Saxophones Levin Ostapeck



History

- Antoine–Joseph Sax, 1814–1894
- Son of an instrument maker, learned at a young age
- Created instrument out of necessity for blending into diverse situations



The physics of the saxophone

Sound Generation

- Reed opens and closes rapidly, acts as an oscillator
- Reed has resonant frequency alone, in use controlled by resonance of instrument
- Oscillations can be dampened by mouth



Turning into a pitch

- Saxophones as well as some other woodwinds resemble a conical air column, with one closed side
- Essentially same harmonics as open cylinder of equal L (2L/n)



Keys

- Force pressure node to create fundamental
- Last key pressed determines L
- Register key disrupts low harmonics, forcing to second harmonic, one octave up









Tone Qualities

- Interpretation of created sound
- Two major classifications in saxophone
 - "Classical"
 - dark, wide, round, etc.
 - "Jazz"
 - bright, narrow, edgy, etc.
- What does it mean?



The saxophone within a musical context

Original Intent

- Dark tone, power of brass, subtlety and control of a woodwind
- Fill out and expand the normal military band
- First used in Western Europe
- Earliest recordings thought to be from around 1890



Expansion

- With changes in design came change in sound, leading to popularity with wind ensembles and emerging big bands
- Evolution into symphonic bands/symphonies and progression of big band and solo jazz players
- Extended technique from experimentation



Works Referenced

- "Reverse engineering the sound of the jazz saxophone", <u>http://www.mayagupta.org/publications/JazzSounds.</u> <u>pdf</u>
- * "ALTO SAXOPHONE MOUTHPIECE PITCH AND ITS RELATION TO JAZZ AND CLASSICAL TONE QUALITIES", <u>http://www.uiweb.uidaho.edu/sax/PDFs/HasbrookTh</u> esis.pdf
- Saxophone acoustics: an introduction", <u>http://www.phys.unsw.edu.au/jw/saxacoustics.html</u>
- Extended saxophone techniques", <u>http://www.jayeaston.com/Composers/sax_techniques.html</u>