

## Double Baluster Leg Turning Process

Steps for machining double baluster legs.

Steps are based on starting with a 8/4 square blank, 20-1/2" long (generally Sugar Maple). Accurately mark centers, because the largest diameter is 1-7/8". There is little room to be off and still have the full diameter.

Punch the centers with an awl then mount in the lathe. Turn to a cylinder. The foot will be toward the headstock.

- 1) Roughly determine the center of the blank and size the left half to 1-7/8".
- 2) Use the template to mark the high spot (score line), the base of the leg, and the location of the left end of the bead. Position the template so the tapered end of the blank protrudes about 1/8" past the template.
- 3) Cut in approximately 1/4" at the base of the foot to mark end of the blank, and size at the left of the bead to 1-3/4".
- 4) Turn from the size mark at the left of the bead to the right end at roughly 1-3/4" diameter.
- 5) Use the template to mark both sides of the bead, and the left of the bulb.
- 6) Cut in to 1-1/2" on the fillet to the right of the bead and to the left of the end of the bulb. Size the entire area between the bead and the left of the bulb to 1-1/2".
- 7) Use the point of a skew to make a "v" cut at the intersection of the left of the bead and the top of the leg vase shape. Make the depth approximately match the diameter of the fillet.
- 8) Shape the bead with a spindle gouge and shape the vase from the score mark to the bead.
- 9) Use the template to mark the center and right end of the large bulb. Size the 1-1/4" dimension to the right of the large bulb.
- 10) Make another "v" cut at the top of the bulb, again visualizing a depth about the same as the measured cut at the other end of the bulb.
- 11) Shape the large bulb, remembering that the end of the bulb toward the tailstock will reverse curve into a long flat below the measured depth.
- 12) Use the template to mark the location of the bevel section that leads into the large bulb.
- 13) Now use a spindle gouge to cut a cove between marks. Make the depth the same as the valley of the "v" cut.
- 14) Make the bevel cut.
- 15) Turn the remainder of the spindle to the right of the large bulb to the measured diameter of 1-1/4".
- 16) Use the template to mark the ends of the 1" flat to the right of the small bulb.
- 17) Size at the two marks to 1". Rough from the left mark to the end at 1".
- 18) Use the long point of the skew to cut a "V" at the left end of the small bulb. Match the depth to the flat at the right end of the small bulb.
- 19) Shape the small bulb.
- 20) Use the template to mark the location of the ends of the 7/8" flat and the peak of the bevel next to the small bulb.
- 21) Cut in the ends of the 7/8" flat and then connect the two sections to form the entire flat.
- 22) Shape the half-cove just to the left of the bevel next to the small bulb.
- 23) Cut in the bevel to the left of the small bulb.
- 24) Complete the reverse shape from the large bulb down to the 7/8" flat. Ensure that you have a smooth flowing curve.
- 25) Use the template to mark the 1" end of the taper. Size the tailstock end of leg at 9/16".
- 26) Form the taper by making a series of straight cuts gradually working from the small end back to the large end where marked. Check the straightness with a straightedge.
- 27) Set a pair of dividers to the distance between the score line and the left of the bead. Mark the blank to the left of the score line. Size to 1-1/2", to the left of the mark.
- 28) Now shape the remainder of the leg gradually working from the foot to the mark. The curve should be convex and symmetrical down to the mark and centered on the score line. The remainder of the leg is a concave curve to the foot.
- 29) Inseize each of the intersections with the long point of the skew.
- 30) Inspect the shape and compare to the pattern or the master.
- 31) Sand with 100, 150, and 220 grit paper.

## Double Baluster Leg Turning Process

Steps for machining short spindles.

Starting with a 3/4" square x 13" long blank. Load into lathe, tighten down lightly. Mark tool rest with marker according to story board.

- 1) Round blank along entire length.
- 2) Size the middle of the tenon to 5/8" and the high point of the swelling to 5/8".
- 3) Use long point of chisel to cut in "V" at the ends of the tenon.
- 4) Use spindle gouge to shape tenon from high point to bottom of "V".
- 5) Shape a slight taper from high point of swelling to of tenon.
- 6) Pencil mark the high point, then shift the tool rest to second index point.
- 7) Shape from the high point down to where the top diameter is relatively constant (per mark on storyboard/toolrest). Use roughing gouge, or if necessary a skew.
- 8) Mark the final diameter at the top of the spindle. Make clearance on waste portion to allow clearance for shaping.
- 9) Shape from the sized area to the finished part from step 7.
- 10) Sand and part off.

skew contacts the workpiece, you'll get a dig. Begin the cutting action with the flat of the bevel rubbing against the rotating workpiece. Then slowly change the skew angle to bring the cutting edge into contact with the workpiece. When the tool starts to cut, use a gentle rolling motion to smooth the shoulder.

This paring operation requires practice, so you may want to use sandpaper instead of the skew to smooth the shoulder.

Once the pommels are cut, the turnings are a straightforward combination of coves and beads around a double vase shape. First rough out the remainder of the cylinder with a gouge, then use the skew and gouge to cut the details. Making a full-size pattern from our drawings will help your accuracy in turning the parts. You can place the pattern behind the turning and refer to it as you work.

With the turning done, move on to the joinery. First, lay out and chop the mortises in the cleats (E) and feet (F). Use a drill press to establish a series of holes within the layout lines. Then square up the mortises with a chisel.

Next, cut the tenons on the ends of the legs and stretchers. You want to be sure of a snug fit, so use test cuts in scrap to make sure your setup is right before cutting the tenons on the turned pieces. Both the legs and the stretchers employ double tenons, but the legs have a  $\frac{1}{4}$  in. shoulder all around, while the stretchers have the  $\frac{1}{4}$  in. shoulder only on two sides.

For both, you establish the tenons in a two-step procedure. You first establish the shoulder with a crosscut on the table saw. (Remember to set the blade  $\frac{1}{4}$  in. high.) You then cut away the rest of the tenon with the workpiece on end. Use a dado head set  $\frac{1}{4}$  in. wide and 1 in. high. When cutting the workpiece on end, use a tenon jig high enough to accommodate two square sections.

After the joinery is complete, move on to the final details. Square up and sand the top, and taper and chamfer the feet and cleats. Also cut the profile along the bottom surfaces of the feet, establish the  $\frac{3}{16}$  in. radius stepped roundover on the top stretcher, and drill for the pins in the mortise and tenon joints. It's best to clamp the workpieces together and cut these holes with a drill press. The pin will be forced in when you do the glue up. While you're boring holes, also drill the screw shank holes and counterbores in the cleats. The counterbores are a bit oversized to allow the top to move with seasonal moisture changes in the wood.

Next, give all the parts a thorough sanding, and dry fit all the parts one more time before gluing and finishing. The glue up is a two-step process. You first glue each leg into the foot and cleat. When each assembly is dry, you glue the two leg assemblies to the stretchers. Insert the pins while doing the glue-ups. Make them a little long and sand them flush.

After the glue dries, give the piece a final sanding and move on to the finishing, which imparts an antique flavor. We stained the piece with Minwax Colonial Maple, let that dry overnight, and then applied a coat of McCloskey's Walnut Varnish Stain. Right after brushing on the varnish stain we wiped the piece down with paint thinner, to highlight the turning crevices. We then applied two coats of orange shellac, rubbing the finish out with 0 steel wool between coats. After the second coat of shellac, which we also rubbed out with 0 steel wool, we applied a coat of Minwax Antique Oil Finish. As a final step, we rubbed the piece down with 000 steel wool and waxed the top. ●

### Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Top	$\frac{7}{8} \times 18\frac{1}{2} \times 30$	1
B	Leg	$2 \times 2 \times 23\frac{5}{8}$	2
C	Top Stretcher	$1\frac{3}{4} \times 1\frac{3}{4} \times 18$	1
D	Bottom Stretcher	$1\frac{3}{4} \times 1\frac{3}{4} \times 18$	1
E	Cleat	$1\frac{1}{2} \times 2 \times 16$	2
F	Foot	$2 \times 2 \times 16$	2

\* Length includes tenon.



