

# Musical Instrument Care - James Jones Instruments

This page is dedicated to things you can do to take care of whatever musical instrument you happen to own. Further down on this page are things specific to hammered dulcimers above and beyond your hammered dulcimer owner's manual.

## Humidity/Dryness

All musical instruments made of solid wood are affected by changes in humidity. Instruments with laminated soundboards are essentially unaffected by the same changes. Solid wood on the other hand is hygroscopic which means that even though it is off the tree and in the instrument the material continues to absorb humidity when the relative humidity is high and lose it when conditions are dry. When wood absorbs humidity the wood swells and gets larger. A moderate amount of swelling is usually not of concern although it sometimes can cause tuning, playing action problems and occasionally unexplained buzzes in response to parts moving about. Prolonged exposure to high humidity, on the other hand, can severely damage a soundboard causing it to belly up and not recover. This sometimes means that the whole soundboard might have to be replaced so avoid leaving your instrument in a moist basement, tropical climates and in general rainy and high humidity environments.

Losing moisture on the other hand causes the material to shrink and possibly crack. At particular risk are soundboards of instruments. The larger the instrument and its soundboard, the greater the risk. As soundboards are bound on the edges there is a limit to how far the wood can shrink before something has to give. The result usually is the dreaded crack. These separations will never repair themselves. They will get wider in the winter and closer together in the summer in response to changing conditions. Usually cracks aren't as much cause for concern at least from a structural standpoint. Severe expansion is worse. Cracks can eventually be repaired and that is best done when the crack is most separated (late winter).

Instruments are most at risk for cracking during the winter during extended heating seasons where the relative humidity stays below 20% for long periods of time and during seasonal shifts where the humidity levels change rapidly. There are also areas of the country where the relative humidity stays very low making instruments brought into those areas potential candidates for splits. Most instruments are built at the mean of 40% relative humidity so they should be able to accommodate both the up and the down without difficulty. Small instruments such as zithers or bowed psalteries usually accommodate most changes in stride. Larger hammered dulcimers and harps are most at risk and will benefit from precautions taken.

## What Can Be Done

I recommend you trying to keep humidity levels around that mean of 40%

- The best solution for us all (human beings and instruments) is whole house humidification.
- The next best is to run a humidifier in the room with your instruments.
- Another help is to leave the instrument in the case with something that will create a small localized increase in the humidity level (within the case).
- Use a dehumidifier in rooms or environments where the humidity is high
- Avoid placing your instrument in extreme environments such as closed cars in the summer, right next to wood stoves, basements, in the sun, etc.
  
- A low tech way of adding humidity; sponges in a ziploc bag. Punch small holes on one face of the bag.

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## Hammered Dulcimer Care and Info

### Your Stringing Chart

The stringing chart which indicates what pitches the instrument is tuned to and what different gauges of wire are recommended for that particular instrument is probably the most valuable piece of paper you have. Make extra copies and keep them in safe places. You need that piece of paper when ordering strings and to pass on if the instrument leaves your possession. I and history will thank you. If you have lost yours, you can find a copy of your stringing chart by following this link.

### Number of Strings per Course

Most contemporary instruments have only 2 strings per course with sometimes 3 on the higher courses. Older instruments and those from Eastern European traditions may have as many as 4 strings per course. Having more strings per course will give the dulcimer a unique sound but greatly increases the tension on the instrument and the difficulty of keeping the instrument in tune. Most players are gratefully only having to deal with 2 strings per course.

### Gauges

Most dulcimers use a variety of different string gauges. I would recommend using what your maker suggests unless you have a compelling reason to switch. The reason various gauges are used is to compensate for the foreshortening affect that occurs by necessity in dulcimer designs. As a result you will go from finer thin steel on top through phosphor bronze down through a variety of wound strings on the bottom end. The range of types and sizes will depend on the size and range of your instrument. In a pinch you can always replace a #8 with a #7 but not the other way around. In other words replace a thicker string with a thinner. When strings are referred to as #8, #7 etc this is a short way of describing the actual thickness of the wire in hundreds; for example a #8 is .012 in diameter, a #7 is .011.

### String Spacing

Spacing varies on most hammered dulcimers from the closest of 3/4" to 1 1/4" on center. Tighter spacing enables smaller instruments and more compact playing patterns while wider spacing enables less exact play and is more forgiving for beginners.

### Kinds of Wire

There are four kinds of wire in general use in hammered dulcimers: steel, brass, phosphor bronze and wound strings. Within those families you will find a whole range of sizes. Most of these kinds of strings are not available through music stores so it is wise to carry some spares particularly of the more fragile brass and phosphor bronze strings and the higher thinner wires used for the highest pitches. Wound strings suitable for the hammered dulcimer generally have to be special made to get the necessary length. I have all varieties of strings available for sale. Spare strings are usually provided with a loop end. I provide all loop end strings so when one breaks you always have one still available (assuming two strings per course).

### Replacing Strings

Replacing a string is always a daunting task the first time but with the proper tools and technique you soon will feel comfortable doing it. The link will take you through the process whether it is one string or the whole instrument.. Fortunately strings break infrequently.

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## Frequency of Replacement

Solid steel and phosphor bronze strings can last for many years especially if you rub off the tarnish with 0000 steel wool or 600 grit sandpaper periodically. Wound strings do become dead after a couple of years and will need to be replaced if you want the best sound from your low end.

## By Whom

If you are replacing one or two you should be able to handle the task but if you are getting a completely new set I recommend you sending the instrument back to the maker. It'll cost you but you'll save yourself a lot of aggravation. If you want to do it yourself, I've put some instructions on this page.

## Tools

You will need a good needle nosed pliers and wire cutter.

## Intonation

As most dulcimers provide a 5th interval across the treble bridge it is absolutely essential that the 5th be right. This means the bridge must be very accurately placed. I do my best to insure that when a dulcimer leaves my shop it is in the right place but I have bad days too and occasionally a bridge gets shifted by a blow. Make sure its not just the result of the strings sticking on the saddle. Over time strings will wear into the acetal rod which caps the top of the treble bridge. Soon the string will begin to stick in that groove giving you uneven tension on either side of the bridge; in other words a false reading of bridge location. To discover whether that is the case, tune both strings to as close to the pitches as possible. If one side is still sharp to the other, lift the strings up with your fingers to equalize the tension of the strings on both sides of the bridge. If that gives you an accurate fifth than the problem is the groove in the top of the saddle. Fixing that means loosening the strings slightly and rotating the saddle giving a fresh takeoff point. If you move your bridge without first checking for unequal tension you may lose your fifth interval bridge placement unnecessarily.

## Tuners

In order to accurately get that 5th interval, I recommend using an electronic tuner. The tuner I'm using these days is located on my ipad. You can get them for most smart phones as well. I'm using INS; the free version. It really locks onto the fundamental, making it considerably easier then following a needle.

## Intonation Continued

If you suspect that the bridge is not right it may be moved by tapping the bridges' base with a cutoff fat children's pencil with the erasure end reduced to about 1/4 inch. (see photo on left). Using this prepared pencil and a hammer tap the base and only the base of the bridge to nudge it in the direction necessary. Make sure you place the erasure on the base of the bridge between the holes and not on the border of the soundboard and bridge as you will dent your soundboard. If you put the erasure too high on the bridge, you can knock the top off your bridge. You can make these adjustments without loosening the strings. Sometimes though the bridge will be resistant to moving as it may have become stuck to the finish. In that case, you may need to tap it with a little more force to free it up before actually making the adjustment. If the left side is sharp in relationship to the right side than move the bridge to the right and au contraire. Most of the time you'll be adjusting just fractions of an inch.

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## Bridge Saddles

Contact points where strings cross bridges are usually of, metal (stainless steel or brass, acetal rod or Delrin (brand name) or in some cases wood. You better hope you don't have wood saddles as they aren't hard enough to give you solid contact points for the strings. Metal saddles will bring out more ringing and higher frequencies and is often used for higher courses. Acetal rod is the saddle of choice these days as it is hard, strong, comes in two colors black and white and is self lubricating which means for the most part strings slide easily over it.

## Care and Protection

Your first line of protection is of course your case. Soft cases, hard cases, flight cases, all provide varying degrees of protection Usually a dulcimer is most vulnerable to damage on the bridge face. Bridges in particular already are being pressed down hard by strings so can receive very little extra energy without damage. Don't lean that dulcimer anywhere it can fall over and land on its face. You will probably break bridges if that happens. When shipping an instrument you most also pay extra attention to the bridge face and the ends. This link will take you to more specifics on shipping your instrument. Flying with your instrument involves many issues. I have pages of my site dedicated to both shipping and air travel. Hard cases although providing more protection add considerable weight to your instrument making transportation of the instrument in such a case more of chore.

## Dusting/Cleaning

Most instruments just need to be dusted using a combination of rags tacked on the end of sticks and 2" wide paintbrushes for between the pins. On more stubborn substances you discover on soundboards I recommend dampening the rag initially with water. If that doesn't do it try some mineral spirits on a small rag. Anything stronger might damage the finish.

## Tuning aids

One of the most persistent and difficult tasks for owner's of hammered dulcimers is that fact there are so many strings to keep in tune. A well tuned dulcimer is a pleasure to play and to listen to but if even one of the strings on a particular course is slightly off that course will sound bad. Your primary tool for tuning is your wrench. There are fundamentally two types of tuners: the T style wrench and the Gooseneck. Most people use the T style wrench. The gooseneck has the ability to make more subtle changes as its leverage is greater but if you are not careful you can loosen the pin with that same leverage by leaning too much on the wrench. At minimum you must have a tuning reference. This can be as simple as a tuning fork but could be a piano or something else you know is already in tune such as an electronic keyboard. Electronic tuners are helpful especially if your ear is weak or you are tuning in noisy environments. There are a lot of varieties on the market. I recommend a fully chromatic tuner. Tuner cords are often used in conjunction with an electronic tuner. You plug the chord into the side of the electronic tuner and clip the other end onto a tuning pin on the instrument. The clipped end has a sensor which reads the vibrations directly off the instrument and gives you a stronger signal than just the internal electronic tuner mic. It also of course doesn't care if you are in a very noisy room as it just reads the vibrations of the instrument not those of your noisy neighbors.

## Tone

There are a lot of different styles and types of hammered dulcimers out there each with a characteristic tone, level of sustain, loudness and of course general playability. Soundboard and bridge selection have the greatest influence on the tone once a particular size instrument has been selected. In general smaller instruments are going to be brighter and less full toned than

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larger instruments. Once the instrument has been built there are very few ways to affect those characteristics except by adding dampers or varying what the instrument is struck by (see next section).

## **Playing Hammers**

There are an incredible number of different types of playing hammers out there and what you strike your instrument with will greatly affect its tone. Hammers most often fall in two categories: double sided hammers with leather or some other soft material on one side of the striking surface and hard wood on the other. What is placed on the soft surface can be experimented with. All woods providing the hard surface don't give you the same tone either. Woods vary from being quite hard to very soft each giving a slightly different tonal quality. The length, size of the head, overall weight, configuration of the handle and balance all contribute to the 'feel' of the hammer and its desirability.

## **Ease of Play**

Ease of play is affected by string spacing and tension, string background, size of the instrument, note accessibility, relationship of the bridges, the distance between those bridges.

## **Structure**

A hammered dulcimer is a combination of frame, back, soundboard and bridges all dedicated to handling the accumulated tension of a great number of strings and yet accomplish the essentials of tone production. The following is a list of the problems with the structure of the instrument you might encounter.

## **Splits**

See humidity section above.

## **Distortions**

Distortions of the back or soundboard can be caused by very humid environments, insufficient internal bracing, a soundboard which is too thin, or structural members inadequate to the task causing the whole instrument to distort.

## **Frame**

Frame members usually remain alright unless they happen to split.

## **Hitch and Tuning pins**

Hitch pins must not be pulling up. Tuning pins must be able to hold the tension of the strings at the designated pitch. Tuning pins are just fine threaded screws which rely on friction to do their job. You want to avoid ever removing a tuning pin unless it is obvious that it is not holding pitch. If you remove a pin unnecessarily you can guarantee that it won't hold very well if you just re-insert it as you have compromised its ability to hold. If a pin is not holding you must remove the pin and just slightly rebuild the interior of the hole. I usually take a toothpick and wipe multiple thin layers of superglue on the sides of the hole. Wait for an hour to make sure the glue is set. Re-insert the tuning pin. A quick fix would be to remove the pin, place a piece of paper as a hole liner and re-insert the pin.

## **Pin Blocks**

Pin blocks must be at least of solid maple or laminated maples. Other woods are just not hard enough to use as pin blocks.

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## **Finish and cosmetics**

Dulcimers are finished with a whole variety of different finishes. Surface finishes like lacquers may be water based or nitrocellulose. Polyurethane may be used as well as combinations of oil and polys. Penetrating finishes such as oils may also be used. I recommend finding out what was used on your instrument originally. This is valuable information for accomplishing any future repairs as well as determining ongoing care.

## **String Buzzes**

Before you ever began searching for buzzes or anomalies make sure your instrument is in excellent tune. Sometimes what can sound like a buzz is just two strings in a course which are not tuned in unison. Once you are satisfied that the instrument is in excellent tune and you still get what you consider buzzes proceed.

99% of all buzzes on my instruments are caused by insufficient string contact on the 1/8" diameter plastic (acetal) or metal saddle running in the groove on the long narrow bridge on the right side of the instrument. The usual problem strings are the tails of strings coming off the bass bridge. This tails aren't played but they can either buzz or vibrate sympathetically when notes you usually play are struck.

Locate the offender by striking the suspected course vigorously with your left hand while your right hand attempts to mute the buzz by pressing downward with a finger along that saddle. This can be difficult if you have dampers. You can also use masking tape to selective dampen tails. The buzz is usually caused by a string tail which is neither down hard on the saddle or clearly off the saddle. The string is hovering close enough to the saddle so that when the course is struck it buzzes against the saddle. The solution is to loosen the tuning pin and string enough so that you can rewind the string closer to the bottom of the tuning pin (to make greater contact with the saddle) or rewind the string slightly higher on the pin which would lift the string clear of the saddle. Either way you should have eliminated this type of buzz. You may have to check all the courses before you find the offending string as sometimes you will strike one course and the buzz will actually be the tail of another course.

Sometimes buzzes may occur because a bridge (or the string) shifted and the string rattles against a bridge when struck hard. To eliminate these first just try and move the string to the side. If that doesn't work your going to have to tap or move the bridge slightly using a sawed off pencil with the erasure end against the bridge. Move the bridge just enough to give the vibrating course clearance. Make sure you don't move the bridge so much you cause additional problems or buzzes

Occasionally on my larger instruments the wound strings may have become too close together so that when struck hard they literally bang into each other. If that seems to be the case separate the individual strings in the course. If the strings won't maintain that separation you can put just a slight groove in the top of the saddle with a knife or sharp file. Don't go too deep or you'll kill the tone of the string. Do not groove the treble bridge saddle as this will affect the fifth interval. Sometimes its a simple matter of just pushing the strings apart with your finger.

Buzzes or unexplained rattles can sometimes be caused by something that is vibrating in sympathy with a course that is being struck. This could be almost anything from a damper part to a loose knob on a stand. You have to think outside the box to locate these guys.

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Some people don't want to hear anything sympathetic so they'll weave small pieces of leather or felt between the two strings in the course effectively damping all tails and anything that could potentially vibrate in sympathy. I don't recommend doing this as I really think the tone of the individual courses benefits from having a freely vibrating tail but that decision is yours.

## **Support**

Support of your instrument is a important. It affects your ability to play comfortably as well as the overall tone of the instrument. Hammered dulcimer stands are offered in a variety of styles. Generally the two positions are sitting down and standing up with a playing angle of between 5-30 degrees. Most better stands are adjustable. Some stands such as the scissors stands and the tri or flat standers are more portable. Table supports can be used but aren't particularly useful unless you don't want to carry a stand when traveling. Mono pod legs aren't used much anymore as they place the instrument too close and at the wrong angle for comfortable play. Some stands are particularly stable and desirable for play with dampers (the tri or flat-standers).

## **Amplification**

There are a a number of different options for increasing the volume of your instrument for the purposes of performance. The two options I offer are piezo film transducers and magnetic pickups. You can cobble up your own attached amplifiers by purchasing lavalier style mics and mounting them internally or using other styles of contact transducers. The advantage of internal installations are just that they are internal and not in the way. Microphones are still important sources although need to be placed in positions where they don't impede play. A mic angled down at about 45 degrees toward the top edge of the top rail roughly 6-8 inches away is a good starting place. If you are outdoors and its windy a wind screen on the mic is a necessity.

## **Dampers**

There are a lot of specific instructions for caring for dampers and for removing and reinstalling them for string changes. Click on this link for my information on that subject.

Replacing strings if you have dampers is a whole lot easier if you remove the damper flappers and set them to the side. To accomplish this unscrew the screws that hold the bottom pillow block . Holding the damper in place, carefully remove the screws from the lower pillow block. Than, with control and holding onto the lower pillow block, slide the tube end out of the hole in the top pillow block keeping the pillow block assembly (tube, flapper and lower pillow block) together. Let the flapper rotate in your hand to take the tension off the spring.

Don't let the pillow block or damper flapper strike the instrument as it rotates. You don't have to remove the top pillow block. You won't be able to take the flappers far from the instrument unless you remove the attached cord but if the cord shows a lot of wear, you may want to cut and replace the cord.

Reinstalling the damper and lower pillow block is all those steps in reverse. Slip the top end of the tube into the top pillow block. Rotate the tube/flapper until it rests on the stop pin located on the top pillow block. This will set the proper amount of tension or pre-load on the spring. Once the tension has been set place the bottom pillow block over the screw holes and reinsert the screws. Make sure the end of the screw goes in the pilot hole on the instrument. You know you've done it right if the damper is being held in the up position by the spring and it rotates on its axis.