

NOTES FOR COMPLETING CURVED SEGMENTED BOX KITS
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You have adopted a seven ring Beads of Courage box kit composed of the following elements:

- One 6 3/4" diameter Top Ring, with twelve 1 1/4" wide segments
- Two circular pieces for the box Lid and Base
- A "Beads of Courage" logo bead to put in the top
- Two 8" rings, 7/8" wide segments, each composed of 6 light and 6 dark pieces
- Two 8" rings, 1 1/8" wide segments, each composed of 6 light and 6 dark pieces
- Two 7 1/2" rings, 1 1/8" wide segments, each composed of 6 light and 6 dark pieces

1. Glue and clamp the 12 segments of each ring. (There are several techniques for doing this). Titebond III is recommended since it is waterproof. Use a hose clamp for each ring to provide uniform tightening of the segments, Figure 1. Approximately 25" of hose clamp is needed for a ring. After gluing and clamping a ring, make sure the bottom surface of the ring is flat and clean off any excess glue from both sides of the ring. Let the clamped individual rings cure overnight.

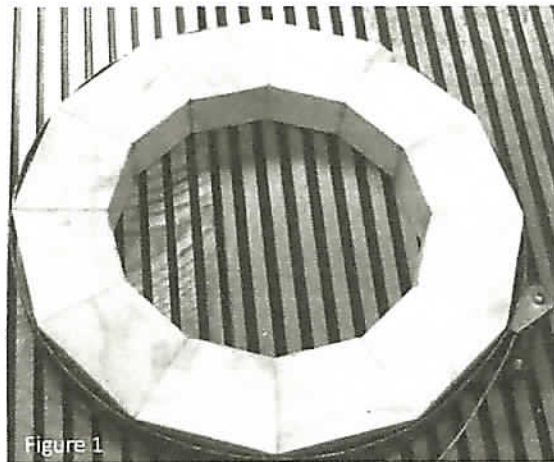


Figure 1

2. After the glue is cured you want to make the top and bottom of each ring flat and parallel. This can be accomplished with a drum sander, disc sander, disc sander made to attach to the lathe, or by hand using a flat surface to which an 8.5 by 11 inch piece of 150 or 180 grit is attached. My preferred technique is to sand one side flat; then with the ring mounted in Jumbo Jaws chuck, turn the other side of the ring flat and parallel. While the Top Ring is still in the Jumbo Jaws, the inside surface can be smoothed and rounded. Once you are convinced each ring is flat & smooth enough to join, you are ready to glue the rings together.

- There are several ways the rings can be glued together. The method I prefer is to assemble half of the rings on the Base and the other half to the Top Ring, essentially making two segmented bowls that can later be glued together. It is a lot easier to shape the interior of each bowl than to hollow out a seven ring box. For gluing the rings together, the Base is held with the exterior jaws of a chuck, and the inside of the Top Ring is held in Jumbo Jaws. If you do not have Jumbo Jaws, use a faceplate and glue block.

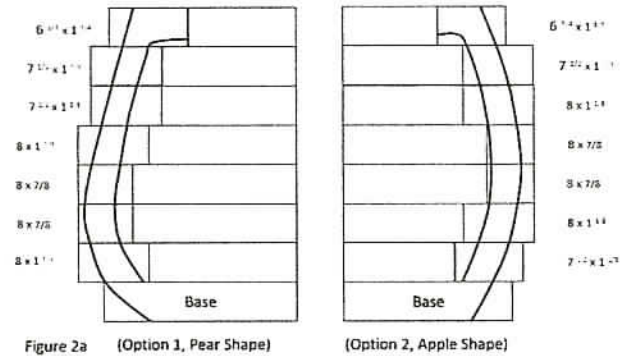


Figure 2a (Option 1, Pear Shape)

(Option 2, Apple Shape)

- You can make two shapes with this kit and two different segment patterns. Figure 2b is a drawing showing how to stack the rings for either a Pear or an Apple shaped box. Figure 2a shows how to stack the rings to obtain either a staggered effect or stair step effect.

- Mount the Base to the lathe using Jumbo Jaws with the jaw buttons on the outside of the ring. Turn the bottom flat (check with a straight edge) and cut a mortise for mounting the Base to a chuck, Figure 3a.



Figure 3 (a)

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, and sand with 180 grit sandpaper, then finish the bottom. Remove the Base and mount it on the exterior jaws of your chuck. Make sure the Base is properly seated before tightening the jaws. Flatten the Base and turn the edge to the approximate diameter of the rings. Shape inside of Base as desired, Figure 3b.



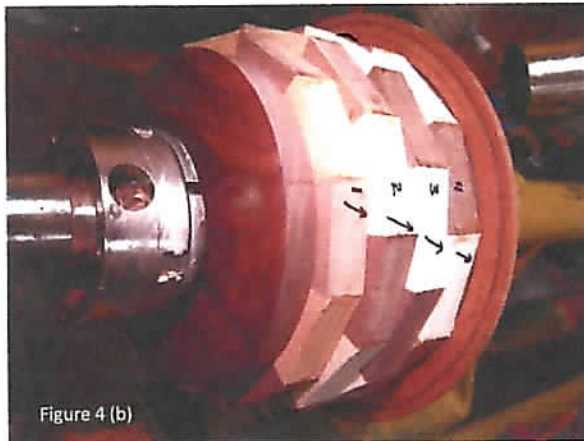
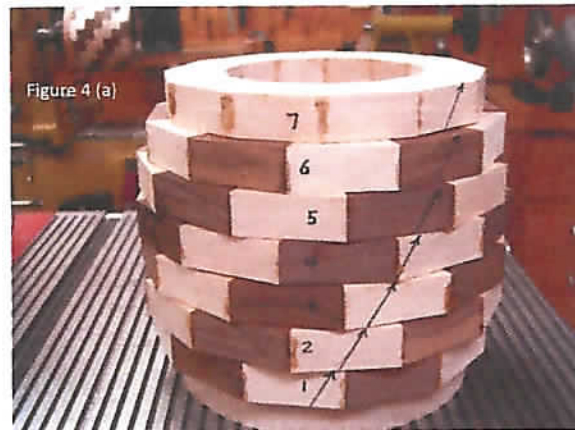
Figure 2b

Before you remove the Base from the Jumbo Jaws, add any decoration or



Figure 3 (b)

6. The rings can be glued to the Base either on the lathe, or in a separate clamping fixture. Before you start to glue the rings together, align the rings in pattern you have selected (stepped, stacked, etc.). Number each ring and draw a line to show how the rings should be oriented, Fig 4(a), this is important to ensure the rings are aligned properly as you assemble the box. Apply glue to one side of the first ring and glue it to the



Base. Take care to accurately center the ring on the Base. A faceplate mounted to the live center can be used to apply even pressure to the ring, Figure 4(b). The circles on the faceplate help get the ring properly centered. Spin the assembly to check how accurately the ring is centered; adjust until the ring spins smoothly. Let the ring cure for about 10 minutes then glue the second ring onto the first, making sure glue joints are staggered and the pattern is aligned

correctly. Let the second ring cure for 10 minutes and then continue with the next ring. Let the glued assembly cure overnight.

7. Mount the Top Ring to the lathe using Jumbo Jaws with the bottom surface facing out. Jaw buttons should be on the inside of the ring with the ring tight against the jaw face. The Top Ring will not be removed from the Jumbo Jaws until the top half of the box is cut to mate with the bottom half. Apply glue to one side of the next ring and glue it to the Top Ring. Take care to accurately center and position the ring on the Top Ring. Continue the process described in Step 5 until all the rings are attached.
8. Mount the Base assembly to the lathe. Flatten the top surface to ensure it is parallel with the Base (removes any variation caused by alignment). Next, turn the inside surface until all the corners have been removed from the rings and there is a smooth curve to the base. Turn the outside surface to roughly parallel the inside surface and the wall thickness is about $\frac{1}{2}$ ". Measure the outside and inside diameters and remove the chuck from the lathe. Mount the top half assembly on the lathe. Flatten the bottom surface and turn the inside and outside until the inside and outside diameters the same way as the Base assembly (note: do not try and turn the Top Ring round at this time). It is important for the inside diameters of the rings that interface between the Base assembly and the top half are the same, the outside diameters are not critical since the outside shape will be turned after the halves are joined. When the inside diameters are the same,

sand the inside of the top assembly with 180 grit sandpaper, then remove from Jumbo Jaws.

9. Mount the Base assembly and sand the with 180 grit sandpaper. Glue the top assembly to the base assembly. Center and make sure glue joints are staggered and the pattern aligned correctly. Use faceplate mounted to the live center to apply even pressure to the ring. Spin the box to check how accurately the halves are centered; adjust until the ring spins smoothly. Let sit for a few minutes, back off the faceplate and remove excess glue from the inside joint. Reapply faceplate pressure and allow to dry overnight.
10. Finish shaping outside surface of the box with a smooth transition between bottom and top surfaces. Turn wall thickness to about $5/16"$. Flatten the top surface of the box and re-cut the box opening to ensure it is centered. Clean up and sand the inside glue joint. Final sand exterior of box with 320 grit sandpaper. Finish interior and exterior surfaces of the box. Remove finished box from chuck.

11. The box lid can be made in many ways. I prefer using Jumbo Jaws to shape and finish the top half and Stepped Jaws to make the bottom half. Mount the lid blank in the Jumbo Jaws and turn the top surface flat. Measure the diameter of the box opening and add $3/8"$ – $1/2"$ to determine the diameter of the lid, mark the diameter on the lid. Cut the outside diameter of the lid by



Figure 5 (a)

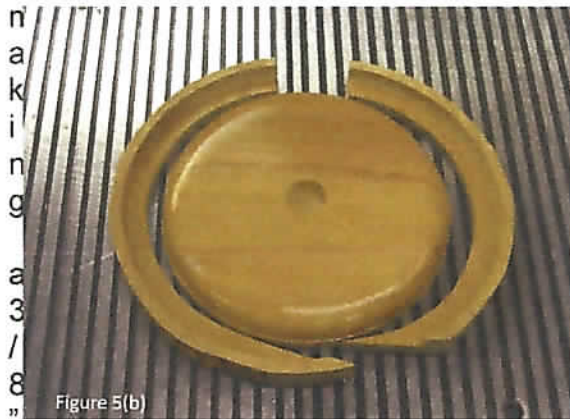


Figure 5(b)

groove around the line. Cut the groove about $1/2"$ deep, this will provide tool space for shaping the lid's outside edge. Shape the lid top and edge, Figure 5(a). Drill a $3/4"$ diameter hole, $3/8"$ deep, for the pull. Sand top of lid to 320 grit and finish. Remove the lid from Jumbo Jaws, use bandsaw to separate the groove from the lid, Figure 5(b).

12. Reverse the lid and mount to the lathe using Stepped Jaws chuck in the $3/4"$ hole on the Top. Use tail stock to apply sufficient pressure to press lid flat against Stepped Jaws. Tighten jaws and spin to verify top is flat. Measure the diameter of the box opening and mark this diameter on the bottom of the lid. Cut outside this line with Bedan or parting tool until only the finished portion of the lip of the lid

remains. Use a skew to fine cut the edge of lid bottom, check frequently, until it fits the box opening. Lid should be easy for a child to remove, not a "woodturners fit". Shape the remainder of the lid bottom, final sand with 320 grit sandpaper, and finish.

13. Make a pull for the lid. Put the "Beads of Courage" logo bead provided with your kit in the pull. If you prefer, you can;burn or engrave "Beads of Courage" on the lid of the box.

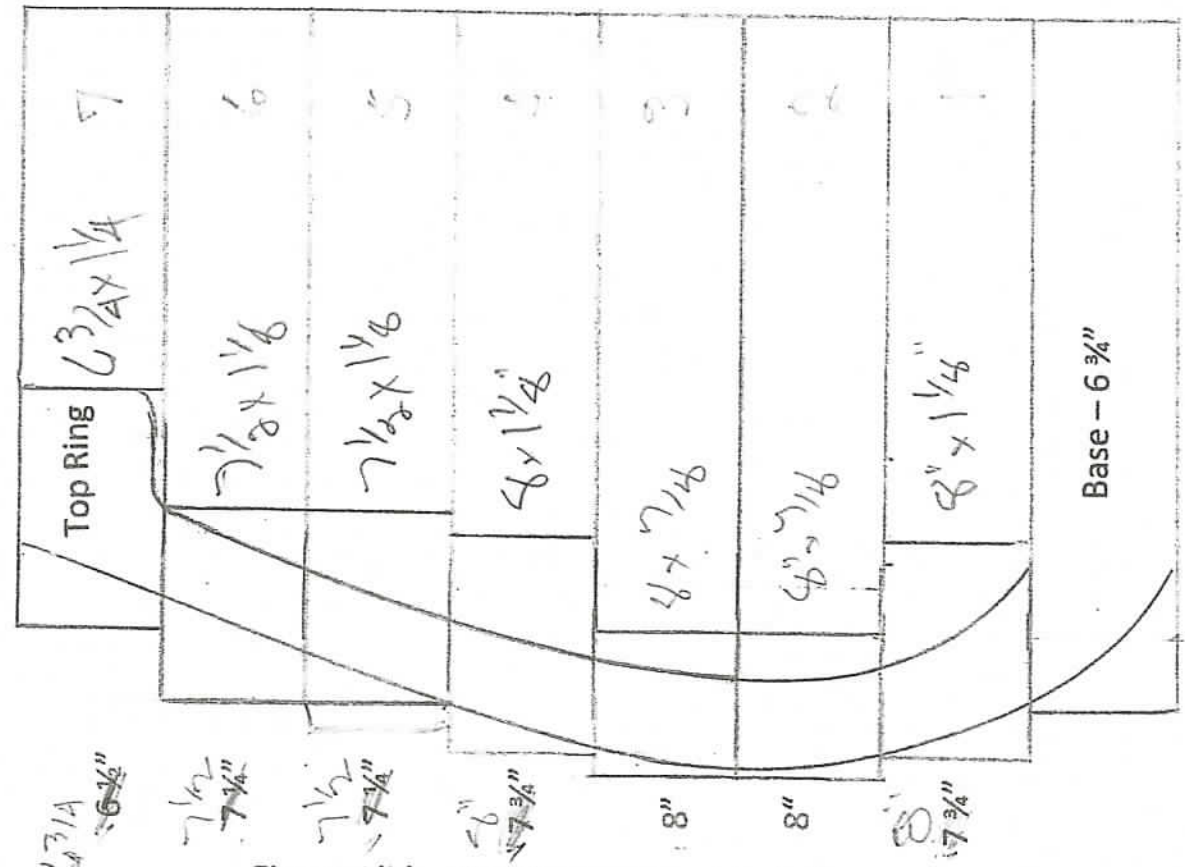
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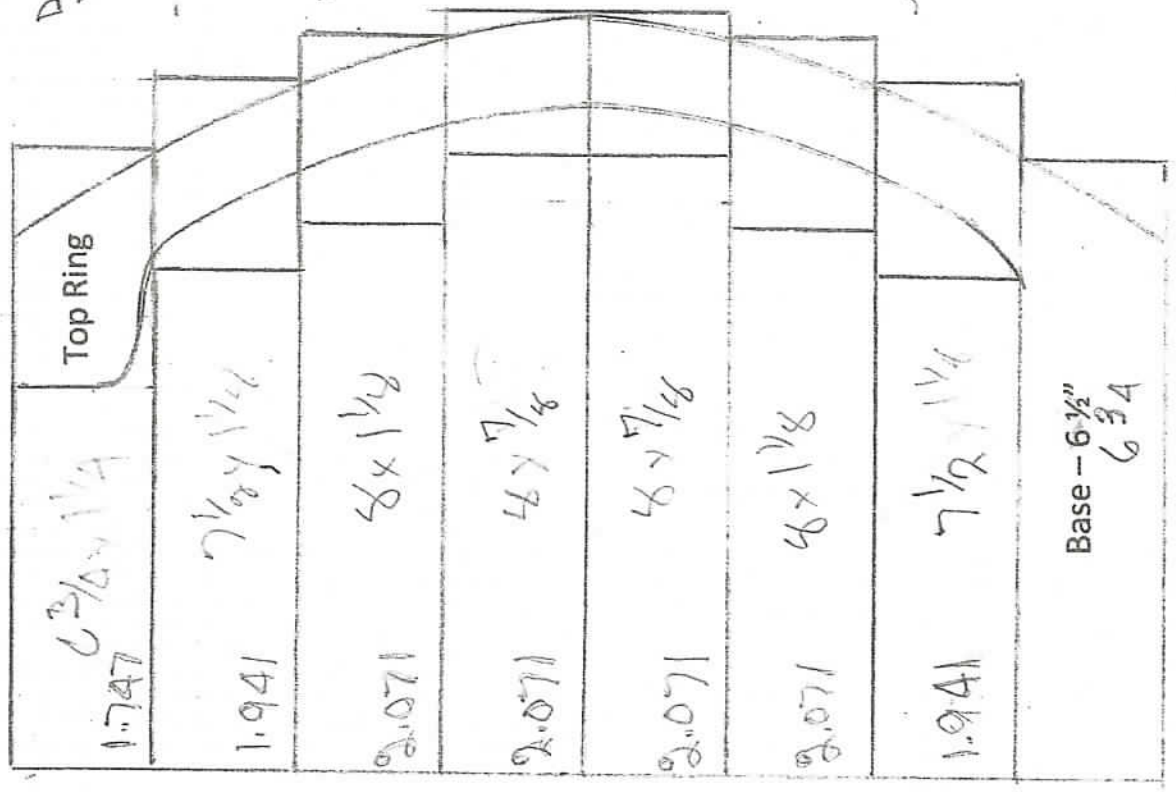
Details for Kit Shape Options

Ring Diameter

Ring Diameter



Option 2



Option 1

Figure 1(b). Ring Arrangement Details