

# Building a practice marimba with kids

## By Stephen Golovnin

These are the basic instructions for building a full sized yet simple and inexpensive marimba for practice or schoolroom use. Simple hand tools are discussed here, as well as tailoring the work for adult supervised construction in a classroom setting.

This marimba is based on my design for an alto/soprano range. It is large enough to easily fit two players, and runs from the high C of the soprano range, to the low F on the tenor, missing only the lowest three tenor notes. There are no resonators with this marimba, it is meant to be softer in tone than a performance marimba. If you want resonators, build a performance marimba.

There are no F#'s in this design. F#'s were put on the first Kwanongoma marimbas in 1960 by Stupid White People and have no real place in traditional African Music. If your ensemble currently uses F#'s, it's never too late to switch over. Then again, if you must, you can adapt this design to any layout of notes that you desire.

Approximate time for construction and assembly, 5 to 8 hours.

### **Materials:**

For the notes: 5/4 cedar, 12" wide by 8' long. Alternately, two 6" wide by 8" long.

For the frame: 1"x 6"x 8' cedar or pine. 8 wood screws, 2" long. If you are making legs, double the amount of wood, add 4 hex head bolts (1/4-20 x 1 1/2"), 4 washers and 4 T-nuts.

For the mallets: One 36" x 1/2" birch dowel. One packet of shock absorber bushings available from Napa Auto Supply, Part # 650-1113

For the sponge rubber: 10' x 1/2" x 1/2", available from Stephen Golovnin 206 547 9696, or Nyamuziwa@Yahoo.com.

One tube of Barge Cement, available from many hardware stores.

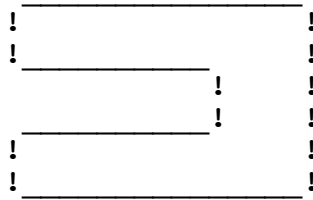
### **Procedure:**

Rip all the wood (frame, legs, and note wood) to 2 5/8". This should be done on a table saw.

Cut all the notes out of the 5/4 cedar, starting with 20" and ending up with 11" in 1/2" increments. Make sure to cut around knots, checks, or splits. This can be done with a hand saw (miter box) or a chop saw.

Sand the top side of each note, by hand or with a belt sander.

Construct a suitable jig using scrap 1/2" plywood in a U shape, glue or screw an edge piece on so that it can be held in a vise.



Place the 20" blank in the jig upside down and start cutting the center area out with a chisel and a mallet. Cut from the cheek towards the middle and make sure not to go past the center. The cheek should start about one third or slightly less of the distance from the end.

The layout of the notes will be as follows:

F3	G3	A3	B3	C4	D4	E4	F4	G4	A4	B4	C5	D5	E5	F5	G5	A5	B5	C6
20"	19.5"	19"	18.5"	18"	17.5"	17"	16.5"	16"	15.5"	15"	14.5"	14"	13.5"	13"	12.5"	12"	11.5"	11"

Keep some sort of tuning device nearby as you tune, a piano, another marimba, a pitch pipe, an electronic tuner, etc. Tune the note to roughly one semitone above the intended pitch, i.e. if you are tuning the note F, tune it to F#.

Once you get close to the intended pitch, you can use a wood rasp to smooth the arch and bring the pitch down in a more controlled manner.

Let the notes rest overnight. Usually cedar is sold wet, just out of the forest. It will take several weeks for the wood to stabilize, less if the notes are rough tuned. The good news is that the notes will only go sharper as the wood dries. Though this may take some time, you are developing good tuning skills in the process.

Using a tuner, or another instrument, fine tune the notes with a rasp, file, or belt or spindle sander.

Cut the frame pieces to 61" with a 2 1/2 degree-off-of-90 end. Make the ends parallel to one another, like a parallelogram. Cut the end pieces at 10 1/2" and 5 1/8" with opposing 2 1/2 degree angles cut in them. Clamp these together and pre-drill and screw the joints together. You can use glue as well, though usually screws are enough. You will be screwing through the side pieces into the end pieces, not the other way around. If you are making a 17 note instrument, make your lowest note 19", the frame sides cut to

54  $\frac{3}{4}$ ", and the low end frame piece 9  $\frac{15}{16}$ ". A 15 note marimba will start with the 18" note, frame sides will be 48  $\frac{1}{2}$ " long, and the low end piece will be 9  $\frac{7}{16}$ ".

Cut the legs to 32", they will be cut shorter after assembly. Round the top ends in a semi-circular fashion and drill through the center point of that semi-circle with a  $\frac{1}{4}$ " drill bit. Measure 12" in from each end of the frame and drill through the center with the same drill bit. Attach the legs with washers and T-nuts, with the legs on the low end of the marimba on the inside of the frame and the legs on the upper end of the marimba on the outside.

These legs will be angled at 10 degrees. Cut a scrap of wood 1" wide by 2  $\frac{1}{2}$ " long with a 10 degree end on it. Glue and screw this to the frame as a leg stop.

Glue the sponge rubber to the top of the frame, stopping just before the end pieces. With Barge cement, this is usually done by applying glue to both pieces (sponge rubber and wood) and allowing to dry for 15 minutes minimum, 4 hours maximum. Then place the sponge rubber onto the frame and apply momentary high pressure with your hands.

Lay the notes out upside-down with  $\frac{1}{2}$ " space between them. This is easy to do with scraps of  $\frac{1}{2}$ " wood cut out on the tablesaw. Line up the ends and lay the frame on the notes so that an equal amount of notes is visible on either side. Mark the notes with a pencil line on the inside and outside of the frame. Apply Barge cement to the notes and then the sponge rubber that has already been glued to the frame. Wait 15 minutes and then carefully press the frame against the notes. Turn it over and apply heavy momentary pressure to the notes where they join the frame.

The mallets are made by gluing the shock absorber bushings to dowels cut to 12  $\frac{1}{4}$ " long. Super glue will work well, though it may need to be reapplied in the future. Alternately, Gorilla glue may work better. Be careful not to get any of that stuff on your fingers because it's very difficult to remove. Sand down the tips of the mallet handles and you are ready to play.

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