
Ron Cook Studios

147 Sacramento Avenue - Santa Cruz, CA - 95060 - (831) 425-4933 - www.roncookstudios.com - ron@roncookstudios.com



Restoration of Circa 1900 Home Educational Co. Mandolin Guitar-Harp



Completed by Ron Cook

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For Craig Harrison

Background

Chord zithers, often called Guitar Zithers, were extremely popular from the late 1800s to the mid-1900s. Hundreds of thousands were made by several companies, including Friederich Menzenhauer, Oscar Schmidt, and Phonoharp. Phonoharp, of East Boston, Massachusetts, made several different models of chord zither, each one manufactured in the thousands. These were primarily sold in Sears and Montgomery Ward catalogs as well as door-to-door. Some Phonoharp models, called Mandolin Guitar-Harps, were distributed by the Home Educational Company of Concord, North Carolina, who applied their own labels inside the instruments. The same is true with the Mandolin Guitar (bottom right), distributed by the American Music Company of Kansas City, Missouri. This one is identical to the Home Educational Company zither I restored. The following examples are in the collection of the National Music Museum in Vermillion, South Dakota.



Mandolin Guitar Harp Model 2



Mandolin Harp by Phonoharp

Valuation

Chord zithers from several U.S. companies were made in the hundreds of thousands and were sold door-to-door from the late 1800s through the depression years and by Sears Roebuck and Montgomery Ward catalogs from the late 1800's up to the 1950's. Because so many have survived, prices are relatively low compared to other stringed instruments. Occasionally, rare and very ornate instruments can go for much more. Some previous auctions have sold chord zithers, in bad condition, for under \$50; in perfect condition, they have been sold for up to \$500.

But, for many people, the value of an instrument is not monetary, but sentimental. To be able to have a restored piece of family history on display, to know its use, its background, and who played it, and to be able to pass it down to future generations, is priceless.

Day 1: Assessment



On the first day, I always look over an instrument to see how much work is needed to repair or restore it. The condition of this zither, when it arrived, was in very bad shape. The surface was crackled and with white paint specks on it. The back was warped and had two large cracks. Glue joints had failed all around the frame. The tuning pins were extremely rusty. Missing were the “harp” post and the tail-pin cover. Little of the label, under the sound hole, remained. The strings were unsalvageable.

One positive thing was that the decals were still in decent shape. A good cleaning and new finish would bring them out better.

Day 2: Remove Strings and Hardware



On the second day, I removed the tuning pins and bridge wires. The bridges have several small steel rods that sit in little grooves that the strings go over. Without these rods, the strings would cut through the wood bridges. (This is often the case on cheaper “children’s” zithers.) The rods, like the tuning pins, were very corroded and needed cleaning.

Day 3: More Assessment



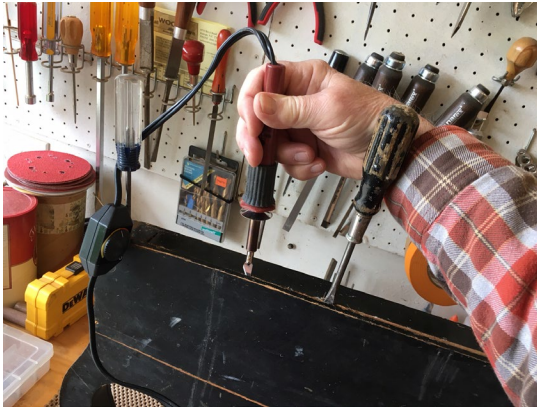
With the strings off, I looked over the instrument some more. A top crack, hidden by the strings before, showed up. On the back, someone had hammered a finish nail through the back into the frame, probably to hold it in place. Of course, removing it left a good-sized hole to repair. Also, on the back someone stuck a thumbtack. No idea why.

Day 4: Cleaning



Now that all the hardware was off, I was able to clean off the instrument. I used water with a few drops of mild dish soap to remove the years of dust and grime. I also used a small knife to lightly chip away all the white paint spots.

Day 5: Removing Back



Removing the back took several hours. Even with over half of it loose, one side was still held in place with glue. All zithers, as well as guitars, violins, and other stringed instruments from this era (late 1800s, early 1900s), were made with hide glue. Hide glue is reversible. Heat and moisture will reactivate the glue, making it soft enough to remove pieces.

Hide glue has been around for over a thousand years and was used exclusively until World War I when other types of “permanent” glues were developed. Hide glue is still used on many stringed instruments today.

Day 6: Removing Bridges



I had noticed that one of the bridges was a little loose. I decided to remove all of them to make it easier to work on the top. They had been glued in place once, but now only a pair of small finish nails in each bridge held them in place.

Day 7: Removing Excess Glue and Failed Glue Joint



Something that's surprising to me is that nearly all antique zithers I've taken apart to restore show how sloppily the hide glue was applied during manufacture. Because the large globs are so brittle, a light tapping with a chisel breaks the chunks away.

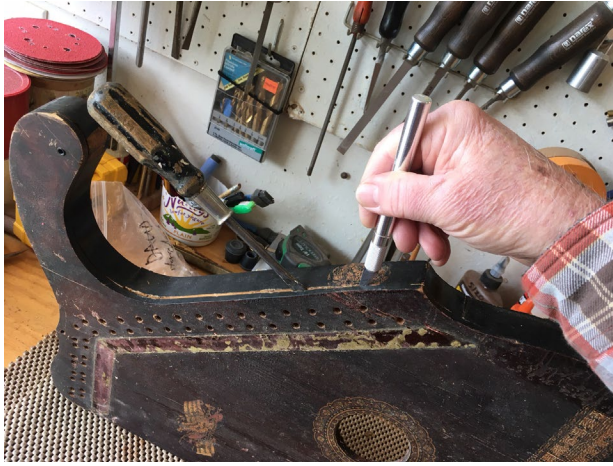
Also, with the back off, I could see that several interior braces and part of the frame had failed glue joints. I removed these so I could more easily clean the glue off.

Days 8-9: Repairing Back Cracks



For the next two days I repaired the back. When I removed it, it came off in three sections. Each section had smaller cracks that I had to fix first. On the second day, I put all three pieces back together using a modern wood glue. After I removed the clamps, I set the back aside while I worked on the frame and top.

Day 10: Removing Tuning Pin Block



Another glue joint failure was the long tuning pin block. When I removed it, there was hardly any glue under it, which was counter to the other parts of the frame that had piles of dried glue that had seeped out during manufacture.

Day 11: Re-gluing Frame



With the large tuning pin block out of the way, I was able to repair the frame's other failed glue joints. It also made it easier to repair the one top crack. For added strength, I used white glue.

Day 12: Back Cleats



When zithers have large cracks that I've closed up, I glue short hardwood cleats to further reinforce the crack on the underside. Top and back woods on the zither are often fairly thin, and to strengthen the closed-up cracks, I glue the cross-grained cleats every $\frac{1}{4}$ to $\frac{1}{2}$ inch apart. The bigger the crack, the more cleats I use closer together. This zither had several large cracks, so I used quite a few.

Day 13: Repairing Failed Glue Joint



The top had one large, failed glue joint above the tuning pins. I had to fix this before doing more work on the frame. I used hide glue on this part of the repair.

Day 14: Fixing Bracing



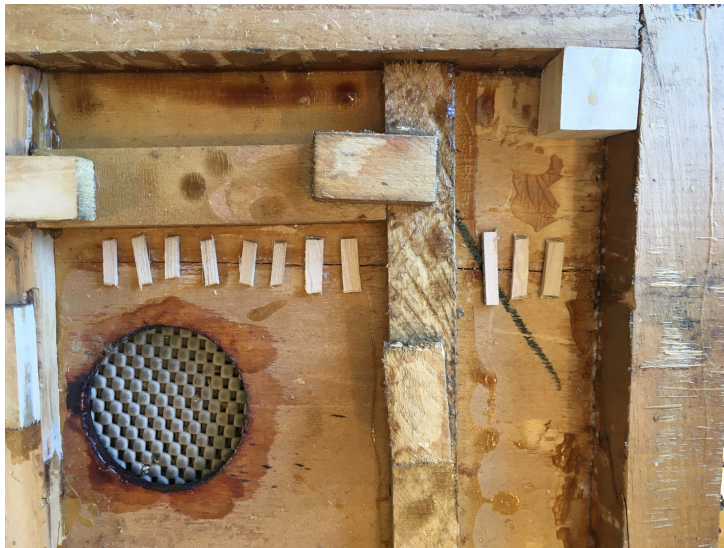
Today I fixed the bracing. For this part of the repairs, I used the traditional hide glue, which takes around 24 hours to cure properly.

Day 15: Strengthening the Frame



When a zither frame is in as bad condition as this one, I like to add small maple blocks in the corners to strengthen the frame. There were four blocks I had to shape to fit properly.

Day 16: Top Cleats



I needed to add a few more cleats to the top's underside. The zither's frame was now fully stabilized and ready to prepare to have the back glued on.

Day 17: Turning a New Post



When I did research into this zither, I was able to design the “harp” post from other identical zithers. I cut a piece of maple close to the final size of the post ends. I turned the shape, sanding it with 100 to 600 grit sandpaper while the lathe turned. Once done, I set it aside. I would size it and glue it in place after the back was reinstalled.

Day 18: Making New Label



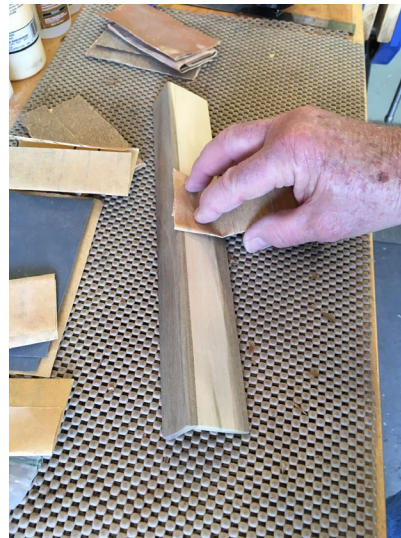
Because the original label was gone, I went online and found a photo of the original label. I was able to duplicate it on my computer and glue it onto the back.

Day 19: Preparing to Glue on Back



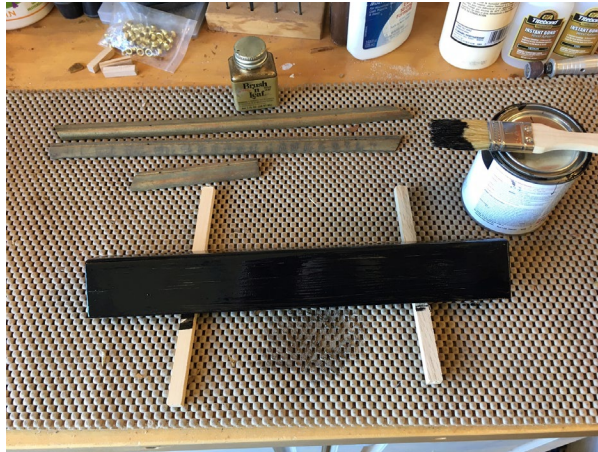
Before gluing on the back, I sanded all remaining glue off the frame and made sure the frame was level and ready for the back.

Day 20: Making New Pin Guard



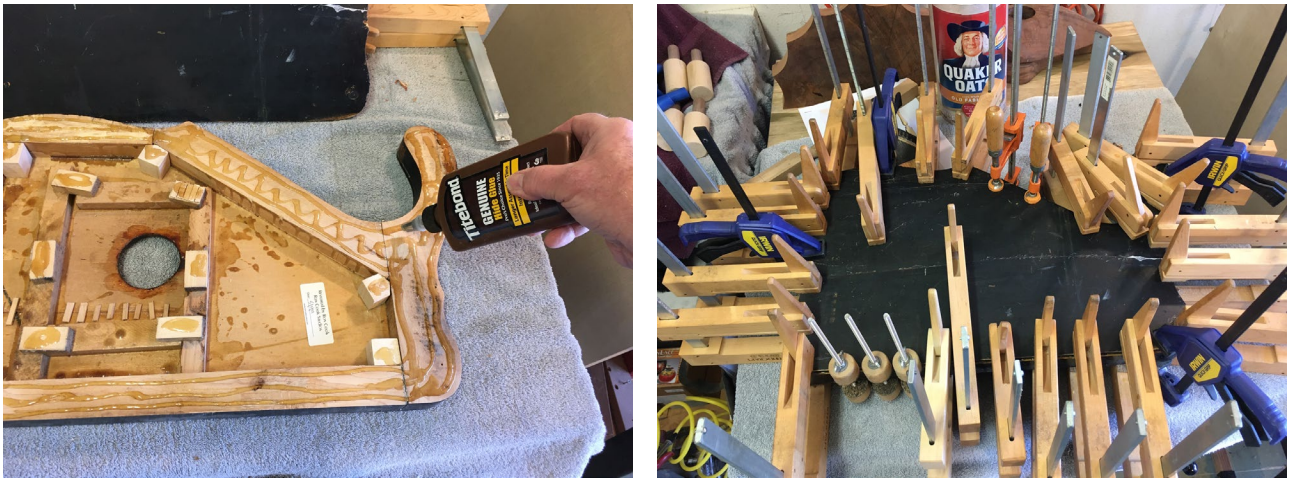
Taking a break from all the other work, I took a little time to put together a new tail-pin guard. I've made several of these for other zither restorations using some of the scrap woods I have all through my studio and shop. I cut pieces of maple around the same size as the original would have been, glued them together and sanded it to 600 grit.

Days 21 & 22: Painting Pin Guard



I used three coats of glossy black enamel to paint the pin guard. Between each coat I rubbed it out with 0000 (very fine) steel wool to clear away dust spots and brush marks.

Day 23: Gluing on Back



Today it was time to glue on the back. I used a prepared hide glue (made by Titebond) and covered the entire frame and bracing with it, then used a silicon brush to smooth the glue out.

Because hide glue has a very slow set time, it gave me time to adjust the back just right and place all the clamps.

Day 24: Scraping and Sanding



Now with the back on and all the clamps removed, I prepared the sides and back for new coats of enamel. I scraped the sides to remove any glue that seeped out, used a random orbit sander to remove the old paint on the back, and a vibrating sander that could fit in the oddly-shaped side areas.

When sanding the back, I started with 80 grit sandpaper then worked my way to 320 grit.

Day 25: Replacing Missing Hitch Pin



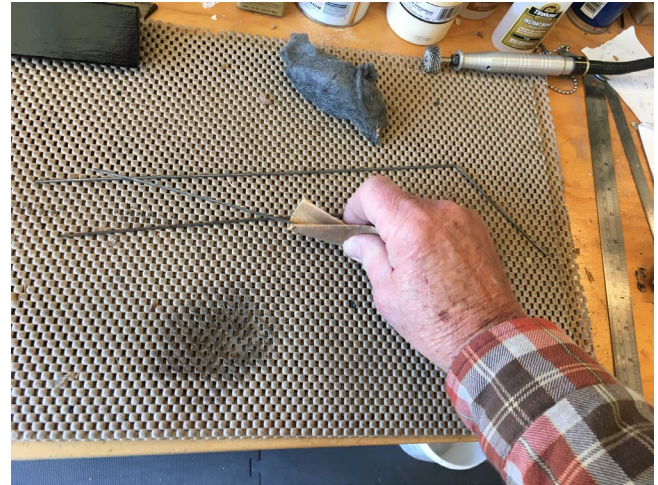
Before painting, I needed to do a couple small repairs. First, I needed to patch an area where there was a small opening, due to compressed wood in the frame under the back. Second, I had to replace a missing hitch pin, where the loop end of a string attaches. I have spare parts from old zithers I've purchased just for the parts, so all I needed to do was tap the new pin in place.

Day 26: Attaching New Post



One last thing before painting. I had to cut and shape the ends of the post to fit properly. I also added a small dowel in each end to help hold the post in place. I glued it using hide glue.

Days 27 & 28: Cleaning Hardware & Installing New Grommets



The tuning pins and the metal bridge inserts were very corroded. The tuning pins took the longest since there were so many. I could only do half of them a day. (My wrists gave out.) I cleaned them with a rotary carving device fitted with a 120-grit flap sanding attachment. I used to use a small wire brush attachment on the carving device, but the wires broke too quickly making pieces fly, sometimes stinging my hands and face. (I do wear safety glasses.) The flap sanding attachment lasts through many pin cleanings and doesn't throw off pieces.

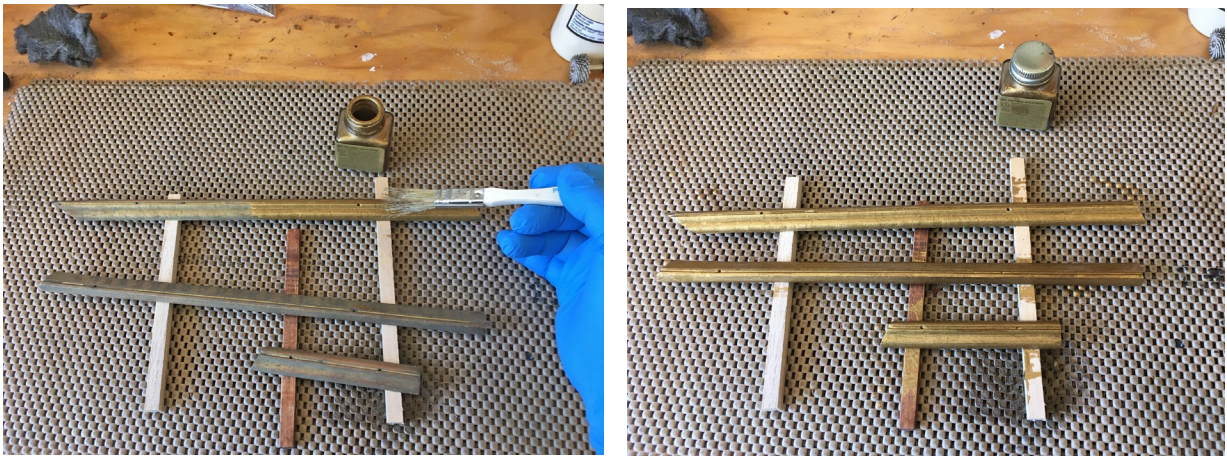
I replaced two grommets in the holes left where the old grommets had been. Nearly all chord zithers have these. They were used for a wire music stand that fit in the holes. None of the zithers I've restored have had a music stand. I understand that they were sold separately, making me think that hardly anyone purchased them.

Days 29-31: Painting the Sides



After taping the top all around the edges with painter's tape, I was ready to start painting the sides and back. For three days I put coats of glossy black enamel on the sides, putting two coats on one side first, then turning it over to put two coats on the other side. This was also when I put some coats on the new "harp" post.

Day 32: Re-gilding the Bridges



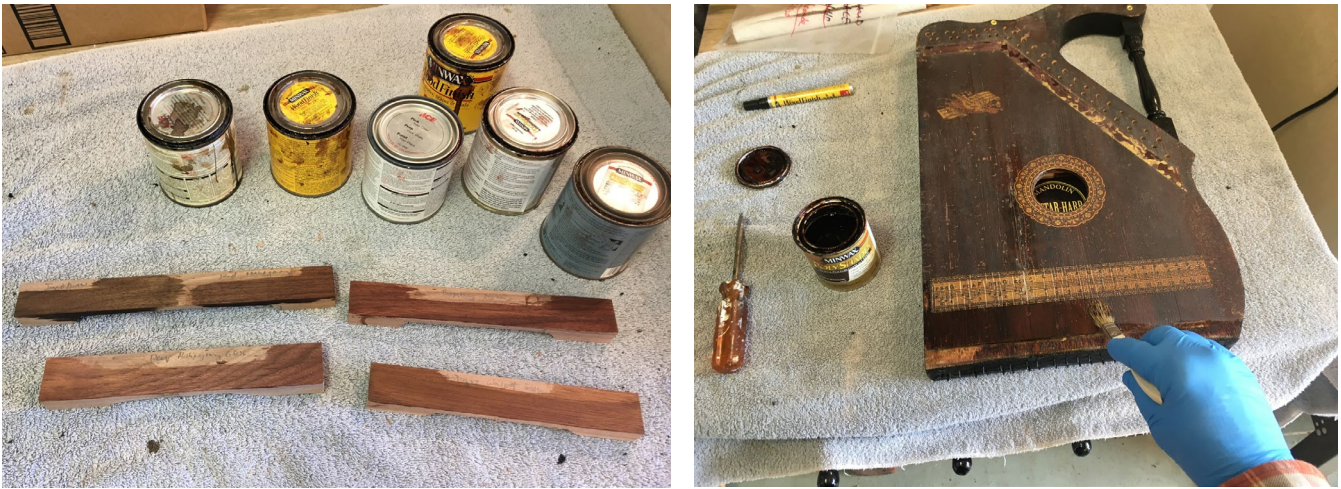
While the paint on the sides was curing, I re-gilded the bridges. They were originally painted in gold, giving the appearance of gilding. I found a “gilding” paint at one of our local art supply stores, and it has worked great on several of my restorations. It made the bridges look new again.

Days 32-34: Painting the Back



For the next three days I applied paint to the back of the zither. Whereas I used a glossy enamel on the sides and the pin guard, I used a black satin enamel on the back. The backs of most chord zithers have a flat or satin finish, probably because they were usually not seen. Zithers were meant to be played on a tabletop.

Day 35: Re-staining the Top



Before applying a new stain to the top, I tried several different colors on scrap wood to see which color stain would replicate the old stain. I found that a red mahogany worked best. The stain also helped bring out the slightly faded decals much better.

The reason I didn't sand down the top like I did the back is that the decals were in decent shape. Sanding would have destroyed them. I am pleased that they look so much better.

Day 36: Reinstalling the Bridges



This day it was time to reinstall the bridges. I spot glued them and clamped them for a few hours. Later, after I took the clamps off, I tapped in and set the original small finish nails, two to each bridge, using the same holes.

Day 37: New Binding and Feet Cleaning



I noticed on some of the identical zithers I saw during my research that the binding on several of them was a simple gold line. I replicated that line on this zither.

Later I cleaned and polished the brass feet, which were corroded. After cleaning, I reinstalled them on the bottom of the zither.

Day 38: Applying Clear Varnish



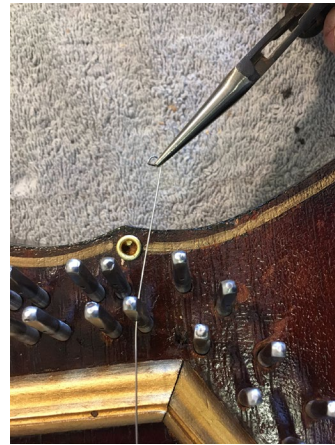
To help protect the surface, I applied two coats of Minwax Wipe On Poly. A brush on poly would go on too thickly and would leave brush marks. Wipe on poly goes on in thin coats. It dried enough in a few hours to put on a second coat.

Day 39: Installing Tuning Pins



I spent most of this day installing all the cleaned tuning pins. I had to take breaks a couple of times to rest my wrist.

Days 40 & 41: Stringing



It took me two days to attach all the new strings. I looped the end of each string I installed, just past the tuning pin, so there would be no sharp ends sticking out that could scratch or poke fingers. This was very time consuming, but much safer.

On the first day I installed the 16 chord strings. The second day I installed all the melody strings then went on to finish the zither.

Day 41 (continued): Installing Pin Guard and Tuning



After I installed the last of the strings, I took a short break to rest my wrists, then put on the new tail pin guard. The pin guard can be used as a wrist rest when playing the doubled melody strings. Also, fingerpicks were often used when playing. The thumb pick would strum a chord, and one or two fingerpicks would play a tune on the melody strings.

Now it was time to tune up the zither. I have a digital tuner that attaches to a part of the instrument with a clip, usually clipped to one of the tuning pins. When a string is plucked, the vibration is picked up through the clip, which has a contact microphone on it, and displays on the tuner's screen. I did some tuning, but for shipping I have to make sure the strings aren't fully tightened.

Day 41 (continued): Completion



Like many zithers from this era, the tone is unique and very beautiful. I'm happy I was able to restore an instrument that is over 100 years old to be playable again. I'm sure that with continuous playing and good care, this "Mandolin Guitar-Harp" should last another 100 years.