Rose Engines Feature Prominently at 2011 AAW Symposium

Ornamental Turning and especially Rose Engine work was prominently featured at the 25th Anniversary American Association of Woodturners Symposium in St. Paul, Minnesota. There were several workshops devoted to OT along with a meeting of OTI on SIN (Special Interest Night). The instant gallery showed many fine examples of ornamental work.

The OT sessions began with Jon Magill and his presentation on *Demystifying the Rose Engine*. Jon said that he always has some tips he wants to share, but runs out of time so he decided to begin his talk with tips. He first discussed his appreciation for the golden mean and its use in design. He then showed his shop made set of golden mean dividers which consisted of a set of dividers made from plastic and hinged at the pivot point so that they produce the golden mean proportions. A handy and easy to make device. Next he showed a couple of items available from Lee Valley Tools. The first is a 15x LED illuminated loupe which can be used to check the quality of cut and for many other shop uses. The second item is called Accu-Angle and is an analogue device that can be used to set angles on cutting frames, cross slides, etc. It has a vernier scale so it is very accurate. He also likes the original Beal Tilt Box and feels that other models are not as accurate. [Ed Note: I think most of us prefer to use an adjustable machinist’s level instead of a Tilt Box.]

He then moved on to show how he finds center for his cutter on the MDF lathe using a scrap disk and a multi-try method. He did a short discussion on Digital Read Outs (DROs) which have come down in price so much that they are now affordable to put on cross slides and other parts of a lathe if you find a digital readout more accurate and reproducible.

As we all know when doing an index pattern it is easy to miscount the number of holes and ruin the piece. If you use a marker on the index wheel it may be difficult to remove and will require the use of a solvent. Jon learned from our English cousins that White Out Correction fluid can be used to paint the holes. After the pattern is finished it is easily removed by scraping or the use of a wet cloth.

He discussed belt welding. There are several jigs on the market that are rather expensive and shop made ones such as Jerry Decker’s belt pliers and jigs made from paper clips. Whatever method you use, the important points seem to be keeping air from the molten surface to keep it from skimming over before the ends join, letting the belt cool thoroughly before using, and removing the mushroom protrusion that forms at the weld. If the molten belt cools and skims over before being put together then the weld will be weak and break. If you use the belt before it has cooled completely, then the weld will be weakened and will break. When the belt is welded the softened material will mushroom out around the circumference of the belt and rub as it goes through the pulleys. Jon removes the extra material with the careful use of a sharp blade or a grinder.

Jon gave a short discussion on the quality of work. He wants us to set our standards bar high and then exceed those standards. We should learn to recognize good work and should not show or repeat poor pieces with rough cuts, non centered work, or with a poor choice of materials or use of grain. Always choose wood with close grain and closed pores.

Jon likes to glue some of his work pieces to waste blocks that he has drilled and tapped for the thread of his lathe spindle. This gives him a solid hold at minimal expense. A 7/8 inch Forstner bit is the proper size drill for a 1x8 tap.

Jon showed a couple of accessories for the MDF lathe. One is an eccentric dome chuck with an indexing head. The other is a cutting frame he and Fred Armbruster have developed which uses cutters made from flat stock. This makes it easier to make shaped cutters since nothing has to be shaped on the holding end of the cutter.

He ended his talk with a quick discussion of making rosettes. He talked about using CNC machines for precision work and...
also referenced an article in *Fine Woodworking* by Jim Cummings showing a jig to use a router to cut wooden clock gears that can be adapted to cut rosettes.

The second workshop was by Joshua Salesin entitled a *Decade of Making Boxes*. Joshua’s talk was a slide show which showed boxes and some of his OT equipment. His presentation gave great insight into how he developed his own sense of design, how he has grown as both a turner and as an artist, and how his design tastes have changed as he has grown. His journey shows a great relationship between equipment, talent, and growth. He learned to fully use the equipment he possessed and knew what he wanted to accomplish when he looked for new equipment. For example, as he grew he wanted to make an elliptical box, but if he had not had an elliptical chuck then he would have done something else.

Joshua started with plain turning. He was inspired by the OT works from the 17th cent. It took him 3 years to acquire his first rose engine and refurbish it. He started in OT by making decorated cups which he evolved into his first boxes. As his work developed he began to work on a series of boxes playing with size, decoration and the basic shape. This series culminated with his early pierced boxes.

For technique he drew from all the standard OT books as well as books on making plain boxes, woodturning design, and books on form for pottery and glass.

From his pierced boxes he turned to the process of making his Wavy Boxes. In discussing materials he spoke about liking African Blackwood. He gets his blackwood as seconds from musical instrument makers. This allows him to use materials that have been rejected by clarinet makers containing flaws that he can work around. He establishes basic form and shape on a plain lathe and then goes to RE. From here he developed a sphere box and then a planet or Saturn box. Joshua did a collaborative series with Mike Shulter using Mike’s segmented rings on the boxes. From there he decided to try elliptical boxes and found that rosettes and division for such things as fluting are very different for an ellipse than for a circle. While he had always made prototypes of his new designs, he found this especially important for the elliptical box.

He found the work of Volmer to be very useful for his oval turning directions. [ED Note: see Volmer’s work at http://www.volmer---ovaldrehen.de/englisch.htm. ] Joshua also drew from the oval work described in Mike Darlow’s books.

After exploring the oval box and then doing further enhancements of his round boxes he decided to develop a lighthouse. He started by doing research and collecting photos of lighthouses. He decided to print the photos in black and white to just give him the impression of the form rather than the fine details. This gave him more freedom of design and allowed him to see what elements of the lighthouse were necessary for the box and what elements could be changed or eliminated.

After his Lighthouse series he became interested in the shape and form of oriental pagodas. Working in a manner similar to the development of his lighthouse box he developed his Pagoda Box. This has been the ultimate development of his boxes—so far. The box is based on an actual Buddhist pagoda build in 247AD. Joshua used his plain lathe, rose engine, and OT lathe to produce the box. The box is six sided and utilizes many of the techniques that he learned making other boxes such as moldings, piercing, fluting, windowing, and other shaping techniques. It is made from 21 pieces and is 5 stacking boxes.

What will his creativity and skill bring the OT world next?

Bill Ooms gave a presentation entitled, *Patterns for Rose Engines*. I found this presentation especially interesting because when I started RE work I remember asking several RE turners how to determine what pattern a given rosette would produce and was always told you just have to try it and see.

In his presentation Bill showed us how various families of rosettes will react and how to design patterns from what we know about our rosettes.

During his talk Bill used rosettes from various makers to illustrate his points. With the many variables
involved designing a pattern is not always a straight forward thing to do. Each family will make a given pattern that varies depending upon the number of repeats on the rosette, the peak to peak amplitude of the particular rosette you are using, the rubber being used, phasing, and whether you cut on the front or back of the rosette. For Bill’s presentation he used a rubber that closely follows the rosette and faithfully reproduces its pattern. Obviously one way to modify the pattern is to use a rosette that does not completely follow the pattern or to use different rosettes for different parts of the pattern.

In designing patterns we usually want the pattern to start in the center without what Jon Magill calls the tornado which happens when our centering of the cutting frame is incorrect. We want each cut to just touch the cut before it. To do the latter we have to know the width of cut for the diameter of cutter that we are using. On his website, billooms.com, under the resources tab you will find his AAW Symposium handouts in pdf format. Bill gives you the math and measurement methods needed to calculate the radius of your cutter. For a triangular cutter you will only need to make this measurement once, but for a cutting frame that holds shaped cutters you will need to make this measurement every time you change cutters. Once you know this measurement you can use the spreadsheets that Bill has developed to calculate the width of cut for any chosen depth of cut. Additionally, Bill gives you multiple recipes for both surface and edge cuts using this method. The images with the recipes are from Bill’s software which I hope to review in a future issue of the newsletter.

Bill pointed out that you can use the various variables to create patterns when you do not have a rosette to create the pattern directly. For example, you may have a 4 pointed star rosette. By using phasing you can create an 8 point star using the same rosette.

When discussing basket weave and bamboo patterns, Bill noted that you can cut the pattern using a rosette. However, he feels that he gets a crisper pattern by using indexing only without a rosette.

Bill discussed pumping vs. rocking vs. pumping and rocking. He illustrated this by showing a pumping flower pattern. He also showed a spiral surface pattern using the LW18 bump pumping rosette.

Bill ended his rotation by discussing his drilling frame which is based on a Foredoom hand piece. He showed slides using his frame with an endmill to cut his Cricket Cages which were the subject of his recent article in the AAW Journal.

John Calver gave a presentation on Decorating your Woodturnings. John enjoys solving problems and developing his own equipment so he began his presentation by describing his several year journey to develop the rose engine he has designed and built. He uses LW pumping rosettes and he uses the same indexing head we use mounted on a T-track so that he can offset the head. He also uses this setup on his regular wood lathe. He showed some turnings made from steamed European pear which he likes to use for its machinability, color and grain. John likes to coat blocks to be used for end grain patterns with black gesso. This makes the pattern stand out and the piece can be finished with water based finish, shellac or lacquer.

John has his headstock fitted with a #2 Morse Taper. He feels that if he keeps the tapers clean he can transfer a piece from his metal lathe to wood lathe to RE and it will run true. This also allows him to use a vacuum chuck on the RE. He makes chucks from stub arbors which can be fitted with drawbars if desired. For phasing he uses a LW worm gear.

Unfortunately, he had to complete his presentation somewhat quicker than he intended. It seemed that something on his lathe had moved during shipping from Canada, and he was not able to do all the cutting that he wanted to do for his demo. I’m sure we’ve all had a similar problem at one time or another. Fortunately he was able to demonstrate the unique features of his machine and show all the thought and development that has gone into it.

OTI SIN—David Lindow moderated the evening for President Steve White who was unable to attend the meeting. Jerry Decker began the evening by explaining OTI and its benefits to the assembled group.

John Lea led a discussion of rose engines and began by showing slides of some antique rose engines. He showed photos of the I. T. Mercklein engine owned by Louis XVI along with slides of several modified, and contemporary rose engines and contemporary work. He gave his view that the thought and development that has gone into it.

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used at the same time usually setting up the rubber for the first rosette to get the pattern and then adjusting the second rubber to allow the second rosette to contribute the amount desired to the new design.

Bill Ooms described his design goals for his computer controlled rose engine. He wanted to do plain and ornamental turning on the same machine. He wanted linear motion and not rotary so that cutter moves, not the headstock. He wanted both pumping and rocking. He wanted to make changing rosette forms and patterns easy. He wanted to be able to follow a hand turned shape. He wanted to use modern materials. He wanted to be able to do one of a kind work, and the work still be affordable. His machine was built for about $2000 by using Ebay, Amazon, and other sources. His operating software is not offered for sale because there is no standard hardware platform for it and he doesn’t want to be in the software business. The 3D design portion of the software has been separated from the operating system and it is for sale through his website. This software allows you to create a shape, ornament that shape, and view the results in 3D.

John Calver finished the evening by talking about OT shaped cutters. Most of us have seen photos of the boxes of cutters that were available for many of the antique machines. Unfortunately, most of those shapes and sizes have been unavailable to us unless we wanted to make them ourselves. John is now selling a line of tungsten carbide cutters that he sharpens to 50k mesh. He offers both flat and 30 degree undercut U-shaped cutters so that you can do patterns like the bamboo cut. You can contact John for availability and pricing. John introduced his friend Garry Miller who demonstrated his fluting attachment. The plans for this attachment will be in an upcoming issue of the AAW Journal.
Instant Gallery AAW 2011

Gorst Duplessis

Dewey Garrett

Joshua Salesin

Gorst Duplessis

Joshua Salesin

Jon Sauer

Joshua Salesin

Bill Ooms
Changing Rosettes on a L-W Rose Engine
By Brian Clarry

One of the most important functions on the L-W Rose Engine is the ability to change rosettes. This document describes in detail how to accomplish this process both quickly and efficiently. It is important that all parts removed should be placed in a clean secure area.

Removing the Rosette Barrel

Overview of the headstock with an existing stack of rosettes in place before starting the exchange process.

Step 1 – On the rear of the spindle remove the shaft collar, the spring if installed, the steel washer and thrust bearing.

Step 2 – On the front of the spindle remove both halves of the two-part shaft collar from the spindle. This will provide more space to move the crossing wheel.

Step 3 – Press the handle of the crossing wheel lever and slide the rosette barrel along the spindle so that the thread on the index wheel is visible. Carefully raise the handle of the lever and remove the spring shown by the red arrow. This spring is not attached and can easily spring out if it is not secured.
Step 4 – Using an extended hex key, loosen the screw installed in the index wheel thread. Also remove the index wheel belt.

Step 5 – Use the left hand to support the rosette barrel and slowly pull the spindle out from the rosette barrel leaving enough of the spindle to support the index wheel. Do not pull the spindle completely out (see below). It is important to support the rosette barrel high enough so that the spindle slides easily.

Support the rosette barrel with the right hand and with the left hand slide the index wheel off the spindle. The index wheel is heavy so be careful not to drop it. Remove both steel washers and the thrust washer. Finally, support the rosette barrel with the left hand and remove the spindle until the rosette barrel is free.

Remove both steel washers, thrust bearing, and wavy spring from the spindle and remove the spindle completely. Now is the time to clean the oil from the spindle with a clean cloth.

Step 6 – This photograph shows all the disassembled parts of the crossing wheel mechanism laid out in order of their removal.

From L to R—Shaft collar, spring, thrust bearing, steel washer; steel washer, thrust bearing steel washer; steel washer, thrust bearing, steel washer, wavy spring, and split collar.

Changing the rosettes

Step 7 – Hold the rosette barrel securely. In the photograph the rosette barrel is held in a wooden jaw vise. Using a metal bar remove the locking nut completely from the rosette barrel.
Step 8 – Change the rosettes ensuring there is a plastic space washer between each rosette. When completed replace the locking washer and snug tightly against the rosettes. If installing a pumping rosette first put two spacers on before the rosette.

Step 9A – First lightly oil both bearings on the headstock. Insert the spindle into the right side of the headstock by about 1”, and slide on the wavy spring, followed by a steel washer, the thrust bearing, and finally another steel washer.

Step 9B – Using the left hand, support the rosette barrel and line up the spindle to insert it through the rosette barrel until it exits about 1”.

Step 10A – Slide on the crossing wheel and in the outboard end cavity of the rosette barrel slide on a steel washer, followed by the thrust bearing, and finally the second steel washer. Push the steel washers into the cavity and leave about ¼” of the barrel showing.

Step 10B – Slide the index wheel onto the spindle. Support both the index wheel and rosette barrel using the left hand and push the spindle through the rear headstock bearing.

At this time move the spindle sideways in each direction and lightly oil the spindle where it moves in each bearing.

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(Cont. from p8)

**Step 11** – On the end of the spindle replace the thrust bearing and a steel washer. The spring may be installed or not. Install the shaft collar and tighten.

**Step 12** – Position the index wheel away from the rear of the headstock casting by at least ¼” and tighten the socket head set screw in the index wheel thread. This gap is required if the detent stops are used.

**Step 13** – Lift the crossing wheel lever and insert the spring back in its holder as shown in the photo at left. Press the lever down and move the rosette barrel towards the index wheel. Insert the head of the lever in a slot in the crossing wheel and release the lever as shown in the photo at right.

**Step 14** – Replace the two-part shaft collar and push it firmly against the wavy washer. Tighten the shaft collar.

**Step 15** – Push the crossing wheel lever (shown engaged in R photo, step 13) down and spin the rosette barrel to ensure that it runs smoothly.
IN MEMORIAL

Allow me to take a bit of editorial privilege to pay tribute to Bill Jones who died on July 31, 2011. Bill and his work was an inspiration to many turners. In my early years of turning I belonged to the Glendale Woodturners Guild in California where Jerry Glaser introduced me to the British magazine, Woodturning. At that time Bill was writing a column for the magazine titled “Notes from the Turning Shop.”

I quickly realized that while I was still trying to learn the difference between a spindle gouge and a bowl gouge here was a man steeped in the traditions of turning who was doing work very different from anything I had seen. His columns were also richly illustrated with drawings he did himself. He used such unusual terms as inside tool, eccentric cutting frame, Holtzapffel lathe, arm rest, and hub cutters. I was fascinated with his writing and had to learn more about how he produced his intricate boxes, baby rattles, and of course his signature chess sets.

Bill was probably the last of the ivory turners and he worked in a period when production turning was still common. Born in 1920 he was a fifth generation turner and came from a time when I’ve been told the trade was divided into two types of turners. Plain turners produced work on a regular lathe and made a variety of products from household items to parts for joinery. These turners worked in native woods. The other group of turners were ivory and hardwood turners. They did specialty work using bone, ivory, and African blackwood. They were also known as “bone grubbers.”

Most people would know Bill best for his thread chasing ability. His work with chess sets required him to join together small pieces of ivory using fine, delicate threads. Watching him hand chase threads was watching an artist at work. However, I remember Bill best for his point tool that I use all the time and his use of the arm rest which I’ve yet to master. I also admire his ability to make beechwood cup chucks which screwed onto the lathe nose. Bill fitted items in the chucks using his trusty chalk for grip and his magic hammer for adjustment. This was a small boxwood hammer he had turned and used for years. It always seemed that a simple tap with the hammer would have the blank firmly seated in the chuck and running true. However, I think we all knew that the magic was in Bill’s skill and not in the hammer.

I had the chance to watch Bill when he came to the Utah Turning Symposums. I particularly remember a rotation when he turned one of his signature baby rattles. This was after the birth of Prince William and Bill’s rattle had been chosen as a baby gift for the palace. Bill seemed able to adapt to any lathe and this day he was working on a well used General. Bill produced a beautiful, rattle in a 90 minute rotation using imitation ivory and boxwood. After the rotation several of the attendees were waiting to speak with Bill. I usually don’t try to purchase demo pieces, but I thought this was probably my only chance to own a piece of Bill’s work. I was next in line to speak with Bill and ask a few questions, but I still don’t own any of his work.

Bill’s columns form Woodturning were complied into two books, Notes from the Turning Shop and More Notes from the Turning Shop by Guild of Master Craftsmen. Both are now out of print. However, if you have the CD from the Society of Ornamental Turners that contains their Bulletin Collection you’ll find that Bill was a frequent contributor to the Bulletin often in his own excellent italic handwriting and always with his drawings. In one of his “Notes form the Shop” articles he says, “My own wise sire, before I was fourteen, thought it was high time I BEGAN my education, so he lugged me (most willingly) out of my double-useless alma mater & into his turning shop. It’d be a clumsy person who couldn’t manage the basic tools & cut a fair thread with a hand chaser in a fortnight.” Well, Bill, I may be clumsy, but thanks to your inspiration I’m still trying.

—John Tarpley
Introduction to Collets
by David Lindow

To non-metal workers, collets can be confusing because of the various names and types in use. For example, some people hear the term 8MM collet and think that this is a collet that holds an item that is 8mm in diameter when in reality it is the name of a type or family of collets that come in a variety of holding sizes. Because I come from the precision metal working world, using collets comes as second nature and is almost a foregone conclusion. In this article I plan to introduce you to collets so that you can learn their uses and disadvantages.

When introduced to ornamental turning I immediately saw the potential of using collets as a work holding device. Despite this I saw few turners using them in any meaningful way and few collet systems marketed to wood turners. A collet can be defined as a cylindrical or conically shaped device, often segmented, that holds two pieces together. In machine work it holds a work piece to a spindle. The type of collet most often associated with metal working lathes was developed by two men working in the American watchmaking tool industry in Massachusetts in the mid-nineteenth century. These men were Webster and Whitcomb, and today the 8MM collet most often used in watchmaking and jewelry lathes still bares their initials and is referred to as “WW” collets. This collet is what is used in the LW Drilling Frame. Though there may or may not be slight differences between the WW collet and the 8MM collet they are most generally interchangeable. The 8MM designation comes from the designations most often used in Europe where the collet size is stated by the diameter of the bearing. Americans more often designated collets with a letter and a size indication which had more to do with the manufacturer’s whim than anything else. For instance, the American 10MM collet is also called a “D” collet which stands for Derbyshire which made it popular. Hardinge used the designation “C” after the size which was indicated by a number. Stark used “S”, Ames used “AM”, Hendy used “H” and so forth. While one may jump on the metric world band wagon and say that the European system is less confusing remember that the 10MM collet made by Pultra and popular in England is different than the “D” collet which Derbyshire developed years before Pultra made collets.

When I first got into ornamental turning I straightaway bought a Bison 5C collet chuck to put on my 1”-8 spindle. The only disadvantages were the weight on the OT crowd (despite Fred Armbruster making his spindle to accommodate that collet size directly). There were several reasons for this. First, was the cost for a new work holding system when most wood turners already owned other systems. Second, few wood turners have the ability to machine the larger step collets. Third, since each 5C collet is very limited in its range some saw the need for a lot of different sizes. Having come to OT from metal working I thought that wood turners would choose just a few spigot sizes on which they could standardize and use them repeatedly eliminating the need for a plethora of collets. There are many advantages of standardizing on sizes, such as the reduction of required tooling, repeatability, less set up time between items and jobs, and increased accuracy. Collets can help in all of these areas.

Today most popular collets take on a similar structure which is a steep taper at the front of the collet, a long bearing surface in the middle and draw in with external threads so as to allow long pieces of stock to be held centrally through the entire spindle. The most popular of these collets was made by Hardinge who offered their “Cataract” line of with sizes starting with 1C and going through 5C. Today they make collets much larger such as the 16C but they still carry the same “C” designation for the older “Cataract” line. The 1C and 2C collets have pretty much gone by the wayside. The 1C size was approximately the same size as a watchmaker’s lathe collet. The 3C will take a ½” rod through it. This collet is still used on a lot of grinders and specialty equipment and was very close in size to the 1A collet which South Bend used on the ubiquitous 9” lathe. The 4C collet was used by Rockwell as well as Hardinge and a few other companies, but I know of no machine being built with it today. It will accept up to ¾” through the collet. The 5C collet would allow up to 1” through the collet. The brilliance of this particular collet structure for metal lathes is that it not only offered the ability to put long pieces of stock in the spindle but it offered good holding power, it held the work piece around almost all of its girth, and the collet released readily. The biggest disadvantage of the collet type was that it is not a “dead length” style which means that the work piece moves toward the spindle as the collet is drawn in. Browne and Sharpe, makers of popular screw machines, developed a collet that offered this “dead length” feature, but it is not

(Cont. on p12)
Pages from a 1980s Hardinge Catalog showing some of the available Collets.

handy to set up and operate in a short run. Today most wood turning lathes come with a Morse 2 taper (MT 2) in both the headstock spindle and the tailstock spindle. Since the MT2 collets only go up to 1/2" it’s not particularly useful in any broad sense in wood turning. It could, however, have some use in chucking a pen mandrel or small expansion chuck.

Another type of popular collet is the “ER” style which is somewhat related to the “Double Angle” style made popular by Erickson. This is a shorter collet that is dead length and mostly used in milling machines to hold end mills in positions where clearance is an issue. It’s also used in situations like a router. There is no thread in these collets as the back seats against the spindle which is what makes it dead length. A collar then is used to squeeze the collet against a matching taper and the collet contacts concentrically through its entire length. This offers exceptional accuracy for a broad range of sizes. In other words one size may hold a 7/32" diameter as accurately as a ¼" diameter as well as everything in between. To avoid the jamming normally associated with taper collets there is often, though not always, a kick out screw that makes removal easier in cases where it is over tightened.

Several Companies now market collet chucks for wood turners. Penn State Industries offers a collet system based on the ER collet which screws onto a 1"-8 spindle. Brian Clarry has one of these and uses it with success. It can be seen on their website at http://www.pennstateind.com/store/LCDOWEL.html, and it costs $90. It’s an ER 32 collet, and the largest size is ¾". Other sizes are available from other suppliers. Both Brian and I are pleased with the quality and accuracy. OT work causes very little tool pressure as compared to regular turning or metal work. As a result a spigot of ¼" is most often adequate and can be readily made to fit the collet. Due to the nature of ER collets you don’t have to hit the ¾" mark exactly, although parallelism is relatively important. These collets allow you to take the part out and reintroduce it to the collet while retaining accuracy even if the size is off a bit.

Beall also makes a collet system that, like the Penn State model, uses ER 32 collets and screws onto the spindle thread. It can be seen at http://www.bealltool.com/products/turning/colletchuck.php. Woodcraft makes a collet system that goes into the MT2 spindle, Item #146110; however, it has a proprietary collet type. When I inquired as to why they chose to use a proprietary collet type there was no reason given; although, the technician said that in 3 years of working there no one had requested another size collet. So, while tapers are considered more accurate than threads if you want sizes in between what is offered by Woodcraft you may want to think awhile about using this system. It can be seen at http://www.woodcraft.com/...
Collet-Chuck-Set-2-MT.aspx.

In general collets and chucks mounted from tapers are considered to be advantageous. However, in the case of OT work this may or may not be the case. While the taper is likely more accurate it cannot be mounted on the leveling chuck without modification.

The prospect of engine turning also brings up an advantage in using collets. A step collet for holding thin sheets of silver or brass is excellent as it offers a solid back against which the thin sheet of metal cannot bend and cause erratic results. These collets can also be machined with an offset center to do things like seconds dials on watches, etc. A collet can also be readily made for cuff links or tie tacks or charms that can allow for quickly repeated jobs in sizes on which you standardize.

If you find that you’re having no problems with work holding in your OT projects by all means continue doing what you’re doing; however, if you find yourself frustrated over the inaccuracy and non-repeatability of your current system maybe collets could be the answer for you. With the several types that are readily available one should suit your needs. The bottom line is solving a problem that exists. Look at your frustrations with work holding and seek a solution to that problem. Each collet system offers advantages and disadvantages for different types of work. Don’t be afraid to inquire about what system would work best for a particular problem and be sure you know why you are choosing any particular system and exactly how it will solve your particular problem. Most difficult of all, don’t be afraid to re-think what you’ve been doing for years. There may be a better way, then again maybe not.

For more information on collets go to: http://en.wikipedia.org/wiki/Collet.

Information on Hardinge collets can be found at: http://printfu.org/read/hardinge-tool-holders-toolholder-collets-and-bushings-catalog-2351g-39be.html?ref=1qeYpurpn6Wih-SUpOGulenK2nh7TO6Mnd1szVkr3d49KVtdTY09vX55SFxOHY2trV4dHK3o-51ODUyuTtltc_iypWv2t_X39Pb24Wz093P4NXcjZefnKeslgPYqgOj6iYpqCmn5bS2uPm11TetnZyo6q6ZZ-loofWlKThrqpqsp4fU4-rVrpeU5-ngnNzH59HO2tbkb9FX0p_n3OCj1tnTIIM_e4tH2Z3JSipZ6fotbZ04en7A.

Specifications and information on ER collets can be found at: http://printfu.org/read/er-collets-1725.html?ref=1qeYpurpn6Wih-SUpOGulen6Wnh7HB1qiqj1NHV5tyQr9mvn5-O4-qHr9ufaoOjkn7b6OH3S3L_GyuDnh6vlo5-uiNuPoN-pqquis3k5tmoo5Xs5Nya5uXX39DU3Nbs3NuU2NzSm7_dmKTHqsK12Nrgy-ngk9zT3lev5Q.

First, I want to thank everyone who helped make this issue possible by writing an article or submitting information. As an editor it is a great feeling not to stare at a set of blank pages and wonder how to fill the space. Not only did you fill the space, but you filled it with useful information.

Recently I’ve had the opportunity to see some impressive work done by owners of the Lindow Rose Engine Lathe. It is clear that many of you are learning and growing in your abilities. I’m really happy to see that happen. I think several things are coming together to make this happen. Several owners have had their lathes for awhile and are now familiar with them. Group meetings such as OTI and owner group meetings are helping us learn basic procedures. Owners are reading the works of Walshaw and others. Brian Clarry has written a number of excellent articles with clear instructions and excellent photographs on the technical aspects of our lathe as well as project articles. David and Eric have done several DVDs that show various aspects of the lathe. Last, but I hope not least, you are enjoying and benefiting from this newsletter.

However, for myself I have not progressed to the point where I had hoped to by this time. Why? It’s very simple, I’ve violated the first two rules I learned when I first started turning. Allan Batty, easily the best turner I’ve ever known, said that if I want to learn to turn I must, “Stand at the lathe.” I was learning to turn in the ‘60s when wooden, beaded curtains were popular. Richard Raffan showed how to make the beads by feeding long stock through the headstock, turning the bead, drilling, and advancing the stock for the next bead. As a part of his presentation he told us new turners that after we’d made a couple thousand beads, we’d have to move on to something else. As a part of his presentation he told us new turners that after we’d made a couple thousand beads, we’d have to move on to something else. As a part of his presentation he told us new turners that after we’d made a couple thousand beads, we’d have to move on to something else. As a part of his presentation he told us new turners that after we’d made a couple thousand beads, we’d have to move on to something else. As a part of his presentation he told us new turners that after we’d made a couple thousand beads, we’d have to move on to something else. As a part of his presentation he told us new turners that after we’d made a couple thousand beads, we’d have to move on to something else.
Engine Turning and the Development of the Lindow Rose Engine Lathe
by David Lindow

As some of you know I came to this addiction to rose engines through engine turning, and as such it has been near to my heart since we started building these machines. Despite this I’ve focused these past couple of years more on ornamental turning than engine turning, but my goal has always been to have a machine that was capable in both disciplines. At long last I think the objective has been achieved, we’ve sold one machine expressly for engine turning and have a couple of others being used for it on a regular basis.

Some may ask the question, “What’s engine turning?” For our purposes I’ll define it as a form of mechanical engraving in geometric patterns in metal or wood using a fixed tool most often accomplished on a rose engine or straight line engine. It is also called guilloché. It was and still is used in the horological world to decorate watch cases and dials as well as clock dials and pendulums on occasion. The art was perfected in the 19th century and some of the best examples can be seen in the work of Breguet, the great watchmaker, and Fabergé who was famous for both case work and eggs. It can also be found on pens, cigarette cases, money clips, women’s compacts and brushes as well as countless other items. High quality items often covered the patterns in translucent enamel.

Engine turned and enameled gold box by Philip Peck done on his Kenloc straight line engine.

Above are two boxes from the collection of Steve White. They are pressed from an engine turned mold. The one on the right combines straight line work with rose engine work, a relatively easy pattern to make. Both have green celluloid covers that imitate enamel work.

(Cont. on p15)
Because much of the mystique of engine turning is created by the optical illusion that is created when cuts cross over each other in a way that makes them look impossible to make, a crossing wheel is necessary to accomplish anything past the most rudimentary patterns. Many of these patterns can be made by use of the notch plate while many others require the use of the worm.

Notch Plate

Worm

Four patterns made exclusively with the 24 bump rosette using the crossing wheel to create the illusory effects. The bottom piece was enameled by Ron McGuire of Wisconsin.

In addition to the crossing wheel several other upgrades have been made available for the Lindow Rose Engine that while not being totally essential should be considered as strongly recommended for high quality engine turning work. First, the steel table offers not only additional mass, but also an extremely flat surface so that the tool slide can be moved without any real change. Also, the compound slide rests flatter on the surface. While the wood table is adequate for ornamental turning because it uses high amplitude rosettes, engine turning often employs amplitudes of only .010-.015” with depths of only a few thousands. Because of this any deflection will be detected, and the table’s accuracy is of critical importance.

Second, the dovetail tower assembly was also designed with engine turning in mind. While it’s very handy and reduces effort for OT work, for engine turning it’s more than just a convenience. It allows you to move the rubber on and off of the rosette and return to the same relative position.
Third, for engine turning we needed a cutting tool set in a tool holder with what is called a “guide” or sometimes called a “geed.” The guide sets the depth of the cut and must be adjustable against the cutter. The guide produces a little mark next to the cut that is sometimes called the “dark line.” Any tool holder would have to be compatible with the quick change tool posts that we all use so I developed a unit that would mount into our regular tool holder and have the guide and cutter both held in a single block that could be easily adjusted both for height and depth.

Engine turning requires that the cutter be fed in by hand. Since our tool holder is mounted on the Hardinge cross slide we can simply remove the two screws that secure the handle end of the lead screw on the top slide and remove the lead screw so that the slide moves freely. As interest grows in engine turning we will also likely develop a lever feed and a micrometer stop for the Hardinge top slide. If there is enough interest we will also develop ratchet feeds for the bottom slide.

One of the most pleasant surprises is how well the straight line chuck performs in engine turning. When I designed it I simply assumed that it would not have the mass necessary to produce superior finishes. It not only produces such finishes with the index head on it but also with the pen chuck (dome chuck in a different mode) mounted on the angle plate.

I don’t recommend using the angle plate unless it’s needed. It was simply on the machine so we dialed it in using two dial indicators. I also wanted to see if the machine could handle it. It did as can be seen in the picture of the pen made with this set up.

Pen made on the straight line set up pictured above.

Three rings turned from nickel silver on the Lindow Rose Engine using the #18 pumping rosette. These rings were made during the October meeting at David’s shop.
This past summer I had a chance to develop and test the first set of engine turning rosettes which I expect to release very shortly after this publication. They are low amplitude rosettes designed specifically to work well with my crossing wheel and accomplish many of the more traditional designs. The set will include 24, 36, 48, 60, 72, and 96 bump rosettes. In future editions of this newsletter I will continue write about engine turning. I will define the major patterns and designs, and the step by step processes to accomplishing them. In time we will add rosettes to the engine turning collection as well.

Whether you want to make an intricate watch dial or simply engine turn a piece of brass or silver for the top of one of your boxes the exercise itself is most relaxing and rewarding. One of the reasons for this is there are no motors running so it’s all done in relative silence, and there is no dust to clean up after you’re finished.

Shot gun shell done on a Kenloc straight line engine by Philip Peck.

A Letter From David

Fall is upon us and with the business of summer over it’s time to head back into the workshop for some new projects. Fortunately, we will be greeted this fall with some new tools. The Large Eccentric Cutter Head’s delivery will be imminent if it is not done by the time of publication, and the engine turning rosettes should be out by then. The Large Eccentric Cutter will not only allow for much larger domes but will bring an added amount of rigidity which will produce better finishes. It will accept 1/8”, 3/16”, and ¼” cutters with the ability to balance the head. It will fit into the Lindow Drilling Frame just as the original model does with the 8MM collet body. The engine turning rosettes will allow many of you to explore a new avenue. For me it’s an exciting step as engine turning is how I got into ornamental turning.

Large Eccentric Cutter Head

All photos for this article courtesy of Charles Waggoner
The Northeastern Meeting gave me opportunity not only to introduce the Large Eccentric Cutter but also an interface between the Hardinge slide and the Jet or Rikon mini lathe. This will allow those of you without a metal lathe a quick and easy method of turning and boring in a quick and true fashion to better fit the expansion chucks and fits throughout your work. It was tested at the meeting with the desired and expected outcome. The section of dovetail mounts to the bed of the lathe with two locating blocks to give relative accuracy to the bottom slide and a cam lock which is activated with a hex wrench from the backside.

The MT 2 spindle has continued to be a disappointment for delivery. I am going a different direction with it and hope to have it soon. One good thing that has come out of waiting is that we’ve decided on a different process which should greatly improve the quality. The pen chuck is in the same place. I hope to have good news soon. If there is a good side to waiting this long it is that with time subtle improvements are often made that make the tool much more user friendly.

The Auxiliary Rosette Holder is about 85% completed. The towers are done and the parts are machined. They are awaiting the arrival of a new fourth axis machine that will engrave the numerals on the circumference of the dial rather than the face. They also purchased a new CAD/CAM program that will allow for more and better choices of font. The machine is expected soon. This will make the dial immensely easier to read which will be important when we use it as the first gear of the spiral attachment and need to index quickly and accurately. So the delay is worth it.

The time to finish the rest of the spiral attachment has eluded me. My summer went by in a hurry and was busier than usual. The parts to make it are stacked up next to the machine waiting for me and reminding me daily where my heart is.

In addition to the spiral and the oval chucks that I’ve so long desired to get built a much easier and simpler project is on the drawing board, the vertical slide. I shall soon have a prototype done. It will be a Sherline vertical milling column modified to fit our cutting frames and Hardinge slides.
Internet Sites for Ornamental Turning

With this issue I’d like to start a new and I hope ongoing feature of the newsletter. I’d like to showcase Internet sites that you find useful for ornamental turning. To do this I need your help so please E-mail me your favorite site(s) along with a description of why you like the site and I’ll feature them in future issues of the newsletter. Feel free to contact me as often as you find an interesting site. I thought I’d start by profiling four sites. The first two may see obvious and the second two are sites I enjoy visiting.

—John Tarpley

Lindow White Machine Works—The URL is http://roseengineturning.biz. The first site I have to mention is the Lindow White site. On this site you will find a lot of information relating to our Rose Engine and its accessories. Also, you will find links to other woodturning sites, photos of work, and links to many of the videos that Steve and David have done. If you have the threading attachment you will find that one of the most useful items on the site is the Thread Calculator. Unfortunately it is a little hard to find. I get to it from the Rose Engine Products →Accessories→Threading Attachment→then at the end of the description you will find a link for the thread calculator. You can use the calculator online by plugging in the needed information. You can also scroll down to the link for “Click here to see how it works and check out the threading chart”, print the chart, and use it offline. You will find it a very helpful addition to your threading accessory. I know David would like to keep the Website more up to date, but there are only so many hours in the day and I’m sure most of us would rather see him producing more parts and developing new accessories rather than updating the site. By the way if you have time you should check out David’s clock making site at http://www.lindowclockmaker.com.

Ornamental Turning International—The URL is http://ornamentalturners.org. Obviously the second site to mention is our OTI site. Just in case you don’t know, OTI is a chapter of AAW; but instead of being a chapter for a geographical area it is a chapter for everyone interested in ornamental turning. If you are not a member you can join through the Web site. The site contains several subheadings with information grouped within each heading. Most people are interested in the Gallery and Forum pages. On the gallery pages you will find many photos to provide inspiration for future projects and lathe modifications. The large number of forums allows you to post questions on any aspect of OT. There is also the hidden Lindow White Forum for LWRE owners only. How to access that forum was described in V1N2 of this newsletter. You will also find information on some books and suppliers under the Resources section.

John Edwards Site—The URL is http://www.ornamentalturning.co.uk. The title of his site is very descriptive. It is, “Ornamental Turning from the viewpoint of a practitioner.” John Edwards from the UK is certainly a practitioner of our art. This site is devoted to OT lathes and Rose Engines. If you have any love for beautiful, antique equipment it is worth a visit to his site just to see the lathes and accessories to which he has access. He has a Gallery page with excellent photography showing wonderfully detailed work. The Craft is a page that contains several articles in pdf format. John is known for his eccentric cutting frame work and one of the articles describes the use of this cutting frame along with some very good photographs of work done with the ECF. The Forum page contains questions and answers about many aspects of OT work.. The For Sale/Wanted page contains information about OT lathes and other equipment either available for sale or wanted for purchase. Also this page gives ordering information for John’s two CDs, “The Eccentric Cutting Frame” and “Ornamental Turning Techniques.” The Book List page has the most extensive listing of OT books that I have seen. The Links page has listings for many turning and ornamental turning sites. The About page gives contact and background information about John. The photography of work displayed on this site is worth the visit. Add to that all the information available and you have a very useful site to visit again and again.

Bill Ooms Site—The URL is http://www.billooms.com. Bill’s site contains several sections that feature different aspects of his work along with information about OT. Under the Resources tab you can find information about Bill’s computerized lathe and his handouts from the recent AAW meeting. In the Software tab you can find several software programs that Bill has developed for his use and now is willing to share with others interested in OT. I hope to do a complete review of his software in a future issue of the newsletter, but for now I’d like to describe his software for a Pen Chuck which is available as a free download. Pen chucks are useful items for mapping your rosettes and as we saw in the last issue of LWRE News rosette maps can be used with drawings to accurately set the rose engine to cut a particular shape. However, if you just want to play with designing patterns it takes time to setup the chuck and the RE. Also, as you develop the pattern, if you decide to change a part of the pattern already drawn you must change the paper and start a new drawing. Since PenChuck software creates a virtual pen chuck on your computer you can experiment, play, and develop designs quicker and easier than using the chuck.

(Cont. on p20)
for your RE.

The download is simply and easily done. Because Bill developed the software on a Mac it does require JAVA to run. Bill provides a link on his site for the newest version of JAVA which is a free download also. The program runs well on my Windows System 7 machine. When you start the program you will see the following window:

On the right pane you see the rosette editor where you can choose the type of rosette and its number of repeats or bumps. You can also adjust the amplitude and phasing in this window. The left pane allows you to change the pen position relative to center and also the pen width and color. The pattern also shows up in this window as you draw. As far as I can tell the present version does not allow the user to add rosettes to the program so you may not be able to use all the rosettes you have. He has retained the traditional lettering system for rosettes as well as adding a descriptive phrase for their names for those who may not be familiar with the lettering system. To show the software in use I chose to use an 8 bump sine rosette with an amplitude of 0.250 with phasing of 180° between each rotation. I started at 0.25 inches positive to center and moved 0.25 per each rotation alternating colors between red and blue with red being used for no phasing and blue for 180° phasing. I kept the pen width at 1. The results are shown below:

I think you will enjoy using this program. Perhaps a future version will allow the user to add rosettes, but even without this ability the program has plenty of functionally.
Michigan Association of Wood Turners Hosts LW Hands-on Meeting

On August 12 and 13 the Michigan Association of Wood Turners hosted a hands-on meeting featuring Lindow White Rose Engine Lathes. Four LW RE lathes were available making it possible for the eleven members present to try their hand at running a lathe. The meeting was organized by Tom Mogford. Special thanks go to Eric Spatt and Mike Foydel who made their lathes available for use.

The first day was spent on general set up techniques for cutting frames and the dome chuck. The importance of alignment, zeroing the cutting frame, the chuck, and work piece were demonstrated by making the “Open Ended Box” for which Brian Clarry has written instructions. This was followed by a demonstration of fluting a small bowl using the dome chuck atop the double eccentric chuck.

The second day was spent making the “Gothic Arch Bowl” from Brian Clarry’s instructions. They also turned the insides of the bowls fluted on the first day.

It was a successful two days with several good pieces being completed. Thanks to all who attended.
Spiral Tea Light Candle & Patterns  
By Soozy Smith

Wood: 2 1/4” x 2 1/4” x 2 1/4” Purpleheart was used for this project. If 2 1/4 square stock is not available 2 inch square stock can be used. Other good woods are Beeswing Nara, Blackwood, Cocobolo, Ironwood, Ivorywood, Lignum Vitae, Mopani, Pink Ivory, Olive Wood, and Hard Rock Maple.

Equipment Used: Lindow Rose Engine with Horizontal Cutting Frame and 12 bump rosette with 2.5 inch low amplitude rubber
1 ½” Expansion Chuck (1” x 8tpi)
1 ½” Forstner Bit
I used a regular wood lathe and tools to rough and setup the blank for the RE.

Tea Light Candles: 1 1/2” x 5/8”.
I purchased my Tea Light Candles at Sam’s Club. A box of 24 candles with 24 replacement batteries cost about $15. If you are lucky enough to find any left after Christmas you can get them for less than $10 a box. Some craft stores have Tea Light Candles of a different size requiring adjustment of the instructions.

I would like to thank Brian Clarry for his Spiral Designs Document which is where I got the inspiration for this project. It is also important that the RE be properly setup and adjusted for reproducible cuts. Instructions for doing these steps can be found in documents from Brian Clarry on “Adjust headstock to top dead center using an adjustable level”, “Adjust headstock to rock equally either side of top dead center”, and “Second level alignment.”

(Cont. on p23)
Mount stock between centers on a regular lathe and rough to round.

1. Square the ends.

2. Mount the blank into a 4-jaw scroll chuck and drill a hole 1 ½” diameter x 5/8” deep using a forstner bit or use a bit and depth that matches the diameter of the tea light candle that you are using. Sand and finish the hole and top surface.

3. Remove the blank from the scroll chuck and remount using the 1 ½” x 8tpi Expansion Chuck. True up the outside & bottom of the blank, sand and apply finish.

4. Now that the blank is complete it is time to move to the Rose Engine to complete the project.

5. Secure the expansion chuck w/blank on the spindle of the Rose Engine. The blue masking tape has been added to the chuck jaws for additional grip. Mount the Universal Cutting Frame with triangular cutters on the tool post of the cross slide and *slightly angle the tool post so the cutter will clear the full length of the work piece*. Make sure the cutter is horizontal and the height of the cutter is at the center of the spindle.

Starting at the top of the candle (closest to the spindle), *set top slide at zero*, while the rubber is in the valley, set the bottom slide to zero. Back out the cutter 2 turns using the bottom slide.

Turn on the RE and the cutter. Move cutter in 2 turns of the bottom slide and begin making the first cut. Take off material a little at a time. I usually take off 10 thou per revolution until the desired depth is reached. Final Depth of cut: 0.125 thou (1 full turn plus 50 divisions on the dial of the Hardinge bottom slide).

Make a note of the final depth of cut. *All following cuts will be to this depth.*
After making the first rotation of cuts, back out the cutter 2 turns and turn off both the cutter and RE. Move the top slide 3 full turns to the right (CCW) and phase 6 degrees using the worm gear by turning the clock key 3 turns CW on the crossing wheel. Restart the cutter and RE to make the second set of cuts to the depth you noted for the first cuts.

For all following cuts—Repeat: Move top slide 3 turns > to the right & Phase: CW 3 turns (6 degrees).

After completing all cuts on the side; move the cutter to the bottom of the candle & put a little rosette in the center of the bottom, or you can leave it plain. Sign your creation.

Some Variations: Pictures of these can be seen on the OTI site, in the Photo Gallery, page 12, Sue’s Stuff.

**Pink Ivory, Ironwood & Mahogany**
- 24 Rosette; 2.5 Rubber; CW Phase 3 turns=6 degrees; Top Slide: 2 turns Depth: 0.100 on the dial (Mahogany Depth=1 full turn)

**Bocote**
- 12 Rosette; 1.5 Rubber; CW Phase 3 turns=6 degrees; Top Slide: 2½ turns Depth: Dial 1 full turn plus 50 thou

**Mystery Wood**
- 12 Rosette; 1.5 Rubber (2.0, 2.5); CW Phase 3 turns=6 degree; Top Slide: 4 turns (NO LARGER THAN 4 TURNS); Depth: 150 thou
My Introduction to an OTI Workshop
by Edward DeMay

As you will see from this article I have been interested in OT work for some time, but the cost of getting started and the steep learning curve have hindered my ability to develop this interest. This is an account of how I got into ornamental turning and my first chance to attend an OTI hands on meeting.

In December 1985 I read an article in Fine Woodworking concerning the Lawler Ornamental Lathe. I have a background in woodworking including plain wood turning, jewelry manufacturing, limited metal working, and I am generally able to fix most things. OT was piquing my interest but the cost was more than I could afford. The idea of buying an antique lathe was also out of my range and I did not have the desire or expertise to rehab one.

While attending one of the American Association of Woodturners Symposums I saw the Lindow White Rose Engine Lathe and the Jon Magill MDF Rose Engine Lathe. Again my budget ruled my future purchase and judgment. I hung around the Lindow White booth at the Tool Show and attended Jon’s demo during the rotations. Each time I attended Symposums I gathered information on the merits of both lathes.

The next thing I did was to join OTI. I looked into who in my area had OT Lathes. Bob Henry and I are both members of Finger Lakes Wood Turners. He had a MDF Lathe and was willing to let me visit his shop. Bob had done an exceptional job building his MDF Lathe, but wanted to sell it for health reasons. We agreed on a price, and I was into the world of Ornamental Turning. Next came reading those books written in the technical jargon common to this craft, which was a tough go. I also began to experiment with a variety of rosettes from Jon. I began purchasing accessories from David Lindow such as additional cutting frames and his overhead drive system. By now I was hooked on OT. My priority was making ornamental turned items. My shop is a well equipped wood shop but I have minimal metal working equipment. Going at OT by yourself and out of books was the hard way to get going but I managed to make a few items for my wife and friends. I decided to purchase a Lindow White lathe and found another member of the Finger Lakes Wood Turners who purchased my MDF lathe.

I contacted David to place my order. He told me he was having an OTI Northeast Group meeting at his shop and I was invited to attend. The light immediately came on and I said YES, after all, watching and hands on is the way to go! David and his wife hosted 13 people from Maine to Oklahoma and from Michigan to North Carolina for Friday and Saturday, October 14 and 15. There were 3 rose engines available with several projects prepared. David and Brian Clarry have produced a series of tutorials on several projects and techniques for the RE. Three of these articles were sent to members attending and reading through them was of great value setting the stage for the weekend. Friday morning after a cup of coffee and a doughnut we started making a Gothic Arch Bowl. Seeing how the RE was setup was invaluable and several sections of the tutorials immediately fell into place. Each member at each lathe had something to contribute and time flew by. David’s wife Becky graciously provided us with meals and the conversation continued during these breaks from the shop. Everything was discussed from politics to weather including things unique to each person’s part of the world. The Friday session continued past supper and well into the evening. The evening centered on David’s shop, making belts, cutters, and all manner of OT equipment. This continued into the early hours of Sat morning.

On Saturday morning there was more coffee and doughnuts and a decorated acorn box with a threaded lid to make. As with Fri each technique was demonstrated for each portion of the box and each group combined their talents to make a facsimile. I greatly appreciated David’s patience with answering our questions, and working with each of us. As a newbie to OT seeing the techniques and listening to everyone’s ideas and thoughts were of immense help. The next thing we knew lunch had passed, the afternoon was gone, and it was time to leave. Many thanks go to David and his wife Becky for a great weekend. Most of us can learn much faster by participating in a hands on session than by simply reading about it or watching a demo. I learned and grew a lot as a RE turner this weekend and look forward to future events.