

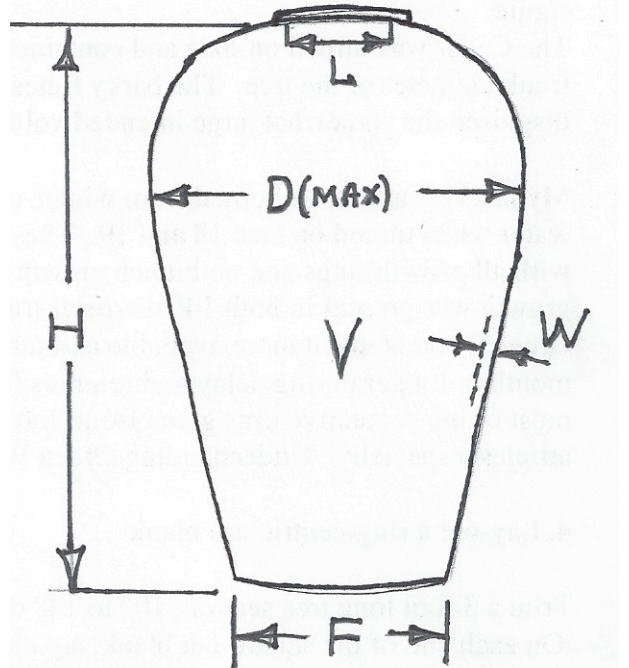
## Turn an Urn

### A Demonstration for the Maine Woodturners, January 22, 2013 by Peter McCrea

"A friend in need is a friend indeed, and if a turners friend has passed, a gift of an urn will be thanked at long last"

#### Outline:

1. Form following function
2. Dimensions that work for me
3. Dry vs green wood
4. Lay-out a ring-centric urn blank
5. Form tenon and profile B.C.
6. Mount in tower jaws, drill borehole
7. Complete top profile with tailstock support
8. Hollow urn
9. Dry urn slowly, inspecting often, stopping checks
10. Retrue tenon, chuck and retruue lid cavity
11. Sand finish
12. Apply surface texture, color, overcoat
13. Create lid with o-ring seal, fit, sand, finish
14. Create reverse-turning driver fitting top of urn
15. Turn off tenon waste B.C., creating concave foot
16. Sand and sign bottom, apply finish
17. Create flower-display lid, add dried flowers



#### 1. Form following function

The purpose of the vessel is to contain the cremains of a loved one. The appearance should be that of your best work, but the volume of the form is dictated by the reality of the function it carries out. Funeral directors recommend, as a rule of thumb, aiming at a volumetric capacity of 200 cubic inches for an average-sized male. I determined the volume of the Black Cherry urn in fluid ounces using birdseed and a measuring cup and multiplied by 1.805 to obtain the volume of 216 cubic inches. Reducing H and F slightly (see below) would result in a more pleasing form and a volume closer to 200 cubic inches.

#### 2. Dimensions: (Measured from Black Cherry urn)

$$H = 10 \frac{3}{8}''$$

$$D(\text{max}) = 7 \frac{1}{16}'' \text{ Located near } 65\text{-}70\%H \text{ from foot}$$

$$F = 4 \frac{9}{16}''$$

$$W = \frac{5}{16}'' \text{ to } \frac{3}{8}''$$

$$L = 2'' \text{ to } 2 \frac{1}{8}'' \text{ (lid cavity diameter)}$$

$$V = 216 \text{ cubic inches}$$

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### **3. Dry vs green wood.**

My first four urns were turned from dry wood (Cherry, Red Oak, White Cedar) that was on hand and free of checking. The Cherry and Oak were turned off-pith axis resulting in nice cathedral figure.

The Cedar was turned on-axis and contained attractive barky regions from the undulations in the trunk diameter of the tree. The barky flutes contributed to the informality of the piece and disguised the somewhat large intended volume.

My last two urns were turned from winter-cut (November 2012) Northern Ash that threw no water when turned on Dec 18 and 19. They were not *perfect pith* (centered pith concentric with all growth rings and no branch growth), as the piths were somewhat off center and branch growth was present in both 14" diameter trunk sections.

Green wood is much more available and turns and hollows easier and without dust, but creates a month or longer drying delay and requires frequent examination for cracking. John Jordan turns most of his decorative urns green from Soft Maple, selecting fresh perfect-pith blanks. See his articles, especially "*Understanding Green Wood*" at [stubbylathe.com](http://stubbylathe.com)

### **4. Lay-out a ring-centric urn blank**

Trim a 3 foot long tree section, 10" to 14" diameter, to obtain a fresh green section 12" long. On each end of the square-cut blank, lay out a 9" circle on a single annual ring, marking the center. I drill a 1 1/2" diameter cavity into the marked center of the headstock end, creating a cavity for my 1 1/2" two-spur drive.

### **5. Form tenon and profile B.C.**

Mounting the blank B.C. (between centers), and setting the drive spur well into the wood, I turn the blank to 7 1/4" dia using a spindle roughing gouge.

After trueing both ends with a bowl gouge, I create a 4 1/2" diameter chuck tenon, 1 1/8" deep, with a 5" dia x 3/8" wide tenon shoulder to register the front of the chuck jaw face.

Starting at the headstock (urn lid) end, measure 10 1/2" toward the tenon and mark the future foot of the urn. Mark another line 6 1/2" to 7 1/2" from the foot toward the top as the maximum diameter location. From this D (max) location, create the curved lower urn profile, ending with a 4 9/16" diameter at the foot location. Now rough turn the steeply curved top urn profile.

### **6. Mount in tower jaws, drill borehole**

Install workpiece in chuck equipped with #3 tower jaws, while chuck is sitting on the lathe ways. Try for grain symmetry with respect to jaw placement. Install assembly onto lathe spindle and retighten workpiece with cheater bar at alternating chuck locations. Green wood is compressible! Verify concentricity.

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Bore center 2 1/8" hole in stages - 1", 1 1/2", 2 1/8" to 9 3/4" from the top, clearing chips frequently to avoid bit binding or slipping in the chuck, or worse, losing the whole bit and chuck within the urn!

#### **7. Complete urn top profile with tailstock support**

With the urn lid cavity supported by a large cone installed on the tailstock, complete the urn top profile, shear scraping the end grain to a smooth finish. Blend the curves on either side of D (max) to create a pleasant continuous curve with no flat spots.

#### **8. Hollow urn**

The top portion of the interior is hollowed with a Jordan hook tool and frequent gauging with calipers. Keep the end-grain wood surface moist to avoid checking while hollowing. Once past the top shoulder of the vessel, I switch to my Jamieson deep hollowing system with the 3/16" carbide cutter and laser attachment for accurate wall thickness gauging. I smooth the interior with a scraper blade mounted on the standard boring bar. I aim for a 5/16" to 3/8" wall thickness for top and side walls, and slightly heavier at the foot end grain. The AAW and other internet sites have many references to laser-based hollowing videos. See also the above Jordan site.

#### **9. Dry urn slowly, inspecting often, stopping checks**

Immediately after turning, the urn receives two coats of Ace water-based sanding sealer to slow moisture loss from the exterior surface. Drip CA glue on the interior surface of any visible piths and cracks. The vessel is stored upright in a basement (typ. 56-58 °F, 35-40% RH) and examined daily for checking and treated with CA low-viscosity glue to stop the growth of checks. After 10 days the vessel is inverted and placed on open gridwork, allowing any moisture-laden air to exit the vessel. The vessel is likely dry enough to complete when the "wet wood" aroma is nearly absent from the interior (about 3-5 weeks).

#### **10. Retrue tenon, chuck and retrue lid cavity**

Mount vessel B.C. using large cone on tailstock -after sanding any glue lumps smooth at the lid cavity exterior- and then retrue the chuck tenon. Mount the urn tenon in the chuck, referencing the lid cavity end with the tailstock cone when tightening the jaws. Retrue lid cavity inside diameter with a square or box scraper held level. Note any sidewall areas where vessel dimensions might vary.

#### **11. Sand and finish**

Sand flush the glue lines of any cracks then sand all external surfaces 80 grit through 400 grit using a soft foam backer on a 3" disc. Do not overheat the wood with aggressive sanding,

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especially on end grain near the vessel top as checking will occur. Carefully sand the interior “to a fingers reach” using curved hemostats and foam-backed 80 grit.

Apply two coats of Minwax satin wipe-on-poly, with a 24 hour dry and hand sanding with 600 grit.

#### **12. Apply surface texture, color, overcoat**

Experiment on an end grain test surface, which has been sanded and sealed the same as the above vessel. Borrowing a page in surface adornment from Mac Ray’s experience (thanks, Mac), I ground a spherical surface to a steel nail which fit the 1/8” chuck recess of a Dremel engraver. After sketching with #2 pencil the outline of a somewhat random pattern of peaks and valleys on the top surface of the urn (the pattern thus covering any glued cracks which had occurred), I proceeded to apply a line of craters which defined the perimeter of the “distressed” surface. I then filled in the balance of the field, up to the lid cavity opening. Light pressure would yield a small dimple, good for filling in a small opening, and heavy pressure yielded a full diameter crater. Growth rings gave more variability to the mix. Glue lines seemed not to influence the size of the deformation. Flat black acrylic gesso was then applied sparingly with a stiff artists brush, taking care to not overfill the craters and to carefully stay within the distressed perimeter. After a 24-hour dry and a burnish with a clean cloth to bring out some contrast between the dark crater bottoms and smooth in-between spaces, the entire urn surface received a 3rd coat of wipe-on poly.

#### **13. Create lid with o-ring seal- fit, sand, finish**

I prefer the o-ring seal to the lid in this application as slight movement in the lid cavity diameter with seasonal humidity changes is unlikely to cause jamming of the lid. Make a longish (4”) lid blank- enough for two lids- and of a finish diameter equal to the lid cavity diameter plus 5/8”. Create a 3/8” long tenon in the outer surface of the chuck-mounted blank which just fits within the urn cavity (within 0.010 or thereabouts). Now cut a 0.10”-wide groove about 0.080” deep, in the outer surface of the tenon, leaving a 1/16” or so of untouched tenon at the outer edge. Dial calipers or a simple tire gauge from NAPA is a handy way to measure the depth of the groove. Since this groove is too narrow for a 1/8” parting tool, and too wide for a 1/16” slicer, I made a dedicated scraper from a 1/8” square tool steel piece held in a handled 3/8” brass rod and ground to the required 0.100” width. Beats repetitive passes with the 1/16” tool guessing on the width to make! Fit the o-ring in place (I use Ace Hardware 1 7/8” ID x 3/32” cross-section) and try a test fit to the urn opening, leaving the lid blank installed in the chuck. You are looking for a tight twisting fit. If a no-go, remove the o-ring (fine awl or safety pin) and deepen the groove SLIGHTLY. If you go too far it’s shim and glue time or start over on that longish lid stock! When it fits, undercut the lid flange underside to compensate for the curvature of the top of the urn, thus minimizing the gap between lid and urn. Sand the lid bottom and flange bottom and sides and apply two layers of masking tape on the lid tenon. Part the lid off and chuck the taped tenon end to allow the forming and sanding of the top surface of the lid. The tape will help protect the lid tenon and o-ring groove from damage. Apply multiple coats of finish with 600 grit, hand-sanding between coats. Re-install the o-ring.

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### **14. Create reverse-turning driver fitting top of urn**

Removing the massive chuck tenon is best handled by making a shaped driver that fits both the lid cavity and the textured top surface of the urn. A 4 1/2" diameter piece of end-grain wood is trued and fastened to a faceplate mounted on the headstock. A tenon is turned which accurately engages the lid cavity. The outer diameter of the driver block is profiled to match the shape of the top of the urn. Two layers of non-skid shelf liner (with the center cut out) are added to the driver surface.

### **15. Turn off tenon waste**

The urn is carefully clamped between the tailstock cup center and the headstock driver. The 3/8" bowl gouge is used to remove layers of waste, directing the cutting pressure toward the headstock. When the center stub is down to 3/4" diameter, the foot bottom is given a slight concave surface and sanded. The waste nub is sawn close to the foot and sanded smooth, trying to avoid checking arising from excessive heat buildup. Pith areas should be stabilized with low viscosity CA glue.

### **16. Sand and sign bottom, apply finish**

Sand the bottom through 400 grit, sign the work, and seal with multiple (at least 4) coats of poly with 600 grit sanding between coats.

### **17. Create flower-display lid, add dried flowers**

A second, loose fitting lid with a 1 3/8" diameter tapered central hole will serve to accommodate pussy willows or other suitable dried flowers while the urn is waiting for gifting to a friend in need.