

ACOUSTICS2008/673
How to play the first bar of *Rhapsody in Blue*

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The two-and-a-half octave glissando opening Gershwin's *Rhapsody in Blue* is one of the great icons of 20th century music and one of the best known bars in music. Expert clarinetists combine unusual fingerings with even more unusual configurations of their vocal tract to achieve a nearly continuous rise in pitch. Using a novel method [1], we incorporated an acoustic impedance measurement head within a clarinet mouthpiece, allowing us to study the player's vocal tract at various stages in the glissando. We measured and compared vocal tract impedance spectra with the corresponding clarinet impedance spectra for the fingering used at that pitch.

Partially uncovering an open finger-hole raises the frequency of clarinet impedance peaks in the lower register, thereby allowing smooth increases in the playing pitch. In the upper register, however, resonances in the clarinetist's vocal tract are manipulated to be comparable with those in the clarinet for frequencies in this range. Thus the pitch in the higher section of the glissando is largely controlled by smoothly varying a resonance of the player's vocal tract.

[1] Chen, JM. Smith, J. and Wolfe, J., (2008) "Experienced saxophonists learn to tune their vocal tracts". *Science*, (in press).