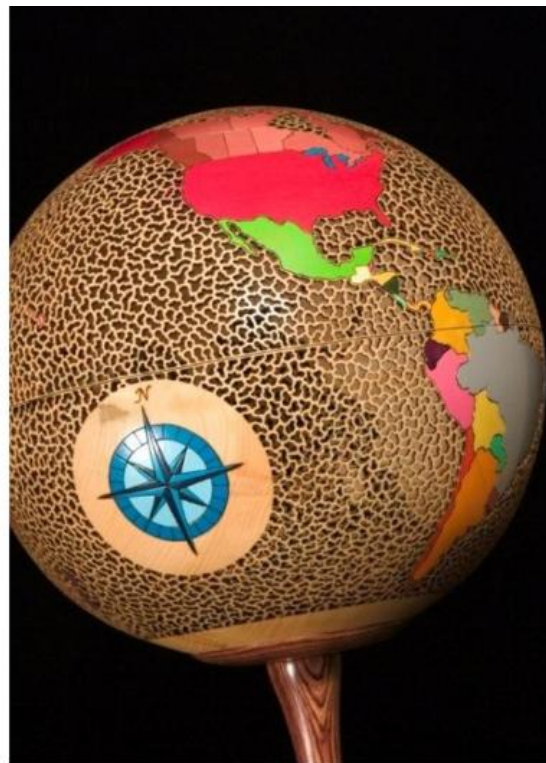


Turning Perfect Spheres

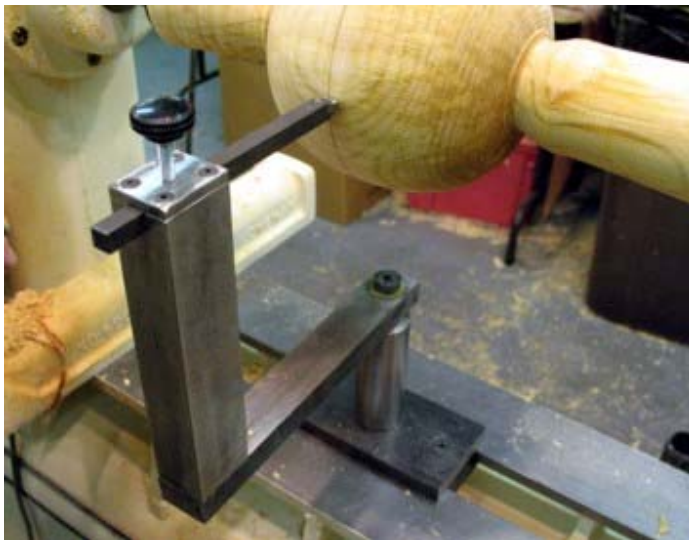
By Brian McEvoy

Sometimes innovation is just meant to happen. A few months back I decided I wanted to turn another of my pierced globes; it's been three years since my last. There are many challenges with this project: Along with turning a 12 inch diameter two piece hollow form less than 1/8 inch thick, drawing 184 odd countries to proper scale, painting them, piercing all the oceans, mounting the delicate sphere at ~24 degrees to match the tilt of the earth, having it rotate smoothly so all the countries can be viewed, the hollow form had to be a perfect sphere. With my freehand technique this was a bit of a hit and miss operation. Three out of five were pretty darn good and one was 16 inch diameter. A few others ended up smaller than intended; you know the problem where you need to remove a little more timber from here then whoops - that's too much and before you know it you've ended up with the small version. Another problem on a few is that I ended up with a flat spot, particularly where I'd left a foot to chuck the piece so I could turn the inside, then you have to remove the foot without being able to measure the thickness. It all seems rather complicated but as long as every step is in the proper sequence it's not as difficult as I'm making it out to be.



Probably the main issue with messing it up is the fact that I've spoiled (at least for this project) a huge piece of timber. In order to achieve a finished 12" globe I have to begin with two matching pieces approximately 7 x 14 inches, rough turn them and a year or so down the road tackle the project. So you really don't want to mess it up.

So finally to the point - a while back I received a call from a fellow named Fred Lindsay, www.lindsaylathetools.com, who was inquiring about the large boring bar set up that my partner Gord Langer and I market and show on our web sites. After a little conversation I learned that Fred manufactures a Sphere Turning Jig. He didn't make them large enough to cut a 12 inch sphere, but thought with a little modification he should be able to build me one. Of course I was pretty darn excited, and just like that, I am now the proud owner of a new tool. I haven't had a chance to try it out on anything larger than nine inches but I'm sure it will be fine. In any case, the other evening Gord came over with his camera and we gave it a go. I thought I should share the simple procedure with you.



Essentially the jig is very simple: It mounts securely on the lathe bed and with the bearing design and a cutter mounted on an adjustable arm, rotates on a center axis forming a perfect sphere.

We started with a relatively green birch log about 13 inches long and 7 inches in diameter mounted between centers using the Elio Safe Drive.



I rough turned it down relatively true and then measured the diameter. Then I marked the equal measurement along the center of the length.

Turn a rough oversize sphere, just so you don't have to remove as much timber with the recommended fine cuts of 1/8 inch or less.



Mark the center of your intended sphere to give you a reference to set the cutter.

Now mount your jig and set the cutter at the largest diameter of your rough turned timber. At this point you can adjust the jig either left or right trying to get a similar space between the cutter and the wood on either side. This simple step will save you some of the fine cuts and insure the maximum diameter of the finished sphere.



Crank up the lathe speed to whatever suits the diameter of your work and start making the fine cuts.





Continue with these cuts as far as you can safely cut down on either side.

Before you know it you'll have a perfect sphere except for the two ends. If you like, you could sand the piece at this point but it's not necessary because the whole sphere can be sanded in different positions once you've re-chucked it to turn off the little nubs.



Turn off as much timber as is safe on both inboard and outboard ends.





I found a pull saw worked great to remove the excess.

Turn yourself a little cup chuck to mount in your 4 jaw chuck and you can use whatever you have at your disposal to center the piece on the tailstock end. I just used the 3 inch Oneway vacuum chuck mounted on

the live center. Since using this method I tried out my 5 inch vacuum chuck to actually hold the piece for turning off the nubs as well as sanding. Fred has a number of great tutorial YouTube videos on his web site and one of them shows his nifty method for mounting your sphere to finish it up. The important thing that I see when re-chucking to finish the sphere is that you don't want to damage the work you've completed. I'm sure with a little ingenuity there could be a number of different methods for this process, depending on what equipment you have at your disposal.



Mount your sphere back between centers and use the same method that we did earlier to find the exact center and adjust your jig on the lathe bed so the cutter is at equal distance from the work piece both left and right.



Carefully, with very fine cuts, turn off the nubs.



Sand and finish. At this point you can easily rotate the sphere and sand the whole piece to completion.

Finished spheres



For a clearer understanding of this handy little tool I'd recommend viewing the videos on Fred's web site: www.lindsaylathetools.com