

The bassoon has a pronounced formant/resonance in the  $f \sim 440 - 500 \text{ Hz}$  region and a weaker one at  $f \sim 1220 - 1280 \text{ Hz}$ . See table below for some brass and woodwind instruments:

TABLE I  
Formant frequencies in hertz for woodwind and brass instruments

INSTRUMENT	FORMANT I	FORMANT II
Flute	800	
Oboe	1400	3000
English Horn	930	2300
Clarinet	1500–1700	3700–4300
Bassoon	440–500	1220–1280
Trumpet	1200–1400	2500
Trombone	600–800	
Tuba	200–400	
French Horn	400–500	

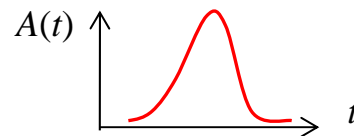
**Sound Effects:** (Create enhanced/richer musical structure to sound(s) from musical instruments)

**Vibrato Effect** — periodic, slow rhythmical variation/fluctuation of frequency of complex tone.  
— frequency modulation

**Tremelo Effect** — periodic, slow rhythmical variation/fluctuation of amplitude of complex tone.  
— amplitude modulation

**Chorus Effect** — Two or more instruments (of same type) simultaneously playing the same music.  
— not at exactly same frequency  
— not perfectly in phase – slight vibrato with respect to each other – beat against each other in musically pleasing way.

**Non-Periodic Sounds** — *e.g.* sound pulses



Some sounds produced by certain musical instruments (*e.g.* percussion instruments) are **not** periodic. Non-periodic sounds - sound pulses - can be fully described mathematically as a superposition (linear combination) of a **continuum** (or **spectrum**) of frequencies, with certain amplitudes.