First hollow form

I turned my first hollow form today - you know, the kind with the little hole in the top where you're working blind inside. It's not thin like Eliot's, but it's hollow, and it has good form, and I'm pleased. It's taken me years to work up to this. Perhaps my first experience with turned wood was seeing a very large HF with voids - probably at the Renwick. It boggled my mind and set me on my path to find out the answer to the question" "How do they do that?" Over the years, I've watched a number of hollowing demos - the most memorable was at a CAW meeting where Tom Boley blew one up. I told him that was a perfect demo because watching all the successes by experts is not necessarily realistic.

I've collected a number of hollowing tools over the years to prepare for the day... today. Was I afraid of blowing it up? Definitely. Did I? Nope. Was it scary and hard? Sure. Is it worth the effort? I think so, although I know now that each one is a major commitment, and I have a new respect for the people that make a lot of these things (like John Jordan who has an outstanding hollowing article in the Spring 2009 issue of American Woodturner and who will be our MCW demonstrator in October).

I learned a lot today, and I still have some issues and unanswered questions. Right now, I'm going to take you along for the ride. If you read this article carefully, you will find a large number of tips. First, decide on a shape and find an appropriate piece of wood. Hollow forms can be turned either end grain or side grain - mine just happened to be side grain because I had roughed a nice piece of slightly-curly silver maple into a cylinder, 5" in diameter and 4"long, two years ago and set it aside too dry. I chose a classic "Southwestern pot" shape for my first effort. I've collected a set of photos of examples I find pleasing, online, and I looked at them to get the shape in my head. I decided that it would have a raised lip, that the height of the maximum diameter would be 1/3 of the total height down from the top, and that the foot would be guite small.

I start most turnings between centers – with a chuck-mounted steb center in the headstock, and a ring and point type live center in the tailstock. This blank had been roughed on a screw chuck and had a 3/8" hole in what would be the top. With the center missing, I couldn't use the steb center, so I reversed it and used a cone center in the hole. Working very carefully at the chuck end, I tried to round the ovaled tenon with a square-end scraper. Not a good idea. The tool rest was too far away, and the width of the cut was too great. I got a little mini catch as a reminder

that there are better ways. Stop. Rethink. I quickly turned an ad hoc jam chuck with a 3/8" tenon in the middle, added a pad with a hole in the middle as a cushion [photo 1], and used that to drive the blank. This permitted me to round the tenon safely with a bowl gouge cutting down the axis. I shaped the lower portion of the vessel, moving from tail toward head to get a clean cut into increasingly long fibers, and then the upper portion (as much as possible near the steb center) moving from head to tail (for the same reason). Note that these directions would be reversed if the wood was in end-grain orientation. Cut a very straight



shoulder for the tenon and shape the tenon to fit your chuck (might be straight or dovetailed).

Reverse and mount the tenon into your 4-jawed chuck. Make sure the ends of the jaws match the shoulder perfectly. Mine didn't, so I turned it around again and did it right. This ensures that the alignment is good and the holding power is strong. The second time, I got a virtually perfect fit, and the axis was right on – a little shear scrape with an inverted bowl gouge was all that was needed to get back into round in this orientation. Take the tail stock off of the lathe – you don't need that thing getting in the way of your elbow or tool handles. Complete the shaping of the top – add a lip or collar shape of your choice.

Put a Jacobs (drill) chuck into the tailstock and mount your favorite drill bit. My 1" Forstner bit isn't long enough, so I used a handy ³/₄" brad point bit. Measure your needed length to the bottom and put a strip of masking tape on the bit to mark the end point. Drill your hole, being careful to back the bit out, as often as needed, to clear the chips. Even though this relatively-small, roughed blank had been drying for nearly two years, it was still wet in the middle. Thick blocks of wood basically don't ever dry fully in the middle. You have to treat them as green if you are concerned about distortion, cracking, close fits, etc. This is a good time to do some preliminary sanding. With the lathe on a slow speed, I started at 120 grit in my passive Sorby Sandmaster and removed the subtle tool marks and a little bit of end-grain tearout. If you're going to hollow very thin, you should probably sand all the way to the finest grit at this time. I'm not going super thin with this first effort, so I can do the finish sanding later.

OK, the time has come. I drew a 1" circle around the center hole and started the hollowing process, expanding the diameter of the drilled hole with a traditional straight Oland hollowing tool

in a 5/16" shaft that I got from every turners friend, the one and only CA Savoy.[photo 2, middle] Set the height of the tool rest so the cutting edge is slightly above center. This is important. In this way, if you have a small grab, the tip will move down into air safely. If you are below center, moving the tip down takes it deeper into the wood. You really don't want to go there. Keep the cutting edge angled slightly downward – it is a scraper, after all. Take this angle into consideration when you set the height of the tool rest.



Taking small, light cuts with the point of the tool, create a step/shelf/ridge, and work across that step repeatedly, by feel alone, from inside to outside, lengthening it to the desired depth. As with most projects, it's a good idea to leave some mass in the chuck as long as possible -- mandatory if you're going thin. Here, it's a good idea to hollow the top half first, before removing the deeper material. Design-wise, I thought the hole would look better a tad smaller, so I tentatively expanded it to just 15/16". (It turns out that was big enough, as I never had need to expand it further.) Continue expanding the hole in this manner.

Stop frequently to remove the shavings and dust – they will ball up around the periphery of the vessel and can cause a catch. I started using my finger but fairly quickly found it chafed by the edge of the hole, and it wasn't effective anyway, because the hole is barely bigger than my finger, so I couldn't get the shavings out. Since I had left my mini zen garden rake in my other pants, I got the pair of spring-loaded tongs I keep around and pulled it out that way.[photo 3, top] Getting

the finer particulates out is a real pain, and also unhealthy. Hollowing tools make a certain amount of dust, and however you get it out, it's going to be in the air. So wear a dust mask. By far the easiest and best way to clean out the residue is with compressed air. If, like me, you don't have air, then the simplest tool is one of those bendable drinking straws. I used one this time, but never again! It's nasty work, and you are

going to get some in your mouth and nose. This is very unhealthy and not a good approach. Next time, I'm going to get a long hose so I can blow from a safe distance or, better yet, I'll make an attachment for my canister vacuum cleaner to suck it out. Again, forget the straw and do not breathe this stuff – I had an allergy attack this night, and my nose completely closed up. I'm sure it was no coincidence. Use better sense than I did and wear a mask if you use air!

Fairly quickly, you will need to undercut the area adjacent to the lip. This is tricky and dangerous. The straight tool won't work, so you'll need a bent or angled tool. (Recall the tools demonstrated by Eliot Feldman a few months ago.) For small items, I have the angled cutter on a 5/16" shaft, again from CA Savoy. This tool has a significant lever arm [photo 2, bottom] and is very torquey. Frankly, it's an accident waiting for a place to happen. With extreme care and white knuckles, I was able to use it successfully for the needed cuts under the top of the vessel, but it really needs an outrigger – I'll never use it again without one.

As soon as I was able, to work on the area closer to the outside of the form, I switched to my $\frac{1}{2}$ " swan-neck with outrigger that I got from CA Savoy.[photo 4] The tool rest has to be lower to accommodate the fatter shaft. Because I didn't have much room to spare at the top of the opening in order to keep the cutting edge above center, I'd say that this 15/16" hole is about as small as possible with a $\frac{1}{2}$ " diameter shaft. Now this is one sweet tool. No more white knuckles. This tool is nearly effortless – just get it in, find your ridge, and cut, center to side, center to side....

Break up your hollowing into a number of small, well-defined tasks. With the lathe off, stick your finger in and feel what you've got. It's easier to feel unevenness than it is to see it, but I also like to use my little flexible light[photo 3, bottom] to look in and see what it looks like. Stop frequently and get all the information you can. Make dry runs each time before you restart the lathe. With the lathe off, put the tool in and run it over the places that need to be cut to get an idea of what they feel like and where they are in terms of tool angle and extension. Then turn the lathe on and do the next small step. As you approach the side, if you don't have a laser rig, measure often with calipers. I don't have a laser, so, as seen in the photo, I simply attached a long twist tie to the outrigger to show me the location of a point in space ½" from the cutting tip. This wouldn't work for a thin piece, but it gave me what I needed to feel safe doing ¼" wall thickness.

Now it's time to do the bottom half. The maximum depth of my needed cut was over 3" off the tool rest, and the 5/16" shaft is barely useful at a 3" length (it starts to vibrate and scream), so I switched to my ½" John Jordan shaft[photo 2, top]. This tool has basically the same cutter but should be good to around 5" depth (recall the July 2008 YMMV article). It did a fine job working the center area all the way to the bottom. At the bottom, it actually reached all the way to the side





wall. Be careful! Measure! I finished up the cuts to the side wall with the $\frac{1}{2}$ " swan neck outrigger and blended the shape from top to bottom.

Done with the hollowing – and I didn't blow it up! Cool.[photo 5] It's ready to sand some more and to reverse it to remove the tenon and complete the bottom shape, but it's also time to stop for dark (and exhaustion). This took more hours than I'd like to admit – and certainly more than it will on number two, now that I have a much better feeling for how to use my tools safely and efficiently. There's still more to do, but that's for another day. After all this hard work, I surely don't want the piece cracking, so I wrapped it in a plastic bag (since the outside is



already dry) and punched a hole through to the inside of the form so the inside of the piece will dry, but not the outside.[photo 6] The intent here is to achieve compression



that will hold the piece together. (It's the same idea as covering the outside of bowls after they've been dunked in denatured alcohol, but leaving the inside uncovered.) The last issue of Woodturning Design (#22, Summer 2009) has a similar idea – in his article on

bottom hollowing, Wes Jones suggests using an aquarium air pump and hose to pump gentle airflow into a newly-hollowed form, while the outside is covered with a brown paper bag. Again, drying from the inside creates compression that hopefully reduces the tendency to crack.

The next problem is figuring out how to hold the piece to complete the bottom. The rim surrounding the opening is quite thin (1/16"), and I don't want to squash it between centers or tear the top off when I reverse it, so I'm going to have to make some kind of appropriate jam chuck – something like a Kirsten Cone (which I don't have, yet) that takes the force all the way to the inside bottom. Then there's sanding the inside. That's going to be difficult. I could make a flap sander with a split dowel. Or I could just paint the inside black! We'll see...

I hope you have enjoyed sharing my first hollowing experience and have gotten some good ideas to use along the way.

Always use common sense. Things that work in one situation may not work in another. Follow all Safety Rules. If it feels wrong, it probably is; stop and rethink. Your **M**ileage **M**ay **V**ary