Turning 25
2016

Demonstration Handbook

SWAT
SouthWest Assoc. of Turners

Two versions of this Handbook are available for your use. One version, *2016 SWAT Handbook Print*, will best serve attendees who desire to print their handbook using a printer capable of printing **two-sided printing**. This assures optimum printing ability while still being able to view the PDF document with most every web browser. The other versions, *2016 SWAT Handbook: Elemental*, will also print with no blank pages. The *Elemental* version may be the best to use as a digital version as it reduces the blank pages one must scroll through.

If your web browser does not open PDF's, download and use Adobe Acrobat Reader or Adobe Acrobat DC.

Allan Batty: Rest in Peace

The woodturning world is saddened by the recent passing of Allan Batty. Batty's influence on our craft and art was immense. Batty's life has made us all richer. We are honored that Allan's son, Stuart, will be a Lead Invited Demonstrator during our 25th Anniversary Symposium.

This version is best viewed as a digital format with almost any device from a lap-top to an smart phone. Obviously, the larger the screen, more enjoyable the view.

A new feature this year is the ability to submit evaluations of both demonstrations and the symposium on line. Symposium evaluations submitted prior to 10:30 am. will be placed in a drawing for tool(s). On line submissions will be compared to the paper evaluations so duplicates will be discarded. **If you know that another attendee whose name is the same name as your's, it would be best if you add something to make your name unique when you submit either paper or digital evaluations.** The link to evaluate the overall symposium is:

Submit Online
Evaluate before 10:30 am
Sunday to be in
Tool Drawing

Submit Online
Demonstration
Evaluation

The final new feature is the ***Speed Link***.

Return to:	*Friday*	*Saturday*	*Sunday*	*Demo Index*

Another link may be found on the last page.

Links to evaluate each demonstration appears below and this link may be found somewhere in every demonstration handout. **Please support SWAT with your evaluations.**

Support SWAT Vendors

Many come from halfway across the country to bring you their products. Show them our Southwest Hospitality

Welcome to the 25th Anniversary of the SouthWest Association of Turners Annual Symposium

This is the 25th Anniversary of Southwest Association of Turners and on behalf of the Board of Directors from each of our 26 member clubs, the Executive Committee, the Committee Chairs and all of the many volunteers who work to make this the best Woodturning Symposium in existence, I would like to thank you for your support of the SWAT Symposium for the past 25 years. Hopefully this will be a great learning experience to all attending.

There are approximately 55 different vendors who will offer tools and accessories, lathes and lathe accessories, woods of all species, finishing, dyeing and enhancement items, sanding materials, new tools and turning items, stabilizing equipment, etc. Once you have purchased that new tool, there will be a Sharpening Booth where you can put the edge on the tool that you desire and then you can go to the Hands On or Pen Turning Booth and try out the new tool(s).

We will have the ever famous and popular 2 for 1 and Art Drawings where there is opportunities to win beautiful art pieces and/or tools, lathes (Robust American Beauty, Vicmark and 3 Jet 1221VS). All 2 for 1 tickets will be gray; the Art Pieces tickets will be green; first drawing on Saturday night at the banquet will be for art pieces, Arrowmont, AAW membership (green tickets) donated by selected turners and followed by the first half of the 2 for 1 (gray tickets) drawing which is pieces donated by approximately 40 turners from our member clubs. The second part of the 2 for 1 drawing (gray tickets) will occur at lunch on Sunday for tools, wood, turning accessories, and lathes which will conclude the festivities of the Symposium.

Our Art Gallery is second to none. It is the largest of its kind in the U.S.A. and is such a special area that we dedicate an entire room for art pieces that are displayed by turners that are attending the Symposium. Any turner has the availability to display (some are for sale) up to ten items in our ART GALLERY. Also a section in the Art Gallery will be dedicated to the Beads of Courage exhibit of boxes that will be donated to various hospitals to be given to youngsters that are struggling through various treatments for serious life threatening diseases. You can also check the SWAT website for more information and a link to the Beads of Courage website.

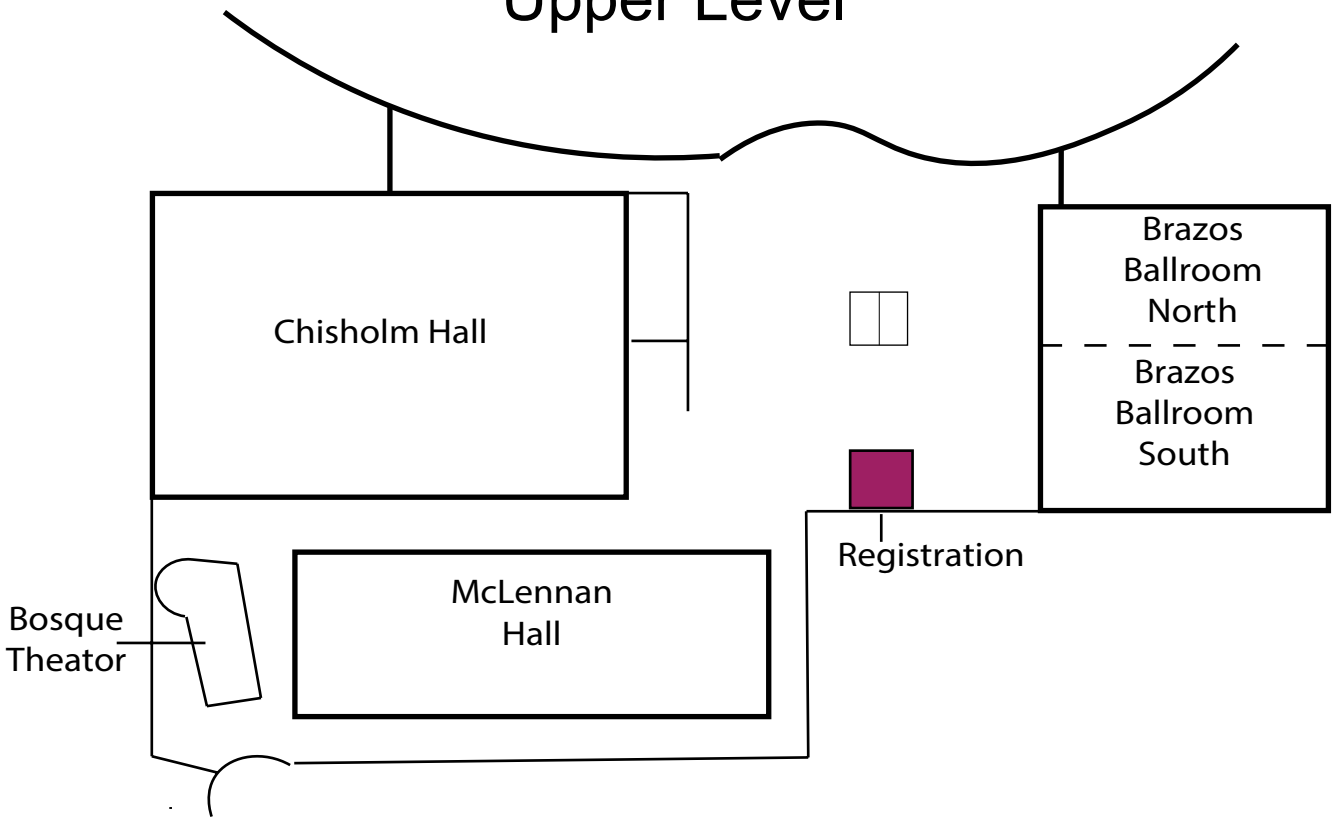
For a very small registration fee of $140 you will be exposed to 8 internationally known Lead Demonstrators (Clay Foster, John Jordan, John Beaver, Mike Mahoney, Cindy Drozda, Mary Lacer, Dick Sing, Stuart Batty) and 11 Regional demonstrators, which create 54 turning rotations. You will receive an electronically generated or printed handbook, access to a tremendous Art Gallery, a lathe duel, featuring Mike Mahoney and Stuart Batty, on Friday night, various vendors and two separate drawings for art and tool items. Women in Turning will gather during lunch on Friday, and World of Woodturning meets after lunch on Saturday.

None of the above would be possible without your participation and the efforts of many volunteers that work hard and long to bring the SWAT Symposium to you each year. **So welcome and may you have an outstanding experience at the 25th Anniversary of the SouthWest Association of Turners Symposium.**

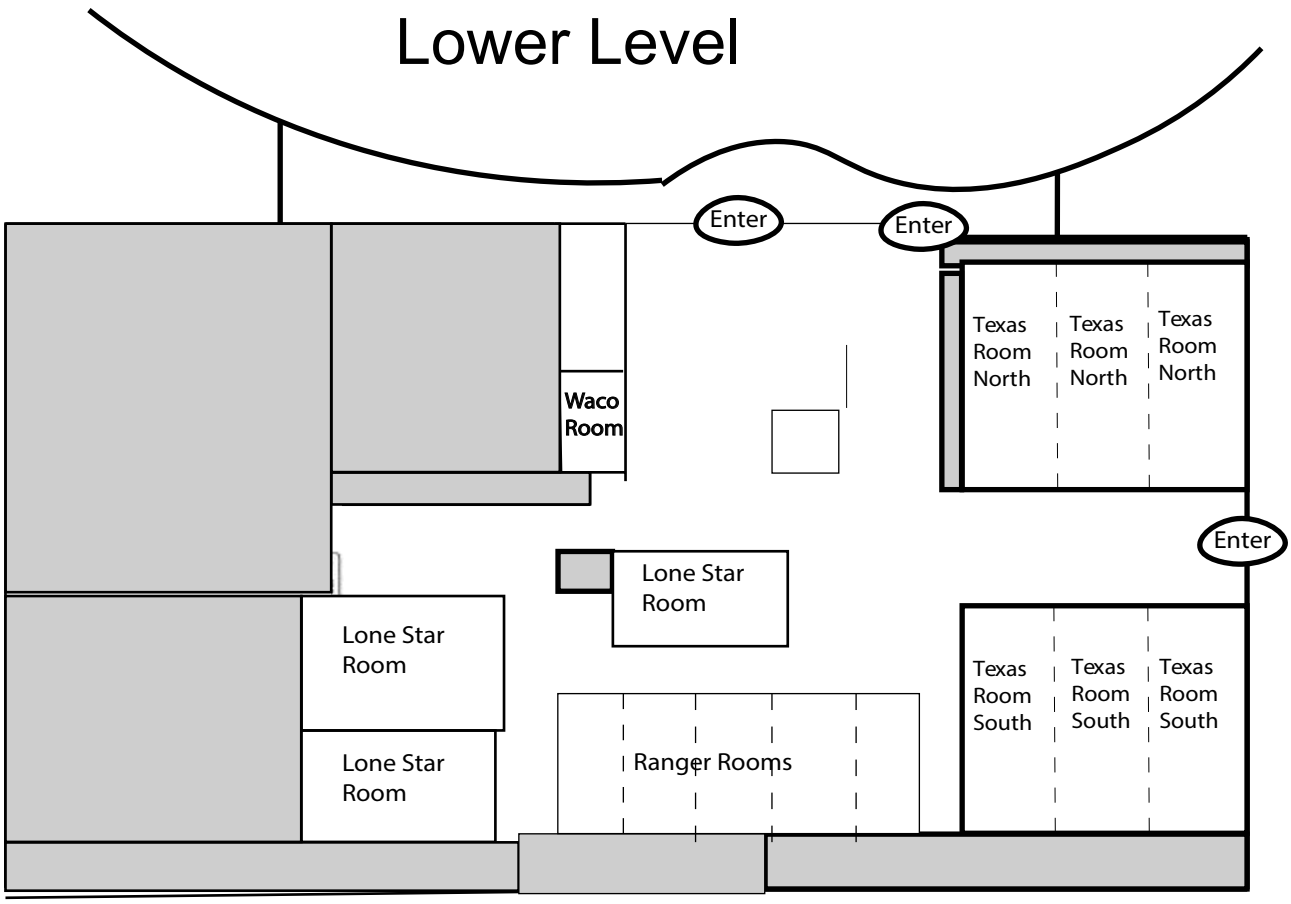
Buddy Compton
President, SouthWest Association of Turners
bcc@wtconnect.com

WACO CONVENTION CENTER

Upper Level



Lower Level



Room	TEXAS NORTH	BRAZOS NORTH	TEXAS SOUTH 116/117	BRAZOS SOUTH	TEXAS SOUTH 118	RANGER
F R I D A Y, A U G U S T 2 6, 2 0 1 6						
9:00-10:00	OPENING CEREMONIES, CHISHOLM HALL					
10:30-12:00	CLAY FOSTER GRIDS & SPIRALS	JAMES JOHNSON HINTS & TIPS from a third of a century of Woodturning	CINDY DROZDA FABULOUS FINIAL BOX	KEN CARDIN PEN ACRYLIC MET-AL INSERTS	ANDY COLE NATURAL EDGE NESTED BOWL SETS 5	KEVIN BASSETT AN ACORN RING BOX W SECRET COMPARTMENT
12:00-1:30	WOMEN IN TURNING GATHERING	L U N C H				
1:30-3:00	LARRY ROBERTS BACK TO BASICS	ALAN TROUT PREPARATION OF A BURL FOR CASTING	WAYNE FURR TURNING THE CLAM SHELL BOX	DICK SING HOLLOW ORNAMENTS	JOHN JORDAN HOLLOW TURNING	MARY LACER TOPOLOGY
3:00-4:00	B R E A K					
4:00-5:30	TOM CANFIELD LEARN OR IM-PROVE BOWL TURNING USING 2X6 LUMBER	STUART BATTY PERFECTING THE ART OF CUTTING	ANDY CHEN FEATURE RING IN SEGMENTED TURNING	MIKE MAHONEY BIG GREEN CALABASH BOWL	JOE FLEMING THE AIRBRUSH DEMYSTIFIED	JOHN BEAVER WAVE BOWLS
6:00-7:30	Special Pre-Duel Dinner—Chisholm Hall – Tickets Must Be Pre-Purchased before SWAT. There will be no "at the door" sales!					
*****SPECIAL DUEL Combined BRAZOS ROOM ****						
7:30-9:00		DUEL		DUEL		
		STUART BATTY	vs.	MIKE MAHONEY		

Room	TEXAS NORTH	BRAZOS NORTH	TEXAS SOUTH 116/117	BRAZOS SOUTH	TEXAS SOUTH 118	RANGER
SATURDAY, AUGUST 27, 2015						
8:00-9:30	CLAY FOSTER LOW TECH SURFACE ENHANCEMENT TECHNIQUES	ALAN TROUT CASTING THE BURL	CINDY DROZDA TWISTED TRIANGLE BOX	DICK SING MINIATURE BIRDHOUSE	JOHN JORDAN HOLLOW TURNING	JOHN BEAVER BANGLES
9:30-10:30	BREAK					
10:30-12:00	GARY BARNES THREE-PIECE STACKING SALT/ SPICE BOX	STUART BATTY BOWL TURNING WITH THE 40/40 GRIND	ANDY CHEN FEATURE RING IN SEGMENTED TURNING	MIKE MAHONEY PLATES, PLATTERS & BOWLS	JOHN JORDAN CARVED/ TEXTURED SURFACES	MARY LACER OFF-CENTER TURNING
12:00-1:30	LUNCH			(1 – 1:30) World of Woodturners		
1:30-3:00	CLAY FOSTER GRIDS & SPIRALS	STUART BATTY SEVEN SET-UP FUNDAMENTAL	WAYNE FURR TURNING THE CLAM SHELL BOX	MIKE MAHONEY HOLLOW FORMS WITH THREADED LIDS	TOM CANFIELD LEARN OR IMPROVE BOWL TURNING USING 2X6 LUMBER	MARY LACER TOPOLOGY
3:00-4:00	BREAK					
4:00-5:30	LARRY ROBERTS BACK TO BASICS	KAI MUENZER VESSEL STANDING ON THE RIM	CINDY DROZDA FABULOUS FINIAL BOX	DICK SING HOLLOW ORNAMENTS	ANDY COLE NATURAL EDGE BOWL TECHNIQUES	JOHN BEAVER FLYING RIB VASE

Room	TEXAS NORTH	BRAZOS NORTH	TEXAS SOUTH 116/117	BRAZOS SOUTH	TEXAS SOUTH 118	RANGER
S U N D A Y, AUGUST 28, 2016						
8:00 – 9:30	CLAY FOSTER LOW TECH SURFACE ENHANCEMENT TECHNIQUES	JAMES JOHNSON HINTS & TIPS from a third of a century of Woodturning	KEVIN BASSETT AN ACORN RING BOX W SECRET COMPARTMENT	DICK SING MINIATURE BIRDHOUSE	JOHN JORDAN CARVED/ TEX-TURED SURFACES	JOHN BEAVER WAVE BOWLS
9:30 – 10:30	B R E A K					
10:30 – 12:00	GARY BARNES THREE-PIECE STACKING SALT/SPICE BOX	KAI MUENZER VESSEL STAND-ING ON THE RIM	CINDY DROZDA TWISTED TRIANGLE BOX	KEN CARDIN PEN ACRYLIC METAL INSERTS	JOE FLEMING AIRBRUSH ART - HOW TO SUCCESSFULLY TRANSFER IMAGES	MARY LACER OFF-CENTER TURNING
12:00 – 1:30	L U N C H A N D T O O L D R A W I N G					

HAVE SAFE TRAVEL HOME AND A SAFE AND PRODUCTIVE YEAR TURNING

2016 Demonstrators	
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Mary Lacer	89, 93
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Larry Roberts	102
Dick Sing	105, 107
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Turning 25 With Gary Barnes

barnes1070@gmail.com

Three-piece Stacking Salt/Spice Box

Image 1

Image 2

If you want to turn boxes, especially stacking boxes without multiple chucking and re-chucking, this demo is right for you. It will show how to turn a 3-piece stacking salt/spice box, plus lid, from a single blank and a single mounting in the chuck. This 3-level box can also be used for storing small items such as rings and earrings. The ladies *love* them

Design Considerations:

This piece was designed to fill a request for a 3-level salt box. There are boxes available where the upper two boxes rotate to the side to gain access to the contents. This design was rejected because it could tip over when open, requires thicker walls for the pin/hinge and is more complicated and time consuming to construct. A design where the boxes could be unstacked using only one hand in order to access the contents and then re-stacked seemed more convenient and was well received by the customers. A second design feature is the interior shape of these boxes. Boxes with a flat bottom making a square intersection with the sides are common but have the disadvantage of making it difficult to remove small objects or the last bit of salt, for example. For this reason the bottoms of these boxes are rounded so that contents can be easily removed. See Images 1 and 2.

Wood Type:

Any good hardwood will work well, preferably with the grain parallel to the ways. Walnut is used for this demo. Maple would also be a good choice. If the boxes are to be used for salt or spices, wood with a strong odor such as cedar should not be used. If the box will be used for jewelry or other small items, odor is not a concern unless it is unpleasant. The blank needs to be dry: wet wood is not suitable for this method. A side grain blank with sufficient dimensions will work but will be much more challenging to turn and would not be suitable for inexperienced turners.

Blank Size

The blank used in this demo is roughly 3x3x6 inches which yields 3 decent sized boxes plus the lid. A slightly larger or smaller blank with box sizes adjusted accordingly will be fine as well. *Longer blanks should be used with caution as that increases risk of vibration and puts more stress on the tenon.*

Turning the Lid and Boxes:

After the blank is secured in the chuck, use a 1/8” parting tool to cut the grooves between each box and the top box and the lid. This forms the tenon that fits into the box under it. The depth of this cut determines the wall thickness of the lip of the boxes, in this demo 3/16”. Since the walls are tapered this does not result in a weak wall. Tip: place a piece of blue tape near the tip of the parting tool the same distance from the tip as the desired depth of the groove to make the depths consistent and avoid frequent measurements of the depth. See Image 5.

Image 5

Image 6

The lid in this design is essentially flat on the top with a rounded top edge. There will also be a hole made by the cone center. See Image 6. The lid can be made thicker so that enough wood can be cut away to remove the hole but requires a longer blank or shorter boxes. To save wood and add a little decorative interest to the project this hole will be left and drilled out later so a small knob or finial can be attached to the lid to cover the hole and add interest. Next, shape the lid, sand it to at least 400 grit, finish it if using friction polish or wax and part it off with a thin parting tool. See Image 7. Make the cut in the groove at the far left side of the groove between the lid and the top box. This parting cut is straight in to the center of the blank. If a finish other than wax or friction polish is used, it can be applied after the lid is parted off.

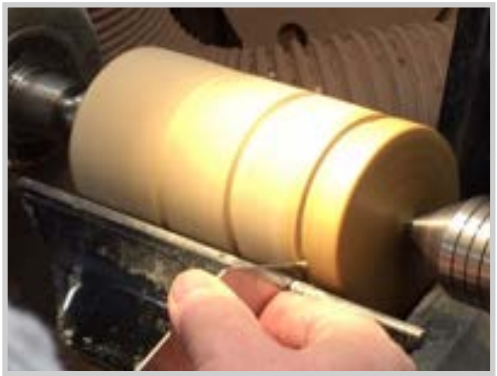

Image 7

Image 8

Now hollow the top box using a spindle gouge, small bowl gouge, round carbide tool or even a scraper according to your skill level and preference. The gouges, properly oriented, slice the wood and thus produce a much smoother finish and require less sanding than the other tools. Drilling a 3/8-1/2 inch center hole will make this easier and also sets the depth of the box to leave the bottom 3/8 inch deep. Mark the desired depth of the hole with blue tape on the drill bit. See Image 8. To cut with the grain the cuts should start in the center and move toward the outside diameter of the box. This also facilitates making the curve from the bottom center up to the lip of the box. See Image 9. Mark the intended thickness of the box lip plus a little extra as a guide for where to stop the hollowing near the rim. Set calipers to the diameter of the tenon on the bottom of the lid and check this mark and then later the actual opening produced by hollowing. See Image 10. When the cuts approach this line, check the fit with the lid, and then carefully take light cuts to sneak up on the fit. Turners like a tight fit that pops when opened: customers usually do not. So the fit of the lid should be loose enough to easily remove/replace it with one hand but not sloppy. Now sand and finish the inside, outside and groove. Then part off the box in similar manner to the lid.

Image 9

Image 10

Use the same process to hollow, fit, sand, finish and part off middle box. After hollowing, sanding and finishing the bottom box, remove it from the chuck, reverse it, and cut off the tenon. To do this fold paper towels into a square half the width of a paper towel and about 6 layers thick. Place this over the chuck jaws and push the box onto the "padded" chuck. Adjust the jaws for a snug fit but not tight to avoid cracking the lip. Run up the tail stock and fit the cone center into the original center hole in the tenon. Cut the tenon away making light cuts using a tool of choice, a spindle or small bowl gouge are recommended, leaving a small nub at the cone point. See Image 11 (tenon has already been turned away).

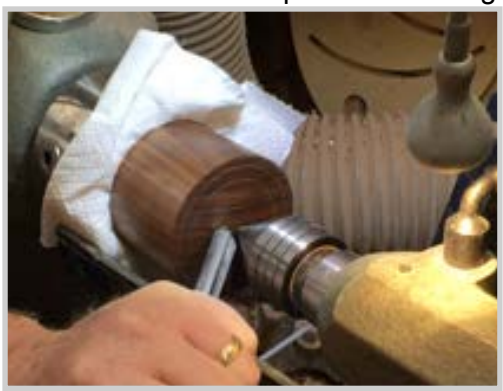

Image 11

Image 12

Turn the knob or finial:

Most turners have small offcuts from pen blanks or other small scraps that were too precious to toss away. One of these makes an ideal knob or finial for the lid. One way to do is to drill a 3/8 inch hole about 3/8" deep in both the scrap piece and the top center of the lid (See Image 12). Glue a 3/8 inch dowel into the scrap and mount in a Jacobs chuck or a collet chuck with a drawbar (See Image 13) and turn it to the desired shape, sand and finish. A ¼ inch dowel proved to be too weak for this and a 5/16 inch marginal, hence the 3/8 inch size is recommended. If the scrap blank is long enough, a tenon can be turned on the blank itself in place of the dowel. A 3/8 inch bottle stopper mandrel can be used and the dowel glued in after turning. Then glue the finished tenon into the lid. See Image 14. Stack the boxes, place the lid and admire your handiwork.

Turning 25

With Kevin Bassett

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Acorn Ring Box with Secret Compartment

This piece was inspired by my friend Bruce A. Smith and his daughter Stephanie. My friend Bruce, a well-known fellow Arborist and a woodturner, died from ALS (Lou Gehrig's disease) in June of 2014. At his memorial service Acorns were cast into the water. The waves and their pattern symbolize the interaction and ripple effect we have on each other's lives.

Recently, Bruce's daughter Stephanie contacted me with a commission to make an acorn for her to use at her wedding upcoming this November. She requested an Acorn Ring Box with a secret compartment where she could place some of her father's ashes. In that way she would feel that he is truly with her and walking her down the aisle on her wedding day. I was honored that she chose me to do the project. Today, I would like to share with you the particulars in creating this special Acorn Ring Box.

Items Needed:

Wood – I selected Mesquite as an ideal wood for this project because the project requires very precise fitting of two lids. Mesquite, besides being one of our most beautiful woods has a rather unique quality of having very little or no differential in movement between the Radial and Tangential planes. So, regardless of humidity level I expect the lid fit to remain consistent. I felt that this quality was especially important since Stephanie lives in Florida where the humidity it quite a bit higher than here. Blank size should be approximately 3 inch in diameter or 12/4 and at least 4 1/2 inches in length. The wood should be free on defects such as ring shakes, cracks and voids.

Tools – I use the normal box making tools which for me is a small detail gouge, a parting tool and a small box scraper. A 1 1/8 inch and a 15/16 inch forstner bits may also be helpful in speeding up the hollowing and lid fitting process. You may use the tools with which you are most comfortable.

Step 1 – Cut a small tenon on one end and remount piece into chuck. Lay out the portions for the different parts of the box: Acorn, Acorn Cap and Stem.

Step 2 – Part the Acorn stem portion from the Cap and Acorn sections. A mortise for the Cap/Stem portion can be cut at this time. I use a 1 1/8 inch Forstner bit to cut 3/16 inch – 1/4 inch deep and a 15/16 inch forstner bit to hollow the secret compartment in the Cap 3/4 inch.

Step 3 – Part the Cap from the Acorn Section.

Step 4 – Mount the cap section held by expanding jaws in the secret compartment.

Step 5 – Cut a very straight mortise 3/16 inch to 1/4 inch deep for the cap lid to fit into and hollow the Acorn. Hollow the Cap leaving avoid cutting through. This is a very shallow cut. Just slightly deeper than the mortise. Sand the inside of the Cap. Finish as desired.

Step 6 – Remove the Cap from the chuck and cut a Tenon on the Acorn portion to fit the Cap Mortise to a snug fit. This should operate smoothly but still take some effort to open. Finish hollowing the Acorn leaving space to finish shape the bottom of the Acorn.

Step 7 – Mount the Stem into the chuck jaws using the Stem as the Tenon (right). Cut the Tenon on the Stem to make a snap fit of the Stem to the Cap (far right)

Step 8 – Rejoin and mount all parts together. Make final cuts and shaping of Cap to Stem and Lower portion of the Acorn leaving a small amount unfinished until the Cap decoration can be added. Note the tail stock is in position to support the final cutting.

Step 9A – Mark vertical lines along the cap in pencil.

Step 9B – Use the lathes index to mark the horizontal lines.

Step 10 – Reverse the Acorn portion in the chuck and make the final cuts to the bottom of the Acorn Sand and finish as desired

Step 11- Re-join and test all parts. Proceed to final decoration and finishing. At this point the Acorn should be complete and function as intended.

Finishing Step 1 – Draw the opposing spirals to create the Cap decoration. Note: These should extend through the secret compartment lid and up to very near the stem. This can also be done by placing an X in each compartment made by the horizontal and vertical lines.

Finishing Step 2 – Use the wood burner to make the Cap scales. The Cap Scale pattern will (for the most part) obscure the line made by the stem cap lid. Finish and polish as desired.

It has been an honor and a privilege to present Stephanie's Acorn Ring Box with a secret compartment to you today. I hope you will find a use for this project and please be generous and consider ALS victims when you make your charitable donations. Bee Awesome and join Bee Smith and her Swarm fighting ALS at http://web.alsa.org

Best Regards,
Kevin Bassett

Turning 25
With Stuart Batty

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The Artist's essay ©2009 and personal image previously appeared in the *American Association of Woodturners Handbook*, 2015, pg 62-67. This reformatted essay, along with original images, is included with the permission of the American Association of Woodturners. ed.

Learning To Make *Perfect Cuts* in Woodturning:
Turning Technique into Art

What are *Perfect Cuts* in woodturning? Perfect Cuts are consistent cuts made by a wood turner who demonstrates effective tool control, cuts easily and with very little physical effort, and produces any desired shape in any kind of wood – hard, soft, even spalted - all with no torn grain and no catches. *Perfect Cuts* reflect effective tool control!

Many wood turners around the world work at this level every day – and they are not all professionals! They work with very little conscious thought since the vast majority of their techniques are performed sub-consciously. They have probably been turning like this for many years, and conscious thoughts control only basic decisions like shape, how much wood is removed, and how quickly the cutting takes place. At first even they found that mastery of the tools was difficult since there was so much to learn initially, and all that initial learning was based on conscious thought rather than sub-conscious action. If correct methods are not learned from the start, bad habits are stored in the sub-conscious, and it is very difficult to break these habits and learn correct methods.

I was fortunate in that I was taught correct cutting methods at a very young age. I served an apprenticeship under my father, but anyone can learn these methods from a qualified instructor. My personal quest is to teach others these correct cutting methods early in their woodturning careers so they turn more proficiently and more safely. By refining and breaking down the fundamental cuts into smaller and smaller increments, and explaining them in a way that is easily understood, I regularly achieve that goal. I instruct a small number of students (typically about 5 or 6 students), in sessions that last between 2 to 5 days. One-day classes are not as effective because repeating the fundamental cuts during at least a second day causes the sub-conscious to start to "kick in" and cement the learning into muscle memory (sub-conscious action).

Practice does not lead to perfect wood turning right away, but practicing *Perfect Cuts* leads to perfection in technique, which eventually leads to greater perfection in woodturning. An imperfect technique may work quite well, at least for a while, but using imperfect techniques long-term is ineffective and fails to foster continuous improvement. Many self-taught wood turners have developed their own styles, but they seldom involve *Perfect Cuts*, and their proficiency in woodturning suffers as a result.

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So what are *Perfect Cuts*? I will explain in words, but doing so is obviously is not as effective as participating in a hands-on class. But…it is a start. For those who have taken a class with me, these words should serve as reminders of the points made in class.

I believe that the rules I espouse are the *only* way cuts should be made. I must admit that many wood turners break these rules and end up with satisfactory cuts. I am not interested, however, in "satisfactory" when I know that every wood turner is capable of attaining perfection if cuts are made correctly. The more rules one breaks, the more difficult the effort, and the less consistent the results – and yes, torn grain will be the rule.

To my great pleasure, many world-class wood turners have enrolled in my classes. They already demonstrated an ability to create incredible art, but they wanted to take their art to the next level by making more consistent cuts (Perfect Cuts). What they take away from my class is an improved understanding of techniques and a new awareness used to more critically analyze their own work and the work of others.

Seven Principles That Lead To *Perfect Cuts*

Perfect Cuts result from practicing seven (7) principles that are summarized below, in order of importance, and then further explained. Very important to understand is that the first six principles must be in order to achieve success in the seventh principle – Technique (Push Cut Style) - and make Perfect Cuts consistently.

1. Grain: Side / End / Mixed
2. Chucking: Secure / Accurate
3. Sharpening Cutting Edge: Type / Size / Shape / Angle
4. Tool Rest: Height / Distance / Angle
5. Lathe Speed: Fast but safe
6. Stance: Position of feet
7. Technique (Push Cut Style): Straight / Concave / Convex

GRAIN (orientation of grain or grain direction)

Woodturning is challenging because of the many types of material turned. Materials may be very soft, very hard, or in between. Grain is the only common denominator – all woods (with the exception of burl or burr wood) have side grain and end grain.
Bowls can have either a side or end grain orientation. A side grain bowl has mixed grain (a combination of both side and end grain), while end grain bowls are pure end grain. If mixed grain, the grain is mounted perpendicular to the lathe bed so that the wood turner is presented half the time with side grain and half the time with end grain. If end grain, the wood turner is presented with only side grain, as in spindle turning, and end grain only is hollowed.
We try to avoid cutting into mixed grain directly since doing so tends to cause catches. Most importantly, we never cut directly into end grain. We focus on making <u>slicing</u> or <u>peeling</u> cuts (a gouge can slice and peel at the same time). Cutting end grain with the cutting edge facing uphill will invariably produce a catch. If the cutting edge of the tool is parallel to the floor or pointing downhill, then <u>scraping</u>, rather than slicing or peeling, is taking place.

In sum, there are only three ways to remove wood:

- <u>Slicing</u> (like a skew): There must be bevel contact (floating rather than rubbing) to create a slicing action.

•Peeling (like a parting tool): Only side grain can be peeled – trying to peel end grain will cause the tool to self feed and catch. Note that when peeling side grain the bevel does not always have to be in contact, but without contact scraping is taking place, and the cutting edge dulls very fast.

•Scraping (many tools): A scraper is not the only tool that scrapes - all tools can scrape if the handle is in the incorrect position. There are three main ways to inadvertently scrape: (a) the handle is too high, (b) the front of the tool is being pulled with the left hand, (c) the left hand / thumb is being used as a fulcrum during the cut.

Note: A gouge is the only tool that can peel and slice at the same time. The tip of the gouge creates the slicing action, and the wing produces the peel. A bowl gouge shape is better at this combination cut than a spindle gouge because of the differences in cutting surfaces in the respective flutes. A spindle gouge has a radius flute, while most bowl gouges have either a vee or elliptically shaped flute. A skew chisel can slice or peel, but not at the same time. A key disadvantage of the skew chisel is that only a small amount of wood may be cut at one time, so cutting with a skew is very time consuming.

CHUCKING (mounting the wood on lathe)

Wood must be mounted both securely and accurately to prevent vibration from occurring during the cutting process. Vibration creates spiral patterns on the surface of the wood as cutting takes place. The shape of a tenon or recess for gripping in a chuck – and most importantly – the seating of the wood against the chuck jaws - are critical to accurate mounting and a more secure grip.

SHARPEN CUTTING EDGE:

Four factors must be considered before sharpening the tool:

•Type of Tool – Using the wrong type can be dangerous.

•Size of Tool - For example, blade diameter for a gouge, and the length of the handle.

•Shape of Cutting Edge – For example, wings of a gouge ground straight across for straight cuts and wings ground back for cuts with more shape and detail.

•Angle of Cutting Edge - 40° for most gouges and chisels (but there are exceptions).

First select the correct type and size of tool for the grain orientation and size or shape of the turning. Example do NOT use a roughing gouge (sometimes called "spindle roughing gouge") on a side grain bowl – you will be breaking *Principle #1* (Grain) by cutting end grain, which will result in a major catch that may snap the tang off the roughing gouge (and hurt the wood turner in the process). Another example – do **NOT** use a skew for roughing a spindle down, despite what you may have seen in a video – the correct tool is the spindle roughing gouge. Using a skew in this manner is dangerous.

When selecting a tool, it is also important to take into consideration the length of the blade plus handle. These concepts involve overhang ratio and gouge diameter overhang (see next page).
In general, spindle turning rarely requires a long handle and blade because the cutting edge is not usually hanging off the tool rest very far. Bowl turning can require use of much longer handles, especially for the inside of the bowl when the overhang can become considerable.

Overhang ratio depends on whether one is cutting, scraping or negative rake scraping

- Cutting requires a 5 to 1 ratio (for example, if the cutting edge of a gouge is extended 3 inches beyond the tool rest, then there must be at least 15 inches of blade / handle length behind the tool rest, and the wood turner must be holding the end of the handle to preclude loss of leverage.
- Scraping requires a 7 to 1 ratio (see above example).
- Negative Rake Scraping requires only a 3 to 1 ratio (see above example) and requires the least amount of leverage.

Gouge diameter overhang is important as it relates to the distance the tool overhangs the tool rest. Too small a gouge, or too much overhang, causes the blade to start vibrating. This vibration may sometimes be mitigated by using lighter and / or slower cuts. Below are guidelines:

Gouge Diameter	Maximum Overhang
1/4”	3/4”
3/8”	1 1/2”
7/16”	2”
1/2”	2 1/2”
5/8”	4 1/2”
3/4”	6 1/2”

Note: Gouge diameters might be cited differently in a mail order catalog – the above diameters listed are the physical size of the haft of the gouge, not the European measurement.

The shape and angle of the cutting edge are also important. In many books and videos, wood turners espouse different angles for different gouges or chisels. For the vast majority of all gouges and chisels, I am convinced that the optimal angle is 40°, and I know that a 30° angle on a spindle gouge tends to be too aggressive. This is the angle of a chef’s knife, and also of a beaver’s tooth. It is also the angle between a self-feeding cutting edge (35° and below) and a duller angle (45° and above) that requires much more pressure to perform the cut (a 45° angle requires about 4 pounds of pressure, while a 40° angle requires only about 2 pounds of pressure). There are of course exceptions to use of 40° all the time; these exceptions will be addressed in a future article on grinding and sharpening woodturning tools.

4. TOOL REST:

Tool rests are critical to effective control of the tool. Height, distance, and angle of the tool rest must reflect the size or type of tool and size of wood blank, as well as the direction in which the cut or scrape is being made, including consideration of the location at which the cut will start and end.

Height:

- The standard height for the majority of cuts is approximately 1/8” to 1/4” below center a little lower for a 5/8” or larger diameter bowl gouge. Lower the tool rest when hollowing the inside of a side grain bowl, but only as the cut gets deeper, to ensure maintenance of an upward angle when cutting.

- When planing or rolling beads with a chisel (not needed for gouges) raise the tool rest to above center. The diameter of the wood blank and the size of the chisel will dictate how much the tool rest should be raised.
- When scraping, the tool rest is generally fixed above center so that the cutting edge of the scraper is pointing downhill (uphill will result in a catch).
- When negative rake scraping, only the negative angle on the top of the blade needs to point downhill not the actual blade.

Distance:
- The distance between the tool rest and the wood is critical to effective control of the tool too much distance, and leverage is reduced. The tool rest can also be so close to the wood that use of the tool becomes impossible. There needs to be just enough space to place the tool securely on the tool rest, ready to produce the cut, without the cutting edge of the tool being in contact with the wood. Usually 1/8” to 1/4” away from the wood is ideal, possibly further for 5/8” diameter or larger bowl gouges.

Angle:
- The angle at which the tool rest is set to the wood is critical for both the shape one desires to produce and control of the tool. One must be able to both start the cut in a controlled manner and complete the cut comfortably.
- Most tool rests supplied with modern lathes are not ideally shaped for what wood turners need them to do and often do not allow optimal positioning of hands. For the most part, however, this failure by manufacturers represents an inconvenience rather than a major issue.

5. LATHE SPEED:

Lathe speed in woodturning is a balancing act. Higher speeds are needed to effectively cut; slower speeds tend to make clean and consistent cuts much more difficult to achieve. With higher speeds there is greater potential for injury, more stress is placed on chucking systems, and unbalanced wood blanks can literally fly off the lathe from excess vibration. Use of variable speed controls on modern lathes has to a great extent made addressing these issues much easier.

Below are guidelines for round wood blanks that are in balance. For square wood blanks, the longest diagonal measurement should be used. The rightmost column is the key to understanding risk.

Diameter of Wood Blank	Maximum Lathe Speed (revolutions per minute)	Outer Diameter Surface Speed (miles per hour)
2	2,400	14
3	2,200	20
4	2,000	24
6	1,700	30
8	1,500	36
10	1,350	40
12	1,250	45
14	1,100	46
16	950	45

6. STANCE:

Stance is the position of one's feet while performing a cut. Stance is an important part of effective and consistent cutting. Positioning one's feet correctly is also critical to producing desired shapes while controlling the tool during the cutting process.

The three stances are:

- Parallel Straight Cut: Feet are parallel to the lathe bed (may also be parallel to the cut if the cut is angled – for example, when removing the corner of a side grain bowl).
- Oblique Straight Cut: Left foot is forward.
- All Curved Cuts (concave or convex – both directions): Right foot is forward. Longer cuts may require the right foot to be even more forward for example, the larger the bowl diameter, the longer the curved cut, and therefore the right foot might need to be quite far forward to maintain balance during the cut.

7. TECHNIQUE (Push Cut Style):

Technique is the way the tool is controlled, both with the type of cut, and with correct use of the hands. Technique is last principle on the list, but technique must be considered before selecting a tool, setting the tool rest, and determining stance.

The Push Cut.

The principal style of cut I use and teach is the Push Cut – a name I assigned to my style after watching other professional wood turners pull the gouge around the outside of a side grain bowl. I call their style the "Pull Cut". Note that this Pull Cut cannot be performed on the inside of a bowl, and also that it is impossible to get into corners using the Pull Cut. The Push Cut should be learned and practiced first to foster use of the most effective woodturning cuts.

Correct Use of Hands:

Assume for the purposes of this explanation that the wood turner is righthanded, and Push Cuts are therefore controlled by the right hand (the one holding the handle).

The key mantra associated with use of the Push Cut is that **CONTROL COMES FROM THE RIGHT HAND!** It is impossible to complete a Push Cut *Perfect Cut* using both hands. The Pull Cut, and also scraping, requires control from both hands.

What does this right hand and arm do to control the tool during a Push Cut? Only four motions & their opposites are possible:

1. Lift or drop
2. Push or pull
3. Twist (left and right)
4. Swing (left and right)

Straight cuts use the first two motions (lift and push). If twist or swing is added, the cut will no longer be straight. Note that nearly all straight cuts involve body contact with the handle during the cut.

Curved cuts require use of all four motions to produce a fair curve. Note that all curved cuts do not involve handle contact with the body. The cut may start with the handle against the body, but as soon as the tool moves, the contact will cease since there is simply too much travel in the handle during curved cuts. If the cut is progressing in the opposite direction, then the handle would start away from the body, and at the very end of the cut the handle would either be touching the body or be very close.

What does the left hand do? Think of the left hand as an assistant who adds no controlling action to the tool. The left hand provides assistance in four possible ways, but only one (weight) is essential in all cuts:

1. Weight: Adding weight to the front of the tool, or down onto the tool rest, is essential in all cuts. Most tools are not heavy enough at the front, largely because the handle is lower than the blade.

1. Positioning the front of the tool for the start of the cut. The right hand is simply too far back to effectively position the front of the tool. The left hand, at the front near the cutting edge, is much more capable of accurately positioning the tool to start the cut.
2. Preventing skid. When starting certain cuts, such as an entry cut on the inside of a bowl or cove, the gouge will want to skid / skate to the left because at that point there is no wood behind the bevel. This skidding effect will not take place on a broken surface such as a natural edge bowl or pommel – the tool will simply not skid on air. The left hand can prevent this skid / skate through use of the left thumb on the tool rest (in contact with the rest) behind the gouge blade, with the left hand fingers on the opposite side of the blade pinching the blade between thumb and fingers. A key points is that this assist from the left hand must be momentary only once the cut has started, and the bevel has wood behind it, the left hand must be moved back away from the rest and used only to add weight. Leaving the left hand on the tool rest often prevents the tool from cutting correctly.
3. Braking or squeezing. At the end of certain cuts, the tool must be prevented from travelling past a certain point for example, past the center on the inside of a bowl or box. The left hand is used to squeeze the front of the tool back toward the right hand to counter the pressure being applied to produce the cut – in essence applying a brake. This squeezing technique is also useful while cutting the outside of a sidegrain bowl to reduce the bounce effect typically caused by the left hand adding pressure to the bevel – in effect helping to float the bevel.

The left hand must **NEVER** control the tool or influence the path of the tool. The left hand will destroy any cut if it influences the path, adds pressure to the bevel, or removes the bevel off the surface by pulling the blade. The left hand or thumb must **NOT** become fulcrum points. The left hand must **NOT** pull the front of the blade at any time since doing so causes the bevel to come off the wood and the cut to become a scrape, leaving small grooves in the surface of the wood. Scraping will also dull the cutting edge approximately 30 times faster than keeping the bevel in contact with the surface.

Other Aspects of Tool Control:

1. Understanding Handle Height:
   - Handles need to be at the correct height for each type of cut. Too high, and the cut turns into a scrape. Too low, and aggressive cuts result.

2. Understanding the Concept of Bevel Flotation:
   - The bevel must be in contact to be cutting (if not, one is scraping), however, the amount of contact is the critical issue. The bevel must **float** (i.e., move across the surface without pressure) rather than rub on the surface.
   - If too much pressure is applied (bevel rubbing), the cut will bounce. This bounce occurs most often in bowl turning because the grain is mixed (both side and end grain) and the bevel therefore travels over different densities of grain. Any pressure on the bevel will start a very small bounce on the surface, which will amplify in longer cuts – and result in an uneven or rippled surface.

   - A vivid demonstration of the destructiveness associated with bevel rubbing is attempting to cut a broken surface while pushing the bevel on to the wood – such as cutting a bark edged bowl or a pommel (the shoulder between the square section and the rounded diameter on a chair leg or balus ter). Unlike rubbing the bevel on a solid surface, the effect of placing pressure on the bevel while cutting a broken surface is instantaneous failure of the cut.

3. Understanding Flute Orientation (applies to gouges only):
   - Flutes must be correctly oriented – too open and the cut will become aggressive, and too closed and the tool will fail to cut.

- An **open flute** means that the opening of the gouge faces the ceiling. A **closed flute** means that the opening of the gouge faces the floor. Since no cuts are possible with the flute fully closed, to achieve a cut the flute must be facing right or left, or more open.

- During any curved cut, the flute must be twisted / rotated to enable the cutting edge to reorient to the grain. **Concave cuts** start with the flute on its side (left or right) and end with the flute fully open (facing the ceiling). **Convex cuts** start with the flute fully open (facing the ceiling) and end with the flute half closed (left or right).

The goal of this paper is to improve understanding of what constitutes *Perfect Cuts* in wood turning. I am convinced that *Perfect Cuts* are possible for all wood turners. Hopefully the information in this paper will enable wood turners – with some practice – to achieve *Perfect Cuts*. Practicing the correct techniques is the key!

Submit Online Demonstration Evaluation

Turning 25
With John Beaver

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Wave Bowls

In this action packed demo I will show two different ways to make my signature wave vessels. For the first piece, I will take a block of wood, cut it apart, add a contrasting wood to create the wave and show you how to put it back together keeping the grain aligned. With a bandsaw, a few clamps and basic turning tools, this is a project you will be able to go home and do yourself.

The second piece will be a protruding wave bowl from a rough turned bowl. For this piece I will use my custom jig to cut a turned bowl into pieces. I will then modify the elements and put it all back together. This piece has a higher skill level but there are many tricks I use that may help you with some of your own designs.

While the design of the wave is the feature of this presentation, there are many additional tricks you will learn. I will show you safe ways to cut a round bowl on a bandsaw with almost any angle, and put it back together keeping the walls and grain aligned perfectly. You will learn how to bend wood in a microwave oven, which is interesting and has many fun applications. You will learn how to precisely turn a bowl smaller keeping the proportions exact. Most importantly, I hope you will be able to use these ideas and tips to change and improve your own designs.

See my cutting jig

Turning 25
With John Beaver

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Bangles

This is a good beginner class but a lot of fun for turners of all levels. Bangles make great gifts for wives, daughters and friends, or for the women in the audience – yourself. They are also great items to add to your craft show booth. Anyone with a basic turning set can make a bangle. In this demo I will demonstrate various ways to mount and turn wood bangles. I will show you specialized tools you can buy to make the process easier, but I will also show you how to use tools you already have to accomplish the same thing. It's amazing how something as simple as a rubber band can make a big difference in the way you use a basic tool. There are many ways to turn bangles and I will give you lots of options so you can find the technique that's best for you. I will also cover bangle sizes and talk about different styles so you can create your own unique bangles

Turning 25
With John Beaver

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Flying Rib Vase

The biggest challenge in cutting a turned vase into pieces is getting the cut perfectly in the center of the vase. I will show you different ways to cut a turned vase apart accurately and safely. Getting the pieces back together can sometimes be a bigger challenge. In this demo I will show how to take a turned and finished vase, cut it apart, add protruding elements and reassemble the whole thing so the grain and walls remain aligned. I will also show how create and add the elements that protrude beyond the walls of the piece.

There are infinite design possibilities with this project, and the techniques I show here have helped many turners solve some of their own design problems. The idea of cutting apart a turned and finished piece is somewhat unique and I hope these concepts will help you develop your own turning voice.

See My Cutting Jig

Turning 25 With John Beaver

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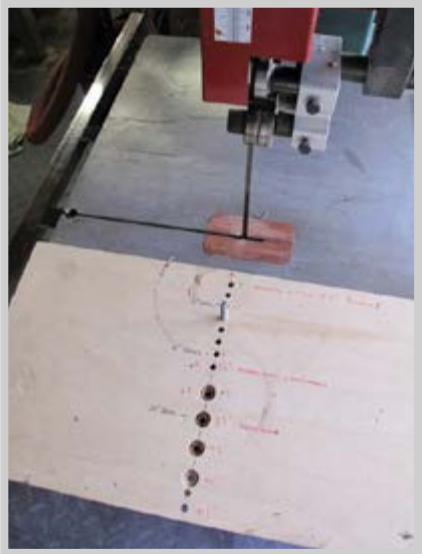
Wave Cutting Jig

This is a series of photos and descriptions of my wave cutting jig. You will need to make adjustments for the size of your bandsaw and lathe spindle so I did not provide exact measurements.
My jig has evolved over time. The photos represent different versions and parts.
Please enjoy making your own "wave" bowls. You are welcome to share this with your friends but please do not publish it on the Internet.
I have spent many hours developing these signature techniques, and I hope if you show your pieces to the public you will give me credit for the design.

BASE PLATE WITH HOLES TO MOUNT SWIVEL PLATE



Step One
The base plate has a miter bar to fit in the saw's miter slot. This will have to be made to fit your saw. I recommending making the base as big as possible.
The holes are spaced at 1/2 inch intervals, and recessed on the bottom to accommodate the pivot bolt. (the four larger holes are examples of the recess) I can rotate mine 180 º for different spacing.
The distance from the blade to the bolt determines the steepness of the wave. I recommend starting at 1 inch away from the blade for each inch diameter of the bowl. You can see the notes I write on the plate.
Align center of holes with leading edge of saw blade and clamp to table.

SWIVEL PLATE WITH GROOVES FOR TOP PLATE

Step Two
The swivel plate has holes drilled every inch. These holes are to accommodate the placement of different size bowls.
There are two grooves that accommodate splines on the bottom of the top plate. These allow the fixture to slide forward and backwards while remaining lined up.
I make this plate out of melamine to help with resistance when cutting the *wave.*
I use a washer, lock washer and nut on the pivot bolt.

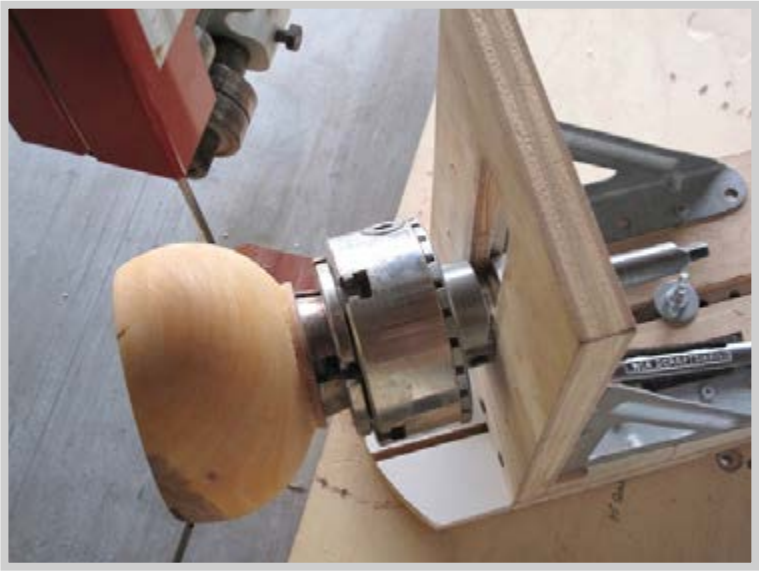
TOP PLATE WITH RIGHT ANGLE BRACKETS AND SLOT FOR CHUCK ADAPTER

Step Three

The bottom of the top plate has splines to fit in the grooves of the swivel plate. I like to use two bolts to make it as solid as possible. This plate will slide forward to your cut marks.
One can use wood or metal for the right angle supports. (Mine are Simpson construction brackets) Using wood for the chuck mounting plate allows the chuck to bite into the wood helping keep it secure.
The vertical piece has a slot that should match your spindle threads.
The back has a mortise so the threads on the reverse chuck adapter can reach a little further into the chuck.

Detail of back of upright support.

Notice recess to fit chuck adapter in bottom of top plate. Notice splines and recess to clear bottom mounting bolt



BOWL MOUNTED IN CHUCK AND ATTACHED WITH REVERSE CHUCK ADAPTER.

Step Four

Please make sure chuck mount is tightened and bowl is secure.
Align edge of bowl with blade and mark that position. (Tilt table to square face of bowl to blade)
Using reference mark on top plate, place predetermined cut marks forward of edge mark on swivel plate. I use masking tape for these so they are easy to change for each new piece.
Slide bowl up to cut mark, and cut with a steady consistent motion.

Turning 25
With Tom Canfield

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2x6 LUMBER BOWLS:
LEARN AND IMPROVE YOUR TURNING

Turning a bowl is not a difficult process. Turning a quality bowl does take some skill and a lot of patience developing turning, sanding, and finishing techniques. This demo suggests using free or cheap 2x6 construction lumber to start developing those techniques and then move up to better quality woods. The 8 bowl profiles on attached sheet are in increasing difficulty from 1 to 8. The demo will do the #1 Standard, a jam chuck, and then #6 side wing square bowl. Some of the other profile techniques will be briefly discussed in doing #6.

Tools & Supplies

- Bowl gouge
- Spindle gouge
- Skew
- Spring loaded punch
- Pencil
- 4 jaw chuck & worm screw
- Live center & flat washer
- Flush cut saw and shield
- 2x6 Disk
- 2x6 Square block
- 2x4 Square block or disk
- Rubber shelf liner & scissors
- Cardboard disk templates
- Drill for worm screw

Standard Bowl Process (Shape #1 on Profile Sheet)

1. Mark center on disk bottom using template and spring punch, pith side down
2. Mount disk jammed between opened 4 jaw chuck and live center (washer on cone to limit depth)
3. Mark tenon diameter laying pencil on live center (about 2 inch diameter) and turn tenon (about 1/8 inch to ¼ inch > min chuck diameter for dry wood – later 3/8 inch to ½ inch for green wood). Use skew for sharp bottom.
4. Check rotation, start at slow speed, and turn outside of bowl from tenon to top with bowl gouge, sharp tool for final cut.
5. Reverse and mount tenon in chuck and *bring up live center as insurance when beginning.*
6. Check rotation and then turn from outside to center to remove interior with bowl gouge. Some start with parting tool to form ledge, but not required and cannot be done with natural edge later

7. Turn down interior in steps for larger diameter, using a sharp gouge for final cuts each stage. Sand when interior removed, and then remove from chuck.
8. Mount 2x4 block for jam chuck between centers and turn tenon (step 1-4 above). Then reverse and turn contour on surface to provide a ring contact with bowl interior about ½ diameter of bowl.
9. Add loose rubber shelf liner, install bowl with live center in dimple of original tenon
10. Turn off or reshape tenon as foot leaving small nub (about ½ inch diameter)
11. Sand exterior of bowl, remove and cut off nub with saw, and then sand nub area.

Mid Side Square Wing Bowl Process (Shape #6 on Profile Sheet)

1. Mount four-jaw chuck and install worm screw. Drill hole in center of square blank and install on worm screw. Bring up live center for added stability.
2. Mark tenon diameter, check clearance, and then turn tenon as above
3. Using bowl gouge, start turning outside from tenon to about ½ to 2/3 up side of bowl, diameter less than square to allow bowl to hang on wing. Use extra care and small cuts on air gap areas.
4. Underside of wing should be flat and cut to sharp angle with bowl using spindle gouge carefully
5. Remove from worm screw and mount in chuck. The live center should again be brought up for support, rotation checked, and then top exterior of bowl and wing turned from outside toward center, again using spindle gouge to get sharp angle. Exterior curve should appear to flow through wing.
6. Interior of bowl is then removed with bowl gouge turning from outside to inside.
7. Interior of bowl can be sanded on lathe, but exterior with sharp wings can be hazardous and hand sanding will be required for wings (Random orbital sander does work well on flat wings)

8 Remove and reverse using jam chuck and live center following steps 8-11 above.

It should be noted that no dimensions are given for the bowls. The primary objective should be to develop the techniques and not get caught up in details. Turn thick and then skinny up with practice.

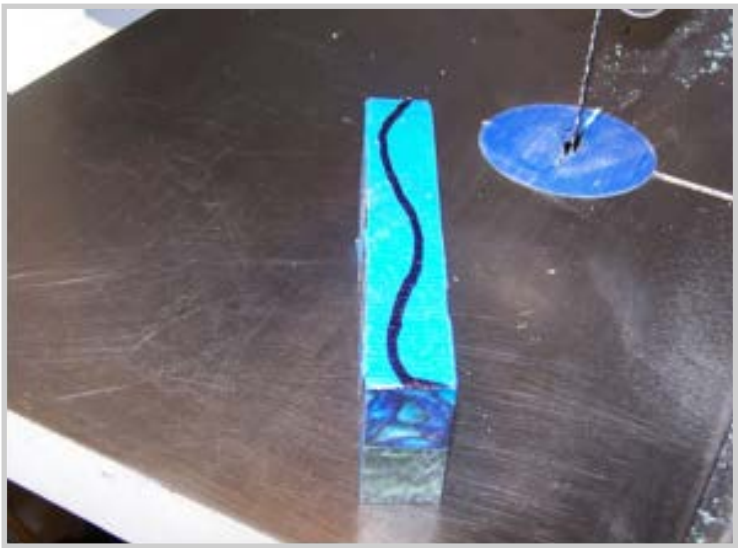
- Try six bowls in succession and see the improvements that happen with the later pieces.
- Note the difference in wood grain patterns with pith up or down.
- Try different profiles or come up with your own.
- Cut some pieces to show the cross section and uniformity of walls.
- Sharp tools make a big difference and the soft/hard growth rings of construction lumber will definitely make you better at sharpening to improve your turning skill to minimize tear out.

Turning a practice piece later also helps reinforce your skills and shows the improvement you have made. Have fun, but be safe, turning bowls.

Horizontal Lamination for Pens

1. Choose two acrylic pen blanks of contrasting colors. For this example blue and green were selected.
2. Tape the two pen blanks together, one on top of the other as shown.

3. Prepare to cut an S-curve line through the taped-together blanks. I have used tape and magic marker to suggest a possible curve to band saw.



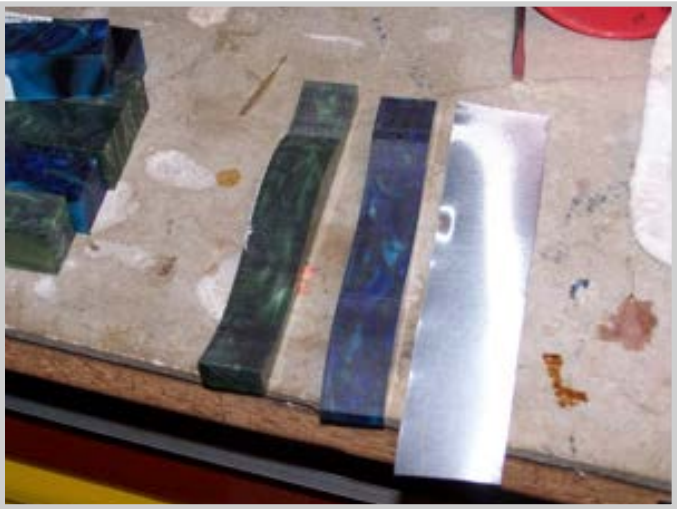
1. Cut the S-curve through the taped pen blanks.

2. Take the remaining halves one blue and one green and match them together.

DO NOT GLUE AT THIS POINT

3. While any metal can be used as an insert, this pen will use aluminum. The aluminum stove pipe was purchased from Home Depot for about $3.50 and will make lots of pens.

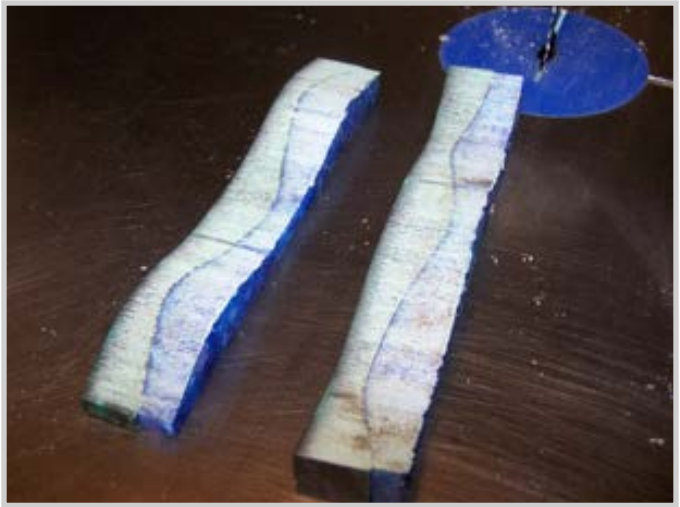
4. Cut an aluminum strip about 1 inch longer than the pen blank.



5. Use sand paper to rough up the surface area on both sides of the aluminum strip. I find the Dremel tool with a small barrel sander works well.

6. Spread thick CA glue evenly on the acrylic cut surface of the pen blanks. Do not leave any part of the cut acrylic surfaces without CA glue on it. If you fail to do this, an air gap will form, and the pen will come apart at that spot when later turning. Clamp the two halves together with the aluminum insert between them and allow to cure.

7. Repeat the process for the second cut. Rotate the glued-up pen blank 90 degrees and do another S-curve cut. After this cut is made, the pen blank will clearly demonstrate the first S-curve cut and you are ready to cut and rough up a new aluminum strip, use CA thick to glue the two pieces back together, and clamp it for curing.



1. After curing, measure the blank for the brass tube insert, cut the blank, and drill. The end result prior to the drilling will look something like this:

2. The finished pen is definitely worth the time and effort!

Turning 25 With Andy Chen

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Feature Ring in Segmented Turning

Image 1. Segmented bowl with a feature ring containing diamonds.

It is relatively easy to make a segmented vessel with one species of wood but the result would be rather bland. Using specific examples I will show you how to build and incorporate a “feature” ring to make the vessel far more interesting and attractive (as shown in Image 1). In addition, other fine design modifications such as thin layers that set things apart will also be covered.
The sky is the limit when it comes to the design possibilities of a feature ring. Geometric patterns, flowers, landscapes and all sorts of other thing can all serve as inspiration. The pattern that will be discussed in this demonstration is diamonds. Two different methods to construct diamonds are depicted in the following series of photos.

Procedure:

Method 1:

As shown in Image 2A a strip of wood (purpleheart) is laminated between two strips of wood of a contrasting color (beech) and the laminate is then cut into equal segments diagonally (Image 2D). Two strips of beech are then glued to each side of these segments (Image 3A). These pieces are then cut into rectangles with the diamond in the center (Image 4A). The two edges of these segments are cut to a miter angle determined by the desired number of segments, 15° for 12 segments in this example (Image 4C). A thin strip of another wood with contrasting color (ebony) is glued to one of the ends on each segment to form a partition between segments in this design (Image 4D). The segments are now ready to be glued into a ring.

The issue that arises with this method of construction is the wood grains run at an angle from the rest of the vessel which causes the instability in the construction because of wood movement. Additionally, it is not esthetically pleasing when members of the design are not symmetric or mirror images of each other. The alternative method described below results in wood grains running in parallel and the pattern is symmetric. However, this method is much more cumbersome and requires a methodical approach

Method 2:

Two species of wood of contrasting colors, beech and bloodwood in this example, are cut into small rectangles (Image 5A). Each rectangle is then diagonally cut into triangles as shown in Image 5D. Then two triangles, one of each color, are glued into a rectangle. (Image 6A. Four of these rectangles are required for each segment.) One end of the triangles (base of the bloodwood in this example) is trimmed off to expose some beech (Image 6B). Pairs of these are glued together at the trimmed end (Image 6C). A narrow strip along the bloodwood side is ripped off to expose some beech (Image 6D). The resulting pieces are then glued together pair-wise to form a rectangle with a diamond in the middle (Image 7A). As in Method 1, the ends of these segments are mitered (Image 7C), a partition added (Image 7D) and ready to be glued into a ring.
Obviously this method is much more labor-intense but the result is much more pleasing. Depending on the size of the vessel, the size of the pieces constituting each segment could be quite small and thus requires special techniques for safe operation. I will share these techniques with you at the demonstration.

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http://www.turnedwood.com/, Kevin Neeley
http://www.curttheobald.com/, Curt Theobald
http://www.andyscustomcraft.com/, Andy Chen
http://www.segmentedwoodturners.org/

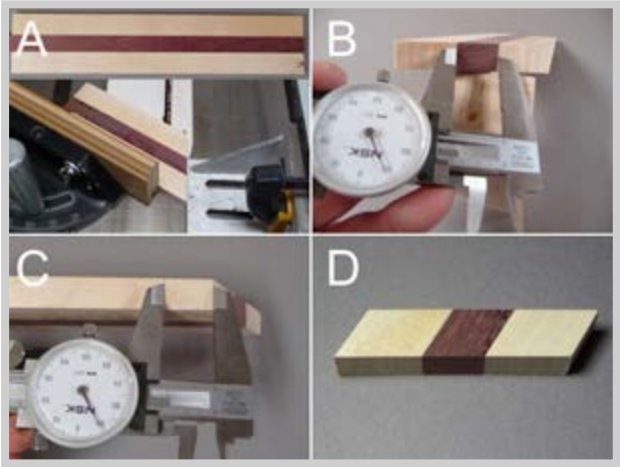


Image 2. Cutting laminated strip.

A. Top panel shows the 3 strips of wood laminated together and a 15° miter cut is made in the bottom panel.
B. The width of the purpleheart is measured with a caliper.
C. The width is transferred to the edge of the laminate for the next cut to ensure a perfect parallelogram with 4 equal sides.
D. The resulting partial segment.

Image 3. Cutting the segment containing the diamond.

A. A strip of beech is added to each side of the piece after the points are cut off.
B. One edge is cut with the aid of a sled that insures the points of the diamond are parallel to the edge.
C. The second edge is ripped off.
D. The segment is almost done except the two ends.

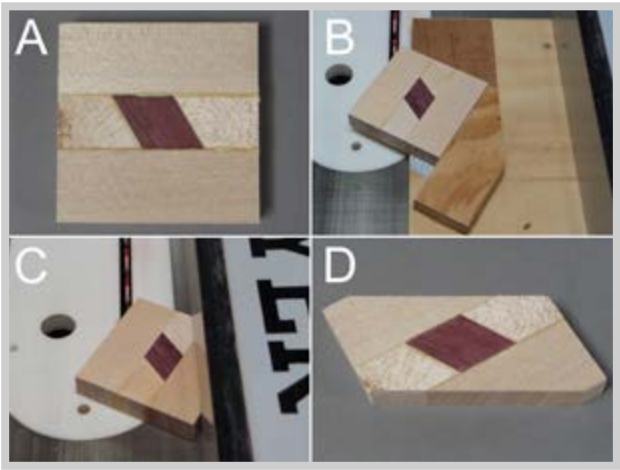


Image 4. Finish making the segment.

A. The ends are squared.
B. Setup for putting a miter on each end.
C. Miter is cut on both ends.
D. A thin strip is glued to one end for a partition.

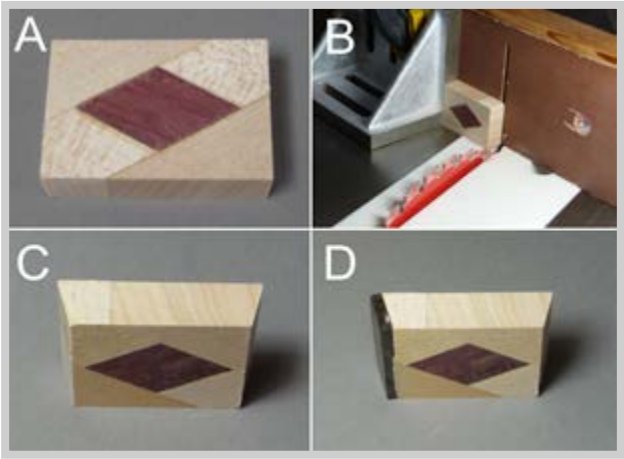
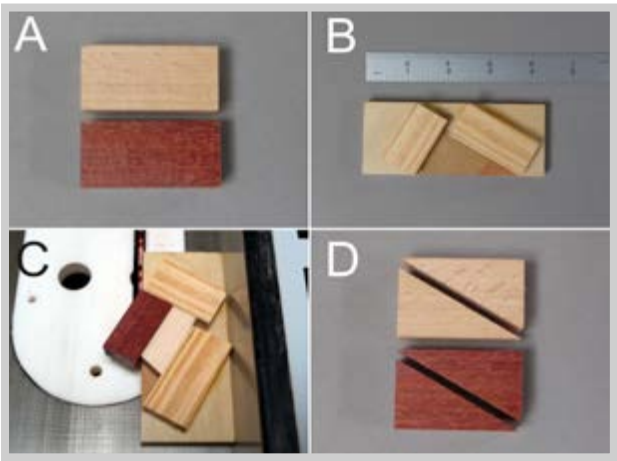


Image 5. Finish making the segment.

A. Two rectangles of different colors ready to be cut into triangles.
B. Sled used for cutting triangles safely..
C. Setup for ripping rectangles into small triangles.
D. The resulting triangles.



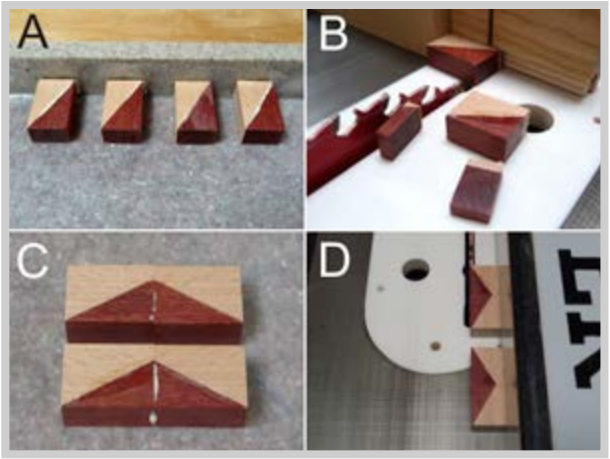


Image 6. Creating half segments.

A. Gluing two triangles of contrasting colors into a rectangle.
B. Trimming off one end of rectangles to expose some beech.
C. Gluing pairs of trimmed pieces.
D. Ripping off a slice of blood wood to expose beech.

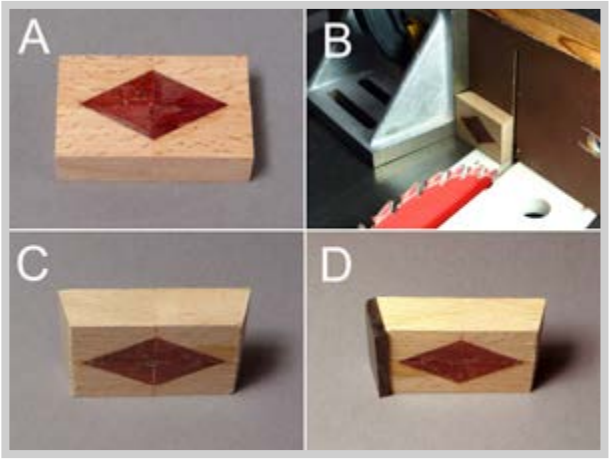


Image 7. Finish making the segment..

A. Gluing two halves to form a rectangle with the diamond in the center
B. Cutting miter on the ends.
C. Finished segment with miter cut on the ends
D. A thin strip is glued to one end for a partition.

Turning 25 With Andy Cole

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Natural Edge Nested Sets

Cuban Mahogany Nested Set

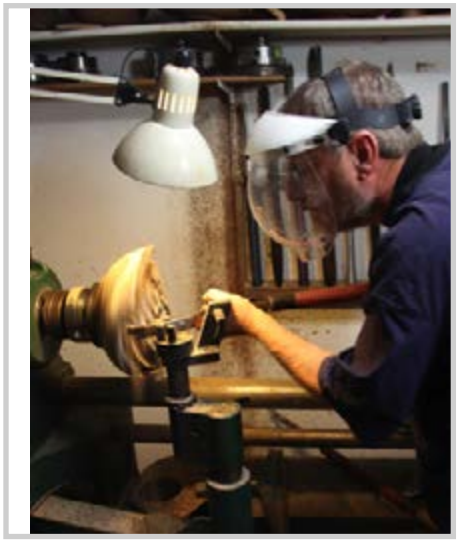
One thing better than turning a beautiful natural edge bowl is to convert the inside into a nested set rather than a pile of shavings.

There are several types of coring systems on the market today, but the Kelton (aka. Kel McNaughton) system is probably the most versatile. It is also one of the toughest to master, but the range of shapes that can be removed makes the system worth learning how to use. Many people have attempted to use this system and encountered much frustration in the process. During my demonstration I will address many of those problems.

The basic process of turning a natural edge nested set starts with blank selection. I always work with green wood with bark firmly attached. For those who live in Northern climates, wood cut later in the season (Fall) tends to work best.

After cutting the blank to a round shape on the band saw it is important to saturate any cavities in the bark with very thin viscosity CA glue. This will help to keep the bark in place once the coring process begins.

The next step is to shape the outside of the bowl as if you were going to make a single natural edge bowl. It is very important to leave room for a large tenon on the bottom of the bowl for chucking. The coring process involves very high levels of intermittent resistance as the blades are entering the wood. It is really easy to break the bowl free from the tenon with a catch while coring. On a 16 inch diameter bowl it is important to leave a tenon about 6 inches in diameter to assure a good hold.



Once the outside of the bowl is shaped, you are ready to begin the coring process. I always start my cuts with the straight blade as this gives much greater control and minimizes the possibility of accidentally nicking the bark during tool entry and extraction. It is best to start your cuts at the outside about 1" from the edge of the largest bowl. You can go in with the straight blade until it becomes obvious that a curved blade is needed to round your way in. The re-application of CA glue throughout the coring cuts on the bark areas will help to assure that fewer pieces of bark come flying off.

After making your first cut on the outer most bowl with the straight blade you can progress your way into the next bowl. The number of bowls that can be extracted depends on a number of factors. The diameter of the bowl will make things pretty obvious as you make your way to the center and run out of space. It is also important to keep in mind the depth of the bowl as a shallow bowl will not allow as many cored pieces due to the lack of wood on the bottoms.

Once all initial cuts are made with the straight blade you can switch to using the curved blades. It will take some experimentation to learn which radius blades work for each size. Practice on junk wood before attempting to work on the good stuff. You will most likely wreck a few before becoming a master. Just remember that any accident you can walk away from unharmed is a good learning experience!

Milo Nested Set

Macadamia Nested Set

Turning 25
With Andy Cole

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Natural Edge Bowls with a Flair

Macadamia

Turning a natural edge bowl is a great way to showcase the beauty of wood and leaving the bark on can highlight the organic nature as well. Often times form is too easily overlooked and can compromise the end result. In this demonstration we will look at various forms that work well and will discuss ways to enhance the shape of a bowl.
Other aspects of the demonstration will include challenges that come with keeping the bark on the edges of the bowls. Tips for repairing broken bark and options for when the bark is totally coming off will also be covered. Chucking methods and blank orientation will round out this lively session.

Avocado

Hau

A brief slide show will kick off this rotation and will be followed by the start to finish turning of a natural edge bowl. Sanding techniques will be discussed and demonstrated to the minimum level needed.

Return to:	Friday	Saturday	Sunday

Turning 25 With Cindy Drozda

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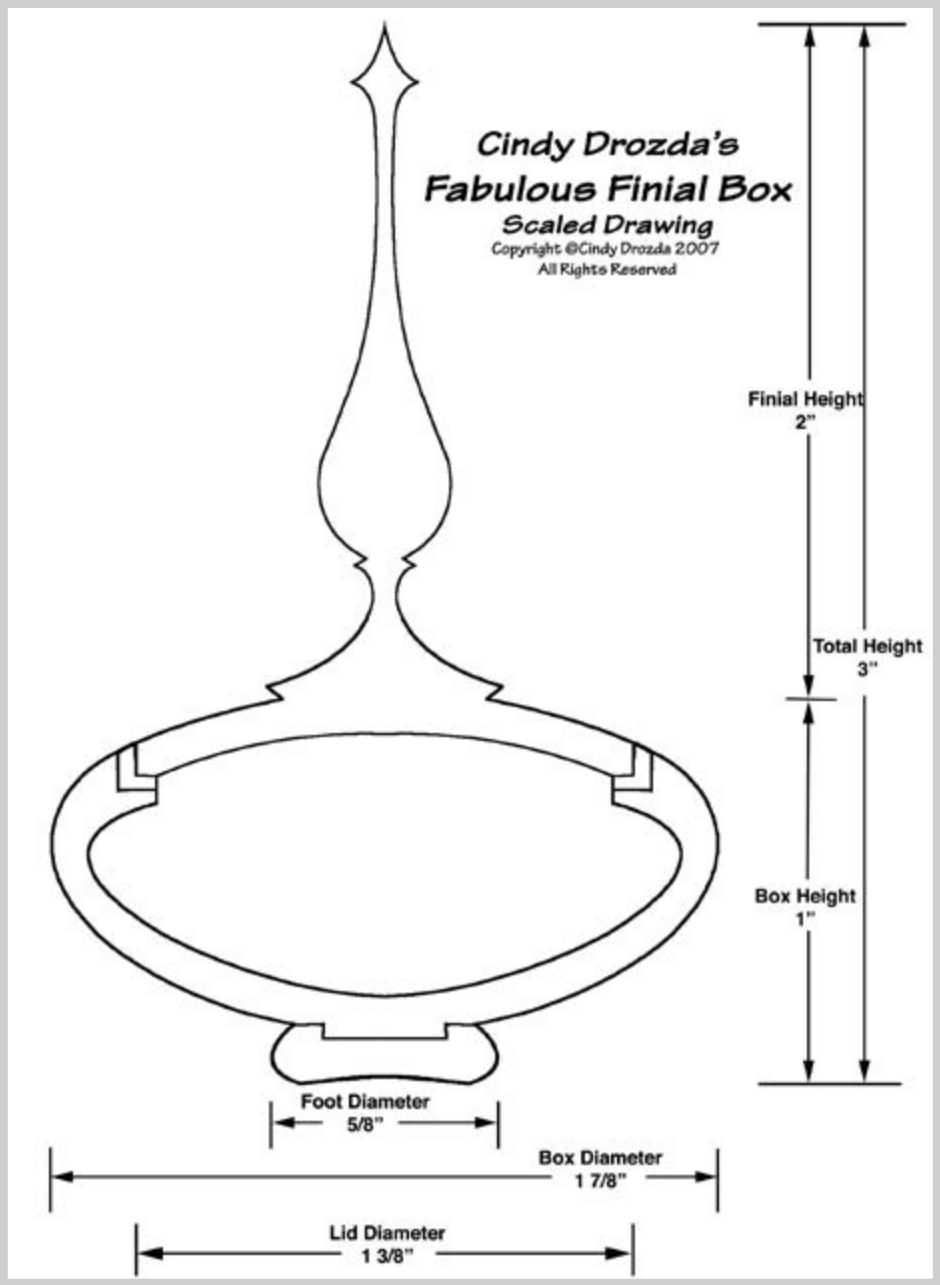
Fabulous Finial Box



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The Finial Box Step By Step

As it's done in my workshops

1 - Material Selection: Start with a piece of dry, straight grained, dense wood 2" x 2" x 3.5"

2 - Rough between centers, and turn a chucking point on each end

3 - Bottom of box in chuck. Completely shape, sand, and finish lid tenon and finial, leaving enough extra material to take a final pass across the inlay ring and box lid later on. Lid tenon is finished paralell (no taper) to about 38" from end. Part off lid.

4 - Flatten end of box bottom and friction drive the flat inlay disk. Disk is about 5/16" thick. For a 1/16" bead, the diameter of the disk is (lid diameter + 5/32""). Disk should have paralell sides and flat face up to tail center.

5 – Transfer disk diameter to the face of the box bottom.

6 - Partially hollow bottom of box. Don't make the walls thin or the base small at this point.

7 - Fit the disk into a recess in the box bottom, and glue the disk in place.

9 – Shape the top curve of the box bottom. Flatten the center of the disk and cut a recess for the foot. Part in to remove the foot blank.

10 - Jam fit the lid tenon into a recess in the inlay disk. Take a final pass across the inlay ring and lid. Sand and finish lid.

11 - If desired, form a bead on the inlay ring with a skew chisel. Refine lid fit.

12 - Hollow, sand, and finish inside and outside of box bottom (to the extent that the chuck will allow).

13 - Chuck up a waste block and jam fit the box bottom on. Shape the box bottom, ending with a tenon for the foot blank. Sand the box bottom now.

14 - Glue on the foot blank. Shape and sand the foot, and finish the box bottom and foot.

15 – Sign your work!

16 - If desired, jam fit the lid into a hollowed waste block to tool the inside, or sand the bottom of the lid with a sanding disk in a drill press, or carve/texture the surface. Be carefull not to remove any material right at the edge or the lid might not sit in the box as you intended. Compressed air will eject the lid from the waste block without damaging the finial.

For more hints on success with this project, check out my "Hints for successful box-making" handout.

Many other designs are possible using these techniques. If we all share, we all grow. Feel free to copy, but let that be a stepping stone to discovering your own voice!

Please turn responsibily!
Use eye and lung protection!
Have fun!

Return to:	Friday	Saturday	Sunday

Turning 25 With Cindy Drozda

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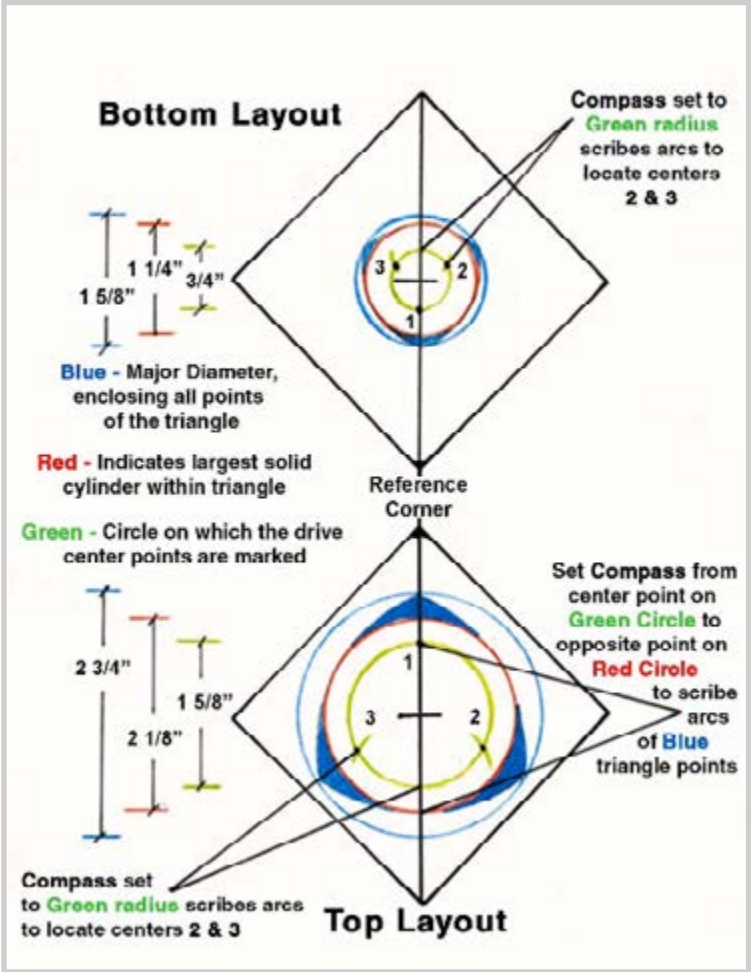
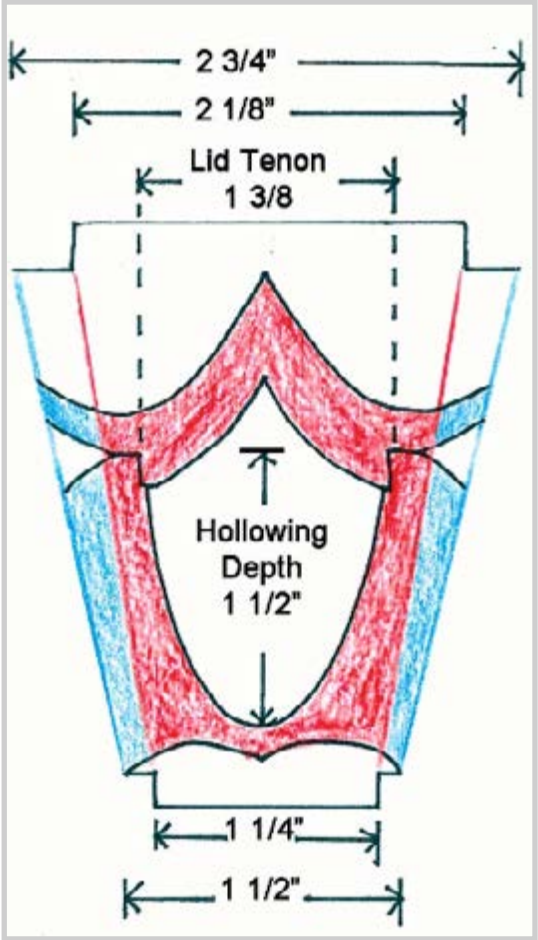
TWISTED TRIANGLE BOX

The artist will expand the Triangle box described below into the *Twisted* Triangle Box, ed.





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The Triangle Box

This design starts with a dry blank 3" x 3" x 3 ¼ "

1. Layout top and bottom of box
2. Mount blank between centers, taper to Blue (major) diameters, scribe ref. line
3. Part in to Red (solid) diameters on ends to create chucking points
4. Chuck on bottom, part off the 1" long piece that will be made into the top of the box.
5. Hollow, sand & finish inside of box. Create lid recess 1 3/8" – 1 5/8" diameter.
6. Chuck on lid, cut tenon to fit recess in box. Hollow, sand & finish inside of lid
7. Glue lid and box bottom together with thin line of glue, lining up ref line
8. Turn multi-axis triangle using the 3 centers on the Green diameter
9. Sand the outside facets of the box completely
10. Mount on center point and cut in to separate box halves
11. Jam fit both lid and base onto waste blocks to complete shaping
    - or-
    Re-cut chucking point on large end, chuck to tool bottom and separate halves of box, jamfit lid to finish.
12. Sand, finish, and sign your work

Done!

These layouts are for one specific size and shape of box, but many variations on this concept are possible. It can also be adapted to make items other than boxes. Try peppermills, vases, accent trim rings, bowls, tool handles, candle holders, etc. The possibilities are endless!

Here's how I determined the relationships in the layout

(this formula works in this size range, and may (or may not) work the same way in much larger layouts):

Starting with the largest diameter available in my blank:

1. Multiply the major (Blue) diameter by .77 to get solid (Red) diameter
2. Subtract ½ " from the Red diameter to get the centerpoints (Green) diameter

Starting with the smallest possible chucking point diameter that my chuck can use:

1. Multiply the Red diameter by 1.3 (or divide by .77) to get the Blue diameter
2. Subtract ½" from the Red diameter to get the Green diameter

Other things I have discovered:

1. The larger the radius of the outer arcs, the more "triangular" the box appears.
2. The smaller the radius, the more like a circle it looks
3. Centers outside the finished piece does work, but presents more of a challenge and wastes wood
4. Centers within the corners also works, but planning is required and chip-out is more likely
5. If the design of the box doesn't fit within the Red cylinder, the hollowing will cut through the sides. This could be either a good thing or a bad thing!
6. Other numbers of centerpoints are also possible using the exact same ideas. 6, 4, and 8 are easy to figure out. Don't feel limited by symmetrical points!
7. If the centerpoints 1, 2, & 3 are shifted in relation to each other, you will get a "twisted" triangle (or whatever). This looks cool but is a lot harder to sand.
8. This same idea works well by only shifting the centerpoints on one end of the block, also. It makes the taper more dramatic.
9. Try tapering in more than one direction on the same piece! More planning required, but an interesting result. Also try tapering from top to bottom instead of from bottom to top.

Turning 25 With Joe Fleming

AirbrushingWood.com

The Airbrush Demystified

Why Airbrush?

Many turners wonder why anyone would want to add surface enhancements to their wooden art pieces. This is a fair question and one with many answers. First of all, I select wood for the effect that it will provide in the final piece. I consider grain type (open or closed cell), grain orientation, grain pattern/figure, and wood color when designing a piece. If I am making a utilitarian piece, I rarely color or carve because I love the simplicity of the form for the function. If I am turning an art piece from an exotic wood, or a highly-figured wood, again, I usually let the wood stand on its own without additional enhancement. Too much enhancement can be worse than a bland piece of wood.
If, however, I decide to color the wood, I want to control the effect to the maximum benefit of the final piece. The airbrush is my main choice of coloring tool because I can control the intensity of the colors, the placement of the colors, and the penetration of the material much more precisely than one can with a rag or bristle brush. Additionally, the choice of airbrush media available, today offers the highest quality of material for art pieces.

What You Need

In order to airbrush, you only need four things:

- An airbrush
- Airbrush quality paint, ink or dye
- A regulated air source
- Something to color

Everything else adds to the effects you can accomplish or the ease of use, but are not strictly necessary. Optional accessories include:

- Airbrush holder
- Masking materials
- Lacquer or other finish
- Stencils and pre-fab designs
- Drafting supplies
- Training videos
- Books and literature

There is a wealth of YouTube videos available and other materials. Keep in mind that there are fifty ways to accomplish everything, so you will find conflicting information.

A Few Definitions

Before diving into the coloring process, I will offer a few definitions:

- Dye – Dyes are colorants that are usually mixed in a solvent such as mineral spirits, oil, water or alcohol. Metal acid dyes are sometimes mixed with MEK or other “nasty” solvents. The dyes used in woodworking are actually very similar to those used for dying cloth and other materials. Dyes are characterized as transparent, as they bring about color changes in wood without obscuring the figure. The molecular size of the dye particles is so small they allow light to pass through virtually unhindered. In simple terms, the pigment in stain and paint is colored dirt ground up into small particles. Dyes are typically soluble salts or metals. Once mixed with their proper solvent, dye crystals dissociate into individual molecules, which are vastly smaller than ground up pigment particles. Thus, dye can get into spaces where pigment cannot.
- Stain (Transparent Paint) - Stains are really nothing more than very thin oil or water-based paints. Whereas dye stains are typically comprised of only dye and a carrier, stains are comprised of pigment, a carrier and a binder. Using a thin varnish (oil-based) or acrylic latex (water-based) as a binder, ground particles of natural and synthetic minerals are added to make stains. Stains should be stirred often to insure an even dispersion of pigment because the particles tend to settle on the bottom.
- Airbrush – An airbrush is a spray painting tool that uses compressed air to atomize the coloring medium and project it onto a surface in an even consistency. It is the smaller sibling to an air gun used by automotive and wood finishers.

Coloring Overview - Dyes

I primarily color wood in two ways. If I use dyes, my colors are bold and flowing. I usually select the colors for the complementary effect the color fields and overlap the dyed areas to create blended colors. Dye is a completely transparent medium. You can think of dye like colored filters for a camera. If one hold up blue and red filters together, one will see purple.

The issue is that the color of the wood will blend with the dye too. If one looks at the majority of dyed pieces on the blog sites, one will almost never see a true blue or a true red piece. These are almost always a shade of teal and orange, respectively. Wood tends to have yellow and red in it. Poplar has green. When I plan to dye a piece, I usually bleach it with two-part wood bleach. I apply the bleach three to five times to get the color out.

The other issue with dye is that it will penetrate end grain much more readily than side grain. This means that wipe-on dye will soak into the end grain and darken that color more than the side grain. When this happens, one will have a white-ish zone where the side grain is located.

You can see both the color shift and the *white ring of death* in these old photos (Image 1 and Figure 2). Both are ash vessels. One is dyed with blue and one with red.

Image 1: “Blue” dyed ash vessel

Image 2: “Red” dyed ash vessel

Now, dye process is as follows:

- Sand to 180 or maybe 220 - no finer
- Wet the surface (raise the grain), then re-sand to last grit
- Bleach three to five times
- Seal with vinyl sanding sealer or lacquer
- Sand back the sealer
- Airbrush dye – do not soak the surface or one will get runs
- Seal with a light lacquer spray – not too wet or one will get runs, or reactivate the dye and cause it to run
- Apply additional lacquer coats to achieve build and desired gloss effect (Image 3)

Image 3: Figured maple vessels, dye and gloss lacquer

I refer to this whole process as the "Don Derry Finishing Technique" and I've documented it on my website – AirbrushingWood.com. He taught me how to build this type of finish. He learned it finishing electric guitars.

Coloring Overview – Transparent Paint

For the demonstration, I will be focusing on completing a piece using transparent paint and masking techniques. Transparent paint is really just stain. What that means is that if you apply enough of the material, it will become opaque. You can see the grain through the paint if you have not over-applied the paint to your project.

In the red oak piece below (Image 4), I used yellow, red, purple, blue and gray transparent paint.

Image 4: Oak platter, carved, burned and painted

Image 5: Birch plate, painted

In the birch piece above (Image 5), I used transparent black, purple, blue and gray. As soft as the grain pattern is in the birch, you can still see it in all of these colors. The white is opaque paint and the brain is pretty well hidden.

With transparent paint, I am less concerned about the color of the wood because the paint will obscure the wood color so bleaching is not usually necessary.

Coloring With Transparent Paint – The Details

Here are the steps I generally follow when painting with transparent paint:

- Sand to 180 or maybe 220 - no finer
- Wet the surface (raise the grain), then re-sand to last grit
- Seal with sanding sealer or lacquer, if wood grain is fragile
- Sand back the sealer
- Layout the design directly on the wood or on the mask
- Cut the mask with a knife
- Lift mask and paint the selected areas in desired sequence
- Peal remaining mask
- Seal with a light lacquer spray – not too wet or you will get runs
- Apply additional lacquer coats to achieve build and desired gloss effect

Sanding:

When sanding for dye or paint, do not sand past 220 grit. Even 180 grit is fine. Why? Over sanding burnishes the wood fibers. Your sealers and paints will not have enough tooth to mechanically grip the surface and you can get a failure in the finish. Dyes will not penetrate as well. What is more important is regular sanding patterns. On a vessel, if you are using a rotary sander, the sanding scratches need to be consistent over the entire surface. They do not need to be invisible. Optically, inconsistent scratch patterns are very noticeable under finish. Regular scratch patterns are not.
As part of my sanding protocol, I wet the surface of almost everything with a damp paper towel to raise the grain. Once dry, I sand to the last grit I used during the sanding process. Finishes can raise the grain. On a clear finish, you get the change to sand it back and apply more finish. On a dyed or painted surface, sanding raised grain can damage the dye or paint treatment. Prevent the problem from occurring by raising the grain ahead of time.

Sealing:

I usually seal the wood surface with either vinyl sanding sealer or lacquer. This keeps dye penetration more even across end grain and side grain on a given piece. For paint, if the wood fibers are prone to lifting, the sealer hardens the surface. Once sealed, I sand back the sealer down to the wood.

Design Layout:

I have had very little success when trying to mask for dye. Dye is so runny, it will follow the wood grain and flow under the mask. My recommendation is to use dye for broad, flowing and overlapping colors.

If you are going to have painted and unpainted surfaces, you will need to mask the unpainted areas. You can use masking tape for this such as painter's tape. Try to avoid leaving the tape on the piece for too many days in a row or you could have tape residue issues. You can block large areas with paper scraps.

For the painted areas that are to have distinct colors, use frisket film to cover the whole areas and a sharp hobby knife to cut the color zones for painting.
For example, on Image 4, the door and the bottom section were masked with tape and paper, as was the outside edge of the platter's rim. The colored area was painted from yellow to gray with no additional masking. The turned moon crescents were turned after the painting was complete.
On Image 5, the rim was taped with flexible automotive masking tape and painter's masking tape, and then the entire inner portion of the plate was covered with frisket. Once covered, the entire image was transferred to the frisket using transfer/tracing/carbon paper. Next, the black areas were cut as one piece, the moon was cut as two pieces (small piece on the right side of the large cactus), and the sky as six pieces (large section on top, four small pieces next to the ground between the two cacti, and one small piece between the arms of the small cactus).
It is very important that you take care when cutting the frisket. Every cut line needs to intersect with adjacent cut lines. Failure to have the cuts meet will lead to stretching and tearing of the frisket which will show up in your painting. It is worthwhile to practice cutting. If you press too lightly, you will have stretching and tearing. If you press too hard, you can end up with deep cuts in your wood.

Painting:

Painting on Image 4 was done in a five-color sequence: Transparent yellow was sprayed for about the first two inches. Transparent red was sprayed from approximate one inch to about four inches. Transparent purple was next from about three inches to the top. Transparent blue from four inches to the top, and finally, transparent gray was sprayed from about five inches to the top. By overlapping the colors, I created oranges, magentas, and violet-blues.
Painting on Image 5 was more elaborate. I carefully lifted the two moon frisket pieces and placed them on a clean piece of paper, sticky side down, for later use. Then, I firmly press the remaining frisket edges to make sure that no paint can blow under the edge.
I sprayed opaque white to fill in the moon. Less paint is better than too much. If you spray heavily, you will have puddles and it will take a long time to dry. If you paint too little, you can always add more paint in successive coats of paint.
Aim the airbrush so that it sprays over the edge of the frisket – not into the edge of the frisket as shown in Image 6. This helps prevent the airbrush from blowing paint under the edge of the mask. Then, let the paint dry. One can use a hairdryer to speed up the process. Once the paint was dry, I **CAREFULLY** replaced the moon sections back on the plate exactly where they were previously. Any deviations will show up as overspray, shadowing or unpainted edges. If you choose to draw in the lines after painting with a fine Sharpie marker, for example, these deviations can be subtly hidden.

Image 6: Airbrush over the edge of the mask

Next, I lifted the frisket from black zone. It was less important to retain this frisket piece because I did not intend to reuse it. It is still a good idea to set it aside for reuse, just in case it is needed. As you lift the frisket, if you find corners of sections where the knife did not through, re-cut the frisket with the knife before lifting it. If you try to pull it apart, you will get little nibs where the frisket stretched and tore. I then firmly pressed all of the exposed edges. Keep in mind that the white paint on the sky frisket might still be wet or tacky. You can dry this with a hair dryer too.
I then painted the black sections with transparent black. I kept the airbrush well back from the plate so the color was even. If you are too close, you will get hot spots and puddles.

Next, I lifted all of the sky sections so that the only frisket remaining was the moon. I pressed the moon edges to seal them down, and then used three colors for the moon's aura: transparent gray, transparent blue and transparent purple. Each color radiated away from the moon in successive rings. I did not mask between the colors. Instead, I overlapped them for a blended effect.
Once the sky colors were dry, I lifted the moon and the rim tape. Finally, I sealed the plate with two coats of satin lacquer.

Summary

An airbrush can add a significant component to your arsenal of tools. One can create so many different effects with a brush from broad colors to fine detail. It allows one to precisely control the amount of color one applies to a specific location, but it also allows one to seamlessly blend colors for very nice color gradients.

Presentation Outline:

1. Airbrushing equipment and accessories
    a. Required materials: 3 things: air, brush, paint
    b. Optional materials
2. Airbrush features
    a. Gravity vs, syphon
    b. Single vs. dual action
    c. Needle size
3. Basic painting skills
4. Transferring an image to your wooden project
    a. Pre-printed friskit
    b. Tracing paper
    c. Cutting or burning the image
5. Painting the image with the airbrush
    a. Painting sequences
    b. Remasking
6. Cleaning the airbrush
    a. Disassembly
    b. Cleaning
    c. Reassembly

Turning 25 With Clay Foster

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Low Tech Surface Enhancement Techniques:

An attractive and visually interesting turning doesn't always end when you take it off the lathe. There are many options to choose from that don't require investing thousands of dollars or years of your life to accomplish. Some of the methods and techniques that will be presented are egg shell, rolled ink, decoupage, color grain fill, burning, and applied wire.

Products list

Liquitex modeling paste - http://www.liquitex.com/us/Shop/Medium/Gel_Medium/Modeling_Paste_Medium,_8-oz.aspx
Available at most craft and art supply stores

Acrylic paint - http://www.goldenpaints.com/products/colors/heavy-body
Available at any craft and art supply store

Acrylic paint retarder - http://www.goldenpaints.com/products/medium-gels-pastes/additives
Available at any craft and art supply store

Flexcut carvers - http://www.flexcut.com/individual-power-gouges/
Available at any woodworking supply store

Printing ink and brayer - http://www.speedballart.com/our-products.php?cat=13
Available at most craft and art supply stores

Milk paint - http://www.milkpaint.com/
Available at many woodworking supply stores

Krylon Matte Finish - http://www.krylon.com/products/matte-finish/
Available at art and craft stores and some hardware stores

Egg shells - https://www.exploratorium.edu/cooking/eggs/eggcomposition.html
Available from most hens.

Turning 25
With Clay Foster

http://www.clayfoster.com

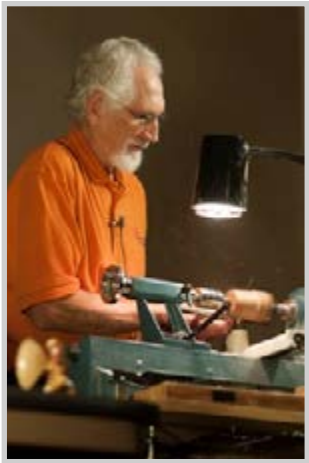
clayfoster4591@gmail.com

Grids and spirals:

Designs based on grids and spirals have more visual interest on a curved surface than a flat one, but are more difficult to achieve. Laying out grids on a vessel will be the focus of this demo, as well as converting a grid to a spiral, and developing patterns based on them.

Turning 25 With Wayne Furr

wayne_furr@okwoodturners.net



Turning the Clamshell Box

The clamshell box is a stylized design based on a natural clamshell. The idea and design of this clamshell box comes from my good friend Mark Baker's book, *Woodturning projects: a workshop guide to shapes*; Guild of Master Craftsman Publications, LTD, 2003, reprinted 2004 & 2005, pages 52 & 53. The shape of the box is pleasing in form, a joy to hold and fun to play with.
Most turners learn to turn a bowl early on. But the challenge; can you turn two nearly identical bowls with only a slight difference? The difference being that one side has a bead to hold the two halves together and the other does not. Another issue is that the grain runs horizontal, which is not what we normally see in boxes. During the demonstration, tool use will be covered along with safety issues stressed. This demonstration is geared for advanced beginners to intermediate wood turners.

Selecting and preparing the blank for turning

Select a suitable block of wood that has a nice grain to simulate the natural clamshell. The initial blank should be about 6 inch square and 2 ½ - 2 5/8 inch thick. Once you have a suitable blank, the next step is to mark and divide it into two nearly equally thick pieces. One side should be about 1/8 inch more in thickness than the other. This will account for the bead to hold the two pieces in place when finished (**See Figure 1**).
Once the square has been divided into two pieces, it is time to mark the center and draw the circle. You can do this by using double sided tape and sticking the two halves together with the band sawn sides facing up, place the thicker half on top. After the center has been marked, draw a circle that extends to the edges of the turning square (**Refer to Figure 2**).


Figure 1


Figure 2


Figure 3

Leaving the two pieces stuck together, it is time to band saw them into circles (**Figure 3**). When they are stuck together, they can be band sawed as one.

Because we will be using a screw drive to mount the blanks to true up, turn the bottom, and tenon, it is time to drill for the screw drive. I am using the screw drive and talon chuck. The directions call for a hole of 11/32 Inch and 3/4 Inch deep. I have found that the 11/32 Inch is a little too tight making the blank too difficult to screw on and off. I find that a bit size of 25/64 Inch works better for this project. Because our blanks are only 1 ¼ Inch thick a depth of 3/4 Inch is too deep, so drill only 9/16 Inch (**Figure 4**). Use spacers to take up the space between the face of the chuck jaws and the blank (**Figure 5**).

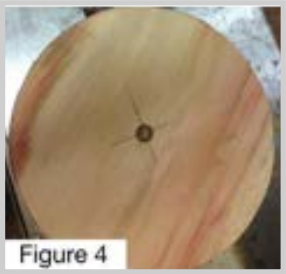


Figure 4


Figure 5


Figure 6


Figure 7

What is a safe lathe speed?

Before getting into the actual turning, now is a good time to talk a little about lathe-speed safety. I have rarely been to a demonstration when the following question was not asked: "What speed are you turning?" The demonstrator will look down at the speed dial and give what the indicator says. This is a very important safety question and one that we should all take to heart. Every once in a while we hear of someone that was injured or even killed when a piece came apart and hit them in the face. Most if not all lathe manufactures provide a chart of safe lathe speed in their manuals. But the big questions, how many of you actually looked at the one that came with your lathe or put a copy up next to the lathe as a reference? The truth is, we don't! About 45-years ago Dale Nish came up with a simple formula that is easy to remember and provides safe speeds when starting a new piece. The formula is D x RPM = (a number between 6000 & 9000) where D = the diameter of the blank, RPM is the unknown that we are searching for, and the number between 6000 & 9000 is just a number. Since the unknown is the RPM, we simply divide the number 6000 to find a safe low turning RPM then divide 9000 to find the fastest safe RPM to turn. A complete description of this can be found at http://blog.woodturnerscatalog.com/2012/08/safe-wood-lathe-speeds/.

Next, true up the edge of the two pieces as one (**Figure 6**).

After you have trued up the edges of the two halves as one, it is time to true up the bottom face (**Figure 7**).

After the bottom is trued up and smooth, it is time to measure and turn the tenon for the chuck. I have set the dividers to 1 ¾ inch which is the minimum diameter for them to close down on the tenon. By eye, I estimate the center of the revolving piece and place the divider's right and left points equally on each side of the center, being careful only to touch the left point to the piece. As the image starts to develop on the piece, I can see if an adjustment is needed to the right or left to make the diameter of the tenon (**Figure 8**).

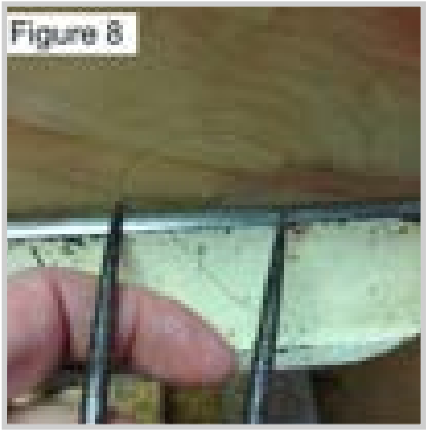


Figure 8

Turn the tenon and then rough shape the back of this piece. Leave the rim at about 1/4 inch. Then separate the two halves and set this piece aside (**Figure 9**).


Figure 9

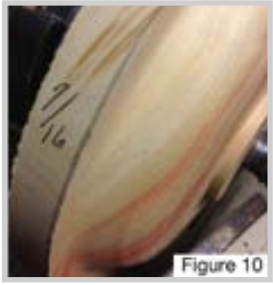


Figure 10

It is time to repeat steps 7, 8, & 9 on the half still on the lathe. This time leave 7/16 inch at the rim. This will allow enough wood to make the bead match up the two halves (**Figure 10**).

Once we have the rough shape for the back of the piece, it is time to reverse the piece and place it in the chuck jaws. The first step is to clean up the face to remove any unevenness and shape the edge in from the edge about 5/8 inch, down about 1/8 inch then curve it down another 1/16 inch to 1/8 inch (**Figure 11**). The amount of curve will give the appearance of the clam shell being closed or partially open. The bead that we are making during this step should be about 1/8 inch tall and slightly rounded to hold the other piece in place (**Figure 12**). I should point out that this is also different than doing boxes in the traditional way of doing the mortise or recess first.

When we are satisfied with the shape of the curve on the lip and the bead that holds the two pieces together, it is time to start shaping the inside of the bowl (**Figure 13**).

As you progress into the bowl, keep checking the thickness of the wall. What we are looking for is about 1/4 inch to 3/16 inch thickness (**Figure 14**). Once we have reached the desired thickness and removed any tool marks, it is time to sand to the desired grit. After sanding, apply sanding sealer/finish to the inside of the piece.


Figure 11


Figure 12

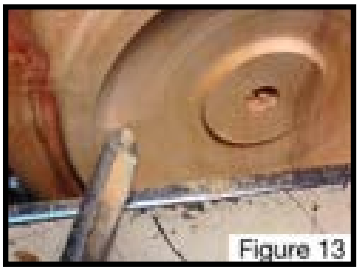


Figure 13


Figure 14

After the sealer/finish is dry, it is time to reverse the piece and finish turning the other side. The method that I use is to use an adapter to fit the chuck onto the live center and a vacuum chuck. I can center the piece perfectly (**Figure 15**). Once I have pulled vacuum, I remove the chuck from the tail stock. I remove the point and use only the ring center to hold the piece in place for the first part of the final shaping. This is done for safety. When I am satisfied with the edge and curve. I remove the tailstock. The thickness at the edge should be about 1/16 inch. With the tailstock removed, I use a shearing cut to remove the remaining tenon (**Figure 16**). By using a vacuum chuck, I can sand this entire side and apply a sanding sealer/finish.

When the sealer/finish is dry you can remove the piece and start on the second piece that we roughed out and set aside. Since we cut the tenon and rough shaped the outside of the piece during the first edge true up (**Figure 9**), we can mount the piece on the chuck and start on the inside. I start by using my dividers to measure the inside of the bead of the first piece (**Figure 17**). Then transfer that diameter to the second piece using the same method that I used when marking out the tenon (**Figure 18**). Once this is done, shape the outer edge with the downward slope as you did on the first side (**Figure 19**).

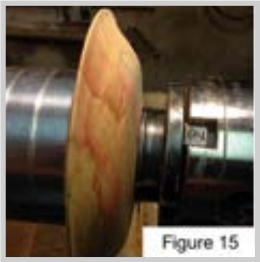


Figure 15


Figure 16

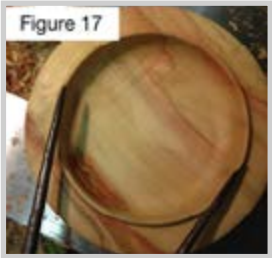


Figure 17


Figure 18

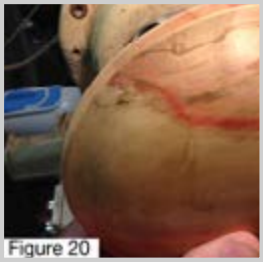


Figure 20

After the rim has the shape that you like, it is time to start sneaking up on the actual fit of the two pieces (**Figure 20**). Continue working on the fit until it is a snug, but not a tight fit as we like to see in a traditional box. After the fit is a nice one, continue to shape out the bowl, clean up any tool marks, sand to the grit of your liking, and apply a sanding sealer/finish. It is now time to reverse the piece and finish the outside (Refer to **Figures 15** & **16**).

When you finish going through the steps referred to in **Figures 15** and **16**, you should now have a finished clamshell box. I generally buff my pieces to the final luster that I like.

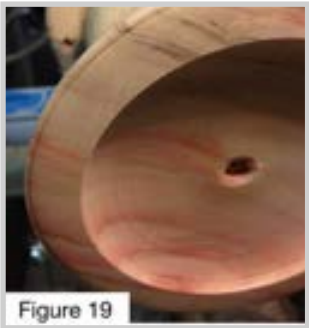


Figure 19

Suggested TOOLS

Bowl gouge: 3/8 inch Preferred, or 1/2 inch
Parting tool: 1/8 inch or 3/8 inch beading parting
Round-nose scraper
Square-edge scraper
Dividers or compass
Inside-outside calipers

Turning 25 With James R. Johnson

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TIPS AND HINTS FROM A THIRD OF A CENTURY OF WOODTURNING

Tip 1. GETTING THE WOOD HOME.

CUTTING THE LOG INTO BOWL BLANKS

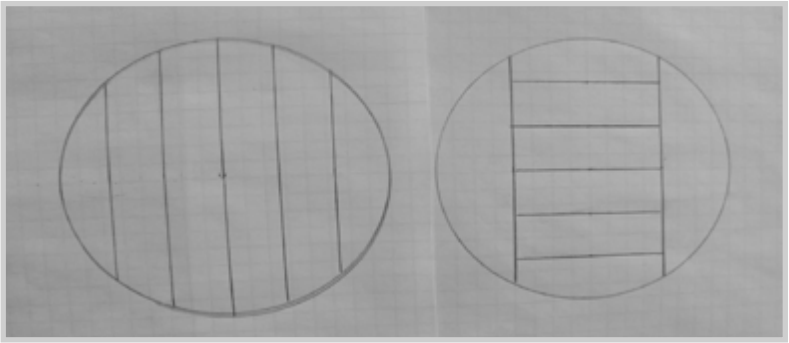
Most woodturners end up hauling cut-up trees home in the back of a pickup or in a trailer. Then they must seal both ends of the log sections in the hope of keeping the wood from cracking. An easier way, would be to haul the whole log home, sealing the two ends, then cutting off a section as needed. What is needed is an easy way to pick up and haul the entire log. The logging trailer I have used for over 30 years was built from 2 1/2 inch x 3/16 inch square tubing and the rear spindles/wheels from an old Honda Civic. With most cars nowadays being front wheel drive, the rear spindle assembly from many cars can simply be unbolted and re-installed onto a plate welded to the bottom of the trailer legs. You are free to modify the design but be sure to keep the diagonal braces (1 inch water pipe) and the triangular braces at the corners of the frame.

In use, the trailer is simply backed up over the (preferably) butt of the log. Chains are snaked under the log at the lifting points and a heavy duty come a long is used to raise the log. Another chain is looped under the log and fastened into the log holding slots. Then the come a long and chain are moved to the other end and that end of the log is lifted. You only have to raise the log high enough to clear obstacles on the way home. However, the *rear of the log must be cradled with two chains*, one looped around the log and dogged to the two extreme left chain slots, the other looped and dogged to the extreme right hand chain slots. This keeps the log from swinging side to side. **Omit this step at your own peril.**

Unload the log onto some sort of support so that you can cut it up into sections without having to run the chainsaw into the ground.

Hint 2. CUTTING THE LOG INTO BOWL BLANKS

Assume you are interested in making 16” to 20” diameter bowl blanks and you have hit the mother load: a great log that is close to 40” in diameter. At this point, 99% of turners will cut a 21” long section of the log. Then they will proceed to slice the log with parallel cuts into 5-6” thick slabs. Well, they will get bowl blanks, but most of them will be *un-centered*. A centered, or balanced bowl will have the pith of the tree centered on a line perpendicular to the very center of the bowl blank.. See the first drawing below.
A better way and one which gives nothing but centered and balanced bowls is illustrated in the second drawing. You will end up with less waste and much better blanks.



Hint 3: ROUGH TURNING BOWL BLANKS

The method I use to prepare and rough turn bowl blanks is one in which safety is the paramount concern. It seems that every time I hear about a turner being seriously injured or killed it was while he (or she) was rough turning a piece. With that in mind, I prepare a blank by marking out the circle with a large compass while the slab is resting on a large tree section that I use as a cutting station. This section is about 32 inches high and about 36 inches in diameter. Once the circle is marked I use a smaller chain saw to trim the corners and continue to trim until no part of the blank extends past the marked circle more than a half inch. Sure, I could cut the blank on a band saw, but maneuvering a 20 inch or larger blank on the band saw is awkward and hazardous to sawblades, if not to the operator. Save the larger pieces as they can be used for all sorts of smaller turnings.
The drive center I use is a fairly large face place with an 8 inch diameter plywood disc permanently mounted to the faceplate. This plywood disc is covered with some sort of rubber. Truck inner tube, a disc cut from a floor pad or a 1/2 inch exercise pad are all excellent. Secure the rubber disc with contact cement. I bore a 5/16 inch hole in the dead center of the plywood disc and screw in a 3/8 inch hanger bolt. A hanger bolt is a bolt with standard metal threads on one end and wood threads on the other end. Once I screw the hanger bolt in place, I hacksaw it to about 5/8 inch long and file down the machine threads.

Before mounting the rough blank, I drill a 3/8 inch diameter hole in the center top of the blank. Then I mount the blank by sliding it onto the hangar bolt that protrudes from the faceplate/disc. I also use a machinist live center which has a pointed revolving center. I hold the blank evenly around the faceplate and screw up the live center very hard. This buries the point quite deeply and puts a lot of pressure onto the faceplate. This setup is as safe as you can get. The blank cannot come off because the pin is in the center hole and the live center is stuck in its hole. As long as everything is snugged up, and the speed is fairly low, there is no danger of the blank coming loose.
After truing up the blank and getting a rough bowl shape, I turn a tenon on the bottom of the piece. I use tenons rather than recesses 98% of the time simply because I think that tenons are safer.
Generally I will mount and rough turn the bottoms of half a dozen blanks before removing the faceplate drive disc and installing a 4 jaw chuck to do the hollowing. Saves time switching back and forth from drive disc to chuck and back.

Hint 4: DRYING OF ROUGH TURNED BOWLS

My shop is fairly large (1000 sq ft plus) but is not heated or air conditioned. However, it is very well insulated and I have a 15 inch exhaust fan in one corner hooked up to a timer. The fan runs from midnight to 8 am, drawing moist night air through an opened window in an opposite corner. The window is closed at 8 am. The result of this is that the shop temperature never exceeds 80° and the humidity is restored to bowl blanks that are in the path of the air flow. This 'tempering' of the bowl blanks is important as it keeps the bowls from drying too quickly and thereby cracking. I have a success rate in drying of about 95%.
Since I turn mostly box elder which is subject to blue mold, it is important to keep the surface dry to prevent the blue mold. Immediately after roughing out the blanks, I arrange them in stacks facing an oscillating fan. Each bowl is separated from the ones below it by stickers which allow the airflow to strike all surfaces. I keep the fan blowing on the lowest speed for about a week before re-stacking the blanks in my drying rack. Blue mold requires surface water on the piece in order to occur, so keeping the surface dry keeps the blue mold away.
In my shop with my drying conditions box elder bowl blanks are ready to finish turn in about six months or even less for the smaller and thinner blanks. Other woods require longer periods of time. Your experience will vary.

Hint 5. FINISH TURNING OF DRY BOWL BLANKS

I have fabricated a large (24 inch in diameter) faceplate from two thicknesses of 3/4 inch MDF which is covered with rubber padding from a router pad, or floor pad. Baltic birch plywood can also be used, but do not use any other plywood or particle board. I assure you they will not remain flat. Also seal all surfaces with shellac, paint, or other material in order to keep the faceplate from adsorbing water and warping. This 'drive plate' is on a dedicated 8 inch steel faceplate and has been in use for over ten years without warping.

In preparing to finish turn a bowl blank, the first step is to mount this *drive plate* and install the bowl blank with the top against this plate. Centering is easy if the mark from the live center is still in place and I always try to preserve this mark. The purpose of this mounting is to true up the tenon and the bottom of the bowl. This way the tenon is always parallel to the top of the bowl and since it has been trued up, if for some reason the bowl has to be re-mounted you at least have a good chance of doing so successfully.

The second step is to remove the drive plate and install a chuck. Install the bowl blank into the chuck. I use a 16 inch long piece of 3/4 inch pvc pipe as a 'pusher' between the live center and the center of the bottom of the bowl. This insures that the bowl blank is firmly in contact with the face of the jaws of the chuck.

Proceed to turn the outside of the bowl blank. If it is a large blank and I have any doubts about its stability, I often will place a piece of board which has been cut to the diameter of the blank across the blank and bring up the tail stock to the center of the board. Pressure against this board stabilizes the bowl considerably. Of course you have to remove the board to turn the very top of the bowl, but it still is a help until I use 5/8 inch bowl gouges with a long swept back grind. Once I have the outside to the shape I desire and with a relatively smooth surface, I often let the handle of the gouge drop all the way to vertical and make the last cut using the curved end of the gouge. Twisting the gouge handle controls the direction of cut. This takes a little experience in order to make smooth continuous cuts, but it is a skill worth acquiring. To help you visualize, the gouge handle is directly in line with the cut you are making.

Once the outside is shaped and turned as smoothly as possible, I turn the inside in steps about 1-2 inches in depth. Again, the bowl gouge is used most of the time. However, a different tool is required to make the final cut on the inside, as the handle of the bowl gouge prevents the straight up and down position used on the outside. For this cut, I have three 1/2 inch round nose scrapers which are **NOT** used as scrapers. Instead, they are tilted up on the right side, the bevel is rubbed, and a shearing cut is performed with the tool. The reason I have three is that they all have different angles on the bevel. One has a bevel of about 20°-25°, one about 45°, and one about 70°. If I can use the one with the keenest bevel (20°) I use it. The others are used when the rim of the bowl interferes with the handle travel. But even the bluntest of the tools will produce a very very clean surface. Incidentally, fluteless gouges make the same cut. The scrapers are stiffer, however.

Hint 6. A FEW NOTES ABOUT SHARPENING

If you do not have a sharpening jig, either buy one or build one. Then use it. I free-hand sharpened for 25 years before I built a jig. I should have built it 20 years earlier. The advantages are well known and do not need repeating. The set up I use is an 8 inch Horrible Fright grinder which turns 3600 RPM. It is equipped with a 46 grit white stone. When I sharpen, I put the gouge in the jig, allow the grinder to get up to speed, then turn it off and sharpen on the momentum of the stone. You only need to remove 1/1000 of an inch of material to sharpen. Remember, you are sharpening, not grinding.

The reason I use such a coarse stone is that the serrated edge I get is like a saw—the teeth sever the fibers of the wood very well, like a saw is used to cut a board. Yes, the surface I get is not as smooth as if I had a honed edge, but if you sand the bowl, what difference does it make if the surface is not absolutely smooth? I personally cannot turn a bowl that doesn't have to be sanded. I have heard of some guy out there who can do so, but I have never met him. Have you?

Also, I have learned that you do not want a bevel to be more than about 3/16 of an inch wide. Wider bevels do not turn as precisely as narrow bevels. With a wide bevel, each little quiver of the handle (from breathing, heart beat, sneezing or whatever) the cutting edge of the tool wavers much more than with a narrow bevel. Think about it. Incidentally, when I talk about gouges and rough stones, this does not apply to skews and spindle turning. Lots of people turn spindles that do not need sanding and that requires very fine edged tools. But bowl gouges are another story. However, I sometimes hone my round nose scrapers when they are used as finishing tools. It doesn't hurt!

Hint 7. SANDING

Sanding is a subject that would require a whole chapter to cover adequately. For the purpose of this project, let me say that most commercial sanding pads are both too hard and too square edged. I make my own pads, often using screw-on sanding discs and mandrels available at the auto supply stores. To make a typical pad, I will use a 3 inch diameter sanding disc to which I attach a rough 5 inch pad of 4 lb polyester foam. This foam should be about 3/4 inch thick. You can cut polyester foam with a bandsaw. I attach a piece of very coarse floor sanding paper to the inside of a cardboard box. Contact cement is used to attach the foam to the sanding disc—use two coats of contact cement.

Once the pad is attached, round it by sanding the edges very lightly against the floor sanding paper inside the box. The box catches most of the rubber dust. Very important—taper the edge of the polyester foam to about 45° so you end up with a pad about 4 1/2 inches in diameter. Cut a disc of 2-4 oz. leather 3/4 inch larger than the foam disc and glue it to the foam disc with contact cement. Again, use two coats of cement. Glue the flesh (rough side) side to the disc.

I attach the sandpaper with double sided carpet tape. Occasionally American Science and Surplus (ASS) (Web site: www.sciplus.com) will have rolls of tape from 2 to 4 inches wide. Buy a bunch of it. When you wish to replace the sandpaper, sometimes you have to heat the sandpaper with a small butane torch to get the tape to turn loose. Once the old paper is off, if the leather pad is a mess, simply press it against a piece of Styrofoam and crank the drill up high. The styrofoam will adhere to the remnants of the tape and clean the leather thoroughly.

My normal sanding process is: start with 120 grit, go to 220, finish with 320. You can get away with skipping the grits in between because the unsupported edges of the sand paper do not make scratches like the stiff square discs do. And the soft foam allows the disc to bend around all kinds of curves, both inside and outside of bowls. To end up with a surface approaching 1000 grit, simply buff the wood surface with a hard cotton buffing wheel charged with either white diamond for light colored woods, or rouge for darker woods. I have never found that the residue from buffing has any effect on any finish I have ever used.

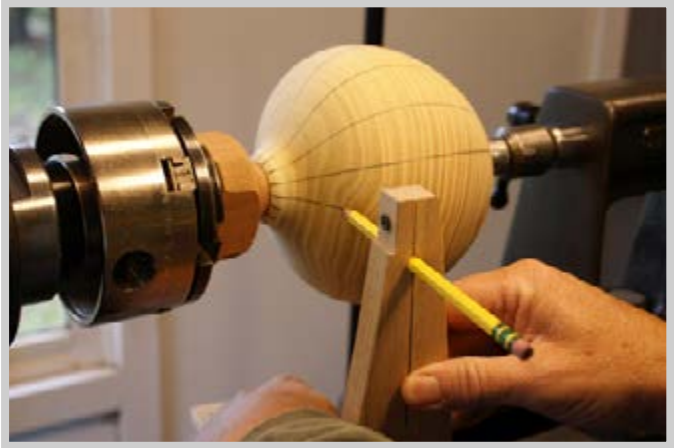
Turning 25

With John Jordan

www.johnjordanwoodturning.com

Carving and Texturing

Marking out the divisions by eye.



Extending the lines using a pencil gauge.

Carving with reciprocating carver/V-gouge

Continuing carving with reciprocating carver/V-gouge

Carving with air die grinder and non-ferrous metal cutting burr

Refining the shapes with rasps

Refining the shapes with sandpaper

Detailing the edge with V-gouge

Detailing the edge with craft saw

Sanding the edges

Texturing with carbide wheel

Black Locust Vessel 6” x 6”

Remember more detail may be found under *Articles* at www.johnjordanwoodturning.com,

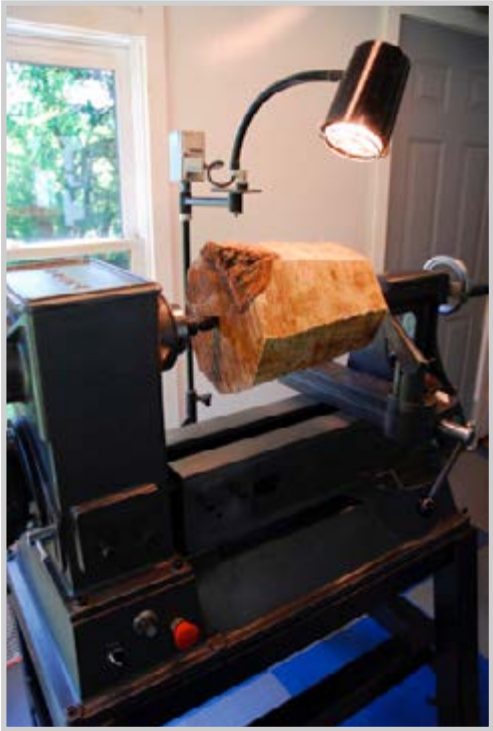
Turning 25
With John Hordan

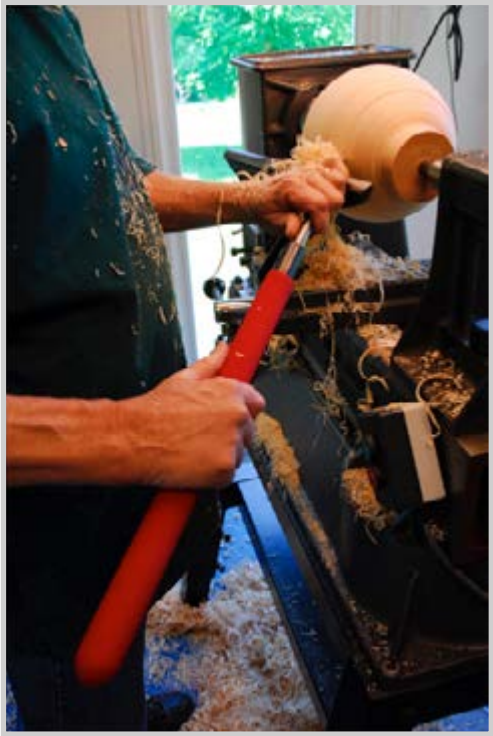
www.johnjordanwoodturning.com

HOLLOW TURNING

Its important to make objects in a logical step by step process, completing each step before moving on to the next. These are the simplified steps that I use to make a hollow vessel. For details, visit www.johnjordanwoodturning.com and click on the articles tab, where there are a number of articles on hollow turning, carving/texturing, and wood selection/using green wood.

Step 1-rough turning between centers-getting the basic shape and taking care of any issues such as defects, cracks etc., and balancing colors and grain patterns. Turn a clean mounting area/tenon for faceplate or chuck

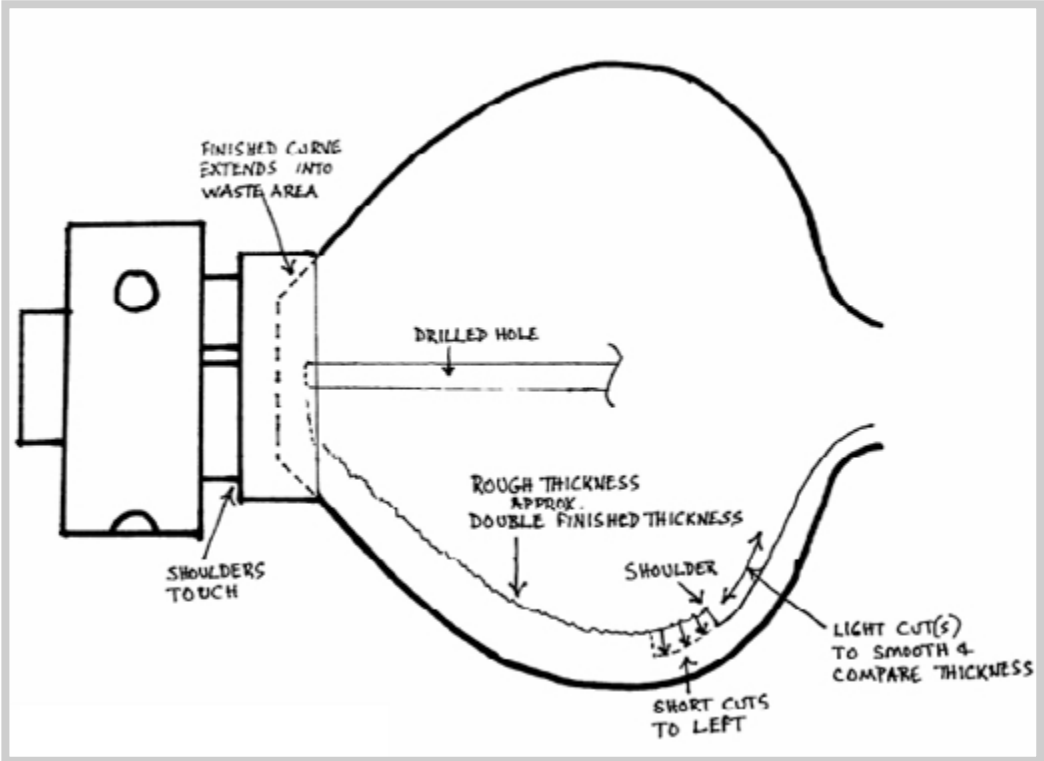




Step 2- Mount on chuck or faceplate and refine the outside shape. I use a ½" bowl gouge for most work, along with a shear scraper and detail gouge.

Step3- Shape the opening and drill a hole to the depth of the inside bottom.

Step 4- Hollow the vessel using a straight and hooktool, progressing step by step



Step 5-Reverse turn the bottom

That's It! The following steps might be to sand and finish, or in my case layout and carve/texture, then finishing. Remember more detail may be found under *Articles* at www.johnjordanwoodturning.com.

Turning 25
With Mary Lacer

http://www.marylacerwoodturning.com/Products.htmlI

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Off-Center Turning Demo

I'm going to be demonstrating off-center work using the Richard Joyner off-center chuck. Some of the different projects I've decorated with this off-center chuck are accent pins, brooches, pendants, buttons, belt buckles, wine stoppers, shawl rings, box tops, drawer pulls, sculptures and the list is endless.
For safety use either a face shield or safety glasses when turning off-center. One never know when a piece might come loose.
I use double-sided cloth backed tape to apply the blank to a waste block which is then attached to the chuck. The tape comes in two sizes 1inch and 2 inch widths. There are four different chucks you can use –

- Wine stopper chuck
- Morse taper mandrel for a wine stopper
- Collet chuck with a threaded draw bar 3/8 x 16 thread
- Jacobs chuck using a bolt to mount it, by cutting off the head

- The first thing I do is finish the back of my piece before I mount it on the chuck; I use a belt sander; one could also use a sanding disk on the lathe;
  Waste block – face grain vs. end grain
- For pendants and pins I use face grain as the tape sticks better;
  - For shawl rings I use end grain because I have a solid piece of tape holding it and it doesn't stick quite as well, so it is easier to get off; when the shawl ring is completed it is a very thin piece of wood and can easily break;

- Tools to use
  - Roughing gouge
  - Bowl gouge
  - Spindle gouge
  - Scraper
  - Skew - I use the skew lying on it's side to make the decorative cuts

- To make a pendant first mount the off-center chuck in the center hole; turn the piece round and sand; the type of cut will look different depending on the curve of the front of the piece; if the surface is flat, you will get the same depth to your cut across the piece; if the surface has more of a curve to it, the cut will be deeper in the center of your piece and then taper off to a very thin cut the farther you go toward the outer edge;

- Now decide which hole you want to mount it, in the off-center chuck to drill the hole for mounting a cord; this will depend on the diameter of the piece; you have to use different off-set numbers for a bigger piece vs. a smaller piece otherwise you could drill through the edge of the pendant; when threading the piece on and off the chuck to determine which hole to use, be careful that your tool rest is far enough from your piece of wood so you don't damage your piece; start the lathe on a slow speed and turn it up only as high as possible before the lathe starts to vibrate; otherwise you won't get a clean cut;
- Drill the hole – a reminder that the size of the pendant comes into play here; drill a smaller hole for a smaller size pendant;
- Using a tapered countersink bit in a quick-release drill chuck I taper the hole; you can leave the sharp edge of the hole or you can blend it round when sanding; you can also taper the hole using a spindle gouge or the skew and sand it smooth;
- Some people put a mark on the bed of the lathe to line up the tool rest base and another mark on the tool rest to position your tool; I find that this changes with the diameter of the piece and the off-center position you choose; I use a pencil to mark a circle on the piece itself; for dark woods I use a white or light colored pencil;

- Now one can keep the same position for the first groove or one can change it to a different number; I often pick numbers across from each other to make an attractive pattern; if you have a bigger piece of wood you can use the numbers on the indexing plate on the off-center chuck;
- There are 8 different numbers that are all different positions on the chuck and with the deluxe chuck which has an indexing plate you have 24 more positions you can mount a piece; the indexing plate can be moved a series of three or six numbers depending on the pattern you are trying to make;
- I often decorate the back side of a pendant to give people a little surprise; you can take the piece off and turn it around and stick it back on the tape; bring up the tailstock and put a small, soft piece of cloth or paper towel against the live center so it doesn't damage your finished piece and apply pressure for a few minutes so the tape sticks;
- If I have a burl or very decorative wood, I don't usually make off-center cuts as it takes away from the natural beauty of the wood;
- To remove the piece from the chuck, carefully put pressure against the side of the pendant and steadily push until the tape releases; you may have to do a little clean-up with a piece of tape, sticking it to itself, to remove a few pieces that may be left on the back of the piece;
- Now I mount a tapered countersink bit in a quick-release drill chuck and taper the hole in the back of the piece to give it a finished look also;

- Your piece is ready for finish;
- If I haven't decided if a piece will be a pendant or an accent pin, I finish the front of the piece first and if it will be an accent pin I then glue the hardware on the back before I finish it because the glue adhers better on raw wood; I use 5-minute epoxy to glue on the metal clip;
- I apply 4 – 5 coats of a Maloof finish (next page), but you can choose lacquer or whatever finish you like. You can apply a flat, semi-gloss or a glossy finish.

Maloof finish – I mix up small batches in little jars since when it is exposed to air, the finish hardens -

1/3 boiled linseed oil
1/3 pure tung oil
1/3 of a solvent based varnish (polyurethane - I use Behlen's rock hard tabletop finish)

Tips –
When turning pendants or accent pins for several hours a day, I tape my fingers - they get very sore from the sharp edges of the wood so I use half inch wide tape to save my fingers. You could also attach a piece of double-sided tape to your piece and hold onto it while working with the wood.

If I'm working with pieces that are small, my fingers start to cramp up so I make small pieces on alternate days.

Turning 25 With Mary Lacer

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Top This - Turning a Dancing Top

Was the first top a maple seed, an acorn, a hard-boiled egg or other form found in nature?

Spinning top definitions from the web –

- A conical child's plaything tapering to a steel point on which it can be made to spin.
- A toy with rounded sides, a flat top, a vertical handle and a point at the bottom, which turns round and round on the point when spun.
- A toy having a body of conical, circular, or oval shape, often hollow, with a point or peg on which it turns or is made to whirl. If given a knock, a spinning top will go around in a circle at a slant; if spun with a slant at the start, it will quickly stand upright until halted by friction. Its physical properties are similar to those of a gyroscope. Some tops, as the common peg top, are spun by means of a cord. Whipping tops are kept spinning by whips with a lash. Other tops are spun by a twist of the hand. Some hollow tops, such as the thunder tops of Japan, have holes cut in them to produce a hum or roar.
- A top (also called spinning top or spintop) is a toy that can be spun on an axis, balancing on a point.

Different types of spinning tops -

- Finger spinners – spun with hands or fingers by twisting the stem;
- Supported top - spun by a cord while the top is held upright with a support;
- Throwing top – spun with a cord on the body of the top and thrown causing it to spin;
- Whip top – spun by whipping the top to give continuous motion.

Other tops and similar toys I played with as a child –

- Pump top - a metal top pumped to spin sometimes making a musical sound;
- Spinner - tying a button with string, winding it up and pulling;
- Yo-yo - what goes up must go down; in 1930 Luck, WI was the yo-yo capital of the world making 3,600/hour; the latest honor for the yo-yo is being the first toy in outer space.

The top is one of the oldest toys found in ancient civilizations. Spinning tops originated independently in cultures all over the world as early as 2000 B.C. Besides toys, tops have also historically been used for gambling and prophecy. Some role-playing games use tops to augment dice in generating randomized results. There is also a reference to spinning a thumbtack.
After many years of making tops, watching professional top performers and the tricks they can do, I was especially intrigued with the thumb top. I've further developed the thumb top into a dancing top. Japan is well-known for their variety of tops and top games. While on a visit to Japan we were taken to a top factory. It was just amazing! I'll be bringing some of these samples to share, among them, racing tops.

References: *The Top – Universal Toy, Enduring Pastime,* Gould, D.W, *1973,*
More Woodturning; The Little Book of Tops, Don Olney, 2003.
4physics.com, *History of the Top*, Oliver, Valerie.

Assorted tops – thumb, throwing, racing, tippe, finger and a celt – upper left - (also known as a rattleback), a simple ancient toy that behaves in a very counterintuitive way; when spun one way about its vertical axis, the celt spins for a long time; when spun the other way, a wobble quickly sets in that halts the rotation and amazingly reverses it); also, tops made from alternative materials – aluminum and Plexiglas. Children **AND** adults need to make time to play!

Whipping Tops

Whip top! Whip Top!
Turn about and never stop!
Monday's top will spin away,
Tuesday's top will sing all day,
Wednesday's top is never slow,
Thursday's top to sleep will go,
Friday's top will dance about,
Saturday's top will tire you out!
Whip top! Whip top!
Spin around and never stop!

References: Gold, D.W.

References: *Country Things*, Uttley, Alison, Faber and Faber, Ltd. 1946.

I'll be turning a dancing top for my demo. I mount a dancing top blank in a scroll chuck using a tenon or I drill a hole through glued up wood, glue in a dowel and hold the dowel in a scroll chuck.
In a thumb top the point the top spins on is up inside the body of the top and it spins on your thumb or finger.
For a dancing top I lengthened the point the top spins on below the edge of the top so you can spin it on your finger, a hard surface or spin it upside down on the handle.
Some tips for making tops –

- Use a solid piece of wood with no sap-wood or knots – that changes the density of the wood and it won't spin true. The Japanese tops are made of dogwood and they have a very steady spin.
- Turn the base heavy on a regular spinning top and the top heavy on a throwing top. The weight gives the top a longer spinning time.
- Put a small drop of super glue on the tip of a top to make it last longer.

I hope I have given you some fun and useful information about tops; it is often called the executive toy; a top might help you to relax during your busy day so keep one on your desk or in your shop and relieve some stress.

Turning 25
With Mike Mahoney

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I have been a professional bowlmaker since graduating from San Diego State in 1998. My main production items are salad bowls followed by burial urns, hollow forms, treenware, and any job that walks through the door. I have been lucky enough to travel the world teaching my craft. I have taught in eight countries and across almost every state in our country. I am passionate about my craft and live and breathe for it. I never miss an opportunity to educate the public about what woodturning is and the wonderful people involved with the craft as a whole.

The artist will be dueling Stuart Batty Friday 7:30 pm - 9:00 pm in the combined Brazos Room.

Additionally the artist will conduct three rotations:

Plates, Platters & Bowls

Hollow Forms With Threaded Lids

Big Green Calabash Bowl

Turning 25

With Kai Muenzer

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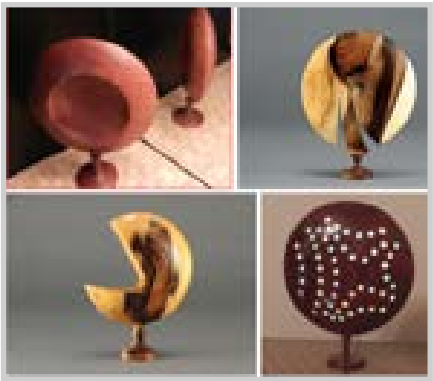
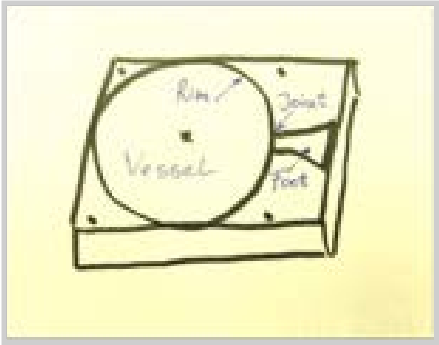
Vessels with a Foot on the Rim



A foot on the rim allows for the vessel to stand on its side! This provides a lot of flexibility in the design of both sides of the vessel, as well as options for extensions at the rim - for example a foot. Although asymmetric and hollow forms are possible, there are ample design opportunities with symmetric vessels. Examples of practical applications are a standing lamp, a standing clock or a hand-mirror.



In the demo we start with a fairly dry wood blank of rectangular shape of about 8 inch x 6 inch x 2 ½ inches. The thickness of the blank dictates the maximum diameter of the foot, the short side the maximum diameter of the vessel and the long side covers the diameter of the face and the total length of the foot. The grain is running along the long side to provide protection for the joint of foot to vessel. All angles should be 90 degrees and at least one of the faces should be flat. After the vessel is turned (cross grain) we use a band saw to trim the rim before we turn the foot parallel to the grain direction. Finally, we arrive with a sculpture of one piece that has been turned at three

Blank Mounted on Jig prior to turning

To turn the vessel sides, the wood is fixed by 4 screws on pre-drilled holes onto a slab (jig) that extends the dimensions of the wood. The rotational center of the vessel has to align with the axis of the lathe. For the jig in the demo we use ¾ inch plywood similar to the function of a faceplate with a diameter that extends the dimensions of the wood blank. The jig can either be fixed to a faceplate or mounted on to a four jaw chuck. The jig allows reasonable rpm for turning, despite the eccentric mass of the blank.

By rotating the mounted wood blank, we establish pencil lines to guide the turning with respect to shape of the vessel, its largest dimensions and for awareness of the location of the screws. Pencil lines along the side of the wood guide with the largest depth of the vessel, leaving a minimum allowance of the diameter for the joint. Turning techniques and tools are similar to turning a base and inside of a bowl. Note that the maximum diameter of the rim is the total widths of the blank, it is also a good diameter to shoot for as it allows a check for symmetry when turning the back side. This however requires turning some *air* and accordingly steady hands and sharp tools.

Cutting out Rom w/ Bandsaw

Breaking Edges After Bandsaw Work

A rim thickness that can support the foot may not be exceeded. This requires careful approach for the final rim cuts on both sides. We mark center and rim thickness for the foot along the sides of the blank. Consider the final intended shape of the rim -after sanding- and allow for a transition zone. We shoot for a straight line towards the edge of the rim and avoid curves, particular convex ones.

Taking Shape w/ Needle gauge

Both Sides of Vessel Turned

As both faces of the vessel are intended to be symmetric, the second face is turned without actually 'seeing' the first face. After finishing the initial face, we note radius and depth of high points and radius and depth of rim and any other features so they can be repeated. Cutting further is always a possibility later on, adding back on is not. We use several aides to memorize the shape of the 'hidden side' of the vessel, like a simple mask, that contain marks for center and rim and high points and a needle gauge. Once the shape of the first side is established the wood is flipped and fixed on the jig in precisely opposite position. Now we use the clues we gathered to mimic the shape of the opposite side.

Shape Rim w/ Sanding Disk.

Shape Rim around the joint.

Before we cut out the waste wood on the outside with a band saw we mark the positions of contact for the in-between-center turning afterwards. The planar (flat) side of the wood blank allow for a good contact with the band saw table and safe sawing. Also the corners are sawn in a pie-shape to maximize stability in the sawing process. The tight radius requires blade with appropriate width. We cut out the vessel along the rim, sparing out the foot and some material necessary for the drive center mounting. Eventually we break off the corners. Now the foot can be turned in between centers using spindle turning techniques. We are limited however in moving tools and hands away from the overhang of the rotating vessel. The thickness of the wood establishes the largest diameter of the foot, particular of the surface area of the stand. We turn the foot from the bottom up, leaving the joint to the very last. This is best for the roughing phase as well for the shaping phase. Cuts near the joint need to be towards the joint instead of from the joint. We check often to see how the final shape of the joint evolves. Better safe than sorry and leave some final work for the carving knife.

Turning the Foot Between Centers

With the foot parted carefully, we provided the final shape the rim of the vessel with a rotating sanding disk mounted on the lathe, and in the vicinity of the joint with files and sanding sticks by hand. The shaping of the rim has to maintain the circular shape as well as to provide a smooth transition of the faces towards the edge. Touching the foot with the sand paper whilst sanding the rim has to be avoided.

There are a few turning challenges with regard to safety in addition to standard bowl turning and spindle turning the are explained in the demo. Eccentric masses are rotating on both the face turning as well as the spindle turning. Assuring free rotating of the blank without hitting the tool rest or your hands is critical before every switch-on of the lathe. Maintain a safe distance from eccentric rotating mass by being aware or marking a 'never cross' line. The demo will explain the challenges and show attitudes and techniques to reduces the risks. Come by and join us before you start your own project of a 'vessel with a foot on the rim'.

Turning 25
With Larry Roberts

The following discussion topics will be intermingled with wood shavings as Larry Roberts turns several examples related to the topics. FIRST lets setup to turn a vessel by selecting a blank of unprocessed wood (limb), mount and rough out to round thus determining the net size of the blank you have to work with. Create a tenon . Turn the outside. Reverse and turn the inside. Sand, finish and consider the following;

A. DESIGN

1. Power point presentation showing several vessels/bases examining the various height/diameter ratios. Is there a mathematical relationship related to a vessel/base that looks poor/good/great?
2. Shapes – good-bad-ugly-short-tall-fat-slim. . . . . .
3. Thick or Thin
4. Rim, Surface embellishment
5. Helpful design tools

B. CUTS

1. Types of cuts. overview
2. How to begin
3. Overcoming problems
4. Finishing cuts

C. SANDING

1. Power
2. Hand
3. Tips

D. CHUCKS

1. Types
2. Uses

E. TOOLS

1. Names, descriptions, uses

D. SHARPENING

1. Tools used to sharpen
2. Methods

F. BODY LANGUAGE

1. Stance
2. Dance
3. Hands, Arms, Hip
4. Control

G. SAFETY
1. Centrifugal force
2. Fatigue
3. Tool rest & tail stock
4. Gloves, face shields
5. Dust

H. ADHESIVES
1. Glues
2. Epoxies

I. FINISHES
1. Overview of the multitude

J. SESSION REVIEW
1. Questions & Answers
2. Comments
3. Turn in Critique sheet
4. Prize Give Away

Turning 25
With Dick Sing

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Ornaments

The making of ornaments has been a source of enjoyable projects for many years. Many articles have been written by many different artists. The fascination keeps a strong hold on many turning desires. Ornaments are a well received gift, it is a salable item at Art & Craft Shows, bragging pieces, and they are just a fun turning project.

The design of ornaments is never ending. The only limitation is your mind. Many years ago, my wife Cindy, decided that I was to make her a new and differently designed ornament for Christmas every year. Over the years, I have made many one-off ornaments to satisfy this request. I used to wait until close to Christmas Day before I became serious about making Cindy's new ornament. This was not too bad at the beginning, but somehow I began to run out of ideas for new designs. I have learned to be aware of possible design possibilities or challenges that are constantly around me in daily life. This carries over into other facets of turning. The world of design is ripe for the picking, just keep looking for the fruits.

One of the favorite designs to make has always been the hollow globe ornaments. Why? My personal opinion is that when the human eye looks at an object, it perceives what that object should weigh. When someone picks up a hollowed, lightweight ornament, it presents an element of surprise, being not what was perceived. Now you have their attention. Yes, this works in all aspects of turning. I feel a hollowed ornament commands more respect over a solid piece of wood. I have seen a few designs that have made me sit up and take notice, but if hollowed, they would have been killers.

Hollowing out an ornament presents a few challenges other than design. To many, reaching into a spinning block of wood to remove its insides is quite scary. As with everything we do, the unknown has to be conquered before we are comfortable with a situation. Making multiples will gain you the confidence, and teach you the pitfalls that cannot be learned any other way. As you progress, what you thought was paper thin at first, will pale with practice. How thin should you go? That, my friend, is up to you. My wall thickness is normally about 1/16 in., but you should make yours to your ability. A partially hollowed globe is normally light in weight, and the one half will usually drop down when it is accidentally cut in two, rather than being a missile like solid piece of wood. In so many words, there is no shame in making a mistake in striving for a thinner wall thickness. We are not talking about major wood expense here. Learning from your mistakes overshadows the cost. The only that caution I have, **leave enough wood to sand.**

Allen Wrench Tool

I use a modified Allen wrench to hollow out the bottom corner of my ornaments. A straight scraper interferes, or contacts both edges of the hole, and will not allow me to work this area without enlarging the entry hole. The modifications I make are cutting off part of the arm, or bent end to lessen rotational forces, grinding a flat on the bottom to lay on the tool rest, and grinding the top flat. The flat on the top surface is necessary as it requires two flat surfaces to make a sharp edge. The tool is then sharpened as a normal scraper. I do not harden the tool. These wrenches are not tool steel, but are tough and last reasonably well for the purpose that I use it for. I fit it with a small wooden handle to control the tool. There are HSS bent tools on the market that will last longer, but it does the job. I grew up in the" Ike Era", (President Eisenhower), and remember his saying "If it ain't broke, don't fix it!"

Wall Thickness Gage

An aid that I use to gage wall thickness is a" Hi-Tech" device made from a coat hanger. Coat hanger wire has some tensile strength, or memory. In other words, it has some spring-back and can be lightly sprung, (within reason) and return to its original shape. Music wire will make a more durable gage, but it is more difficult to bend into shape. I leave a 5/16 in. gap between the legs, and when one foot is touching the inside wall, the distance from the other foot to the surface, subtracted from 5/16 in., is the wall thickness. If you have a gap of 1/4 in., the wall thickness is 1/16 in. This is really a comparator, and only gives accurate readings 90 degrees to the surface. My gage is not a "one-gage-fits-all" shape. To achieve the 90 degree angle, you may need a different configuration for your design. Draw the outline of your globe, including the entry hole, onto a piece of paper. This will allow you to see how to bend the wire by laying it on the drawing. By doing this, you can visibly see how to get the 90 degree angle around the form by going through the entry hole.

Turning 25
With Dick Sing

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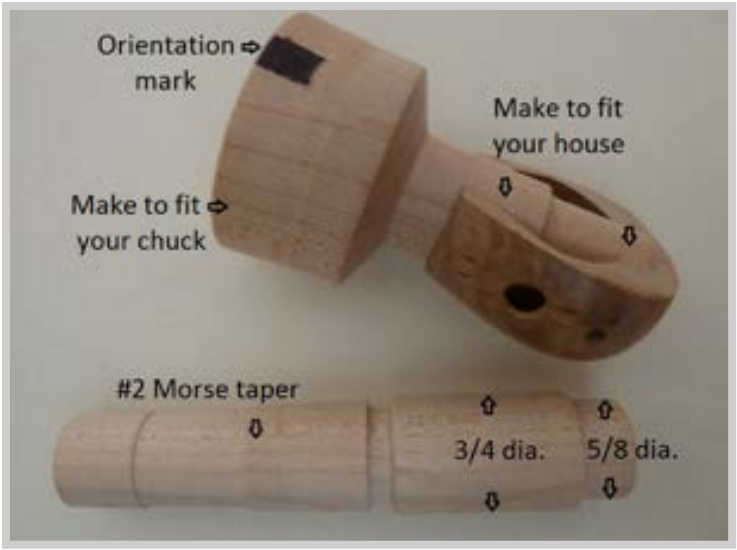
Miniature Birdhouses

This is a fun and rewarding project. The consensus of opinion of most people, is that smaller is easier. Nothing could be further from the truth. The slightest mistake can be the ruination of a near completed piece. Small changes in the work piece, can make monumental differences in the design. Any change in a small piece is more drastic than the same change in a larger piece. With all this being said, the finished project outweighs the odds in satisfaction and learning how to handle something small. The tools, choice of materials, and how you approach the turning all come into play. When a small, delicate, well proportioned turning is completed, the finished object and the sense of pride in having made it, makes it all worthwhile.

Small makes you use your tools with more sensitivity, and gentleness. No white knuckle grip here. If nothing else, the cost of materials becomes a moot subject. If you are working with a $50.00 dollar bowl blank, cost becomes a consideration. With miniatures, the four corners of that bowl blank can provide the stock for at least four projects. Many turners set their goals on really large bowls, such as 25 inch diameter or larger pieces. Number one, where do you get the blank? Number two, who helps you mount it to the lathe? Number three, who cleans up all those shavings? Turning small projects eliminates many of these issues. Don't get me wrong. I have turned big, and I still do, as it seems to be the nature of the beast. I was just making a comparison between large and small. Give small a try, you may like it.

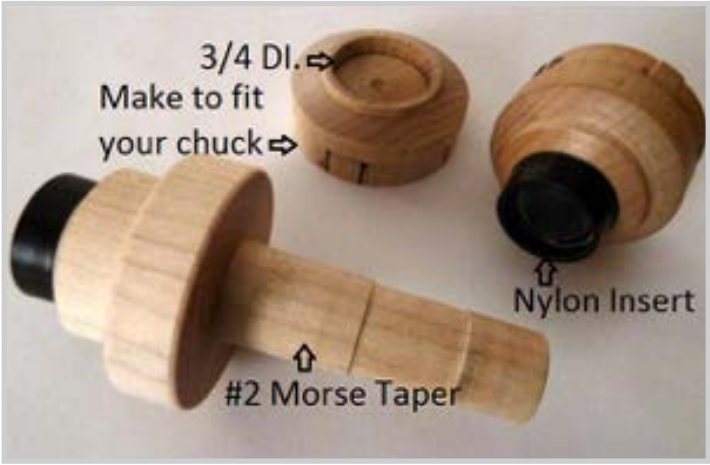
I make my jigs from hard maple, mainly because of its stability, and the amount of use that they receive. No matter what you make jigs from, the care taken in their construction, determines how well they will perform. The first step in making a reusable jig is to create a clean, precise hold for the chuck. Turn the chuck end of your jig close to the mien diameter and jaw shape of your chuck, and put into the jaws. Tighten the chuck, release the pressure, re-tighten, and mark its position in the jaws. By tightening and re-tightening, the jaws seat themselves into the wood. Wood is not the same hardness all the way around the diameter, as there is face, and end grain, which causes the jaws to seat differently. By putting it back with the same orientation, you can get repeatability, so always mark anything that you intend to reuse. Once the hold is completed, make the jig, or whatever your intent is. Jigs can also be made using a Morse taper instead of being held in a chuck. Here the precision comes into play by the taper being precise enough to repeat, drive, and hold the jig. When using a tapered jig, make sure that the headstock taper is clean to avoid seating problems.

Birdhouse Jig



The jig that holds the house body is a two step jig, used to hold and drive it when you turn it around, after the initial work in the chuck. There are two different diameters holding and driving the house body. The reasoning behind this is that if only the large diameter was used, it would limit the shape of the house. This way, we have many more options for design. The dimensions used are for the design I use mostly. Alter the dimensions to suit your design as needed.

Roof Jig



When making jigs, cleanliness is next to godliness.

I make my jigs from hard maple, mainly because of its stability, and the amount of use that they receive. No matter what you make jigs from, the care taken in their construction, determines how well they will perform. The first step in making a reusable jig is to create a clean, precise hold for the chuck. Turn the chuck end of your jig close to the mien diameter and jaw shape of your chuck, and put into the jaws. Tighten the chuck, release the pressure, re-tighten, and mark its position in the jaws. By tightening and re-tightening, the jaws seat themselves into the wood. Wood is not the same hardness all the way around the diameter, as there is face, and end grain, which causes the jaws to seat differently. By putting it back with the same orientation, you can get repeatability, so always mark anything that you intend to reuse. Once the hold is completed, make the jig, or whatever your intent is. Jigs can also be made using a Morse taper instead of being held in a chuck. Here the precision comes into play by the taper being precise enough to repeat, drive, and hold the jig. When using a tapered jig, make sure that the headstock taper is clean to avoid seating problems.

I believe that raw wood holds better than most materials for making jamb chucks. There are other materials that have benefits that are worth addressing. I have made quite a few birdhouses, and have worn, or burnished the holding surfaces where they ceased to hold securely. I tried using PVC inserts which held fine, but if the roof spun, (slipped on the jig) the melting point of the PVC was so low, it also lost its holding ability. I now use nylon inserts, which work fine, and last reasonably well, but wood still holds best.

The measurements are of the house size that I normally make, using a 3/4 ID. hole in the house. All measurements should be made to suit the size of the birdhouse that you are making.

Turning 25
With Alan Trout

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Burl Selection and Preparation for Resin Casting of a Vessel

Burl casting can be a fun, creative, and satisfying creative process. In many ways, I feel most of the artistry of producing a resin cast burl vessel begins in the selection of the burl and its orientation in the finished piece. This comes with experience, and creative placement of the stock in the preparation for the casting process.

We all draw inspiration from within and also from external stimulation. Much of a woodturner's external inspiration comes from seeing others' innovations in the field of Woodturning. There is such diversity there, it's hard not to get inspired. Often we can combine techniques to create new and exciting styles of turnings.

In this demonstration, I will discuss and demonstrate the way that I select, design, and prepare a burl for resin casting into a vessel. I pre-turn all of my pieces. This gives me the most control over orientation and composition of the piece. Randomly casting a piece of wood to turn does not give you that control and limits your creativity for the piece. That is just leaving too much to luck.

Burl Selection: I have specific criteria for a burl that I want to cast into a vessel. I look for a burl with an even distribution of potential exposed wood when finished. I generally favor more resin than exposed wood. I think there is a contrast that draws the eye around the piece and makes it more visually interesting. I have seen many castings that are filling small defects or topping burls in resin. Personally, I haven't found these pieces as esthetically pleasing. This is where experience and visualization comes into play. The piece that you want to make must be accommodated by the dimensions of the burl. You want to think of the raw burl in the three dimensions of your design. This will help you determine if you have the ability to create that visually pleasing piece. We all make some dogs, but we get better with practice and experience. I also try to avoid saw cuts and straight lines in the piece. Very few things in nature are straight and the harshness of the straight line does not go well with all of the organic shapes and profiles of the piece with the burl.

Burl orientation: The potential of the burl blank dictates the shape of the piece. In many instances a instant visualization of the piece will be apparent. Other times you will have to think more creatively. At this point do not worry about how you will hold or turn the piece in preparation for the casting. We will get to that with and employ some unique techniques that make any orientation possible. It is here many people make their biggest mistakes. Remember you want to make that best piece with the available wood, not the biggest piece.

Work holding: If the burl allows you to put the piece between centers, do so and turn your tenon to grip the piece with a chuck. If the burl has nothing that you can turn to make a tenon, then this can be handled differently. This process can be a little tricky. You know how you want the piece to be oriented, and you want to identify where the opening of the piece will be. Decide how large an opening you want (sized appropriately for your blank). Next get some good quality hardwood dowels. I tend to use oak for these, but hard maple will work. Orient the piece on a drill press with its future opening in the up position (as if the finished piece was sitting in its finished position). I use a forstner bit to drill a hole the size of a dowel to fit into the piece. For this, I suggest using dowels no smaller than 1⁄2 inch. Drill the hole as deep as you can without going through the bottom of the piece or at least where the piece will be stable. Now we can grab the dowel with a collet chuck and turn the piece with a live center to establish the vessel's rough shape. At this point, I will make a tenon to cast the piece. This tenon will be used for forming as well as turning after it is cast. Hardwoods need to be used for the tenon. I usually use hard maple end grain for these, but any hardwood should work. Drill a hole the size of the dowel that you used in the tenon. Now glue the dowel in the tenon and you will have a sacrificial tenon for turning after casting. Basically, the piece will be built upside down.

Turning: Turning the burl has some dangers, as you will be turning air and sometimes fairly questionable wood. Sharp tools are needed, along with appropriate head and face protection. If something is unstable-don't turn it. It is not worth a potentially fatal or catastrophic injury over a piece of bad wood. In the demonstration, I will show how I turn the piece and leave the roughed-out form for casting.

Forming and Casting Techniques For Vessels

This is final part of a series of Casting For Vessels. However this can serve as a stand alone demonstration. In the demonstration I will form and cast a piece wood for turning a vessel. We will cover the materials, safety considerations, and processes in real time. By the end of the demonstration you will have a better understanding of the basic casting techniques and materials needed to make your own unique turnings.

Casting can be rewarding and challenging and offers the opportunity to make unique turnings. However, there is some risk associated with casting.

1. Don't Blow It! The pressure vessels that are typically available are intended to be used as a pressure paint pot. While there are casting pots available, they tend to be more expensive and other than fittings, there is very little difference. Do not pressurize a tank over its maximum ratings. On occasion, I have done it, but there have been reports of catastrophic pressure vessel failures which could be life threatening. You must understand these risks and mitigate them where possible. The primary safety precaution is to never pressurize the vessel beyond its intended ratings and never stand over the vessel while pressurizing.
2. Protect Yourself. Always wear a face shield. The fumes are also a hazard. Polyurethaneresins have a very mild odor and that is the dangerous part. The fumes are very toxic and ideally an organic vapor mask should be worn when mixing the components or at least be in a very well ventilated area. Also some of the resins contain trace amounts of heavy metals which are toxic. Wear appropriate gloves and clothing to prevent it from getting on your skin and when turning wear appropriate respiratory protection to keep it out of your lungs.

Pressure pots/vessels that we use can range in price from under $100 to over $1000. The cheapest pot available is the Harbor Freight brand unit that can be had for about $80.00. Then add about another $20 to $40 dollars worth of fittings, and it can be put together for around $100. These are the pots that have had the most reported failures, so keep this in mind if you plan to use one. I dismantle/remove the safety pressure relief valve and regulator to prevent air leaks, but this is a critical safety component and its removal is the main reason pots fail. You must always be cautious of filling these tanks and never over-pressure them. The more expensive pots that start at about $400 (and go up) are of better quality.

I use a polyurethane resins (name brand Alumilite and Smooth On 200 series). Alumilite can be purchased directly from www.alumilite.com and Smooth On must be purchased from a dealer listed on their website. These are a two-part mix: parts A and B are mixed in equal amounts by weight (not volume) for the Alumilite, and 100% to 90% for the Smooth On, so a precision scale is needed. A simple analog postal scale will work fine as long is it will handle the amount of weight being placed on it. Alumilite is a quick-cure resin that has about a 7 to 10-minute pot life, so you must work fast. They do have an extend-cure product and the Smooth On that I use has about a 15 minute pot life. De-mold times vary between the products. They can range from 2 to 16 hours. I always prefer to let my pieces cure for a couple of days before turning.

Submit Online Demonstration Evaluation

Demo Title:

Demonstrator:

Please rate with the following numbering system: 1 - Poor, 2 - Fair, 3 - Average, 4- Good, and 5 - Excellent. Comments in the space provided.

Demonstrator:					
Knowledgeable/ Good presentation of topic.	1	2	3	4	5
I would recommend the demonstrator.	1	2	3	4	5
Class Content:					
Good use of my time and I will utilize knowledge/skill from this demo.	1	2	3	4	5
Class Logistics:					
The time allotted to this demo was adequate for the topic.	1	2	3	4	5

Comments:

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Comments:

Evaluate before 10:30 am Sunday to be in Tool Drawing

2016 SWAT SYMPOSIUM EVALUATION
Name:

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Return This Form by 10:30 A.M. Sunday to be Eligible for the Drawing
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1. Demonstrations/Demonstrators/Handbook: 1 2 3 4 5. Comments:

2. Vendors/Products/Prices: 1 2 3 4 5. Comments:

3. Meals/Drawings. 1 2 3 4 5. Comments:

4. Family Activities, Hands On, Art Gallery. 1 2 3 4 5. Comments:

5. Overall experience at the 2016 SWATurners Symposium 1 2 3 4 5. Comments:

Note: Name and address information provided above will only be used to notify the winner of the drawing.

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