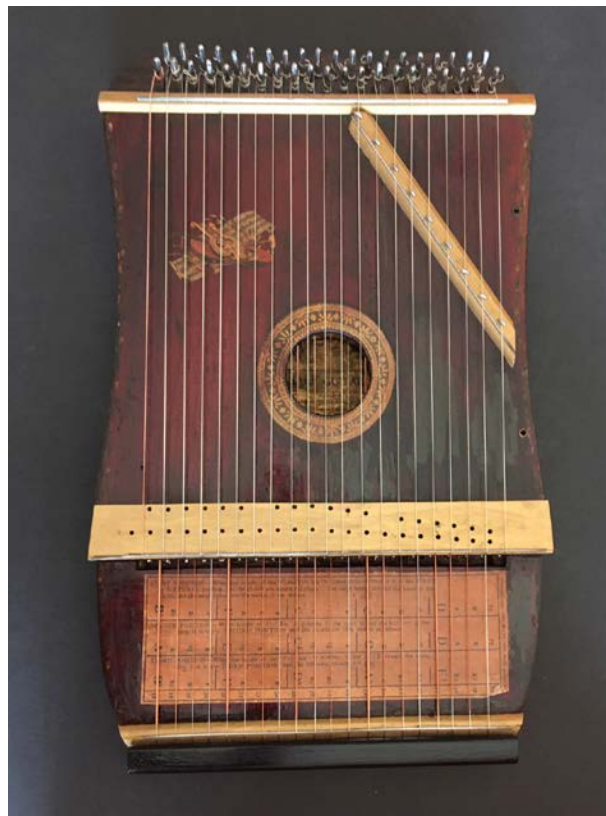

Ron Cook Studios

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



Restoration of 1894-1904 Harp Guitar Zither



Completed by Ron Cook

June 2020

For Heath Sell

Background

Chord zithers, often called Guitar Zithers, were extremely popular from the late 1800s to the mid-1900s. They were made by several companies, including Friederich Menzenhauer, Oscar Schmidt, and Phonoharp. With all the different companies and models of chord zither, there were hundreds of thousands manufactured. Most were sold in Sears and Montgomery Ward catalogs, but also by door-to-door salesmen, especially during the depression.

A newer term used by modern collectors calls the more unusual styles of zithers gizmo-harps. Some have keyboards like a piano, some are bowed like a violin, and others have strikers or autoharp-style keys that hit or pluck the strings. Heath Sell's "Harp Guitar", made by the Harp Guitar Mfg. Co., is yet another type of gizmo-harp.

The zither I restored for Heath Sell is part of a family of zithers called the Germania Harp Family of instruments. They all have two layers of strings: chords on one layer and melody strings on another. Most Germania Harp Family zithers have from 4 to 6 chords, usually on the top, and 19 to 21 melody strings running through the inside of the instrument. The Harp Guitar I restored is just the opposite. Five chords run through the inside, and 21 melody strings are on top. It also has a perforated bridge, which accommodates fret bars (commonly known as sharpening levers or sharpening cams). These turn against a string, changing the note from its natural to a half step sharper, partially making a diatonic instrument almost chromatic. The following photo is a smaller version of Heath's zither, by the same manufacturer, showing the fret bars. Unfortunately, the fret bars are missing on Heath's zither.



Harp Guitar with Fret Bars (at arrows)

The next photos show the different styles of the Germania Harp Family of zithers. Instead of having a perforated area for fret bars that turn, they have actual sharpening levers that run vertically, similar to actual harps.



Six-chord Harp Guitar with vertical sharpening lever (one shown at left)



Harpanola Six-chord Guitar (No sharpening levers shown)

The zither on the left is also made by the Harp Guitar Mfg. Co., and is from around 1905. The Harpanola on the right was often sold through Montgomery Ward in the 1930s. It is a much larger Germania Harp Family zither with 7 chords and 25 chromatic melody strings. The melody strings on earlier Harp Guitar zithers, like Heath's and the one on the left, are tuned diatonically.

Valuation

Chord zithers from several U.S. companies were made in the hundreds of thousands and were sold door-to-door through the depression years and by Sears Roebuck and Montgomery Ward catalogs from the late 1800's up into the 1950s. Because so many have survived, prices are relatively low compared to other stringed instruments. Germania Harp family of zithers on Ebay that need a lot of work to restore are going for less than \$100. Occasionally, some models of mint condition Harp Guitar Mfg. Co. instruments can go for several hundred more.

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 biggest problem with this zither was the large glob of paint that somehow got on the top. The whole zither was weathered. The tuning pins and metal bridges were very corroded. The top had a large crack, which is wood shrinkage caused by hot and cold conditions. Quite a bit of the finish was also missing, and some glue joints had failed. The only decal in decent condition was the upper left image of layered instruments over a page of music. The rosette and the chord note information decal were scratched with pieces missing.

Day 1 (continued): More Assessment



The back was very pitted and scratched up. It is hard to say how the back got into this condition. Some scratches could be from it being played a lot, but the pitting and large scratches might be caused by where it was found.

The perforated bridge, especially on the right side, had many of the holes filled with the same paint that was on the top.

Day 2: Removing Strings and Hardware



On the second day, I spent removing all the strings and hardware. The strings were too corroded and brittle, and most of them broke right at the tuning pin as I was unwinding them. I was not able to salvage any of them.

I put all the tuning pins and metal bridges in a large plastic bag for safekeeping.

Day 3: Removing Bridges



On this day I carefully removed all the wooden bridges. None of these were glued on and were only held in place with small brads. They pulled off quite easily, but I had to go slowly so the wooden bridges wouldn't break.

Day 4: Removing Paint



I took several hours this day removing all the thick paint off the surface. I had hoped the paint would have been water soluble, but it was old oil-based paint and could only be removed by chipping and scraping.

Day 5: Cleaning Surfaces



After getting all the paint off, I took some water, with a little dish soap, and thoroughly cleaned the entire zither. This got rid of all the remaining paint chips and dust.

With it all clean, I was ready to start removing the back.

Days 6 & 7: Removing Back



All stringed instruments of this age, and many new instruments, are assembled with hide glue. Hide glue is animal based and is derived primarily from collagenous material present in animal hide or from the extraction of collagen present in animal bones, primarily cattle. Fish glue is another type of hide glue.

Hide glues are reversable. Heat can soften hide glue so that damaged instruments can be taken apart and repaired. I use a special heated device that has a 1-inch blade, like an Xacto knife blade, that I run along the glue joint around the back. This is a slow process and can't be rushed. As openings develop, I use both a wide blade screwdriver and a 2-inch putty knife to keep areas open, so the heated glue won't reset.

It took two days until I was able to lift off the back.

Day 8: More Cleaning



The channel where the chord strings go through also had quite a bit of paint in it. I scraped it out with an awl and thin-blade screwdriver, continually vacuuming it out until it was clean.

Inside there was dust, old spider nests, and sow bug or pill bug remains. I vacuumed it all out before continuing.

Day 9: Failed Glue Joints



There were other areas on the frame where glue joints had failed. The top had one side that was loose (left photo), and the tuning pin block had absolutely no glue holding it in place (right photo). It popped right off. Since the tuning pin block came off, I thought I would have an easier time repairing the top crack.

I repaired the open top before continuing. I forced new hide glue into the opening and clamped it shut.

Day 10: Removing Old Glue



When this instrument was manufactured, some areas on the frame had lots of glue, and others had barely any. To be able to reglue properly, I had to scrape off all the glue down to the wood. I used a cabinet scraper to do this.

Day 11: Repairing Cracks



With the back off and the tuning pin block removed, it was easier to repair the cracks. One back crack was easy to repair. The top crack was a little harder to work on, but with the tuning block out of the way, gluing and clamping the crack closed it up nicely.

Day 12: Regluing Bridge Block



Another glue joint that failed was the angled block that sits under the short top bridge. Again, I applied hide glue and clamped the block in place.

Day 13: Strengthening Cracks



When zithers have large cracks that I've closed up, I glue short hardwood cleats to 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.

Day 14: Regluing Tuning Pin Block



After cleaning all the glue off the tuning pin block, I applied more hide glue and clamped the block back in place.

Day 15: Patching Back



Today I patched the back with an ebony-colored wood putty. Most wood putties from hardware stores never dry completely hard. I found that the Timber Mate brand does dry very hard and sands easily without clogging the sanding papers that much. Timber Mate comes in many different colors to match the colors of woods.

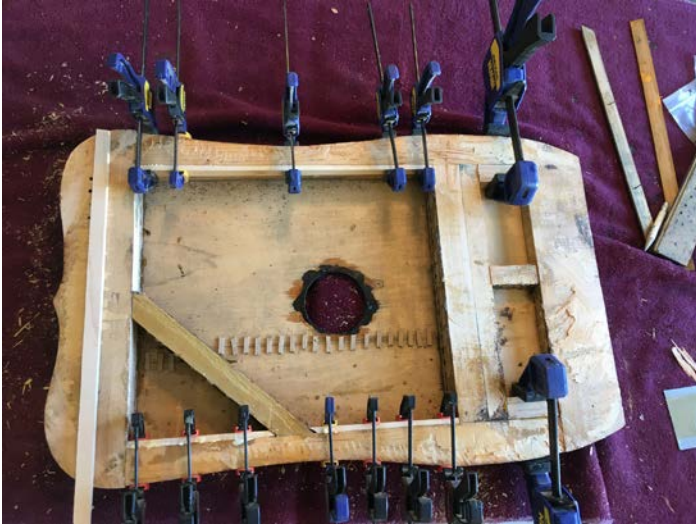
I use a plastic putty knife to apply the putty. (Wood putty knives can sometimes scratch surfaces.) I had to put several coats over some of the larger gouges on the surface.

Day 16: Sanding Back



After letting the putty dry overnight, I used my random orbit sander to remove the paint and smooth out the surface. I use several grades of sanding pads, from 60 or 80 grit for quick removal, up to 320 grit for a smooth surface ready for painting.

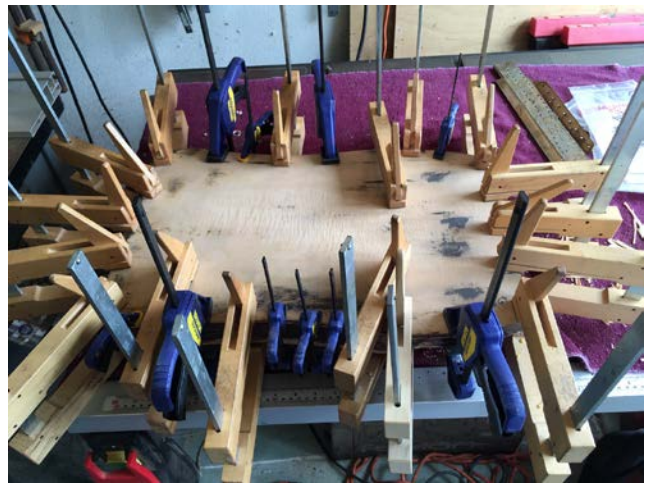
Day 17: Strengthening Frame



When glue joints begin to fail, many old zithers warp from all the tight strings. This one was warped a little, but not too badly.

To strengthen the frame so it won't warp again, I added maple strips and blocks all around the inside of the frame.

Day 18: Gluing Back



It's always an exciting day when the back can be glued back onto the frame. It is a fairly long process, and I have to use a lot of clamps.

As you can see in the left photo, I brushed on quite a bit of hide glue before putting the back on. Hide glue has a long set time, so I have plenty of time to position the back on the frame.

Day 19: Cleaning Hardware

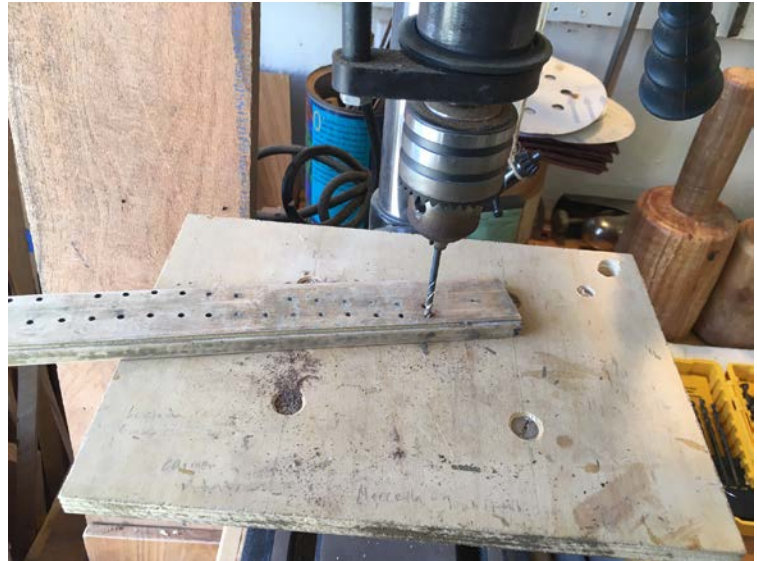


One job I have on every zither I've ever restored is cleaning the hardware. For years I used a circular wire brush on my rotary carving tool, but the wire wore down fast and little pieces of wire always flew off onto my hands and clothes. (I always wear safety glasses to protect my eyes.) Now I use a 120-grit flap sanding attachment on my rotary tool. This lasts much longer and actually cleans the corrosion off the tuning pins better than the rotary wire brush. It also runs at a slower speed, so the sanding flap pieces don't break and fly off.

After cleaning the tuning pins, I had enough time to clean the wire bridges. These seemed more corroded than the tuning pins, but they did clean well by hand sanding with 120-grit sanding paper and 0000 (very fine) steel wool.

Once the bridges were clean, I applied some paste wax to keep them from corroding again.

Day 20: Working on Perforated Bridge



The perforated bridge is the one the 21 melody strings run over. Today, I clamped it upside down in my large wood vise and cleaned the hide glue off it.

After the glue was cleaned off, I cleaned the paint out of many of the holes with an 1/8 inch machinist bit. Regular wood bits have larger spirals that can sometimes catch and tear up the wood around the hole. My machinist bit is finer and cleaned the holes out quite well.

After drilling out the holes, I sanded down the bridge to prepare it for re-gilding.

Day 21: Fabricating Pin Cover and String Installing Rod



I noticed in photos I saw online of other Harp Guitar Mfg. Co. zithers that they all had tail pin covers made of wood. I know this one had a cover at one time, because the screw holes where the pin cover was attached were still there.

I've made new pin covers for other zithers that had them missing or were broken. I made a new one for this zither based on those I saw online. It will be painted black like the back of the zither.

Because the chord strings need to run through the holes at each end of the instrument and inside the body, I figured these zithers originally came with some kind of rod to fish the strings through. I couldn't find any evidence online, so I designed my own. I made a hook on one end of a narrow 16-inch-long steel rod and ground it to a fine point that the loop end of each string could be attached to. Each string could then individually be pulled through the body. (I show how this is done later when I string up.)

Days 22 to 25: Painting Back



For the next four days, I applied several coats of semi-gloss black enamel. I first put painter's tape all around the sides so the black paint wouldn't drip onto the mahogany colored stain on the sides.

Day 26: Re-gilding Bridges



While the last coat of black on the back was drying, I painted all the bridges with a gold-leaf colored paint. Bridges on this zither, and many others, have always had gold coloring replicating gold leaf.

I use the same type of gold-leaf paint to coat all the bridges. One coat is always enough.

Day 27: Testing Stains



Before refinishing the top and sides, I needed to check out how each of my stains would look on maple. It turned out that the red mahogany stain was the closest to the original.

Days 28 to 32: Staining



It took several days to apply stain to the right consistency on the top and sides. I brushed or wiped it on, then rubbed it with a clean rag so there were no drips. I had to do this time after time to match up the remaining original stain.

Days 33 to 35: Varnishing



After the stain had dried a few days, I applied a couple coats of clear varnish over the instrument. Originally, most of these instruments were coated with a guitar-like lacquer, which often wore down from constant playing and handling.

Days 36 to 38: Decals



I spent several days on the computer working on replacements for the chord and rosette decals.

On the internet, I found an identical instrument with an identical rosette that I was able to download to use for this zither.

The chord decal was a different story. I photographed the damaged one on this zither, ported the photo to my computer, and did a lot of cutting and pasting in Photoshop to replace damaged words and notes. Then a lot of time was used inserting color in all the scratched and scraped off sections of the original decal. This entailed much “bit twiddling”, in computer terms.

After completing all the computer work, I printed test sheets on regular paper to make sure the decals were the right size. When the sizing was correct, I printed the new images on special decal paper.

Day 39: Reinstalling Bridges



The bridges had never been glued in place. Each of the four bridges was nailed with 1-inch brads. I cleaned the original brads and was able to use all the originals to re-tack the bridges in place.

After reinstalling the angled bridge, I reinserted the cleaned string guides back in their holes.

Day 40: Reinstalling Tuning Pins



The Harp Guitar zither was nearly finished. On this day I reinstalled all the cleaned tuning pins. It took over a half a day to screw in the 41 pins.

Note that American-made zithers from this period, like this one, have tuning pins that tighten clockwise (right-hand threads). Many antique German and Eastern European zithers have tuning pins that tighten counterclockwise (left-hand threads).

Days 41 to 43: Applying Decals



The reason the decal process took so long is that each decal sheet I printed had to be spray coated with several coats of a clear acrylic varnish so the inkjet printer ink wouldn't smear and run when placed in water to loosen the backing. I put half a dozen coats on both decals and let them dry well overnight.

The next day I started by cutting out the decals and worked on the rosette first. This went well.

I next started to work on the large chord decal. My first attempt at that failed, because the decal folded under and tore. I tried another (I had printed two, one for backup), and it went on okay, but there was not enough varnish on part of it and the ink faded out. I had to print more and start over with the varnishing.

The third time was a charm. It worked. I used a hair dryer to dry all the moisture off the decal. After drying, I applied some stain over the decals to "antique" them to fit the age of the instrument.

Day 44: Final Polishing



Before stringing, I gave the zither a final polishing with a dark colored paste wax.

Days 45 & 46: Installing Chord Strings



Because this restoration took place during the Covid-19 pandemic, the strings I ordered from Germany nearly two months ago were not available. My supplier said that their supplier was partially shut down so they couldn't get string sets. I did find another supplier, in the Netherlands, and they had the strings in stock. They have yet to arrive.

However, my first supplier was able to get their stock renewed and they shipped my string order to me. The strings arrived less than a week after they were shipped.

The most difficult stringing process was the internal chord zither strings, which took two days. I had to fish the rod I made through the holes at each end of the zither (upper left photo), hook the loop end of a string on the hook (upper right photo) and draw the string through to the hitch pins at the tail end of the zither (lower left photo). Once the wire was in place, I twisted a loop in the end so there were no sharp wire ends, then tightened the string.

Days 47 & 48: Installing Melody Strings



The next two days I installed the new melody strings. These run over the soundboard.

Zither strings are always labeled with the note and a number that shows the string position on the zither. String #1 (C) is the only wound string of the melody strings. All the others are plain steel strings. I laid them out in order of position.

The right photo shows the chord strings as they go through the holes and run internally to the tuning pins at the top end, as shown on the previous page. The melody strings bend at a sharp angle to attach to the hitch pins in a channel that is between the holes just above the chord decal.

Day 49: Finishing Up



Today I tapped the string guides down pressing the strings onto the angled bridge. If this weren't done, the strings would vibrate over two bridges and make a buzzing sound instead of a clear note.

And finally, I installed the new pin cover over the tail pin area.

Day 50: Completion



The last day 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. With 21 melody strings and 20 chord strings, this took a little time.

I did have to loosen the strings again for shipping. Woods and strings are affected by temperature changes, and it is best to loosen strings so there's less strain on the instrument. (Also, UPS suggests loosening strings.)

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 good care, this Harp Guitar Mfg. Co. Zither should last another 100 years.

A Short Biography

Ron Cook is an author, artisan luthier and craftsman living in Santa Cruz, California. He has appeared in, and written for, *Renaissance Magazine*, and his works have appeared in *American Woodworker*, *American Craft*, *Early Music America*, *Dulcimer Players News*, *Crafts Report*, *Guitarmaker*, *Sunset*, and several technical trade journals. He has also written and published four books: *The Mountain Dulcimer*, an introduction to tuning and playing the dulcimer; *Onward Through the Fog*, a series of short stories and novelettes; *A Young Upstart*, a collection of poetry and contour drawings; and *On Guard in the General's Chorus*, a chronical of Ron's life in the Army and in the Entertainment Corps in Korea. He and his artistic creations have appeared on television: WABC in New York, KGO in San Francisco, San Jose Community TV, and Community Television of Santa Cruz.

Ron's career path began in the 1960s as a cowboy, raising horses in Central California, and as a folk singer, playing at college events and at fraternal organization dinners. After being drafted and serving in the Army for two years, he returned to San José, California, in November, 1968, and became a bass player in a popular rock group, playing the Filmore Auditorium and backing Chuck Berry for one of his San José appearances. It was during that period that Ron built his first instrument, a solid body electric dulcimer to play on stage with the band. During the mid-1970s, Ron changed careers and became a carpenter, following in his father's footsteps. A prolonged building freeze in the mid-1980s convinced Ron to return to college, earning a certificate in technical writing. For about 20 years, Ron worked in the high-tech industry writing and illustrating manuals. He became skilled in desktop publishing software programs as well as illustration and photo programs. Ron retired from the public sector in 2000 and continued as a wood craftsman.

As a craftsman, he uses sustainably harvested, salvaged, and urban forest woods to create one-of-a-kind medieval and Early American stringed instruments, furnishings, and sculptures. He has also restored many antique and vintage stringed instruments for over 15 years.

Ron exhibited at American Crafts Council Shows in San Francisco and Baltimore and at other nationally renowned arts festivals. His pieces have been shown in galleries and events as far away as Barcelona, Spain, and are in collections throughout the world.

Ron is a founding member of the Santa Cruz Woodworkers, a 40+ year member of the Guild of American Luthiers, a member of the American Association of Woodturners, the National Music Museum, and the Santa Cruz Art League. He has also been a Santa Cruz County Open Studios artist for 20 years.