highland hardware

Wood News

Number 24 | Serving Woodworkers | Winter 1990

The New Yankee Workshop Begins Second Season

NORM ABRAM'S premier season as host of PBS television's *The New Yankee Workshop* ranked among the most successful new do-it-yourself shows in public broadcasting history. Viewers will be glad to hear that Norm will be back this winter and spring with thirteen all new episodes. In each show, he builds an entire furniture project from beginning to end.

Highland Hardware will again provide local sponsorship of the show in the Atlanta area. Atlanta area viewers will be able to see *The New Yankee Workshop* at either of two Saturday times. WPBA (Atlanta's channel 30) will begin the new 13-week series on Saturday, January 27 at 3 pm. (Beginning April 28, WPBA will feature re-runs of the first season's *New Yankee Workshop* programs in the same time slot.)

WGTV (Georgia's channel 8 which features statewide coverage) is scheduled to begin the new series on Saturday, February 10 at 6 pm. The series will run on channel 8 thru May 5.

Here is the schedule of shows planned by WPBA/Channel 30. (WGTV/Channel 8's schedule will run two weeks behind this schedule). Other areas check local listings.

January 27	Rocking Horse
February 3	Adirondack Chair
February 10	Butler's Table
February 17	Kitchen Dresser
February 24	Hearthside Settle
March 3	Pencil-post Bed
March 10	Chair Table
March 17	Kitchen Work Table
March 24	Mission-Style Sofa
March 31	Picture and Mirror Frames
April 7	Chest-on-Chest
April 14	English Garden Bench
April 21	Armoire

Measured drawings for each week's project will be available from Highland Hardware for $6 postpaid. Norm's book, which covers all the projects from the first season, is available from Highland Hardware for $13.95 + $3 shipping.

INSIDE Wood News 24

Woodworking Shows Coming to Charlotte Jan. 26-28, Atlanta March 23-25

HIGHLAND HARDWARE will participate in two upcoming southeastern trade shows. January 26-28 the store will set up shop at the Charlotte Convention Center along with vendors from around the country at one of the south's largest regional woodworking shows.

March 23-25, the Lakewood Fairgrounds at 2000 Lakewood Avenue (off Interstate 85) will be the site of the Atlanta Woodworking Show.

Each show will feature demonstrations of countless new tools, free educational workshops and (for an extra fee) seminars by leading woodworking educators. Highland Hardware will have a large exhibit at each show featuring many of our most popular tools at outstanding savings.

Call the show sponsor at 800-826-8257 (weekdays between 9 am & 5 pm *Pacific time*) for details and to receive a free brochure.

*Mark Duginske, author of **Bandsaw Handbook**, is shown here using a small bandsaw to make veneer. He will teach two seminars at Highland Hardware March 31 & April 1. His article on tracking bandsaw blades appears on page 16 of Wood News.*

1990 Seminars at Highland Hardware

January 6	Sharpening
January 8	Carving a Mask Course Begins
January 10	Basic Carving Course Begins
January 13	Getting the Most Out of your Scrollsaw
January 20	Using Hand Tools
January 26-28	Charlotte Woodworking Show
January 27	Basic Woodturning/PCC Chuck
February 3	Cutting Dovetails by Hand
February 10	Survey of Stationary Tools
February 17	Fundamental Wood Finishing
February 18	Finishing with Hydrocote
February 24	Getting the Most Out of your Table Saw
March 3-4	Wood Turning with Liam O'Neill
March 10	Routers and Jigs
March 17	How to Build a Workbench
March 23-25	Atlanta Woodworking Show
March 31 & April 1	Bandsaw Seminars with Mark Duginske
April 6	Tage Frid Design Lecture
April 7-8	Tage Frid Workshop on Building Solid Wood Cabinets
April 20-21	Making the Traditional Shaker Oval Box
April 21-22	Making a Wooden Plane
April 27-May 1	Build a Windsor Chair with Michael Dunbar
May 5-6	Chip Carving Workshop with Wayne Barton
May 18-20	Hands-On Turning Workshops with Ernie Conover

1990 Seminars at Highland Hardware

Sharpening

- *Saturday, January 6* — *9 am to 4 pm*
- *#S1* — *Admission: $25.00*
- *Instructor: Zach Etheridge*

Sign up early; this one always sells out fast. Sharpening skills are absolutely essential, and are easier to acquire than you think. Emphasis is on sharpening plane irons and chisels using Japanese waterstones; any other kinds of tools will also be addressed. Bring along a few tools to work on, and bring your own stones if you have them – if you don't, use ours and find out how they work.

Getting the Most Out of your Scrollsaw

- *Saturday, January 13* — *9 am to 4 pm*
- *#SS1* — *Admission: $25.00*

During the 1980s, the scrollsaw became one of the most popular woodworking machines. Great strides were made in tool design, and prices actually came down. In this seminar, Brad Packard will show scrollsaw owners a number of things not usually dealt with adequately in owner's manuals, including maintenance fundamentals, choosing and tensioning blades, and how to easily perform a variety of cuts, including interior cuts.

Basic Woodcarving Course

- *January 10 - February 14*
- *Wednesday evenings* — *7 pm to 9:30 pm*
- *#BC1* — *Admission: $100.00*

This course is geared for beginning to intermediate level carving students. Each participant will select a project and follow it to completion within the 6-week period. Tony Dileo will begin each class with a presentation on a topic relevant to the stage reached by students' projects. The bulk of each class will be devoted to hands-on work by students, with time allowed to handle questions and solve problems encountered while working. The fee includes enough wood to handle a moderate-sized project. (If you select a larger project, additional wood may be purchased from the store.) Tools must be supplied by each person. For those without tools, a list of recommended tools will be provided. Bench space and sharpening equipment will be provided at the class. Size is limited to 12 students.

Course: Carving a Wood Mask

- *January 8 - February 12*
- *Monday evenings* — *7 pm to 9:30 pm*
- *#CM1* — *Admission: $100.00*

Format is identical to the basic carving course above, except the project for each student will be a life-size sculpted mask.

Using Hand Planes

- *Saturday, January 20* — *9 am to 4 pm*
- *#HP1* — *Admission: $25.00*

Making shavings with the noblest of hand tools is the topic in this popular hands-on class led by Zach Etheridge. Jointer planes, smoothing planes, block, rabbet, and combination planes will be discussed, demonstrated, and used by participants; emphasis is on joinery, finishing, and shaping by hand. Zach will also discuss tinkering with your planes to make them better than money can buy. Bring any planes you have, especially old and unusual ones. Some are available for those not yet equipped. ***Sharpening skill is prerequisite.*** Class size is limited, so sign up early.

The Charlotte, NC Woodworking Show

- *Friday thru Sunday, January 26-28*
- *Charlotte Convention Center*

(Call the Show Office at 800-826-8257 for details.)

Highland Hardware will travel again to Charlotte, NC to participate in one of the South's largest regional woodworking shows. In addition to exhibits of tools and supplies by vendors from around the country, there will be free educational workshops as well as (for an extra fee) seminars by nationally-known woodworking educators.

Basic Woodturning & Using the Precision Combination Chuck

- *Saturday, January 27* — *9 am to 4 pm*
- *#BT1* — *Admission: $25.00*

Tony Dileo of Highland Hardware will present a one-day introduction to woodturning which will include demonstration of basic techniques for spindle and bowl turning. Tool selection, sharpening, and chucking methods will also be covered, with special emphasis on the Precision Combination Chuck.

Register for seminars by visiting the store, or by mailing the order form found on page 62 of *Wood News* along with a check for the seminar fee. Visa, MasterCard, and Discover users may register by phone at (404) 872-4466.

(Fees are refundable if you cancel at least *two weeks* prior to the seminar.) Location for all events (except Woodworking Shows) is our seminar room behind the store.

Cutting Dovetails by Hand

- *Saturday, February 3* — *9 am to 4 pm*
- *#DT1* — *Admission: $25.00*

The dovetail joint stands for many woodworkers as the symbol of hand tool craftmanship, and for most aspiring joiners is regarded as the most challenging test of their skills. Participants will practice all the fundamental skills of hand joinery: layout, sawing, chiseling and repairing the finished joint. Discussion will relate these skills to other joints such as mortise and tenon, but the main energy of the day will be devoted to successful dovetailing by one and all. Zach Etheridge instructs.

Survey of Stationary Tools

- *Saturday, February 10* — *9 am to 4 pm*
- *#ST1* — *Admission: $25.00*

When you're setting up, expanding or upgrading your shop, several questions always come up: what tool should you get first? What technical info do you need that the manual doesn't cover, and how can you safely learn basic operating techniques? This class with Brad Packard will answer all these questions and more. Brad will use and discuss a number of basic shop machines, including tablesaw, bandsaw, radial arm saw, jointer, planer, drill press and belt/disc sander, covering set-up, operation and basic maintenance for each.

During the afternoon, Torben Helshoj, the machine expert who appears in the Robland combination machine video, will be here in person to demonstrate how a variety of tools (including tablesaw, sliding table, jointer-planer, shaper and mortiser) have been successfully combined in one space-saving, affordable unit.

Fundamental Wood Finishing

- *Saturday, February 17* — *9 am to 4 pm*
- *#WF1* — *Admission: $25.00*

Zach Etheridge will provide a day-long demo of finishing techniques covering many of the most popular and practical finishes: tung oil and Watco, oil-varnish mix, and other custom chemistry. Wood preparation (with special emphasis on using planes & scrapers), filling, staining, dyeing, and maintaining the finish will be covered. The focus will be on using simple methods to achieve consistently outstanding results.

Finishing with Hydrocote

- *Sunday, February 18* — *1 pm to 4 pm*
- *#FH1* — *Admission: $15.00*
- *Instructor: Zach Etheridge*

Fast-drying, environmentally safe Hydrocote water-based lacquer and polyurethane finishes are revolutionizing the furniture finishing process at all levels, from the home shop to large production factories. The class will feature step-by-step demonstrations of the use of Hydrocote, including application by brushing or spraying. Time will be allowed to answer questions you have about Hydrocote.

Those attending will receive a complimentary sample of one of the Hydrocote products.

Getting the Most Out of Your Table Saw

- *Saturday, February 24* — *9 am to 4 pm*
- *#TS1* — *Admission: $25.00*

Brad Packard will begin with fundamental table saw techniques, and continue through advanced applications. Fundamentals will include setting up and adjusting your saw, operating your saw safely, and producing accurate rips and crosscuts. Basic joinery, the role of the table saw in preparing stock, and useful jigs and fixtures which you can make for your table saw will also be covered. Advanced work will include making raised panels and decorative moldings on the table saw. Tage Frid's book, ***Joinery: Tools and Techniques*** will be referred to during the seminar, and is a good reference for participants to own.

Wood Turning with Liam O'Neill

- *March 3-4*
- *Saturday 9 am - 4 pm Sunday 9 am - 3 pm*
- *#LO1* — *Admission: $60.00*

Liam O'Neill will be with us for a weekend of woodturning, Irish style. Any aspiring or already-addicted turners who missed Liam on his last visit will have another chance to see a highly talented and thoroughly amiable craftsman demonstrate technique with a vast array of tools, and create his unique brand of beauty on the lathe. Liam will cover everything from basic turning (including his innovative method of grinding gouges) to making bowls full of holes – an experience not to be missed.

Routers and Jigs

- *Saturday, March 10* — *9 am to 4 pm*
- *#RJ1* — *Admission: $25.00*

This is a full day on the most versatile machine in the shop. Zach Etheridge will start with router basics, and continue through shop-built jigs for shaping and joinery, commercial dovetail jigs, and raised-panel construction. He'll take a look at what's new and exciting in the rapidly changing router marketplace. You'll also get the step-by-step on the unique table-mounting system developed here at Highland Hardware.

How to Build a Workbench

- *Saturday, March 17* *9 am - 4 pm*
- *#WB1 Admission: $25.00*
- *Instructor: Zach Etheridge*

The workbench is not only one of the most fundamental of all woodworking tools, it's also a great woodworking project in its own right. In this class Zach Etheridge discusses the merits and demerits of various common workbench designs, and covers the process of designing a bench suited to your own needs and shop space. Building the base and attaching the top, installing Record vises and other traditional vise hardware, and building in a system of bench dogs will be covered in detail. Focus will be on practical bootstrap methods available to the small shop not already equipped with a good bench on which to do the work.

The Atlanta Woodworking Show

- *Friday thru Sunday, March 23-25*
- *Lakewood Fairgrounds*
  2000 Lakewood Ave, SE (off I-85)

(Call the show office in Calif. at 800-826-8257 for details and to receive a free brochure).

Don't miss this opportunity to see the exhibits of a large number of woodworking suppliers from around the country. There will be demonstrations of countless new tools, and free educational workshops to attend. Seminars by leading woodworking educators will also be available for an extra fee.

Highland Hardware will have a large exhibit featuring many of our tools at outstanding savings.

Bandsaw Seminar with Mark Duginske, author of the new *Bandsaw Handbook*

- *#BS11 Saturday, March 31 9 am to 4 pm*
  or
- *#BS12 Sunday, April 1 9 am to 4 pm*
- *Admission either day: $40.00*

One of the most popular new woodworking books on the market is Mark Duginske's comprehensive manual, *Bandsaw Handbook*.

Mark comes to Atlanta this spring for two seminars in which he will demonstrate many of the techniques discussed in his new book. Each of the intensive one-day seminars will begin with adjustment and tune-up of the bandsaw and will end with jigs and fixtures. Topics will include: wheel alignment; tracking large blades for ripping and resawing; co-planar tracking; tracking small blades using center tracking; choosing the best blade; modifying blades for efficiency; adjusting the guides; jigs and techniques for cutting curves; jigs and techniques for straight cuts; and bandsaw jigs for cutting mortise and tenon and dovetail joints.

Design with Tage Frid An Entertaining Slide Lecture

- *Friday, April 6* *7:30 pm*
- *#FL1 Admission: $5.00*

(free for those enrolled in weekend seminar)

The most widely known and highly regarded woodworking teacher and author in the U.S. will share an evening of slides on woodworking and design, punctuated with his insightful commentary and penetrating wit.

Mr. Frid will show a large number of slides illustrating examples of what he considers both good and bad design, and explaining what makes each so.

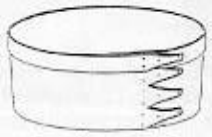
If you are interested in broadening your design perspective, or merely understanding woodworking in its broader context, you will find this event enlightening, satisfying and fun. Please reserve a space in advance.

Tage Frid Workshop on Building Solid Wood Cabinets

- *April 7-8*
- *Sat. 9 am - 4 pm Sunday, 9 am - 3 pm*
- *#TF1 Admission: $90 (incl. Fri. lecture)*

Tage Frid, dean of America's woodworking teachers and source of some of our most popular and enjoyable seminars in the past, returns to Atlanta for a seminar in which he will use machines and hand tools to demonstrate building a small solid wood cabinet, utilizing his unique hidden spline-miter joint instead of mortise and tenon joints. Though it appears complicated, the spline-miter joint is easy to make, as Tage will reveal in this seminar, and is a joint that can be used in many kinds of furniture. Drawer construction, and building necessary jigs for the project will be included. He will also cover other woodworking subjects of interest to the group.

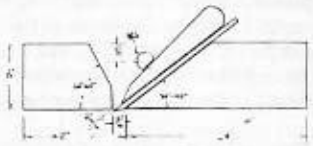
Seating is limited, so register early to avoid missing a chance to see and hear a truly remarkable teacher performing woodworking demonstrations in an action-packed seminar.



Making the Traditional Shaker Oval Box

- *April 20-21*
- *Friday 6 pm - 10 pm Saturday 9 am - 4 pm*
- *#SB1 Admission: $90.00*

John Wilson, an expert boxmaker in the Shaker tradition, will teach this very popular two-day hands-on class in which each participant will make several Shaker oval boxes. Five sizes can be made in the class, and most students can expect to complete a nest of five. Working from patterns, you'll learn to cut hardwood veneers, bend box bands, fit tops and bottoms, and form handles for carriers. The fee includes use of tools and cost of all necessary materials for making the boxes, including patterns. Class size limited.



Making a Wooden Plane with John Wilson

- *April 21-22*
- *Saturday 6 pm - 9 pm Sunday 9 am - 4 pm*
- *#WP1 Admission: $75.00*

Wooden planes remain a part of the craftsman's tool kit. They also remain within the range of the home shop's facility to make. In this two-day session, each participant makes a wooden block plane. The workshop fee includes use of all necessary tools, plus the cost of materials for the plane, along with several handouts which will provide useful background for toolmaking.

An important part of the process in this seminar is the shaping, hardening, tempering, and sharpening of the tool steel blade. What you learn here can be applied to the whole range of blades for woodworking hand tools. Class size is limited.

Build a Windsor Chair with Michael Dunbar

- *April 27 - May 1 Friday thru Tuesday*
- *Daily hours: 8:30 am - 5 pm*
- *#WC1 Admission: $450.00*

Each participant in this 5-day class will have the opportunity to build a complete sack-back Windsor chair under the guidance of Michael Dunbar, America's best-known Windsor chairmaker. The admission fee includes all necessary materials. ***Prior woodworking experience is required.*** Participants should provide their own hand tools, although a shared pool of tools will be available to borrow for those without certain tools. (A list of tools will be provided after registration). Each participant should read a copy of *Make a Windsor Chair with Michael Dunbar* (available from Highland Hardware for $13.95 plus $3.00 shipping) before the class begins.

Register by sending your deposit of $225.00 to Highland Hardware. (The balance of $225.00 is due no later than April 6, 1990.) Registration can also be done by phone using a charge card. Register early, as the class is limited to 14 students.

Chip Carving Workshop with Wayne Barton

- *Sat. - Sun., May 5-6* *9 am to 5 pm*
- *#CC1 Admission: $95.00*

The Swiss style of chip carving is the most decorative, functional, and enjoyable method of carving, and can be quickly learned by everyone. This hands-on class will cover all phases of the Swiss style. Students will practice the specific techniques for producing border designs, grid work, rosettes and lettering. What tools to use and how to sharpen will also be covered. (Tools are available to purchase for those who don't already have them). Carving blanks to practice on will be available for $1 each. Wayne Barton, the instructor, is Director of the Alpine School of Woodcarving, Ltd. of Park Ridge, Illinois. Please register early, as the class size is limited.

Hands-On Turning Workshops with Ernie Conover

- *#TW11 Friday, May 18 6:30 pm - 10 pm*
- *#TW12 Saturday, May 19 8:30 am - Noon*
- *#TW13 Saturday, May 19 1 pm - 4:30 pm*
- *#TW14 Sunday, May 20 8:30 am - Noon*
- *#TW15 Sunday, May 20 1 pm - 4:30 pm*
- *Admission: $60.00 per workshop*

During this weekend, Ernie Conover from Conover Woodcraft Company of Parkman, Ohio will be at Highland Hardware to conduct five 3-1/2 hour *hands-on* turning workshops. Rather than simply watching a turning demonstration, each student will have his own Conover 16" heavy-duty lathe to use for the duration of the workshop.

The first part of the program will be a short primer from Ernie on spindle turning followed by an exercise at the lathe. Then it's on to faceplate work with a demonstration by Ernie, after which each student will turn a small green wood bowl. Each workshop is limited to 10 students. Pre-sharpened professional-grade turning tools will be provided for use in the workshop.

This is a unique opportunity to develop your turning skills under the tutelage of an expert and to resolve problems you may have experienced while turning in the past.

To register, select one of the five times and bring or send your fee to Highland Hardware, or register by phone using a charge card. Participants must sign a liability release to complete their registration.

The Makita 2012 Portable Thickness Planer

by Hugh Foster

THERE HAVE BEEN OTHER portable surface planers on the market for the past four of five years, but none of them has ever matched the Makita's combination of width of cut, quality of cut, ease of use, and realistic price.

All the portable power planers look pretty much alike. The units are approximately a foot and a half wide, a foot and a half high, and just under a foot from front to back. These physical similarities are deceptive; the Makita is different from the other portable thickness planers in several respects. Most portable planers on the market have a fixed bed and the cutterhead and motor ride up and down, powered by a crank. One of the easiest to crank, the Makita planer is more like my European model: the cutterhead is fixed, and the table (which is called a bed when it is not movable) moves up and down. The Makita's cut is two inches wider than that of the most popular competing model – those might be an important two inches; many projects can be completely built with components 12" wide or less. The Makita planer offers a very fine cast dust hood as an option; I wouldn't consider the hood optional, for planing makes lots of waste. Setting up the dust collector is lots quicker and neater than shoveling the chips, but that's not really the reason for using the

collector. Along with the chips, planing generates very fine dust that collects in hard-to-clean places like your nostrils, sinus cavities and the like. This fine dust is what messes up your lungs and gunks up your tools. The Makita 410 dust collector does a good job of catching the chips and the dust; I've used a 410 in my shop for years, and can't imagine setting up this fine small Makita planer without it.

An interesting side note might be that the Makita's dust hood arrived without the requisite fasteners; I was worried about this because metric fasteners are hard to get in small-town hardware stores, but the 10-32 machine screw I used to mount the dust hood was a perfect fit.

I pay $22/hour for planing in my small town. At this rate, forty hours of planing will pay for a planer – almost twice. And, when you have control over the sharpness of the blades and depth of cut, you'll find that you get better work and save a lot of material, perhaps enough to pay for the machine a third time.

Blade installation is another area where the 2012 shows a major difference. The other portable planers use an easy-to-change set-up that requires that the blades be sharpened regularly, and the Makita uses double-edged throw-away blades that can be changed in a second. A friend who uses another portable planer suggested that a monkey could be trained to change the knives on his machine; after my single attempt at changing the knives on both machines, I suggested to him that "The monkey could be blind and still successfully change the Makita's knives." My monkey won't have to search for a sharpening service or lose a bunch of time at the grinder either. With the cost of labor going up as it has in recent years, and with good sharpening getting hard to find as well as more expensive, the throw-away blades seem a terrific idea to me – especially if you're likely to use the planer in potentially abusive situations. Planing a nail will put any kind of blades out of commission, but the throw-away blades will be both reversible and cheaper to replace. When the cover is removed, the Makita cutterhead locks in place automatically for blade changing. The Makita has a locking switch to prevent unauthorized use; each user will have to decide whether that is a useful feature or a nuisance (which it might be if you're hauling it to various job sites). At 52 pounds, The Makita planer is over 10% lighter than the other most popular portable planer. The Makita also features a depth-of-cut gauge that is missing on any other planer I've encountered. When a workpiece is inserted in the planer, the depth gauge will rise, indicating the depth of cut. Though a scale would make the gauge more useful, it helps to keep from taking too much off at a pass. The planer is scaled elsewhere in both inches and mm. Attention to details like this make the Makita look like a real winner!

Makita's 18-1/4" stand seems to be the ideal height, for 1" planing is done 28-1/4" from the floor. Highland's Red Leg Stand is about 28" high, putting the bed at about 39" for 1" planing. If you don't like the height of either of these stands, building your own will be an easy enough task. Indeed, a well made wood stand might absorb some of the vibration created and reduce the noise level in your workplace. This is not to say the planer is overly loud: it measured 94 dB unloaded and 101 dB while planing 1/16" from 8-1/2" maple. As planers go, this is fairly quiet; nevertheless, wise woodworkers (woodworkers who want to be able to hear in their old age) will wear some kind of hearing protection.

The Makita manual is a model of clarity that the makers of European and American woodworking tools should strive to emulate. The instructions, particularly regarding blade changes, are among the best I've ever seen.

If you need the extra width capacity, want to enjoy the latest high-tech features, and don't want to fool much with sharpening, choose the Makita portable planer for your shop, along with a dust collector. Together they will revolutionize your woodworking.

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WOOD NEWS 24 **Winter 1990**

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highland hardware

New DeWalt Compound Miter Saw Is Replacing the Radial Arm

by Mark Duginske

OCCASIONALLY a tool comes along that is an outstanding example of creative design. This is particularly true of the new DeWalt model 1707 compound angle saw.

Creative design is often a matter of mixing two seemingly unrelated objects into one totally new one. In this case the DeWalt compound angle saw is a mixture of the radial arm saw and the power miter box. It has the pivoting guillotine features of the miter saw and the width capacity and compound angle cutting ability of the radial saw, yet it comes in a compact design that is easy to carry.

One selects a tool for the working options it offers as well as for the capacities it can handle. The beauty of this tool is that it offers the option of three different sawing techniques. Like the "chop box," the saw can be lowered through the work. As with the traditional radial arm saw approach, it can be pulled through the work. The third option, pushing the saw through the work, is a European concept. It was first introduced in the USA with the Inca radial arm saw which was designed to cut on the push rather than the pull. When using the DeWalt on wide boards, the saw is first lowered onto the workpiece and then pushed through the remaining material.

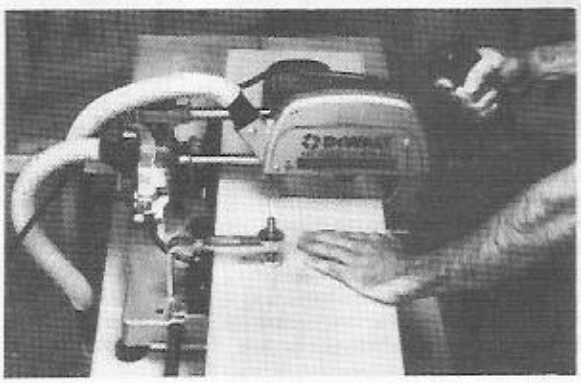
It may take some time before you get used to the push technique, but once you do, it will seem very natural. When you think about it, pushing is the best option. No one would ever think about pulling a circular saw backward when cutting a sheet of plywood. Yet that is exactly what you are doing when you pull a radial arm saw through a piece of wood. Pushing allows you the option of feeding the blade a manageable amount of material. When the blade is pulled into the wood, it has a tendency to feed itself and can take too much material at once. This creates the familiar radial arm saw phenomenon of the saw bogging down, and this in turn causes a rough cut.

The chop and push techniques are possible on this saw because of the two unique telescoping arms that support the saw motor. The arms allow the saw to move very smoothly in and out. A hinge allows the operator to lift or lower the saw. This "in and out" and "up and down" motion is smooth because the saw is so well balanced.

DeWalt's design and construction are in the best European tradition; the saw is actually made by Elu for DeWalt. When I use this saw or my Elu plunge router, I always have the satisfaction of knowing that I am using the very best tools available.

When the saw came out of the box it was perfectly adjusted. The 90 and 45° settings produced perfect cuts. (Try that with a new radial arm saw). The one thing that may seem a little clumsy on this saw is the guard. Releasing the guard requires a fair amount of pressure and is something that you have to get used to. However, applying this pressure does cause you to take a firm grip on the tool before you use it.

The saw is also capable of cutting a compound angle. This is done by an adjustment that allows the whole cutting mechanism to be rotated at an angle. Here again, it worked well for me straight out of the box.



I should mention that the saw comes with a very high quality blade that is specifically made for the saw. It has a negative rake that prevents the board from being picked up on the push stroke. The blade that comes as standard equipment makes a smooth cut on hardwoods. An optional blade with more teeth makes an even smoother cut.

After having used the saw in my shop for six months, I find that my working habits have changed. Even after six months the saw is still super accurate. That's the greatest advantage of this saw over a radial arm saw. When the contest is for accuracy, the DeWalt compound angle saw knocks out the radial arm in the first minute of the first round. In fact, I took my radial saw apart to make a new table for it because it had warped. After several months, I still haven't gotten around to making a new table for the radial arm.

The conclusion that I have come to is that I would choose the DeWalt 1707 over a radial arm saw. Even though the DeWalt's 10" crosscut capacity is less than a radial, it is an accurate 10" cut. For accurate crosscuts on wide pieces, I don't trust the radial arm saw anyway, and instead use a variety of other techniques, including a router or a cut-off tray on the tablesaw.

Although the radial arm saw promised to be all things to all people 20 years ago, its popularity for high quality work continues to decline. The router and the router table are often a better and safer choice for shaping, rabbeting, and dadoing. This is especially true with plywood because of the thin veneers which tend to tear out.

I have found the DeWalt compound miter saw to be a first class tool. It does not do everything that a radial arm saw can do, but what it does do, it does extremely well. Combined with a plunge router and a router table, it will let you do everything a radial arm saw can do except rip, and the radial saw's strong suit isn't ripping anyway. By using the DeWalt for cutting and a router for shaping, you avoid the time consuming set-up time needed for the radial saw.

The DeWalt 1707 has become the main crosscut tool in my shop. The radial saw will probably be used more on the construction site where its lack of accuracy isn't as disturbing as in a shop setting.

I think it's important to understand that woodworking is an evolving craft. This tool is a step in that evolution.

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The DeWalt 1707 and its accessories are available from Highland Hardware as listed below:

1707	Compound Miter Saw	$499.00
1707-1	8-1/2" 60t Forrest Blade	89.00
1707-2	17-ft. Dust Extractor Hose	66.50
1707-3	Work Clamp	36.50
1707-4	Extension Support System	79.50

(Add shipping charges listed on page 62)

A Matter of Design

Edited by Zach Etheridge and Chris Bagby

BACK IN SEPTEMBER OF 1980, *Fine Woodworking* magazine generated a veritable storm of controversy and reaction with the publication of three photographs which appeared on the back cover of issue #24. Pictured were Garry Knox Bennett's Nail Cabinet, a well-proportioned, beautifully finished padauk showcase with a large bent nail driven into one of its doors as "a refined comment on crafts processes and router-bit aesthetics;" and Wendy Maruyama's Writing Desk, a piece with a narrow triangular maple top featuring purple painted squares where tenons from the base would have come through but didn't, and a bounding squiggle in green crayon intended to "graphically express [the writing table's] function." Readers' reactions ran the gamut from interested approval to steaming outrage; emotions reached incandescent heat and the woodworking community reverberated with the contumely of debate.

Nine years later The Taunton Press, publisher of *Fine Woodworking*, a growing library of woodworking videos, and many of the finest books on woodworking, has once again turned a spotlight on "the artistic fringe of cabinetmaking" with the publication of ***Designing Furniture – from concept to shop drawing: a practical guide*** by Seth Stem, edited by Laura Tringali. Seth Stem teaches furniture design at the prestigious Rhode Island School of Design. The book naturally attracts attention because the process of designing furniture is one that plagues practically every woodworker. Those who build from published plans or who faithfully copy existing work usually do so out of a sense of their own inability as designers; those who wish to execute only original designs often must struggle to create, only to see the finished piece obviously less successful than their dreams.

How can woodworkers in either camp learn more about design? There are certainly many fundamentals that can be taught, such as classically recognized attractive proportions, the average height of chairs, standard knee clearance under desks, and so on, and this kind of information is well covered in ***Designing Furniture's*** text and appendices. But the book doesn't begin or end there. The majority of the objects Stem uses to illustrate his text are of the Post-Modern, self-expressive ilk, with enthusiastic use of color and forms which are unusual to say the very least. Is this truly the new direction of furniture design?

The debate rages once again. This time around it takes place more publicly than ever, as one of the interested parties is Atlanta newspaper columnist Jack Warner, who has expressed his thoughts on ***Designing Furniture*** in his widely syndicated weekly column on woodworking. In this issue of *Wood News* we have reprinted Jack's editorials and a response from John Kelsey, associate publisher for books and videos at The Taunton Press. We have included an unsolicited letter from a customer who liked the book, as well as reviews from a library trade journal and the *L.A. Times Magazine*. Our hope is to encourage any interested reader to further reflect on the nature and aesthetics of design.

Rules Overpower Taste in *Designing Furniture*

by Jack Warner

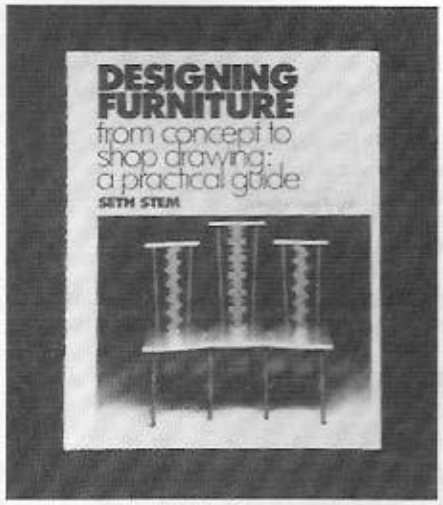
(First published April 30, 1989)

The latest book from The Taunton Press arrived almost immediately after what is always one of the most eagerly anticipated weekends of the year for me – the one when Tage and Emma Frid come to town.

The coincidence has brought on a lot of odd feelings and philosophical ruminating about where we, as woodworkers, are headed, and where The Taunton Press, which has had an incalculable effect upon the woodworking boom, is going.

The book is called ***Designing Furniture***, a $24.95 hardback by Seth Stem, who teaches at Rhode Island School of Design. This, of course, is the school where Mr. Frid taught for many years and influenced more of today's outstanding woodworkers than any other single man.

Some would go so far as to say he is the father of fine woodworking in America.



Certainly his books, the best in the field, taught me all I know about working wood.

Most of those who know Mr. Frid only through his trilogy, The Taunton Press's first venture into book publishing, consider him a technician, the man who can cut every joint imaginable. But if you talk to him, you realize his chief concern is design.

Back cover of *Fine Woodworking* #24

It is a curious thing that Mr. Frid's sense of design is seen by some as dreadfully avant-garde and by others as hopelessly old-fashioned.

I speak, of course, of those on the one hand who believe nothing designed in this century is worthy of the woodworker's attention, and on the other of those whose chief aim in life appears to be doing things that quite clearly have never been done before.

"There's usually a reason why something's never been done before," Mr. Frid is wont to say, peering over the top of his glasses with that impish grin of his.

Mr. Stem's book is full of things that have never been done before.

It is sad, to me, to know that a school where Mr. Frid tried, usually successfully, to teach woodworkers to make furniture that works is now given over to encouraging the outré, the sensational whose only purpose is to be sensational.

Mr. Frid takes the position that furniture, before it is art or anything else, must serve its purpose. He has no use for a chair that is not comfortable, for a dining table that will not safely hold a glass, or a coffee table that might do fearful damage to a small, awkward child. I submit this is not a matter of taste but of sanity.

Once that requirement is satisfied, in Mr. Frid's view, design can have a field day. But there are still principles.

He carries a couple of trays of slides with him for his lectures; some are of pieces he considers good, some are bad.

He points out one piece, gaudily painted in several colors, with knobs and bumps and encrustations all over it.

"It looks like a parakeet," he says wonderingly.

Lest one think that I have no use at all for ***Designing Furniture***, I should say it is difficult to argue with most of the postulations Mr. Stem sets forth, and there are many useful tables and charts.

The general deduction to be made from all this, I suppose, is that you can follow every rule of design and still make a hideous piece of furniture. Mr. Stem's own work, heavily concerned with bent wood, is some of the nicest in the book.

There is a Sam Maloof rocking chair there, looking as though it is trying to find a way out

There is not a single piece of Mr. Frid's work, which is curious, considering that if there is one institution to which he has meant more than Rhode Island School of Design, it must be The Taunton Press.

In fact, if it were not for the publisher's imprimatur right there on the spine, I would not have believed this book was a product of The Taunton Press.

The publisher, chiefly through the magazine *Fine Woodworking*, has steadfastly maintained standards of good taste and the best techniques.

This book will not find much favor with that institution's constituency.

There is so much in ***Designing Furniture*** that is meaningless attention-grabbing – a ploy that has pretty well taken over some other disciplines and clearly is threatening woodworking.

The book is not up to Taunton's standards; no dust jacket, a gaudy, high-tech sort of magazine-style design. It looks more like a product of *Popular Mechanics* than of *Fine Woodworking*.

In fact, it looks like a parakeet.

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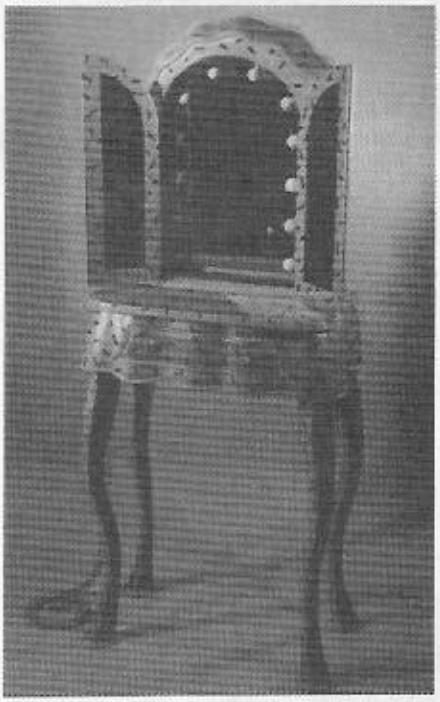


"All American Make-Up Mirror dressing table by Paul Sasso of Murray, Ky., used carnivals and fairs for its icons and so it has a lively, festive air. (Photo by Paul Sasso.)"

June 1, 1989
Jack Warner
The Atlanta Journal-Constitution

Dear Jack:

I'm writing to discuss your piece of April 30, 1989, about Tage Frid and Seth Stem and Taunton's book publishing program. I'm sure this is the first time I have ever written to a reviewer to discuss his views of our work. I guess I hope to provoke you to think again, and perhaps to write again too.

I have to say at the outset that I always enjoy, and appreciate, your column. You were one of maybe two woodworking writers who really seemed to understand what we do.

But now you write that Seth Stem's book makes you wonder where The Taunton Press is going. The short answer is, the same direction we have always been going, toward good and useful information shared among craftspersons. We are journalists, we cover the world of woodworking as we find it. We're not arbiters of taste.

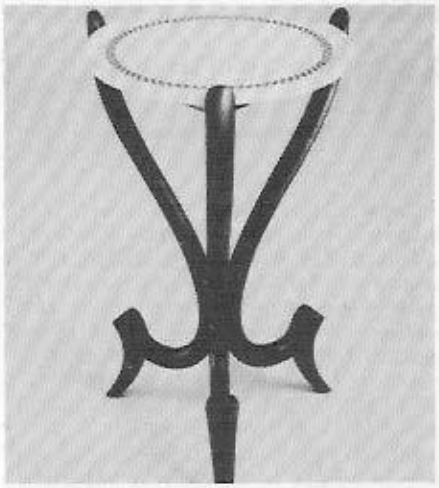
The sum of your review seems to be that you don't like the work Stem chose to illustate his points, and therefore we should not have published his book. I'll try to show you why Seth Stem's book absolutely belongs in the publishing continuum we've established these last dozen years.

Furniture design is the most difficult subject in our field. When we began publishing, there was exactly nothing useful in print about it. The manifold difficulties seem to reduce to these three: 1) most designers are visual people, not able to tell what they do; 2) design might require some inefffable thing that's neither teachable nor even communicable; 3) design is so enmeshed in taste that noisy clashes of opinion are inevitable. The first hurdle is only a challenge in journalism, to find lucid designers and help them commit their thought to print. The second might be true, but even if so, there remains a base of useful and teachable techniques to sort out and set down – "the postulations Stem sets forth." The third we take on the chin – there's nothing that somebody won't find hideous. We can't operate in fear of those who would arbitrate taste.

So anyway, in the last 12 years we've pumped not one but seven books into that wood-design void. Our initial venture into book publishing (before the Frid trilogy, actually) was the ***Biennial Design Book***, the first of four (soon five) collections of photographs of contemporary work in wood. These books contain nothing but the fruit of "our Taunton Press constituency," they document the state of the woodworker's art in our time, and you don't have to turn far into them to find things that might look "like a parakeet."

We (with Frid's invaluable help) approached the design books as woodworking journalists: we excluded things that were badly made (or badly photographed), we also excluded plain bad design, but we carefully kept space for images that didn't suit our own tastes. This is a difficult but crucial distinction.

As you say, it's true that some contemporary pieces, especially student work, are naked



"Bruce Volz of East Hampton, Mass., produced an extremely pleasing active form with the linear base of this table. Interesting interior relationships hold the viewer's eye. (Photo by David Ryan.)"

grabs for attention. So are many antique pieces; ostentatious display has always been a function of fine furniture. But some contemporary pieces present ideas we don't yet understand; antique styles, when they were new, often were that way too.

I guess I've seen as many pieces of contemporary furniture as anybody. Often I don't like the work on first encounter. But when I discuss such pieces with their makers, I usually find thoughtful people who've seriously followed the logic of their ideas. When I take the time to understand their intentions and to comprehend their work, to look and touch and walk all around, my initial unease sometimes solidifies, but other times it turns into appreciation. I've had that experience enough to have learned to read the internal message "I don't like this," as "Something new and worthwhile might be going on here; find out more."

The first design book provoked a lot of noise from people who didn't like some of the work. It'll probably surprise you to learn that we took as much flak from contemporary makers who want to see no antique reproductions, as from those who believe nothing designed in this century is worthy of attention. The subsequent books drew less flak. I always hoped the series had softened up the boundaries, helped people to accept as valid, work which didn't fit their own tastes or experience. More likely, people with rigid opinions just quit buying the books. Anyway, next we embarked on an open-ended series of books about learning how to design.

The first of these (in conception, though not in execution) was Tage Frid's ***Book 3, Furnituremaking***. Tage of course had free reign in it and as far as I know he considers that text his statement on design, on what's good by his taste, and on how to do it. In it, as in his life's work, Tage proceeds from the axiom that you should design around the construction: work with what you know how to make, start by seeing what you can do with the tools, techniques and materials you have already explored.

(continued on next page)

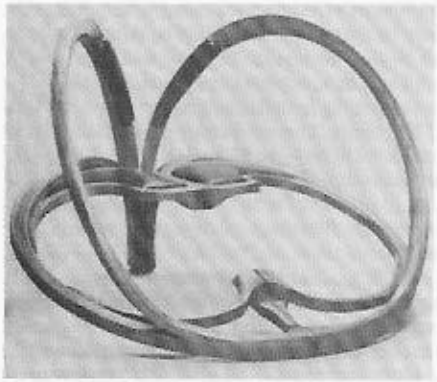
A Matter of Design

(continued from previous page)

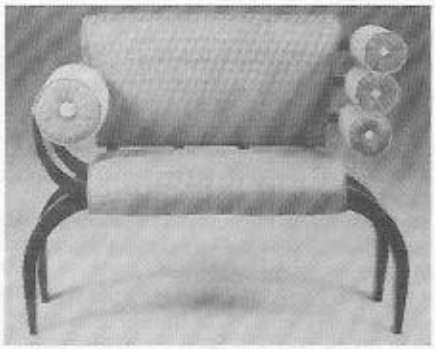
The second was Simon Watt's book, ***Building a Houseful of Furniture***. Simon was educated as an engineer and he is an obdurately practical man. His book proceeds room by room through the house and he emphasizes household function—how do you want this furniture to work? As much as anyone can, Simon obeys the axiom that form follows function, that you must always begin (and usually end) with function.

By now we have made a book that follows the cabinetmaker's axiom, form should follow construction, and another that follows the engineer's axiom, form should follow function. But there's lots of good thought (Pye, for example) to the point that both of these are actually masks covering the niggardly economics of small-shop production, and rather arbitrary as guides to form. And as an alternative there is the contemporary artist's axiom that form should follow Idea: the view Stem (among many others) holds. I think this is a perfectly valid proposition, intellectually as sound as the other two. Furthermore, actual woodworkers did make all that furniture, so the proposition has some currency in our world. And so, here we had a sound idea that promised to continue a decade-long publishing project, a qualified and willing author, and some evidence that an audience existed. Better yet, our contemporary author was even willing to support his points with some examples of industrial-design furniture and some antique pieces. This was exactly what we had been looking for.

Even so, nobody here had any illusions about the audience. We think books on design are important, but we also know they don't sell anything like books on joinery. The people who would like Stem's book will really use it, so we had to make a durable binding. But the edition is small, there are a lot of color photos, and a conventional cloth cover with a dust jacket would have forced the price up from $24.95 to $29.95 – prohibitive for students and struggling wood craftspersons. The book has a functional, well-crafted



"Seth Stem's rocking chair moves from side to side instead of front to back. (Photo by Gary Gilbert.)"



"The different-sized armrest bolsters of this asymmetrical loveseat by Kalle Fauset of New York, NY, provide balance. Using an odd number of bolsters on the right creates an informal, natural composition. (Photo by Seth Stem.)"

and appropriate binding, in fact the very same binding as the Frid trilogy. For you to consider it "more like a product of *Popular Mechanics* than of *Fine Woodworking*" must amuse our colleagues at Hearst as much as it does me.

By the way, I don't recall you or other reviewers complaining about the work featured by Frid, or Watts. I'll bet you liked their work, so no problem. But now comes Stem, an author whose tastes you don't share, and you complain not only about the work he chooses to show, but also that he fails to show any of Frid's work. You call this a curious lapse, but I think it was simply because (unlike the artisans Stem does feature) Frid already has a whole book devoted to his work. Given the opportunity, Stem chose to show some new stuff. I would have asked Stem about this, but he is traveling out of the country this summer.

You also find it sad to know that Frid's professorship has been given over to someone so different. I did ask Frid about this, during our *FWW* interview back in 1985. He was pretty plain about it. He just figured they'd had 35 years of Danish, that any successor in the same vein would never get out from under the shadow of the master, so it was time for a completely new approach. Makes sense to me.

You know I was editor of *FWW* during the golden black-and-white years, I've worked closely with Tage Frid on many projects, I brought Simon Watts into our publishing house and developed his book with him, and I also brought in Seth Stem. I respect all of their work, their diverse tastes, and I've worked hard for them, because I believe each of their books to be valuable contributions to the problem of furniture design. But for all of that I'm sure you don't know my own tastes. My job is not to advocate my own tastes, but to present such a visual smorgasbord that you are certain to find something that speaks to you, whoever you are. A newspaper reviewer's obligation is somewhat the same.

So OK. Frid's books spoke to Warner, gave him the gift of craft. Why can't Warner be glad that Stem is there to speak to others who hear a different wavelength?

Yours truly,

John Kelsey
Associate Publisher, Books & Videos
The Taunton Press

Controversial Furniture Book Forgets about Function

by Jack Warner

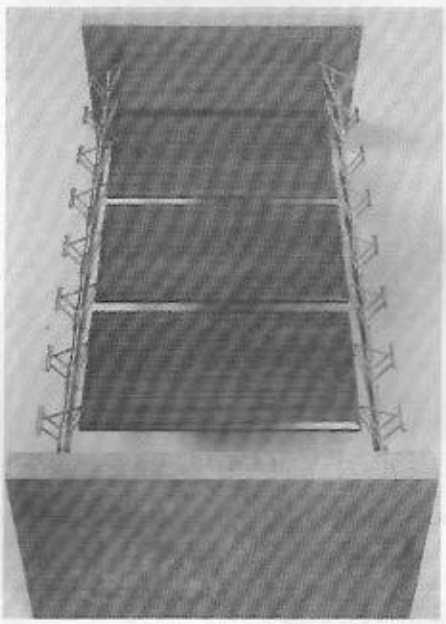
(First published July 9, 1989)

It seems the latest volume from The Taunton Press, ***Designing Furniture***, is becoming a first of sorts – a controversial woodworking book.

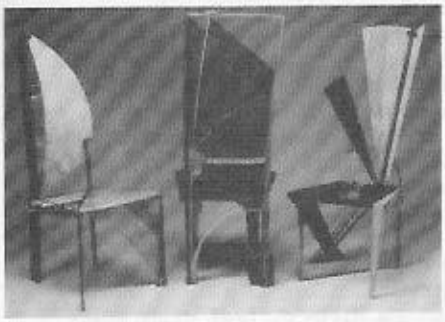
You may recall that I reviewed it here a couple of months ago and found it the first publication from that firm that I didn't like. Rather to my surprise, I learned recently that at least one major woodworking supply house has decided not to carry it. It's not an editorial judgment but an economic one: they don't think anybody will buy it.

My problem with the book, written by Rhode Island School of Design professor Seth Stem, was not the text but the illustrations; I have not sat down with it and counted them, but the preponderance of them are the most avant of avant-garde work. I found them preposterous, and objected to the implication that this sort of thing is the epitome of good furniture design.

The text of the book is much less objectionable, although I must say I found most of it very tedious going. Mr. Stem does a yeoman-like job of analyzing and quantifying the principles of furniture design, and there is nothing in it that really says you have to make gaudy, proposterous and even useless furniture. I think furniture design ultimately has as much to do with heart and soul and emotion as it does with graphs and formulas, and you can't quantify that, but Mr. Stem's book seems to gives a thorough grounding in everything that can be reasoned out.



"The form, materials and details in Seth Stem's table developed through the use of gems and architectural buttresses as visual references. (Photo by Gary Gilbert.)"



"A flamboyant character was developed in this chair series by Jay Stanger of Charlestown, Mass., through the use of bright colors, lively and incongruous forms, asymmetry and directionality as the main elements of the visual vocabulary. (Photo by Dean Powell.)"

I recently received a four-page letter from a reader politely upset with my view of the book. By implication, he suggested I am a Neanderthal whose idea of good taste stops somewhere immediately after Danish design. He also accused me of saying that The Taunton Press should never have published the book.

I reject both accusations, and I'll pass along my rebuttal here.

The first problem is not so much one of taste but of concept. If the book had presented much of the work illustrated therein as sculpture employing a furniture metaphor, I could accept that, and perhaps even enjoy some of it – a little of it. I would, perforce, have a different view of it.

As it stands, though, this stuff is presented as furniture, which implies that it meets, or attempts to meet, certain fairly ephemeral but nonetheless essential standards. For instance, I seriously doubt that anyone could bear to spend more than a few minutes in most of the chairs in this book.

Furniture should work; it is by the very nature of it functional. If it does not function – especially if its maker was never concerned that it should function – then it is not furniture. It might, for all I know, be art of the highest order, but by Neddy Dingo it isn't furniture.

I never intended to imply that this book should not have been published; I did intend to say that it was probably not going to enjoy widespread acceptance. If I am a Neanderthal, then most woodworkers who write me letters are still wandering around in Olduvai Gorge. They are not only not going to buy it, they are likely to be personally affronted.

For my part, I only wish The Taunton Press – an organization for which I have great admiration – had used a broader mix of photographs, and put something rather less grotesque on the cover. Had that been done, I believe ***Designing Furniture*** would have enjoyed brisk sales.

Finally, given Mr. Stem's position at RISD and the choice of pictures for this book, which one assumes were his choices, one has to worry about the current trend in formal woodworking education.

Here, I must admit, I probably am pretty Neanderthally. I believe it is the job of a university woodworking or furniture design school – or any other craft department – to give its students the broadest possible education, while teaching them to make a living. I strongly feel that the concept of "making a statement" is not something that should be encouraged at this level. I am not at all sure that furniture is something that ought to make statements in any case.

There is a wonderful book with which most potters are familiar, but which applies equally to any discipline, called ***The Unknown Craftsman***, essays by the Japanese craft aethestician Soetsu Yanagi translated by Bernard Leach. In one of these essays, Mr. Yanagi contends that in each generation, there are one or two artists who break valid new ground and lead us to greater heights. There are also a great number of workers who recognize their inability to break valid new ground, and choose to quietly try to perfect the work they know and understand. Between the two extremes are the folks who strike out in all sorts of directions, doing something new for the sole reason that it is new, making a great deal of noise and no lasting impression at all.

I believe the objects portrayed in ***Designing Furniture*** are made up largely of the latter. But if you want to learn about designing furniture, then you really ought to read this book. Don't let the photographs get in your way.

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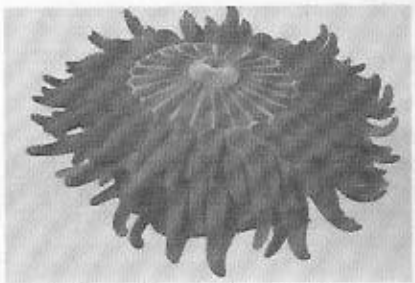

"The foam-rubber tentacles of Sea Anemone Chair by Larry Hunter of Long Beach, Calif., envelop the sitter. (Photo by Larry Hunter.)"

Chris Bagby, Editor June 24, 1989
Wood News

Dear Mr. Bagby:

I would like to recommend a book for Highland Hardware and for *Wood News* readers: ***Designing Furniture***, by Seth Stem, edited by Laura Tringali, from Taunton Press. I believe it should be on the shelf of every woodworker who is not content with duplicating pieces from measured drawings.

Subtitled ***From Concept to Shop Drawing: A Practical Guide***, this book will help the aspiring designer-craftsperson find his or her way in a difficult area. The accent should be on "practical" – this is not a high-flown theoretical treatise or refined aesthetic criticism; it is basic technique for design.

Woodworking libraries are full of technical manuals, with more on the way. But what are we to do with our wonderful skills? We've all had the unsettling and depressing experience of noticing a beautifully crafted clunker. It's especially unsettling and depressing when that clunker is your own, as I can attest: after long hours of care and labor, standing back to look can be a rude shock. Of course, after the piece

"This chair by Eliel Saarinen has an elegant character due to its crisp forms, attention to detail and sophisticated back. (Photo collection of Cranbrook Academy of Art Museum.)"

is done is too late; what we need is to learn how to see the object we are preparing to make, ahead of time, as it will look when finished, rather than the nifty idea or tricky joint which inspires the piece. Then we need to evaluate this image, to critique it for excellence and to work on improving it, before we expend our labor, money and valuable materials. ***Designing Furniture*** provides us with the tools we need to do this imaginative work.

For sixteen years now I have been making furniture professionally, and for most of that time I have been looking at photographs in magazines of pieces which seemed more sophisticated, spicier, exciting, yet balanced, than what I could come up with. Now I know why: these pieces have composition and proportion, unity, dominance, rhythm, contrast, character and style. Seth Stem explains what each of these values is, why it matters, how to develop your skills in these

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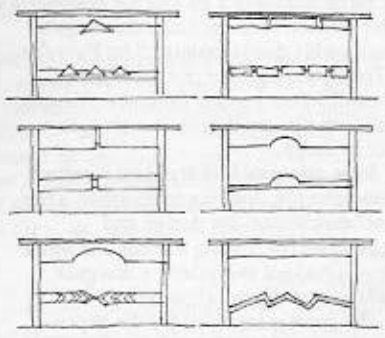
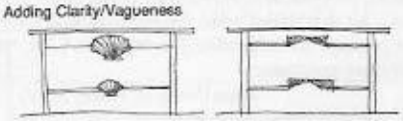
Manipulating Sympathetic and Contrasting Forms



Adding Clarity/Vagueness



A Matter of Design

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areas and (most usefully) why the copious illustrations are good and bad examples of each. He draws examples from all times and styles of furnituremaking, with an exciting emphasis on current work. Indeed, this book could stand as an overview of the best in the contemporary studio craft movement.

In addition to discussing these aspects of good design, Stem describes a procedure you can follow to produce good work, starting with conceptualization (stating the project as a problem to be solved) and research, carrying through design development and building, to evaluation and presentation. He takes the reader through a sample design development with words and pictures. And he appends practical introductions to working-drawing and model-making materials and techniques (including the fundamentals of perspective), along with 12 pages of standard dimensions.

Seth Stem teaches furniture design at Rhode Island School of Design, which is in the first rank of craft institutions in the USA, and his teaching skills show in ***Designing Furniture***. This is not a collection of formulas to make your work look like his (in fact, he critiques the shortcomings of some of his own pieces). It is an extremely useful conceptual toolbox which can liberate your creativity. I feel lucky to have found it.

Sincerely,
Fletcher Cox
Tougaloo, MS

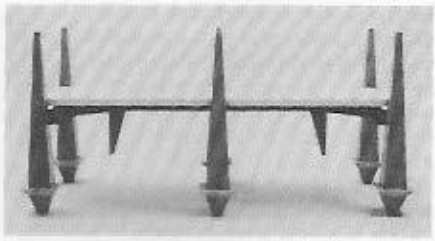
Reprinted from *L. A. Times Magazine:*

Seth Stem's furniture would be right at home in a modern, multi-million-dollar Bel-Air manse. While this book doesn't tell anyone how to make furniture, Stem, a well-known furniture designer and teacher, details a series of steps in a basic design process. He also presents many full-color photographs of dazzling contemporary pieces: Garish Memphis-style chairs, sleek tables, and downright weird cabinets are offered as examples of the furnituremaker's art and the designer's achievement. Stem includes drawings to illustrate his design points: "An Exercise in Proportioning," for instance, shows seven different vertical cabinet rectangles, each with distinct details that seem to alter its shape.

Stem also provides standard furniture measurements, drawing techniques, a list of necessary tools for design and suggestions for making models and mock-ups – just about everything a designer needs except the imagination.

The book is intended for the experienced, professional furniture maker. But don't let that daunt you; the pictures and the process are engrossing even to furniture spectators.

—Reviewed by Judith Sims



"The analogous colors of yellow, orange and yellow-green were used in this lacquered table by Everett Bramhall of Cambridge, Mass. (Photo by Everett Bramhall.)"

Definition of Art Comes from the Heart

by Jack Warner

(First published November 5, 1989)

The question of what constitutes art, of where craft ends and art begins, is generally one I ignore; if the letters section of crafts magazines are any indication, though, some folks appear to delight in endless wrangling over it.

The problem is that too many of the wranglers don't have the self-confidence to use their own eyes and their own hearts to answer the question. They expect it to be answered by a dictionary.

The general presumption is that someone who paints pictures is an artist. There is, of course, a great range of definition; one may be a great artist or an abominable one. But in the eyes of many, the act of painting pictures classes one as an artist.

On the other hand, someone who makes furniture is generally considered a craftsman.

It has less to do, I think, with the medium than with the ultimate intent; curiously, the preponderance of opinion seems to be that if the object in question is useful, then it cannot be art.

Most of the woodworkers out there on the cutting edge, busily making objects they call furniture but which for the most part are useless, certainly consider themselves artists, and from what I've seen they consider a fellow who makes chairs you can sit in and tables you can eat on a craftsman.

Certainly any artist of merit, regardless of the medium, must be in command of his tools; he must have learned his craft. If you wish to resolve the art/craft dilemma that way, then an artist is a craftsman who has so thoroughly assimilated technique that he moves into the area of true art.

The problem with this reasoning is that it is fairly common to see a master technician at the service of garbage. There are people in every medium who become extremely facile with the material, but never make anything really fine; their aesthetic sensibilities seem to have been cauterized.

Museums have solved the dilemma rather slyly by classifying furniture as Decorative Art. As far as I can see this is an essentially meaningless phrase; all art is decorative. One of the few firmly held ideas I have on the subject is that art cannot be ugly or disgusting. It may be emotionally harsh or philosophically controversial, but it can't be merely nasty.

The idea that art must make a "statement" is equally preposterous. Taken at face value, such a rule would disqualify the bulk of the holdings of every museum on Earth. Some art – perhaps the greatest art – exists only for its own sake. Art that makes a statement can be – it most often isn't, but it can be – deeply moving. But by and large, art that makes statements seems generally to diminish in quality as its statement narrows and becomes more obvious.

Ultimately, I think, nothing is so moving as beauty. Beauty tends to make statements to our hearts and souls rather than our minds. The music of Beethoven stands as one of the crowning achievements of mankind, and there are few who hear it who do not receive a definite statement from it; yet Beethoven very rarely attached statements to his music.

Most of us woodworkers, I think, should be content to be considered craftsmen; I would certainly rather be called a craftsman than a decorative artist. If a woodworker produces a table or a chest that looks good, is properly built to withstand the ravages of time and use and serves its purpose aptly, then he has contributed something eminently worthwhile. There it is, he can say. Use it; it will serve you well the rest of your life and your children's, and it has something of me in it.

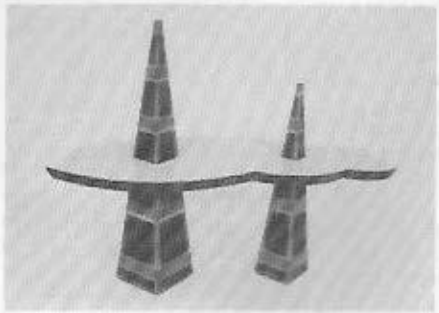
There are only a few furniture makers, I think, who are really artists, and not very many of them tend to call themselves that. A greater preponderance of woodturners must be judged as artists, having forsaken function for something that must justify its existence by beauty alone. A few are great artists, some are good artists, and a lot are just along for the ride. There's nothing wrong with that.

Instead of worrying about what is art and what isn't, forget the labels and the semantic distinctions and let your heart decide.

I know a man who freely admits that tears came to his eyes the first time he saw a Sam Maloof rocking chair.

If it moves you, then it must be art.

§



"Cloud table by Everett Bramhall of Cambridge, MA, explores how complementary colors can interact to create a mood of high energy. (Photo by Seth Stem.)"

Reprinted from *Choice* (published by the American Library Association):

Stem (Rhode Island School of Design) has written the first book to treat furniture design as a serious discipline. It is a veritable "toolbox" of ideas with which people who have a serious interest in furniture making but little or no design background can craft unique and handsome furniture. There are four sections to the book: The Design Process, a Visual Vocabulary, Directing the Design, Theory into Practice: Appendicies. The first three sections are equally important. Emphasis is placed on the designing process, with a clear explanation of what conceptualization is and the importance of research to design problem solving. Comprehensively covered are design development, size/scale, manipulating forms, surface treatment, choosing appropriate materials for construction, visual references and icons, principles of form, directionality, animation and posture, line/form interaction, composition, proportion, color, texture, ornamentation, unity, dominance, repetition, contrast, character and style. The fourth section is outstanding. It explains tools for creating working drawings, drawing techniques of isometric/perspective/orthographic, building models and mockups, designing custom furniture. An excellent dimensional glossary gives standard measurements for pieces of furniture. Includes a very fine bibliography of books and magazines, and many beautiful color and black-and-white photos, and hundreds of drawings. Highly recommended.

—Reviewed by V. M. Juergensen
Mohawk Valley Community College.

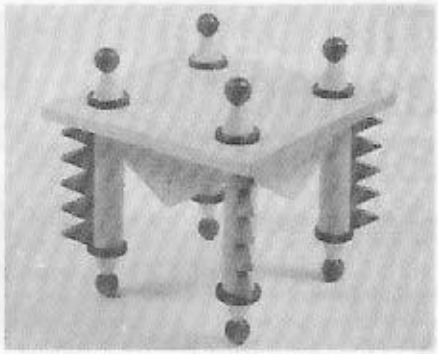
An excerpt from Seth Stem's introduction to *Designing Furniture*:

The design process presented in this book is somewhat formal. There are structured exercises to produce different forms, visual references, icons, an array of proportioning systems and a visual vocabulary to master. This is quite different from the intuitive approach to design taught in many colleges and taken by most self-taught designers. I don't wish to imply that excellent pieces cannot be achieved by the intuitive method – in fact, some of the freshest designs are produced this way. I believe, however, that a more structured approach can open a designer's eyes to new possibilities and add a new degree of dynamism to a piece. In addition, for the beginner not quite comfortable with the language of design, there is no doubt that a sense of structure lends a great deal of reassurance and builds confidence.

Part of our society is open to new ideas and change, while another faction relates best to the familiar. Designers can affect both of these attitudes, but I feel real creative progress comes only when risks are taken and innovation is courted, because only then is there growth that impacts on the visual and functional qualities of things that we encounter in day-to-day living. Many furniture designers are involved in this quest for newness, but in a variety of ways. They look for new styles, new materials and production methods, and innovative ways to deal with function. Recently, furniture has even begun to be viewed as an art form, which greatly widens the range of visual issues a designer can legitimately explore. It is my belief that the opportunity has never been greater for furniture designers to become involved in work of an adventuresome nature.

Design isn't usually an easy task. It requires a lot of thought, work and indeed trial and error to produce a piece of high visual and functional quality. I hope readers will find this book a worthy contribution to the effort.

Seth Stem
Providence, Rhode Island
March, 1989



"The designer can manipulate forms to interact with each other in order to create various moods. The forms of this table by Elisabeth Scheidl of North Caldwell, N.J., are watchful and protective, giving the piece a fortress-like feeling. (Photo by Seth Stem.)"

Parting Thoughts on the Matter

It isn't particularly surprising that a book on furniture design should turn out to be controversial, or that emotion should be so inextricably a part of many readers' reactions to the book. Human beings have known for thousands of years that certain basic shapes and proportions are usually more pleasing than others; these have been codified as the golden rectangle, the five orders of classical architecture, and so on. *Why* these shapes are pleasing is not so easily quantified; we can talk about individual training, cultural/historical context, instinctive ergonomics or whatever else, but finally we must also acknowledge that one of the most important parts of perception is *feeling* – subjective, emotional, not always explicable. Beauty is deeper than rules; feeling pleasure is entirely different from explaining it. It is absolutely appropriate that emotion should inform both design and the evaluation of design. But for both the author and the readers of a book on design, this presents a great challenge: how to put into words that which is never perceived verbally, how to identify and discuss the emotional component of design more meaningfully than merely reciting "I like this, I don't like that – this feels good, that feels bad." Many of the key words Stem develops throughout his book are used as a form of code, verbal tags to hang on an object where a particular feeling comes into play. This can be an effective technique *if* the reader is willing to study the book, to cooperate diligently and thoughtfully in creating the vocabulary of design.

Another equally challenging problem is one suggested in Jack Warner's second column: how to separate feelings evoked intrinsically from those brought extrinsically to the visual experience. To label as a chair (not as "Chair") an object which cannot be sat upon creates a sense of conflict, arouses indignation or hilarity and obscures feelings that could be evoked by the piece if it were otherwise labeled. The evocation of conflicted and powerful emotions, as with Bennett's Nail Cabinet (which appears in ***Designing Furniture***, incidentally) may be the goal of a design, but this particular book on design might possibly have been more effective as a teaching text if intrinsic and extrinsic sources of feeling had been more carefully distinguished.

For further reading we highly recommend a book unfortunately now out of print: David Pye's ***The Nature and Aesthetics of Design***, which is well worth a trip to the library for its original and insightful examination of the subject. The author provides thought-provoking discussion of both function and beauty, subjects left oddly underexposed in ***Designing Furniture***. Pye, widely considered the foremost thinker on design and principles of woodworking, is perhaps best known for ***The Nature and Art of Workmanship***, which among other things explores one of the hardest subjects of all: quality – which everyone can recognize but few can define. ***Nature and Art*** is still in print, and can be ordered from Highland Hardware.

Zach Etheridge

__Designing Furniture__ is available from Highland Hardware for $24.95 plus $3 shipping. __The Nature and Art of Workmanship__ (by David Pye) is available for $15.95 plus $3 shipping. The two books can be purchased together for $39.95 plus $4 shipping.

The Delta 32-100 Biscuit Joiner

by Hugh Foster

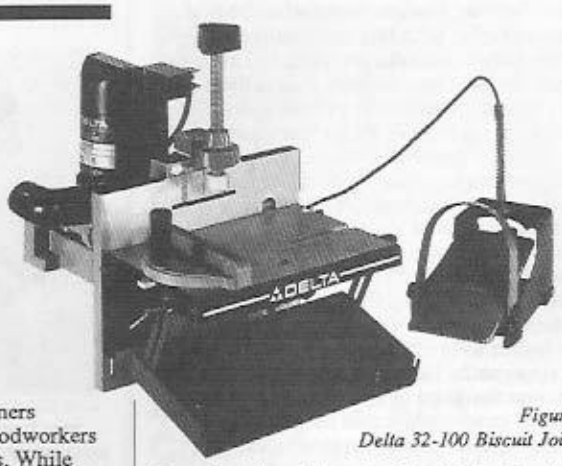


Figure 1
Delta 32-100 Biscuit Joiner

UNTIL NOW, all biscuit joiners available to American woodworkers have been hand-held tools. While you're almost sure to prefer a portable if you can have only one biscuit joiner, you are sure to appreciate the convenience of the Delta 32-100, the first affordable stationary joiner available in this country.

Delta's 32-100 is loaded with convenient features. There are quick-release threads on the height adjust and hold-down screws. A table height micro-adjuster makes precise positioning possible.* These components make easy the ultimate convenience: accuracy. While Delta cautions the user to tighten the right-side knob first to keep the work table parallel to the blade, I found the table locks parallel whichever way I tightened it.

The hold-down clamp is so easy to use that I actually use it! The 8" x 12" adjustable table and the face on which it rides have both been machined to accept the clamp's tight-fitting square base; thus clamping work either horizontally or vertically is possible. Clamping work firmly to the table is one of the "secrets" that leads to the unit's very accurate work. On some bevel joining, you may prefer to use another kind of clamp to hold the work down, as in Figure 2. Additionally, when joining bevels, it is good practice to clamp a back-up stop block to the angle fence to take the place of Delta's adjustable stop stock on the regular table.

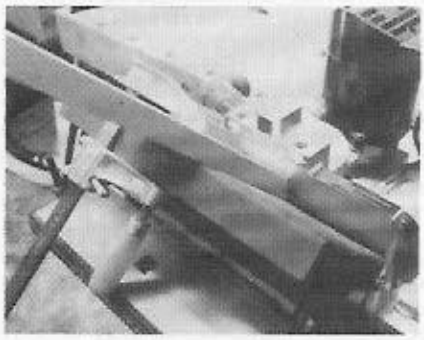


Figure 2

What looks like the tool's miter gauge is actually an adjustable stock stop which can be positioned anywhere on the table with either right- or left-hand reference, and then screwed into place from the underside of the table. If you adjust this regularly, it will be a convenience to remove the angle guide rather than leaving it hanging under the main work table as the owner's manual recommends.

The angle guide is a steel tilting table provided for joining beveled work. This is far handier than all but the flip-fence of the Lamello Standard and Top 10, and, since the work can still be clamped to the table, this may be more accurate even than that. Note that the levers that lock the tilting table in place are spring loaded, so they can easily be positioned out of the way. It may be worth noting that most portable biscuit joiners work best at 45 or 90°, but the 32-100, like the Lamello Top 10 will cut handily at any angle.

Figure 3

A ribbed "Super-Torque" belt transfers the power from the motor to the cutter. The motor and blade assembly are plunged forward to make a cut by stepping on a heavy-duty foot pedal, leaving both hands free to control the work. A spring returns the blade from the plunge cut without jarring the machine even slightly. The 12"-wide machined face is marked for width as well as center line of #20, #10, and #0 biscuits, which lets you visually confirm whether or not a given biscuit size is suitable for a particular workpiece (see Fig. 3).

The tool's noise level measures 89-90 dB from 3 feet away, making it the quietest joiner on the market. The tool can be locked "off" by installing a padlock through the switch block.

Joinery is even easier with this machine than with a standard biscuit joiner, especially when you're cutting a production run of joints into end grain or near the end of a workpiece. Just mark out the first piece, clamp the board and lock the stop in place next to it; after the first cut is made, just clamp the next board in place against the stop. If the boards being joined are not the same thickness, they must be positioned on the joiner face side down.

Edge-to-edge joining is done much the same with this machine as with any of the hand-held models, except that with all but the largest boards, it is easier to bring the material to the joiner rather than vice versa. That is the real beauty of this stationary machine.

Figure 4

One joint cannot be made with this machine. Figure 4 shows a photo of a framing type joint. More than 5" from either end of the board or on long stock, these joints must be made with a hand-held joiner. The 32-100's advantages in so many other circumstances make this a minor problem.

When floor space is at a premium, it may be most convenient to bolt the joiner to a board which can be clamped to your workbench during use, then hung on the wall out of the way. Be careful not to crimp the foot pedal cable if you use the tool this way.

The question ultimately comes down to this: is this Delta joiner a substitute for a portable joiner like the Lamello Top 10 or the Freud JS100, to mention only the two extremes of the price list. I'd have to say "no."

The biscuit joiner is an absolutely revolutionary tool; after you've used one, you'll never look at any woodworking project in quite the same way again. Part of the beauty of the hand-held joiner is its portability.

In many production settings, however, the Delta 32-100 joiner will do the work even more efficiently, making accurate rapid-fire assembly the simplest job in the shop.

Through Feb. 28, 1990, Delta offers a $100 rebate on the purchase of each 32-100 stationary biscuit joiner. Purchased from Highland Hardware for $499.00, the joiner's cost after rebate becomes just $399.00.

32-100	Delta Stationary Joiner	$499.00
20.03.89	Biscuit Joiner Handbook	14.95
Joining Plates, Box of 1000		
17.70.02	#0	29.95
17.90.03	#10	29.95
17.90.04	#20	29.95
17.90.98	Assortment of 3 sizes	29.95

(Add shipping charges listed on page 62)

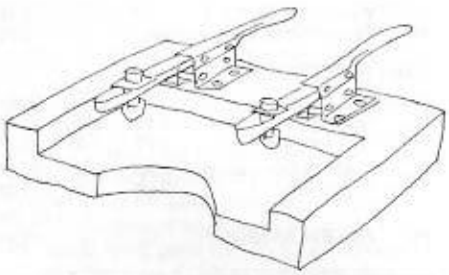
Hugh Foster is a woodworker, English teacher and writer who lives in Manitowoc, Wisconsin. He is the author of the new ***Biscuit Joiner Handbook.***

*The table height micro-adjuster will be included as standard equipment on all 32-100's sold by Highland Hardware after January 1, 1990. Anyone who purchased a 32-100 before then may obtain the micro-adjuster as a retro-fit item from Highland Hardware for a nominal cost.

I'm a Toggle Believer

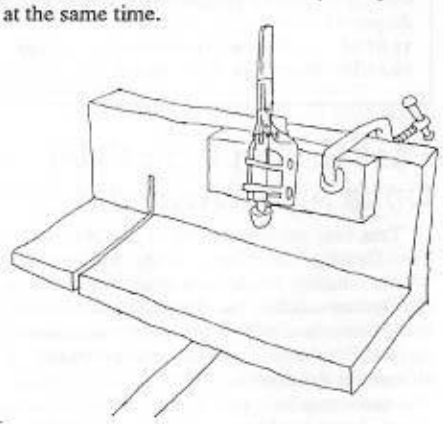
by Brad Packard

I WAS FIRST INTRODUCED to toggle clamps twelve years ago when a new jig I had made insisted on giving an inconsistent depth of cut. To correct the problem, I employed one of these useful devices to apply constant pressure on the workpiece. Not only did I get perfectly accurate cuts with the toggle clamp added to the jig, but I found that my hands could then be positioned a safer distance away from the sawblade. This was the beginning of a beautiful relationship.



The shaper jig shown above is an excellent example of where a toggle clamp (in this case Highland's model H-2) can be used to hold the workpiece securely, increase accuracy, and perhaps most important, reduce the risk of a dangerous kickback.

Another good example is the table saw cut-off jig pictured below. The P-2 clamp screwed to a scrap piece of plywood can be a real finger saver when cutting small pieces. It can also assist in holding a long piece that is otherwise difficult to hold securely and guide at the same time.

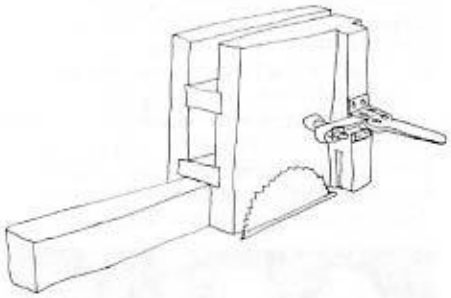


Brad Packard has been a professional furnituremaker, stationary tool sales rep, and is now Tool Sales Manager at Highland Hardware.

Sketches by Tony Dileo

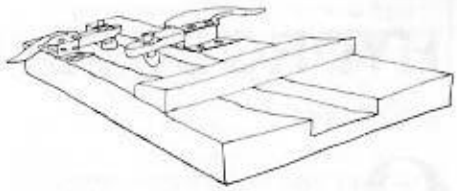
The P-2 can also be attached to a 2 by 4 which is clamped down at its ends, and used to apply downward pressure on hard-to-reach places, such as when gluing a piece of inlay in the middle of a large panel.

Incidentally, just about all of the jigs suggested here (and most of the ones you dream up) can be fabricated using scraps of plywood cut to the appropriate size and assembled with drywall screws, which takes no time at all using your cordless drill.



The jig for making tenons on a tablesaw pictured above uses the vertical handle of the V-2 clamp as a hand hold. When used with the blade tilted 10-15° away from the jig, raised panels can be safely cut.

Another useful jig which employs toggle clamps is the router jig pictured above right. The workpiece is clamped in the gap in the middle of the jig, with the workpiece's end



extending beyond a wood fence which crosses the jig. The router can then be used to cut tenons, dadoes, or half-laps at the end of the workpiece. You can also feed a long workpiece through the jig, clamping it at intervals in order to cut dadoes as needed.

These are only a few examples of what can be done with toggle clamps. Your imagination is the only limit in finding ways to use them to enhance stationary tools, miter boxes, router jigs, etc. Carvers can have a field day employing toggle clamps to hold workpieces being carved. Not only do the clamps hold work very securely, but the workpiece can be instantly released and repositioned with the flip of a handle.

And best of all, besides improving accuracy and adding a new level of convenience to your woodworking, toggle clamps can play a big role in helping you to keep your fingers attached to your hands.

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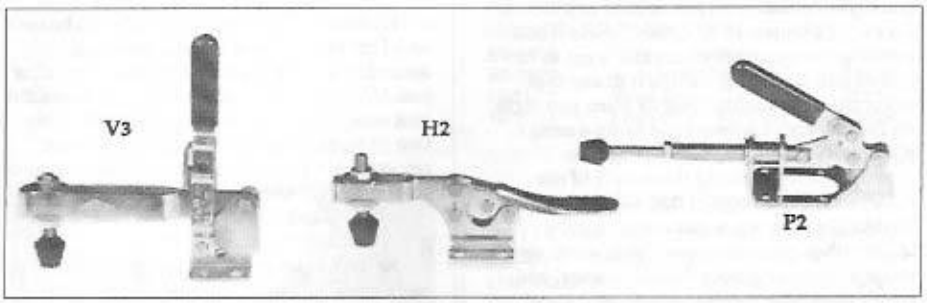


TOGGLE CLAMPS

Whenever you need to hold a piece still to work on it, these toggle clamps will do the job quickly and securely. Practically every jig you own can be perfected with a toggle clamp or two, and many of your stationary tool operations can benefit as well. Each clamp is provided with a threaded, neoprene-tipped spindle and four mounting holes in the base flange (except model P1, which has a nylon spindle and three mounting holes). Models P1 and P2 will lock in pull as well as push mode; the standard spindle for push mode can be replaced with eye bolts, screw hooks, threaded rod or any other hardware that suits your needs and imagination.

TOGGLE CLAMPS

16.60.01	V1	$9.95
16.60.02	V2	12.95
16.60.03	V3	12.95
16.60.04	H1	9.95
16.60.05	H2	10.95
16.60.06	P1	8.95
16.60.07	P2	14.95

TOGGLE CLAMP SPECIFICATIONS

Vertical-Handle Hold-Down Clamps

Model	*Reach*	*Grip Range (Base to U-bar)*	*Holding Capacity (lbs.)*
V1	0 to 1-1/2"	3/4"	200
V2	0 to 2"	1-1/4"	375
V3	0 to 3-5/8"	1-1/4"	375

Horizontal-Handle Hold-Down Clamps

Model	*Reach*	*Grip Range (Base to U-bar)*	*Holding Capacity (lbs.)*
H1	3/8" to 2"	3/4"	200
H2	3/4" to 2-1/2"	1-1/4"	500

Push-Pull Clamps

Model	*Travel*	*Spindle Height*	*Holding Capacity (lbs.)*
P1	5/8"	1/2"	100
P2	1-1/4"	7/8"	300

Deduct 10% discount from prices listed when buying 6 or more toggle clamps. Add shipping charges listed on page 62.

HYDROCOTE® Goes *PLUS*

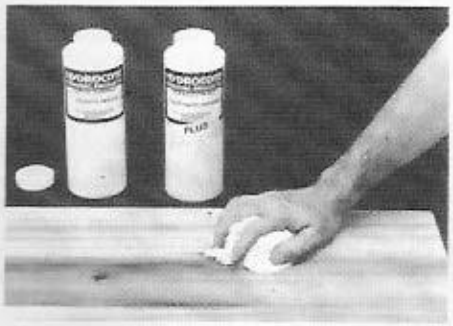
by Zach Etheridge

OUR FIRST YEAR'S EXPERIENCE with Hydrocote's revolutionary water-based finishes has been a good one, and recent developments have us looking forward to doing even better in 1990. Many of you have already discovered **Hydrocote *Plus***, the new lacquer formula introduced during the summer of 89, and your reaction has been a lot like ours: wow! *Plus* works so well and so easily that it's actually hard to get it to go wrong in spray or hand application.

For any of our readers who've missed the news, Hydrocote makes a line of non-toxic, non-flammable finishing products designed to offer realistic alternatives to today's most popular wood finishes. By "realistic" we mean this: any product that claims to be a replacement for nitrocellulose lacquer or oil-based polyurethane has to do a lot more than just be safe—it had darn well better work, because for all their faults, conventional finishes do ultimately provide excellent protection for wood. There have been many attempts over the years to develop safe new finishes, all driven by the inescapable awareness that many of the products we've had to work with all this time are bad medicine indeed. We won't burden you with horror stories about conventional lacquer (take a look at the January-February 1990 issue of *Fine Woodworking* magazine if you really want to be scared half to death); suffice it to say that when the manufacturer has to warn you right on the can about irreversible brain damage, it's time to start using something else.

For us and for many thousands of our customers, Hydrocote is that something else. Hydrocote *Plus* is a water-based acrylic lacquer that goes on crystal clear, cures up to twice as hard as nitrocellulose lacquer, and provides excellent resistance to stains and wear damage. The finish dries tack-free in a few minutes, and can be recoated in as little as 1/2 hour. For a short while during and after application there's a mild odor of ammonia with a hint of fresh-cut plexiglas, but even that disappears before you've finished cleaning up. You can leave a puddle of coffee or cola standing on a one-coat finish of Hydrocote *Plus* for an hour with absolutely no evidence of harm to the finish or the wood underneath — hard to believe until you try it. The finish can be applied by hand quite easily with a bristle brush, sponge brush, or even a wad of cheesecloth. Spray finishing is very nearly as easy as with nitrocellulose. The only way we've managed to avoid excellent results is to forget to put down enough finish for adequate flow-out. We've sprayed the finish at 60° on a dry day and we've sprayed it at 85° with 90% relative humidity, and the results have been the same. For a few more technical details about Hydrocote *Plus* lacquers, have a look at page 2 of our 1990 catalog, and see also the application guide we provide with the finishing material.

Hydrocote lacquer is available in **Clear Satin** or **Clear Gloss** finishes, and in **Black Gloss** or **White Gloss** as well. White lacquer can be used as a mixing base base for custom-tinted lacquers using universal tinting colorants (UTCs) such as those listed on the next page. For semi-transparent color, Hydrocote **White Pickling Stain** allows excellent flexibility in choosing exactly the amount of pickling effect desired; it too can be tinted with UTCs for custom color washes. Pickling Stain should be top-coated after an hour with clear lacquer or with Hydrocote Polyshield polyurethane (see next page).



Hydrocote **Sanding Sealer** should be used as a first coat on bare wood, since it is formulated to sand smooth quite easily (after just 1/2-hour drying time). Sealer is also used as a clear filler on close-pored woods, with two or more coats providing a completely smooth base for gloss top coats. On stained or previously finished wood, Hydrocote *Plus* may be applied directly without raising the grain or requiring much sanding.

Reducer is the thinner for Hydrocote lacquers. It is used to control viscosity for spray application, and for cleaning equipment after use. If shop or spray conditions produce a blushed finish, Reducer can be used to flash the surface and clear it up quickly.

Flow-Out additive is used as a retarder to extend the time available for self-leveling. It's especially recommended for hand application, and may also be useful if shop conditions can't easily be held above the suggested 60° minimum.

Highland Hardware stocks both rubbing and polishing compounds for use on Hydrocote finishes. Both can be used by hand or with an electric buffer; a buffer is particularly recommended for high-gloss finishes. Hydrocote **Rubbing Compound** is designed to cut fairly aggressively following ultra-fine sanding; it will leave a fairly low sheen. **Pro Polish** takes the finish on up to a fairly high satin sheen by hand, or to a high gloss with a buffer.

Fish-Eye Eliminator is a silicone-based additive for use when silicone or other contamination is known or strongly suspected to exist on a piece to be finished. Hydrocote *Plus* does not fish-eye easily, and the eliminator does not need to used as a matter of course.

Please note that **Hydrocote products must not be allowed to freeze.** When ordering during winter months, please be sure to provide a shipping address where *someone will be present* to receive your delivery; the material may be ruined if it's left out on your doorstep in very cold weather. We will do everything possible to insure prompt delivery throughout the winter, but *we avoid shipping Hydrocote products by surface UPS into or through regions experiencing extreme cold.* Please bear this in mind and stock up while the weather permits.

HYDROCOTE *PLUS* LACQUER PRODUCTS

Cat. No.	Item	Quart	Gallon	5 Gal.
GL	Clear Gloss Lacquer	8.95	19.95	89.95
SL	Clear Satin Lacquer	8.95	19.95	89.95
SS	Sanding Sealer	8.95	19.95	89.95
GB	Gloss Black Lacquer	9.95	22.95	99.95
GW	Gloss White Lacquer	9.95	22.95	99.95
FO	Flow-Out Additive	5.95	14.95	64.95
RE	Reducer	5.95	14.95	64.95
PS	White Pickling Stain	7.95	17.95	79.95
VC	Viscosity Cup, Each			3.95
SF	Pack of 20 Straining Filters			2.95

OTHER HYDROCOTE PRODUCTS

Cat. No.	Item	1/2 Pint	Quart	Gallon
FC	Flatting Compound	6.95	16.95	44.95
RI	Rust Inhibitor	3.95	9.95	22.95
RC	Rubbing Compound	2.95	6.95	17.95
PP	Pro Polish	2.95	6.95	17.95
				1/2 Pint
FE	Fish-Eye Eliminator			14.95

Starter Kits

Our starter kits provide an excellent way to get acquainted with Hydrocote finishes. The Hand Starter Kit contains a quart each of Gloss, Satin, and Sealer; a pint of Flow-Out; and a half-pint each of Rubbing Compound and Pro Polish.

The Spray Starter Kit includes a gallon each of Sanding Sealer and Gloss and Satin Lacquer; a quart each of Reducer and Flow-Out; a half-pint each of Rubbing Compound and Pro Polish; 2 oz. of Fish-eye Eliminator; a viscosity cup and four disposable strainers.

19.61.08 Hydrocote Hand Starter Kit $29.95
19.61.10 Hydrocote Spray Starter Kit 79.95

Fast-Drying Pore Filler Once Again Available

True fans will have noticed that Hydrocote's **Fast-Drying Filler** failed to appear in our Fall/Winter catalog. Production changes made it briefly unavailable, but the good news is that it's back, same as always, offering a water-based surface filler which, at 80% solids content, almost always does its job in one application. The same true fans will be happy to note we've adopted new packaging that should make this very thick product a lot easier to scoop out of the jar. Fast-Drying Filler is a fairly neutral tan color which works fine as is in blonde woods like ash, birch or light white oak. It can be tinted to darker shades with universal tinting colorants for contrast or for use in deep-toned woods.

Cat. No.		1/2 Pint	Quart	Gallon
PF	Fast-Dry Pore Filler	4.95	11.95	29.95

Hydrocote Polyurethane

Like Hydrocote *Plus*, Hydrocote Polyurethane is a non-toxic, non-flammable water-based finish with very little odor and remarkably fast drying time – it can be sanded and re-coated in just one hour. It is the clearest polyurethane we've ever used, and adds almost no color to bare, stained or pickled wood. Like conventional oil-based polyurethanes, Hydrocote Poly provides an incredibly tough finish which resists damage from water, alcohol, and other stains or spills even through prolonged exposure. Unlike any other poly we're aware of, Hydrocote actually exhibits a degree of chemical fusion between coats, thus eliminating completely the single thorniest problem in repairing or re-coating polyurethane finishes.

Formulated specifically for extreme hardness and abrasion resistance, Hydrocote Poly is a superb finish for any high-wear situation, and it's one of the best choices you can make for new or refinished floors in home or commercial settings; in fact, it meets all performance and maintenance specifications of the National Maple Flooring Manufacturer's Association. Hydrocote poly goes on without the thick plastic build-up typical of solvent polys, and it goes farther, too. Coverage on floors is conservatively figured at 550 sq. ft. per gallon.

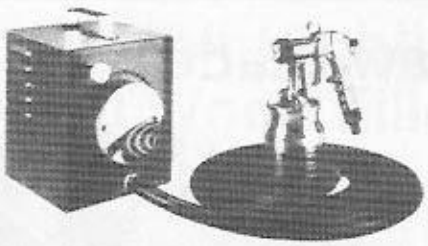
Hydrocote Polyurethane is outstandingly easy to apply by hand. It can be brushed, wiped, sponged or squeegeed as desired. It also lends itself quite well to spray application where a furniture finish even tougher than Hydrocote lacquer is called for, as in bars, countertops, and so on. It is more tolerant of cool weather than most other polyurethanes or lacquers, going on with no trouble at temperatures as low as 50°F. All of the additives listed on these two pages are usable with Hydrocote poly as well as with *Plus*.

Cat. No.	*Item*	*Quart*	*Gallon*	*5 Gal.*
GP	**Gloss Polyurethane**	12.95	34.95	139.95
SP	**Satin Polyurethane**	12.95	34.95	139.95

New Exterior Hydrocote Poly

Along with the great improvement in its lacquer formula, Hydrocote has also just introduced its first exterior-rated finish. **Polyshield™** is a water-clear, virtually odorless water-based polyurethane with strong UV protection built in for long-term non-yellowing outdoor use. Like the other Hydrocote finishes, Polyshield is a non-toxic, non-flammable product designed for spray application, but it can also be brushed, or wiped with easy success. Like the original interior-only Hydrocote polyurethane, Polyshield imparts almost no color to bare wood, so it's an excellent choice for use over light-colored or pickled woods where the ambering effect of olil-based polyurethane would be undesirable. Polyshield can be used over bare wood or over practically any other finish — just clean thoroughly and scuff lightly to insure good adhesion. Like the other Hydrocote finishes, Polyshield contains roughly 35% solids, making for a decent rate of build-up with excellent coverage rates.

Cat. No.	*Item*	*Quart*	*Gallon*	*5 Gal.*
GE	**Gloss Polyshield**	14.95	39.95	159.95
SE	**Satin Polyshield**	14.95	39.95	159.95



EAGLE SPRAY TURBINE-DRIVEN HVLP FINISHING SYSTEMS

Spray finishing, the most efficient way to do a good job of coating wood, has been made far more effective and a lot more economical with the introduction of high volume, low pressure (HVLP) spraying systems. Typical compressed-air spray systems routinely manage to put no more than around 30% of your finishing material on the object you're trying to finish; the rest is wasted as overspray and bounce-back. Our EagleSpray systems, on the other hand, use HVLP technology to achieve 80% transfer efficiency, costing you less than half as much in finishing material and greatly reducing the hassles and hazards within your spray booth. The fact that EagleSpray systems cost much less and are far more compact than compressed-air systems of comparable quality doesn't hurt at all either.

We offer EagleSpray systems to suit the needs of shops both large and small. **Model 1000** is an economical commercial-duty unit made to handle practically any kind of sprayable material from lacquers, paints and polyurethanes to contact adhesives to special automotive and aircraft coatings. An 850-watt (7-3/4 amp), 110-volt motor drives a two-stage turbine delivering 96 cubic feet of air per minute (CFM) to the gun at 5 psi operating pressure. This low pressure is enough to pump fluid from the cup and gently but thoroughly atomize it at the gun's tip; this is where overspray is nearly eliminated since the finish isn't being blasted out of the gun in a wild cloud of high-speed particles. The atomized finish is then carried by a warm, dry, high-volume air flow which delivers it to the object being finished quickly but without violent bounce-back. Model 1000's double-walled all-metal cabinet measures 12" x 9" x 12.5", and weighs just 19 lbs. The unit can handle up to 40' air hose length.

Model 2000 is a 1000 watt (9 amp), 3-stage turbine unit capable of driving 2 guns simultaneously for production finishing, delivering 77 cfm at 4-1/2 psi to both guns, or over 100 cfm to a single gun. The turbine housing measures 16" x 12" x 12.5", and weighs 29 lbs. The 2000 can handle up to 60' of hose to one gun, or 40' each to two.

Both models are equipped with two permanent washable air filters, twenty feet of 3/4" i.d. air hose with a quick-connect fitting for the gun, and a production-grade DeVilbiss spray gun with 1-quart cup.

Highland Hardware carries both models 1000 and 2000 in stock and available for immediate delivery via UPS. Each is provided with a split one-year warranty: six months' full replacement coverage, followed by six months' 50% repair coverage. In our first year of selling EagleSpray equipment, we've had no calls for service on any of the machines we've sold.

ES-1000	**Turbine Sprayer**	**$695.00**
ES-2000	**Turbine Sprayer**	**845.00**
19.61.11	**Extra Spray Gun**	**250.00**
19.61.12	**Extra 20 Ft. Air Hose**	**40.00**

A UNIVERSAL TINTING COLORANTS

Consisting of very finely ground pigments in a soft fluid base, these versatile UTCs manufactured by Sheffield can be used to tint or shade practically any finishing materials from oils and varnishes to fillers and waxes to water-based Hydrocote lacquer and polyurethane. We stock a total of 34 different colors to provide the broadest range of mixing possibilities. They are sold in convenient 1-1/2 oz. tubes with screw caps. A color chart and mixing guide is provided free with any purchase of UTCs, or may be purchased separately for $1.00 postpaid

Our 12-color assortment makes an excellent universal tinting kit for the shop alchemist and custom color enthusiast. Colors include:
Light Yellow, Yellow Ochre, Raw Sienna, Burnt Umber, Raw Umber, Lamp Black, Burnt Sienna, Venetian Red, American Vermilion, Medium Green, Prussian Blue and Flake White.

19.49.01	**UTC 12-color Assortment**	**$19.95**
19.49.02	**Single 1-1/2 oz. tube** *(specify color from chart)*	**1.95**
19.49.03	**UTC Color Chart**	**1.00 ppd.**

UTC DISPENSER PUMPS

These one ounce/30cc capacity graduated pumps are indispensable for accurate, repeatable measurement of the small quantities of UTCs typically called for in paint color formulas. Sold individually, or in a pack of six (which minimizes waste and washing time when using several colors).

B	**19.49.04**	**1 Oz. Dispenser Pump**	**$1.00**
	19.49.05	**Pack of 6 Pumps**	**4.95**

ANILINE DYE ASSORTMENT

Many customers are using our Arti water-based aniline dyes to color wood before protecting it with Hydrocote. To acquaint you with the deep, clear colors, simple application, and remarkable economy of ARTI dyes, this kit provides sufficient dye to mix a half pint each of 10 colors, plus our ARTI color chart of 24 colors. The kit includes Red, Blue, Green, Gray, Black, Rosewood, Light Mahogany, Light Oak, Medium Walnut & Dark Pear.

19.60.04	**ARTI Dye Assortment**	**$19.95**

Tracking Bandsaw Blades

by Mark Duginske

THE BANDSAW is the most misunderstood tool in the shop. Because it is misunderstood, it is often the most frustrating tool to use. Much of the misunderstanding has to do with misconceptions about adjusting and tracking the blade. If you follow the common practice of angling the top wheel to track the blade, you may find it hard to get good performance, especially when using the wider blades. The goal of this article is to explain the important considerations for tracking large and small blades. This is the foundation that good bandsaw performance is built upon.

For the past four years I have been working on a book called the ***Band Saw Handbook***, which was published by Sterling this fall. While researching the book, it was hard to find any good information about bandsaws written after World War I. Since that time, writers have repeatedly tried to oversimplify the bandsaw with a "one size fits all" mentality. A result of this approach has been the misconception that all blades should be tracked in the middle of the top wheel.

The bandsaw is a very complex tool. Like a musical instrument, it must be well tuned for peak performance. This is contrary to the "automatic" mentality that is so common today. Tuning the bandsaw requires skill that is not difficult to develop if the correct information is available. This means that you must understand the relationship between the wheels, the blade, wheel alignment, and tension. In the past, writers have isolated one factor such as the blade or tension and didn't stress the interrelationship between these various factors.

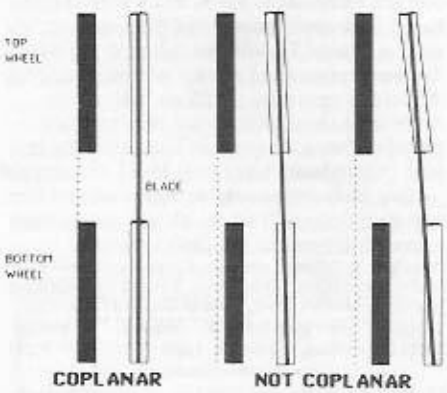
The first place to start understanding the bandsaw is to take a close look at the blade. The band is straight until the teeth are ground and hardened. That manufacturing process causes the front of the blade to shrink in relationship to the back. This is called "positive camber." When the two ends are welded together, the front of the blade is shorter than the back of the blade. Because of this, the blade will have a tendency to track toward the front of the wheel rather than in the middle of the wheel.

Your goal when tracking the blade is to allow it to run as straight as possible. If the wheels are in the same plane (coplanar) the blade will find its own equilibrium and essentially track itself. Most often it will track toward the front of the tire depending on the amount of camber and the straightness of the weld. In the ***Band Saw Handbook***, I call this "coplanar tracking." This is the best technique for tracking blades 3/16" and larger. Larger blades are stiff and do not tolerate misalignment of the bandsaw wheels as well as small blades, which are more flexible and thus more forgiving.

Using a straightedge to determine if both bandsaw wheels lie in the same plane.

Coplanar tracking is important for making straight cuts or cutting thick stock, such as in resawing. With coplanar tracking, you do not tilt the top wheel (which is otherwise the usual practice). Begin by using a straight edge to make sure that the wheels are parallel to each other and in the same plane. If the wheels on your bandsaw are not parallel and coplanar, they should be adjusted. (see *Wood News 20* or *Fine Woodworking* #75, March/April 1989, for how to adjust the wheels on Sears, Delta, Inca and Taiwanese bandsaws).

Initially it may seem unusual for the blade to be tracking on the front half of the wheel, but remember that at that position, it is in balance or equilibrium. The top wheel can be angled back slightly if the blade has a tendency to come off the wheel, but this is rare. It usually means the blade was not welded straight.



With coplanar tracking, the blade exerts the same amount of pressure on the tires at all points of contact. There is no binding as in the case of angling the top wheel. The blades will last longer and cut straighter. The blade will also require less tension for good performance. Overtensioning the saw can actually change wheel alignment by pulling the wheels out of plane or causing the wheels to twist in relationship to each other.

Small flexible blades such as the 1/8" and 1/16" require as much support as possible. The top wheel should be angled slightly, and the thrust bearings set so they always contact the blade. Here it is appropriate to track the blade near the center of the wheel.

These small blades will last longer if the top guides are kept about an inch above the workpiece. This allows the blade to flex back gently during the saw cut. When the top guide is very close to the work, it forces the small blade to bend sharply under the top thrust bearing. This sharp bending decreases blade life. Raising the blade guide exposes about an inch of blade above the workpiece; this could be a potential safety hazard, so be careful when you do this.

Be careful not to overtension the blade. Small blades require a practiced technique. Do not force these blades to cut with heavy feed pressure, but rather let them cut at their own pace. Work with the small blades rather than against them. With proper technique you should get outstanding performance.

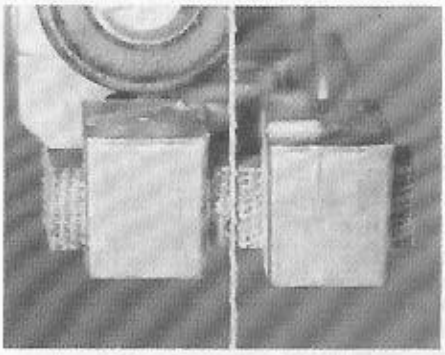
Two other tricks help all blades. First, round the sharp corners on the back of each blade with a stone or a diamond paddle. Wear safety glasses and do this carefully while the saw is running. The rounded corners permit the blade to move through the kerf more smoothly and with less binding, particularly while cutting curves.

"Cool Blocks," graphite-impregnated phenolic blade guides which can be used in place of the normal steel guides on bandsaws, measurably increase performance with all blades. In addition to running much quieter, they decrease the amount of heat from friction between the blade and the guides. Cooler blades do not get dull as fast, and are less prone to breakage. Cool Blocks are a virtual necessity in providing support for narrow 1/16" blades. Such narrow blades are naturally prone to overheating, and ordinary steel guides would easily damage the fine teeth.

Lately I have found that I prefer to have the Cool Blocks actually touching the blade. This prevents the sideways slapping of the blade and thus increases the accuracy of the bandsaw. This is a must when cutting dovetails or tenons. When Cool Blocks wear, they are easily resurfaced with sandpaper.

The bandsaw is the most versatile saw because it will both cut straight and make curves. However, to work well, it must be

Mark Duginske is a woodworker, teacher and author from Wausau, Wisconsin. He will be at Highland Hardware to teach two seminars on using the bandsaw on March 31 and April 1, 1990.



Cool Blocks, replacement bandsaw guides.

carefully adjusted. The ***Band Saw Handbook*** is an attempt to help the modern woodworker develop skill in setting up and using the bandsaw. Four chapters of the book are devoted to: 1) Wheel alignment and tracking; 2) Adjusting guides and thrust bearings; 3) Tensioning blades; and 4) Maintenance and troubleshooting. In the book, I attempted to combine the wisdom of the past with a scientific approach.

It seems to me these days that there is unfortunately less emphasis on developing skill and more emphasis on finding new gadgets and gimmicks. I would like to see that trend reversed, and hope that the ***Band Saw Handbook*** will help woodworkers discover and develop new skills in mastering the use of their bandsaws.

*The **Band Saw Handbook** is available from Highland Hardware for $16.95 plus $3 shipping. A thorough review appears on the back cover of this issue of Wood News.*

"COOL BLOCKS" PROLONG BLADE LIFE AND INCREASE ACCURACY

Cool Blocks are made to replace the original metal guide blocks which came with your bandsaw. They are made of special composite phenolic resins impregnated with graphite, and can be set closer to your blade than metal blocks, thus offering a more stable, guided cut.

Conventional metal guide blocks create friction and heat by their metal-to-metal contact with the blade, leading to blade fatigue and premature breakage. Cool Blocks eliminate this problem so blades run cooler with less friction and last longer.

The dry lubricant in Cool Blocks is formulated to give sufficient blade lubrication but will not stain the wood. The blade will run smoother and quieter. Cool Blocks pay for themselves quickly by extending the life of your bandsaw blades.

COOL BLOCKS, Set of 4

	Bandsaw	Cool Block Size	Price
08.60.01	Delta 14"	1/2"x1/2"x3/4" (1 beveled)	$11.95
08.60.05	Taiwan 14"	1/2"x1/2"x3/4"	11.95
08.60.02	Sears 12"	3/8" x 3/8"x3/4"	11.95
08.60.06	Old Sears	1/4" round x 3/4"	11.95
08.60.07	Old Sears	5/16" round x 3/4"	11.95
08.60.09	Delta 16"	5/16" square x 3/4"	11.95
08.60.03	Inca 10-1/2"		11.95
08.60.04	Shopsmith 11"		11.95

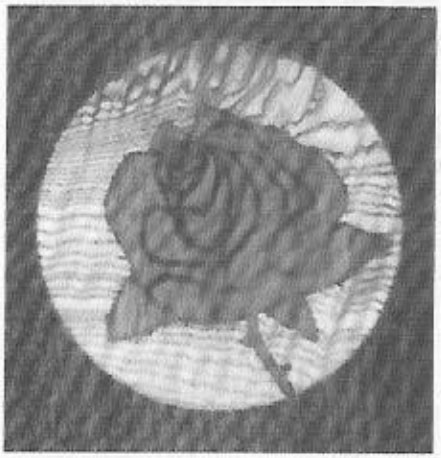
(Add shipping charges listed on page 62.)

Low-Melt Highlight: Metal Wood Filler

by Zach Etheridge

THE SEVENTY-SEVENTH IDEA we've picked up from Tage Frid's visits to Highland Hardware is this decorative and versatile metal filler. The alloy liquifies at less than 230°F, so it can easily be melted in a steel container over the kitchen stove or with a propane torch in the shop. It won't burn or darken wood at that temperature, so it offers a unique opportunity to incorporate a silvery metallic element in many designs. One of the alloy's properties is that it exhibits no shrinkage as it solidifies and cools; in fact, it actually expands very slightly to insure permanent retention within any straight-sided or undercut recess.

Tage used his low-melt metal as a highlighting filler in cracked knots and other natural flaws found in large slabs; it occurred to us that there might be many interesting things one could do with such a cooperative material. Scrollsaw enthususiasts will find the alloy makes a fascinating way to enhance their designs; inlay and marquetry practitioners will now have one more option in their arsenal of decorative techniques. The alloy can be sanded smooth without risk of melting it out of the work, though large amounts of excess metal will tend to clog your sanding belts. A cabinet scraper with a fine burr does a beautiful job of removing excess and leveling surfaces. The filler can be scoured to the white sheen of old sterling, scraped to a bright stainless shine, or even shellacked to resemble gold. It may be coated with oil, lacquer, Hydrocote, or whatever finishing product you like. One of our guys with a machinist's background immediately thought of using the metal as a way to grip small hard-to-handle objects for drilling or other machining: just cast a block of low-melt around the piece, then melt it off after the job is done. Let us know about your own ideas for creative uses – this stuff looks like it's going to be a hot item indeed.



This American Beauty medallion (cherry, ash and mahogany – inlays glued in with 5-minute epoxy) is 5" in diameter. We used 1/5 of a pound of low-melt filler to complete the project. Surface tension keeps the molten metal from flowing into gaps much less than 1/16" wide; we were able to fill narrow kerf lines by letting the filler cool until it became slushy, then squeegeeing it into the kerfs with a knife blade just before it solidified.

Please note that 230°F is more than hot enough to cause serious burns on humans and other creatures. We urge you to handle the molten metal just as you would boiling water, with all due care and precautions. Lead is one of the components of the alloy, so it should never be used on children's toys or on food-contact surfaces.

Low-melt filler (catalog #21.50.01) is available from Highland Hardware in 7 ounce bars for $12.95 each plus shipping.

SANDVIK 475 SCRAPER

This has long been the scraper chosen by professionals. Its carefully machined edges come ready for immediate burnishing without need for initial filing and honing. Its high quality Swedish steel holds sharp edges much longer than ordinary hand scrapers. 2-1/2" x 5-7/8".

03.15.01	Sandvik 475 Scraper	5.25
03.39.23	Triangular Burnisher	8.50

World-renowned woodworking teacher Tage Frid returns to Highland Hardware for a slide lecture on Design April 6, and a weekend seminar on Building Solid Wood Cabinets April 7-8. He is pictured above demonstrating mortising with a plunge router at his first Highland Hardware seminar in 1984, at which former President Jimmy Carter was a participant.

Dust Protection in the Shop

How Much Dust Is Too Much?

by Zach Etheridge

As we were beginning work on this feature for *Wood News*, we received a letter from one of our tool suppliers with the following astonishing information:

> Dear *Wood News*:
>
> The U.S. Department of Labor Office of Safety and Health Administration (OSHA) has determined that exposure to airborne wood dust from Western Red Cedar in excess of 2.5 milligrams per cubic meter of air (mg/m^3) and to dust from any other woods in excess of 5 mg/m^3 is hazardous to your health, and has ruled that starting September 1, 1989, General Industry must keep exposure in the workplace below these limits.
>
> It's interesting to note that OSHA considers wood dust exposure more hazardous than exposure to Chloroform with a mg/m^3 limit of 9.78; Carbon Monoxide at 40; Turpentine 560; VM&P Naptha 1350; or Acetone 1800.
>
> There is no requirement that hobbyists comply with these limits in their home shops, but it would benefit their own safety and that of others in the home, especially kids.
>
> I would be interested to know, and I think your readers would also, how much airborne wood dust is 5 milligrams per cubic meter?
>
> Sincerely, R.S.L.

We're not exactly ready to rush out to the workshop laboratory and measure out a government-approved five milligrams of wood dust, but we can illuminate the subject at least dimly as follows: 5 mg equals less than two ten-thousandths of an ounce. According to OSHA standards, a moderate-size woodworking shop, 15 by 30 feet with ten-foot ceiling, will reach the permissible exposure limit (PEL) when there are two hundredths of an ounce of wood dust in the air. Egad, Pogo, that's not much dust! (A dime weighs eight hundredths of an ounce.) If anyone happens to know any intelligible details on this subject, such as how OSHA defines dust, how visible dust is at 5 mg/m^3, and can you even turn on a sander or a planer or a router without going over the PEL, please let us know.

These standards might sound absurdly strict and downright unrealistic, but they do make one fact quite clear: the people charged with keeping workers safe in the workplace think that wood dust is *very* bad for you. Most of us won't have any trouble agreeing with that, having experienced plenty of clogged lungs, wood-toned sinuses, bleary eyes, sore throats, allergies and other assorted ailments traceable to breathing in the average shop. We also know that a dusty shop is indirectly hazardous to the occupants' well-being; though most of us don't even want to be conscious of it, the direct health effects together with the physical inconvenience of a dirty shop add a constant background of stress to an activity that doesn't need that at all, for the hobbyist or professional alike.

Dust Collection

Almost every shop could do a whole lot more to reduce the amount of dust allowed to get into the air. Some tools, the hand-held router for instance, present really difficult control problems because it can be nearly impossible to collect waste at the source; once dust gets into the air only powerful whole-shop filtered circulation or exhaust can relieve the problem. Many tools, though, allow the user to hook up a dust collector or shop vac right at the source and eliminate most of it immediately. More and more tools are now coming equipped for efficient dust collection – as witness the built-in plastic hoods on DeWalt's new Model 1765 Belt/Disc sander, and on Delta's two 1" belt sander models. Hoods like these which are designed as an intergral part of the tool can be extremely effective, picking up 95% or more of the jet-blast of dust coming off the abrasive. In our experience, a decrepit old 8-gallon shop vac provides plenty of vacuum to transform running these big sanders from nightmare to routine.

Sooner or later a good dust collection system becomes an inescapable necessity in the well-equipped shop. A lot can be accomplished with a good shop vac and a little ingenuity, but the vac reaches its limits when dust is accompanied by huge quantities of solid waste, such as comes from a thickness planer, or when the dust source area is greater than a few square inches, such as under an open-stand tablesaw or jointer. Highland Hardware sells two economical and effective small-shop dust collectors by Makita and Delta, each of which we feel is the best in its class.

Makita 410 Dust Collector

Our special extra-low price on the Makita 410 makes it a terrific buy. The machine is extremely compact, and it has been the choice for many shops where space is at a premium; vented to a collection bin outside the shop, the 410 takes up barely one cubic foot of space indoors. Its specialty is moving heavy waste over long distances without clogging or losing effectiveness; its extremely high static pressure and high-velocity air movement mean the 410 almost never gets clogged with debris, even when exhausting wide thickness planers or heavy-duty jointers. 300 CFM is plenty of air volume to exhaust any source that can be fitted with a maximum hood opening of roughly 50 square inches. Single-stage design means everything moves through the centrifugal fan into the 8 cubic foot collection/filter bag – welded steel fan blades and plate make for reliable long-term durability even when picking up knots and other hard knocks.

A very limited quantity of the Makita 410 (catalog #08.10.40) is available from Highland Hardware for $249.95 plus $6 shipping.

Delta 50-179 Dust Collector

When shop space isn't quite so tight and budget elasticity allows, Delta's model 50-179 35-gallon collector is an excellent choice for all-around dust control in any small shop. 580 CFM is enough air movement for efficient pick-up of large volumes of very fine dust even when hood opening area cannot be closely limited, making the 50-179 particularly well suited for use with tablesaws, shapers, or other large debris sources.

The most noticeable feature of this machine is its quiet operation. You can actually hold a conversation without shouting even while standing right next to it, a most unusual treat. Delta's static pressure, unlike Makita's, is merely respectable rather than phenomenal, so it will not be as well suited to central or out-of-the-way placement with long runs of ducting to individual tools. The 50-179 comes equipped with a wheeled base, however, so it can easily be moved to the scene of the action.

The 50-179 is available from Highland Hardware for $369.95 plus $6 shipping.

Filtered-Fan Air Cleaner

Even a shop with vacuum ports on every tool and a dust collector in full-time operation is still going to run well over OSHA's guidelines in many situations. It's a good idea to have a simple filtered-fan arrangement set up to routinely clean all the air in the shop. Running at low speed so as not to unduly stir up dust that's already settled out, an inexpensive window fan moving air through a couple of 95¢ furnace filters will gradually and effectively remove very fine dust which would otherwise remain suspended for long periods.

Dust Mask

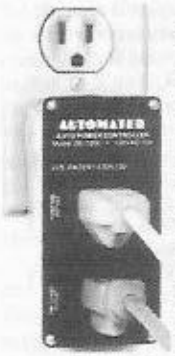
Finally, anyone who works wood with any tool more aggressive than a whittling knife needs a good dust mask, and should automatically put it on whenever a machine is in operation, and keep it on until there's no dust left in the air (or at least less than 2 ten-thousandths of an ounce per cubic meter). Lots of folks think dust masks are a nuisance, but would you really rather have bronchitis, or dust pneumonia, or hypersensitivity to rosewood or some other shop horror? Inexpensive one-strap paper masks don't seal well enough to offer good protection in the shop, but heavier and costlier two-strap disposables work quite well. The only drawbacks to these masks are replacement cost and non-selective breathing– that is, you breathe out as well as in through the filter medium. When you're working hard and breathing hard, water vapor in your breath dampens the mask, causing it to lose its shape, load with dust and become hard to breathe through. Inexpensive plastic masks with replaceable filters are a good choice if you find one that happens to fit your face and seal well; sometimes you can improve the fit with a bit of stick-on weatherstrip or other custom alteration. Using a paint-spray respirator with the chemical cartridges removed isn't all that great an alternative, because the masks

are hot, bulky and not especially easy to breathe through. Their under-the-chin wraparound design also makes it harder for them to seal well over beards.

Thus we're pleased to introduce the best all-around dust mask we know of, a mask that's been a favorite of several of us here at the store for many years: the **Dustfoe® 66.** This mask sits lightly on the face (total weight is just 4 oz.), seals almost perfectly even over beards, and provides easy breathing for long-term comfort. The replaceable filter is folded to clip into a wedge-shaped holder, offering large surface area (8-1/2 sq. in.) without adding awkward bulk to the design. Two adjustable elastic straps let the user ensure a good fit with minimal presssure on the head and face. The mask's light aluminum body is deformable to allow custom shaping if required for a perfect fit. Simple one-way valves direct exhalation through a port in the bottom of the mask, keeping the filter dry and easy-breathing. The effectiveness of the valve system means the user can't talk through the mask worth a flip–you'll sound like Donald Duck at the end of a long pipe–but that's a fair trade for a mask that's as close to painless as we've come across yet. The Dustfoe 66 is rated to handle any situation from the heaviest particle fog to super-fine mists of particles too small to be visible. When we used it recently through one of the most stringent tests we can think of, sanding floors, we could not even smell the oak dust that completely trashed the house. If you've never found a dust mask you liked, try the Dustfoe 66. As usual, if you're not completely satisfied we'll buy it back. Comes with 5 replacement filters.

DF66	**Dustfoe Dust Mask**	**$24.95**
DFF	**Pack of 5 repl. filters**	**6.95**

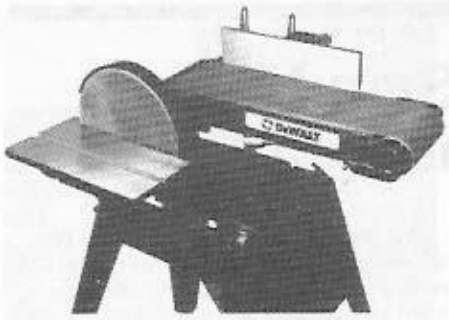
AUTOMATER Automatic Power Controller



This new timesaver will help make life easier for anyone who frequently runs two electric devices at once. Internal electronics switch on one outlet when the other outlet is in use; switch on your sander, and the shop vac comes on automatically; fire up the portable planer and your dust collector comes on without waiting for your command. Just plug your primary tool into the control outlet, and plug the accessory machine into the switched outlet, leaving its switch in the ON position. The Automater can be plugged directly into a grounded outlet, or into any grounded extension cord rated to handle the load. The electronics are built into a stout, compact cast aluminum box with heat-sink vanes on the back. Some warming during use will be normal, but the Automater is made to handle 15 amp loads without overheating. Just be sure the circuit you plug into can handle the load of both tools at once.

08.49.11 Automater Controller $39.95

(Add shipping charges listed on page 62)



The DeWalt 1765 features a 6" x 42" belt sander and a 10" disc sander.

Stationary Sanders

As we've added one new stationary sander after another to Highland Hardware's line, more and more of our customers have begun asking us what the devil these machines are good for anyway, since we seem determined to swamp the store with them. Well, the secret is out: they're fantastically useful for shaping, truing, joining and finishing pieces of wood. That you can also use them for non-wood-related jobs such as tool grinding and sharpening (see *Wood News 23* for details) is merely a bonus.

Power sanding with a stationary belt or disc sander is most commonly aimed at shaping wood, using the machine to quickly and accurately nibble away excess material until you've sanded to a layout line or achieved a shape that suits you. Many times it's far more efficient to turn to the sander for final fitting and shaping work than it would be to jig up a cutting tool for the job; the sander may lack the saw's elevated air of precision and speed, but it will do the work with minimal set-up and fuss. This work is mostly done on flat surfaces or outside edges and corners because discs and wide belts can't reach anywhere else very well, but the increasingly popular 1" belt sanders, which can also run belts 1/2" or 1/4" wide, can be used for sanding intricate shapes, scrollwork, toys and whatnot that can't be reached with larger machines.

The little American Beauty project pictured on page 17 of this issue serves as a good example of how indispensable a stationary sander can become. As the project got underway, small pieces of cherry and ash were resawn to roughly 1/4" thick, and the bandsaw tracks were then sanded smooth on the DeWalt 1765's 6" belt, using 80 grit. The rose petal pattern was routed into the cherry; then the two pieces were stuck together with spray glue, cut to a rough circle and the rose outline cut out on a scrollsaw. The mahogany background piece was sanded lightly on the DeWalt belt, and a 5" diameter recess was routed about 3/16" deep. The piece of ash was then laid on the DeWalt disc sander table and sanded round until it would just fit into the mahogany recess. A pencil compass marked a smooth circle 1/8" diameter less than the recess, and the ash was once again laid up to the sanding disc and carefully cut exactly to the line. Both ash and cherry were then glued into the mahogany, and the metal filler was applied. The uneven, metal-covered surface was quickly sanded clean and flat on the belt sander, then taken closer to a finish on a 120-grit belt. A sharp Sandvik scraper completed the prep, and tung oil finished the piece.

As you've read this description, you might have thought of a half-dozen other ways to carry out the same project. What struck us most about letting the belt/disc sander play a large role was the freedom it gave us to forget about precision where it would have been difficult or time-consuming to achieve, and the ease with which the sander let us accomplish precise work when that was actually needed. If the rose plaque were a production piece, we might well come up with quite different tooling and methods aimed at mass production, but for a one-of-a-kind piece it's hard to imagine a more efficient way to take the piece from daydream to completion.

As you go about normal operations in your shop, try to imagine doing some of your routine jobs freehand on a disc or belt sander. When you're building a jig for radiusing corners on your bandsaw, picture a 50-grit disc doing the same job in a few seconds with no set-up time at all. When you're trying to figure out an accurate jig for routing perfect small circles in thin stock, remember that the sander can do the same job, possibly with fewer potential safety problems. When you're scratching your head over a bizarre compound- angle butt joint, imagine setting the belt sander in vertical mode, mounting the table before it, and simply sanding to your layout lines. (Sam Maloof uses a stationary sander to make sure the rockers mount cleanly to the legs of his rocking chairs.)

None of these conveniences would be worth a toot without a shop vac or dust collector hooked to the built-in dust hoods on the stationary sanders. Sanding is messy enough at the best of times, and machines as efficient as these can fog the whole shop in seconds. Fortunately, dust hood design seems to be a fairly mature technology, and with a vacuum hooked up, even aggressive take-down on coarse grit is no worse on the atmosphere than a little light finish work with your palm sander.

Whether you're into toys, fine joinery, fretwork or just fooling around in the shop, you'll find that the right stationary sander can be a mighty handy addition to your collection of tools.

The DeWalt 1765 6" Belt/10" Disc Sander, which features effective dust ports for both belt and disc units, is available from Highland Hardware for $399.95 plus $40 shipping. Includes stand & 3/4 HP motor. Weighs 94 lbs.

Video Profile of Sam Maloof Shows a Singular Man

by Jack Warner

THERE ARE MANY very fine wood workers in this world, and a few of them are also excellent designers. Standing a little apart from all of them is Sam Maloof.

I know of no one who can reasonably be compared to Mr. Maloof, which is intended neither as a compliment to him nor a putdown to the rest of us. He is, simply, sui generis: one of a kind.

He was in Atlanta this past weekend. He gave a slide lecture on Friday night and separate one-day seminars at Highland Hardware on Saturday and Sunday.

His visit coincided fairly closely with the release of a Taunton Press video titled "Sam Maloof: A Woodworking Profile."

Mr. Maloof is 75 now. His face is virtually unlined; he can still round over the edge of a chair leg by holding the wood in one hand and the router in the other. He has not slowed down his production at all, yet he is three to five years behind on his orders.

The new Taunton Press video Sam Maloof: Woodworking Profile (catalog #22.04.15) is available from Highland Hardware in VHS format for $29.95 plus shipping.

Mr. Maloof's work is unique, I suspect, because everything came from within. He had no training, either in the techniques of woodworking or the art of design.

There was no received truth, no dogma, for there was scarcely anywhere to learn the craft in this country when he began working wood 45 years ago.

As he put it, "There was only Nakashima and Wharton Esherick and myself, and none of us knew about the others."

So Mr. Maloof picked it up on his own. There was nobody to say "Hey, kid, you can't do it like that." There were very few books available back then on the art of joinery. Certainly you will find no text that tells you how to operate a router with one hand, and purists cringe at the way Mr. Maloof carves his chair arms on the band saw.

Because he is the product of no school, either formal or informal, his teaching, on a purely technical level, is not of great practical use.

Of course, he is happy to demonstrate the way he does anything, but I seriously doubt whether anyone but Sam Maloof could successfully employ many of his techniques, because they are dependent upon his eye and his hands, not upon a vise and a tool held in a precisely standard manner.

Mr. Maloof's teaching succeeds on an emotional or inspirational level. Students are given a window into the world of a man who has devoted his life to his craft and succeeded beyond his, or anyone else's, wildest dreams.

There are, perhaps, greater technicians than Sam Maloof; at least he says there are. Certainly there are greater teachers – Tage Frid, for example.

Probably the most curious thing about Sam Maloof is the breadth of his repertoire and the disparity within it. He can, and regularly does, make virtually every piece of furniture common to the ordinary household and quite a few uncommon ones.

But there seems to me a considerable gulf between his case goods and his legged pieces, be they chairs, music racks or desks.

His chests of drawers, for instance, are very good, but they give no hint of the ineffable, sensual beauty of his chairs; they might almost have been made by another man.

They are very simple and straightforward, with none of the long, graceful curves, the swellings and the sweeping interplay of hard edge against soft to be found in all his seating.

There is no denying a Danish influence in his work, bit it's almost beside the point; the work transcends its influence.

Mr. Maloof has spent his life perfecting the concepts he established at the beginning of his career; he has not leapt from fad to fancy, doing this sort of thing now and that sort of thing then. His work has not changed; it has grown.

The Taunton Press video belongs in the library of every woodworker.

One can only hope that Taunton intends to make this "Woodworking Profile" concept a series to document the lives of the other great woodworkers of our time – especially Mr. Frid.

This is not a technical, how-to tape. While it depicts the basic steps in the making of one of Mr. Maloof's rockers, its aim is to give you the flavor of the man, how he works and how he lives, and it succeeds admirably.

Mr. Maloof says in his lectures, and he says in the video, that the craftsman's hands are simply the tools of a higher power.

In his case, at least, perhaps that is true, because in so much of his work there is a power that seems unearthly. He is that rarest of creatures, a true genius.

§

Jack Warner is an Atlanta woodworker who writes for the The Atlanta Journal and Constitution. Reprinted with their permission.

Sam Maloof Woodworker

This beautiful book provides an intimate look at the life, the work and the philosophy of one of the world's most successful woodworkers. It is in many ways the ideal woodworker's autobiography; the personal, anecdotal text and the luxurious color photographs will appeal to anyone, while the amount of detail on Sam's design, construction and finishing techniques is enough to satisfy woodworkers looking for a how-to book. You'll follow the gradual evolution of some of his most famous pieces, such as dining chairs, cradles and the incomparable rocker, and you'll also learn about many lovely pieces that haven't gained as much public recognition: tables, desks, office chairs and music stands among others. The book is lavishly illustrated with Sam's distinctive sketches, shop drawings and notes, along with hundreds of photographs of the work, the shop, and the Maloof house with the myriad personal touches he's added over the years. About the process of design, Sam says "There are three things that I emphasize: eye, hand, and heart." For the reader and woodworker, his book will fully engage all three.

The book Sam Maloof – Woodworker is available in softcover from Highland Hardware for $39.95 plus $4 shipping. Order catalog #20.05.59

Sam Maloof Wood Finishes

For many years woodworkers have coveted the secret of Sam Maloof's custom finishes, famous for their rich, deep warmth and beauty. His recipes aren't actually secret, especially after the publication of ***Sam Maloof — Woodworker***, in which Sam shares every step of his finishing process including the formulation of his oil/varnish and oil/wax treatments.

Now for the first time, these two finishes have been packaged in ready-to-use form available to anyone determined to give his or her work the final heirloom-quality touch.

Sam uses his oil/varnish mixture on just about everything he builds. On dining tables or other pieces where stain and spill resistance must be as great as possible, three or four coats yields the toughness of satin polyurethane together with the warmth of pure tung oil and boiled linseed oil. There's very little build-up; rather, the finish is rubbed in vigorously for maximum penetration and then wiped to remove excess. The result is a hard satin finish that will stand up to any amount of normal household use.

On his chairs and rockers, Sam starts with the poly/oil finish as described, then follows up with several coats of his oil/wax finish, a creamy blend of beeswax, pure tung oil and boiled linseed oil, which yields a deep, silky finish that is absolutely delightful to touch. The manufacturer of the Maloof finishes has chosen to use carnauba rather than beeswax in the oil/wax mixture; carnauba is much harder than beeswax, and also polishes to a higher shine.

Both Maloof finishes are available in pints and quarts. We also offer the poly/oil in gallon size. Please note that since they are flammable, neither poly/oil nor oil/wax can be shipped by air, so be sure to order before it's time for the finish to go on.

Sam Maloof Wood Finishes

19.52.01	Pint Poly/Oil Satin	$6.95
19.52.02	Quart Poly/Oil Satin	9.95
19.52.03	Gallon Poly/Oil Satin	32.95
19.52.05	Pint Oil/Wax	6.95
19.52.06	Quart Oil/Wax	9.95

(Add shipping charges indicated on page 62)

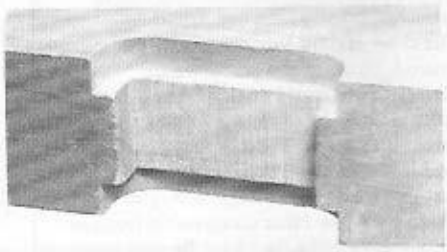
Sam Maloof is pictured at left completing the rocker which he built during his seminar at Highland Hardware in November, 1989.

Router Bits for Maloof-Style Joints

A weekend chairmaking class with Sam Maloof here at the store this autumn has reminded us of the widespread fascination with the beautiful joints Sam has developed for attaching his chair legs to the seats. Two years ago in *Wood News* #20 we published a description of the Maloof joint, and in this issue we'll recap the how-to from that article.

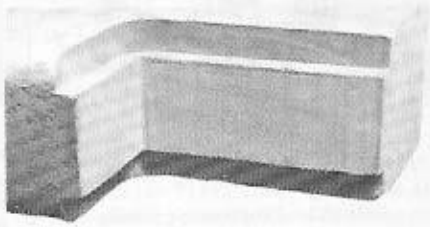
The basic joint is a tongue-and-grooved cross-lap created with dado blade and router bits; what makes it look so special is rounding the corners where the leg laps into the seat, and sculpting the way Sam does with disc sander, rasp and Surform, leaving a smooth, seamless flow from seat to leg as though the two had grown together. It might take a little practice, say ten or twenty years' worth, to develop a feel for shape as sensitive as Sam's but in the meantime anybody can master the fundamentals of cutting the joints. Accurate dadoing and totally straightforward use of two router bits is all it takes.

One of the bits is a garden-variety 1/2" rounding-over bit; you probably already own one. The other is a rabbet bit which is not at all common, being 1" in outside diameter. (Most rabbet bits are 1-3/8" o.d., and there are no rounding-over bits of matching radius.) Highland Hardware stocks a 1" o.d. rabbet bit specifically for Maloof-style joints. It has a 1/4" shank to fit any router, and cuts rabbets 1/4" wide.



We'll commence with a front leg joint. Sam will cut leg blanks about 2" x 2-1/2" in section; seat stock runs about 2" thick. On the tablesaw (or with a handsaw and chisel, of course), cut a dado in the edge of the seat where the leg is to go. Depth of cut will be 1/4" less than the depth to which you want the leg to penetrate into the seat; Sam dados about 1/2" deep. The width of the dado should be precisely 1/2" less than the width of the leg. Next you'll rabbet around the three inside edges of the dado, top and bottom. Depth of cut should be about 3/8". (Photo below left)

Take up the leg blank and mark around the front, inside and back surfaces where you'll saw dados that exactly match the thickness of the tongue you've created within the seat dado. Before sawing the dados, put the rounding-over bit in your router and round over the two inside edges of the leg in the vicinity of the joint, thus the sculpting the curve that will mate with the radiused corners in the seat blank. Now cut the dados1/4" deep. That's just about all there is to the joint; now's the time to proceed with turning or shaping the leg before gluing it into place.



The joint at the rear corners of most of Sam's chairs is similar, but instead of a dado you'll cut an open-sided notch 1/4" shorter and narrower than the width and thickness of the leg blank. Rabbet the notch as before with the 1" o.d. rabbet bit. Lay out and dado the front and inside edges of the leg, rounding over only the inside corner.

The 1/4" Rabbet Bit with 1" diameter cutter and 1/4" shank (our catalog #10.14.39) sells for $26.50.

Our 1/2"-radius Rounding-Over Bit with 1/4" shank (#10.14.32) costs $26.50. With 1/2" shank (#10.12.26) it costs $28.50.

Add shipping charges listed on page 62. Our toll free order line for chargecard customers is (800) 241-6748.

Chain Mortisers Returning to U.S. Market

by Zach Etheridge

CHAIN MORTISERS are tools designed specifically for timber-frame construction techniques which call for large-scale mortises, cross-laps, half-laps, or slip joints in architectural-size timbers. The machines are basically small electric chain saws mounted on columns which allow the cutter chain to be plunged vertically into a timber, quickly and accurately cutting rectangular mortises up to 6" or more in depth. Various mechanisms on the mortiser allow the chain bar to be quickly re-positioned for longer or wider mortises without having to unclamp the machine.

Makita 7104L

Years ago Highland Hardware carried Makita's model 7104 chain mortiser, an interesting machine which had just begun to develop a market for itself when it was discontinued (this was a marketing decision, not the result of a design or technical problem). Though it was designed with timber-frame construction in mind, the 7104 had become a favorite not only among timber framers but with other workers using fairly large-dimension lumber, such as might be used for playground equipment, fences and other outdoor structures. One mortiser went to a doormaker who installed a lot of mortise locks; the 7104 was the fastest way he could find to cut very deep mortises in the edges of 1-3/4" doors. The only people who regretted the the machine's disappearance more than we did were those customers who had bought 7104s and become dependent on their efficiency and economy; the only alternative then available was nearly four times Makita's price.

Now we're faced with an embarrassment of riches: both Makita and Ryobi are bringing out chain mortisers at about the same time. As soon as prototypes became available we borrowed one from each manufacturer and ran a thorough side-by-side evaluation. Makita's mortiser is a revived new edition of the 7104 with significantly expanded clamping capacity; Ryobi's seems to borrow a number of ideas from Makita, but also shows several innovative departures. Both are good, thoughtfully designed machines that work easily, quickly and accurately. As we studied the

Ryobi CM30A

tools we found our preference swaying first one way and then the other. If we penalized one mortiser for some specific weakness, there would turn out to be an offsetting penalty applied to the other mortiser. We'd find a really fine feature on one of the machines, then turn to the other and find a different but equally effective design.

The chart at right lists practically every dimension, capacity and performance characteristic we could think of. For clarity and economy we have chosen to label mortise dimensions as X and Y; the X axis identifies the width of a mortise, running across a timber; the Y axis runs along its length.

There are a few other comparable features that don't show up in the chart. Ryobi's motor is 14% more powerful than Makita's, but it's working on 165% more wood with its larger chain. So Ryobi takes longer to reach any particular depth than does Makita—but then you'd have to make two cuts with Makita to equal the Ryobi mortise anyway. Net time elapsed for a given mortise size seems to work out roughly equivalent.

The 7104L's clamp foot can be set and locked anywhere along the transverse rods up to its 12" maximum capacity.

Specifications

		Makita 7104L	Ryobi CM30A
Clamping Capacity	Maximum	12"	7"*
	Minimum	1-1/4"	1-1/4"
Minimum Mortise Size (X by Y) (= blade size)		3/4" x 2"	1-1/4" x 1-7/8"
Max. Mortise Size (X by Y) (without unclamping)		11" x 5-3/8"	6" x 4-7/8"
Max. Depth of Cut		7-1/2"	6-1/4"
Adjustable Depth Stop		Yes	Yes
Instant X-Axis Travel Adjustment Range		0 to 9/16"	3/8" to 3/4"
Overall X-Axis Movement		Threaded Rod and Crank	Threaded Rod and Crank
Y-Axis Movement		Pivoting Head, 2 adj. stops	Lockable Lever-driven slide, no stops
Motor Size		10.5 Amps	12 Amps
Blade Speed		1000 fpm	3400 rpm (approx.1000 fpm)
Net Weight		39 lbs.	37 lbs.
Std. Chain Size		18mm (23/32")	30mm (1-3/16")
Cost of Std. Chain		$179.95	$269.95
Repl. Chain Sizes		15mm-24mm	9.5mm-30mm
Price of Mortiser		$895.00	$795.00
Availability		Feb. 1990	Jan. 1990

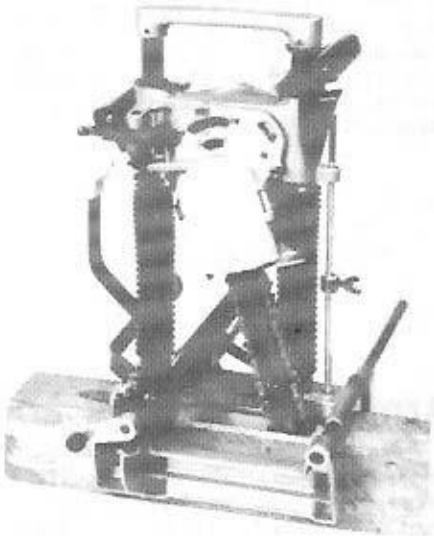
*Optional 12" retro-fit clamp assembly should become available in the spring of 1990; price to be announced.

The CM30A's clamp foot is shown pinned in the widest of its two positions. The pad is screwed in or out to set actual width up to 7" maximum.

The mechanisms for control of X-axis movement on the two machines are virtually identical, but their operation is different. Both machines mount the cutterhead and post assembly on transverse rods which also hold the clamp feet in position across the timber. For cutting mortises slightly wider than the chain, a lever can be used to shift the cutterhead along these rods almost instantly, with adjustable stops for exact range of motion. Cutting wider mortises is accomplished by cranking a threaded rod which pulls the cutterhead assembly back and forth over the ranges shown in the chart. It takes some willpower to turn Makita's crank, but the Ryobi machine moves with remarkable ease and smoothness. The difference is probably due mostly to the way the machines clamp onto a timber, which we'll describe shortly.

The mechanisms for Y-axis movement are quite distinct. On the 7104L, the operator squeezes a locking lever and pivots the cutterhead sideways, releases the lever to engage an adjustable stop, and then plunges the assembly vertically as usual. Mortises longer than about 4" will require one more tilt of the blade, with another adjustable stop for preset accuracy. The resulting mortise is not flat-bottomed, though the peaks between each plunge point can be smoothed out with a full-depth sweep across the full pivot range. Here the CM30A shows its greatest departure from Makita's basic design: Ryobi has mounted the cutterhead and post assembly on a second set of rods mounted across the first, allowing the whole assembly to slide along the Y axis while the blade remains vertical. A screw-locking lever is used for very smooth control of Y-axis travel. There are no positive stops, however, so the operator will have to be awake to maintain accuracy. A steel tab shows the chain position, so setting to layout marks shouldn't be too challenging.

The way the the machines clamp onto a timber leaves something to be desired in both cases. Both employ a spring-loaded foot which locks onto the transverse rod opposite the clamp lever. On the 7104L this foot can be slid along the rod to any position and locked in place; the only drawback to the design is that if the locking handle is loosened a half-turn too far, it can run into other parts of the machine before it can be re-tightened when setting up for narrow timbers. Makita's clamp lever is engaged by pressing it from its 45° open position to horizontal. This makes it easy to clamp onto any timber quite securely, but it also presses the machine tightly against the surface, making X-axis movement fairly stiff. The CM30A's clamp lever engages when it's pushed to a vertical position; you might have to pay a little more attention to avoid tipping everything over, but it's not difficult to control. The clamp foot assembly, though, can be locked in only two places along the transverse rod; up to several inches of adjustment must be set by screwing the clamp pad in or out as needed. As we made trial cuts in a few different pieces of stock, we found the necessary threaded adjustment to be a bit time-consuming and tedious.



The 7104L's blade at maximum tilt, being plunged vertically for the final cut in a long mortise.

Both machines have springs around the plunge posts; on the Ryobi CM30A, these springs fully support the weight of the motor assembly when the plunge lock tab is released. The springs on the Makita 7104L are much softer, and hardly support the motor at all in its fully raised position – if the plunge lock tab were accidentally or carelessly released by an inattentive operator, the motor and chain could drop suddenly onto the work. The trade-off is that it takes a pretty substantial amount of pressure to plunge the Ryobi all the way to max depth of cut, while on the Makita the springs offer only reasonable resistance at full depth, and at that compression they do offer positive assistance in lifting the cutter back out of the work.

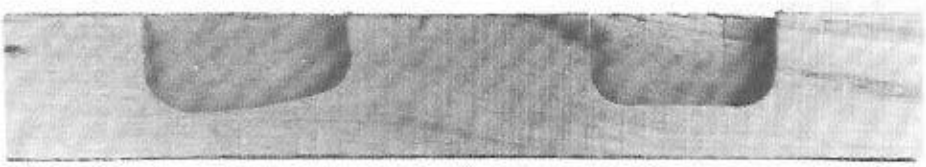
The Ryobi mortiser is equipped with a bolt-on clear plastic full-length chain guard, while the Makita machine has a hinged steel guard over the upper third of the chain bar. We suspect that this will be a moot point to most professional operators, with whom Ryobi's guard will probably suffer the same fate as most of their other saw guards.

We should mention that the competition between Makita and Ryobi is pretty fierce, and it's possible that some of the specific disadvantages to either machine may eventually be eliminated.

You can't go wrong with either machine. Choose the mortiser whose specs most completely meet your needs, and get ready to assign an extra hand to cutting tenons. Mortising is about to become one of the easiest parts of your work.

The Makita 7104L chain mortiser is due to be available from Highland Hardware beginning in February, 1990 for $895.00 plus $6 shipping.

The Ryobi CM30A chain mortiser will be available in January, 1990 for $795.00 plus $6 shipping.



Makita 7104L *Ryobi CM30A*

Makita's advantage in maximum depth of cut is offset by the 7104L's rising bottom profile. End and side cut quality is nearly indistinguishable.

Making Your Own Lathe Chucks

Anything can be turned if you can get a hold of it!

by Ernie Conover

I AM FREQUENTLY ASKED my opinion of the wide variety of lathe chucks that are now available. My personal recommendation generally is to just make your own chuck. A well-constructed homemade chuck should be more accurate, won't leave any marks, and can hold things that no metal one can. Let's look at chucking.

Any old turning book (from early in this century to as far back as 1750) devoted at least one chapter to chucks, so there is nothing new in anything I am going to relate here. Wood chucks, called jam chucks because you jam the work into them, work on the principle of locking tapers much like a Morse taper that holds things in our lathe headstock and tailstock.

A Morse taper is about 3° inclusive or 1-1/2° per side. At around this angle, a taper becomes locking in that it stays put when snapped into a socket. If we go to a greater taper, we have one that centers but does not lock, such as an R-8 milling machine taper. If we go to less taper, a full locking taper is achieved, one that is difficult to get apart once in place. Old machinery cogs and wheels were pinned with locking taper pins. Oddly enough, we find the same rules work well in wood and we can construct wood chucks using the same geometry of 1-1/2° per side.

Cup Chucks

The chuck I reach for most frequently is what I call a cup chuck (see Figure 1). To make a cup chuck, simply turn a 3" to 4" cylinder about 4" to 6" long between centers. True one end and attach a faceplate. Since the plank grain is running between the centers of the lathe, the faceplate will be screwed to end grain. For this reason, it is best to use #12 or bigger sheet metal screws. I usually use screws that are 1" or 1-1/2". Mount the faceplate to the spindle and using a drill chuck in the tailstock, drill a 1/2" to 5/8" hole through the wood cylinder to allow for a knockout bar to eject work from the chuck. Now it is simply a matter of scraping a pocket in the face of the chuck the diameter of what you plan to hold, with a 1-1/2" taper in the side.

The wood selected for making a chuck is important! The old treatises all recommended boxwood, which today is both hard-to-find and pricey. If you find any, make little boxes out of it. Dogwood is a close replacement which is readily available in the South. Actually though, I have had good luck with maple, white ash and even yellow poplar. Cherry, walnut and oak have worked out poorly.

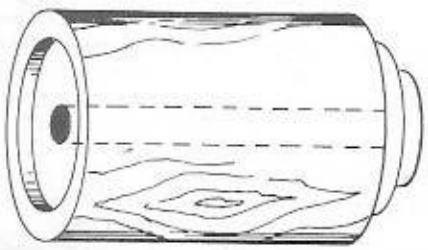


Figure 1. Typical Cup Chuck

For making and sizing (fitting the chuck to the piece to be held) I use a homemade scraper like the one shown in Figure 2. I used to use an old file, but these days I try to find a piece of high speed steel. The important thing is to have the face and left side at right angles to each other.

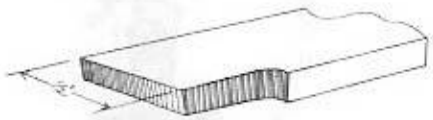


Figure 2. Homemade Scraper

Armrest

I also use a very little-known tool called an armrest (see Figure 3), which is no more than a stout rectangular section of steel with a right angle bend at the end. I forged my own, case hardening it for wear resistance and tapering the handle end to a tang. An armrest is fitted with a robust handle of the 18-inch to two-foot variety.

In use, the handle of the arm rest is placed under the left arm (sort of in the armpit) and the armrest itself is placed across the tool rest. The tool rest is set parallel to the lathe bed, an inch or so from the chuck, so that it stays out of the way during the entire fitting operation. The scraper is then placed in the right angle bend of the armrest and applied to the work, which in this case is the chuck. It is sort of a two-handed type of turning, but easy (and fun) once you get the hang of it. The big advantage is that a chuck can be fitted to the workpiece very quickly, and trial fits are much easier because the tool rest never has to be moved. For this one job alone, an armrest is worth learning to use, but it is useful in many other pieces as well. Using an armrest is a bit like a game of teeter-totter, so watch that you don't get too far out over the rest or you will get bumped!

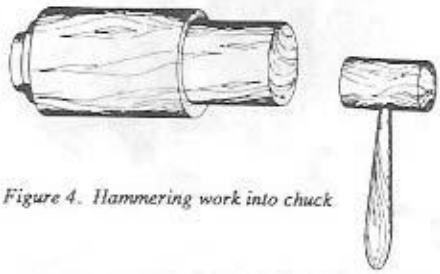


Figure 4. Hammering work into chuck

The mouth of the chuck should be sized line on line with the work to be held. The opening tapers back from here at the above-mentioned 1-1/2° and should only be 1/8" to 3/16" deep. Touching a bit of chalk to the finished chuck makes it hold the work much better!

A special tool is needed to force the work into the chuck and bring it square. Fortunately most households have one: the common hammer (see Figure 4). Simply place the work in the mouth of the chuck and smack it a light blow. Now turn the lathe over by hand and note the direction out of true. Make a correction with your trusty hammer and inspect again. With a little practice, you will be able to have things running dead true in a minute or less. If it is something like a nearly-finished box that you are chucking, it may be good to place a block of wood between the work and the hammer.

Other Chucks

Jam chucking is particularly useful for holding small objects such as boxes, balls and finials. I practice what I call my *First Law of Jam Chucking*, which should be strictly adhered to, especially during the learning stage. Ernie's *First Law of Chucking* is, "One should never jam chuck anything one is not prepared to be hit in the head with." Saying all

Figure 3. Armrest

Ernie Conover is a turner, lathe manufacturer, educator and author who lives in Parkman, Ohio. This article originally appeared in the December 1989 edition of Woodshop News. It is reprinted here with their kind permission.

Ernie will teach several half-day hands-on turning workshops at Highland Hardware on the weekend of May 18-20, 1990.

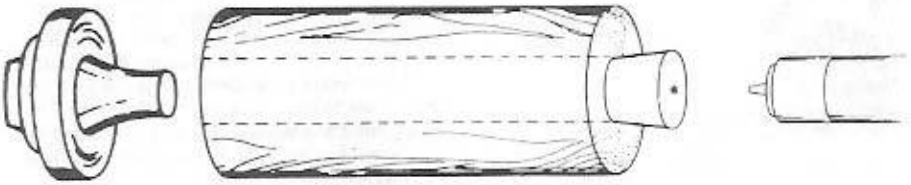


Figure 6. Tapered Mandrel (at left) and plug

of this, however, I have jam chucked things as big as a boccie ball and regularly chuck bowls this way. With bowls though, I employ the tailstock, which makes things quite safe. More about this in a minute.

A jam chuck must be retrued every time it is used because the wood moves with every change in humidity. At certain times of the year, even a few hours are enough to make things egg-shaped. Truing only takes a few seconds and very little has to be removed. If the chuck starts to get too big, it is just a matter of cutting back the face and scraping the pocket deeper. I never throw a chuck away until there is danger of hitting the faceplate screws.

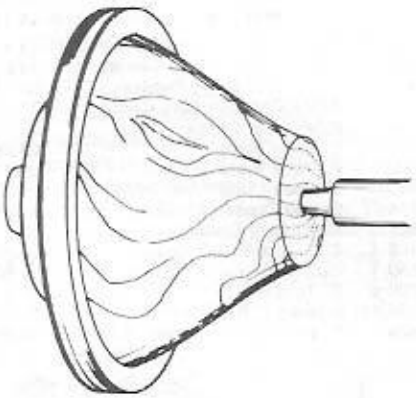


Figure 5. Bowl and Faceplate

As mentioned above, a bowl can be jam chucked for turning the base. It only works with a traditional bowl and rough tops.

I mount a disk of medium-density fiberboard on a faceplate (see Figure 5).

I then measure the diameter of the bowl with dividers and transfer the measurement to the disk. Now using a cutoff tool and the trusty armrest, I cut a groove in the face of the disk that the bowl will fit into. The groove should be about 1/8" to 1/4" deep. If done well, the bowl will stay in the groove by friction and vacuum.

Actually though, the groove need only contain the rim of the bowl and could be as much as 1/8" larger if the tailstock is also employed. Extend the tailstock ram out two to three inches and put the center against the bottom of the bowl. Now place the tool rest at right angles to the bed and just under the ram. A spindle gouge may now be employed to finish the bottom to a concave shape leaving an elegant base. This is quite safe if the speed is kept low. A small nubbin is left under the center which is easily removed with a chisel.

Tapered Mandrel Chucks

Finally, the principle of jam chucking may be turned inside out with tapered mandrels. (See Figure 6.) This is a great way to make an outside diameter concentric with an inside diameter. This is particularly useful for such things as pepper mills, bracelets and lamps. Simply mount a piece of wood on a faceplate (again with the plank grain running between the centers) and turn a gentle taper (1-1/2°) which fits the inside diameter of what you want to hold. Force the work over the taper and turn away.

For longer objects with a hole all the way through (such as a pepper mill) a tapered plug is also turned. Tap the plug into one end and slip the other over the mandrel on the faceplate. Pick up the center mark in the plug with the tailstock center and the inside diameter is now running dead true. I have used this method to turn coopered columns 12" in diameter and eight feet long. They weighed about one hundred pounds each and were held securely.

In closing, let me say that to use jam chucks, you do need to be able to turn well enough that a catch is the exception rather than the rule. They are vexing the first few times, but if your persevere, it gets easier and easier. It's just matter of telling yourself you can do it, and not getting discouraged. The benefits of teaching yourself jam chucking will be repaid many times over.

Finally, keep speeds sensible. Don't replace skill and sharp tools with speed. Everything I have outlined above can be done at speeds between 600 and 1700 rpm.

I wish you good (and inexpensive) turning.

§

PORTER-CABLE 12-Volt MAGNEQUENCH® 3/8" VSR Adjustable-Torque CORDLESS Driver/Drill

This heavy-duty monster from Porter-Cable is designed to do just about everything a 3/8" electric drill can do – except make you drag a cord around behind it. The Magnequench features six torque settings to handle every need from driving #4 wood screws into soft wood without stripping to full-power boring through steel plate. The drill comes with 12-V battery, 1-hour fast charger, steel case & bit. Weighs 4.4 lbs. Speed is 0-400 rpm.

In our tests of the Magnequench here at the store, we started off by using a 2-1/8" hole saw, moderately dull, to cut through 1-1/2" of poplar – not the sort of thing a cordless drill is supposed to be able to handle at all. It not only did the job, but had plenty of charge left over for lots more screwdriving and drilling. If you've discovered the great convenience of cordless tools but have always needed more power, try the Magnequench.

820	12-Volt Cordless Drill	$149.95
8500	Spare 12-V Battery	48.00

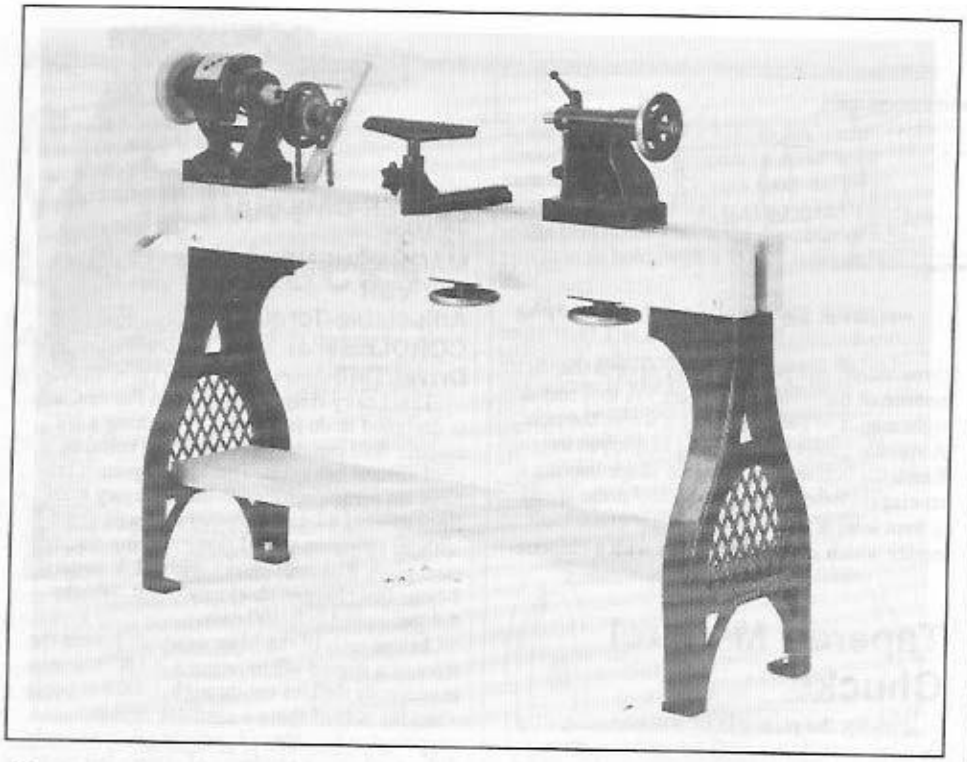
Hot Stuff™ Adhesives

Hot Stuff is a non-toxic "super-glue"-like adhesive which has dozens of useful applications for woodworkers. This cyanoacrylate liquid sets up hard in less than a minute (almost instantly when Accelerator is sprayed on) and creates powerful, permanent bonds in wood, metal, plastic, and most other materials. Already a favorite of woodturners for repairing cracks and punky areas in interesting woods, Hot Stuff is increasingly used as a general-purpose instant clamp in jig making, repair work, prototyping, toymaking & more.

We stock three kinds of Hot Stuff in 2-oz. bottles: **Original Hot Stuff**, about as runny as water and used primarily on non-porous materials; **Super T**, a thicker formula that is the turner's choice; and **Special T**, fairly viscous and ideal for bonding of wood and other porous stuff. **Hot Shot Accelerator** comes in a pump spray bottle for easy application. We highly recommend **Hot Stuff Solvent**; the adhesive, like all the "super glues," can bond flesh almost instantly.

Also available as a package which includes each item listed above at a savings of 25%.

14.61.01	Original Hot Stuff	$9.95
14.61.02	Super T Hot Stuff	9.95
14.61.03	Special T Hot Stuff	11.50
14.61.04	3-oz. Accelerator	3.95
14.61.05	Hot Stuff Solvent	4.95
14.61.06	Package Deal	29.95



Conover 16" Heavy-Duty Lathe

WE ARE PROUD to offer as part of our line of turning tools and machines the Conover heavy-duty 16" lathe. Its robust cast iron construction, meticulous machining, large 16" swing, unlimited bed length, and its variable speed option make it one of the most versatile and appealing lathes on the market. It is also an outstanding value.

With its massive 1-1/2" diameter spindle, the Conover lathe is ideal for the serious turner for both large faceplate work as well as spindle turning. While other new "heavy-duty" lathes have settled for a 1" spindle diameter (such as one finds on smaller lathes), the Conover's spindle is one of the largest in the marketplace. Its cross-sectional area is more than twice that of a 1" spindle, thus control of large workpieces is far more stable.

The spindle is held in heavy Timken™ tapered roller bearings. Unlike ordinary ball bearings, roller bearings can handle both radial and axial loads well and can be preloaded. A ball bearing must have some "play" to work. At certain harmonics this play prints out into your work. Because roller bearings are opposing cones, they can be preloaded, or brought to a condition of zero play. By turning the nut at the rear of the spindle, the preload may be adjusted at any time to accommodate wear and the needs of the turner.

The Conover lathe's headstock, tailstock, and toolrest, as well as the optional legs, are heavy iron castings poured for Conover by a small foundry located in Ohio. The timber bed for the lathe is supplied by the user (two 2" x 6" planks are required), permitting you to choose whatever length is appropriate for your work up to 12 feet. Weight of the lathe including cast iron legs, timber bed, and typical motor is about 400 lbs.

Weighing nearly 150 lbs, the optional pair of Conover cast iron legs greatly simplifies bed building and yields a rock-solid lathe of classic beauty. There are provisions for including two shelves or a box section for sand. We highly recommend the leg set. Alternatively, plans are included with the lathe for building a leg-stand from wood.

The 1-1/2"-8 tpi spindle is bored for a #3 Morse Taper. The tailstock spindle is a #2 MT, and is hollow, allowing up to 3/8" "gun drilling" of workpieces mounted between centers.

The drive pulley offers four principle speeds (600, 1100, 1725, & 2600 rpm) and is indexed to 24 positions. An optional counter shaft kit provides an additional range of lower speeds for large diameter work. With it, the four principle speeds are reduced to 1/3 normal, yielding a low speed of 200 rpm.

Many purchasers choose to outfit the lathe with the Variable Speed DC Motor option, permitting continuous speed control down to a remarkable 50 rpm, a distinct advantage for serious bowl turners.

Outboard turning is possible by moving it to the end of the bed, eliminating the need for extra lefthand faceplates. (An optional extra set of motor mount brackets is recommended for ease in relocating the motor assembly when setting up for outboard work).

An optional walnut outboard hand wheel fitted on a precision machined hub greatly aids screwing and unscrewing heavily laden faceplates onto the spindle, and is useful in turning working for inspection and as a brake.

An optional full length tool rest kit includes a stepped cast iron pin which fits into the toolrest base and a threaded right angle pin which screws into the tailstock, allowing mounting of a user fabricated wood rest of any length to facilitate production spindle turning situations.

The optional Conover 3-Jaw Scroll Chuck provides a quick way to perfectly center objects up to 4" diameter. Supplied with two sets of jaws for both inside and outside holds. Allows feeding of up to 3/4" dowel through the head stock spindle. Work can be chucked and unchucked frequently to within .003" accuracy.

CONOVER LATHE PACKAGES

The lathe is offered either in component fashion, or as a standard or deluxe package. When purchasing as components, the headstock, tailstock, 12" tool rest and base, motor mount, belt and motor pulley are offered as the **Basic Lathe.**

When ordering the Basic Lathe, the following items must be ordered or provided separately: drive center and tailstock center for spindle turning, face- plate for bowl turning, motor, switch, and legstand.

Our **Standard Package** includes the items included with the Basic Lathe, plus these items: #3MT 2-spur center, Conover live center, 1-1/2 HP 1725 rpm AC motor, enclosed toggle switch, and Conover cast iron legs.

Our **Deluxe Variable Speed Package** includes the Basic Lathe plus the #3MT 2-spur center, Conover live center, 3" faceplate, outboard handwheel, 1-1/2 HP Variable Speed 220V DC motor and controller, and Conover cast iron legs.

The Basic Lathe, Legs, and Lathe Packages are shipped by truck Freight Collect.

011	Conover Basic Lathe	$999.00
021	Conover Standard Package	1750.00
031	Conover Deluxe Package	2199.00
535	Cast Iron Leg Set	399.00
498	1-1/2 HP 110/220V AC Motor	219.00
499	Switch for AC Motor	29.95
540	Counter Shaft Kit	149.95
428	1 HP 110V DC Motor & Var. Speed Controller	499.00
429	1-1/2 HP 220V DC Motor & Var. Speed Controller	599.00
430	Shop Wiring of DC Motor	47.95
411	Spare Motor Mount Brackets	15.95
509	#3MT 2-Spur Drive Center	29.95
510	#3MT 4-Spur Drive Center	29.95
511	#3MT Mini Drive Center	34.95
520-2	#2MT Conover Live Center	74.95
513	#2MT Cup Center	29.95
501	3" Face Plate	29.95
502	4" Face Plate	33.95
503	6" Face Plate	35.95
514	Screw Center	47.95
521	#2MT Drill Chuck	39.95
505-4	4" 3-Jaw Scroll Chuck	199.00
560-1	Outboard Hand Wheel	88.50
306-6	6" Tool Rest	27.95
306-12	Spare 12" Tool Rest	28.95
509	Full-Length Tool Rest Kit	24.95

Conover Live Center

CONOVER LIVE CENTER WILL IMPROVE ANY LATHE

Necessary for the serious turner, a live center eliminates burning and chatter while allowing much higher tailstock pressure. The Conover model fits any lathe with #2MT tailstock, and is equipped with four interchangeable points. The extended cup point is used for turning tool handles and for getting into such things as goblets and weed pots. The normal cup point is used for most turning. The core point is inserted into a 3/8" hole, providing secure holding of large items. The 60 degree point is used for small, delicate turnings.

520-2 #2MT Conover Live Center $74.95

Ask Liam O'Neill

Dear Liam,

I recently read an article in *Wood* magazine on segmented bowl turning. I tried it on my Sears 12" lathe and had good results, so I made a few more. I enjoyed it so much I purchased a Vega 24" 6-speed bowl lathe. All the turning tools I have are the Sears basic turning tools.

I realize I am just a novice, and that it takes much practice and time to be good at turning. Maybe I jumped the gun at buying a bowl lathe. Before I use it, I want to purchase the right turning tools, partly to do the job right and also for safety reasons.

I would like to know what tools to purchase to make large and small segmented bowls, and also if there are any books available on segmented bowl or plate turning.

Thank you,
Henry L. Swift, Jr., Holt, FL

Dear Henry,

Welcome to the wonderful world of woodturning. You are obviously well and truly hooked since you have invested in a heavier lathe. Buying the biggest lathe you can afford even at the outset is never jumping the gun. Too many people start off with a lightweight lathe, intending to turn fairly big bowls, and find themselves struggling with vibration and chatter problems which make acquiring the basic turning skills even more complicated.

There are two areas of skill attached to the making of segmented bowls and plates, so you are sourcing two kinds of information. The turning skills are really the same as for work turned from solid stock, so there are quite a few how-to books and workshops available to help you. I often recommend Richard Raffan's book ***Turning Wood*** supplemented with ***The Craftsman Woodturner*** by Peter Child.

The other skill you need is the assembling of the turning stock and the design of the finished product. There is not been much writing done in this area apart from articles such as the one you describe in *Wood* magazine, although there is an increasing body of good work available now. In the past, much of the segmented work available was very "Bricks in a Wall," but lately there is much more originality around.

I can only make some general recommendations on which tools to purchase. Turning segmented work usually entails using dry wood, so go for High Speed Steel tools, as they hold their edge better, and particularly with the scrapers a good cutting burr can be raised straight from the grinding wheel. I recommend a white aluminum oxide wheel on a regular bench grinder. We use 60 grit for reshaping tools and 100 grit for the sharpening.

I would use deep-fluted bowl gouges which are available in three widths of flute: 1/4", 3/8" and 1/2"; and in two styles: regular factory ground and Liam O'Neill side ground. Start with one or two of each and build your set up as your experience grows.

For fine scraping, use heavy HSS scrapers 1-1/2" wide by 3/8" thick. Buy a couple of square end scrapers. Use one for flat work and dome the other one for shallow curves in the bottom of bowls. Grind scrapers to a 45° angle.

Always use long handles. I recommend a 26"-long handle for 1/2" bowl gouges and 18" for 3/8" gouges and the scrapers. If you wish to purchase handles in these lengths, they are available from Highland Hardware.

Good woodturning,
Liam

Liam O'Neill, who lives in Shannon, Ireland, has been a full-time professional woodturner for over 20 years. He will teach a turning seminar at Highland Hardware March 3-4, 1990.

Readers are invited to submit questions on all aspects of turning (tools, techniques, sharpening, wood, design, marketing your work, etc.) for Liam to answer in future issues of Wood News. If your letter is selected, you'll receive a free Highland Hardware T-shirt.

Send questions to "Ask Liam O'Neill," c/o Highland Hardware, 1045 N. Highland Ave, Atlanta, GA 30306.

Dear Liam,

I have recently taken up bowl turning following a stroke 12 years ago which left me with one working hand. I have several questions.

I have difficulty making a shearing cut inside a bowl. Can I expect to master this procedure with one hand? (I use my bad left arm as weight to hold down the turning tool.)

I have the best luck on quick stock removal with the gouge held a little less than 90° to the work but not quite at a scraping angle, bevel not rubbing. If you have a catch, you bend the gouge. Is this correct or acceptable?

How do you stop bowl blanks from checking before turning and after?

All my tools are shallow, thin spindle tools that came with a second-hand lathe. Do I need a bowl gouge, and will it be easier to control?

What type of wood is best for making bowls for ease of cutting and lack of checking? I have been turning black walnut. Is it considered a difficult wood to turn and finish on the lathe?

My lathe is a 12" Delta which is powered by a 3/4 HP motor. I often stall the motor. Is it powerful enough? Would a larger motor be dangerous? How large a motor do you recommend?

Sincerely,
L. D. Branden, Jr., Wake Forest, NC

Dear L.D.,

I recently had a wallop on my left thumb which crushed the bone. Although my recovery will be complete, it gives me some idea of your predicament as I have had to think of what the hands do individually when turning wood.

When turning on the right hand side of the headstock (the inboard side), the right hand does the pushing and rolling of the tool in action and the left does the steadying. While finger tip gripping of the tool by the left hand is an advantage, I have found that I can use the karate chopping edge of the hand to steady the tool on the toolrest. In your case, I can only imagine that this may be more difficult and you may be using your arm to do the same job, as you describe, with some difficulty.

If you can, get some one-on-one tutoring, but if that is not possible, here are some hints which may be helpful. Use deep fluted factory-ground bowl gouges in High Speed Steel. Start off with the 3/8"-wide flute as this does less hogging off of material and is easier to control. For removing waste and finish-cutting the side walls of bowls, grind one gouge to a 45° bevel angle and for the bottoms of bowls, use a bevel of 70° or so. A HSS tool will develop a cutting edge at amazingly low angles.

Use long handles (see my answer to the other letter) so that you can rest the handle under your arm and against your body for extra support. Learn to cut with the gouge over on its side with the bevel rubbing on the freshly cut wood behind the cut.

Bowl stock in the log or block is hard to keep from checking. I try to rough out the bowl blanks while the wood is still fresh, leaving a wall thickness of 10% of diameter, or wider if you make wide-rimmed bowls. This gives wood a chance to relieve internal stresses which build up while the tree is growing and the roughed out bowl will go oval.

There are proprietary products on the market designed to be painted onto such rough outs as well as solid pieces. These set hard on the surface and prevent moisture exchange and checking. Woodturning supply catalogues are the best source of these products.

When choosing your wood, you must bear a number of factors in mind: function or non-function, ease of cutting, and grain and colour.

Sassafras looks good and cuts well, as does walnut, and is least likely to crack. Cherry makes a good utility bowl but is harder and more prone to checking, while poplar is easiest to cut, and hence a good practice wood, but is not that interesting.

When you mention stalling the motor on your lathe, I wonder if this happens due to your cutting method, or are you digging in? I would have thought that a 3/4 HP motor on a 12" Delta would suffice. A stalling motor is often used as a safety device as it causes less damage than an unstoppable brute during a dig-in situation.

I hope these points help,
Liam

Side Ground Gouges

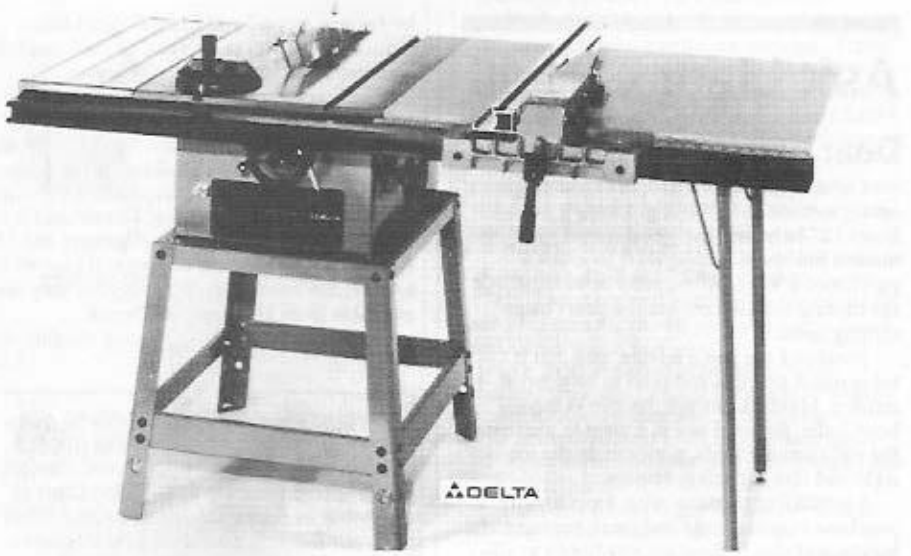
Liam O'Neill's side ground gouges are available (unhandled) from Highland Hardware. Add shipping charges on p. 62.

Liam O'Neill Side Ground Gouges		
14.17.91	1/4"	$45.00
14.17.92	3/8"	55.00
14.17.93	1/2"	65.00
14.17.94	Set of 3	150.00
Long Handles for Side Ground Gouges		
14.17.95	1/4"	12.50
14.17.96	3/8"	17.50
14.17.97	1/2"	23.50
14.17.98	Set of 3	49.50
Books		
20.04.29	Turning Wood	17.95
20.03.55	Craftsman Woodturner	14.95

New Unifence Upgrades Delta Contractor's Saw

Compact Unifence is perfect for retro-fitting other saws

Delta's new Contractor's Unifence is one of the prettiest things they've come up with in a long time. It's nearly identical to the popular and superbly accurate original Unifence, but its smaller size makes it far more inviting for any shop where space is at a premium. The new fence is available as std. equipment on a deluxe edition of Delta's 1-1/2 HP Contractor's Saw – in fact, it's a real bargain at an after-rebate cost only $100 above the standard edition of the saw. ***(Thru Feb. 28, 1990, Delta is offering a $100 rebate on the new Model 34-445).***



Delta's Contractor's Saw has long been the benchmark of quality for affordable tablesaws. It doesn't look a whole lot different from other open-stand saws that cost half as much, but performance tells the tale. Motors don't burn out, trunnions don't get loose and begin migrating randomly under the table, castings don't warp and owners don't spend more time repairing the saw than using it. In the rare event that parts or service should be needed, they're available quickly at hundreds of service centers nationwide. Delta's 1-1/2 HP motor provides plenty of power for ripping, crosscut or joinery operations up to 3-1/8" max. depth; the 5/8" arbor is built to handle dado sets up to 13/16" max. width. The saw's mitre guide features micro-adjustable positive stops at 90° and 45° left or right for verifiable precision in demanding joinery. Table surface is unusually large, 27" deep by 40" wide on the standard saw, or 27" by 62-1/2" with the compact Unifence installed.

The Contractor's Unifence is also sold separately as a replacement fence for almost any other make of tablesaw, including commercial models like the Unisaw or Powermatic 66. Its low price and highly precise performance make it one of the best possible choices in after-market fences. The fence rail and table mounting hardware can be installed on any saw table at least 1-1/2" thick. 27" depth from front to back is ideal, but a little custom drilling would accommodate smaller saws. Clear mounting instructions and a drilling template are included.

Nobody who's ever used an inadequate tablesaw fence will need to be persuaded of the value a straight, rigid fence that locks perfectly parallel to the blade every time, and which has a built-in measuring system more accurate than a tape rule. In fact the measuring system *is* a tape rule, but an adjustable hairline cursor built into the clamp head allows easy 1/128" accuracy with no parallax error. The rail and clamp head on the Contractor's Unifence are the same heavy extrusion and wide T-square casting found on the original Unifence, but the rail has been shortened to 62", enough to allow 30" rips right of the blade without taking up an inordinate amount of floor space. The fence itself is likewise the same two-position T-slotted extrusion as on the original, but shortened to 33-1/2", longer than standard fences but again not enough to require building a new shop. Provided with the fence is an adjustable table-support bracket to be mounted to the right side of the saw, and a pair of sturdy steel legs with braced mounting plates and adjustable feet. This hardware is for mounting a 32" wide, 27" deep table board which can be purchased separately or provided by the user.

If you've got a decent saw with a fence that drives you crazy, the Contractor's Unifence might be all it takes to make the old dog work the way you'd like it to. And if even a new fence won't do it, the Delta Contractor Saw with Unifence (made in U.S.A., we're proud to note) offers a chance to upgrade to a good professional-quality saw at a reasonable price. ***Saw is shipped by truck within 48 states for a $40 charge. Fence alone is shipped UPS.***

34-445	**Contractor Saw with Unifence**	**799.00***
34-915	**Contractor's Unifence Only**	**279.95**
34-914	**Tableboard for Contr. Unifence**	**69.95**

(Price after rebate, $699)

Save on Delta's 12" Variable Speed Lathe

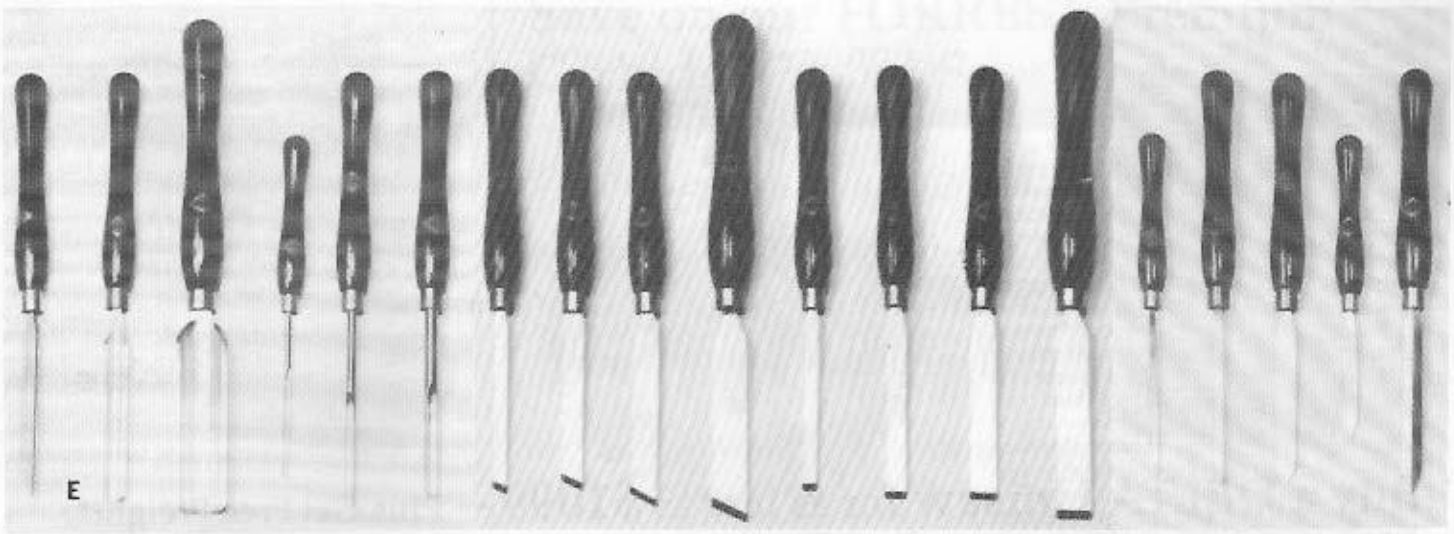
For a limited time Delta is running a great special on their popular 3/4 HP 12" variable-speed lathe, offering savings of 42% off list price. This lathe has all the features you need for turning bowls or spindles easily and efficiently, whether you're doing the work strictly for fun or for income as well.

Model 46-541 offers 39" between centers, and allows turning large objects up to 12" in diameter over that entire length. A short gap (3") between the ways and the head of the lathe allows inboard turning of shallow bowls and platters up to 16" in diameter. Optional outboard faceplates will accommodate even larger material such as deep bowls, or plates and trays up to about 18-20" max. diameter. The lathe's mechanical speed control is a real luxury, allowing the turner to select the most comfortable and effective speed for any job, from roughing out an unbalanced blank to finish sanding a delicate spindle. RPM can be set anywhere from 340 to 3600. 340 RPM is far lower than most step-pulley systems offer, taking most of the hazard and a lot of the nervousness out of turning really big pieces of wood. It's also slow enough to allow a modest amount of double-center turning, a specialized technique for making "impossible" angles in turned work – a turned cabriole leg is a product of this technique.

The lathe is made of heavy iron castings for mass and stability under load. The headstock is fitted with a 1" (8 tpi) drive spindle set in two permanently lubricated ball bearings; 5/8" through-bore allows drilling, center marking, and easy removal of #2 Morse taper drive centers or other accessories. Incorporated into the headstock pulley is an indexing mechanism with two rows of holes, 8 and 60 holes respectively, for reeding, fluting, or tapering work with a router jigged above the ways. Standard equipment includes a safety shield, four-prong drive center, 1/2" cup tail center, both 6" and 12" tool rests, and a 3" inboard faceplate. The machine is mounted on a heavy steel stand with enclosed motor cabinet and a shelf where sandbags can be stored to absolutely minimize vibration during aggressive turning. Total weight is 410 lbs. ***Lathe is shipped within 48 states for an $80 shipping charge. Sale quantity limited.***

List Price $2599

46-541 Delta 12" Lathe SALE $1499.00



HIGH SPEED STEEL TURNING TOOLS

High Speed Steel turning tools represent a major breakthrough in edge tool technology, and provide the beginner and professional alike the satisfaction of sustained periods of high performance at the lathe without the inconvenience of frequent resharpening.

Diamic High Speed Steel tools feature a special steel especially formulated for its toughness, as well as its ease of sharpening to a fine edge and long edge-retaining characteristics. High Speed Steel's outstanding resistance to abrasion and frictional heat accounts for its ability to hold edges many times longer than turning tools of traditional carbon steel. The keen edge needs less pressure to cut and makes the tool easier to control. Fine finishing at high speed can be achieved to give a silky finish not possible with carbon steel tools.

Peter and Roy Child, respected English woodturners and designers, collaborated with Henry Taylor Tools of Sheffield to produce this fine collection of tools which are without equal in today's marketplace.

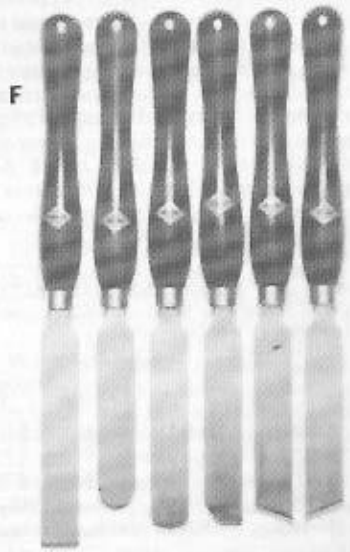
Tools are available individually, or as a set of the 3 turning gouges – 1/4", 3/8", and 1/2", or as a basic set of 6 tools, which includes the 3 turning gouges, 3/4" roughing out gouge, 1/2" skew, and 1/8" standard parting tool. Tools range in length from 13" to 19" long.

E High Speed Turning Tools

14.23.36	Set of 6 Basic Tools	109.95
14.23.37	Set of 3 Gouges	49.95
14.23.42	1/8" Fluted Part Tool	37.95
14.23.43	3/4" Roughing Gouge	36.50
14.23.44	1-1/2" Roughing Gouge	59.95
14.23.45	1/4" Turning Gouge	13.50
14.23.46	3/8" Turning Gouge	18.50
14.23.47	1/2" Turning Gouge	24.95
14.23.48	1/2" Skew	18.95
14.23.61	3/4" Skew	21.50
14.23.62	1" Skew	24.95
14.23.49	1-1/4" Skew	37.50
14.23.63	1/2" Square	18.95
14.23.64	3/4" Square	21.50
14.23.65	1" Square	24.95
14.23.50	1-1/4" Square	37.50
14.23.51	1/4" Bead & Part	13.95
14.23.52	3/8" Bead & Part	18.95
14.23.53	1/8" Std. Parting Tool	24.50
14.23.72	1/8" Small Parting Tool	16.50
14.23.73	1/8" Diamond Parting	33.50

HIGH SPEED STEEL BOWL SCRAPERS

Diamic HSS bowl scrapers take advantage of the same outstanding technology as the other HSS turning tools for excellent performance and long periods of use between sharpenings. The tools are created from solid HSS bars 3/8" thick by 1-1/2" wide. The exceptional mass and resulting rigidity damps out vibration allowing an extremely smooth finish. Safe to use even with a large overhang over the tool rest. Overall length is 19". Available singly, or in a set of all six.



F High Speed Steel Bowl Scrapers

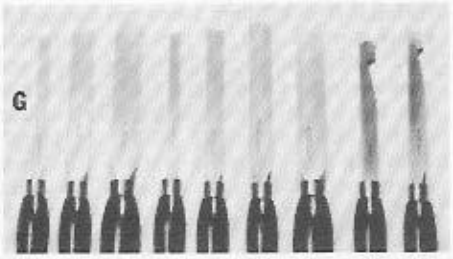
14.23.39	Set of 6 HSS Scrapers	229.95
14.23.54	Straight Scraper	49.95
14.23.55	Full Round Scraper	49.95
14.23.56	Domed Scraper	49.95
14.23.57	Righthand Half Round	49.95
14.23.58	Righthand Skew	49.95
14.23.59	Lefthand Skew	49.95

G HIGH SPEED TURNING SCRAPERS

The assortment of Diamic HSS bowl turning scrapers described at left has been expanded to include the popular square and round nose patterns in smaller sizes, and also two new patterns have been added. The round side cutting scraper and diamond side cutting scraper are ideal for turning the inside lip of bowls.

High Speed Turning Scrapers

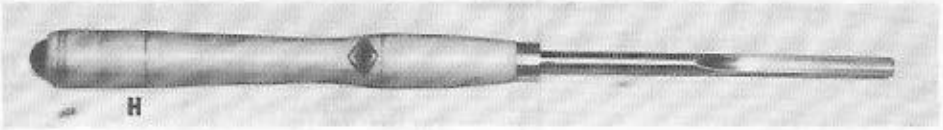
14.23.66	1/2" Round Nose	18.95
14.23.67	1" Round Nose	24.95
14.23.74	1-1/4" Round Nose	37.50
14.23.68	1/2" Square	18.95
14.23.69	3/4" Square	21.50
14.23.70	1" Square	24.95
14.23.71	1-1/4" Square	37.50
14.23.75	3/4" Round Side Cutting Scraper	24.95
14.23.76	3/4" Diamond Side Cutting Scraper	24.95

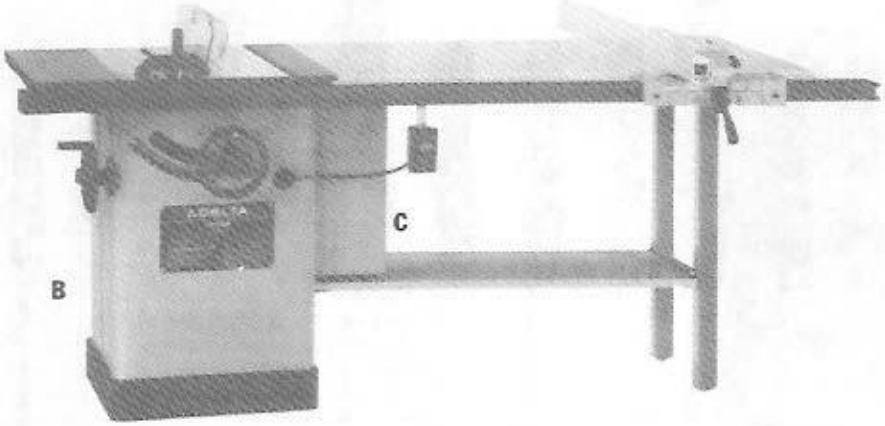


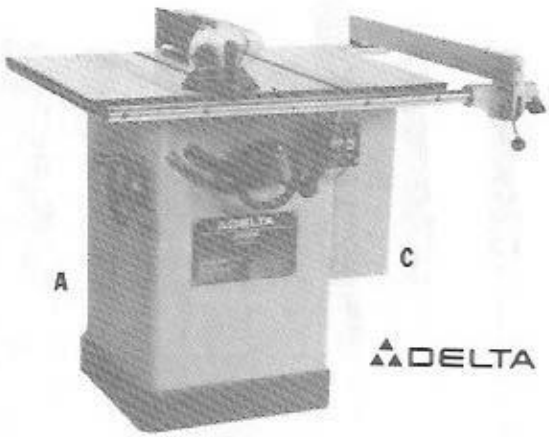
H SUPERFLUTE BOWL GOUGE

The Superflute is a strong, well-balanced gouge manufactured by Henry Taylor Tools and designed to outperform other deep bowl gouges. Its blade is top quality High Speed Steel, carefully milled to an exact shape and precisely heat treated to the right temper. Its long hardwood handle is designed to increase leverage and provide a good grip. The HSS blade takes a sharp edge that will last through hours of use roughing out, slicing, and finishing. Size of the cutting edge is 3/4". The tool is 26" long overall.

14.23.35	Superflute	59.95







Buy a DELTA Unisaw for as low as $1099 – Plus Get Free Freight*

Fifty years of tradition have gone into making the Unisaw the nation's most popular heavy-duty 10" tablesaw. Now, with modernized production facilities and ongoing design improvements, Delta has made the Unisaw not only better than ever but more affordable as well. And they've made their excellent T-square Unifence part of the package at tremendous savings for a limited time. We feel the 3-HP Unisaw with Unifence is the best tablesaw value on the market, and we're proud to include this great American tradition in our catalog.

UNISAW WITH UNIFENCE

The Unisaw features a heavily ribbed cast-iron work surface measuring 28" wide by 27" deep, with 18" of table surface to the left of the blade. Equipped with a shop-built table surface on the Unifence frame, it offers a working surface 27" deep by 76" wide, providing 51" rip capacity right of the blade and plenty of support for full-size sheet material. The 43"-long fence can be used in either vertical (3-1/2" high) or horizontal (1/2" high) position; changing from one position to the other takes just a few seconds. The fence can be locked onto the T-square clamp head anywhere along its length, allowing the user to choose the best arrangement for the job at hand. The clamp head incorporates an adjustable cursor, calibration screws and leveling glides; once set up precisely, the fence can be set smoothly and locked with totally reliable accuracy at any desired distance from the blade.

Equipped with Delta's 3 horsepower, 220v (13.5 amp) single phase motor, the Unisaw has all the power you need for ripping, crosscutting, or dadoing in any stock thickness. 3-belt drive system guarantees full power transmission to the blade regardless of load. Max thickness at 90 degrees is 3-1/8", 2-1/8" at 45 degrees. The tablesaw surface has T-slots on both sides of the blade; the mitre guide can be pulled beyond the front of the table for crosscutting up to 25" wide without twisting or falling out. The mitre guide has built-in adjustable stops at 90 and 45 degrees.

UNISAW WITH JET-LOCK FENCE

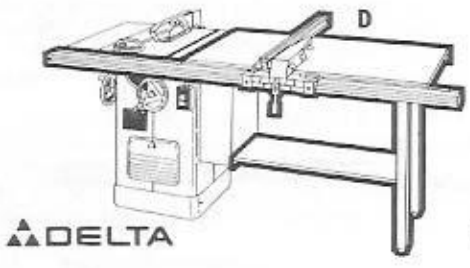
The standard Unisaw differs only slightly from the Unifence model described above. An extra cast iron extension brings table size to 36" wide by 27" deep; heavy tubular fence rails allow 25" rip capacity to the right of the blade. Overall width of the saw including fence rails is just over 45". Though the Jet-Lock fence may not feature all the precision and sophistication of the Unifence, it is nonetheless a reliably functional fence, with the advantage of a built-in micro-adjuster for exact setting. A low-voltage safety switch is standard on all 3-HP models; Unisaws with 1-1/2 HP motors are equipped with a pushbutton switch with built-in overload protection.

Through Feb. 28, 1990, SPECIAL FACTORY INCENTIVES allow us to deduct $200 from our current prices on these three models:

			Our Price	Including Delta's "$200 Off" You Pay Us Only
A	34-761	1-1/2 HP Jet-Lock Unisaw	$1299	$1099
	34-763	3 HP Jet-Lock Unisaw	$1499	$1299
B	34-782	3 HP Unisaw w/Unifence	$1699	$1499

**Delta Unisaws are shipped Freight Prepaid within the 48 states while current supplies last.*

	HRS-10G	Mobile Base for Unifence Model	198.50
	HRS-10	Mobile Base for Jet-Lock Model	109.00
	34-254	Dado Insert for Unisaw	22.95
C	34-829	Motor Cover for Unisaw *(fits only Unisaws manufactured after Sept. 1988.)*	55.00

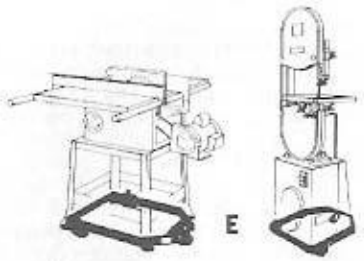


UNIFENCE SAW GUIDE

Owners of virtually any 10" table saw can improve accuracy and work support by replacing their existing fence with the Delta Unifence. A template and instructions are enclosed to ensure precise mounting. Unit includes fence, carriage assembly, front guide bar, table frame, legs and mounting hardware. (Table board and shelf board are available optionally, or can be fabricated by user).

Unifence is shipped by UPS.

D	34-897	Unifence Saw Guide	369.00
	34-998	Table Board and Shelf	115.50



HTC MOBILE MACHINE BASES

For any shop with more machinery than floor space, our collection of wheeled machine bases can give you the luxury of adequate working room without building a new shop. Each welded steel base is equipped with two fixed wheels and one steerable wheel; both fixed wheels have built-in braking knobs to securely lock the machine in position. Wheel housings are arranged so as to raise a machine only 3/4" off the floor.

Of particular note is our Mobile Base for the Delta Unisaw with Unifence. Unlike an earlier model, our base is designed to work with the Unifence table leg and shelf system system, providing firm support for the right end of the extension table and allowing continued use of the utility shelf beneath.

We also carry in stock Mobile Bases for the standard Unisaw, 8" and 6" Delta precision jointers, Delta 18" scrollsaw, Delta Heavy Duty Shaper, Delta Heavy Duty Belt/Disc Sander, and three models of Delta 14" bandsaw (open stand, old-style closed stand, and new black-band closed stand). Other styles are available by special order to fit most stationary tools – check with us for price and delivery.

All mobile bases listed below are shipped by UPS.

E MOBILE BASES

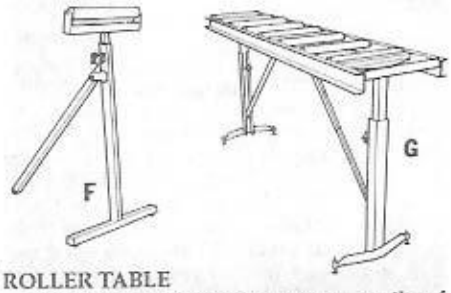
	For Use With Delta Machine:	
HRS-10G	Unisaw with Unifence	198.50
HRS-10	Standard Unisaw, HD Shaper	109.00
HRJ-8	DJ-20 8" Precision Jointer	148.50
HRJ-15	DJ-15 6" Precision Jointer	109.00
HRSS-18	18" Electronic Scrollsaw	109.00
HRBS-14	14" Bandsaw with Open Stand	109.00
HRD-14	14" Bandsaw or Belt/Disc Sander with Black-Band Enclosed Stand	109.00
HRLB-6	14" Bandsaw or Belt/Disc Sander with Old Model Enclosed Stand	109.00
HRD-10	10" Contractor's Saw (straight legs)	109.00
HRC-10	10" Contractor's Saw (curved legs)	109.00
HRD-10X	Contractor's Saw w/ Unifence	148.50

This collection of heavy-duty roller stands offers economical alternatives to having another pair of hands in the shop. For all those situations where handling your stock is too big a job for one person, there's an HTC roller system that can help you get the work done safely and easily. *All the HTC rollers we stock are shipped via UPS.*

F PEDESTAL ROLLER

This is the most mobile and most affordable work support we sell. The ball-bearing steel roller, 12-1/2" wide, can be set at any height from 26" to 45". The pedestal's compact footprint (17" wide by 20" to rear leg) lets it be placed wherever it's needed in the shop, providing outrigger support for radial arm saw, drill press, router table, etc. Folds flat to store.

HPR-13 Pedestal Roller 39.95

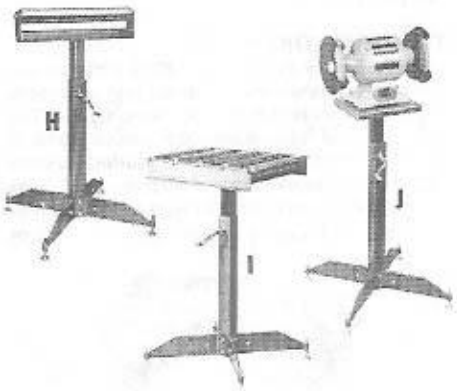


G ROLLER TABLE

The Roller Table is the most versatile of HTC's free-standing supports, lending itself beautifully to work with thickness planer, jointer, radial arm, and as infeed or side support for the tablesaw. We do not particularly recommend the Roller Table for use as tablesaw outfeed support (see description of outfeed roller system at right). The Roller Table provides 5-1/2 feet of support 13" wide; positive height adjustment lets you set any height between 26-1/2" and 43-1/2" even while bearing a load. Easily adjusted leveling feet accommodate uneven shop floors. When not in use, the unit folds flat for out-of-the-way storage.

The Roller Table is available with either 9 rollers spaced 8" apart, or with 17 rollers spaced 4" apart. An optional 8-roller kit lets you convert a 9-roller stand to 17 rollers, or create your own custom rolling support devices. Single rollers are also available.

HRT-68	Roller Stand (9 Rollers)	175.00
HRT-70	Roller Stand (17 Rollers)	214.00
HRT-8	8 Roller Kit	39.95
2031	Single 13"-Long Roller	6.95



Save on our FORREST Premium Carbide-Tipped Saw Blades

K

In response to rave reviews and insistent demands from many of our customers, we're pleased to add these superb Forrest circular saw blades to our line. On the tablesaw or radial-arm, these blades will cut cleaner, more efficiently, and longer between sharpenings than almost any other blades available.

Of the three styles we carry, the 40-tooth Woodworker II is the most popular for general-purpose tablesaw use. However, if almost all of your cutting is in stock over 1-1/2" thick, Forrest recommends that you use the 30-tooth blade. Either blade will rip very cleanly and easily; crosscut is smooth, fast, and tearout-free.

For the radial-arm saw, mitre saw, or for mostly crosscut work on the tablesaw, the 60-tooth Woodworker I will provide mirror-smooth, astonishingly efficient cut-off. The 3/32" kerf width lets any saw do its work more easily, with less load on you and the motor, and less stock wastage as well.

For the smoothest possible cutting, Forrest's precision blade stiffeners eliminate vibration at the rim of the blade. A single stiffener mounted on the outside of the blade makes even these superb blades run quieter and more efficiently. Forrest recommends using a stiffener 4" smaller than your blade; on 10" tablesaws this would be a 6" stiffener, allowing 2" max. cutting depth. If, however, you regularly use your saw's full capacity, a 4" stiffener will provide significantly improved cuts without limiting their depth.

Forrest backs up their blades with a straightforward promise: "All of our tools are guaranteed to work for you properly, on your machine, or your money will be refunded." If you're looking for the finest blade you can buy, try a Forrest – you'll like it, or you'll get your money back.

K FORREST PREMIUM SAW BLADES

	Size	Kerf	List	SALE
Woodworker II For Table Saws				
05.60.01	10" x 40	1/8"	156.00	94.00
05.60.02	10" x 30	1/8"	135.00	81.00
05.60.03	9" x 40	1/8"	146.00	88.00
05.60.04	8" x 40	3/32"	136.00	82.00
Woodworker I For Radial Arm Saws				
05.60.11	10" x 60	3/32"	162.00	97.00
05.60.12	9" x 60	3/32"	156.00	94.00
05.60.13	8" x 60	3/32"	150.00	90.00
05.60.21	6" Blade Stiffener			29.00
05.60.22	5" Blade Stiffener			27.00
05.60.23	4" Blade Stiffener			25.00

HTC HEAVY-DUTY PEDESTAL GROUP

Each of these three stands is based on HTC's new heavyweight adjustable-height steel pedestal. The unit features a stable 24" x 24" base with adjustable feet, and can be set at any height from 24" to 40". Thoughtful design makes it impossible for the stand to drop suddenly when you loosen the locking screw, even under load – a detail that will save a lot of mashed fingers and blue language in the shop.

H HSS-18 Stock Support

This is a single-roller ultility stand, with a heavy 2" diameter ball-bearing mounted roller 15-1/2" long. The unit weighs 23 lbs.

HSS-18 Stock Support Stand 79.95

I HRT-18 Roller Table

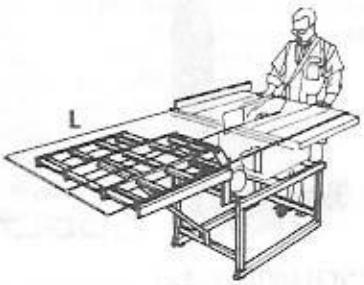
Here the pedestal is fitted with a stout five-roller table frame measuring 12" wide by 17" long, ideal for miter or radial arm saw or thickness planer extension support. 29 lbs.

HRT-18 Roller Table 109.50

J HGP-8 Grinder Pedestal

This edition includes a 9-3/8" x 8-1/4" steel mounting plate with slots for bolting down any bench grinder with mounting holes from 6" to 8" apart. The unit weighs 20 pounds.

HGP-8 Grinder Pedestal 79.50



L TABLESAW OUTFEED ROLLER

This system provides exceptional safety and convenience for most 10" cabinet-type saws (Unisaw, Powermatic 66, General 330, Jet, Vega, etc.). The unit bolts directly to the saw cabinet, insuring accurate fixed alignment of the rollers, which must of course be set precisely perpendicular to the plane of the blade. (Any mobile roller could possibly be set somewhat askew, at risk of moving your stock into a kickback situation.) Precise mounting templates are provided.

The 12-roller support surface is 37" wide, and extends 39" from the rear of a Unisaw table, providing plenty of surface area to maintain complete and balanced control of full-size sheet material. The Outfeed Roller unit can be quickly folded flat behind the saw.

Note: When mounting this unit on a Delta Unisaw with magnetic controls, the control unit on the back of the saw must be lowered 3".

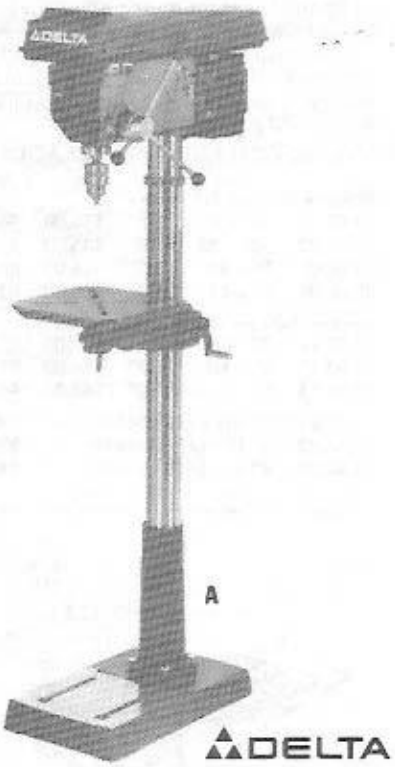
HOR-1038 Outfeed Roller 288.00

DELTA TOOLS

16-1/2" FLOOR MODEL DRILL PRESS

This heavy-duty model is our most popular. 5/8" chuck, 3.3" stroke, adjustable locking depth stop, 3/4 HP 115/230V motor, 12 spindle speeds from 250 to 3000 rpm, and 190-lb. mass make this a best buy. The flanged and slotted 12 x 12" table tilts 90 degrees in either direction, and can swivel completely out of the way for drilling in large objects. *Shipped within 48 states for $40.00 shipping charge.*

A	17-900	Delta 16-1/2" Drill Press	349.95
	17-905	Mortising Attachment	27.50
	Mortise Chisels and Bits		
	08.34.05	1/4"	36.50
	08.34.06	3/8"	39.50
	08.34.07	1/2"	44.50



B 14" BENCH DRILL PRESS

If floor space and budget demand your attention, this model is an easy choice. Heavy construction (145 lbs.), 1/2" chuck, 1/2 HP motor, adjustable depth lock with 3.3" stroke, 5 spindle speeds (460 to 2500 rpm) and compact dimensions make this an ideal compromise. Handles above mortise accessories. *Shipped within 48 states for $40.00 shipping charge.*

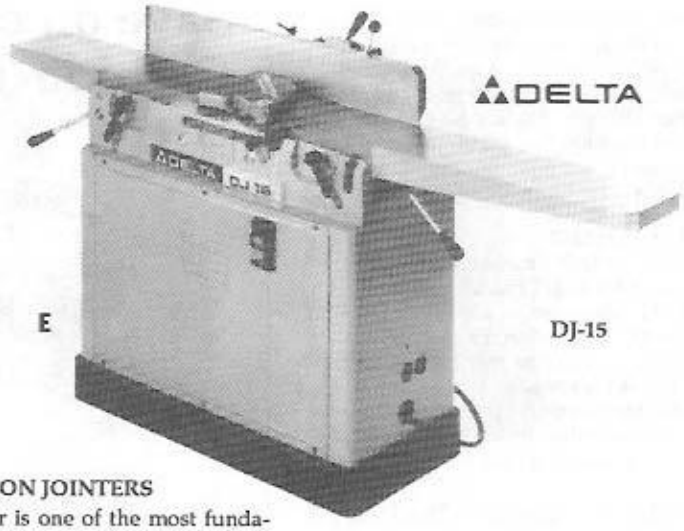
14-040	Delta 14" Drill Press	279.95

C 8" BENCH DRILL PRESS

If your work and workspace are small, but your need for accuracy and versatility is not, this economical entry deserves a look. 1/4" motor and 1/2" chuck let you do full-size work; five spindle speeds (620 - 3100 rpm), 2" stroke, tilting table, and 7 x 17 x 24" high dimensions combine function and unobtrusive convenience. Weighs 48 lbs. *Shipped UPS.*

11-950	Delta 8" Drill Press	149.95

(A note about drill press nomenclature: the size listed indicates max. diameter that can be center drilled; distance from chuck to column is one half of listed size.)



DELTA PRECISION JOINTERS

A good jointer is one of the most fundamental stationary tools, for it is the tool that prepares stock for planing, joining, cutting, and shaping. It's a machine that's used every day, on every job, and frequently it is the quality of work done on the jointer that determines the quality of the finished workpiece. A tool this important ought to be as reliable as the sunrise, capable of doing its job accurately and easily time after time for years to come.

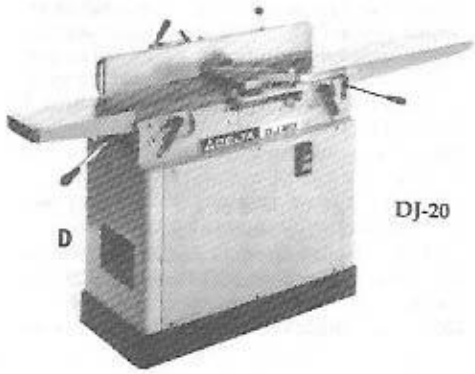
Delta's 8" and 6" precision jointers fit the bill perfectly. Despite the difference in their widths and power ratings, the two models share a number of design features that make each an outstanding value. Infeed and outfeed tables are mounted on a new parallelogram support system which eliminates wear and binding problems, and which moves each bed in the same arc as the cutterhead, maintaining the smallest possible gap between bed and blade at any depth setting. Torsion springs counterbalance the table supports to provide extremely smooth, easy adjustment. Infeed tables are extra-long for maximum efficiency and ease of handling large stock. The 5" high, 36" long fence is center-mounted for rigidity and setting convenience; it can be moved all the way out for rabbeting, and can tilt outward or inward (a real strong point) with positive stops at 90 and 45 degrees. A rabbeting ledge is built in to facilitate that operation. The three-knife cutterhead is equipped with jack screws to simplify installation and adjustment of each knife; it rotates at 5500 rpm (16500 cuts per minute) for smooth, tearout-free jointing.

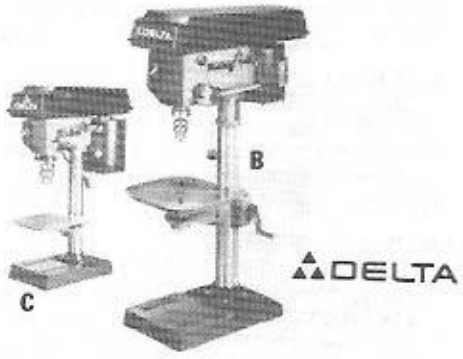
The DJ20 8" Precison Jointer offers a total table length of 76-1/2" for superb stock-handling ease (infeed table is 42" long). The jointer can be used for rabbeting to 5/8" deep. Tables stand 32" above the floor. The DJ-20 is supplied with enclosed stand and a 1-1/2 HP, 230-volt motor capable of handling full-width surface jointing as well as any depth of edge jointing with ease. The DJ-20 weighs 466 lbs.

The DJ-15 6" Precision Jointer has a total table length of 55-1/2", with a 30" infeed table. Max depth of cut is 1/2". Includes stand and 3/4 hp motor, wired for your choice of 115 or 230 volts. The DJ-15 weighs 328 lbs.

Shipping charge on either item within 48 states is $60.00. Quantity limited at sale price.

D	37-350	DJ-20 8" Jointer	SALE 1399.00
	C460	Spare Set 8" Knives	43.50
	HRJ-8	Mobile Base for 8" Jointer	148.50
E	37-154	DJ-15 6" Jointer	SALE 999.00
	C390	Spare Set 6" Knives	38.50
	HRJ-15	Mobile Base for 6" Jointer	109.00

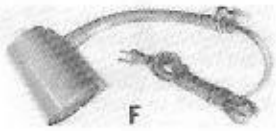




F FLEXIBLE WORK LIGHT

This handy lamp has a 9" flexible gooseneck for convenient positioning wherever extra illumination helps get the job done. The reflector will handle standard bulbs up to 40 watts. A horizontal flange is included for bolting the lamp to bandsaw, drill press, scrollsaw, or any other machine. Includes 8' power cord.

25-858	Flexible Work Light	29.95



Premium Bandsaw Blades

Although many factors affect the quality of a bandsaw's cut, one of the most important remains the choice of a high-quality blade of the appropriate size and tooth style.

The weakest point of any bandsaw blade is its weld. Our blades have the strongest, most uniform welds in the industry, yielding longer blade life and smoother cutting.

We offer blades for popular bandsaws in the following sizes: 1/2"x 3 TPI for resawing and ripping thick material; 1/4"x 6 TPI for larger radius scrollwork, roughing out, and ripping up to 3 or 4" thick; and 1/8"x 14TPI for tight scrollwork and fine joinery.

We also offer a 1/16"x 24TPI blade for very fine and delicate scrollwork. This size blade will obviously not last as long as wider blades. For 1/16" blades, we strongly recommend the use of Cool Blocks (see page 18) in place of ordinary bandsaw guides .

Our 1/16" & 1/8" blades have standard raker teeth. The 1/4" & 1/2" blades have hook teeth for more aggressive cutting.

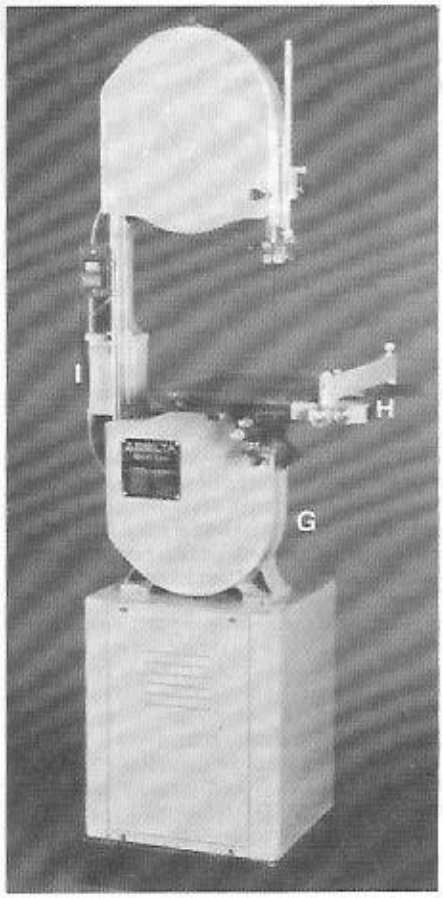
Specify one of these bandsaw brands when ordering:

	Length	
Delta 14" (& Taiwan copies)	93-1/2"	(7' 9-1/2")
Delta 14" with riser kit*	104-1/2"*	(8' 8-1/2")
Sears 12"	80"	(6' 8")
Shopsmith 11"	72"	(6' 0")
Inca 10-1/2"	73"	(6' 1")

Premium Bandsaw Blades

	Width	Teeth per Inch	
08.34.21	1/16"	24	12.95
08.34.32	1/8"	14	10.95
08.34.33	1/4"	6	9.95
08.34.34	1/2"	3	9.95

** Price per blade is $1.00 higher for 104-1/2" blades.*



$100 Delta Rebate
28-283 Cost after Rebate:
$595.00*

DELTA 3/4 HP 14" BANDSAW WITH ENCLOSED STAND

You will love this saw's exceptionally quiet, smooth, and powerful operation. Its wheels are balanced and true, and the special resilient motor mount transmits almost no noise or vibration to the stand.

The enclosed stand occupies a compact 25" x 17-1/2" of floor space. Standard height is 65-1/2", with the table 43" above the floor. Table size is 14" square and tilts right to 45°; left to 10°. Throat opening is 13-5/8"; or 13" with the optional riser block installed. Upper and lower blade guides and thrust bearings are fitted with smooth-acting, easily reached micrometer-type setting knobs. Maximum thickness capacity under the guides is 6-1/4". Standard blade length is 93-1/2".

Optional accessories for the Delta bandsaw include a miter guide with stops at 45 and 90°, and a rip fence assembly with your choice of 18" or 32" fence rails. The fence is 17" long, and has built-in micro-adjust and rear locking knob. Also available is a 6" riser block kit which increases the saw's maximum thickness capacity to 12-1/4" under the guides.

G	28-283	Delta 14" 3/4 HP Bandsaw with Enclosed Stand	695.00*
	HRD-14	Mobile Base for 28-283	109.00
	08.60.01	Cool Blocks for Delta	11.95
	34-895	Miter Guide	49.95
H	28-843	18" Rip Fence Assembly	69.95
	28-845	32" Rip Fence Assembly	74.95
I	28-984	12" Riser Kit	74.95

**Quantity limited at this price. Rebate expires 2-28-90. Shipped within 48 states for $40 freight charge.*

J DELTA HEAVY-Duty Shaper

This 3 HP, two-speed workhorse from Delta provides powerful efficiency and a broad range of applications for the production-oriented shop. Interchangeable 3/4" and 1/2" spindles are standard equipment; options include a 1" spindle, a 1/2" stub spindle for cope cutters, an extra-long 3/4" spindle with 4-3/8" under the nut, and a router spindle which handles 1/4" and 1/2" shank router bits. With this many spindle configurations available, practically any cutter on the market can be run on this machine. Spindle speeds are set by step pulley, and can be quickly switched between 7,000 and 10,000 rpm. The spindle, pulleys, motor and raising & lowering mechanism (with 3" travel) are all in a single self-contained unit, guaranteeing rigid, vibration-free and accurate operation.

The cast-iron table surface, with one extension included as std. equipment, measures 28" deep by 27" wide; another extension table can be added to increase depth to 36" if desired. Insert rings are provided to custom-fit the opening around different cutter diameters. A 3/4" x 3/8" groove is milled across the table 5" forward of the spindle, for use with mitre guide, sliding table, tenon jig, etc. The fully adjustable fence mechanism offers independently micro-adjustable right & left sides, 3-3/4" by 12-3/8" wood faces which can be positioned to allow various bit openings, and a cast cutter guard with dust collector port.

The Delta Heavy-Duty Shaper comes with an enclosed steel cabinet, 3 HP, 220-volt Delta motor, low-voltage safety switch and magnetic starter. Table height is 34". Net weight is 424 lbs. *Shipping charge on this item within 48 states is $50.00. Quantity limited at this price.*

43-375	Heavy-Duty Shaper	1499.00*
HRS-10	Mobile Base for 43-375	109.00
43-345	1/2" Stub Spindle	59.50
43-821	Extra Long 3/4" Spindle	278.30
43-822	1" Spindle	278.30
43-824	Router Spindle	110.90

** Regular price is $1699. With Delta's $200 "Instant Cash Back Offer" (through 2-28-90), you pay us $1499.*

$100 Delta Rebate
40-601 Cost after Rebate:
$649.00*

K DELTA 18" VARIABLE-SPEED SCROLLSAW

Big 18" throat capacity, variable motor speed, and fine cutting performance make this Delta scrollsaw worth a good look from anyone who needs a saw to meet serious scrolling demands. Its smooth operation, fast and effective blade mounting and tensioning system, high power and high maximum speed make this an excellent choice for scrolling in any kind of wood, and lower stroke speeds also lets the user cut metals and plastics with ease.

Delta's electronic speed control includes a digital read-out that lets the user choose any strokes-per-minute rate betwen 40 and 2000; provides constant torque to maintain selected speed. Max thickness of cut is 2". Round cast-iron table is a generous 16" in diameter for easy handling of any size work. Wt. incl. stand is 132 lbs. Includes 96 assorted blades. *Shipped within 48 states for $40.00. Rebate ends 2-28-90.*

40-601	18" Electronic Scrollsaw	749.00*
HRSS-18	Mobile Base for 40-601	109.00

DELTA TOOLS

DELTA'S NEW 1" x 42" BELT SANDER 8" DISC SANDER COMBINATION

This surprisingly affordable new machine is destined to make life easier in countless woodworking shops both large and small.

The 1" x 42" belt sander's 6-1/8" x 7-1/8" cast iron work table tilts 45° forward for chamfering and mitering. The 8" disc sander's 4" x 10" table also tilts 45°. Both are slotted for a miter guide, which is included.

A powerful 1/2 HP induction motor gives plenty of power for heavy sanding jobs. The disc sander runs 1725 rpm. Belt sander speed is 3000 SFM. Sawdust can be vented through a 1-1/2" dust collector port. The unit stands 19-1/2" high x 15" wide x 25-1/4" deep. The machine weighs a hefty 62 lbs. *Shipped by UPS.*

31-340	1"x42" Belt/8" Disc Sander	189.95
008	8" Stick-on Discs, Box of 3 *(specify 80, 120 or 150 grit, or Assorted)*	6.50

42" Sanding Belts, Box of 6
(specify 80, 120 or 150 grit, or Assorted)

0542	1/2" width	5.80
1042	1" width	6.80

DELTA 1" BELT SANDER

This multi-purpose machine brings inexpensive efficiency to a variety of common shop chores. It's an excellent light belt sander for contouring and finishing edges; a steel platen which supports the belt for straight work can be removed for sanding curved surfaces. The work table can be tilted up to 45° forward for chamfering and mitering. Optional felt belt can be used for polishing wood or metal, while regular sanding belts can do double duty for tool sharpening. An optional flex shaft tool can be attached to the motor for use in carving, drum sanding, etc.

The 1" belt sander is powered by a 1/4 HP motor which delivers a belt speed of 3150 sfm for fast, clean sanding. Belt length is 30"; 100-grit belt is included. Net weight is 12-3/4 lbs. Backed by Delta's 2-year warranty.

31-050	1" Sander/Grinder	74.95
31-055	Flexible Shaft	19.95
31-054	Felt Buffing Belt	12.50

Sanding Belts, Box of 6

0530	1/2" Width	5.80
1030	1" Width	6.80

(specify 80, 120 or 150 grit, or Assorted)

SAVE WITH OUR PACKAGE DEAL ON THE DELTA 15" SCROLLSAW

This little saw represents one of the best deals to come along in a long time. It's affordable, easy to use, compact enough not to burden your limited shop space, and best of all it works nearly as well as saws costing hundreds of dollars more. If you've been wishing for something capable of finer work than you get from your bandsaw, or if you're one of the thousands of folks who love making toys for kids and grandkids, the Delta 15" scrollsaw is the tool you've been waiting for. It might sound nearly too good to be true, but in fact the saw works as well as advertised – or a good bit better yet with a few tips from our User's Guide, which we provide with every purchase.

The saw's design is the secret of its success. Rocking parallelogram arm structure, rear tension rod, and floating blade clamps together form a system which allows constant high tension, high speed sawing with clean kerf, absolutely minimal blade breakage and no tendency to deviate from a true vertical cut. The saw can accommodate stock up to 2" thick, though like any other scrollsaw this one works best in stock of 1" thickness or less. The cast-iron table measures 17" long by 7-3/4" wide at the front; throat depth is 15", which is more than enough for 360° access to most projects. The table can tilt left to 45°; an adjustable stop screw lets you be sure you reset it precisely perpendicular to the blade.

With each Delta 15" scrollsaw, we include a kit of accessories worth over $30 which will help you get the most out of your tool. The kit includes 2 books of puzzle and toy patterns, 62 extra blades covering the full range of sizes for work in every stock thickness, and a copy of our Scrollsaw User's Guide which we've prepared to supplement Delta's manual.

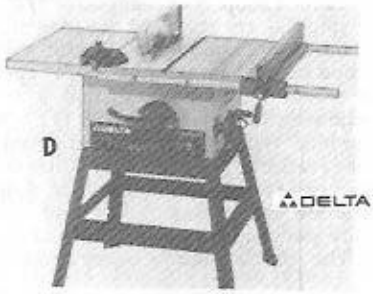
The User's Guide includes tips on simple modifications for greater safety and convenience, tensioning blades for cleanest sawing and lowest breakage, a blade selection chart, and instructions on how to successfully put your saw to work. We also describe in detail (with a full-size plan) how to build a work hold-down system that really lets the saw work at its best, and we describe a blower that can be added to keep the work area clear of sawdust.

A kit of all the hardware parts needed to build the hold-down (except for a scrap of hardwood) is available optionally. Also optional is a kit containing the parts used in the dust blower, including the small air pump, tubing and connectors.

We also offer basswood scrollsaw lumber in packs of 3 pieces 5-1/2" wide by 16" long, in either 1/4" or 1/8" thickness.

Saw is shipped UPS within 48 states for $6.00.
See page 38 for open stock on scrollsaw blades.

40-150	Scrollsaw Package Deal	169.95
40-155	Extra pair Blade Clamps	12.95
40-151	User's Guide Only	3.95
40-152	Hold-Down Hardware Kit	7.95
40-153	Dust Blower Kit	16.95
40-156	1/8" Scrollsaw Lumber	3.95
40-157	1/4" Scrollsaw Lumber	3.95



D DELTA SUPER 10 TABLE SAW

For the budget-minded woodworker with full-size projects in mind, Delta's popular Super 10 is a great combination of capacity and economy. Its quiet 1-HP induction motor provides high-torque power for all kinds of sawing and joinery work. The Super 10's cast iron table with extension wing supplies a 22" x 37" work surface, with 24" right-side rip capacity and 10" table width in front of the fully raised blade. Heavy tubular steel rails support the reliable steel rip fence; mitre guide is std. equipment. Max depth of cut at 90° is 2-9/16", 1-13/16" at 45°. The saw weighs 152 lbs. including steel stand. For best performance, we recommend adding our thin-kerf 40-tooth carbide combination blade to reduce the load on your saw while producing beautifully clean cuts. *Super 10 is shipped by truck for $40 charge.*

34-740	Super 10 Table Saw	399.95
05.64.91	10" Thin-kerf Comb. Blade	39.95

E DELTA MOTORIZED JOINTER

This is a compact, economical jointer with full-size features. Delta's 3/4 HP motor drives the three-knife cutterhead at 4300 rpm, delivering 12,900 cuts per minute for clean, smooth jointing on edges or surfaces. Center-mounted fence tilts in or out, with positive stops at 90 and 45 degrees. Maxium depth of cut is 3/8"; a built-in ledge assists in rabbeting to to that depth. Cast iron bed totals 35-1/2" long. A pair of offset-handle push blocks is included for your safety. Net weight is 143 lbs.

Shipping charge on this item within 48 states is $40.00. Quantity limited at this price.

37-280	6" Motorized Jointer	349.95

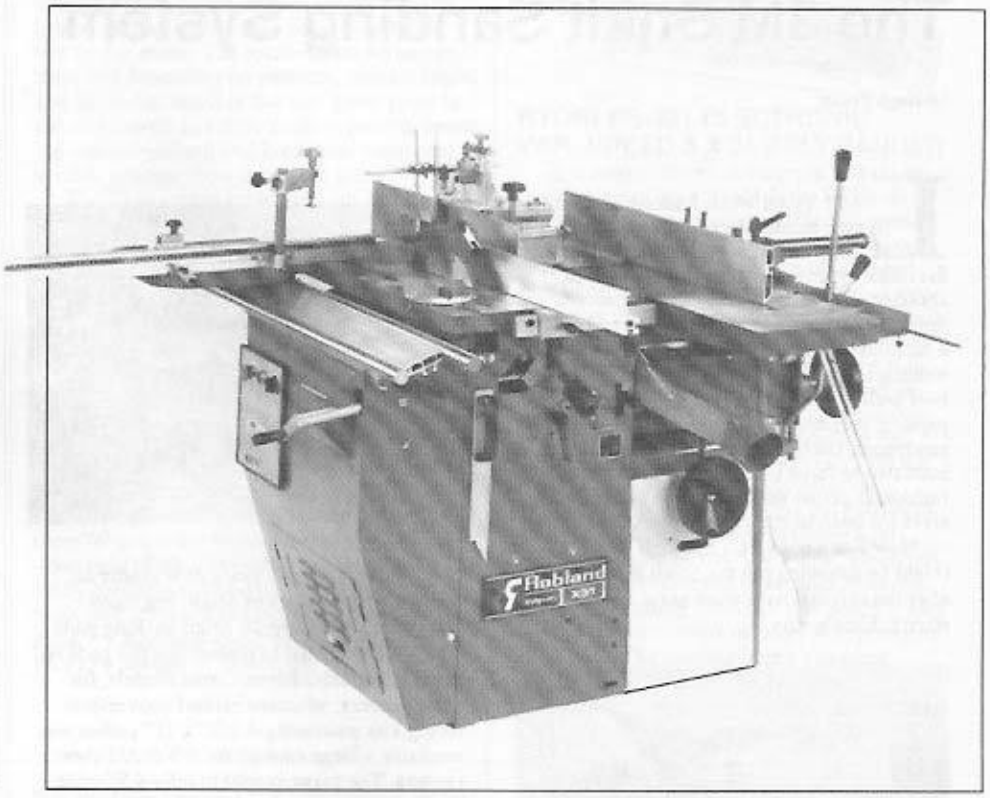
ROBLAND Woodworking Machine

The Intelligent One-Man Shop

For many years we have seen European combination machines exhibited at trade shows and offered in magazine ads. Each one we looked at seemed to have several basic weaknesses, either in practicality, safety, or value for money.

After seeing the new Robland X31 Woodworking Machine at the 1988 International Woodworking Fair, we were impressed by its overall quality of design and construction, its practicality, and particularly its use of standard U.S. sizes, such as the 5/8" table saw arbor. Of great interest is the fact that its price is 30% less than that of five individual tools of the same capacity and quality.

The Robland machine offers a practical solution for the person with substantial stationary tool requirements who is limited by a small workspace. We have had very positive feedback from our customers who now own one.



MANUFACTURED IN BELGIUM by the world's largest maker of multi-function woodworking machines, the Robland machine combines 10" table saw, 12" autofeed thickness planer, 12" jointer, shaper, and mortise table. The machine is imported by Laguna Tools in California, an organization whose staff includes more than one savvy tool expert with practical experience in woodworking applications and machine troubleshooting – the kind of people we like to deal with.

The tool's power plant consists of three separate 220-volt 3 HP industrial-duty induction motors. Conversion from one operation to another is quite simply and quickly accomplished. There are no belts to change or gears to adjust. No operation change requires more than 30 seconds (for a user, not just the salesman). A switch selector allows you to start the appropriate motor. (Two motors cannot be accidentally started simultaneously). Stop buttons are located conveniently near each operating position.

All work tables are made of carefully ground heavy iron castings. All spindles run in sealed-for-life bearings. The unit weighs approximately 1000 lbs. Despite its bulk, an optional mobility kit makes it quite portable on smooth floors, enabling you to move your shop out of the way in a couple of minutes when necessary.

THE 10" TABLE SAW features an excellent sliding table assembly which comes as standard equipment. The sliding table provides a remarkable crosscut capacity of 50", making it possible (assuming external work support is provided) to accurately halve 4x8 plywood without even having to worry about maintaining contact with the rip fence. The 10" saw blade can be instantly retracted below table level or raised to its maximum 3-3/16" depth of cut position. The blade tilts up to 45 degrees, with micro-adjustment of cutting angle. Speed is 3200 rpm. The jointer tables can be positioned at the same height as the saw table providing good work support to the right of the blade.

THE THICKNESS PLANER handles work up to 12-1/4" wide by 9" thick. A 3-knife cutterhead rotates at 5500 rpm, providing 16,500 cuts per minute. Feed rate is 19 feet per minute, yielding 72 strokes per inch, sufficient for smooth finish planing. A dust collector head is built in.

THE 12" JOINTER uses the same cutterhead, and features a table length of 55". Height of both infeed and outfeed tables can be finely adjusted, and the fence tilts up to 45 degrees, with stops at 45 and 90 degrees.

THE SHAPER features a heavy-duty 6000 rpm spindle which features up to 5" of vertical travel. The lower portion of the spindle is 1-1/4" diameter, while the upper portion is 3/4" diameter, permitting use of either standard size cutter without the need to change spindles. A spring-loaded spindle locking device enables quick setup of cutters. Fully adjustable fence assembly includes vertical and horizontal work hold-downs. The sliding table provides a safe and efficient method of feeding difficult workpieces.

THE MORTISER is a heavy-duty unit featuring a 5/8" diameter chuck. Table size is 8" x 17", with travel up to 6-1/2" wide by 5-1/2" deep x 3-1/2" high. Spindle speed is 5500 rpm. (The mortiser is easily removed from the main unit to provide better access when doing a large volume of jointing, though it is quite possible to use the jointer on moderate sized workpieces without removing the mortiser).

In addition to the instruction manual, a clearly illustrated 118 page book is included which covers in detail the operation of each part of the machine.

Robland has sold more than 50,000 combination machines around the world. Each machine is backed by a one year factory warranty covering parts and labor.

If your shop space is limited but your need for quality equipment is not, ask us for a demonstration of the Robland machine on your next visit to Highland Hardware.

The Robland machine is shipped FOB Laguna Beach, California.

X31	Robland Machine	$4950.00
XMK	Mobility Kit	125.00

VIDEO DEMO

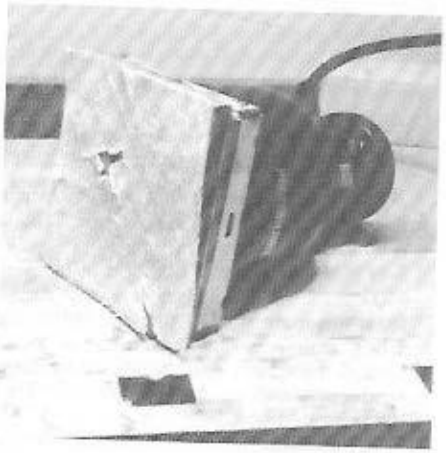
If you are interested in seeing the Robland machine and cannot visit our store, we have available in VHS format a new video in which an expert thoroughly explains how it operates. To receive it for up to 30 days, send a check for $20 (to cover a $15 refundable deposit plus $5 handling charge), or call us at (800) 241-6748 and charge the payment on Visa, MasterCard or Discover.

The 3M Stikit Sanding System

by Hugh Foster

LAST YEAR when I asked Santa for a new sander, he responded with a gorgeous new Porter-Cable 330 with the Stikit system and seven rolls of Stikit abrasive, one of each grit. Being unaccustomed to owning sandpaper by the roll, I was a bit taken aback. Now that Christmas is many months and a few projects behind me, I see how well it works, and that in reality, the paper is perhaps less expensive than ordinary sandpaper. Each sheet I tear off the roll lasts at least two to three times longer than the old-fashioned garnet and aluminum oxide abrasives I'd been using in my worn-out sander.

Now I'm a convert. I had first thought I might be throwing out the Stikit dispenser after the original rolls were gone. I was wrong. Here's why.



Stikit paper is tough, sharp, silicon carbide grit bonded to A weight paper featuring a reliable pressure-sensitive backing. Stikit is available in a variety of grits: 80, 100 ,120, 150, 180, 220 and 320. Changing grits on your finish sander takes only a few seconds, and you'll never have paper slippage again. When you tore old fashioned abrasive paper the way the paper in the photo above is torn, that sheet was all done sanding. The Stikit sheet in the photo has seen at least 30 minutes of use since it was torn. This may help to illustrate the product's economy. Stikit abrasive costs just under 14.5 cents per torn sheet, less than one might pay for 1/4" sheets cut from full-size silicon carbide paper.

Hugh Foster is a woodworker, English teacher and writer who lives in Manitowoc, Wisconsin. He is the author of the new Biscuit Joiner Handbook.

You don't have to buy a new sander to enjoy the advantages of Stikit. Highland Hardware stocks special Stikit backing pads which are designed to replace the felt pads on Makita and older Porter-Cable models; for other sanders, adhesive backed conversion facing kits measuring 4-1/2" x 11" inches are available – large enough for 1/3 or 1/2 sheet sanders. The paper is sold in rolls 4.5" wide by 10 yards long, enough for 90 4" sheets.

When you're doing a lot of sanding, the double-roll dispenser for 4-1/2" Stikit paper will come in handy. It stores two rolls with a crisp cutting edge for each. Just pull out the length you need and tear.

For sanding shaped pieces, the Stikit hand pad is a great help. It's a 4-1/2" x 4-1/2" soft neoprene pad with a finger strap on the back and facing fabric on the front. It molds easily to any shape, providing support to keep paper from tearing or crimping, and insulating your hand against heat buildup. The hand pad uses the same 4-1/2" wide paper as described for finishing sanders. Stikit is also available in 5" and 6" sanding discs for as little as 24 cents per disc, depending on size and grit. These have the advantage over the roll paper of being paper-backed, so one can remove from the roll as many discs as one plans to use rather than having to go back to a full-size dispenser for each refill.

The Porter-Cable 330 comes equipped with 3M's Stikit-compatible sub-base. A similar sub-base is available for the Makita BO4510, and a simple conversion facing can be cut to fit any other finishing sander bases, including 1/3- and 1/2-sheet sanders.

After you've tried Stikit abrasive, you'll convert your existing sander, and you'll insist that your next sander be prepared to use it. More than just a gadget, Stikit is a godsend!

§

PORTER-CABLE MODEL 330 SPEED-BLOC® FINISHING SANDER

This classic quarter-sheet sander is now factory-fitted with 3M's new Stikit™ pad for use with quick-change self-adhesive sandpaper, making the Speed-Bloc not only the smoothest finishing sander you've ever used b one of the most efficient as well. The Speed-Bloc has long been known for its extremely smooth operation; 15,000 orbits per minute together with its heavy-duty design let you work longer without suffering the pangs of "sander's arm" while producing superbly finished surfaces. For production sanding, it's hard to beat the convenience of Stikit paper, with its long-lasting no-fill abrasive that won't slip or go on loose. Standard paper clamps are still built in, of course, so you can use regular sandpaper as well as 3M's Stikit system. 1.2-amp motor. Weighs 4 lbs.

330 Speed-Bloc Sander 59.95

PORTER-CABLE 505 HALF-SHEET SANDER

When conditions call for finer sanding than you get from your belt sander, but faster work than you get from your 1/4-sheet sander, the 505 half-sheet orbital sander is the tool of choice. Full 4-1/2 X 11" paper size together with an aggressive 1/8" orbit diameter powered by a 2.3-amp, 10,000 rpm motor provides very fast stock removal and smooth, swirl-free surfaces. The 505, like the Speed-Bloc®, is factory-equipped with 3M's new Stikit™ base, ready to use with self-adhesive sandpaper; standard clamps also allow use of regular paper. Weighs 7-1/4 lbs.

505 Half-Sheet Sander 125.00

MAKITA BO4510 4" FINISHING SANDER

Compact design, high-impact housing, and ball-bearing construction give the BO4510 an industrial-duty rating. 1.8 amp motor delivers 12,000 very small orbits per minute for the smoothest finish and lowest vibration of any finishing sander on the market. The spring-loaded hold-down bar and locking lever provide a simple and totally reliable clamping system. Pad size is 4" x 4-3/8", for use with quarter-sheets of 9 x 11" sandpaper.
An optional 5"-diameter round rubber base which uses stick-on sandpaper can be added by purchasing the rubber base and an adapter. Alternatively, the sander can be converted to use 3M's Stikit® system by purchasing a Stikit replacement backing pad.

15.10.25 BO4510 4" Sander 54.95
15.16.01 Stikit Backing Pad 5.25

PORTER-CABLE 7334 RANDOM-ORBIT DISC SANDER

This new machine from Porter-Cable borrows a successful idea from pneumatic tooling to create a very aggressive sander that provides remarkably smooth, swirl-free surfaces. The 7334 sands almost as cleanly as a good half-sheet orbital sander, leaving very little finishing required even on the finest work. And yet it also sands almost as quickly as a disc or belt sander, so when you're looking for fast work without tearing up the wood, this is the perfect choice. The 7334 sands even painted surfaces with no clogging of the paper, and without gouging, melting or scratching.

The 7334's 3.7 amp motor drives the 5" sanding disc at 6000 3/8"-diameter orbits per minute, which accounts for the its aggressive cutting action. The disc is mounted on a free-wheeling shaft which rotates as a result of its orbital motion, rather than being directly driven by the motor. The rotation rate varies considerably depending on pressure, contact angle, and so on; the result is that any given point on the disc travels in a truly random pattern, ensuring that no uniform swirls or other consistent scratch patterns show up on the wood.

The 7334 comes equipped with 3M's standard 5" Stikit™ backing pad for use with self-adhesive sanding discs. This is a firm foam pad with just enough give to avoid gouging when using the edge of the disc; the sander is normally used flat on a surface, but can be angled for tight areas or heavy spot sanding. A softer backing pad is available for gentle work in contoured areas. A removable side handle, mountable right or left, is provided to facilitate control in any position. The 7334 weighs 5 lbs.

5" Stikit sanding discs (offered on the opposite page) are sold in bulk rolls costing less than 25¢ a disc. Grits range from 80 to 220. We also carry 60-grit self-adhesive discs in packs of 10 – our tests of the 7334 sander showed that it can easily handle paper that coarse for very fast work on hard wood or painted surfaces.

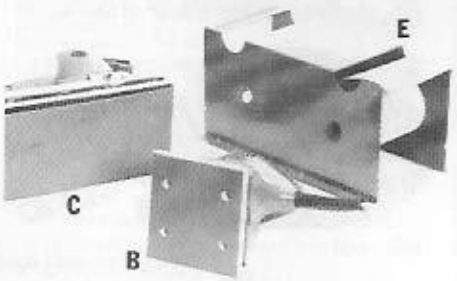
7334	**Random-Orbit Disc Sander**	**139.95**
15.10.70	**60-grit 5" Discs, pk. of 10**	**3.80**

RYOBI BE-321 ELECTRONIC VAR.-SPEED 3 X 21 BELT SANDER

In a contest for most versatile belt sander, this new entry from Ryobi is the hands-down winner. Constant-torque variable belt speed (from 755 to 1148 feet per minute) lets you choose the best rate for sanding hard woods or soft, veneers, painted surfaces, metal, or anything else that needs sanding. The 321's "locomotive"-style design assures excellent center balance and allows sanding flush to the right side of the machine. Lever-actuated belt tensioning, a powerful vacuum system and dust bag are standard equipment. Weighs 8 lbs.

An outstanding popular accessory for the BE-321 is a simple but totally effective sanding frame, which converts the hand-held tool into a surface leveling machine with adjustable depth of cut. The frame, which can be installed or removed in seconds, prevents gouging or cutting too deep, and makes it easy to sand even veneered surfaces with precision and safety. The sanding frame measures 5-3/8" by 13", and weighs 1-1/2 lbs.

15.33.01	**BE-321 3x21 Belt Sander**	**139.95**
15.33.02	**Sanding Frame for BE-321**	**49.95**



3M STIKIT™ SANDING SYSTEM

One of America's most creative companies has come up with yet another boon for the woodworker: the Stikit family of self-adhesive sandpapers and sanding tools. For hand or machine sanding, Stikit paper is tough, sharp silicon carbide grit bonded to A weight paper with a reliable pressure-sensitive backing, available in a range of grits to cover all your finishing needs. Changing grits on your finish sander or disc sander takes only seconds, and you'll never have to hassle with paper slippage again – but perhaps the best feature of the Stikit system is its economy. Remarkably, Stikit paper for a Makita palm sander costs less than 14-1/2 cents a sheet, less than the cost of full-size silicon-carbide sheets you cut yourself.

For finish sanders, 3M offers 2 options. For Makita and Porter Cable palm sanders, we carry Stikit backing pads which replace the sanders' standard felt pads. These are metal-backed closed-cell foam pads with a special fabric facing for positive hold and durability.

For other sanders, the adhesive-backed Conversion Facing measures 4-1/2" x 11", large enough for 1/3- or 1/2-sheet sanders. Stikit finishing-sander paper is sold in rolls 4-1/2" wide by 10 yards long, enough for 90 4" sheets. It is available in a range of seven grits from 80 to 320, as listed below.

When you're doing a lot of sanding, the double-roll dispenser for 4-1/2"-wide Stikit paper will come in handy. Stores two rolls, with a crisp cutting edge for each. Just pull out the length you need and tear.

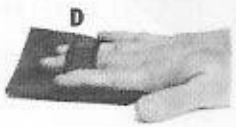
For sanding round, highly contoured or very delicate pieces, the Stikit hand pad is great. It's a 4-1/2" x 4-1/4" soft neoprene pad with a finger strap on the back and facing fabric on the front; it moulds easily to any shape, providing support to keep paper from tearing or crimping, and insulating against heat build-up as well. The hand pad uses the same 4-1/2" wide paper as described above for finishing sanders.

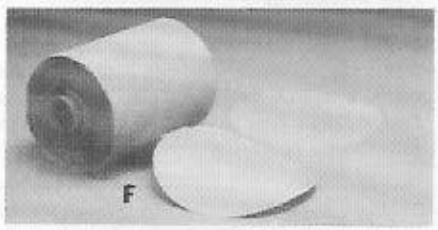
STIKIT SANDING ACCESSORIES

B 15.61.01	**Backing Pad for Makita BO4510 Palm Sander**	**5.25**
15.61.02	**Backing Pad for Porter Cable Palm Sander**	**5.25**
C 15.61.04	**Conversion Facing for all Finishing Sanders**	**2.95**
D 15.61.05	**Stikit Hand Sanding Pad**	**3.75**
E 15.61.06	**Two-Roll Dispenser**	**12.95**

4-1/2" WIDE STIKIT ROLLS (10 yds.)

15.61.11	**80 grit**	**12.95**
15.61.12	**100 grit**	**11.95**
15.61.13	**120 grit**	**11.95**
15.61.14	**150 grit**	**11.95**
15.61.15	**180 grit**	**11.95**
15.61.16	**220 grit**	**11.95**
15.61.17	**320 grit**	**11.95**





F STIKIT SANDING DISCS

For disc sanders, we carry both 5" and 6" Stikit discs in rolls at less than 24 cents a disc. They may be applied directly to any 5" or 6" rubber sanding disc, with no special interface required. Available is 80, 120, and 220 grits.

Rolls of Stikit Sanding Discs

	Diameter	*Grit*	*Discs per Roll*	
15.61.31	**5"**	**80**	**125**	**23.00**
15.61.32	**5"**	**120**	**125**	**21.00**
15.61.33	**5"**	**220**	**250**	**45.00**
15.61.34	**6"**	**80**	**125**	**30.00**
15.61.35	**6"**	**120**	**125**	**28.00**
15.61.36	**6"**	**220**	**250**	**55.00**

G STIKIT SANDING BLOCK

For hand sanding, 3M's sanding block is one of the most comfortable we've tried and is also very convenient. It has a firm felt surface 3-1/4" wide by 5" long; the curved end can be used in contoured areas, while the square end will sand right into corners. Rolls of paper are stored in and dispensed from a holder built into the block. 3-1/4" wide Stikit paper rolls are available in four grits listed below.

15.61.21	**Stikit Sanding Block**	**8.95**
15.61.22	**55" roll of 100 grit paper**	**2.20**
15.61.23	**70" roll of 120 grit paper**	**2.20**
15.61.24	**80" roll of 150 grit paper**	**2.20**
15.61.25	**95" roll of 220 grit paper**	**2.20**

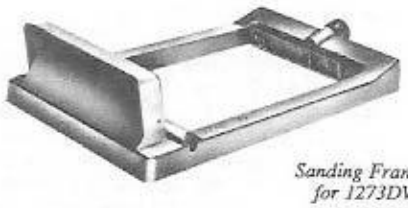
The Bosch 1273DVS Belt Sander and Its Accessories

by Hugh Foster

WHEN THE 1273DVS SANDER entered the market last year, it struck me as the finest 4" x 24" belt sander available. It offers a big footprint for accurate sanding, and its variable speed switch permits the user to sand different materials effectively; the higher speeds are naturally for faster stock reduction, and lower speeds with finer grits are for finer sanding, as on veneers. Its lower speeds also contribute to quieter operation, sure to win favor in my shop. Now, a year after its introduction, the sander has been enhanced by several accessories: a sanding frame, a bench stand, and the AirSweep dust collection system. Even with all these features the 1273DVS doesn't appear to be outrageously more expensive than conventional, now nearly obsolete belt sanders.

We may well be at a watershed in belt sander design; the European-style sander with a sanding frame and other accessories deserves to dominate the productivity-minded sections of the market. Two years ago, sanding frames were readily available only in Europe. Now that the sanding frame is as readily available as it is easy to use, it seems almost foolish not to want one. Since the sanding frame multiplies the effective footprint of the machine by five- or six-fold, it guarantees the flattest finish. Bosch's "brush" sanding frame provides a 9" x 16-1/4" flat surface and allows

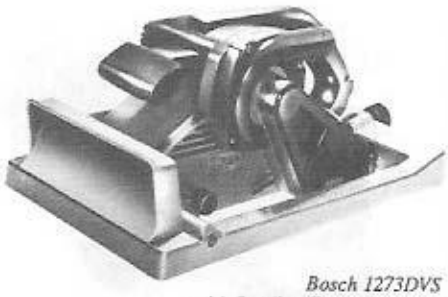
Hugh Foster is a woodworker, English teacher and writer who lives in Manitowoc, Wisconsin. He is the author of the new Biscuit Joiner Handbook.



Sanding Frame for 1273DVS

adjustment to remove as little as a couple of thousandths of an inch of material at a time. With this frame, it is virtually impossible to "take a divot" as one can easily do with a standard belt sander. Amazingly, the sanding frame is so simple that most users will be able to install the thing on their Bosch 1273DVS sanders in just a very few minutes.

There has never been a reason to buy a belt sander for use in a wood shop without a dust bag – even so, you should wear a particle mask. Even better than the dust bag is a device Bosch has called "unfortunately, the best kept secret in American woodworking." The "AirSweep" dust collection system so efficiently keeps the dust down, there's almost no excuse for buying a sander without it. The Bosch AirSweep 16-foot 1"-diameter crush-proof hose connects the sander's dustport to any shop vac which features a standard 2-1/2" opening. If my shop had a Bosch sander, I would tape the "AirSweep" hose to the power cord at about two foot intervals, and the machine would be almost ready for sanding in the living room, not to mention in the shop.



Bosch 1273DVS with Sanding Frame Mounted

Another very useful accessory is Bosch's sanding stand. Combined with the optional sanding fence, it converts the 1273DVS into a small stationary sander.

Combining the sanding frame, bench mounting kit, and the AirSweep Dust Extraction System with the 1273's quiet continuous variable speed, this American-made product will be really hard to beat. If the 1273DVS isn't the best 4 x 24 belt sander on its own merit, these accessories certainly make it so.

§

The Bosch 1273DVS belt sander and accessories are available from Highland Hardware as follows:

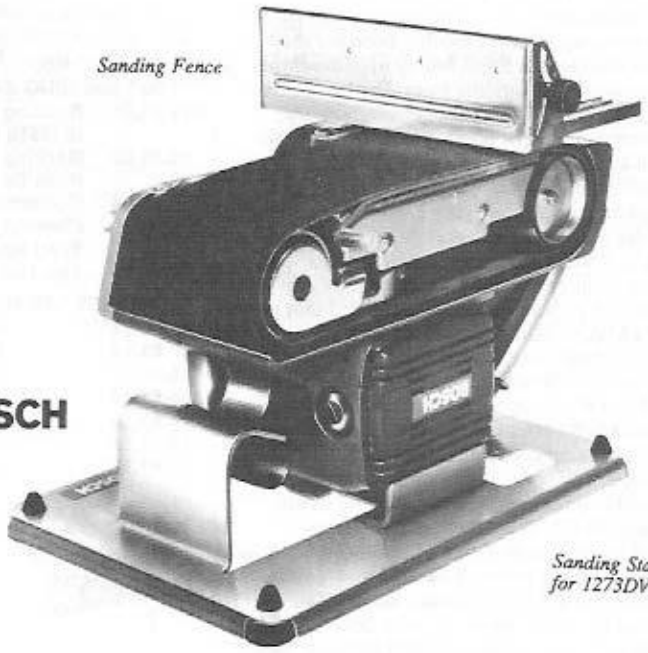
1273DVS	**4x24 Belt Sander**	**$229.95**
1273-1	**Sanding Frame**	**99.95**
1273-2	**Air-Sweep Hose & Fitting**	**19.95**
1273-3	**Sanding Stand**	**34.95**
1273-4	**Sanding Fence**	**29.95**

(Add shipping charges listed on page 62)

AirSweep Hose and Fitting

1273DVS 4x24 Belt Sander

Sanding Fence

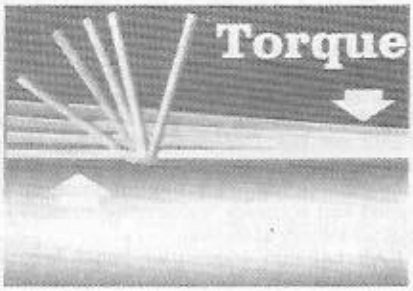


Sanding Stand for 1273DVS

Magna-Set Instant Knife Setting Jigs

ASK ANY WOODWORKER what's the most frustrating adjustment to make on tools in his shop, and he will likely say "adjusting all three jointer (or planer) knives so that they each cut at the same height."

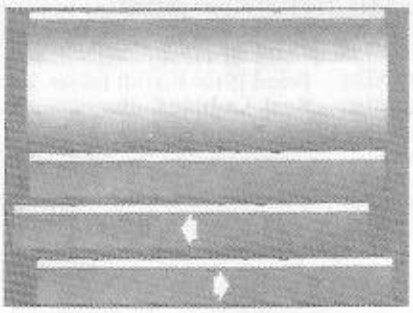
Invariably, one of the knives ends up too high or too low. Generally the reason for this is that one or more of the knives wants to squirm out of position as it is being tightened down. No matter how carefully you align them while they are loose, the last twist of the wrench creates torque (a twisting force) which transfers to the knife, forcing it to move out of position. The frustrating part of knife setting is the need to repeatedly reposition the knives by trial and error in an effort to compensate for that aggravating bit of torque.



To solve this problem and forever cure your frustrations, we are pleased to now offer the Magna-Set knife setting jig.

The Magna-Set uses powerful magnets to hold each knife in perfect alignment as you tighten the bolts which hold it in place. The entire process is so simple and foolproof that it can be completed in five minutes.

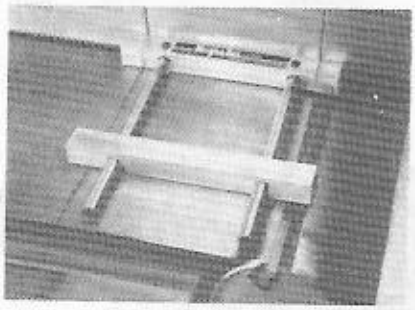
The Magna-Set can also solve another common problem. When you strike an embedded nail, or sometimes even just a hard knot with your jointer or planer, each knife develops a nick. These nicks then leave a ridge along the length of every board you plane thereafter, until you remove the knives and grind out the nicks.



Since Magna-Set makes absolute accuracy available in an instant, it's practical to shift the nicked knives in opposite directions so the nicks no longer line up with one another, thus eliminating the unwanted ridge on planed boards without having to resharpen.

Jointer Jig

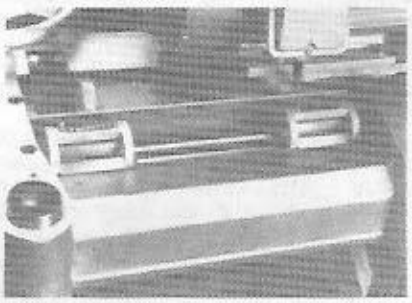
Magna-Set's Jointer Jig fits just about every American-made jointer on the market, including all models made by Delta. (The imported models which it does not fit, Inca, Makita and Ryobi, come with their own systems for rapidly adjusting knives.) For jointers using knives wider than 10", optional 12"-long extension rods are used with the jig.



The procedure for setting knives with the Jointer Jig is simple. To begin (with the power disconnected), find top-dead center of your cutterhead, and using a steel square, scribe a vertical line on the fence at this point.

Align the front mark on the Magna-Set with this line on the fence, and using a square, scribe lines on the fence and jointer table to correspond with the Magna-Set's rear mark.

This "indexing" procedure allows you to quickly position the Magna-Set each time you wish to adjust your knives. The jig is then ready to hold each knife in position (within plus or minus .002") while you lock it in place by turning the nuts or bolts with a wrench.



Planer Jig

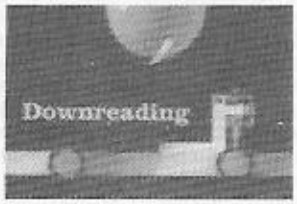
Magna-Set offers a separate Planer Jig for setting knives on thickness planers. It consists of a pair of C-shaped jigs, each with magnets for holding the jig to the cutterhead and the knife to the jig. These can be calibrated to fit any size cutterhead. The Magna-Set Planer Jig fits virtually all American-made machines. (As with the Jointer Jig, the Planer Jig is not compatible with planers by Makita, Inca, Hitachi, or Ryobi.)

With the power disconnected, each of the jigs is placed on the cutterhead, one near each end, straddling the loosened knife. While the jig pair is in position with the knife edge maintaining contact with the ground magnets, the knife is held in the proper position to a tolerance of plus or minus .002". After tightening down the nuts or screws, repeat the process on each succeeding knife.

Rotacator

Sets Rollers, Pressure Bar & Planer Bed

In response to demand for a device to aid planer owners accurately set planer feed rollers, bed rollers and pressure bars, Magna-Set offers a third device called the Rotacator. Since planer cutterheads are typically not adjustable but remain fixed or rigid relative to the machine frame, all other planer settings must be calibrated relative to the cutting arc of the knives. The Rotacator is a dial indicator designed especially for this purpose. The Rotacator is particularly useful for schools and commercial shops where planers receive heavy wear and tear, necessitating frequent re-adjustment of rollers, etc.



After setting the planer's knives with a Magna-Set Planer Jig, the Rotacator is used first to level up the planer bed in relation to the cutterhead. It is then used to set the bedrollers and overhead feed rollers at the heights recommended in your planer's operator's manual. It can then be used to adjust your planer's chip breaker and pressure bar.

Magna-Set Knife Setting Jigs

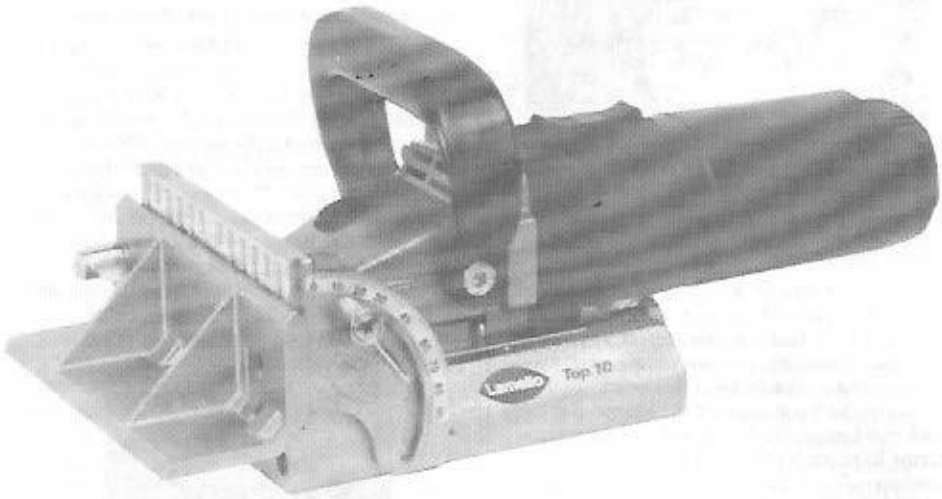
JJ	Jointer Jig	$49.95
EX-12S	12" Extension Rods (pair)	6.95
PJ2	Planer Jig (pair)	159.90
ROT-1	Rotacator	159.95

Add shipping charges listed on order form

BISCUIT JOINERY

Not long ago we answered a long-distance call from a customer who wanted to tell us about the Lamello Top he had purchased from us the week before. Of course we'd told him about the Lamello's incredible efficiency and ease of use, and how it would dramatically increase his productivity. But since he was an empirical kind of fellow, he decided to run a fairly objective test on a custom cabinet job he had ready for assembly. First he assembled one cabinet unit with dowels, just as he always had. Elapsed time from start to glue-up was 56 minutes – not too bad. Then he turned on the Lamello and assembled another unit identical to the first. Elapsed time: two minutes!

In the words of another customer who's had his Lamello Top for years now, assembling with the Lamello is the next best thing to having someone else do the work for you, and it's faster, too.



New LAMELLO Top 10 SALE $499

The world-famous Lamello Top biscuit joiner was given a new look and a new name in 1989. It remains fundamentally the same superb, industrial-quality tool that earned its reputation in the first place, but now the Top 10 incorporates a more powerful 700-watt, 10,000 rpm motor, along with several new design elements that make it easier to use than ever before. When you need the best, there's no doubt that the Lamello Top 10 is the tool to choose.

The Top 10 retains Lamello's unique hinged nosepiece, an outstanding feature which insures virtually foolproof accuracy and makes this joiner easier to use hand-held than any of its competition (except the Lamello Standard, of course). The fence can be flipped forward and locked in horizontal position, guaranteeing perfect surface alignment across flat butt joints, or it can be set at any angle between horizontal and vertical for aligning mitres, coopered staves, or other angled joints. Locked in its vertical position, the fence forms a nosepiece machined to precisely 90° from the base for vertical plunge cutting. A scale built into the fence's pivot lock lets you set the fence to any angle with 1° accuracy. A new accessory fence clamps to the vertical nosepiece to allow blade alignment up to 2" from the surface of a workpiece; the accessory fence is self-squaring and locks positively with a single lever.

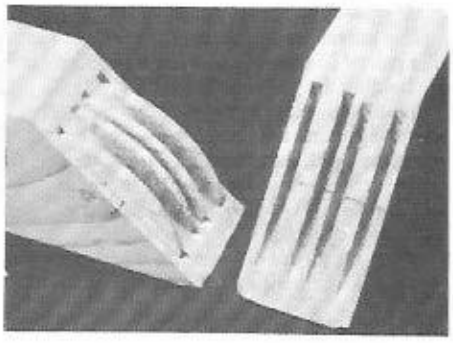
Other new features include a compact quick-setting depth stop dial conveniently located up front near the fence, with no jam nuts that might loosen and change your depth of cut. The base of the tool has been redesigned to allow nearly instant removal for accesss to the blade, and an exhaust port has been added that directs chips out the right rear of the machine. A spindle lock atop the motor housing allows use of a single wrench for blade change. As always, the machine comes with a stout wooden case with separate compartments for accesories and tools. The Top 10 weighs 7 lbs. *Sale Quantity Limited*

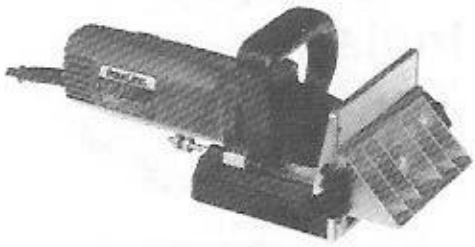
SALE 499.00

17.90.01	Lamello Top 10	~~Was 569.00~~
17.90.05	Repl. Carbide Cutter	62.00
17.90.06	Dust Collector Adapter	50.00

Lamello Joining Plates, Box of 1000

17.90.02	0	9/16" wide	29.95
17.90.03	10	3/4" wide	29.95
17.90.04	20	15/16" wide	29.95
17.90.98		Assortment of 3 sizes	29.95





FREUD JS100 BISCUIT JOINER

When Freud introduced the JS100 in 1986, the tremendous productivity of biscuit joinery became so affordable that just about everyone could experience it for themselves. Small shops, custom woodworkers and hobbyists snapped up tens of thousands of JS100s, and demand continues to grow as word spreads about how the tool makes dead accurate joinery the easiest and fastest part of your work.

Though the Freud joiner is clearly not intended to compete with the likes of the Lamello for use in heavy-duty commercial situations, it certainly offers the best combination of function and affordability that we've seen yet. With more than a thousand JS100s currently at work in our customers' shops, we have a very encouraging track record: we've seen few problems occur, and have been pleased with prompt service from Freud on the rare occasions when we've needed help. With only moderate care and attention the JS100 provides precisely the speed and accuracy we've come to expect of biscuit joinery at its best.

All Lamello accessories listed here are compatible with the JS100 ; the glue bottle, KD, K-20, and C-20 splines, and the Paumelle hinges will add convenience and versatility to your Freud system.

The JS100 uses a fence design somewhat different from the Lamello's, trading some of the Lamello's convenience for a bit more versatility, particularly on mitered work. A fixed vertical nosepiece works with a sliding horizontal fence for vertical-axis positioning. Angled vanes on the on the back of the horizontal fence allow it to be flipped over and used for 45-degree joints, while shop-built accessory fences will be required for other angles. The fence can be set at any distance up to 2" from the blade.

Pre-set cutting depths, 550-watt motor with conveniently located switch, and six-lb. net weight make the JS100 easy to use and get used to. The tool comes packed in a protective carrying case, with tools, manual, and a handful of sample splines.

17.20.01	Freud JS100 Biscuit Joiner	169.95
17.20.02	Repl. Carbide Cutter	39.95

Joining Plates, Box of 1000

17.90.02	#0	29.95
17.90.03	#10	29.95
17.90.04	#20	29.95
17.90.98	Assortment of 3 sizes	29.95

FREUD
Saw Blades

We honor all Freud blade specials.

Using the finest carbides, Freud induction brazes its carbide tips to milled tool steel plates that have been heat treated twice and surface ground on both sides before being tensioned to relieve stresses in the blade. The carbide tips are 50% longer than most others available, and honed to sharpness using 400 grit diamond wheels. Laser-cut closed expansion slots relieve heat stress without whistling. We offer these Freud blades with confidence that they will give you better service and longer blade life.

H FREUD LU84M
INDUSTRIAL COMBINATION BLADE

Our most popular blade for all saws, this blade is a workhorse for ripping hardwoods as well as producing smooth crosscuts. 4 Alternate Top Bevel teeth followed by a straight ground raker provide superb chip clearance.

05.20.26	10" LU84M 50t Comb.	49.95
05.20.27	9" LU84M 40t Comb.	54.95
05.20.28	8" LU84M 40t Comb.	54.95

I LU73M INDUSTRIAL CUT-OFF BLADE

For the very smoothest crosscuts, this 10" 60 tooth blade with ATB teeth is ideal for tablesaws and radial arm saws. Also available in 9" 54 tooth and 8" 48 tooth. 5/8" arbor. This blade works well in fine plywoods, as well as solid hardwoods and softwoods.

05.20.22	10" LU73M 60t Crosscut	52.50
05.20.23	9" LU73M 54t Crosscut	59.95
05.20.24	8" LU73M 48t Crosscut	54.95

J LU82M MAN-MADE BOARDS
Cut-Off Blade

Features 60 tooth Triple Chip Grind pattern particularly for crosscutting and trimming of plywood, particle board and chipboard.

05.20.03	10" LU82M Cut-Off	64.50

K LU72M GENERAL PURPOSE BLADE

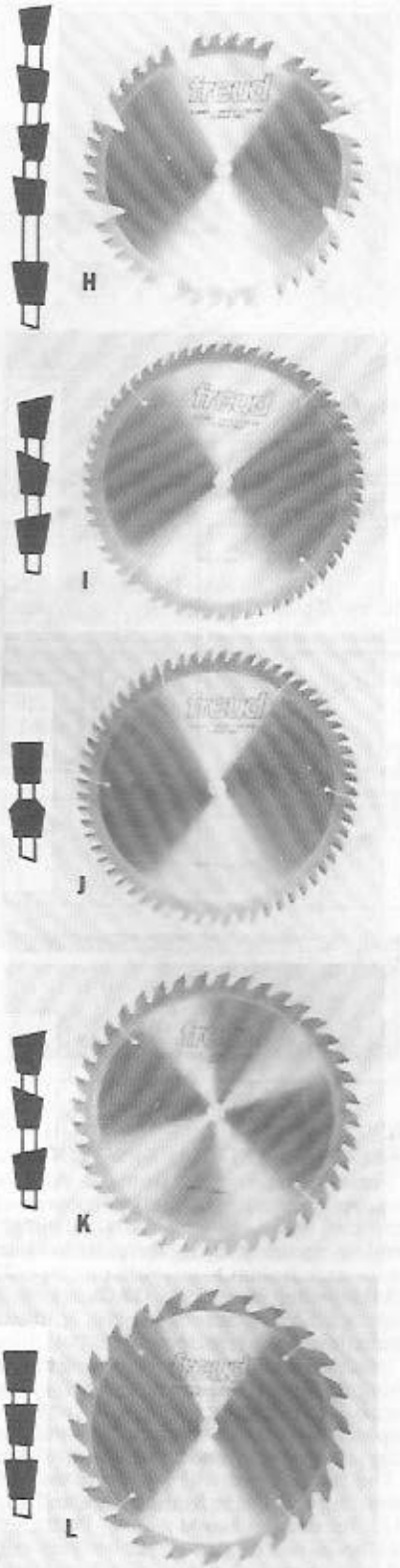
An excellent blade for very clean ripping and crosscutting. This can be the one blade you keep on your saw for all solid wood, plywood, and particle board. ATB grind.

05.20.01	10" LU72M 40t	44.95
05.20.21	7" LU72M 30t	43.95

L LM72M INDUSTRIAL RIP BLADE

24 tooth blade with flat top chisel tooth grind for rapid ripping of solid woods.

05.20.02	10" LM72M 24t Rip	44.95



NEW FREUD THIN-KERF SAWBLADES

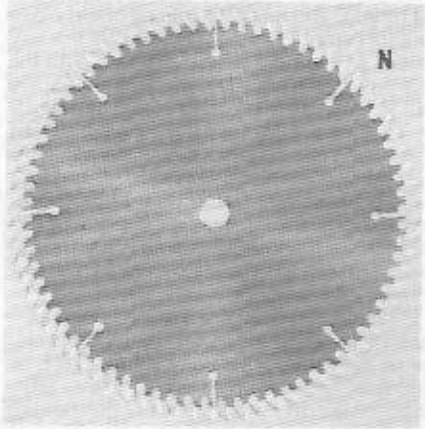
These blades were designed to reduce production time and minimize waste while producing the finest edge. Your tablesaw or radial arm will actually seem to perform more powerfully due to the thin kerf blade's reduced load. Freud's specially ground teeth, teflon coating and computer controlled blade tensioning minimize the tendency for thin kerf blades to bind or flex in the cut. Expansion slots are engineered and positioned to eliminate heat build up. Wide slots help reduce the heat build up while thin slots control the expansion of the blade as it rotates. 5/8" arbor.

LU87M Thin Kerf Rip Blade

	Diameter	*No. Teeth*	*Kerf*	*Price*
05.20.41	8"	22	.086"	42.50
05.20.42	9"	22	.094"	47.50
05.20.43	10"	24	.094"	49.95

LU88M Thin Kerf Crosscut Blade

05.20.44	8"	48	.082"	52.50
05.20.45	9"	54	.090"	56.50
05.20.46	10"	60	.090"	59.95



N FREUD LU85M
ANTI-GRIP CUT-OFF BLADE

Freud's anti-grip blade produces cuts finer than any we've seen with other sawblades. A plate tolerance of less than .001", a Teflon coating on the plate for minimizing friction between the blade and the wood, and a specially modified ATB grind result in fantastically smooth crosscuts. 8" and 10" models have 5/8" bore. 12" has 1" bore.

05.20.34	8" 64 tooth LU85M	59.95
05.20.35	10" 80 tooth LU85M	69.95
05.20.36	12" 96 tooth LU85M	109.95

FREUD BLADE STIFFENERS

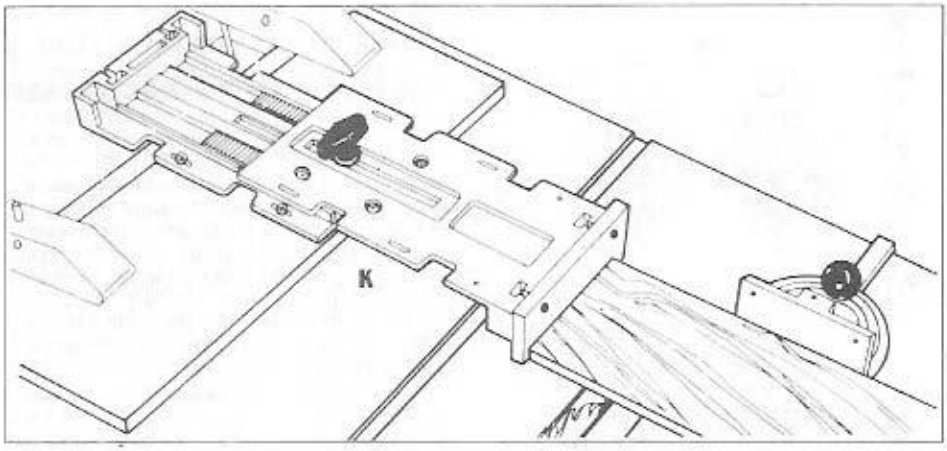
For the utmost in precision cutting, Freud blade stiffeners enhance rigidity and damp out vibration or flutter at the rim of the blade. They're especially recommended for thin-kerf blades from any manufacturer.

05.20.10	Pair Freud Blade Stiffeners	12.95

M NEW FREUD DADO BLADE SETS ARE DESIGNED TO RESIST KICKBACK

Freud's popular commercial-quality carbide-tipped dado sets have been redesigned and repackaged this year for more safety and more convenience than ever. Each set now comes in a padded case with fitted liner to keep each cutter in perfect condition between jobs. Both outside blades and chippers now are built with laser-cut anti-kickback blanks which not only increase operator safety but add mass and stability as well, making these the best dados Freud has ever offered. Set consists of two outside blades, four 3/16" chippers and one 9/64" chipper. Max dado width is 13/16". 6" and 8" dados have 5/8" arbor holes; 10" set has 1" arbor holes.

05.20.06	6" Diameter Dado Set	139.00
05.20.07	8" Diameter Dado Set	149.00
05.20.08	10" Diameter Dado Set	199.00



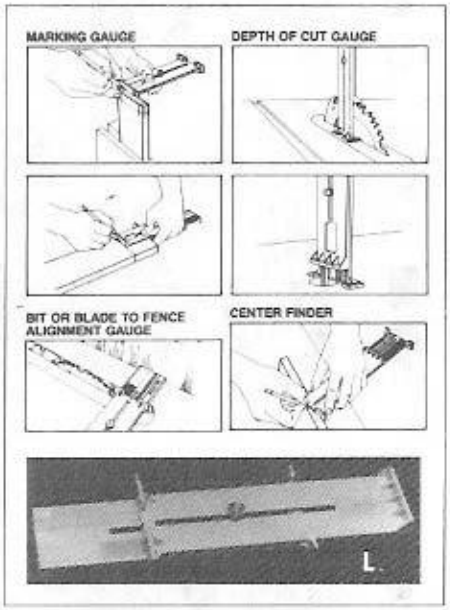
K INCRA POSITIONING JIG

Do your sliding dovetails always work the first time? If you forget to cut one of forty-two box joint corners, can you set up again in a few seconds and cut the joint perfectly? With the Incra positioning jig, challenges like those are dealt with so easily it almost seems like cheating. This simple, inexpensive jig enables you to set a fence or stop block in 1/32" increments over eight inches of total travel, to set and lock in any position with better than 1/250" accuracy, and to return to any previously set position with less than 1/1000" error. When precise stock positioning is mandatory, Incra makes it virtually effortless.

Clear, straightforward instructions show you how to set up the jig for use on the tablesaw or bandsaw, with your router table, or (especially with two jigs) for X - Y axis positioning on the drill press table. For positioning stock, use the jig alone or install a hardwood fence up to 24" long. Even at full extension the jig is rigid enough to provide complete stability so long as the fence itself resists flexing. Once you've set up the Incra on your router or saw table, you'll find you no longer have to reach for a ruler every time you move the fence; a ruler is built in to the jig to provide accurate measurement at a glance.

Incredibly durable precision-cast acrylic racks provide the Incra jig's repeatable accuracy; fiberglass-reinforced polystyrene makes the body light, stable and tough. For those who work in decimal inches or the metric system, there are optionally available racks in 1/20" and 1mm steps, along with a self-adhesive rulers in the appropriate scales. The jig's only moving part is the knob that tightens the racks on each other – not a lot to go wrong. This jig is destined to be a popular and enduring tool.

08.53.11	Incra Jig	32.95
08.53.12	1/20" Racks & Rule	8.95
08.53.13	1mm Racks & Rule	8.95



L INCRA GAUGE MEASURING AND MARKING TOOL

This ingenious device from the maker of the popular Incra Jig is a multi-purpose measuring tool with both simple design and tremendous accuracy. Using the patented Incra double-rack system to provide precise 1/32" lockable setting increments, the Gauge can be used as a layout tool for joinery, hardware installation, or surface decoration.

It works beautifully as a measuring tool for setting rip fence distance and for establishing precise depth of cut on the tablesaw, router, or shaper. It works as a hook rule, a marking gauge, a step gauge, and as a mitre stop block.

The Incra Gauge will extend up to 7" for measuring or marking from an edge, and up to 3-1/2" for use as a height gauge. Permanent 1/32" scales cast into the acrylic body are crisp and easy to read. A notch in each end helps guide a pencil or scratch awl for layout work. On small pieces, the gauge can serve quite reliably as a straightedge and square; in edge-distance mode, its single locking screw and interlocking rack system provide rigid accuracy with a simple twist of a wingnut.

For many of your measuring needs, this new example of old-fashioned American ingenuity will be the most versatile, accurate, and inexpensive tool in the shop.

08.53.14	Incra Gauge	15.95

THE OFFICIAL INCRA JIG HANDBOOK & TEMPLATES

by Chris Taylor, inventor of the Incra Jig. This eagerly-awaited handbook will help every Incra Jig owner get the most out of this popular, versatile and extremely accurate positioning device – and while you're at it, you'll create some amazingly intricate and beautifully decorative joints. The 92-page handbook contains detailed information on set-up and operation of the jig, and chapters on box joints, dovetails (through and half blind), double dovetails, and variations of your own. There are plans for 17 joints, including an end-to-end double dovetail. And for each of the 17 joints there are reusable adhesive-backed measurement templates which can be placed directly on your jig so you're ready to cut the joints with no further layout work. If you don't own an Incra Jig, but enjoy exposed joinery which is both functional and decorative, let this book inspire you to new efforts. And if you already own a jig, get ready to give it a real workout!

08.53.15	Incra Book & Templates	18.95

BOSCH 1581VS JIGSAW

Use this saw one time, and you'll know why it is broadly acknowledged as the finest there is. Steady, precise control is virtually effortless – in fact, it's hard to believe that reciprocating action can be engineered to be so smooth. Includes 4 orbital-action settings and a speed range from 50 to 2100 strokes per minute. 4.8 amp industrial-duty motor. Blower keeps cut line free of sawdust.

05.16.01	Bosch 1581VS Jigsaw	139.95
05.16.06	Steel Carrying Case	29.95
05.16.02	Rip Fence/Circle Guide	9.70
05.16.03	Repl. Blade Locking Screw	.95
05.16.04	Replacement Screwdriver	2.50
05.16.07	Repl. Blade Inserts, pk of 5	1.95

Bosch Jigsaw Blades, Pack of 5

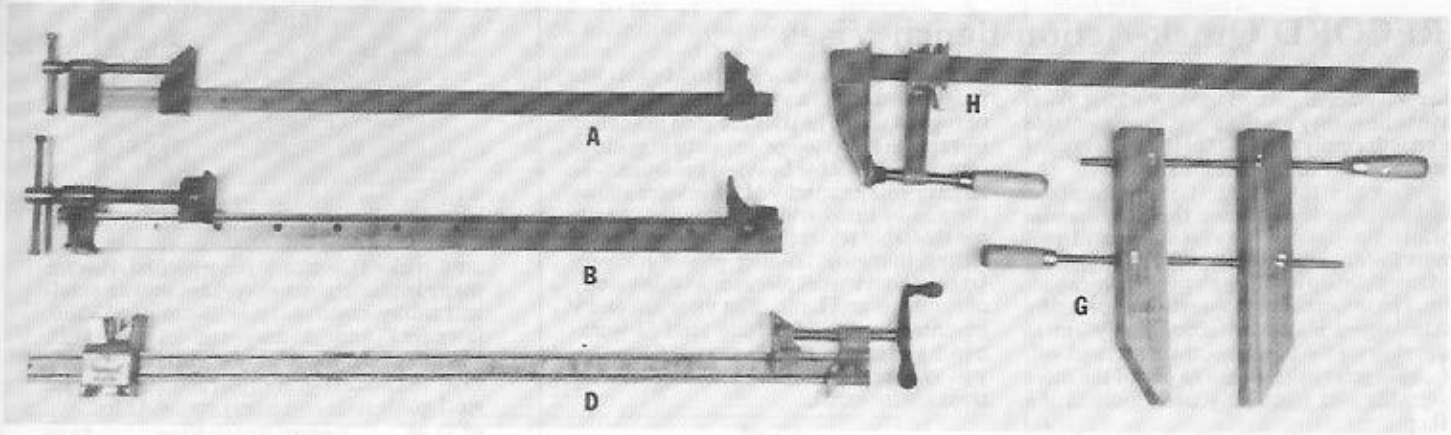
	Length	*tpi*	*Application*	
T144D	4"	6	Fast rough cut	5.50
T244D	4"	6	Fast rough scroll cut	6.95
T101B	4"	10	Very clean cutting	5.95
T119BO	3"	12	Tight scroll cutting	5.95
T101BR	4"	10	Downcut; laminates	5.95
T127DF*	4"	8	Metals up to 1/4" thick	9.95
T144DF *	4"	6	Nail-resistant rough-in	9.95

** Bi-metal blades with HSS edge*

Wood Cutting Rasps for Bosch Jigsaws, Each

T129	4" Half-Round	)	10.95
T130	4" Flat	▬	10.95
T131	4" Triangular	▶	9.95

CLAMPS



A RECORD SASH CLAMPS

Robust, heavy duty clamps extremely well built, fitted with a working slide which incorporates large thrust surfaces ensuring high wear resistance and a reliable coupling between slide and screw. Optional lengthening bar adds 3' to capacity. Bar cross-section is 1/4" x 1-1/4". Size listed is capacity.

Record Sash Clamps

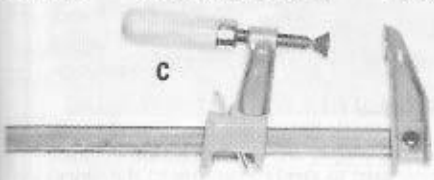
16.11.01	18"	38.95
16.11.02	24"	39.95
16.11.03	30"	39.95
16.11.04	36"	41.50
16.11.05	42"	42.50
16.11.19	48"	44.95
16.11.06	3' Lengthening Bar	28.50

B RECORD T-BAR CLAMPS

This is our heaviest clamp offered. It employs a T-bar cross-section that is 3/16" by 3/4" thick and 1-3/4" wide. The heavy slides operate on dimensionally accurate T-edges ensuring smooth movement. Resists bending even under high pressure. Optional lengthening bar adds 4 feet to the capacity (excess inventory of the L-bar enables our current below-market price). Size listed is capacity.

Record T-Bar Clamps

16.11.13	42"	57.95
16.11.15	48"	59.95
16.11.16	54"	63.95
16.11.14	4' Lengthening Bar	34.95



C LIGHT STEEL BAR CLAMPS

These light pattern instant acting bar clamps are among our most popular. Bar is 1/4" x 3/4" spring steel with 2-1/2" reach. Multiple disc clutch for quick release, instant adjustment, and secure holding power. Size listed is capacity.

Light Steel Bar Clamps

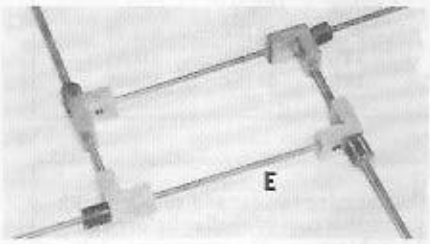
16.35.04	6"	6.95
16.35.05	12"	7.95
16.35.06	18"	8.95
16.35.07	24"	9.50
16.35.08	30"	10.50
16.35.09	36"	11.50

D JORGENSEN STEEL I-BAR CLAMPS

Extra high carbon steel in this I-bar of 1–1/2" by 7/16" by 5/32" cross-section yields a load limit of 6800 lbs. Jaw reach is 2" from bar, 1-3/4" wide. Size listed is capacity.

Steel I-Bar Clamps

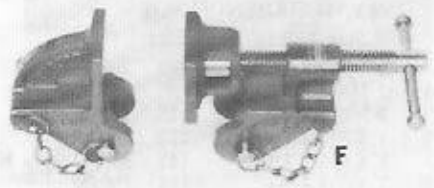
16.35.13	36"	22.95
16.35.14	48"	25.50
16.35.15	84"	34.95



E Quick-Action PICTURE FRAME CLAMP

This simple and reliable framing clamp from Lee Valley has more to it than meets the eye. The 1" high, 1/2"-section aluminum corners are anodized to prevent smudging the work, and have a a built-in escape channel for glue squeeze-out. One of the clamp's nicest features, however, is the quick-release action of the solid brass barrel nuts - just give them a twist and slide them instantly to accommodate whatever size frame you have, eliminating all that tedious twirling you'd otherwise be stuck with. The clamp comes provided with 18" threaded rod. Standard 1/4-20 all-thread from your local hardware store lets you customize your own lengths as needed.

16.70.01 Picture Frame Clamp 22.95



F RECORD CLAMP HEADS

Used to make a bar clamp of any length using a piece of lumber 1" thick. Rugged castings, heavy steel screw and handle.

16.11.11 Clamp Heads 24.50

G HANDSCREW CLAMPS

Regarded as the leading manufacturer of handscrew clamps, Jorgensen makes our handscrews with straight-grained hard maple jaws, cold drawn steel screws and nuts, and handles of hard maple protected by heavy steel ferrules.

Jorgensen Handscrew Clamps

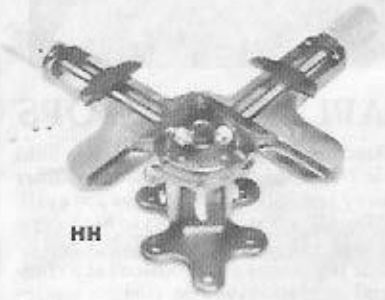
	Jaw Length	*Max. Opening*	
16.35.20	6"	3"	11.50
16.35.21	8"	4-1/2"	13.95
16.35.22	10"	6"	15.95
16.35.23	12"	8-1/2"	18.50
16.35.24	14"	10"	23.50
16.35.25	16"	12"	24.95

H DEEP REACH STEEL BAR CLAMPS

Exceptional 5" deep reach is a feature of these heavier clamps with 5/16" by 1-3/8" spring steel bar. Load limit 1600 lbs. Size listed is capacity.

Deep Reach Steel Bar Clamps

16.35.10	12"	21.95
16.35.11	24"	24.50
16.35.12	36"	26.95



HH PROFESSIONAL MITRE VISE

Here's a serious tool to bring one of nature's most cantankerous joints under control. Machined cast-iron jaws hold work firmly assembled for gluing or nailing. Jaws are 3" wide, opening to 4-1/8". The vise head rotates 360° and can be tilted to a vertical position. Exclusive heavy aluminum speed handles accelerate re-positioning the jaws and provide an excellent grip for getting the work down tight. Vise comes assembled and ready to use. Wt. 11-1/2 lbs.

16.77.01 Mitre Vise 92.50

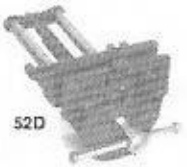
WORKBENCH HARDWARE

RECORD Quick-Action Bench Vises

Highland Hardware is proud to offer several sizes of Record woodworking vises. We believe they are the finest vises available and will amply serve either the professional woodworker or the serious amateur.

Record's three largest vises feature a quick-action lever under the drop handle which disengages the vise screw and permits instant adjustment of the jaw opening to any point up to the vise's maximum capacity. The smoothness of operation afforded by this feature allows an efficient rhythm to develop for the hand woodworker, and will quickly establish the vise as one of the most versatile and frequently used tools in the shop.

Heavy cast iron jaws and solid steel slide rods contribute to a vise made for lifetimes of rugged use. The jaws are toed in slightly toward the top edge to assure positive clamping under the heaviest pressure. The large opening capacity of these vises allows them to be fitted with heavy wooden jaws considerably wider than the vise itself, providing immense holding power for very large or heavy workpieces or a wide variety of shop jigs and tools. The vises are easily mounted to practically any kind of workbench and may be used in any configuration you choose. Detailed mounting instructions are included.



Record Quick-Action Vises

Catalog Number	*VISE*	*Quick Action*	*Dog*	*Jaw Width*	*Jaw Opening*	*Weight*	*Price*
01.11.01	52D	Yes	Yes	7"	8"	20 lbs.	$89.95
01.11.02	52-1/2D	Yes	Yes	9"	13"	36 lbs.	119.95
01.11.05	53E	Yes	No	16-1/2"	15"	38 lbs.	129.95

MAPLE BENCHTOPS

Benchtops are available from us in hard maple 2-1/4" thick suitable for all manner of heavy use. Six different sizes are available (from 2' x 5' up to 3' x 8') to fit the size of your shop and the scope of your work.

Our benchtops are produced at a commercial operation whose custom equipment and quality control permit us to offer a one-year guarantee on the tops against any major de-lamination. In gluing up the tops, a sophisticated glue press automatically clamps the pieces of the top together while a high frequency electric charge is passed through the glue joints, fully curing the glue in a matter of minutes. After the tops are thickness planed, they are smoothed on successive passes through a drum thicknessing sander and sprayed with a thin protective coat of shellac before being packed for shipment. The benchtop is delivered ready for mounting on an underframe construction by you. Plans for building a sturdy underframe are included with the top.

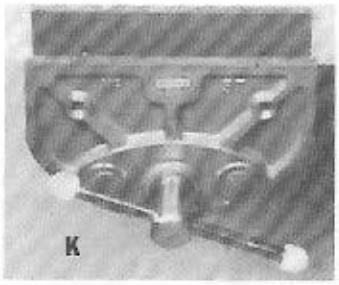
Our benchtops are dead flat when they come from the manufacturer, but like anything made of wood they will tend to change shape in response to atmospheric changes in your shop. Therefore you should check every now and then to see how your top is behaving, and re-flatten it if necessary. This is readily accomplished by planing straight across the grain with a good long hand plane such as the Record 07, removing stock from high spots revealed by straightedge and winding sticks. The top should then be scraped smooth and re-sealed with oil.

These benchtops are ideal for use with the large Record vises as well as our other vise hardware.

HEAVY DUTY WORKBENCH TOPS

	Size	*Wt. lbs.*	
01.16.13	2' x 5' x 2-1/4"	79	200.00
01.16.14	2-1/2' x 5' x 2-1/4"	98	250.00
01.16.15	2-1/2' x 6' x 2-1/4"	118	275.00
01.16.16	3' x 5' x 2-1/4"	118	300.00
01.16.17	3' x 6' x 2-1/4"	143	350.00
01.16.18	3' x 8' x 2-1/4"	188	450.00

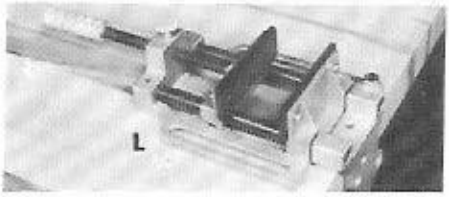
Workbench tops are shipped by truck freight collect. Allow up to 4-6 weeks delivery.



K RECORD BENCH VISE

The combination of stoutness and economy make this vise a favorite first vise for many beginning woodworkers, and an excellent utility vise for the well-equipped shop. Jaws are 7" wide, 3" deep, and open to 6-1/2". Mounts under the edge of a workbench top 1" to 3" thick. Cast iron construction with solid steel guide rods and heavy screw. 12 lbs.

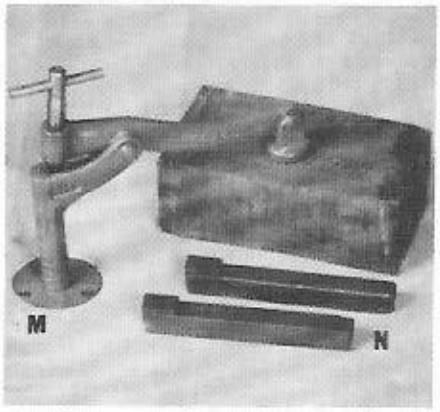
01.11.08 Record Bench Vise 39.95



L UTILITY VISE

This is a drill-press type vise with mounting assembly for universal use on any work surface up to 2-1/2" thick. The vise easily locks into place at one of three angles. A quick-action screw activated by a thumb latch gives instant access to full throat capacity. 4" jaws open up to 4".

01.56.01 Utility Vise 23.95



M BENCH HOLDFAST

Holds work flat to the bench surface regardless of shape. Screw cam action engages the lever arm to apply pressure to the workpiece. Maximum height is 7-1/2". Reach is 7". Mounting collar supplied is mortised into your benchtop.

01.11.10 Bench Holdfast 44.95
01.11.14 Extra Collar 6.95

N BENCH DOGS

Each of these bench dogs is mounted with a short length of spring steel along one side to snugly grip the inside of the bench dog hole. A machined, non-slip face at the top of the dog engages the workpiece. 6" x 11/16" x 5/8".

01.97.05 Pair of Bench Dogs 34.95

BENCH SCREW HARDWARE

One alternative to buying a ready-made vise is to buy one or more of our vise screw assemblies *(pictured at right)* and supply your own wooden jaws. We offer shoulder vise screws and tail vise screws for which you fabricate from wood the necessary assembly for guiding the motion of the movable jaw. More sophisticated tail and shoulder vise screw assemblies are also offered, which feature a pair of round steel guide rods or a set of machined steel plates to guide the action of the vise.

We recommend that you have your vise hardware in hand before beginning construction of your bench, so that critical dimensions can be verified.

	Catalog Number	Item	Screw Diameter	Screw Length	Overall Length	Width	Wt. Lbs.	Price
A	01.97.06	Shoulder Vise Screw	1-1/4"	11"	14"	–	9	$36.95
B	01.97.07	Tail Vise Screw	1-1/4"	19"	22"	–	9	39.95
C	01.97.03	Large Tail Vise	1-1/4"	17"	19"	4"	16	109.95
D	01.97.04	Small Tail Vise	1"	10"	14"	4"	14	79.95
E	01.97.01	Large Shoulder Vise	1-1/4"	16"	23"	10"	21	109.95
F	01.97.02	Small Shoulder Vise	1"	10"	17"	10"	15	79.95
G	01.97.10	Quick-Action Large Shoulder Vise	1"	19"	23"	10"	22	129.95
H	01.97.11	Guided Shoulder Vise	1-1/4"	11"	14"	Any	14	99.95

ADJUSTABLE BRASS BENCH DOGS

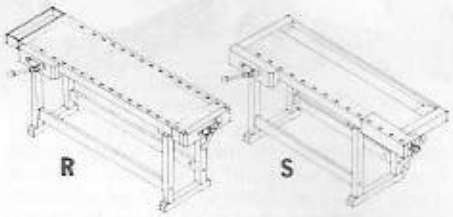
Add a touch of elegance to your workbench with these highly functional solid brass bench dogs. Each dog has a slightly undersized 3/4" shank fitted with a friction ring to allow positioning at any height from flush to 1-1/4" above the bench for work with stock of any thickness. The 1-1/8" diameter head, 1/2" high, has a 3/4" wide flat face undercut at 4° to provide secure, non-lifting hold for sanding, planing, routing, etc. Installation in your bench is as easy as drilling two holes. Total height of each dog is 2-1/4".

01.97.13 Pair Brass Bench Dogs 8.95

WOODEN VISE HANDLE

1-1/8" diameter by 14-1/2"-long hardwood handle fits all vises shown at right. Features removable wooden end knobs.

01.97.12 Wooden Vise Handle 4.95



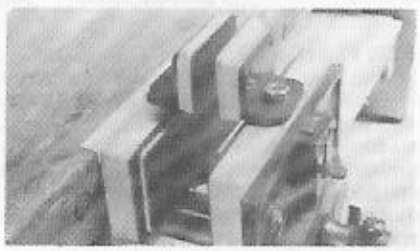
WORKBENCH PLANS

Excellent plans for building a traditional or modern European-style workbench. The modern plan will take either of the European-style shoulder vises mounted in either the front or end vise position. The traditional plan uses either of these vises in the front and either of our European-style tail vises on the end.

The modern bench measures 82" x 23". The traditional bench measures 84" x 25-1/2". Plans include complete detailed drawings, material lists, and construction notes.

R 01.70.02 Modern Bench Plan 9.95
S 01.70.03 Traditional Bench Plan 9.95

Enhance Your Bench Vise with these Custom Liners and Pivoting Jaws



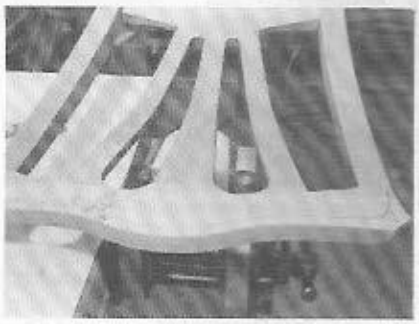
This jaw liner system provides new ways to clamp difficult objects. A steel bushing in each liner lets you instantly mount a pair of pivoting accessory jaws which grip tapered or oddly-shaped work, as well as holding small pieces where you can get at them.

The hard maple jaw liners are faced with a layer of thick, long-wearing full-grain leather for a positive non-marring grip. The main faces are rabbetted all around, leaving a square-sided shelf for supporting stock to be planed, or for holding two pieces at an accurate right angle for marking, drilling, etc.

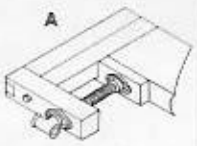
The pivoting jaws, like a carver's vise, provide clamping capability your bench vise never had before. They're mounted on heavy steel angle fitted with 1/2" case-hardened shafts which fit into the main jaw's steel sockets. They're strong enough to hold a chair by one leg, and their leather-lined faces grip the smallest workpieces without slipping.

The jaw liners are 11" wide, 3-3/4" high, and 1-3/8" thick. The pivoting jaws are 3-1/2" wide by 2-1/4" high. Mounting instructions and hardware are included.

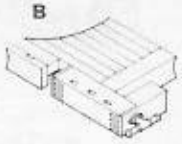
01.60.01 Custom Jaw Liners 39.95



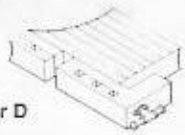
SHOULDER VISE SCREW can be used as a traditional Scandanavian shoulder vise as pictured here, or as a tail vise as described in *The New Yankee Workshop* (catalog page 96).

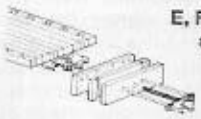


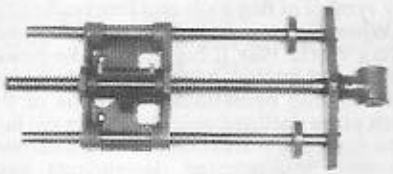
TAIL VISE SCREW A popular, inexpensive heavy screw designed for use as an end vise.



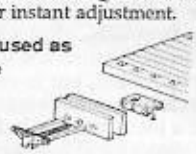
TAIL VISES. Slotted steel plates guide the action of these heavy-duty end vises.

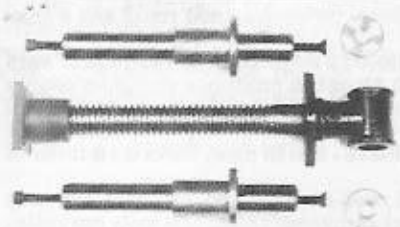




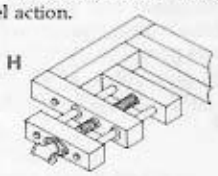


SHOULDER VISES. Heavy duty steel guide rods insure stable action. Can be used as either front vises or end vises. Quick-action model has half-nut for instant adjustment.

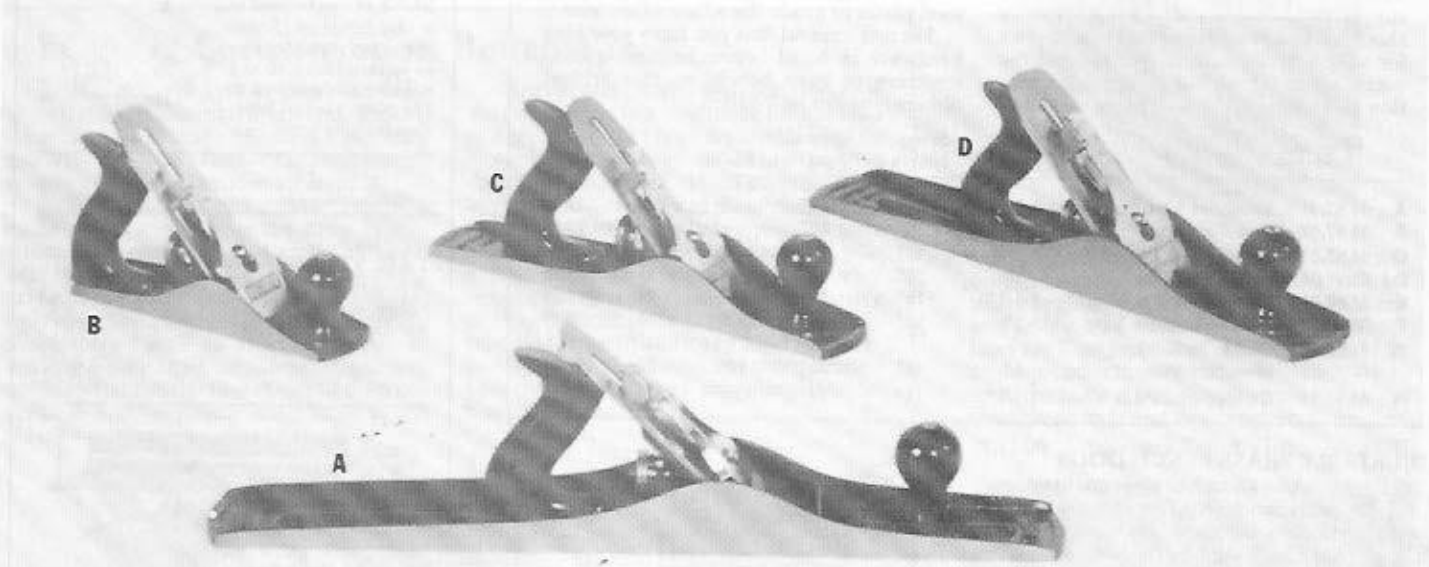




GUIDED SHOULDER VISE can be used either as a front vise or shoulder vise. Steel guide rods and machined brass bushings maintain parallel action.



PLANES



If woodworking handtools were to be ranked in order of importance, the bench plane would surely be at the head of almost every woodworker's list. Its versatility, accuracy, efficiency, and the sheer pleasure to be had from its use have for centuries made it the very symbol of fine tools and fine craft.

When the new industrial revolution following World War II began to make power planers and jointers available to small-scale woodworking operations, the status of the bench plane declined considerably in the face of the new faith in machines. Those machines and their sophisticated descendants have undeniably brought woodworking into a new era of vastly increased productivity, accessibility to craftsmen and public alike, as well as more uniform (and probably overall improved) quality. For a time machines were viewed as the ultimate tools for almost every shop operation, but in recent years more and more craftsmen have come to understand that while a machine may indeed be the most efficient choice for 95% of their work, it is the other 5% of the work, done by hand, that makes the difference between a good result and a great one.

Indeed it might come as a surprise to learn that a plane can produce a straighter edge, a tighter, stronger joint, or a smoother surface than the finest jointer or planer or sander is capable of - and in many cases do it faster as well.

A well-tuned plane provides not only superb results but also a supremely rewarding woodworking experience - don't be surprised if you find yourself occasionally making shavings just for the joy of it.

For amateur and professional alike, the bench plane is once again coming into its own, and we are proud to contribute to this renaissance by offering a wide selection of fine planes from Record Tools of Sheffield, England.

RECORD BENCH PLANES

Record bench planes feature very hard tungsten-vanadium steel cutting irons, precision-milled bodies and soles, smooth-acting knurled brass depth-of-cut adjust knob, adjustable frog, and beech handles. They are cast in the classic Bailey pattern which has been the industry standard for over seventy years.

A 07 JOINTER PLANE

Most popular in the series is the 07 Jointer plane, 22" long with a cutter 2-3/8" wide. As the name implies, this is the classic tool for making dead-straight edges for joining, and for producing surfaces that are flat in length and width. If you own only one bench plane, this should be the one.

03.11.07	07 Jointer Plane	99.95

LAMINATED PLANE IRONS

The superb edge-holding characteristics of Japanese planes are now available in irons to fit most Record and Stanley planes. A thin layer of extremely hard steel is laminated to the back of the iron, providing a cutting edge of about Rc65; it will still be razor sharp when other irons would have lost their edge entirely. Sharpen to a micro-bevel to keep the edge strong. Available in 2" and 2-3/8" widths.

03.64.13	2" Japanese Iron	29.95
03.64.14	2-3/8" Japanese Iron	29.95

CORRUGATED SOLE PLANES

Five models of bench planes are available with corrugated soles (grooves cut lengthwise) for reduced friction and easier handling. All other specifications are the same as for the other bench planes.

03.11.10	03C Corrugated	62.50
03.11.11	04C Corrugated	65.80
03.11.12	05C Corrugated	79.50
03.11.13	06C Corrugated	94.50
03.11.16	07C Corrugated	132.00

B SMOOTH PLANES

The 03, 04, and 04-1/2 Smooth planes are used for surface finishing after stock has been prepared using the larger planes. Where absolute surface flatness is not a necessity, these planes are ideal because their relatively short lengths (9", 9-1/2", and 10-1/4") allow them to follow slightly irregular contours, and they are the tools of choice for planing small workpieces. The 03 and 04 have cutters 1-3/4" and 2" wide; with its 2-3/8" wide cutter and stable handling, the 04-1/2 is the most popular of the lot.

03.11.01	03 Smooth Plane	48.95
03.11.02	04 Smooth Plane	49.95
03.11.03	04-1/2 Smooth Plane	54.50

C JACK PLANES

The 05 and 05-1/2 Jack planes are general purpose tools used for rough work and heavy stock removal. Their irons are usually ground to a convex edge for taking down rough-sawn lumber. They are also an excellent addition to a remodeler's toolbox. They are 14" and 15" long with cutters 2" and 2-3/8" wide respectively.

03.11.04	05 Jack Plane	59.95
03.11.05	05-1/2 Jack Plane	75.20

D 06 FORE PLANE

The 06 Fore plane, 16" long with 2-3/8" cutter, is so named because it is traditionally used before the jointer plane for the relatively rough work of bringing stock close to the desired dimensions, saving the sharp iron of the jointer for the finishing work. The function of the 06 has today been largely superseded by the power jointer, but if you don't have that machine this is a very useful plane to add to your collection.

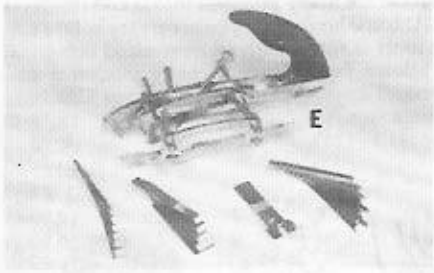
03.11.06	06 Fore Plane	89.95

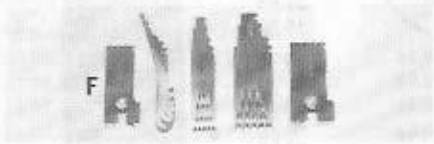
RECORD
Combination Plane

Record's combination plane will cut dadoes, rabbets, fillisters, edge beads, center beads, and matching tongue and grooves with precision. The plane can handle any of the cutters used by the now out-of-production model 405 multiplane, with the exception of the slitting cutter.

The combination plane features a depth stop, beading stop, and two cross-grain spurs. 18 cutters are provided, including 12 plough (straight) cutters 1/8" through 7/8", five beading cutters 1/8" through 1/2", and a 1/4" tongue cutter. Additional cutters are available below.

E 03.11.21 Combination Plane 199.95





F 16 ADDITIONAL CUTTERS

These special purpose cutters can be used on the combination plane above, or on Record's 405 multiplane, or Stanley's 45 and 55 multiplanes. Included are six fluting cutters 3/16" to 3/4", 1-1/2" and 1-3/4" sash cutters, four 1/8"-bead cutters 1/4" to 5/8", and four 1/4"-bead cutters 1/2" to 1-1/4" wide.

03.11.22 16 Extra Cutters 145.00

N RECORD 060-1/2 Low-Angle Block Plane

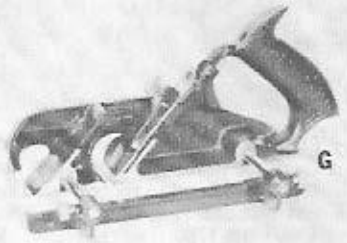
The extremely low angle (12-1/2°) of this beautifully-made plane makes it ideal for the cleanest work on end grain of any kind of wood. Its small size (2" x 6"), light weight (1-1/2 lbs.) and fully adjustable throat also make it the tool of choice for smoothing tight places and planing small or delicate work without tearout. Depth of cut is mechanically adjusted. Brass and polished steel fittings make the 060-1/2 as attractive as it is useful.

03.11.50	Record 060-1/2 Plane	47.80
03.11.51	Replacement Cutter	6.20

G 778 RABBET PLANE

This is a heavy duty plane for cutting rabbets up to 1-1/2" wide with or across the grain. A hardened steel spur incises the grain ahead of the cut for crisp results. The fence may be fitted to either side and is attached with two arms for rigidity. The cutter can be positioned on either of two frogs for standard or bullnose work. 9" long. Cutter width is 1-1/2". Weighs 4 pounds.

03.11.17	778 Rabbet Plane	68.40
03.11.43	Spare Cutter 778	7.00



H CIRCULAR PLANE

The flexible sole of the 020C Circular plane is adjustable to match the contour of either concave or convex surfaces. This makes it possible to bring the quality and efficiency of a plane finish to wood which would otherwise have to be sanded, such as bent wood, curved laminates, round-surface edges, etc. Cutter adjusts as in bench planes. 10" long with cutter 1-3/4" wide.

03.11.18	020C Circular Plane	165.00
03.11.35	Spare Cutter 020C	8.50

REPLACEMENT BLADES for Bench Planes

Three sizes of plane irons to fit the various Record Bench planes are available here. The 1-3/4" cutter fits the 03 Smooth plane as well as the 020C Circular plane. The 2" cutter fits the 04 Smooth plane and the 05 Jack plane. The 2-3/8" cutter fits the 04-1/2 Smooth plane, the 05-1/2 Jack plane, the 06 Fore plane, and the 07 Jointer plane. All are made from highest quality tungsten vanadium steel.

03.11.35	1-3/4" Cutter	9.95
03.11.36	2" Cutter	10.50
03.11.37	2-3/8" Cutter	12.80

I BENCH REBATE PLANE

The 010 Bench Rebate plane is basically a light jack plane featuring blade exposure along both edges of the body as well as at the sole, allowing the production of straight, crisp rabbets, or perhaps more common today, smooth, fast and accurate clean-up of rabbets cut with router or saw. 13" long, 2-1/8" cutter.

03.11.09	010 Rebate	118.95
03.11.39	Spare Cutter 010	10.50

J 09-1/2 RECORD BLOCK PLANE

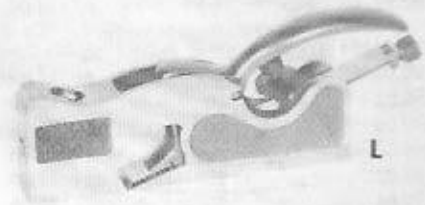
This well-constructed plane features careful machining for fine work. A screw adjustment raises or lowers the cutter, and a lever adjusts it laterally. The mouth is adjustable for fine or coarse work. The iron is set at 20° for good general purpose work. 6" long, 5-5/8" cutter. Weighs 1-1/2 pounds.

03.11.30	09-1/2 Block Plane	51.70
03.11.44	Spare Cutter	6.20

K 077 BULLNOSE RABBET PLANE

A very handy plane for fine rabbetting which features detachable nose for alternate use as a chisel plane in very tight quarters. Overall length is 4". Cutter width is 1-1/8". Weighs 2 lbs.

03.11.15	077 Bullnose Rabbet	62.50
03.11.42	Spare Cutter 077	7.50



L 073 SHOULDER RABBET PLANE

This is a fairly large rabbet plane 8-1/8" long with a 1-1/4" wide cutter. It is carefully machined for use on side or sole. Screw adjustment controls the size of the mouth and cutter position. Weighs 4 lbs.

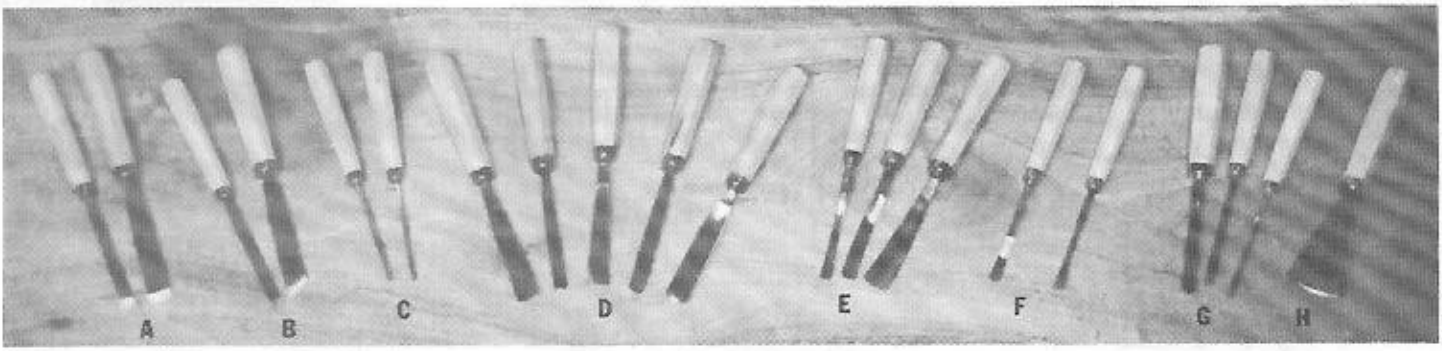
03.11.14	073 Rabbet Plane	115.50
03.11.41	Spare Cutter for 073	7.50

LOW-ANGLE BLOCK PLANE

This Stanley plane has its cutter set at just 12° for extremely clean work on end grain. The 1-3/8" cutter is fully adjustable as is the throat opening. 7" long. 1-1/2 lbs.

03.12.01	60-1/2 Plane	36.50
03.12.02	Spare Cutter 60-1/2	7.95

CARVING TOOLS



STAG Carving Tools

We are pleased to offer Hirsch Stag brand carving tools, regarded by many as Europe's finest woodcarving tools. Manufactured in Germany continuously since 1780, the Stag tools are second to none in performance and quality.

Hand-forged of West Germany's finest high carbon tool steel and tempered to a Rockwell hardness of 61, these carving tools are known for their ability to take an edge that will remain sharp during long periods of demanding professional use. The tools are finely polished inside and the bevel carefully ground. Some honing may be necessary before use.

Each of the tools is fitted with an over-sized octagonal handle which allows for an exceptionally powerful and sturdy grip. Overall length of the tools averages 11".

Sizes listed are in mm.

A Straight Carving Tool

12.97.98	2mm	12.95
12.97.31	6	12.95
12.97.32	14	15.50
12.97.33	18	16.95
12.97.34	25	22.50
12.97.35	40	36.95

B Skewed Carving Tool

12.97.36	10	12.95
12.97.37	14	15.50
12.97.38	20	19.95
12.97.39	25	22.50

C Veiner Gouge

12.97.96	1	26.50
12.97.97	2	26.50

#3 Straight Gouge

12.98.01	6	16.95
12.98.02	10	16.95
12.98.03	14	19.95
12.98.04	20	24.95
12.98.05	25	28.50
12.98.06	35	36.95

#5 Straight Gouge

12.97.40	6	16.95
12.97.41	10	16.95
12.97.42	14	19.95
12.97.43	20	24.95
12.97.44	25	28.50
12.97.45	35	36.95

D #7 Straight Gouge

12.97.46	6	16.95
12.97.47	14	19.95
12.97.48	20	24.95
12.97.49	25	28.50
12.97.50	35	36.95

#9 Straight Gouge

12.97.51	6	18.95
12.97.52	10	18.95
12.97.53	14	20.95
12.97.54	18	24.95
12.97.55	25	35.50
12.97.56	35	59.95

#11 Straight Gouge

12.97.57	6	18.95
12.97.58	10	18.95
12.97.59	14	20.95
12.97.60	18	24.95
12.97.61	25	35.50

#4 Bent Gouge

12.97.62	6	18.95
12.97.63	10	18.95
12.97.64	14	20.95
12.97.65	25	33.95
12.97.66	35	43.95

E #6 Bent Gouge

12.97.67	6	18.95
12.97.68	10	18.95
12.97.69	14	20.95
12.97.70	25	33.95
12.97.71	35	43.95

#8 Bent Gouge

12.97.72	6	18.95
12.97.73	10	18.95
12.97.74	14	20.95
12.97.75	25	33.95
12.97.76	35	43.95

#11 Bent Gouge

12.97.77	6	20.95
12.97.78	10	20.95
12.97.79	14	23.95
12.97.80	25	38.95
12.97.81	30	47.95

#3 Spoon Gouge

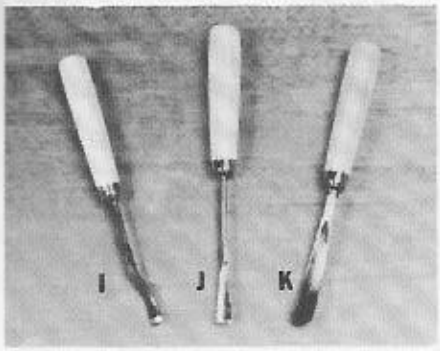
12.98.22	10	18.95
12.98.23	14	20.95
12.98.24	25	36.95

F #5 Spoon Gouge

12.98.16	10	18.95
12.98.17	14	20.95
12.98.18	25	36.95

#8 Spoon Gouge

12.97.82	10	18.95
12.97.83	14	20.95
12.97.84	25	36.95



#39 V Gouge

12.97.85	4	24.95
12.97.86	8	24.95
12.97.87	12	26.95

G #41 V Gouge

12.97.88	6	24.95
12.97.89	10	24.95
12.97.90	14	26.95

#45 V Gouge

12.97.91	4	24.95
12.97.92	8	24.95
12.97.93	12	26.95

H 50mm Swiss Pattern Gouge

12.98.25	#1 Sweep	44.95
12.98.26	#3 Sweep	49.95
12.97.94	#5 Sweep	49.95
12.97.95	#7 Sweep	49.95

#3 Back Bent Gouge

12.98.27	6	17.95
12.98.28	10	17.95
12.98.29	14	18.95

I #5 Back Bent Gouge

12.98.07	6	17.95
12.98.08	10	17.95
12.98.09	14	18.95

J #6 Fishtail Gouge

12.98.13	10	14.95
12.98.14	14	18.95
12.98.15	20	26.95

#8 Fishtail Gouge

12.98.219	10	14.95
12.98.20	14	18.95
12.98.21	20	20.95

K #39 Curved Parting Tool

12.98.10	6	27.95
12.98.11	10	27.95
12.98.12	14	31.95

Carving Tool Selection

Carving tools are identified according to their shapes by a universal numbering system. Regardless of who manufactured it, for example, a #1 tool is always a straight firmer chisel, a #2 is always a skew chisel, #3 and higher tools are gouges.

All gouges have a curved cutting edge which allows both with-grain and cross-grain cutting. This curve is referred to as the sweep. The shallowest sweep is the #3 and the deepest sweep is the #11. Generally speaking, the deeper the sweep, the greater the amount of wood you can remove. If you were working in sequence, the deeper gouge would be used for roughing out, and you would move to a shallower gouge for smoothing.

If you are relying on the mark left by the tool for texturing your workpiece, the choice of a specific sweep and width comes into play.

Likewise, if you are carving mouldings or reproducing an existing pattern, a specific sweep may be required to duplicate a radius.

Gouges are either straight or bent along their length. **Straight gouges** are used on flat or convex surfaces. **Bent gouges** are used for concave surfaces. The bent gouges are made in two variations: long bend and short bend (usually called a spoon gouge). The **spoon gouges** allow you to cut a concave surface with a tighter radius than the long bent gouges can handle. Spoon gouges are also used for undercutting in relief carving. The numbering of sweeps on the bent gouges is the same as for the straight gouges.

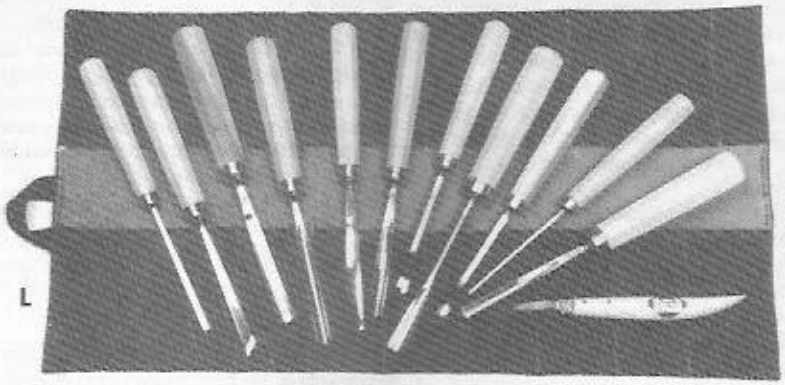
The tapering blade of the **fishtail gouge** allows access to areas of a carving that would be impossible to reach with a straight-sided gouge. The **back bent gouge** is utilized for undercutting in relief carving.

The **straight chisel** is used in relief work for setting and ground work, and flat cutting on convex surfaces.

The long point of the **skew chisel** allows you to cut into an area where access is limited to an angled approach.

The "V" **gouge** (or Parting Tool) produces a V-shaped mark. It is used for incising and texturing.

STAG CARVING SETS



L COMPREHENSIVE 12-TOOL STARTER CARVING SET

This set allows you to do both carving in the round as well as relief carving, and is designed for intermediate to small size carvings. It includes a 6mm #1 straight chisel, 10 mm #2 skew chisel, 14mm #3 straight gouge, 10mm #9 straight gouge, 14mm #4 bent gouge, 10mm #8 bent gouge, 10mm #5 spoon gouge, 14mm #6 fishtail gouge, 10mm #5 back-bent gouge, 1mm veiner, 8mm #39 V-tool, and a whittling knife, all packed in a 12-pocket denim tool roll. To accommodate larger carvings, we recommend adding the Intermediate set of three 25 mm gouges.)

12.98.31 12-Tool Carving Set 199.95

CARVING GOUGE SETS

The three 3-gouge sets listed here are intended as basic starter sets for fully 3-dimensional carving. They are alike in that each set affords a range of sweeps for roughing out, intermediate smoothing, and smoothing. The sets differ from one another in terms of the size carving for which they are suited, from small scale up to life-size sculpture.

M BEGINNING GOUGE SET

For basic carving in the round on small to intermediate size projects (approximately 12" in dia. or smaller). It consists of three 14mm (9/16") gouges with sweeps of #3, #7, and #11, and comes packed in a 6-pocket denim roll.

12.98.32 Beginning 3-Gouge Set 54.95

N INTERMEDIATE GOUGE SET

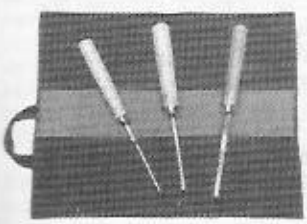
For carving in the round and sculpture larger than 12" in diameter. It includes three 25 mm (1") gouges in #3, #7, and #11 sweeps and a 6-pocket denim tool roll.

12.98.33 Intermediate 3-Gouge Set 95.00

O SCULPTOR'S GOUGE SET

For heavy stock removal on projects of human scale or larger. It features three #50 mm (2") Swiss pattern gouges with sweeps of #3, #5, and #7 and a 6-pocket denim roll.

12.98.34 Sculptor's 3-Gouge Set 149.95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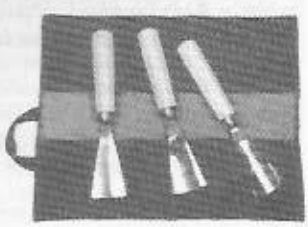
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Multi-Router Means Profit

By Curtis Whittington

I've been making furniture for more than 25 years. For the past nine years, it has been my only source of income. All my work is commissioned, so I rarely do any two pieces alike. This is a tough way to earn a living, and had I known from the beginning how tough it would be, I probably would not have begun doing it professionally.

Gloom

Two years ago, I got tired of barely getting by, and decided to "hang it up", put on a coat and tie, and re-enter the rat race. Fortunately, my closest friends convinced me that a last effort should be made. I was pursuaded that larger, more efficient machines should be purchased and "let's see what happens".

I attended the woodworking show in Charlotte, N.C. with buying a new sliding table saw in mind. I had no idea what else could be purchased, as there wasn't much I didn't already have.

In the first booth I stopped at, my good friend Ben Covington was demonstrating a machine that produced tenons with rounded edges. I watched this marvelous machine for a few minutes, then handed over my Visa card and said "I want one". The Multi-Router was being introduced for the first time, and I became the proud new owner of machine #4, along with every size tenon template.

I've bought a lot of things in my years as a woodworker, and too many times, I've been disappointed. It is not uncommon to go home and have to totally assemble a new machine because it has arrived in "KD" form, and find that I even have to re-machine parts to make them fit together and work properly. That's not the case with the Multi-Router. Screw in three bolts that hold on the operating handles, install your router base and the stylus assembly, and you are ready for action within about 15 minutes. It is a ready-to-go machine right out of the box. No hassle. There are *no* adjustments to be made, and nothing to get out of alignment. After two years, I can still say this is the finest machine I have ever encountered in woodworking.

Profit

Now we get to the meat of this article. Several weeks after I got the Multi-Router, I walked into the shop at 8 AM. First thing to do that day was to mortise and tenon and glue a simple 48" x 22" cocktail table. Four legs, four rails and a top. I had dimensioned the wood the day before, so I went straight to the Multi-Router to begin. Forty-five minutes later, I was finished mortising, tenoning and gluing, and was drinking a leisurely cup of coffee.*

It was only then that it hit me what I had bought for myself. It had generally required 3-1/2 hours to do this operation in my shop using table saw, bandsaw and/or hand saw for the tenons, and then rasping over the edges. (I especially hated rasping over the edges). Mortises had been done using a jig and plunge router. (I also had a square chisel tenoner on a drill press, but never really used it much).

80% Savings

By installing a Multi-Router, I had just eliminated 2-3/4 production hours from this job. I was almost in shock. This 80% time savings applies to all mortise and tenon work, as well as the many other Multi-Router uses. It will perform just about any kind of joinery used in furniture and cabinetmaking except half-blind dovetails.

All this has proven out over the past two years. I've always known that one-man shops had a problem turning out enough work fast enough to be profitable. And profitable to me means sufficient income for more than just getting by. Well, this past year I finally took a real vacation (to Key West), I worked fewer Saturdays, and best of all, I have a much brighter attitude about my future in furniture making.

Whether you are a professional or a hobbyist, I can promise you that a Multi-Router will make a great asset for your shop. A hobbyist can actually get weekend projects accomplished in a weekend, and the small professional shop owner will certainly make more profit while experiencing less stress. I even know of a large manufacturing plant that

* The same operation now takes me thirty minutes.

uses a Multi-Router to produce small-run parts, such as for prototypes, or to fill in when larger production machines are being repaired.

The range of work which the Multi-Router will handle is part of the reason for its versatility. In my shop, we've used the Multi-Router to produce joints on work ranging from 1"-cube ring boxes for a local jewelry store (using 1/4" box joints) up to a mortise and tenon frame 15' x 5' x 6' for our furniture-hauling trailer.

Design

I now have an employee who enjoys using the Multi-Router. We will soon buy our second machine in order to produce a box I have designed to sell in local stores. My furniture designs have also benefited from having the Multi-Router. I can now design and make furniture that would have been too expensive before because so many joints would have had to be cut by hand. This is true because the Multi-Router can do multiple-angle joinery as easily as it does straight joinery. Because of this, I am competitive in chairs again, also.

Charge

One last note. When you get your Multi-Router, don't charge it out at the same hourly rate as say your table saw. Because it saves so much time, charge for this and take advantage of it. For instance, my table job used to require 3-1/2 hours at say, $35/hour for joinery, or $122.50. Charge $110 for the first hour, and charge a full hour. You are making the profit and saving the customer money too. And that's the bottom line – profit and saving.

Curtis Whittington makes furniture full-time at his shop in Pawleys Island, S.C. This artice is reprinted from a previous issue of Wood News.

MULTI-ROUTER
Production Joinery Machine

This new American-made jointmaker is a dream machine for commercial-duty production of almost any solid-wood joint imaginable. Extraordinarily heavy aluminum alloy castings, low-tolerance computer-controlled surface machining, and complete X-Y-Z axis control with linear ball bearings on solid steel ways make the Multi-Router the smoothest, most precise and most versatile joinery device we've ever seen. An excellent video-tape presentation is available to provide an in-depth view of the machine at work in a shop environment – details below. Equipped with the optionally available pneumatic clamp system, the Multi-Router will be equally at home on the factory floor or in a one-man custom shop.

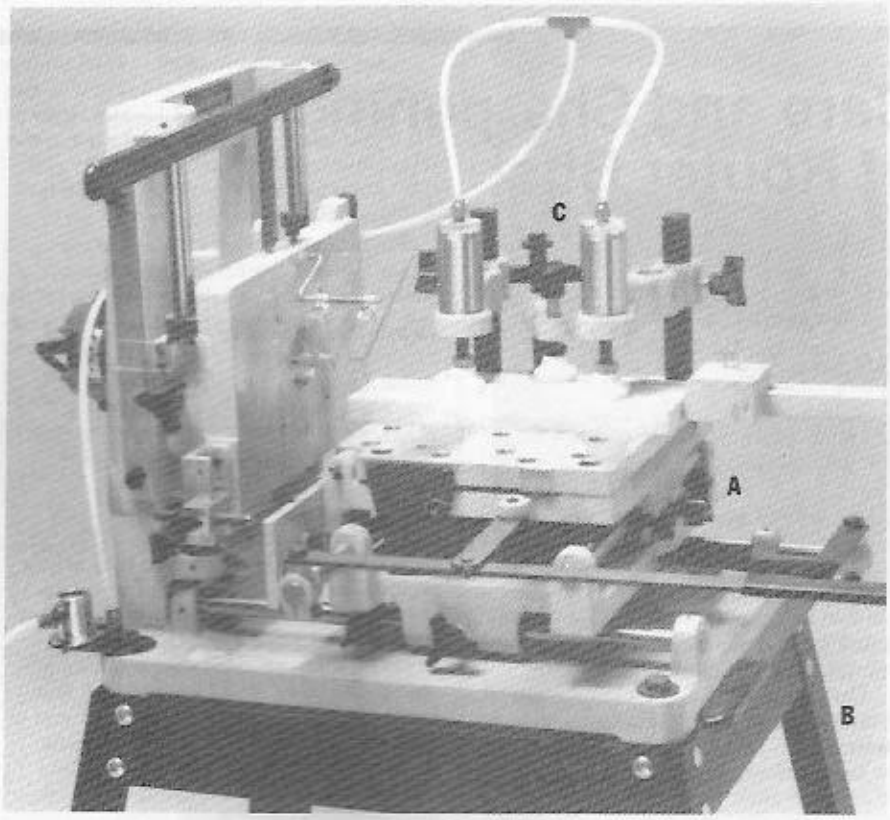
While its specialty is mortise and tenon joints (up to 1/2" x 3"), the Multi-Router also produces dovetails, box joints, splined miters, sliding dovetails, round stub tenons, and numerous decorative joints. The tilting work surface (0 to 45 degrees) makes both simple and compound-angle joints almost unbelievably easy. Mortises are are set up and milled using built-in stops for control in every dimension. All other joint components are produced under template control; once set up, the machine will mill anything from one to a thousand parts with no further adjustment.

The work mounting table rides on four 3/4" diameter hardened steel ways which offer 8" of side-to-side and in-and-out travel. Thompson linear bearings assure tight, precise movement with almost dreamlike ease and smoothness. 20" lever handles move the table along both axes with positive control and excellent mechanical advantage. The vertical platen serves as router mount and positioning jig for stock set-up and some milling operations. It is bored for mounting either a Bosch 1604 router or a Makita 3612BR, and most other makes and models can be mounted with additional boring. The platen offers 6" of vertical travel, and is equipped with a gas-cylinder return which completely offsets the weight of any router, a great safety feature as well as an indispensable convenience.

A variety of optional templates is available for production of standard tenons, box (or finger) joints, 14 degree dovetails, mitered dovetails, and round tenons. ***An optional ball-bearing-tipped guide stylus is required for use with any of the templates.*** Standard tenon templates are very easy to use, as the stylus is completely controlled within a closed track.

Variable-size tenon templates are available to provide complete assurance that your tenons can be made to fit even if your mortises come out slightly over or under absolute dimension (such as will occur after your bits have been sharpened, or if they weren't perfectly sized to begin with). All the variable-size templates are used in a master insert holder; each tenon size set comes with three inserts to change tenon size in very small increments.

The comprehensive template set we offer includes all the templates *except* the standard tenon templates. It includes the master insert holder and all sizes of variable-size tenon templates.



The pneumatic Power Clamps are available either as original equipment or as an accessory system for those who already own the Multi-Router. If you're not already outfitted with an air compressor, low-cost units are readily avaialble; the clamps require only minimal S.C.F.M. at 70 PSI. The machine can of course be used without the Power Clamp system, as it comes provided with two manual hold-down clamps which mount in any of the work table's 14 sockets.

Whether you want a machine for commercial mass production of chair parts, or if you're just looking for the ultimate router jig, you will find the Multi-Router to be an outstanding combination of ingenious design and meticulous execution. The Multi-Router is shipped by truck freight collect. Shipping wt. is 99 lbs.

MULTI-ROUTER

A	08.52.01	Model 101-L Multi-Router	1495.00
B	08.52.03	Machine Stand	88.00
C	08.52.04	PC-1 Air Clamps	255.00
	08.52.05	Ball-bearing Follower Stylus	49.50

Comprehensive Template Set

08.52.63	Master Insert Holder, Set of 3 each Var. Size Tenon Inserts in All 14 Sizes, 3 Dovetail, 2 Finger Joint, & All 4 Round Tenon Templates	356.00

MULTI-ROUTER Video

Seeing is believing, and we encourage you to borrow the instructional video and get a first-hand look at the Multi-Router in operation. To receive the video for up to 30 days, send us a check for $20 (or charge by phone toll free 800-241-6748) to cover a $15 refundable deposit and $5 handling fee. If you buy a Multi-Router during those 30 days, we'll credit your $20 toward the purchase and let you keep the video manual.

Tenon Sizes Available (inches):

1/4 x 1	3/8 x 1	1/2 x 1-1/2
1/4 x 1-1/2	3/8 x 1-1/2	1/2 x 2
1/4 x 2	3/8 x 2	1/2 x 2-1/2
1/4 x 2-1/2	3/8 x 2-1/2	1/2 x 3
1/4 x 3	3/8 x 3	

Variable-Size Tenon Templates

08.52.61	Master Insert Holder for Variable-size Tenon Inserts	25.00
08.52.62	Set of 3 Var.-Size Tenon Inserts *(Specify one of fourteen nominal set sizes from lenon size chart above).*	13.50

Standard Tenon Templates

08.52.11	Std. Tenon Templates, Each *(Specify size from chart above)*	15.25

Other Standard Templates

08.52.31	Dovetails (Pins and Tails)	36.50
08.52.35	Mitered Dovetail	18.50
08.52.32	1/4" Finger Joints	18.50
08.52.33	3/8" Finger Joints	18.50
08.52.34	Round Tenons, Each *(Specify size: 1/2 & 5/8; 3/4; 1; or 1-1/4")*	15.25

Precision Spiral End Mill Bits

High Speed Steel

	Diameter	*Cutting Length*	*Shank*	*Overall Length*	*Price*
0225H	1/4"	5/8"	3/8"	2-7/16"	14.70
0237H	3/8"	3/4"	3/8"	2-1/2"	14.70
1225H	1/4"	1-1/4"	3/8"	3-1/16"	16.85
1237H	3/8"	1-1/2"	3/8"	3-1/4"	16.85
1250H	1/2"	2"	1/2"	4"	24.15
Titanium Nitride Coated (stays sharp 6x longer)					
0225T	1/4"	5/8"	3/8"	2-7/16"	20.70
0237T	3/8"	3/4"	3/8"	2-1/2"	20.70
1225T	1/4"	1-1/4"	3/8"	3-1/16"	22.85
1237T	3/8"	1-1/2"	3/8"	3-1/4"	22.85
1250T	1/2"	2"	1/2"	4"	30.15

Care and Sharpening of Router Bits

by Zach Etheridge

Zach Etheridge, Product Engineer
Highland Hardware

Dear Zach,

I spoke to one of the guys on the phone at Highland Hardware just now and complained about the enclosed router bit, a 1/2" 8° carbide dovetail bit which came with my Leigh jig. He said to send it in to you so you could look at it. I'm getting what I would consider excessive tear-out, and then I noticed the chipped edge. I have probably less than a dozen completed projects on this bit.

The wood [sample cut enclosed] is a South American hardwood called Incienso (?).

Your comments would be appreciated.

Yours very truly,
BFW
Columbus, NC

THIS IS FAIRLY REPRESENTATIVE of the kinds of problems we're asked to deal with when our customers experience problems with their router bits. Tear-out, burning, excessive feed pressure, and "spontaneous edge fracture" (to coin a fine, technical-sounding term) are problems most of us have experienced at one time or another, and here at the store we've had plenty of opportunities to think about why these things occur and what might be done to minimize them.

Sometimes there really is a flaw in the offending router bit, but over the years it's been our experience that at least 80% or 90% of the time performance problems originate in the shop – and can easily be solved there as well. The above letter was a timely reminder that a few tips in this issue of *Wood News* might help you avoid the aggravation of working with cutting tools that don't cut right.

If router bits were hand tools we'd almost certainly handle them quite differently, but when it's the electric company that's doing most of the work, it's easy to forget what makes cutting tools cut. For me, it took a long time to begin looking at router bits as cutting tools fundamentally no different from my hand tools, requiring frequent inspection and routine maintenance. Once I made the connection, I was astonished at how much better my bits worked – and just a little embarrassed that it took so long to figure it out. When working with a hand plane or chisel, we take it for granted that we'll have to stop fairly often for a quick round of resharpening. Even though good-quality carbide can be expected to hold an edge easily twenty times longer than tool steel, it should be fairly clear that sharpening is going to have to be a regular business; if a good chisel might need sharpening twenty times during the course of a week's hard work, then a carbide-tipped router bit doing the same work will have to be sharpened at least once a week. I don't know about you, but that sure isn't the way I used to treat my router bits. Even on a hard, brittle wood like the sample that accompanied our correspondent's bit, tear-out can be greatly reduced with a *sharp* bit.

Sharpening router bits is surprisingly easy to do. You don't need a jig, precision measuring instruments or complex machinery. All you need are a couple of diamond paddles (or diamond needle files for the smallest router bits), a good light source and a comfortable place to sit. You're only going to work on the flat radial face of each flute, so there's no fancy fingerwork required. You don't want to work on the outside edge of the flute, of course, because that would alter its diameter or profile quite quickly. It's fairly important to sharpen uniformly so the bit will remain balanced and cut smoothly. Rather than working on one flute until it's sharp, and then doing lord knows what to the other flute, you can insure an even job simply by giving one flute four or five strokes, rotating the bit and giving the next flute the same number of strokes, then back to the first, and so on. Just lay the diamond paddle or needle file flat on the face of the flute, holding it lightly so you can feel it staying flat (or not), and have at it.

Figure 1. No surprise – tearout is at its worst where the bit has been damaged.

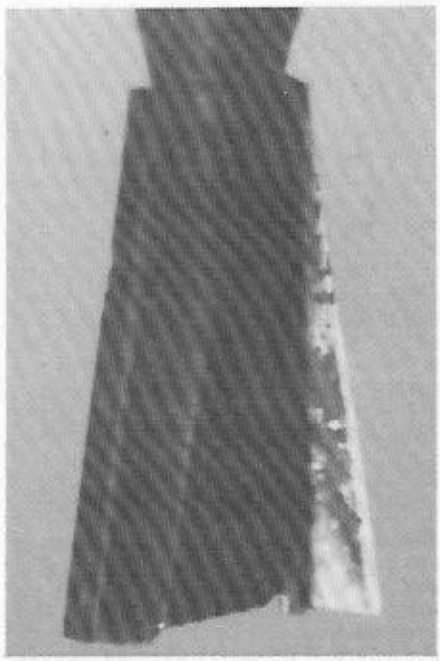


Figure 2. This bit is going to require some pretty serious grinding. It also suffers from heavy build-up on the edge and face of both flutes.

Your diamond abrasives can be used dry, but they'll resist clogging better and need cleaning less often if you keep them wet with water or light oil. I usually find myself holding the bit in one hand and the sharpener in the other, but if it feels better to you, try securing the bit in your router collet or drill chuck on your workbench.

Take a good close look at each flute as you work. What you're accomplishing will be unmistakably clear, and it will be obvious if you're doing the job the way you want to, or if you're putting more pressure in one place than another, or perhaps missing a spot entirely. By the way, don't be surprised to discover that the surface of the flute isn't flat as it comes from the factory. It might take some extra work the first time out to lap each flute entirely flat so you can get on with the business of creating a sharp edge. I suggest that you work with medium (400) or fine (600) grit diamond abrasives; if a bit needs more aggressive work than these grits can provide, it probably ought to be sent out for professional grinding. The damage to our problem dovetail bit, for example, is severe enough to require some pretty serious grinding, to the extent that it will be something less than a full 1/2" bottom diameter by the time it's usable again.

Zach Etheridge is Highland Hardware's Product Engineer.

How do you know when the bit is finally sharp? Just feel it and look at it. If under a strong light you see no bright spots along the edge, and if the edge feels good and sharp, then it is – you're done.

Regular cleaning is nearly as important as sharpening. Baked-on crud around a cutting edge interferes with chip clearance, reduces relief behind the cutting edge and increases frictional heating just as if the edge were dull. Plain old caustic oven cleaner (not the heat-activated kind; I use Easy-Off) does a fast, reliable and harmless job (harmless to the bit, that is – *you* be careful!) of dissolving the nastiest accumulations of resins and glaze. Remove ball bearing pilots before cleaning. Just brush or spray a liberal coating of cleaner all over the cutting edges, let stand ten or fifteen minutes, then scrub clean with a toothbrush or brass stove brush under a stream of warm water. Dry the bit thoroughly and go back to work. I should recommend against oiling router bits to prevent corrosion, since it's a friction fit that holds them in the router – just dry them well and you should have no problem with rust. If you're working in pine or other resinous woods, it might be necessary to clean your bits every day. It might take a while to get used to that idea, but the payoff will be pretty convincing. Dri-Cote, a spray-on lubricant available from Highland Hardware, does an effective job of slowing resin accumulation on bits and helping them run cooler, and it also works well to free up and maintain ball bearing pilots.

Next, and perhaps as important as any of the foregoing, is the simple matter of how you handle your cutting tools. When you've put several minutes into honing a plane iron to perfection, you naturally tend to handle it with considerable care. One slip while setting it into the plane, and you get to sharpen it all over again. Carbide too is very easily damaged when freshly sharpened; casual handling around wrenches or guide bushings can easily fracture a cutting edge before it ever makes a cut. It may be merely a coincidence, but the damage to both flutes of our problem dovetail bit falls *exactly* where the flutes would contact the wall of a 7/16" o.d. guide bushing (the size used with this bit in the Leigh jig) if the bit were raised a little too far while setting up for a cut.

Figure 3. The face of this flute isn't flat as it came from the factory; the highlights show where the diamond paddle has made contact during the first 15-20 strokes.

Extreme stress is also a potential source of carbide failure (not to mention shank failure), particularly in this age of monstrous routers so powerful that you don't even notice when you're loading a bit to death. Under load, 1/4" shanks can allow enough vibration to visibly affect the quality of cut, and if you could watch the bit through a super slow motion microscope you'd see it jerking around in the cut and slamming into the walls rather than slicing cleanly through a smooth arc. Dovetail bits are especially susceptible to overload, for two reasons: first, where the flutes are ground to their narrowest point the actual shank diameter may drop to as little as 3/16"; second, dovetail bits must usually run at full depth in one pass. Stress can be greatly reduced if a 1/4" straight bit is first used through several passes to clear as much waste as possible, leaving only the lower corners to be removed by the fully extended dovetail bit.

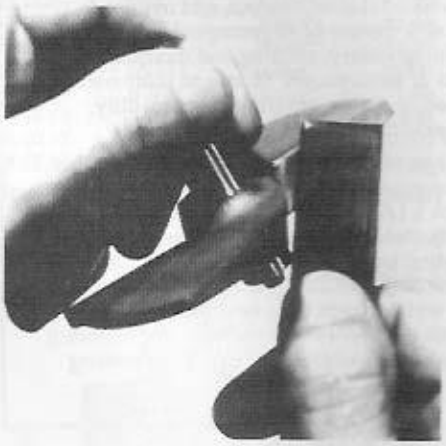


Figure 4. Sharpen only on the flat radial face of each flute, rotating the bit frequently to ensure uniform work.

The time you spend cleaning, sharpening and using your router bits gently almost surely costs less than replacing the bit when it dies before its time. And it's certainly worth a fair amount of work to avoid the nuisance of feeling a bit's gone defective on you, sending it back to point of purchase and waiting for a replacement. And if your work turns out a little better because your bits are always in like-new condition, call it a bonus – you'll have earned it.

§

Fine diamond paddles (catalog #02.53.01) are available from Highland Hardware for $4.95 each plus shipping. A set of 3 diamond paddles (catalog #02.53.04) which includes fine, medium and coarse, is available for $19.95 plus shipping.

A set of six fine diamond needle files (catalog #02.53.14), including round, square, triangular, half-round, flat and knife shapes is available from Highland Hardware for $29.95 plus shipping.

FREUD ROUTER TABLE

Until very recently, we didn't know of a single commercially available router table that we could have recommended to you as a reasonable investment. Now Freud has introduced a table which is not only a very functional addition to the shop, but an affordable one as well.

The Freud table's hardwood-trimmed, melamine coated work surface measures a generous 30-3/4" x 21". Its up-to-date design includes a 1/4" phenolic drop-in sub-base system for mounting your router efficiently – and giving you instant access to it in right-side-up position for changing bits and setting depth of cut. The fence is cleverly designed for easy positioning and positive lock-down without the use of slots which might weaken the tabletop. Freud includes a see-through free-form guard and a steel pivot pin for starting freehand work safely. Also included is a unique mitre-guide slot assembly, designed to be custom-fitted to any guide bar, again without cutting into the table surface. The router table's hardwood leg stand sets the top at a 36-3/4" working height, and is easily customized to suit the stature of any owner. Assembly of the leg stand, assisted by clear instructions in the owner's manual, is quick and easy; all necessary hardware is included. *Shipped UPS.*

10.20.01 Freud Router Table $169.95

(Add shipping charges listed on page 62)

ROUTER HANDBOOK
ROUTER JIGS AND TECHNIQUES

By Patrick Spielman. We heartily recommend these two books for anyone interested in getting maximum benefit from his router.

20.03.51 Router Handbook $10.95
20.03.84 Router Jigs & Techniques 14.95

ROUTERS

During the first part of the 1980s, there began what was to become a major evolutionary transformation of the traditional woodworking router. Motors were made more and more powerful, 1/2" collets began appearing on hand-held machines, new applications and new techniques proliferated, and plunge-router design began to gain popular acceptance. In the late 80s, new router models are being introduced by practically every manufacturer – and most of them are plunge routers.

Plunging capability is an outstandingly useful feature. It allows vertical entry into the work, as needed for surface forming, routing mortises, or cutting stopped grooves or edge treatments. It lets the user pre-set final and intermediate cutting depths with great precision, and then reach any setting almost instantly. And, perhaps almost accidentally, the plunge feature offers greatly increased safety in most hand-held operations. Once installed in the collet, most common bits will be withdrawn above the router base when the motor housing is fully raised, allowing the router to be set down securely on its base while waiting for the bits to stop rotating after a cut is completed.

Powerful new motors drawing from 12 to as much as 15 amps (all commonly described as 3 horsepower) have also had a profound effect on routing. Conventional bits, such as those for rounding over, grooving, rabbeting and so on, can be used almost effortlessly for full-depth one-pass cutting that is cleaner and smoother than ever; high power keeps the bit rotating at high rpm for reduced chatter, tearout, and overload burning. Dependable 1/2" collets on these big new motors have prompted a rush to large 1/2"-shank bits increasingly capable of performing joinery, shaping and moulding functions formerly reserved for stationary tools or hand planes. More and more owners do most of their work with their router mounted in a table, enjoying the versatility, precision, and greatly boosted productivity a good table system can provide.

Highland Hardware now carries heavy plunge routers from four different manufacturers. Each model has its own particular strong points, but all have several important features in common. Each comes equipped with a 1/2" collet, with provisions for handling other shank sizes. Each comes with an adjustable depth stop rod attached to the motor housing, and each has a three-stage rotating turret on the base which lets adjustable stop screws be selectively located under the stop rod. Each has parallel holes passing horizontally through the base casting, which accept twin steel rods used to mount edge-guide hardware – and which enable the user to construct a table-mounting system unmatched for ease and efficiency of use. *We provide the plans for this mounting system with each plunge router we sell.*

RYOBI RE-600 ELECTRONIC
VARIABLE SPEED PLUNGE ROUTER

This new entry from Ryobi is causing quite a stir out there in routerland. Somehow Ryobi has managed to create a big, powerful, soft-start variable-speed machine, load it with features, specs, and accessories, and bring it to market for an astonishingly low price. The RE-600 is very nearly the ideal router for table-mounted use. Of all the routers we sell, this is the only one that comes factory equipped for easy and positive under-table depth of cut adjustment, for accepting bits up to 3-3/8" diameter without special add-on sub-bases, and for operating at low rpm with enough power for any kind of cutting in any kind of material you might have in mind.

The RE-600 is powered by a 15 amp motor which operates at any speed from 10,000 to 22,000 rpm. It is equipped with large, stout handles which offer solid control for hand-held use; toggle switch and plunge lock lever are reached on the right side without releasing the handle. Max plunge depth is 2-3/8". A large height adjustment knob can be used for micro-adjusting depth of cut, and it works exceptionally well for effortless depth setting with the router mounted in a table. The base is round, 6-5/8" in diameter, with a 3-1/2" opening in the sub-base. A chip deflector shield can be placed at front or rear as needed for operator safety.

Standard equipment includes a 3-piece guide set with micro-adjustable holder, straight fence and roller guide. Also included are 1/4" and 3/8" adapter sleeves for use in the standard 1/2" collet. Optional guide bushing adapter allows use of Black & Decker guide bushings *(available on next page).*

The RE-600 weighs 14 lbs.

A	RE600	Ryobi Var. Spd. Plunge Router	229.00
	6072503	Guide Bushing Adapter for Black & Decker Bushings	9.00

New Design for 1990

ELU 3338
ELECTRONIC
VARIABLE-SPEED PLUNGE ROUTER

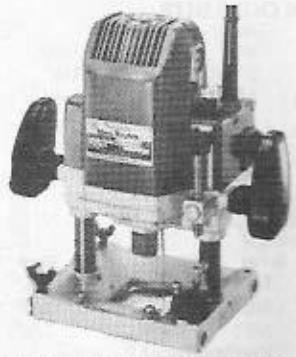
Elu has just issued a new edition of its renowned variable-speed plunge router, featuring five changes to the original design which will make the 3338 easier to use and more productive than ever. Unchanged is Elu's unique and superbly precise depth setting system, incorporating a graduated rack-and-pinion plunge stop rod with a magnified adjustable cursor (with parallax eliminator, no less). Likewise untouched is the 8000-20,000 RPM electronic constant-torque variable speed control, a wonderfully useful feature for all manner of routing situations: running really big bits; routing Corian and other synthetics; following intricate patterns or using complex templates – all these operations are safer, smoother and more efficient when you can run the router at appropriate cuts-per-inch and feed rates.

New for 1990 are larger, upright handles that fill the hand for a comfortable and secure grip. The plunge lock lever has been freed (originally this lever was self-locking) and it is now the user's choice to have the router locked or unlocked on its posts. (Unfortunately, the new locking lever cannot be retro-fitted onto older models of the 3338.) Also incorporated into the new motor housing is an internal spindle lock for secure one-wrench bit installation. On the plunge return limit post at the left front of the machine, the double nuts used to limit the router's upward travel have been replaced with a snazzy little nut with built-in quick release. Finally, the 3338's thin phenolic sub-base is now attached with screws rather than being cemented onto the base casting.

The Elu 3338 operates at any speed from 8000 to 20,000 rpm, drawing from 12 to 10 amps depending on the speed selected. It offers a maximum of 2-5/8" of plunge travel, with precision-machined bronze bushings moving smoothly on polished, case-hardened steel posts. The 1/2" collet supplied with the machine has an unusually long 1" grip length for holding any bit shank securely, and the spindle is bored 2-1/4" deep to accept even the longest shanks. 1/4" and 3/8" replacement collets are available as options, as is a fine height adjuster required for table-mounted operation. A straight edge guide system, now including a micro-adjust feature as standard equipment, is provided with the router. The 3338 has a modified circular base 6-5/8" in diameter with the front edge chopped off straight 2-1/4" from center. A bushing adapter is is provided to enable use of any standard Black & Decker guide bushings. Net weight is 12-1/4 lbs.

See accessories at right on next page.

B	3338	ELU Var. Speed Plunge Router	299.00



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MAKITA 3612 PLUNGE ROUTERS

The 3612 routers are among the most durable, most versatile, and most powerful routers ever made. Their great success has inspired users and manufacturers alike; many of the features that are now standard on every plunge router first appeared on Makita machines a decade ago. Even in the face of good, innovative competition, the Makita 3612 routers remain a sound and secure choice for any woodworker who demands precision, power, and an unbeatable track record from his or her tools. Having sold thousands of Makita plunge routers during the past ten years, we're happy to report that these are among the most reliable power tools you can buy.

There are two models in the 3612 series: our old favorite 3612B with its rectangular base, and the 3612BR which is the round-base edition of the same machine. Other than for base configuration, the two models are identical in powerplant and fittings. The rectangular base measures 6-5/8" by 5-1/2", while the round base is 6-1/4" in diameter; this gives the rectangular base about 13% more surface area than the round base and makes it a bit easier to control during hand-held routing. In fact, the 3612B has a larger footprint (36.44 sq. in.) than any other router we carry, giving it unexcelled stability in edge-forming work and unequaled ease of use in joinery and surface-forming jigs.

The 3612 routers offer 2-1/2" of plunge depth with a micro-adjustable stop rod. The rod is threaded through a spring-loaded half-nut; press the release button to instantly move the stop rod close to the desired setting, then rotate it up or down to precisely set final depth of cut. The micro-adjust system doesn't interfere with the motor's upward travel, so bits can still be retracted after depth of cut is set.

Specifications common to both models are: universal 14-amp, 23,000 rpm motor rated for commercial use; externally accessible brushes; 1/2" collet with 1/4" adapter sleeve included; internal spindle lock for one-wrench bit change; chip deflector shield on base; right-hand toggle switch and plunge lock lever. Weight is approximately 13 lbs.

C	10.10.09	3612B (Rectangular-Base)	225.00
	10.10.10	3612BR (Round-Base)	225.00
	10.10.55	Guideset for 3612B & BR	48.95

ACCESSORIES FOR ELU 3338 ROUTER

C40902	1/4" Collet	29.95
C40904	3/8" Collet	29.95
C40966	Fine Height Adjuster	9.95

Black & Decker (ELU) Guide Bushings

C62943	5/16" o.d.	6.95
C62944	3/8" o.d.	6.95
C62945	7/16" o.d.	6.95
C62947	39/64" o.d. *(approx. 5/8" o.d.)*	6.95
C62942	Template Guide Nut *(reqd. for guide bushings above)*	2.95

GUIDE SYSTEM FOR 3612B & BR

This 3-piece set consists of a guide holder, a straight guide, and a roller guide for following contoured edges. A notched flange in each guide fits over an indentation in the guide holder's adjust screw, allowing positive micro-adjustment of the guide after the holder has been locked down within 1/2" or so of the desired position. Bits can be positioned up to 6" from the edge of a workpiece or template.

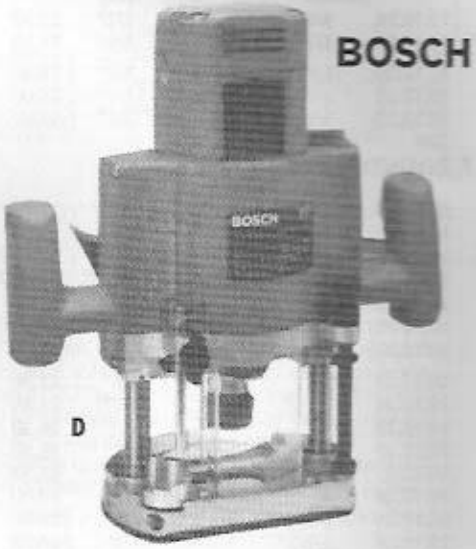
10.10.55	Guideset for 3612B & BR	48.95
10.10.02	Guide Holder only	29.95
10.10.03	Straight Guide only	12.80
10.10.04	Roller Guide only	9.30

MAKITA ROUTER GUIDE BUSHINGS

Makita guide bushings screw directly to the router. The Makita guide bushing adapter allows use of 2-piece guide bushings from Black & Decker or Porter Cable.

Guide Bushings for Makita 3612B, 3612BR and 3620 Routers

	Outside Diameter	*Bushing Height*	
10.10.32	3/8"	29/64"	18.00
10.10.56	7/16"	33/64"	22.00
10.10.57	1/2"	33/64"	22.00
10.10.58	5/8"	33/64"	11.00
10.10.34	25/32"	33/64"	18.00
10.10.35	1-1/16"	33/64"	9.00
10.10.36	1-9/64"	19/64"	18.00
10.10.37	1-3/16"	33/64"	13.50
10.10.38	1-37/64"	29/64"	10.00
10.10.44	Guide Bushing Adapter		16.00



D

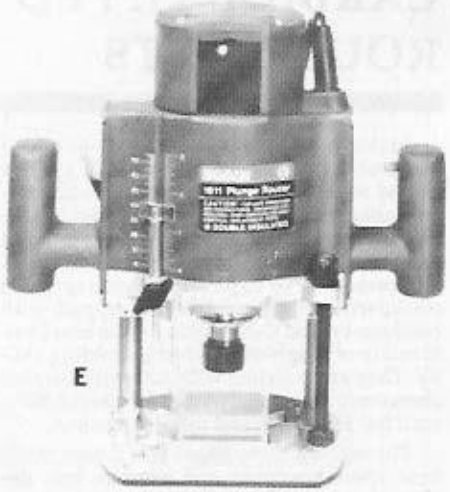
D NEW BOSCH 1611EVS ELECTRONIC VARIABLE-SPEED PLUNGE ROUTERS

With this new edition of their heavy-duty plunge router, Bosch has gone all out to produce the most powerful and most usable routers on the market. While leaving unchanged most of the features of the already familiar Model 1611 plunge router (see description above right), Bosch has added a variable speed control which incorporates both soft start and constant torque power supply. If you've used the 1611-220, the soft-start feature will be the first thing you notice about the 1611EVS; the dramatic start-up kick furnished by 220 volts has been completely tamed, and you can now fire up even big panel-raising bits with impunity. Variable speed (12,000 to 18,000 rpm on either 110-volt or 220-volt models) will furthermore let you run those big bits without fear of tearing the roof off, while the constant-torque circuitry insures that all of the router's power is available at any speed under any load.

The only visible design changes on the 1611EVS are the pumped-up motor housing on the 220v model and a new depth-stop turret. The latter is a clever innovation featuring a stair-step rim that does away with the traditional 3 adjustable screws in favor of a simpler multiple-choice design.

With the addition of variable speed capability, the Bosch 1611EVS combines enormous power with all the control you need for using any bits in hand-held or table-mounted modes. The 110-volt model, drawing 14 amps, is a fine all-around performer. The 220-volt machine (7 amps) is designed to met the most demanding requirements in any shop where production is the first order of business. See page 31 for guide bushings.

	1611E-1	Bosch 110v EVS Router	299.95
	1611E-2	Bosch 220v EVS Router	319.95



E

BOSCH 1611 220-VOLT PLUNGE ROUTER

This is without a doubt the most powerful router we've ever used. It's a big, beefy machine with oversize handles for good control, 3" of total plunge travel, and a 7 amp, 220-volt, 22,000 rpm motor that runs even the biggest bits without blinking. If you need a machine for heavy production routing, this is the one to look at.

The 1611 has a self-locking plunge lock lever, a plunge stop rod with built-in cursor, an external spindle lock, and a lockable trigger switch in the right handle. A 1/2" collet is standard; 1/4" and 3/8" replacements are available. The spindle is bored 2-1/2" deep to accept even the longest shanks without difficulty. The collet can actually be plunged as much as 3/8" below the base, so when the router is mounted under a table it can compensate for what would otherwise be lost depth of cut. Optional edge guide includes steel rods for up to 10-1/2" reach, with adjustable-face straight fence. The 1611 has a modified round base 6-3/4" in diameter, chopped straight along the front edge 2-1/4" from center. A bushing adapter is included which allows use of guide bushings for the Bosch 1604 router (see page 59). Net wt. of the 1611 is 12-1/2 lbs.

E	1611-220	Bosch 220V Plunge Router	269.95
	82993	Edge Guide for 1611	23.50
	499503	1/4" Collet for 1611	12.50
	499502	3/8" Collet for 1611	12.00

CARBIDE TIPPED ROUTER BITS

In this, our largest selection yet, we offer a comprehensive line of high-quality carbide tipped router bits for professional and amateur alike. These are not the cheapest bits on the market; instead they are among the best available, offered at very competitive prices and backed up by experienced and reputable manufacturers. These bits are tipped with machine-brazed C-2 carbide for the best combination of toughness and edge-holding ability. They are polished with 400-grit diamond abrasive to a very sharp edge for clean cutting with fast feed rates and minimal tearout.

Throughout these pages you'll note many new, special-purpose and oversize bits, designed primarily for use with the new generation of heavy 1/2"-collet routers now dominating a large share of the market. We're not forgetting about those of you with 1/4" collets, however, and you'll see several excellent new bits now available with 1/4" shanks. For the first time ever we have 1/4"-shank bits for rail & stile cutting, and likewise a panel-raising bit with 1/4" shank (for use with table-mounted router). Our new full bead and flute cutting bits are also available with 1/4" shanks.

Whenever possible, we offer both 1/4" and 1/2" shanks, usually at very little difference in price. If you own a large router, the larger shank size will give you greatly increased stability and safety in use; a 1/2" shank is about four times stronger than a 1/4" shank. Many of the largest bits we sell are intended for use in table-mounted routers, where the fence and other safety & control devices help minimize the risk in running huge cutters.

Router bits can easily represent a greater investment than you have in your router. We're persuaded that it makes sense to invest in bits you can rely on for precision and durability, and we offer these high-quality bits with confidence that they will meet your most exacting standards.

Throughout these listings, "Carbide Height" is a vertical measurement regardless of edge profile.

A STRAIGHT BITS

	Cutter Diameter	Carbide Height	Shank Diameter	
10.14.01	1/16"	1/4"	1/4"	12.90
10.14.02	1/8"	1/4"	1/4"	9.90
10.14.03	3/16"	7/16"	1/4"	9.90
10.14.04	1/4"	1"	1/4"	9.90
10.14.05	5/16"	1"	1/4"	10.80
10.14.06	3/8"	1"	1/4"	10.80
10.14.07	7/16"	1"	1/4"	11.90
10.14.08	1/2"	1"	1/4"	11.90
10.14.09	5/8"	3/4"	1/4"	11.90
10.14.10	3/4"	3/4"	1/4"	13.30
10.12.65	1/4"	3/4"	1/2"	11.40
10.12.66	5/16"	1"	1/2"	11.40
10.12.01	3/8"	1"	1/2"	11.40
10.12.02	7/16"	1-1/4"	1/2"	11.90
10.12.03	1/2"	1-1/4"	1/2"	11.90
10.12.04	1/2"	2"	1/2"	15.90
10.12.05	5/8"	1-1/4"	1/2"	13.80
10.12.06	11/16"	1-1/4"	1/2"	15.30
10.12.07	3/4"	1-1/4"	1/2"	14.90
10.12.08	7/8"	1-1/4"	1/2"	17.70
10.12.09	1"	1-1/4"	1/2"	18.90
10.12.10	1-1/2"	1-1/4"	1/2"	28.90
10.12.11	1-3/4"	1-1/4"	1/2"	42.90

B V GROOVE BITS - 90° Angle

	Diameter	Carbide Height	Shank	
10.14.11	1/4"	3/8"	1/4"	10.50
10.14.12	1/2"	1/2"	1/4"	23.30
10.12.12	5/8"	1/2"	1/2"	29.80
10.12.13	3/4"	5/8"	1/2"	35.90

C ROUND NOSE BITS

	Radius	Carbide Height	Shank	
10.14.13	1/16"	1/4"	1/4"	16.80
10.14.14	1/8"	1/4"	1/4"	17.60
10.14.15	3/16"	1/4"	1/4"	19.90
10.14.16	1/4"	5/16"	1/4"	19.90
10.14.17	5/16"	3/8"	1/4"	20.50
10.14.18	3/8"	1/2"	1/4"	20.90
10.14.19	1/2"	5/8"	1/4"	33.90
10.12.14	1/4"	1-1/4"	1/2"	26.90
10.12.15	3/8"	1-1/4"	1/2"	32.90
10.12.16	1/2"	1-1/4"	1/2"	44.90
10.12.17	5/8"	3/4"	1/2"	49.90

D COVE BITS

	Radius	Carbide Height	Shank	
10.14.20	3/16"	9/16"	1/4"	24.90
10.14.21	1/4"	9/16"	1/4"	24.90
10.14.22	3/8"	9/16"	1/4"	23.50
10.14.23	1/2"	3/4"	1/4"	28.50
10.12.18	3/8"	9/16"	1/2"	26.80
10.12.19	1/2"	3/4"	1/2"	29.80
10.14.84	Replacement Bearing			3.80

E DOVETAIL BITS

	Bottom Diameter	Angle	Carbide Height	Shank	
10.14.24	3/8"	9°	3/8"	1/4"	13.90
10.14.25	1/2"	14°	1/2"	1/4"	14.50
10.12.20	3/8"	9°	3/8"	1/2"	14.90
10.12.21	1/2"	14°	1/2"	1/2"	15.90
10.12.22	3/4"	14°	13/16"	1/2"	49.50

F ROUNDING OVER BITS

	Radius	Carbide Height	Shank	
10.14.26	1/16"	1/2"	1/4"	23.70
10.14.27	1/8"	1/2"	1/4"	21.90
10.14.28	3/16"	1/2"	1/4"	21.90
10.14.29	1/4"	1/2"	1/4"	21.90
10.14.30	5/16"	1/2"	1/4"	23.70
10.14.31	3/8"	5/8"	1/4"	23.70
10.14.32	1/2"	3/4"	1/4"	26.50
10.12.23	1/4"	1/2"	1/2"	22.50
10.12.24	5/16"	1/2"	1/2"	24.50
10.12.25	3/8"	5/8"	1/2"	24.50
10.12.26	1/2"	3/4"	1/2"	28.50
10.12.27	3/4"	1"	1/2"	42.50
10.12.28	1"	1-1/4"	1/2"	90.00
10.12.29	1-1/4"	1-1/2"	1/2"	120.00
10.12.30	1-1/2"	1-7/8"	1/2"	128.00
10.14.86	Replacement Bearing			3.80

G POINT CUTTING ROUND OVER BITS

	Radius	Point Width	Shank	
10.14.33	1/8"	1/8"	1/4"	17.60
10.12.31	1/4"	1/4"	1/2"	36.50

H FRENCH PROVINCIAL CLASSIC BITS

	Cutting Width	Carbide Height	Shank	
10.14.34	9/16"	5/8"	1/4"	54.95
10.12.32	9/16"	5/8"	1/2"	54.95

I OGEE BITS

	Cutting Width	Carbide Height	Shank	
10.14.35	5/16"	1/2"	1/4"	36.90
10.14.36	7/16"	11/16"	1/4"	39.90
10.12.33	5/16"	1/2"	1/2"	36.90
10.12.34	7/16"	11/16"	1/2"	39.90
10.14.86	Replacement Bearing			3.80

J ROMAN OGEE BITS

	Cutting Width	Carbide Height	Shank	
10.14.37	5/16"	5/8"	1/4"	29.90
10.14.38	1/2"	7/8"	1/4"	30.90
10.12.35	5/16"	5/8"	1/2"	29.90
10.12.36	1/2"	7/8"	1/2"	30.90
10.14.84	Replacement Bearing			3.80

K RABBETTING BITS

	Width of Rabbet	Diameter	Carbide Height	Shank	
10.14.39	1/4"	1"	9/16"	1/4"	26.50
10.14.40	3/8"	1-1/4"	1/2"	1/4"	22.60
10.12.37	3/8"	1-1/4"	1/2"	1/2"	22.60
10.14.86	Replacement Bearing				3.80

L MORTISING BITS

	Diameter	Overall Length	Shank	
10.14.41	1/2"	1-3/4"	1/4"	10.80
10.14.42	5/8"	1-3/4"	1/4"	12.30
10.14.43	3/4"	2"	1/4"	13.80
10.12.38	1-1/4"	2-1/8"	1/2"	19.90

M FLUSH TRIM BITS

	Diameter	Carbide Height	Shank Diameter	
10.14.44	1/2"	1"	1/4"	12.50
10.12.39	1/2"	1"	1/2"	14.50
10.14.86	Replacement Bearing			3.80

N BEVEL TRIM BITS

	Angle	Carbide Height	Shank Diameter	
10.14.45	7°	1/4"	1/4"	19.90
10.14.46	15°	1/4"	1/4"	14.20
10.12.40	15°	1/4"	1/2"	19.90

TWO-WING SLOT CUTTERS

	Thickness	Slot Depth	
10.14.47	1/16"	1/2"	10.90
10.14.48	1/8"	1/2"	10.90
10.14.49	5/32"	1/2"	10.90
O 10.14.50	1/4"	1/2"	10.90
P 10.14.51	1/4" Arbor & Bearing		5.90
10.12.41	1/2" Arbor & Bearing		5.90
10.14.88	Replacement Bearing		3.80

Q CHAMFER BITS - 45° ANGLE

	Carbide Height	Shank Diameter	
10.14.52	1/2"	1/4"	22.50
10.12.42	1/2"	1/2"	23.50
10.14.84	Replacement Bearing		3.80
10.14.53	11/16"	1/4"	31.90
10.12.43	11/16"	1/2"	31.90
10.14.86	Replacement Bearing		3.80

R BEADING BITS

	Radius	Carbide Height	Shank	
10.14.54	1/16"	1/2"	1/4"	23.70
10.14.55	1/8"	1/2"	1/4"	21.80
10.14.56	3/16"	1/2"	1/4"	21.80
10.14.57	1/4"	1/2"	1/4"	21.80
10.14.58	5/16"	1/2"	1/4"	23.70
10.14.59	3/8"	5/8"	1/4"	23.70
10.12.44	1/4"	1/2"	1/2"	22.50
10.12.45	3/8"	5/8"	1/2"	24.60
10.12.46	1/2"	3/4"	1/2"	28.50
10.14.82	Replacement Bearing			3.80

S LOCK MITER BIT

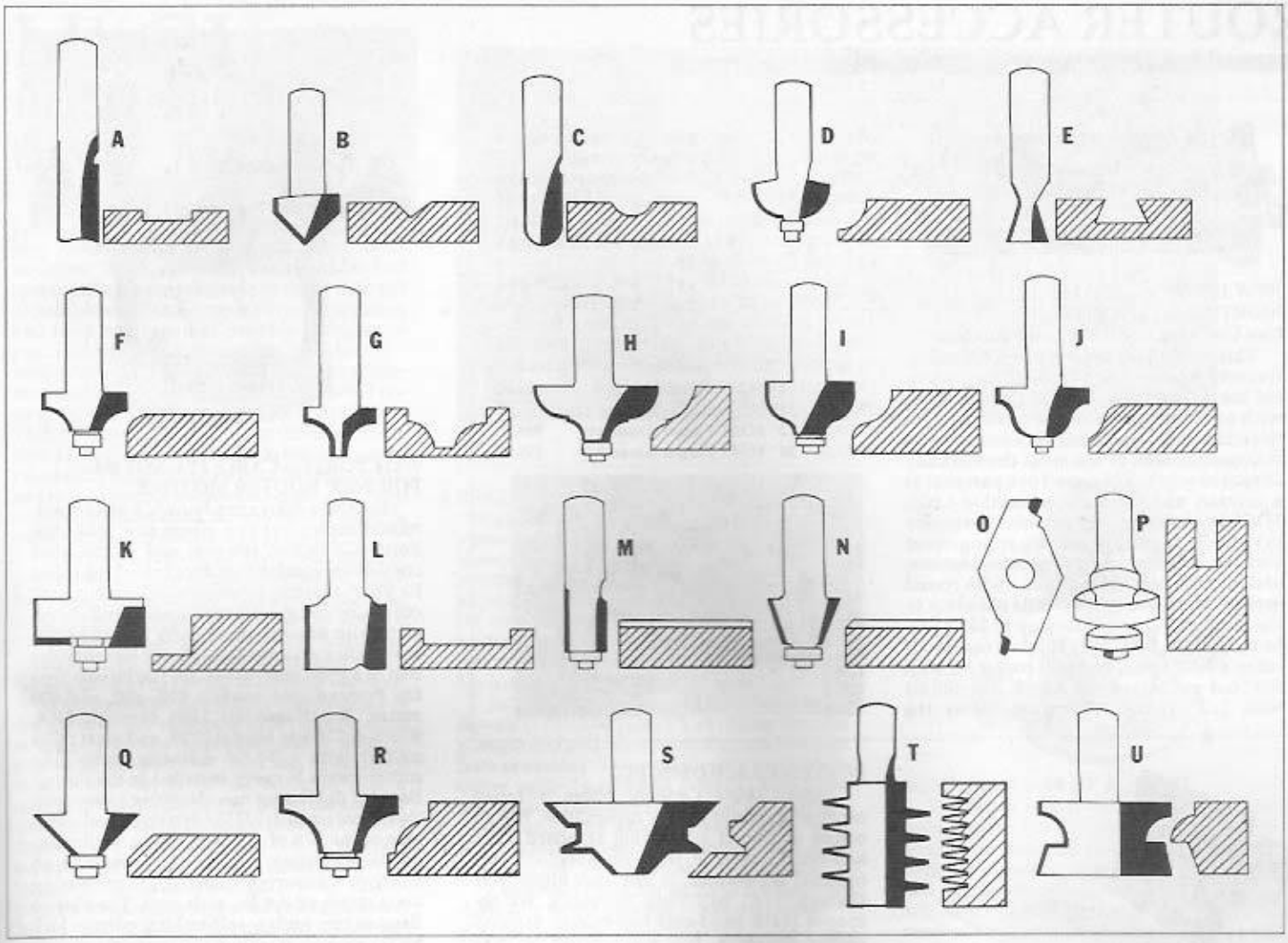
	Diameter	Stock Thickness	Shank	
10.12.47	2-3/4"	1/2" to 1-1/8"	1/2"	99.95

T FINGER JOINT BIT

	Diameter	Carbide Height	Overall Length	Shank	
10.12.50	1-3/8"	1-9/16"	3-1/16"	1/2"	96.90

U CABINET DOOR LIP BIT

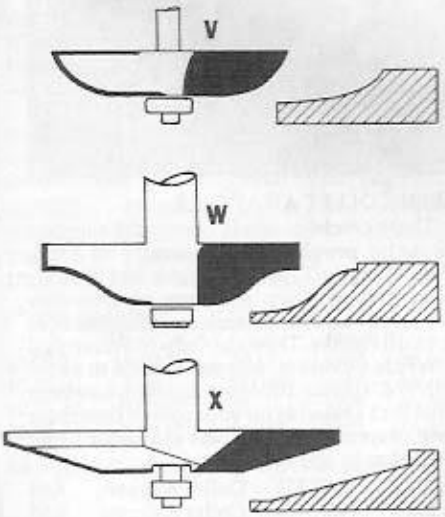
	Diameter	Stock Thickness	Shank	
10.12.49	2"	1/2" to 1-1/4"	1/2"	59.95



RAISED PANEL ROUTER BITS

	Diameter	Cutting Width	Carbide Height	Shank
Cove	2"	3/4"	3/8"	1/4"
Cove	2-1/2"	1"	5/8"	1/2"
Ogee Fillet	2-5/8"	1-1/16"	11/16"	1/2"
Provincial	3-3/8"	1-7/16"	1/2"	1/2"

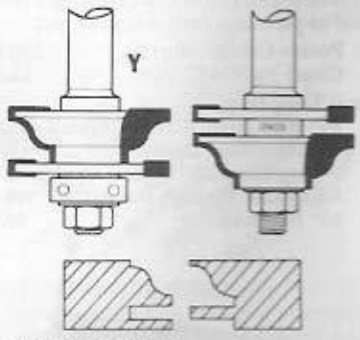
V	10.14.67	Cove Raised Panel, 1/4" shank	64.95
	10.12.68	Cove Raised Panel, 1/2" shank	74.95
W	10.12.51	Ogee Fillet Raised Panel	79.50
X	10.12.52	Provincial Raised Panel	99.95



6-PIECE 1/2" SHANK CARBIDE ROUTER BIT SET

This assortment (not pictured) of six popular, premium-quality bits was selected to meet the needs of someone who has recently purchased a large plunge router or other router with 1/2" collet capacity. It includes 3/8" and 1/2" straight bits, 3/8" radius round-over bit, 1-1/4" diameter rabbbeting bit, 5/32" radius Roman ogee bit, and 1/2" dia. flush trim bit. Sold individually, the bits would cost $114.80.

10.12.97 **6-Pc. Set of 1/2"-shank Bits** 99.95



Y RAIL AND STILE BIT

This remarkable carbide bit reconfigures to cut both a rail and matching stile in 3/4" to 7/8" thick stock. 1-3/4" diameter. 3/8" cutting width. 1/2" shank.

10.12.53	Rail and Stile Bit	85.50
10.14.88	Replacement Bearing	3.80

Z OVERHEAD-PILOT FLUSH TRIM BITS

Like conventional flush trimmers, these overhead bits are ideal for final template-guided shaping of roughed-out stock, pattern duplication, edge truing, and so on. In many situations, however, the bearing on the bottom of the conventional bit gets in the way, and that's where these overhead-pilot bits really shine. Note that the maximum depth of cut will be considerably greater than the bits' cutting length, for as soon as part of the workpiece has been trimmed the template can be removed and the work itself used as a guide.

The 1/2" and 3/4" bits have 1/4" shanks for use in any router. The 1" bit has a 3/8" shank. Please note that the maximum cutting depth listed below may vary slightly depending on the design of your router.

Overhead-Pilot Flush Trim Bits

	Diameter	Carbide Height	Maximum Depth	
10.14.61	1/2"	1"	1-1/4"	24.95
10.14.62	3/4"	1"	1-1/2"	27.95
10.14.63	1"	1"	2"	34.95

ROUTER ACCESSORIES

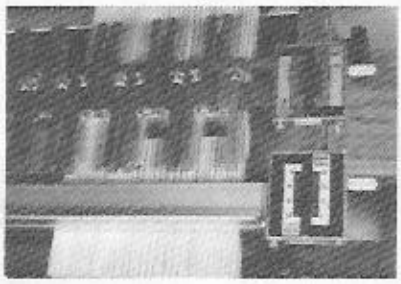
NEW LEIGH MULTIPLE MORTISE & TENON JIG
(For Use with any 1/2" Plunge Router)

This new jig from the makers of the immensely popular Leigh Dovetail Jig lets you cut one of the most challenging joints there is with ease and precison. The multiple mortise and tenon is traditionally considered the strongest as well as the most dramatically attractive way to join a shelf or a partition to a carcase; and the fully adjustable Leigh MMT jig enables you to cut this classic joint in virtually any size or spacing arrangement you like. You can cut flush or raised tenons, and through or blind mortises – with round corners or square (with a little chiseling in the mortises) – in any stock up to 24" wide, from 5/16" to 1-1/2" thick. Joints can be cut using a 1/2" spiral end mill router bit with 5/8" o.d. guide bushing. A 1/2" end mill bit with 1/2" shank is provided with the MMT-500-24" jig; bushings are available from us to fit most plunge routers.

The 24" MMT jig can be converted into a dovetail jig with the purchase of Leigh's 24" dovetail finger assembly; bit and bushing requirements are as described for the Leigh Dovetail Jig on page 59.

For owners of 12" or 24" Leigh D1258 and D1258R dovetails jigs, the adjustable finger assembly from the MMT jig may be purchased separately in either length, and will fit your jig with no modification required.

10.53.21	Leigh MMT-500-24" Jig	429.00
10.53.22	24" Dovetail Finger Assembly	189.00
10.53.23	12" MMT Finger Assembly	225.00
10.53.24	24" MMT Finger Assembly	250.00



PHENOLIC RESIN BOARD AND CLEAR LEXAN® FOR ROUTER TABLES AND ACCESSORIES

These two materials are both terrifically useful for construction of router mounting devices, jigs, templates and accessories. (A number of uses are detailed in Pat Spielman's superb book, *Router Jigs & Techniques*.)

Phenolic resin board is an ideal material for oversize sub-bases for drop-in table mounting systems. It is very durable, nearly friction-free, and extremely stiff to resist sagging when supporting even the heaviest routers. It can be cut, drilled, and sanded with ease, no special tooling required. The phenolic board we sell is nominally 9" x 12" x 1/4" thick; actual dimensions may vary slightly, so don't start building until you have it in hand.

Clear Lexan® is just about perfect for a myriad of special-purpose see-through sub-bases, templates, jigs and what have you. It is virtually indestructible, but is easily worked with standard woodworking machines and hand tools. When it gets too scratched for easy viewing, it can be buffed back to clarity with our Green Rouge polishing compound (see page 52) and a soft buffing wheel on your grinder or drill. We stock 1/4" clear Lexan in 12" x 12" sheets.

10.20.05	1/4" Phenolic Resin Board	10.95
10.20.06	1/4" Lexan Sheet	12.95
02.64.32	Green Rouge	16.95
20.03.84	Router Jigs & Techniques	14.95

PORTER-CABLE OMNIJIG

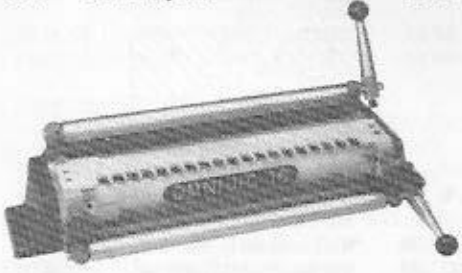
Porter-Cable's Omnijig offers a broad range of different joinery capabilities. The jig comes equipped for cutting standard 1/2" half-blind dovetails, flush or rabbeted; with optional accessories, it can also guide you through 1/4" half-blind dovetails, widely spaced (as if hand-cut) half-blinds, tapered sliding dovetails, box joints (flush or rabbeted), and variably spaced 1/2" or 3/4" through dovetails.

The Omnijig is best known for its extremely heavy construction and ease of use. Its 5/8" thick cast aluminum base and 1/4" thick precision-milled aluminum templates are designed for the rigors of commercial joinery; its cam-action clamping bars are solid steel. Maximum stock width is 16". Maximum stock thickness is 1". Unit weighs 55 lbs. Comes with 1/2" half-blind template, 1/2" dovetail bit & a 5/8" o.d. Porter-Cable guide bushing. An instructional video showing set-up, alignment and use of the Omni Jig is now available to purchase for a nominal cost.

5116	Porter-Cable Omni Jig	299.95
5999	Omni Jig VHS Video	12.95

Optional Templates

5118-9	1/2" Half-Blind "Hand" Dovetail	66.95
5120	1/4" Half-Blind Dovetail	59.95
5121	Sliding Dovetail	43.50
5122	Adjustable Through Dovetail	109.50
5123	1/2" Box-Joint	59.95



NEW PORTER-CABLE PLUNGE BASE FOR 3-1/2" ROUTER MOTORS

For those who already own a good fixed-mount router, here's a clever new idea from Porter-Cable that lets you add all the great convenience and versatility of plunging action to your routing repertoire. Mortising, cut-outs, stopped grooves and dados, and almost all of your normal router work as well will be easy, quick and precise – for far less than the cost of a good plunge router. The Plunge Base fits **Porter-Cable models 100, 350, and 600 series; Bosch models 1601 through 1606, Black & Decker Model 2720,** and most other routers with a 3-1/2" diameter motor. The router motor is easily installed in the Plunge Base by tightening one clamping screw; you then have up to 2-1/2" of vertical travel available at the flip of a locking lever, with a six-position rotating depth stop turret and an effective measuring stop rod for pre-setting your depth of cut for each pass. The Plunge Base comes with a self-locking plunge lock lever, bronze bushings for smooth plunge travel, and a 5-3/4" diameter sub-base which will accommodate Porter-Cable and Black & Decker guide bushing assemblies. The Plunge Base weighs 5 lbs.

Options available for the unit include a clear sub-base with 2-1/2" hole, and a straight edge guide with twin steel mounting rods.

6931	Router Plunge Base	89.95
P42188	Clear Sub-Base	10.50
P42160	Straight Edge Guide	17.50

FIBER COLLET ADAPTERS

These precision-made fiber collet adapters solve the problem of dangerous bit creep when using 1/2" or 3/8" shank bits in 1/2"-collet routers. They are more compressible than steel, and offer a much more reliable hold on small shanks. They also help to absorb and eliminate vibration, a problem hard to avoid with 1/4" shanks. If a down-sized replacement collet isn't available for your router, then these fiber adapters are your best choice for using small shanks securely.

10.20.07	1/4" Fiber Collet Adapter	8.95
10.20.08	3/8" Fiber Collet Adapter	8.95

LEIGH ROUTER DOVETAIL JIGS

During the past few years Leigh dovetail jigs have revolutionized the business of cutting dovetails with a router. Leigh (pronounced "lee") jigs offer variable size and spacing of both pins and tails in either through or half-blind joints. Set-up is surprisingly easy, and once set these jigs provide a degree of precision that has to be seen to be believed – with a little practice & a few minutes' calibration, you can routinely produce joints that are so good you might as well call them perfect. Though Leigh jigs are not inexpensive tools, they are certainly more affordable than many other other dovetailing devices on the market, and they represent a sound investment for any shop where dovetails are commonly used in one-of-a-kind or production pieces.

The Leigh models will allow production of custom through or half-blind joints in stock from 1/4" to 1-1/4" thick (tail piece must be rabbeted to 1" max. thickness for through dovetails). There are two sizes available: Model D1258-12 with a 12" maximum width capacity, & Model D1258-24 with 24" capacity.

In through-dovetail mode, the D1258s are designed to cut dovetails at 8° (about a 1:7 pitch), providing a sleek, custom look which is especially attractive in thick stock, where a more conventional 14° bit tends to give a rather clunky-looking joint. Note that another advantage of this slim angle is extraordinary depth of cut, allowing router-fast production in stock far thicker than ordinary bits can handle. 8° dovetail bits from 3/8" to 13/16" maximum diameter are available and listed below. 3/8" and 1/2" dovetail bits are paired with 5/16" straight bits and used with a 7/16" o.d. guide bushing in your router. The 11/16" dovetail bit is paired with a 1/2" straight bit; the 13/16" dovetail with a 7/16" straight. All run with a 5/8" bushing.

In half-blind mode, both halves of the joint are cut with the same dovetail bit (much like the operation of conventional half-blind jigs); thus any bit angle will be usable (7,8,9,14,15 or any other degrees). This is a distinct advantage when you're working in thin stock, where operation will be just a bit simpler if you choose a 14° bit.

Both models come provided with a 1/2", 8° dovetail bit and a 5/16" straight bit (both carbide). Additional sizes of 8° carbide dovetail bits are listed below. Bushings for Makita and Bosch routers are listed on pages 55 and 59.

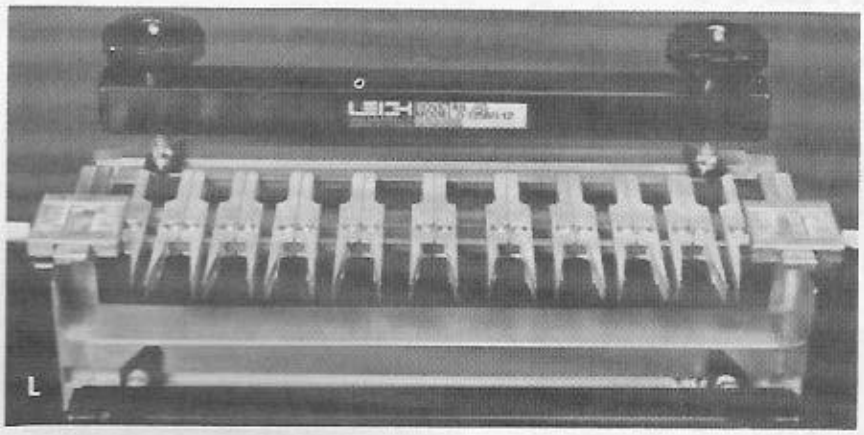
A new 45-minute instructional video can be purchased to supplement the excellent new owner's manual. You may also rent the video (as described for the Robland video, page 35).

L	10.53.03	D1258-12 Leigh Jig	299.95
	10.53.04	D1258-24 Leigh Jig	349.95
	10.53.15	Instructional Video	29.95
	10.53.16	New Owner's Manual	9.95

8° Dovetail Bits

	Diameter	*Max. Depth*	*Shank*	
10.53.11	3/8"	7/16"	1/4"	29.50
10.53.12	1/2"	13/16"	1/4"	29.50
10.53.13	11/16"	1"	1/2"	39.50
10.53.14	13/16"	1-1/4"	1/2"	49.50

See page 56-57 for straight bits and other dovetail bits.



I BEALL WOOD THREADING KITS

Wood threads can be produced on dowels on a production basis with a router using the Beall wood threading kit. Any router attaches to the housing, and as a dowel is fed through the appropriate sized insert, a HSS 60° spiral veiner bit cuts perfect, uniform threads. The only router adjustment required is setting the appropriate depth of cut. Manual taps are provided for cutting matching internal wood threads.

Sold as a complete outfit for three sizes of dowels (1/2", 3/4", and 1"), or choose one size to begin and add other sizes of inserts and taps later as needed. Taps and dies are available in either right- or lefthand threads. ***Righthand will be provided unless lefthand is specified.***

Included in a kit are molded plastic housing, threaded insert for appropriate size, matching tap, router bit, and instructions.

Optional bottoming taps are available for threading to the bottoms of stopped holes.

Beall Wood Threading Kits

10.53.51	3 Size Kit Complete	99.95
10.53.52	1/2" Kit Complete	59.95
10.53.53	3/4" Kit Complete	59.95
10.53.54	1" Kit Complete	59.95
10.53.55	1/2" Tap & Insert Only	33.50
10.53.56	3/4" Tap & Insert Only	33.50
10.53.57	1" Tap & Insert Only	33.50
10.53.62	Carbide Router Bit	27.95
10.53.59	1/2" Bottoming Tap	27.95
10.53.60	3/4" Bottoming Tap	27.95
10.53.61	1" Bottoming Tap	27.95

J ROUTER DOVETAIL JIG

This simple fixture is useful in producing 1/4" and 1/2" dovetail joints quickly and accurately on boards up to 8" wide. By following the contour on the template of the fixture with 5/16" or 7/16" guide bushings, flush, offset, and rabbetted dovetail joints are possible in the 1/2" size and flush dovetails can be made in the 1/4" size.

10.67.01	Router Dovetail Jig	34.50

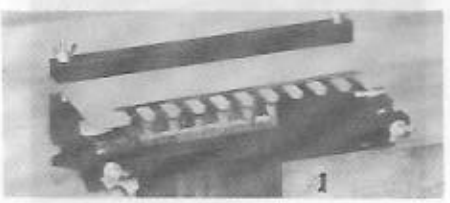
K BOSCH 1604 1-3/4 HP ROUTER

The Bosch 1604 is well known as a superb utility router for all manner of general-purpose shop work. Its 10-amp motor provides plenty of power for shaping and joinery work, and its interchangeable 1/4" and 1/2" collets will let you use all the bits you now own and most of the new ones on the market as well. 25,000 rpm operating speed assures the cleanest, smoothest cutting possible. 6-inch diameter base, 7-3/4 lb. weight, low center of gravity handles and good visibility through the base make hand-held operation unusually easy.

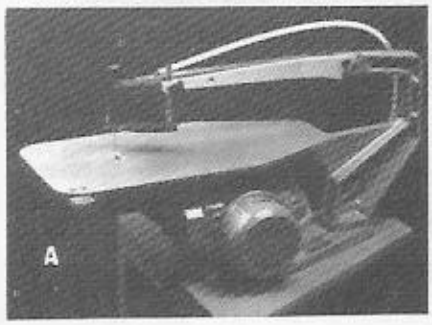
The 1604 incorporates Bosch's remarkably good depth of cut adjustment system, in which the entire motor housing rotates within and registers on the spiral-rim base assembly, allowing smooth and precise setting. Cast index marks show 1/32nd-inch depth increments.

Optional equipment includes a straight guide, trammel point for circle cutting, and Bosch's unique and exceptional Air-Sweep™ vacuum attachment, which comes with a custom sub-base for the 1604, an edging attachment, a template-guide sub-base, and 10 feet of 1-1/2" flex hose.

10.16.01	Bosch 1604 Router	129.95
10.16.02	Straight Guide	23.50
10.16.08	3/8" Collet Cone	12.00
10.16.03	Trammel Point	10.30
10.16.05	7/16" Template Guide	10.55
10.16.06	1/2" Template Guide	7.30
10.16.07	5/8" Template Guide	10.25
10.16.09	Router Vacuum Attachment	102.50



QUALITY MACHINERY



A HEGNER MULTIMAX 18 SCROLLSAW

Hegner scroll saws have set new standards for productivity and precision in scroll and detail sawing. Superb design features and meticulous West German construction provide fast, smooth, and extremely acccurate cutting while insuring minimum blade breakage and maximum user satisfaction. **Now Hegner has introduced a terrific new 18" variable-speed saw which is the quietest, smoothest-running model they've ever made.**

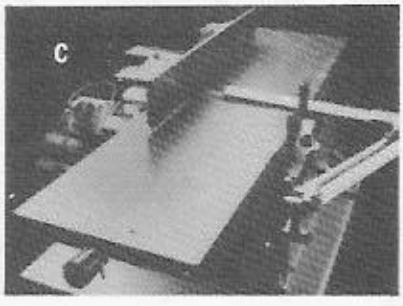
A tensioned parallelogram rocker arm assembly, like a bowsaw, keeps the blade under unvarying tension, allowing the use of very high tension and high stroke speed, for a smooth, clean and reliably straight cut. Parallelogram geometry also delivers vertical motion with negligible front-to-back movement of the blade through the stroke, making it easy to scroll tightly, quickly and accurately without distracting blade blurring.

The pivoting blade clamp system pioneered by Hegner makes another prime contribution to the saw's excellence. When cutting pressure is applied to the tiny blades used in scroll saws, they inevitably bow backward, regardless of tension level or sawing technique. In the Hegner system, each end of the blade is clamped in a hardened steel prism-shaped holder which is seated in a groove at the end of the rocker arm. The holder pivots as the blade bows, distributing bending loads along the entire length of the blade without creating hot spots that lead to early failure.

Max thickness capacity is 2-3/4". 2.8 amp motor will handle heavy loads. Speeds are from 400 to 1480 strokes per minute.

Other features include a built-in sawdust blower and a fully adjustable hold-down foot that eliminates chatter and leaves your hands free to guide the work. Worktable tilts left to 45° and right to 15°. Comes with 72 assorted blades and a welded steel stand. 2-year warranty. *Shipped via UPS.*

05.29.32	Hegner Multimax 18	895.00



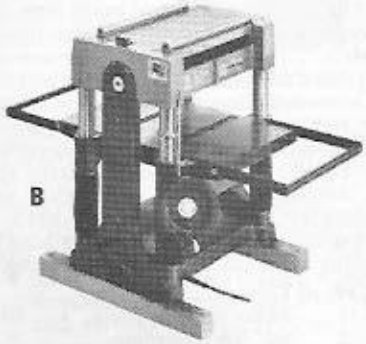
MAKITA 2040 THICKNESS PLANER

The 15-5/8"-width capacity of this thickness planer makes it a great buy for any shop already equipped with a good jointer. The factory feed rate of 22 feet per minute under load lets you dress a lot of wood in a hurry, while the optional speed reducer kit can give you an incredibly smooth finish. Makita's fine 2 hp, 115 volt motor drives the cutterhead at 6500 rpm, delivering plenty of power to remove 1/16" per pass on even wide stock. Max depth of cut on narrower stock is 1/8". The 2040's cast-iron bed is equipped with rollers for rough stock, which are easily lowered for finish passes on dressed material. Hard rubber feed rollers cannot mar the surface of even the softest lumber, and are tough enough to last for years of rough work.

The 2040's large width capacity and exceptional 7-3/4" maximum thickness make this an ideal machine for dressing glued-up panels, valuable wide stock, and even heavy timbers. Four-post construction and 254 lb. net weight add sturdiness for lasting durability.

Sale quantity limited.		*List Price 2595.00*
B 08.10.14	2040 Planer	1599.00
08.10.15	15" HSS Knives, Pair	49.95
08.10.27	Stand for 2040	98.00

Receive a FREE STAND & FREE FREIGHT with purchase of 2040 before January 31, 1990.



C INCA 10-1/4" PLANER-JOINTER SALE

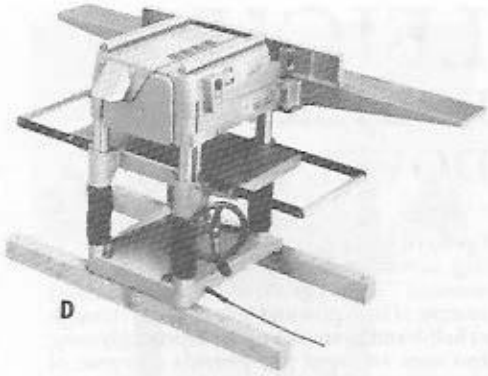
Two models of this superb, smooth-running machine are available.

Model 570 features the revolutionary Swiss 3-knife Tersa cutterhead. It produces an incredible 18,000 cuts per minute, and uses disposable self-aligning double-edged planer knives which require just 30 seconds for accurate installation. Using the thicknesser's 11 fpm feed rate (high speed is 16 fpm), the 570's cuts-per-inch ratio is a staggering 136, producing the smoothest machined finish on hardwoods this side of a super surfacer.

Model 550 is identical to the 570, except that it uses a 2-knife cutterhead with conventional knives whose height is adjusted up or down by turning set screws located near the end of each knife. At the lower feed rate, the 550 produces 91 cuts per inch, still an outstanding ratio which results in superbly smooth finishes.

As an automatic-feed thickness planer, either model handles material up to 10-1/4" wide and 6-1/4" thick. As a jointer, it provides an amazing 10-1/4" wide cut, with a table length of 42". Height of both infeed and outfeed tables is adjustable. Changeover from planer to jointer requires only a few seconds. Machines are equipped with 115v or 230v 2 HP motor. *Shipped Freight Collect.*

Sale quantity limited		SALE	Regular
570	10-1/4" Planer-Jointer	1995.00	2195.95
550	10-1/4" Planer-Jointer	1695.00	1895.95
3005	Stand for 550 or 570		129.90



Receive a FREE STAND & FREE FREIGHT with purchase of 2030N before January 31, 1990.

D MAKITA 2030N PLANER-JOINTER

The 2030N combines two important machines in one efficient package. It is powered by an efficient and reliable 13-amp motor that has proved itself over many years' use.

As a planer, it will handle 1/16" depth of cut on 12" hardwood at 7000 rpm for very clean planing. It provides 40" of support under your stock, which helps minimize snipe and reduces load on the feed rollers. Nominal feed rate is 26 or 17 fpm, offering 45 or 69 cuts per inch. A built-in electric brake stops the cutterhead in seconds. No-voltage safety switch makes accidental starts virtually impossible.

The jointer features solid cast-iron beds which total 59-1/2" in length for ease in handling long and heavy stock. Outfeed bed is permanently fixed for reliable accuracy; infeed bed adjusts smoothly to a maximum 3/16" depth of cut. The two 6-1/8" knives are easily re-installed using a straightedge registered on the outfeed table. The jointer fence measures 28-3/4" long by 4" high, and conveniently adjusts over 4" of the bed width.

Sale quantity limited		*List Price 3120.00*
08.10.51	2030N Planer-Jointer	1899.00
08.10.27	Stand for 2030N	98.00
08.10.52	HSS 12-1/2" Knives, Pair	39.95
08.10.10	HSS 6" Knives, Pair	25.50

E MAKITA 9820-2 BLADE SHARPENER

Over the years, one of Highland Hardware's most popular Makita tools has been the 9820-2 sharpener. Well over a thousand woodworkers have purchased 9820-2's from us, and many have expressed their extreme satisfaction with it.

A common factor among those satisfied has been appreciation for the additional sheet of operating instructions (written by Zach Etheridge) which Highland Hardware provides with each sharpener it sells. Though it is a fairly low-tech machine, mastering its use involves understanding a few subtleties not mentioned in Makita's instruction manual.

The machine comes equipped with a 1000-grit medium stone, and is ready to sharpen planer and jointer knives. With the optional Highland accessory jig, it is also great for sharpening chisels and plane irons. The optional 120-grit Green Wheel rapidly removes metal for re-shaping a bevel or repairing a nicked cutting edge. The 6000-grit fine wheel will put a mirror finish on any edge.

02.10.01	9820-2 Sharpener	219.95
F 02.26.01	Highland Jig	12.95
02.64.30	120 Grit Green Wheel	49.50
02.10.03	1000 Grit Med. Wheel	39.95
02.10.04	6000 Grit Fine Wheel	49.95

We Invite You to Apply Now for Highland Hardware's new SERVISTAR MasterCard or Visa Card

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To apply, complete the application below and return it to Highland Hardware.

If you are in a rush and you are placing an order worth $100 or more, specify "INSTANT CREDIT", and we will expedite processing of your application, and notify you within a few days. (Otherwise, it normally takes 2 to 3 weeks to receive your card).

Businesses are eligible for a non-revolving SERVISTAR Visa or MasterCard account, but must complete a special business application, rather than the one below. Call or write us for a copy.

Disclosure Summary

Annual Percentage Rate	17.9%
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Grace Period	25 days on purchases
Finance Charge Minimum	50¢ when a Finance Charge is due on purchases.

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1045 N. Highland Ave.
Atlanta, GA 30306

Please tell us about yourself

Type of account ☐ Individual ☐ Joint — Check one: ☐ New Visa Account ☐ New MasterCard Account

Cash Advance Checks
☐ I want to pay off my other credit card balances which total about $ _____ Please send me cash advance checks so I can pay off these balances.

First name | M.I. | Last name (indicate Jr., Sr., etc.) | Date of birth | Number of dependents | Social Security Number

Home street address | City | State | Zip Code | Home telephone ( )

How long? Yrs. ____ Mos. ____ ☐ own ☐ rent ☐ with parents ☐ other | Previous home address (including City, State, and Zip Code) | How Long? Yrs. ____ Mos. ____

Highest level of education completed ☐ High School ☐ College ☐ Some college ☐ Graduate school | Name and address of nearest relative not living with you | Relationship

Name of business or employer | Type of business | Position | How long? Yrs. ____ Mos. ____ | Check if ☐ self-empl. ☐ retired | Gross monthly salary $

Business street address | City | State | Zip code | Business telephone ( )

Previous employer | Address | Position | How long? Yrs. ____ Mos. ____

OTHER INCOME. COMPLETE FOR APPLICANT AND CO-APPLICANT. Income from alimony, child support, or maintenance payments need not be revealed if you do not wish to rely upon it in connection with this application. | Name and address of source of other income | Gross monthly amount $

Please tell us about your co-applicant

First name | M.I. | Last name (indicate Jr., Sr., etc.) | Date of birth | Relationship to applicant | Social Security Number

Home street address (if different than applicant's) | City | State | Zip Code | Home telephone ( )

Name of business or employer | Type of business | Position | How long? Yrs. ____ Mos. ____ | Check if ☐ self-empl. ☐ retired | Gross monthly salary $

Business street address | City | State | Zip code | Business telephone ( )

Previous employer | Address | Position | How long? Yrs. ____ Mos. ____

Please give us some financial information

Type of account ☐ Checking | Name of institution | Account number | Type of account ☐ Savings ☐ Other ☐ Money Market | Name of institution | Account number

Name of current ☐ Mortgage holder ☐ Landlord | Purchase price $ | Current market value $ | Balance owed $ | Monthly payment or rent $

List ALL Applicant's AND Co-Applicant's credit references (including installment loans, charge accounts, and credit cards). If none, so state. Attach separate sheet if necessary.

Name of creditor and city	Type of credit (e.g., auto loan)	Original amount or credit line	Unpaid balance	Monthly payment
		$	$	$
		$	$	$
		$	$	$
		$	$	$

AUTHORIZED USER. There is no extra charge for the first two cards issued on each account. Additional cards are provided at a one-time cost of $10 each. Please issue a card on my/our account to: Relationship

AGREEMENT. I certify that the information contained in this application is complete and accurate and authorize PNC National Bank ("Bank") to: (1) check my credit and employment history and answer questions about its credit experience with me; (2) retain this application; and (3) exchange financial information with any of Bank's affiliates or correspondents. If the application is approved, I agree to pay the Annual Membership Fee and to be bound by the terms of Bank's Credit Card Agreement as is in effect from time to time, and also authorize Bank to provide my name and address to SERVISTAR Corporation and/or its dealer owners.

Applicant's Signature X _____ Date _____ Co-Applicant's Signature X _____ Date _____

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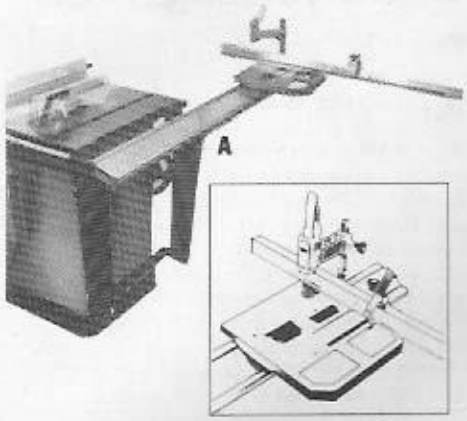
Service problems, requests for technical information, and order tracing, CALL (404) 872-4466

* *Above shipping charges apply to UPS shipments within 48 contiguous states only. If you require shipping via U.S. Mail, please specify, and add an additional $5.00 to the UPS charge. If shipment is to Alaska or Hawaii, or to Canada or another foreign country, additional shipping charges may apply. Refer to "Freight Charges" on inside front cover for instructions. Above shipping charges do not apply to machines and workbenches, which are shipped either freight collect, freight prepaid (Unisaw special only), or for a flat rate, as indicated in the catalog description of the items.*

NOTE: If ordering HYDROCOTE products during cold-weather months, please give a shipping address ***where someone will be present*** to receive your delivery. This will help to eliminate the possibility of the product freezing due to being left at your doorstep by UPS.

New Shop Accessories Add Comfort & Convenience to your Woodworking



50" SLIDING TABLE ATTTACHMENT FOR TABLE SAWS AND SHAPERS

This commercial-duty sliding table by the makers of our Robland combination machine can be added to the Delta Unisaw, Powermatic 66, Delta Heavy-Duty Shaper, and most other small commercial saws and shapers. It provides 50" crosscut capacity at 90° (approximately 42" at 45°, depending on your saw), more than enough to allow accurate cutting of full sheets of plywood or other man-made materials. The unit mounts on three brackets which are easily bolted to your machine (the left-side extension wing must be removed from the Unisaw or similar designs). It consists of two moving parts, a 14-1/2" x 14" rolling table and a 70" sliding rail assembly. Two solid 1-3/16" diameter steel rods, joined by a heavy aluminum extrusion, make up the rail assembly, which can slide forward to be flush with the front of your saw or pulled back as far as needed for cutting wide stock. A front support leg is provided for stability in panel-cutting mode. The cast-iron rolling table mounts on the rails with seven sealed ball bearings; its angle is adjustable to assure it lies in perfect plane. The table can be instantly removed from the rails so it's never in the way of other operations. Mounted on the table is a 48" cut-off fence with 45° angle capacity and an adjustable positive stop at 90°; it also features a sliding drop stop for repeat cut-offs up to 5 feet long. A heavy cam clamp reaches over the fence to hold work secure for precise cutting or shaping. The entire sliding table unit weighs 115 lbs., and is shipped via UPS in 2 cartons.

The sliding table works quite well as a full-time substitute for your standard mitre guide. For this purpose, we recommend its optional 24" mitre fence, which does a fine job on solid wood and other less bulky material.

A 08.51.03 Robland 50" Sliding Table 695.00
08.51.04 24" Mitre Fence 35.00

PELONIS DISC FURNACE PROVIDES SAFE, LOW-COST HEAT FOR YOUR SHOP

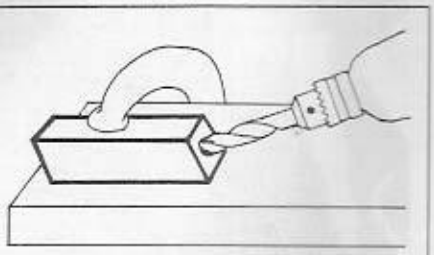
This high-tech 1500 watt, 5200 BTU space heater (pictured below) is one of the safest ever built, and is ideally suited to providing winter comfort for the small woodworking shop. Minutely honeycombed ceramic discs are at the heart of the system, efficiently transfering heat to fan-forced air without generating temperatures high enough to ignite common shop materials such as shavings, sawdust, paper, etc. A single Pelonis furnace will handle the heating requirements of a moderately well insulated 400 square foot shop.

Superlative features include: thermostat control for constant temperature maintenance without hot/cold cycling; tilt sensor that shuts the unit off if it's accidentally tipped over; powerful fan for effective air distribution; washable intake filter; low cost operation; and vanishingly small space requirement. The entire unit is housed in a 6" cube, and weighs only six pounds. Each Pelonis Disc Furnace is provided with a five-year limited warranty.

Sale Quantity Limited *Last year was $149.95*

B 08.60.21 Pelonis Shop Furnace Sale 129.95

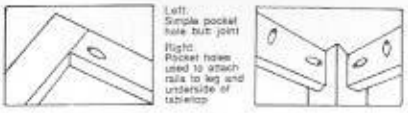
B



POCKET HOLE DRILL GUIDE

This simple fixture makes quick work of drilling pocket holes for clean, unobtrusive screw assembly of butt joints in any stock 3/4" or thicker. Simply clamp the jig to your work using a C-clamp, slide your bit through the guide hole, and drill. 18° angle allows use of 1-1/2" screws to join 3/4" stock. For best results, we recommend the use of sharp brad-point bits. Standard-length bits will work fine; no special bits required. Instructions for use are included with each pocket hole guide.

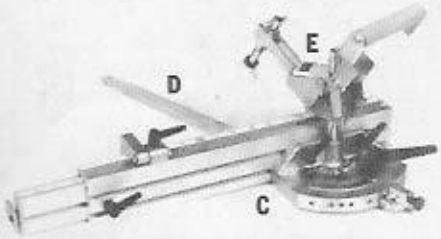
07.52.11 Pocket Hole Guide 12.95



I'm very pleased with my new Accu-Miter precision miter guide. Now for the first time ever, I am getting consistently perfect 90° cuts.

I use a machinist's square accurate to a string of zeros and I see no daylight anywhere. Can't beat that.

R.C., Fairview, North Carolina



ACCU-MITER™ DELUXE MITER GUIDE

This new miter gauge is designed to provide all the precision and convenience you've ever needed but been unable to achieve with the guide that came on your saw. The precision-cast miter head can be mounted to your own guide bar (probably requiring drilling and tapping one or two new mounting holes), or it may be mounted on an optional precision 3/8" x 3/4" x 23-1/2" steel guide bar (with washer for T-slot grooves). A spring-loaded shot pin provides positive stops at 15°, 22-1/2°, 30°, 45°, and 90°; a precise cast scale and scribe line allow reliable setting to any other angle.

The Accu-Miter's adjustable fence is an outstanding feature. The standard fence, 18" long, has a built-in measuring scale, a sliding drop stop for repeat cut-offs and controlled mitering, and a sliding inner rail with pivoting stop that extends out to 34". The fence extrusion can be set for exact measurement from the blade, or can be adjusted left or right as desired, a tremendously useful feature in many joinery operations. If you work in long stock lengths, the Accu-Miter is also available with a 24" miter fence whose inner rail reaches to 46".

Optionally available for the Accu-Miter are two clamping systems. One, a heavy-duty manual clamp, will reach up to 3-1/2" forward of the fence and can handle 4-3/4" maximum stock thickness. The other is a pneumatic clamp, with cylinder, mounting bracket and supply hose, for production cut-off work.

C	08.52.81	Accu-Miter (18"-34" model)	149.00
	08.52.82	Accu-Miter (24"-46" model)	164.00
D	08.52.83	3/4" x 3/8" Bar	14.95
E	08.52.84	Manual Clamp	29.95
	08.52.85	Pneumatic Clamp	159.00

Band Saw Handbook

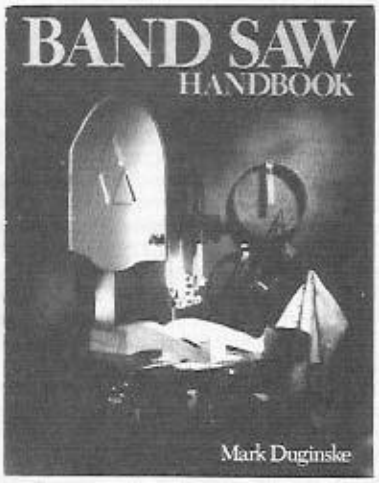
Written by Mark Duginske

WELL, it's about time. Ever since the invention of the bandsaw (England, 1808, says Duginske) we've been waiting for a thorough, comprehensible, creative, small-shop-oriented source of practical information on one of the safest, most versatile cutting tools in the shop. In your shop, is changing blades easy? Do you always saw straight when you want to? Can you routinely generate veneers 6" wide, 5 feet long, and 1/32" thick? Do you cut dovetails on the bandsaw? All of the above are standard operating procedures for author Duginske (pronounced with a soft G), who has done a fine job of distilling his years of experience into the best book yet on this subject.

You may not have known it, but there's enough information about blades alone to fill nearly seventy-five pages. You'll learn about every kind of bandsaw blade known to the civilized world, what they're for, what they're not for despite what you may have been told, and how to choose the best one for a specific job or the best one for a variety of uses. Welding, soldering, cleaning and sharpening are covered in detail.

Next there's another 45 pages or so on "pre-use procedures" – this is quite possibly the most original and most useful part of the handbook. Here Mark describes how to align your bandsaw wheels to make tracking dead easy, how to tune your guide post, blade guides and thrust bearings, how to round the back of a blade used for cutting curves, how to tension a blade properly and more. If you learn nothing else about the bandsaw, these procedures alone will dramatically improve your saw's performance and your satisfaction with its results.

Finally comes the good part: maintenance and cutting procedures. Here you'll learn to balance wheels, true rubber tires and install new ones when needed. Then a word about safety and dust collection, and it's onward to cutting wood. The *Handbook* leaves very little to the imagination on this score. Cutting forms and figures, making and using patterns and templates, making circle-cutting jigs, cutting straight lines (rip or cross) and resawing thick stock each get individual, detailed attention. Much of the information is presented visually with captioned photos and line drawings; illustration quality sometimes requires a creative squint for clarity, but overall the presentation is quite effective. There's a seventeen-page section on making dovetails, both pins and tails, using jigs and fixtures made in the shop. The book closes with a collection of bandsaw projects for those not satiated by the dozens already used throughout the text.



If you think you already know everything there is to know about bandsaws, we'll make you a bet: if you don't learn something new from this book, we'll give you your money back. And if your bandsaw isn't already one of your all-time favorite woodworking tools, the ***Band Saw Handbook*** will be one of the best investments you can make for your shop.

—Reviewed by Zach Etheridge

Band Saw Handbook (20.03.93) is available from Highland Hardware for $16.95 plus $3.00 shipping.

Restoring, Tuning & Using Classic Woodworking Tools

Written by Michael Dunbar

FOR ANYONE whose love of tools is one of the joys of working with wood, this book is worth its weight in moulding cutters. It's not written for collectors, but for those whose interest is primarily in putting the tools to the use for which they were made. As Dunbar explains, using them is one of the good reasons for buying second-hand tools: in many cases they were made in a time when the user depended on them for his livelihood, and the tool makers worked within a tradition of craftsmanship more concerned with quality than with low-priced mass-market sales.

Wonderful though they may be in principle, many old tools are a long way from the good old days when they're found at the flea market. Dunbar opens the book with a chapter on basic buying guidelines, designed to help develop judgement about the worth of tools with damage, missing parts, and so on. The next chapter is a practical guide to tuning, cleaning and refinishing, with several invaluable pages on heat-treating, grinding and shaping your own irons. This is the clearest presentation on the subject that we've seen, and this chapter by itself would make the book a good buy.

Planes of every type take up much of the rest of the volume: bench planes (wooden and metal), moulding planes, special-purpose planes and combination planes each get their own chapters. Another chapter covers plane-related tools: spokeshaves, drawknives, scrapers, scratch stocks and toothing planes. Another fifty pages or so are devoted to chisels and gouges, braces and bits, and saws.

In summary, ***Classic Woodworking Tools*** is the most practical guide we know of for those woodworkers who have inherited, collected, or stumbled across one or a hundred second-hand tools. And for anyone who's never been charmed by an old tool's mix of tradition and utility, this book may be your introduction to a kind of woodworking you thought long vanished from the earth. 256 p.

—Reviewed by Zach Etheridge

***Restoring, Tuning & Using Classic Woodworking Tools** (20.03.94) is available from Highland Hardware for $14.95 + $3 shipping.*

highland hardware

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