

Physics of Musical Sound

Brass Instruments
Class 17
Read Chapter 11
Quiz Today

8/30/01

Physics 120

Serpent



8/30/01

Physics 120

Shofar



8/30/01

Physics 120

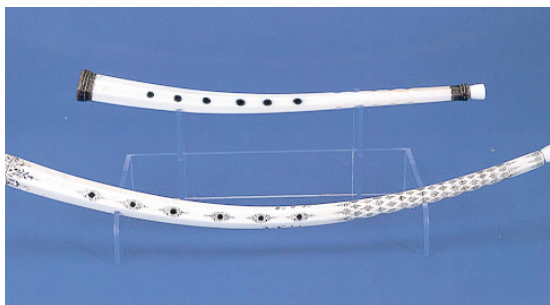
Sackbuts



8/30/01

Physics 120

Cornetti



8/30/01

Physics 120

Keyed Bugle



8/30/01

Physics 120

Ophicleides



8/30/01

Physics 120

Euphonia & Baritone



British euphonium
www.dwerden.com



American euphonium
www.dwerden.com



British baritone
www.dwerden.com

8/30/01

Physics 120

Trumpet vs. Cornet



Trumpet

Cornet

8/30/01

Physics 120

Brass Instruments

- Two basic families with rather little difference in tone
 - Straight tubes with some conical or flared sections
 - Trumpet, Trombone, French Horn
 - Brighter sound. Used in orchestras where brightness is needed to cut through mass of other instruments.
 - Conical tubes with some flared or otherwise slightly altered sections
 - Cornet, Flugel horn, alto horn, baritone, Euphonium, Tubas
 - Mellow sound. Used in ensembles (brass bands, silver bands) where the sound blends better than trumpets etc. would.

8/30/01

Physics 120

Brass instruments



8/30/01

Physics 120

Brass Instruments

- Lip reed
 - Player can alter tension in lip over a very wide range. Gives the player control over natural frequency and over Q not available to other reed players.
- Mouthpiece
 - Surface to rest lips, resonator chamber with a sharply constricted opening, conical tube to match to bore of instrument
- Body tube
 - Basically straight or basically cylindrical according to family.
 - Length determines pitch of instrument. As usual, the longer the tube the larger the bore to allow low frequencies to get out.
- Bell
 - Couples tube to the outside world.

8/30/01

Physics 120

Changing the Note

- Have to alter length of tube. Two methods available
 - Slides/Valves change physical length of tube
 - Trumpet, French Horn, all the Cornet/Tuba family use valves.
 - Trombone and rare slide trumpet use a slide.
 - Sound always comes from complete tube so that tone color is quite constant.
 - Can only put into a straight section of tube!
 - Holes can shorten acoustic length of tube
 - Cornett (2 T's), Serpent use simple holes
 - Keyed bugle, Ophicleide use keywork
 - Tone color is much less even over range. Obsolete.