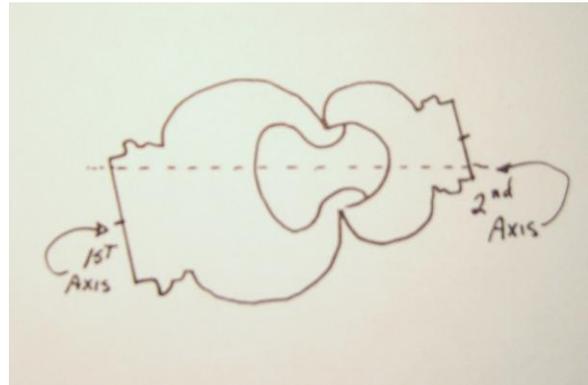
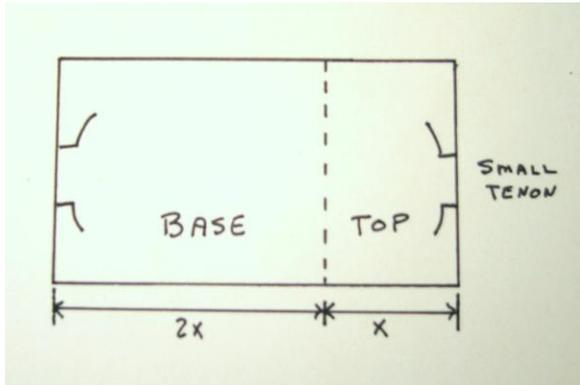


## Lidded box – double axis

**The Wood:** Avoid the pith or take a chance. Select an interesting grain pattern or decorate the plain grain. Turn a cylinder with grain parallel to the axis. See the graphic below to set the layout of the cylinder. Cut small tenons on each end. The base should be twice as thick as the top to show some variation. Experiment with size as you wish.



**Cylinder prep:** A smaller tenon (1.5") on both ends is needed to permit shifting the center for the second axis. Allow extra shoulder (markings on figure 1) to help support the drive center and tail stock center for second axis. A bevel is made on each end for better grip on the second axis. Fig 2 shows how the tail center matches the bevel. The same is true for the drive center. Draw a horizontal line for future reference for grain matching. Transfer this mark onto the bevel. Next you are ready to separate the top from body. The band saw is a good choice to limit waste. A parting tool is also an option if no band saw is available.



Fig 1



Fig 2

**Turn the top:** Chuck the top and reduce the diameter and make a smooth knob. Allow some extra wood next to the tenon for second axis. Next hollow out the end grain to make the lid. Work from center out and be sure to leave at least 3/16" straight lip for a good fit of the lid. This lid will be a tight fit in order to have them hold together for the second axis tuning. This is referred as a popping lid. When shaping the lid do not cut to a too small diameter. The waste will support the second axis and be taken away at that time.



**Turn the base:** Chuck the base and shape the base into another ball shape. Cut a tenon that matches the lid you just turned. It must be a tight, popping, fit which will become obvious when you mount the two pieces on the second axis.

Hollow the box but don't make it too wide or too deep as it might create a hole when turning the shape on the second axis. This box is a keepsake box vs a functional box for general use. The popping lid helps make this a secure place for keepsakes.



This is the completed lidded box on the first axis. Remember to do all sanding when you have finished shaping the base and top. This is the last time for this finishing step.



**Finished box on first axis**

**Second Axis:** Several options exist for placing the box on the second axis. Placement of the drive and tail stock will determine the shape of the final box. Rotation of the axis will determine the degree of final shape. Having the second axis in the same plane will produce one shape while rotating the axis will produce a different final shape.



**Second Axis mounted**

**Safety first:** Turning the second axis requires higher speed due to cutting a lot of air. A face shield is required for this part of the turning. You can now see why a tight fit on the lid is required. Selection of drive and tail stock center is also critical.



Drive center in contact with the bevel on the shoulder.

Final shaping: 1,700 – 2,000 RPM is a good speed for this final shaping. Sharpen your gouge and take light cuts on all this work. As you can see the pressure on the piece is at quite an angle and the tight fit lid plays an important part in holding the bottom and top together. The picture below shows the box about one half finished. Notice the smaller support on the right as the angle cut is made. That is why the top is not made too small on the first axis. A very sharp bowl gouge or detail gouge can be used for the final cuts. Making a smooth cut on end grain can be tricky. Remember just one more cut will do it.



Completion of the cuts is up to you how thin you make the small tenon. I suggest not smaller than 1/8" due to the pressure on the pieces and the possibility of a catch of the parting tool which will throw the piece off the lathe. The two figures below show the base that is cut and the top that is down to 1/8" inch. These can be separated off the lathe with a saw or sharp knife. Hand or power sanding will finish the base and top. An orbital sander with fine paper is a good choice for finishing the top. Be sure not to round off the edges of the top or bottom. I like to use an oil finish vs. other finishes as you can coat the entire surface and not affect too much the popping lid.



Credit to Remi Verchot for ideas on this concept



Finished box of Western Cedar