Dulcimer Fast Track

Case 3: But, It Was in Tune When I Bought It!

By Gwen Caeli

If you play music with others, everyone must use the same tuning rules. Electronic tuners are one way to set those rules. When an instrument's strings are plucked, the vibrations create a 'waveform' (looks like a wave) that constantly repeats itself as it vibrates back and forth and slowly fades out. An electronic tuner mathematically captures those vibrations, it does not have ears to 'hear' them. The range of vibrations (soundwaves) are then calculated by our tuners and are measured by 'Hertz' (Hz). Hertz is a unit of frequency in the International System of Units and is defined as one cycle per second. One of its most common uses is for musical tones. So, in 100 Hz you have 100 music cycles per second, in 400 Hz you have 400 music cycles per second, and so on. In 1926, the American music industry reached an informal standard of 440 Hz (the A note above Middle C) and it started being used as the standard by some instrument manufacturers. It was formally adopted by the American Standards Association in 1936, then was adopted in 1955 by the International Organization for Standards. This is now 'Standard Concert Pitch' in America and the British Isles. Older period instruments in continental Europe often use a 414 Hz, or other pitch as standard. In 1711, tuning forks were invented, but even they had pitch variations. In 1740, Handel's tuning fork was pitched at 422.5 Hz and one in 1780 was pitched at 409 Hz.

Relating this to dulcimer:

- All electronic tuners for dulcimers and other instruments are preset at the standard 440 Hz. Sometimes, when thrown in our instrument cases, a tuner's Hertz setting button might accidentally be pushed and will reset your Hertz. I have had students call me between sessions not being able to get in tune and that is often the culprit. Some tuners will show '440 Hz' on the start-up screen, others have a separate button to locate it. You may need to check and reset your tuner at times.
- When tuning, strike your string hard enough to create strong vibrations and waveforms that your tuner can calibrate – '*wimpy'* will not cut it, strike it like you mean it! You may be out of tune with the person next to you just because your tuner cannot properly calibrate your string's vibrations. It has to 'hear' the vibrations, so be sure it does.
- Make sure you know to *'which tuning peg your string goeth'*! If you keep turning a peg and you hear no difference in the pitch as you strike the string – STOP! You are probably turning the wrong peg and can pop the string attached to the peg you are turning. ***Constantly*** and ***consistently*** pluck the string you are tuning to listen for changes. Know that if you turn a peg, there will a change in the pitch of the string.
- Tune from a pitch that is flat (lower) up to the desired pitch. This minimizes the effect of friction in your tuning mechanism. If you tune down from a sharper (higher) pitch, there is a greater tendency for the mechanism to slip after you are finished tuning.
- There are many sources of friction on a dulcimer's string. The slots in the nut at the peghead end may be tight on the string, preventing it from smoothly gliding over the area or through the slot. Try some graphite, or pencil lead, rubbed into the slot to smooth it out.

- Using a capo puts a lot of pressure on strings, pulling them out of tune. Pressure from a capo can also prevent the strings from sliding smoothly if a tuning peg is being turned while the capo is on the fretboard.
- When you pluck a string, the waveform sound will start shallow, grow tall like the crest of a wave, and return to shallow. This is just a natural part of acoustic instruments and has nothing to do with your tuner or instrument. Your tuner may look like it is jumping all over – it is! It can move up 4 or 5¢ (cents) by the end of the plucked tone. (Musical intervals are often expressed in 'cents' – a unit of pitch based on an equal-tempered octave. A whole step, as in going from a D note to an E note is 200¢. A 12-tone/half-step octave is 1200¢). The first two seconds of tuning will be most accurate.
- Your tuner can pick up 'sympathetic vibrations' between two strings that confuse the tuner. The sound vibration of a plucked string creates movement in the air that causes another string to vibrate and slightly sound. It is the same effect where a classically trained opera singer creates resonant frequencies to smash a crystal goblet. It is the transference of sympathetic vibrations. You can mute the strings that are not being tuned or take the best three out of four tuning tries on each string.
- What's the difference between a dulcimer and a tuna fish? You can tune a dulcimer but you can't tuna fish!