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From: John Dallas

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So do any of you "sweet tuners" ignore the tuner altogether, and do it by ear?

[Bob]

I'll start by saying that tuning an autoharp by ear until it seems right is a pain, and one is not likely to get exactly the same result twice. You can spend more time tuning than playing, trust me.

You have perhaps rediscovered the wheel re tuning, but I suggest purchase of a good tuner for accuracy, consistency, and speed of tuning. The Seiko ST-747 for around \$30 will get you there, since it is one of the few of, if not the only, inexpensive ones that can accurately set special tunings without the subjective interpretation of an analog dial, a moving target. The Seiko will show you the +- digits on the LCD display.

I note in your follow up post that you sounded a bit cynical about quantifying tuning settings, preferring perhaps to romanticize it a bit by celebrating natural ability over math or science. Just understand that there needs to be some method of achieving the same result consistently and quickly with some hope of being in a zone that's playable with a fellow musician.

Even if you prefer to tune by ear and perhaps do it well, it is still easier or comforting to understand some of the principles involved. Like it or not, there is a science to it and a well developed body of work on the subject.

It sounds like you achieved something like Just Major temperament and will probably find that the ii chord is quite unsatisfactory. Just Intonation is done either to optimize the minor third intervals (Just Minor) or the major third intervals (Just Major). Note that "Mean tone" tunings are merely an attempt to compromise on the two Just temperaments. As "mean" implies, the 22 cent variance inherent on one interval in each scale is averaged between the major thirds and minor thirds. Coincidentally the same result is achieved by uniformly flattening all the fifth intervals in a either a diatonic or chromatic scale.

Within Just Intonation, primarily applied to the diatonic scale, most but not

all fifths are perfect (Pythagorean) (no beats). Totally Pythagorean would not be a practical tuning for a chording instrument, because the V and ii chord share a note (II) that requires a different tuning for each chord. Just Intonation is Pythagorean (perfect fifths) except for the choice of favoring either the ii (Just Minor) or the V chord (Just Major). One or the other chord is not usable unless all the notes in the diatonic scale are tuned as if tempered with the neighboring key (that associated with the root of the IV chord). Thus a variant of meantone, most commonly 1/4 comma meantone, is a better choice for even single key, regardless that it is counterintuitive described as a way of tempering multiple keys, yet employed on a single key harp. That is to say that Just Intonation has no real application on an autoharp unless a tune uses a ii without a V or a V without a ii or there is some clever way of switching on the fly between the two tunings required of one note in the scale (II).

Also note that 7th chords are acceptable in meantone tunings but are out of tune in Just Intonation. Thus a Just harp cannot have 7th chords, which actually sound best in equal temperament. The Just player would then have to use the V and the IV to pick out all the notes he or she would have otherwise found available in the V7 alone on another instrument.

If you analyze the intervals of the chords in meantone tuning, you should have a fifth interval that is uniformly more narrow than the fifth interval yielded by equal temperament, itself more narrow than a perfect fifth (700 cents vs. 702), major thirds that are significantly flat, and minor thirds that are quite sharp. By "flat" I mean the tuning of the major third note is lowered, with "sharp" meaning the tuning of the minor third note is raised.

If you make all the fifths equally flat yet tolerable, you will have a good tuning overall. Equal temperament is one of these meantone tunings (1/12 comma meantone). That is done by piano tuners, certainly those who tune at least partly by ear, by counting beat rates produced by the fifth interval. Each fifth interval tuning has a characteristic beat rate (beats per second). If you base your tuning on pure fifths (that don't beat), it won't work. That is Pythagorean temperament, which sounds dreadful on some triads and is only suitable for open fifths on a pentatonic harp. A pentatonic instrument (5 note scale) would have only one complete triad, but only the root and fifth of that potential chord should be open on the felting. All chord bars would be just I and V notes and no 7ths. The major third interval would be too sharp to be included with that tuning.

If you use Just Major intonation on a single key harp, you would need to retune

one note of the ii chord before you could play anything in Dorian mode, one of the minor modes. In other minor modes you could probably pick around the bad note or wouldn't need the ii. The ii chord contains a root that is also the fifth of the V chord, requiring two pitches 22 cents apart. An example would be in F single key, where the Gm chord and the C chord both contain G. In Just Major, the tuning most likely selected by ear, if F is +-0, a perfect C would be +2, G would be +4. The I, IV, V, iii, and vi chords would be perfect, but the G in the ii (Gm) would be off by 22 cents. To play the Dorian mode, rooted on the ii chord, the G should be retuned to -18.

A meantone tuning would give you fifths, major thirds, and minor thirds that all had the same adjustment from equal temperament within each type of chord, thus known as a "regular" temperament, principally referring to the uniformity of the fifth interval. That tuning is a compromise but is a science rather than subjective. Various "irregular" temperaments favor the sound of specific cadences, e.g. especially sweet in a particular key and mode at the expense of some other.

When you try to tune by ear, you inevitably tend to favor either a major chord or a minor or a fifth interval and wind up with chords within each type that have a bit different flavor. That's okay though, as long as none of them sound sour, you like the overall result, and you have no one else to please.

You might in fact get a "better" result than a mathematically determined tuning. There are other variables within the instrument, which only your ear can accommodate. They are so subtle though that one should not be the least concerned about addressing them except perhaps for completely personal satisfaction. Few, if any, others will notice. Mathematical tunings are very reliable and quite satisfactory. If you just use the calculated settings and go play, the process is much, much faster, ergo more practical. My sense is that excessive precision is lost when the tuning shifts while the strings are being played or due to environmental effects on the instrument. "Your" tuning is actually a zone within which you are content. That precision is measured in whole cents, not to some number of decimals. Even an instrument tuned to standard with expertise should not be defended as perfect. It will be off a little and will change with play and time.

I should note here that most tuners are unable to set these tunings or even equal temperament (standard) exactly. A little touch up by ear is okay, but one has to be careful not to set one tuning with a machine and wind up with a quite different, perhaps sweeter or irregular, tuning during touchup. A tuner that

sounds reference pitches for the tuning desired will keep you on track. Thus I use the Korg MT-1200 as the only choice for real precision. I also have the new Peterson electronic Virtual Strobe Tuner but I don't care for it much. I have more to learn about using it.

The practical answer to precision is to have a tuner that is steady and has 1-2 cent granularity in the readout. The Seiko ST747 meets those criteria while also being inexpensive. Then just tune to the best of your ability, trusting the tuner, run through the chords without listening too carefully, and just play.

If you check fifths, they will be a little flat. If you check major thirds, they won't be perfectly sweet. If you check minors, they won't be quite as dark as perfection but very nice compared to equal temperament. In other words, you can't trust your ear at that point or you will adjust some chord toward Just Intonation and some other chord will be way off as a result. Again, just play and don't worry about it.

The old method of tuning an autoharp by ear was indeed superior in result to today's common method because it was not equal temperament. It was, by definition, something that sounded as good as we could make it. By cycling through the chords until you get the best compromise and overall sound, you achieve meantone tuning. The problem was it took too long and we didn't achieve exactly the same result twice. We also had trouble tuning independently and then trying to play together. If we didn't understand the principles of tuning, we never stopped tweaking, since it was never perfect and couldn't be.

The reason meantone is so important to get the best sound from an autoharp is because the autoharp plays complete chords like no other instrument, except perhaps the pipe organ, which used special tunings historically. Equal temperament is never the best tuning for an autoharp but merely the most practical for the majority of players. A solo or home instrument is a different story and the perfect candidate for meantone or other special tuning. I have never used equal temperament in 27 years of playing. I intended to but, for a long time, couldn't figure out why matching a pitch pipe didn't sound good. I always tweaked it and cycled through the chords. Then along came electronic tuners as well as a study and understanding of alternate temperaments. There was then no looking back. Tuning was indeed a science.

I believe there are two basic tastes involved in this matter. One player will delight in being able to play lots of tunes, especially with other instruments,

and the other will focus on how the autoharp sounds, content to play or polish a more narrow repertoire and more likely to often play alone. The first will care little about tuning nuances and the other will care a great deal. Those without the necessary tuner will tend to favor equal temperament because that is what their basic tuner supports. In my opinion, the Seiko ST747 is the only cheap "autoharp tuner" and the Korg MT1200, at over \$300 and now discontinued but still available from existing inventories, is the ultimate.

One's choice of tunings is not necessarily "wrong", because it is a matter of taste and personalized application. The key is to be discrete about which tuning is used when folks come together. The independent tunings have to be close or the combination will not sound very good. If everyone used the same foundation pitch and tuned by ear, the tunings should actually be quite close. With a little bit of training, tuning capabilities are very similar among us. Those with extraordinary ability are just a little more precise and maybe faster. The application problem is that few other instruments are quite like the autoharp and, for the most part, more than one or a few autoharps together is more of a joyful noise than pleasing music. The more common application is for one autoharp to play with an ensemble of other instruments or solo. Playing the autoharp in a band is kind of a force fit in my opinion, so I would have to concede that tuning the autoharp to equal temperament, or very close to it, is inevitable in some cases.

Because the autoharp sounds so questionable when not in optimal tuning, I am inclined to characterize it as fundamentally suited as a solo instrument. Any other application is a rather strong compromise for the sake of being able to participate with other instruments. That's okay. Lots of people do it. If it doesn't matter to you, don't worry about it. Just know what's possible.

However, I experience that the autoharps that get the most praise are those that are well tuned. That is most apparent from the solo player. When just right, you don't even have to play in any dazzling manner for the instrument to sound really good and sublimely soothing, both to you and to others. Those instruments that are not well tuned create a questionable reputation for us, not representing the instrument to best advantage.

I suggest that those who use equal temperament for solo playing are really missing the boat. If you are happy and the audience has no basis of comparison, that's fine, but some of the autoharp's potential will be missing from your performance.

Since the advent of electronic tuners, many autoharps are not being tuned as well as they used to be...just faster and more consistently. On the other hand, I suppose some people would give up on the thing if it was too demanding and no suitable tuner aid was available.

tuneit :>)