Bob Muir, Jan. 2006

The project is to turn a ladle with a 2 ¼" outside diameter spherical bowl and a handle approximately 5" long as seen in Photo 1. The distance between the drive center and the lathe ways limits the length of the handle. Five inches is a safe length on my lathe.

The procedure begins with a cylinder about 9" long mounted between centers. It has been inspected for cracks and the decision made as to which end contains the bowl. The end that will be the handle is mounted toward the headstock and the bowl end toward the tailstock. A tenon will be turned at the headstock end that is about 0.4" long and about 2 ½ " in diameter so that the piece can be mounted in a 4-jawed chuck. The sketch (Figure 1) shows the cylinder and tenon and the *visualized* ladle lurking inside.

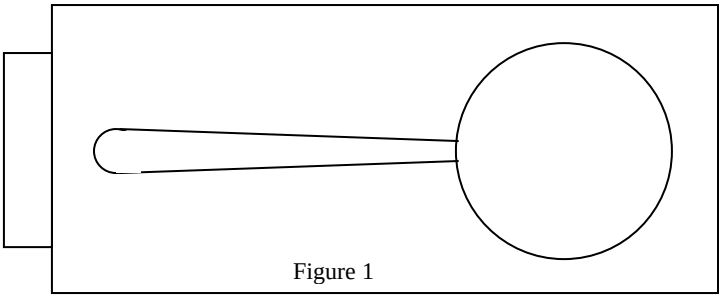

Figure 1

Once the tenon is finished, the piece is mounted in the 4-jawed chuck and the tailstock is used to ensure stability.

The polygonal method described by Mike Darlow in **WOODTURNING METHODS** is used to help achieve a spherical shape with a fairly accurate diameter. This method is illustrated in Figure 2 (See also Photo 3). The idea is to turn the octagon first and then to round off the corners to form the sphere.

The first step is to calculate the numbers: If D = 2.25", then

0.414 D = 0.932"
0.586 R = 0.659"
0.414 R = 0.466".

The second step is to mark positions on the surface of the cylinder that correspond to the points **A, B, C, D,** & **E**. I made a "story board" (Photo 2) from a piece of file folder to help mark these 5 points.

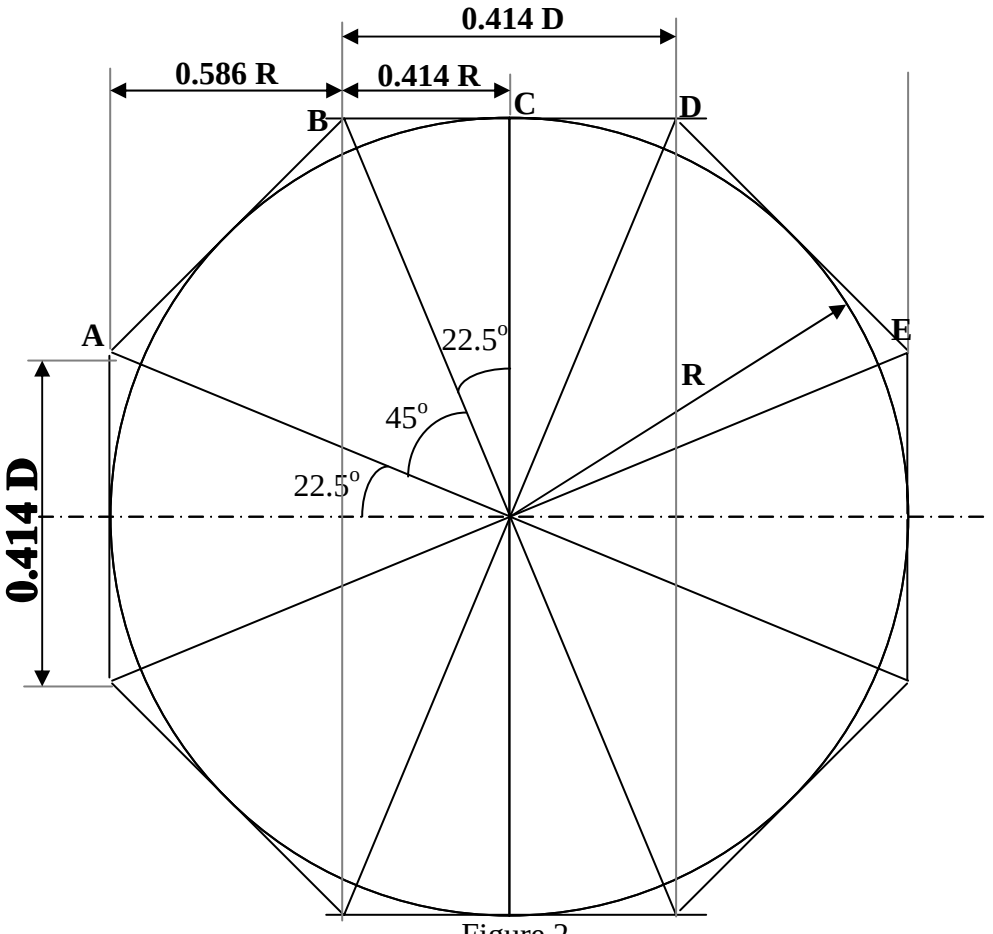

Figure 2

The third step is to use a parting tool to establish the diameters at each of the 5 points. Points **B, C,** & **D** have diameter = 2.25" and points **A** & **E** have diameter = 0.932". The parting tool should cut outside points **A** & **E** and inside points **B** & **D** so that the lines **A-B** & **D-E** can be cleanly fashioned. The result of this step is shown in the Photo 3.

The fourth step is to shape the sphere down to the handle diameter at point **A** and get down to a small diameter near

the tailstock. A rigid piece with a circular hole is very useful for locating high and low deviations from spherical shape. I cut the end off different diamter pieces of PVC tubing and bought some large steel washer for this purpose.

The fifth step is to sand as much of the sphere as possible through all the desired grits while the tailstock is still providing support.

The sixth step is to use a skew or parting tool to separate the waste at the tailstock, then use the skew or gouges to finish turning the spherical shape on the end, and sand the end.

The seventh step is to use a conical adapter on the tailstock to provide support while turning the handle. To avoid scaring the sphere, I remove the pin from my OneWay live center and place a pad inside the cone before bringing it up for support.

The last steps are to turn and sand the handle, finish on the lathe if desired, and to part off the piece.

Now we have a ball with a handle. The next job is to hollow out the ladle bowl. I use a homemade wooden collet chuck to hold the sphere. See Photo 4. This one is from basswood. I think the wood should be close grained and pliable. It has a ½" hole all the way through the center so a rod can be inserted to knock the ladle out if necessary. I used a coping saw to cut the slots that allow a small amount of adjustment of the collet diameter. I also used the coping saw to cut the notch for the handle.

After jamming the sphere into the collet and adjusting the angle of the handle, the hose clamp is tightened. It is a good idea to put a piece of white tape on the end of the handle to help see it while it is whirling around.

BE CAREFUL while positioning the tool rest for hollowing. **The handle must clear both the tool rest and the banjo!** See Photo 5.

A ¼" drill bit is used to drill a hole 1 7/8" deep into the center of the sphere to serve as a depth indicator (leaving about 3/8" thickness in the bottom. This is to avoid making a ladle with a hole in the bottom. Hey, make it a big hole and fill the hole with screen and you've got a sieve!

I use a bowl gouge with a fingernail grind to flatten the top of the bowl and then a homemade cutter to "hog" out most the the interior of the bowl. I then finish the inside with a roundnosed scraper. The business ends of these are shown in Photo 6.

The last step is to sand the inside of the bowl and apply the finish.

A SIDE NOTE: I used a free CAD program to draw the "story board" and the diagram shown in Figure 2. The program is eMachineShop and it can be downloaded from http://www.emachineshop.com/. This is not a full featured CAD program, but it is very nice and easy to use. It is easy to obtain accurate dimensions in inches or metric.

It is able to display your design in 3-D. It has a builtin feature that allows you to upload your design and have it machined.

Photo 1

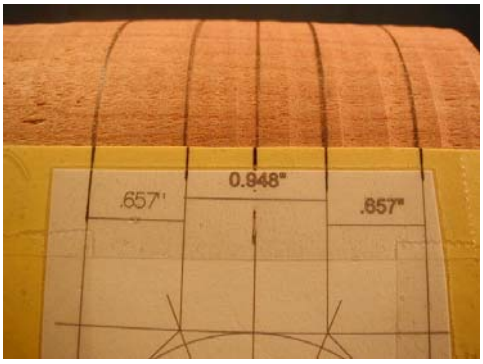

Photo 2

Photo 3

Photo 4

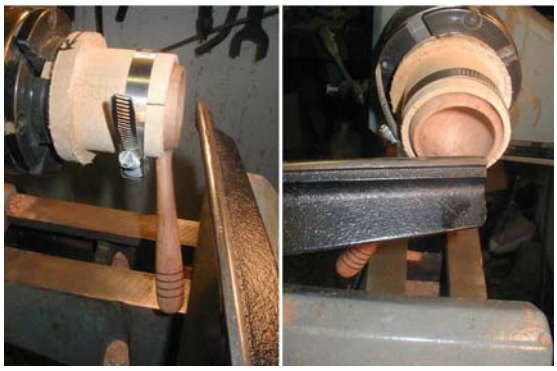

Photo 5

Photo 6