

## ***Northwest Woodworkers Association***

# ***THE SAWDUST NEWS***



February 2018

An association for woodworkers of all skill levels to share their common interest

## ***The Next Meeting***

**Date: Thursday, March 29, 2018 at 6:30 PM**

**Location: Rockler Woodworking - Northgate**  
832 NE Northgate Way  
Seattle, WA 98125

**Program Highlight: Hand Tools Aren't Dead Yet!**

Tony Grosinger will be giving a presentation discussing and demonstrating the use of hand tools such as planes, mortising chisels, and hand saws. He will be focusing on when they have an advantage over machine tools (and when they don't). Tony will be demonstrating the making a couple types of joinery. Don't miss it!

## ***February 2018 Meeting Highlights***

***Newsletter Photos by Scott Wilson***  
***Newsletter Notes by Tony Grosinger***



The February 2018 meeting of the Northwest Woodworkers Association was held on Thursday, February 22, 2018 at Woodcraft Supply. Ten members braved the cold Winter weather to attend the meeting. Tim Newsome conducted the meeting.



Due to a mix up in scheduling, we were unable to meet in the workshop classroom. However, we appreciate the quick thinking and prompt action by the **Woodcraft Staff** to set up an alternate place for us to meet in the library area, including a makeshift projector screen. We want to express our appreciation to **Ron and Michelle Hall and the Woodcraft staff** for again providing a wonderful venue for this meeting. We really appreciate your long-standing support of the **Association**.

## ***New Tools***

**Paul Stoops** noted that he recently took advantage of an online sale to purchase a variety of **Mirka Abranet**® ROS disks. **Abranet**® is a thin woven mesh impregnated with abrasive particles. He noted that these disks are somewhat aggressive, but are long lasting and resist loading with dust or finish like typical abrasive paper disks. They are also easily cleaned by just rapping the disk against the edge of a trash container. However, when used with a random orbit sander (ROS), an intermediate adapter pad is required to prevent the heat of sanding from damaging the hooked surface of the ROS pad. He also noted that these **Abranet**® disks conform extremely well to hand sanding blocks with a hooked pad. Although **Abranet**® disks are somewhat more expensive than conventional paper disks, he feels the performance offsets the higher cost.



## ***Show 'N' Tell***



**Paul Stoops** showed some photos of a hardwood serving tray he recently built as a donation to a charity auction benefitting the **Leukemia and Lymphoma Society**.

The 11 inch x 18 inch tray was an original design crafted from **Black Walnut** and **American Beech**. The tray was elevated on a low base frame made from **Beech** which had been ebonized using **India Ink**, and top coated with clear finish. Although the color was a nicely intense black, **Paul** noted that the **India Ink** just deposited on the surface, with minimal penetration, making it too easy to sand through the coating on the corners.... 😞. He said that next time he tries ebonizing he will use a black dye, which should promote better penetration into the wood — a lighter sanding touch would probably help too..... 😊!





The bottom view shows the tapered, ebonized base, inset from the edges of the tray. Soft, non-marring button feet were press fitted into holes in the base. The metal handles with threaded studs were installed with epoxy into blind holes in the tapered end rails.

**Paul** made the custom inlays using leftover remnants from a previous end grain cutting board project – too purty to throw away...☺! He used high gloss **Target Coatings EM8000cv** conversion varnish, a water-borne clear coat finish, over a seal coat of **Zinsser Sealcoat** shellac, to produce a warm tone in the **Black Walnut**. He selected this finish due to its advertised durability for commercial furniture and cabinetry and slightly warm amber hue.

**[Ed. Note: Paul said he received a nice thank you note from the person who purchased the tray at the auction, making him feel that his donation was doubly worthwhile!]**

# **Program Highlight – CNC Woodworking**



We were treated to a truly enjoyable and informative presentation about CNC Woodworking from **Mr. Eugene Bagdon**, owner of **By Design Woodworking, LLC** (<http://bydesignwoodworking.com/>). (His website has a delightful gallery of his wide variety of projects!) Although his business principally provides design and CNC machining services to both private and commercial clients, he also teaches CNC Woodworking at **Woodcraft** on a part-time basis.

**Eugene** began his presentation illustrating the versatility of CNC Woodworking by showing us a wide variety of projects he has created – from objects small enough to hold in his hand to long decorative claddings to exquisite inlaid floor tiles, as well as 3D carvings, boxes, wedding cake toppers, signs, guitar prototypes, etc.— a real smorgasbord of fascinating projects!



This project was created for the folks at **Google** as an employee motivation tool. The pie-shaped inserts were awarded for accomplishing environmental impact targets. Each of the inserts had an embedded steel screw which engaged a small rare earth magnet centered in the matching pocket to secure it. **Eugene** said he made about 100 of these creations, which paid for about half the cost of his first CNC machine!

He then showed us one of his current projects he is creating for a commercial client. Apparently the project design involves a pair of common grade 6 x 6 inch posts which he will clad on all four sides with curved panels about seven feet long. As can be seen in the photo, the panels have a striated surface, which he produced using bull nose bits. He noted that his initial panel machining with evenly spaced grooves looked too uniform and not artistic enough, so he altered his programming and added more random grooves with a smaller radius bit to produce the desired effect. He also said that the panels were too long to fit within his machine, so he had to carefully register the panels to allow repositioning on the bed of his machine to keep the groove pattern aligned.



He also noted that when finished the two columns will be separated by a series of wooden plaques of different wood species, CNC engraved with meaningful words selected by his client.

One of the fascinating projects **Eugene** showed us involved making inlaid wooden floor tiles for a custom home installation. The tiles were made from **Appleply**®, a premium grade hardwood plywood made from uniform 1/16” thick **Birch** plies, and usually faced with blonde-colored **Maple** veneer.



The tiles for this floor were approximately 30 inches x 30 inches, fabricated with curved edges.

These beautiful hardwood tiles were further embellished with a variety of vividly colored, leaf-shaped hardwood inlays in several wood species, providing a striking contrast with the light-colored tiles. Purposely, the grain patterns of the inlays were aligned to imitate the veins in actual leaves. Also note that most of the leaf inlays are divided along their **curved** centerlines, producing a bookmatched appearance. The white areas on the panel are pockets which were CNC machined to precisely match the profile of the leaf-shaped inlays.





Is that beautiful, or what!!

This project, almost impossible using conventional woodworking equipment, graphically demonstrates the versatility and accuracy provided by CNC equipment. The unique geometry and multiplicity of different leaf inlay configurations, and their accurately machined matching inlay pockets, are a magnificent testimony to the necessity of this kind of precision equipment and control software for such a demanding task! Without question, this project also required a high degree of artistic talent as well as advanced CNC programming and woodworking skills. What a remarkable project, **Eugene!** Thanks for sharing it with us.

**Eugene** said he has two industrial flavor CNC machines in his 3-car garage shop. One of them is a 5 ft. x 5 ft. capacity machine currently in use. The other is a larger machine which he said is idle, awaiting a source of 3-phase electrical power! Three-phase power, provided by the local utility company, commonly available in industrial areas, is usually prohibitively expensive to install in residential environments. He is considering the alternate use of a phase converter to produce the required 3-phase power from his available 120/240 VAC single phase residential service. However, such accessory equipment also involves a substantial monetary investment.

He noted that his CNC equipment will also machine nonferrous metals, such as aluminum and brass, as well as plastics, composites, etc.

**Eugene** also showed us an example of 3D relief carving, noting that this task requires more sophisticated and expensive control software. This plaque demonstrates a two-part programming process, in which the initial rough machining, shown on the top half of the plaque removes much of the excess material, followed by final machining which produces the fine detail shown on the lower



half of the plaque. Different bits are used for the two operations, with several tool configurations required to produce the fine detail. CNC machines which do this kind of task usually incorporate automatic tool changers (ATC's) which allow the same machining program to use several different router bits, optimizing machining efficiency and maximizing throughput.

### About CNC

- **CNC** is an acronym for **Computer Numerical Control** and usually refers to a machine which uses a computer to execute pre-programmed sequences of machine control commands in accordance with **Computer Aided Design (CAD)** drawing.
- **CAD** software is used to design and create a drawing of the part.
- **CAM (Computer Aided Manufacturing)** software generates the actual tool paths to be followed to machine the part in accordance with the **CAD** drawing.
- Additional software transforms the **CAM** data into a machine language (**GCODE**) which controls the actual operation of the machine.
- Sophisticated industrial CNC machines sometimes also include a 4<sup>th</sup> axis rotary control capability which is used to machine round objects.
- Using a CNC machine requires some familiarity with CAD design and machining parameter selection, such as chip loading, feeds, speeds, bit changing, etc. Fortunately, some of the software programs have programming menus with built in prompts or recommended parameter values determined by the CAD design.

### Pros and Cons of CNC

- **Benefits:** Process automation, precision, flexibility, repeatability, predictability
- **Limitations:** High cost equipment and software, unable to create square inside corners

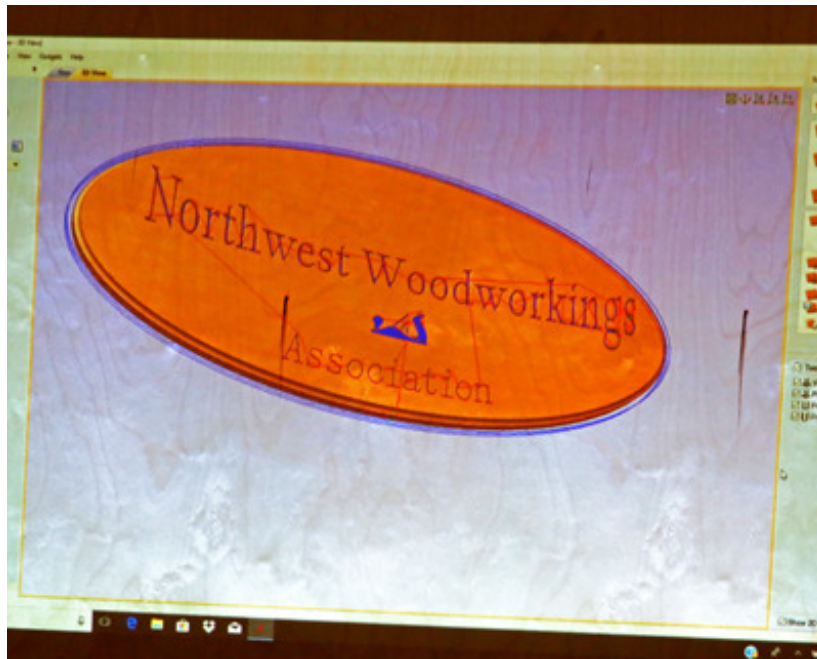
Software – There are a large number of CNC software programs available.

- Free programs include **Autodesk Fusion 360**, which is a 3d parametric modeling program (<https://www.autodesk.com/products/fusion-360/free-trial>).
- **Aspire** (<http://www.vectric.com/products/aspire.html>) This is the 3D program that Eugene says he and many other professionals use for their projects. It is expensive, however.
- **VCarveDesktop and VCarvePro** (<http://www.vectric.com/products/vcarve.htm>) are lower cost 2D/2.5D programs that are more commonly used on hobbyist machines.

**[Ed. Note: Many software suppliers offer free trial versions which can be downloaded from their websites. Many of them also have free user forums that are said to be very valuable sources of information and help.]**

## Real-time Software Demo

Using the **Aspire** program on his laptop computer, **Eugene** conducted a real-time demo of this CAD software to design a virtual engraved sign using our **Northwest Woodworkers Association** name (almost..!) He noted that he can employ any of the **True Type** fonts used by **Microsoft**. He demonstrated some of the software features including displaying the type in an arc, imbedding a bitmapped image of a hand plane, creating an oval shape for the sign, and adding an edge profile to the sign. He said that there are many other features of this software that can enable the design of much more complex objects.



Following this software demonstration, **Eugene** took us out on the showroom floor and showed us some of the CNC machines currently for sale by **Woodcraft Supply**. These machines ranged from small desktop models suitable for hobbyist use to larger floor-mounted units which could be used for light commercial applications.

However, he noted that two of the most important differences between machines is the rigidity of the machine construction and the type of drive systems. These features largely govern the machine's ability to handle the cutting forces required, the ability for rapid, high speed movement of the machine gantry, and control machining accuracy. He also noted that the heavy-duty machines employ a robust water-cooled spindle, rather than the conventional standard or trim router used on the hobbyist machines. Also, industrial CNC machines are typically designed with heavy duty, precision components, and rigid, welded steel structures to provide high machining accuracy, durability, and high speed, high duty cycle performance.

However, the capabilities of the smaller hobbyist CNC machines are amazing! Typical hobbyist applications like engraving a name on the top of a box, making a custom sign, carving a 3D image on a plaque, etc. are now much more easily and accurately done with these machines using the user-friendly software programs that are typically provided as part of the hobbyist machine packages.



Another avenue that many enterprising hobbyist woodworkers have pursued successfully is the building of DIY machines. Some of the machine designs are available as DIY projects with dimensioned construction drawings and parts lists of required ancillary purchased components. There are also complete machine DIY kits available. Other companies specialize in providing the control electronics and components for these DIY machines. A listing of many of these resources can be found by conducting an online search for **DIY CNC Machines** on your computer's browser. Many **YouTube** videos on the subject are also available online.

However, it must be noted that most of the DIY machines lack the rigidity and accuracy of commercially made units. Software can also be a significant part of the cost. That said, many folks find great enjoyment building and using such equipment for typical hobbyist applications, making craft items, etc. and the feeling of accomplishment from having built the machine.

We want to thank **Eugene** for the fascinating presentation and introducing us to one of the newer technologies that we have available to us in the woodworking world.

For those who are interested in exploring the fascinating world of CNC machining, a valuable resource of more information may be found here: <http://www.woodezine.com/cnc.html>

## **Note from the Editor**



I really enjoyed **Eugene Bagdon's** CNC Woodworking presentation. His presentation dovetailed nicely with last month's program by **John Gonder**, in which he explained how he had used his CNC machine to craft tooling components for his shop.

Even though there is an ongoing disagreement over the question, "**Is CNC machining really woodworking?**", does it really matter? This seems to me to be as pointless as the arguments between hand tool aficionados and power tool users. I think all of these woodworking disciplines and technologies have a place in our craft. Some of them are more useful for certain tasks than others; some of them are better suited to newer woodworkers with good computer skills; some are better suited to older, retired woodworkers who have a reservoir of woodworking knowledge and experience, patience, time, and manual skills honed over long years of practice.

However, as **John Gonder** so aptly demonstrated, integration of some of the newer technologies like CNC machining with conventional woodworking processes and practices can use the best features of both worlds to produce a complementary marriage of the new and old.

I, personally, would love to have a CNC machine in my shop. There are some tasks, involved in the small projects I usually make, that would be much more easily and accurately done using a CNC machine. However, my shop is so small that there is no room for even a desktop machine! So, I feel like I can spend a little more on that beautiful piece of figured hardwood, considering all the money I saved by **not** buying that tempting CNC machine..... 😊

Happy and Safe Woodworking,

Paul

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We encourage our members to contact any of the above individuals with questions, comments, or items that may be of interest to the membership.

In addition, please visit our website: <http://www.nwwoodworkers.org>