Making a Goblet with a Long, Thin Stem and Captive Ring

Design Considerations

Before you begin a long stemmed goblet there are a number of design questions to consider. First is overall size and length. If you are intending to make a goblet about 2" wide, then a maximum practical length is about 12". With a 2" wide cup, a proportional stem should be about 3/16" and something longer than 12" would be difficult without a steady-rest to support the stem. If you want to make the goblet bigger, then the proportionally larger stem could allow you to increase the length, but not much past 15" without a steady-rest.

Another consideration is the shape of the bowl. Just look at the variety of wine glasses available to see that goblet shapes can be quite diverse. Shape can vary from a simple bowl shape, to a straight sided version to a tulip shape, to a flared version of each.

Transitions from the bowl to the stem and from the stem to the base are also important. Transitions can be simple to complex, but should always be proportional to the size of the goblet bowl and not detract from the bowl shape itself.

The stem also has an important design role to play. The stem can be either straight from bowl to base or tapered. Tapered is a bit harder since you have to image the end point of the stem as you're turning rather than just following a fixed dimension. One other consideration of the stem is whether you will add a decoration. A straight stem is quite simple and elegant, but on a long stem, some design relief at the midpoint can add a bit of energy to the piece. Like the transitions any stem decoration should not overpower the elegance to the thin stem. It can also be used again to mimic a design by using some of the same elements as the transitions.

You can also add one or two captive rings, more or less just to show off your turning prowess, since they'll generally be sitting down at the base. Make them thin however, or they will detract from the lines of the thin stem.

Time to Turn

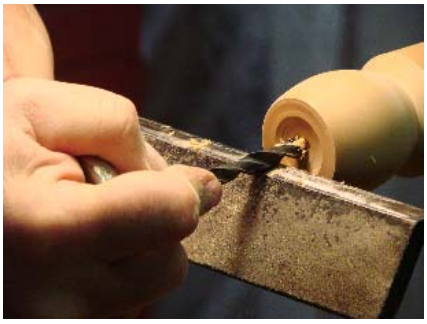
Start the turning by mounting a blank in a scroll chuck, bringing up the tailstock and turning it to a cylinder. Clean up the cylinder with a skew. You might want to pull away the tailstock to make sure that the blank is well centered, since after the initial turning the tailstock cannot be used.

The tailstock can be used for the initial shaping of the bowl of the goblet. Use a spindle gouge to create the shape of the upper end of the goblet bowl first, then determine where the bottom of the bowl will be and start to form the curve for the bottom of the goblet bowl. Don't cut too far, since you still need significant mass to hollow the bowl out.

Once you have to bowl shape refined, sand the outside of the bowl through all the grits. Doing it now reduces the risk of cracking from heat buildup once the bowl has been hollowed.

Clean up the face of the blank and create a dimple in the center to use to position for drilling a hole to the establish the bottom of the bowl. Use a 5/16" or 3/8" drill bit, marked with tape as a depth stop and drill to

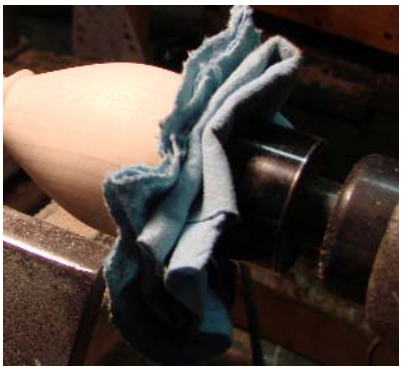
the desired depth. You can either mount the drill bit in Jacobs chuck in the tailstock, or use a bit held in some Vice-Grips. The hole not only establishes the depth, but make it easier to start the hollowing process. This is key since the hollowing is at the least supported part of the piece and anything that can avoid adding extra lateral force is desirable.



Begin the hollowing. This is end grain turning so your hollowing cuts should be done with a spindle gouge from the center to the rim. Make sure your tool is sharp and that you take light cuts. It's very easy to start getting the blank to chatter at this point, so just take it easy. If you feel inclined you can use a steady-rest to reduce the vibration. A steady-rest will generally get in the way, so I prefer to just use a sharp gouge and take my time to hollow the goblet bowl.

Since there is so little support, hollow down in stages taking each step to the near final wall thickness. Check the wall thickness with either a figure eight caliper of a homemade wire depth gauge (ala Dick Sing). This is especially critical near the bottom of the bowl since you will be continuing to refine the outside shape and don't want to turn through. Do a few refining cuts after you've reached the bottom and then use a round- side ground scraper to clean up and gouge marks and thin out the walls just a bit more. You can also use a shear scraper with a round cutting head to refine the inside. Sand the bowl through all the grits making sure to not generate too much heat. A lathe speed around 700 rpm will help.

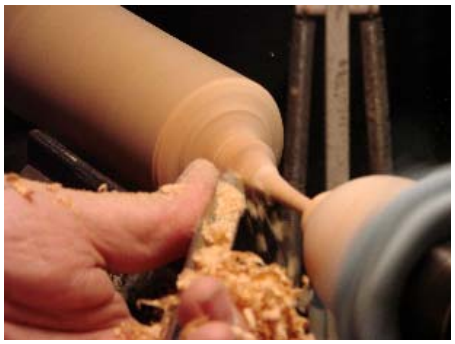
You can now decide if you want to be brave and turn the rest of the goblet unsupported, or bring the tailstock back into service. I generally use the tailstock unless the bowl shape makes it difficult to seat the live-center. Use some folded up paper towel and put it in the cut. Then use a live center with either an cone attachment or that is wide enough to seat in the goblet bowl opening.



Don't tighten up too much on the tailstock. You just want it tight enough to help minimize chatter from lateral forces, especially as the stem is turned thinner and thinner. If you crank up on the tailstock you can actually cause the stem to bow as you start thinning.

Next you refine the bottom shape of the goblet bowl and begin the transition to the stem. Take it easy refining the final bottom shape of the outside of the bowl, checking the

wall thickness regularly. You want to maintain a consistent wall thickness and you don't want to turn through the bottom. Once the outside of the bowl shaping is complete, sand through the grits. Get the outside surface just the way you want it since this is the last time you'll be able to do any work on the goblet bowl.



Start working on the transition to the stem. Don't cut too far back on the blank since you still want as much support as possible. From now on most of the work will be done in ½"-¾" increments. Complete the transition and then sand it.

Now you begin the stem. Cut back the blank in steps, opening about a ½" of area below the transition to start the stem. Keep reducing the steps until you get the end next to the transition to the desired stem diameter. Then come back and take another cut to continue to reduce the steps and lengthen the stem.

As you can see in the picture there is still plenty of blank left to add support. Once you get the fist inch or so to the right diameter make another series of steps in the blank to do the next section of the stem. Once you have about an inch of the stem to nearly the final diameter you can finalize shape with a skew.

It's a good idea to support the stem with your finger as you use the skew. Also take a light cut since you don't want a catch at this point. If it is a straight stem check the diameter with a caliper for consistency. Any variation will stand out in the final project if not addressed now. For a tapered stem you much "imagine" the line from the top transition to the bottom transition. It may be worthwhile to mark the bottom of the blank where the base will start and where the transition will be. This will help in defining the required taper.

Once this first section of the stem is done the rest of the stem is a bit easier. You now have a target diameter, or taper line, to shoot for and the closer you get to the base the more support you have. Just cut the blank down in steps ½" to ¾" at a time. Keep on going one increment at a time until you near the middle to begin the center ornament, if you plan on one.

If no ornament, then just keep on going to the transition to the base. A center ornament is basically cut the same way as the transitions. You again cut a series of steps on the blank, but don't take them as far as you would for the stem. Make sure that the transition from the stem to the top of the ornament is smooth and clean, since once the ornament is done, you won't have a chance to refine. Make sure the ornament is proportional with the stem and transition. Err on the side of a smaller ornament. When the ornament is complete, sand through the grits.

Work back to the stem diameter for about an inch or so and then begin to cut the blank down for the ring. First use the gouge to reduce the diameter of the blank to a cylinder the size of the ring. The cylinder should be a diameter that will allow a ring to be cut that will be able to fit over any center ornament, so that it can slide the full length of the stem. Forming the cylinder can be done either with a gouge or a parting tool. Cut the face of the cylinder clean nearly down to the stem diameter. Then use the parting tool to cut

the cylinder to the thickness of the ring, again taking the diameter to nearly the stem diameter. The ring should be thinner than the stem.

Once the ring cylinder is turned you can begin to refine the outer shape of the ring. Use a gouge to round over the corners of the cylinder.

When you achieve the final shape you want, sand the outside of the ring. Use the gouge to cut some relief in both the front and back side of the ring to begin to form the inner radius of the ring. You don't need to cut too far since the final shaping of the ring will be done with either a dental pick or ring cutting tool.

If you use a dental pick, then slowly nibble away at the front and back wall of the ring making sure that your cuts are parallel with the stem. This will give you a thinner ring. If the tool is at an angle, the inside of the ring will be thicker than planned.

If you use a small ring cutting tool, make sure that like with the dental pick, you undercut the ring to give a nice thin ring. With either tool approach from both sides evenly so that you get a nice symmetrical ring.

These pictures show the dental pick and the ring cutting tool in action.

Once the ring (or rings) are free, carefully clean up the stem underneath the cut and refine the stem all the way back to the center ornament.. The rings will jump around and travel up and down the stem, but don't have enough weight to cause the stem to break. If they do get in the way of your gouge work you can tape the ring in place.

Once the stem is cleaned up you can sand the inside of the ring. This can be done by taping a piece of sandpaper around the stem and then holding the ring and rotating it against the rotating sandpaper.

The next step is to begin the transition to the base, which again involves cutting a step in the blank down to the diameter of the transition element and forming the element with the gouge.

Now is a good time to sand both the ornament and the stem.

Starting forming the top of the base making a clean cut

up to the transition. You can either make a plain base or add steps. The base diameter should be about the same diameter as the goblet bowl. Smaller makes the goblet look top heavy and too much bigger makes the base look clunky. When the base is done, sand through the grits.

With the parting tool begin to part off the base. Make sure to undercut the base so that the goblet will stand on the outside rim of the base.

Support the stem as you part through the base and hopefully the piece can be supported until you get the lathe turned off. If you have turned the goblet unsupported, the goblet will just drop into your hand.

Next carve away the parting off nib and sand the bottom. You can then complete the goblet by finishing with your favorite finish. I generally use lacquer, but any finish will work.