

Wood News

Published by Highland Hardware, Inc.

Serving Woodworkers

Number 16, Fall 1985

Fall Seminars

You are invited to join us for these seminars at Highland Hardware this fall. Since space is limited, we urge you to register now by completing the registration form on page 23.

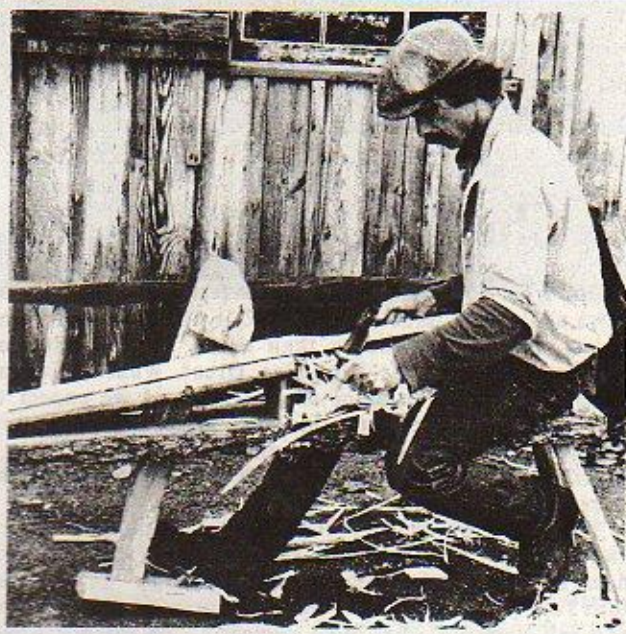
Zach Etheridge will begin the seminar season with two seminars on Sharpening: Saturday, October 4, and repeated for a different group on Sunday, October 5. From 9 am to 4 pm, participants will receive hands-on instruction on sharpening plane irons and chisels using Japanese waterstones. Participants should bring tools to be sharpened and stones if you have them, or we will provide the stones. Cost is \$20.00.

The following Saturday, October 11, 9 am to 4 pm, Zach will give a day-long demonstration of Routers and Jigs, showing how to customize your router for precise and accurate work and accelerated production using this most versatile of woodworking tools. Cost is \$20.00.

By popular demand, George Frank returns to Highland Hardware October 19-20 for another seminar on Wood Finishing. This seminar will bring alive George's book *Adventures in Wood Finishing*, and will be an excellent chance to pick up a thorough understanding of French polishing along with methods to color wood in ways more beautiful than you could ever imagine. A master storyteller, George's wit and humor will make this seminar a weekend to remember. Hours are Saturday, 9 am to 4 pm and Sunday, 9 am to 3 pm. Cost is \$60.00. A condensed version of the seminar will be presented Friday evening, October 18 from 7 to 10 pm for those unable to participate all weekend. Cost is \$10.00.

On Saturday, October 26 9 am to 4 pm, Zach Etheridge will give a free seminar on Stationary Power Tools, covering techniques useful in the operation of tablesaws, jointer-planers and bandsaws. Special offers on many of our Inca tools will be available to those attending this seminar. Please register in advance.

Rude Osolnik, described by Dale Nish as one of America's most versatile woodturners, will be in Atlanta November 1-3 for a Woodturning Seminar. A professional who has been turning and teaching for over 40 years, Rude will cover bowl turning (wet and dry), spindle turning, pressure turning, mandrel turning, soapstone turning, as well as metal spinning. Hours of the seminar will be 9 am to 4 pm Saturday and 9 am to 3 pm on Sunday. Seminar participants will have free admission to Rude's Friday evening slide lecture (7:30 to 9:30 pm) which will cover turning techniques as well as show finished objects. Cost of Friday evening's lecture only is \$5.00. Cost for the entire weekend is \$60.00.



November 8 - 10, Highland Hardware will play host to a weekend visit by Roy Underhill (pictured above), creator and star of the popular PBS television series *The Woodwright's Shop*. Currently the master housewright at Colonial Williamsburg, Roy will be here to present a day-long seminar on Saturday, November 9 entitled *Tools and Traditions of 18th Century Woodworking*. The seminar will be repeated for a different group on Sunday November 10. Cost of participating either day will be \$50 per person. Friday evening, November 8 (7:30 to 9:30 pm), Roy will give a slide lecture entitled *Have Broad Axe, Will Time Travel - Adventures in Experimental History at Williamsburg*. The lecture is free to those enrolled Saturday or Sunday. Cost is \$5.00 for others.

Mark Duginske, author of *The Inca Machinery Handbook*, will be at Highland Hardware December 6-8 for a seminar on Machine Joinery, covering machine set-up and stock preparation, bandsaw and tablesaw jigs, and plate joinery. Hours are 9 am to 4 pm Saturday and Sunday, with a slide lecture Friday evening from 7:30 to 9:30 pm. Cost for the weekend is \$60.00. Admission to Friday evening's lecture is free.

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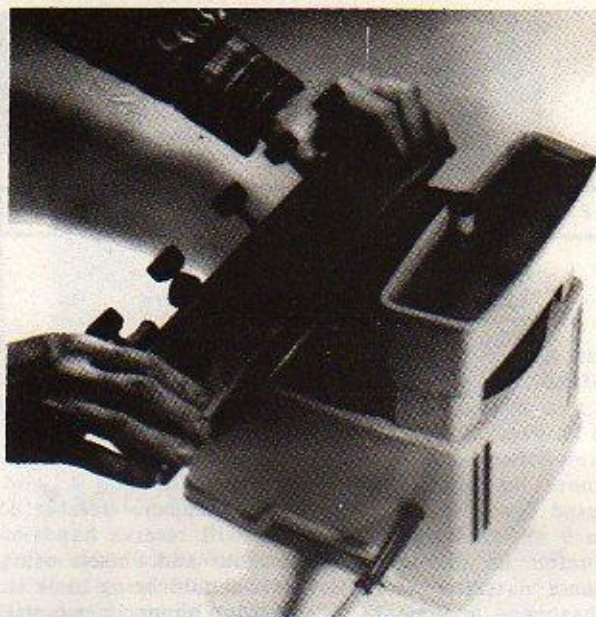
Sharpening News

Our trusty old Makita electric sharpener is back in the news again this issue - the 9820-2 is not only still going strong, it's going stronger than ever. The introduction late last year of our exclusive Green Wheel grinding stone has stirred up a lot of interest, and we expect to stir up a lot more with this special offer: from now through December 31, 1985, we're going to give away a FREE Green Wheel with every 9820-2 purchased in the store or by mail order.

The 120-grit Green wheel grinds conventional tool steel and high speed steel with remarkable efficiency, and does so without heating the cutting edge. In our use thus far, the Green Wheel has proven to be self-cleaning and self-dressing when used correctly; the surface wears away in typical waterstone fashion, just fast enough to prevent clogging or dulling, and one round of planer-knife grinding smooths away any surface wrinkles introduced by grinding chisels or doing freehand work on tools that don't want to be jigged.

We've also ground carbide jointer knives quite satisfactorily, and though carbide takes a bit longer to sharpen than does steel, we've found we can do a good job with far less trauma to the knives than the local sharpening service seems to inflict. We finish off to a fine edge with a couple of small diamond hones (a pair of fine and medium hones costs \$15.20 plus \$2.50 shipping.)

The 9820-2 continues to intrigue me at least a little bit even after four years' of use. It always seems as though the machine must have been deliberately designed as an illustration of the gray area between David Pye's definitions of the workmanship of certainty and the workmanship of risk; it's a jigged tool which requires some fairly subtle hand skill in its operation, and it remains mysteriously difficult to explain why the machine is capable of the superbly accurate results it provides. The tool rest provides control of grinding angle, and of course the powered stone does the labor involved in removing metal from a cutting edge, but it's up to the user to control the rate at which the tool is fed past the stone - this feed rate is critical, naturally, and it's not a uniform speed (this is covered in detail in the user's guide we provide with each machine we sell). This sounds like a difficult challenge, one of those tricky performances only a professional demonstrator can ever get right, but we've got hundreds of customers out there who'll testify that with a little practice (and a little help from us) it's easy.



The original 9820-2 was designed very specifically to sharpen Makita's jointer and planer knives, but modifications and accessories we've added to the tool have dramatically expanded its performance envelope. First we modified the shape of the tool holder to accommodate American-made machine knives. (Makita later adopted this modification at the factory). We also came up with a US-made grinder jig that works well with the 9820-2 for sharpening chisels and plane irons. Now our Green wheel has virtually doubled the machine's capability, making it a general-purpose grinder as well as honing device. I suppose we could say that our latest customer service has been keeping the machine available during the past two years through special purchases while Makita sought (and received) UL approval on the tool. It's nice to know that Underwriters Labs agrees with hundreds of our customers: there ain't nothing wrong with this machine, thank you. It's pleasant to have it officially back on the market.

Now, after our special of giving away a Green wheel with each new sharpener expires late in December, I haven't the faintest idea what we'll do next - maybe we'll publish an article on the custom improvements some of our customers have cooked up. Several users have described ways to keep the water tank from running dry, using anything from sophisticated drip valves to jerry-rigged toilet tank plumbing. If you're doing funny things with your 9820-2 that Makita never thought of, and particularly if you're doing funny things we never thought of, let us know. We're also interested in hearing about unorthodox applications of the machine. Our most out-of-the-ordinary customer thus far uses his 9820-2 to keep a keen edge on a whopping collection of Christmas tree knives. What are you doing with yours? ZJE

Cost of the 9820-2 is \$195.00 postpaid from Highland Hardware, and includes a free Green wheel if purchased before December 31, 1985.



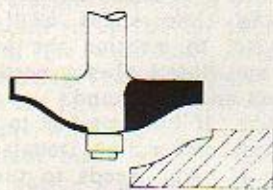
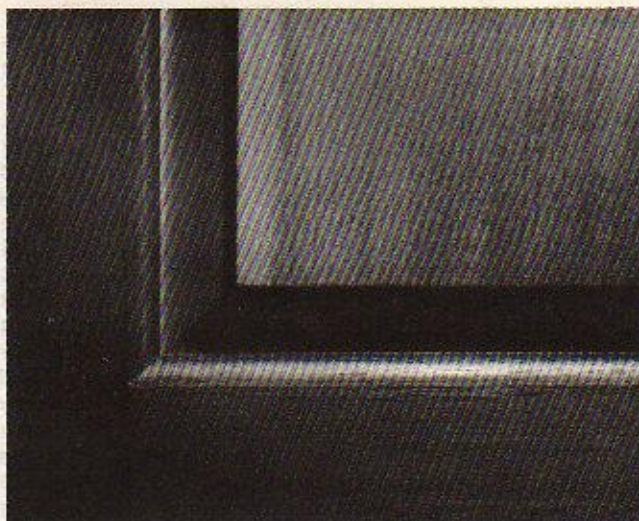
New Router Bits

In case you've been out of the country or stuck in solitary for the last couple of years, here's news: when woodworkers gather to talk about routers these days, you'll almost always hear them talking **BIG**. Certainly all we ever talk about around here is the monstrous Makita 3612BR plunge router, and we've seen it (and its competitors) showing up frequently in articles, letters and tips in the various woodworking publications. The new generation of heavy routers generally feature 1/2" collets, high horsepower ratings, and in most cases other important conveniences such as plunge capability. They've quickly gained widespread market acceptance by virtue of their great efficiency at normal routing and an array of extraordinary capabilities (see *Wood News* 13 for some examples).

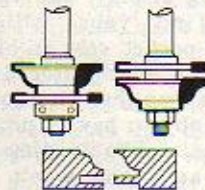
Router bit manufacturers have taken note of the rapid increase in large routers' popularity, and have responded with a trickle (so far) of new bits designed to take advantage of their weight and muscle. Many bits are the standard patterns we're familiar with, provided with 1/2" shanks. Some of these are a lot larger than we're used to (such as our 3/4" radius rounding over bit, or a straight bit with 2-1/2" cutting edge), but they represent no fundamental change in router capability or methods of work. Some new bits, however, are genuinely new and different, and are pointing the way toward a qualitative change in the kind of work many of us choose to do. The Ogee Fillet Raised Panel bit we've had for two or three years now is one such radically different bit. Its enormous size and pleasing style are not all that make it noteworthy; more significant is that with this bit, a small-shop operator (on a budget which doesn't include purchase of a shaper) can for the first time crank out professional-quality raised panels in solid wood with very brief set-up time and virtually no hand work involved.

Our recently introduced Rail & Stile bit is a perfect complement for the Raised Panel cutter, providing a quick and accurate system for router-powered production of traditional frame and panel designs. This is where qualitative change comes in: during the past few decades, cleverly moulded tongue and groove frames and elegantly shaped panels have been widely superseded by plain dadoed framework and broad expanses of 1/4" plywood. This is surely due at least in part to shifts in popular taste, but shows as well the influence of both new materials and new demands on woodworkers. Up until recently, if you didn't have access to a shaper and a collection of expensive cutters, frame and panel construction involved a fair amount of tablesaw set-up and a good bit of hand finishing work. That's the sort of thing that's hard to afford in a competitive marketplace, and I suspect it's a good part of the reason for switching to more efficient plywood construction.

And why should this be of interest to you, the overworked and under-rewarded woodworker? Well, consider: if you can offer your customers the option of a classic solid-wood frame-and-panel cabinet design for about the same price that your competition is charging for the same old flat plywood work, how long will it take to pay for the router bits that give you this advantage? Not that we would expect everything to be built with frames and panels just because they're economically accessible, but merely having the realistic option gives you a powerful new weapon in the ongoing battle to survive.



Ogee Fillet Raised Panel Bit



Rail & Stile Bit

Of course the Rail & Stile bit can be used for framing around 1/4" plywood, too, or mirrors, photographs or custom cat doors. It offers a very convenient way to frame practically anything very quickly - in fact, almost any router with the required 1/2" collet should have enough power to handle one-pass cutting in most hard woods. The bit lends itself to table-mounted or hand-held routing, though you'll find that the tongue-profile cut on the rail ends will be easiest with table and mitre guide. The 3/8" deep tongue & groove created by re-configuring the bit provides sufficient glue surface for a strong corner butt joint - incidentally, the ogee moulding profile will automatically look neatly mitred in the corners. If the frame you're building has load-bearing function such as in a cabinet door, you'll probably want to reinforce the corners; your plunge router will easily cut the hard part of a mortise & spline joint for that purpose.

The Rail & Stile and Raised Panel bits work so well together that we've wrapped up a package deal for you. Even given the savings on the set, you'll perhaps notice that these big bits aren't exactly cheap; a few seconds spent contemplating the price of shaper cutters should ease the pain. These two bits give you some idea of the new capabilities being visited upon us by the advent of big routers and cutters to match. There's already at least one other raised panel bit in production, and there are surely going to be a lot more within a relatively short time. In fact, there are going to be surprises all around, I believe, as practically all the most useful shaper-cutter patterns start turning up as router bits. Keep your eyes peeled, as they say - the fun is just getting started. **ZJB**

Highland Hardware offers the Ogee Fillet Raised Panel Bit for \$99.95 postpaid, and the Rail & Stile Bit for \$89.95 postpaid. The two bits can be purchased as a pair for \$175.00 postpaid.

Hustling Wood

©1985 by Wallace Macfarlane

When you start making treen, it doesn't take too long to find out you need more wood. If you make flat things like a cutting board or a lazy Susan, you can buy what you need. One trouble with turned objects is that wood from a lumber yard or a specialty store is expensive. Worse, expensive wood insures a mind-set that you can't afford to experiment, that you'd better hold your breath, not wiggle, and be perfect. With only a single pretty piece of walnut, apprehension can outweigh pleasure, and if you screw things up as I often do, you can get severely bitten in the pocketbook.

A further consideration is the size of wood you can buy. One-by and two-by means that you must laminate to make a big bowl. You can do tricky stuff like gluing purpleheart veneer between pieces of ash and make a striking display, but unless this sort of detail is where you find your jollies, the time spent and the out-of-pocket cost is high. Not to mention the whole world of gluing procedures and how I always need one more clamp than I've got. And one more hand.

All objects have a proper size. If I want a box to hold cookies, available dimensioned lumber like Douglas fir 4x4's and 6x6's won't make it. Who needs to turn a boxful of cracks? Who needs a cookie tasting like Doug fir? While you can chop a cottage from a redwood, in real life a two-foot diameter tree is as big as I need. I've seen pictures of polyethylene glycol-ed bowls with a kid inside. They're remarkable as the Lord's prayer written on the head of a pin, a difficult and amazing accomplishment, but not something I need to do.

Of course it comes down to what you enjoy doing. If you like to work with finished wood and find romance in ebony and padouk and koa, I can appreciate your work and cheer you on, but it's not for me. Don't misunderstand. I like zebrawood and wenge as well as the next man, but I take as much pleasure in mesquite and Monterey cypress.

There is also the lagniappe of surprise in the most ordinary wood. I once turned a box lid from peach, just beautiful with a strongly patterned pinky-orange color, and ever since I've been looking for another piece of peach that's not cracked and gone-to-hell in general. Right now I have some logs of yellow pine with heavy red-brown heartwood and thick pale yellow sapwood with orange-brown rings. Quite handsome, but the occasional buried pitch pocket puts adventure back into turning a bowl. Some sections weep for no obvious reason. A friend told me that anything will dry sometime and Charlie Chan said "Patience are a very lovely virtue," and this all goes to convince me that ordinary wood can be exciting.

After I rummaged through the woodpile for turning stock and made a lot of leftovers and sawdust, I figured out that if I was going to make treen for fun and profit, I would have to hustle my own wood. Curiously enough, a big part of the hustle was to establish a philosophic stance that let me enjoy a 40-mile trip for some Chinese elm that ended up as firewood six months later. If I didn't have a fireplace, I would probably be less philosophical about it. But it was a splendid summer day with thunderheads, the beer bar had a most

memorable sausage out of a jar (simply awful but that's about all they had to eat), and the proprietor was as flavorful and tangy as the sausage she sold. Chinese elm can be a delightful wood, hard and water satin patterned with an intriguing chatoyancy, but the logs I got had begun to split and as it turned out, there was no way I could save them. But oh, the taste of that sausage washed away with beer! A first class day.

A fireplace is high on a list of important things if you are going to hustle your own wood. It's also very useful in my general shop practice. The promising bowl that came apart on the lathe, that bark intrusion that never quit, the disastrous mis-measurement, the hidden rot, the time I got carried away artistically and made a candlestick that on later consideration looked exactly like a pile of petrified dog poop: all these misadventures, in the last analysis, will keep me warm.

Another fundamental premise for me is to make a nickel. It's part of keeping score and knowing where it's at. There are a great many things I could do to make more money, but even considering the perquisite entertainment in originating treen, I'd like to make at least minimum wage. Sometimes I make a great deal more and sometimes I put more labor into an item than is reasonable. I made some elegant spinning tops and sold them at what seemed to be a ridiculously high price and figured out I was making maybe a dollar an hour. I made some more tops to reconsider my production methods and gave them away to friends. It's got to be maybe-yes, maybe-no to make cutting boards when anybody can buy very nice ones for half of what I charge and don't make minimum wage on. But I can use pretty wood that might otherwise be wasted, dark and light strips of apple glued and doweled and elegant. Customers call them cheeseboards and keep them in a glass cupboard most of the time.

People from New York and Washington, DC and Chicago and San Francisco have assured me my prices are modest. They tell me this after they've paid for the box or bowl. It doesn't have to be a comment on my stupidity. I take it for a compliment on my belief that it is better to sell something than keep it on the shelf, and it's also nice to give the *cognoscenti* and *hoi polloi* a perceived bargain. I don't have to make a living at treen, but granted a lot of preconditions, I think it's possible to do so.

In pursuit of wood, authorities mention loggers and sawmills and the pioneering phase of construction jobs as sources. They suggest following the siren song the distant chainsaw sings. There are no loggers or sawmills where I live and construction crews mostly take out live oak. In any warp-wane-wander-check-split contest, live oak is a top contender. It took me three years to cure some live oak for single-piece lazy Susans and six months of trepidation to see if they would be stable even then. The wood ended up dark, dark brown, ray-flecked and handsome, but it will be a long time before I talk myself into trying it again.

In other circumstances, I have thought it might be a good idea to cozy up to the local park department, the power company, the city street maintenance folks, the man who keeps a woodyard and sells firewood, and the various tree service people in the yellow pages. I suspect there are as many ways to find wood as people looking for it: I heard of a man who gets myrtle which washed into the ocean and cast up on Oregon beaches. He uses carbide tip chains and saws a lot of sand, but there is no

such thing as a free lunch. There is no pie in the sky either, though every once in a while somebody will bring you a piece of wood that is unexpectedly gorgeous.

About 90% of the time your goodhearted but chuckleheaded donor brings a wormy chunk of checked oak, or splintered cedar or elderly ash. Because I like to encourage donations, they get back at least a darned egg even though that's the only piece in the log. Sometimes you are promised a tree and it turns out to be a dead pine thirty feet tall in a six foot space between a garage and fence, with a power line ten feet away and a hound of the Baskervilles commenting on your work in the next yard. Then the wood is blue and beetle-ridden.

Such an experience is better than a bottle of smart pills. You learn to be judicious about the next tree. Even smart enough to look before you promise. But keep an open mind. The world is organized so the pure in heart get their rewards, and me too. One time the next tree was an old apricot from which I turned \$300-plus worth of glorious treen. If you were to give me just one tree, I would take apricot, thanks. It is pretty, pretty wood and nice to work besides.

Wood is the same as they used to say about whiskey: some kinds are better than others. I got hold of a bunch of western Sycamore that was all fiber and pith, just as nice to work as a palm tree might be. It mildewed when I tried to dry it under plastic. When I finally burned it, it stank. You are better off leaving it alone. I suppose there's whiskey like that. And yet one piece of dry sycamore made a respectable bowl. (The next dry piece didn't). If it comes my way again maybe I'll have another drink - I mean there's probably a lot more for me to learn about that wood.

With sycamore at the bottom of the list, I've turned

treen from everything I could lay my hands on. Coulter pine is a good example. It was used for firewood and pit props in mines where it rotted as quickly as it could. The wood is light, coarse-grained and soft. Cut into lumber to meet a shortage during the second world war, you had to nail it the day after it was sawed - when dry, not one stick in a hundred would stay flat. So I had a poor opinion of Coulter pine until a friend said he had some trees down in a high wind and would I like? I took my chainsaw and got some logs which I turned into big bowls that ended up bright, light and handsome with tight translucent knots, very nice indeed. I was not able to maintain any inventory because people bought them when they saw them. The next time I got a bunch of Coulter pine it had a coarser grain and darker yellow wood. The time after that the wood blued due to the action of decay fungi. I have learned to avoid working any stained pine, though when turned to an Indian-looking pot or bowl, people will buy them, though not with the eagerness they show toward my breadmaking Coulter pine bowls.

A traveling sawmill fifty miles away cut up/cut down a walnut grove and for an encore I suppose, made lumber out of the windbreak cottonwoods along one edge. A commuting friend brought home several truckloads of slash for firewood and staked and stacked the best. The walnut was English walnut grafted onto the disease-resistant black walnut stock. It's nice enough, with a gray cast - I got some of that and it was okay. The surprise was the air-dried cottonwood: light, soft, straight-grained with pin knots in colors from light tan to beige to light brown. I am charmed by the wood.

(continued on next page)

Quality Tools!



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Sharpens planer and jointer knives with great speed and accuracy. Medium grit Japanese waterstone rotates in gravity-fed bath for safe work on your edge tools.

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* SPECIAL thru FREE GREEN WHEEL Dec. 31, 1985 with purchase of 9820-2

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Hustling Wood (continued from page 5)

I made some very short rolling pins and called them "The Chuck Wagon Model". They sold after a while, but bowls and boxes made of the same thing sold more slowly. I think cottonwood is historic, the wood of the covered wagons on the great plains, the only source of fuel aside from buffalo chips, and the only shade anywhere in Kansas. If you cut off sticks for a fence, they sprout to a wall of cottonwoods. Just because buyers are not equally charmed is too bad, but I'll look for more cottonwood.

Plum is a wood I'd like to know better. The Santa Rosa tree I cut up was a reddish brown with some nice purple streaking and about as dense as a garden grown cherry. I've had good luck curing almond, but poor luck with peach and nectarine. Pear is a pleasant, stable wood, fine-grained and tractable, but not spectacular except when you find dead wood along one side or are lucky enough to catch spalted pear before the decay has gone too far. Apple can be a splendid wood with clouded mysterious figuring in the best pieces although the grain twists vertically and the trees are subject to borers. Mulberry is a prominently-grained rich yellow that tends to darken as the tree is exposed to light. All the citrus woods are fine-grained and light in color, very pleasant wood to turn, and I cannot distinguish between grapefruit and orange and lemon and kumquat, or I suspect, any of the other citrus I've not worked.

Avocado is wonderfully variable, light and stable, ranging in color from bland cream when newly cut, to a grey quite like laurel, to highly-figured greys almost to a dramatic black. Guava is a shrub, but you get pieces large enough to make attractive pink-gray knobs, dibbles and dowels. Apricot is patterned with orange-yellow-brown coloration, attractive to me and to customers who snatch it away. Twenty years ago I got some cherry from a Royal Anne tree cut fifty years before that and stored in a barn. It is delightful with all the rose and lavender and even green shadings I didn't know about at all. I think I am spoiled for ordinary cherry, but I'd like to see. Olive is another wood that differs from tree to tree. What I've had to turn is nondescript, but the common-enough burls could be interesting and I've seen pictures that make me want to try again.

I was bored with Oregon myrtle until a friend from Bandon brought half-a-dozen six-foot slabs and the color and patterning were outstanding. I made beautiful lazy Susans and zap, they were sold! We have old locusts around and I've sawed down a bunch. I cured some 6"-thick rounds two feet in diameter and they made spectacular chopping blocks. Old air-dried-on-the-vine locust can be extremely hard. I cut an 18" tree growing in a cienega that turned out to be about as tough as pine. Black willow is described as "a low density hardwood" and the few pieces I've had to work made good-looking bowls.

This inventory is a long way from being complete, but it will indicate the utility and beauty I've found in almost every tree I've come across. Making treen does not require exotic wood. It does take a lot of wood. I have a four-foot loading dock outside my shop door, and ten months ago I started shoving the sawdust over the edge instead of carting it away. I now have a mound level with the dock for three to four feet before it ramps

gently down to the yellow pine and eucalyptus logs awaiting attention. I've been putting in half a day playing with wood, and that's even more sawdust than I expected in the ordinary course of events. There are boxes and boxes of kindling of course, bark and ends and slices and mistakes and face plates.

How do I get all this wood? I think the most important one source in hustling wood is friends. I can saw my own apple and some oak and locust and others, but I'll get a phone call from Les Ecklund about pear, or Marty Sather about black acacia and incense cedar, or Dick White about white oak (what else?), or Woody Barnes about manzanita, or Dick Davis about ironwood from the desert, or Gerda Bennett about apricot. Friends are even more important than a chainsaw. No chainsaw ever gave me wood or told me a joke or bought me a drink.

About the theatre Noel Coward said, "Speak clearly and don't bump into people."

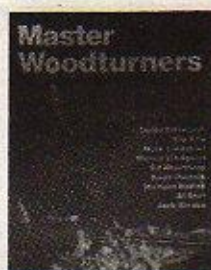
About writing Raymond Chandler advised, "Doublespace and leave an inch margin."

About racing at Indianapolis Bill Vukovich said, "Turn left and step on the gas."

About making treen, I can give equally valuable advice to put on a bumper sticker or tattoo on your heart: Get hold of some wood, crank up your lathe, and give it a whirl.

Besides turning wood in his shop in Santa Ysabel, California, Wallace Macfarlane is a published science fiction author.

MASTER WOODTURNERS by Dale Nish

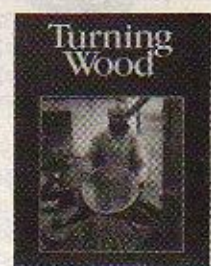


One of America's best known woodturners has brought together into one illustrated volume the skill and experience of nine of the world's leading master woodturners. This work makes a great contribution to the available pool of woodturning knowledge, with primary emphasis on bowl turning, and will prove invaluable to those wishing to expand their repertoire of skills and techniques. The book is definitely a "how-to" book, providing over 600 sequenced photos augmented by carefully detailed step-by-step instructions.

The work includes Rude Osolnik's laminated plywood bowls and free-form twig pots; Ed Moulthrop's custom turning tools and his methods for turning huge bowls; David Ellsworth on hollow turnings; Ray Key on platters and domed boxes; Mark Lindquist on turning burls; Melvin Lindquist on turning vases; Richard Raffan on green wood bowls and scoops; Al Stirt on fluting bowls; and Jack Straka on turning koa wood bowls.

The book concludes with an illustrated gallery of the master woodturners' latest work, including 16 pages in full color. \$17.95 plus \$2.50 shipping.

TURNING WOOD with Richard Raffan



Also a "how-to" book, this work presents turning fundamentals and advanced techniques in the clear, readable style to which we have grown accustomed in books from the Taunton Press. The author, a professional woodturner now working in Australia, provides a useful introduction to the lathe, its accessories, turning tools, and safety considerations, followed by detailed chapters on spindle turning and bowl turning. In-depth text is augmented by hundreds of captioned photos. A section of full-color illustrations of the author's work appears near the end. Useful appendices on selecting wood, troubleshooting, and making your own turning tool handles and a screw faceplate are also

included. The book caters to the beginning woodturner, but is certainly sophisticated enough to help advance the learner to an accomplished level of woodturning skill. \$17.95 plus \$2.50 shipping.

Lamello News

The Lamello Top assembly tool has earned itself another round of attention in this issue: lower prices, a new array of accessories and functions, and steadily increasing sales all indicate that the Lamello is coming of age in the American market.

During the first couple of years after we began selling the Lamello Top, most visitors and callers who expressed interest in the tool were curious about what it was, exactly - how it worked, and how it could possibly be a reasonable thing to spend a fair amount of change on. Recently, however, we seem to have reached a point of critical information mass on the machine; these days most prospective customers already have a pretty clear idea of what the tool is all about, and are usually just verifying its usefulness for their particular circumstances. In case anybody's managed to miss out on the enlightenment, here's a brief review of what the Lamello Top does.

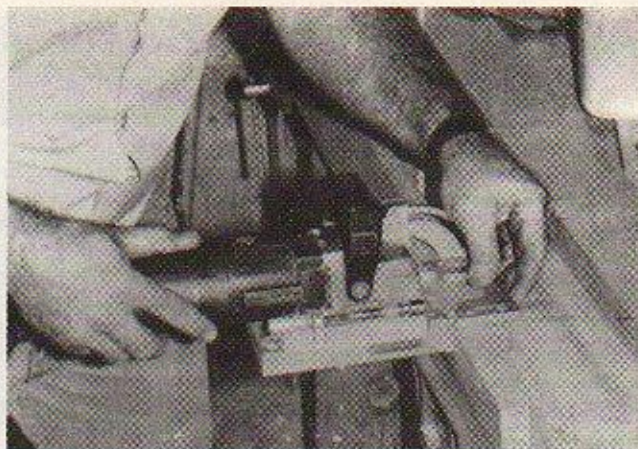
It's a remarkably simple tool for something so new and influential. Its basic components are a motor and a base within which the motor housing slides back and forth. A gearbox at the front end of the motor drives a 4" horizontal sawblade; as the motor is moved forward, the blade partially emerges from the front of the base. If the front end of the tool happens to be held against a piece of wood while this is being done, the blade will cut a shallow section of an arc in the wood. Take one of the manufacturer's die-cut elliptical splines and insert half its width in the cut, and you have effortlessly created the first half of a dado-and-spline joint. Do the same operation to another piece of wood, and you're prepared to put the two together with a strong joint that aligns their surfaces perfectly. That's not quite all there is to it, of course; so far we've described the principle of any of the plate joinery tools on the market, but there are one or two other features that make the Lamello outstandingly better than the rest.

The patented flip fence on the Lamello's business end is the one design feature the competition can't copy, and it's the single most important feature in terms of efficiency and ease of use. The fence is the jig that determines where you're going to cut the groove for a spline; when the fence is flipped down, it will align the blade parallel to the surface on which it rests, and it's marked to show the center of the cut, which allows you to easily follow your layout marks just as if you were dowelling the joint. This system makes edge-to-edge butt joints almost unimaginably easy. The plunge depth of the saw blade is purposely set a little greater than half the width of the spline, so the groove you cut is a little longer than absolutely necessary. This frees you from the need to position the machine with time-consuming care - if the center mark on the fence is within about 1/8" of your layout mark, the groove you cut will seat the spline properly. Preparing an 8 foot panel for solid edge-banding with as many as two splines per foot will take no more than a few seconds of casual layout and cutting, and when you glue up, the surfaces you fenced on will be dead flush along their full length. Excess groove length leaves room for about 1/4" of lengthwise movement in the joint, so if you need to get ends flush or line up some showy figure across the joint, you can do so with light taps from a mallet. Sounds pretty good, doesn't it?

Note that since the fence is permanently attached and pivots on firm mounts at the front of the Lamello, it provides a reliably accurate register and serves as a convenient hand-rest for steadying the tool and workpiece as well. This means that you don't have to spend time securing the workpiece and you don't have to have any specially prepared work area; just slap the work on any handy surface, pick up the Lamello and shoot.

Because the flip fence pivots from horizontal to vertical, you can set it to any angle you like when preparing other than 90 or 180 degree joints. Getting the angle right is easy, and requires no tools: once you've cut the workpiece as needed, use it to set the fence to the proper angle and you can't go wrong. Only if you need to spline acute angles will you ever need to make your own fence attachments.

That's the basics on the Lamello Top assembly system. There are surely a thousand other ways to use the tool, many of which are already standard procedure in many shops. Jigging up the tool and bringing the workpiece to it is often an effective method



for small-item production assembly. If the surfaces being joined are sufficiently wide and deep, enough splines can be stepped in end to end and side to side (with a small space between) to create an extremely strong joint, eliminating the need for more time-consuming joinery.

Recently Lamello introduced several accessory systems that further expand the machine's capabilities. There's the Simplex connector, which resembles a miniature aluminum bed-rail fastener in the shape of a Lamello no. 20 spline. Several of them in tandem would in fact serve as bed rail hardware, though their most convenient feature might be that they pull a joint together very tightly. For many assemblies, such as drawer backs, light boxes, etc., this self-clamping action might be all you need for glue-up - another real time-saver.

Then there's the Lamex knock-down assembly system, which uses the Lamello Top to install screw-tightened interlocking hardware similar in principle to the user-friendly stuff you find in House of Denmark furnishings and the like. If you've got a staple production item like a shelf unit, the Lamex system would make it possible for you to leave assembly to the customer and get on with building more shelf units.

The new Lamello Minispot patch system uses a custom-shaped blade to cut an elliptical groove (about 3/8" wide x 2-1/2" long) in a surface marred by resin gall, damage or check. Glue in a pre-shaped hardwood insert of the appropriate species and the defect is gone.

Productivity is what the Lamello Top is all about. The tool remains somewhat expensive, but every professional who's bought one from us has come back with enthusiastic reviews and what must surely be exaggerated claims of quick pay-back. We've heard from customers who refuse to let anybody see the tool for fear of giving away the secret of their success, and of others who won't tell their comrades where they got theirs. Not everybody's been quite so careful though, because as we mentioned earlier, the word has begun to spread that this tool merits a hard look from anybody doing a lot of woodworking. The new array of accessories will make the Lamello more useful than ever, and there will probably be more goodies to come. In the meantime, if you're in Atlanta do come by the store for a look, and if you can't visit, give us a call or write and we'll send you a detailed information packet at no charge. Reviewed by ZJE

The Lamello is available from us for \$525.00 postpaid. Lamello splines (1000 pack) are \$27.50 postpaid. Specify large (20), medium (10), or small (0).



A Plane for Chair Bottoms

c1985 by Michael Dunbar

The feature that is most responsible for the legendary comfort of Windsor chairs is the body-conforming contour of the seat, which is called saddling. Saddling a Windsor chair seat requires the removal of a lot of wood. This is most efficiently done using coarse tools that work quickly, but coarse tools leave a coarse surface. To smooth the surface left by the roughing and shaping tools (the gutter adz and the scorp) I use a wooden-bodied compass plane. This process is more completely described in my book *Make a Windsor Chair with Michael Dunbar*, published by the Taunton Press.

As with all wooden compass planes, the sole of the one I use has a convex curve from toe to heel (front to back). It also has a slight, convex curve from side to side. The heel-to-toe curve of the plane's sole enables it to work inside the entire saddled surface. The side-to-side curve allows the plane to take a heavy chip without choking. The tool I use in my own shop has an ebony body (Fig. 1). It was hand-made, probably during the mid-19th century, and is one of a kind. It came in a box of wooden planes I bought from an elderly boat builder who had worked locally.



I travel all over the country teaching Windsor chairmaking classes, averaging a total of 100 students per year. Since my plane is a hand-made antique, I do not expect my students to own one like it. As a result, I have in the past found it necessary to bring my ebony plane with me and allow each student to use it to finish his or her chair seat. This situation made me uncomfortable for two reasons: 1. The airlines might someday lose my tools, and 2. The additional use will eventually wear out my ebony plane.

A couple of years ago, a student in California brought a Highland Hardware catalog to class and showed me their wooden Japanese compass planes, asking if I recommended them. At the time, I was unfamiliar with the tool, and was unfamiliar with Highland Hardware. When I returned home from that trip I decided to order a plane, thinking that if it were satisfactory, I would take it with me instead of the ebony plane when I traveled. I did not have a Highland Hardware catalog, and from past experiences with mail order companies, knew that it would be very difficult to order a tool without a stock number. However, I was pleasantly surprised with the friendliness and helpfulness of the person at the other end of the line. From my description she recognized the tool, and within a week it arrived at my house.

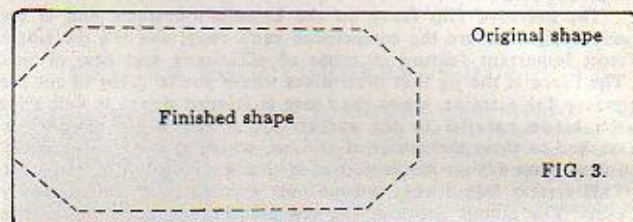
The plane I received needed some modifications to make it work on Windsor chair seats, but I was so satisfied with the finished tool that today, my Japanese

compass plane is the one I take on the road with me. It has been used by many students and is still as good as when I first modified it. This is how to convert one of these planes for making Windsor chair seats.

First, order your plane from Highland Hardware. Their catalog refers to it as a "scooping out plane". Its stock number is 03.64.07 (\$29.00 plus \$2.50 shipping). When it arrives, begin by removing the iron. Do this by rapping the sole with a wooden mallet or a broad-faced hammer, such as my cobbler's hammer.



The Japanese compass plane, like most Oriental woodworking planes, is designed to be pulled rather than pushed. As a result, the plane's toe is longer than is typical of American and European planes (Fig. 2). The length of the toe makes the plane's body too long for my purposes (smoothing the saddling of a Windsor chair seat). Also, I prefer to push the plane, feeling that I have more control if I can place the weight of my shoulders above the plane.



The first step was to reduce the overall length of the stock (the plane's wooden body) by trimming the toe. To see how much should be trimmed, compare the tracings of the original stock with tracings of its modified shape (Fig. 3). Use a square to lay out the new length and cut off the waste with a fine-toothed (about 12 points) back saw (Figs. 4 and 5).

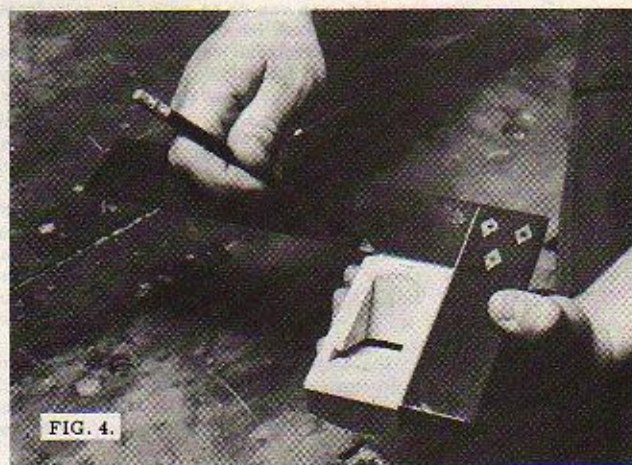




FIG. 5.

As received, the Japanese plane is wider than my ebony plane. I made it narrower by planing the sides. Clamp a jointer plane in a vise with the sole placed upward, in effect creating a poor man's jointer. This technique is much safer for trimming or squaring small pieces. I laid the Japanese plane on one cheek (a cheek is the side of the plane) and pushed it over the mouth of the jointer. This method allowed me to trim the cheeks in a very controlled manner, one shaving at a time (Fig. 6). I trimmed the cheeks until they were about 1/4" thick.



FIG. 6.

If you trim the corners of the stock it will be easier to hold the plane and it will be less likely to raise blisters. Lay a mitre square on the cheek and trace a line at 45° to the corner. Do this on each corner. Cut the corners with a dovetail saw (Fig. 7). Clean up with sandpaper.



FIG. 7.

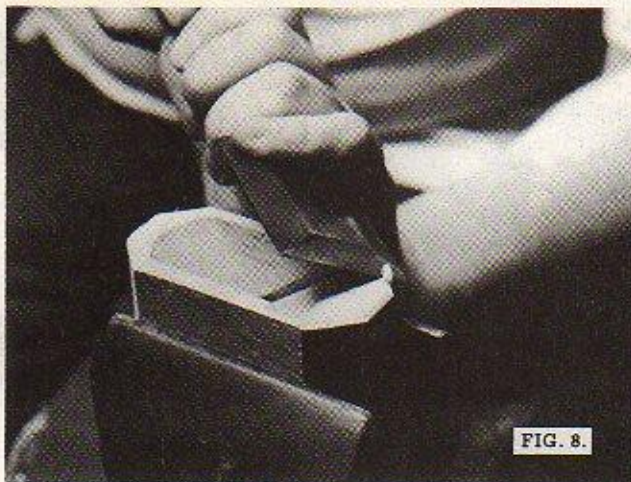


FIG. 8.

The plane's body still has sharp edges around its upper outline. The tool will look nicer and will be more comfortable to use if you break this arris by chamfering the edges with a bench chisel (Fig. 8).

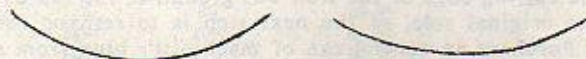


FIG. 9. Original curve

Finished curve

The side-to-side curve of the plane's sole is too pronounced to clean up the seat's saddling. If used as received, it leaves a corrugated surface, like that made by a scrub plane. I reduced the amount of side-to-side curve. This is done by increasing the sole's radius. You can see how much by comparing the tracings (Fig. 9). To accomplish this modification, I clamped the compass plane in a vise with its sole placed upward. I used a wooden spoke shave to alter the sole (Fig. 10). The one I am using in the photos is itself a copy of the spoke shave shown in my book. It, too, is available from Highland Hardware, stock number 03.78.01 (\$24.50 plus \$2.50 shipping).



FIG. 10.

Start at the mouth and work towards the toe. Reduce the height of the center of the curve, and then smooth the two ridges that this creates. Do the same in front of the mouth, working the spoke shave from the mouth

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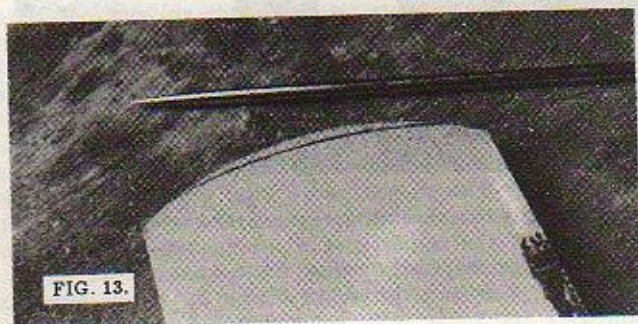
A Plane for Chair Bottoms

(continued from page 9)



towards the toe. Clean up the entire sole with a cabinet scraper (Fig. 11). If you had any difficulties making the curve uniform, you can make final corrections with sandpaper. Wrap the paper around a sanding block.

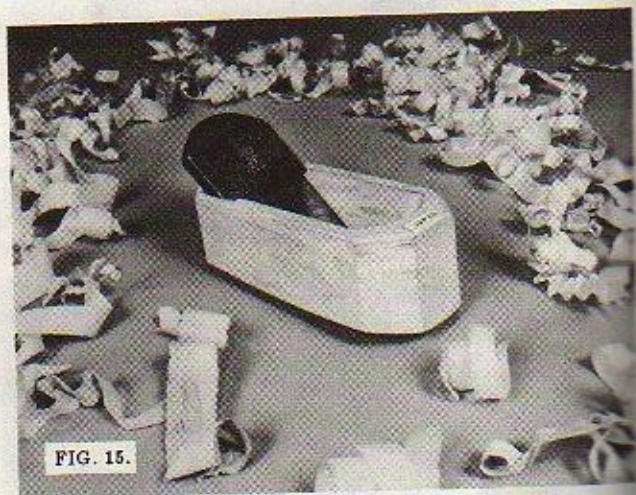
The cutting edge of the iron was ground to the radius of the original sole, so the next step is to reshape the iron. Purchase an aerosol can of machinist's blue from a machinist supply house. Spray the blue on the iron's upper surface. It will dry in seconds and can be easily removed. (Spray paint will also work if you are willing to wait a little longer for it to dry.) Place the iron in the plane and tap the back end to set it in place. Use a sewing needle to trace the sole's new contour in the blue (Fig. 12).



When the iron is removed, the line scratched in the blue shows you the exact shape of the new contour (Fig. 13). Grind to this line, quenching often, so that heat generated by grinding does not draw the temper. Next, grind a new bevel. Return the iron to the plane and test the fit of the cutting edge to the sole. If it is not perfect, make the necessary adjustments on the grindstone. When you are satisfied with the fit, hone to a razor edge.



When you test your new plane, hold it by cradling it between your two hands (Fig. 14). I have small hands and can hold it without covering the mouth. If your hands are larger and cover the mouth, the shavings will not eject and you will have to periodically clean out the throat. If you do this often enough, the plane will not choke and the shavings can be removed by simply turning the plane over and shaking them out (Fig. 15).



For a description of the actual use of the plane and the other tools used in saddling chair bottoms, I refer you to pages 14-23 of my book.

Editor's note: Dunbar's book Make a Windsor Chair with Michael Dunbar is available from Highland Hardware for \$13.95 plus \$2.50 shipping.

Makita Tool Sale through Oct. 15, 1985

A recent special purchase from Makita enables us to offer for a limited time unprecedented low prices on most of our line of Makita tools. The prices listed below include freight prepaid delivery within the 48 adjacent United States. For fastest service, telephone your order by calling toll free (800) 241-6748. Order now, as this special offer ends October 15, 1985.

ITEM	DESCRIPTION	MAKITA LIST	OUR REGULAR	SPECIAL SALE
SHARPENER				
9820-2	Blade Sharpener	228	195	Free Green Wheel (\$35.00 value)
PLANERS				
1100	3-1/4" HD Hand Planer with case	278	199	179.00
1805B	6" HD Hand Planer with wood case	416	299	269.00
1900B	3-1/4" Hand Planer with case	154	110	99.95
2020	8" Longbed Jointer with stand	1700	1195	1095.00
2030	12" Planer and 6" Jointer	1980	1499	1295.00
2030N	NEW 12-1/2" Planer and 6" Jointer	2160	1699	1499.00
2040	15-5/8" Thickness Planer	1780	1299	1195.00
SAWS				
LS1400	14" Deluxe Miter Saw	568	439	399.00
2708	8" Contractor's Table Saw	336	249	229.00
4301BV	Orbital Var. Speed Jig Saw	208	149	135.00
JG1600	Single Speed Jig Saw	138	99	89.95
JV1600	Variable Speed Jig Saw	145	105	89.95
4300DW	NEW Cordless Jig Saw	158	119	99.95
4200N	4-3/8" Circular Saw	152	110	99.95
5007NB	7-1/4" Circular Saw	158	115	99.95
5008NB	8-1/4" Circular Saw	178	129	115.00
5201N-A	10" Circular Saw	348	265	229.00
5402A	16" Circular Saw	468	360	329.00
5081DW	Cordless 3" Circular Saw	165	119	108.00
JR3000V	Var. Sp. Recipro Saw with case	178	129	115.00
ROUTERS				
3600BR	2 HP Plunge Router	284	189	149.00
3612BR	3 HP Deluxe Plunge Router	286	199	Free 3 pc. Guideset (\$24.50 value)
3601B	1-3/8 HP Router	196	139	125.00
3608B	3/4 HP Router	125	79	69.95
3700B	Laminate Trimmer	124	89.95	79.95
DRILLS				
DP3720	3/8" Var. Sp. Rev. Drill	88	59.95	49.95
DP4700	1/2" Var. Sp. Rev. Drill	154	119	99.95
6013BR	1/2" Contractor's Rev. Drill	174	129	115.00
6510LVR	3/8" HD Var. Sp. Rev. Drill	114	89	79.95
HP1030	3/8" Var. Sp. Rev. Hammer Drill	145	105	89.95
DA3000	3/8" Angle Drill	158	119	105.00
DK1001	Cordless 3/8" Drill w/ Vacuum	178	129	99.95
6010DWK	Cordless 3/8" Drill	152	109	95.00
6010DL	Cordless 3/8" Drill w/ Light	162	119	105.00
6010SDW	NEW Cordless 3/8" Drill	82	59.95	49.95
6002DWK	NEW Cordless 3/8" 2 speed Drill	154	119	99.95
6012HDW	Cordless 3/8" HD 2 sp. Drill	178	135	119.00
SCREWGUNS				
6800DBV	Drywall Screwdriver 0-2500rpm	133	99	89.95
6801DBV	Drywall Screwdriver 0-4000rpm	133	99	89.95
6802BV	Teks Rev. Screwdriver 0-2500rpm	168	119	99.95
6710DW	Cordless Screwdriver	155	112	105.00
SANDERS & GRINDERS				
BO4510	4" Block Finishing Sander	79	49.95	44.95
BO4530	4" Fin. Sander (rnd. stick-on paper)	84	59	52.95
9045B	9" Finishing Sander	156	109	99.95
9045N	9" Dustless Finishing Sander	170	125	109.00
9030	1-1/8"x 21" Belt Sander	185	135	119.00
9900B	3"x 21" Belt Sander	198	139	125.00
9924DB	3"x 24" Belt Sander	214	159	139.00
9401	4"x 24" Belt Sander	279	199	179.00
GV5000	5" Disc Sander	79	59	49.95
9501BKIT	4" Sander-Grinder Kit	119	89	79.95
9218SB	7" Disc Sander	165	119	105.00
9207SPB	7" Sander-Polisher	194	149	129.00

Japanese Woodworkers

©1985 by Tom Frazer

Writer's note: The first Japanese craftsman I ever saw was Toshio Odate. That was a few years ago at a seminar at Highland Hardware. My interest in Japanese tools was new at the time, but sufficiently strong to persuade me to drive from New Orleans to attend Odate's seminar in Atlanta. I was not disappointed. In fact, I became fascinated with Japanese tools and the Japanese attitude towards woodworking. At the time, little did I imagine I would ever travel to Japan and meet such masters as Tetsunosuke Miyano the sawmaker, Chiyozura Sadahide the plane maker, and Ouchi Mitsuaki, the chisel maker.

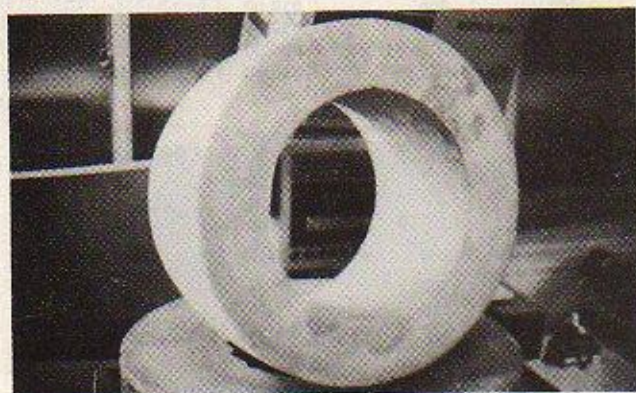
In Kyoto, Japan, a few supreme artisans such as woodworker Isaburo Wada still ply their craft in a timeless tempo known as "Kyoto time".

For more than a thousand years, Kyoto was the capital of Japan. As such, her rulers attracted the most skilled artisans, and slowly, over the centuries, the city became a repository of the highest expression of artistic endeavor.

By good fortune, I was invited to Japan last fall by that country's Ministry of Foreign Affairs and was able to meet Wada and other Japanese woodworkers, as well as most of the master toolmakers of Miki City.

And indirectly from Wada, I learned the meaning of "Kyoto time". It went like this:

Wada is the sixth generation head of Enami Co., Ltd., a company that has specialized in textiles and traditional Kyoto joinery for 200 years. It is the oldest Kyoto joinery firm still in business. As he showed me through his multi-story workshop, a large, donut-shaped piece of wood caught my eye, and I asked Wada what it was.



"It's going to be a traditional *hibachi*," answered Wada. Then glancing at his homemade lathe, he commented, "I could have turned it on that machine in five minutes, but I wanted to shape the wood the old-fashioned way, by hand planing. But you must shave off only a small amount at a time. Otherwise, the wood will crack."

"How long have you been working on it?" I asked in all innocence.

"Ten years," responded Wada. "And the wood was aged ten years before I began work."

Wada, official boxmaker to the Emperor, thus knows how to work according to "Kyoto time", a timeless time in which an artist works to utter perfection, his attitude uncluttered by any other earthly consideration.

But don't imagine that Wada is simply a cobwebby throwback to yesteryear. He is a tireless experimenter, and uses everything from outdoor weathering to chemicals and a kiln to stabilize the shape and color of wood. Although he has achieved 20-year stabilization, Wada nevertheless is dis-satisfied and says he is trying to do even better.



He is particularly proud of an elaborate wood lathe he designed and constructed of aluminum, welding it himself. The lathe is used chiefly for making wooden bowls, and because Wada wanted to make it easier for apprentices to duplicate a given shape, he designed his own screw-feed bit arrangement, very similar to that of a metalworking lathe. Instead of employing a hand-held turning tool, an apprentice can turn handscrews to feed the cutting bit.

But Wada's crowning achievement with his lathe is his own novel design which permits the workpiece to be held onto the chuck by vacuum supplied by an electric air pump. Without screws or chuck jaws, Wada pointed out, the wood cannot possibly be damaged.

Without doubt, Wada's dogged pursuit of artistic achievement resulted in his being designated a *kyo-sashimono*, or traditional craft joiner, by the Japanese government in 1977. Three years earlier, Wada made 36 boxes for the Ise Shrine, the holiest shrine of Japan's native Shinto religion. (Showing a spirit remarkably different from the builders of the pyramids, officials responsible for the Ise Shrine order the sacred wooden complex torn down and painstakingly rebuilt at 20 year intervals.)

Wada and his ten apprentices specialize in handcrafting exquisite small-to-medium sized objects of wood, such as intricate boxes, bowls, screens, trays, lamps, inkstone containers, spoons, tables, chests and shelves.

Wada and his craftsmen use some 35 varieties of hardwood and softwood, although he said about sixty percent of what he uses is *paulownia*. He described it as "the lightest and softest wood in Japan."

Years ago, Wada said, *paulownia* was exported to the United States where it was planted as a shade tree. But since no one used it for any other purpose, he said, the Japanese are now importing it back to Japan. "It has a cell structure similar to grass and only grows a maximum of about eighty years, like a human being," said Wada. "When it reaches forty to sixty years, that is the best time to take the tree - also the best age for a craftsman to produce his best work," said Wada.

The *kyo-sashimono* is so determined to preserve traditions that his workshop still can turn out an incredible 7500 different wooden objects of traditional Kyoto design. In many cases, the objects are made in exactly the same manner that craftsmen made them 1000 years ago. Sometimes, over the centuries, the designs evolved minutely. For instance, items made for the Ise Shrine included a box-like container crafted from peeled willow switches to hold cups and slippers. According to Wada, the original containers were tied together with strips of willow bark. Now he uses silk thread to copy the newer, current design.

Although Wada employs the use of some power tools, traditional Japanese hand tools account for the bulk of his shop's craftsmanship. His company possesses a collection of some 45,000 hand tools, among them planes between 200 and 400 years old.

Wada's apprentices sit at the lower end of slanted, thick cherry planks that serve as workbenches. Only a small wooden stop set into the plank at the apprentice's end adorns the workbenches. Traditionally, said Wada, craftsmen sat on cushions on the floor and bent over their work. But because bending for long periods can hurt the back, Wada has arranged for the workbenches to be elevated and his apprentices now sit on low stools.



For himself, Wada reserves a small room for his private workshop. He sits on a cushion and works under a solitary hanging lamp. On the *tatami* mat within easy reach are a variety of marking gauges, chisels, saws and planes. More saws and planes rest in wall racks.

For an interested visitor, Wada will pluck several ancient tools from their special places and display them reverently. He explains that the small saw and the worn chisel were made from very special blue steels, which enable them to hold their sharpened cutting edges longer than the tools available today. Wada, a traditionalist, treasures their exquisite quality.



Another premier Kyoto woodworker is Kenkichi Kuroda, the teacher mentioned by Charles Roche, his former student who wrote about Japanese lacquer in the March '85 issue of *Fine Woodworking*. Thanks to

Howard Lazzarini, another former student, I was able to meet Kuroda, who specializes in lacquered wooden trays.

Lazzarini, both guide and translator, explained that Kuroda is unusual in Japan because he both crafts the trays and applies the lacquer. Normally, he said, craftsmen concentrate on either one or the other.

A lacquered tray measuring roughly 12 by 18 inches requires an "absolute minimum" of a month and a half to complete, said Lazzarini, adding that prices run in the vicinity of \$500 to \$600.

Incidentally, Lazzarini recalled that during the first three months of his apprenticeship, he was restricted to sharpening tools. "Regular" Japanese apprentices, he said, begin by sharpening tools for six months before being allowed to move forward. During this time, Lazzarini said, he also made his own tiny finger planes, shaping the metal blades as well as the wooden bodies.

Kuroda often uses an elm-like wood called *zelkova* with a very pronounced grain pattern. Moreover, he clearly is a "wood freak" equal to any of us. In one room of his house he proudly shows off huge, thick planks of a wood that translates as "horse chestnut". It is shot through with a highly-figured, burl-like pattern. Looking fondly at his precious wood, he joked with a smile, "My friends say they are anxious for me to die."

Kuroda, according to Lazzarini, is a philosopher (or philosophizer) when it comes to wood. "He feels that there is a proper way to use wood. And wood from a 500- or 600-year-old tree should be used in a special way."

Speaking for himself, Kuroda said, "In today's Japanese society, it is important to have automated things. Japan is concerned with fads, and right now, handicraft is 'in'. But Kuroda warned, "That is not a good way to approach wood. It is better to really work with your soul - not because it is a fad."

Lazzarini recalled that during his apprenticeship, Kuroda "told us to treat wood with reverence. He told us that good pieces are rare." Furthermore, Kuroda rejects the idea that human beings are somehow "above" things such as wood, Lazzarini said. "Kuroda holds that wood also has a spirit and that people should treat wood with the same respect that they treat other people."

The lacquer traditionally used by Japanese craftsmen, incidentally, doesn't come from a can. It comes as thick brown sap from the *Urushi* tree, and frequently produces a rash like that caused by poison sumac. After someone works with the sap for some time, he generally becomes immune to it. But Kuroda said that even after years of using lacquer, he sometimes gets a rash on soft portions of skin, such as between his fingers and behind his ears.

One of Kuroda's prize possessions is a lacquer brush given to him by his late father, one of Japan's elite "Human National Treasures". The brush is 300 years old and is made from human hair. Kuroda confides that many Japanese lacquer craftsmen believe the best brush hair comes from fishermen. "But some argue for women's hair", he added. Japanese craftsmen seem to cherish such small points.

When I told Lazzarini that I found ripping with a Japanese-style saw awkward because of the shape of the teeth, he responded that Kuroda takes both his saw and the wood he intends to cut to a sharpener, and instructs him to sharpen the teeth appropriately for that particular type of wood!

The author is a newspaper writer and amateur woodworker from Metairie, Louisiana.

Systematic Tool Storage

©1986 by Fred Kachelhofer

"Making storage cabinets, jigs, and tools greatly adds to your system and is very rewarding. No one can develop your system for you. It is something you have to do for yourself".

(Quoted from Thoughts on a Working System by Mark Duginske, Wood News 15, Spring 1985.)

It's too bad that Mr. Duginske and I didn't meet about 20 years ago. That's about how long I have been working on my "system". I have made, changed, remade and changed again just about everything in my shop until I have practically worn it out. I'm now getting close to a system that I like, and have cut down dramatically on the number of footsteps required to locate a particular tool for a job.

Looking back on the way my shop has developed takes me to the time when I was a small boy. My father had a fairly extensive shop, and I was allowed to use any tool (except the power tools until I grew older) and make anything that I wanted as long as I followed two rules. The first was that everything had to be put back in its place and second, everything had to be clean when I left. There wasn't any "I'll do it tomorrow." It was clean when I left. Mother tells me that Daddy inherited this himself. My grandfather was a master machinist and he always had his tools and equipment in perfect order.

When I left home, I started out with a few basic hand tools which my father had given me. The hand-made tool box made by Father was enough for me to store all that I had, and it was simple enough to find what I needed. The tool box was made of one piece of metal with the corners welded together and a rain lip between the sides and top so that falling water could not get inside. It also had small sliding lift-out trays so it would be easier to get things from the bottom. I still have this tool box and it is one of my prized possessions.

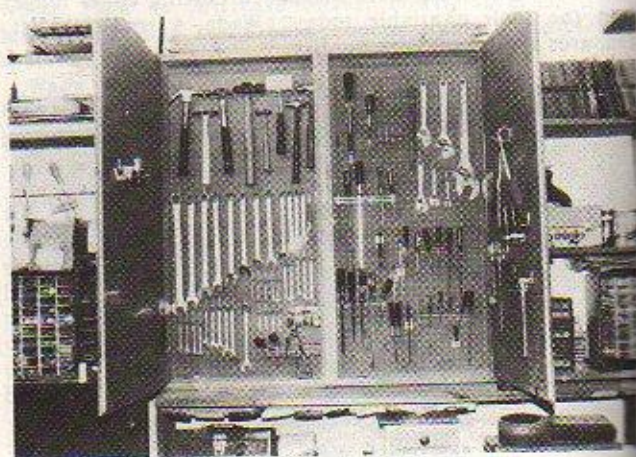
As I accumulated more tools, I felt an inner compulsion to have everything in a place so that I could find it without having to hunt. Right after getting my radial arm saw, I built a bench that would hold the saw and give me some storage room. This first bench was from plans in the Craftsman radial saw book which gave all the dimensions and views for me to follow. There was a set of drawers on the righthand side with a cabinet on the left. Across the back of the bench was a set of shelves with sliding doors to keep out the dust. I still have this work bench/saw table, and have recently modified it so it has all drawers instead of the cabinet on the left side. (The cabinet sufficed for a while, but it allowed too many things to be jumbled up and stacked on top of one another.)

After building the radial arm saw unit, I added a wall cabinet with pegboard inside and on the doors, giving me lots of area to hang things. This proved to be okay, but since it was about 10 inches deep and hung out over the workbench too far, it was always getting in the way of my working area. I recently gave it away, and now simply have pegboard mounted against the wall for hanging the tools that I use the most. I added a rail across the bottom similar to the ones on a chalk board, providing a place to put small tools and such in order to keep them off the workbench and out of the way.

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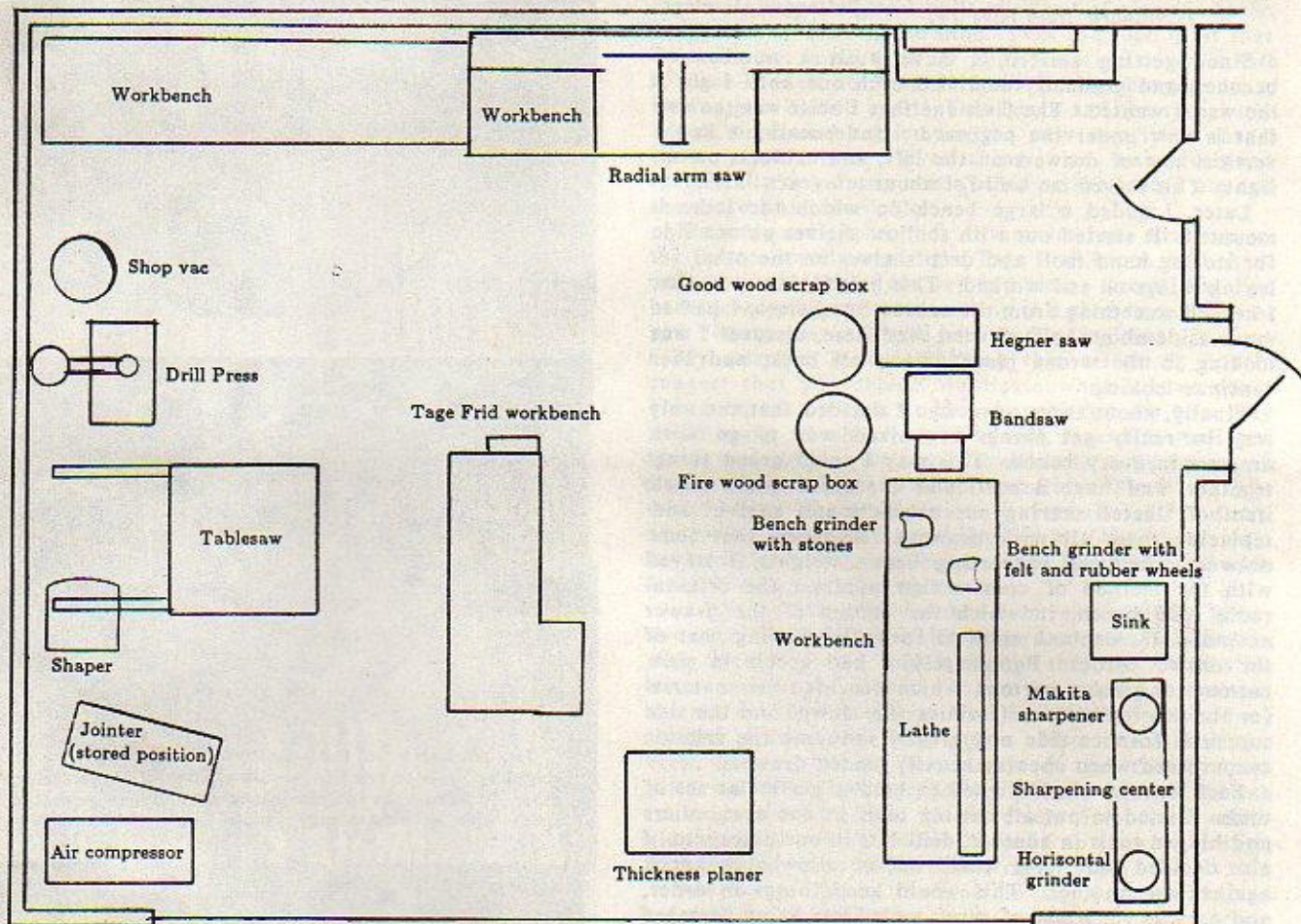


A long convenient work surface shown in the two photos above is enhanced by the close proximity of many of the most frequently used tools on pegboard and in drawers. The radial arm saw is built directly into the bench (above). Tools used for assembly are kept together in the pegboard cabinet illustrated below.



highland hardware

SHOP LAYOUT



Lumber and plywood are stored in two outdoor sheds.



Power tools are always within easy reach as they nestle in convenient space left open in front of these large storage drawers (above). Note the strategically placed electrical outlets.



This roll-around cabinet features pockets on either side for safe storage of handsaws. It includes a file drawer for ready access to shop paperwork, machine instruction manuals, etc.

Systematic Tool Storage

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Since getting started, I have built a number of benches, and gradually modified each one until I got it the way I wanted. The first one that I built was the one that is now under the pegboard. Underneath, it had a vertical row of drawers on the left, and cabinets on the right. This served me well for about ten years.

Later, I added a large bench on which the lathe is mounted. It started out with shallow shelves on one side for storing hand tools and deep shelves on the other for laying things on as I worked. This helped, but everytime I needed something from the cabinet or shelves, I had to move aside about half of what was there, discover I was looking in the wrong place, put it all back, and then continue looking.

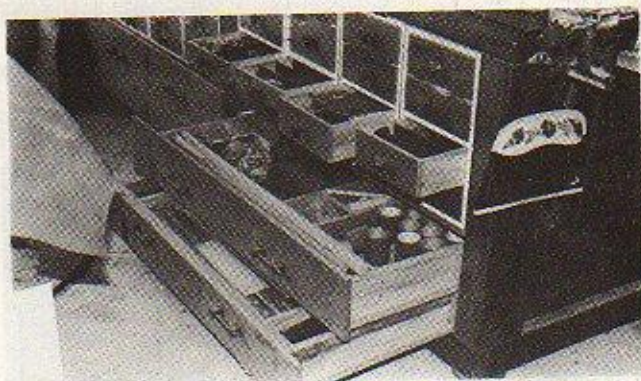
Finally, about three years ago I decided that the only way to really get things organized was to go with drawers in every bench. This way I could group things together, and have a particular place for every single item. I started tearing out cabinets and shelves and replacing them all with drawers. Knowing that some drawers would be supporting heavy weights, I stayed with the method of construction used on the original radial saw bench, in which the bottom of the drawer extended out on both sides to form the moving part of the drawer slides. Fortunately, I had access to sink cut-outs and scrap bartops, which provided the material for the drawer bottoms (formica side up), greatly reducing the friction encountered when opening heavily loaded drawers.

Each drawer was designed to hold a particular set of tools. I tried to put all cutting tools in one area, pliers and hinged tools in another, drill bits in one place, etc. I also decided that tools would not be allowed to knock against one another. This would keep things in order, and prevent the edges of sharp tools from being damaged by other tools. Now when I see an empty space, I know that a tool is missing and I'll search around until I find it.

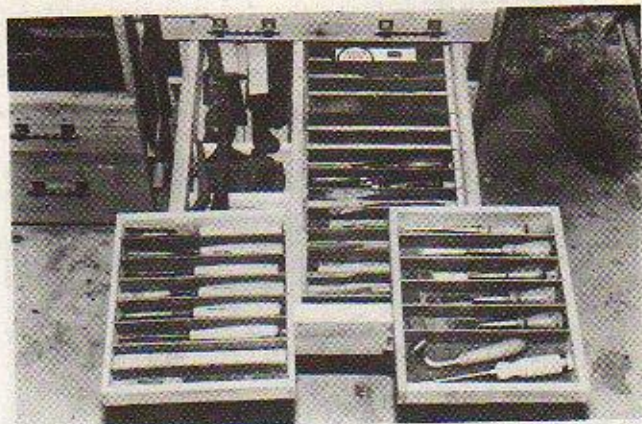
As I was devising some of the drawers and the way they would stack together to provide maximum storage, I began to feel a little like Maxwell Smart. My wife thought I was crazy as I searched for scrap and laboriously cut and fit and drilled it so that everything went together. Now, however, she likes what I did because she can easily find things by herself. My guiding principle is that a tool is really an extension of the hand, and the benefit of owning a tool is lost if it can't quickly be found when needed.

Additional refinements to the shop included enclosing the space beneath the tablesaw and jointer so I could confine sawdust and shavings in order to make clean-up easier. Also, putting everything on wheels has made it easy to move the machines around the shop as needed. In the case of the jointer, I designed the wheels so they don't touch the floor when the tool is being used. However, when the handles are lifted to move the machine, the upward motion rocks the stand onto its wheels and it can be moved much like rolling a wheelbarrow.

The other workbench that I felt was needed and would get maximum use was the European-style bench which uses vises and dogs. I chose to build the one designed by Tage Frid which was featured in issue 1 of *Fine*

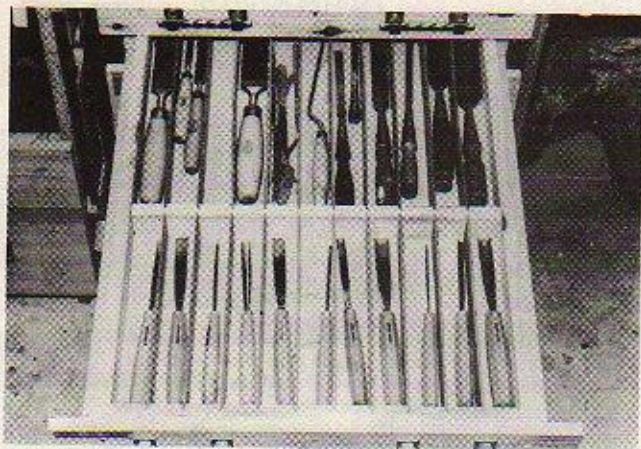


The bench on which the lathe is mounted (above) contains shelves on one side, and 44 subdivided drawers on the other. A door on the end provides access to otherwise wasted space inside, allowing storage of pipes, long outdoor tools, etc.

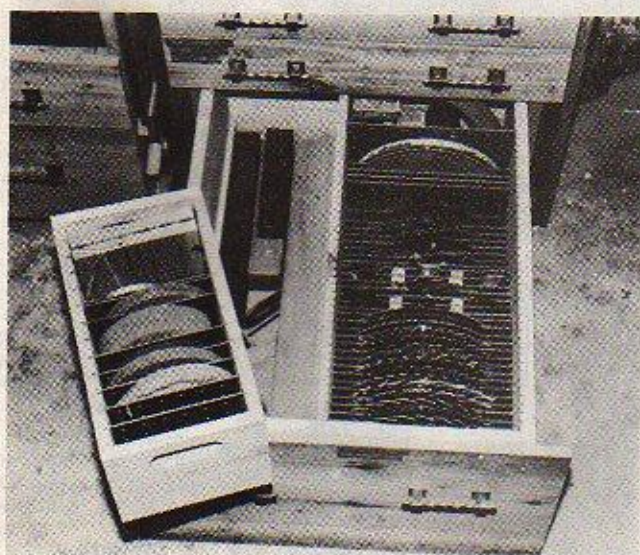


Removable trays permit additional storage space in some of the shop's drawers (above). Below, note the construction method used in drawers meant to handle heavy loads.





Drawers are compartmentalized and fitted for specific types of tools. Above, long narrow slots accommodate carving tools and chisels. Below, the base of the drawer has been bored to hold every kind of drill bit. At bottom, a deep drawer provides easy selection of sawblades and grinding stones.



Woodworking. I had no maple to use as the bill of materials suggested, so I built mine out of cherry. It has been a major asset to the shop. I am so proud of it that when it's not being used for joinery work, I cover it with a piece of felt to keep it from getting banged up or having glue spilled on it. This bench and the radial saw bench mentioned earlier are the only two items that I built from plans. Everything else was designed specifically to suit my needs based on the tools I use and the space I had available.

The only two items that do not yet have drawers are the Hegner scrollsaw and the Tage Frid bench, and that's only because I have not yet had time. Recall that I've been developing and constructing this shop layout for the past twenty years. What's been done takes time.

My purpose in contributing this article is not to suggest that you should duplicate what I have done. However, take a look at the pictures and see how they could apply to what you have with regard to tools and space, and imagine what you could do to make your work in the shop easier and less frustrating. These are just some ideas. Don't hesitate to venture out and try something that you think might work. Over the years I have tinkered with my design until I have achieved what I think works best for me (so far).

Notice in the pictures that I have a shelf in every available space on the wall. There are even some shelves over the garage door which, though they are inaccessible unless the door is closed, are fine for storing things that are not needed very often. This has greatly increased my limited amount of storage space. Also notice there are racks to hang all my glue clamps so that they are not piled up. Each one is readily available without having to move others. This is extremely important while glue-up is in progress when there is no time to struggle with digging out a clamp of the right length.

One thing that is foremost in my woodworking is safety. It is something that is much talked about, though rarely practiced. I feel that safety begins with a clean shop where tools are kept sharp and properly stored so things don't get stumbled over or fall into running equipment. Notice in the photos that a pair of ear protectors stay on the radial arm saw so they are easily accessible when I am running any piece of equipment. Notice there are several brooms around the shop. I sweep the floor frequently so that I do not run the risk of turning an ankle or have my feet slide out from under me. (My wife thinks I do this just to keep the sawdust out of the house). I also find it hard to do fine, detailed work when I am in a messy area. Quite frequently I sweep the floor, vacuum up all that I can, then open the garage door and take the leaf blower to the shop to blow out most of what is left. I usually go over the area several times and while it still doesn't get all the dust out, it's sure better than when I started. I can then settle back for some serious work.

I also don't like extension cords all over the shop. I've installed electrical outlets around the walls and also mounted them in front of each workbench so there is a convenient place to plug in portable power tools. I also have three electrical cord reels that can be pulled out and retracted so that only the length I actually need is used. One of these is mounted on the wall and the other two are on the ceiling directly over one of the

(continued on next page)

Systematic Tool Storage

(continued from page 17)

workbenches. In this way I can have one for drilling pilot holes and the other for driving screws with a screw gun. The layout of the electrical outlets is as important to me as the design of the rest of the shop.

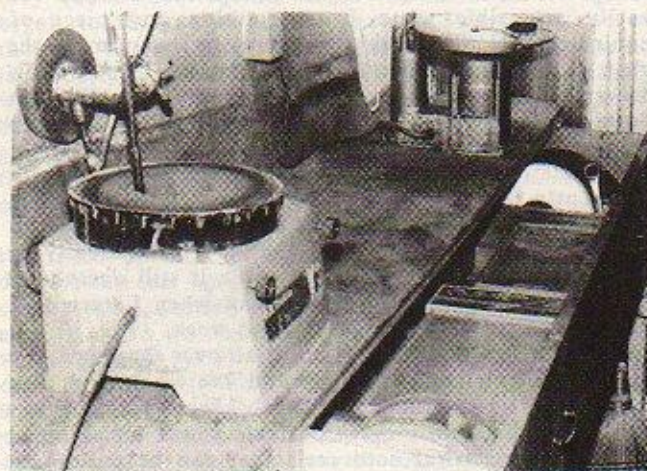
Somewhere I need to make the confession that I like tools, and that I usually try to have whatever is needed to do a good job without having to improvise too much. I had to do enough of the Rube Goldberg approach when I first started. Now I try to have the correct tool. This results not only in a better job, but a safer one as well. Some people accuse me of being a tool freak. Well, perhaps I am, but I do know how to use what I have and I insist on taking good care of them. I feel that the tools that I buy are a lifetime investment, and should one day be heirlooms for my grandchildren.

If you have not read the article by Mr. Duginske, then I suggest you go back and find the article and read it carefully. If you have read it already, go back and read it again. This type of article may need to be read several times to get the full impact of his message. I find that I went through many of the stages that he describes while trying to find for myself what I really wanted to do with my shop and in my work.

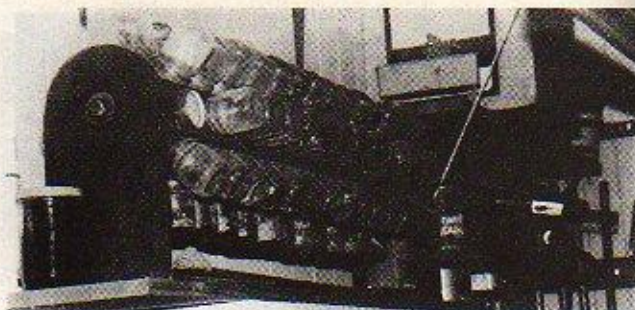
Some people say "I wish that I had a shop like yours". But what do they do the next weekend? They go fishing, play golf, or just watch TV. This reminds me of a saying of a fellow I used to work with. His comment when people were undecided was "You have to really have a case of the 'wants'." Most people want something, but they don't really want to work for it. The odd thing is that if most of them were handed an ideal shop, they would probably be too lazy to use it!

I would like to quote Mr. Duginske one last time. In his article he said "Ideas and concepts are seeds". I hope that this article and these pictures may have planted a few more seeds that can help your shop grow and develop into a place for doing satisfying work.

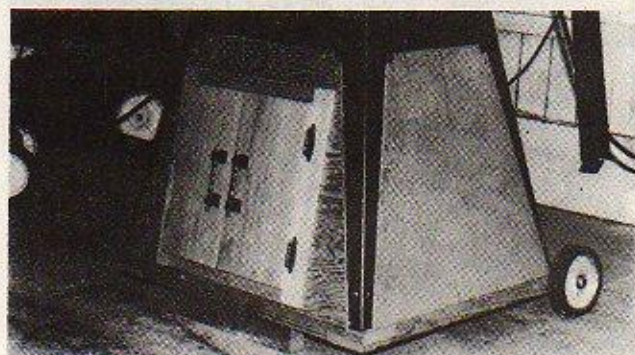
Besides being a woodworker, Fred Kachelhofer is Power Superintendent for Owens-Illinois in Valdosta, Georgia.



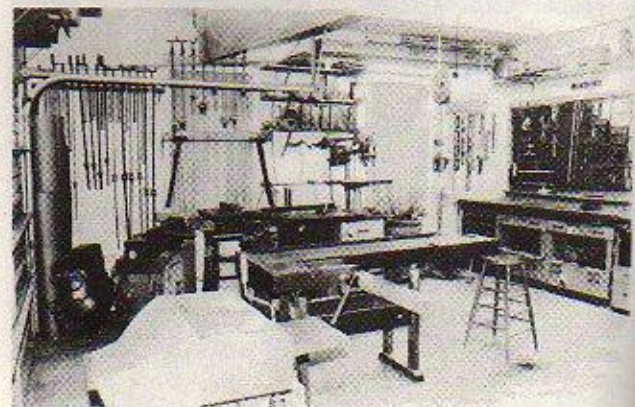
The author's Makita 9820-2 sharpener is plumbed directly into a water supply. In the background, a West German horizontal grinder with slotted wheel permits the user to actually view the edge as it is being ground. Grinding wheels are stored in the drawer, as are hand waterstones, which are maintained wet in plastic containers.



Room for over a hundred different fasteners is created by the 3 foot long revolving bottle rack pictured above. Below, drawers like this one store larger quantities of fasteners, such as nails and commonly used screw sizes.



The table saw stand (above) as well as the jointer stand are fully enclosed to confine sawdust. A pair of wheels permits the saw to be tipped up like a wheel barrow and easily repositioned in the shop. Below, long clamps are stored along the wall for quick and easy access.



FINISHING

Ask George Frank . . .



What is the difference between potassium bichromate and potassium dichromate, and what is the right solution to use?

There's no difference between the two. Two names, same product. I dissolve 100 grams of it in one liter of water, and keep this as my base solution (very concentrated). As various jobs require, I further cut this solution, always keeping a record as I go.

Potassium dichromate is a chemical mordant which can be used with natural dyes to produce remarkable color changes in a range from yellowish to dark chocolate brown. For a full description of its use, see chapter 2 of my book *Adventures in Wood Finishing*.

I live in Juneau, Alaska, and for love or money I cannot buy here colored wax-sticks for filling up small holes and defects in wood. Could I possibly make such wax-sticks?

They are quite simple to make. Melt in a double boiler equal amounts of beeswax and paraffin wax. Color this with the proper dry colors (earth colors) to match the color of the wood you want to fill. Mix this together well, and add to the mixture one drop of boiled linseed oil for every ounce of wax. You can form small paper tubes with one end closed and pour the wax into them before it hardens. The oil will cause the wax to remain malleable, and you will have some first-class filler sticks.

[Editor's note: Toilet bowl rings (no, not the one in your toilet - the kind you buy at the hardware store) are an inexpensive and commonly available source of beeswax.]

In southern Asia, Burma, Thailand and India, much of the teak furniture is dyed black. (In fact, there was a time when many people thought black teak was a subspecies of the teak family.) How can I dye my teakwood black like that? The stains I use don't seem to even come close.

There are two ways to do the job. One is to use a modern aniline dye; in this case the best kind is "oil-soluble", which is also soluble in lacquer thinner [this would be an "NGR" (non-grain-raising) type dye]. Or you can try to copy the old way of producing a black color on teak: Prepare a fairly strong solution of Logwood extract (Campeche), about 80 grams per liter of water. Soak your wood with this solution two or three times, letting it dry and sandpapering between coats. Follow up by applying a coat of ferrous sulfate or copper sulfate (80 grams per liter), and your wood will become pleasantly and permanently black. Incidentally, these old-fashioned dyes and mordants are more potent if they are applied warm.

Wood News readers are invited to ask George Frank questions on any aspect of wood finishing. Answers will be printed in future issues as space permits. Mail to: Ask George Frank, c/o Highland Hardware, 1045 N. Highland Avenue, Atlanta, GA 30306.

Adventures in Woodfinishing is available from us for \$9.95 plus \$2.50 shipping.



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Edited by John Kelsey. Reader response to our review of this series of books in the last *Wood News* has been nothing short of astounding, resulting in orders for literally thousands of books. The convenience of having the most informative articles from the first nine years' of *Fine Woodworking* logically grouped by subject makes these books great references and real time-savers. Each volume contains around 30 to 40 articles.

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The Woodwright's Shop

A Practical Guide to Traditional Woodcraft, by Roy Underhill. Based on the work done in his first series of PBS television programs, this book combines historical background, folklore, alternative technology and ample humor to provide a useful introduction to traditional woodworking as it was done in the days before power tools. Beginning with a guide to trees and tools, the book includes chapters on gluts and mauls, shaving horses, rakes, chairs, weaving wood, hay forks, dough bowls, lathes, blacksmithing, dovetails, frame and panel construction, log houses, and timber frame housing. It's extremely well illustrated, and gives the reader a real sense of the 18th century woodworking experience.

Available for \$12.95 plus \$2.50 shipping.

The Woodwright's Companion

Exploring Traditional Woodcraft, by Roy Underhill. The author's second book continues to demonstrate "how to start with a tree and an axe and make one thing after another until you have a house and everything in it." Included are chapters on helves and handles, saws, a search for the whetstone quarry, crow chasers and turkey calls, hurdles, whimpy diddles, snaplines and marking gauges, candle stands, planes, window sash, riven shingles, and pit sawing. The final chapter offers a glimpse of traditional woodworking techniques still used by the Colonial Williamsburg housewrights.

Cost is \$12.95 plus \$2.50 shipping.

The Woodwright's Shop begins an entirely new series of shows this fall. Watch for it on your local PBS station beginning in October or November.

BOATBUILDING

with John Wermescher



©1985 by John Wermescher

Over the millennia that man has sought to travel on the water, boats have been built of every conceivable material. The material, and thus the method, was usually dictated by local availability. On the western coast of Ireland and the Aran Islands, boats have long been made of animal skins, since there were few trees but plenty of cattle. In tropical rain forests, where great trees are in abundance, local watercraft are hewn from a single log to make a solid one-piece canoe. Useful vessels have been made of balsa logs lashed together, reeds, tree bark, hides, canvas, paper, and goodness knows what else. People have even made boats of concrete and chicken wire.

Here we'll put the emphasis where the interest lies for us in the 20th Century, USA. There are four materials you are likely to run into when considering building a boat today: concrete, metal, plastic and wood.

That first material, concrete and chicken wire, goes under the euphemism of *ferro-cement*. If you want to build a boat of concrete and chicken wire, do so. Please don't tell me about it. There will be no further reference to that material in this column.

Metal boats have been limited to larger sizes, with some exceptions. In general, the boat should be over sixty feet in length before building in metal becomes practical. Ships are built of metal. The metals include iron, steel, bronze and aluminum. Some fine yachts were built of bronze in the early part of the century, but as you can imagine, the material is a mite expensive. But who knows? "Expensive" to one person may mean little to another. I recently heard of a boat made entirely of carbon fiber. I didn't learn the cost, and it's just as well - I can sleep better.

Aluminum is not an easy material for the amateur to work unless he is specially trained in it. Most aluminum craft are small fishing boats or canoes, factory-produced of riveted construction. A number of amateur boat builders have successfully completed welded steel hulls and it is a challenge worth considering if you are at ease with metal work, know how to weld and are willing to invest in some equipment specific to that endeavor. For more information on the subject, I recommend: *Boatbuilder*, PO Box 1109, West Palm Beach, FL 33402.

This is a magazine which features steel construction more than any other. The March/April issue began a series by Joe Pence, "Getting Started in Steel", which really spells out what you need to know from the beginning. Yours truly has no experience in metal boatbuilding, and so will leave it at that.

The material of which most popular boats are built today is plastic. I think it is proper to use the term "plastic" in the general sense, because there are several kinds of plastic resins used and more coming on all the time. You have probably heard all such boats referred to as "fiberglass". Note that if you spell it with one s, Fiberglass, it is the trade mark of Owens-Corning.

What we are talking about here is a hull made of some type of glass fiber matt or fabric combined with a plastic resin, usually polyester. That's your common "fiberglass boat". A better term is FRP, Fiberglass Reinforced Plastic. This is the construction we'll talk about here, but recognise that there are other resins, such as epoxy and ABS (the stuff your phone is made of) that are being used, too.

There are also other reinforcing fibers and fabrics, some of which may be superior to fiberglass in specific applications. Some of these are Vectrex (Vectra) which is a polypropylene; Dynel, which is a modacrylic fiber; and Kevlar, an aramid fiber. New additions such as carbon and graphite fibers, boron fibers and the like are quite expensive and still somewhat experimental. All but polyester are used mainly as reinforcement to a hull made of other material, usually plywood or strip planked wood. For a good study on that whole subject, see *Woodenboat* no. 17, July/August 1977.

But let's get back to good ol' fiberglass, that maintenance-free, last-forever, indestructible, Wonder Material - the answer to all boatmen's prayers. Actually, it was the answer to boat manufacturers' prayers. They wasted little time in seeing the payoff from investment of capital in a system that would let them produce thousands of boats from a single mold using unskilled labor. Good advertising sold the public on plastic boats. It will probably remain sold, but I will remind you of something I stated in a previous column. There is a wooden boat in service today in England that has been in almost continual rough service for about 170 years and is in fine shape. It will be another 140 years before that can possibly be said of the plastics.

Still, they give the average boater a cheap, quick, easily kept up (for a while) hull that will take some of the abuse and neglect you dare not cast upon

a fine wooden boat. If the gel coat (outer hull finish) is kept in good shape and all the wood (that mahogany and teak the manufacturer uses to spiff up the boat and make it look yachty) is kept bright, many fiberglass boats are fine looking and should last a long time.

It is worthwhile to understand just how these boats are manufactured so that the amateur boatbuilder can appraise their suitability to his needs. Let's begin by stating that 99% or more of the fiberglass hulls are made with polyester resin and glass fiber. Glass fiber is actually spun glass, very fine, in long single filaments. Handle the stuff much and you'll itch for days. These fibers are then treated with some sort of chemical sizing agent to make them weave well, then a finish to make them handle better while applying. There are mainly two types of finishes: Chrome, or Volan, for use with polyester resin, and Silane, for use with epoxy resin. If you are going to use epoxy resin, it is important to get fabric with the Silane finish. It adheres better.

The fibers can be manufactured into several products: matt, which is a felt-like sheet made of chopped strands matted together loosely, not woven. It is an inexpensive way to add bulk to a hull layup. Matt is sold in weights of one or two ounces per square foot. Woven roving is a loose weave of continuous filament bundles, or roves, and resembles very coarse burlap. It weighs about 24 ounces a square yard and is very thick compared to matt or cloth. Fiberglass fabric, or cloth, is woven from twisted strands, just like any fabric, and resembles coarse linen, slick and shiny white. It comes in weights of 10 ounces per square yard (fairly coarse), 7-1/2, 6 and 4 (fairly fine).

That's the reinforcing material, fiberglass. The plastic is polyester resin, in two liquid parts: resin and catalyst, or hardener. Mix them together and they stay liquid for a little while and then, bang! They stiffen up and become harder and harder, until in several hours they are the dense, hard material we know.

It is a curious property of polyester resin that it will not cure in the presence of air. It will remain tacky forever as long as it is in contact with air. Plain polyester resin is marketed as "air-inhibited" resin. Add a little wax to the resin (the manufacturer does this for you) and it becomes "non-air-inhibited" resin, because when you spread it out, the wax floats to the surface and seals off the air. Thus, the polyester cures. But now you have wax on the surface and nothing is going to stick to it. You get around this in two ways. First, you lay up successive layers of material before the resin sets up and gets waxy, or second, you use only air-inhibited resin for your layup and non-air-inhibited resin for your finish coat, or last coat on. That's what it's for, anyway.

If you've been around plastic boats much, you've probably heard the term "gel coat". This is the outer finish of a hull and therefore the first material to go into a female mold. It is a special polyester resin to which pigment has been added to give the hull its chosen color, and to which an agent has been added to make it thixotropic. That's a four cylinder word meaning it won't run or sag. Gel coat is air-inhibited. It is sealed from the air on the one side by the mold and on the other by successive courses of layup material.

That's it for the materials. Now for the procedure. First, you go to your banker. See if you can get enough money to tool up. Money or time, whichever you can get a lot of. The boat manufacturer invests considerable amounts of capital. With a design chosen, specific for FRP construction, a "plug" is made. This is a full size model of the hull shape, made to precise measurements, and of any handy and workable material, usually wood. This is then covered with resin and reinforcing material, or whatever the builder deems necessary to get a plug that is absolutely perfect. It is ground, filed, sanded, faired, polished, buffed and fussed over until it is flawless. Many hours and dollars go into this plug which will very soon be thrown on the scrap heap. But it must be perfect, because every boat that is produced from then on will reflect exactly the shape of this plug.

Next the plug is coated with a release agent, something that resin will not stick to. Then the builder makes a layup of resin, cloth, matt, cloth, woven roving . . . whatever the designer's schedule calls for, to produce the female mold. Finally he adds stiffening members, reinforcements, handles, roll bars, wheels, whatever fits into his manufacturing scheme. With the mold completed and perfect, the plug is discarded. At this point the manufacturer may have anywhere from \$6000 to \$60,000 or more invested in just tooling up. Now it's time to make boats, or rather, hulls. Remember, when the hull is made, you are only 1/3 of the way to a finished boat.

What is laid up in the female mold varies. Always first, of course, a release agent is applied to the mold surface. Then the gel coat is sprayed in, and in top-of-the-line boats, fine cloth is applied by hand, then matt, then heavier cloth, more matt, roving . . . again, whatever the builder's or designer's schedule calls for, until the required hull thickness is achieved. Cheap boats use a *chopper gun* after the gel coat. This device looks like something Al Capone might have liked. Simply put, hollow lines lead to the gun supplying resin, catalyst, and a continuous bundle of glass strands. The gun chops these to little pieces at the nozzle, mixes them with the catalyzed resin and spews this mixture out into the mold. Just like a Gunitite swimming pool. This mush is fired into the mold until the desired hull thickness is reached. Then it cures.

The basic hull shell is now complete. Interior reinforcing members are added, glassed into place, and the hull is popped from the mold. Perhaps the deck-cockpit-cabin assembly is made in another mold the same way and the two are joined after completion.

You can easily see that this is far too involved and expensive a method for the home builder wanting a one-off boat. I have known some people who got together, several of them with the same small boat in mind, created a plug and mold jointly and got their hulls off of it. Other than this, fiberglass boatbuilding was strictly for the manufacturer up until about ten or so years ago. Then some bright people: Seemann Fiberglass, Inc. (PO Box 13704, New Orleans, LA 70185) came up with a new idea.

Basically, they made long thin rods of FRP, laid them side by side with alternating bundles of loose roving, and held this assembly together loosely with lightweight fiberglass cloth. They thus formed endless floppy "planks" of

(continued on page 22)

Guild Picnic

A new event at the Woodworkers Guild of Georgia's annual picnic pitted member against member in a quest to create the most unusual "floatable" - one capable of transporting the maker past yon buoy and back. Prizes were awarded in several categories. Judged "Best all around" (and also the first to make it back to shore after circling the buoy) was the craft made by Tom Lathrop and Mark Palmquist (above right). Its materials? Cardboard, polyethylene, and duct tape (plus the mandatory two board feet of wood).



SUGGESTED WOODS TO USE

Keel, stem, dead, sternpost	White oak, Longleaf yellow pine, fir
Main knees in backbone	White oak, Hackmatack crooks, Longleaf yellow pine
Frames, bent	White oak
Frames, sawn	White oak, Longleaf yellow pine, fir, mahogany, lauan
Long stringers	White oak, Longleaf yellow pine, fir, mahogany, lauan
Planking	Fir, marine plywood, N. white spruce, cedars, mahogany, cypress
Decking	White pine, marine plywood, N. white spruce, cedars, teak
Spars	Sitka spruce
Tiller, oars, poles	White ash
Deck beams	White oak, white ash, laminates
Other joinery, interior, etc.	Mahogany, lauan, teak, oak
Rubbing strips (gunwale guards)	White oak

STRENGTH TO WEIGHT ORDER

From strongest to weakest.
Wt. in lbs. per board foot.

White ash	3.4
White oak	4.2
Longleaf yellow pine	3.4
Douglas fir	2.9
Teak	3.5
Hackmatack	3.1
Mahogany	2.9
Phillipine "mahogany"	3.0
Cypress	2.8
Sitka spruce	2.4
Northern white spruce	2.4
Port Orford cedar	2.4
Alaska cedar	2.6
White cedar	1.9
White pine	2.1
Western red cedar	1.9

material consisting wholly of glass and resin. This they call C/Flex. The material comes in various widths and any length, roll form. A minimal wood mold is set up. (Note: the term "mold" here, and in all subsequent discussions in this column, means a temporary shape over which boat material will be bent into hull shape.) C/Flex planks are stapled to this mold, bending the loose planks to shape as required, and then the whole thing is coated with resin to harden it in place. Slick! Now all you do is apply a few layers of fabric and resin and you have a hull. The system has been quite successful and is about the only way for the home builder to make an FRP boat.

Before we finish with plastic boats, we ought to touch on one more aspect of manufacturing - one that the home builder might well consider for some applications. This is cored structures. A sandwich is formed between two skins of FRP, the filler being end-grain balsa wood or one of several chemical foams developed for this purpose and sold in sheet form. Adhering two light skins of fabric on either side of a very light cellular material, using resin for the binder, results in a stiff, light, and strong structure for both hulls and decks. Doing a hull this way is pretty much a job for the pro builder, due to the compound curves involved. But you might consider it for a deck, where light weight up high is desirable. Note this, however: where fastenings are to go through the deck, such as for winches, stanchions, cleats, etc., substitute solid wood for the foam in that area.

New materials, and thus new methods are popping up every day. Last summer in Newport I saw boats made of criss-cross sticks that looked like kite frames. Then Kevlar twine was wrapped around them in some pattern and a translucent Kevlar skin applied to this to form a hull. Talk about light! The boats performed well and seemed to be tough. This is the brainchild of inventor Platt Monfort, the man who brought us Git-Rot. Anyone interested in trying out Geodesic Kevlar, as he calls it, should write to: Monfort Associates, P.O. Box 1490, Wiscasset, ME 04578.

Of course, I've saved the best for last. Here are some clues to the real Miracle Boat Material: What is pound for pound stronger than steel, stiffer than FRP, lighter than water so that every piece of it adds flotation, cellular so that it has heat and sound insulating quality, is in abundant and renewable supply, can be found in virtually every hamlet in the land, is easily worked with most common tools, is beautiful to behold, comes in a great variety of property qualities, and can easily be shaped to most any desired form?

Aw, you knew it all along. Wood was probably the first material ever used for boat construction when some long past ancestor found that he could climb on a floating log and go downstream. It has had a long history of use in the broadest possible range of shapes, forms, and structures for boats. It was the principal material for boats well into the 20th century.

Wood, in its natural form however, has two strikes against it. Let's talk about these two drawbacks in reference to boatbuilding just a bit, with the idea that the more we understand what's happening here, the more we can find ways to work around it. First, wood is an open cell material which will take on or give off moisture according to the surrounding humidity. I'm not talking about just wetness here, so much as I am about atmospheric moisture which is very small in molecular size and will easily penetrate most any paint or other finish film. When wood is dry, i.e. below about 20% moisture content by weight, it is strong, stiff, stable and rot resistant. When the conditions around the wood are moist enough (marine environment) so that the wood takes on moisture and gets above 20%, several things happen. First, as the wood soaks up moisture, it swells. In some places, quite a lot. It loses strength and stiffness. And it provides an ideal medium for the fungi that cause rot.

WOOD DATA

WOOD MOISTURE

Fiber saturation point is roughly 25%.
- Below this you get shrinking & swelling as Moisture Content (MC) changes.
- The moisture in wood changes with the Relative Humidity of the air.

Wood with over 20% MC:

- Increases in weight
- Reduces in strength
- Is ready for rot

DRYNESS

"Bone dry" means it has been dried in an oven (samples, usually) until no further reduction in weight is measurable.

Kiln dry - means the lumber has been artificially dried in a controlled kiln and should be down to around 7-8% MC.

Problems:

- Was the wood dried too quickly and damaged?
 - Will it be put into a damp environment, take on moisture, and swell?
- Example: a kiln dry board 8" wide, if it goes up to 25% MC, can become 8-1/2" wide! This depends on the species and how it is cut. The power of this swelling force is tremendous and cannot be easily controlled.

Moisture barriers - no surface film that depends on evaporation of solvents to set up will be a true moisture barrier. Remember, water vapor is an invisible gas which is lighter than air and can easily penetrate most materials.

BOATBUILDING WOOD

Ideal MC is about 15%, with 12% a minimum and 16% close to maximum. Never over 20%.

- Much below 12% and swelling is a problem when it gets moist.
 - Much above 16% and shrinking will be a problem.
- There is a lot of controversy on this subject!

Boatbuilding wood should be:

- Straight, except where you really want it crooked
 - Clear
 - Quartersawn
- To the extent that you deviate from these, expect trouble.

SOME BOATBUILDING WOODS

Cedars - White, Port Orford, Alaskan

Good planking material: light, easy to work, rot resistant, stable.

Western Red Cedar - soft. Good in thin strips for cold molding.

Sitka Spruce - light, strong, supple. First choice for spars.

Oak (White Oak) - called bending oak. Tops for frames, beams, anywhere hardness and strength are needed. Especially good for steam bent frames and beams. Durable. Holds fastenings well.

Red Oak - much like white oak (often look exactly alike). Not as rot resistant.

Juniper (Southern cedar) - Tops for planking. Much like Cypress. Does not swell so much. Usually sold in flitch boards (bark edge intact).

Mahoganies - classy and most traditional boatbuilding wood. All mahoganies are good, Honduras the best. Excellent for planking, interior work, bright work. Mahogany has all the desired boatbuilding traits.

Lauan - "Phillipine Mahogany". Very good cheaper choice. Tends to be rough.

Douglas Fir - "Oregon Pine". Good for most any boat if quartersawn and straight. Strong. A bit heavy for things like planking. Tends to split easily and splinter.

Yellow Pine - Only the Longleaf is good and it is very good for places where you need hardness, strength, durability, weight. Excellent backbone material.

Cypress - Use only Tidewater Cypress, as it is the most rot-resistant wood we have. Good mainly for planking small rowboats. Tends to be rough and takes on a lot of moisture and gets heavy.

White Ash - Strong and durable. Tillers, oars, deck beams.

Hackmatack - Also called Tamarack, Larch, Juniper. Big trees growing on hillsides have strong roots that curve. These natural crooks are rare today, and expensive, but are tops for knees and curved stems.

Teak - Really high class. Most beautiful wood when kept up (the big problem with teak). Heavy, expensive, dulls tools, hard to finish. Can be used mainly for decks and interior joinery work.

Marine Plywood - The old standby for amateur boatbuilders.

- Must be marine grade
 - Fir is okay where it will be covered.
 - Mahogany, lauan, birch, and others also very good.
- Special grade with resin paper laminated.

Swelling and rot. These are the two problems that have plagued wooden boatbuilders and owners down through the ages. We can discuss approaches to these problems in two general categories: *traditional* boatbuilding and *modern* boatbuilding.

Traditionally, boatbuilders selected their wood with care. They had better stuff to choose from and a lot more of it. Wood may be a renewable resource, and it is truly all around us, but it was wasted badly in the past and it takes a good while to grow a white oak or a Sitka spruce. So they chose with care, selecting woods most resistant to rot such as white oak, mahogany, cypress, long leaf pine, cedar and spruce. They were careful to use only air-dried wood in places where there would be much swelling, such as below the waterline. Sometimes they even soaked wood in salt water to season it, bent it on wet and let it dry in place. The point is, they were very much aware of their wood's moisture content and what was going to happen to a particular member once swelling took place. They allowed for the swelling by not fitting planking up tight, but leaving room for the wood to move. They caulked seams with fiber and goo to keep out the water when the seam dimension changed. They provided drainage everywhere, so that water or condensed moisture would not stand on horizontal parts. They used joints, adhesives and methods which took into account that the vessel would "work" - that is, give, move a bit, twist around some and still maintain structural integrity.

They fought rot with a variety of poisons, oils and finishes to both kill the fungus and keep moisture out. On the whole, for the types of boats they built, their methods were largely successful. Those boats, however, will not tolerate neglect. Either you keep up a traditional wood boat or you eventually lose it to rot.

Today's wooden boatbuilder has at his disposal the most modern of materials: epoxy resins. Thanks mostly to the research and development of people like the Gougeon Brothers of Bay City, Michigan, a whole new approach to wooden boatbuilding has developed in the past few decades which takes full advantage of wood's positive attributes, while countering the two bugaboos, swelling and rot. WEST System is what the Gougeons call their epoxy resin together with its fillers and additives, which allow the builder to tailor mixes for every possible application. The idea is to coat every stick of wood that goes into the boat with the resin, use the resin for all adhesives, fillers, structural buildups, etc., then give the whole boat a couple coats of the epoxy resin. Used in this way, epoxy resin is hard, tough, somewhat pliable, and completely impervious to moisture, even the atmospheric kind. A couple coats of epoxy resin stiffens a piece of wood appreciably.

What the builder creates in modern boat construction is a wood-epoxy composite which is ultra light, tough, stronger than the wood itself, and will not swell or rot. For this reason more than any other, wood is making a strong comeback as a boatbuilding material. Many large manufacturers are now using modern wood boatbuilding techniques.

There are several other pluses to the method. Because the epoxy resin forms a tremendously strong joint (much superior to other adhesives) and because you can use filleting techniques to enhance the function of the joint, very few fastenings (which require holes punched in your wood) are needed. Because of the additives available in the epoxy method, mixtures can be tailored to fit a variety of demands, such as bridging gaps. The old-timers knew how to make a perfect joint. Most amateur boatbuilders today do not have the time to learn such joinery. But the epoxy will fill joints that are less than perfect with no compromise of strength.

Because the epoxy resin adds strength and stiffness to wood members, we can utilize the wood left to us today, wood that the boatbuilder of yesteryear might have rejected. Quite often time and budget allow us no choice but to get

what we can from lumberyard sources. And epoxy resin lets us use techniques which utilize forms of wood less wasteful and less picky - thin strips, plywood, veneers. If you would like more information on how this system works for you, send \$2.00 to Gougeon Brothers, PO Box 908, Bay City, MI 48706, which gets you their technical manual, list of products, and prices.

Epoxy resin is the material of choice for sheathing, i.e. putting a skin of fabric (glass or one of the others) on a plywood or strip-planked hull. Polyester is definitely inferior here, as many people learned back in the early days. In the 50's a fellow with a wooden hull that leaked a lot would say "I think I'll fiberglass her and end my problems". All he did was accelerate his problems. He put a layer of cloth on the outside of the hull with polyester resin, which provided somewhat of a barrier there, depending on how well he did it (often not very well). But moisture was still free to enter on the inside of the planks, which set up an imbalance. Often the moisture migrated to the outside of the planking and stayed there, next to the sheathing. Soon the polyester, which made a poor bond, let go and the poor guy found that he could grab one end of his sheathing and pull the whole thing off like masking tape. And underneath the bubbles that inevitably formed he found rot. Epoxy resin, properly applied to clean wood will never let go and is more compatible with all sheathing materials.

In subsequent issues we'll get into just how these methods work. To close, I'd like to discuss the various common boatbuilding woods and how each is used according to its special properties. Of course, high on the list, especially if you build in the traditional way (as many people do today) is decay resistance. Strength is important for main structural components. Lightness is important, especially as you go up from the waterline, so as to keep the center of gravity low. Modern boatbuilding tries to keep the whole boat as light as possible, then add ballast just where you want it to better control performance and motion.

In certain applications bendability is important. Surely workability with tools is good. And the big one, availability, which relates to cost. Let's face it, you can get any wood you can name, but can you afford the freight?

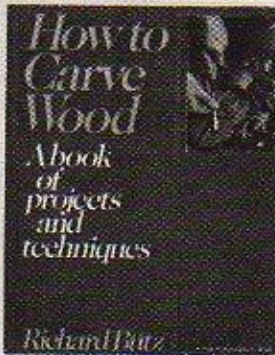
Before we get into wood data and specific lists, let me clear up two problems that crop up invariably. The first is names of woods: one species will be known by many different names, and some of these names are really the names of other woods in other places. Juniper is a good example. It consists of about four species of western conifers giving soft wood used mainly for pencils and novelties, and has berries of distinctive taste and odor. We know where the berries go. You sure won't find any mention of its use as a boatbuilding wood, and I don't recommend it. But go to the coast of Virginia or the Carolinas and you'll find builders there who regularly use "juniper" for planking. What they call juniper is really white cedar, also called Atlantic cedar, swamp cedar, or boat cedar. See the problem? Don't be dismayed. Just ask around and learn what the local builders use and where to get it.

As a boy I had one thing pounded into me again and again: Never use kiln dried lumber in a boat. I always asked why, but never got an answer, just the emphatic warning. I grew up terrified of kiln dried lumber and never did find a clear explanation. There are still boatbuilders who will use only air dried stuff and there are some reasons. As lumber comes from the kiln it may be as low as 7% MC. Use that for planking in a traditionally built boat and you are going to have lots of planks pop out when she swells up. Some fear that kiln dried lumber may be case hardened: dried too fast so that the outside of the piece dries and shrinks before the moisture on the inside can get out. This results in irreparable damage to the interior of an otherwise good-looking board. But this can happen in air drying, too, if it's done too fast. In a modern boat, using the epoxy system, a really low MC is good. The wood is lighter, stronger, stiffer, and you will seal it to remain that way forever.

So the old air dry vs. kiln dry controversy boils down to this (as do most things): know what you plan to do with the wood and what MC you desire. And know what the wood is at the point you use it. After all, bent frames are often boiled for hours to make them limber. Some builders will frame only with green oak. And even kiln dried wood, if it sits around in your yard or shop a few months, will come to equilibrium with the relative humidity of the air and establish its MC. Doesn't matter how it was dried to begin with.

Next issue we'll briefly discuss adhesives and fastenings, and then take a broad overview of how a boat is constructed.

HOW TO CARVE WOOD by Richard Butz



Subtitled "A book of projects and techniques", this *Fine Woodworking* book provides an especially clear, thorough, and well-illustrated presentation of the elements of woodcarving. Butz begins with an absorbing analysis of carving tools, sharpening, woods and finishes, followed by a chapter on creating your own designs. Whittling, chip carving, relief carving, wildlife carving, lettering, and architectural carving are all covered in separate, detailed chapters, each of which includes enticing projects for the reader to try as a means of developing specific carving skills.

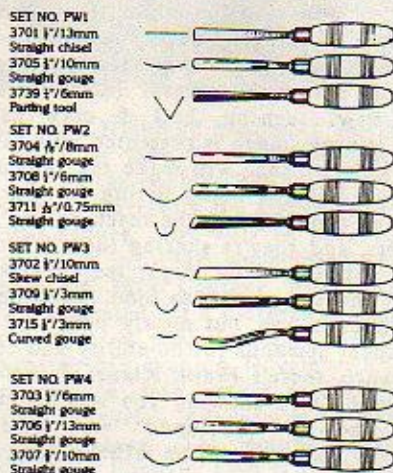
In his introduction, Butz says that he wrote this book "for anyone who wishes to understand and master woodcarving... The secret to woodcarving is to develop your own personal style by experimenting with the tools and techniques until you feel comfortable with them... Feel free to make modifications in the patterns, or better yet, create your own designs. One of the real joys of working with your hands is seeing your own ideas take on a physical form." *How to Carve Wood* should inspire anyone curious about woodcarving to progress rapidly in developing skill and achieving the creative satisfaction intrinsic to this craft. 211 pages.

Available from Highland Hardware for \$13.95 plus \$2.50 shipping.

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We are pleased to offer four new sets of Henry Taylor's Acorn brand carving tools. Each set includes 3 carving tools, a slipstone, and the booklet "How to make a start in Woodcarving", all packed in a convenient storage case. Purchase all four sets for a complete basic assortment of carving tools, or choose sets individually to suit specific carving needs.

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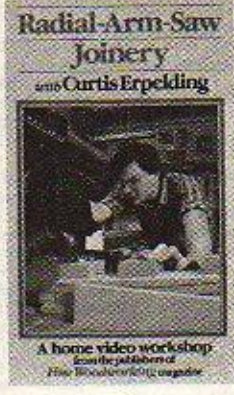
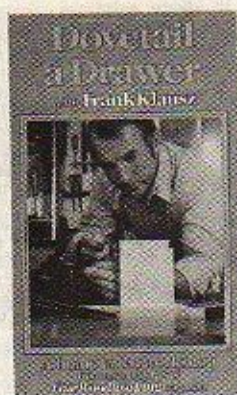


Each set costs \$29.95. Add shipping charge as follows: 1 set, \$2.50; 2 sets, \$3.30; 3 sets, \$4.20; all 4 sets, \$5.00.

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John Wermescher is an Atlanta commercial artist and part-time boatbuilder.

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Fine Woodworking Home Video Workshops

Here's one of the year's best non-surprises (somebody had to do it): *Fine Woodworking* magazine has released the first five tapes in their new Video Workshops series, and they've done an excellent job of it. In fact, it's fair to say that watching one of these tapes is the next best thing to being there, and in some instances may be better. Nobody's head blocks the view during close-ups, the instructor doesn't holler at you when you doze off just a little, and if you miss a really simple point you don't have to admit it in public. And there's always instant replay for the good parts.

The subjects *Fine Woodworking* has taped are all good ones, chosen for their general interest: dovetailing, finishing, bowl turning, ball & claw carving, and radial-arm joinery. Each is presented with fine technical and textual clarity that will make the subject accessible to the novice without being boring for the expert. By the way - the people doing the teaching are professional woodworkers, and they're sharing the methods by which they make a living. You might see emphasis on doing good work, and you might see some rather refined tricks and techniques in use, but mostly you'll see methods of work that meet demands for do-ability and efficiency.

For instance, there's Frank Klausz doing his *Dovetail a Drawer* tape. He's showing you how to cut dovetails by hand, the "old-fashioned" way that so many woodworkers aspire to from afar. He explains and

demonstrates with such simple clarity and effectiveness that you have to wonder what all the fuss has been about - anybody can do those things (though it might take a little practice to attain the furious pace at which Klausz cranks them out.)

Like all video recordings these days, the *Fine Woodworking* Video Workshop tapes sport some pretty solid prices. They're still cheaper than being there, though, and your seat will doubtless be a lot more comfortable to boot. These tapes are going to be great assets for woodworkers' organizations, school libraries and shop classes, as well as individuals.

Highland Hardware is pleased to offer these tapes by mail order from stock as listed below. Those visiting our store in Atlanta may rent the tapes at very reasonable rates, and even visually sample the tapes for free using the VCR on our tool mezzanine.

Dovetail a Drawer with Frank Klausz (60 min.)	\$49.95
Wood Finishing with Frank Klausz (110 min.)	\$59.95
Bowl-Turning with Del Stubbs (120 min.)	\$59.95
Carve a Ball-and Claw Foot with Phil Lowe (115 min.)	\$59.95
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Add \$3.30 shipping for one tape; \$5.00 shipping for two or more tapes. Please specify VHS or Beta format.



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