material. Woodworkers often face similar problems. Luckily, if you know a little chemistry, you can select a solvent that not only does the job, but also poses the least health and safety hazards.

Reactive and inert solvents

Despite the rising popularity of water-base finishes (see *FWW* #89, pp. 52-55; *FWW* #69, p. 80 and *FWW* #47, pp. 65-66), sooner or later you will need to use another solvent besides water. Solvents work in one of two ways. Inert solvents, like mineral spirits and lacquer thinner, reduce the viscosity of finishes and allow deeper penetration, more even application and faster drying. They don't alter the composition of the oils or resins used in the finish. In contrast, reactive solvents attack the chemical structure of the materials they dissolve; for example, when methylene chloride is applied to paint, it becomes a paint stripper.

Reactive solvents can dissolve stains or glues and strip finishes because they break apart the molecular bonds. These solvents change substances permanently, so they can't be used to thin paint. Reactive solvents must be chosen carefully, because you don't want them to dissolve

more than you had intended. Some compounds in finish removers, for example, will also attack plastics.

Not all reactive solvents require you to don rubber gloves and eye protection, however. Water is a reactive solvent when it is used with soap (a surfactant), because it alters the structure of grease and dirt molecules, making them water soluble. In addition, solvents may act very selectively. Sugar dissolves readily in water but not in lacquer thinner, even though the latter instantly attacks the varnish on your table. The reactions are not the same because the molecular geometry of the two substances causes great differences in solubility.

Inert solvents make good thinners (diluent), degreasers and cleaners because they can freely intermix with a substance without disturbing its molecular structure. This ability is related to a phenomenon chemists call polarity. Depending on their structure, chemicals have a wide range of polarities. For example, two atoms of hydrogen bond to one oxygen atom to give a water

molecule (H₂O) a wishbone shape (shown on the bottom of the facing page). This arrangement is polar because the hydrogen end has a slight positive charge compared to the end with the oxygen atom. In contrast, methane (CH₄), is non-polar. Its symmetrical structure causes the internal charges to be evenly distributed. The methyl alcohol molecule (CH₃OH) is weakly polar. Its central carbon atom is surrounded on three sides by hydrogen atoms. But on one side, the oxygen atom disturbs the symmetry of electric charge.

A useful rule based on this polarity lesson is "Like dissolves like." Oil, grease and wax have non-polar molecules, so they dissolve easily in non-polar solvents such as paint thinner, not as easily in weakly polar solvents like acetone, and not at all in water, which is strongly polar. When a substance (such as sugar) dissolves readily in water, it's proof that the material's atoms have a polar arrangement. When choosing a solvent for a particular task, you can eliminate a lot of guesswork by referring to the chart on the facing page. For instance, suppose sticky residue from a label has marred your new tool.

If a dab of mineral spirits (non-polar) won't dissolve the gum, don't waste your time by trying turpentine or naphtha. Instead, try alcohol (slightly polar) or water (strongly polar).

Solvent precautions and safer alternatives

You should use less dangerous chemicals in place of highly toxic solvents whenever possible. For example, save your lacquer thinner for its intended purpose, and use mineral spirits, instead, for cleaning brushes. And when diluting shellac, ethanol (denatured, ethyl or grain alcohol) can be substituted for the much more toxic methanol (wood or methyl alcohol).



Flammable chemicals should be stored in a steel cabinet that is vented to the outside. A lidded, metal bucket (at left above) provides temporary safe storage for solvent-laden rags.

Common Shop Solvents					
Solvent	Applications	Chemical Type	Toxicity ¹ TLV (Threshold Limit Value) in PPM	Flammability ² * FP (Flash Point) in Degrees F	Usual Route of Absorption L = Lung, S = Skin
Mineral spirits	General-purpose thinner, degreaser, brush cleaner, wood filler	Non-polar	200	86-105	L, S
Turpentine	General-purpose thinner, degreaser, brush cleaner, wood filler	Non-polar	100	95	L, S
VM&P naphtha (benzene)**	Quick-dry thinner, degreaser cleaner	Non-polar	300	20-55	L, S
Xylene, toluene	Some paints and glues	Non-polar	100	40-81	L, S
Hexane	Rubber and contact cements	Non-polar	50	-7	L, S
Lacquer thinner	Quick-dry thinner	Non-polar	100	-50	L, S
Halogenated solvents: methylene chloride†‡, perchloroethylene, trichloroethylene, methyl chloroform	Paint and varnish removers, refinishers, contact cement, aerosols, adhesives, some paints, degreasers	Non-polar	25-350	0-90	L, S
Ethanol (denatured or ethyl alcohol)	Shellac, spirit stain thinner	Weakly polar	1,000	55	L
Isopropanol (isopropyl or rubbing alcohol)	Surface cleaner	Weakly polar	400	53	L, S
Methanol (methyl alcohol)†	Shellac, spirit stain thinner, finish stripper, blush	Weakly polar	200	52	L, S
Acetone	Cleaner, thinner for epoxy and plastic cement	Weakly polar	750	1.4	L
Methyl ethyl ketone	Aerosols, plastic cement	Weakly polar	200	21	L
Methyl isobutyl ketone	Aerosols, plastic cement	Weakly polar	50	73	L
Ethyl acetate	Aerosols, plastic cement	Weakly polar	400	24	L, S
Water	Latex finishes, grime remover	Strongly polar	None	None	NA

Notes

1. Toxicity—highly toxic: less than 101 PPM; moderately toxic: 101-500 PPM; slightly toxic: more than 500 PPM

2. Flammability—extremely flammable: less than 21°F; flammable: 21°F-99°F; combustible: 100°F-150°F

* Even moderately flammable solvent vapors will ignite readily if exposed to heat sources, sparks or open flames, provided the solvent's temperature exceeds the FP. Vapors may be explosive if they are allowed to accumulate.

** Benzene is not to be confused with benzene (a known carcinogen).

† This solvent's vapors pass freely through filters of most respirators.

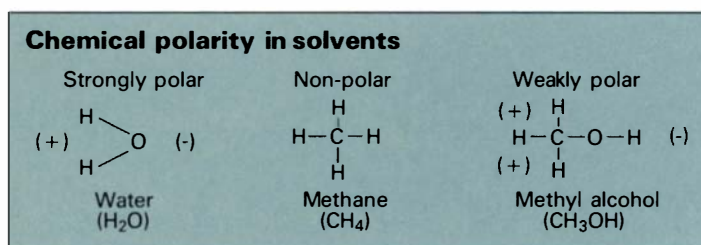
‡ No FP, but flammable when vapors reach 14%-22% by volume at 77°F.

Halogenated hydrocarbons are the only petroleum-base solvents that are not combustible, but this safety feature is often counterbalanced by serious health risks. Carbon tetrachloride is a halogenated hydrocarbon that some older books recommend as a degreaser, but a single exposure to its strong vapors can be fatal. Instead, use mineral spirits or naphtha to remove oil or wax residues. Another familiar halogenated solvent is methylene chloride, a major ingredient in most paint removers and non-flammable brands of contact cement. This liquid is very effective as a stripper because it attacks the adhesion layer of a finish right at the wood, allowing the old coats of finish to be conveniently removed as a gelat-

inous layer. The acute toxicity of methylene chloride is relatively low, but the vapors have strong narcotic effects and may disrupt your heartbeat. Methylene chloride is also one of two solvents that pass freely through the filter cartridges of organic-vapor respirators (the other is methyl alcohol). Goggles are important since splashed droplets can cause serious eye damage.

The diluents used in both compressor-

powered sprayers and spray-can finishes also are highly toxic. And since sprayers require liquids with exactly the right viscosity and drying rate, it's best to follow the manufacturer's recommendations for thinners. Most of these solvents are identified only by a trade name; they are typically a mixture of petroleum distillates and can produce health problems ranging from eye and throat irritation to neurological damage, liver and kidney injury, and blood diseases, so it's best to limit your use of them. One way of minimizing exposure to these solvents is to use brushes or rollers whenever possible, rather than spray guns or aerosol cans. With direct applicators, like brushes, you won't need to dilute the finishing mate-



rials as much, which greatly reduces the amount of toxic vapors that are emitted.

Many petroleum-base liquids can be used as thinners for brush-on varnishes and paints, and even though most of these organic solvents perform similarly, their toxicities vary widely. The least-hazardous choice for brush-on varnish and paint thinner is mineral spirits. Turpentine also has low toxicity, but it's more likely to cause allergic skin reactions. In fact, prolonged or repeated skin exposure to most solvents (except water) can cause skin irritation. This occurs because many solvents, like acetone, ethanol and ketones, extract natural oils from skin layers, which results in severe chapping. If you

need a thinner that dries quickly, naphtha is safer than most other fast-evaporating solvents, but be aware that quick-dry solvents all pose substantial fire hazards. Woodworkers are usually surprised to learn that the most flammable shop solvent is acetone—a liquid that's often handled with very little caution.

Most finish removers contain solvents that are toxic to some degree when inhaled or absorbed through the skin. Some non-chemical refinishing alternatives are safe, but they require a bit more time and effort. Sanding and cabinet scraping are two methods that don't rely on chemicals. And the new, so-called safe strippers, such as Wood Finisher's Pride, Easy-Off, Bix Hydro

Stripp and 3M's Safest Stripper, are other possible alternatives. These products utilize relatively safe compounds like methyl pyrrolidone (NMP), dibasic ester (DBE), d-limonene or citrus extracts. However it's still a good idea to conduct a test before using any of them to refinish one of your favorite antiques.

If you do have to use a highly toxic solvent, you can guard yourself against absorption and inhalation by avoiding spills, wearing goggles and butyl gloves, and using a chemical-cartridge respirator with an organic-vapor canister. And, of course, the warnings to "use with adequate ventilation" should be heeded. For more information on

Will new VOC regulations affect you? by Michael Dresdner

Twenty-one years ago, Americans launched Earth Day to emphasize the environmental damage caused by humans. Since then, more attention has been paid to the hazardous wastes we've been putting into our air. Among these are hydrocarbon solvents called volatile organic compounds (VOCs) that evaporate into the air and are widely used by wood finishers.

The media has chronicled the problems associated with ozone depletion caused by the release of chlorofluorocarbons (CFCs) into the upper atmosphere. Although CFC pollutants continue to thin our protective ozone layer, the VOC/ozone problem acts in reverse and occurs in our lower atmosphere. Since VOCs are photoreactive, sunlight causes them to create, rather than destroy, ozone. But excess ozone in our surface air makes breathing difficult and combines with particles to form smog. Unfortunately, the surplus ozone in our troposphere (surface atmosphere) doesn't travel high enough to benefit our stratosphere (upper atmosphere).

Since most of the solvents that make up finishing materials are ozone-producing VOCs, it's actually easier to name the three groups of VOC exceptions. First, there are additives, like ammonium hydroxide used in latex paint, which are not organic compounds. The second group contains VOCs that produce little or no ozone. Alcohol (a shellac solvent) and methylene chloride (a solvent in paint remover) fall into this category. The third group contains VOCs that evaporate so slowly they aren't counted in a paint's formula. Virtually everything else used to thin paint and varnish is an ozone-producing VOC.

As a way to reduce tropospheric ozone, the 1990 Clean Air Act restricted the amount of VOCs finishers (and everyone else) are allowed to release.

Presently, there are two actions being taken to reduce VOCs, and together they can create even more significant reductions. The first is for solvent users to increase their transfer efficiency (TE), which is a percentage of the amount of finish that actually contacts the wood. The TE rates the application method used on the wood and not the finish's solvent content.

Brushes, paint pads and rollers boast TE's of almost 100%. By contrast, a typical compressed-air spray gun operates at only a 35% TE; two-thirds of the finish leaves via the spray-booth fan without ever touching the work. Between these application methods are high-volume, low-pressure (HVLP) turbine sprayers and airless systems with TE's from 60% to 85%.

The second VOC action deals with the finishes. Finish and paint formulators are redesigning coatings with lower solvent levels and, in some cases, replacing a portion of their product's VOCs with alternative diluents such as water. Most current water-base finishes still contain VOCs, but less of them.

Each state is responsible for meeting the national ambient air-quality standards. Regulations vary widely from state to state. The toughest come from the south coast air-quality management district (SCAQMD), the southern California area that includes Los Angeles. SCAQMD regulates both VOC content in finishes and the minimum TE of application methods.

Many states will eventually pass similar legislation, but in the interim, the Environmental Protection Agency (EPA) has suggested that all states use the Chicago, Ill., standards (see chart below) as a minimum guideline if stricter laws aren't already in place. Companies that want to find out a state's regulations can contact their local air-quality department. For information, call the EPA at (703) 308-8721.

Hobbyists and shop owners will, in most cases, be exempt from regulations because they represent a small part of the problem. In comparison, big furniture manufacturers put out more VOCs in one day than a dozen small shops produce in a year. But that doesn't mean small users shouldn't be concerned with the VOC issue. Voluntary compliance with these regulations sets a good example for other finish producers and sends a message to lawmakers. Considering the current state of our environment, we simply can't afford to look the other way. □

Michael Dresdner is a finish consultant, woodworker and author in Perkasie, Pa.

Finishing Material Limits		
Item	(grams/liter)	(lb./gal.)
Clear topcoat	670	5.6
Opaque stain	560	4.7
Pigmented coat	600	5.0
Repair coat	670	5.6
Sealer	670	5.6
Transparent stain	790	6.6
Wash coat	730	6.1

Grams of VOC per liter of coating less water and any exempt compounds for the eight-county Chicago, Ill., area. Limits are given as guidelines by EPA for other states.

safely using hazardous chemicals, see *FWW* #80, pp. 58-63.

Proper ventilation and fire safety

Adequate ventilation consists of a steady flow of fresh air across a work area in a direction that carries fumes away from the worker. Indoors, this means opening all the doors and windows for good cross-ventilation. If a strong odor is present or you develop dizziness, headache or nausea, leave the area immediately. But don't trust your sense of smell to protect you from all vapors. For example, the legal maximum limit considered safe for workplace exposure to methyl alcohol is only 200 parts per million (PPM), but most people can't smell it until the vapor level reaches 2,000 to 6,000 PPM. Also, most solvent vapors are two to four times heavier than air, so fumes accumulate near the floor. Because of this, ventilation is especially important for basement shops and storage areas. An air-to-air exchanger and a spark-free exhaust fan are ideal for basements.

The proper handling and storage of solvents are important for fire and ventilation safety. It's risky to stockpile large amounts of solvents; a few gallons will satisfy the needs of most shops. Woodworkers should not be using gasoline or kerosene except for its intended use as a fuel. Besides its high flammability, gasoline may also contain toxic tetraethyl lead or benzene. Kerosene is less

hazardous and may work for degreasing machine parts, but like gasoline, it is a poorly refined petroleum product that has relatively inferior handling properties when used as a shop solvent. Frequently used solutions are best stored in a flame-proof safety can (shown at right). Keep solvent-contaminated rags in lidded, metal disposal cans (see the photo on p.80) that are located away from potential fuels. Flammable vapors must be protected from heat in case of a shop fire, to delay ignition so that occupants can escape. Rather than putting solvents in glass jars or using open containers to park used paint brushes, keep them in sealed cans. To store cans, buy a double-walled steel, flammable-liquid storage cabinet, like the one shown in the photo on p. 80, or build a fire-resistant locker. Most states require that the lockers be vented to the outside and limit the total amount of solvents that you can legally keep on hand. And some states have now imposed restrictions on the use of solvents that are volatile organic compounds (VOCs). See the sidebar on the facing page for more information on VOCs.

Records compiled by the National Fire Protection Association reveal that spontaneous combustion is a leading cause of woodshop fires. Turpentine and oil finishes are particularly hazardous because of their tendency to oxidize in air. A heap of oil- or turpentine-soaked rags can reach ig-



Safety cans are ideal solvent containers. The cans have flash arrestors and caps that release pressure, dissipate heat and retard vapor ignition. Here, Mustoe adds mineral spirits via a can's triggered spout.

nitiation temperature in a few hours. Soaking rags in water can delay combustion, but it's best to dispose of solvent-laden wastes each day. Fortunately, there are many environmentally sound options for removing waste solvents (see the sidebar below). Finally, make sure your shop's fire extinguisher is suited for flammable liquids, and keep it handy. □

George Mustoe is a geochemist in Bellingham, Wash. His part-time woodworking projects include skis, snowshoes and Irish harps.

Disposing of solvents responsibly

by Jeff Jackson

As woodworkers, we use solvents and finishing products that end up as hazardous wastes, so it's important to keep abreast of environmentally responsible waste-disposal methods. The *Code of Federal Regulations* (Title 40—Protection of the Environment) defines hazardous waste and establishes reportable quantities for releases of certain chemicals. However, these laws don't apply to most woodworkers because they use such small amounts of organic compounds, such as solvents.

Nevertheless, even small quantities of hazardous wastes can contaminate the environment. A quart of stripper carelessly discarded in a stream can contaminate millions of gallons of water. But there are some safe ways to dispose of small amounts of hazardous waste, as follows:

- Air-dry brushes, rags and the hazardous liquids left in containers outdoors or in well-ventilated areas, away from pets, children and ignition sources. Even though this pollutes the air with hydrocarbons, sunlight and air will break down common volatile chemicals in hours or days. Dry wastes discarded in landfills are less likely to become part of the leachate (liquid) that may ooze into groundwater under a landfill or into nearby surface water. Also, solidified waste is more easily handled by municipal waste-disposal firms.

- Mix hazardous liquids with non-reactive absorbents, like cat litter, and dry the material or seal it in a container. Don't use sawdust because it could lead to spontaneous combustion.

- Never pour flammable solvents or hazardous-waste compounds down the drain. This could create a fire hazard, upset your septic system or allow the solvents to enter your groundwater. If you're on a municipal sewer system, the compounds may not be removed during waste-water treatment.

- Never pour hazardous liquids in surface water or ditches. When poured into the soil, chemicals may eventually enter the groundwater via rainwater or melted snow.

- Recycle waste finishes and solvents by brushing them on an old shed or other outbuilding. Also, take advantage of community recycling efforts and exchange programs for paints and varnishes. Check to see if your town's health department has a program to handle small volumes of hazardous wastes.

- Rethink your finishing processes to reduce or eliminate hazardous materials. If you need a quart of stripper, but the gallon container is on sale, buy the quart anyway. It's a small price to pay for reducing waste volume. □

Jeff Jackson is an environmental engineer and part-time woodworker living in Taylors, S.C.

Making a Landing Net

Steam-bending and laminating a curved frame

by Geoffrey G. Carson

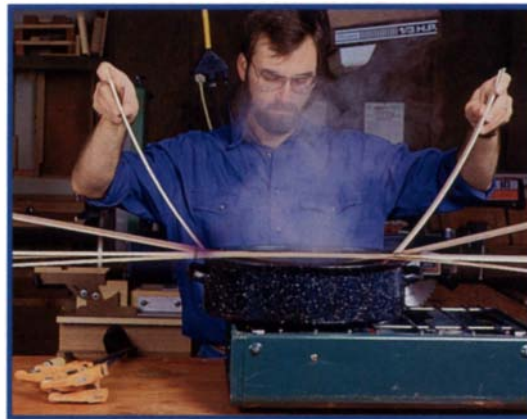
Besides woodworking, one of my favorite avocations is fly-fishing. Whenever I've had a good dose of shop sounds and sawdust, and it's time to clear my head and lungs, I take to the mountain streams of the Sierra Nevada. But I don't forget the pleasure of working with wood because I bring a piece of my craft with me in the form of a steam-bent landing net. To me, there are few things as rewarding as gently lifting a just-hooked rainbow trout from clear water using a piece of gear I crafted in my workshop.

The net is a straightforward project that offers practice in both steam-bending and bent-lamination techniques. The wooden frame is comprised of three $\frac{1}{8}$ -in.-thick strips that are steamed and bent around a form and then, after they're dry, laminated in a clamping fixture. A wooden-handle insert is then fitted and glued in place. After the frame is prepped for a net, it is sanded and finished and a net bag is attached.

The frame I use for an 18-in.-deep by 28-loop net bag is lightweight and comfortable to hold. It's long enough to accept a sizable fish, but narrow and compact enough to be maneuverable and to fit into my fishing vest. You may want a larger or smaller net depending on the type of fish you are after, but you should have a net in hand before building the frame (see the sidebar on p. 86 for a source for nets). Another consideration in the frame's shape is the radius of the bend. I've found a 3-in.-radius curve is as tight as I care to bend $\frac{1}{8}$ -in.-thick strips of wood.

Building a bending and gluing fixture

My bending fixture consists of a $\frac{3}{4}$ -in.-thick plywood plug screwed to a plywood base. The plug, which is the exact shape and size of the desired frame hoop, has holes drilled equidistantly around the perimeter to accept clamps (see the drawing on the facing page). To keep the frame from being glued to the base, I place a sheet of 0.5- or 1-mil. polyethylene between the plug and base. When band-



The author's steamer is a roasting pan filled with a bit of water heated on a Coleman camping stove. Only the middle of the $\frac{1}{8}$ -in.-thick laminations are steamed before they're clamped around a plywood plug to form the frame.



A steam-bent landing net is a welcome addition to any angler's gear. This bird's-eye maple and walnut frame holds a 28-loop bag.

sawing the plywood plug, I remove a $\frac{3}{8}$ -in.-wide hoop of waste to allow space for the frame, so the outside scrap plywood can be used as clamping cauls. I bandsaw just outside the layout lines and then use a file and drum sander to smooth the edges of the plug and cauls to the lines.

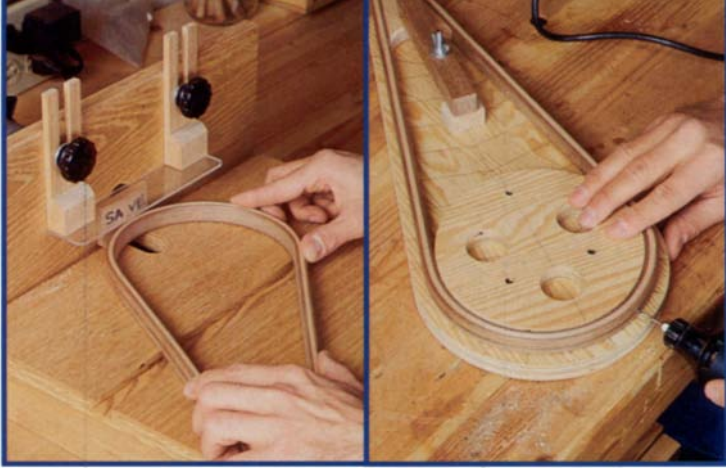
Selecting and preparing stock for the laminations

Various contrasting woods can be used for the landing net's frame, but each one will have its own bending characteristics. Woods like oak, maple, walnut and poplar bend with relative ease, while mahogany and many exotic woods require thinner laminations or longer steaming times during the bending process. I always select straight-grain lumber for the frame because it's frustrating to have steamed laminations snap in two due to slash grain.

After selecting the wood, I rip three $\frac{1}{8}$ -in.-thick laminations (usually two of one wood, one of another) from $\frac{3}{4}$ -in. stock. The length of the laminations will vary with the size of the net frame; the strips for the frame shown here should be about 48 in. long. Once I've cut all the strips, I'm ready to bend them.

Using a simple steam-bending pot

Although my method of steam bending may seem somewhat crude, it works well enough for me. I use a turkey roasting pan, boiling approximately 3 in. of water in the bottom. I lay all of the wood strips across the pan, as shown in the top photo above, with the portion that will form the tight curve at the net's end over the steam, and then I cover the strips with the lid. It isn't necessary to steam the part of the strips that will form the handle portion because its curve is minimal and will be formed during laminating. I steam each strip until it is very pliable—both ends are bent upward until the strip's center is bowed down enough to touch the boiling water. As I mentioned earlier, different woods will require differ-



A $\frac{1}{8}$ -in.-wide groove for recessing the line that secures the net is routed around the frame's perimeter (left). A curved, hardwood block, attached to the fence of the horizontal mortising table with double-faced tape, allows for full depth of cut all along the frame's outer edge.

Equally spaced holes for mounting the net bag are drilled along the groove that surrounds the frame. To minimize tearout, Carson drills with a high-speed Dremel Moto-Tool (right).

ent steaming times. I've found that maple, poplar and walnut take about 10 to 15 minutes, while mahogany takes at least 30 minutes.

While the wood is still hot, I bend the laminations around either a 6-in.-dia. circular plywood form, like the one being used for drilling in the photo at right, or around the fixture's plug, as illustrated in the drawing at right. I clamp the net end of the frame's curve only, not the handle, and let the layers sit overnight. The next day I remove the laminations from the bending fixture, separate them and place a rubber band around their ends to hold the curve until they're fully dry, which usually takes two or three days.

Gluing and clamping the frame

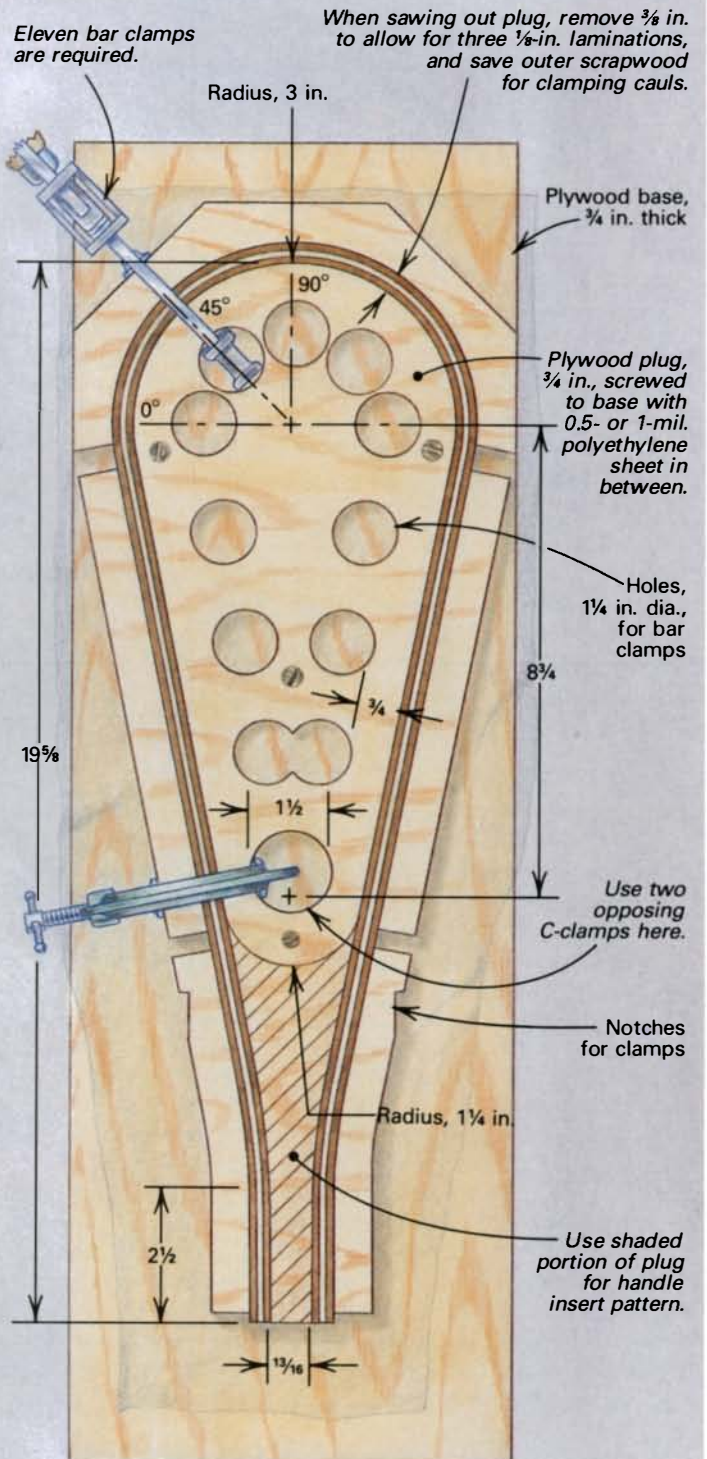
To glue the laminations, I use Weldwood's plastic resin glue with a water-activated catalyst. It's easy to mix, highly water resistant and strong (provided the manufacturer's recommended mixing ratios and clamping times are closely followed). Be aware that the pot life of this glue is relatively short and brushing glue on the strips can be time consuming.

Before gluing, I dry-clamp the strips in the fixture to ensure a proper fit. To prevent excess glue from sticking the frame to the fixture, I generously coat the plug's and cauls' edges with Minwax furniture paste wax. Next, I place the inner lamination on the fixture, and then liberally cover the inside surfaces of the middle and outer laminations with glue before adding them to the fixture. Starting at the top of the frame, I position the clamping cauls over the outer lamination and, working alternately in both directions, I tighten the clamps until there is even glue squeeze out around the frame. I also make sure that the edges of the laminations are lined up since this makes the frame easier to surface later. It's normal to encounter a small amount of springback when the frame is unclamped, but that won't be a problem once the handle insert has been glued in place.

Adding a handle insert and prepping the frame for a net

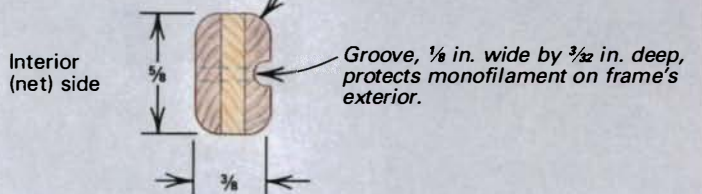
Before cutting the $\frac{3}{4}$ -in. stock for the handle insert, I use the handle end of the glued-up frame to trace the insert's pattern. To overcome springback, I squeeze the ends of the frame to the desired width before marking out the handle. I shape the wide end of the insert to form a smooth transition between it and the frame. The insert is glued in place and clamped using two hand screws and the lower cauls. After the glue has cured, I run the frame through

Bending/gluing fixture



Section through finished frame

Edges are radiused $\frac{1}{8}$ in.



my thickness planer to remove any offset in the laminations. I minimize cross-grain tearout at the end of the frame by keeping my planer's knives sharp and their depth of cut set for very light passes. When the top and bottom surfaces are even, I trim and round the end of the handle, sand and smooth the upper end of the handle with a drum sander. Radius all edges of the frame, inside and out, with a 1/8-in. roundover bit (see the detail in the drawing on the previous page). Occasionally, my mahogany and oak frames split out at the curved end while I'm routing. But almost all splitting can be eliminated by first easing the frame's sharp edges with a sanding block and then passing the router slowly over that area.

Although the net bag is hung on the inside of the frame (see the instructions in the sidebar), it is secured around the frame's perimeter with 50#-test monofilament fishing line. To reduce abrasion of the line and net loops, I rout a 3/32-in.-deep groove into the outside of the frame with a 1/8-in. veiner bit fitted into my shop-built mortising jig (see the left photo on the previous page). After counting the net's attachment loops, I lay out and mark the hole locations, starting at the center of the frame's curved end. The last hole at each side of the handle (below the hoop) should be drilled at an upward angle so that the hole spacing along the inside curve

of the handle insert matches the spacing along the frame. I use a Dremel Moto-Tool to drill the evenly spaced 3/64-in.-dia. holes (see the photo at right on the previous page) along the frame's groove for attaching the net bag. The Moto-Tool's high speed minimizes tearout where the bit exits the inside of the frame.

Sanding and applying a protective finish

I hand-sand the frame to 220-grit in preparation for the finish. Then I brush on successive coats of clear Watco oil, allowing the frame to soak up as much oil as it can in 30 minutes. Next I apply two coats of Formby's High Gloss Poly Finish as a topcoat, which provides some protection against the net's occasional dunking. Because of the frame's curves, I make an applicator from an old T-shirt with rolled-up balls of cloth inside (similar to those used for French polishing). I dip the applicator several times to saturate the inner cloth with enough finish to do the entire frame. When the frame is dry, I tie on a net bag and install a brass screw eye in the butt of the handle to tether my landing net to my vest, ready for the next fishing adventure. □

Geoffrey Carson runs Carson Woodworks, a part-time woodworking company in Orange, Cal.

Hanging a net bag

After making my first landing net frame, I decided to tie my own net using nylon line and a book on knots. Unfortunately, it took longer to tie the bag than it did to build the frame. I have since vowed never to tie nets again. Instead, I purchase net bags from Greg Lilly's, A Fly Fishing Adventure, 13011 Newport Ave., Suite 105, Tustin, Cal. 92680. The nets come in a variety of sizes, but the methods for hanging them on a frame remain about the same.

First, devise a stand, like the one in the photo at right, to secure the frame and free your hands for tying. Begin attaching the bag's loops on one side of the frame's handle and work up that side, around the net and then down the other side toward the handle again.

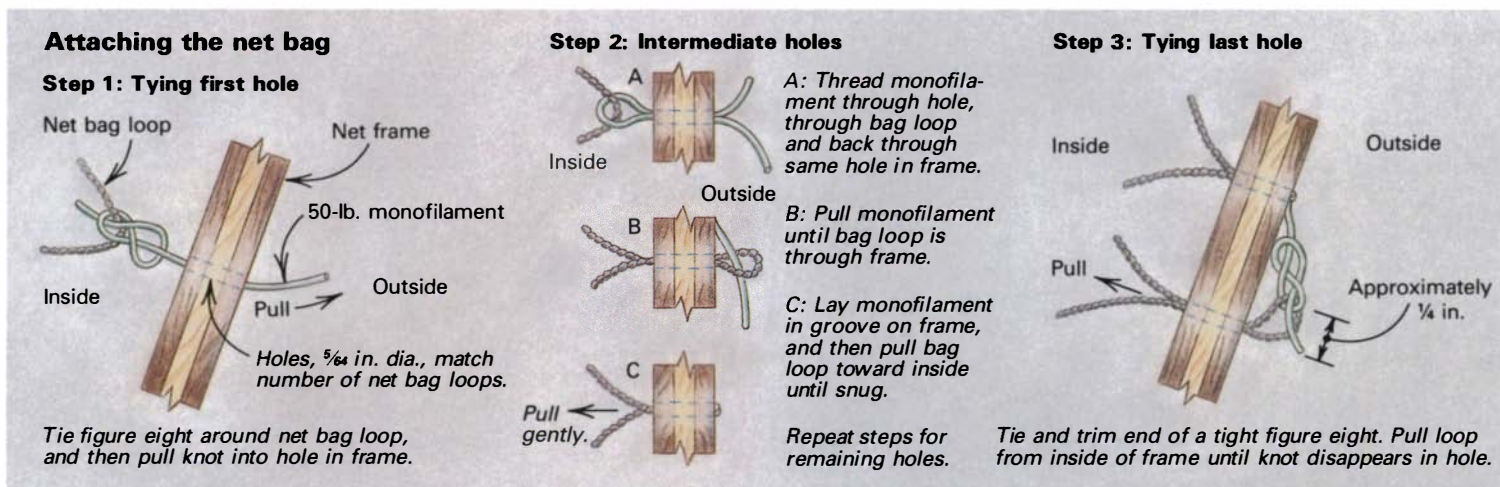
Here's my procedure: Cut a piece of 50#-test line about twice the length of the frame's perimeter, less the handle. With one end of the line, tie a figure-eight knot around the net bag loop, and then feed the other end through the frame's first hole from the inside. Pull the line until the knot just disappears into the hole, as detailed in step 1 below. This takes some force, so heavy gloves are a good idea to keep the line from cutting your hand.

Next, thread the monofilament through the second hole of the frame from the outside, as shown in step 2. Repeat this sequence for all the intermediate holes. For the last bag loop, pass the monofilament through the frame from the outside, through the loop and then back through the last hole in the frame. Pull the line until the bag loop is completely through the frame. While holding the line taut in the frame's groove with a small pair of needle-nose pliers, tie a figure-eight knot around the loop (see step 3). Trim off the excess monofilament, and then pull the loop from the inside of the frame until the knot and net-bag loop disappear into the hole.

—G.C.



The author built this stand to clamp his work when he's hanging nets. It holds the net frame, so Carson's hands are free to attach the net. Using a length of 50#-test monofilament, which measures twice the length of the frame's perimeter (minus the handle), Carson secures the net loops within the perimeter groove.



Router-Assisted Cockleshell Carving

A swinging jig shapes the interior and defines the flutes

by Howard Wing

The key to making a profit on a complicated piece like a shell-top cabinet is to control labor hours. When researching shell design before my first attempt at carving one, I read an article by Franklin Gottshall, an experienced carver and period furniturer. Gottshall acknowledged putting two weeks of labor into carving a shell, and I got the impression he worked long days. If I took that long just to carve the large cockleshell, the cabinet would be a sure budget-buster. So I began to think about a router set-up that could shape the basic spherical surface of the shell as well as rough out the flutes.

The two-axis router jig I developed worked well to shape the interior of the shell and to define the flutes for the cabinet shown at right. However, I did notice some undesirable flexing in the jig, so when the next shell-carving job came along, for a smaller shell to top off a clock, I reworked the jig to eliminate these problems. The new jig, shown in the top photo on p. 89, worked perfectly. I first cut the inside of the shell to a spherical shape with a straight bit mounted in the jig-held router. Next, I changed to a core-box bit to outline both edges of the flutes. Then, by shifting the vertical pivot point, as shown in the drawing on the next page, I was able to cut the bottom of the flute with decreasing depth from front to back. Although I could have continued to rout away the waste in each flute, I found it quicker to hand-carve the waste with a gouge, connecting the router cuts along the edges of each flute with the bottom cut that defined the flute's depth. The total time to make the shell, including building the jig, was just 36 hours.

Stack-laminating the shell

The blank for carving the shell is glued up from a series of decreasing diameter brick-layered arches. I made a full-size drawing so I could determine the inside and outside diameters of each layer, as shown on the next page. From the drawing I was also able to determine the approximate angle of the inside face of each layer. To minimize the amount of material I would need to remove with the router, I bandsawed the inner diameters to these angles. The angle for the top layer is too acute to bandsaw, so I left it as a solid slab for glue-up and later chiseled away enough waste to provide clearance for the router jig. After bandsawing the semi-circular bottom layer, but before cutting its inside face, I used an extended fence on my tablesaw's miter gauge to guide the piece while crosscutting flat reference surfaces on the outer ends. These surfaces are used later to mount the router jig on the shell. I also ripped a flat reference face along the center of the back edge of the bottom layer, so I could screw the shell blank to a mounting board. I then glued, stacked and screwed the individual layers as shown.

Building the router jig

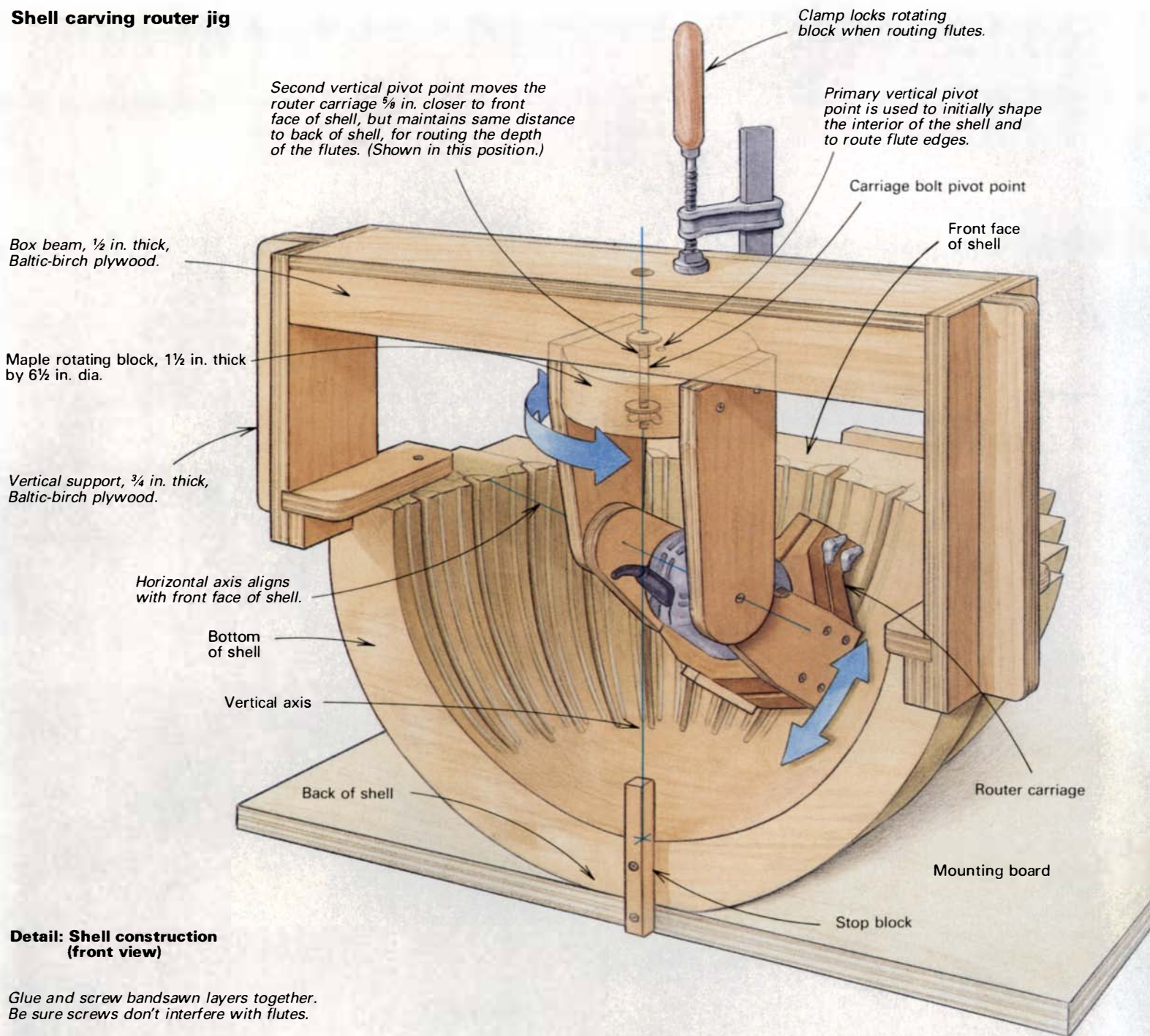
Although the jig in the top photo on p. 89 is for a much smaller shell than I used for the cabinet shown below, the principles are the same. The dimensions are immaterial as long as the jig is designed so that the pivot points are located directly on the shell blank's vertical and horizontal axes.

The jig has a fixed box beam that bridges the front of the shell and provides a mounting-and-pivoting point for a swinging arm that carries a router. The box beam is held by vertical supports screwed to the shell blank and supports the swinging router carriage so that the router bit is aligned with the vertical axis of the quartersphere. The



Cocklesbells traditionally required many hours of skilled hand-carving. But the author devised a router jig that helped him cut the time in half for making the shell in this cabinet.

Shell carving router jig



beam's key design consideration is to ensure it doesn't interfere with the swinging arm that carries the router through 90° of front-to-back movement and 180° of side-to-side movement.

The router carriage consists of split rings that hold the router and a pair of articulated plywood arms suspended from the rotating block bolted to the box beam. The arms are dimensioned so that their pivot point falls on the horizontal axis. It is important to eliminate vibration and play in the rotating axes and in the router hanging at the end of the swinging arm. For the pivot point at the vertical axis, I used a 3/8-in.-dia. bolt that fits tightly through holes in the beam and the rotating block to which the swinging-arm router carriage is attached. For the horizontal pivot points, I used two #10 flat-head wood screws. By slightly adjusting the screws, I can remove all play yet maintain smooth movement.

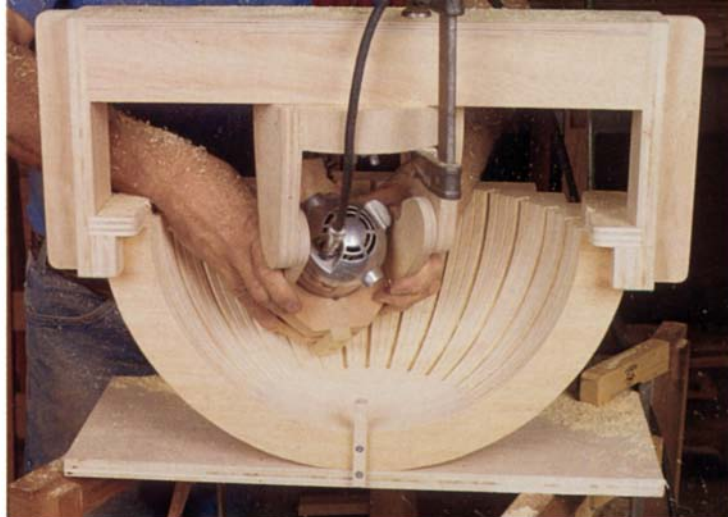
To rout the sides of each flute, the rotating block can be clamped to the beam to restrict movement about the vertical axis, and then the router carriage can be swung about the horizontal axis. While the bottom of the flutes have the same radius as the basic spherical section, they are deeper at the shell's front edge than at the back. So, I drilled a second vertical pivot point in the rotating block, 5/8 in. behind the first pivot point, to shift the jig's horizontal axis of rotation toward the front of the shell while maintaining the same relationship to the back. This allows the router to cut flutes that become shallower as they move from front to back.

Using the router jig

To hold the shell for routing (and later carving), I screwed it to a mounting board. I then aligned the jig on the shell, as shown in the drawing, so that the router bit lined up with the vertical axis and the router-carriage pivot points lined up with the horizontal axis. Because the jig is used to rout the internal surface of the sphere, this alignment was not critical; anything within 1/16 in. of the layout lines would be fine. Then I screwed the jig to the shell.

I started cutting the spherical interior surface with a 1/2-in.-dia. straight mortising bit adjusted to cut 1/8 in. deep. Depth of cut is adjusted by loosening the wing nuts that secure the router carriage's split wooden rings, sliding the router to desired depth and then tightening the nuts. I guided the router in both axes' directions using my hand to support the swing arm. I adjusted the depth and repeated this process until the inside surface was completely shaped. This went quickly, and in less than an hour, I had a nice spherical surface with only slight tool marks. I thought I might need to switch to a large core-box bit after rough-cutting with the mortising bit to get a better finish, but the straight bit worked very well. I then hand-sanded the shell down to 120-grit to get a paint-quality surface (only 15% is used because the rest is cut away in making the flutes).

Before cutting the 15 flutes, I laid them out along the front edge of the shell. I put a 1/4-in.-dia. core-box bit in the router and, after aligning the bit to one of the layout lines, clamped the rotating block to the box beam to prevent any movement in the vertical axis. I adjusted the depth of cut until the bit was just shy of the inside surface of the sphere and swung the router toward the back of the shell to determine where to position a stop block to limit the length of the flutes. Because I wanted to leave room for a carved, semicircular design at the back of the shell, I needed a stop to prevent the flutes from converging. With the stop block in place, I swung the router back to the front edge, adjusted the router to cut 1/8 in. deep and made the pass from front to back to define one edge of a flute. Next, I unclamped the rotating block, realigned the bit with the other edge of the flute layout line and made a second pass to outline that edge. I repeated this procedure 28 more times to outline all the flutes. I found that having a helper work the clamps while I controlled the router cut the time required for this process in half.



A two-axis router jig is used to define the edges and bottom of each flute. By shifting the horizontal axis, the flutes are routed progressively deeper from front to back. The jig was also used to shape the interior of the shell before fluting.



Hand-carving the flutes on the shell with a gouge is fairly easy after their sides and the depth have been defined by router cuts. A sharp gouge is essential to minimize tearout when carving endgrain, and a spoon gouge or bent gouge is helpful in tight areas.

To rout the grooves that define the bottom of the flutes, I had to remove the router carriage from the bridge and remount it using the second vertical pivot point I had drilled in the carriage's rotating block. This moved the horizontal axis forward and allowed the router to cut the flutes deeper at the front of the shell than at the back. To cut the flutes to final depth, I used the previously described technique of aligning the bit, clamping the rotating block and swinging the router through the horizontal axis. Since I couldn't cut to the full 5/8 in. depth in a single pass, I had to make the circuit around the shell five times, increasing the depth of cut by 1/8 in. after each completed circuit.

Carving the flutes

After the machine work came a day of hand-chopping the flutes with gouges, as shown in the bottom photo above, and then scraping and sanding the flutes smooth. But it only took about 20 minutes to do each flute, because the router cuts had done the difficult work of making clean, straight edges and establishing the depth of each flute.

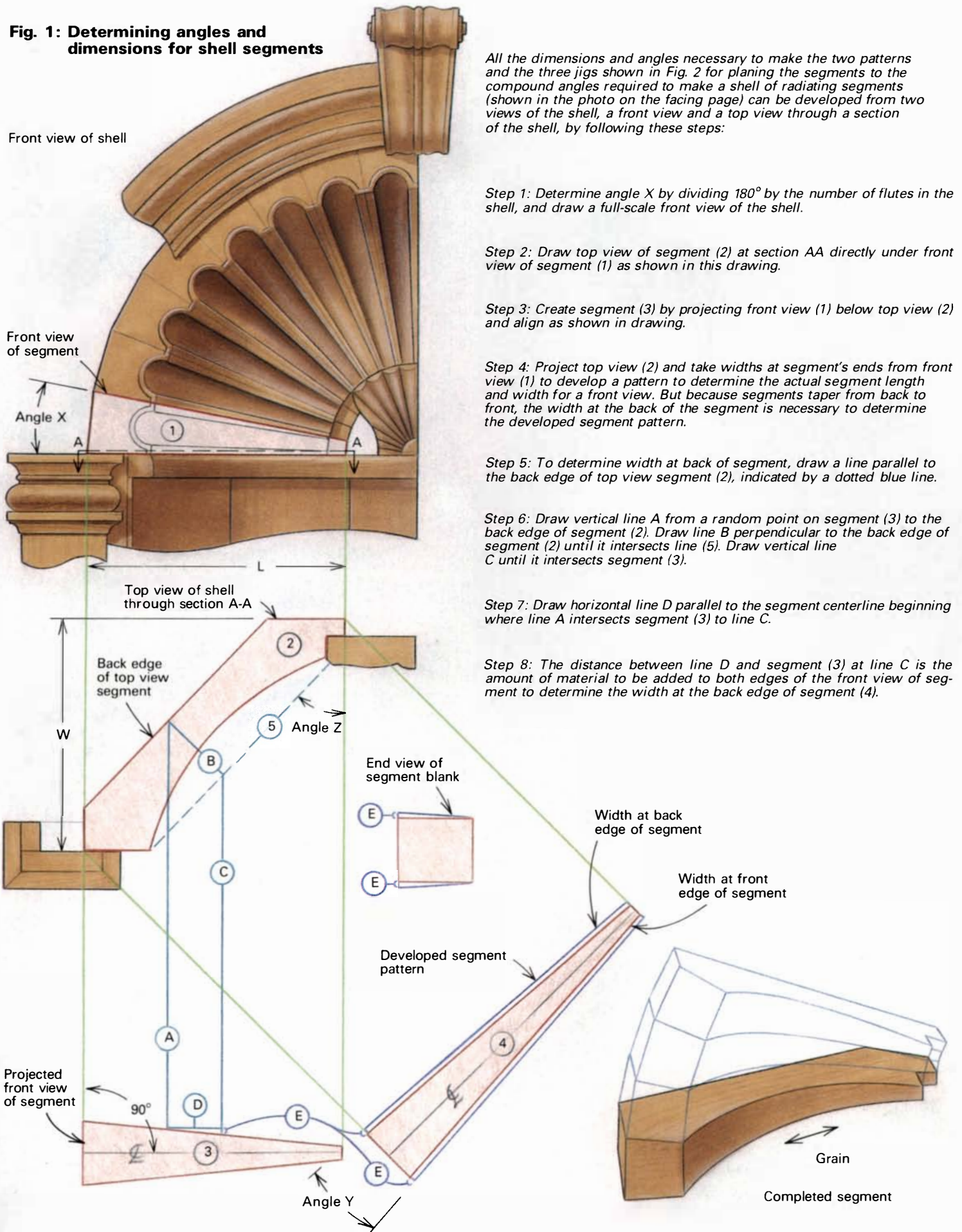
At this point I realized the biggest advantage of my router technique was the guarantee of a high-quality spherical surface as the starting point for the flutes. This was confirmed when I looked at museum pieces with hand-carved shells and saw that flutes with tiny imperfections tended to have slight wanderings in the lands between flutes. Aberrations like this are expected and charming in true period pieces, but I suspect that even oldtime carvers used every means available to make their flutes as straight and true as possible. □

Howard Wing is a professional woodworker in Boxborough, Mass.

Gluing up a shell with tapered segments

by Philip C. Lowe and Justin P. Smith

Fig. 1: Determining angles and dimensions for shell segments



All the dimensions and angles necessary to make the two patterns and the three jigs shown in Fig. 2 for planing the segments to the compound angles required to make a shell of radiating segments (shown in the photo on the facing page) can be developed from two views of the shell, a front view and a top view through a section of the shell, by following these steps:

Step 1: Determine angle X by dividing 180° by the number of flutes in the shell, and draw a full-scale front view of the shell.

Step 2: Draw top view of segment (2) at section AA directly under front view of segment (1) as shown in this drawing.

Step 3: Create segment (3) by projecting front view (1) below top view (2) and align as shown in drawing.

Step 4: Project top view (2) and take widths at segment's ends from front view (1) to develop a pattern to determine the actual segment length and width for a front view. But because segments taper from back to front, the width at the back of the segment is necessary to determine the developed segment pattern.

Step 5: To determine width at back of segment, draw a line parallel to the back edge of top view segment (2), indicated by a dotted blue line.

Step 6: Draw vertical line A from a random point on segment (3) to the back edge of segment (2). Draw line B perpendicular to the back edge of segment (2) until it intersects line (5). Draw vertical line C until it intersects segment (3).

Step 7: Draw horizontal line D parallel to the segment centerline beginning where line A intersects segment (3) to line C.

Step 8: The distance between line D and segment (3) at line C is the amount of material to be added to both edges of the front view of segment to determine the width at the back edge of segment (4).

A shell can be constructed with stacked, crescent-shaped pieces, as long as the resultant checkerboard grain pattern is covered with paint. When we make shells that will have a clear finish, like the one shown at right, we glue up radiating segments (one for each flute) to provide a more uniform appearance and to make carving with the grain easier.

The shell's blank is comprised of compound-angle segments that taper from outside end to inside end and from back to front. To cut the blanks for these segments, we developed patterns following the step-by-step procedures given in figure 1. It's easy to come up with a top-view segment pattern and a front-view pattern based on a full-scale drawing. But because the segment is wider at its back face, we used a boatbuilder's trick known as lofting to determine the front-to-back taper without resorting to complicated mathematical formulas (see steps 3 through 8 in figure 1). Using the patterns, we laid out and cut the segment blanks and then we planed the compound angles on the sides of the segments using the jigs shown in figure 2.

Before gluing the segments together, we

bandsawed the front face of each to rough shape. A spare segment, ripped along its centerline and placed under each segment when bandsawing, ensured that the cut was perpendicular to the segment's centerline.

We glued up the segments in pairs with hot hide glue by rubbing the segments together until the glue just began to grab and then quickly aligning the pieces. If the joints are good, clamps are not necessary. We then glued pairs of pairs together until the shell was completed.

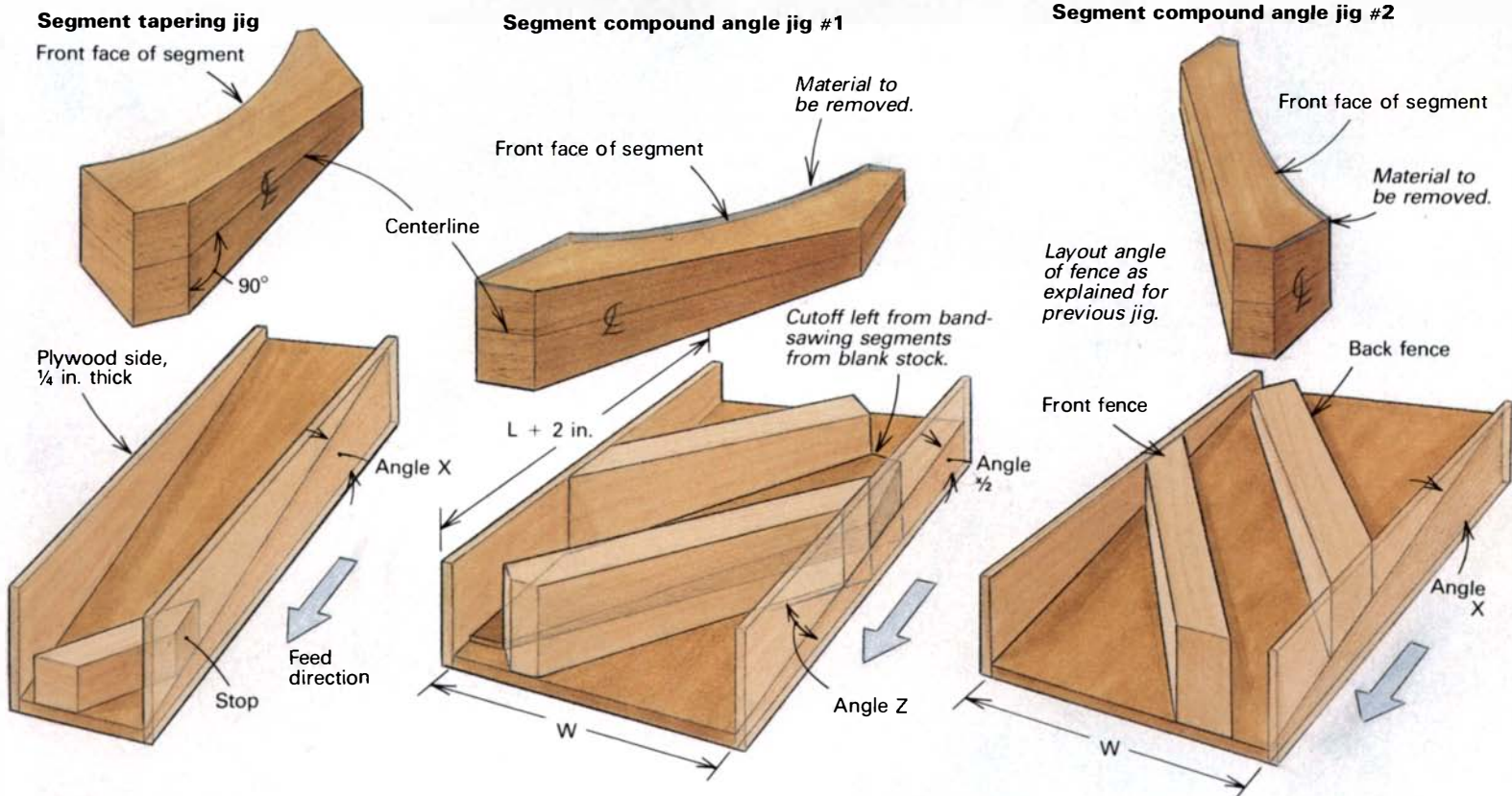
When we developed these methods we were making two cabinets, and so we glued the two shell blanks together with paper between them to form a bowl shape and then turned the interior on a lathe. Turning a blank this size requires a low speed on a large, well-anchored lathe. For a single shell, we normally hand-carve the interior shape before carving the flutes, but the jig shown in the previous article is an attractive alternative. □

Phil Lowe and Justin Smith specialize in designing, fabricating and restoring fine furniture in Beverly, Mass.



A clear-finished shell glued up from compound, angled segments has a more consistent color across the interior of the shell than the checkerboard pattern of endgrain and long grain found in the typical layered shell.

Fig. 2: Angle jigs for preparing shell segments (angles and dimensions taken from Fig. 1)



This jig is used to plane all segments to the same dimension and create uniform end-to-end tapers as determined from full-scale drawings. Prepare the blanks by first planing stock to thickness and then layout each piece using the developed segment pattern. Bandsaw the segments from the blanks and save two cutoffs: one is used in the compound angle jig #1 and one is placed under the segments so that bandsaw cuts are perpendicular to the segment. Joint one face of the segment and then place it, jointed face down, in the jig.

When run through the planer, this jig adds a back-to-front taper creating a compound angle on one side of the segment.

Lay out angle of fence (angle Z from top view in Fig. 1) on flat bottom surface of base, transfer lines up sides with square and connect with straight edge.

This jig positions the segment for planing to final dimension and produces the required compound angle on the second side so that the segments, when assembled, will form the shell blank.

Note that the angle of the fences is reversed from previous jig for planing the opposite face of the segment.



It took William Schnute of Carmel Valley, Cal. seven months to sculpt both sides of these limed-finish, white oak doors (above). To reduce weight and improve stability in the 9-in.-thick by 9-ft.-high doors, he engineered torsion-box cores for the pair. Schnute made the 16-in.-dia. brass pulls and his wife, Ronda Reinke, helped design the relief work, which is based upon an 18th-century Chinese silk screen.



Photos: Tom O'Neal

Grand Entrances

by Alec Waters

Main exterior doorways have traditionally been more than means of entry or exit. Visually, they can convey an invitation to people. Also, like a figurehead carved on a ship's bow that helps describe the vessel's charter name, purpose or crew, an entrance door can characterize a building's architectural design, function or occupants. And just as a figurehead may reveal something about a boat's builder, an entryway can represent a doormaker's style and acknowledge his or her skill. Because of this, entrances are prized commissions for woodworkers, and their construction usually shows a high level of craftsmanship. The results are often striking and may be an artist's or cabinetmaker's finest work. The doors shown here "speak" for themselves, so I'll let them offer their own opening and closing statements. □

Alec Waters is an editorial assistant at FWW.



Photo: Victor Brown



Photo: Gert Anderson



Large and inset photos: Douglas Christiansen



Don Woodsmith designed the 3½-ft.-wide by 7-ft.-high teak entrance and storm doors (above left) to adorn a log home near Steamboat Springs, Colo. The carved dragon has 1½-in.-deep relief and 1400 hand-chiseled scales. Fellow woodworker, Jeff Simon, assisted with the storm door and metalworker, Jim Selbe, helped Woodsmith fire a custom bronze-and-silver handle for the main door. It took Woodsmith over 1000 hours to complete the \$28,500 pair.

Douglas Christiansen laminated ¾-in.-book-matched veneer for the face of this black walnut entryway (above right) in Los Altos, Cal. To help the doorway resist earthquakes, he designed the framework with glued mortise-and-tenon and dovetail joinery, and he used tempered glass for the door's central- and side-lights. To reduce moisture exchange and decay, Christiansen treated all the components, including the hand-shaped raised panels, with preservative and marine varnish.

Duane Brown of San Diego, Cal., carved the eagle on a 130-lb. Philippine mahogany door (left). He laminated the 1½-in.-thick door and carved its 1-in.-deep relief, and then he coated its surfaces with sanding sealer in preparation for painting. The carved handle forms part of the cliff on the door's left side.

Andre Poineau made the walnut entry (right) in his company's Boyne Falls, Mich., shop, and Brendan Keenan hammered out the door's stainless steel hardware. The doweled-tenon door is 4½-in.-thick (including the carved trees on both sides) and has smoked thermal-pane glasswork.



Photo: Randy Coes

How to build a sound

Some people buy stocks, bonds, mutual funds.

Then there are those of us who invest in tools, machines, wood.

One thing's for sure, whether you're in "the market" or in the shop, it pays to buy the very best. To make the smartest investments you can.

That's why at Delta, we build our machines with a long-term payoff in mind. We look at how well they'll be producing for you 20 years from now. Just try to talk an old-timer into parting with his old Delta machine.

We're also constantly working to develop new products and accessories. And looking for ways to improve on our old standbys.

The idea is to help you round out your shop. Solidify your investment.

We're staking our future on it.

**Building
On Tradition**
DELTA
A Pentair Company

For information on these and other new products, call toll free for the name of your nearest Delta distributor. Delta International Machinery Corp., Pittsburgh, PA., 800-438-2486. In Canada, call: 519-836-2840.

NEW

The new Delta 16" 2-Speed Scroll Saw cuts an inside curve like a sports car at speeds of 850 and 1725 CS/M, with a 2" depth of cut. Cast-iron table and frame. Just one of our full line of scroll saws ranging from 15" to 24" capacities.



NEW

Here's a real luxury. A machine devoted entirely to mortising. Faster and more accurate than a drill press. And don't be fooled by its small size. It'll handle work up to a full 4" under holddown and accommodate mortising chisels up to 1/2" x 1/2".

NEW

The Delta Blues. Our complete line of heavy weight, carbide-tipped, perfectly balanced Shaper Cutters, that is making our competition green with envy. Computer aided design and machining means precise profiles. We'll even make a custom profile for you.



investment portfolio.



NEW

This Stationary Plate Joiner goes way beyond a portable joiner. A foot pedal controls blade movement so both hands are free to control your work. Handles all types of joints in all three biscuit sizes.



A handful of prevention is worth a shopful of cure. If you agree it's time to stop eating, breathing and sweeping all that dust, we've got the right dust collector to meet your needs. A whole range of two-stage, industrial quality, portable dust collectors, ranging from 3/4 to 3HP, will let you breathe easier.



FREE EMS AND STAND Handle 13" wide and 5.9" thick stock with the Delta 13" Planer. Lets you precision plane down to 1/8" thickness. Rugged cast-iron throughout.

Buy now and we'll throw in our heavy-gauge steel stand for free.* And just for good measure, we'll add on a free Electronic Measuring System to eliminate the guesswork.*

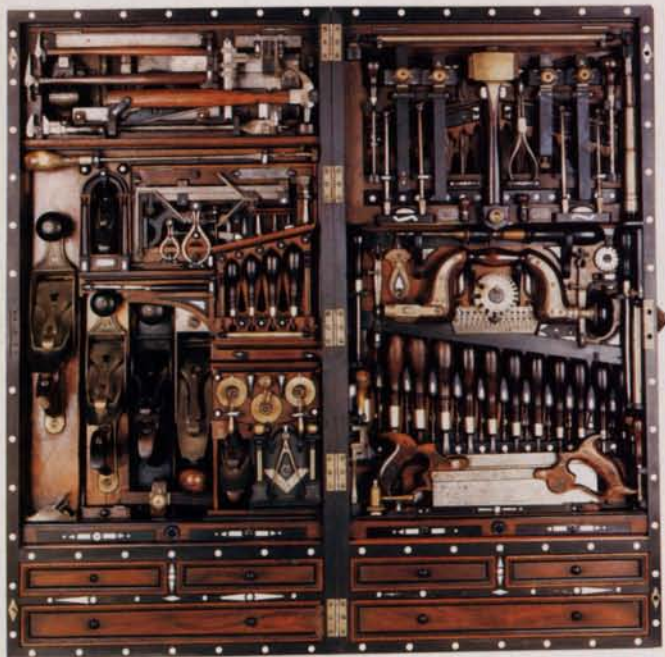


*Standards of the Industry. We set them and we won't compromise them for any reason. But how about a rebate or two. Or four. Choose one or all four of these "Standards": Our Combination 6" Belt/12" Disc Sander, 8" Precision Joiner, Heavy Duty Wood Shaper and any model Unisaw® 10" Tilting Arbor Saw. Each comes with a hundred dollar rebate check from Delta.**



*Offer good only from participating distributors in the continental U.S., Alaska, Hawaii and Canada, from September 1, 1991 thru March 31, 1992. To qualify, machines must be purchased with motors.

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 stonemason H.O. Studley must have been awe-inspiring. In an oak classmate 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 machinist and seamstress tools. To pack the 300-plus tools into a case only 19 1/4 in. thick and somewhat narrow, Studley devised a ingenious arrangement of flip-up trays, fold-out layers and hidden compartments. Maine native Perc Hardwick now owns the chest, which has been in his family since it was bequeathed to his grandfather by Studley. Hardwick acquired the chest from his brother by trading a 1934 Ford sedan for it. A good trade? It would seem so. Just one tool, the Stanley #1 plane housed in the ebony archway in the upper-left part of the chest, was appraised at \$700. Hardwick, a woodworker, 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

Here's your Help!

with HTC's saw enhancement system

ROLLERTABLES
Sturdy, adjustable top quality, free standing, work supports

"I love my new roller stand."
J.K.S.-Beaumont, TX

- 1 Mobile Bases
- 2 Outfeed Rollers
- 3 Support Panel
- 4 Access Motor Cover
- 5 Brett-Guard Table Saw Guards

"Good product - Makes my small shop larger. Love it!"
R.E.D.-S. Windsor, CT

HTC **HTC PRODUCTS, INC.**
120 E. HUDSON, ROYAL OAK, MICHIGAN 48067

FREE CATALOG! CALL 800-624-2027/(313)399-6185, ext. 12

MADE IN USA

READER SERVICE NO. 19

WOODWORKING #1 TOOL SUPPLIER

FREE CATALOG SUBSCRIPTION

Celebrating our 45th year!

THE FINEST TOOLS AVAILABLE AT COMPETITIVE PRICES

If we don't have it, they don't make it!

WILLIAMS 100 & HARDWARE SUPPLY

For your FREE catalog subscription Call: 1-800-788-0007

Ask about our Exclusive Preferred Plus Club... Save an extra 5% on purchases.

READER SERVICE NO. 139

MLCS Ltd.

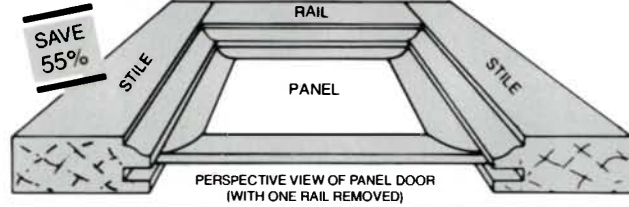
MAKE BEAUTIFUL RAISED PANEL DOORS WITH YOUR . . . 1/4" or 1/2" ROUTER . . . 1/2" or 3/4" SHAPER

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.

SALE PRICE **\$69⁹⁵** Regular value over \$150.00!
FOR COMPLETE SET 1/4" Shank set item #554 (includes all bits shown below)

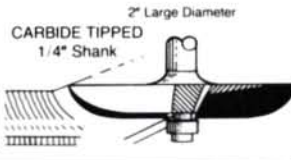
SET ALSO AVAILABLE IN 1/2" SHANK - \$79.95 - Item #852

Shaper Cutters set: Item #1059
SAVE! only \$99.95
 Set: Rail & Stile & Raised Panel Cutters



RAISED PANEL BIT
 SUPPLIED WITH BALL BEARING

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" thick



CARBIDE TIPPED ROUTER BITS • PROFESSIONAL PRODUCTION QUALITY *GUARANTEED* WHEN ORDERING ANY THREE OR MORE **DEDUCT \$1.00 EACH** • FREE SHIPPING IN CONTINENTAL U.S.

ITEM NO.	BEST CUT BEST PRICE	DESCRIPTION	ANGLE/DEPTH/RADIUS CIRCLE DIAMETER	LARGE DIA.	CUTTING LENGTH	SHANK SIZE	PRICE	ITEM NO.	BEST CUT BEST PRICE	DESCRIPTION	ANGLE/DEPTH/RADIUS CIRCLE DIAMETER	LARGE DIA.	CUTTING LENGTH	SHANK SIZE	PRICE
#601	Solid Carbide	1/8" Spiral Cutter		1/8"	1/2"	1/4"	\$ 9.00	#211	3/8" Core Box	round nose	3/8"	3/8"	1/4"	\$10.00	
#603		1/4" Spiral Cutter		1/4"	3/4"	1/4"	\$12.00	#212	1/2" Core Box	round nose	1/2"	1 1/2"	1/4"	\$13.00	
#903		1/4" Spiral Cutter		1/4"	3/4"	1/2"	\$12.00	#418	3/4" Core Box	round nose	3/4"	3/8"	1/4"	\$15.00	
#904		3/8" Spiral Cutter		3/8"	1"	1/2"	\$24.00	#213	1" Core Box	round nose	1"	3/4"	1/2"	\$17.00	
#905		1/2" Spiral Cutter		1/2"	1 1/2"	1/2"	\$29.00	#548	Lockmitre		2"	7/8"	1/4"	\$32.00	
#530		3/16" Edge Beading	3/16" Dia. of Circle		1/2"	1/4"	\$15.00	#214	1/4" Straight	plunge cutting	1/4"	3/4"	1/4"	\$ 6.50	
#531		5/16" Edge Beading	5/16" Dia. of Circle		1/2"	1/4"	\$15.50	#216	3/8" Straight	plunge cutting	3/8"	1"	1/4"	\$ 6.50	
#350		1/8" Round Over	1/8" R	3/4"	3/8"	1/4"	\$11.00	#474	1/2" Straight	plunge cutting	1/2"	1"	1/4"	\$ 7.00	
#351		3/16" Round Over	3/16" R	7/8"	1/2"	1/4"	\$11.00	#219	3/4" Straight	plunge cutting	3/4"	1"	1/4"	\$ 9.50	
#230		1/4" Round Over	1/4" R	1"	1/2"	1/4"	\$12.00	#779	3/4" Straight	plunge cutting	3/4"	1 1/2"	1/2"	\$10.00	
#353		5/16" Round Over	5/16" R	1 1/8"	1/2"	1/4"	\$14.00	#462	1/2" Bull Nose	1/2" Dia. of Circle		3/4"	1/4"	\$16.00	
#209		3/8" Round Over	3/8" R	1 1/4"	5/8"	1/4"	\$15.00	#464	3/4" Bull Nose	3/4" Dia. of Circle		1"	1/4"	\$21.00	
#355		1/2" Round Over	1/2" R	1 1/2"	3/4"	1/4"	\$17.00	#764	3/4" Bull Nose	3/4" Dia. of Circle		1"	1/2"	\$21.00	
#655		1/2" Round Over	1/2" R	1 1/2"	3/4"	1/2"	\$17.00	#545	Tongue & Groove	Straight	1 5/8"	1"	1/4"	\$29.00	
#656		3/4" Round Over	3/4" R	2"	7/8"	1/2"	\$21.00	#845	Tongue & Groove	Straight	1 5/8"	1"	1/2"	\$29.00	
#199		Multiform Moulding	Unlimited Patterns	2 1/4"	2"	1/2"	\$40.00	#546	Tongue & Groove	Wedge	1 3/16"	1"	1/4"	\$29.00	
#205		1/4" Cove	1/4" R	1"	1/2"	1/4"	\$12.00	#846	Tongue & Groove	Wedge	1 5/8"	1"	1/2"	\$29.00	
#206		3/8" Cove	3/8" R	1 1/4"	9/16"	1/4"	\$13.00	#450	1/8" Beading	1/8" R	3/4"	3/8"	1/4"	\$11.00	
#207		1/2" Cove	1/2" R	1 1/2"	5/8"	1/4"	\$14.00	#233	1/4" Beading	1/4" R	1"	1/2"	1/4"	\$13.00	
#643		1/2" Cove	1/2" R	1 1/2"	5/8"	1/2"	\$15.00	#454	3/8" Beading	3/8" R	1 1/4"	5/8"	1/4"	\$15.50	
#208		3/4" Cove	3/4" R	1 7/8"	3/4"	1/2"	\$26.00	#455	1/2" Beading	1/2" R	1 1/2"	3/4"	1/4"	\$17.00	
#231		5/32" Roman Ogee	5/32" R	1 1/4"	1 5/32"	1/4"	\$16.00	#500	3/8" Flush	Trimming	3/8"	1/2"	1/4"	\$ 7.00	
#232		1/4" Roman Ogee	1/4" R	1 1/2"	3/4"	1/4"	\$17.00	#501	3/8" Flush	Trimming	3/8"	1"	1/4"	\$ 7.50	
#506		1/2" Pattern	Flush Trim	1/2"	1"	1/4"	\$15.00	#503	1/2" Flush	Trimming	1/2"	1"	1/4"	\$ 8.50	
#508		3/4" Pattern	Flush Trim	3/4"	1"	1/4"	\$17.00	#221	1/2" Flush	Trimming	1/2"	1 3/16"	1/2"	\$ 8.00	
#366		1/8" Slot Cutter	3/8" Deep	1 1/4"	1/8"	1/4"	\$14.00	#558	Thumbnail		1 3/16"	3/8"	1/4"	\$18.50	
#368		1/4" Slot Cutter	3/8" Deep	1 1/4"	1/4"	1/4"	\$14.00	#558	Thumbnail		2 1/2"	3/4"	1/2"	\$35.00	
#204		3/8" Rabbeting	3/8" Deep	1 1/4"	1/2"	1/4"	\$13.00	#579	Molding Plane		1 1/8"	1 3/4"	1/4"	\$31.95	
#670		3/8" Rabbeting	3/8" Deep	1 1/4"	1/2"	1/2"	\$14.00	#879	Molding Plane		1 1/8"	1 3/4"	1/2"	\$31.95	

New 32-page catalogue featuring 100's of high-quality router bits, plus other professional woodworking products.



CONTROL THE SPEED OF YOUR ROUTER ROUT AT THE SPEED THAT GIVES THE BEST RESULTS WITH THE WOOD AND BIT YOU ARE USING!

FEATURES:

- Speed Adjustable from Full Speed to 0 RPM
- Full Horsepower and Torque at All Speeds
- Go Back and Forth from Any Pre-Set Speed to Full Speed at the Flip of a Switch
- Works with All Routers 3/4 HP or Less
- 120V 15 Amp
- Gives Your Router a Feature Only Available on Routers Costing Hundreds of Dollars!

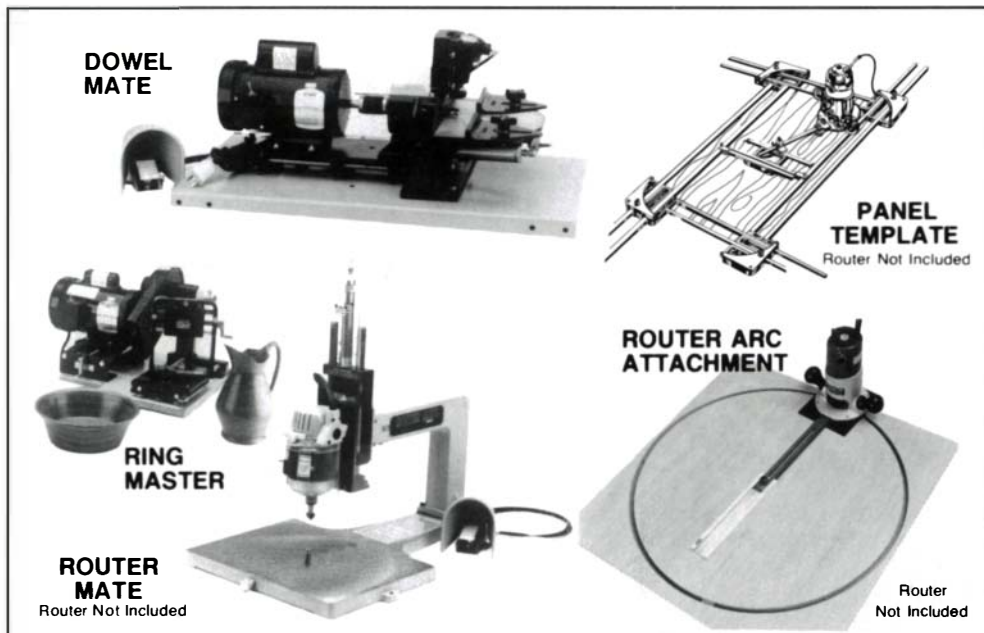
EASY TO USE - Simply plug in Speed Control and plug your router into the Speed Control - turn dial for best results. (Speed Control has a clip that can be worn on your belt or hung on wall or left loose.)

• Reduces speed electronically without reducing torque; electronic feed-back maintains speed by increasing voltage to motor as load increases.

NOW ONLY
\$39.95
 Order Item #200

While in the Phila. Area
 Visit Our Fully Stocked Showroom
 (Call for easy directions - 8:30-5:00, M-F)

To order by Master Charge, Visa, or Discover Call Toll Free, 7 Day - 24 Hour Order Service,
1-800-533-9298 or send check to: **MLCS Ltd., P.O. Box 4053 FP, Rydal, PA 19046**



DOWEL MATE

PANEL TEMPLATE
Router Not Included

RING MASTER

ROUTER MATE
Router Not Included

ROUTER ARC ATTACHMENT
Router Not Included

FMI Family of Fine Wood Working Machines
(ALL MADE IN THE USA)

- **DOWEL MATE** for tough joints that are perfectly aligned. The Dowel Mate is the answer. A single step on the foot pedal first clamps the wood & then shoots in two dowel holes. Air clamp & air feed.
- **RING MASTER** Test your imagination . . . Cut rings out of a board with the renowned Ring Master & produce any hollow cylindrical shape in wood. Create beautiful wood works of art from start to finish.
- **PANEL TEMPLATE** Produce something special! . . . Route decorative panel designs in seconds. 32 different corner designs, a side design & arc attachment are available to create unique parts.
- **ROUTER MATE** converts portable routers to precision Routing machines.
 - Route Faster • More Accurately • More Profitably . . . with the All New Router Mate
- **ROUTER ARC ATTACHMENT** cut precision arcs and circles from 9" to 50" in diameter with your router. Easily adjustable and precisely repeatable. Adaptable to any portable router.

See your woodworking machinery dealer or call toll free for an informative brochure.
PORTA-NAILS, INC. • PO BOX 1257 • WILMINGTON, NC 28402, USA • 919-762-6334 • 1-800-634-9281

READER SERVICE NO. 37

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		CABINET PAPER	
50/pk	100/pk	50/pk	100/pk
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
		100 thru 150C	13.00 23.00
NO LOAD PAPER			
180-A thru 400-A	50/pk 100/pk		
	\$11.00 \$19.00		
WET/DRY PAPER			
JUMBO CLEANING STICK		220 thru 600A	50/pk 100/pk
			\$14.00 \$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. 14

Buy 1 Tool And Get Our 228 Page Tool Free.



A / Giant 17" x 11" Aluminum Shop Dustpan Makes Short Work Of Clean Up
Shops generate huge amounts of debris. The extra capacity of this dustpan makes clean-up faster. It's like using a shovel instead of a trowel.
24K03.01 Giant Dustpan \$13.40

B / Band Saw Blade Tuning Stone Helps Produce Tighter, Smoother Curves
This 3" x 1/2" x 1/4" Silicon Carbide stone is strongly recommended in the best-seller *Band Saw Handbook*. Comes with complete instructions on how to gently round the backs of your blades. The difference in performance is remarkable.
38M01.01 Blade Tuning Stone \$8.95

C / Versatile & Strong Shop Cloths Repay Their Extra Cost Quickly
Soft as cotton rags but much thicker, and alot stronger than paper toweling. Very absorbent, lint free and can be rinsed and reused many times. Great for picking up glue squeeze-out and staining as well as machinery clean-up. Each is 10 1/4" x 16 3/8".
23K02.01 100 Shop Cloths \$12.95

WOODWORKER II - Best on TABLE SAW

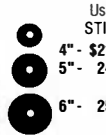
With this ONE ALL PURPOSE blade 40 Teeth you can SMOOTH RIP & CROSSCUT 1" - 2" ROCKHARDS and SOFTWOODS with smooth-as-sanded surface. PLY-VENEERS oak/birch crosscut with NO BOTTOM SPLINTER.

- 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	9" x 40T	\$146
14" x 30T x 1"	195	30T	125
12" x 40T x 1"	183	119	89
12" x 30T x 1"	162	109	89
10" x 40T 1/8&3/32	156	109	79
30T 1/8 & 3/32	135	89	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.



5/8" holes std. Boring up to 1-1/4" \$7.50 extra. Others available. Add \$2.50 Shipping.

Use our large 1/8" DAMPENERS, against one side

Tryable and RETURNABLE Stops vibration, flu ter, cu ing noise and blade ring. Parallel and flatto .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
New 8-1/4" x 40T x 5/8"	136

RYOBI RA200 TS200 SEARS MAKITA 5008 NBA
HITACHI PSM8 PORTER CABLE 368-1

ODD 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. NOTHING LIKE IT IN THE USA!!



Boring up to 1-1/4" \$25 Per Set

8" - 5/8" Bore List \$299 / SALE \$269 • 10" w/1" Bore List \$362 / SALE \$325

For HOLZ-HER VERTICAL PANEL SAW 220mm x 30mm Bore For STREIBIG VERTICAL PANEL SAW 300mm x 30mm Bore

50 Teeth CONCAVE FACE 80 Teeth FLAT FACE 60 Teeth CONCAVE FACE 100 Teeth FLAT FACE

#1 or #2 List \$162 SALE \$139 #3 or #4 List \$204 SALE \$159 #1 or #2 List \$238 SALE \$179 #3 or #4 List \$263 SALE \$179

(List with or without 2 hole spacer)

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.



All 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	10" x 80T	266
10" x 80T 1/8 & 3/32	207	16" x 80T	262
12" x 80T x 1 1/8	212	100T x 1"	294
100T x 1"	253	Above 1" bore std.	

All 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"	\$179
Delta 9" x 80T x 5/8"	204
Ryobi-Makita 10" x 80T x 5/8"	207
Hitachi 12" x 80T x 1"	229
Ryobi-Makita 14" x 100T x 1"	266
Hitachi 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 or 2nd Day Air \$7.

NOW...ORDER the one blade that will outlast you! (10-20 sharpenings possible).

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. TD 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. 156

D / "Hot Stuff" Is Great Stuff For That Quick Fix In Woodworking Instant glues don't bond wood well or don't have any gap filling strength. Super-T has been specially prepared for gap filling and Special-T for ultra-gap-filling (both 2 oz.). The 3 oz. Accelerator is used to prepare oily and pitchy surfaces and to speed up curing. Use the Solvent (2 oz.) for clean-up and to separate pieces.

21J10.01 Hot Stuff Kit \$29.95

E / Wonderbar: A Simple Product That Works Fantastically Well Removes rust, corrosion, scratches or stains. Polish any metal surface.

The 3/4" x 2" x 3/4" blocks are completely saturated with silicon carbide particles. Works on metal like an eraser, dry or with any lubricant (including water). Self-cleaning and self-sharpening. Can also be cut to any shape. Use them in the shop, kitchen or garage. Comes Coarse and Fine.

06K03.01 Pair Wonderbar Blocks \$12.95

F / Stainless Steel 6X Magnifying Tweezers Save Your Fingers

Pulling splinters seems to be an inevitable part of woodworking. These let you see exactly what you are doing. A great value.

03K01.01 Magnifying Tweezers \$4.95

G / Garrett Wade Special Furniture Wax Provides Real Protection From UV Damage Ultraviolet radiation, which is everywhere - inside and outside - inevitably damages finishes.

Now, we've developed a high-quality furniture wax (a mixture of lustrous Beeswax and hard Carnuba) so that you can keep your furniture looking beautiful and protect it the way it should be. Comes in 6 1/2 oz. cans.

51P02.02 Garrett Wade UV Wax \$19.95

H / Set Of 7 Steel Twist Gimlets Are A Great Value

These are very underrated tools. Easy and quick, they will pre-drill for screws #2-9. Very nice, inexpensive Everyone uses them.

37J03.04 French Gimlet Set \$9.95

Garrett Wade Co., Inc.

161 Avenue of the Americas
New York, NY 10013 Dept. 143
Call Toll Free 800-221-2942
(NY 212-807-1757 No Collect Calls Please)
Please send me my tools and a FREE 1992 Catalog.



NAME: _____
ADDRESS: _____
CITY: _____ STATE: _____ ZIP: _____

Check/Money Order Visa MC AE

Expiration Date: _____

--	--	--	--	--	--	--	--	--	--

NUMBER	QTY.	DESCRIPTION	PRICE	TOTAL
GW	1	1992 Catalog with order.	\$4 00	FREE

SHIPPING COST:

\$3.25 up to \$10
\$4.45 for \$10.01 to \$20.00
\$5.45 for \$20.01 to \$50
\$6.90 for over \$50

(Prices good until Sept. 14, 1992) SUB TOTAL

SHIPPING COST

(NY State add Sales Tax) SALES TAX

GRAND TOTAL

CLASSIFIED

The CLASSIFIED rate is \$5.75 per word, minimum ad 15 words. All payments must accompany orders; all are noncommissionable. The WOOD & TOOL EXCHANGE and SITUATIONS WANTED are for private use by individuals only; the rate is \$8.00 per line. Minimum 3 lines, max. 6 lines, limit 2 insertions per year. DISPLAY CLASSIFIED rates on request. Send to: *Fine Woodworking*, Advertising Dept., Box 5506, Newtown, CT 06470-5506. Deadline for the *March/April* issue is December 26. Phone (800) 283-7252 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.

ATTENTION WOOD CRAFTSMEN. I have an idea how we can unite to market our products nationally. Combined we can do it. For more information call Gary Miller: (219) 325-0186, Mon. - Thurs.

INVENTIONS/NEW PRODUCTS/ideas wanted. Call TLCI for free information. Inventors Newsletter. 1-800-468-7200, 24 hours per day. USA and Canada.

SHARE—FULLY EQUIPPED SHOP, spray booth. Build high-end Shaker furniture on contract basis. Wayland, MA (508) 358-4370.

LIVE/WORK 10,000 SQ. FT. SHOP FACILITY on 40-acre farm with large 1860 farmhouse in tranquil New Jersey countryside. 40 miles from NYC. Call (212) 686-7855.

FINE WOODCRAFT WANTED

Whether you can complete one item every 6-months or 30 items each month, we are interested. For consideration and possible nationwide exposure send a color photo of each finished piece of work, the quantity per month of each item that you can finish, and a brief description of each item to: **R&R Fine Woodcraft, P.O. Box 8436, Bartlett, IL 60103-8436**

Situations Wanted

EXPERIENCED JOINER SEKS IMMEDIATE P/T or associate position in small furniture shop within 1-hour of New London, NH. Resume, portfolio. M. Smith, PO Box 537, Portsmouth, RI 02871. (401) 683-4070.

EXPERIENCED FRENCH EBONIST seeks position in US. Resume on request. (514) 731-3574. 3420 Pl. De Celles #42. Montreal PQ, Canada H3S 1X4.

Help Wanted

WOODWORKING INSTRUCTOR to teach and live-in at summer camp for teenagers in New Milford, CT. July—Aug. 1992. Buck's Rock, 193 N. Detroit Ave., N. Massapequa, NY 11758. (516) 293-8711.

MANAGER: Owner of prosperous cabinet and furniture shop wishes sabbatical. Needs skilled administrator to handle all aspects, except production. Future partnership possible. FITZ, INC., 11 Sandy Cove Ln, Loveladies, NJ 08008.

25—MAN CUSTOM ARCHITECTURAL CASEWORK/MILLWORK/furniture shop seeks experienced project manager. Must have professional hands-on woodworking experience and proven shop drawing ability. Send complete resume to: C. W. Keller & Assoc., Inc., 9 Hale Spring Rd, Plaistow, NH 03865. No phone calls accepted.

CAMP WEKEELA FOR BOYS & GIRLS, Canton, Maine seeks experienced woodworking instructors (age 20+) June 21 — August 22. Contact: Eric/Lauren Scoblionko, 130 S. Merkle Rd, Columbus, OH 43209. (614) 235-3177.

Instruction

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.

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., HoneyBrook, PA 19344. (215) 273-3840.

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.

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.

CABINETMAKING, BOATBUILDING, AND CARPENTRY Trade Programs are offered at Seattle Central Community College. Open enrollment. For information call: 206-587-5460 or write: SCCC/Wood Construction, 2310 S. Lane St., Seattle, WA 98144.

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, NATTS. Financial aid available. Equal opportunity enrollment. TheLandingSchool, Box 1490F, Kennebunkport, ME 04046. (207) 985-7976.

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 HYMILLER SCHOOL of FINE FINISHING & HAND 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 Hymiller.
Send \$5 for complete info package.
912 Lakeshire Dr., Fairfield Glade, Tennessee 38555 (615) 484-9309

WOODTURNERS

Since 1976, I've been teaching beginners to turn, and experienced turners to hone their skills. I also stock Myford *Mystro* 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

GETTING STARTED IN STAINED GLASS. Instructions, bonus coupons, \$2. Whittemore, Box 2065MS, Hanover, MA 02339.

RESIDENCY PROGRAM
Anderson Ranch's Studio Residency Program offers a supportive, interactive environment for furniture makers, sculptors, painters, photographers, and ceramists from Oct. 1 - May 15. For information contact:
ANDERSON RANCH ARTS CENTER
Box 5598, Snowmass Village, CO 81615
303.923.3181 fax: 303.923.3871

Finishes

POLYESTER WOOD FINISH. A complete line of professional products for producing the ultimate piano/high tech finish. Clears, custom colors. Information kit \$3. Donald M. Steinert Co., Dept. FW, 800 Messinger Rd., Grants Pass, OR 97527. (503) 846-6835.

SPRAY-ON-SUEDE. Free brochure (sample encl.) Donjer Products, Ilene Court—Bldg. 8F, Belle Mead, NJ 08502. (800) 336-6537.

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., Box 1280, Matthews, NC 28106. (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 4669-F Lander Rd
Chagrin Falls OH 44022
(216) 248-0770

Accessories

ANTIQUÉ TOOL DESIGNS on T-shirts and sweatshirts. Original illustrations. Antique tool calendar, and other items. Free catalog. Matlin Group, 281 Rte. 79, Morgantown, NJ 07751.

CUSTOM Branding Irons—logos, signatures, \$36.50 (one square-inch). \$1 plus SASE for details. BRAND-NEW, Dept. 16A, 2538 Pierpont Blvd., Ventura, CA 93001.

CANING/BASKETS SUPPLY. H. H. Perkins has been supplying woodworking customers for the past 75 years with quality service and merchandise. For all your seatweaving and refinishing needs. Free catalog. 10 South Bradley Rd., Woodbridge, Ct 06525. (203) 389-9501.

BRANDING IRONS. Names, signatures, logos, any size, design. Norcraft Custom Brands, Box 277F, So. Easton, MA 02375. Telephone (508) 238-2163 anytime.

STAINLESS STEEL SCREWS
PLUS STAINLESS
• STAPLES • BOLTS • NUTS • NAILS •
Call or write for our free catalog!
CALL: 1-401-782-3760
ANCHOR
STAPLE & NAIL CO.
P.O. BOX 570 • WAKEFIELD, RI • 02880

CUSTOM BRANDING IRONS
DRILL PRESS or HANDHELD
250 to 800 watts
SEND \$1.00 FOR BROCHURE
ENGRAVING ARTS (707) 964-8201
P.O. Box 787 FAX (707) 964-8245
Lafayette, CA 94544

WILLIAMSBURG BLACKSMITHS
Wrought-Iron Hardware
To Order Catalog, Send \$5 To:
P.O. Box 1776, Dept. FW
Williamsburg, MA 01096
Phone: (800) 248-1776

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

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

SELF MEASURING ADJUSTABLE STOP BLOCK
FASTOP MADE IN USA
Accurate Cutoffs • Stopped Grooves • Exact Positioning
QUICK • EASY • SAVES TIME • PROFESSIONAL RESULTS
As mentioned in *FWW* Product review. Iss. #86, p.118
\$29.95 POST PAID CHECK OR M.O.
WITTY INVENTIONS, INC.
P. O. Box 10807, New Iberia, LA 70562

THE FINE GOLD LEAF PEOPLE™
Genuine. Imitation & Variegated Sheets & Rolls • Brushes & Supplies
Technical Books & Videos
In USA: Three Cross Street • Suffern, N.Y. 10901-4401
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"

Musical Supplies

VIOLIN, GUITAR, banjo, mandolin-making materials, accessories, books. Catalog, \$1. International Luthiers Supply, Box 580397, Tulsa, OK 74158.

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.

HAMMERED DULCIMER PLANS! By noted builder Charlie Alm. Best book on subject. \$19.95. WOODWORKS, Box 428, Dept. FW, Brookline, IN 47923. (317) 563-3504, 800-526-4791.

GUITAR, BANJO MANDOLIN and violin kits. Repair tools, replacement parts, tone woods and finishing supplies. Free 96-page catalog. Guitar Shop Supply, Box 900F, Athens, OH 45701. 800-848-2273.

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.

Services

CHISEL SHARPENING for woodcarvers and lathe operators. Prompt service; reasonable prices, satisfaction guaranteed. Free brochure. Precision Sharpening, PO Box 2848, Missoula, MT 59806. (406) 728-6793.

Software

COMPUTER-GENERATED PARTS LISTS for raised panel doors. Saves hours of calculation time. \$79. For more information contact: Davis Woodworking, 42 Thompson Rd., Thompson, CT 06277. (203) 923-2771.

CABINETMAKERS!

PROFESSIONAL COMPUTER PROGRAMS
CUT LISTS/SHOP DRAWINGS.....\$349
PANEL LAYOUT.....\$299
DEMOS (Refund if purchased).....\$25
IBM/Macintosh — FREE Info. Packet

SEQUOIA SOFTWARE CO.,
P.O. BOX 1556, LAYTONVILLE, CA 95454
(707) 984-8472 Visa MasterCard/Discover

Plans & Kits

VIOLIN PLANS, 16 full-scale drawings for making regular 4/4 violin. \$27. C. I. S. Crafts, PO Box 8176, Toledo, OH 43605.

FULL-SIZE WOODWORKING PLANS FOR WHIRLIGIGS, lawn ornaments, adirondack furniture, windmills, birdhouses, toys, etc. Catalog, sample plans \$2 (refundable.)

MASTERCRAFT, Dept FW, Box 625, Redmond, WA 98073.

DESIGNER GAZEBO BIRDFEEDERS: sell for \$175, in specialty shops. Send \$1 for details, picture. WaltWorks-II, 7 White Oak Rd., Asheville, NC 28803.

FREE WOODWORKERS CATALOG. Specialty hardware, patterns, tools and more. Armor, Box 445, Dept. T, East Northport, NY 11731.

MAKE WOODEN TOYS, whirligigs, door harps, dollhouses, clocks, music boxes, weather instruments, crafts, furniture with our plans, parts, kits, supplies — Catalog \$1. (800) 848-4363 — Cherry Tree Toys, Belmont, OH 43718-0369.

"YOU CAN MAKE IT" catalog with hundreds of woodworking patterns, \$3. Craft Patterns, Dept. FW, St. Charles, IL 60174-5598. (800) 747-1429.

CLOCK PLANS (CAD) Grandfather, Grandmother, mantel, wall. Catalog \$3. Mike Flanigan's Clock Shop, 1706 Broadway, Graham, NC 27253.

Hand Tools

HAND FORGED CHISELS: superior edge—custom made to order. Send \$1 for catalog. CAPE FORGE, PO Box 987, Burlington, VT 05402-0987.

JAPANESE TOOLS SINCE 1888. Free catalog. Tashiro's, 1024 S. Bailey St., Ste. B, Seattle, WA 98108. (206) 762-8242.

HANDPLANE GRINDING-Tool Tec precision grinds the soles of all types of handplanes to correct out-of-flat soles due to wear, twist, warp, rust, etc. All work guaranteed, reasonable prices. Ship planes to: Tool Tec: 106 S. 3rd, Yukon, OK 73099. (405) 354-5033.

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.

HARTWOOD

- BAR CLAMPS
- HAND SCREWS
- MITRE CLAMPS
- DOUBLE BAR CLAMPS

MAKERS OF FINE CLAMPS FOR OVER 70 YEARS
PROMPT SHIPMENT • CUSTOMER SATISFACTION
FREE CATALOG • REPLACEMENT PARTS

HARTFORD CLAMP CO. • P.O. BOX 280131
EAST HARTFORD, CT 06128-0131 • 203-528-1708



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

One of the best tools you'll ever buy. **GUARANTEED.**

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

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

Power Tools

BANDSAW—SAWMILL KIT Affordable and portable. Write for free literature. Linn Lumber Co., PO Box 326, Lebanon, OR 97355.

WOODTURNING LATHES: bowl, spindle, large swing, long bed, slow speed, custom built. DeRose & Co., PO Box 150, Mechanicsville, VA 23111. (804) 746-1705.

INVISIBLE CLAMP holds fast for obstruction-free routing, sanding, no marring. \$90.50 basic kit, \$175 deluxe kit, \$4 S/H, or SASE. Vac-U-Clamp Systems: PO Box 114, American Fork, UT 84003.

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

BELT SANDERS

Edge Sanders, Stroke Sanders. 14 models to choose from, quality built by "PROGRESS". For your free brochure and price list write, phone or fax:

Progress Machine Co., 729 Finley Ave.
Ajax, Ontario, Canada L1S 3T1
Tel: 416-686-3305 Fax: 416-686-7004

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

Publications/Catalogs

LEATHERCRAFT GUIDE— New 64 page wholesale catalog. \$2. (refundable) Leather Unlimited, FW0991, Belgium, WI 53004-9990.

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.

TOOL BOOKS: SPIERS/NORRIS METAL PLANES (revised & enlarged \$15.) 2nd printing SOME 19th-CENTURY ENGLISH WOOD WORKING TOOLS, \$42.50. Send for listing of other titles, Ken Roberts Publishing. PO Box 151, Fitzwilliam, NH 03447.

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

Wood & Wood Parts

NEVER BUY TOY WHEELS AGAIN! Make your wheels with our WHEELRIGHT. The Tool Co-FW2, 812 Kurzweil, Raymore, MO 64083. (816) 537-6308.

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

Catalog on request

THE BEALL TOOL CO.

The Beall Wood Threader

The ultimate wood threading device. Attaches to router & makes perfect threads in 5 right hand sizes and 3 left. Write or call: Dept. FW, 541 Swans Rd., NE, Newark, OH 43055, 614-345-5045, 1-800-331-4718.

Safety Equipment

FILTER BAGS FOR DUST COLLECTION SYSTEMS. Fabric \$12/yd. ppd. Free system plans. Barter Enterprises, Box 102B, Prospect Harbor, ME 04669.

BUILD YOUR OWN DUST COLLECTOR Blue print, \$14.70. 100% polyester fabric for collection bags, 58-in. wide. \$9.24 per yard ppd. Need custom made bags call: SAGERIST MFG. CO., 7141-126 St. Surrey, BC V3W 4A8 Canada. Telephone (604) 596-4783, Facsimile (604) 596-4982.

Wood

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.

EXOTIC HAWAIIAN HARDWOODS— bundles of kiln-dried Koa, Mango woods. Slabs, turning squares. Also custom wood products, furniture. Call or write for list. Maui Trading Company. (808) 878-2705. RR2, Box 263, Kula, HI 96790.

VENEERS, BURLS, FIGURED, AND CROTCHES available in black walnut, redwood, madrone, myrtle, maple. Also burl turning blocks and maple musical instrument wood. Free samples. Price list. Pacific Burl and Hardwood. 696 S.E. J Street, Grants Pass, OR 97526. (503) 479-1854.

CHERRY TURNING STOCK 8/4 to 16/4, to 48-in. lengths. Poplar precut, sanded drawer parts. SASE for prices and details. Randall Grace, 3110 Summers Rd., Franklin, TN 37064. (615) 791-1832.

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).

SUSTAINABLE RAINFOREST LUMBER

Exotics from the Yanasha Forestry Coop (see FW2 #82) & "Smartwood" Lumber (Rainforest Alliance certified)

call or write
Pittsford Lumber & Woodshop
50 State Street, Pittsford, New York 14534
716-586-1877

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

LARGE HIGHLY—FIGURED CALIFORNIA WALNUT SLABS, dry. Contact: California Walnut Designs, 12681 Wolf Rd., Grass Valley, CA 95949. (916) 268-0203.

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. (FAX) 305-246-0404, (phone) 305-248-0593.

NATIVE AMERICAN HARDWOODS, 21 domestic species from the greatest hardwood forest in the world. Call 800-688-7551 for catalog.

GOOD HOPE HARDWOODS—Curly cherry, walnut, 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.

CUBAN MAHOGANY (swietenia mahogoni). Direct from importer. Kiln dried 4/4, 5/4, 8/4, 12/4 squares and slabs. West Indies Resources. (813) 764-0936.

WOOD FOR CARVERS, cut-outs, decoys, carousel horses, starter kits, tools and books. Also for turning and furniture. SASE for list. Wood, 3505 32nd St. West., Brandon, FL 34205.

GUARANTEED CLEAR COCOBOLO, squares, lumber, bocote, ebony, lignum, cirocote. Vacuum kiln-drying. Tropical Timber: (503) 621-3633.

APPALACHIAN AND EXOTIC
HARDWOODS VENEERS PLYWOOD
TURNING AND CARVING BLOCKS

freud-complete line of tools and accessories
Call or write for free price list

HARTWOOD, LTD.

EAST GOLDEN LANE, P.O. BOX 323, DEPT. 18
NEW OXFORD, PA 17350
PHONE (717) 624-4323
FAX (717) 624-4365

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 Since

5402 S. 40th St. • Phoenix, AZ 85040
(602) 437-4415

WINTERWOODS
FIGURED HARDWOODS
& FOREST SPECIALTIES

Tiger & Birdseye Maple
Curly Cherry & Curly Aspen

- Lumber 4/4 thru 20/4
- Turning Squares & Bowl Blanks
- Basswood Carving Blocks

Rt 1 Box 765G, Nunsing, MI 49862
906-387-4082

ARCHITECTURAL HARDWOODS & VENEERS, INC. The finest in materials. Custom blue print panels. Wholesale/retail. Call for samples and prices. (415) 822-1423 (CA), FAX (415) 822-1453.

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. dia. dowels and turning stock. Dunlap Woodcrafts, Vienna, VA. (703) 631-5147.

HOMESTEAD HARDWOODS, 2111 Messick Rd., N. Bloomfield, OH 44450. (216) 889-3770. Kiln-dried ash, basswood, butternut, cherry, chestnut, curly maple, oak, poplar, sassafras, walnut.

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.

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.

ATTENTION WOODWORKERS—maple and redwood burl. Figured, quilted, bird's-eye, lace Any size or thickness available. Quality. Albany, OR. (503) 926-1123.

NATIVE TEXAS HARDWOODS. Mesquite, figured fiddleback oaks, pecan, many others. Burls, turning, carving blocks. Texas Kiln Products. (800) 825-9158.

RAREST CALIFORNIA BURLS direct from logger. Huge selection of beautifully figured redwood, maple, manzanita and madrone. Also guitar-quality squares & slabs. (707) 442-1319.

SELECT & BETTER 20/BD. FT. BULK PACKS: cherry \$2/bd. ft.; red elm \$1.47/bd. ft.; walnut \$3.04/bd. ft.; 4 by 4 walnut carving stock. Additional species. Visa—MasterCard. Free catalog. BADGER HARDWOODS, Rt. 1 Box 262, Walworth, WI, 53184. (800) 252-2373.

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.

MICRO-THIN HARDWOODS. 1/4-in., 3/16-in., 1/8-in., 1/16-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.

BEST QUALITY, BEST PRICES. Exotic and domestic lumber, turning stock, craft wood. SASE, Gray Hardwoods, 1750 Ravine Rd., Vista, CA 92083. (619) 940-1856.

FINE VENEER

Highest Quality Retail or Wholesale Low Prices Area Code 716 Full Length Veneers Large Selection 655-0206 Exotic Lumber Call or Write Custom Plywoods 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.

SEASONED HARDWOODS

Specialty: Highly figured & colored domestic woods Burls: Madrone, Myrtle, Maple Curly: Rhododendron, Chittum, Brown Oak Custom cutting available · bowlblanks · small whole burls · lumber · instrument woods It will be my pleasure to serve you with over 16 years of experience

ALL INQUIRIES WELCOME

34707 Squaw Valley Road Gold Beach, OR 97444 503-247-7875

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.

TRUE QUARTERSAWN LUMBER. Oak, cherry, pine, cut from prime logs. Air-dried. Newman, Box 46, New Braintree, MA 01531. (508) 867-3318

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.

MESQUITE LUMBER. Kiln-dried and bowl blanks. MESQUITES UNLIMITED, Rte. 4, Box 322, Wichita Falls, TX 76301. (817) 544-2262.

4/4 F.A.S. WALNUT \$2.95, 4/4 wormy chestnut \$1.50, 4/4 Honduras mahogany \$2.75. H&B Hardwoods. (502) 425-1326.

Sawmill Kiln Hardwoods Exotics



Willard Brothers Woodcutters
300 Basin Rd., Trenton, NJ 08619
Call (609) 890-1990

DOMESTIC HARDWOODS

ASH • CHERRY • OAK • POPLAR • WALNUT
AROMATIC CEDAR • CYPRESS
SPECIALTY LUMBER - PRE-PACKAGED BUNDLES
PRE-SANDED SPECIALTY MOULDINGS
S-4-S LUMBER - FLOORING - PANELING
JOHNSON'S PRECISION MILLWORK
P.O. BOX #275, MCKENZIE, TN 38201

UPS - LTL SHIPMENTS **901-352-5656** FREE LITERATURE

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

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

UNICORN UNIVERSAL WOODS Ltd

OVER 90 SPECIES IN OUR LARGE INVENTORY OF QUALITY MATERIAL EXOTICS—DOMESTICS—MILLWORK VENEER—MAIL ORDER—FREE CATALOG

4190 Steeles Ave. West, Woodbridge Ontario Canada L4L 3S8
CALL US AT (416) 851 2308

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

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 FAX: (703) 451-0186
Shipped UPS or Common Carrier

Flooring

Wholesale! Hardwood, Strip, Plank, Parquet, Prefinished, Unfinished

Harmony Exchange
(800) 765-9663

Materials for Log & Timber Construction

GROFF & HEARNE LUMBER

PREMIUM WALNUT-CHERRY & OTHER FINE CABINET WOODS.

Boards to 40" wide, matching flitches, slab cuts, kiln dried.

Groff & Hearne Lumber
858 Scotland Road
Quarryville, PA 17566
717-284-0001 800-342-0001

WOOD & TOOL EXCHANGE

Limited to use by individuals only

Wood For Sale

FINE WOODWORKING- issues 1-90, plus Index 1, perfect condition \$200, plus UPS shipping. (301) 592-8083.

OLIVER WOOD LATHE machine #51D, Ser. #200875 EVS induction motor 208/200V. 3/4HP, 3PH. Super cond. Cast iron bed, stand, motor housing, face plates, tool rest, etc.FOB (516) 887-2803. Box 504, Hewlett, NY 11557.

10,500 bd. ft. of hardwoods in the rough, and air-dried 10 years. Cherry (70%), walnut, curly maple, poplar, birch, sassafras, and ginko. Wide boards. (615) 896-6826.

FELDER BU8—16-in. joiner, thicknesser, 14-in. saw, horizontal borer, shaper. With 3PH converter, like new \$5000. Best offer. Will deliver. (302) 328-2466 (DE).

MARUNAKA Super-Mini-4 surfacer. Call for more information: Henry (213) 661-5550.

FINE WOODWORKING issues 1-90 complete. Most still in wrappers. \$225. plus shipping. (806) 355-1983.

POST OFFICE BOX DOORS. Small size-single combo dial. 1950-60's. \$12 pp, ck/mo Steve Allen, 3109 Doulton Ln., Fuquay-Varina, NC 27526.

SLIDING TABLE FITTINGS for Inca table saw & spindle moulder. \$500. (705) 526-1449.

POWERMATIC 12-in., 3HP planer with grinder \$2200. 8-in. jointer \$900. Walker Turner 39-in. lathe \$900. All mint condition. (508) 993-4800.

FINE WOODWORKING issues 1-present. Excellent condition, price negotiable to cover cost plus express. Bert Seward, RR #4, 7701 Somenos Rd., Duncan, BC, V9L 3W8. (604) 748-9633.

STROKE SANDER 7 by 253 belt. Will sand 40 by 78-in surface, can adjust to any length. 3HP, 230V. This is an old machine, runs like new. \$1200 firm, will have to pick it up in western NC. Bob, (704) 625-9738.

PARKS 95 PLANER, 4 in. by 12 in., 3HP/IPH, with extras. Never used. \$1200. Rockwell-Delta industrial 6-in. long-bed jointer, 3/4HP/IPH with extras, fine-tuned mint condition. \$650. (606) 849-4010.

16-in. BEAM SAW, \$1000. 16-in. DeWalt, \$1000, 16-in. table saw, \$400. 20-in. & 36-in band saws, L.N. stroke sander \$900. Powermatic H.C. mortiser, \$1500. New 12-in. Freud dado, \$100. Kerfoot (410) 939-4667 (MD).

DEWALT 16-in. Heavy duty radial saw. Like new 5HP, 1PH motor, restored. \$2200. (213) 455-4006.

5HP/3PH MOTOR FOR UNISAW \$300. William Zweck, 12928 E. Galveston St., Gilbert, AZ 85234. (602) 926-0966.

MAC EBONY LOGS TO 6 ft. long, \$3 per pound. 1—pound sample, \$6 ppd. Jim Rudholm, 2300 Sierra, Kingsburg, CA 93631.

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION
(Required by 39 U.S.C. 3685)

1a. Title: Fine Woodworking. 1b. Publication no. 03613453 2. Date of filing: September 30, 1991. 3. Frequency of issue: Bimonthly. 3a. No. of issues published annually: 6. 3b. Annual subscription price: \$25.00. 4. Location of office of publication: 63 So. Main Street, PO Box 355, Newtown, CT 06470. 5. Location of the headquarters of the publishers: 63 So. Main Street, PO Box 355, Newtown, CT 06470. 6. Publisher: John Lively, 63 So. Main Street, PO Box 355, Newtown, CT 06470; Executive editor: Jim Boesel, 63 So. Main Street, PO Box 355, Newtown, CT 06470. 7. Owner: The Taunton Press, Inc., 63 So. Main Street, PO Box 355, Newtown, CT 06470. Stockholders owning or holding 1 percent or more of the total amount of stock: Paul Roman, 63 So. Main Street, PO Box 355, Newtown, CT 06470; Janice A. Roman, 63 So. Main Street, PO Box 355, Newtown, CT 06470. 8. Known bondholders, mortgagees and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities: None. 9. Not applicable. 10. Extent and nature of circulation:

	Average no. copies each issue during preceding 12 months	Actual no. copies of single issue published nearest to filing date Sept. 30, 1991
A. Total no. copies (net press run).....	335,394	331,046
B. Paid and/or requested circulation		
1. Sales through dealers and carriers, street vendors and counter sales.....	61,162	59,918
2. Mail subscription.....	218,110	213,263
C. Total paid and/or requested circulation.....	279,272	273,181
D. Free distribution by mail, carrier or other means, samples, complimentary, and other free copies.....	5,727	4,124
E. Total distribution.....	284,999	277,305
F. Copies not distributed		
1. Office use, left over, unaccounted, spoiled after printing.....	12,256	15,561
2. Return from news agents.....	38,138	38,180
G. Total (sum of E, F1 and 2).....	335,394	331,046
11. I certify that the statements made by me above are correct and complete. Signature: John Lively, Publisher.		

POWER TOOL PRICE BREAKERS

Trend-lines

**FREE
SHIPPING**

FEATURING RELIANT, A GREAT LINE OF STATIONARY TOOLS AT DISCOUNT PRICES

<p>Reliant 15" PLANER 3 HP 230V triple cutter head, 13500 cuts per minute. Adjustable power feed. DD37 \$795.00 Complete W/Stand.</p> 	<p>Reliant 6" BELT/ 9" DISC SANDER Micro-adjusts, tilts and locks from 0°-90° for vertical or horizontal work. DD69 \$199.95 Complete W/Stand.</p> 	<p>Reliant DUST COLLECTORS NN720 1 HP, 110/220V \$199.95 NN820 2 HP, 110/220V \$299.95 NN830 3 HP, 220 V \$475.00</p> 	<p>Reliant 14" 4 SPEED BANDSAW 1 HP, 115/230V. Independent guides, multiple speeds. Complete W/Closed Base Stand DD90 \$299.95</p> 
<p>Reliant 18" 2 SPEED SCROLL SAW Complete W/Stand 3/4" stroke, cast iron construction, low vibration. AL18 \$229.95</p> 	<p>Reliant JOINTERS Three knife head. DD38 6" 110V \$299.95 DD40 8" 230V 695.00</p> 	<p>Reliant 40" WOOD LATHE Heavy Duty Pro Model Many accessories available Complete W/Stand NN100 \$199.95</p> 	<p>Reliant DRILL PRESSES 13" Bench Shown 17" Floor Model 12 Speeds DD55 \$269.95 13" Bench Model 5 Speeds DD50 159.95</p> 
<p>Reliant 12" PLANER Complete W/Stand 2knife head. 16000 cuts/min. NN912X \$375.00</p> 	<p>RYOBI 10" TABLE SAW RYBT3000S Complete With Stand \$575.00</p> 	<p>DELTA 10" COMPOUND MITER SAW RW36220 \$234.00</p> 	<p>DELTA 10" CONTRACTOR SAW WITH UNIFENCE Free electronic measuring system included. RW34446 \$775.00 Expires 3/31/92</p> 
<p>freud 3 1/4" HP PLUNGE ROUTER \$30.00 MFR REBATE Expires 1/31/92 TF2000 AFTER REBATE \$139.95</p> 	<p>CARB-TECH™ 15 PC ROUTER BIT SET Tungsten carbide tipped. 1/4" shank. Most every bit you'll need. DPARB151 \$88.00</p> 	<p>HEAVY DUTY BALL STAND Height adjustable from 26"-43". Roller system has eleven 3/4" balls. 17" wide. LX55 \$59.95</p> 	<p>freud EXTRA FINE CUT 60 TOOTH CARBIDE BLADE TREND-LINES EXCLUSIVE TF1060 10" DIAMETER \$29.95</p> 
<p>freud BISCUIT JOINER \$30.00 MFR REBATE Expires 1/31/92 Joiner only TFJS100A \$127.95 After Rebate Joiner, 1000 biscuits, qt. Titebond glue TFJS100K 157.95 After Rebate</p> 	<p>Trakita MK2012 12" Planer \$454.00 MK3612BR 3 HP Plunge Router 164.00 MK98202 Blade Sharpener 188.00 MK6820V Drywall Screwdriver 91.00 MK6404 3/8 Vari Speed Rev.Drill 57.00 MK6170DW 7.2V 3/8 Cordless Drill 62.00 MK6510LVR 3/8 Vari Speed Reversible Industrial Drill 82.00</p>	<p>PORTER+CABLE PO9851 Magnaquench 9.6V Dvrr/Drill \$129.95 PO7334 5"Orbital Sander 118.00 PO691 1 1/2 HP Router 159.95 PO7336 6" Vari Speed Orbital Sander 132.00 PO362 4 x 24 Belt Sander 183.00 PO5116 Dovetail Machine 259.00 PO97310 Laminate Trimmer Kit 184.00 PO93151 7 1/4" Circ. Saw/Steel Case 114.00</p>	<p>RYOBI RYAP10 10" Planer 347.00 RYTS254 10" Super 10 Miter Saw 187.95 RYSC160 16" Scroll Saw 129.95 RYRA200 8 1/4" Radial Arm Saw 235.95 RYE 3800 Vari Speed Drywall Driver 69.95 RYDCU65 Drywall Cutout Tool 69.95 RYRE600 3 HP Plunge Router/ Electronic Control 204.00 RYWCSET 4" Angle Grinder & Woodcarving Attachmnt 99.95</p>

FAST FREE SHIPPING TO 48 CONTIGUOUS STATES

Trend-lines®

Dept. FW12P
375 Beacham Street
Chelsea, MA 02150

1-800-767-9999

To Order At These Special Prices,
Mention Dept. FW12P To Our Operator.

Offer Expires 2/29/1992. Misprints Subject to Correction.



MA, RI, ME. Res. Add Sales Tax.

1992 SUMMER WORKSHOPS

Jim Barefoot
Designing For Upholstery

Michael Emmons
Willow Furniture

Bob Flexner
Understanding Finishing

Gail Fredell
*Furniture Design:
Developing A
Personal Aesthetic*

Nora Hall
*Classic European
Woodcarving*

Residencies and
scholarships available.

For our free
1992 catalog contact:

Silas Kopf
*Marquetry, Veneering,
and Inlay*

Peter Korn
Basic Woodworking

James Krenov
A Personal Approach

Kathleen Loe
Faux & Painted Finishes

Sam Maloof
Furniture

Stephen Proctor
Advanced Furniture

Monroe Robinson
Designing With Veneers

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

READER SERVICE NO. 103

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. 13
Decatur, Illinois 62526
1-800-222-VEGA

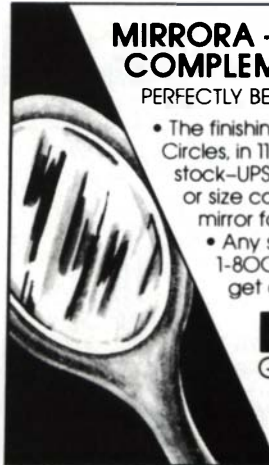
Thoughtfully designed machines made in the USA.

READER SERVICE NO. 51

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. 35

PORTER CABLE

309	LAMINATE TRIMMER	\$ 92
100	7.8 HP ROUTER	94
314	4 1/2" TRIM SAW	126
315	7 1/4" BUILDERS SAW	114
345	SAW BOSS 6" CIRCULAR SAW	98
330	SPEED BLOCK FINISHING SANDER 1 1/4 SH	56
351	3" X 21" BELT SANDER	128
352	3" X 21" BELT SANDER WITH DUST BAG	131
360	3" X 24" BELT SANDER WITH DUST BAG	176
361	3" X 24" BELT SANDER	169
362	4" X 24" BELT SANDER WITH DUST BAG	184
363	4" X 24" BELT SANDER	179
504	3" X 24" BELT SANDER XTRA HEAVY DUTY	324
505	1 1/2 SHEET FINISHING SANDER	112
548	BAYONET SAW WORM DRIVE	185
555	BISCUIT JOINER WITH STEEL CASE	163
617	7 1/4" BUILDERS SAW	115
621	3/8" DRILL VARIABLE SPEED REVERSIBLE	92
690	1 1/2 HP ROUTER W/ 1 1/4" & 1 1/2" COLLETS	123
691	1 1/2 HP "D" HANDLE ROUTER	138
693	PLUNGE BASE ROUTER 1 1/2 HP	162
695	SHAPER TABLE W/ 1 1/2 HP ROUTER	194
696	SHAPER TABLE	117
5008	DOVETAIL TEMPLATE	78
5009	MORTISE & TENON JIG	41
5116	OMN JIG	259
5556	BISCUIT JOINER TILT FENCE	39
6931	PLUNGE ROUTER BASE	77
7310	LAMINATE TRIMMER 5.6 AMP	85
7312	OFFSET TRIMMER	118
7319	TILT BASE TRIMMER	102
7305	5" RANDOM ORBIT SANDER VARIABLE SPD	125
7306	6" RANDOM ORBIT SANDER VARIABLE SPD	129
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	206
7538	3 1/4 HP PLUNGE ROUTER SINGLE SPD	224
7539	3 1/4 HP PLUNGE ROUTER 5 SPEED	259
9118	PORTA PLANE KIT W/ CASE CARBIDE BLADE	194
9314	4 1/2" TRIM SAW KIT	147
9345	SAW BOSS 6" CIRCULAR SAW KIT	122
9637	TIGER SAW VAR SPEED RECIP. SAW KIT	134
9647	TIGER CUB RECIPROCATING SAW KIT	114
9652	VERSA PLANE KIT	178
9653	12 V 3/8" COLESS DRILL KIT KYLS 2 SPD VAR	253
9654	12 V 1/2" COLESS KIT VAR SPD W/ GEARED CK	159
9505	COMMEMORATIVE 505 WITH OAK CASE	135
97310	LAMINATE TRIMMER KIT W/ 4 BASES & CASE	184
73333	RANDOM ORBIT DUST EXTRACTION SYSTEM	24



PORTER CABLE
MODEL 7306
6" VARIABLE SPEED
RANDOM ORBIT
SANDER WITH STICKIT
PAD
OUR PRICE
\$129.00
NEW DUST EXTRACTION SYSTEM - \$24.00!

PORTER CABLE
MODEL 636
3 1/8" TRIANGULAR
OSCILLATING CORNER
SANDER WITH STICKIT
PAD, STEEL CASE &
SANDPAPER
ASSORTMENT
OUR PRICE
\$283.00

RYOBI
MODEL TS251U
10" MITER SAW
OUR PRICE
\$159.00
ACCESSORY KIT - INCLUDES DUST BAG, EXTENSION WINGS, & VICE ASSEMBLY-\$29.95

INTERNATIONAL TOOL CORPORATION

1939 TYLER STREET, HOLLYWOOD, FL 33020
COD ADD \$5.00
CASH, CASHERS CHECK OR MONEY ORDER PLEASE
1-800-338-3384
FAX US YOUR ORDER AT 1-505-927-0291
FREE FREIGHT & SAME DAY SHIPPING
ON MOST ORDERS WITH \$25.00 MINIMUM PURCHASE

BOSCH & FREUD ROUTER
BITS ARE 40% OFF OF LIST!
DELTA
22-540 12" PORTABLE PLANNER \$410
31-460 4" BELT 6" DISC SANDER 135
40-560 16" TWO SPEED SCROLL SAW 184
31-080 1" BELT 5" DISC SANDER 164
31-050 1" BELT SANDER 77
40-150 15" SCROLL SAW 132
CALL FOR PRICES ON DELTA INDUSTRIAL MACHINERY

HITACHI
TR8 1 1/2 HP PLUNGE ROUTER \$117
TR12 3 HP PLUNGE ROUTER 166
CBFB 8 1/2" SLIDE COMPOUND MITER W/ 24" 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

RYOBI
JP155 6 1/8" VAR SPEED JOINTER \$297
RE600 3 HP PLUNGE ROUTER VAR SPEED 199
BT2500 10" TABLE SAW BENCH TOP 278
BE424 4" X 24" BELT SANDER W BAG VAR SPD 164
L1323ALS 3 1/4" LONG SHOE PLANNER KIT 119
TS251U 10" MITER SAW 159

SKIL FREE CARBIDE BLADE WITH SAW PURCHASE
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
5560 7 1/4" CIRCULAR SAW W CARBIDE BLADE 89
5660 8 1/4" 60 DEGREE PRO BEVEL SAW W CBD 138
1575 3 3/4" PLANNER W CARBIDE BLADES 119
7484 RANDOM ORBIT SANDER 5" DUSTLESS 99

freud

JS100	BISCUIT JOINER W/ CASE AFTER REBATE	127
FT2000	3 1/4 HP PLUNGE ROUTER AFTER REBATE	145
LU85M008	8" X 6 1/2" ATB ULTIMATE WOOD CUT OFF	52
LU88M008	8" X 48" ATB CROSSCUT THIN KERF	42
LU89M008	8" X 60" TCH NON FERROUS METALS	47
LU84M008	8" X 40" ATB COMBO WOOD BLADE	38
LU82M010	10" X 60" ATB CROSSCUT RIP BLADE	48
LU84M011	10" X 50" ATB COMBO WOOD BLADE	38
LU85M010	10" X 80" ATB CUT OFF BEST FOR WOOD	55
LM72M010	10" X 24" FLAT TOP RIP BLADE WOOD	36
LU87M010	10" X 24" RIP BLADE THIN KERF	37
LU88M010	10" X 60" CROSSCUT THIN KERF	43
LU89M010	10" X 72" TCH NON FERROUS METALS	64
LU92M010	10" X 80" TCH BEST FOR LAMINATES	68
LU86M010	10" X 80" TCH WOOD OR LAMINATES	66
TK103	7 1/4" X 16" THIN KERF DECKING	14
TK203	7 1/4" X 24" THIN KERF	18
TK206	10" X 24" THIN KERF RIPPING	20
TK306	10" X 40" THIN KERF COMBINATION	25
TK906	10" X 50" THIN KERF CROSSCUT COMBO	27
S0308	8" DADO SET WITH CARRYING CASE	116
WC104	4 PIECE WOOD CHISEL SET WITH CASE	39
WC106	6 PIECE WOOD CHISEL SET WITH CASE	52
WC110	10 PIECE WOOD CHISEL SET WITH CASE	79
FB107	7 PIECE FORSTNER BIT SET WITH CASE	49
CS106	6 PIECE CARVING SET WITH CASE	73
CS112	12 PIECE CARVING SET WITH CASE	129
88-100	9 PC BASIC ROUTER BIT SET 1 1/4" SHANK	104
91-104	6 PC STARTER SET PROFILE BITS 1 1/4" SH	114
94-100	CABINET DOOR SET 1 1/2" SHANKS	154
EB100	EDGE BANDING SYSTEM AFTER REBATE	194

Panasonic
EY6207BC 12V 1 2" KYLS CK 2 SPD VSR 2 BAT 15MIN 235
EY6205BC 12V 3/8" CK KYLS 2 SPD VSR W 15 MIN CHRG 165
EY6205B2 SAME AS ABOVE BUT WITH 2 BATTERIES! 199
EY6000BC 12V 3/8" HAMMER DRILL 15 MIN W 2BAT CSE 225

BOSTITCH
N80S STICK NAILER 6 TO 16 PENNY \$388
N80C COIL NAILER W CONTACT TRIP 399
T405-1CT ROOFING STAPLER 299
N12B ROOFING NAILER 409
N50FN FINISH NAILER 1" TO 2" CAPACITY 335
N60FN FINISH NAILER 1 1/4" TO 2 1/2" CAPACITY 335
MIII-812 T NAILER 9 16" 2 1/4" CAPACITY 429
T28-5 FINISHING STAPLER 1 1/2" CAPACITY 269
T31-3 FINISHING STAPLER 1" CAPACITY 149
T36-50 DECKING STAPLER 349

READER SERVICE NO. 3



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. 93

Makita

Same Day Service
FREE FREIGHT
CALL 1-800-262-5482

For LOW Prices On Entire Makita Line!

3612BR 3 HP Plunge Router List \$350 SALE \$169	9820-2 Blade Sharpener - Up To 16" Blades List \$373 SALE \$198
LS1011 10" Slide Com pound Miter Saw w/Vise List \$818 SALE \$444	2708 8 1/4" Table Saw List \$490 SALE \$264
2012 12" Surface Planer w/Blades List \$895 SALE \$454	6095DWE Special Edition 3/8" Cordless Driver/Drill Kit w/Keyless Chuck, Case, & 2 Batteries List \$268 SALE \$138

RYOBI 10" Precision
Bench Top
Table Saw
BT3000

NEW!
SALE \$599
Includes FREE Stand
(\$90 Value)

4 1/2" Random
Orbital Sander
List \$134
SALE \$74

RS-115
Biscuit Joiner
w/Case
List \$430
SALE \$214

WC101
Woodcarver™
Fits Any 4" Or
4 1/2" Grinder List \$50
SALE \$38

HOME LUMBER CO.
449 WHITEWATER ST., WHITEWATER, WI 53190

VISA • MC • DIS • COD • CHECK
READER SERVICE NO. 206

INCA 710
20" Bandsaw

SWISS QUALITY
Woodworking Machines

Renowned Precision Machines
at Sale Prices.

EXAMPLE:
NEW #2100 12" Table Saw:
ONLY \$2,185 (EXP. 3-31-92)
(1989 Original Price: \$3,175)

Shipped Direct from Inventory
5 Year Warranty (Parts & Labor)

Call or Send for More Information

(818) 797-8262
INJECTA MACHINERY
2217 El Sol Ave.
Altadena, CA 91001

INCA

READER SERVICE NO. 59

SINGLEY

Sleeveless DRUM SANDERS

Build the **BENCH TOP SPINOLE SANDER**. Plans and instructions for only... **\$11.99**

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

Strong "F" Weight SANDPAPER
3" x 10' rolls that outlast regular sandpaper 3X. Assortment pack of 1 each... 80, 120, 220... **\$12.99**

Sleeveless DRUM SANDERS

3/4"x3" Long	\$15.95
1"x3" Long	14.95
2"x3" Long	18.99
3"x3" Long	19.99
Kit of all 4	64.99
Drum Sander Plans	11.99
3"x10' Pre-Cut Sandpaper Roll Assortment	12.99

BONUS
Kit of all 4 Drums, receive FREE Plans & 1 FREE 3"x10' Sanding Roll... 80, 120 or 220 grit.

PHONE **1-800-776-5467**
...they are out the next day!

Check MasterCard
 Visa (Please include exp. date)
PA Residents add 6% Sales Tax.
S&H: Under \$25 - add \$3.75.

OUR HOLIDAY GIFT TO YOU...
FREE SHIPPING
ON ORDERS OVER \$25.00
(Offers good 'till Xmas '91)

PHONE **1-800-776-5467**
...they are out the next day!

QUAKER STATE WOODWORKING SUPPLY
4434 Kutztown Rd.
Reading, PA 19560

PORTER-CABLE

RANDOM ORBIT Disc RIOT! BUY 50 . . . Get 50 FREE!

Buy 50 5" STIKY DISCS get 50 FREE (100 discs)... **\$15.99**
Buy 50 6" STIKY DISCS get 50 FREE (100 discs)... **\$19.99**
DISCS come 50 to a roll. Available in 80, 100, 120, 150, 180, 220, 320 grit O.K. to Mix and Match 50 each grit.

P-C MODEL #7334, 7335, 7336

5" Random Orbit	\$119.99
5" V.S. Random Orbit	\$129.99
6" V.S. Random Orbit	\$134.99

(Sanders shipped freight FREE!)

SUNGOLD

SANDING BELTS
Buy 12 Belts
Get 13 FREE!

65% polyester, 35% cotton, belts don't stretch, sand cooler, and stay sharper longer.

BELT SIZE	PRICE/25 or 13* Belts
1x30	\$16.99
1x42	17.99
2 1/2 x 16	17.99
3 x 18	17.99
3x21	18.99
3x24	19.99
4x21	24.99
4x21 1/2	24.99
4x24	25.99
4x36*	24.99
6x48*	35.99

BUY 6 GET 7 FREE

Available in 40, 60, 80, 100, 120, 150 and 220 grit. Please order in multiples of 5 per grit size.
Belt Cleaning STICKS... \$4.99
3 for \$9.99 6 for \$15.99

QUICK-GRIP

BAR CLAMPS

The ONE-HANDED Clamp That's Sweeping The Country!

JAW OPEN	PRICE EA.
6"	\$12.75
12"	\$14.95
18"	\$15.95
24"	\$17.75
36"	\$19.75

4-Piece Corner Kit fits any length bar clamp... **\$5.95** **6" CLAMP and CORNER KIT**... **\$17.50** New!!! **6" MINI QUICK GRIP**... lighter Weight Clamp for Crafts and Hard-to-Reach places... **\$10.95** New!!! **QUICK GRIP HOLO DOWN CLAMP**... Perfect Workbench Hold-Down, simply drill 3/4" hole and your ready to go... **\$19.95.**

New! TITEBONO II WOOD GLUE
The first one-part wood glue to pass Type II waterproof testing.
Sands easier, sets faster
8 oz. TITEBONO II... **\$2.99**
16 oz. TITEBONO II... **\$4.99**

ACCESSORIES

PORTER-CABLE #330 BLAST!
The CADILLAC of the 1/4 Sheet Vibrating Sanders. Only 15,000 O.P.M. Sander on the market and look at the selection of sander accessories that we offer!
Model #330... \$54.99
(Sanders Shipped FREE!)

#330 Replacement Pads	\$5.99
#330 Contour Pads	\$9.99

4 1/2" x 10 yds. **STIKY ROLLS**... White s/c Non-Loading Paper for your Vibrating Sanders, avail. 80, 100, 120, 150, 180, 220, 320 grits.

1 Roll	\$11.99
2 or more Rolls	\$10.99/roll
Box of 10 Rolls	\$8.99/roll

(Can mix and match grits.)

PORTER CABLE STIK-IT DISPENSER
\$10.99
Holds 2 rolls at a time.

9x11 **WHITE s/c Non-Loading Sheets**
Packs of 50 sheets... **\$14.99**
or 2 packs for... **19.75**
or 4 packs for... **37.95**
(Can mix and match grits.)
SAME GRIT AS STIKY ROLLS

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... **\$24.99**
(Fits both 5" and 6" Sanders)

5" Replacement Pad	\$14.99
6" Replacement Pad	\$17.99
5" Contour Pad	\$14.99
6" Contour Pad	\$17.99
5" Conversion Kit Rep. Pad & Counter Weight	\$19.99
6" Conversion Kit Rep. Pad & Counter Weight	\$21.99

READER SERVICE NO. 119



WHOLE EARTH ACCESS

PORTER CABLE

330 Speed-Bloc Finishing Sander



- 58.**
- 666 3/8" VSR T-Handle Drill 120.
 - 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.
 - 367 3-1/4" Plane 149.
 - 9118 Porta-Plane Kit 199.
 - 9652 Versa-Plane Kit 295.
 - 555 Plate Joiner Kit 165.
 - 100 7/8 HP Router 99.
 - 690 1-1/2 HP Router 129.
 - 691 1-1/2 HP D-Handle Router 139.
 - 693 1-1/2 HP Plunge Base Router 169.
 - 7310 Laminate Trimmer 85.
 - 7312 Offset Base Laminate Trimmer 119.
 - 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.
 - 352 3"x21" Dustless Belt Sander 139.
 - 360 3"x24" Dustless Belt Sander 179.
 - 362 4"x24" Dustless Belt Sander 189.
 - 504 3"x24" Wormdrive Belt Sander 329.
 - 505 1/2 Sheet Finishing Sander 115.
 - 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 135.
 - 315-1 7-1/4" Top Handle Circular Saw 115.
 - 345 6" Saw Boss Circular Saw 99.
 - 7549 VS, Var-Orbit D-Handle Jigsaw 135.
 - 9345 Saw Boss Kit 124.
 - 9637 VS Tigersaw Kit 139.
 - 9647 Tiger Cub Reciprocating Saw 115.

BOSCH

3050VSRK 3/8" Cordless Driver/Drill, 2 bat.



135.

- 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 105.
- 9166VSR 1/2" Mighty Midget VSR Drill 115.
- 1347A 4-1/2" Mini Grinder 89.
- 1348AE 5" EFC Mini Grinder 115.
- 11202 1-1/2" Rotary Hammer 419.
- 11212VSR 3/4" VSR SDS Bulldog Rotary Hammer 195.
- 11215DVSR 3/4" Dustless Bulldog VSR SDS Hammer 289.
- 11304 Brute Breaker Hammer 1205.
- 11305 Demolition Hammer 689.
- 3258 3-1/4" Planer 129.
- 1942 Heavy Duty Heat Gun 72.
- 1604 1-3/4 HP Router 129.

- 1606 1-3/4 HP D-Handle Router 155.
- 1608LX Laminate Trimmer w/ Deluxe Guide 105.
- 1608T Tilt Base Laminate Trimmer 105.
- 1609 Offset Base Laminate Trimmer 125.
- 1609K Installers Trimmer Kit 179.
- 1609KX Deluxe Installers Trimmer Kit 229.
- 1611EVS 3-1/4 HP EFC VS Plunge Router 239.
- 12720 3"x24" Dustless Belt Sander 175.
- 12730 4"x24" Dustless Belt Sander 185.
- 1273DVS 4"x24" VS Dustless Belt Sander 199.
- 1370DEVS 6" VS Random Orbit Sander w/Access. 299.
- 3270D 3"x21" Dustless Belt Sander 139.
- 3283DVS 5" Dustless Random Orbit Sander 95.
- 1581DVS VS, Var. Orbit Jigsaw, Dustless 159.
- 1582VS VS, Var. Orbit Jigsaw w/CLIC 135.
- 1581VS VS, Var. Orbit Jigsaw, D-Handle 135.
- 1632VSK VS Panther Recip. Saw Kit 145.
- 1654 7-1/4" Circular Saw 109.
- 1420VSR VSR Drywall Driver, 0-4000 RPM 85.

MILWAUKEE

- 0399-1 3/8" VSR 12v Driver/Drill Kit 159.
- 0402-1 VSR 12v Driver/Drill w/Keyless Chuck 163.
- 6546-1 Cordless Screwdriver, 2-spd 75.
- 0222-1 3/8" VSR Drill, 0-1000 RPM 104.
- 0224-1 3/8" Magnum Holeshooter, 0-1200 RPM 110.
- 0234-1 1/2" Magnum Holeshooter, 0-850 RPM 112.
- 0239-1 VSR Keyless Chuck Drill 119.
- 0244-1 1/2" Magnum Holeshooter, 0-600 RPM 112.
- 0375-1 3/8" Close Quarter Drill 125.
- 0379-1 1/2" Close Quarter Drill 149.
- 0567-1 Drain Cleaner Kit 229.
- 1676-1 Hole Hawg Kit 235.
- 3002-1 Electricians Rt. Angle Drill Kit 182.
- 3102-1 Plumbers Rt. Angle Drill Kit 185.
- 3107-1 VS Right Angle Drill Kit 190.
- 5192 Die Grinder, 4.5 Amp 169.
- 6140 4-1/2" Angle Grinder 95.
- 6141 5" Angle Grinder 109.
- 5362-1 1" TSCR Hawk Rotary Hammer 275.
- 8975 Heat Gun 59.
- 5680 2 HP Router 219.
- 5925 3"x24" Dustless Belt Sander 219.
- 5936 4"x24" Dustless Belt Sander 225.
- 6012 1/3 Sheet Finishing Sander 114.
- 6014 1/2 Sheet Finishing Sander 117.
- 6016 1/4 Sheet Finishing Sander 49.
- 6215 16" Electric Chainsaw 169.
- 6232 4-3/4" Bandsaw w/Case 275.
- 6365 7-1/4" Circular Saw 118.
- 6377 7-1/4" Wormdrive Saw 169.
- 6460 10-1/4" Circular Saw 249.
- 6528 VS Super Sawzall 169.
- 6750-1 VSR Drywall Driver 89.
- 6754-1 VSR Magnum Drywall 119.
- 6798-1 TEK Screwdriver 109.

FREUD

- LM72M008 8" x 24T Rip 35.
- LM72M010 10" x 24T Rip 36.
- LU73M010 10" x 60T ATB 43.
- LU81M010 10" x 40T TCG 39.
- LU84M008 8" x 40T Combination 44.
- LU84M011 10" x 50T Combination 38.
- LU85M008 8" x 64T ATB Fine Cut Off 49.
- LU85M010 10" x 80T ATB Fine Cut Off 55.
- LU85M014 14" x 108T ATB Fine Cut Off 105.
- LU85M015 15" x 108T ATB Fine Cut Off 105.
- LU87M008 8" x 22T Thin Kerf 42.
- LU87M010 10" x 24T Thin Kerf 37.

- LU88M008 8" x 48T Thin Kerf 49.
- LU88M010 10" x 60T Thin Kerf 43.
- LU91M008 8-1/2" x 48T Miter Saw Blade 38.
- LU91M010 10" x 60T Miter Saw Blade 49.
- LU98M010 10" x 80T TCG 68.
- TK203 7-1/4" x 24T Framing Blade 18.
- TK204 8-1/4" x 24T Framing Blade 21.
- TK303 7-1/4" x 40T Finish Blade 21.
- TK304 8-1/4" x 40T Finish Blade 27.
- SD308 8" Dado Set 117.
- WC106 6 Pc. Chisel Set 49.
- 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. |
| EA. BOX/6 | | |
| 3706 6" Steel Bar Clamp | 6.29 | 35.65 |
| 3712 12" Steel Bar Clamp | 6.79 | 38.49 |
| 3718 18" Steel Bar Clamp | 7.35 | 41.69 |
| 3724 24" Steel Bar Clamp | 7.99 | 45.25 |
| 3730 30" Steel Bar Clamp | 9.05 | 51.19 |
| 3736 36" Steel Bar Clamp | 9.95 | 56.65 |
| 0 Wooden Handscrew, 4-1/2" Open | 11.95 | 62.95 |
| 1 Wooden Handscrew, 6" Open | 12.95 | 71.49 |
| 2 Wooden Handscrew, 8" Open | 15.95 | 81.89 |

DELTA

- 22-540 12" Portable Planer **418.**
- 

- UNISAW, SHAPER, JOINTER & FINISHING MACHINE SALE!**
- 34-761 10", 3 HP Unisaw, 1 PH 1359.*
 - 34-783 10", 1-1/2 HP Unisaw/Unifence 1329.*
 - 34-782 10", 3 HP Unisaw/Unifence, 1 PH 1499.*
 - 31-730 6" Belt/12" Disc w/Electricals 939.*
 - 37-350 8" Long Bed Joints w/Electricals 1239.*
 - 43-375 3 HP HD Two-Speed Shaper 1459.*
- (Prices include \$100. mfg. mail-in rebate, good thru 3/31/92)*

EMGLO

- AM39HC4V 3/4 HP Vertical Twin Tank **289.**
- 

MAKITA

- 6095DW 3/8" VSR Cordless Driver/Drill w/ Keyless Chuck **145.**
- 

- DA390D Cordless Angle Drill, 9.6v 85.
- 5090DW 3-3/8" Saw Kit, 9.6v 139.
- 6093DW 3/8" VSR Driver/Drill Kit, 9.6v 129.
- 6200DW 3/8" VSR Hi-Torque Driver/Drill Kit 155.
- 6404 3/8" VSR Drill, 0-2100 RPM 58.
- 9207SPC 7" Electronic Sander Polisher 148.
- 1805B 6-1/8" Planer w/Case 355.

MAKITA cont'd

- 1900BW 3-1/4" Planer Kit 112.
- 1911B 4-3/8" Planer Kit 145.
- BD4510 1/4 Sheet Finishing Sander 52.
- BD4550 1/4 Sheet Dustless Finishing Sander 57.
- 9401 4"x24" Dustless Belt Sander 164.
- 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.
- 5077B 7-1/4" Hypoid Framers Saw 139.
- 5402A 16" Circular Saw 325.
- 2012 12" Portable Planer 455.
- 2708W 8-1/4" Table Saw 265.
- 2711 10" Table Saw w/Brake 475.

RYOBI

- RS115 4-1/2" VS Random Orbit Sander **75.**
- 

- TF0220VRK 12v Cordless Drill Kit 165.
- L1323ALSK 3-1/4" Planer Kit, Long Base 119.
- 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 198.
- AP10 10" Portable Planer 359.
- BT2500 10" Table Saw 298.
- BT3000 10" Sliding Table Saw 569.
- JP155 6-1/8" VS Joints 299.
- RA200 8" Radial Arm Saw 245.

HITACHI

- C8FB 8-1/2" Compound Miter Saw w/ Extra 60T ATB Carbide Blade **479.**
- 

- M12V 3 HP VS Plunge Router 235.
- C10FA Deluxe 10" Miter Saw 275.
- C15FB 15" Miter Saw 379.
- C7B0 7-1/4" Circular Saw, Elect. Brake 135.
- W6V2 VSR Quiet Drywall Screwdriver 89.
- P12RA Portable 12" Planer/6" Joints Combo 829.

HITACHI NAIL GUNS

- NR83A Full 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 3/4"-2-1/2" 319.

SKIL

- 2735-08 3/8" VSR 12v Cordless Drill Kit, w/2 Bat. 135.
- 77 7-1/4" Wormdrive Saw 145.
- 5860 8-1/4" 600 Wormdrive Saw 169.
- 3810 10" Miter Saw 225.
- 1605-02 Plate Joiner Kit 119.

822 ANTHONY STREET • BERKELEY • CA • 94710 • * FOB BERKELEY CA TOLL FREE 7 DAYS
 FREE FREIGHT IN CONTINENTAL USA • ERRORS SUBJECT TO CORRECTION • VISA • DISCOVER • MASTERCARD
 1-800-829-6300

Fine Woodworking®

Index to issues 86 through 91

This alphabetized index to Fine Woodworking covers departments and articles published between January 1991 and December 1991. We will publish an index once each year in our January issue. These indexes supplement, but do not replace, our cumulative indexes to issues 1 through 50 and to issues 51 through 65, which were published as separate booklets. The index to issues 1 through 50 is still available for purchase. Each reference consists of an issue number, a colon and page numbers for that issue. A hyphen between the page numbers means the discussion of the topic is unbroken on the named pages; commas between page numbers indicate an intermittent discussion. The index to issues 86 through 91 and the previous booklets were prepared by Harriet Hodges of New Castle, Va.

- A**
Acrylic plastic: gluing, 89:75
Adhesives: spray-on, 89:16
African woods: discussed, 88:14
Air quality: information on, 90:28
Aliphatic resin glue (yellow):
for carcasses, 86:84
shelf life of, 91:26-28
waterproof, reviewed, 91:130
Anisopiera: as mahogany substitute, 86:30
Antiquing:
distressing in, 91:64-65
with milk paint, 91:63, 64
Archival damage: preventing, 88:30-32, 89:6
Arcs: radius of, finding, 88:28-30, 90:32, 91:4-6
"Artitude": warnings for, 90:4-6
Arts-and-Crafts style:
books on, 88:93, 110
demise of, 88:92-93
Roycroft, 88:90-93
Ash (*Fraxinus* spp.):
growing, for bending, 87:26
scratch resistance of, 87:6
white (*americana*), vs. hickory, 87:79
Aspen, quaking (*Populus tremuloides*):
identifying, 88:72
Australia: work from, 88:94-95
- B**
Balls: holes in, drilling, 88:18, 90:4
Bandsaws:
angle-modifying jig for, 88:18
blades of, for measuring, 91:18
books on, reviewed, 87:114-16, 90:114
box-making blade for, 89:57
disc sander on, making, 89:71
guide blocks for, 88:65
log carriage for, 91:22
plexiglass guide for, making, 88:65
radii with, 88:63
tapers on, 91:75
tuning, 88:64, 65, 89:12
See also Featherboards. Fences.
Hold-ins.
Beading:
cock, 89:24-26, 90:75, 78
making, 89:50-51
with router, 86:44
Bearings:
ball, 90:49-51
booklet on, 90:51
lubricant for, 88:49, 90:50
sources for, 90:51, 91:10
Beds:
contemporary Queen Anne, 87:76
"Egyptian," 91:124
pencil-post, construction time for, 87:34
rail-fastening system for, 91:50
with slatted headboard, 86:92
sleigh, making, 91:46-51
- Beetles:
dealing with, 87:28, 91:84
verifying damage from, 89:6
Belts: flat leather, source for, 90:24
Bench grinders: See Grinding wheels.
Benchstones:
substitute for, porcelain as, 88:22
water-, truing, 86:32
Binding: See Stringing.
Biscuit joinery: See Plate joinery.
Bits:
auger, fast-lead, 91:26
instantly changeable, 89:106
low-angle countersink, source for, 89:78
Bleaches: action of, 86:28, 65-67, 87:34-36
Books: archival protection for, 88:30-32, 89:6
Bottoms: felt for, applying, 89:81
Bowls, turned:
with lathe-and-router-formed inlay, 88:83
salad, 90:28-30
of spalted, painted maple, 87:95
See also Cups.
Boxes:
bandsawn, 89:57
insert hinges for, 89:58
lids for, floating-panel, 86:22, 32
lining for, 90:55
marquetry, 86:51
Swiss wooden-hinged, making, 87:86-89
turquoise, silver, inlaid, 89:57
veneered, making, 90:52-55
Boxes, turned: tiny exquisite, 91:128
Box joints: on tablesaw, 88:28, 89:74
Braces: alignment of, straightening, 91:26
Brackets: upper-to-lower carcass, 89:47, 51
Brass:
engraving, 87:56
replicating, in brass-fiberglass, 86:86-87
Bridle joints:
with router, 87:46-47
with tablesaw, 89:74
Britain: woodworking in, 86:50-53
Browning Arms: salt-cured gunstocks of, 89:4
Buffers:
compound for, 89:58
using, 87:71, 89:8
Bureaus:
four-drawer, making, 86:82-85
See also Frame-and-panel. Semainiers.
Business:
beginning, hints for, 86:4-6, 87:4-6, 88:6, 89:12
counseling source for, 89:14
pricing for, 86:6, 48, 87:6, 89:12-14
selling options for, 86:48, 91:130
See also Production runs.
Butt joints:
with angled screws, 89:78
bolted, 91:60, 61
- C**
Cabinets:
"Badminton," sale of, 87:122
built-in, making, 86:42-46
display, 86:50, 91:97
doors for, making, 86:76-79
English, 86:52, 53
entertainment-center, building, 88:56-60
face frames for, with molding, 89:50
file, making, 87:44-47
fir-and-doussie, 91:97
with fluted inlaid doors, 88:114
gold-leafed half-round, 90:95
hall, 86:51
marquetry Krenovian, 91:95
music, making, 86:54-55
after Ruhlman, 90:94
with scalloped-top, 91:96
with sculpted painted panels, 87:128
stereo, 88:57, 91:73
tool, making, 89:82-84
wall cleats for, 89:83, 84
wiring for, 88:60
See also Semainiers.
Calculators: reviewed, 91:88-90
Calipers, dial: discussed, 87:58-59, 61, 89:8
Canes: snakewood, 89:102-104
Carcasses:
backs of, frame-and-panel, 89:46, 47
bases for, bridle-jointed, 87:46-47
bases for, sturdy, 86:54-55
with concave sides, making, 86:82-85
contemporary Queen Anne, 87:76, 77
with curved sides, 88:66, 67-69
curved, with bending plywood, 87:66-68
insides of, finish for, 86:85
for machines, 87:64
miniature, sanding, 87:89
from multiple frames, 89:47, 48-49, 50
plywood, 86:44
of slats in dovetailed rabbits, 87:44, 45-46
for sleigh-bed headboard, 91:49-50
for small drawer table, 90:92
for wood movement, 86:54
See also Boxes. Frame-and-panel. Gluing up.
Carpenter ants: baits for, 86:32
Carvers, power: discussed, 87:81-84
Carving:
basics of, 90:70-73
books on, 86:120, 87:114, 116, 90:73, 114
carbide burrs for, reviewed, 91:130
chainsaw machine for, reviewed, 87:124-126
of chair seat, 87:92-92
copying, with masking tape, 90:12
of leaves, 88:77
of matchsticks, 87:126
of mirror cartouche, 88:74, 75
patterns for, glued paper, 91:51
restoration of, English, 89:100-102
routed, with duplicator, 87:56
of scalloped corners, 88:75-76
for sleigh bed, 91:47, 48, 51
tool for, in show, 86:122
- of tool replicas, 86:126
tools for, basic, 90:71
Caschardening: testing for, in kiln, 91:85
Cast iron: wax vs. talc for, 86:24
Casters: shock-absorbing adjustable, 88:59, 60
Casts:
making, 86:86-87
supply sources for, 86:86-87
Cedar, western (*Thuja plicata*):
bleaching, 86:65
growing, for bending, 87:26
Cello: maker of, 86:54-55
Chainsaws: carver version of, 87:124-26
Chairs:
Art Deco leather lounge, 89:87
blackwood-and-ash, 88:94
cane seats for, book on, 90:116-18
Chinese, English-contemporary, 86:53
combs for, making, 87:92-93
desk, 90:74
English, 86:52
finish for, 87:93
Krenovian, 91:1, 96
loose joints in, tightening, 90:20
rear arm joints of, stresses on, 87:34
rocking, walnut slatted, 86:92
seats for, carving, 87:92
of turned rejoined parts, 87:95
washboard-rockers, 88:114
See also Windsor chairs.
Chalk: for fitting pieces, 89:41
Chamfers:
belt-sander jig for, 91:70, 71
for box edges, 87:88, 89
around mortises, 91:73, 74-75
Cherry (*Prunus* spp.):
bending, 89:24, 91:6
ebonized, 86:44
sapwood of, color problems with, 89:24
Chess sets:
turned, making, 89:79-81
weighting, 89:81, 91:6
Chests:
ash-and-silky oak, 88:94
-on-chest: contemporary Queen Anne, 87:76
See also Bureaus. Lowboys.
Chisels: cabinet for, making, 89:82-84
Chopsaws: digital measuring system for, reviewed, 89:106
Circles: radii of, finding, 88:28-30, 90:32
Clamps:
band, quick light-duty, 86:18
cam, in positioning cradle, 89:67
edge, improvised, 91:22
go-bar, for lamination, 90:16-18
band-screw, storing, 91:14
leather pads for, making, 88:22
pipe, support leg for, 87:14
for plywood edgings, 91:16-18
reverse-action, for disassembly, 88:24
with styrofoam and cauls, 87:20-22
vertical wall-hung, reviewed, 90:126
Clocks:
book on, reviewed, 86:120

tall-case contemporary, 88:120
Compressed-air systems:
couplings for, interchangeable, 89:8-10
PVC with, cautions against, 86:10, 88:10
Computers:
recommended, 89:14
workstations for, making, 86:42-46
Coopering: feather joints in, 89:104
Coping: router jig for, 89:20
Corian:
antiquing, 89:70
machining, 89:69, 70
Countertops: scribing, with pattern, 87:18
Cracks: gluing, hydraulics for, 86:14-16
Cups: Scottish bicker, joinery of, 89:104
Curves:
analyzed, 87:73-74
fairing, 90:47
See also Arcs. Cylinders. Ellipses.
Parabolas.
Cushions: webbing frame for, 90:46, 48
Cutting boards: making, 90:28-30
Cyanocrylate glue:
aging properties of, 87:28
chair-joint repairs with, 90:20
for inlay, 89:58
Cylinders: stave-constructed, 86:47, 49

D
Dadoes:
with router, 88:49, 91:16
tablesaw blades for, evaluated, 89:59-63
Design: "natural," 90:4-6
Desks:
built-in, making, 86:42-46
cubby system for, 86:46
"deinonychus," 86:91
elegant writing, making, 90:74-8
fall-front mechanism for, 86:55
Roycroft ladies', 88:92-93
satinwood-leather, 86:51
trompe l'oeil marquetry, 88:114
V-shaped partition grooves for, making, 90:22-24
See also Cabinets: music.
Dial indicators: discussed, 87:58-59, 61, 90:8
Dipterocarpaceae spp.: as mahogany substitute, 86:28-30
Doors:
building, 90:8-10
crosscut box for, 89:75
curved, hanging, 89:84
curved, kerf-bent, 87:55
"flipper," using, 86:44
frame-and-panel, 86:44, 76-79, 88:12-14, 89:51
pivots for, 88:58-60, 89:6
Douglas-fir (*Pseudotsuga menziesii*):
identifying, 88:70-71
Dovetails:
fitting, scrapers for, 91:66
sliding, 87:44, 45, 90:64
on tablesaw, 90:76
Dowels:
dial-indicators with, 87:61
drilling, 88:26
grooving, jig for, 89:16
joinery with, 89:83, 84, 90:76, 77
locating, with ball bearings, 87:16, 90:4
machine-tenon reinforcing, 86:77
making, router jigs for, 90:79-81
precision-made, source for, 86:32
for table aprons, 86:63
Drawers:
beading for, integral, 89:51
cardboard-pull, 87:57
for contemporary Queen Anne, 87:77
curved, making, 90:78
desk, making, 90:74-76
file, making, 87:47
finish for, 86:85
frames for, 89:50, 90:76-77
laminated curved, making, 88:44-47
making, 86:44, 89:51
pulls for, 86:85, 88:22, 44, 47, 87:44, 47
rosettes for, inset, 87:57
runners for, 86:83, 84-85
shaped, making, 86:85
slides for, 86:44, 47
sliding-dovetail joinery with, 87:44, 45
small Shaker, making, 90:92
splined, mitered, faced, 88:66, 68, 69
veneered, with bending-plywood fronts, 87:67, 68
See also Pulls.
Drill presses:
ball-centering jig for, 88:18
biscuit joinery on, 87:22
chucks of, removing, 89:26

dial indicators with, 87:61
endgrain-drilling jig for, 87:89
mortises with, 88:68
as pin routers, 88:26
for removing bearings, 90:50-51
round stock on, cross drilling, 88:26
See also Fences.
Drills, hand:
angle guides for, 87:91
boring jigs for, 88:85, 86, 88, 89
pocket jig for, making, 90:18
quick-change system for, reviewed, 89:106
Drywall: panel fasteners for, 88:57
Dust: respirators for, 86:4
Dust-collection systems:
for routers, 88:50, 90:56, 57, 59, 61
rubber-seal flashing for, 86:16
switch for, wireless-vacuum, 86:14
See also Air quality.
Dyes:
applying, 90:30
and water-base finish, 89:53-54

E

Ebonizing: of cherry, 86:44
Ebony (*Diospyros* spp.): domestic substitute for, 86:124
Electricity:
in built-in cabinetry, 86:43, 46
cords for, storing, 86:18
Electromagnetic radiation: from shop motors, 90:4
Ellipses:
describing, 86:88-89, 88:44, 46
See also Parabolas.
Elm (*Ulmus* spp.): properties of, 87:6, 79
Environmental Protection Agency:
information number for, 90:28
Epoxy:
fortified, 90:51
industrial-grade, 88:69
for lamination, 86:22
metal repairs with, 90:51
small quantities of, mixing, 87:14
strengthening filler for, 88:88
Esterly, David: carving career of, 89:100-102

F

Face shields: anti-static treatment for, 89:16
False mopane (*Guibourtia coleosperma*):
described, 88:14
Featherboards: See Hold-ins.
Feet: glass ball-and-claw, replacements for, 86:22
Fellowships: Wintertur Library, 91:128
Felt: for bottoms, applying, 89:81
Fences:
diagonal crosscutting, 91:69, 70
miter-gauge, making, 88:78-79
stop blocks for, 88:78-79, 118
vacuum, 91:51
Files:
aluminum particles, spray against, 88:18
on plywood, 90:12
Fillers:
reviewed, 90:126
sequence for, 91:28-30
and water-based finishes, 89:53
Finger joints: See Box joints.
Finishes:
application cloths for, source for, 87:34
and archival damage, preventing, 88:32, 89:6
color-protecting, 89:30
crude-oil, discouraged, 89:26-28
for eating utensils, 90:30
exterior, oil vs. varnish, 88:32
flyspecking, 90:124-26
freeze-proof storage for, 86:26
and glue spots, locating, 87:30
nontoxic citrus-based, source for, 91:51
polishing compounds with, 87:70-72
repairing of, 87:72, 88:30
salt-cured, 89:4
solvent-based vs. water-based, 89:53
for tabletops, 88:47
See also Bleaches. Refinishing. Surfacing. Volatile organic compounds. Water-base finishes.
Fir (*Abies* spp.): identifying, 88:72
Fisheyes:
from fisheye eliminators, 89:55
from silicone, 89:30
in water-base finish, 89:55
Flags: source for, 88:12
Flowers: carving, 90:70-73
Flutes (grooves):
with lathe-mounted router, 88:82-84

with shaper jig, 90:78
spiral, making, 88:84
Footrests: rocking, 86:51
Forests:
responsibility toward, 86:8-10, 87:122-24, 88:4, 89:6-8
See also Trees.
Formaldehyde:
and archival damage, 88:30-32
testing for, 90:28
Frames:
elliptical, making, 86:88-90
for mirrors, 89:67
for parquetry "quilt," 90:84, 85
picture, hangers for, 89:22
Frame-and-panel:
face, joining, 89:78
false, 87:56, 57
machine-made, making, 86:76-79, 88:12-14
with sliding dovetails, 87:44, 46
Furniture:
exhibitions of, 88:114-16, 89:85-87
miniature, source for, 88:116
southern, book on, 88:110

G

Glues:
freeze protection for, 86:26, 87:36-38
for inlay, 89:58
for plastic, 89:75
removal of, scrapers for, 91:66
rollers for, making, 88:20
small quantities of, mixing, 87:14
waterproof one-part, 91:130
See also separate glues.
Gluing up:
of carcasses, 86:83-84, 89:50, 51
cleanup after, 87:30
of drawer cases, 90:77
jigs for, 87:89, 89:65, 67
See also Cracks.
Goblets: "nest" carved, 91:128
Gouges:
carving, sharpening, 90:73
deep-fluted, for spindle turning, 90:4
spoon, countersinking with, 87:16
Grinding wheels:
and aluminum particles, spray against, 88:18
dressing, 91:26
pivoting rest for, making, 89:16
of resin-bound particles, 86:124
water-cooled Scandinavian, reviewed, 88:118
Guitars: assembling, 89:28-30
Gunstocks: salt-cured, 89:4

H

Hammers:
crutch-tip softeners for, 86:14
shields for, 87:20
wax depository for, 89:22
Handles: See Pulls.
Hardware:
brass, source for, 87:77
display case of, 86:126
joint-connector bolts, source for, 89:67
keyhole, 89:66, 67
mortising for, 91:91-93
Roycroft reproduction, 88:93
sources for, 86:22, 86:87
T-nuts, source for, 89:67
See also Brasses: replicating.
Hemlock, eastern (*Tsuga canadensis*):
identifying, 88:71-72
Heppelewhite: table after, 86:62-64
Hickory (*Carya* spp.):
discussed, 87:78-80
pecan (*illinoensis*), qualities of, 87:78-80
true, qualities of, 87:78-80
Hide glue:
ground, source for, 91:8
for guitars, discouraged, 89:28
for guitars, encouraged, 91:8
liquid, problems with, 91:8
Highboys: Queen Anne, 87:73
Hinges:
applying, glue aid for, 90:55
card-table, source for, 86:64
for drop-leaf table, source for, 90:92
European-style free-swing, 88:58, 59
hasps as, brass, 90:54
heavy-door pivot, 88:58-60, 89:6
incised, 87:56
insert, source for, 89:58
knuckle wooden, making, 86:64
mortising for, 91:92
for tool-chest lids, 90:64

wooden box, making, 87:87, 89
See also Latches.
Hold-downs: cranked chain-driven, 88:50-51
Hold-ins:
double-acting, 90:12
spring-loaded, 91:20
Holes: angled, drilling, 87:91
Hutches: designing, 89:46-47
HVLP: See Spray equipment: high-volume low-pressure.

I

Inlay:
backed, source for, 86:63
dental burrs for, 86:62
elliptical, jig for, 88:46, 47
flower, making, 86:62-63
for Hepplewhite table, 86:62-63
lead, 86:22-24, 88:8-10, 89:6
router, 87:44, 45, 47, 88:83
silver, 89:56-58
string, for tabletop, 88:47
supply source for, 86:60, 89:58
of tagua nuts, 88:47
of turquoise, 89:56-58
Instruction:
classes in, 87:89
in conservation, Smithsonian, 91:128
in router techniques, 87:47
schools of, 91:96
Intarsia: project book for, reviewed, 87:114-16
Ipe (*Tabebuia* spp.): legs of, 87:67, 69
Ironwood, desert (*Olneya tesota*):
turquoise and silver inlay in, 89:56-58
Ivory: See Tagua nuts.

J

Jewelry:
boxes, 86:52, 91:94
cabinets, wall-hung, 91:96
Jigsaw puzzles:
book on, cited, 88:55
making, 88:52-55, 91:8
Joinery:
for partitions, miters for, 90:22-24
Scottish feathered, 89:104
See also separate joints.
Joiners: dial indicators with, 87:61
Joining: with router, 91:14-16

K

Kaleidoscopes: making, 86:47-49
Kilns: building, 91:83-87
Kitchen cabinets:
designing, 87:34
face frames for, screw-joining, 89:78
panel router for, 88:48-51
radio for, 86:10
system for, 89:76-78
Kitchens: design for, 87:34
Knox, Frank: obituary for, 87:126
Krenov, James: and students, show on, 91:94-96

L

Lacquer:
aerosol, applying, 90:55
black toning, using, 87:69
cans of, clean-pouring, 91:18
cure time for, 87:71
"European-style black" (see Polyester finishes.)
power buffing, 87:70-72
and silicone, 89:30
strainer for, quick, 86:16
Lamination:
for curved aprons, 88:44, 46
for curved headboard, 91:49-50
for curved veneered doors, 88:60
of different woods, weather-resistant, 86:22
Latches: touch, installing, 88:58, 59
Lathe chucks:
jam, making, 86:49
screw, making, 90:16
Lathes:
compound slide rests for, 88:80-81
drive center for, universal-joint, 90:87, 89
as drum sanders, 90:12
duplicator, discussed by brand, 86:68-73 (erratum, 88:4)
guards for, Lexan vs. Plexiglas, 86:32
as horizontal mortisers, 86:77-78
indexing on, 88:81, 83, 90:87-88
tool-post slide suggested for, 86:10

truck-axle, 87:95
 Lazy susans: from hard-drive components, 88:24
 Lead:
 as inlay, 86:22-24, 88:8-10, 89:6
 for weight, 89:81, 90:16, 91:6
 Legs:
 with angled tops, making, 88:46
 cabriole, 87:72, 73, 77
 curved, carcass pockets for, 88:66, 66, 67, 68
 curved, jigs for, 88:67
 doweled feet for, 88:45
 fluted, 90:77, 78
 levelers for, making, 90:58
 mortising, 90:91
 oval, with pear caps, 87:69
 sleigh-bed, carved, 91:48
 turned simple, 90:91
 twin tenons for, 91:73, 74
 Windsor, woods for, 88:72
 Lexan: gluing, 89:75
 Linseed oil: and tung, 89:41, 51
 Locks:
 latch-and-hook, 87:56, 57
 mortising for, 91:92
 Logs: cutting, for crotch figure, 90:20
 Lovescats: *See* Settees.
 Lowboys: huon pine, 88:95
 Lumber:
 air- vs. kiln-dried, 88:28
 salvaged, from sawmills, 90:6
See also Kilns.
 Luthiers: convention of, reviewed, 91:126

M

Machinery:
 bearings in, 88:49, 90:49-51
 cast-iron, coatings for, 86:24, 88:12
 cord holders for, 88:50, 90:14
 dial-indicator checks for, 87:58-61, 90:8
 ELF-EM readings from, 90:4
 epoxy repairs to, 90:51
 with flat belts, converting, 90:24-26
 heavy, mover for, 86:16-18
 measuring system for, 89:106, 91:6
 miter-gauge slots in, filling, 88:20
 positioning, 89:76, 77
 power outlets on, 89:20-22
 rollers for, from delrin tubing, 88:49
 from salvage, 87:6
 securing, with adhesive, 89:18-20
See also Motors.
 Magnolia (*Magnolia* spp.):
 described, 91:28
 staining, 91:28
 Mahogany, Philippine (*Sborea* and *Pentacme* spp.): as mahogany substitute, 86:28-30
 Mahogany (*Suietenia* spp.): bleaching, 86:65, 86:28-30
 Mantels: carved cherry, 86:128
 Maple (*Acer* spp.):
 bird's eye, planing trick for, 88:24-26
 dyeing, 90:30
 identifying, 88:70
 Oregon, virtues of, 87:6
 scratch resistance of, 87:6
 sycamore (*pseudoplatanus*), qualities of, 87:36
 Marquetry: *See* Parquetry.
 Masking tape: as copying aid, 90:12
 Measuring:
 bandsaw blades for, 91:18
 calculators for, reviewed, 91:88-90
 digital system for, reviewed, 89:106, 91:6
 penny for, 90:12
 Melamine: panel router for, 88:48-51
 Mersawa: *See* *Anisoptera*.
 Metal: repair compound for, 90:51
 Metric: vs. English, 88:6
 Micrometers: making, 89:18
 Milk paint:
 discussed, 91:62-63
 exterior, 91:62, 63
 source for, 91:64
 Mirrors:
 with inset sculpted panel, 87:128
 knockdown stand-up, making, 89:64-67
 Queen Anne, making, 88:73-77
 source for, 86:48
See also Frames.
 Miter gauges: fitting to, 89:74
 Miterers:
 odd-angle, figuring, 89:84
 with radial-arm saws, 86:14
 small precise, 86:16, 90:53
 in vertical plane, for partitions, 90:22-24
See also Spline joints.

Models:
 (ship) book on, reviewed, 86:120
 for workshop layout, 91:54-55
 Molders: curves on, 86:90
 Molding:
 book on, cited, 87:50
 cap, altering angle of, 88:18
 compound, 87:49-50
 coping, router jig for, 89:20
 cove, 87:47, 50, 51, 89:83, 84, 90:6-8
 crown, around built-in shelves, 86:42-46
 elliptical, making, 86:88-90
 reproducing, 87:50-51
 shapes of, basic, 87:48-49
 for small box, 90:53, 54, 55
 tablesawn, 89:50-51
 Mortise-and-tenon:
 chalk-fitting for, 89:41
 dial indicators with, 87:61
 machine-made, 86:77, 78-79
 raised-and-chamfered, 91:74-75
 with self-tightening wedges, 89:38, 41
 slide-bolt system for, 89:40-41
 on tablesaw, 86:78-79
 through-wedged, 89:39
 twin tenons for, loose, 91:73, 74
 Mortisers:
 horizontal shopmade, 91:74
 lathes as, 86:77-78
 Mortises:
 angled, router jig for, 88:46
 for hinges, routed, 91:91-93
 on horizontal mortiser, 91:74
 large, sawing, 89:39-40
 with router, 88:18-20, 89:66, 90:45, 47
 Motors:
 gear, for sander, 87:65
 reversing switches for, 87:26-28
 Motor tools:
 for carving, discussed, 87:82
 evaluating, by brand, 87:82-85
 for inlay, 86:62-63, 89:57, 58
 for jigsaw puzzles, 88:52
 micro-, discussed, 87:82
 router base for, 91:74
See also Carvers, power.

N

Nails:
 concealing, veneer dots for, 89:22
 waxing, 89:22
 Nightstands: curved-leg, making, 88:66-69

O

Oak (*Quercus* spp.):
 bleaching, 86:65
 red (*rubra*), scratch resistance of, 87:6
 Obeche (*Triplochiton scleroxylon*):
 as mahogany substitute, 86:28
 Oil finishes:
 and silicone, 89:30
 tung-linseed, 89:41, 51
 Ottomans: Art Deco leather lounge, 89:87
 Oxalic acid: using, 86:66-67

P

Paint:
 book on, 91:63
 cans of, clean-pouring, 91:18
 freeze protection for, 87:36-38
 for parquetry "quilt," 90:84-85
 small quantities of, mixing, 87:14
 strainer for, quick, 86:16
 supply source for, 91:63
 upside-down storage for, 87:18
See also Milk paint.
 Palosapis: *See* *Anisoptera*.
 Paneling:
 transit check for, 88:57
 with veneered fiberboard, 88:57
 Parabolas: describing, device for, 86:16
 Parquetry: in quilt patterns, making, 90:82-85
 Patterns:
 adhesive for, 89:16
 tracing, white pencils for, 86:16
 Pedestals: making, 91:80-82
 Pediments: in Queen Anne style, 87:74, 75
 Penetrating-oil finishes:
 defined, as varnish, 88:32
 problems with, 90:20
 Phenolic:
 for baseplates, grade of, 90:58
 source for, 90:79
 Photographs: archival protection for, 88:30-32
 Pianos: as bar, 90:124
 Pictures: *See* Frames.
 Pin routers:

drill press as, 88:26
 panel router as, 88:51
 Pine (*Pinus* spp.):
 drying resin in, temperature for, 91:84
 identifying, 88:71-72
 Pink ivory (*Berberia zeyheri*): uses of, 88:14
 Pinto Collection (England): mentioned, 89:104
 Planers:
 digital measuring system for, reviewed, 89:106
 replacement cutterhead for, 86:124
 taper jig for, 88:86, 87
 tearout with, reducing, 88:24-26
 portable, in show, 86:124
 portable, stands for, 86:32
 Planes:
 books on, cited, 89:69, 70
 dovetail, 90:64
 plow, making, 89:68-70
 scrub, using, 90:65
 Plans:
 books on, reviewed, 88:110, 90:114-116, 118
 system for, 89:76
 Plate joinery:
 for drawers, 88:68, 69
 on drill press, 87:22
 new, in show, 86:122
 for paneling, 88:57
 for plywood carcasses, 86:45
 safety with, 87:38
 Pleasant Hill Veneer Co.: visited, 89:42-44
 Plexiglas: gluing, 89:75
 Pliers: brad, making, 90:14-16
 Plywood:
 bending, using, 87:66-68
 cart for, reviewed, 91:130
 curved-cut, filing, 90:12
 dadoes in, centered, 89:24
 edging for, clamping, 91:16-18
 edging for, curved end-grain, 91:47, 48-49
 edging, without clamps, 88:22-24
 edging for, luan, 90:14
 for jigsaw puzzles, 88:53, 54
 lumbercore, cutting strategy for, 86:45
 source for, 87:68
 spans for, 88:30
 veneered, panel router for, 88:48-51
 Polishing compounds:
 pads for, recommended, 89:8
 and silicone contamination, 89:4
 using, 87:71
 for water-base finish, 89:55
 Polycarbonate: gluing, 89:75
 Polyester finishes: repairing, 87:72
 Polyvinyl resin glue (white):
 for carcasses, 86:84
 clean-sanding, source for, 87:69
 iron-cured, for veneer, 87:68, 69
 shelf life of, 91:26-28
 Production runs: basics for, 89:76-78
 Pulleys:
 dial-indicator checks for, 90:8
 large, on tablesaw, 87:14-16
 Pulls:
 carved, making, 90:78
 routed, 88:66, 69
 from tuning pegs, 88:22
 Purpleheart (*Peltogyne* spp.): good color in, 88:30
 Puzzles:
 book on, cited, 90:81
 finish for, 91:71
 interlocking-cubes, 91:68-71
 sliding-tile, 91:69-70

Q

Queen Anne style:
 in architecture, 87:75
 elements of, 87:73-77
 Quilts: parquetry, making, 90:82-85

R

Radial-arm saws:
 angle blocks for, 87:16
 dado blades with, 89:60, 61, 63
 dial indicators with, 87:58-61
 dust-cleaning air flow for, 91:22
 miters with, 86:14
 multiples with, jig for, 91:18-20
 strips with, ripping, 91:14
 wider cuts with, shims for, 90:12-14
See also Featherboards. Fences. Hold-ins. Hold-downs.
 Rags: bulk, source for, 86:18
 Rainforest Alliance: exotic wood certification by, 87:124
 Rasps: on plywood, 90:12
 Redwood (*Sequoia sempervirens*):

bleaching, 86:65
 ebonzing, 88:20
 Reeds with lathe-mounted router, 88:82-84
 Refinishing:
 book on, reviewed, 91:122
 cleaning for, 87:36
 debris of, disposal of, 91:122
 Reproductions: part source for, 86:22
 Respirators:
 approval numbers for, 86:4
 cartridges in, testing, 91:26
 Restoration:
 disassembly jack for, 88:24
 of rotted sections, 87:26
 varnish for, 87:26
 Rocking horses: crow, 91:124
 Rosewood (*Dalbergia* spp.):
 domestic substitute for, 86:124
 glue for, 91:47
 Rotary grinders: *See* Motor tools.
 Routers:
 angle cuts with, jig for, 88:46
 angled mortises with, jig for, 88:46
 bases for, extension all-purpose, 91:20-22
 bases for, polycarbonate, 88:49
 beads with, 86:44
 bearings of, protecting, 86:59
 bit bearings for, 87:45
 bit care for, 86:59
 bits for, 87:45
 bridle joints with, 87:46-47
 carcass pockets with, 88:68
 circle-cutting jig for, 90:59
 classes in, 87:47
 collets of, 86:56-58
 coping jig for, 89:20
 corner template for, making, 86:80-81
 dadoes with, storyboard for, 91:16
 decorative techniques with, 87:44-47, 88:80-84
 dial indicators with, 87:61
 dowel-making jigs for, 90:79-81
 duplicator for, 87:56
 ellipses with, 86:89-90, 88:44, 46, 47
 hardware mortising with, 91:91-93
 inlay groove with, 86:62
 joinery with, 87:44-47
 jointing with, 91:14-16
 lathe compass fixture for, 88:80, 81, 82
 lathe spirals with, 90:86-89
 lathe swing fixture for, 88:80, 82
 moldings with, compound, 87:50
 mortises with, 88:18-20, 89:66, 90:45
 panel, building, 88:48-51
 sculpting with, jigs for, 86:83, 85
 shaper-, in show, 86:124
 shaping with, 89:66-67
 spline joints with, 86:82-83
 subbase for, offset-knot, 87:46
 tearout prevention jig for, 87:46
 templates for, 87:45-46, 47, 89:66-67, 90:47, 58-59, 82, 92
 tongue-and-groove joints with, 87:46-47
 tuning, 86:56-59, 89:4
See also Pin routers.
 Router tables:
 bases for, 90:58-59
 fences for, 90:57, 60-61
 space-saving, 90:60-61
 shopbuilt portable, making, 90:56-61
 tops for, designing, 90:58
See also Fences.
 Roycroft Community:
 discussed, 88:90-93
 reproduction items from, 88:93

S

Safety: attitude for, 89:10, 90:122
 Salad servers: making, 88:61
 Sanders:
 belt, chamfer jig for, 91:70, 71
 belt, tuning up, 91:52-53
 drum, lathe as, 90:12
 drum, source for, 87:65
 drum, oscillating-spindle drum, 87:62-65
 measuring system for, reviewed, 89:106
 pad, reviewed, 89:104-106
 random-orbit, in show, 86:122-24
 Sanding:
 gang-, for wheels, 89:16, 91:6
 of metal inlays, 89:58
 Sandpaper:
 adhesive for, 86:14, 89:16
 auto-body soakable, 89:8
 fine, lubricants for, 87:71
 non-loading, stearates in, 89:53
 ultrafine finishing, sources for, 87:70, 72
See also Scotch Brite pads.
 Sapwood: color in, discussed, 89:24
 Saws: and aluminum particles, spray

- against, 88:18
- Scoops:
making, 91:76-79
maple-burl, 90:95
- Scotch Brite pads:
abrasiveness of, 89:4
using, with block, 87:71
- Scrapers:
file-sharpened, 91:66-67
traditionally-sharpened, 91:67
lathe, using, 91:77
- Scratch beader:
making, 89:26, 47
pre-scoring for, 89:47, 50
See also Beading.
- Screwdrivers: spiral, magnetic tips for, 87:22
- Screws:
countersinking, with gouge, 87:16
pocket-drilling jig for, making, 90:18
- Scribing: with pattern, 87:18
- Scroll saws:
blades for, 88:53-54, 90:83-84, 91:8-10
book on, cited, 88:53
gang cutting with, 90:83-84
for jigsaw puzzles, 88:52-53
- Sculpture:
carrot, 86:93
earth-mourning, 86:93
kinetic, 86:122
medicine-chest, 86:93
of men in can, 86:52
pedestals for, making, 91:80-82
model airplane, 90:128
redwood-lace-burl, 90:95
of ribbon-like loops, 89:108
tool for, in show, 86:122
tricycle, 90:122-24
from turned, rejoined pieces, 87:94-95
- Sealers:
described, 91:28
sequence for, 91:30
for water-base finish, 89:53, 54
- Semainers: making, 87:66-69
- Settees:
cherry carved-back, 89:87
English postmodern, 86:53
- Shaker:
boxes, wood for, 89:24
drawers, 90:92
furniture, books on, 91:122
- Shapers:
backing-board hold-down for, 87:88
dial indicators with, 87:60-61
flutes on, 90:78
jigs with, using, 89:65, 66
for paneled doors, 86:76-77
replacement cutterhead for, 86:124
router, in show, 86:124
tapering jig for, 87:88
template for, 89:66-67
See also Fences.
- Sharpening:
of carving tools, 90:73
diamond hone for, 86:59
of veneer-mill knives, 89:43
- Shaving horses: vertical, making, 90:12
- Shellac:
flakes of, source for, 86:30
water-base finish under, 89:54
wrinkles in, causes of, 86:30
- Shelves:
back dados for, 89:48, 50
built-in, making, 86:42-46
holes for, brass-grommetted, 86:45-46
holes for, drilling, 86:45
spans for, 88:30, 90:32
wedge-tenoned, 88:95
- Shiplap joints: making, 89:50
- Sboj#*: book on, reviewed, 87:114
- Silicone:
avoiding, in finishes, 89:4
in fish-eye eliminators, 89:53
remover for, 89:30
- Silver:
inlay with, 89:57-58
sanding, 89:58
- Skew chisels: using, 91:78
- Sleds:
Cape racer, making, 86:74-75
laminations for, of different woods, 86:22
plans for, source for, 86:75
- Sleighs: baby, 91:132
- Slides:
archival protection for, 89:6
booklet on, 86:4
storing, 86:4
- Snakewood (*Piratinera guianensis*):
cane of, 89:102-104
qualities of, 89:102-104
- Sofas:
small, building, 90:44-48
- See also* Settees.
- Spindles: turning, 87:93
- Spinet: miniature, 88:116
- Spirals:
hollow, 90:86, 89
on lathe, mechanical, 90:86-89
- Spline joints: making, 86:82-83, 84, 88:66, 69
- Splinters: removing, safety pin for, 87:20
- Splits:
from reaction wood, 87:32
from salt cure, 89:4
- Spray equipment:
high-volume low-pressure (HVLP), 90:66-69
quick cleanup for, 87:14
respirators for, 86:4
and water-base finish, 89:55
- Stains (blemishes): *See* Bleaches.
- Stains (finishes):
non-grain-raising, 87:30, 89:53-54
oil-base, and water-base finish, 89:53-54
with sealers, fillers, 91:28-30
spray-gun application of, 89:18
water-base, source for, 89:53
- Stars: five-point, drawing, 89:16-18
- Steambending:
of combs, 87:92-93
posts for, growing, 87:26
of settee back, 88:86
timing for, 86:24-26
wood for, 86:26, 89:24, 91:6
- Steel wool: and water-base finish, caveat against, 89:53
- Stereo systems: cabinets for, 88:57, 91:73
- Stock preparation:
of cupped boards, 91:30
to length, hinged stop for, 87:88
with miter-gauge jig, 88:24
for wood movement, 89:38-39
- Strainers: making, 86:16
- Stringing: for desk top, 90:78
- Surfacing:
grease removal in, ether for, 88:18
hot-glue sled for, 87:16-18
for water-based finishes, 89:53
- T**
- Tables:
aprons for, curved laminated, 86:62-63
aprons for, gate-leg, 86:64-65
bubinga hall, 91:94
Chinese side, 86:51
coffee, twin-tenoned, 91:73
with convex mirror, 89:86
"deinonychus," 86:91
elliptical veneered, making, 88:44-47
feathered, 89:102
gate-leg, making, 86:60-64
glass-topped, 89:86
glass-topped, with fish rails, 87:128
huon-pine, maple, Australian myrtle, 88:94
moradillo-ebony-glass, 86:124
multipurpose, 90:120
night, contemporary Queen Anne, 87:76, 77
oval laminated ash, 89:87
of particleboard pillars, 89:86
with rotating secretary beneath, 87:54
Shaker drop-leaf, making, 90:90-93
side "Batrille," 89:85
small dining, 86:52
top mountings for, 86:64
trestle, large, 86:53
trestle, making, 89:38-41
"trout," 91:124
twin-aproned hall, making, 91:72-75
vegetable, 86:93
See also Nightstands.
- Tablesaws:
accidents with, 87:6-8, 89:10-12
angle cuts with, boxes for, 89:66
blade guards for, making, 89:75
blades for, plastic-cutting, 91:69
box joints on, without tearout, 88:28
cart-infeed table for, reviewed, 91:130
cove molding on, 87:51, 89:83, 84
crosscut boxes for, making, 89:72-75
cross-cutting curved stock on, 88:44-46
dado blades for, adjustable wobble, 89:59, 60, 61
dado blades for, reviewed, 89:59-63
dado blades for, stacking, 89:59-60, 61-62
dado blades for, safety with, 89:60
dado-blade spacers for, from hard-drive components, 88:24
dial indicators with, 87:58-61, 90:8
digital measuring system for, reviewed, 89:106
dovetails on, 90:76
edging jig for, 88:24
- grooves with, 87:88
guards for, raised, 87:88, 89
kerf micro-adjustment for, 87:18-20
moldings on, 87:50, 51, 89:50-51, 90:6-8, 53, 54, 55
pulleys with, making, 87:14-16
puzzle pieces on, jigs for, 91:69
pyramids with, 91:69-70
rip-fences on, aligning, 86:26-28
Sears, pulley problems with, 87:30-32
small pieces on, jig for, 91:51
stock drift with, correcting, 90:20-22
taper jigs for, improving, 90:18
See also Featherboards. Fences. Hold-ins. Hold-downs. Panel routers.
- Tabletops:
attachment methods for, 88:45, 47
drop-leaf, making, 90:90-93
making, 89:39
veneered, making, 87:69, 88:47, 91:75, 77-78
- Tagua nuts: inlay with, 88:44, 47
- Tambours: for curved headboard, 91:49-50
- Tap: masking, for tearout prevention, 88:28
- Tapers:
bandsawn, 91:75
jigs for, improving, 90:18
- Teak (*Tectona grandis*): bleaching, 86:65
- Television: cabinets for, 88:57
- Templates:
for complex shapes, routed, 91:82
lathe, making, 86:69, 72
for routed square slots, 86:80-81
for routing spline mortises, 86:83
- Tenons:
angled, with router, 88:46
interlocking, 90:45-46
round, with dowel cutters, 88:68-69
on tablesaw, 89:40, 74, 90:44-45
- Thickening:
of cupped board, 91:30
with scrub plane, 90:65
- Threads: on machine lathe, 89:70
- T-nuts: using, 87:63, 64
- Tongue-and-groove joints: with jointer, 87:46-47
- Tool chests:
making, 90:62-65
rare 19th-Cent., 88:4
restoring, 87:26
- Tools:
ball bearings in, 90:49-51
cleaning, with compressed air, 91:10
cords of, holders for, 88:50, 90:14
epoxy repairs to, 90:51
magnetic holders for, making, 89:83, 84
small, magnet holding of, 91:20
- Towers: child's, 89:102
- Toys:
book on, reviewed, 88:110
wheels for, sanding, 89:16, 91:6
See also Puzzles.
- Trammels: for measuring tapes, making, 88:20-22
- Trees: moral issue surrounding, 87:4, 88:6-8
- Tricycles: rocket-powered, 90:122-24
- Trim:
rosette, 86:42-46
stile, 86:42-46
valance, 86:42-46
See also Crown molding.
- Tulip poplar (*Liriodendron tulipifera*): in praise of, 88:10-12
- Tung oil: and linseed, 89:41, 51
- Turning:
book on, reviewed, 87:118, 88:112
compression mounts for, 86:49
decorative, books on, 88:80
gauges for, wrenches as, 87:93
gouges for, 90:4
hats of, 91:126
hollowing in, sequence for, 91:77
ornamental, center for, 87:126
for rejoined forms, 87:94-95
of scoops, 91:76-79
show of, 1991, 91:126
of spirals, router jig for, 90:86-89
symposium on, 1990, 87:124
See also Lathe chucks.
- Turning tools: for miniatures, 89:80
- Turquoise: inlay with, 89:57-58
- V**
- Vanities: mauve maple, 90:120
- Varnish:
cans of, clean-pouring, 91:18
defined, 88:32
gel, source for, 87:56
- natural resin, for restorations, 87:26
respirators for, 86:4
and silicone, 89:30
spar, drying problems with, 87:26
strainer for, quick, 86:16
- Vases: turquoise, silver, inlaid, 89:56
- Veneer:
over bending plywood, 87:68-69
bending, with tea kettle, 90:52-53
clamping, rigid-foam aid for, 86:18
over curved headboard, 91:49-50
for desk top, 90:77-78
figures in, illustrated, 89:44-45
with hydraulic press, jig for, 88:60
with iron-cured PVA glue, 87:68, 69
milling, process of, 89:42-44
for mirror frame, 88:73-75
slippage with, preventing, 91:14
for tabletop, 88:47
vacuum-bag, 87:32, 38
- Vessels:
carob-burl, 91:126
with lathe-and-router-formed inlay, 91:126
mahogany-maple-oak, 90:120
turned, carved, painted, 88:95
- Vises:
bench, from hand screws, 88:18
dog for, making, 91:14
as router-table support, 90:61
support leg for, 87:14
tapers in, ball aid for, 86:14
- Volatile organic compounds (VOC):
legislation on, 89:52-53
- W**
- Wall hangings: parquetry, making, 90:82-85
- Walnut, black (*Juglans nigra*):
compounds in, safety of, 90:28-30
growing, for bending, 87:26
identifying, 88:72
- Walnut, claro (*Juglans regia* and *bindsif*):
reaction-wood problems with, 87:32
salt-cured, 89:4
- Water-base finishes:
discussed, 89:53-55
cream defoamer for, 89:54-55
extenders for, 89:55
legal basis for, 89:52-53
- Waxes:
and silicone contamination, 89:4
on water-base finish, 89:55
- Webbing: source for, 90:48
- Windsor chairs:
assembly for, 88:88-89
backs for, 88:86, 87
boring jigs for, 88:85, 86, 88, 89
bow holes for, drilling, 88:86, 88
finish for, clear, 88:89
settee, making, 88:85-89
tandem child's rocking, making, 87:90-93
turnings for, 88:87, 88, 89
- Wine closet: hidden, building, 88:56-50
- Wiring: for cabinets, 88:60
- Women:
tool strategies for, 88:10
as woodworkers, issue of, 87:8-10
- Wood:
books on, cited, 88:28, 89:102
casehardening of, explained, 91:85
exotic, certification program for, 87:124
exotic, sources for, 89:102, 104
identifying, 88:70-72
identifying, books on, 88:72, 91:128-30
machining, book on, 87:6
manufactured, and archival damage, 88:30-32
moisture in, measuring, 91:85
samples of, in egg form, 88:116
spans for, 88:30
stresses on, book about, 87:34
toxic, reactions to, 91:26
See also Kilns. Lumber. Sapwood. Stock preparation.
- Woodworkers Alliance for Rainforest Protection (WARP): conference of, 87:122-24
- Wooton patent desks:
building, 87:54-57
styles of, 87:52-55
- Workbenches: easy, building, 91:60-61
- Workshops:
book on, reviewed, 86:120, 87:116-18
clamp storage for, 91:14
examples of, 91:55-59
floor plans for, 91:55-56
organizing, 89:76-77
rags for, source for, 86:18
space-saving hints for, 90:60-61
travails of, 86:124-26
See also Safety.
- Writing box: Krenovian, 91:95

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 ½-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

PHAT

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

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.

ARIZONA: Classes—Carving Two Flat-plane Figures with Harley Refsal, Jan. 10–12; Carving a Standing Black Bear with Desiree Hajny, Feb. 13–15; Carving a Peccary (Arizona pig) with Desiree Hajny, Feb. 17–19; Carving a Cowboy-type Figure with Harold Enlow, Mar. 5–7; Carving a Hillbilly-type Figure with Harold Enlow, Mar. 9–11. Dave Rushlo Wood Carvers Supply, 2530 N. 80th Pl., Scottsdale. For more information, contact Dave Rushlo: (602) 994-1233.

Juried show—Desert Festival '92 Woodcarving Show, Feb. 7–9. Phoenix Civic Center, Phoenix room. For more information, contact Claude Michaelson, Show Chairman, Grand Canyon State Woodcarvers, Inc., PO Box 6169, Carefree, 85377-6169. (602) 488-0318.

Show—Frozen Illusions by Tom Eckert, Jan. 1–31. Joanne Rapp Gallery/The Hand and the Spirit, 4222 N. Marshall Way, Scottsdale. For more information, contact Louise Roman: (602) 949-1262.

CALIFORNIA: Exhibition—Many Mansions, Jan. 4–Feb. 22. Structures as artistic statements. San Francisco Craft & Folk Museum, Landmark Bldg. A, Fort Mason, San Francisco. For more information, contact Mary Ann McNicholas: (415) 775-0990.

Juried shows—Contemporary Crafts Market, Mar. 20–22, Fort Mason Center, Herbst and Festival Pavilions, Marina Blvd. at Buchanan St., San Francisco. For information, contact Roy Helms & Associates, 777 Kapiolani Blvd., Suite 2820, Honolulu, HI 96813. (808) 422-7362.

Show—A Trio of Woodworkers, thru Dec. 31. Boxes by Lauren Yonan, Turnings by Vishnu and Marquetry by Dave Peck. Mendocino Gallery, 13500 S. Highway 101, Hopland, 95449. (707) 744-1300.

Juried exhibition—California Design '92, Jan. 16–Feb. 16. Furniture and the decorative arts. Contract Design Center Gallery, San Francisco. For info, contact California Design, Baulines Crafts Guild, Schoonmaker Point, Sausalito, 94965. (415) 331-8520.

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 Mayo Co., 6067 Wilshire Blvd., Los Angeles, 90036. (213) 934-7239.

Juried Exhibition—Tables of Stone and Wood, new works by Paul Schurch, thru Jan. 4. Vencer marquetry combined with Pietra Dure (stone inlay). Morrey's Antique Gallery, 1225 Coast Village Rd., Montecito, 93108. (805) 969-4464.

Exhibition—Handmade for the Table at the Folk Tree Collection, thru Jan. 5. 1992. Fair Oaks Ave., Pasadena, 91105. (818) 793-4828.

Workshops—Various workshops including Japanese woodworking, joinery and sharpening. Contact Hida Tool Co., 1333 San Pablo, Berkeley, 94702. (415) 524-3700.

Exhibition—International Lathe-Turned Objects Challenge IV, Feb. 1 thru Apr. 12. Craft & Folk Art Museum, Los Angeles. Contact Wood Turning Center, PO Box 25706, Philadelphia, PA 19144. (215) 844-2188.

COLORADO: Residency program—Anderson Ranch Arts Center's Studio Residency Program, thru May 15. Offers interactive environment for furnituremakers and designers. For information, contact Anderson Ranch, PO Box 5598, Snowmass Village, 81615. (303) 923-3181.

Workshops—One- and two-week woodworking and furniture design workshops, summer. Scholarship application deadline March 13, 1992. For free catalog, contact Anderson Ranch Arts Center, Box 5598, Snowmass Village, 81615 (303) 923-3181.

Classes—Woodworking and related classes, year-round. Red Rocks Community College, 13300 W. 6th Ave., Lakewood, 80401. (303) 988-6160.

Show—7th Annual American Craftsmen's Custom Woodworking Show, Vale Public Library, Vale, Feb. 1–15. For more information call Tim O'Brien at (303) 328-7253 (after 6:00 PM).

Classes—Woodcraft classes, various topics. For info contact Woodcraft, Tamarac Terrace, 4403 South Tamarac Parkway, Denver, 80237 or call (303) 290-0007.

CONNECTICUT: Juried show—13th Annual Holiday Festival of Crafts, thru Dec. 24. Free admission. Guilford Handcrafts Center, Rte. 77, Guilford. For further information, call (203) 453-5947.

Juried exhibition—23rd annual Celebration of American Crafts, thru Dec. 23. The Celebration, Creative Arts Workshop, 80 Audubon St., New Haven, 06510. (203) 562-4927.

Exhibit—Fine Art Furniture by Thomas Stender, thru Jan. 6. South Norwalk Gallery, Brookfield Craft Center, South Norwalk. For info, call (203) 853-6155.

Juried Exhibition—Fifth Annual Fine Art Exhibition, Jan. 15 thru Feb. 4. For prospectus send SASE to Multimedia 1992, Guilford Handcrafts, Inc., P.O. Box 589, Guilford, 06437. (203) 453-5947.

Workshops—18th Century Carving Techniques, Jan. 11–12; Basic Furniture Construction, Antique Finishes, Jan. 18–19; Japanese Tool Sharpening Techniques, Desk Accessories, Jan. 25–26; Woodworking, Feb. 1–2. Brookfield Craft Center, Brookfield and Norwalk. For information, call (203) 775-4526 or (203) 853-6155.

DISTRICT OF COLUMBIA:

Fellowship program—Fifth annual fellowship program in crafts at the Renwick Gallery. Application deadline Jan. 15, with appointments to begin on or after June 1. For more info and application write Fellowship Program, Renwick Gallery, National Museum of American Art, Smithsonian Institution, Washington, D.C. 20560. (202) 357-2531.

Courses—Exhibition, Storage and handling of furniture, Feb. 10–13. For further info contact Training Secretary, CAL/MS, Smithsonian Institution, Washington, DC 20560. (301) 238-3700.

Show—Woodworking World Shows, Feb. 14–16. DC Armory, 2001 East Capital St., Washington, DC 20003. For more info contact the Woodworking World Show information line at (800) 521-7623 or call (603) 536-3768.

FLORIDA: Meeting—Central Florida Woodworkers Guild, second Thursday of every month, Winter Park. For information, contact Ed Harte: (407) 862-3338.

Show—South Florida Woodworking Show, Mar. 13–15. War Memorial Auditorium, 800 N.E. 8th Street, Fort Lauderdale, 33304. For info call (800) 826-8257.

Show—Central Florida Woodworking Show, Mar. 6–8. Florida State Fairgrounds, Special Events Center, 4800 U.S. Hwy. 301 North, Tampa, 33610. For information call (800) 826-8257.

Juried exhibition—The Turners Dance, Jan. 10 thru Feb. 29. Florida Craftsmen Gallery, 235 Third Street South, St. Petersburg, 33701.

Show—Florida State Fair Fine Handcrafted Furniture Show and Exhibit, Feb. 5–16. Contact Lynn Keiter, 4538 W. Kennedy Blvd., Tampa, 33609. (813) 877-9585.

Juried festival—29th annual Coconut Grove Arts Festival, Feb. 15–17. Contact Coconut Grove Arts Festival, Box 330757, Coconut Grove 33233-0757. (305) 447-0401.

Demonstration—Polk County Woodcarvers. Florida Citrus Festival, Jan. 30 thru Feb. 9, Winter Haven. For more information, call Florida Citrus Showcase (813) 293-3175.

GEORGIA: Competition—Call for entries. Design Emphasis '92 furniture design competition. 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.

ILLINOIS: Exhibition—The Art of the Fish Decoy, Feb. 10 thru Apr. 6. John G. Shedd Aquarium, Chicago. For info, contact Susan Flamm: (212) 977-7170.

Show—Woodworking World Show, Feb. 29 thru Mar. 2. Illinois State Fairgrounds, Eighth St. and Sangamon Ave., Springfield, 62702. For more info contact the Woodworking World Show information line at (800) 521-7623 or call (603) 536-3768.

Show—The St. Louis Woodworking Show, Feb. 7–9. Gateway Center, Center Hall, One Gateway Drive, Collinsville, 62234. For info call (800) 826-8257.

INDIANA: Exhibition—The Art of the Fish Decoy, thru Jan. 20. National Art Museum of Sport, Indianapolis. For info, contact Susan Flamm: (212) 977-7170.

Show—The Indianapolis Woodworking Show, Feb. 21–23. Indiana Convention Center, Hall 4, 100 S. Capitol Ave., Indianapolis, 46225. For info call (800) 826-8257.

Classes—Various woodworking-related classes and workshops include general woodworking, lathe, and router seminars. Contact Woodworking Unlimited, 6038 E. 82nd St., Indianapolis, 46250. For current schedule call (317) 849-0193.

Show—Mid-American Lumbermen's Show, Feb. 14–15, Indianapolis Convention Center, Indianapolis. For info contact Trade Shows, Inc., P.O. Box 796, Conover, NC 28613. (704) 459-9894.

IOWA: Juried fair—22nd annual Art in the Park, May 16–17. Four Square Park, Main Ave., Clinton. Fine arts & fine crafts only, \$5 jury fee. Closing date Mar. 15. SASE Clinton Art Association, Box 132, Clinton, 52733 or call Carol Glahn (319) 259-8308.

KANSAS: Show—The Kansas City Woodworking Show, Feb. 14–16. Merchandise Mart, Hall A, 6800 W. 115th Street, Overland Park, 66211. For more information, call (800) 826-8257.

KENTUCKY: Workshops—Woodturning and joinery instruction. Contact Jim Hall, Adventure in Woods, 415 Center St., Berea, 40403. (606) 986-8083.

Meeting—Kyana Woodcrafters Inc., first Thursday of each month. Bethel United Church of Christ, 4004 Shelbyville Rd., Louisville, 40207. (502) 426-2991.

LOUISIANA: Juried competition—Lafayette Art Association Annual National Juried Competition of Original Two and Three Dimensional Art, Mar. 3 thru Apr. 7. Fee: \$25 for 3 entries, \$8 for 2 additional, limit 5 entries. Slides due: Jan. 10. For prospectus send #10 SASE to: J.K. Sommer, Lafayette Art Gallery, 700 Lee Ave., Lafayette, 70501.

MAINE: 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: Exhibition—The Art and Fantasy of the American Carousel, thru Jan. 12. Carved antique figures from 1880-1930. The Historical Society of Talbot County, 25 S. Washington St., Easton, 21601. (301) 822-0773.

Fair—The Winter Market of American Crafts, American Craft Council Craft Fair. Open to the trade Feb. 18–20, to the public Feb. 21–23. Baltimore Convention Center, Baltimore. For fair information, contact American Craft Enterprises (800) 836-3470.

Show—17th annual Spring Arts & Crafts Fair, Apr. 10–12. Montgomery County Fairgrounds, Gaithersburg, 20878. May 1–3, Maryland State Fairgrounds. Jurying begins Jan. 13. For detailed information and applications send 3 loose stamps for postage (NO SASE, please) to: Deann Verdier, Director, Sugarloaf Mountain Works, Inc., 200 Orchard Ridge Dr., Suite 215, Gaithersburg, 20878. (301) 990-1400.

Show—15th annual Spring Arts & Crafts Fair, May 1–3, Maryland State Fairgrounds, Timonium. Jurying begins Jan. 13. For detailed information and applications send 3 loose stamps for postage (NO SASE, please) to: Deann Verdier, Director, Sugarloaf Mountain Works, Inc., 200 Orchard Ridge Dr., Suite 215, Gaithersburg, 20878. (301) 990-1400.

MASSACHUSETTS: Classes—Woodworking classes, throughout most of the year. Boston Center for Adult Education, 5 Commonwealth Ave., Boston, 02116. (617) 267-4430.

Juried exhibition—Selected works by members of the Central New England Woodturners Assoc., thru Jan. 11. Worcester Center for Crafts, 25 Sagamore Rd., Worcester, 01605. (508) 753-8183.

Workshop—13th annual Wood Identification Workshop, R. Bruce Hoadley, Jan. 14–17. Univ. of Mass. at Amherst, Wood Technology Lab, Room 105, Holdsworth Natural Resources Center. For info, contact Alice E. Szlosek or Trudie Goodchild, Div. of Continuing Education, Goodell Bldg, Univ. of Mass., Amherst, 01003. (413) 545-2484.

Exhibition—Let Us Entertain You: Crafts for Special Occasions, thru Jan. 25. The Society of Arts and Crafts, 175 Newbury St., Boston, 02116 (617) 266-1810.

Classes—Turning Miniatures with Mark Salwasser. Jan. 18. Woodcraft, 313 Montvale Ave., Woburn, 01801. (617) 935-5860.

MICHIGAN: Show—3rd annual Grand Rapids Woodworking Show, Feb. 7–9. Grand Rapids Jr. College Fieldhouse, 111 Lyon NE, Grand Rapids, 49053. For info call (800) 826-8257.

Classes—Various woodworking classes available. Contact Woodcraft, Heritage Plaza, 14695 Telegraph Rd., Redford, 48239. (313) 537-9377.

MINNESOTA: Show—The Twin Cities Woodworking World show, Jan. 17–19. Minneapolis Convention Center, 1301 S. 2nd Ave., Minneapolis. For info, contact Woodworking Association of North America: (800) 521-7623, (603) 536-3768.

Classes—Various woodworking classes available. Contact Woodcraft, Plaza at Oxboro, 9741 Lyndale Ave. South, Bloomington, 55420. (612) 884-3634.

MISSOURI: Classes—Various woodworking classes available. Contact Woodcraft, Dierberg's Heritage Place, 12511 Olive Boulevard, Creve Coeur, 63141.

NEW HAMPSHIRE: Classes—Classes in 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.

Demonstration—Guild of N.H. Woodworkers and demonstration by Bill Thomas. Jan. 18. Hillsboro. For info contact John Skewis; 132 Drinkwater Rd., Kensington 03833. (603) 778-7360.

NEW JERSEY: Show—The North Jersey Woodworking Show, Feb. 28 thru Mar. 1. Westfield Armory, 500 Rahway Ave., Westfield, 07090. For info call (800) 826-8257.

NEW MEXICO: Classes—Woodworking classes. Northern New Mexico Community College, El Rito, 87520. (505) 581-4501.

SQUARE DRIVE SCREWS

Simply the Best!

- Square Drive Beats Driver Slippage
- Hardened Steel for Extra Strength
- Deep Thread for Super Grip
- Also Brass & Stainless Steel

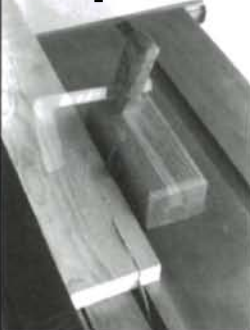
Send \$3 for Samples and Catalog

McFEELY
HARDWOODS

P.O. Box 3 • Dept FW92
Lynchburg • VA • 24505
Toll Free 1-800-443-7937
or FAX (804) 847-7136

READER SERVICE NO. 82

Grip-Tite™ magnetic featherboard



3 second, one-handed setup
No clamping!

Lexan® springs push wood down and against the fence.

It holds anything from kite sticks to 2x6's.

Use it on tablesaws, jointers, shapers.

\$29.95 + S/H

Satisfaction Guaranteed
30 day full refund

Mesa Vista Design • 804 Tulip Road
Rio Rancho, NM 87124 505-892-0293

READER SERVICE NO. 69

VISIT THE SHOW NEAR YOU!

- Free Workshops • Prizes •
- Hundreds of Products •
- Seminars by Mastercraftsmen •

★*The*
Woodworking Shows★
machinery
tools • supplies

See the Widest Variety of
Woodworking Products
All Under One Roof!!

HUNDREDS OF ITEMS! NEW PRODUCTS!!
Machinery • Power & Hand Tools • Supplies

COMING IN 1992

- Atlanta
- Baltimore
- Charlotte
- Chicago
- Columbus
- Denver
- Detroit
- Ft. Lauderdale
- Indianapolis
- Kansas City
- Milwaukee
- No. Jersey
- No. California
- Philadelphia
- Phoenix
- Portland
- Richmond
- Sacramento
- San Bernardino
- Seattle
- So. California
- St. Louis
- Tampa
- Twin Cities

• Ventura

1-800-826-8257 or 213-477-8521

Call NOW to be placed on mailing list for
FREE Brochure & Discount Coupons
Phone Hours 8-5 Pacific Time Weekends

READER SERVICE NO. 43

NEW

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. Let us prove it to you.

PLEASE SEND ME A FREE BROCHURE
Excalibur Machine Corp.
P.O. Box 82
Anderson, MO 64831
Telephone orders: 1-800-368-ROSS

ROSS

READER SERVICE NO. 84

YOU CAN WORK WITH ACRYLICS

New! "Working With Acrylic Plastic: Getting Started" 28-minute video

Step-by-step acrylic fabricating techniques demonstrated by master craftsman Reu Richards takes the mystery away. Sawing, bubble-free cementing, edge finishing and more. Use your existing tools to incorporate wood and acrylic for great look and function. A must for every woodworker's library.

Video, VHS, only **\$39.95**
Plus \$3 shipping & handling

1-800-395-0963

(8:30-5:00 CST)

FAX (915) 687-0392

1107 Pueblo

Midland, TX 79705

ACRYLIC IMAGE
CONCEPTS, INC.



READER SERVICE NO. 38

NEW

Incra Jig PRO

U.S. PATENT #4,793,604

From the makers
of INCRA JIG

The new INCRA JIG PRO, the latest innovation from Taylor Design, uses the same rack positioning technique that gives INCRA JIG its phenomenal accuracy. And, just like the original INCRA JIG, INCRA JIG PRO can be used to produce flawless joinery as well as other intricate work on virtually any stationary woodworking machine in your shop.

What's different is the design.

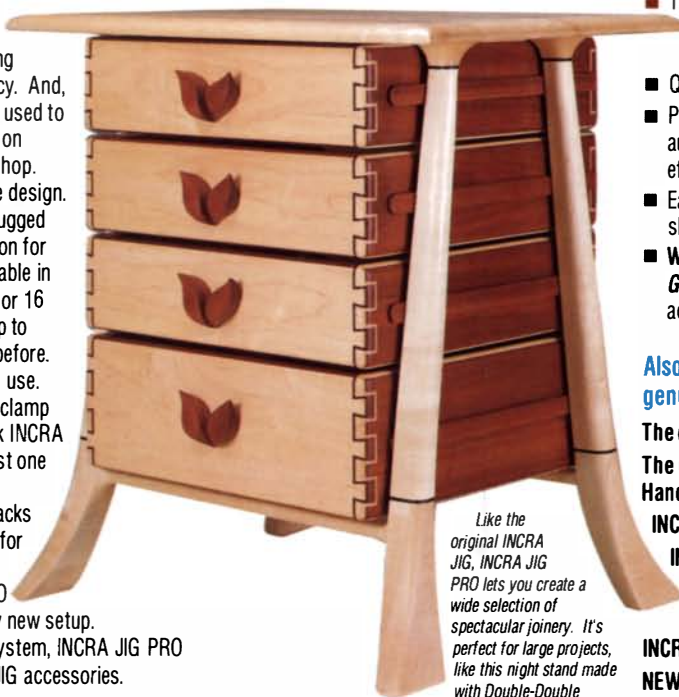
INCRA JIG PRO features rugged solid aluminum construction for absolute rigidity. It's available in two models with either 12 or 16 inches of range. That's up to **TWICE** as much range as before. And it's easier than ever to use.

The new quick action cam clamp allows you to instantly lock INCRA JIG PRO into place with just one hand. When the clamp is released, the positioning racks automatically spring apart for

effortless sliding action. The easy to read top mounted sliding scale allows you to quickly move INCRA JIG PRO to any setting. And there's no need to buy a completely new setup. From the templates, to the video, to the INCRA Fence System, INCRA JIG PRO is entirely compatible with **ALL** of your current INCRA JIG accessories.

For a **FREE INCRA BROCHURE** and the name of your nearest dealer, write:
Taylor Design Group, Inc. P.O. Box 810262 Dallas, TX 75381

Original nightstand designed and built by Perry McDaniel.



Like the original INCRA JIG, INCRA JIG PRO lets you create a wide selection of spectacular joinery. It's perfect for large projects, like this night stand made with Double-Double Through Dovetails.

INCRA JIG PRO Features:

- Solid aluminum construction.
- 12" or 16" range - up to **TWICE** as much as before.
- Quick action cam clamp.
- Positioning racks automatically disengage for effortless sliding action.
- Easy to read top mounted sliding scale.
- Works with all current **GENUINE** INCRA JIG accessories.

Also look for these other genuine **INCRA TOOLS**:

The original **INCRA JIG**

The Official **INCRA JIG Handbook & Templates**

INCRA Fence System

INCRA Right Angle Fixture

INCRA GAUGE

NEW! The Complete

INCRA JIG VIDEO

NEW! INCRA MITER SLIDER

NEW! INCRA HINGE PLANS

©1991, Taylor Design Group, Inc. INCRA is a registered trademark of Taylor Design Group, Inc.

READER SERVICE NO. 106

Show—Woodworking World Shows, The Albuquerque Show. New Mexico State Fairgrounds, School Art/Flower Building, Albuquerque, 87198. For info contact Woodworking World Show information line at 1 (800) 521-7623 or call (603) 536-3768.

NEW YORK: Exhibits—Ed Zucca, Michelle Holzappel and gallery artists, thru Jan. 4; Thomas Hucker, Jan. 9–Feb. 1; Albert Paley, Feb. 6–Mar. 15; Timothy Philbrick, Jonathan Bonner, Mar. 15–Apr. 15. Peter Joseph Gallery, 745 5th Avenue, New York City, 10151. (212) 751-5500.

Classes—Contemporary Woodworking I, Doug Redmond, 15 sessions beginning Feb. 4. Contact Ken Coleman, Director, Craft Students League, YWCA of the City of New York, 610 Lexington Ave., New York, 10022. (212) 735-9731.

Exhibition—Swiss Folk Art: Celebrating America's Roots, thru Jan. 1. For more info, contact Museum of American Folk Art, Two Lincoln Sq., New York City, 10023-6214. (212) 595-9533.

Classes—Dovetailing a Shaker Blanket Chest; Building a Shaker Rocker, Eric Ekum. Begin Jan. 14. For more info contact Eric Ekum, 117 Beechview Ave., Jamestown, 14701. (716) 665-5344.

Festival—New York International Gift Fair®, Feb. 22–26. Juried. For info and applications, contact Lynn White Show Manager, George Little Management, Inc., 2 Park Ave., Suite 1100, New York, N.Y. 10016-5748. (212) 686-6070, ext. 249.

Exhibit—The Art of the Keyboard: Rediscovering Pianos and Organs, thru Jan. 15. New York State Museum, Albany. For more information, contact University of the State of New York, State Education Dept., Albany, 12234. (518) 474-1201.

Classes—Various beginning and advanced woodworking classes. Constantine, 2050 Eastchester Rd., Bronx, 10461. (212) 792-1600.

Festival—16th Annual American Crafts Festival, July 4, 5 and July 11, 12. Lincoln Center, New York. Juried. Application deadline Jan. 25. Send SASE to Brenda Brigham, American Concern for Artistry & Craftsmanship, P.O. Box 650, Montclair, NJ 07042. (201) 746-0091.

Meetings—New York Woodturners Association, first Tuesday of each month. Woodturning techniques exhibits, more. The Craft Student League, YWCA, 610 Lexington Ave., New York City.

Festival—8th Annual Autumn Crafts Festival at Lincoln Center, Fordham Univ. Plaza, New York. Juried. Aug. 29, 30 and Sept. 5–7. Application deadline Jan. 25. Send SASE to Brenda Brigham, American Concern for Artistry and Craftsmanship, P.O. Box 650, Montclair, NJ. 07042. (201) 746-0091.

Show—Woodstock-New Paltz Arts & Crafts Fair, Spring Show, May 23–25, Ulster County Fairgrounds. Juried. Application deadline Feb. 1; Fall show, Sept. 5–7, application deadline Feb. 1; Capital Arts & Crafts Marketplace, Knickerbocker Arena, Albany, Dec. 4–6, Application deadline Feb. 1. For info contact Quail Hollow Events, P.O. Box 825, Woodstock, 12498. (914) 679-8087 or (914) 246-3414.

NORTH CAROLINA: Workshops and programs—Eddie Howard Wood, thru Dec. 31; Christmas with the Guild, thru Dec. 31. For info, contact Southern Highland Handicraft Guild, PO Box 9545, Asheville, 28815.

Video course—Wood Technology, six-lesson correspondence course on the wood industry. For info, contact Vann Moore, Dept. of Wood & Paper Science, North Carolina State University, PO Box 8005, Raleigh, 27695-8005. (919) 737-3181.

Workshops—Woodworking and woodcarving workshops, year-round. Including woodcarving, more. Contact John Campbell Folk School, Rte. 1, Box 14A, Brasstown, 28902. (800) 562-2440, (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.

Show—The Charlotte Woodworking Show, Jan. 24–26. Charlotte Convention Center, Hall A, 101 S. College St., Charlotte, 28202. For info call (800) 826-8257.

Course—A Development Program for Managers in the Wood Industry, Jan. 20–24. North Carolina State University. For more information, contact Ms. Vann Moore, Department of Wood & Paper Science, North Carolina State University, Box 8005, Raleigh, 27695-8005. (919) 515-3181.

Conference—5th Annual Grove Park Inn Arts & Crafts, Feb. 21–23, Asheville. For info contact Bruce Johnson, P.O. Box 8773, Asheville, 28814. (704) 254-1912.

Show—High Point Woodworking & Furniture Supply Show, Mar. 6–7, Market Square Tradeshow Center, High Point. For info contact Trade Shows, Inc., P.O. Box 796, Conover, 28613. (704) 459-9894.

Exhibition—Showcase of Woodcarvings, Feb. 22–23, Charlotte. Juried. For info contact Bonita Heffner, Charlotte Parks and Recreation Department, 1418 Army Drive, Charlotte, 28204. (704) 336-2584.

Show—Winterfest Art & Craft Show, Feb. 13–16, Asheville Mall. Contact Gail Gomez, High Country Crafters, 46 Haywood St., Asheville, 28801. (704) 254-7547.

Exhibition—Splendors of the New World: Spanish Colonial Masterworks, Feb. 1–Apr. 26. The Mint Museum of Art, 2730 Randolph Rd., Charlotte, 28207. For info call

(704) 337-2000.

Workshops—Swiss cooperage, Jan. 6–10; ladderback chairmaking, Jan. 20–24, Mar. 2–6; Windsor chairmaking, Feb. 3–7, Mar. 16–20; advanced Windsor chairmaking, Feb. 17–24. Drew Langsner, instructor. For info, contact Country workshops, 90 Mill Creek Rd., Marshall, 28753. (704) 656-2280.

NORTH DAKOTA: Show—The Bismark Woodworking World Show, Jan. 24–26. Bismark Civic Center, Sixth & Sweet Ave., Bismark, 58502. For info call (800) 521-7623.

OHIO: Workshops—Doors, Drawers and Panels, Jan. 4; Chests and Cabinets, Feb. 1; Finishes, Mar. 7. Instructor: Earl Richards. Carriage Hill Farm, 7860 Shull Rd., Dayton, 45424. (513) 879-0461.

Exhibition—Awards in the Visual Arts 10, thru Jan. 26. Toledo Museum of Art. Call (202) 357-2700.

Show—The Columbus Woodworking World Show, Jan. 10–12. Veteran's Memorial Hall, 300 W. Broad St., Columbus, 43215. For info, contact Woodworking Association of North America: (800) 521-7623, (603) 536-3768.

Classes—Traditional Furniture Building, Jan. 25; Cabinetry structures and the use of plywood in cabinetmaking, Feb. 22. The Hardwood Store, 1813 Dalton Dr., New Carlisle, 45344. (513) 849-9174.

Show—The Columbus Woodworking World Show, Jan. 10–12. Veteran's Memorial Hall, 300 West Broad St., Columbus, 43215. For info call (800) 521-7623.

Convention—111th annual convention and Our Town '92 Lumber and Building Products trade show, Feb. 25–27, Ohio Lumbermen's Association. Holiday Inn Crowne Plaza and Columbus Convention Center, Columbus. For info contact OLA (614) 267-7816.

OKLAHOMA: Show—Oklahoma City Woodworking World Show, Jan. 31–Feb. 2. Oklahoma State Fairgrounds, 500 Land Rush St., Oklahoma City, 73147. For info call (800) 521-7623.

OREGON: Meetings—Guild of Oregon Woodworkers, third Friday of every month. For location, contact the Guild at PO Box 1866, Portland, 97207. (503) 293-5711. **Show**—Woodturning II lathed turned vessels, Mar. 14–Apr. 26. Made in Jefferson Gallery, 3259 Jefferson Scio Dr. S.E., Jefferson, 97352. (503) 327-2543.

Seminars—Furniture Design, Feb. 9 & 16; Introduction to Bowl Turning, Mar. 1; Sculptural Marquetry, Mar. 8. Contact Oregon School of Arts and Crafts, 8245 SW Barnes Rd., Portland, 97225. (503) 297-5544.

Show—Traditional African Crafts, Hoffman Gallery, Feb. 6–Mar. 1. Portland. Contact Oregon School of Arts and Crafts, 8245 SW Barnes Rd., Portland, 97225. (503) 297-5544.

PENNSYLVANIA: Juried exhibitions—Re-Awakening: A Celebration of Spring, May 2–June 7; de-Adeline: Jan. 27. Also, Stories: The Narrative Art in Contemporary Crafts, Aug. 8–Sept. 20; de-Adeline: Mar. 2. For more information, contact Luckenbach Mill Gallery, 459 Old York Rd., Bethlehem, 18018. (215) 691-0603.

Classes—Windsor chairmaking, all levels, weekly and weekends. For more information, contact Jim Rendi, Philadelphia Windsor Chair Shop, PO Box 67, Earlville, 19519. (215) 689-4717.

Exhibition—Philadelphia Buyers Market, Philadelphia Civic Center, Feb. 21–24. For more info call (800) 43-CRAFT, ext. 214 or 216.

Festival—Central Penn. Festival of the Arts, July 9–12. Juried. Application deadline early March. Call for application Katherine Talcott, Assistant Director, Central PA Festival of the Arts, P.O. Box 1023, State College, 16804. (814) 237-3682.

Seminar—Wood Technology with Dr. Bruce Hoadley. Feb. 20–Mar. 1. Olde Mill Cabinet shoppe, 1660 Camp Betty Washington Rd., York, 17402. (717) 755-8884.

Shows—Market Square Traditional Wholesale Shows. Feb. 8–10, Valley Forge Convention Center, King of Prussia.

Market—20th annual Lancaster designer spring art and craft market, June 6–7. Application deadline Feb. 29. Juried. For application send SASE to Lancaster Designer Craftsmen, P.O. Box 552, Lancaster, 17603. For more info call Pegge Shannon (717) 291-1173 or Lancaster Designer Craftsmen (717) 295-1500.

Competition and show—16th annual Mid-Atlantic Woodcarving Show and Competition, Apr. 4–5. Penn State Abington campus gymnasium, Woodland Rd., Abington. For info call Al Ritter, Show Chairman (215) 757-2152.

Show—Greater Philadelphia Woodworking Show, Jan. 17–19. Sun Center Complex, Auditorium, 63 Concord Rd., Feltonville, 19013. For info call (800) 826-8257.

SOUTH CAROLINA: Show—The Columbia Woodworking World Show, Feb. 21–23. Columbia State Fairgrounds, Hampton Building, Columbia, 29202. For info call (800) 521-7623.

TEXAS: Competition and exhibition—2nd annual Furniture of the '90s, Aug. 28–Oct. 31. National, juried, art furniture competition co-sponsored by American Society of Furniture Artists (ASOFA) and ASOFA Institute. Entry deadline: May 2. For prospectus, send a SASE to ASOFA, Furniture of the '90s, PO Box 270188, Houston, 77277-0188. For more info, contact Adam St. John,

executive director, at (713) 660-8855.

Show—The San Antonio Woodworking World Show, Mar. 20–22. Villita Assembly Building, Navarro at Villita, San Antonio, 78296. For info call (800) 521-7623.

Show—6th annual Rio Grande Valley Woodcarvers Inc. show and sale, Jan. 26–27. McAllen Civic Center. For info contact Dorothy Caldwell, PO Box 3824, McAllen, 78502. (512) 631-0422.

VIRGINIA: Show—5th annual Norfolk Woodworking World show, Jan. 3–5, Norfolk Scope, corner of St. Paul and Brambleton, Norfolk. For more information, call Woodworking Association of North America at (800) 521-7623, (603) 536-3768.

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. Entry deadline: Feb. 15. For application or info, contact Spotlight '92, Hand Workshop, 1812 W. Main St., Richmond, 23220. (804) 353-0094.

Show—12th annual Virginia Crafts Festival, Sept. 11–13, Prince William County Fairgrounds. Jurying begins Jan. 13. For info and applications send three loose stamps (NO SASE) to: Deann Verdier, Director, Sugarloaf Mountain Works, Inc., 200 Orchard Ridge Drive, Suite 215, Gaithersburg, MD 20878. (301) 990-1400.

Show—The Norfolk Woodworking World Show, Jan. 3–5, Norfolk Scope, on the corner of St. Paul and Brambleton, Norfolk. For info call (800) 521-7623.

WASHINGTON: Meetings—Northwest Woodworkers Guild, last Wednesday of each month. Contact Kirk Kelsey, 744 N. 78th, Seattle, 98103. (206) 789-2142.

Show—Rocking furniture, Gilman Village Gallery, Seattle. For more information, contact Cheryl Peterson (206) 625-0542.

Call for entries—3rd Annual Goblet Show, Feb. and Mar. Write for information to Cheryl Peterson, Northwest Gallery of Fine Woodworking, 216 1st Ave. S., #240, Seattle, 98104.

Show—6th annual juried show & Sale, Kitsap County Woodcarvers Club, June 13–14. Kitsap Mall, Silverdale. For info contact Chuck Malven, 6015 Osprey Circle, Bremerton, 98312.

Workshops—Steam Bending, Jan. 25; Sailmaking, Feb. 8; Pattern making & keels, Feb. 29. Port Townsend. For more information, contact Northwest School of Wood- en Boatbuilding, 251 Otto St., Port Townsend, 98368. (206) 385-4948.

Classes—Various classes available. Contact Woodcraft, 5963 Corson Ave. South, Seattle, 98108. For more information, call (206) 767-6394.

WISCONSIN: Show—The Greater Milwaukee Woodworking Show, Jan. 31–Feb. 2. MECCA Convention Hall Arena, 500 W. Kilbourn Ave., Milwaukee, 53203. For info call (800) 826-8257.

Festival—20th annual Festival of the Arts, Apr. 12, Interior courtyard of the fine Arts Building at the University of Wisconsin-Stevens Point, Stevens Point. Juried. Application deadline, Jan. 31. For info contact Festival of the Arts, P.O. Box 872, Stevens Point, 54481.

CANADA: 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 Bob Stone, PO Box 8812, Ottawa, Ont., K1G 3J1. (613) 824-2378.

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 Rd., 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.

Workshop—with Michael Fortune, Jan. 17–19. Northern Alberta Woodcrafters Guild. Contact Douglas Lobb, 121 Healy Road, Edmonton, Alberta T6R 1W3. (403) 430-7391.

Show—Beneath the Ice: The Art of the Fish Decoy, Sept. 9–Nov. 4, Kamloops Art Gallery, Kamloops, British Columbia, Canada.

Show—Ontario Wood Show, Mar. 6–8, Lansdowne Park, Ottawa. Contact Cryderman Productions Inc., 136 Thames St., Chatham, Ontario N7L 2Y8. (519) 351-8344.

ENGLAND: Classes—Woodworking classes. Smith's Gallery, 56 Earlham St., WC2. Contact Lactitia Powell, Parnham, Beaminstor, Dorset, DT8 3NA. (0308) 862204. **Juried show**—Nottingham Woodcarving Competition, May 1–2. Entry deadline: March 13. For more info, contact Mr. R. Flint, hon. secretary, Newark & District Woodcarvers Association, (0636) 707020.

TAIWAN: Show—Taipei International Furniture show, Feb. 17–21. Taipei World Trade Center Exhibition Hall, 5 Hsinyi Road, Sec. 5, Taipei, Taiwan. (886-2) 725-111.

Fine & Creative Woodworking

A two-year program which emphasizes designing & building of fine quality custom furniture. Related areas studied in depth.

Curriculum includes:

- Furniture Construction (Contemporary & Period) • Finishing • Wood Turning • Chair Construction • Design & Drafting • Wood Forming & Bending • Business Operations • Equipment & Maintenance

Located near the furniture center of the Southeast, RCC offers affordable tuition, outstanding facilities, small classes, and experienced instructors David Kenealy and Ted Currin. A balance between the use of handtools and woodworking machinery enables students to acquire the knowledge and skills of a well-rounded craftsman. Graduates receive an Associate of Applied Science degree.

CALL (919) 342-4261



Rockingham
Community College

P.O. Box 38 • Wentworth NC 27375-0038

An Equal Opportunity/Affirmative Action College
READER SERVICE NO. 141

MITRERITE MITRERITE™ FRAME MITRE TOOLS

- Easy to use
 - Make exact complementary cuts
 - Create 4, 6, & 8 sided frames, plus circles and ovals
 - Complete instructions
- Kit contains 3 precision molded angles, each with an adjustable stop.

- 1- 45° angle tool for 4 sided frames
- 1- 30° angle tool for 6 sided frames
- 1- 22½° angle tool for 8 sided frames, circles and ovals

Bill Bartz Manufacturing Co.
854 Arbor Oaks Dr., Vacaville, CA 95687
707-451-9104 FAX 707-451-4666

DEALER INQUIRIES INVITED

READER SERVICE NO. 57



\$19.95 + 3.00 S&H

Cal. residents add \$1.45 tax

M/C - VISA

— 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



FRESH FACES NEW SEMINAR TOPICS SAVE \$\$\$!

VIRGINIA SHOW

Norfolk Scope
Norfolk, VA
Jan. 3-5, 1992

*COLUMBUS SHOW

Vets Memorial Hall
Columbus, OH
Jan. 10-12, 1992

*TWIN CITIES SHOW

Minneapolis Conv. Ctr.
Minneapolis, MN
Jan. 17-19, 1992

N. DAKOTA SHOW

Fargo Civic Auditorium
Fargo, ND
Jan. 24-26, 1992

OKLAHOMA CITY SHOW

State Fairground
Oklahoma City, OK
Jan. 31-Feb. 2, 1992

GRAND RAPIDS SHOW

Grand Rapids Jr. College
Grand Rapids, MI
Feb. 7-9, 1992

WASHINGTON, DC SHOW

DC Armory
Washington, DC
Feb. 14-16, 1992

COLUMBIA SHOW

State Fairgrounds
Columbia, SC
Feb. 21-23, 1992

SPRINGFIELD SHOW

State Fairground
Springfield, IL
Feb. 28 - Mar. 1, 1992

Coming in March: Houston,
Albuquerque, Tennessee Tri-Cities, Ft. Wayne

ARE YOU A WOODWORKING ARTISAN?

Participate in our Gallery of Peers.
Receive a free three day admission.

Show Hrs: Fri. 5-9pm • Sat. 10am-6pm
Sun. 10am-5pm

*Fri. Hours: Noon-6pm

Admission Charged • Special Intensive Seminars

Call 1-800-521-7623 or 603-536-3768
for More Information M-F

READER SERVICE NO. 7

INCRA® Precision Woodworking System

With the **INCRA Precision Woodworking System**, even the novice woodworker can produce flawless dovetails and box joints, as well as other intricate work on the router table, table saw, drill press . . . or virtually any other woodworking machine in the shop. Used as a precision incremental fence or variable stop block, **INCRA Tools** rely on patented sawtooth positioning racks to literally force themselves into perfect alignment and lock positively in place. Projects that would have been impossible before can now be readily accomplished with the unprecedented accuracy of the complete line of **INCRA Tools**.



Now you can make wooden hinges like this one quickly and easily, with the new **INCRA HINGE PLANS & DRILLING GUIDE**.

The INCRA SYSTEM

- **INCRA JIG**
- **Official INCRA JIG Handbook & Templates**
- **INCRA Fence System**
- **INCRA Right Angle Fixture**
- **INCRA GAUGE**
- **NEW! INCRA JIG VIDEO**
- **NEW! INCRA HINGE PLANS & DRILLING GUIDE**
- **NEW! INCRA JIG PRO**
- **NEW! INCRA MITER SLIDER**



The Complete INCRA JIG VIDEO

This one hour program will help you take advantage of INCRA JIG's incredible versatility and inspire new ideas for its use. It includes complete step-by-step instructions, by the inventor, for making box joints, as well as through, sliding, and half blind dovetails, plus much more. Also included are full video instructions plus **FREE** templates and plans for making the INCRA Double-Double Box Joint.



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.

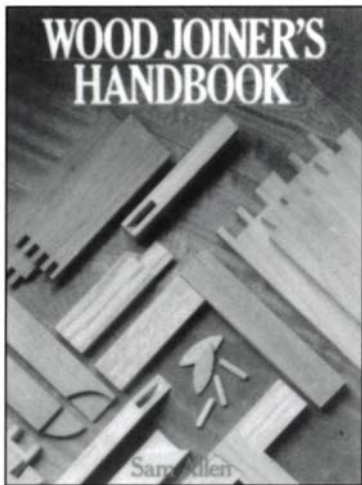
YES! Please send me a **FREE INCRA BROCHURE** & the name of my nearest dealer.

NAME _____

ADDRESS _____

Mail to: Taylor Design Group, Inc. P.O. Box 810262 Dallas, TX 75381

Wood Joiner's Handbook by Sam Allen. *Sterling Publishing Co., 387 Park Ave. S., New York, N.Y. 10016; 1990. \$14.95, paperback; 256 pp.*



The Wood Joiner's Handbook takes a thorough, well-organized look at woodworking joinery. The book is divided into three main sections: joinery fundamentals, advanced techniques, and joinery applications. And, the reader is taken from the most basic joints through final products. Allen assumes that the reader has a good grasp of hand and power tools and how to use them, and only devotes a cursory couple of pages to this area. This is a welcome relief from the numerous simplistic chap-

ters on tools that most books on joinery contain.

Allen divides woodworking joints into six basic categories: butt, miter, rabbet, dado and groove, mortise and tenon, and dovetail. The fundamentals section of the book is concerned with techniques for hand-cutting these joints, as well as joint reinforcements like dowels, splines and biscuits.

The center section of the book, on advanced techniques, goes into greater detail on joint variations and covers machine setups for cutting them. There is a chapter devoted to cutting with dovetail jigs, as well as a section on cutting mortises with hollow-chisel mortisers and a plunge router. Setups for box joints and multiple spline joints are also included.

The last section covers practical applications for the information presented earlier in the book. A good chapter on frame-and-panel joinery emphasizes techniques for coping a frame, as well as various methods of cutting raised panels. Carcase and drawer joinery are covered, including a look at the special requirements of working with plywood and particleboard.

In addition, the book presents Chinese and Japanese joinery, and other specialty joints. Though enjoyable reading, these areas are not covered in enough detail to be very useful in a practical sense.

Throughout the book, special attention is paid to the seasonal movement of wood and dealing with this variable. One of the things I like most about Allen's book is the inclusion of numerous "rules of thumb" for everything from dovetail spacing to tenon thickness and dowel size. This, along with the progression of the book from simple to complex, makes it an excellent choice for novice or intermediate woodworkers. Advanced woodworkers probably have most of this information in their heads already, although it would be a welcome addition to the bookshelf for occasional reference.

—Ben Erickson

The Marquetry Manual by William A. Lincoln. *Stobart & Son Ltd., 67-73 Worship St., London EC2A 2EL, England; 1989. paperback; 270 pp.*

The Marquetry Manual is an extremely informative, well-organized and comprehensive text that presents a wealth of technical and design information on the subject of marquetry. It offers an approach to technique that can be easily understood by beginners, yet allows craftsmen to progress in a sensible way to more advanced areas. The book is organized by chapters that allow advanced or more skilled craftsmen to sort through basic information and focus on more complicated technical issues.

The book starts with several chapters about types of veneers, how they are made, useful characteristics, how they are best used

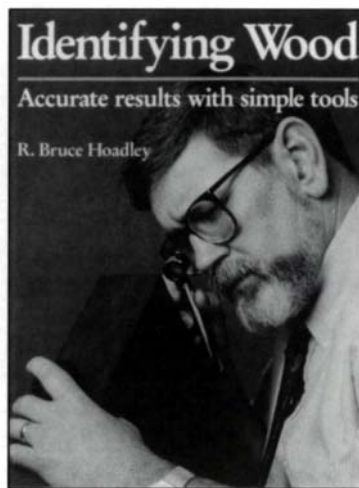
in marquetry, and how they are prepared and flattened. Next, Lincoln discusses tools—what needs to be purchased or what can be made. Many options are given so that an eager reader can begin decorating with marquetry with only a minimal financial investment in hand tools. But Lincoln goes on to advise serious marquetarians which expensive tools are good to purchase, such as fretsaws. Interesting bits of history about how marquetry techniques developed in relation to veneer manufacturing methods and tool evolution are also explained.

One of the nice things about this book is that it encourages the reader. Methods of work are explained very well—all my questions were anticipated and answered—and step-by-step information is meticulously conveyed in clear, precise terms. Lincoln has written a nice introduction suggesting that beginners use kits or line drawing pictures with numbered parts, so that design is not a concern initially, and technique can be honed. But for those who are ready for design, Lincoln also devotes a section of his book to this aspect of the craft, including how to adapt an illustration or photograph and how to create an original design. There are several informative chapters on perspective drawing, composition, color, shadows and reflections, all of which help marquetarians expand their creativity after they have mastered various levels of technique.

The book progresses through marquetry, applied marquetry, parquetry and inlay, explaining the differences and specific methods of work involved. *The Marquetry Manual* also has a selection of some fine contemporary marquetry work, shown in both color and black-and-white photographs. The translation of a drawing or photograph into an assembly of veneers has to be approached knowledgeably and sensitively, and Lincoln offers helpful guidelines to ensure a successful design, both aesthetically and technically.

—Seth Stem

Identifying Wood by Bruce Hoadley. *The Taunton Press, Inc., 63 S. Main St., PO Box 5506, Newtown, Conn. 06470-5506. 1990. \$39.95; 223 pp.*



My strongest reaction to this book is an unshakeable sense of having been cheated. Mind you, it has nothing to do with the book itself or its price, but with the fact that it wasn't in print a quarter of a century ago when I began the laborious study of wood identification.

Like Hoadley's earlier work, *Understanding Wood*, this book is outstanding and destined to become a popular reference among woodworkers. Hoadley has an amazing talent for dissecting intricate topics and expressing them in a clear, novel-like style that is comprehensible even to readers who have little or no training in the field. To be sure, *Identifying Wood* is not what you might call light reading, but it presents a complex, technical subject about as simply as it can be handled.

Hoadley begins with a chapter on the botanical classification of species, then shifts into the meat of the topic with five chapters on the cellular anatomy, physical properties, chemistry and unique features of, first, softwoods and then hardwoods. After providing this general understanding of the structure and diversity of wood tissue, the emphasis turns toward practical application, with three chapters on selecting the necessary equipment and learning the techniques and processes involved in identifying wood. Use of the hand lens for macroanalysis is thoroughly discussed, as is the more certain, but more demanding use of the microscope in microanalysis.

RYOBI PRESENTS THE WORKAHOLIC™ OF NEW SANDERS.



INTRODUCING AN INNOVATIVE NEW SANDER THAT'S DRAMATICALLY FASTER AND SMOOTHER THAN CONVENTIONAL SANDERS. IT'S THE RS115 RANDOM ORBIT SANDER. AND IT'S FROM RYOBI. NATURALLY. THE RS115 OFFERS FEATURES SUCH AS VARIABLE SPEEDS FOR BETTER CONTROL, REMOVABLE FRONT GRIP FOR MANEUVERABILITY IN TIGHT SPOTS, ERGONOMICALLY DESIGNED REAR HANDLE TO REDUCE FATIGUE, AND RYOBI'S EXCLUSIVE FILTER-FLO™ DUST REMOVAL SYSTEM TO KEEP THE WORK AREA CLEAN. THE RS115'S RANDOM ACTION COMES CLOSEST TO DUPLICATING THAT OF THE HUMAN HAND, PROVIDING AN EXCEPTIONALLY SMOOTH FINISH, YET REMOVES STOCK UP TO 50% FASTER THAN TRADITIONAL SANDERS. WITH A VARIETY OF OPTIONAL ACCESSORIES, THE RS115 CAN HANDLE ALL YOUR CONTOUR SANDING AND POLISHING NEEDS. SEE THIS WORKAHOLIC AT A TOOL SUPPLIER NEAR YOU.

RYOBI®

W O R K A H O L I C S™

RYOBI AMERICA CORPORATION, 1424 PEARMAN DAIRY RD., ANDERSON, SC 29625

© RYOBI AMERICA CORP. 1991

READER SERVICE NO. 129

With the reader now versed in the finer points of what to look for and how to go about it, Hoadley offers three very well organized and beautifully illustrated chapters, one on hardwoods, one on softwoods and a third covering some of the more commonly encountered tropical woods. These chapters detail the unique features or individual "signatures" of more than 180 species and in so doing make this book one of the most valuable references I've yet seen on wood identification. In the last chapter, Hoadley loosens up and gets a little chatty with a discourse on the real world utility of wood-identification techniques as they apply to archaeology, antique restoration and civil engineering, providing a pleasant wind down from his more mentor-like approach elsewhere in the book.

The final 40 pages are dedicated to helpful appendices covering some interesting side eddies, such as identifying atypical woods and fibers, chemical analysis and dealing with partially decomposed or altered samples, as well as providing an excellent glossary, a lengthy bibliography and a thorough index. This first edition is marred by the inclusion of an errata sheet, but the errors relate primarily to misplaced or improperly described illustrations rather than significant points in the text. Personally, the book is too valuable a reference to ponder the option of waiting for a corrected second edition. If you really want to get into wood identification, I can't think of a better place to start.

—Jon Arno

Lutherie Tools: Making Hand and Power Tools for String Instrument Building edited by Tim Olsen and Cyndy Burton. *Guild of American Luthiers, 8222 S. Park Ave., Tacoma, Wash. 98408; 1990. hardback; 122 pp.*

LUTHERIE TOOLS

Making Hand and Power Tools For String Instrument Building



Guild of American Luthiers Resource Book One

In any aspect of woodworking, whether it be cabinetry, furnituremaking or musical-instrument making, there are tricks of the trade and shop-made accessories devised to facilitate the project at hand. Through the centuries many of these shortcuts and jigs were private property, something that provided an edge over a competitor, or were strictly controlled by trade guild regulation. For example, templates for various musical instruments, a few tools and miscellaneous instrument parts survive from

the shop of the great violin maker Antonio Stradivari. However, nothing indicating the day-to-day, smooth operation of his shop survives, and neither does anything definitive about his source of wood and varnishes. Those of us who emulate this master would greatly desire to know those very mundane secrets.

Lutherie Tools is a compendium of contemporary jigs, shortcuts, day-to-day operational techniques and sources of supplies from string musical-instrument makers and repairers, commonly known as luthiers. Through the Guild of American Luthiers, various luthiers over the past fifteen years have freely shared their secrets and ingenious inventions for the furtherance of their craft and the benefit of fellow luthiers.

Lutherie Tools is divided into 10 chapters including: Measuring and Inspection Tools; Bending Irons; Knives, Chisels, Scrapers, and Planes; Clamps, Gluing, and Holding Devices; Routers; Sanding Machines; Bandsaw and Drill Press; Circular Saw; and Two Approaches to Tools. Each section is replete with black-and-white photographs as well as line drawings, many with detailed measurements so that the reader may duplicate the item discussed. Interspersed are full-page photographs showing the workshops of var-

ious well-known luthiers. The appendices are comprehensive, including references, sources of supply, a survey of luthiers and a list of further reading on various subjects in *American Lutherie*, the quarterly publication of the Guild of American Luthiers. The surveys of 17 well-known and respected luthiers are particularly interesting since each one discusses his or her main focus as a luthier as well as the hand and power tools they prefer. These luthiers also share some trade secrets such as a list of supplies used as tools, including masking tape, a microscope, dental tinfoil, a computer and beer (for attitude adjustment!). The jigs discussed are clearly explained and range from incredibly simple to quite sophisticated; for example, the construction of a sanding machine for tops, sides and backs is described in detail. Other items discussed include making bridge slot-cutting jigs, an arch-top carving gauge, a miniature tablesaw, specialized instrument clamps and shaping the top of an arch-top guitar with a router.

A quality musical instrument requires that the luthier make not only a beautiful object but also an object that acoustically sounds good. *Lutherie Tools* will help provide the necessary jigs, short cuts, and insights for accomplishing that task.

—Joseph Johnson

Antique and Collectible Stanley Tools—A Guide to Identity and Value by John Walter. *The Tool Merchant, Box 6471, Akron, Ohio 44312; 1990. \$24.95, paperback, 460 pp.*

As both a user and collector of period and antique tools, I'm generally skeptical about tool price guides. I'm always pleased to know the "value" of the tools I happen to own, but I'm usually distressed at the prices I would have to pay for tools I could use in my shop. Price guides bring good and bad news, but in all fairness, I believe they generally have the best intentions.

One of the main reasons that Stanley tools are so "collectible" is that ample documentation is available concerning their production. Many original catalogs and excellent reprints exist illustrating the complete Stanley line, along with original price lists. Because collectors are able to classify and catalog their collections, and note the tools they have and the ones they want, Stanley tools are attractive. Walter's book does little to add to this body of information, except perhaps to consolidate it in one place.

Factors such as rarity, condition and vintage are rightfully discussed in the introduction and also in the tool listings. The average prices given are all retail; they represent what a dealer would be apt to charge, but are far from what he would pay you for that special plane you found at a yard sale. Admittedly, dealers need to make a profit. So, unless you happen to know an avid collector, and he happens to want exactly what you have, expect about 50% of Walter's average price. Indeed, many Stanley items are quite rare and relatively easy to sell, but the vast majority of extant tools are quite common, and sit on tool dealers' shelves for months, if not years, until they wind up being offered at the tail end of an auction. Bargains on these are a boon to the woodworker, but Walter makes no mention of this situation. I was always taught the old horse trader's philosophy: something is only worth what someone is willing to pay.

Nevertheless, it is quite interesting to peruse this guide, if just to see the fantastic stuff Stanley used to make (though you'll be saddened at the decline in production and quality that's come with so-called progress). Knowing approximately what a tool is worth is certainly helpful, and at least you'll lessen the chances of being tricked into selling too low.

—Norm Vandal

Jon Arno is a wood technologist and consultant in Schaumburg, Ill. Ben Erickson is a furnituremaker in Eutaw, Ala. Joseph Johnson is the museum educator at the Shrine to Music Museum of the University of South Dakota. Seth Stem is a furnituremaker from Providence, R.I. Norm Vandal, a consulting editor to FWW, is a cabinetmaker in Roxbury, Vt.

For that
"SPECIAL"
project



TABLE BASES
W/ CARVED FEET
(TABLE SLIDES AVAILABLE)



QUEEN ANNE LEGS

In stock
No minimum



COUNTRY KITCHEN LEGS

Free
Brochure



Adams Wood Products, Inc.

974 Forest Dr., Dept. Q-11
Morristown, TN 37814 • Phone (615) 587-2942

READER SERVICE NO. 52

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. 303

Your Tool Source
for the 90's ...



Send \$2.00 for
our new catalog

Name _____

Address _____



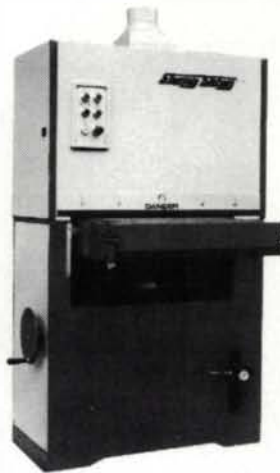
8815 Telegraph Rd
Lorton, VA 22079
800-452-9999

(703) 550-8600

READER SERVICE NO. 203

SUNHILL MACHINERY

Time Proven and Affordable SDM Series Wide Belt Sanders



SDM-25 25" Wide Belt Sander (Single Belt "B" Type Head)

The B-Type combination head with platen featured on all SDM series sanders offers greater versatility and quality in finish sanding. The platen is adjustable and removeable. These wide belt sanders are also available in 15", 37", 44", and 52" widths.

SDM-25 \$5995

Sheng Shing

Wide Belt Sanders Feature:

- All cast iron steel plate construction
- Safety Interlocks and Automatic Braking
- Unmatched air tracking system with proven reliability
- Powerful TECO motor (TECO has service centers throughout the United States).



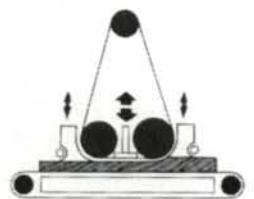
SDM-237 37" Wide Belt Sander (Double Belt Combination "A-B" Type Heads)

The A-B Type Head featured on the SDM-225, and SDM-237 models offer the versatility of aggressive drum sanding (A), and combination drum/platen sanding (B).

SDM-237 \$15,950



A-Type
Drum Head



B-Type
Platen Head

Take Advantage of Our Limited Time Freight Sale:

* Freight charges will not exceed 3% of the purchase price on any of the above items (in the 48 states). Alaska & Hawaii call for special quote. Special Freight Rates Available Until February 29, 1992

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

Build Power Tools
You Can Be Proud Of...
And SAVE!!!

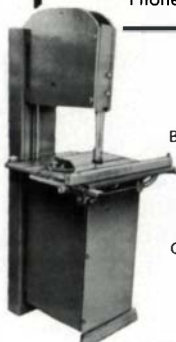
Remember when "quality craftsmanship" meant something? With GIL-BILT tools it still does.

- Construct your own:
- 12-in BAND SAW
 - 18-in BAND SAW
 - 10-in. TILT/ARBOR SAW
 - LATHE/DRILL PRESS COMB.
 - 9-in TILT TABLE SAW
 - 6-in BELT SANDER
 - SPINDLE SHAPER
 - CIRCULAR SAW TABLE

GIL-BILT kits include step-by-step plans, full scale patterns and all necessary metal parts and components except wood and motor. Made in America with pride by Gilliom Manufacturing, Inc. since 1946.

Send \$7.50 per plan or \$25 for plans for all eight tools listed above or send \$2 for descriptive brochure only. Satisfaction Guaranteed.

GILLIOM MANUFACTURING, INC.,
Dept. FW-12
P.O. Box 1018
St. Charles, MO 63302
Phone (314)724-1812



Featured here: 18-in. Band Saw
Specs: Throat capacity 18 in.
Thickness capacity 12 in.
Table size 26 in. x 28 in.
Table tilt 0° to 45°
Blade furnished 124 in. x 1/4 in. x 6T
Table height 39 1/2 in.
Overall dimensions 33 1/2 in. wide
29 in. deep
71 1/2 in. high
Speed (w/1,725 rpm motor)
425 rpm 2000 blpm
Order No. 451-K only \$239.50 (less cost of plan, if previously purchased) plus shipping
Speed reduction kit available for cutting steel.

READER SERVICE NO. 157

READER SERVICE NO. 126



This longleaf yellow pine desk was made from a 400-year-old log felled in the 1880s, which sank and was preserved in the depths of the Suwannee river in Florida. DeWindt's design for the partner's desk was derived from a Nakashima dining table that her client owned.

Treasures of the deep

The longleaf yellow pine desktop, shown in the photo above, was milled from a log that was preserved for more than 100 years in 50 feet of water. Years ago longleaf yellow pine was the mainstay of the American wood industry. Timbers, joists and flooring were made almost exclusively of longleaf yellow pine. So popular was the wood that it was milled to commercial extinction. Today there are two ways to obtain this rare and beautiful wood: by salvage or by diving deep into the rivers used to transport logs to sawmills. The Suwannee, one of two rivers that drain the vast Okefenokee Swamp, is a slow and wandering river; the kind of river where giant logs could get trapped in a bend. Some of these logs, including the one used in this desk, were so dense that they sank to the bottom, where they were preserved in an airless environment, which was immune from decay and rot.

The tree for this log was already over 300 years old when it was felled by ax in the 1880s. What made the log so unusual was its

extremely large diameter and its consistently curly growth from end to end. Even in the rough it looked different from the many logs in the mill yard of the Goodwin Lumber Co., Micanopy, Fla., where it was slabbed into boards and dried.

Inspired by the magnificence of this log and the natural edges of my client's dining room table, built by George Nakashima, I designed the partner's desk shown in the photo. The design places the natural curly wane surfaces edge to edge in the center of the desktop. The top is supported by four drawer boxes, which are mounted on double trestles, and the trestle members incorporate the natural wane outline of the tree. The feet show the original ax marks from when the tree was felled.

Every piece of wood in the desk, which was built by Bob Richardson, Vince Gratta and Trent Edwards of Wood Design in Santa Fe, N.M., was milled from that one log.

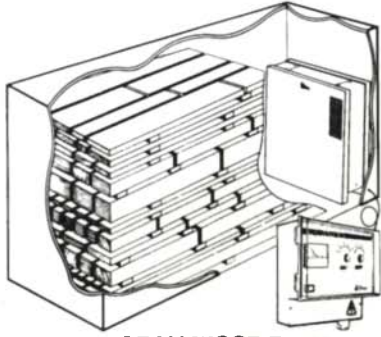
—Lila DeWindt, *DeWindt & Associates*,
Santa Fe, N.M.

Woodworking in the family

When the phone call came telling me that my father had died, I was just putting the finishing touches on a letter to him. One of the photographs I was enclosing was of his old tablesaw, a Craftsman of about 1950 vintage. It hadn't been used in 10 years or so when I got it from my brother. He thought I was crazy to lug it home because it didn't work, and he also thought that it couldn't be fixed. But after about 50 hours of patient examination, cleaning, adjusting and rewiring, I cranked it up, and it cut a pine board like a hot knife through butter.

In small-town Vermont, where I grew up in the 1950s and early '60s, woodworking was one of those *guy* things. (I apologize to all the female readers, but that's the way it was.) The men of the family were expected to be able to fix cars, catch fish, shoot animals and make things out of wood. It wasn't necessary to be a master cabinetmaker, but

DRY YOUR OWN LUMBER...



LD800 WOOD DRYER

...With an EBAC Wood Drying System.

Whether you're a serious home woodworker, small cabinet shop or a large wood retailer, EBAC has a wood drying system that's right for you.

Ebac Wood Dryers:

- save you money
- are easy to operate
- are energy efficient
- give you complete control over your wood's moisture content
- give you higher quality wood

Call or write today!



EBAC LUMBER DRYERS
106 John Jefferson Road, Suite 102
Williamsburg, VA 23185

Fax (804) 229-3321 Toll free 1-800-433-9011
In Canada: (416) 985-2123 Fax (416) 985-3708

READER SERVICE NO. 1



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.

Olsham

UNITED STATES SAW

The Professional's Choice
Burt, New York 14028

Teflon is a registered trademark of the DuPont Corp.

READER SERVICE NO. 140

TABLE SAW FENCES

T50	50" BIESEMEYER	294
X50	50" EXCALIBUR	329
34-897	50" UNIFENCE	299

BOSCH

1604K	1 3/4 hp Routerkit	163
1606T	Tilt base Trimmer	95
1631K	2 spd recip saw	128
1632VSK	VS Recipsaw	133
1942	Heat gun	68
3283DVS	5" R.O. Sander	99



1581VS \$133

VS Orbital Jigsaw

11202	1 1/2" Roto hammer	418
11203	1 1/2" Roto hammer	448
11212	3/4" Roto hammer	188



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



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

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

One horizontal-One vertical vial. Silver anodized body.

2434	24"	19
2737	48"	27
2411	72"	56

FANTASTIC TOOL DISCOUNTS

Makita
6093DW \$124
Cordless Driver Drill
6012HD tool only Drill 61
1900BW Plane KA 109
3612B 3hp PlungeRouter 164
3612BR 3hp PlungeRouter 164
4200N Trim Saw 126
4302C Jig Saw 158
5005BA 5 1/2" Circ. Saw 134

5081D tool only \$65
3 3/8" Cordless Saw
6402 1/2" Drill 99
6404 3/8" Drill 57
6510LVR 3/8" Drill 82
9207SPB Sander/polisher 153
9924B 3X24Sander 148
BO4510 Pad Sander 49
DA3000DW 7v RA Cordf drill 136
DA3900DW 9v RA Cordf drill 139
DA390D RA tool only 9v 84
HP2010N Hammer Drill 164
JR3000V Recipro Saw 123

LS1030 \$209
10" Miter Saw
Panasonic
CORDLESS POWER TOOLS
EY571B 9v Cordf Drill 127
EY571BC with case 139
EY970B battery 39

6511 \$125
2 spd Sawzall
6528 \$164
VS SuperSawzall

Milwaukee
0222-1 3/8" Drill 103
0234-1 1/2" Magnum 114
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
537-1-1 1/2" Hammer Kit 184
5392-1 3/8" Hammer Drill 114
5397-1 3/8" Hammer Kit 136
5399 1/2" Hammer Drill 189
5455 7" Polisher 128
5660 1 1/2 hp Router 184
5680 2 hp Router 204
6014 1/2 sheet Sander 115
6016 Pad Sander 48
6234 VS BandSaw 259
6365 7 1/4" Circular Saw 116
6368 Circular Saw Kit 133
6507 VS Sawzall 131
6508 VS Sawzall 129
6527 Super Sawzall 165
6539-1 Cordless screwdriver 69
6543-1 VS Screwshooter 139
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 83
8975 Heat Gun 58

7336 \$131
VS Orbital Sander
7334 5" Orbital Sander 114
7335 VS 5" OrbSander 126

PORTER-CABLE
100 \$95
7/8hp Router
330 Palm Sander 54
351 3x21 Belt Sander 129
5116 Dovetail Jig 259
555 Biscuit Joiner 162
659 Drywall Gun 83
690 1-1/2 hp Router 123
693 Plunge Router 163
6931 Plunge Base 73
7319 Tilt Base Router 103
7750 1/2" Hammer Drill 145
9118 Door Plane Kit 185
9345 SawBoss Kit 123
9629 Recipro Saw 134

SKIL
1605-2 Biscuit Joiner 116
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 \$139
7 1/4" Wormdrive Saw

RYOBI
RS115 \$74
Random Orbit Sander
BE321 3x21 Sander 127
E3810 Screwgun 74
JM100K Biscuit Joiner 208
JS045 Jig Saw 85
RS01 2hp Plunge Router 148
RE600 3hp Plunge Router 203
S500A Palm Sander 39
SC160 16" Scroll Saw 138
TFD170 VS Cordless Drill Kit 144
TFD220 VS Cordless Drill Kit 164
TR30U Laminate Trimmer 84
TS200 8" Compound Miter 143
TS254 10" miter Saw 197
WC101 wood carver blade 29

HITACHI
C10FA 10" Miter Saw 268
CC14 14" Chop Saw 195
CR10V Recipro Saw 119
F20A Plane 96
M12V 3 1/4hp Plunge Rtr 223
TR6 Trim Router 93

C8FB \$438
Compound Miter
998862 8.5" X 60T blade 39.95
Aux. Fence for small cuts 12.95
Hold down Clamp 18.95



94-100 5pc \$153
Router Bit Cabinet Set
WC104 4pc Chisel Set 38
WC106 6pc Chisel Set 51
Professional Carbide-Tipped Blades
LU85M010 10" 80T Finish 59
LU84M011 10" 50T Combo 39
LU87M010 10" 24T Rip 39
TK906 10" 50T Combo 25S
D308 8" Dado 119
• after 30\$ factory Rebate •
• FT2000 Plunge Router 129 •
• JS100 Biscuit Joiner 129 •
• EB100 Edge Bander 229 •

SENCO
not available in all areas
LS2 Pinner 5/8" - 1" 249
LS5 Pinner 1" - 1 1/2" 255
SFN2 Big Finish Nailer 379
SN3 1/4" Crown Stapler 249
SN4 Frammer 6d - 16d 467
SPB 1" crown Router 335

SFN1 \$259
1-2" Finish Nailer

NEW FROM MILWAUKEE
0564-1 Cordless Drain Cleaner 169
0565-1 0546-1 Kit 197
5460 VS Polisher 247
6125 5" R.O. Sander 125
6126 6" R.O. Sander 128
8978 Variable Heat Gun 97

USE VISA, MC, DISCOVER
FREE SHIPPING on orders over \$50.
Sales limited to stock on hand.
Prices subject to change without notice

ABBHEY 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

READER SERVICE NO. 111

when it came time to replace a porch step, you didn't pay someone else to do the job.

The societal imperative aside, woodworking was supposed to run in our family. My grandfather was widely acknowledged as one of the best around. He worked almost entirely by hand, with tools generally dating from the early 1900s. It wasn't that he didn't like power tools; I think he just wanted to enjoy each project as long as possible. And what incredible projects they were! He had a habit of just showing up at one of the relative's houses with his latest work (he gave away everything he made), and it was always something the recipient would scramble to make room for. His last and best efforts were the grandfather clocks he made for all his children and married grandchildren. He didn't build them from kits or drawings; he made his own patterns by scaling up photographs he had seen in a furniture catalogue.

My father was more utilitarian. He cranked out the usual plywood bookshelves, storage cabinets and toolboxes for the back of the station wagon, but he made these so well that they are still around our various houses and doing their jobs. Around town he was considered to be a pretty good carpenter.

He worked in a cavernous, two-level shed with a loft that was attached to the back of the house. That shed still comes to mind every time I smell sawdust. There resided the aforementioned tablesaw and all the other mysterious and dangerous tools. Like all kids, I wasn't allowed to touch any of the good stuff, but if I nagged enough I would get a hammer, some nails and some scrapwood to whack together into a vague approximation of a boat. That was the extent of my childhood woodworking education—

probably because I never asked to learn more. I just wasn't very interested.

I became interested real fast, though, when I got divorced and moved into an empty house with an empty bank account. Although I was able to get along with just a rolltop desk and a set of bookshelves at first, I knew that eventually I would need more furniture. I had two choices: Head over to Goodwill to pursue bargains in the used furniture department, or buy some wood and basic tools for about the same amount of money and hope that my heritage and a few library books would provide the rest.

Well, I don't know if it was genetics or necessity that did it, but I now have a houseful of furniture that I made myself. As I look at each piece chronologically, I can see the improvement in skill, design and technique. Coming late to woodworking doesn't mean you can't learn quickly. And, of course, each new project provided a handy excuse to buy a new tool and learn how to use it. There are still a few spaces left in the house that I fill with shopmade projects. I'm even thinking about making a new sofa, if I can learn how to do the upholstery, and, of course, that will mean another trip to the tool store. But I won't need to buy a new tablesaw.

I kept asking my father to come to the house so he could see my furniture and how I had fixed up his saw as good as new, but he never made it. He probably figured he'd have time to do it later, as we all do.

I wish he had, though, because every time I complete a project, the child within wants to say what I said to him so long ago, holding up that ridiculous boat made of pine scraps and nails, "Hey, Dad, look what I made!"

—Colin Goff, North Branford, Conn.

cific about the piece of equipment you want, tell the operator the type, size, power (110v, 220v, 3 phase, etc.), dollar limits and any other requirements you may have. You can also specify an area of the country or state. For large ticket items, TRG will act as an escrow agent, holding payment until the purchaser has a chance to see the equipment.

For more information or a subscription to the National Tool Trader, call (815) 727-2400.

—Charley Robinson

Woodworkers' Forum on CompuServe

CompuServe is an electronic bulletin board that's available to computer users via a telephone modem. Subscribers to CompuServe can exchange information, keep abreast of the news, buy and sell stuff or research topics across a broad spectrum of interest, including woodworking.

CompuServe's woodworkers' forum provides access to a library of files on a variety of woodworking topics. The last time I logged on to the service, I downloaded a file that reports the best in woodworking books. Another file helped to clear up some common misconceptions about tablesaws. It's not just one-way communication, either. You can upload any information that you have just as easily as you download. (I know because I just uploaded the "Events" calendar from this issue of *Fine Woodworking*. And I'll upload subsequent issues as well.) Have a look, there's probably something in the library that will interest you, and I know that one of you is hoarding that widget I need for my Oliver bandsaw.

If you want to subscribe to CompuServe, you need a phone line, a computer and a modem. For more information, call CompuServe at (614) 457-8600, and drop me a note at 71141,552 when you get online. I'd love to swap lies with you.

—Andy Schultz, associate editor, FWW Books

Product reviews

PC Index to Fine Woodworking, Meredith Associates, PO Box 792, Westford, Mass. 01886-0792; (800) 831-3200

Anyone who's ever spent an evening sifting through a pile of old *FWW* magazines looking for a vaguely remembered article will welcome this new computer software. The "PC Index of *Fine Woodworking*" program (\$29.95) provides a listing of all *Fine Woodworking* articles and departments (such as "Letters," "Q&A" and "Notes and Comment") as well as cross references to all *Fine Woodworking* books containing article re-

Point of View

The maple tree was down, and spalted.
My neighbor thought it double-faulted.
Once for falling on his roof,
Once for being so aloof
That it would turn its golden grain
Into an anaerobic stain
Of waves and streaks and mottled lines
And prove unfit for smooth designs
In kitchen cabinets and such,
In short, he didn't like it much.
And so he gave the tree to me,
Who knew, conversely, how to see
That germs can beautify a wood,
And "ruin" can sometimes be good
For men who find their hearts exalted
By maple logs that have been spalted.

—Richard L. Miller, Elizabethtown, Pa.

Tools by telephone

The National Tool Trader is a subscription service offered by TRG Enterprises, Inc., Joliet, Ill., which allows members to buy and sell tools, materials and related items anywhere in the country via telephone. Membership is \$15 a year, and the cost to place an ad is \$3 plus \$1 per minute access fee. (TRG accepts only Visa or MasterCard.) Typical access times are from two to three minutes, so placing an ad usually costs \$5 to \$6. The operator who answers the phone can help you place the ad, which can remain on the service for one year. When buying an item, you pay just the \$1 per minute access fee while the operator searches the data base for the item you want.

The president of TRG, Anthony Taves, said that currently more than 23,000 tools are listed in the database, 70% of the listings are home-shop quality tools and the balance is industrial equipment. To keep the access fees to a minimum, it's best to be very spe-

WOODWORKER'S CATALOG

Serving woodworkers
for 179 years

More than 4,000 hard-to-find products to

BUILD, REPAIR, RESTORE, REFINISH

anything made of wood!

It's the catalog woodworkers rely on for fine woods, veneers, finishing supplies, tools, hardware, moldings, adhesives and more...all top quality, reasonably priced, and covered by our 60-day no-questions-asked guarantee. Just \$1.00 brings you the 116 page color catalog plus all supplements for two full years. Write for your subscription today!



CONSTANTINE 2065Y Eastchester Road, Bronx, NY 10461

READER SERVICE NO. 153

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).

BAND SAW BLADES

Made to Order

SYSTMATIC Accu-Fence

STERLING

CARBIDE SAW SHARPENING SERVICE

DOWNRIVER SAW SERVICE

8653 LAKE RD. GROSSE ILE, MI 48138
1-800-258-9841

READER SERVICE NO. 62

Two ways to plant a tree for Global ReLeaf

Now there are two ways you can plant a tree. You can dig in and do it yourself. Or, dial 1-900-420-4545.

You see, when you call our special Action Line, the \$5.00 charge actually pays for planting a tree and we'll also send you detailed information on Global ReLeaf. So call now. Earth needs all the trees you can plant. And that's why we need you.

1-900-420-4545



A program of The American Forestry Association
Citizens caring for trees & forests since 1875
P.O. Box 2000, Washington, DC 20013



ANYTIME ANYWHERE ANYWOOD

W&H Molder-Planer & Lathe

Professionals and hobbyists alike know the strengths of our products! The W&H Molder-Planer converts from planing to molding in only two minutes, and duplicates moldings from 3/4" deep to 7" wide.

Our 12" Lathe, with its cast iron headstock/tailstock and solid steel ways, has four-speed versatility and 46" between centers!

Superior made-in-USA construction, exceptional warranties, and free 30 day trials are your assurance of long life and total satisfaction.

Mail this ad or call us toll-free today.
1-800-258-1380 In NH 603-654-6828

Williams & Hussey
P.O. Box 1149, Dept. 132AA
Wilton, NH 03086

YES! Send your free information kit today!

Name _____

Address _____

City _____ State _____ Zip _____



READER SERVICE NO. 10

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

prints including: *Techniques, The Best of Fine Woodworking...*, and *Fine Woodworking on...*. The program, which comes on two diskettes, is designed to run on an IBM PC or compatible computer with at least 512K of memory. "PC Index" allows you to quickly access the table of contents of any issue of *Fine Woodworking* by typing in the issue number. Further, the index will indicate if an article has been reprinted in a *FWW* book and allow the table of contents of the book to be reviewed. "PC Index" also has a search function that will find, assemble and print a list of all magazine entries that contain a key word. One of the best features of the program lies in its ability to be updated by the user—a welcome alternative to many programs that require waiting and paying for the software developer's update.

Starting and running the program is made easy by on-screen prompts and an excellent manual. But I wish that I had a faster, more powerful computer; it took my antiquated PC several minutes to do a search that found a dozen articles. But that's a wink of the eye compared to the time it would have taken to find them the old-fashioned way!

—Sandor Nagyszalanczy

Shark Saws, Takagi Tools, Inc., PO Box 14355, Torrance, Cal. 90503

I recently received five Japanese handsaws made by Takagi Tools, Inc. for evaluation. Like all Japanese handsaws, these saws cut on the pull stroke. This means the blade is in tension when it's cutting, so it can be thinner and thus more flexible than its Western equivalent, which is pushed through the cut. The thinner blade produces a smaller kerf and requires less effort to make the same cut than a saw with a stouter blade. A professional-quality Japanese saw is flexible indeed, which can be difficult to control without practice. However, the saws from Takagi Tools had blades that are on average 50% thicker than their more traditional Japanese counterparts. The less experienced woodworker may welcome this increased rigidity.

On the cardboard protective jacket, which came with each saw, the manufacturer states that the saws can be used for both ripping

Photo: Charley Robinson



The Shark Saw series from Takagi Tools, Inc. are reasonably priced Japanese-style, pull-stroke saws. The replaceable blades eliminate the need for sharpening.

and crosscutting. While I suppose one can make a saw do anything, I found this statement misleading since none of the saws I received came with teeth suitable for ripcuts.

In the United States, one drawback to using traditional Japanese saws is the difficulty of finding someone to sharpen them. Because of this problem, the greatest advantage of the Takagi saws is the blades are replaceable. The blades, which range in price from \$15 to \$19, are removed by simply depressing a button on the handle. On several of the saws I found this mechanism had play in it; while this did not seem to affect the saws performance, the rattling was disconcerting.

The offset, black plastic handle on all but one of the saws (shown in the bottom left photo) proved to be the greatest departure from the traditional Japanese tool. The handle is a cross between the D-handle of a Western-style saw and the long, straight wooden handle of a Japanese saw. Because I am used to a traditional Japanese handle, I found this new configuration to be the saw's biggest drawback. The hand's position is more or less dictated; it's fixed in a certain position and distance from the blade. This would be okay if all cuts had the same requirements in speed, power, accuracy, angle, depth and position of stock and body, but I have always appreciated the variety of

grips possible with a long, straight traditional handle. With a straight handle you can hold close to the blade, far away from it or anywhere in between; you can use two hands by placing one hand behind the other; or you can adjust the angle of the saw, rotating the handle in the palm instead of awkwardly cocking the wrist. In addition, on a hot and humid day, the plastic handle became slippery, and even though I could still adequately grip it, I had a certain loss of feeling for the tool. Under the same conditions, an unfinished, porous wooden handle fares much better than plastic.

In summary, I would characterize the saws as a Western version of a traditional Japanese tool, designed specifically for the American market. If, as a woodworker, you have learned to exploit the qualities of a professional-quality traditional Japanese saw, you will find these saws cumbersome and unsuited for critical work. For those of you who have found traditional Japanese saws difficult to control or too fragile, the compromise these saws offer may be welcome. Takagi saws range in price from \$21 to \$26 and are available from selected home improvement centers, or they can be mail ordered from C. R. S., Inc, PO Box 4567, Spokane, Wash. 99202-0567.

—Carl Swensson, Timonium, Md.

"April Fools' Library Ladder"

I titled the library ladder, shown in the photo at right, "April Fools' Library Ladder" because it was conceived on April 1. When an interior designer rejected my original idea for a rustic, heavy-timbered library ladder, she asked what else I had. Without hesitation I blurted out, "something with geometric shapes and bright colors!" I didn't have anything in particular in mind, but I had been playing around with these themes in some other work. Fortunately, the idea appealed to her client, and after receiving approval of a clay model, I began to build the 48-in.-wide by 36-in.-deep ladder that would stretch 104 in. to the tip of the pencil's eraser. The pencil wasn't a part of the original plans; it was an afterthought that just seemed natural in a library setting.

The green base and the blue pyramid are made of ash stained with aniline dye and then lacquered. I covered a turned foam core with fiberglass and then sprayed it with auto lacquer to form the red sphere. After shaping two pieces of maple, I glued them around a 2-in.-dia. steel tube to make the pencil. The entire unit is supported on 6-in.-dia. casters for mobility. Four fluorescent black lights under the base and a neon light under the pyramid add real pizzazz to the overall effect of the ladder.

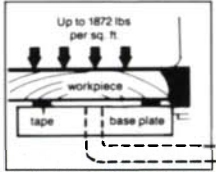
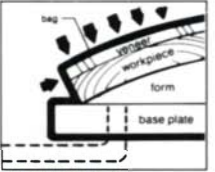
—Michael Bright, St. Petersburg, Fla.

Photo: Frank Baptie



This flamboyant library ladder is also functional. A welded steel frame provides stability, and the 7-ft.-long pencil lends support when reaching for an upper shelf.

NEW Clamping **VACUUM** Veneering

Up to 1872 lbs per sq. ft.

gauge
vac-u-clamp
vacuum pump

Fast, strong, safe, low cost vacuum jigs of any shape secure workpiece for routing, sanding and shaping.

VAC-U-CLAMP KIT \$90.50
Vacuum pump (requires 1/2 hp compressor), gauge, tape, valve & muffler.

VAC-U-BAG (pump extra) applies even pressure for veneering straight, curved or odd shapes.

VAC-U-BAG KIT \$99 to \$181
20 mil vinyl bag sizes: 52" x 60", 52" x 98", 52" x 122", 52" x 146"

1-800-848-8788

VACCON Co. Inc.

VAC-U-CLAMPing and Veneering must be done separately.

READER SERVICE NO. 64

DAVIS WELLS Quality, Durability and Accuracy Since 1930

WOODWORKING MACHINERY

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

CAST IRON QUALITY
11090 S. Alameda • Lynwood, CA 90262

213 636-0621 FAX 213-635-2901

READER SERVICE NO. 154

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

INDEX TO ADVERTISERS

AAA Tool	7	Grizzly Imports	14, 29	<i>Projects In Metal</i>	40
Abbey Machine	121	Guild of Master Craftsmen	14	Quaker State	15, 105
Acme Electric Tools	44 - 45	HTC Products	96	Red Hill Corp.	41
Acrylic Image Concepts	113	Harchuck Sales	11	Rio Grande University	41
Adams Wood Products	119	Harper Hardware	12	Rockingham College	115
Airstream Dust Helmets	10	Hartville True Value	17	Ross Drum Sanders	113
American Clamping Corp.	7	Hida Japanese Tool	40	Rousseau	23
Ammax Tools	27	Highland Hardware	31	Ryobi Power Tools	117
Anderson Ranch	104	Home Lumber	105	School of Classical Woodcarving	9
Arrowmont School	26	Horton Brasses	119	Scherr's Cabinets	26
Ashman Technical	9	Imported European Hardware	32	SECO Investment Co.	15
Atrax Tooling	39	Industrial Abrasives	10	SY Industrial Bits	41, 43
Auton Co.	41	Incra Jig	11, 113, 115	Seven Corners	13
Aviation Supply	25	Injecta Machinery	105	Shaker Workshops	23
Ball & Ball	39	Insty-Bit	7	Shopcarts	5
Berea HardWoods	27, 115	Intelligent Product Designs	32	Silverton Millworks	23
Better Built	21	International Tool Corp.	104	Sisco Supply	15, 105
Biesemeyer	31	Jointech	24	The Source	119
Bill Bartz Mfg.	115	Journeyman Products	7	Suffolk Machinery	11
Blume Supply	36	Kaune	15	Sugino Corp.	37
Boulter PlyWood	36	Keller Dovetail System	9	Sunhill Enterprises	25, 119
Brandmark	26	Klingspor	21	TS-Aligner	5
C & L International	14	Laborsaber	40	Tarheel	38
Carter Products	7	Laguna Tools	26	The Taunton Press	34, 35, 37, 96
Classified	100 - 102	Leigh Industries	40	Tool City	20
Clayton Machine Corp.	21	LeNeave Supply	43	Tool Crib of the North	44 - 45
CoMatic Machinery	36	Lie-Nielsen Toolworks	26	Tools on Sale	13
Maurice L. Condon	123	Lignomat	12	Transpower Industries	11
Constantine	123	Lobo Power Tools	27	Trendlines	18, 26, 103
Craft Supplies USA	21	MLCS	97	United States Saw	121
Davalco	43	Magnate	17	Vaccon	125
Davis & Wells Machinery	125	Makita Power Tools	33	Vacuum Pressing Systems	21
Delmhorst	41	Manny's Woodworker's Pl.	42	Vega	104
Delta	94 - 95	Marling Lumber	41	Steve Wall Lumber	5
Downriver Saw Service	123	Marshco Products	5	Whole Earth Access	32, 106
Ebac Lumber Dryers	121	McFeely's	113	Wilke Machinery	127
Econ-Abrasives	98	Mesa Vista	113	Williams & Hussey	123
Emperor Clock	37	Miller Woodworking	37	Williams Tool & Hardware	96
ENDesigns	32	Moon's Saw & Tool	21	Wolfe Machine	37
Factory Store	9	Mule Cabinetmaker	36	Woodcraft	36
Fein Power Tools	39	Northland Wwkg.	23	Woodmaster	31
<i>Fine Homebuilding</i>	111	Nyle Lumber Dryers	7	Wood-Met Services	32
Floral Glass & Mirror	104	PC Index	9	Wood-Mizer	9
Forrest Manufacturing	99	Paxton Hardware	23	Woodpeckers	39
Freud Power Tools	2	Performance Coatings	27	Woodworkers' Book Club	19
Furniture Designs	37	Performax Products	27	Woodworkers Source	5
Garrett Wade	98 - 99	Phantom Engineering	13	Woodworker's Store	22, 125
Gilliom	119	Philipps Brothers	26	The Woodworking Shows	113
Glass & Mirror Craft	17	Pootatuck Corporation	32	Woodworking World Shows	115
Global ReLeaf	123	Porta-Nails	98	Worcester Craft Center	15
Gordons Designs	5				

Don't miss a single issue!

New! 1991-92 Catalogs

The **WOOD** Woodworkers' Store



Over 150 new, hard-to-find items!

Yes! Send me the next four issues of The Woodworkers' Store catalog for only \$2/year.

Name _____
Address _____
City _____ State _____ Zip _____

The **WOOD** Woodworkers' Store
Dept. 13046
21801 Industrial Blvd.
Rogers, MN 55374
Credit card orders
(612) 428-2199

READER SERVICE NO. 164

Woodworking: For love or money?

Recently I've seen several letters to the editor in *FWW* about the pros and cons of working with wood for a living. Doing for money what you already do for the love of it certainly sounds appealing. But it's the goal of many and the reward of few.

After more than 20 years of working at woodworking, I'm still discovering just what it takes to turn a wonderful avocation into a sus-

taining occupation. But in the beginning, I had to ask myself some major questions (and there were more I should have asked) before I felt I could make the plunge into self-employment.

If you're at this stage, you might find it helpful to take the following test, rating your answers on a scale of 1 to 10. Each question includes a brief explanation to help you give an informed and honest answer.

1. **Do I love woodworking well enough to do it all day, everyday (and in my sleep too)?** *For the self-employed, there are few, if any, holidays; no, and I mean no, paid vacations; and there is no such thing as an eight-hour workday.* _____
2. **Can I live with working man's wages?** *An established custom woodworker makes a little better wage than the janitor at the local high school, but not nearly as much as the backhoe operator gleefully excavating the neighbor's defunct septic system.* _____
3. **How much do I hate working for the "pharaoh"?** *One of the greatest attractions (and addictions) of self-employment is the indescribable joy of working without the glowering presence of a boss (the pharaoh reincarnate). But for an artist/craftsperson to really make the commitment to self-employment, the importance of this freedom must be no small thing.* _____
4. **How much will I likely hate working for myself?** *The successful entrepreneur must be his own "boss from hell." Instead of sleeping in, you'll need to boot yourself out of bed headlong into your table saw. When you want to catch the season finale of L.A. Law, you'll be dragging yourself to a client's house to collect a deposit so you can eat for the next month.* _____
5. **I'm pretty organized, but can I really handle doing three things at once?** *Do you think you can simultaneously run molding stock through the shaper, remember which client had to be called before noon and mull over a design decision? All that and ending the day with five fingers on each hand.* _____
6. **How much do I enjoy working alone?** *Do you really like to spend a lot of time without any social contact? You won't be able to hire anyone, at least not right away. And don't count on your spouse. (Remember the boss from hell back in question 4?)* _____
7. **Can I afford to live for at least six months with a neutral, or perhaps negative, cash flow?** *A very important question. Those first months will likely see more money going out than coming in, even if you've already paid for all your tools before you jump in full time. The best you can hope for at first is to break even.* _____
8. **Do I have access to a shop suited to commercial woodworking?** *Base this answer on the amount of overhead a shop at least the size of a two-car garage is going to set you back. Owning a garage where you can legally and practically do commercial work scores a 10; renting a space that will cost you a week's wages and requires a one-hour commute scores less than 5.* _____
9. **What are the chances that people in my community will appreciate custom woodworking enough to pay for it?** *The heck with appreciation. Are there people out there who will buy your work? Give this question some serious thought. If you live in a rural area, expensive fine furniture, or even custom kitchen cabinetry, may be as "local as a fish in a tree."* _____
10. **Do I believe that doing woodworking for money is a form of prostitution?** *Introducing the element of commerce into our happy little world of aromatic wood shavings and sweetly sharpened edge tools is like opening Pandora's box. It's a lousy box, too; it's badly fitted, poorly finished and of poor design, to say nothing of the demons inside. Knowing how money corrupts, can you keep it from tainting your joy of woodworking? No cheating on this one.* _____

Total: _____

Scoring

80 to 100: Go for it!

60 to 79: Go for it anyway. You're probably just more honest than those who scored over 80.

59 and below: Give this career move a little more serious thought.

Jim Tolpin is the author of Working at Woodworking, published by The Taunton Press, 63 S. Main Street, PO Box 5506, Newtown, Conn. 06470-5506.

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.

Drawing: Bob Kato



**GO BACK
TO BASICS**
...WITHOUT LEAVING
QUALITY!

**WILKE
MACHINERY COMPANY**

WILKE MACHINERY

BRIDGEWOOD®

WOODWORKING MACHINERY

BW-12P	\$ 399.	BW-16PV*	\$2495.	BW-612PV*	\$6295.
BW-15P	\$ 895.	BW-20PV*	\$3295.	BW-612PVG*	\$6895.
BW-20P	\$1295.	BW-508*	\$3995.		
BW-200P*	\$2595.	BW-508G*	\$4595.		

*U.S.A. motors. BW-200P
BW-16PV

BW-20PV

BW-508

BW-612PVG

PLANERS (10 MODELS)

BW-15P



BW-512TS
\$4395.



BW-511TS
\$3395.



TC-50
\$4695.



BW-3S
\$1565.



BW-2S
\$ 950.



BW-1S
\$ 329.95

BW-6S
\$3795.

SHAPERS (7 MODELS)

WIDE BELT SANDERS (7 MODELS)

BWS-25 \$ 6495.
BWS-37 \$ 9595.
BWS-25VS \$ 7095.
BWS-37VS \$10,295.
BWS-13 \$ 4995.
BWS-25-2 \$13,995.
BWS-37-2 \$17,100.



BWS-25-2

*U.S.A. motors.

JOINTERS (6 MODELS)



BW-6J
\$ 329.95



BW-8J*
\$ 895.



BWJ-872*
\$1795.



BW-12JC*
\$2695.

TABLE SAWS (5 MODELS)

BW-16TAS-S* \$4495.
BW-12TAS-S* \$3795.
BW-14TAS \$3795.
BW-12TAS \$2595.
TSC-10B \$ 689.

*Scoring saws.



BW-12TAS-S

BANDSAWS (5 MODELS)

PBS-940* \$4495.
PBS-740* \$2695.
PBS-540* \$1995.
PBS-440* \$1695.
BW-14BS \$ 329.95

*European made.

PBS-740

PBS-440



PBS-540



DUST COLLECTORS (5 MODELS)

BW-003
\$795.



BW-003A
\$595.



BW-002A
\$429.



BW-015
\$319.



BW-015A
\$239.



Buy Right the First Time; Buy BRIDGEWOOD®!

WILKE Machinery Company

3230 SUSQUEHANNA TRAIL, YORK, PA 17402

PHONE: 717-764-5000



FOR SPECIFICATIONS ON THESE MACHINES
AND MANY MORE, SEND \$1.00 FOR FULL COLOR
CATALOG TO: WILKE MACHINERY CO.
3230 SUSQUEHANNA TRAIL, YORK, PA 17402
WOOD & METALWORKING MACHINERY
AND ACCESSORIES.



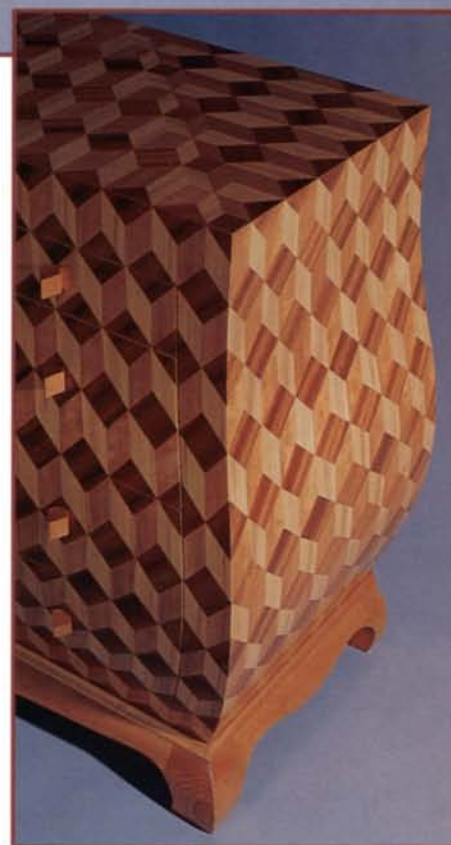
VISIT OUR SHOWROOM . . . 1 Block West of Interstate 83, Exit 11
Mon-Thurs, 8 a.m.-5 p.m. • Fri, 8 a.m.-8 p.m. • Sat, 9 a.m.-12 noon
SHIPPED F.O.B., YORK, PA.
PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

91B1



Creating a wrap-around pattern of illusory blocks on the undulating surface of a bombé chest was a challenge for Elliot Price, a Tucson, Ariz., furnituremaker who spent 400 hours building the piece. The curvaceous front and sides are laminated $\frac{1}{8}$ -in. poplar plywood and kerf-cut $\frac{1}{4}$ -in. hardboard over a ribbed inner box. Price transferred the parquetry by taping drawings to the chest and punching through each line intersection with a pencil. The veneers—African mahogany, cherry and red elm—share a reddish hue, yet provide contrast to give the pattern depth. Before cutting out the 850 pieces, Price ironed a special heat-setting adhesive film to the veneer. He then ironed the pieces onto the chest individually, using pencil marks to align them before rubbing them down with a rounded wooden block. He averaged eight pieces an hour.

BLOCK PARTY IN BOMBÉ



Photos: Sandor Nagyszalanczy