APPENDIX

MUSICAL INSTRUMENTS & ENSEMBLES

MUSICAL INSTRUMENTS OF THE WESTERN WORLD

Every musical instrument or voice has its own characteristic sound. Once you become familiar with these, you will start to hear music "in color."

The HUMAN VOICE

Though not an "instrument" in the strictest sense—the voice is one of the most colorful vehicles for musical expression. It is certainly the most personal of all instruments (each voice is unique)—and the only one capable of presenting both words and musical sound simultaneously. (Voices can also make many noise-like sounds that are colorful in their own right). Voices are classified by their *tone-color*, *register* and *range*:

- ***soprano*** (highest female voice)
- ***mezzo-soprano*** (rich female voice mixing soprano and alto colors)
- ***contralto*** or "***alto***" (lowest female voice)
- ***countertenor*** (a very high male voice)
- ***tenor*** (high male voice)
- ***baritone*** (rich male voice mixing tenor and bass colors)
- ***bass*** (very low male voice)

Young boys whose voices have not yet "changed" can sing in the soprano or alto ranges. Boy sopranos have a sweet sound that is much less intense than a female soprano.

Instrumental families can also be categorized by the designations *soprano*, *alto*, *tenor* and *bass*), as described below.

The STRING Family

The string family is comprised of instruments whose sounding mechanism is directly contacted by the hands. Many stringed instruments are played with a bow, which greatly increases the possible sounds that the instrument can produce. The most common types of stringed instruments include:

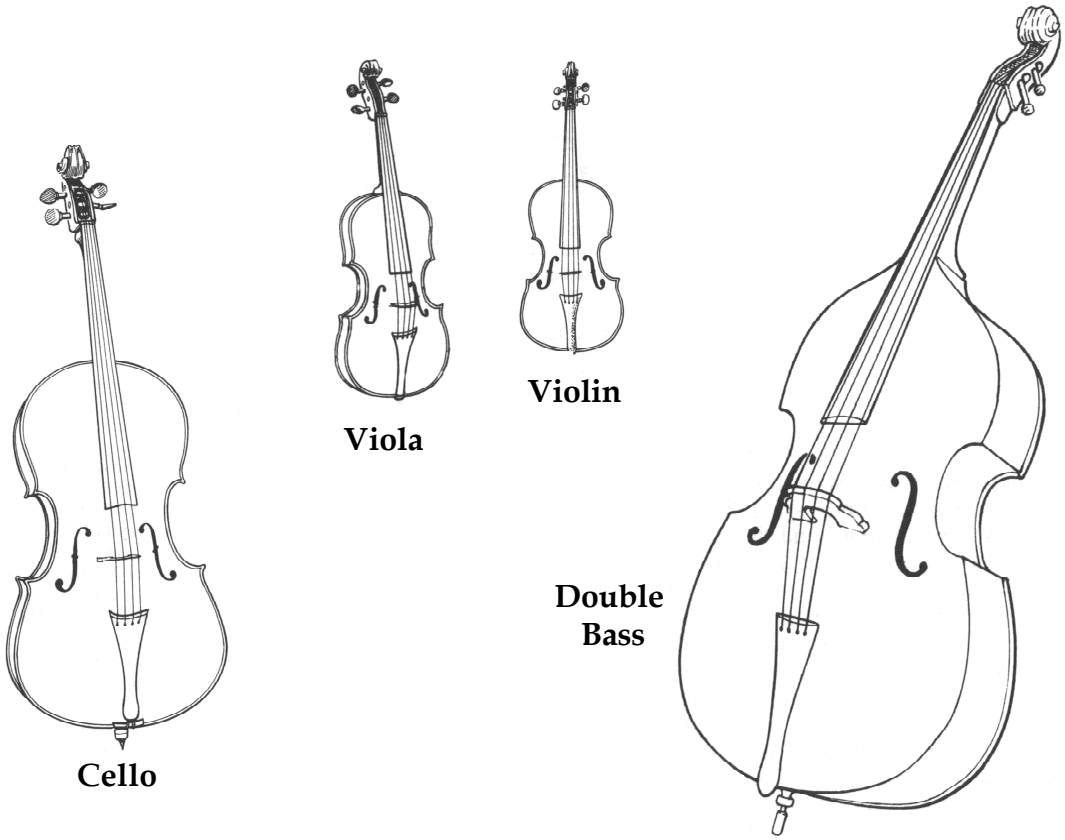
- the **violin family** (***violin***, ***viola***, ***violoncello*** *and* ***double bass***)
- the **harp**
- the **guitar family** (***guitar***, ***bass guitar***, ***banjo***, ***mandolin***, ***ukulele***)
- various folk instruments such as the **dulcimer** or the **psaltery**
- the ancient **viol family** (ancestors to the violin family)

The violin family became the core of the modern orchestral string section in the mid- 1600s.

The standard range categorization of this family is as follows:

- **Violin** (soprano), **Viola** (alto), **Cello** (tenor), **Double Bass** (bass)

Note: The piano and the harpsichord ARE NOT string instruments, since the player's hands do not come in direct contact with the strings.



The Violin Family

The WOODWIND Family

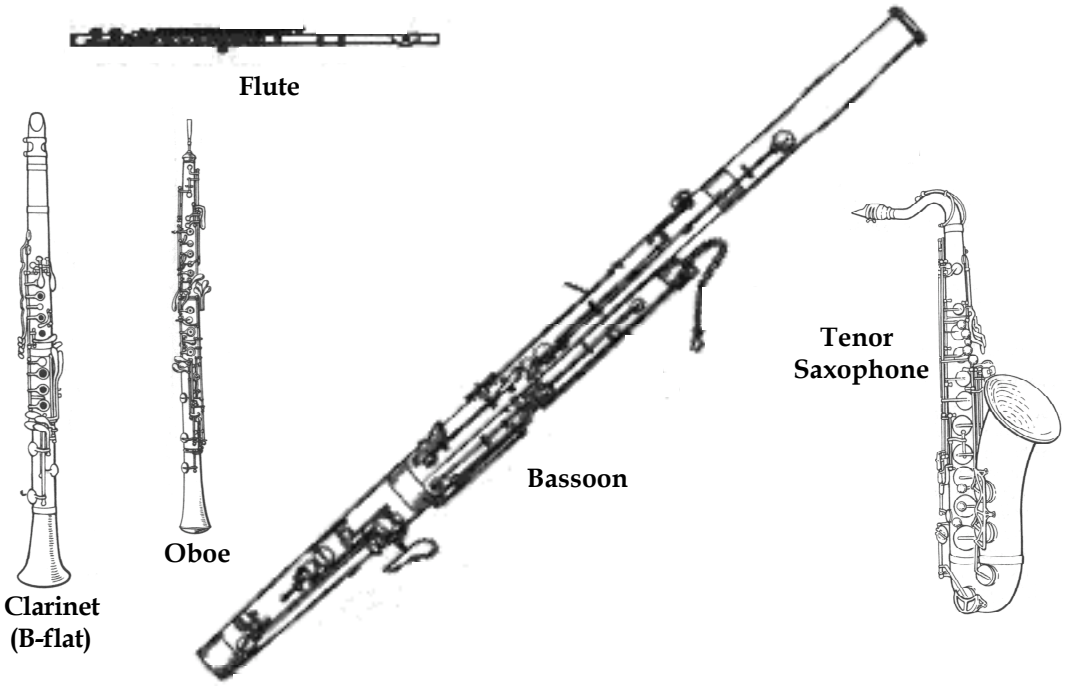
The woodwind family is comprised of wooden instruments that the player must blow into to create a musical sound. Most members of the modern woodwind family are "reed" instruments (a piece of wooden reed attached to its mouthpiece adds character to the sound). The complete woodwind family became a standard part of the orchestra by the early 1800s. Common woodwind instruments include:

- the ***piccolo*** (very high) and various-sized ***flutes***
- the ***oboe*** and the ***"English" Horn*** (a *tenor* oboe)
- various-sized ***clarinets***
- the ***bassoon*** and ***contrabassoon*** (very low bassoon)
- various-sized ***saxophones***
- various-sized ***recorders*** (ancestors to the modern flute family)

The standard range categorization of this family is as follows:

- **Flute** (soprano),
- **Oboe** (alto),
- **Clarinet** (tenor)
- **Bassoon** (bass)

*Note: The **organ** is essentially a **wind instrument** (when its keys are pressed, compressed air is passed through a series of pipes)*



Common Woodwind Instruments

The BRASS family

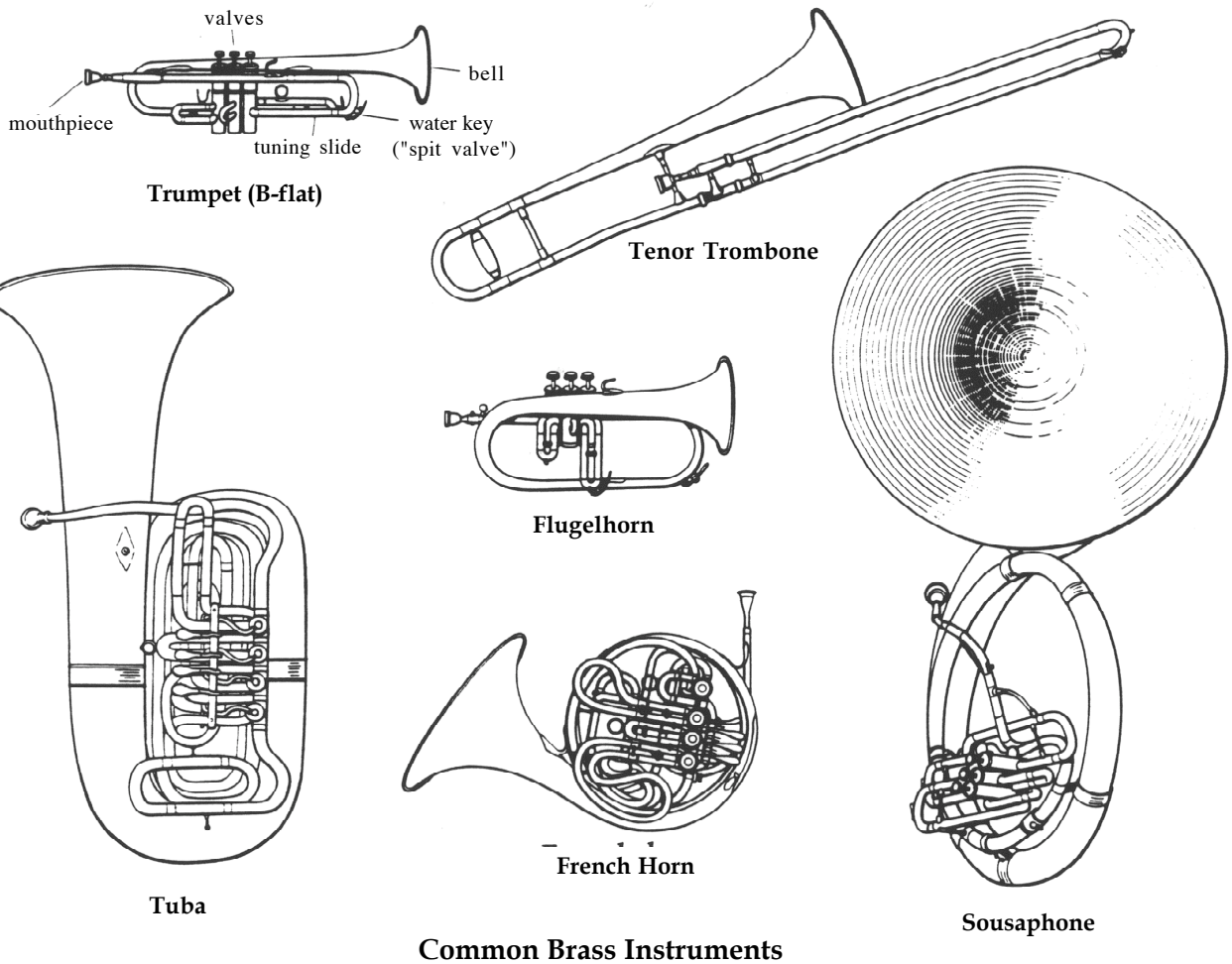
The brass family is comprised of powerful metallic instruments that must be blown into by the player to make a musical sound. The tone-color (timbre) of most brass instruments can be altered by the use of various types of **mutes** which are inserted into the large end of the instrument. Until the invention of the VALVE, brass instruments could only produce a limited number of pitches, which lessened their usefulness to composers. Instrument builders experimented with various VALVES that would avail more pitch varieties to these instruments. Many modern brass instruments have a system of 3 VALVES that can be depressed in various combinations to produce different pitches. The modern "rotary" valve was invented in the early Romantic period (c. 1830)—an invention that made the brass family more responsive and reliable. As a result, Romantic composers made greater use of the brass family.

The most common types of brass instruments include:

- various-sized ***trumpets*** (use **valves** to change pitch)
- various-sized ***trombones*** (use a **slide** instead of valves to change pitch)
- the ***"French Horn"*** (use **valves** to change pitch)
- the ***Tuba***—a very low brass instrument (uses **valves** to change pitch)

The standard range categorization of this family is as follows:

- **Trumpet** (soprano), **Alto Trombone** (alto), **Tenor Trombone** and **upper French Horn** (tenor), **Bass Trombone** and **low French Horn** (bass)



Common Brass Instruments

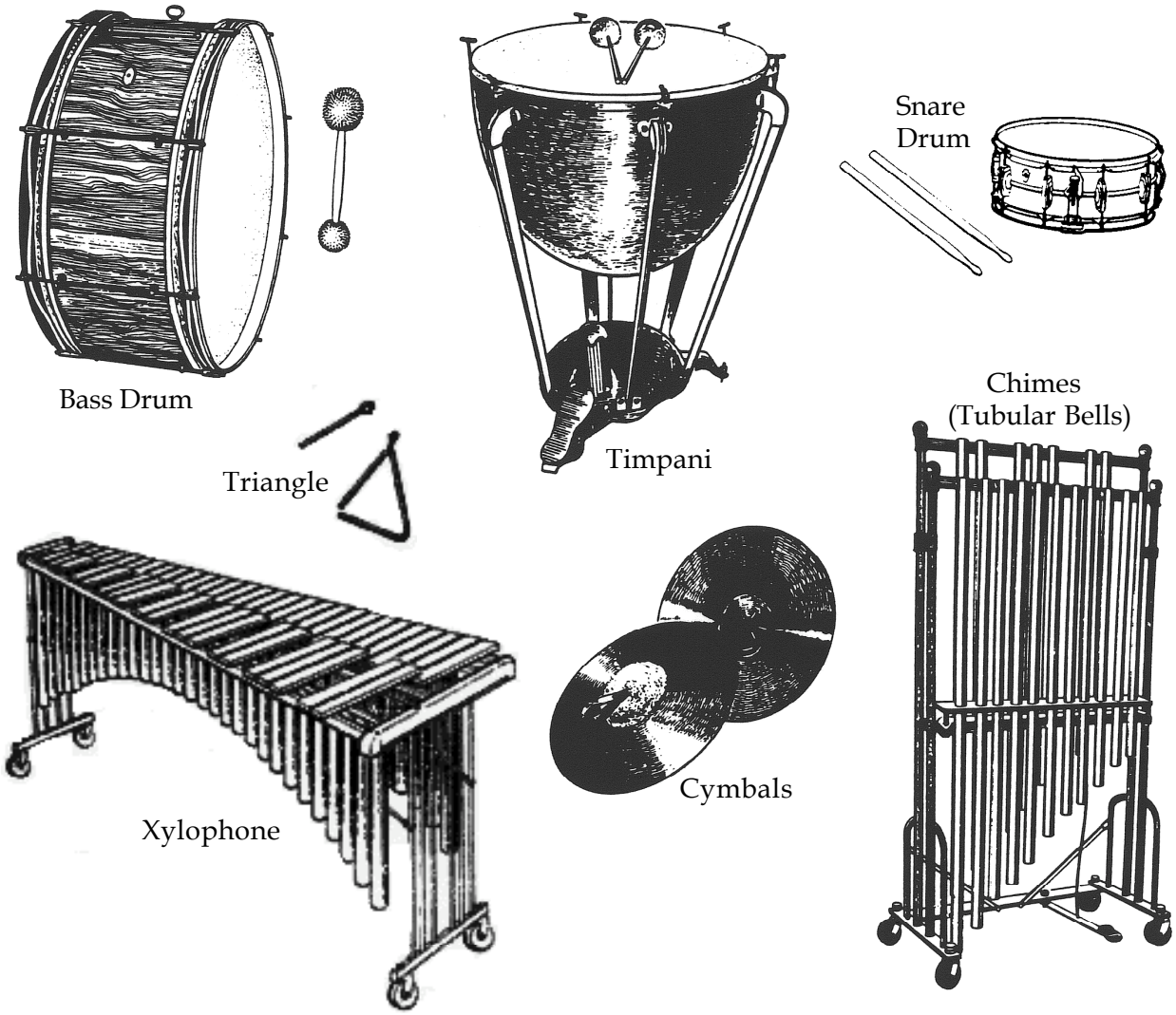
The PERCUSSION family

The percussion family is comprised of instruments that must be struck by an object (usually a mallet, a stick, or a hammer) in order to produce a musical sound. Composers have made greater use of percussion color in their scores since the 1880s. Percussion instruments fall into two types (**pitched** and **non-pitched**):

PITCHED Percussion (can play specific notes):
- ***timpani*** (various-sized kettle drums)
- ***piano*** and ***harpsichord*** (an internal object hits the strings)
- ***orchestra bells*** ("chimes"), ***glockenspiel*** (a rack of metal bars), and ***handbells***
- ***xylophone*** (an arranged series of various-sized *metal* bars)
- ***marimba*** (an arranged series of various-sized *wooden* bars)
- ***vibraphone*** ("vibes"—an electric "xylophone" with windpipes)

NON-PITCHED Percussion (no distinct pitch is created):
- ***bass drum*** • ***snare drum*** • ***castanets*** • ***cymbals*** • ***triangle***
- ***tambourine*** • ***gong*** (a large, suspended "Chinese" cymbal)

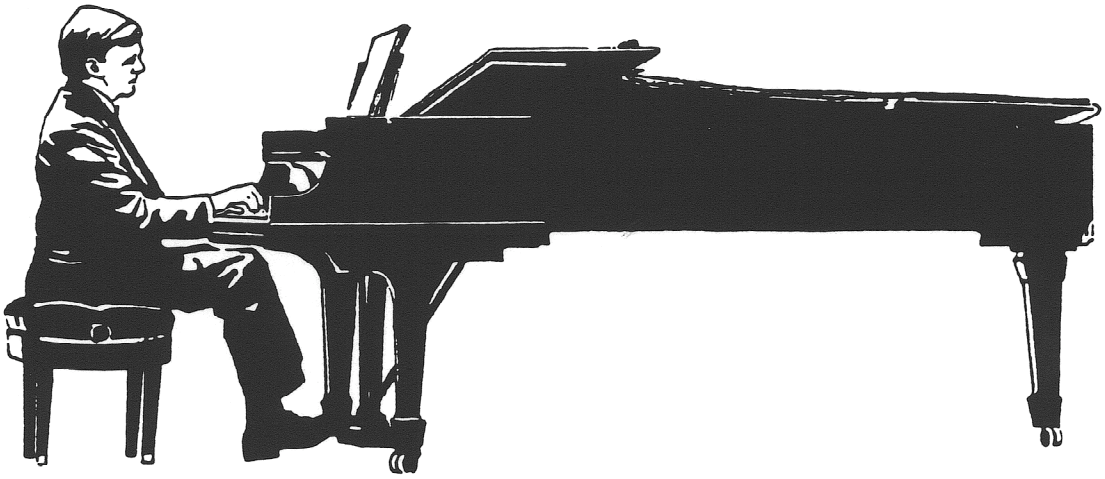
Both pitched and non-pitched percussion instruments can be classified by range, for example:
- **Triangle**/**Glockenspiel** (soprano), **Snare Drum** (alto), **Timpani** (tenor), **Bass Drum** (bass)



Some Common Percussion Instruments

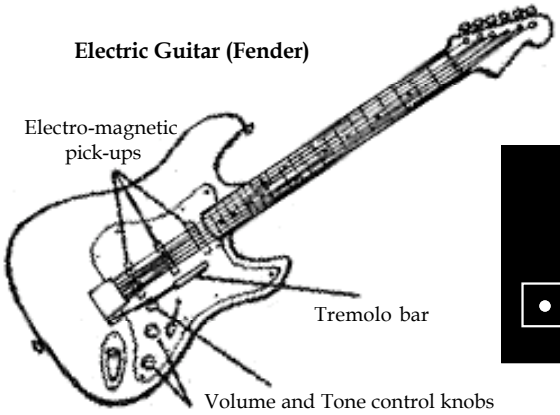
The PIANO

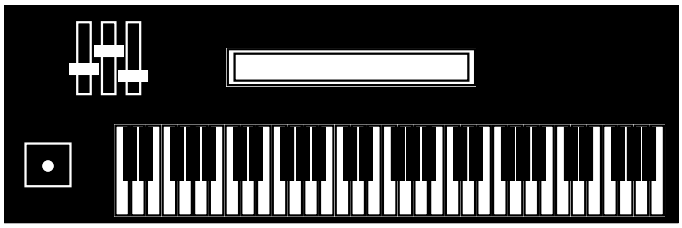
The piano, the most prominent of all keyboard instruments, is actually a percussion instrument, because it employs an intricate key-mechanism that engages a felt-tipped hammer to attack the string. The piano can produce a variety of dynamic contrasts and tone colors, depending on how hard/fast the keys are depressed by the player. The original piano prototype was called a "Fortepiano," because it was capable of playing both loud and quiet (unlike a harpsichord which has no dynamic variance.)



ELECTRIC and ELECTRONIC Instruments

Various **ELECTRIC** instruments (such as electric guitars, keyboards and amplifiers) have risen to prominence in the late 20th century, primarily due to developments in popular music. ELECTRIC instruments, however, should not be confused with **ELECTRONIC** instruments—true ***synthesizers*** that **rely on digital and/or microchip computer technology**. Synthesized instruments can *simulate traditional musical sounds* as well as *create sounds that are completely original*. Many *synthesized* keyboards, guitars, drum machines and wind instruments can communicate with computers through a technology known as **MIDI** ("**M**usical **I**nstrument **D**igital **I**nterface"). Synthesizers and the more traditional "Electric" keyboards and guitars have added new dimensions of color to modern music.





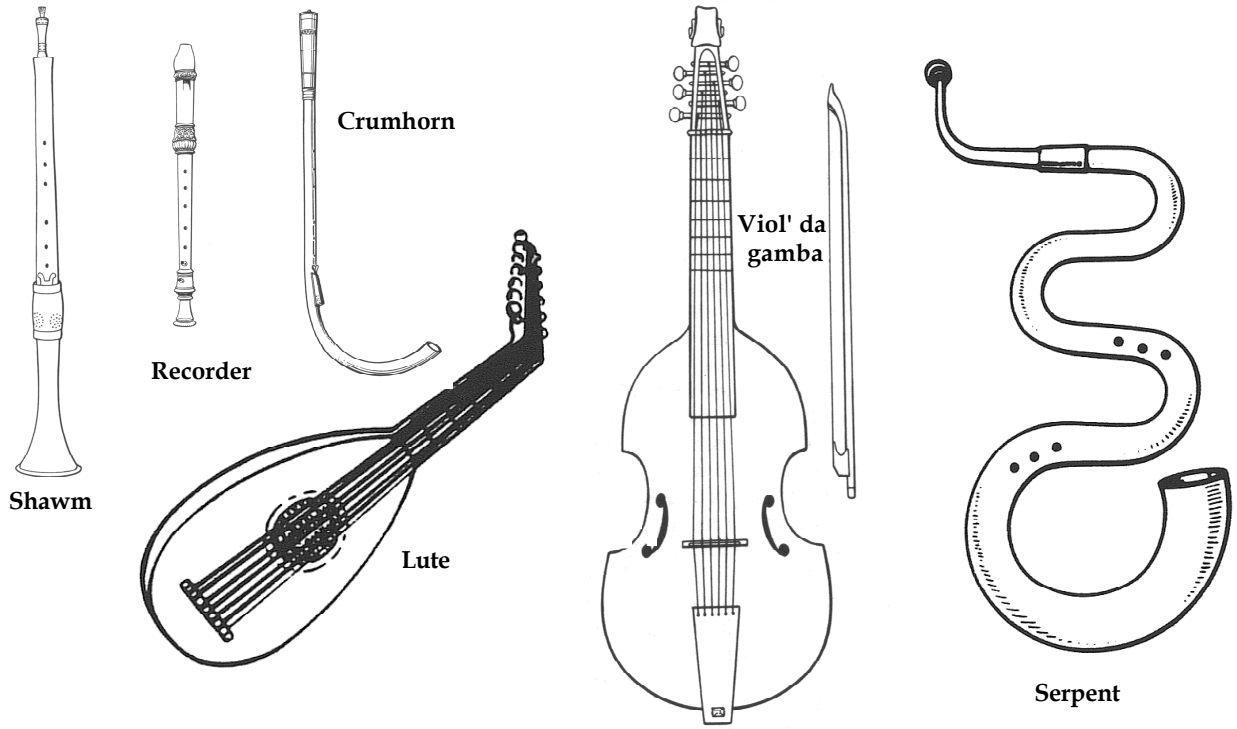
COMMON ANCIENT INSTRUMENTS

The VIOL Family (Ancestors to the modern violin family):
These bowed instruments come in a variety of sizes, and they have a lighter sound than that of the modern violins.

The LUTE Family (Ancestors to the modern guitar family):
The ***lute*** is a pear-shaped guitar-like instrument with a rounded back and a short, wide fingerboard. The ***lute***, and its larger relative the ***chitarrone*** (Bass-lute) were the most sophisticated polyphonic string instruments of the Renaissance.

Ancient WIND instruments (ancestors to the modern woodwind family).
Recorders (the preferred wind instruments of the Renaissance period) are various-sized wooden instruments that play much like a flute, but are softer in sound. The ***shawm***, the ***crumhorn***, and the ***racket*** are raucous-sounding reed-instruments that are ancestors to the modern oboe and bassoon.

Ancient BRASS instruments (ancestors to the modern Brass family).
Sackbuts are trombone-like instruments of various sizes used in the Medieval, Renaissance and Baroque eras. The ***cornetto*** and the ***serpent*** are trumpet-like wooden and leather instruments that use finger holes instead of valves to produce their pitches. The ***natural horn*** is a valveless brass instrument that evolved into the modern "French horn."



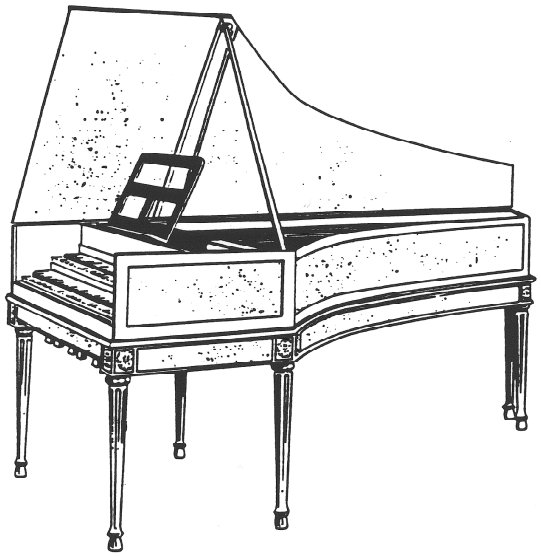
Selected Ancient Instruments

Ancient Keyboard Instruments

The harpsichord and organ were the most prominent types of keyboard instruments in the Renaissance and Baroque periods.

The HARPSICHORD (an ancestor to the modern piano)

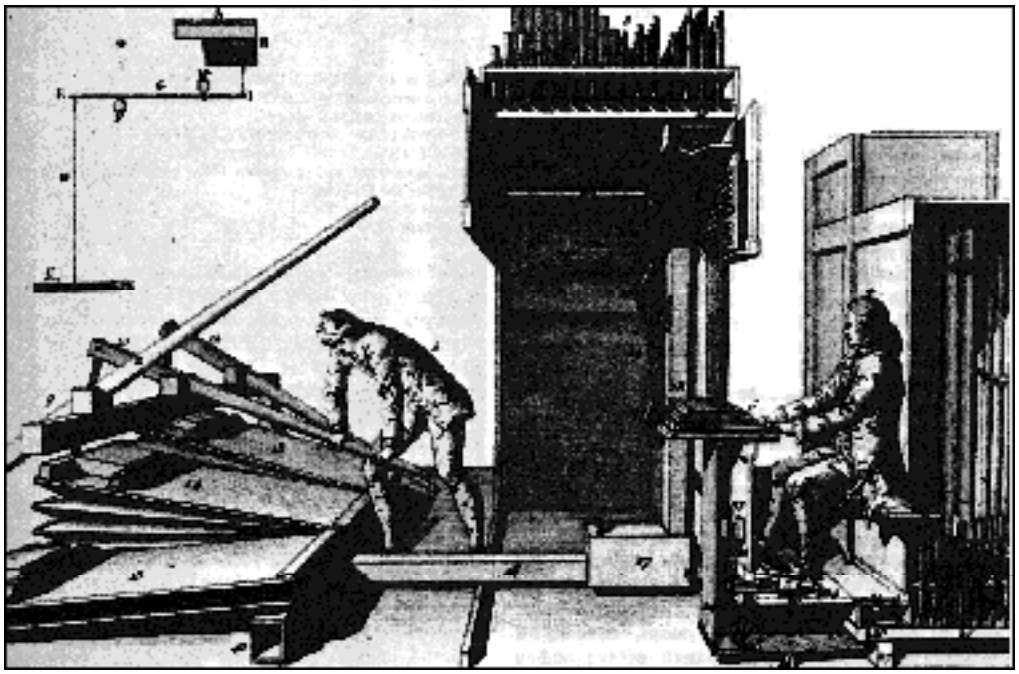
The harpsichord's distinctive "plucked" sound is due to its unique key mechanism: When one of its keys is pressed, a quill attached to a lever *plucks* the respective string, producing a sharp, dry sound that dies away quickly.



The harpsichord was the most popular keyboard instrument of the Renaissance and Baroque periods. It is still used today by performers specializing in early music.

The ORGAN

The organ—the most complex Western instrument ever devised— is comprised of a series of wooden or metal pipes connected to one or more keyboards (called *manuals*) via a set of "stops" (mechanical levers or electrical switches that open or close air flow to the individual pipes). Before the advent of electric motors, the wind pressure had to be supplied by an assistant pumping a *bellows* (a corrugated air bag).



This cross-section diagram of an 18th-century French organ, shows the hand-pumped air *bellows* and several *manuals* (keyboards) on the organ's console. A cut-away view of an interior church wall is located in the center of the diagram (the organist is to the right of the wall, the bellows operator is to the left of the wall)..

MUSICAL ENSEMBLES

It is essential that you remember the difference between an ***ensemble*** and a ***genre***. An ***ensemble*** (pronounced "ON-SAHM-BULL") is a group of musicians playing together. Ensembles range in size from smaller groups, such as string quartets (four players), to larger ensembles such as the symphony orchestra. The "type" of piece that a musician plays (such as *symphony*, *concerto*, *Mass*, *motet*, etc.) is the ***genre*** (pronounced "GSHAN-RUH")—the category of musical composition. For the most part, the terms for *genres* and *ensembles* are easily distinguishable. In a few cases, however, the same term can be used to describe BOTH a *genre* AND the *ensemble* that plays it. For example, the *string quartet* is a four-player chamber *ensemble* BUT it is also a *genre*. In other words, Beethoven's ***String Quartet in C minor*** is performed by an **ensemble** of four string players, but this work is also an example of the *string quartet* **genre**. The term *symphony* can also refer to BOTH a *genre* and the *ensemble* that plays it. It might be helpful to illustrate this with a musical example from a concert program:

The GROVE SYMPHONY ORCHESTRA
Dr. Joseph Twotwaba, Conductor

Symphony no. 1 in C minor — *Johannes Brahms (1833-97)*
Un poco sostenuto-Allegro
Andante sostenuto
Un poco Allegretto
Adagio-Allegro non troppo

Garden Grove Civic Auditorium

Saturday, November 2, 2007 8 PM

You can probably tell right away that the performing ***ensemble*** is a symphony orchestra. Now, what ***genre*** of music is being performed? It is evident by the title, ***Symphony No. 1 in C Minor***, that the *genre* is also a *symphony*. Each individual movement of this four-movement work has its own form (you can tell there are four movements because there are four Italian *tempo indications* listed below the title of the work).

* * *

The following are descriptions of the most common "classical" ensembles:

ENSEMBLES (performing groups)

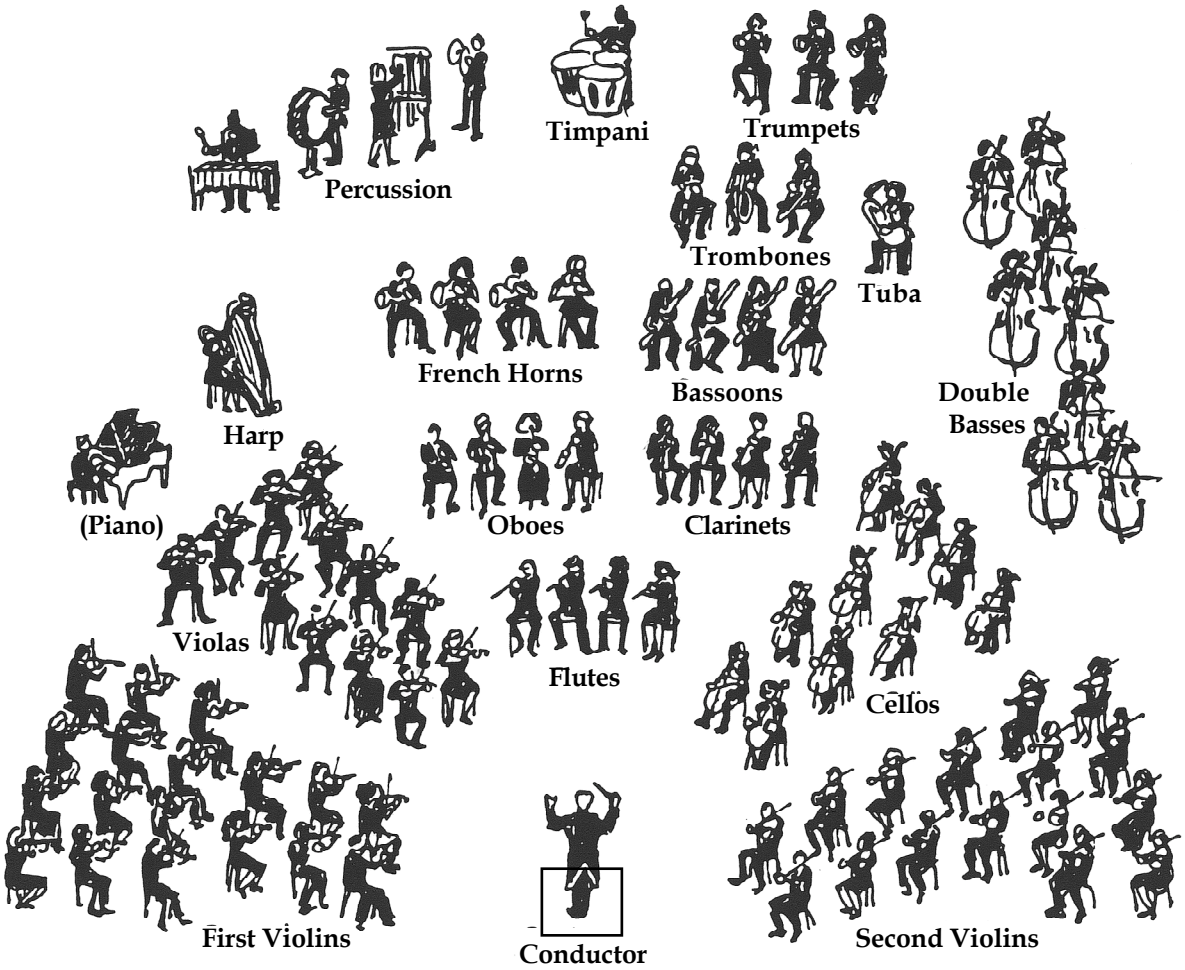
Large Ensembles

Orchestra (also called **Symphony** or **Symphony Orchestra**)
divided into four main families of instruments: *string*, *woodwind, brass*, and *percussion*. The illustration below shows one possible arrangement in relation to the conductor:

EXAMPLES of ORCHESTRAL INSTRUMENTS

BRITTEN: *Young Person's Guide to the Orchestra*

See MUSIC GUIDE 1 (page 8)



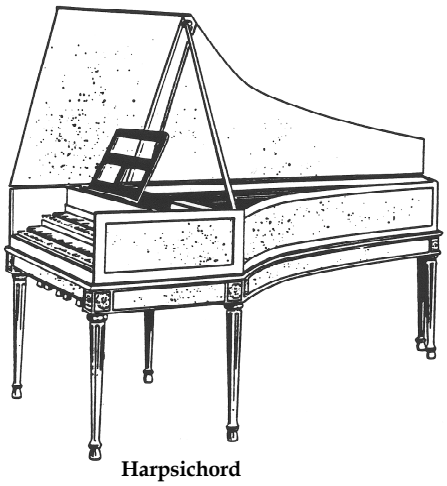
Concert Band
an *orchestra without strings*, with more emphasis given to the *brass*, *woodwind* and *percussion*. Types include symphonic band, jazz or dance band, and military band.

Choir (or Chorus)
a body of singers divided into sections according to voice type. Choirs may be all male, all female, or mixed (***women***: soprano & alto / ***men***: tenor & bass).

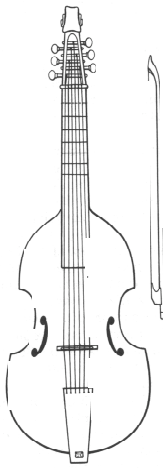
Small Ensembles

Basso Continuo

provided an improvised harmonic accompaniment for many types of Baroque music (similar in function to the keyboard and bass instruments in today's jazz, rock and pop styles). *Basso continuo* was usually comprised of a keyboard instrument (harpsichord or organ) and a melodic bass instrument (cello or viol' da gamba).



Harpsichord



Viol' da gamba

Chamber Ensembles

groups of 1 to 10 players that perform *chamber music* (usually without a conductor). The *string quartet* and the *woodwind quintet* are the most common examples of modern chamber ensembles.

The String Quartet

an instrumental ensemble with four players (two violins, viola and cello):

The Woodwind Quintet

(a *quintet* is any chamber ensemble having five players). A woodwind quintet is a specific group of four *woodwind* instruments (flute, oboe, clarinet, and bassoon) plus "French" Horn (a *brass* instrument that blends well with winds).

THE ROLE OF THE CONDUCTOR

Think of what would happen if an orchestra had to perform without its conductor? With no one at the helm, the results could be disastrous. Who would determine the tempos or the dynamic levels? Who would cue a player after he/she had not played for several minutes? What about the rehearsals? Without the conductor, much time would be wasted, and rehearsal time for a large, professional ensemble is extremely expensive. Inefficient rehearsals usually lead to poor performances, which can embarrass the performers and result in loss of audience interest and financial support. Rehearsals can be especially critical for the non-professional conductor, whose players/singers are usually less available for rehearsals and less skilled than paid musicians. In such cases, the conductor must allocate the rehearsal time for maximum efficiency—attacking areas where the ensemble needs the most polishing.

Conductors must be multi-talented. They must thoroughly know the musical score (the notes on the printed page) and its proper interpretation (style considerations). They should fully understand instrumental and vocal production, and they must know the abilities and limitations of the group's players. Aside from these innumerable technical demands, today's conductors are also responsible for the well-being of the personnel that make up their ensembles. Thus, conductors are often involved in hiring, firing or recruiting players; they may intervene in contract negotiations or clear up disputes between orchestra members, and they usually serve as the liaison between the musical organization and the public.

Above all, the conductor's greatest responsibility is to determine the proper interpretation of the music. Maestro Varujan Kojian, former conductor of the *Santa Barbara Symphony* and the *Ballet West*, put it this way: "If you ask 110 players about interpreting a piece, then you will get 110 different viewpoints. Variety may be the spice of life, but when it comes to interpreting a piece of music, it should be left to only one person—the conductor."

So, do not be fooled into thinking that conductors just stand up in front of an orchestra, looking pretty and flapping their arms to impress the audience. Such gestures, which may at first seem flamboyant or unnecessary, help to convey the conductor's interpretation to both the players and the audience. Without the efforts that conductors make on and off the stage, today's large-scale performances would be virtually impossible.