

# Tidewater Woodworkers Guild



## Notes from the Wood House

Greetings all! Although we missed the hard winter, I am still not quite sure what spring is trying to do.

Next month's meeting in May will be on **May 21st**. We normally meet on the fourth Monday of each month. However, since that Monday falls on Memorial Day, we are pushing the meeting date up one week.

I would like to welcome aboard Jerry Crick as our new training coordinator. Last week, the program and training committees met to discuss future programs and possible training ideas. Jerry has some good ideas and we look forward to some requested training.

At the last Guild meeting, Ed Bunker agreed to head a

group to edit our by-laws. We had at least four people volunteer to join the group. If you are interested in joining the group, please contact Ed and let him know. We hope to have the first meeting within the next few weeks.

### Wood Chips

To follow up on the Eastern Shore visit, I am awaiting confirmation on the date of the next meeting as well as the location. Hopefully, I will have the information by the our next meeting.

For those of you who missed last month's meeting, I would like to enlighten everyone regarding the discount offered to us by Cabinet Makers Hardware.

With your 2007 membership card, you can receive the contractor's price on most items. This discount can be 20—40% off the retail price. The owner is Rob Kist and he is looking forward to renewing the relationship between his company and our Guild. If you have not been by, stop in and take peek and have a Tootsie Roll while you are there.

They are located at:

5025 Cleveland Street

Virginia Beach, VA 23452

(757) 490—1185

We are planning have a presence at Woodcraft one Saturday each month. The possible date of our first presence would be May 19th.

## April 2007

### Next Meeting

April 23, 2007  
7:00PM

Woodcraft of Norfolk  
5802 E. Virginia Beach Blvd.  
Norfolk, VA 23502  
(757) 466-1166

Monthly Meeting

4th Monday of Each  
Month

### Find Us On the Web

[www.twwwg.com](http://www.twwwg.com)

Please note that parts of the site are password protected. The password is provided to those whose dues are current.

### Club Dues

Dues are \$15.00 per year and are payable by check or cash.

## Upcoming Meetings

Bret Lancaster will be coordinating presenters and demonstrators each month. If you know of someone that would be a good presenter or if you would like to demonstrate your talents, please contact Bret.

### April

Guest Presenter

Robert Waddell

& Guests

Favorite Shop Gadgets

### May

Guest Presenter

Bob Fred

Making a Wooden

Hand Plane

## The Executive Board

<b>Andy Steinberg</b>	<b>President/Editor</b>	<b>624-9151</b>
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## The Cutting Edge: Get the most out of your vertical band saw

While the modern vertical band saw has tremendous potential as a deep-cutting contour and ripping saw, the average woodworker seems to have great difficulty realizing that potential.

This is evidenced by the disproportionate number of books and articles written on the subject of how to operate them. It's further evidenced by the numerous discrepancies between the solutions they collectively offer. But for all the advice they provide on machine set-up, not a word is said about the most critical aspect of band sawing: the blade and its geometry. Keep reading and you'll see how easy it really is to get consistently flat cuts through the thickest, gnarliest timbers with a narrow band saw blade.

The first thing we need to clarify is the concept of "thin kerf resaw blades." While the economical use of precious hardwoods is certainly an important consideration, you have to also consider the waste involved in planing. If your cut is anything less than perfectly flat, you'll plane off everything you saved using a "thin kerf" blade. The kerf of a blade is wide or thin only in the context of its intended function to the work piece.

"Smoothness" is another important consideration, but its importance is often overemphasized to the point that flatness is lost and the planer eats your savings. "Thin," in terms of kerf width, and "smooth," in terms of finish, are relative to the size of the work piece — and unless your cuts are consistently flat, you're sacrificing economy. Plus you can get very frustrated in the process. A "smooth" rip cut through 2" of material can be hand-sanded but a "smooth" cut through 18" of the same material would call for a belt sander. You just can't get a baby-smooth finish and a flat cut at the same time, through thick timber, with the average band saw.

Half of the problem is based in machine dynamics and the other half of the problem has to do with blade dynamics.

### Test results

We purchased a selection of nine of the most likely blades to succeed in cutting straight and true through a 16"-thick reclaimed Douglas fir. We tested for turn radius, resistance to deflection, ability to follow a fence rip, and efficiency as it relates to feed rate. In the process of testing we tried to analyze the elements of tooth geometry that contributed to each blade's performance in a particular application. We often had to adjust our blade tension and re-run the same test. It was immediately apparent that each test constituted a distinct cutting solution based on the blade being used, the shape of the cut, and the method of execution (free-hand, scribed line, fence-guided, etc.).

In the end certain consistencies emerged that changed our whole way of thinking about blades. While there are too many overall variables to even comprehend, some stand out as central to the understanding of band saw blade performance:

- tooth pitch — the number of teeth/inch — determines aggressiveness
- set — the spread of the off-set teeth, expressed in thousandths — is the blade's footprint
- width — from the tip of the teeth to the back edge — and thickness
- set angle — in degrees, from outside tooth tip to back edge corner — defines turn radius.

Of all the variables we encountered in finding the correct cutting solutions for our blade tests, set angle was the one blade parameter that consistently determined the ultimate success or failure of a given blade. Variations in beam strength and pitch certainly entered into the

complexity of the problem, but those variations now seem insignificant compared to the vast differences found in the set angles of the blades we tested; and the degree to which the set angle influenced the outcomes. Understanding the importance of set angle is therefore critical to the selection of blades for big timber cuts and, by inference, minimizing kerf width where that criterion applies.

Why is the set angle so important? Visualize a .032" x 1/2"-thin strip of steel flying through 18" of wood at 76'/second. It's going along OK until it runs into a knot and one side of the blade is into harder wood than the other. This creates a situation analogous to an airplane in a cross wind. In order to maintain directional stability it has to crab; crabbing is when you're pointed one way while going another.

Band saw blades will try to crab automatically because they're wrapped tightly around two fast-turning blade transport wheels. If the back edge of the blade bumps into the sides of the kerf, the blade is forced to run off. The kerf needs to be wide enough to allow the trailing edge of the blade to crab in response to deflectional forces.

If you doubt the power (or existence) of deflectional forces, try to tension a band saw blade so tight that you can't bend it in the middle of an 18" span. You can't. You can bully a blade through 3" of hardwood with enough tension, but you have to finesse a blade through 18" of hardwood with geometry. Once you learn what it takes to cut through 18" of knotty Douglas fir you can apply that knowledge to 6" and 12" cuts, proportionally, for thinner kerfs and smoother finishes.

### Change the blade

Our experience suggests higher blade tension leads to blade breakage at the weld, excessive tire wear, and heat build-up on the blade and guides. More importantly, raising blade tension is merely a short-term solution and as soon as the teeth start getting dull you have to raise it again — after you've ruined a critical workpiece.

Case in point: we rip-tested two very expensive carbide-tipped blades of 3/8" (SA=4.68 degrees) and 1/2" (SA=3.34 degree) widths. The finish was beautifully smooth but the surface looked like a terrain park. These were exceptional blades in that they were so thin and lacking in beam strength that even when we ran the tension springs almost all the way down we couldn't get a flat cut. A tire came off in the process so we ran it again with the cover off and saw the most amazing thing: the blade was wrapped so tightly around one non-coplanar-aligned wheel that it literally screwed the tire off (at 1,750 RPM) leaving the blade on top center, still spinning. We didn't used to fuss with coplanar alignment much but we do now. Sufficient beam strength can't be assumed and to the blade's credit, it didn't break at the weld. But the point is this was clearly a case of a machine's inability to overcome the dynamics of the blade. Blade speed, guide settings, feed rate and the use of coolant/lubricants were shown elsewhere to be secondary factors relating to machine dynamics which ultimately proved to have only marginal effects on the final outcomes.

We also tested a 3/4"-2TPI blade on a fence-guided rip cut. The kerf was .128" wide and it looked very aggressive, but it drifted and bowed miserably no matter how much tension was applied. It wasn't until we discovered the set angle connection that we understood why: It had a set angle of 1.83 degrees and couldn't crab. When we looked back at our other test results it became obvious that all the blades with a set angle of less than 3 degrees failed to give us flat rips while every degree over that minimum yielded flat rips with ever increasing feed rates. Furthermore, set angles over 6 degrees produced turn radii under 3/4", which blades are excellent for intricate detail cuts. Perhaps the

## The Cutting Edge: continued from page 2

most conclusive proof of the blade's importance can be found on a video shot while ripping a 15" by 36" Douglas fir beam. With the camera focused on the blade gap between the upper blade guide rollers you can clearly see the blade lightly brushing one roller with a good 1/8" gap to the other. Throughout the entire cut the blade never moved away from its original position. The blade guides were fully retracted and the top guide was about 2" from the workpiece. The camera angle was such that you could actually see the back edge of the blade down inside the kerf. You could see it swaying randomly from side to side in slow motion as the cut progressed. The cut was perfectly flat despite some lens distortion. To view the video, visit [www.falbergsaws.com](http://www.falbergsaws.com).

In conclusion, if the blade you're using won't follow your fence, don't adjust the fence, change the blade. Drifting, bowing and meandering occurred throughout these comparisons as a direct result of disproportionately low set angles for the depth of cut undertaken, so put away your tension gauge and read the blade specs. Use the set angle formula to determine what blade is going to work and you'll save yourself hours of fidgeting with your fence alignment and tension settings. Curved fences won't cut flat boards; you might as well draw a line and free-hand it.

Until the blade manufacturers start producing blades with wider sets you might have to reset your own blades. It's not that hard to do and it doesn't require any great precision to be very, very effective. Just clamp it in your vise and alternately tap each tooth with a punch or tweak them with needle-nosed pliers. It only takes about 15 minutes and you'll be amazed at how much better your saw cuts.

Stick wax is reported to work quite well at eliminating sap build-up, prolonging blade life, and cooling the blade and guides; some use frying pan spray for the same reasons. Keeping the blade guides well away from the workpiece seems to minimize blade breakage while allowing more room for the blade to crab.

William H. Falberg is the owner of Falberg Saw Co., a manufacturer of portable resaw band saws, in Grand Junction, Colo.

Submitted by: Bob Fred on behalf of William H. Falberg

## Show and Tell From Our March 2007 Meeting



## Wooden Toys for the Holidays

At last month's meeting, Corey Larson brought in a number of toy plans. I still have copies available to anyone who would like a set. The object, of course, would be to make toys this year for the holidays and donate them to a charitable group for the holidays. It was suggested that people work in teams to assist in the effort. To date, we have 3 teams committed.

We would like to set a goal of 10 teams with each team producing 10 toys. Most toys can be made utilizing scrap wood laying around the shop. And, there are a variety of web sites out there offering free plans to make toys. Please let Andy Steinberg know if you are interested as well as your team member.



Busy month for show and tell. At the top, **Phil Cary** brought in some unique stools that have been in his family for a number of years. At the bottom left, **Frank Pogue** shows off a puzzle of miniature furniture that he cut utilizing a band saw that would be a good challenge for one of the teams to create for the holidays. **Corey Larson** (below middle) brought in a seashell chest that he created for a family member. And, **Don Hubbard** (below right) proudly displays a guitar that he hand built with his son-in-law over the past few years.

## Wood'n You Like To Know

Each month we will feature some general information about a wood that you saw in the stores or heard about in conversation but maybe you never took the time to inquire about the wood. If there is a wood you wish to see featured, please contact me and let me know.

This month, our featured wood is *lignum vitae*. Referring to this wood as hardwood is an understatement; *lignum vitae* is also known as ironwood. On the Janka Scale of Hardness, a scale used to measure the relative density of various types of wood, *lignum vitae* ranks the highest. It is 3 times harder than oak. Besides being known as the hardest wood, it is also known to be one of the densest woods. In water, this wood sinks.

*Lignum vitae* is found throughout the West Indies and Central South America. The nations of Jamaica and the Bahamas call the *lignum vitae* their national tree.

Like many hardwoods, growth is slow with this tree but it does grow normally to 12" in diameter. In days gone by, diameters of 18" to 30" were quite common.

*Lignum vitae* is reddish brown when freshly cut, with pale yellow sapwood. As it oxidizes, the color turns to a deep green, often with black details. The grain is highly interlocked, making it difficult to work with edge tools, but it machines well and takes a high polish. Since the wood provides natural lubricating oils which do not dry out, it is highly resistant to moisture and damaging fungus.

The name, *lignum vitae*, is Latin for "wood of life", and derives from its medicinal uses. Wood chips of this tree can be used to brew a tea and resin has been used to treat a variety of medicinal conditions from coughs to arthritis.

Because of its hardness, though difficult to machine, *lignum vitae* is used the creation of mallets, block planes and handles for other tools because it turns quite well. With the World Cricket Tournament occurring, *lignum vitae* is key; some cricket bails are made of this wood. The density of the wood makes it a perfect component on windy days. The wood also has seen widespread historical usage in mortars and pestles. And, for the submariners in our Guild, the shaft bearings on the WWII submarine USS Pampanito (SS-383) were made of this wood.



## Program Highlights from the March 2007 Meeting



John Moore (middle) demonstrates the first cutting steps in creating the cabriole leg. The top picture shows a finished leg and the bottom photo shows how the leg is incorporated into a piece of John's furniture. Thank you John for a great demonstration. (photos by Adrian Marshall)

## Tools and Their Real Uses

**DRILL PRESS:** A tall upright machine useful for suddenly snatching flat metal bar stock out of your hands so that it smacks you in the chest and flings your beer across the room, splattering it against that freshly-stained heirloom piece you were drying.

**WIRE WHEEL:** Cleans paint off bolts and then throws them somewhere under the workbench with the speed of light. Also removes fingerprints and hard-earned guitar calluses from fingers in about the time it takes you to say, "Yeow sh\*\*...."

**ELECTRIC HAND DRILL:** Normally used for spinning pop rivets in their holes until you die of old age.

**SKIL SAW:** A portable cutting tool used to make studs too short.

**PLIERS:** Used to round off bolt heads. Sometimes used in the creation of blood-blisters. The tool most often used by all women.

**BELT SANDER:** An electric sanding tool commonly used to convert minor touch-up jobs into major refinishing jobs.

**HACKSAW:** One of a family of cutting tools built on the Ouija board principle. It transforms human energy into a crooked, unpredictable motion, and the more you attempt to influence its course, the more dismal your future becomes.

**WISE-GRIPS:** Generally used after pliers to completely round off bolt heads. If nothing else is available, they can also be used to transfer intense welding heat to the palm of your hand.

**WELDING GLOVES:** Heavy duty leather gloves used to prolong the conduction of intense welding heat to the palm of your hand.

**OXYACETYLENE TORCH:** Used almost entirely for lighting various flammable objects in your shop on fire. Also handy for igniting the grease inside the wheel hub you want the bearing race out of.

**WHITWORTH SOCKETS:** Once used for working on older British cars and motorcycles, they are now used mainly for impersonating that 9/16 or 1/2 socket you've been searching for the last 45 minutes.

**TABLE SAW:** A large stationary power tool commonly used to launch wood projectiles for testing wall integrity.

**HYDRAULIC FLOOR JACK:** Used for lowering an automobile to the ground after you have installed your new brake shoes, trapping the jack handle firmly under the bumper.

**RADIAL ARM SAW:** A large stationary power saw primarily used by most shops to scare neophytes into choosing another line of work.

**TWO-TON ENGINE HOIST:** A tool for testing the maximum tensile strength of everything you forgot to disconnect.

**CRAFTSMAN 1/2 x 24-INCH SCREWDRIVER:** A very large pry bar that inexplicably has an accurately machined screw driver tip on the end opposite the handle.

**AVIATION METAL SNIPS:** See hacksaw.

**PHILLIPS SCREWDRIVER:** Normally used to stab the vacuum seals under lids and for opening old-style paper-and-tin oil cans and splashing oil on your shirt; but can also be used, as the name implies, to strip out Phillips screw heads. Women excel at using this tool.

**STRAIGHT SCREWDRIVER:** A tool for opening paint cans. Sometimes used to convert common slotted screws into non-removable screws.

**AIR COMPRESSOR:** A machine that takes energy produced in a coal-burning power plant 200 miles away and transforms it into compressed air that travels by hose to a Chicago Pneumatic impact wrench that grips rusty bolts which were last over tightened 30 years ago by someone at Ford, and instantly rounds off their heads. Also used to quickly snap off lug nuts.

**PRY BAR:** A tool used to crumple the metal surrounding that clip or bracket you needed to remove in order to replace a 50 cent part.

**HOSE CUTTER:** A tool used to make hoses too short.

**TWEEZERS:** A tool for removing wood splinters and wire wheel wires

*This article was submitted by Ed Bunker. Although the origination escapes Ed at this time, this article provides us with a better explanation of the tools that we utilize in our workshops.*

**EIGHT-FOOT LONG YELLOW PINE 2X4:** Used for levering an automobile upward off of a trapped hydraulic jack handle.

**E-Z OUT BOLT AND STUD EXTRACTOR:** A tool ten times harder than any known drill bit that snaps neatly off in bolt holes thereby ending any possible future use.

**TROUBLE LIGHT:** The home mechanic's own tanning booth. Sometimes called a drop light, it is a good source of vitamin D, "the sunshine vitamin," which is not otherwise found under cars at night. Health benefits aside, its main purpose is to consume 40-watt light bulbs at about the same rate that 105mm howitzer shells might be used during, say, the first few hours of the Battle of the Bulge. More often dark than light, its name is somewhat misleading

**HAMMER:** Originally employed as a weapon of war, the hammer nowadays is used as a kind of divining rod to locate the most expensive parts adjacent the object we are trying to hit. Women primarily use it to make gaping holes in walls when hanging pictures.

**MECHANIC'S KNIFE:** Used to open and slice through the contents of cardboard cartons delivered to your front door; works particularly well on contents such as seats, vinyl records, liquids in plastic bottles, collector magazines, refund checks, and rubber or plastic parts. Especially useful for slicing work clothes, but only while in use.

**DAMMIT TOOL:** Any handy tool that you grab and throw across the garage while yelling "DAMMIT" at the top of your lungs. It is also, most often, the next tool that you will need.

## Club Discounts Available

Over the years, certain businesses have offered a variety of discounts to our membership. Below is a current list of companies that offer some type of discount for products and services.

Woodcraft	10% off on meeting night
	Norfolk (757) 466-1166
Sure Set Saw	13% Discount
	Chesapeake (757) 420-7991
Cabinet Makers Hardware	Contractor's Price
	Virginia Beach (757) 490-1185
Plywood & Plastics	
	Norfolk (757) 858-3908
Scroll-it Service	
	Portsmouth (757) 237-6867
Sherwin Williams Paint	15% Discount
	All stores in Hampton Roads