

Lecture 2: Timbre

SEPTEMBER 12, 2016

Hornbostel-Sachs system of instrument classification

1) Idiophone: vibrations are produced by striking either one portion of the instrument against another, or another object against the instrument

Idiophones

Definition:

Idiophones are musical instruments that produce sound through the vibration of the body without the use of strings or a membrane.

1. IDIOPHONES

- 1.1 Struck and indirectly struck idiophones
- 1.2 Plucked idiophones
- 1.3 Friction idiophones
- 1.4 Shaken idiophones*

* Not shown on this poster

* Increased body availability system of neuro-musculoskeletal



Mallets



Mallet

Indirectly struck idiophones

The instrument vibrates through some movement other than being struck, such as shaking.
Examples: Maracas, Sistrum, Manzani



Maracas



Bell



Xylophone

Plucked idiophones

Sound is created by plucking of a flexible tongue fixed at one end.
Examples: Jew Harp, Kalimba, Mechanical Music Box



Mechanical music box



Claves



Triangle



Xylophone (wood)



Cymbals



Castanets



Xylophone

Friction idiophones

The instrument is made to vibrate by friction.
Example: Jingling bowl

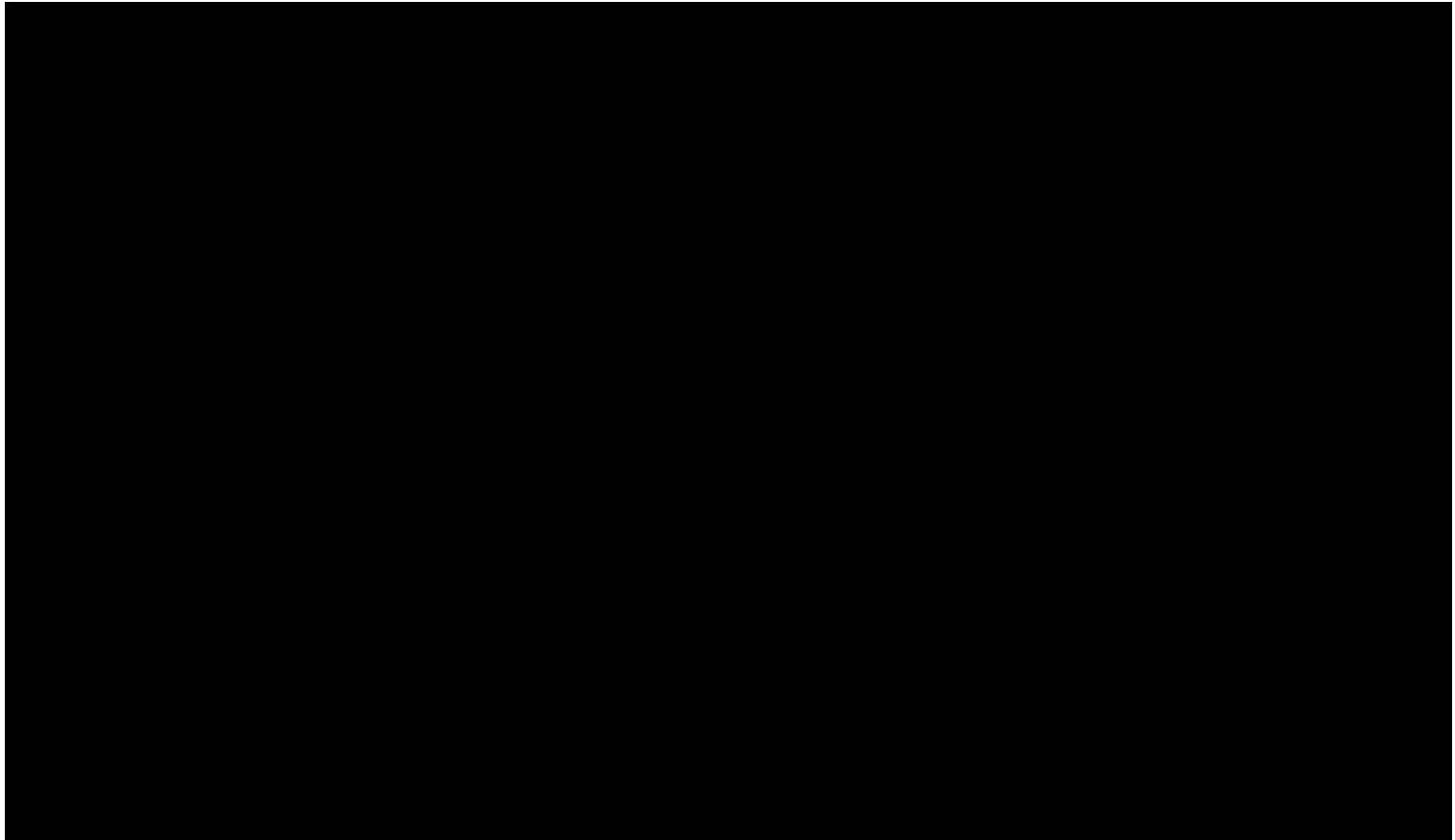


Jingling bowl (Jing)

Struck idiophones

The instrument is made to vibrate by being struck either by the musician or by two different parts.
Examples: Claves, Cymbals, Castanets, Wood block, Triangle, Vibraphone

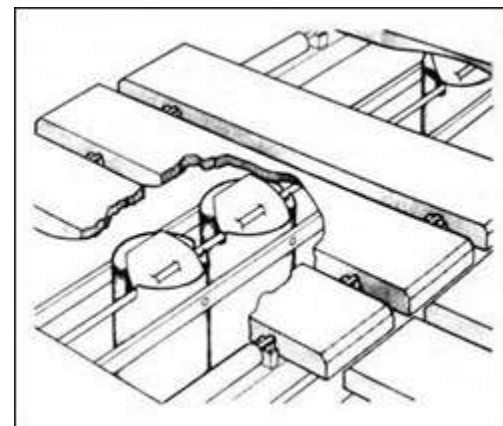
Idiophones with definite pitch



Joseph Kosma, *Autumn Leaves*

Idiophones with definite pitch

Vibraphone

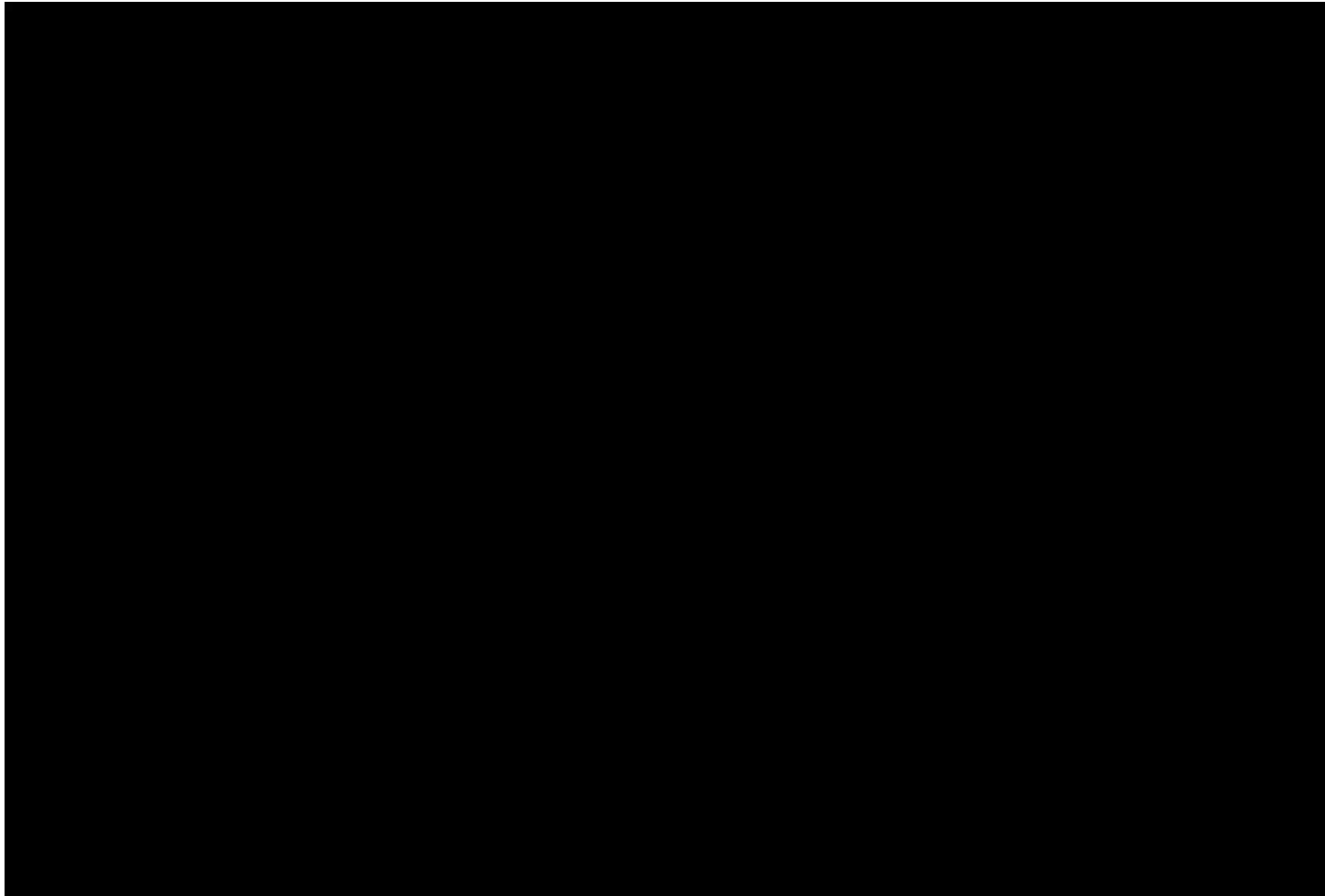


Marimba





Idiophones with indefinite pitch



E. Argenziano, *Stinkin' Garbage* (performed by TorQ)

<https://www.youtube.com/watch?v=l0XdKwFe3k>

2) Membranophone: sound is produced by vibrations of a stretched membrane that is struck or rubbed

Membranophones

Definition:

Membranophones are musical instruments which produce sound through the vibration of a tightly stretched membrane.

2 MEMBRANOPHONES

- 21 Struck drums
- 23 Friction drums
- 24 Singing membranes

Membranophone classification system of Hornbostel-Sachs

Struck drums

The drummer produces sound by striking the drum skin with a beater or object. Struck drums are very common.
Examples: Clarinet, Snare drum, Talking drum, Bells, Bongos, Steel drum, Tom-tom, Mridanga and Tam Tam.

Clarinete (Italy)



Bongos



Talking drum (Africa)



Bongos (Africa)



Clarinete (Italy)



Clarinete



Clarinete

Friction drums

The drummer produces sound by rubbing a bar of object against the drum skin.
Example: Clarinet



Clarinete (Italy)



Clarinete (Italy)

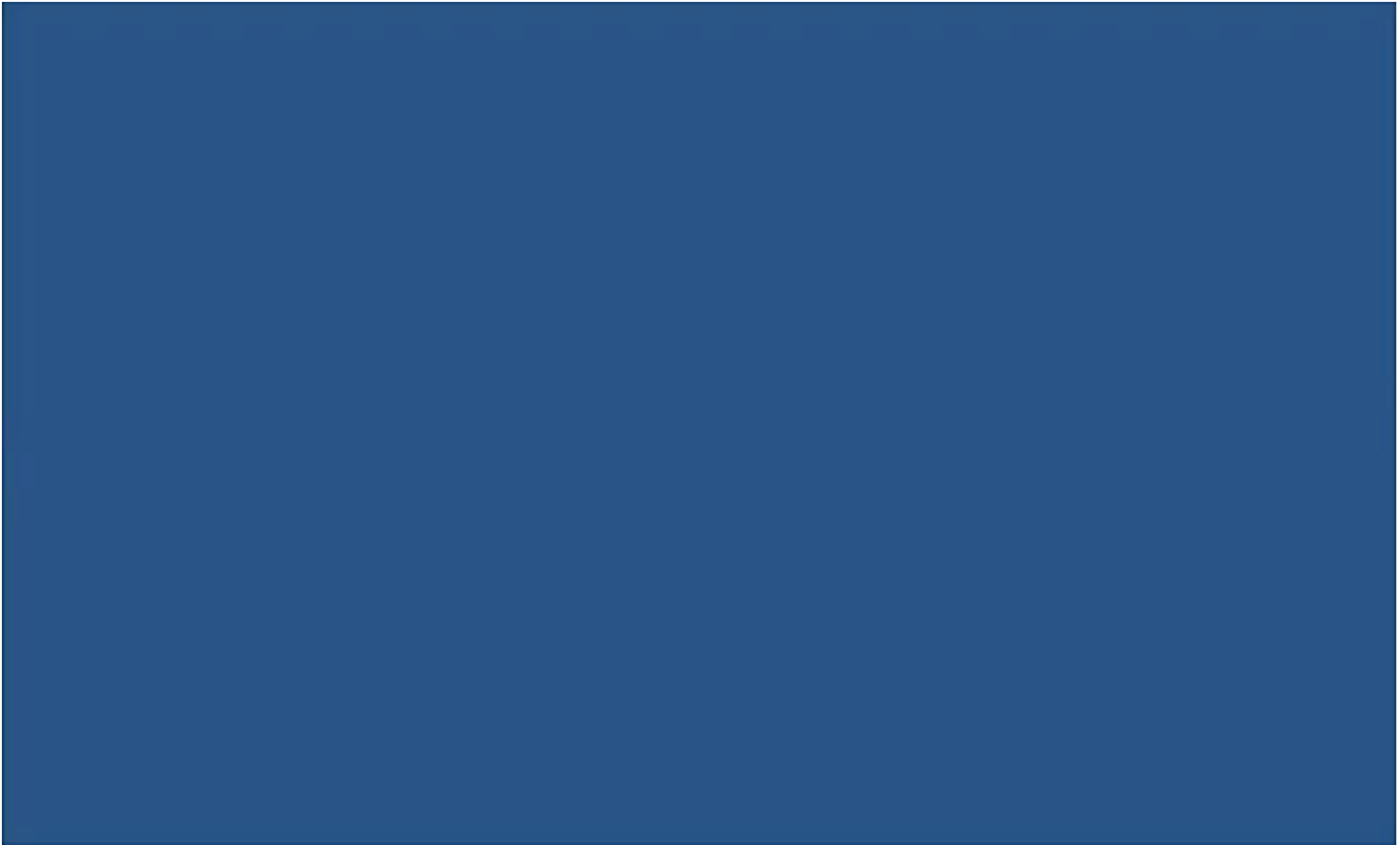


Clarinete (Italy)



Clarinete (Italy)

Membranophones with definite pitch



Timpani

African Talking Drum



Idiophones and membranophones may be untuned (indefinite pitch) or they may be capable of producing a variety of pitches (definite pitch)

indefinite-pitch instruments



gong



cymbals



tambourine



snare drum



triangle



castanets



street drum

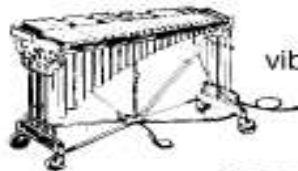


bass drum

definite-pitch instruments



glockenspiel



vibraphone



timpani (kettledrums)



celesta



chimes



bell-lyra



xylophone

© 2012 Encyclopædia Britannica, Inc.

<https://www.youtube.com/watch?v=IU3V6zNER4g>

3) Chordophone: sound is produced by a vibrating string activated by striking, plucking, or bowing

Musical Instruments

Chordophones

Definition

Chordophones are musical instruments which produce sound through the vibration of one or more tightly stretched strings fixed between two points.

1. CHORDOPHONES

- 1) Simple chordophones or others
- 2) Composite chordophones
- 3) Variable tension chordophones or plucked drums

Harmonium (left), mandolin (right), guitar (center)



Gu Zheng (Zhuqin)



Sitar

Simple chordophones or others

An instrument consisting of a string bearer with or without a resonator.

Examples: Gu Zheng, Sitar, Zither, Harmonium.



Guitar



Mandolin



Banjo



Harmonium

Composite chordophones

The string bearer and resonator are both an essential part of the instrument. These chordophones can be divided into major categories that include:

Lutes

Example: Lute

Pipa

Example: Pipa

Lutes

Example: Lute, Guitar, Sitar, Banjo

Bowed chordophones

Example: Violin, Cello, Double Bass



Banjo



Cello

Violin



Double bass



Lyre



Harp

Zither – an instrument in which the strings run the length of the body

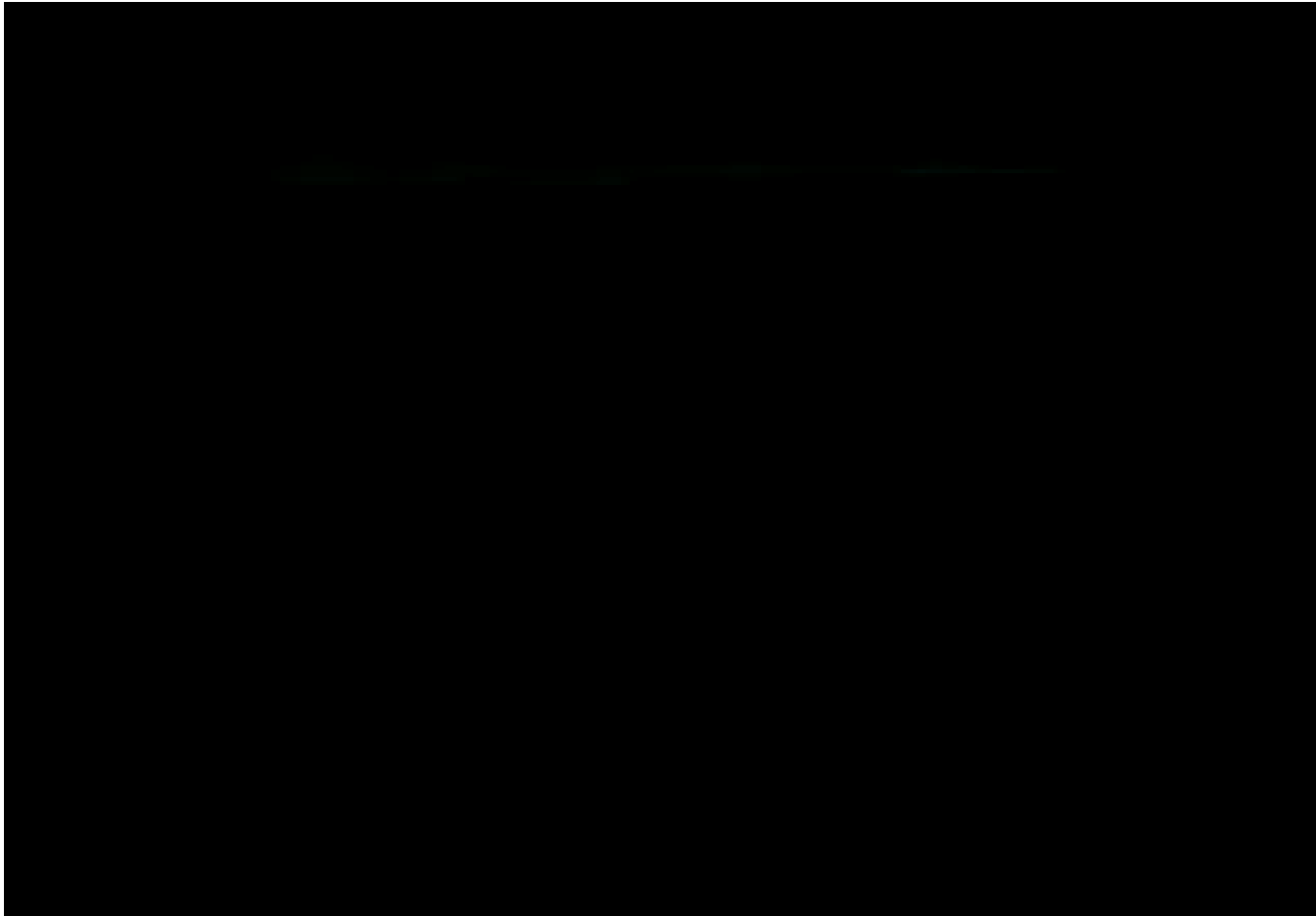
Appalachian dulcimer – a plucked zither found chiefly in the Appalachian Mountains; it is held horizontally in the player's lap and strummed with a quill or the thumb of the right hand; the string nearest the player is the melody string and is stopped either with a finger or a wooden bar; the remaining strings are drones

Drone – a continuous sound on one or more fixed pitches



Appalachian dulcimer

Jean Ritchie, *Shady Grove*



Sitar



The Beatles, *Norwegian Wood*



Sympathetic string – a string that is not normally played upon directly but that is set in motion by the acoustical phenomenon of resonance

Performance Techniques

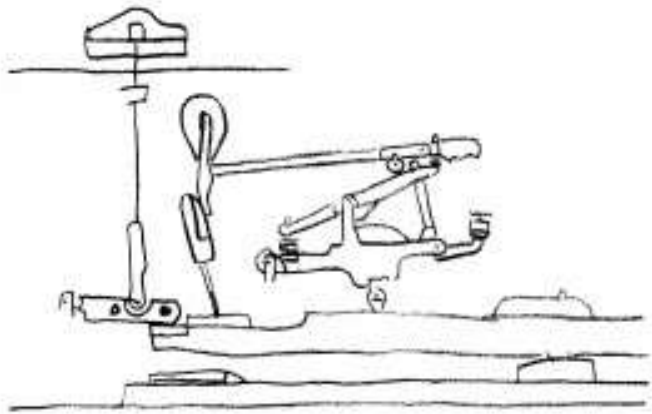
Vibrato – a wavering of pitch used to enrich and intensify the tone of a voice or instrument; it is practised in particular by wind players, string players, and singers; it is produced in string instruments by controlled vibration of player's finger stopping the string and in wind instruments by breath-control

https://www.youtube.com/watch?v=vWdHId_KfIM

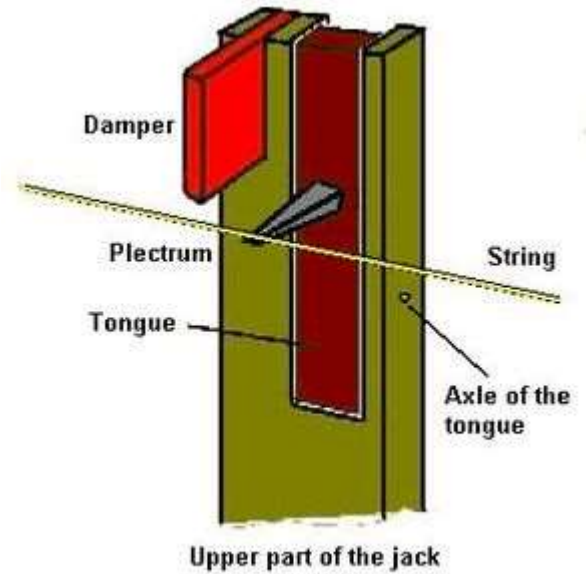
Pizzicato – the strings are plucked with the finger rather than bowed

<https://www.youtube.com/watch?v=LtvKJaltYmA>

François Couperin, *Les Baricades Mistérieuses*, piano



François Couperin, *Les Baricades Mistérieuses*,
harpsichord



Henry Cowell, *The Banshee*



4) Aerophone: sound from a vibrating column of air is activated from a blow hole, a reed, or buzzing lips

Aerophones

Definition:

Aerophones are musical instruments which produce sound through the vibration of air.

4 AEROPHONES:

- 4.1 Free aerophones
- 4.2 Non-free aerophones
 - 4.2.1 Edge-blown aerophones (flutes)
 - 4.2.2 Reed aerophones
 - 4.2.3 Trumpets

* See also on the next page:
Revised Table 1: Classification system of musical instruments

Intermittent free aerophones:

The air stream used to make the sound is interrupted periodically in these musical instruments.
Examples: Accordion, Harmonica



Non-free aerophones (wind instruments proper)
The air itself is the vibrator and is contained by the instrument. The three major groups are shown here.



Recorder



Flute



Concert flute

Edge-blown aerophones or flutes
The musician's lip directs a narrow stream of air against an edge.
Examples: Concert flute, Piccolo, Flauto



Tuba



Trumpet

Trumpets
The musician's lips vibrate the air in the instrument to vibrate.
Examples: Tuba, Cornet, French horn, Trombone, Trumpet



French horn



Trombone



Cornet

Reed aerophones
The instrument makes a sound when air is blown over the reed causing the air to vibrate.
Examples: Clarinet, Oboe, English horn, Saxophone



Saxophone



Clarinet



Oboe



English horn

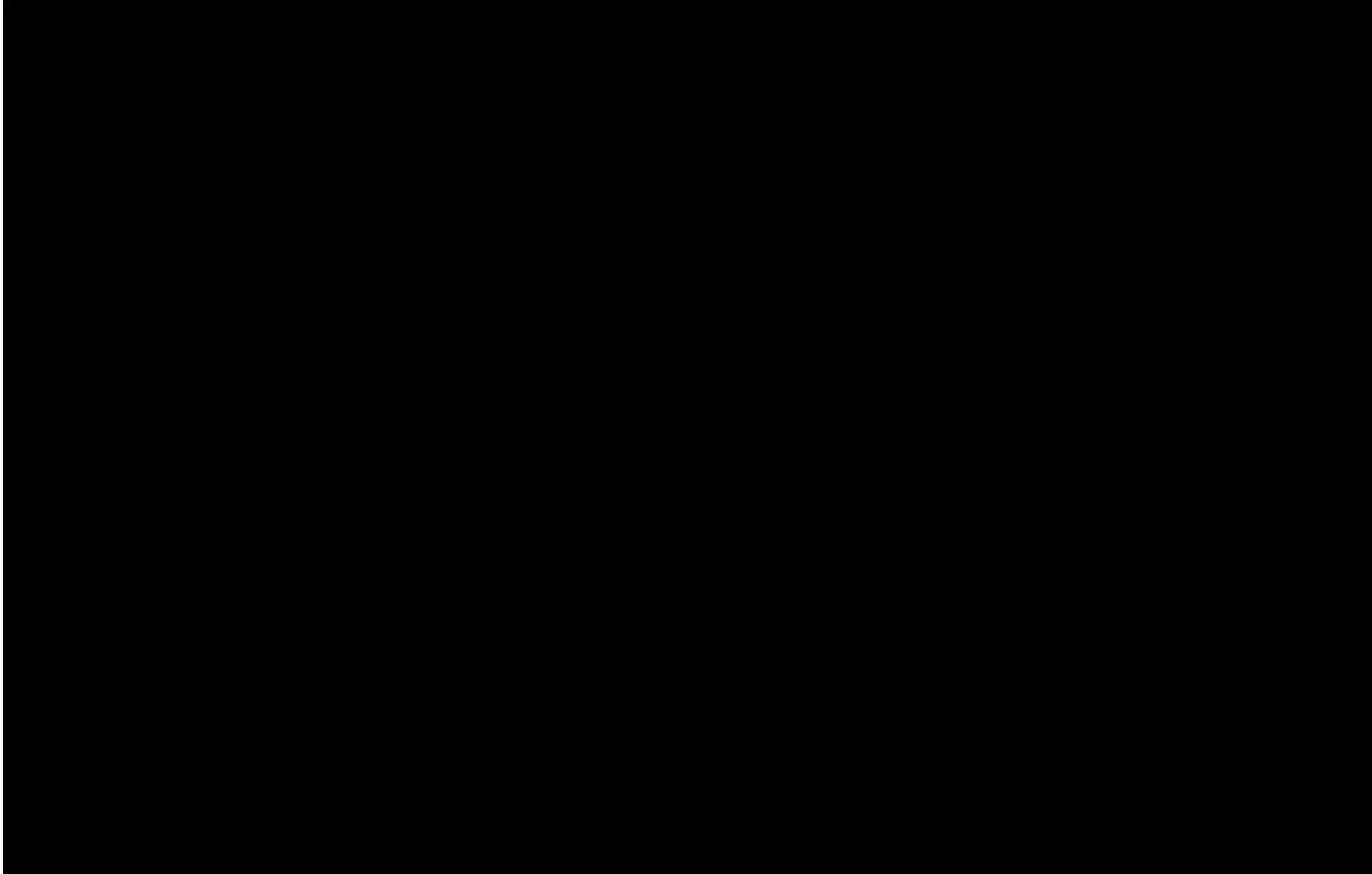
Tonguing – the use of the tongue for articulation in the playing of wind instruments; the tongue releases the wind stream for an initial attack and interrupts it for successive notes that are separately articulated

Flutter tonguing – the tongue is fluttered or trilled against the roof of the mouth, just behind the front teeth

Richard Strauss, *Don Quixote*, Variation II



English Cornett and Sackbut Ensemble - Giovanni Gabrieli, *Beata es virgo*





5) Electrophone: sound is produced or modified by electronic means





How to splice a tape:

<http://www.tapeheads.net/showthread.php?t=276>

Philips Pavilion, Brussels World's Fair, 1958



Edgard Varèse, *Poème électronique*

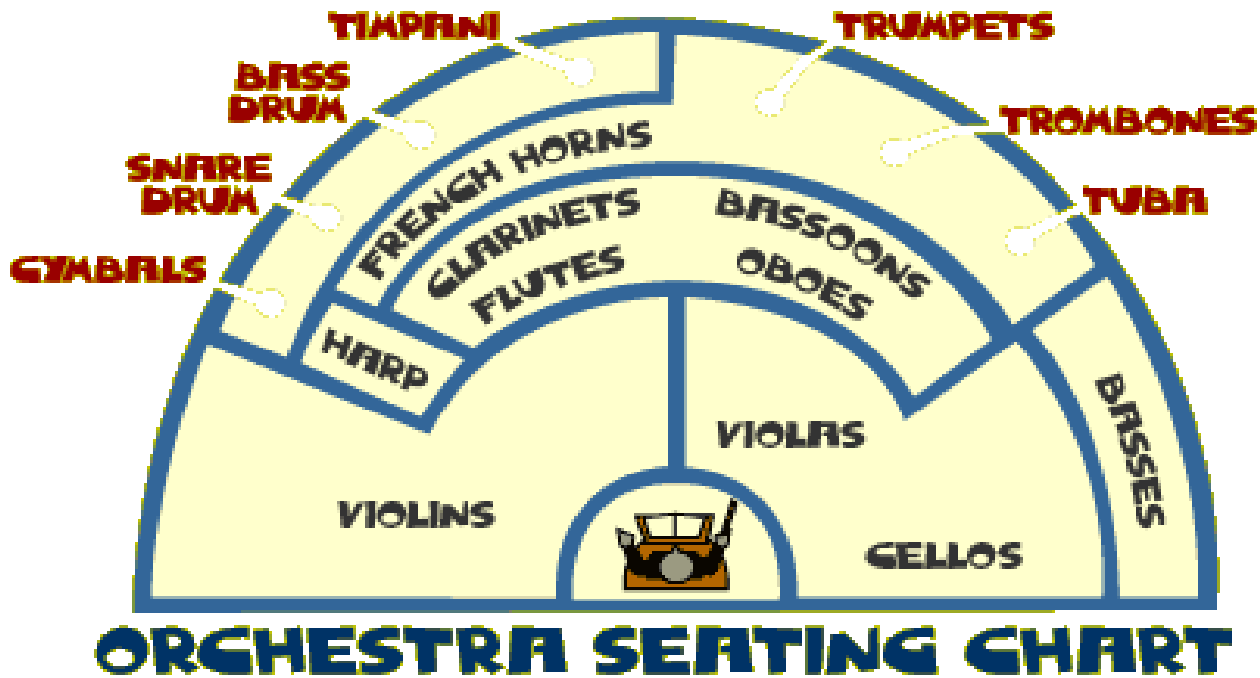


musique concrète – music in which the composer works directly with both natural and electronically produced sounds recorded on magnetic tape

- traditional and new instruments: included pure electronic sounds; non-traditional sounds such as sirens; and traditional sounds such as voice; these sounds are often altered by electronic means, providing an even greater variety of timbre and pitch options
- Varèse wanted to explore the spatial nature of sounds, so he recorded on three separate tracks and directed the tracks through complex wiring schemes into hundreds of speakers situated throughout the building; created the impression of sounds literally moving through space

Instrument Families of the Orchestra: String, Woodwind, Brass and Percussion

INSTRUMENTS OF THE ORCHESTRA



Orchestration: the art of employing instruments in various combinations; orchestration includes the concept of instrumentation – the study of properties and capabilities of individual instruments

Quiz No.1

On-line on the course Blackboard page on Friday, September 16

You may access the quiz any time between 9 a.m. – 9 p.m.

You will be given 20 minutes to complete the quiz

The quiz will consist of 12 questions in multiple choice format

There will be 3 listening examples (about 1 minute in length; played from the beginning of the track) and the multiple choice questions accompanying these tracks will relate to the context in which the piece was discussed in class. If you have trouble playing the tracks, try opening a different browser (see below)...

There will be 3 questions for each of the listening excerpts and three questions related to general concepts discussed in class.

Check your browser compatibility before the quiz at: https://en-us.help.blackboard.com/Learn/9.1_2014_04/Administrator/020_Browser_Support/Browser_Checker
(or https://en-us.help.blackboard.com/Learn/9.1_2014_04/Administrator/020_Browser_Support/017_Browser_Support_Q4_2015)

Browser

[Chrome](#)**

[Edge](#)**

[Firefox](#)

[Internet Explorer](#)

[Safari](#)

Supported Desktop* Browser Versions

36+

20+

31+

11+ (Windows only)

6+ (Mac OS only)