

## One Piece Yo Yo

Based on design of Ed Davidson

Ed Davidson has an excellent DVD to show how to make a one piece yo yo in either wood or acrylic. The DVD will show you a lot more detail than this tutorial, but this should get you started.

There are some basics that should be considered before making a yo yo. First the final yo yo should be between 45 and 90 grams in weight. With a typical 2" diameter for the yo yo, this means you should select a wood species that is fairly dense. Some light weight woods like poplar and cherry may not have enough weight to work well at this diameter.

Another thing to consider is that both sides need to be the same weight, so measurement to the thickness of each side becomes critical.

There are also lots of ways to decorate a yo yo like this. You can do chatterwork or insert contrasting wood or other materials. There are grooves cut on each side that will hold O-Rings. This will dress up the yo yo as well as add some weight to the outside rim. The O-rings are 1 7/8" in diameter and can be ordered from <http://www.oringsusa.com> . Yo yo strings can be ordered from <http://www.yoyoguy.com/PL/1/71/Yo-Yo-String> .

Start with a blank about 2" in diameter.

1. The first step is to true up the blank. The blank should be about 1 3/4"-2" in length. This will accommodate the two sides, the slot in the middle and enough wood to mount and work around the chuck.



2. Start cutting the slot for the string about  $\frac{5}{8}$ " in from the front side. Use a thin parting tool if you have it and make the initial slot only about  $\frac{1}{2}$ " deep. The slot should be  $\frac{1}{8}$ " wide



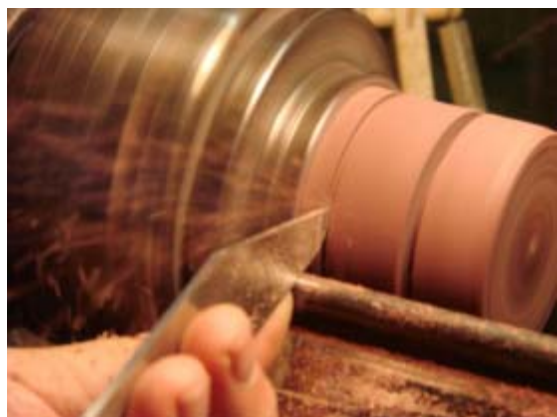
3. Measure accurately the thickness of the front side of the yo yo.



4. Transfer this thickness measurement to the other side of the slot. Mark just a little wider than the front side.



5. Cut a mark about  $\frac{1}{8}$ " deep to indicate the outside edge of the backside of the yo yo. Measure as often as required and trim the back side slightly until it is the exact same width as the front side.



6. Mark the positions for the O-ring grooves. They should be symmetrical on each side, but don't have to be in the middle. Your design will dictate where they should be placed.



7. In this picture the V-grooves for the O-rings are cut, the string slot is about 1/2" deep and the back side disk is marked for width. Notice how the sides are symmetrical.



8. Begin forming the design for the yo yo. You can round the outer front edge and the two edges around the slot, but can't do too much on the back side. Make clean cuts, again keeping both sides uniform.



9. Clean up the face. You can leave this straight or concave or convex. You could also use a Forstner bit to drill a recess and then glue in a disk of contrasting wood or other material.



10. I'm adding chatterwork to the front face using a thin gouge hanging 3-4" over the end of the toolrest. Use a regular chattertool, or a Sorby texturing tool.

If you do chatterwork you can use the point of a skew to outline the beginning and end of the chatter marks to help the chattering show up better.



11. Do the final sanding and finish the front side with friction polish. Don't finish very far into the string slot, since the friction of the unfinished surface helps the string to return.



12. Protect the front side by either slipping a ring cut from an old bicycle innertube or by wrapping the front side in four layers of masking tape. This is because this side now needs to be mounted in the chuck.



13. Part off the top at the mark you made on the back side of the yo yo.



14. Reverse mount the parted off blank in the chuck. Align the groove with the jaws. This is easier if you have a chuck with dovetail jaws. Don't tighten down all the way, but rather snug it up and then fine tune to get the blank running true.



15. Finish off the back side of the yo yo mirroring whatever you did to the front side. Final sand and finish the back side of the yo yo.



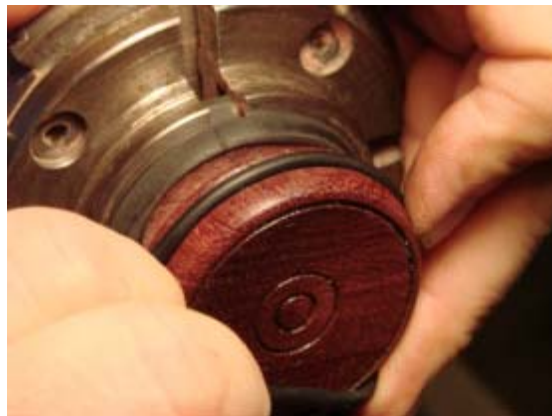
16. Cut the string slot to it's full depth. You should leave about a 3/8" axel. Use the parting tool to clean up the axel surface and make sure it is even all the way across.



17. Put on the string. Note that most yo yo strings have a finger loop at one end and the other end is twisted tight. You have to untwist this end far enough that you can slip the formed loop en to the axel.



18. Slip the O-rings into the grooves and your yo yo is finished.



by Ed Malesky