

## Chapter Six

### Fabricating and Attaching String Ribs

In this chapter I will outline the method I use to make string ribs then attach them to the soundboard. Some harp builders omit the external string rib entirely. If you are going to do this with a solid spruce or fir board, you should take measures to reinforce the holes around the eyelets as the tension of the strings is high enough to crush the wood underneath the eyelets. A hardwood veneer will help, but I usually back this up by laminating a strip or two of fiberglass cloth underneath the decorative veneer (in epoxy).

Traditionally, string ribs are made from Hard Maple which can be difficult to cut and shape into long, gently tapered sticks. I found a way to make the long tapers with a surface planer.



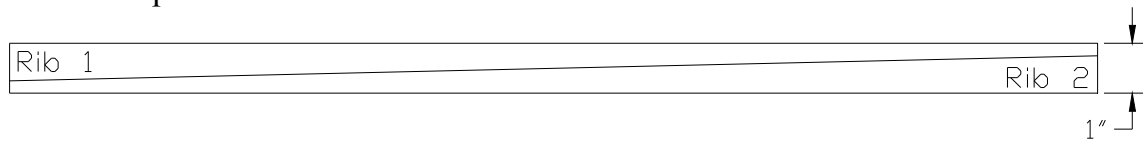
*The clamping jig, a soundboard and finished ribs ready for gluing*

Fabricating the ribs:

Start by ripping a stick little over 1" wide from a piece of 8/4 Hard Maple. It needs to be as long as the soundboard. Run all four edges of the stick through a jointer or planer to get them flat and smooth. For a conventional 36 string harp, the stick for making the two ribs should be 1" wide, 1 $\frac{3}{4}$ " thick, and 48 long.

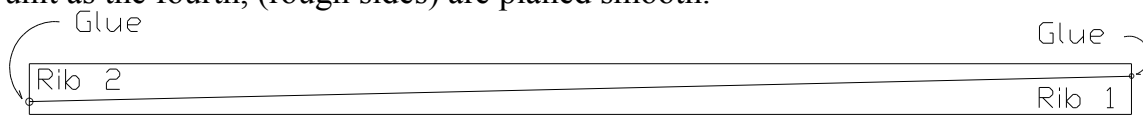
On each end of the stick place a mark  $\frac{1}{4}$  inch in from opposing edges and use a straight edge to strike a line along the length of the board. At this point I plug in a

hot glue gun (the cheap hobby kind) and take the stick to the band saw to re-saw it into two tapered rib blanks.



Mark and saw the stick into two tapered blanks

After cutting the taper, the blanks will have three smooth sides and one rough side. Arrange the two blanks with the smooth sides together and the two rough sides facing out. Glue them together with the small bead of hot melt glue at each end. Gluing them together allows them to be fed through a thickness planer as a single unit as the fourth, (rough sides) are planed smooth.



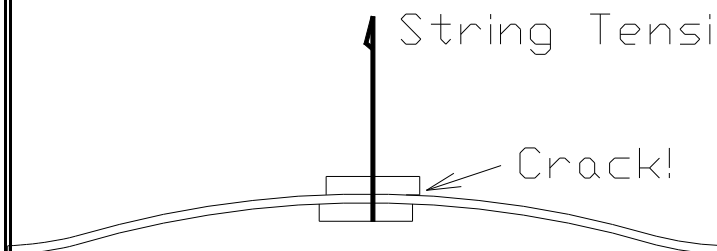
Glue the blanks back together rough side out.

Gluing the two blanks together also allows me to power plane the thin ends safely as they are supported by thick end of the other rib. I feed them through the thickness planer till the thin ends are  $\sim 1/8$ " thick. At this point, the thick end of each blank should be  $1/4$  inch thick.

If I had enough foresight to make the ribs an inch or two long, I can simply cut off the glued ends. Otherwise, I use a putty knife to pry the two ribs apart and clean off the glue with a sharp chisel.

### The case for a narrow outer rib

I center the ribs as accurately as I can, and lightly pencil the outline of the rib on the soundboard. Wet glue and clamping can make the rib slither around, and it is difficult to keep them centered. If they are the same width, and they are not perfectly centered over one another, the outer rib may begin to separate from the soundboard.



The crack is not usually a fatal structural flaw, but it can be an annoying cosmetic defect.

So, I make it a rule to keep the outer rib  $\sim\frac{1}{4}$ " thinner than the inner rib, especially in the high stress area where the bottom octave of strings pass through the sound board and ribs. Some builders address this by making outer rib  $\frac{1}{2}$  inch wide and about  $\frac{3}{8}$  inch thick along its entire length.

Next, lay out the taper across the width of each rib. Cut close to the line with a band saw:



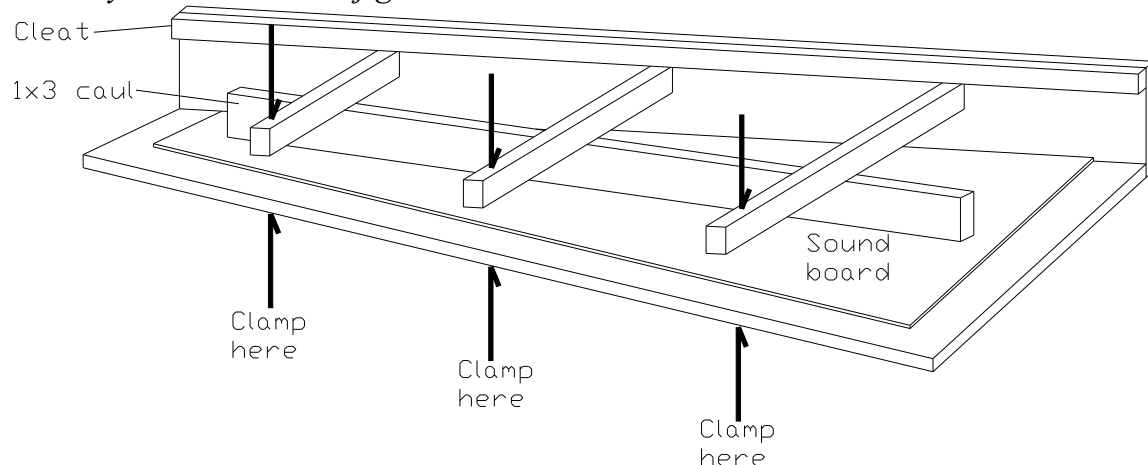
I use a block plane and sanding blocks to true up the edges. I cut the top 3-4" off the outer rib and finish the tip to the classic fingernail profile.

Different harp makers use different shapes for their string ribs. Some use a much narrower outer rib, or eliminate the outer rib entirely. Unlike sound board thickness, rib dimensions are readily visible on most harps, so you can study what other builders are doing.

## Clamping Jigs

If you only plan to make one or two harps, you can use weights and tape to clamp the string ribs to the sound box while the glue dries. A slightly more sophisticated jig can be built from scrap plywood and "one by" lumber

*Lee Gayman's cross bar jig:*



<Write description of gluing process, taper on caul to facilitate glue clean up>

For my first dozen harps, I used a set-up similar to Lee's. It works well. A more sophisticated production jig can be found in the online tutorials at [www.sligoharps.com](http://www.sligoharps.com).

Before the glue sets, the string rib will tend to slip and slide around under clamp pressure. I clamp or tape small sticks of wood onto each side to keep the rib centered. Once the glue has grabbed (2-3 minutes), I will remove sticks and use a wet rag to remove the excess glue.

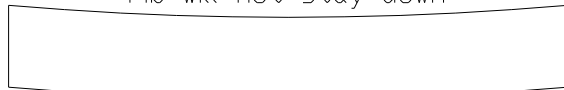
One last Gluing tip:

On some of my first harps, I found the edges of the string rib pulling up and away from the sound board. I made several futile attempts to close the gap with wider cauls and more pressure. I finally began to realize that the water in the glue was making the wood swell:



Wet glue causes the bottom to swell

The edges of a cupped rib will not stay down



I keep a small pail of water and wet rag or sponge to glean up excess glue. After the glue is spread and the string rib in place, I wet the top with a damp sponge or cloth.

Since the top and bottom of the board are both damp, the rib will stay flat and the edges will not lift up from the sound board. It also helps if you make the rib from quarter or flat sawn stock. Quarter sawn ribs cup less during glue-up.