

# DIMENSIONS

Newsletter of the Pacific Woodworkers Guild

## At a Glance:

- Next meeting is Tuesday April 17th, 2001 – This meeting will feature the 2001 2x4 Challenge.
- 2001 Richmond Carvers Show is May 25-29, at the Steveston Community Center.
- Workbench building project is underway (see page 3).
- Interested in CNC? This month's newsletter features the first in a series of articles on this subject (see page 4).

## When Last We Met

By Marco Berera

### [Pre-Meeting Demonstration](#)

If you weren't there on time (6:30 pm), you missed a fantastic demo by **Art Liestman**. Art showed us how to colorize his beautiful small hollow forms, turned from green cherry, carved, and colored with brilliant shades of acrylic ink.

### [General Business](#)

**Bill Ophoff** opened the meeting by greeting newcomers and having them introduce themselves. Bill also shared that at the last executive meeting, the members discussed how to make our monthly meetings more exciting.

**Paulin Laberge** encouraged us to sign up for the 2x4 Challenge. By the end of the meeting Paulin had 10 new entries. In addition to this year's entries, past years entries should be brought along to be enjoyed by our guests.

**Paul Townsend** invited us to check previous years entries on our web site, and also mentioned that newsletters on e-mail are in color.

Finally, to create an even more exciting evening, the April meeting will also host the usual Presidents Challenge. Please bring a toy which you may wish to donate to the Christmas Toy Workshop.

### [Guest Speaker](#)

**Ken Vickets** from Lee Valley Tools introduced himself as the Seminar Program Coordinator at Lee Valley. He punctuated his whole evening of do's and don'ts of sharpening tools with numerous stories and jokes. He gave us tips on how to flatten and sharpen chisels to a degree that we'd be proud to show them off to our friends. He prefers to sharpen his chisels with

Japanese waterstones. (Can you reveal the secret composition of the waterstone and let us know? The Japanese won't tell us). If you have any natural Arkansas stones, keep them. They are hard to get and expensive.

Ken also showed us how to flatten a worn waterstone with 1/4" plate glass (window glass is not flat). Use 90 grit aluminum oxide and water to make a slurry to coat the glass plate before rubbing the waterstone back and forth until the scratching sound ceases. The stone will then adhere to the glass due to vacuum. For further information read **Leonard Lee's** book or watch his video on sharpening tools [*Ed. Note: this video is in the PWG video library*].

Once the stone was flat, Ken showed us how to remove the scratches on the back of chisels, in order to create a sharp edge which he produced with the Lee Valley honing guide and angle jig. Fine Woodworking Magazine highly recommends these gadgets. When sharpening a gouge the cheap way, cut a groove in a piece of pine, rub jewelers rouge in it, and you have a "custom sharpening device".

### [Show and Tell](#)

**Harry Taylor** demonstrated his Swan Lake music box created by fine delicate scroll saw work on mahogany, cedar and aspen. He used #20 double tooth blades with no sanding required. Well done!

**Art Liestman** showed off his unique colorized hollowed turned vessels with contrasting wood neck inserts as seen in the pre-meeting demo.

**Reminder – The April meeting of the Pacific Woodworkers Guild will be held at the Sapperton Pensioners Hall, in New Westminter (see map on page 2).**



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Please direct newsletter submissions to the newsletter editor, Murray Mackinnon, via email: [murraym@istar.ca](mailto:murraym@istar.ca) or call 986-5471.

The Pacific Woodworkers Guild is a non-profit association of British Columbia Craftspeople dedicated to excellence in woodworking. Guild members meet on the third Tuesday of each month (except July and August) in Richmond, B.C.

The newsletter is published monthly, ten times per year, and distributed free to members and associate members. Membership is available to anyone interested in any form of fine woodworking. Membership fees are \$25 for twelve months; Associate membership fees (newsletter only) are \$15 for ten issues.

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### Guild Executive

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*Treasurer*  
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 Dan Lemire  
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 Paulin Laberge  
 Paul Townsend  
 Bill Fox  
 Art Liestman  
 Bob Bedier

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##### Richmond Carvers' Show

##### BC Woodworking Show -

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##### Christmas Toy Workshop

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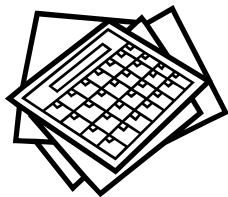
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 Harry Taylor  
 Denis Reid  
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 Klaas Focker  
 Bob Bedier

### Next Meeting

The next meeting of the Pacific Woodworkers Guild will be held on Tuesday April 17th, starting at 7:30 pm. The meeting will feature the exhibition and judging of the 2001 2x4 Challenge.

The meeting will be held at the *Sapperton Pensioners Hall* which is at 318 Keary Street, New Westminster, B.C. (across the street and west of the Royal Columbian Hospital).

Map at right reprinted from [www.mybc.com](http://www.mybc.com).



## Workbench Sawdust Huddle

By Bill Ophoff

On Saturday March 24th members of the PWG Bench Building Brigade (BBB) met at **Bill Fox's** shop to work on the two old fashioned wood-worker's benches to be offered as prizes in upcoming raffles. We decided to divide the project in such a way that we could take materials away, work on sub-assemblies, and then marry the pieces at our next sawdust huddle.

**Mel Anderson** and **Barrie Treasure** each have a set of legs to mill and prepare for assembly. **Lou Hafer** is making the stretchers for both benches. **Marco Berera, Lor Pellett, Jan Dicks,** and **Jack Wagner** took on the task of laminating the bench tops complete with the mortises for the bench dogs. **Denis Reid, Bill Ophoff,** and **Mel Anderson** will take on making the components for the wooden vises complete with wooden screw.

After a good dose of coffee and donuts the business of ripping the 2 x 6 and 2 x 8 Eastern

Maple got off in fine form. The bench top pieces were ripped on the bandsaw, edge jointed and then thickness planed. The pieces for the legs and stretchers were ripped on the table saw, trimmed to length on the chopsaw, edge jointed, and thickness planed. With only a few moments of head scratching and double checking planned versus actual, the pieces were all set by the end of the session to go their respective homes. A very productive session and great fun to boot.

The PWG BBB will meet again Saturday April 28th to give those entering the 2 x 4 challenge enough time to regain their wind and wrap up the making of the sub-assemblies. At that huddle we will see how the mating pieces of our efforts mate up, make the adjustments, and refine the bench tops by adding the rear tool till. We plan to have at least one unit ready to display at the Richmond Carver's Show May 25 – May 27. This will mean at least one more huddle to deal with final assembly and accessories (Saturday May 12th).

## President's Challenge – March 2001

By Bill Ophoff

The challenge for March was miniatures small enough to fit inside a 35 mm film canister.

**Harry Taylor** brought in a recycling masterpiece. His miniature banjo clock with a working timepiece was made from found wood and the works were from a second hand (no pun intended) woman's wristwatch.

**Lor Pellett** brought us a set of miniature wood-working tools. Her hand saw is made from a hacksaw blade with a piece of cocobolo for the handle. Also from cocobolo and brass she crafted a functional bevel gauge and a tiny brass-sided handplane.

**Henry Schulz** showed us a well-crafted nut and bolt assembly made of maple. Henry told us he used a Beall jig to fashion the screw threads.

**Ted Fromson** had a delightful series of nested eggs complete with eggcups. Ted used oak and cherry to make his offerings.

**Marco Berera** had three sets of miniatures to intrigue us. The first was a set of tables and chairs, which reassembled into a rectangle, which in turn slid into the cylinder of the film canister. Marco had made these just prior to this meeting. His comment of 'just try it' should encourage us all. His second showing was a collection of 15 to 20 small bandsawn animals of various woods, which fit en masse into the film canister. Offering three included a figurine of a turn of the century woman in long dress holding an umbrella and as well a small bird on a pedestal.

After the voting was completed, this month's bragging rights were awarded to **Marco Berera**. I was pleased to hear that every entry received votes this month, as it should be. The idea of the challenge is to provide a focus topic that members of the guild can challenge themselves with. Topics are general enough to allow a broad range of interpretation so enjoy yourself and rise to the challenge.

The themes for the next few President's Challenges are:

**April** - A toy that will be donated to the Christmas Bureau;  
**May** - A rocking chair scaled for a doll; and  
**June** - A functional wooden coin bank.

## CNC – Computer Numerical Control

By Phil Laliberte

*This is the first in a series of articles about CNC.*

CNC (Computer Numerical Control) is the control of a machine tool using a code of numbers and letters. Modern CNC systems allow a person to draw a part on a computer screen, assign a tool and machining strategy to the design and subsequently have the part manufactured exactly as designed.

Today CNC machines are found in many different manufacturing plants, the major ones being the aerospace, metalworking and woodworking industries. Within each industry, there are wide range of CNC machines with all kinds of capabilities and price ranges. Machines consist of mills, routers, lathes, wire edm, water-jet cutters, grinders, plasma cutters, oxy-acetylene, forming, bending, punching, VMC (vertical machining center), welding, painting, panel cutting, optimizing cut-off saws, etc.

CNC machines are available from \$2000 to \$250,000 and more depending on features and capabilities. A USEFUL machine for woodworking starts at about \$6000 U.S. (you supply a computer and the router). At about \$30,000, you get routers that are more powerful with faster travel and cut speeds with extremely high precision.

CNC machines typically exhibit .0003-inch positional accuracy and .00004 position repeatability. Some metalworking machines are easily adaptable to woodworking. CNC machines with automatic tool changers and automatic material handling are considered high-end machines and can run unattended in a "lights out" factory. Points to point machines at \$150,000 or more are the workhorses of the woodworking industry.

Hobbyists have built machines for their own use. (Sort of like building a dune buggy instead of buying a car or truck.) The cost is way down, but functionality and features are limited. However, these offer a lot of pride and flexibility to the user/builder.

### CNC History

**1947 – John Parsons** began experimenting with the idea of generating thru-axis curve data and using that data to control machine tool motions. (U.S.A.)

**1949 –** A contract granted to the Parsons Corporation to search for a speedy production method.

**1952 –** MIT successfully demonstrates a model of the NC machine of today. The machine was a three-axis simultaneous movement type of vertical machining center. The storage medium for programs was perforated paper tape one inch wide. The machine successfully made parts with simultaneous thru-axis cutting tool movements. MIT coined the term "numerical control".

**1955 –** Commercial models of NC machines displayed for customer acceptance.

**1956 –** US Air force sponsors the construction of 100 large NC machines. Four major manufacturers build machines. (Bendix, General Dynamics, General Electric and EMI)

**1957 to 1960 –** NC accepted by aircraft industry; several are installed and in use.

**1960's –** Modular design and standards emerge for controllers and programming capabilities

**1964 –** Shoda (Japan) builds first NC router for the woodworking industry

**1973 –** Phil takes his first CAD course.

### CNC Advantages

High degree of quality due to accuracy, repeatability, and freedom from operator-introduced variations.

Reduced scrap. Errors due to operator fatigue, interruptions, and other factors are less likely to occur.

*(Continued on page 5)*

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*“CNC machines are available from \$2000 to \$250,000 and more depending on features and capabilities. A useful machine for woodworking starts at about \$6000 U.S.”*

*(Continued from page 4)*

Simplified inspection. Once the first piece has passed inspection, minimal inspection is required on subsequent parts.

Lower tooling costs due to less need for complex jigs and fixtures.

Reduced cycle and lead-time.

Complex operations are more easily accomplished due to advanced machine control.

#### CNC Disadvantages

Tools on NC machines do not cut material any faster than conventional machines.

CNC does not eliminate the need for expensive tools. There is also a greater initial cost involved with the CNC machine.

CNC will not totally eliminate errors. Operators can still fail to push the correct buttons, make incorrect alignments, and fail to locate parts properly in a fixture.

## Woodworking Web Sites

By Bill Ophoff

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*“This is a short list but as I have already cautioned, the links will take you to hours of interesting research.”*

Here are a few websites that feature tools and related topics. Use at your own peril!

[www.supertool.com](http://www.supertool.com) — This website is run by Patrick Leach and is called The Superior Works. This is the site for those interested in Stanley Tools, especially the area called "Patrick's Blood & Gore". You are toured through Stanley's all time tool catalogue by the numbers, literally and figuratively. Very chatty, great info, and stunning photos.

[www.antiquetools.com](http://www.antiquetools.com) — Museum of Woodworking Tools" is the title of the webpage to visit. It is just what it sounds like. You go on a virtual tour of a museum with specialized rooms and time limited special exhibits. Great concept, very good execution. As with the other sites mentioned there are some extensive links from this site guaranteed to keep you going 'til the wee hours.

Selection and training of programmers and maintenance personnel is required.

*Next month I will cover the various types of CNC machines that are used for woodworking.*

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*Phil graduated from the University of Saskatchewan (1973) with a Bachelor of Science in Electrical Engineering and is currently registered as a Professional Engineer in British Columbia. Phil has been working with CNC for more than 20 years and has applied his skills to the electronic, sheet metal, motion control and woodworking industries. He has spent considerable time in the automation of various processes for these industries. His current projects include the design and manufacture of a low-cost automated tool positioning system. Phil is the instructor for the CNC Basics router course as well as CNC Introduction to 3D course offered by B.C. Wood Value-Added Development Centre in Abbotsford.*

[www.cs.cmu/~alf/en/en.html](http://www.cs.cmu/~alf/en/en.html) — Web page titled Miller's Patent Tools is a tribute from another tool lover to Stanley's competitor. This is a subset of a site called the Electronic Neanderthal, which is well worth a tour. Again, more great links to other interesting sites.

[www.tooltimer.com](http://www.tooltimer.com) — This is a dealer in old tools who presents a well organized site with many articles, photos, etc. There is a page here called *Other Sites* with a drop down box guide to links. Very dangerous if you only have a little time to spare.

[dialspace.dial.pipex.com/tplanes.htm](http://dialspace.dial.pipex.com/tplanes.htm) — This is a great site, one of my favorites. The focus here is on British hand planes which are a class unto themselves. The work of many contemporary toolmakers is on display and for sale here. Great photos.

This is a short list but as I have already cautioned, the links will take you to hours of interesting research.

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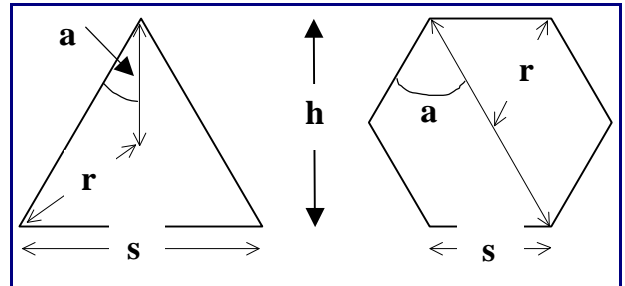
## Shop Notes – Table for Polygonal Angles and Lengths

By Murray Mackinnon

Ever been making a frame in the shape of a regular polygon and not had a framing square with the angles to help you. The first column of the table at right gives the exterior mitring angles (a) for the regular polygons from n=3 to n=12 sides ( e.g. for an equilateral triangle the angle is 30° and for a square it is 45° ). As well, it gives the height (h) in terms of both the radius ( r ) of the circle enclosing the polygon, and the height (h) in terms of the length of a side (s). So for a hexagon, the height or altitude is 1.732 times the radius and 3.464 times the length of a side. The last column gives the length of a side (s) in terms of the radius of the enclosing circle ( r ). All of these relationships can be worked backwards. So if you want to know the radius to draw a circle that will form a heptagon whose side will be x inches then divide x by 0.434.

For those needing more sides, or just plain curious, the formulae are just high school trigonometry ( $a=90^{\circ}(1-2/n)$ ,  $h = r*(1+\sin a)$  for n odd,  $h=2* r*\sin a$  for n even,  $s = r*\cos a$ ).

n	polygon	a	h(r)	h(s)	s(r)
3	equilateral triangle	30.000	1.500	1.732	0.866
4	square	45.000	1.414	2.000	0.707
5	pentagon	54.000	1.809	3.078	0.588
6	hexagon	60.000	1.732	3.464	0.500
7	heptagon	64.286	1.901	4.381	0.434
8	octagon	67.500	1.848	4.828	0.383
9	nonagon	70.000	1.940	5.671	0.342
10	decagon	72.000	1.902	6.155	0.309
11	11-gon	73.636	1.959	6.955	0.282
12	dodecagon	75.000	1.932	7.464	0.259



## Shop Notes – Hot Melt Glue

By Bob Vergette

I do a fair amount of woodturning and have discovered a great helpmate for several aspects of what I do. Hot melt glue has been available for many years, but I discovered its use in woodturning only recently. I use it for attaching blanks to a faceplate. This can be done directly on the steel of the face plate or for more strength the blank can be attached to a board screwed onto the face plate resulting in a wood to wood joint.

I also use hot melt glue for the last part of the process of turning bowls. I usually use a Nova chuck to hold bowls to finish the inside but like to turn the bowl around so that I can finish the base. One way to do this is to make a round mortice the same diameter as the rim of the bowl in a plywood base attached to a faceplate. I then apply 4 to 6 dabs of hot melt to hold the bowl into the mortice which is usually enough to hold it securely. The best part is that to remove the bowl simply hammer

a chisel into the wood under the bowl being careful not to damage the rim and pry up. Repeat this several times and the bowl will come free. The glue does not penetrate the wood or leave any permanent residue on the surface of the bowl that could affect the finish.

Another idea is to use hot melt glue when gluing up the rings for a stacked bowl. When making stacked bowls or vessels, the rings of mitred sections (usually 8 to 12 pieces per ring) are glued together. The ring, once complete, it is glued onto the previous ring on the bowl. This process is repeated the number of times required to make the desired depth of bowl.

The normal way to glue-up the ring is to glue 2 sections (with yellow glue) at a time and then glue the doubles together and in that way build up the ring. The method using hot melt glue entails gluing the whole ring together at one time on a piece of plywood using hot melt to glue the sections down on to the plywood.

