About Pitch Pockets

How to overcome pitch problems of one-section vertical flutes.

By
George Kelischek, December 2015

A Pitch-Pocket is a small, round recess, milled about 90 degrees left or right of a vertical flute's labium window into the side of the instrument's body, creating a pocket for a small, semi-round-head screw, varyingly opening or closing a very small hole drilled through the wall into the bore, for the purpose of raising the pitch of the entire instrument without changing it's length or bore geometry. The Pitch-Pocket screw needs only a one-halve turn to adjust pitch; accomplished with a thumb or fingernail. I hope that my invention will be used by others. It will not be patented! It is also significantly more economic to make one-piece vertical flutes. Jointed sections cause unneeded expenses. Sopranino, soprano and alto-sized vertical flutes are most suitable for Pitch-Pockets. The technique is suitable for instruments made of wood or man made materials of many kinds.

For many centuries, adjusting the pitch of one-section vertical flutes has been very difficult. The pitch of even very well crafted multi-section recorders or pennywhistles still varies to some small extent, while ensemble playing requires that all instruments are tuned to the same reference pitch. Tuning is relatively easy for bowed or plucked stringed instruments. Wind instruments are tuned mainly by varying the length of the instrument's body: pulling sections out a bit, to lower the pitch, or pushing sections closer together, to raise the pitch. Warming up cold instruments a few minutes before tuning the whole ensemble helps as well.

Many makers of multi-section recorders and pennywhistles have come to the realization that tuning all their instruments to exactly A-440Hz when "cold" at room-temperature is not good enough! Such instruments will sound "flat" in cold air and cannot play at A-440Hz until warmed up sufficiently. Most manufacturers are now tuning their vertical flutes to A-442Hz.

To be able to play "on pitch" right away, even when ambient air and the instrument are still somewhat cold, then a tuning of A-442Hz or higher overcomes most of such shortcomings, allowing to play with a cold instrument. When, after playing at A-442Hz tuning for a while, the pitch has gone up too far for comfort, the instrument can be adjusted downward in pitch by pulling one or more sections slightly out to lengthen the bore, thus lowering the pitch. Basically, multi-section instruments **tune downwards,** while one-section instruments can only **tune upwards** in pitch.* Therefore: Pitch-Pocket equipped instruments can still be manufactured at A-440Hz, (or slightly lower, in anticipation of warming-up effects) because their pitch can easily be raised to A-442Hz or higher, even when still cold!

But what can a player do to adjust the pitch of a one-section recorder or pennywhistle? Sound travels faster in hot air, but excessive warming-up of a "flat" one-piece instrument to raise the pitch is not practical. Playing with much higher air-pressure to raise pitch is, for various reasons, not an acceptable solution either.

Here comes Pitch-Pocket to the rescue!

Many wide-bore Renaissance style recorders are, or were, made of one piece of material, with no moveable sections to adjust pitch. (That's why it was customary to buy carefully pitch-matched sets!) Some clever makers made such one-piece models pitch adjustable (mainly sopranino, soprano and alto sizes) by drilling two or three very small holes of perhaps 1mm to 2mm in diameter through the wall of the wood, a bit to either side of the labium window. Such small holes effectively increase the labium-window's surface area, resulting in a raised pitch level of the entire instrument **without making it shorter, nor changing the bore geometry.** Depending on the number and diameter of such little holes in close proximity to the labium window, pitch can easily be raised 10cents to 25cents of a semi-tone; sufficiently much to overcome small tuning problems for ensemble playing. In reverse, if such drilled holes raised the pitch too much, one or more of those little holes could be closed up again with a bit of bees-wax. My Pitch-Pocket screw is a better solution for pitch adjustments than fidgeting with wax, or making costlier multi-section instruments. Being able to make such pitch adjustable one-section instruments at a lower price is "icing on the cake".

* Gemshorns can be tuned **downwards** by "shading" the labium window with a "belt" of leather.