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Restoration of C. 1925-1930 Carl Fischer Concert Zither

Completed by Ron Cook

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For David Spirk

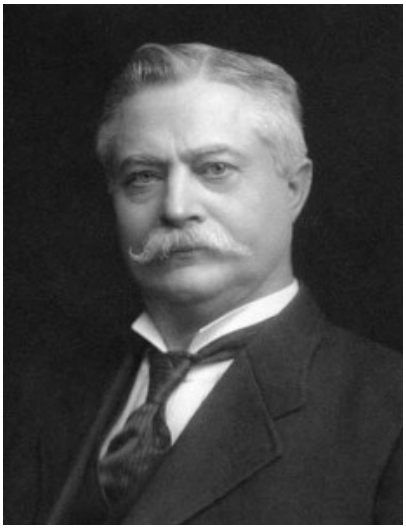
Background

Tens of thousands of concert zithers were manufactured in both Europe and the United States in the late 1800s and early 1900s. There were many shapes and styles, with the number of strings often ranging from 31 to 46. Most concert zithers were basic “entry level” instruments with little or no decoration and a laminated front (usually black walnut) and sides with a back painted black. Some, like the gorgeous zither in this repair log, were highly ornate and decorated with marquetry, mother of pearl and abalone inlays and laminated walnut or rosewood on the front, sides and back.

The label inside this beautiful concert zither is very faded from moisture, but the name Carl Fischer is visible as is the street name, Cooper Square. Carl Fischer Music was founded in 1872 when he opened his musical instrument repair shop in an East Village neighborhood of New York City. He supplied musicians with sheet music, including zither music, and instruments from Europe, while supplementing his income with professional engagements as a violinist in several orchestras and bands throughout the city.

As his company grew too large for the original store, his family, in 1924, shortly after Carl passed away, constructed a new 12-story building on Cooper Square, in Manhattan, where they stayed until the fourth-generation heirs sold the building in 1999. The company, now 146 years old, is currently based on Long Island.

Carl Fischer was not an instrument manufacturer, but a reseller. I found no maker marks inside this beautiful harp-like zither, so the original manufacturer is unknown. Because the label says Cooper Square, this zither was probably sold around 1925-1930.



Carl Fischer

Valuation

Concert zithers and the unfretted versions, often called “guitar zithers”, were manufactured on both continents in the late 1800s. The older concert zither companies were primarily in Germany and Austria, and the newer companies were in the eastern and mid-western part of the United States. These were run by German and Austrian immigrants who brought to us their musical knowledge and skills.

Because of the number of manufacturers, and due to the popularity of the instrument at that time, hundreds of thousands were made. Quite a few of those have been destroyed and thrown away when they warped and developed cracks. However, many more, even those in perfect condition, were stored away in attics, closets, and damp basements and are finally being brought to light as estates are inherited or sold. Many now show up on auction web sites, often going for as little as $25, with cracks and very few or no strings, or as high as $1000, if in near-perfect to perfect condition. Very ornate harp-style concert zithers in very good condition, with original cases, can go for more.

Putting a value on this Carl Fischer zither is a little difficult, since the original maker is unknown; however, the history of the Carl Fischer company is fascinating, and it is still a family business. This is a very well-made and well-used instrument that has survived around 90 years. For many people, the value 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 do a thorough assessment of the instrument. This beautiful old zither showed that at one time it had been played quite often. The fingerboard was a little worn but not pitted.

The biggest problem was the large upward warping around the sound hole. It appears that this zither had been exposed to water or was stored in a damp area. The biggest warp also caused a large crack to form through the base wood and the lamination.

The back was in good shape, even with the old, well-done repair. Five 1/8 inch “plugs” went through the back into the hitch pin block. This may have been added to repair a failed glue joint or to keep the pin block from turning up from the decades of string tension. (A common happening on many old zithers I’ve restored.)

The mechanical tuning gears and all the tuning pins were corroded. The strings were blackened and partially corroded from many years of playing.

Days 2 & 3: String and Hardware Removal

On the second and third day, I removed the strings, the tuning pins and the tuning gears. All the tuning pins were rusty and needed cleaning. The nickel silver plate that covered the gears was corroded. These I would later clean and polish.

The tuning pin tops are square, which is typical of later German and U.S. zithers. They are also reverse threaded, common in German zithers of this era. This means that they loosen clockwise. Earlier zithers, from the late 1800s up to World War I, had rectangular topped tuning pins.

Day 4: Additional Assessment

After removing all the strings and hardware, I was able to get a better look at the problems.

I could now see that the top crack was humped up quite a bit from the sound hole warp. The label is faded so much that the model name information is missing. Only Carl Fischer's name and store location are visible. Water stain is visible inside around the label.

The fingerboard showed wear. This instrument was heavily played at one time.

At one approximately six-inch section on the side, a glue joint failed where the sides met the back. This is the spot where I'll begin the back removal.

Days 5 & 6: Removing the Back

It took me two days to carefully remove the back. I used a special hot knife that was on the end of a hand-held heating device.

This device is like a soldering iron or wood burner but has thin blades, similar to small Xacto blades, that screw into the end.

All instruments from this period were put together with hide glue. Hide glue is reversible. A little heat and a little moisture (I used a spritzer) cause the glue to become viscous enough for parts to come apart.

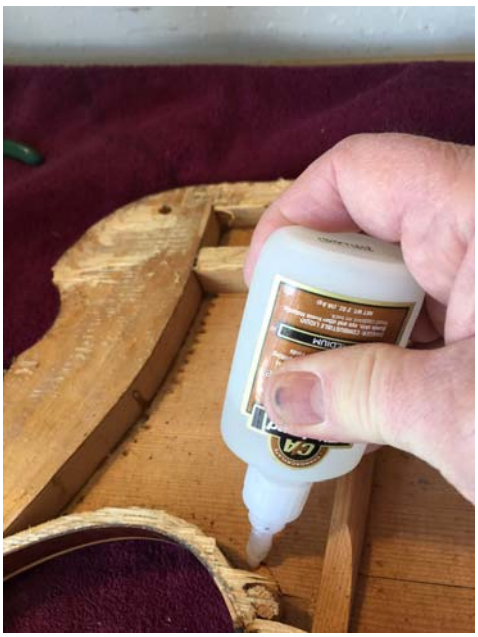
Several zithers and other stringed instruments I've restored have come to me already falling apart because of storage in unsuitable environments such as hot attics, damp basements, or storage facilities in humid areas of the country. The hide glue softens, and joints fail as the still tight strings pull pieces apart.

Day 7: Fixing Back Crack

After taking the back off, I noticed a crack that had formed along the edge that was under the fingerboard. The crack was only in the base wood and didn’t go through the back veneer.

I applied some thin instant wood glue and let it wick into the crack then, clamped it down to hold the crack closed.

Day 8: Starting on Top Crack and Sound Hole Warp



A small area of the top crack ran to the tuning pin block. This area wasn't a big problem, so I injected some instant wood glue, like I used on the back, and let it wick into the crack.

I also started work on the sound hole warps. For this first try, I damped the wood a little and started applying clamps to try to flatten the warp. It worked a little, but not enough.

Days 9 to 11: Steam Un-bending

Because my first attempt at flattening the warp didn't work well enough, I decided to go with steam bending.

I use another type of heating device to bend thin woods for the curved sides of dulcimers and guitars. For this type of repair, I used my hand-held heating device with a flat surface set on high heat.

I first spritzed enough water to dampen the underside of the warps, then with a flat piece of wood under the warp, pushed down in several places to flatten the wood.

The process took three days. I clamped flat pieces of wood top and bottom between wood bending sessions until the warp was almost gone. I left the last clamping overnight until the wood was completely dry. The top looked much better.

Day 12: More Work on Top Crack

Now that the top was quite flat, I worked more on sealing up the top crack. This time I forced white glue into the crack. I couldn't use the instant glue here because the thin glue would have leaked onto the top surface and I would have to sand the top, which is touchy because of the thin veneer. It wouldn't have taken much sanding to go through the veneer and expose the base wood underneath.

Day 13: Repairing Loose Brace

The large warp had also loosened one of the top braces. On this day I forced more white glue under the loose brace and clamped it down.

Day 14: Cleaning the Top

Now that the warp was nearly gone I worked on cleaning the top. I first used the round edge of a cabinet scraper to remove any glue that had squeezed out of the crack repair.

I cleaned the top with water mixed with a little mild liquid dish soap, then dried it with paper towels.

Day 15: New Bracing

Wood has memory. There is a chance that the area around the sound hole could warp a little again trying to get back to its previous shape.

To protect the wood from warping again, I glued two pine cleats on each side of the sound hole. Once clamped in place, the sound hole warp was gone and would not return.

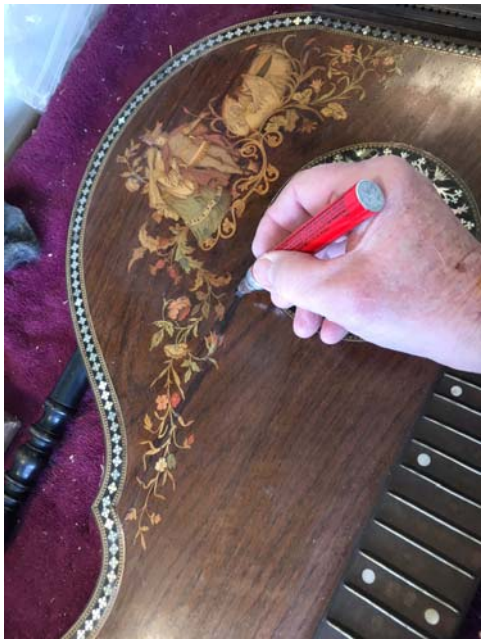
Day 16: Cleats

Whenever I close cracks, I glue cleats on the underside to help stabilize them. These are thin pieces of maple I set crosswise over the crack. This will keep the crack from opening again if in the future some more wood shrinkage occurs.

Soft wood, like the spruce base wood under the veneers, tends to shrink and expand with environment changes, like periods of heat and cold. Heat will expand the wood, especially humid heat. Cold will shrink the wood. Keep the instrument in a moderately controlled temperature.

Note: leaving any wooden instrument in a hot car will often destroy it.

Day 17: Top Touch Up



The large sound hole warp next to the beautiful marquetry caused some of the pieces of mother of pearl inlay to pop out. I found two small pieces inside the zither when I removed the back and saved them to insert later. Unfortunately, a couple were missing.

When I removed the squeezed-out glue with the scraper, it left a thin line of unfinished veneer. I have several different colors of touch-up pens and used one that matched the dark wood color to cover the discoloration.

Day 18: Ebonizing Fingerboard

The fingerboard was worn and faded from use. Many years of oils and sweat from playing can wear and fade the surface.

When I cleaned the top, I also cleaned the fingerboard between all the frets. A sponge cleaned most of it, but I had to clean the narrow frets at the lower end of the fingerboard with cotton swabs.

To bring the ebony fingerboard back to its original dark finish, I first put painter's tape around the fingerboard, so no stain could get on the veneer, then applied a water-based black stain with a small brush and cotton swabs.

Note: Fingerboards on fancy zithers like this one are made with ebony. Cheaper concert zithers often have maple or birch fingerboards stained to look like ebony.

Days 19 to 23: Liquid Mother of Pearl

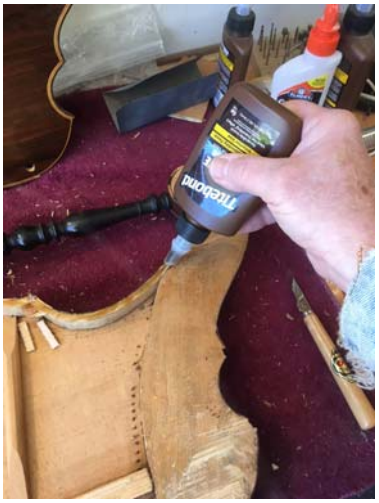
I've never had to replace mother of pearl pieces before. After a little research, I found a liquid mother of pearl on the internet that would help in replacing the missing pieces. It only took two days after ordering for the liquid MOP to arrive.

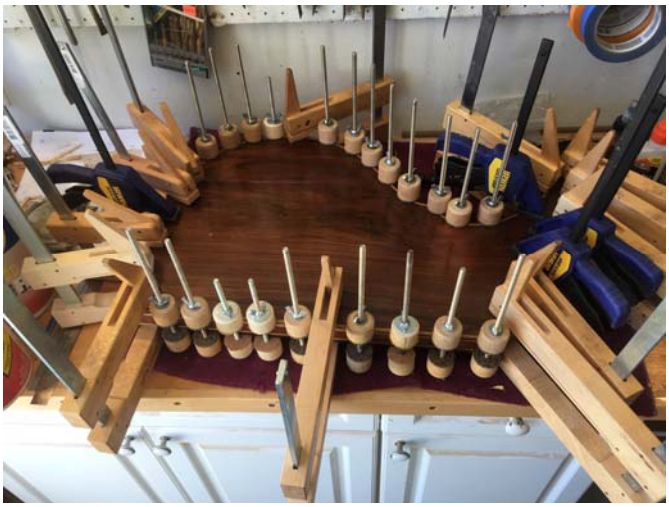
While waiting for the liquid MOP to arrive, I glued the couple of pieces I found back in place.

When it arrived, I started filling the voids with the liquid. I used a toothpick to daub the liquid into the spaces. Each application slowly filled the voids. The liquid was slow drying, so it took several days to fill them.

After the last application dried, I used a fine-point black marker to touch up around the new inlays.

Day 24: Gluing on the Back





Big day! Time to reglue the back to the frame.

As is necessary with stringed instruments of this type, I used hide glue. As I mentioned before, hide glue is reversible. Therefore, if any repairs would be needed at some future date, a repair person could again remove the back if needed.

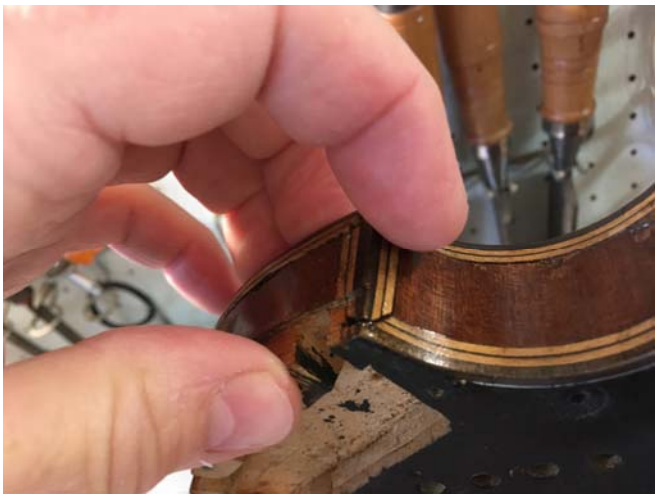
I use a prepared hide glue made by Titebond. This is a very good and convenient way to use hide glue instead of making it with flakes and a hot pot. The one downside to prepared hide glue is that it won't last in the container for much more than a year. Whenever I use it, I purchase a new bottle so it's at its optimum strength.

Day 25: Reinstalling Binding

After I removed all the clamps, I started reinstalling the binding and purfling pieces that had come off when I removed the back.

Again, I used hide glue.

Days 26 to 28: Binding Repairs



Several of the small edge pieces of binding had popped out when I removed the back. It took a few days to piece them all back together.

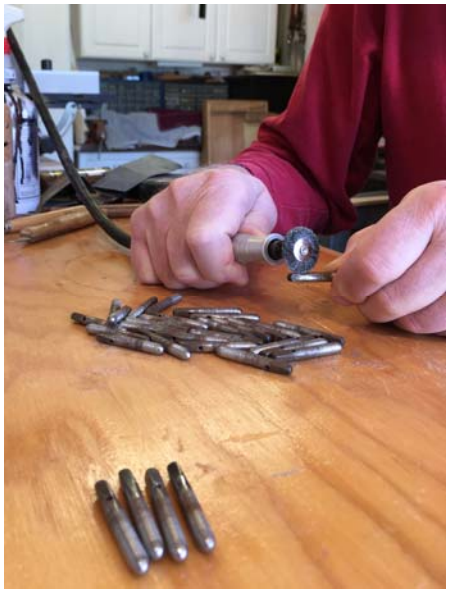
Days 29 & 30: Continued Touch Up

With all the binding and purfling pieces back in place, I spent two days touching up all the edges.

Day 31: Reinstalling Plugs

Since the back had been drilled for the small plugs and there was really no way to patch the veneer there, I thought it would be prudent to reinstall the same plugs back in. At this point, with the internal repairs done, these plugs are only in place as a piece of the instrument's history.

Days 32 & 33: Cleaning Hardware



For two days I cleaned all the hardware. For the tuning gear cover I used a metal polish to clean and shine it.

The harder part, which took two days, was cleaning the corrosion off the tuning pins. I use a small fine wire brush on my rotary carving tool to clean off each of the many tuning pins. This is hard on the wrists, so I had to take breaks quite often.

I also used 0000 steel wool (very fine) to clean the corrosion off the metal bridge inserts.

Days 34 to 37: Varnishing

To get the zither's original shine back, and to protect the surface more, I applied two coats of tung oil varnish. I could only do one surface at a time, so after 24 hours, after one surface dried completely, I'd turn the zither over or on edge and do the other surfaces.

Day 38: Waxing

I let the tung oil varnish set for a couple of days. I then applied a dark paste wax with 0000 steel wool. I applied it this way to work any dust specks and/or brush strokes out of the surfaces.

Dark paste wax is good to use on dark walnut or rosewood surfaces.

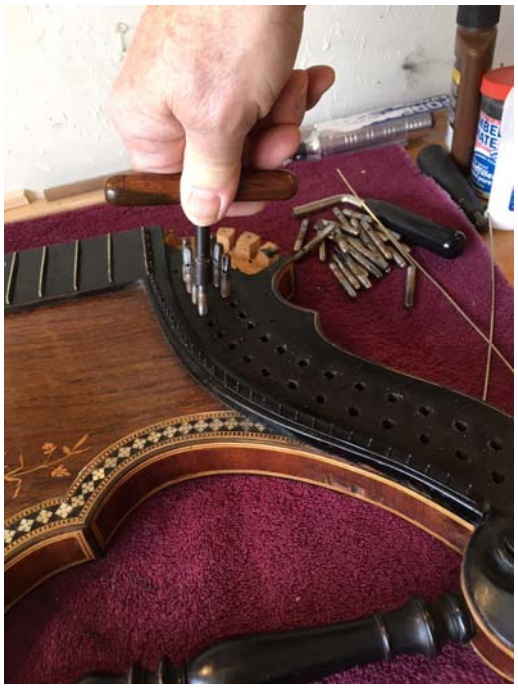
Day 39: Swelling Liquid

Before reinstalling the tuning pins, I always squirt some swelling liquid into the pin holes.

Removing tuning pins often cause the holes to be slightly larger. Without the swelling liquid, the pins would not hold as well as when the zither was new, and the strings would not hold their tuning.

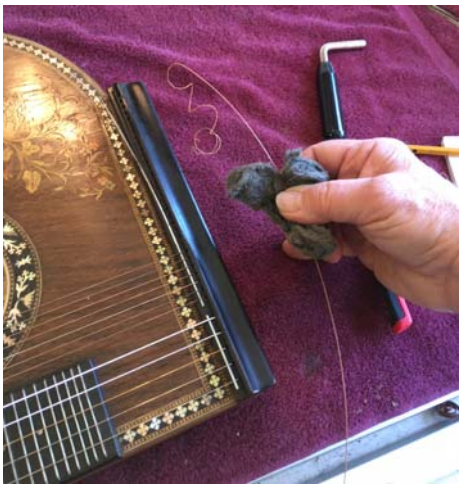
Swelling liquid is mainly used by furniture repairers and poured around chair rungs or in rung holes to tighten up loose chairs. I've found it works quite well when restoring zithers. I let the liquid soak in for two days before reinstalling the hardware.

Days 40 & 41: Reinstalling Hardware



Now that the wood had swollen so the pin holes were smaller, I spent the next two days reinstalling all the tuning pins and the tuning gears.

Days 42 & 43: Stringing



It took another two days to restring the zither. I was able to salvage nearly all the strings, but I had to clean each string with 0000 steel wool to take all the corrosion off and shine up the strings like new.

The only strings that needed replacing were the fingerboard strings and two missing contrabass strings.

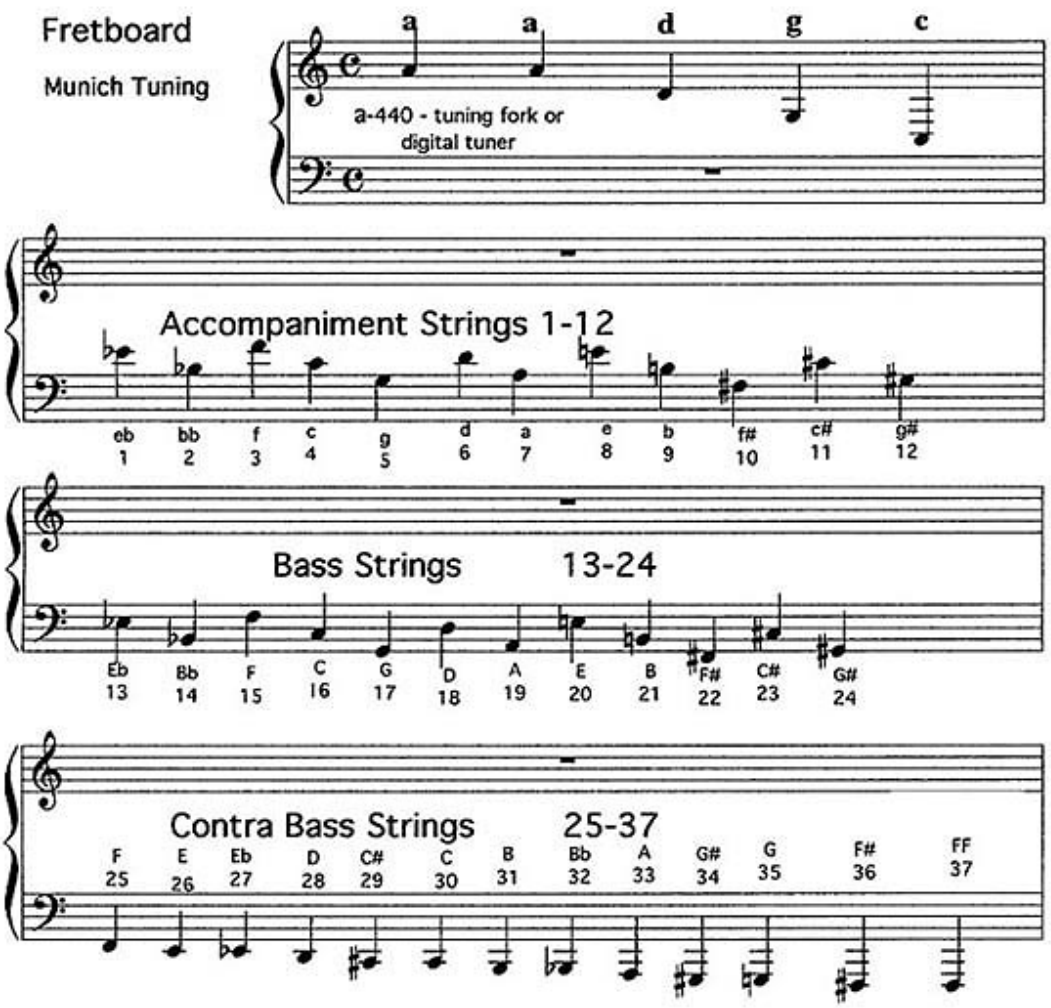
Day 44: Completion

With stringing done, I reinstalled the three spiked feet on the bottom, then I partially tuned it up. The few new strings will continue to stretch for a short while until they stabilize.

This is a very beautiful zither with pretty mother of pearl rosette and binding and wood marquetry. The tone is beautiful, and I'm sure this will make wonderful music once again for many years.

Concert Zither String Diagram
Munich Tuning

There are two zither stringing formats in use today: Munich and Vienna. Munich is the most commonly used because it incorporates every note in the chromatic scale encompassed by the scope of the instrument. The stringing pattern on the fretboard is like the violin family, a fifth apart. The open strings are in the circle of fifths, broken between Eb and Ab and laid flat on the zither, similar to a accordion layout.



In addition to the basic 29 fretboard, accompaniment and bass strings, zithers may have 2, 3, 5, 7, 9 or 13 contra bass strings - the full harp zither has 42 strings (5 fretboard and 37 open strings). In some early versions, and on perfecta zithers, the contra basses were arranged in the same circle of fifths as the accompaniment and bass strings. Munich tuning was often expressed in treble clef (violin key, or similar to guitar clef) but today is mostly written in bass clef.