I was asked by a local Band Director if there was some way I could modify a Flute for a young girl interested in playing who had some challenges. Specifically, she did not have the upper fingers on her left hand, just the full thumb and pinky. She had been playing percussion, and while happy with being part of the band in that capacity, really wanted to play the Flute if at all possible. Well, to me, if I can help someone achieve their dreams, then I'm in!

Now, there are many ways to approach this. I like to start with the premise that everyone was born that way and so my thinking was, "If everyone was born this way, then exactly what would a Flute be designed to look like/function?" I figured that the three keys that needed to be depressed (keeping with current designs of modern-day Flutes) would simply need extensions.

The problem was that her fingers were shorter, but instead that the keys were too short. So I searched around for some parts to solder onto the keys. Finding some Clarinet parts in a box, I chose to use those.

Using an old Artley Flute that needed an overhaul, I modified the pad cups with the Clarinet keys (cut to size) and tightened the springs a bit to compensate for the added weight of the pad cup/key combination.

Next, considering the size of the child and the thought that shifting the Flute to allow better access to the keys with the left hand, I replaced the straight head joint with a curved/Headstart head joint.

Here is my current prototype:

As you can see, it is a rather rough facsimile to what the final product will be. But first, I need the little girl to try it out to see if she can move the keys correctly as necessary. If not, then I will try another approach.

I have considered many other options, but feel it is best to begin with the most straight-forward before moving on with the next step. I have considered adding a key next to the G# so the pinky can perform multiple tasks. I have considered attaching a right-hand wrist brace to support and hold the instrument so the right thumb is available to depress a key normally depressed by the left hand fingers. That thumb could also depress two keys! Or perhaps the girl can use her three shorter fingers together to engage a single key.

There are many ways to reconfigure a Flute to accommodate what she can easily use. And if she can't 'depress' keys enough, then I could even reverse the springs so the keys are normally closed and use leverage to open them as needed.

Are there other ways to accomplish this goal? Probably. One rather 'high-tech' way I feel could be done and probably will be part of future technology used on a daily basis, is to insert/attach sensors to her shorter fingers that will detect the nerve pulses and that would trigger mechanical servos on the Flute keys.

Wouldn't it be great if a Robotic's Club at some school or college took on such a project? Perhaps a 'glove' could be constructed that would have both the sensors and the servos already connected and she could 'wear' the additional 'finger extensions' that would allow her full movement and use of those fingers for any task!

But for now, this is what I can do. I can modify a Flute for this child to use, and hopefully she will be able to achieve her wish.

As this project continues I will provide updates. Stay tuned!