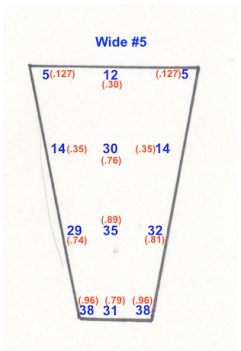
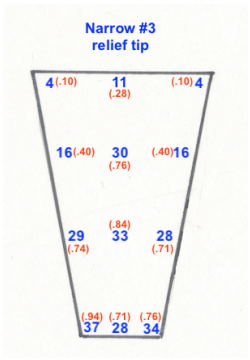
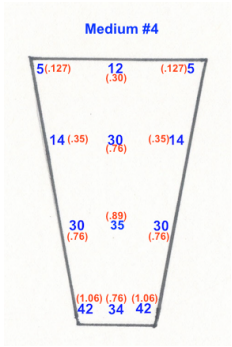
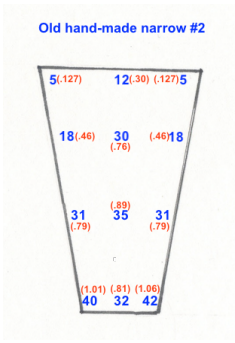
DIAL INDICATOR FEELER ARM TESTS

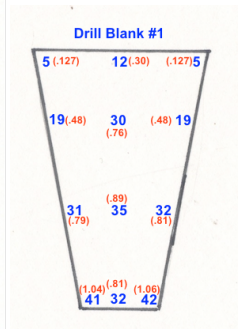
Measurements of the same reed using 5 different feeler arms.
Flex increased moving from #5 to #1. Feeler #5 was the most rigid

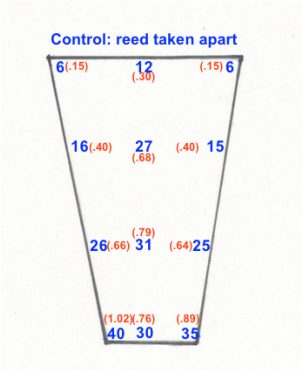












NOTES ON THE TEST

As I mentioned earlier due to differences of opinions from some of his customers, my father and I experimented with finding a balance between the size of the feeler arm and its stiffness. A small amount of flex does not bother me as long as the needle returns to the zero position— but this flex does bother some reed-makers a lot.

I have looked at the various types of feeler arms available these days and there is a wide variety of them to address both ends of the spectrum: a heavier, thicker feeler flexes less but is much more difficult to fit into the tight places of a reed (not an unfolded piece of profiled cane) — such as the extreme edges (rails) of the reed and the back corners of the reed just in front of the collar area on the sides. The smaller, narrower arms will fit more easily into the tight places of a reed. So, the question I would pose someone looking to buy a measuring set-up would be: ***to what purpose would you use the gage for the most?*** If we are measuring the dimensions of the cane before the cane is put together into a blank, or checking the dimensions of gouged cane, then any type of arm will do— probably the stiffer the better. If our main use will be to measure many areas inside of a reed while we are scraping on it then a smaller narrower arm may be more appropriate.

All of these thoughts were by and large untested by me until recently. The reason I got to thinking more about this is that my friend, Roger Tropman of Nexus Woodwind Supply is in the process of producing an excellent dial gage and asked me my thoughts about what feeler size might be best. What we eventually decided on was to make available several different designs to meet the demands of people who differed in their views of the best way to bias the design: toward stiffness, or smallness or a compromise between these two poles. Several

feelers will be available so that the reed-maker using Roger's gage won't be hemmed into either extreme since the feelers are easily interchanged.

Now to study the data. The first thing I did was to calibrate all of the dial gage units using known thickness measurements by checking an automotive set of feeler gages. I measured 3 different feelers to represent the values I wanted to check, namely .005" (.127 mm), .30" (.76 mm) and .45" (1.14 mm). All the dial gages agreed on these values. I then proceeded with the testing on one reed using all the gages fitted with the feelers shown above.

If you study the different feelers in the photograph above and look at the corresponding measurements each one gives ***of the same reed*** you will see that there is very little difference in their readings. As a control, after I was finished measuring the reed using the 5 different arms, I took this reed apart and re-measured it by turning the reed over so that the inner curve of the blade was away from the feeler arm thereby taking any curve of the inside of the reed's blade out of play. I could measure the "actual" thickness without worrying about the feeler being inside of the reed nor the shape of the feeler influencing the "real" thickness of the cane due to differing curvatures of the feeler arm not matching the inside curvature of the reed.

What the results suggest to me, is that there is some slight variation between the different feeler arms though not what I would consider as terribly significant— .006" (.15mm) at the back of the reed. Slightly more significant is the range of the most variation between the control measurements (the reed taken apart) and the value most different in that case. That difference is .007" (.18 mm). Almost all of the other places measured with each feeler

corresponds to within .001-.002" (.025-.050mm). These are the most crucial measurements from the tip to the center of the reed perhaps 2/3 of the way to the collar. Since the back of the reed is so much heavier than the tip, even this relatively larger difference only represents only 2 human hairs' thickness difference in the back corners of the reed just in front of the collar. This doesn't really take into account my error in placing the gage in exactly the same place— so that error is part of the equation. This is magnified by the small relief or bump on the end of feeler tip #3 and a very small point on the dial gage's probe— it will then read a much smaller area on the reed. Some reed-makers may want this added accuracy, others not. I am not concerned to pinpointing my readings so much as getting a general idea of an area's general thickness value.

We face an additional problem using measurements provided from books, articles or any other source outside of our own chosen dial gage, since we have no way of knowing the type of feeler arm that was used in generating those measurements. Therefore in my view it is best to take any of these figures with a grain of salt and use them as a general guide rather than an absolute standard. And the measurements of thickness maps really are only valid taking into account the density and "quality" of that particular piece of cane and the dial gage making those readings.

By taking other people's measurements only as a general guide we can then proceed using our own gage in its own "closed system". By this I mean that whatever small deviation from "real" measurements taking readings inside of a reed, those will be consistent within your own measurements on your own gage. Measuring our own successful reeds and then comparing

our new reeds within this closed system will work well enough, in my view. It certainly has worked well enough for me over the 48 years I have used my gages.

Finally, each reed-maker will determine the best amount of use for using the dial gage. For myself, almost all of my readings take place before the reeds are formed into blanks. I check the gouge of each piece I cane I process. I rarely check the profile unless I am making any changes to my machinery or I am replacing the blades on any of my machines after sharpening. I will, when finishing my reeds, occasionally check the window area of a reed after I have removed some cane from that area— but by and large I find it more important to judge at this point in the reed-making cycle to go by how the reed feels and plays rather than by any exact thickness numbers. I can say this however because my profile and tip profiling contours have worked well for me for many years and I haven't changed them significantly. This may not yet be the case with beginning reed-makers or people still trying our various designs to find one that is suitable. It is at this stage in the exploratory process that a dial gage may be of good use.