A lathe-turned GUITAR

Ted Beebe

Recently, I began thinking about how to make a guitar using the lathe, and it occurred to me the curvy guitar body shape, with its lower and upper bouts, could be turned. I realized I could turn a large segmented vessel to the appropriate shape and then slice off a layer to create the guitar's soundboard (top). After that revelation, there was no turning back. Here's how I did it.

Making the soundboard

I first cut a piece of plywood into a 20"- (51cm-) diameter circle. This represented the widest cross section of the lower-bout section of the segmented vessel I would need. I then determined where the vessel would need to be cut (like a slab) to give me a 16" (41cm) final lower-bout width. With this cut line established, I could determine the rest of the dimensions for constructing the thirty or so segmented rings that would comprise the vessel.

Photo 1 shows the constructed and turned segmented vessel, and *Photo 2* shows how it looked after the soundboards were cut from it. You can see the guitar shape, with lower and upper bouts, on the vessel carcass. I was able to cut three guitar soundboards from one vessel.

I constructed the vessel from both ends, with faceplates attached to plywood, and began gluing on the rings in stages (*Photo 3*). After turning the outside, I completed the inside, bringing the walls to about ¼" (6mm) thickness.

After I had built the vessel up to two rings past the soundhole location, it was time to drill and decorate the soundholes. I was aiming for a 3" (8cm) hole with a ½" (13mm) decorative insert. I drilled the holes at the lathe (*Photo 4*) but next time would do this on the drill press. I started with a hole saw, then reamed the hole's edges to achieve a small bevel. I made a segmented insert to fit the soundhole (*Photo 5*) and repeated the process similarly for the other two holes. After gluing in the soundhole inserts (*Photo 6*), I re-turned that area of the vessel before adding more segment rings, turning in stages, until the entire piece was built, turned, and sanded.

Cutting the three soundboards from the vessel would require a large bandsaw. In my case, I took the vessel to a local sawmill that operates a horizontal bandsaw (*Photo 7*). The result was three soundboards in the shape of a guitar body, one of which is shown in *Photo 8*.

The back and sides

My intention was for the sides and back to be segmented and for the glue lines

One vessel, three soundboards

The author's vision: Turn a guitar-shaped vessel, then slice off sections of it to create contoured soundboards.

Segment rings

The author constructs the vessel one segmented ring at a time, using the lathe as a holding device during glue-up and turning the form in stages.

Soundhole accents

The segmented form, once built past the soundhole location, is bored with a hole saw.

Soundhole accents are inserted, then turned flush before construction of the vessel continues.

Slabbing off soundboards

The author (*right*) employs the use of a local sawmill to slab off the three soundboards. Note the specially made jig for holding the vessel safely during cutting.

A segmented guitar back

A segmented board is turned to thickness, then cut to shape and used as the guitar back.

from the soundboard's segmented rings to follow down the sides and around the back. I wanted all of the grain in the body to be running in the same direction.

By gluing boards together, cutting, and re-gluing several times, I was able to make a flat, segmented board for the back (*Photo 9*). At the lathe, I turned the back to ¼" thick, with a slight dished area in the middle.

To build the guitar sides, I face-glued several 1¾"- (4cm-) wide boards together (*Photo 10*) and dimensioned the block to about 1½" (38mm) thick. I then laid the completed soundboard on top, lined up the glue lines, and marked the shape of the soundboard. From this reference line, I could cut out the rough outer shape of the guitar body at the bandsaw, then the inner shape to achieve the curved sidewalls. To get the bandsaw blade to the inside of the form, I was careful to cut through the side on an existing glue line, so when I glued it back together, the cutline would be invisible (*Photo 11*).

One turning, two necks

I turned the neck on the lathe as a split turning, a process that results in two necks. I glued together two pieces of wood, each large enough for the dimensions of a guitar neck, including the headstock and shoulder area. I then drew the headstock and shoulder elements onto the blank and rough-cut those shapes at the bandsaw.

I turned the neck taper to specific dimensions that would accommodate my desired fretboard size (*Photo 12*). After turning, I cut the two necks apart at the bandsaw.

The bridge

The bridge is attached to the soundboard near the highest part of the lower bout. I shaped the underside of the bridge so its profile would match up nicely with the contour of the soundboard for a good glue joint. To form this profile, I made a jig to hold and turn several bridge pieces at once. ▸

Constructing the sides

The author glues up several boards from which he cuts out the guitar sides.

To cut out the inside of the form at the bandsaw, a kerf through the side is necessary to provide blade access. After cutting the inside shape, the kerf was closed back up with glue.

Split-turned necks

12

The neck is a split turning, generating two necks. The headstock and shoulder are drawn and rough-shaped on the bandsaw, while the neck portion is turned to dimension before the two pieces are cut apart.

Trimming the sides

13

After the sides are glued to the back, reinforced with kerfing, the author trims the sides to final thickness at the bandsaw.

Final assembly

14

The turned and shaped neck, ready to accept the fretboard.

15

The assembled guitar body, ready to accept the neck.

The bridge has six tapered holes that trap the ball-end of the guitar strings. I used a reamer to taper the holes. With a coping saw blade, I carefully formed grooves in the tapered holes to accommodate the strings. The six bridge pins were turned with a taper to match that of the holes. The pins fit snugly in the holes and keep the strings from coming out of their grooves.

The bridge must be located in a specific predetermined location based on the scale length of the fretboard. I located the bridge and glued it in place, then continued the bridge-pin holes by drilling through the soundboard.

Assembly and finish

I set the sides on top of the back, with the glue lines lined up, and glued the sides and back together. I then used the bandsaw to cut along the final outside line on top of the sides (*Photo 13*), which was drawn earlier using the soundboard as a guide.

Before gluing the soundboard in place on the sides, I dated and signed inside the guitar, in a place visible though the soundhole.

There are many ways to design the headstock and shoulder, and to attach the neck to the body. I formed the shoulder to a profile that would conform to the guitar body and cut away the very front of the soundboard and side where the shoulder would go (*Photos 14, 15*). I first dry-fitted the neck and body and marked where I needed to cut this recess to accommodate the shoulder. Next, I glued the neck/fretboard assembly on the body.

After finish-sanding the guitar, I applied a couple coats of wipe-on polyurethane and buffed the finish to a nice sheen. I then completed the guitar by installing the tuning machines, nut, saddle, and strings.

Options/lessons

There are many things I could have done differently, and my third guitar will include several alterations. The sides will be made from thin veneer, laminated around a form to achieve the necessary shape. The back will be checkered with three species of wood, and the guitar will have an electric pickup installed under the bridge.

A friend also suggested that the initial piece slabbed off of the vessel could be used as the guitar back, and the piece I used as the back could then be used as the soundboard. There are lots of options, but the underlying principal is that a properly designed vessel will cause the slab to be in the shape of a guitar body.

I enjoyed the challenge of creating a turned guitar, and the two I've made so far produce a pleasant sound. Now, if only I could play! ■

Ted Beebe is a retired banker, a Vermonter, a lifetime woodworker, and a turner since 2012. He particularly likes segmented work and often enters his work in competitions, which inspires him to bring his work to new levels. For a more detailed explanation on how to make a similar guitar on the lathe, e-mail Ted at teddy.beebe@gmail.com.